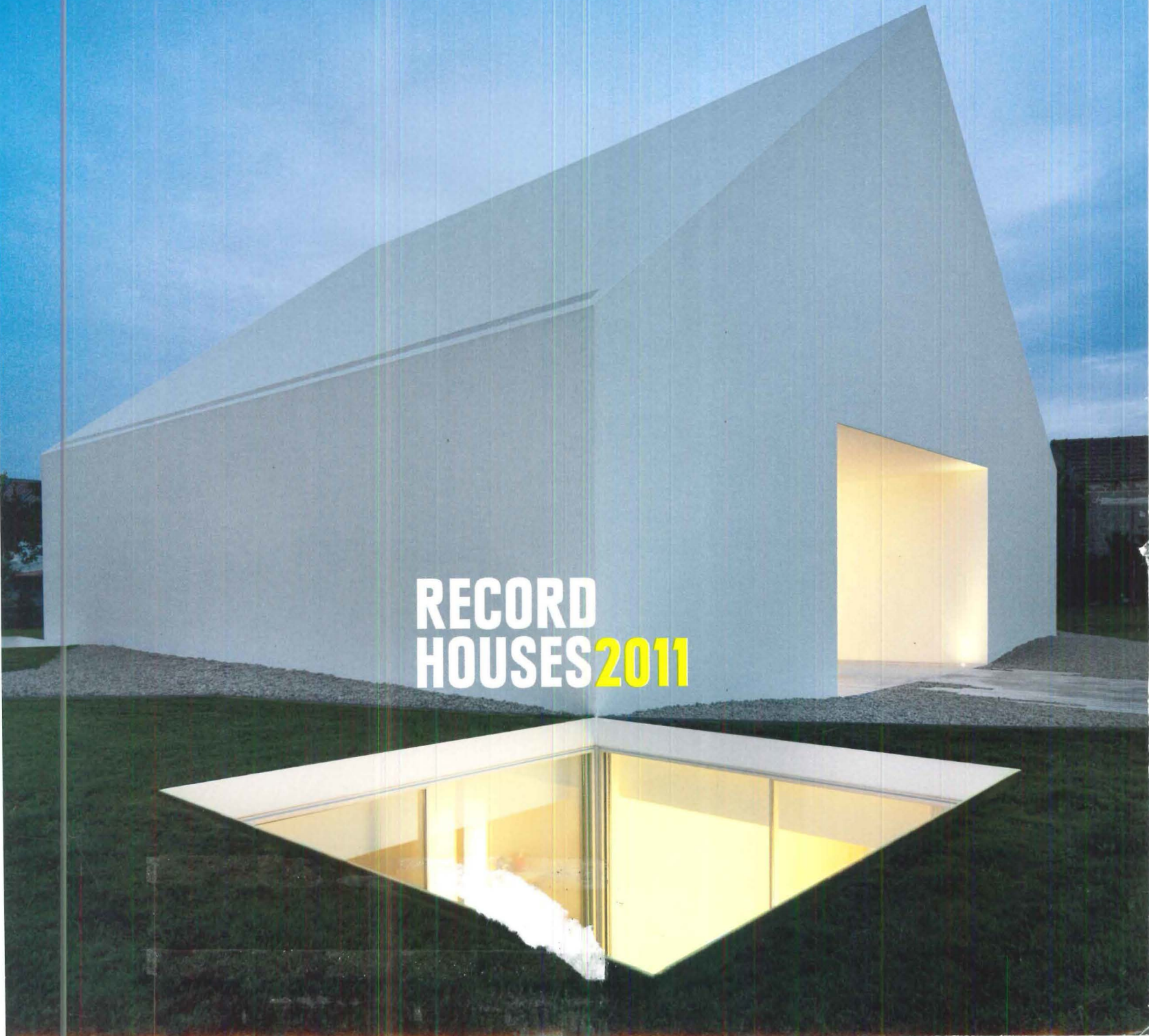
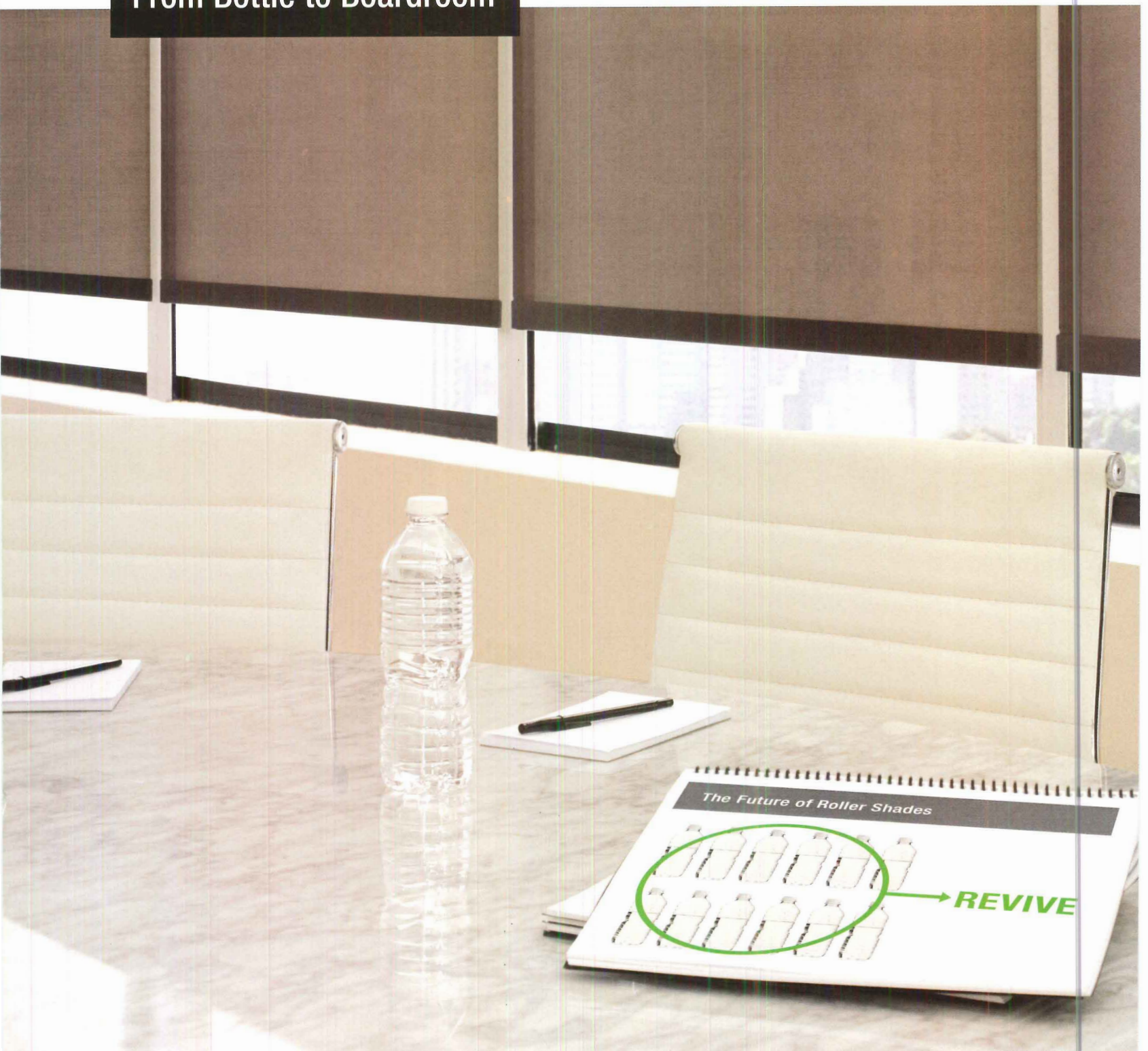


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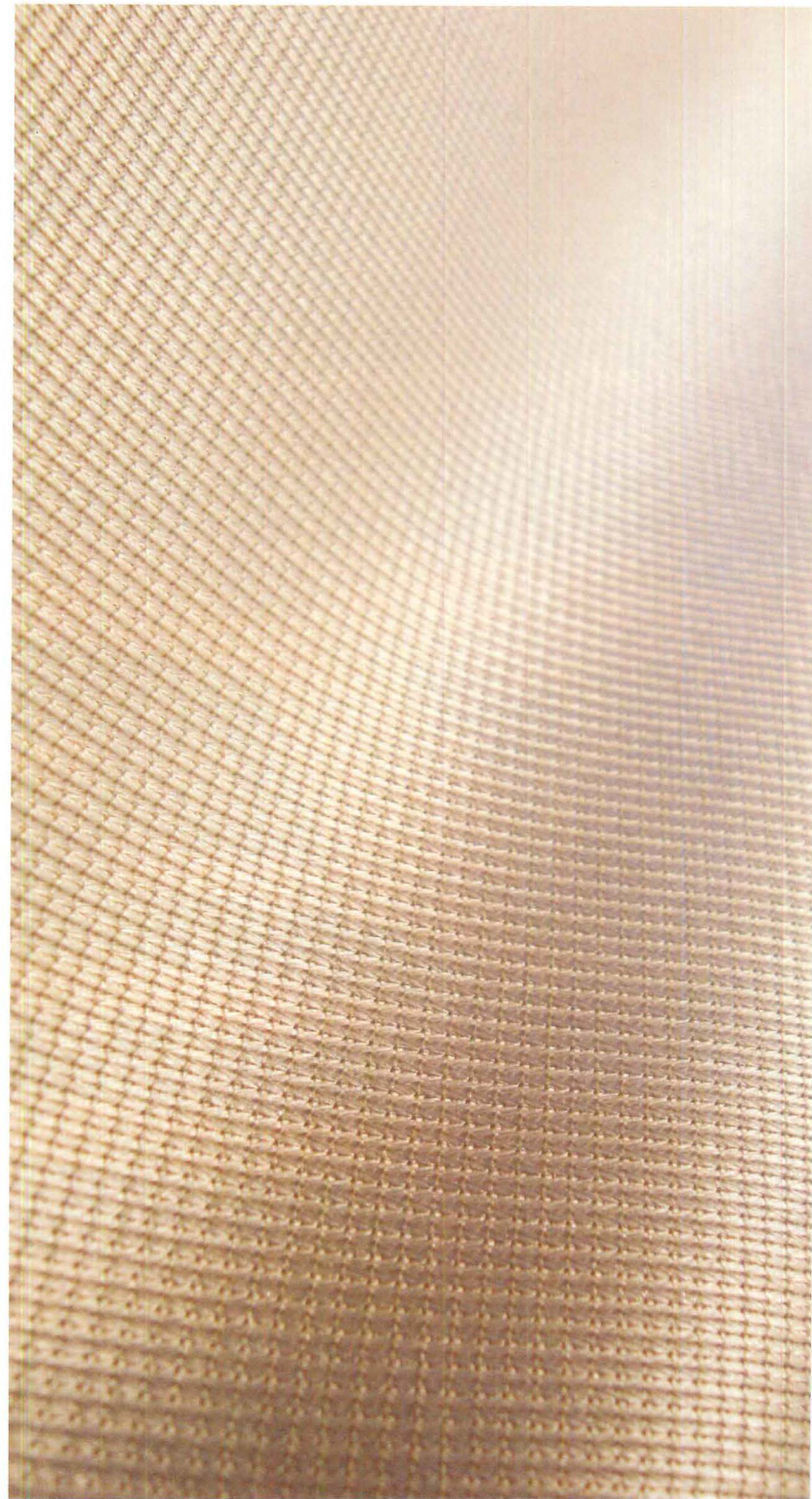


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DEPUTY EDITORS Clifford A. Pearson, pearsonc@mcgraw-hill.com
Suzanne Stephens, suzanne_stephens@mcgraw-hill.com

SENIOR EDITORS Jane F. Kolleeny, jane_kolleeny@mcgraw-hill.com
Joann Gonchar, AIA, LEED AP joann_gonchar@mcgraw-hill.com

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NEWS EDITOR Jenna M. McKnight, jenna_mcknight@mcgraw-hill.com
SPECIAL SECTIONS EDITOR Linda C. Lentz, linda_lentz@mcgraw-hill.com

PRODUCTION MANAGER Juan Ramos, juan_ramos@mcgraw-hill.com
EDITORIAL PRODUCTION Rosa Pineda, rosa_pineda@mcgraw-hill.com

ART DIRECTOR Helene Silverman, helene_silverman@mcgraw-hill.com
CONSULTING ASSOCIATE ART DIRECTOR Donna Agajanian, donna_agajanian@mcgraw-hill.com

EDITORIAL SUPPORT Monique Francis, monique_francis@mcgraw-hill.com

EDITORIAL ASSISTANT Laura Raskin, laura_raskin@mcgraw-hill.com

CONTRIBUTING EDITORS Sarah Amelar, Robert Campbell, FAIA, Andrea Oppenheimer Dean, Martin Filler, C.J. Hughes, Blair Kamin, Jayne Merkel, Robert Murray, B.J. Novitski, David Sokol, Michael Sorkin, Ingrid Spencer

SPECIAL INTERNATIONAL CORRESPONDENT Naomi R. Pollock, AIA
INTERNATIONAL CORRESPONDENTS David Cohn, Tracy Metz

WEB EDITOR William Hanley, william_hanley@mcgraw-hill.com
WEB PRODUCTION Laurie A. Meisel, laurie_meisel@mcgraw-hill.com

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TECHNOLOGY: Roy Kops
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PRODUCT NEWS SPOTLIGHT: Elise Rutkowsky (609) 426-7738 Fax: (609) 426-7136, elise_rutkowsky@mcgraw-hill.com,
Kameesha Saunders (609) 426-7703 Fax: (609) 426-7136, kameesha_saunders@mcgraw-hill.com,
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INTERNATIONAL

GERMANY: Uwe Riemeyer
(49) 202-27169-0 Fax: (49) 202-27169-20, riemeyer@intermediapartners.de

ITALY: Ferruccio Silvera
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KOREA: Young-Seoh Chin
(822) 481-3411/3 Fax: (822) 481-3414

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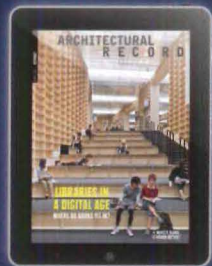


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ABOVE: 18.36.54 House, Connecticut, by Studio Daniel Libeskind. Photo by Todd Eberle.

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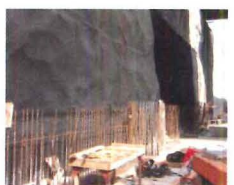
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- For Cocktail Napkin sketch, think about unleashing your creative genius within about 20 minutes.
- Sketches are to be drawn specifically for this competition.
- Sketches should be architecture oriented.
- Create a sketch on a 5-inch-by-5-inch white paper cocktail napkin.
- Use ink or ballpoint pen.
- Include the registration form below or from the website.
- You may submit up to 6 cocktail napkin sketches, but each one should be numbered on the back and include your name.
- No digital entries and no digital files accepted!
- No entries will be returned.
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- Judges for this contest are Architectural Record Editors.
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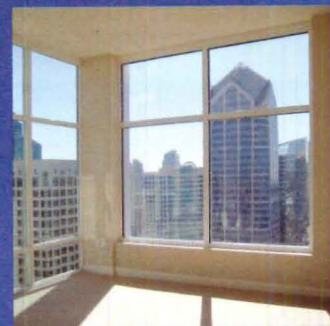
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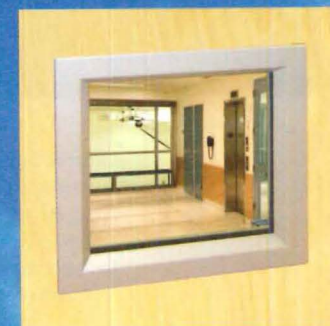
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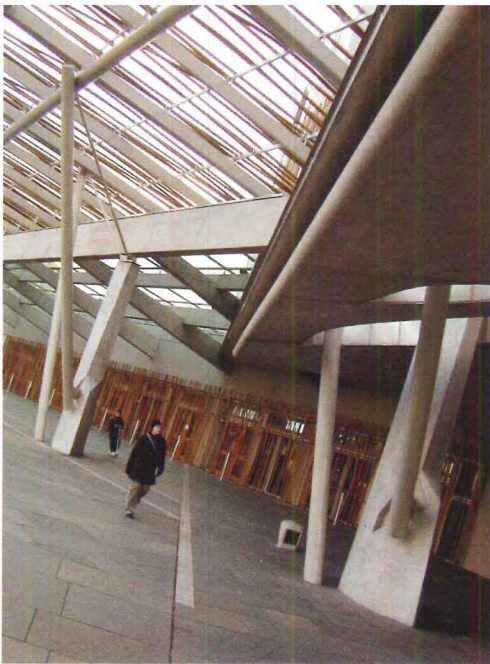
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[READER PHOTOS]



Our news story about the pending destruction of Wayland High School, a 1960 Boston-area complex designed by the Architects Collaborative, the noted Cambridge firm cofounded by Walter Gropius, generated a discussion that will definitely crop up again as more and more mid-20th-century buildings begin to require serious upgrades and repairs.

[COMMENTS AND LETTERS]

"I am a student at WHS and a huge lover of architecture. While these edifices may be historically important, their era is over. Over vacation, two classrooms suffered flooding due to the age of the buildings. I have two friends who use wheelchairs around campus, and they are actually unable to access certain places in the Administration, Arts, and Language buildings due to a lack of accommodations. In New England, where winters can be harsh, a campus with separate buildings for every subject is simply impractical. Not only that, but the classrooms that do exist are entirely too small. Twenty-five-plus students are now crammed into a classroom—sometimes there isn't enough room for a teacher to move through the rows of students...Not only will the new school building be able to accommodate more students, it will be environmentally efficient, a cause about which many WHS students and teachers are passionate. While I will be in the new school for only a year at the most, I am



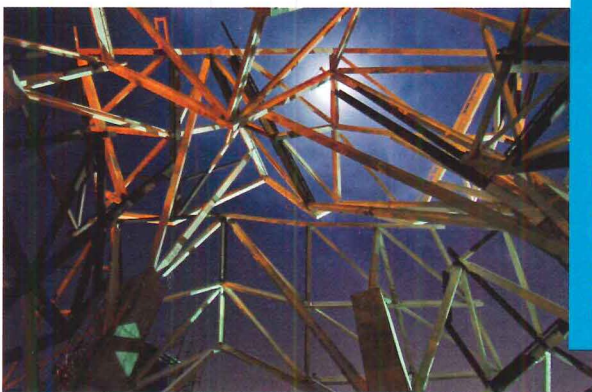
The Architects Collaborative's Wayland High School opened in 1960. With the exception of the field house, the complex will be razed.

confident that future generations of WHS students and faculty will thrive and succeed in a building more suited to the community's needs."
 —Anonymous

"To the student who posted, I think 99 percent of the posters on this thread understand the need for updated spaces and ADA upgrades. Sometimes it just does not make

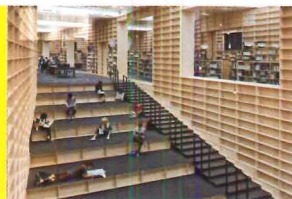
sense financially to renovate a facility. A good number of the comments revolve around the bland design of the new building. This could be an office building in a business park, a bad school, an industrial facility, etc. In the United States we have an evolving precedent being set to pull a design 'off the shelf,' as this looks like it was. People have become numb to their surroundings and the buildings they visit. Interesting design encourages people to visit these places and enjoy being there. I hope this building can achieve that, but I fear that after a few years and the excitement of a new facility has left, there will be nothing to look forward to daily." —jmsrchl

"It is truly a shame that apparently not much careful thought was given to renovation. Asbestos in ceiling and floor tiles, as pipe wrap, etc., is a known quantity and the building could have been gutted easily...a little trenching in concrete and then the buildings' interiors could be ANYTHING, including all-new HVAC, plumbing, electrical, fire alarm, and audio-visual systems! I totally disagree that it is more expensive to renovate, even with some repair and/or replacement to the soffits and roofs. If you have a knowledgeable architect, who is really familiar with renovations, this project would have been so beautiful...What a crying shame." —ademagistris



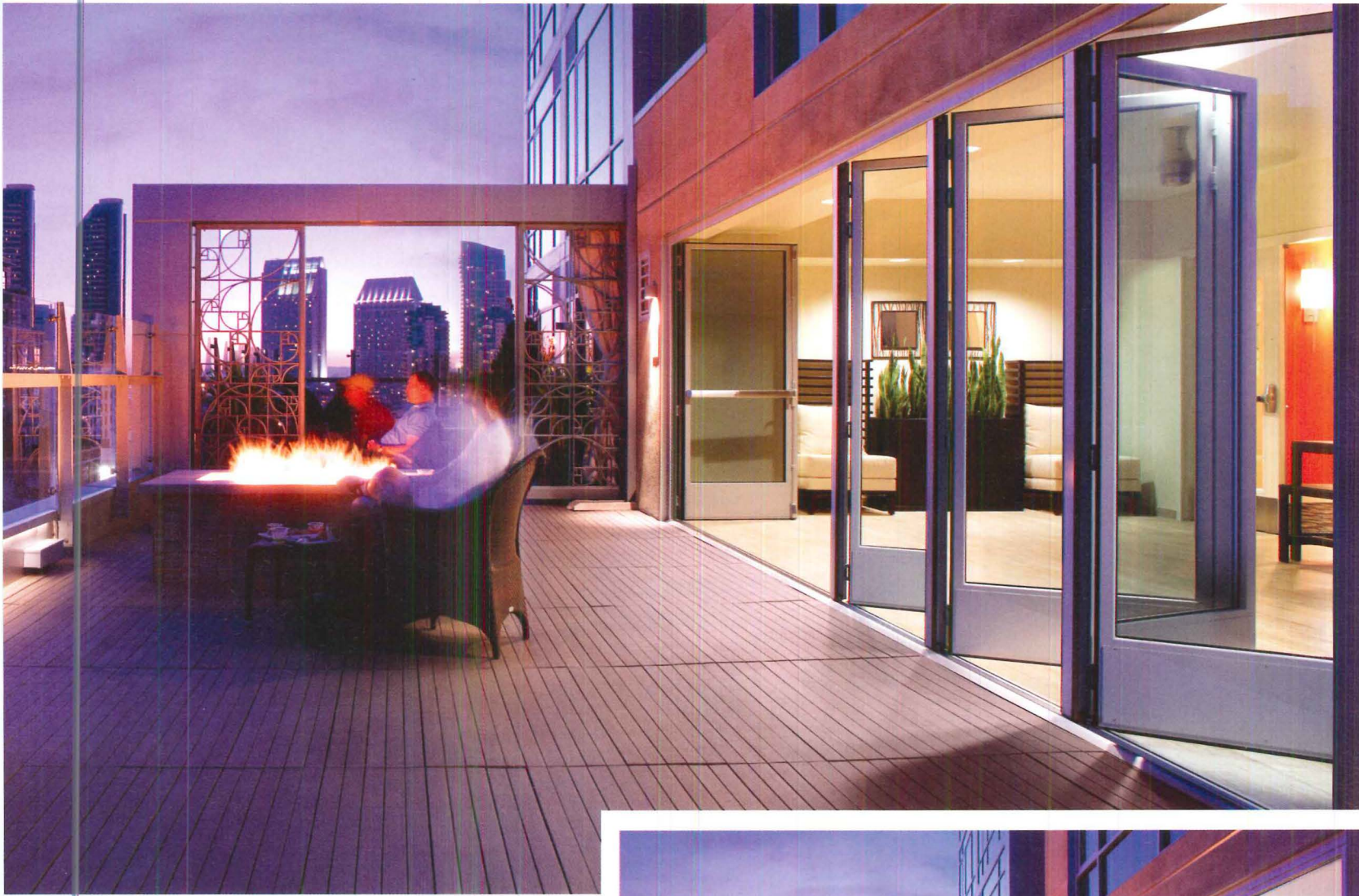
Every month, we call out the best photos submitted to our online galleries, including these images of Enric Miralles/EMBT's Scottish Parliament building in Edinburgh (top) and Frank Gehry's Biomuseo (left) under construction in Panama City, in our Top Ten Reader Photos feature.

Correction: The images of Sou Fujimoto's Musashino Art University Museum & Library (right) that appeared on the cover and on pages 61-67 of the March issue were attributed to the incorrect photographer. The credits should read: Photography: © Iwan Baan.



Photography: (top left) Submitted by "riccardo"; (top right) © Christine Cipriani; (bottom left) Submitted by "rgumpel"

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Domestic Seduction

Why we are drawn to those sexy, dangerous houses.

SOME OF OUR readers call our annual RECORD Houses issue the “Swimsuit Issue.” It’s not exactly our mission (and we don’t normally equate ourselves with *Sports Illustrated*), but we’ll take it. Every year since 1956, ARCHITECTURAL RECORD has compiled and published a collection of houses from across the world – a telling snapshot that captures and reflects the state of architecture at a distinct moment in time.

The houses we select – not just for RECORD Houses, but also for our new House of the Month column and the Featured Houses section on our website – are not wallflowers or trend followers. They stick their necks out and strut, so, unsurprisingly, they attract lots of attention, both positive and negative. Apparently, not everyone is swept away by their sex appeal. You, our readers, we are happy to say, are opinionated and vocal.

Over the years we have been called out on the houses we publish and the preponderance of high-maintenance material choices and big budgets. We have been taken to task about context and a lack of conformity – buildings that don’t follow the conventional setback from the street or apply the prevailing local material palette have been accused of “snubbing” their neighbors. We have listened as readers marvel that roofs attached to the structure by delicate moorings do not let loose and take flight. We have been asked how occupants perform such pedestrian duties as putting away groceries, making the bed, and cleaning. We have been advised to refer to *Fine Homebuilding* for guidance in the residential-project-selection process as well as for edification in terms of addressing our audience. We have been called overindulgent. And we have been lambasted, again and again and again, for acknowledging houses with handrail-less stairs. In a nutshell, some readers tell us, the projects we highlight are too expensive, too different, too impractical – too dangerous!

In the world of everyday practice, a focus on durability and utility – *firmitas* and *utilitas* – is a given. But the houses you will see on these pages are exploratory and look beyond. There is a good likelihood they don’t have all the problems solved, all the kinks worked out – they invariably are imperfect. We know this is a byproduct of the tradition of the house as



The Fullerton Kit house, as pictured in a 1920s Sears, Roebuck “Modern Homes” catalog. Houses like this reassure us and reiterate what has long been a part of our lexicon.

laboratory for the development and testing of ideas that may eventually seek expression at a larger scale.

We value functionality and code compliance. But they do not motivate architects to test limits and move the discipline forward. These matters, therefore, are not the primary focus of RECORD Houses, nor should they be allowed to impede the issue’s commitment to serving as a showcase for design and innovation. The houses here are ones that set forth a vision – not ones that illustrate tried and tested design and construction methods that have resolved yesterday’s challenges and refined last decade’s ideas. They are not the archetypal house, which reassures us and reiterates what has long been a part of our lexicon.

Architecture, at its most basic, is about sheltering in an artful way. The house is most representative of that idea, of course, and can be described as the atom of the architectural molecular world as well as serving as a barometer for future trends and directions in the field. And, by its very nature, the house is a cultural artifact, revealing much about its time and place and telling stories about its occupants and the people who designed it.

Adolf Loos questioned whether the house, like all other architecture that fulfills a direct function – famously excepting the tomb and monument – can be considered art. We think it can (the history of architecture offers us many examples). But to do so, it must forsake being “safe,” and take on all of the challenges and risks that are inherent in experimentation and investigation.

—The Editors

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[DEMOLITION]

Steve Jobs, the Demo Man

Decades ago, Jobs purchased the historic Jackling mansion in Silicon Valley. In February, he finally succeeded in tearing the house down.

CULMINATING YEARS OF legal battle with preservationists, Apple Computer CEO Steve Jobs demolished the historic Jackling House on his property in Woodside, California. In February, this affluent Silicon Valley enclave issued the final demolition permit, and within days, the mansion – by architect George Washington Smith, father of the Spanish Colonial Revival style in the United States – was flattened, leaving far-reaching issues lingering in that great cloud of dust.

The saga of Jobs and the 17,250-square-foot, 14-bedroom mansion dates back to 1984, when he purchased it for a reported \$2 million. He was 29 and had just launched the Macintosh. Early photos of Jobs at the house suggest its fine condition, though his bachelor furnishings apparently amounted to little more than a mattress and state-of-the-art audio system. Whatever his original intentions, he would later scorn the house as “an abomination.” After living there a decade and then renting it out, he left it vacant from about 2000. He later maintained, “I bought [the property] to tear down the house, [but] I’ve been very busy the last 20 years.” He wanted to replace it with a smaller home.

Easier said than done. Because the mansion was over 50 years old, its demolition required review under the California Environmental Quality Act (CEQA), which extends protections to historical resources. The review found the house eligible for California’s Register of Historical Resources. Later the National Trust for Historic Places would weigh in, defending its worthiness for preservation.

The white-stucco Jackling House, built in 1926 for copper magnate Daniel C. Jackling, evoked adobe’s heft with an unusual and superbly insulating double-wall system. The interior included thousands of handmade Tunisian and Spanish tiles, dark wood-clad steel beams, wide-plank white oak floors, an Aeolian pipe organ, and copper-rich custom hardware and chandeliers.

Despite its historic value, Woodside issued the demolition permit in 2004, citing “overriding considerations.” An ad hoc citizens’ group sued the town for violating CEQA. In January 2006, a California Superior Court ruled Jobs could not destroy the house, holding that local government had bent its statutes for one powerful individual. Jobs appealed the decision and lost.

For long periods, the mansion was left to decay, open to the elements, with doors and windows removed and no plywood covers. Jobs reworked his proposal and, in 2008, reapplied for the permit, which the town granted and preservationists contested in court. His case rested on a questionable cost comparison: replacing the house with a 6,000-square-foot home (by Bohlin Cywinski Jackson, designers of the Apple Stores) versus historic restoration of the derelict mansion with extensive luxury enhancements. This time, the court ruled in Jobs’s favor.

His concession, as early as 2004, was to give the house to anyone willing to move it. But no interested party was given the chance, including Woodside residents Richard Pivnicka, who had successfully restored other distressed historic properties, and Magalli and Jason Yoho, who committed to a detailed preservation proposal endorsed by the National Trust. At least some



The 14-bedroom California mansion was designed by noted architect George Washington Smith and built in 1926.

proposals needed “a reasonable contribution” from Jobs toward the relocation. No deal progressed.

But what if Jobs had put the funds he poured into destroying the house toward its creative salvation? What if he had embraced relocation as a win-win, freeing his land while preserving a cultural resource? Would a “reasonable contribution” (public or undisclosed) have impinged on a man with \$8 billion net worth? Or why didn’t he sell the property years ago, and be done with it?

According to Brian Turner, a National Trust regional attorney, “In property disputes, people tend to defend their initial position. They develop tunnel vision, dig in their heels.”

The house is history, but, in keeping with the town’s stipulations, most interior fittings were salvaged – even Victorian marble sinks, reputedly from a house Jackling had demolished to build his estate. *Sarah Amelar*

WEB HIGHLIGHTS

- Dispatches from Devastated Japan
- Anish Kapoor, Cecil Balmond’s “London Orbit” Rising Fast
- DiMenna Music Center by H³ Hardy Opens in NYC

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[PRESERVATION]

Taliesin Celebrates 100 Years



In honor of Taliesin's centennial, a series of events will be held at the Wisconsin estate this year.

MOST ARCHITECTS ARE well acquainted with Taliesin, one of the most storied dwellings in America. Situated in the rolling countryside near Spring Green, Wisconsin, the 600-acre estate was Frank Lloyd Wright's primary residence and studio for more than four decades. It also was the original campus for Wright's architecture school, launched in 1932. This year marks Taliesin's centennial – a remarkable birthday for a work of architecture that wouldn't look out of place among today's modern homes. "Like his Oak Park house, Wright used Taliesin as an opportunity to experiment," says Anthony Alofsin, a noted Wright scholar. "He was constantly testing new ideas."

Wright set out to build Taliesin in 1911 after many years in Chicago, bringing with him Mamah Borthwick Cheney, his mistress and former client. The architect, then 43 years old, was deeply connected to the bucolic site, as his Welsh relatives had settled in the area in the 1800s. The house began as a wood-and-stone bungalow tucked into the brow of a hill ("Taliesin" is Welsh for "shining brow"); over the years, it grew into a 37,000-square-foot complex. Wright experts emphasize that Taliesin was intentionally never finished. "It's a perfect demonstration of what organic architecture might mean: It's constantly adapting to life," says Sidney Robinson, a faculty member at the Frank Lloyd Wright School of Architecture.

Some adaptations followed misfortune. In August 1914, on a day when Wright was away, a crazed servant set the house ablaze and killed, with an ax, six fleeing inhabitants, including Cheney. Years later, in 1925, Taliesin caught fire again, this time due to lighting or an electrical fault. In both cases, the house was salvaged. By 1927, Wright was in financial straits. He lost the house to the bank, but his supporters came to the rescue, raising money and buying the property at auction.

Succeeding years were happier ones for Wright: he remarried; he founded his school; his practice thrived. In 1937, he built Taliesin West, a winter campus in Scottsdale, Arizona. He split his time between both sites until his death in 1959.

Today, Wright disciples carefully manage Taliesin. Various elements added after the architect's death have been removed, including a swimming pool and blue shag carpet. Remarkably, several of the school's early fellows, now in their eighties and up, still live at the site, as does a couple with young children. "It's nice to see kids playing in the sprinklers," says Robinson. "Nobody wants Taliesin to become an empty museum." *Jenna M. McKnight*

Notable Houses in 1911

We combed through back issues of **RECORD** to see what types of houses were appearing in 1911, the year Taliesin began construction.

RESIDENCE BY LOUIS SULLIVAN

Conceived for Henry Babson, this two-level Riverside, Illinois, home was profiled alongside Wright's Coonley House – both deemed "a revolutionary departure from the classic tradition."



COUNTRY ESTATE BY DELANO & ALDRICH

While French and Italian conventions influenced its design, this mansion in Mount Kisco, New York, was described as an "excellent example" of a nascent American style.



SUMMER HOME BY JOHN RUSSELL POPE

This house in Greenlawn, Long Island, was designed for Charles A. Gould. Intended to be framed by trees, the lofty central volume recalls French domestic architecture.

Firm: John Friedman Alice Kimm AIA | Photographer: Fotoworks

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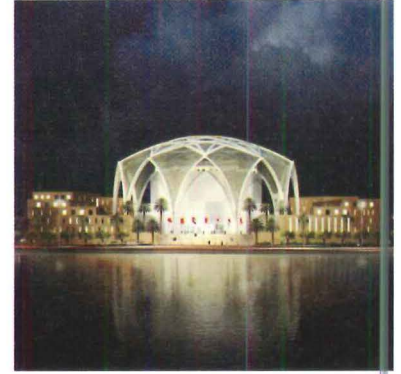


Project **Mashouf Performing Arts Center**
Location **San Francisco**
Architect **Michael Maltzan Architecture**

San Francisco State University has unveiled plans for a new, 242,000-square-foot performing arts center by Los Angeles-based Michael Maltzan. Designed to express a "spirit of creativity," the building will include a 1,200-seat theater and four smaller theaters, along with classrooms and broadcasting facilities. The project is being partly funded by a \$10 million gift from the businessman Manny Mashouf and his former wife, Neda Nobari. Construction is slated to begin in December 2012.

Project **UAE Parliament Building**
Location **Abu Dhabi, UAE**
Architect **Ehrlich Architects**

Ehrlich Architects has won an invited competition to design the United Arab Emirates' new parliament building. Situated on the Persian Gulf, the 1.3 million-square-foot complex incorporates traditional Arabic motifs and includes a 100-meter-diameter domed structure that evokes a desert flower. The Los Angeles firm beat out three other finalists: Foster + Partners, Massimiliano Fuksas Architects, and Zaha Hadid Architects. Construction is expected to begin in 2012.



Project **Green Tech City**
Location **Hanoi, Vietnam**
Architect **Skidmore, Owings & Merrill**

SOM has five active projects in Vietnam, including a master plan for Green Tech City, a new, 358-acre urban district. The design, which integrates two existing villages, calls for low-rise neighborhoods, a cluster of high-rises, and ample parkland. Tri-generation plants and rainwater harvesting are among the scheme's many sustainable features. The plan awaits final approval.

IMAGES: COURTESY SFSU (LEFT); COURTESY EHRLICH ARCHITECTS (TOP);
COURTESY SOM (BOTTOM)

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Work to Begin on Transbay Center

When the wrecking ball came down on San Francisco's 71-year-old Transbay Terminal bus station last December, it marked the end of an era – and the beginning of a new one. The drab concrete structure will be replaced with the long-planned Transbay Transit Center, perhaps the most ambitious transportation hub to be built in the United States in the past few decades. Construction is slated to begin this May.

The \$4.2 billion project, designed by Pelli Clarke Pelli Architects, includes a multimodal transportation hub, a

5.4-acre rooftop park, and a 1,000-foot-tall tower that will displace the Transamerica Pyramid as the city's tallest building. The transit center, scheduled for completion in 2017, will be the focal point of a new mixed-use downtown neighborhood south of Market Street. Funding will come from a variety of sources, including sales-tax revenues, bridge tolls, and federal loans and grants.

In 2007, Pelli Clarke Pelli won a competition to design the project, which is being developed by the Transbay

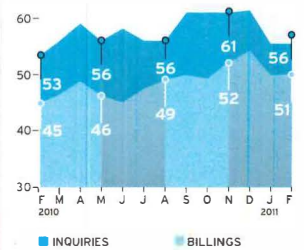
Joint Powers Authority. The structure will occupy nearly five city blocks and accommodate buses, commuter trains, and California's planned high-speed rail line, making it the nation's first high-speed-rail station. The terminal eventually will serve more than 45 million passengers a year.

The firm's scheme features a light-filled multilevel facility

with undulating glass panels supported by a network of steel columns. A key element is the rooftop park. "That was probably the boldest part of our proposal," says Fred Clarke, senior principal of Pelli Clarke Pelli. Designed by PWP Landscape Architecture, the public park will occupy the transit center's entire roof and will include walking paths, playgrounds, cafés, an amphitheater, gardens, and a massive fountain with water jets triggered by the movement of the buses below.

Though still in the planning-and-review stage, the obelisk-like Transbay Tower will be adjacent to the terminal, allowing office workers to have direct access to the rooftop park.

John King, the *San Francisco Chronicle's* urban design critic, says few will miss the old Transbay Terminal. Designed by noted local architect Timothy Pflueger and completed in 1939, it had long outlived its usefulness. "It wasn't Grand Central Terminal," King says. "There was no real push to preserve it." *David Hill*

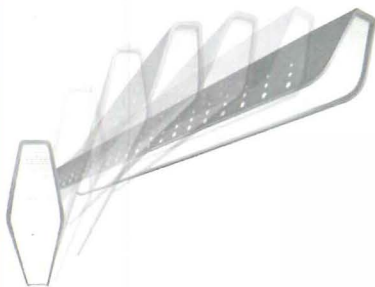


Billings Steady

The Architectural Billings Index registered at 50.6 in February, up slightly from January's 50.0. Regional scores were: Midwest (55.3); South (50.1); West (49.1); Northeast (46.4). "Overall demand for design services seems to be trending water," says AIA chief economist Kermit Baker. "We still expect the road to recovery to move at a slow but steady pace." The February inquiries score was 56.4.



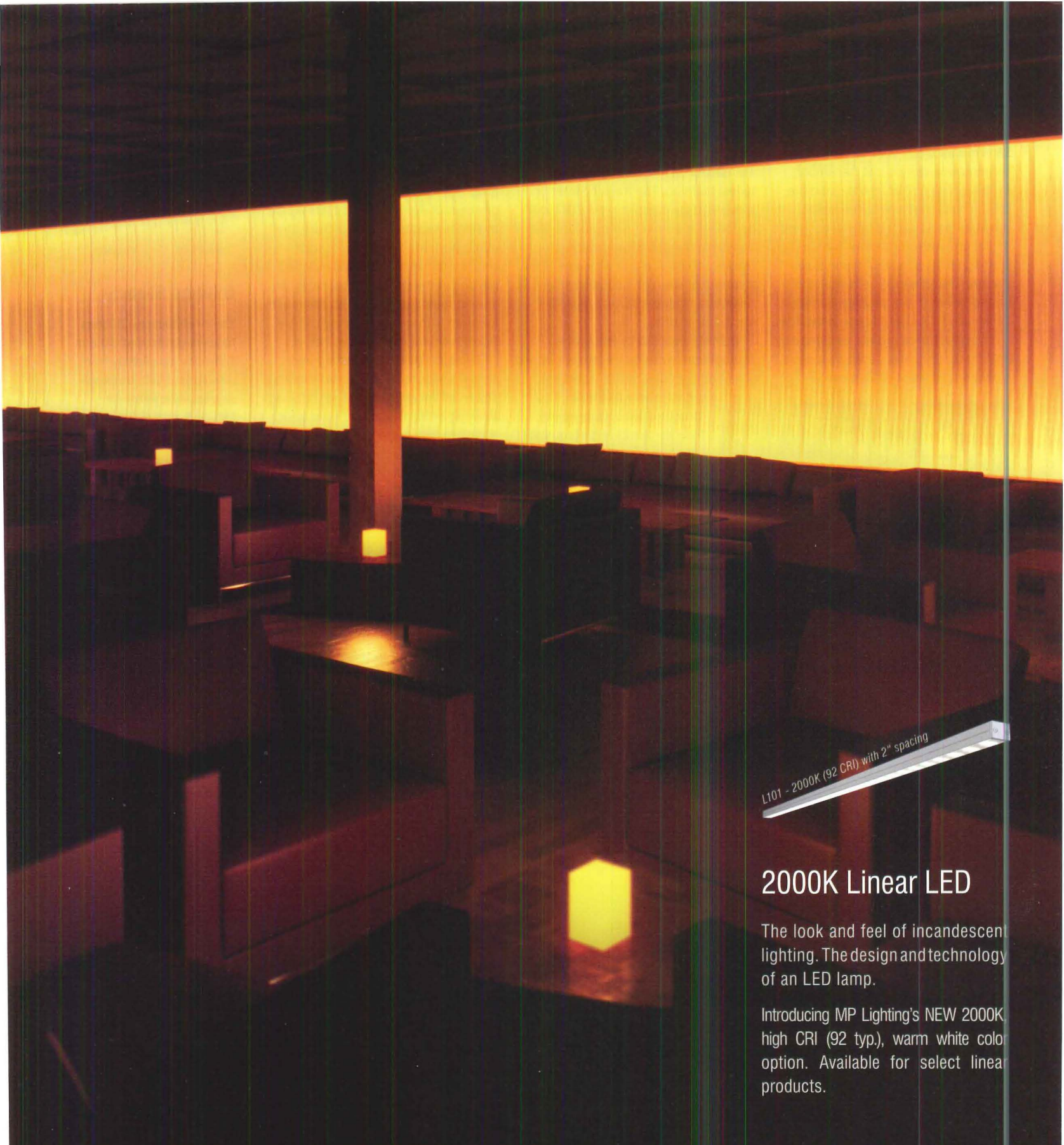
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When a House Is Not a Home

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AMERICA – LAND of the free and home of self-actualization – remains unsurpassed for the license we grant to wholesale personal reinvention, a transformative process perhaps most tellingly revealed in people's homes. Our ingrained national penchant for imagining whom you want to be and then becoming it grew to unprecedented proportions during the Golden Age of Hollywood.

Those who came to cultural awareness during the heyday of the great motion picture studios have been particularly susceptible to the spell cast by the silver screen, a magical aura that suffused not only manners and mores, but also dress and design. This demographic includes Ralph Lauren (b. 1939), Barbra Streisand (b. 1942), and Robert A. M. Stern (b. 1939) – whom architecture critic Paul Goldberger has lauded as “the Ralph Lauren of American architecture.” As creators and protagonists of their own time-warping myths, they have few present-day equals.

Small wonder that these three near-contemporary products of Brooklyn and the Bronx are leading exponents of deeply nostalgic, unapologetically romantic, and blissfully bogus evocations of tradition and class as purveyed by Louis B. Mayer, Jack Warner, Samuel Goldwyn, and their movie-mogul ilk. How else to explain the giddy theatricality, freewheeling excess, and sheer obliviousness to the here and now that took center stage when, in remarkably similar ways (save for one striking divergence), Lauren and Streisand lately realized mirror-image visions of the American dream house circa 1940?

For nearly four decades Lauren has been steadily perfecting his directorial approach to design in an ever-widening series of manifestations from men's clothing to women's fashions to home furnishings. Goldberger has called Lauren (with no apparent irony) “a one-man Bauhaus.” This megamerchant's ever more comprehensive story line now encompasses architecture on the civic scale, as demonstrated by the recent opening of his latest retail extravaganza – a big, new, old-fashioned building on Manhattan's Upper East Side.

Michael Gilmore (of the Scottsdale, Arizona firm Weddle Gilmore Architects), with executive architect Thomas Hut (Hs2 Architecture), designed the grandiose store at 72nd Street and Madison Avenue. It faces the Polo Ralph Lauren flagship in the former Rhinelander Mansion, a French Renaissance Revival pile by Kimball & Thompson, which was completed in 1898 and internally revamped by interior designer Naomi Leff for Lauren in 1986.

As *Departures* magazine recently burred, “[E]verything from the Beaux Arts-inspired facade to



1. The new Ralph Lauren store at 888 Madison in New York looks like a Parisian *maison particulier*.

2. Barbra Streisand's “street of shops” in her Malibu home evokes the old Henri Bendel store.

the richly ornamented interior looks and feels like an 1880s building or, even better, as if it were the Gilded Age all over again.” Indeed, this is a pluperfect specimen of the heartless hedge-fund luxe that typifies what has been called America's Second Gilded Age.

It must be admitted that the architects' French-inspired wannabe mansion is technically well executed – for this kind of thing, as the expression goes. But in a quite different way from Leff's Anglomaniacal Polo Ralph Lauren clubhouse across Madison Avenue, this new building approximates a private residence only if you happen to inhabit a *maison particulier* in Paris. Alternatively, one thinks of those “Fifth Avenue” mansions portrayed in 1930s screwball comedies, which looked no more like the real thing than this concoction. The Home department, on the uppermost story, is decorated in Lauren's three favorite interior design styles – Old English, Moderne, and Safari – but it all seems as inauthentic as Meryl Streep's and Robert Redford's accents in *Out of Africa*.

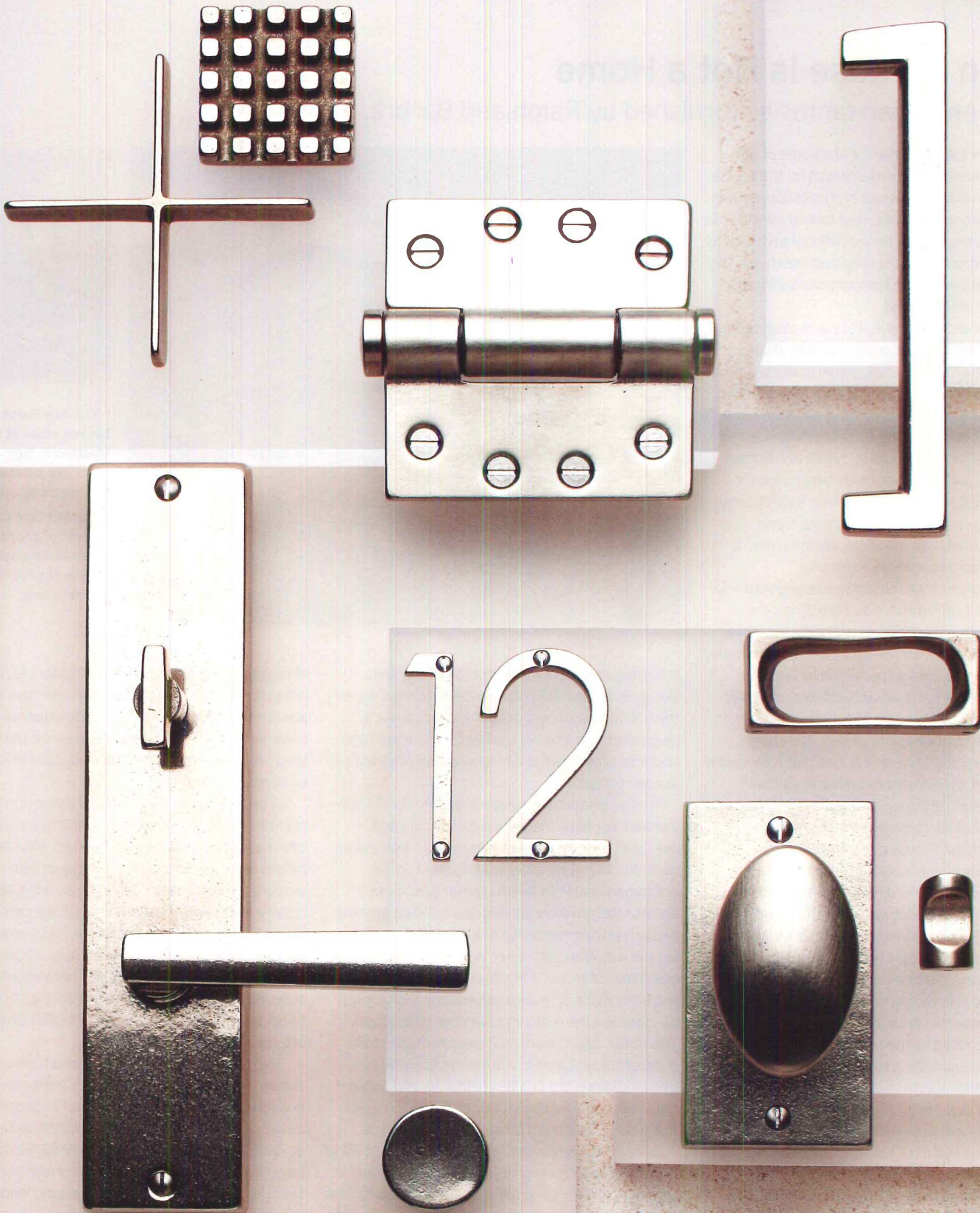
In contrast, Streisand's Malibu home – subject of her jaw-dropping new monograph, *My Passion for Design* (Viking) – aims to be as American as Kansas corn in August. However, the incongruous complex she has built on a bluff overlooking the Pacific – a cluster of fake barns, sham silos, and clapboard cottages crammed together like a miniature golf course – brings to mind Richard Mique's Hameau de la Reine of 1775-1784 at Versailles, the faux-rustic farm hamlet where Marie Antoinette played

at being a milkmaid while peasants starved. It's not just the artificial pond, stream, and operative waterwheel that the two twee ensembles have in common, but rather the same disquieting feeling they provoke – that ostentatious simplicity is the ultimate decadence.

Streisand, by her own detailed admission, is the client from hell. She relates how she hired and fired one hapless (and nameless) architect after another before resorting to movie-set designers who executed things to her control-freak liking. Most bizarre of her specifications is what she calls the “street of shops” in her basement – a cobblestone-paved walkway flanked by phony, glass-fronted emporiums in which she displays her various collections, each named accordingly: Bee's Doll Shop, the Antique Clothes Shop, the Gift Shoppe, etc. Ralph would never do this.

The owner claims she got the idea from a similar exhibit at the Winterthur Museum, but a more likely source was the famous Street of Shops devised for New York's Henri Bendel by its legendary president, Geraldine Stutz, in 1958. So now we have Ralph Lauren endeavoring to make his store seem like a house and Barbra Streisand laboring to make her home look like a series of salesrooms: a dizzying *Through the Looking-Glass* inversion emblematic of our society's dual addictions to celebrity and consumption. ■

Martin Filler writes for the New York Review of Books.

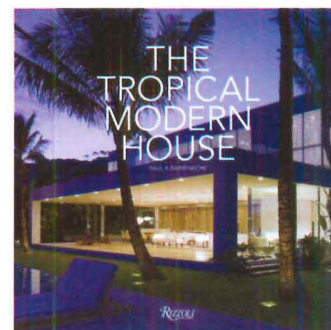
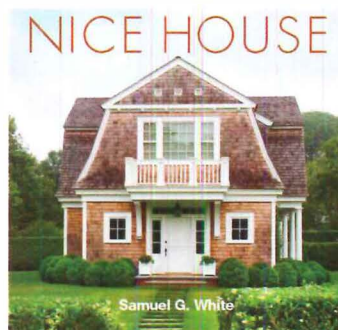


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Home Sweet Home: Changing notions of where we live



Nice House, by Samuel G. White. Monacelli, 2010, 256 pages, \$45.

Most Americans want their houses to “look like houses in a traditional sense,” Samuel White tells us in his eye-candy collection of domestic virtue. *Nice House* is sadly reminiscent of the anti-intellectualism that has repeatedly surfaced in American history. While attempting to strike a blow for modest design that celebrates “everyday life rather than employing significant personal and professional attributes to conquer and escape it,” this is a polemic for mediocrity.

Among the curious selection of 32 houses – all but half a dozen on the East Coast, seven in the Hamptons – are a handful that are “noticeable and newsworthy,” a phrase White equates with homes “difficult to live with on a daily basis.” But most fall “well below the radar of architectural critics, design professionals, and shelter magazines.” In making a case against “bespoke houses,” the author needs better-reasoned criteria than “Nice houses are found in nice places,” the fact that they are built on small sites, and “nice houses are invariably neighborly.”

Furthermore, White bemoans the lack of “public acknowledgment, particularly peer recognition,” for his putatively pleasurable and satisfying houses. But you will find here Robert Stern’s Dream House for *LIFE Magazine* and well-published dwellings by Jaquelin Robertson, White himself, and others. *William Morgan*

Cellophane House [Kindle Edition], by Kieran Timberlake and Stephen Kieran. Kieran Timberlake, 2011, 9425 kilobytes, \$20.

Kieran Timberlake’s experimental Cellophane House subverted timeworn design and construction processes with off-site fabrication. With its first edition in e-book format, the book *Cellophane House* similarly subverts publishing procedures. And to paraphrase Marshall McLuhan, the medium fits the message: the hallmarks of both the building and its published incarnation are efficiency and sustainability.

In clear, concise language, the authors describe and answer

questions about their prototype five-story, 1,800-square-foot dwelling, commissioned for MoMA’s 2008 exhibition *Home Delivery*:

Fabricating the Modern Dwelling and assembled (and later disassembled) on a vacant lot near the museum. Because the fabrication system was modular and flexible, it allowed “mass customization.” The architects collapsed the typical house’s thousands of parts into a few dozen off-the-shelf elements and attached them to an aluminum scaffold. They used a skin that was primarily SmartWrap, which they developed themselves from polyethylene terephthalate (PET), commonly used for water bottles. And they covered

it with photovoltaics and glare-reducing patterns.

The e-book market is skyrocketing. But reading *Cellophane House* on the newest Kindle leaves too much to the imagination. The tiny (6-inch-diagonal) screen has only two colors, black on gray, making drawings illegible and photographs indistinct. The iPad, with its larger (9.7-inch), four-color, “zoomable” screen, is doubtless better. But for architectural content, e-publishing has inherent problems. With readers able to manipulate type and images, designers lose control over page design. Readers, meanwhile, can’t leave an e-book on a client’s coffee table or pass it to friends. *A.O. Dean*.

At Home: A Short History of Private Life, by Bill Bryson. Doubleday, 2010, 512 pages, \$29.

At Home is a sprawling book, covering in its 452 pages, among others, Charles Darwin, Eli Whitney, Thomas Jefferson, Andrea Palladio, Queen Victoria, Queen Anne (and her possibly latent lesbianism), William Shakespeare, Thomas Edison, Joseph Swan, Thomas Crapper, Catharine Beecher, and Friedrich Engels. The author structures his loosely woven historical anecdotes according to each of the rooms in his house, a conceit that, about halfway through, becomes clear is simply that.

Funny bits abound, but insights into the nature of private life do not. In many instances, Bryson flirts with the idea of tackling the book’s title subject, then veers away at the last

moment. For instance, after a disquisition on various types of mattress stuffing, he says, “Privacy was a much different concept in former times.” The ensuing paragraph, on how men used to sleep in the same bed but not romantically, is, however, about as far as the investigation goes.

Bryson, though an indispensable popular historian and literary figure, has made no inroads whatsoever into the very big, very complicated history surrounding ideas of home and private life. For a book that purports to be at least nominally about privacy, the absence of that word in the index gives rise to the question of how focused this project truly was. Billed as “a short history of private life,” *At Home* is not so much a short history as it is a superficial one. *Eva Hagberg*

[BRIEFLY NOTED]

The Tropical Modern House, by Raul A. Barreneche. Rizzoli, 2011, 240 pages, \$50.

Barreneche offers a tour of houses – including three from *RECORD* – combining modern technology and local materials from around the world.

Small Eco Houses: Living Green in Style, by Cristina Paredes Benitez and Alex Sanchez Vidiella. Universe, 2010, 420 pages, \$35.

Fifty small projects – woody houses and repurposed barns, smart apartments and urban lofts – make little dwellings seem roomy.

How to Design a House, by Design Museum. Conran, 2010, 112 pages, \$20.

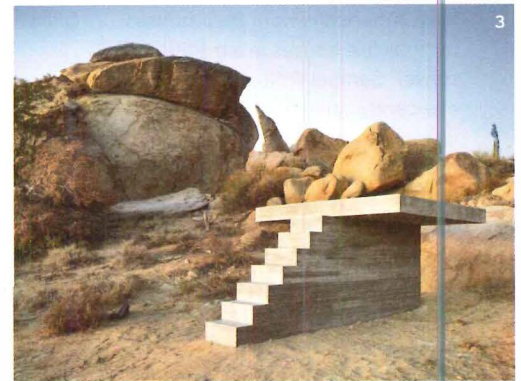
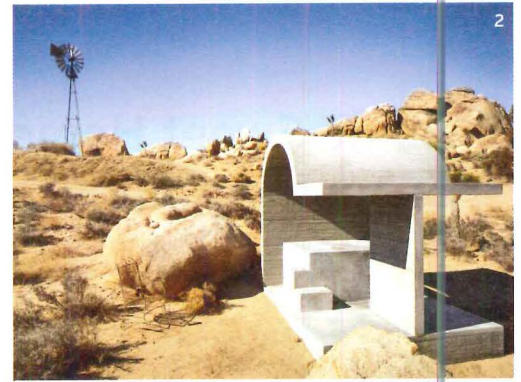
This slim volume describing the principles and processes of house design offers a bonus: John Pawson explaining his own house.

FOLLIES INGRID SPENCER

THREE DESERT STRUCTURES, DESIGNED BY ARATA ISOZAKI, STRIP THE HOUSE TO ITS ARTFUL BASICS.



Arata Isozaki has designed three concrete desert pavilions called *Obscured Horizon* for a family. Each structure addresses a particular season: the enclosed pavilion (1) is designated for the winter; the spring/autumn pavilion (2) is sheltered against the wind; while the summer platform (3) is open to the sky.



THREE Poured-IN-PLACE

concrete structures, each 100 square feet – and each with its own unique characteristics – are scattered within close proximity on a rocky, scrubby, 5-acre site in California's Mojave Desert. These platforms are places upon which to sleep, read, or take in the sun's rays, the night sky, and "the occasional lonely coyote howl," says their owner, Jerry Sohn.

A codirector of Little Steidl, which publishes books created by artists, Sohn, his wife, Eba, and their young twins use these pavilions as much as time allows them to escape their Los Angeles home. It is a three-hour trek to their desert property.

An open slab 6 feet off the ground, which is designated for the summer months, requires climbing a stair. A large rock acts as a natural headboard. A curved vault provides shelter from the wind and the morning dew for the spring/autumn pavilion, while a concrete cube, enclosed by glass, is reserved for the

winter months.

It's not the first time the idea of small shelters in nature has appealed to those who want to get away from it all. Henry David Thoreau's cabin at Walden Pond (1845) and Le Corbusier's *Cabanon* in Roquebrune-Cap-Martin (1952), in the South of France, famously preceded these structures. But these little objects in the Mojave Desert are very basic. "They're really not supposed to be anything more than that," explains Sohn. Except, perhaps, to Sohn's friend, the Tokyo-based architect Arata Isozaki, who designed them.

Isozaki, who is known for his work on a grander scale – for example, the Museum of Contemporary Art in Los Angeles (1986) and the Kyoto Concert Hall (1995) – calls the collective piece "Obscured Horizon," a term adopted from a text work by artist Lawrence Weiner. Appropriately, Weiner's words are painted on the back surface of the

spring/autumn platform.

Isozaki talks of the project as also being inspired by an important Japanese short text written in 1212 by Kamo no Chomei, titled "Hojoki." The essay, often translated as "An Account of My Hut" or "The 10-Foot-Square Hut," describes a small shelter that gives a bit of protection against the elements but mostly enhances the majesty of the surrounding landscape. Part sculpture – the work of Brancusi and Donald Judd come to mind, among others – and part architecture, the structures are "completely useful," says Sohn.

Sohn has remodeled a 480-square-foot cabin on his property, but claims to have rarely slept inside. (Not surprisingly, the house is off the grid.) Even before the platforms existed, he preferred a sleeping bag outside. But his wife, who was not fond of the snakes that share the property, wanted something slightly elevated.

Sohn discussed the possibilities with Isozaki, and the architect, says Sohn, "was willing to create something exceptional. It was an opportunity for him to work on a very small scale, which he enjoys." (Yuko Oka from Isozaki's office helped with the project.) Isozaki offered the couple a "house" with three "bedrooms" – the desert as the floor, the sky as a ceiling, and no walls except for the unframed landscape.

Sohn made it a labor of love, convincing a contractor, engineers and suppliers to travel the distance and accomplish the feat to the most exacting detail.

"They're just fun," says Sohn of the platforms. "You can use them, and you can look at them." And you can think about them.

Ingrid Spencer, formerly a RECORD managing editor, is a contributing editor based in Austin.



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HOUSE OF THE MONTH **LINDA C. LENTZ**

SMITH-MILLER + HAWKINSON'S CONDOMINIUM MIX ON MANHATTAN'S WEST SIDE



AS NEIGHBORHOODS GO, New York City's Midtown West (aka Clinton or Hell's Kitchen) is a microcosm of the city itself. Roughly carved between 34th and 59th Streets, from 8th Avenue to the Hudson River, it retains the grittiness of its immigrant roots with tenement buildings, warehouses, shops, restaurants, hospitals, and schools. It is also a stone's throw from the urban core of Manhattan – Broadway, Fifth Avenue, Times Square, Lincoln Center, Central Park, and the Midtown business district – making it ripe for gentrification, a process that has been evolving for about 20 years.

Most of the area's residential developments are configured for professional couples or single occupants, and include high-rise apartment towers that skirt the height-restricted blocks central to the community. But the Dillon, a recently opened seven-story condominium on West 53rd Street, is sized for families, too, referencing the historic urban fabric and scale of the location. Its protracted and folded south-facing curtain wall and diverse floor plans speak to new generations.

This in fill project, designed by Smith-Miller + Hawkinson Architects for the SDS Procida Development Group, features a 176,000-square-foot concrete structure on a sloping, 300-foot-long, L-shaped site.

Referring to such urban works

as Le Corbusier's Ville Radieuse, design principal Henry Smith-Miller worked closely with project architect Christian Uhl and executive architect Richard DeMarco of Montroy Andersen DeMarco to devise a livable, high-density scheme. What they came up with is an innovative 83-unit hybrid project comprising 52 unique layouts.

Nine triplex townhouses line the street on the building's east end, each having a dedicated entrance, backyard, and basement with adjacent parking space. Directly above, 22 duplexes – some with private roof rights – are organized along skip-stop corridors on the fourth and seventh floors to maximize the spatial potential of the volume. At the building's deeper west end, 52 studios and one- and two-bedroom apartments top the condo's common areas, an entrance to underground parking, and a loft-like, 6,000-square-foot commercial unit that fronts West 54th Street.

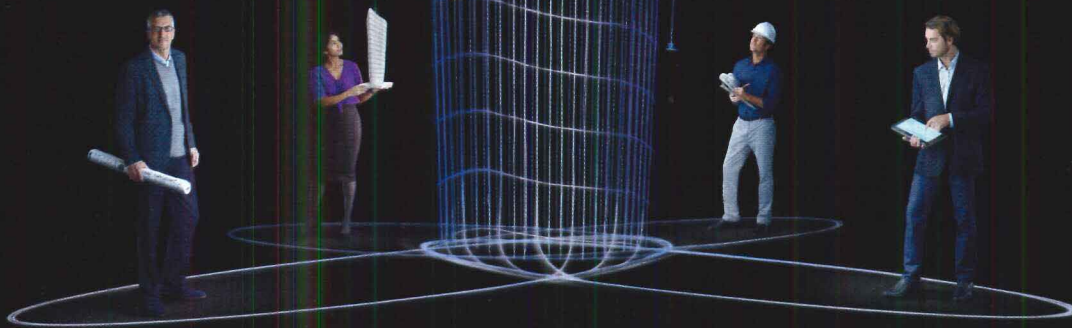
"It's packed with salable square feet," notes Smith-Miller. Indeed, all of the units are daylight-filled and have wood floors, spacious closets, and terrific kitchens and baths. Clearly, the architects have created equally pleasing residences that consider the needs of real New Yorkers. Since it opened in September, says developer Mario Procida, the Dillon is nearly 50 percent sold. ■



1. Punctuating the curtain wall, operable windows fill the Dillon's units with daylight and fresh air. Folds on the east elevation facilitate east/west views.
2. 3. Studio or townhouse, all of the units are generously proportioned with flexible spaces and white oak flooring. Lenticular film along the bottom and sides of the glazing tempers height, visibility, and sunlight.

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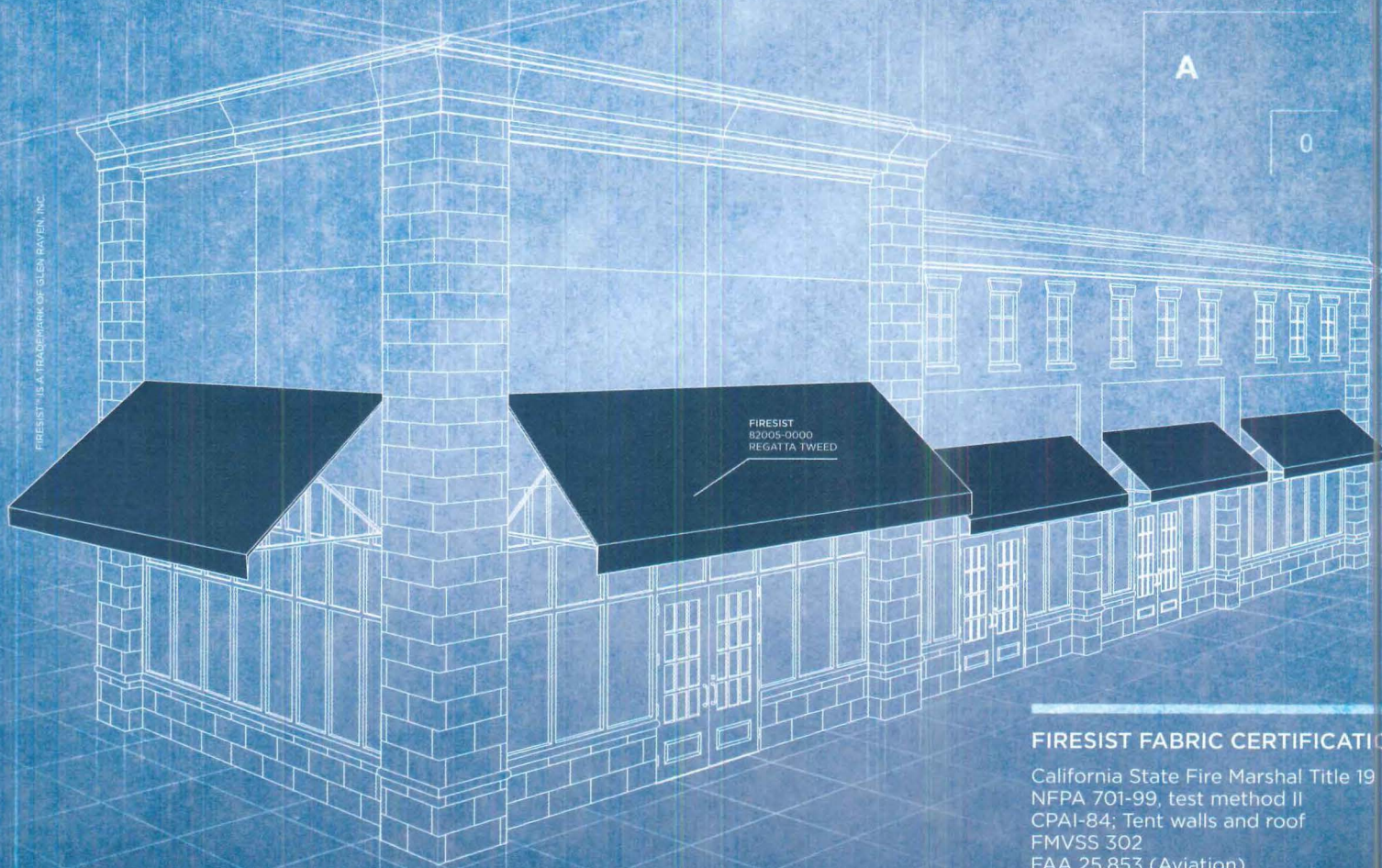
CIRCLE 23

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BACKSTORY RITA CATINELLA ORRELL

MILAN'S SALONE DEL MOBILE TURNS 50 THIS MONTH. RECORD TAKES A LOOK AT HOW THIS FURNITURE FAIR BECAME AN ANNUAL DESIGN MECCA.

ON A COOL APRIL NIGHT in 2007, I found myself in a dangerous crush of bodies trying to cross a narrow pedestrian bridge near Via Tortona in Milan. This mob wasn't rushing to a World Cup final or fleeing a natural catastrophe. It was heading toward a group of parties celebrating new pieces of furniture. Welcome to the annual Salone del Mobile, the rock star of design fairs that celebrates its 50th birthday this month in Milan.

It wasn't always that way, however. In fact, the show started off more humbly than many of today's attendees might imagine. Salone was founded in 1961 by Tito Armentini, along with about a dozen other leading furniture manufacturers based near Milan. With 328 exhibitors and 12,000 visitors (compared with over 2,500 exhibitors and 300,000 attendees in 2010), the first fair emphasized traditional Chipperfield- and Louis XV-inspired designs, not the modern pieces associated with it today. The organizers hoped to give small- and medium-size companies the opportunity to sell products worldwide, as well as to a larger Italian market.

The Italians had tough competition. When the show first opened its doors on September 24, 1961, Scandinavia was the dominant force in the European furniture market and Germany's Cologne Furniture Fair (founded in 1949) was the leading international design show. "The Italian furniture manufacturers were in awe of their Scandinavian colleagues and wanted to bring to Italy the same sense of universal style but also the same sense of government-like organization of the industrial sector," says Paola Antonelli, the Milan-born senior curator in MoMA's department of architecture and design.

In 1965, however, a significant shift occurred. In an attempt to break the Scandinavian stranglehold, Salone's founders added a select number of companies that were showing growth in the field of design, including Cassina, Boffi, and



ABOVE: Posters promoting the inaugural Salone in 1961 (left) and the 45th edition (right) that welcomed visitors to the new Rho-Però fairgrounds in 2006.

BELOW: Joe Colombo at the 1967 show, on the Universale chair he designed for Kartell.

Kartell. This was the birth of Pavilion 30, the epicenter of the fair dedicated to modern design, where Joe Colombo, Achille and Pier Giacomo Castiglioni, and Gaetano Pesce, among others, pushed the boundaries of exhibition design and the use of plastics in furniture. "Italian furniture manufacturing has always been so important in the second half of the 20th century because the companies are all midsize and family-based, and so they can take some risks," Antonelli says. "When you are a gigantic multinational company you cannot churn out a prototype without spending an enormous amount of money in overhead." Often, these companies may have known their subcontractors for generations, she adds. These relationships created an atmosphere where designers from around the globe could get their designs finally produced in Italy.

The 1970s and 1980s were boom years for the show – the biennial Eurocucina kitchen expo and Euroluce lighting show launched in 1974 and 1976, respectively, and in



1982 the Eimu office exhibition followed. In 1987, Salone organizer Cosmit won the Compasso d'Oro, Italy's most prestigious design prize, which it won again in 1998 for corporate identity designed by Massimo Vignelli of New York City-based Vignelli Associates. Vignelli, a native Milanese, worked with many of the designers that made the scene in Milan. He only wishes the fair had a more lasting year-round effect.

"Milan is a rather provincial city," he says, "but there are two weeks during the year when it's Salone del Mobile and the fashion show, when it really becomes an international-level kind of a city. That's how it should be all of the time."

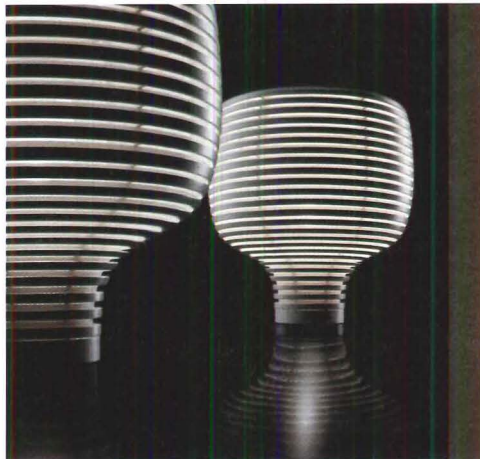
Many trace the show's continued success to the move from September to April in 1991, giving it access to the entire exhibition grounds, or to the decision in 1999 to start organizing major cultural events in conjunction with the fair. The biggest revitalization for the show, though, came with the move in 2006 to the 2.1-million-square-foot glass-canopied Rho-Però fairgrounds, designed by Italian architect Massimiliano Fuksas [RECORD, August 2005, page 92].

In the end, Salone wouldn't exist if it didn't help sell products. "Showing there is just part of my business," says American designer Todd Bracher, who has new pieces for Horm, Swarovski, and Humanscale at this year's fair. "I don't see it as a 'wow' but instead a necessary and vital part of growing my clients' business, as well as my own." ■



TRADE SHOW PREVIEW **SALONE DEL MOBILE**

A SNEAK PEEK AT SOME OF THE FURNITURE AND LIGHTING INTRODUCTIONS THAT WILL BE ON DISPLAY DURING THE 50TH EDITION OF THE MILAN FURNITURE FAIR, TAKING PLACE APRIL 12–17 **RITA CATINELLA ORRELL**



Piana Folding Chair by David Chipperfield AlessiChair by Lamm lamm.it

In collaboration with Italian furniture company Lamm, Alessi presents a new folding chair designed by David Chipperfield in an off-site installation also designed by the English architect. The stackable chair is made of fiberglass-reinforced polypropylene with matte surfaces. Produced in six colors, it has a synchronized opening and closing system that rotates around a single point. **CIRCLE 207**

P-frame Bookcase by Christophe Pillet Porro porro.com

In addition to new pieces designed by the Swedish design trio Front and Milanese icon Piero Lissoni, Porro will introduce a new bookcase from Paris-based designer Christophe Pillet that can function as a room divider. The unit's lightweight, rigid structural system eliminates the need for a back, while 2"-thick suspended shelves define the form. Available through U.S. dealers including Luminaire in Miami and Chicago. **CIRCLE 208**

Entre-Deux by Konstantin Grcic Azucena azucena.it

For his new project with Azucena, designer Konstantin Grcic studied the historic Milanese brand's catalogue that includes over 150 pieces designed since 1947. The result is Entre-Deux, which nods to the form and finishes of the earlier works, while also displaying Grcic's style. Entre-Deux's two hinged, curved, reflective surfaces create an adjustable partition or backdrop for home or office settings. **CIRCLE 209**

Behive Table Lamp by Werner Aisslinger Foscarini foscarini.com

For his first collaboration with Italian lighting manufacturer Foscarini, architect and product designer Werner Aisslinger designed a halogen table lamp with a form constructed of an overlapping sequence of rings. While simple in appearance, the lamp required a highly complex and collaborative engineering process. The body of the lamp is made of ABS plastic, while the upper screen is polyethylene. **CIRCLE 210**

Eghoor-01 Floor Lamp by Danilo De Rossi Leucos leucosusa.com

This high-end, nearly 6'-high floor lamp, designed by architect and Leucos art director Danilo De Rossi, can be illuminated by a halogen or CFL light source. The body of the lamp is a mold-injected dense resin with a glossy white polyester-coated finish. The ovoid diffuser, which is elegantly supported by the stem of the lamp, is made of blown glass with a glossy white finish. **CIRCLE 211**

The Tapiovaara Collection Artek artek.fi

To celebrate the company's 75th anniversary last year, Artek acquired the rights to the furniture collection of Ilmari Tapiovaara (1914–1999), a Finnish designer greatly influenced by the work of Artek founder Alvar Aalto. The Trienna table, shown in walnut, is just one of the many pieces that will be reintroduced at an off-site exhibit at the Gio Marconi gallery on Via Tadino. The company will also showcase lighting at the EuroLuce expo at the fair. **CIRCLE 212**



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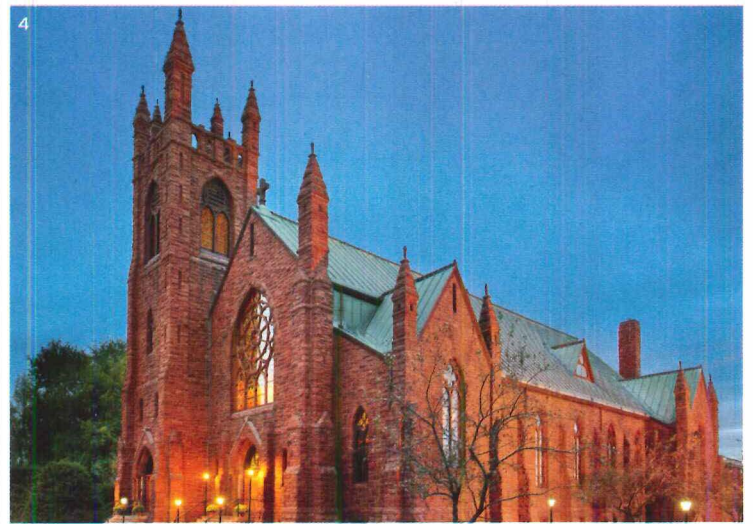
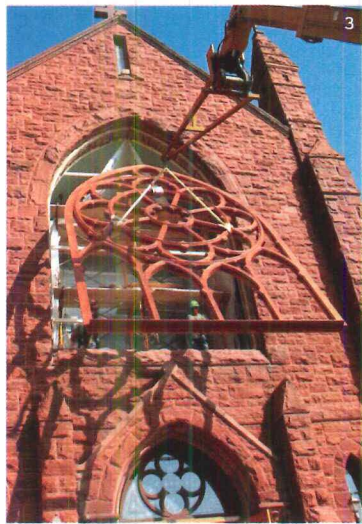
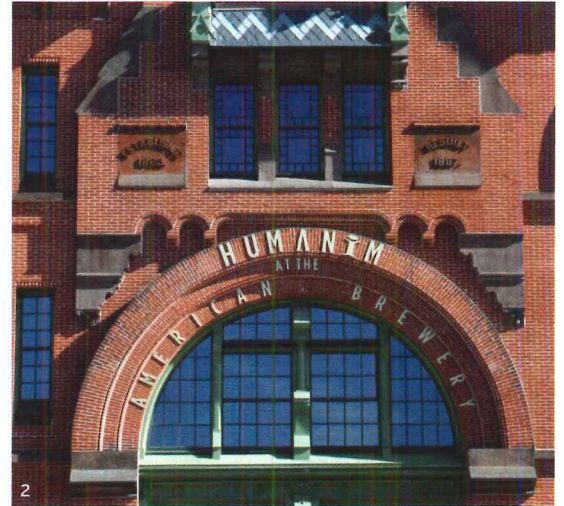
Brewers & Baptisms: Two Case Studies

FEATURING THREE PAGODA-like towers designed to conceal grain elevators, the American Brewery Building in East Baltimore was originally erected in 1887.

Abandoned for over 30 years, the building fell into disrepair, along with the neighborhood surrounding it. A registered historic landmark, the project caught the eye of Humanim, a human services organization serving Maryland that hoped a renovation of the 60,000-square-foot building would kick-start a neighborhood revitalization.

Marvin Signature Products and Services was selected to tackle the project's challenging window restoration. Created in 1997, Signature works on several hundred projects a year, ranging from very large to a single installation. For this project, they were chosen for their ability to meet goals of historic accuracy, energy efficiency, and cost.

Baltimore-based architectural firm Cho Benn Holback + Associates used historic photos and the project's two remaining windows to determine how to replicate the original fenestration. As a significant number of window frames were repairable, sash replacement was a viable option. In total, Signature supplied 115 sash replacement units and 77 complete window replacement units. At least 20 different shapes of double-hung and round-top windows were involved, plus special casings, mouldings, and divided lite patterns. "The variety of historic detail made it one of the more interesting projects," says Maura Williams, marketing communications project manager



1, 2. For the renovation of the American Brewery Building in East Baltimore, completed in 2009, at least 20 different shapes of double-hung and round-top windows needed repair. One of the project's more complex window sections, right. 3, 4. The new frame constructed for the 14' x 23' rose window in St. Mary's Church in Potsdam, New York, needed to fit precisely to accommodate the existing stone structure and stained glass units.

with Signature.

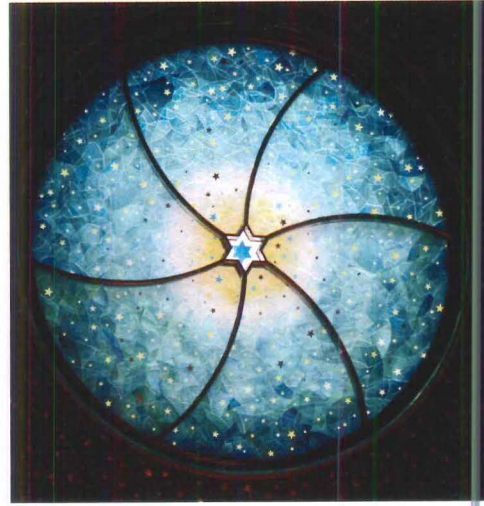
A little over a decade after the American Brewery Building went up, St. Mary's Parish in Potsdam, New York, was busy with its own project – carefully installing stained glass windows into its new church. Last year, that glass was removed from the original pine windows and Signature was contracted to help replicate the decaying window frames, this time in Honduran mahogany. The project consisted of 15 exterior and interior Gothic Revival units, including a 14-by-23-foot rose window.

Precise measurements were critical to the project, as the large-scale wood window frames had to fit both the stone openings, which had weathered and settled over a century, and the original stained glass, which had been removed and would be replaced in the new units. "Realistic planning for this kind of project is crucial," says Signature project manager Todd Dalen. "All the different processes need to have a realistic time frame, starting with getting accurate measurements and part drawing files from the designer." Signature called on Halifax, Nova

Scotia-based Jerry MacNeil Architects Limited to do a forensic inspection of the wood windows, and then measure and provide part drawings. The firm used tacheometric survey software in combination with rectified photography to capture measurements digitally. BIM and CAD/CAM technology, cyber models, and cutter designs downloaded directly to Signature's CNC equipment allowed the window fabrication to be a paperless (and prayer-free) process. Signature Windows and Doors, Warroad, Minn. marvinsignature.com **CIRCLE 200**

PHOTOGRAPHY: COURTESY MARVIN WINDOWS AND DOORS

[View videos of these projects online.](#)



Copper-Clad Angled Windows

Wausau wausauwindow.com

When windows needed to be replaced during the remodel of Eastern Michigan University's First-Year Center in Ypsilanti, Mich., Detroit-based Hamilton Anderson Associates set the frames at various angles against the building rather than replicate the existing flush-frame placement. More than 675 operable, high-performance 2250-LP Series low-profile windows with a copper-anodized finish were installed. **CIRCLE 201**

Tilt & Turn Custom Wood Windows

Jeld-Wen Windows & Doors jeld-wen.com

Available for residential and commercial applications, this new line of energy-efficient custom Tilt & Turn windows offers the functionality of a casement and the ventilation of a hopper. The windows can achieve a design pressure rating of 65, even for the largest size of 48" x 84". With protective exterior aluminum clad available in 41 colors, a number of size, shape, design, wood, glass, and grille design custom options are available. **CIRCLE 202**

Triangular Skylight

Linetec linetec.com

For the Silver LEED-certified Research Triangle Park Headquarters in North Carolina, a custom triangular-shaped skylight helped the project meet daylighting and performance goals while providing a strong architectural presence. The 27' x 74' skylight was installed as a total flush-glazed, single-slope unit. The glass area spans 2,005 square feet and is composed of clear, laminated, heat-strengthened lites. **CIRCLE 203**

3700 Series Windows

Tubelite tubeliteinc.com

Tubelite's 3700 Series windows are now manufactured using EcoLuminum, a high-recycled-content aluminum billet composition featuring finishes that send 90% less waste to landfills than traditional anodizing. The operable windows are available as conventional, concealed, and casement units that are engineered to let fresh air into the building through a storefront or curtain wall system. Shown here in Calvary Church in Naperville, Ill. **CIRCLE 204**

Silicone Lamination Technique

Bendheim bendheimartglass.com

After more than 20 years, restoration of Eldridge Street's landmarked 1887 synagogue and museum in New York City was completed with the installation of a new 16'-diameter window featuring over 1,200 hand-cut pieces of Lamberts art glass. Artist Kiki Smith and architect Deborah Gans used a new silicone-lamination technique to create rich, painterly windows without dark lead lines. **CIRCLE 205**

Triple-Pane Glass

Kolbe Windows & Doors kolbe-kolbe.com

Kolbe now offers window products featuring triple-pane glass to meet the new Energy Star criteria for U.S. and Canadian climate zones. The glass is available with Majesta Double Hungs, Ultra EP casements (shown) and awnings, Windquest EP casements and awnings, as well as other windows and sliding patio doors. Kolbe's triple-pane glass windows come standard with insulating glass and low-E coatings designed to achieve low U-factors. **CIRCLE 206**

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IN APRIL 2006, the *Onion* nailed architects with an article titled "Beaver Overthinking Dam." The article explained how an Ontario beaver named Dennis Messner was "spending an inordinate amount of time and effort in the planning and construction phases of building his dam." The satirical newspaper quoted the buck-toothed mammal as saying, "I just want everything to be perfect." As a result, Messner's neighbors predicted he would fail and end up "burrowing a hole in the muddy ground where he will spend the rest of the season, as he has done the past three years." All architects who read the article understood it was talking about them.

When designing their own dams or lodges, architects know the project must serve as both a home and a calling card. It must represent their approach to architecture and manifest everything they've learned in school and practice. Gulp. And it must be done on a shoestring because most architects can't afford anything more. The problem becomes even harder when architects design their own live-work places.

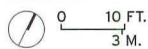
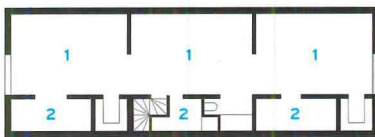
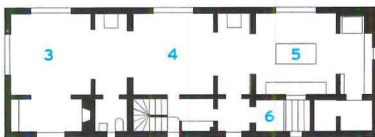
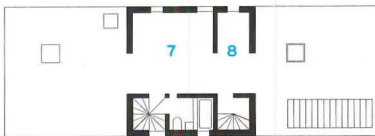
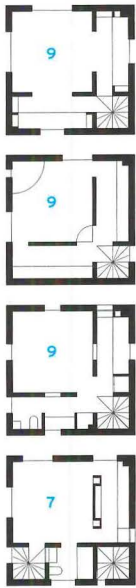
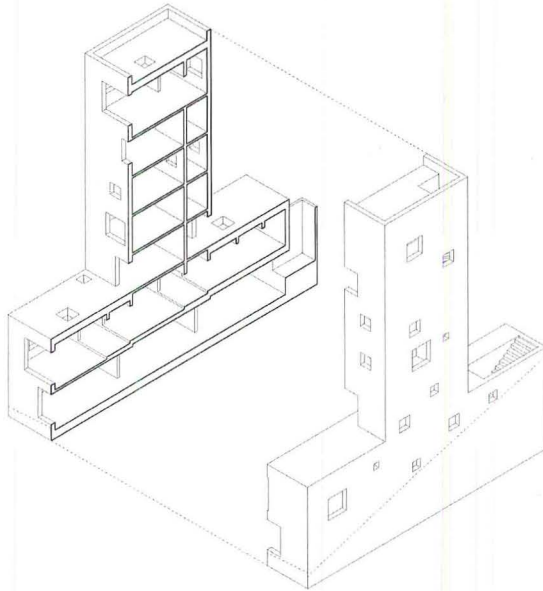
While most architects want their work to evolve over time, building their own homes/offices means pinning down their ideas. What will clients and colleagues think of your design skills when your place is 10 years old? Will it look dated and stale? Frank Lloyd Wright solved the problem by ripping up and reworking each of his own houses on a regular basis. Not surprisingly, he was constantly in debt and went through three wives and a number of mistresses.

Designing your own house-and-office means playing the role of client as well as architect. Doing this can be more difficult than it sounds, in part because good clients engage their architects in an intellectual and pragmatic back-and-forth that can push projects in new and (sometimes) better directions. Louis Kahn always credited Jonas Salk with making the Salk Institute in La Jolla, California, a better design. Would the building have become such a landmark if Kahn were the client as well as the architect?

This article examines three examples of architects designing their own live-and-work places: two involving husband-and-wife architects and one an architect and his wife who photographs architecture. So the dangers of intellectual inbreeding are present in all of these projects. Freed to explore (or is that indulge?) their own notions of design, these architects created buildings that reveal a great deal about themselves and show how to overcome the challenges of designing for the toughest client. *Clifford A. Pearson*

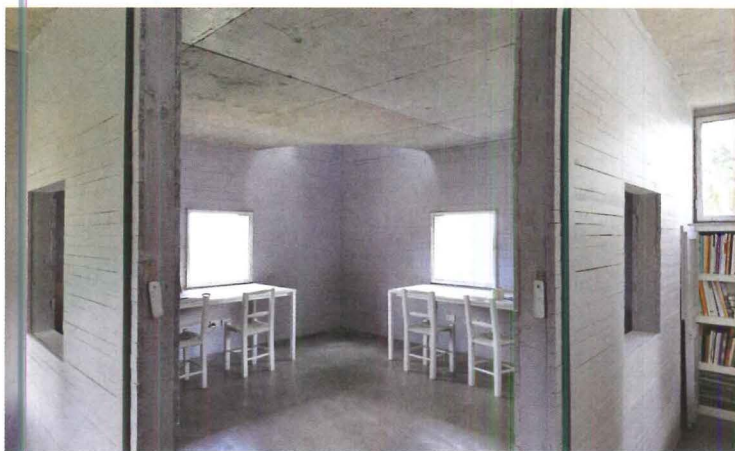


- 1 WORKSHOP
- 2 STORAGE
- 3 LIVING
- 4 DINING
- 5 KITCHEN
- 6 ACCESS TO HOUSE
- 7 BEDROOM
- 8 ACCESS TO OFFICE
- 9 OFFICE



TOP: The top of the building's podium stands at 100 meters above sea level, so the architects call the project the Cien (One Hundred) House.

RIGHT: Single steps separate the main living spaces, which unfold on axis on the second floor.



LEFT: The architects created a subtle range of interior spaces simply by dividing each floor's square module (or modules) in different ways. The partners work on one floor together.

BELOW: A tight stair, just 5 feet square, serves the office floors, while another one provides access to the residential floors.

FOR THEIR OWN house and office in Chile, the husband-and-wife team of Mauricio Pezo and Sofia von Ellrichshausen challenged themselves to create variety out of repetition. Starting with 12 identical square modules (11 indoors and one on the roof), they used perpendicular walls to divide the spaces in different ways, then arranged or stacked them to add another layer of variety. In the process, they designed a place that is both intellectually rigorous and spatially playful.

Set on a hill overlooking Concepción, the poured-concrete structure rises seven stories to capture views of the city. The narrow lot constrained the 4,625-square-foot building's footprint but not its height, says von Ellrichshausen. So the architects took advantage of those conditions and gave the project a strong sculptural presence to "stand up to the sunsets and the views," she explains. To emphasize the building's monolithic character, the architects used concrete with large aggregate and had workers chip away its outer layer so the surface is textured but uniform.

Pezo and von Ellrichshausen created a sense of tension and balance by playing the project's tower off its base, or podium. They placed three studios for art projects in enfilade on the lowest floor, then did the same with the living, dining, and kitchen spaces on the second floor. Bedrooms occupy the beginning of the tower on the third and fourth floors, while the office resides in the top three floors. The firm employs four to six people, in addition to the partners. "We wanted different expressions for living and working," says von Ellrichshausen, "so we made one horizontal and the other vertical." Separate cypress wood staircases serve the house and the office. The architects clad interior walls with inexpensive 2-inch-wide planks of pine, but painted those in the house white and those in the office gray. In the living spaces, they installed eucalyptus floors to add warmth and separated the rooms by single steps to give each a different character.

Designing their own home and studio was a great experience, states von Ellrichshausen. But the couple had been thinking about their own house for years, so they had too many ideas at the start. "The biggest challenge was focusing on the most important ones," she says, a task that might have been facilitated in conversations with an outside client.

With its unusual height and sculptural form, the building perplexes some people, says von Ellrichshausen. "They ask, 'What is it?'" A touch of mystery only adds to its charm. C.A.P.



PHOTOGRAPHY: © BILL TIMMERMAN, EXCEPT AS NOTED; MARK BOISCLAIR (6)





MARIA AND MATTHEW Salenger have no fear of suburbia. When the couple, who are both architects, returned to the Phoenix area in 1999 following graduate studies in London, they embraced their surroundings by purchasing a non-descript 1,100-square-foot, three-bedroom 1954 ranch house in the middle-class suburb of Tempe.

But that's where their "going native" stopped. Removing most of the interior walls, the couple created an open living space and built two basic steel-and-fiberglass sleeping pods in the backyard. With the birth of their son in 2008, however, this living arrangement proved impractical. Over the next year, the couple drew up about 50 different schemes for adapting the house to their new lifestyle (as well as designing houses for other prospective sites). While recognizing that designing for themselves presented the opportunity to flex their creative muscles, they, like their clients, struggled with the reality of resale value. "We almost hired a friend as our architect," says Matthew. "We couldn't come to a meeting of the minds." Instead, the couple surveyed over 30 friends of friends, asking about their programmatic needs and their dream houses. The consensus was for three bedrooms and a "great room," and "85 percent said they wanted a courtyard or atrium," adds Matthew. The couple already knew that a secondary structure (which contains living and studio space) would need to accommodate separate day and night functions. "So the house started to design itself as a big, clean, open box," says Matthew.

The team dismantled the pods and repurposed elements for the new construction. "It was a challenge creating something that would be definitive of who we are as designers," Matthew says, "especially for Maria and me, who don't like to be pinned down." The new volume connects to the original house via steel-framed walkways with polycarbonate roofing and tempered acid-etched glass walls, which provide privacy from the neighbors and protection from the elements while rendering the courtyard an integral part of the house. The focal point is a 1,600-square-foot patch of turf, a fitting nod to the suburban archetype as well as a good place to play or host a party. Inside, mobile millwork can be reconfigured to expand and contract living and sleeping areas as needs change. "This space is always flexible and changing. Everything has to be transformable because our lives are not set," says Matthew. *Beth Broome*

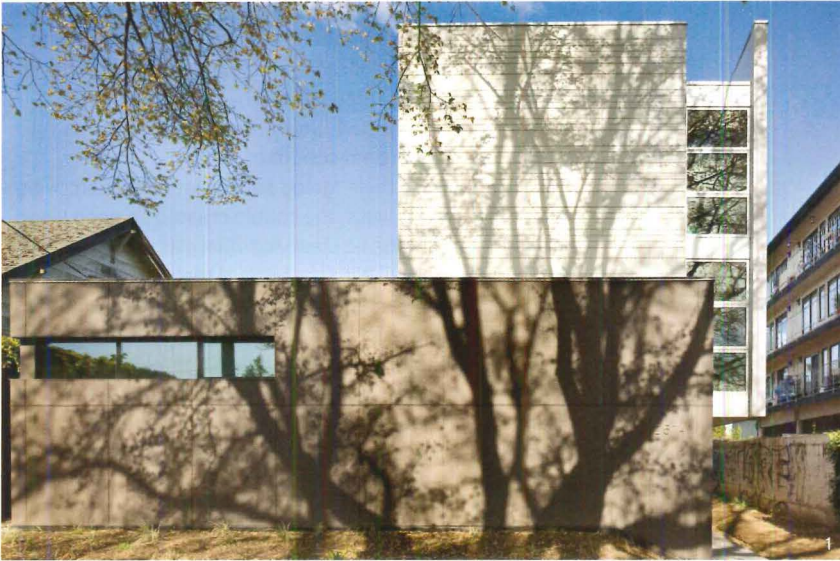


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6

1. A new wing contains the architects' studio and the family's "great room."
2. The architects renovated a ranch house and incorporated it into the new ensemble.
3. A weathered-steel garage contrasts with the old house and a new glass wall on the side of the property.
4. An exterior walkway leads to a door opening onto the central lawn.
5. A mechanized polycarbonate awning on the new wing provides shading when needed.
6. The living area can be expanded by pushing cabinetry on casters toward the studio portion of the space.



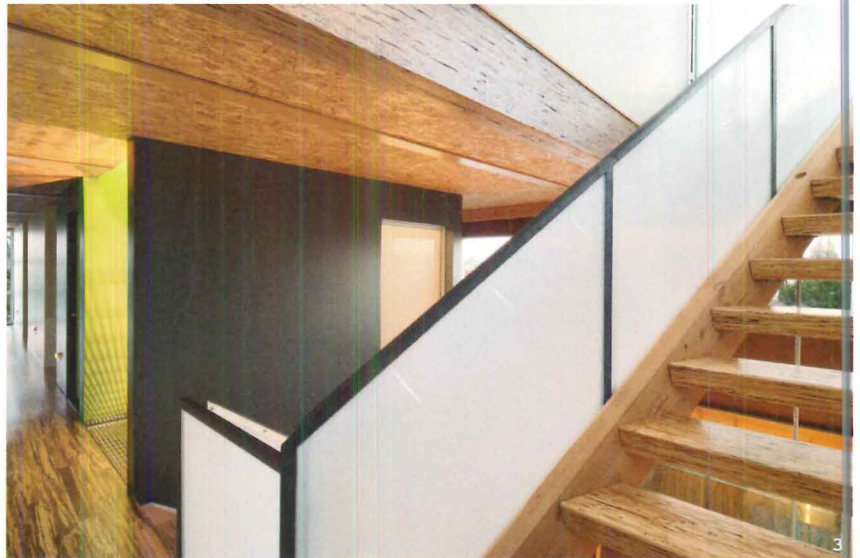
1. A one-story wing serves as the architect's office but can become an accessory dwelling unit or commercial space in the future.
2. The residential part of the building sits above the work spaces.
3. Zimmer says he used inexpensive materials to create interiors that are "rough-and-tumble but elegant at the same time."
4. The architect's studio was kept simple and flexible.



WITH THE RECENT arrival of their second child, architect Robert Zimmer and his wife, photographer Lara Swimmer, have grown accustomed to planning for the not-quite-knowable. While thinking about their own 4,250-square-foot live/work building in the North Admiral district of Seattle, they got to practice these skills – imagining not just how it would evolve as the kids grew up, but how it might accommodate new zoning in a changing neighborhood. Although the area right now is zoned for multifamily use on two sides and commercial on another, it is becoming more densely developed. So Zimmer designed the building to be adaptable, creating a wing on one side that he uses as his office but could be converted into an accessory dwelling unit or a commercial space. He and his family currently live in the two upper floors, but a new owner might divide it into multiple apartments or office space for multiple tenants. He even designed stacked storage rooms on all three floors so an elevator could be installed there in the future. Flexibility informs the project now as well, with a conference room on the second floor becoming a home theater in the evening.

To stay within a tight budget (\$870,000), Zimmer and his firm, Zimmerraystudios, designed an efficient structure that uses structural insulated panels (SIPs), engineered lumber, and some steel, and created interiors with "luxury in spaces, not finishes," he says. Exposed structural elements, along with simple materials such as plate steel, oriented strand board, and colored polycarbonate panels, establish an aesthetic that is "rough-and-tumble but elegant at the same time," says the architect. "I tried to pare it down as much as possible to create open, flexible space for as little money as possible." At \$205 a square foot, he hit his mark. "It was a fantastic experience designing the project," he says, "but a horrible experience building it," due to problems with the contractor, whom he eventually fired. If he had a client, he would have fired the contractor earlier on, admits Zimmer.

Zimmer hates the term "green" because he says all good design takes environmental issues into consideration. But the great majority of the building's materials and products come from local sources, most within five miles. He also designed the building so solar panels can be installed and rainwater collected. Designing for himself and his family was easy, states Zimmer. What was hard was "taking the financial leap." C.A.P.





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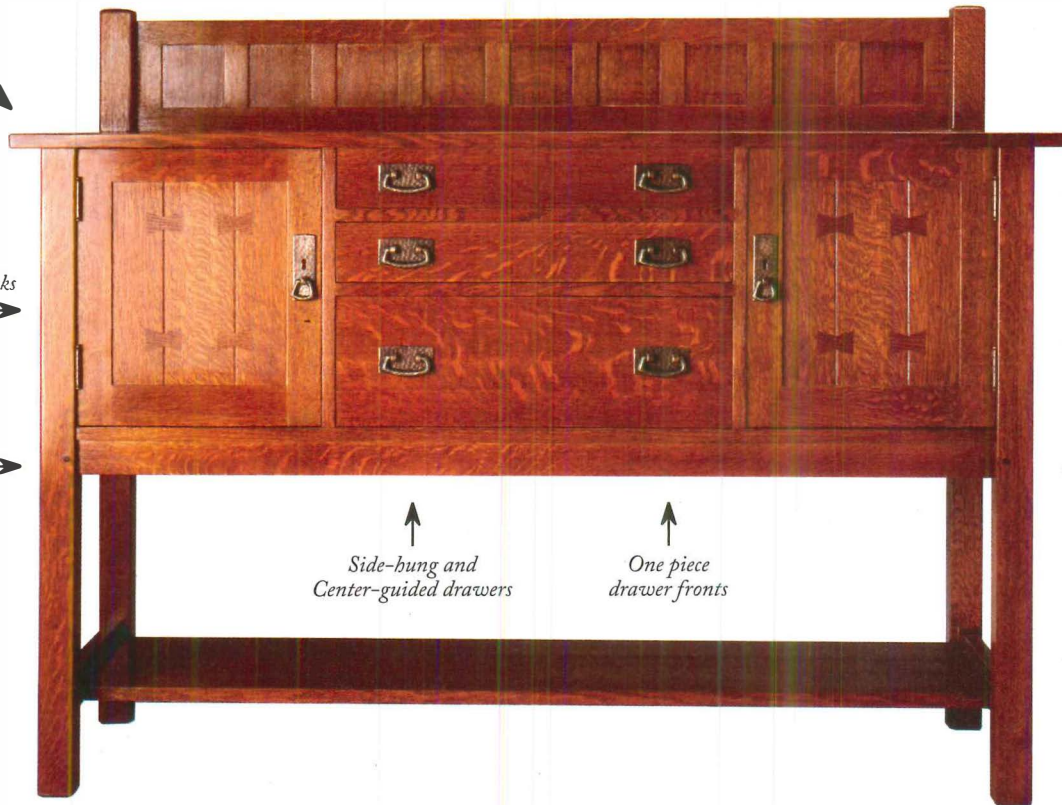
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Design and Time

When applied to residential architecture
 “innovative” and “timeless” need not conflict.
 By Suzanne Stephens

BY THEIR SELECTION of RECORD Houses, the editors seek both innovative design and timeless architectural responses to the residential program. While the adjectives “innovative” and “timeless” verge on the oxymoronic, we would like to think we can make a case for conjoining them in this issue.

One such example, we would argue, is a substantial expansion built in 2010 for a house that RECORD profiled in 1957. The house addition, designed by Japanese architect Kengo Kuma for a couple in Connecticut, demonstrates that the classic lines and clean, clear, taut planes of architect John Black Lee’s original can be retained – and transformed with a new design. Indeed Kuma’s extension, by taking advantage of up-to-date glazing and building techniques, emphasizes the ethereal presence of a house floating above a wooded landscape.

Similarly, a house Barton Myers Associates designed in Montecito, California, retains a Modernist vocabulary. But in this case, it shows that a discrete rectilinear form rendered in steel and glass can still seem to merge with the landscape. Its quasi-organic siting gives us a new look at the machine in the garden.

In a secluded community in Salvador, Brazil, Marcio Kogan of Studio MK27 arranged a house around a grassy courtyard, much like Mies van der Rohe’s court house schemes of the 1920s and 1930s. In this instance, Kogan executed Modernism’s planar forms in rustic stone, wood, and clay tile. The both/and quality helps smoothly integrate the house into its residential context.

A weekend retreat in Connecticut, designed by Daniel Libeskind, may be the antithesis of Miesian principles, but it pays deference to other contemporaneous architecture of the early 20th century. Its roots in German Expressionism and Russian Constructivism show that the avant-garde past can be parlayed into a cozy and edgy solution today.

A timeless vernacular form combined with a note of the surreal manifests itself in a house in Leiria, Portugal, where architects Aires Mateus & Associates placed the bedrooms underground for privacy in a dense residential neighborhood. Five courtyards, including a partially covered central one, admit daylight to the lower level, while more light comes in through an opening carved out of a plastered, gabled roof. Another house assumes a villagelike approach: In Karuizawa, Japan, Koji Tsutsui Architect & Associates has created a series of wood pavilions, connected by a roof, that fan around a sloping, wooded site.

The response to the landscape obviously provides an interesting subtext to this collection: Houses float over the land, or perch on it; some are embedded in the earth, and others turn inward for privacy. By rethinking the house’s relationship with nature, architects have brought the timeless and the innovative together in unexpected ways.



PROJECT **GLASS/WOOD HOUSE**
 LOCATION **NEW CANAAN, CONNECTICUT**
 ARCHITECT **KENGO KUMA & ASSOCIATES**
 BY **JOANN GONCHAR, AIA**

FEW ARCHITECTURAL DESIGN problems are as tricky as adding to a building that is rigorously symmetrical. If not sensitively conceived and carefully executed, an expansion can compromise the integrity and compositional balance of the original. But such was the challenge faced by Tokyo-based Kengo Kuma for his first commission in the United States: a new wing for an almost templelike mid-century Modern house in New Canaan, Connecticut.

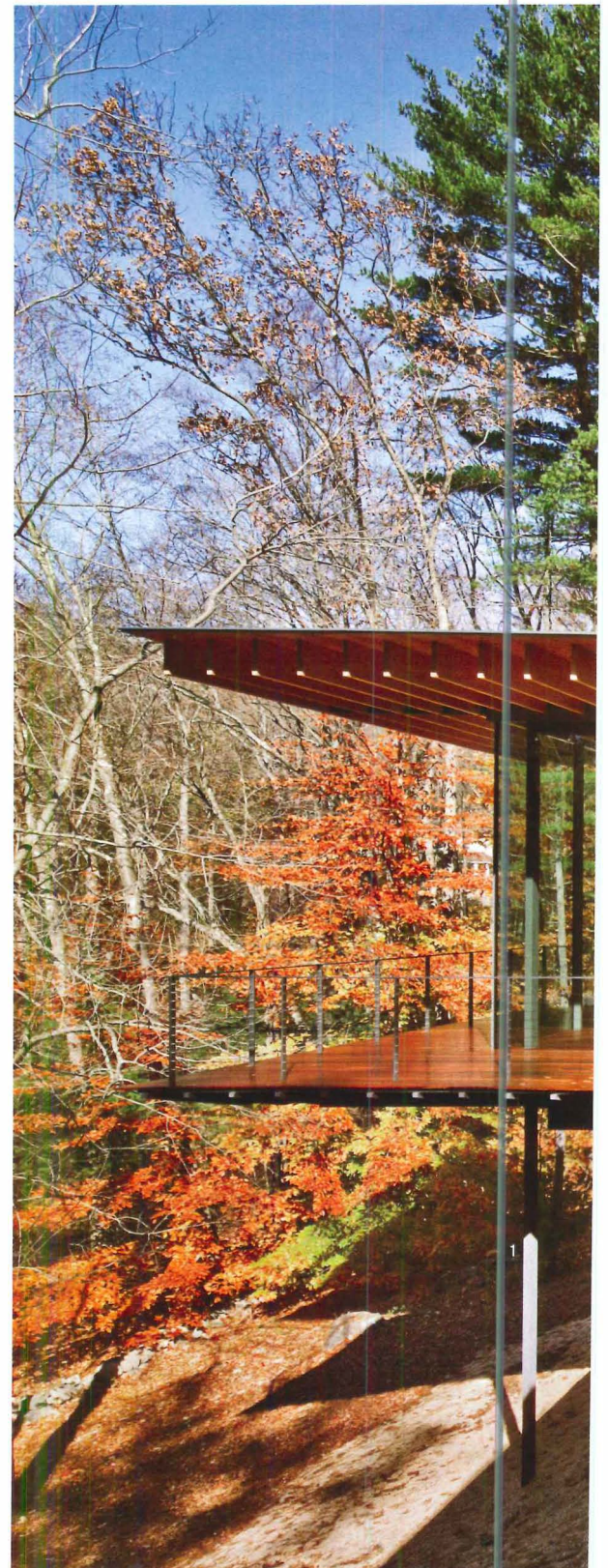
The house's original owner and designer was John Black Lee, an architect affiliated with the so-called Harvard Five – a group of architects that included Philip Johnson and Marcel Breuer who began settling in New Canaan starting around 1940, transforming the town into a hotbed of Modernism. Lee's axially symmetrical, one-story structure, completed in 1956 and published in *RECORD* as part of a collection of rectangular houses [November 1957, pages 152-156], featured a large open space, about 30 feet square, which contained a central fireplace, a living room, and a compact island kitchen. This main room had a perimeter clerestory and two all-glass exterior walls, on the north and south, providing views of the wooded 2-acre property. Bedrooms, two each on the east and west, flanked the main space, with a veranda and a generous overhanging roof surrounding the house on all four sides.

The current owners, a finance executive and a lighting designer, bought the property from Lee in 1990. Soon afterwards they commissioned New York City-based Toshiko Mori to renovate the house. Mori, who has since renovated or added onto several buildings by some of Modernism's giants, made subtle but significant alterations that included raising the central roof by about 18 inches, thereby enlarging the clerestory, and replacing deteriorated wood columns with stainless steel. The changes helped make the already elegant structure seem even more delicate and graceful. Even Lee, who now lives in another house he designed a few miles away, approves. "It was one of the most sensitive remodelings in New Canaan," he says.

Then in 2004, the couple, who by this time had a son and a daughter, transformed the unfinished basement into a family room with the help of another New York firm, Thomas Phifer and Partners, known for ethereal and impeccably detailed structures. The space had previously been accessible only from a hatch near the front door, but Phifer designed an interior stair protected by a minimal glass balustrade for the house's southwest corner, in what had been one of the four bedrooms.

The couple had already started thinking about further expanding their living space when a tree crashed through the roof during a January 2006 storm, providing the impetus for another renovation, as well as for an addition containing a master bedroom, a more spacious kitchen, and a formal dining area. After extensive research, they approached Kuma because they liked the delicacy of his structures and found his buildings sympathetic to their surroundings. "He has a light touch," says the wife.

Kuma designed a transparent, L-shaped addition that sits just to the



The roof of Kengo Kuma's addition to an American mid-century Modern house cantilevers from columns pulled behind its all-glass skin. The edge of the roof, and of the veranda it shelters, tapers so it is nearly razor-thin, helping create the impression that the structure floats above its site.





west of the original. The interior is almost entirely open, with very few walls. Instead, stainless steel mesh screens differentiate circulation space from other parts of the program. The structure is composed of steel columns only 3 inches wide and 6 inches deep, with equally minimal steel beams, and a roof supported by exposed glue-laminated spruce joists.

The project also entailed modifications to the existing house, such as the replacement of one section of solid exterior wall near the addition with glass, in order to provide more of a visual connection between new and old structures. As part of the renovation work, Lee's kitchen, which had been just inside the entrance, was removed, making the entire central zone of the older structure into an airy space for welcoming guests, like the *genkan*, or entryway, in a Japanese house, explains Kuma.

The expansion, like its mid-century neighbor, has an encompassing veranda, as well as a sheltering canopy at the same elevation of that on the original. However, the tectonic reality of these similar elements is very different. While Lee placed vertical structural components at the edges of his veranda, Kuma pulled them to the interior, behind a smooth skin of insulated, low-emissivity glazing. Although Lee concealed the roof structure behind a fascia and a drywall ceiling, Kuma's joists are left exposed with the plywood sheathing on top of them tapering to a projecting, paper-thin edge. And while Lee's pavilion is elevated just above a mostly level ground plane, Kuma's expansion is supported on attenuated columns over a steeply sloping section of the site. The newer piece feels almost like a





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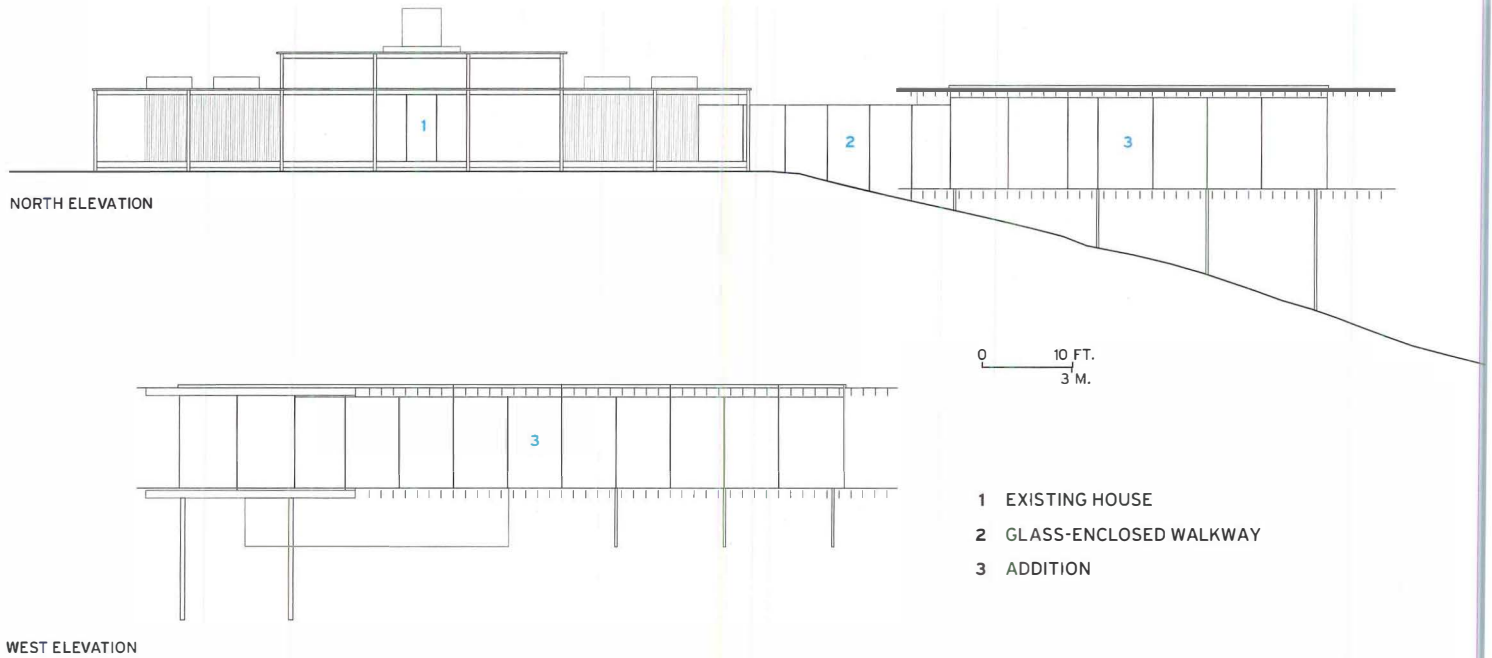


1. A corner of the older part of the house, where there had been a bedroom, is now the approach to Kuma's addition. The space also contains a stair inserted as part of an earlier renovation. It leads to a basement family room.

2. Stainless steel mesh screens, instead of walls, define space in the addition. At night, LED fixtures inserted in a slot in the floor illuminate the screens from below.

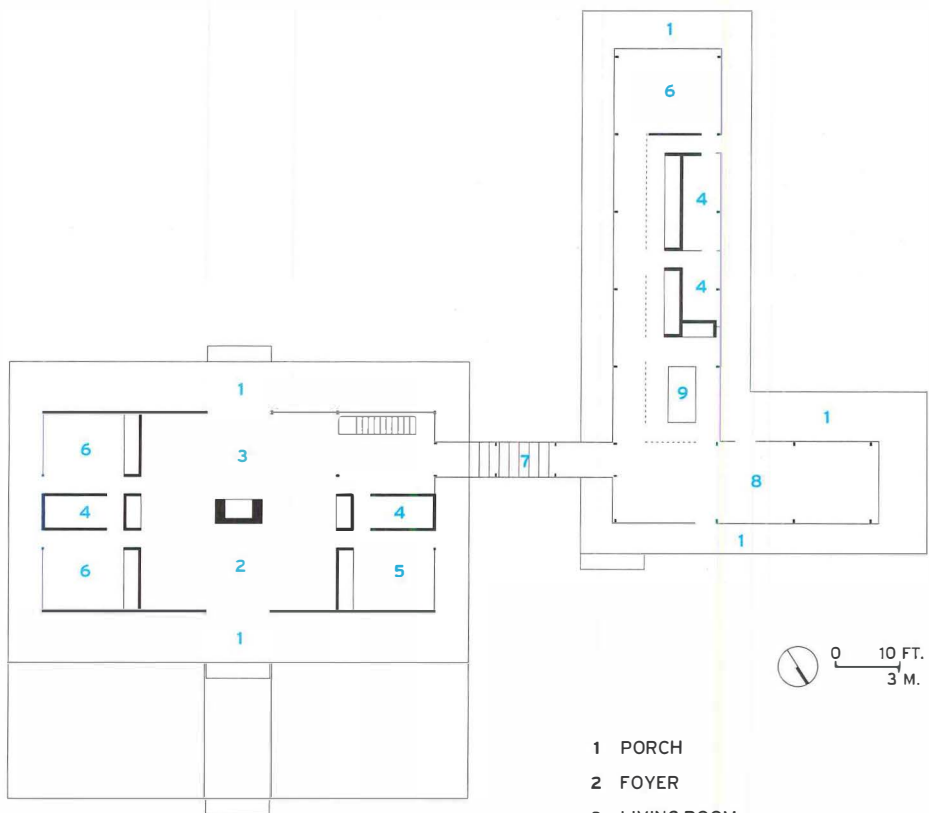
3. The roof over the glass-enclosed walkway linking the new living space and the mid-century piece appears to have been slid below the canopies that surround both structures.

4. With its original kitchen removed, the main room of the Lee pavilion serves as an airy *genkan*, or foyer, for the rest of the house.



0 10 FT.
3 M.

- 1 EXISTING HOUSE
- 2 GLASS-ENCLOSED WALKWAY
- 3 ADDITION



0 10 FT.
3 M.

- 1 PORCH
- 2 FOYER
- 3 LIVING ROOM
- 4 BATHROOM
- 5 OFFICE
- 6 BEDROOM
- 7 GLASS-ENCLOSED WALKWAY
- 8 DINING ROOM
- 9 KITCHEN

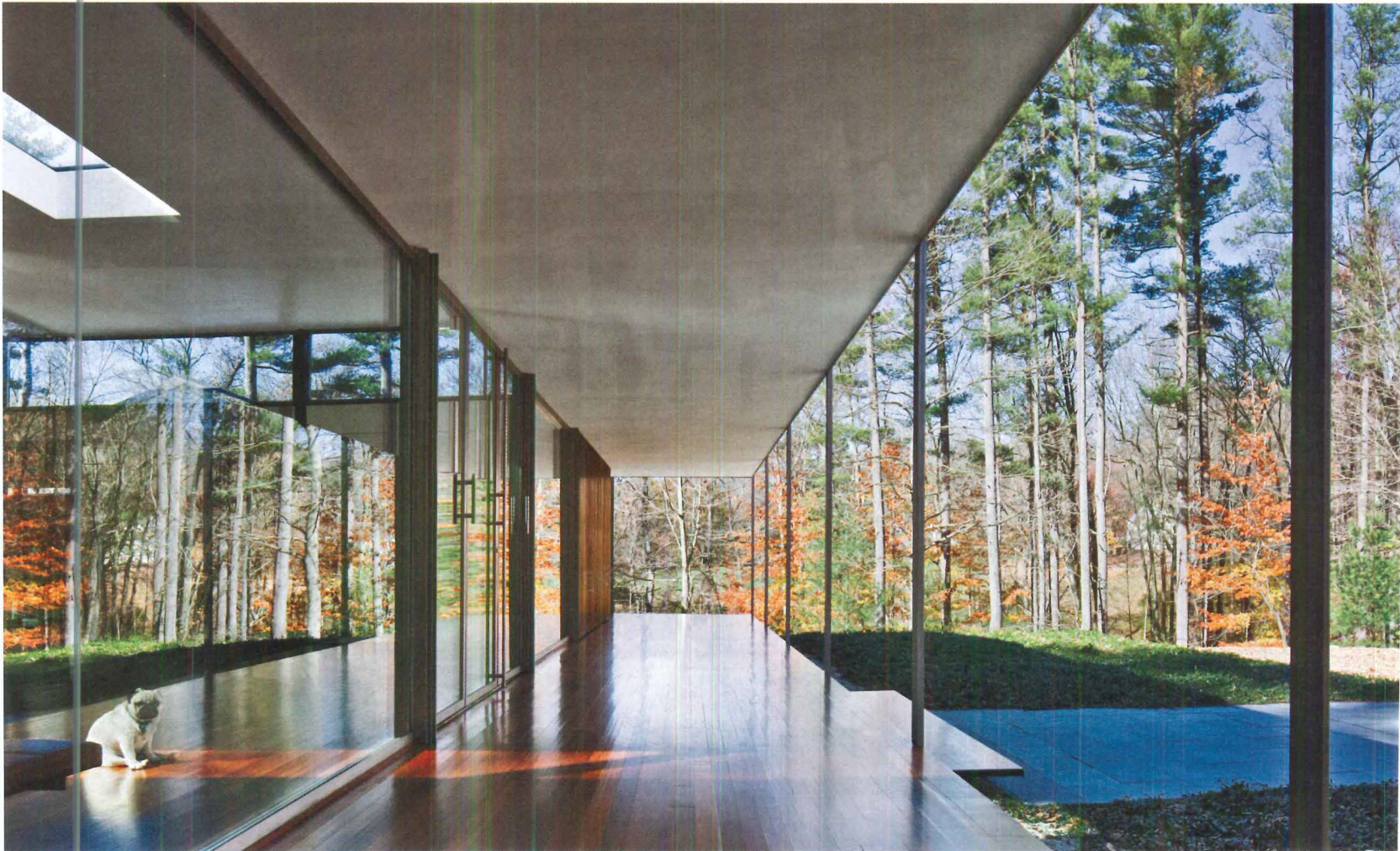
CREDITS

ARCHITECT: Kengo Kuma & Associates
 – Kengo Kuma, principal architect; Yuki Ikeguchi, Satoshi Sano, project architects
ARCHITECT OF RECORD: Gregory T. Waugh + Kazuki Katsuno
ENGINEERS: The Di Salvo Ericson Group (structural); Kohler Ronan (mechanical)
CONSULTANTS: Susan Leaming, Architectural Ix (lighting)
SIZE: 3,820 gross square feet (existing); 3,800 gross square feet (addition)
COMPLETION DATE: June 2010
SOURCES
GLAZING: Oldcastle BuildingEnvelope, Viracon
SKYLIGHTS: Wasco
ROOF: Sarnafil
HARDWARE: Rixon, Dorma, Sugatsune, d line
TILE: Vermont Structural Slate
EXTERIOR RAILINGS: Kueka Studios
DOORS: Suntech of Connecticut
CABINETWORK: Clifton A. Nelson

FLOOR PLAN

NORTH ELEVATION

WEST ELEVATION



TOP: The original part of the house sits on a mostly flat terrain. But the addition, supported by attenuated columns, extends over a steeply sloping section of the site.

BELOW: As part of the most recent renovation of the original house, a skylight was added over the entry. Huey, one of two pugs owned by the clients, enjoys the patch of sun it creates.



treehouse, especially at the western end of the dining room, where the floor is 17 feet above grade.

In response to the sticky problem of joining these distinct but sympathetic expressions, Kuma created an 18-foot-long glass-enclosed walkway that gently steps down about 4 feet, following the terrain. The roof of this passageway appears to have been slipped under the canopies surrounding both new and old buildings, creating the impression that the two could be disconnected if some future owner so desired.

Although the existing and new structures have been carefully linked, Lee wishes the connection had been made without piercing the skin of the original. Even so, he says he likes the addition, especially the way it relates

to the site. "It's nicely installed in the landscape," he observes.

And that is precisely the effect that Kuma was after. The goal of the descent from old to new, for example, "was to create the sense of being fused with nature," says the Japanese architect.

Even though Lee might find reason to quibble, the expansion shows a respect not only for the natural surroundings, but also for the existing built environment. It provides a new vantage point – one lifted off the sloping terrain – for viewing and appreciating the clarity and simplicity of the older structure. And while Kuma doesn't slavishly mimic Lee's language, the addition is clearly the product of keen observation, as well as thoughtful reinterpretation, of the piece built more than a half century earlier. ■



OPPOSITE: Soon after completion in 1956, Lee's templelike residence appeared in *ARCHITECTURAL RECORD* as part of a feature on rectangular houses.

ABOVE: The front facade looks much the same as it did 55 years ago, even though it has been modified. Changes that were part of a renovation designed by Toshiko Mori included lifting the central roof by about 18 inches, thereby enlarging the clerestory, and the replacement of deteriorating wood columns with stainless steel. Kuma added the vertical ipé louvers to visually tie the mid-century piece with the addition's wood roof structure.

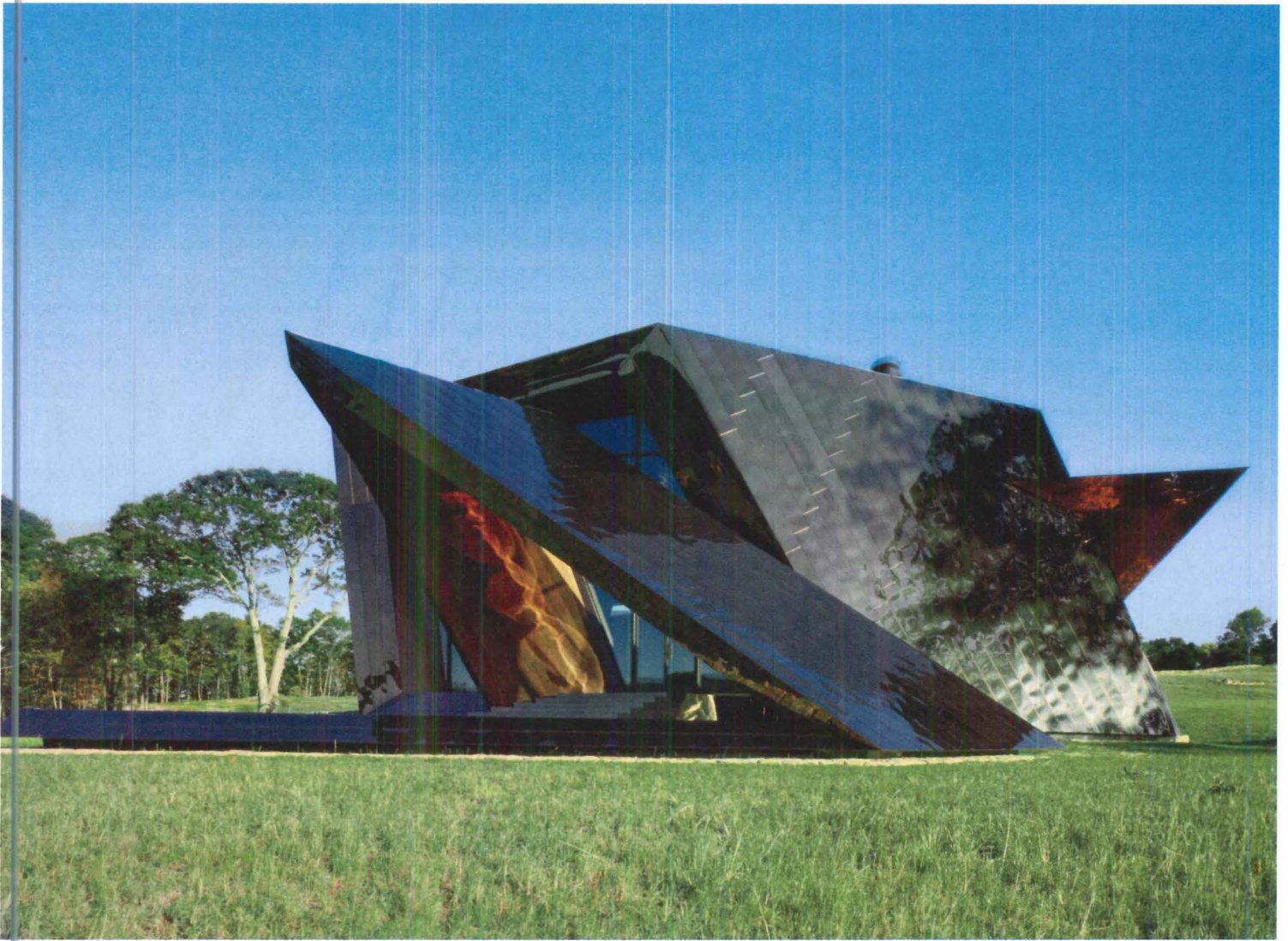
For a video tour of the project with the client, visit architecturalrecord.com.

PROJECT **18.36.54 HOUSE**
LOCATION **CONNECTICUT**
ARCHITECT **STUDIO DANIEL LIBESKIND**
BY **SUZANNE STEPHENS**



The house's inhabitants can look through a glazed opening on the south to the pastoral surroundings.

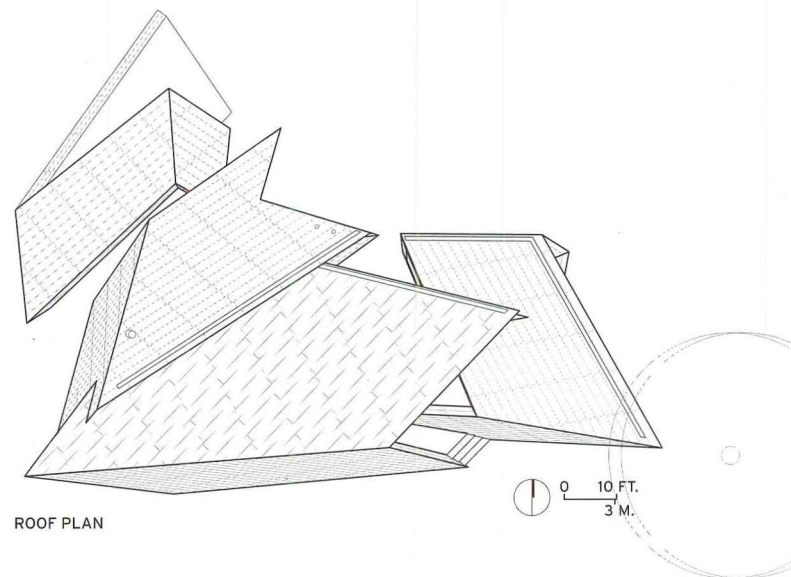
OPPOSITE: On the west side of the house a patio extends from the living area and kitchen.



A HOUSE IS not a museum. And the clients for a 3,000-square-foot weekend retreat in Connecticut clearly knew that. While they are involved in the art world, they did not want their country home to be a gallery-like setting for art. Yet it was the Jewish Museum in Berlin, completed in 1998 by Daniel Libeskind, that spurred them to turn to the architect with this residential commission. Like many visitors to the museum, they had observed that its tilting walls, the angular ceilings, and slanted floors heightened the kinesthetic as well as the visual experience of walking through its spaces.

The clients wanted a house that would have these experiential qualities, as well as provide a place where they could relax, read, cook, and take in the landscape. Libeskind, who is not known for creating cozy cabins in the woods, wondered if the latter meant *gemütlich*. One of the owners recalls challenging him: "Whatever you design, we'll ask you to make it more extreme." Libeskind said yes, and did not even ask for a contract.

The couple had found a rolling 54-acre site in Connecticut dotted with large oak trees and crumbling fieldstone walls left from the 18th century. The architect's radical interpretation of a weekend getaway turned out to be a stainless steel-paneled house that perches on a grassy knoll like a Russian Constructivist bird: its 18 folds yield 36 knifelike points and 54 lines (both folds and edges) following a mathematical series that guided Libeskind and gave the house its name.



ROOF PLAN

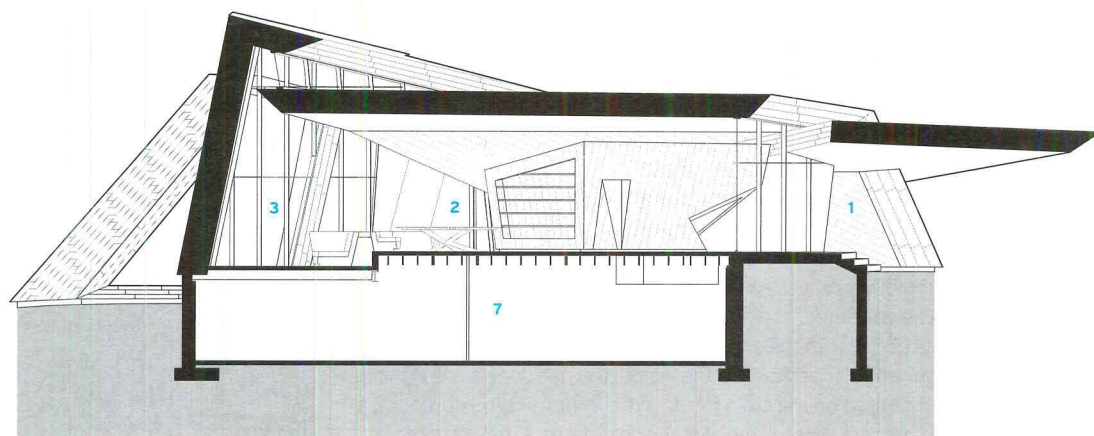
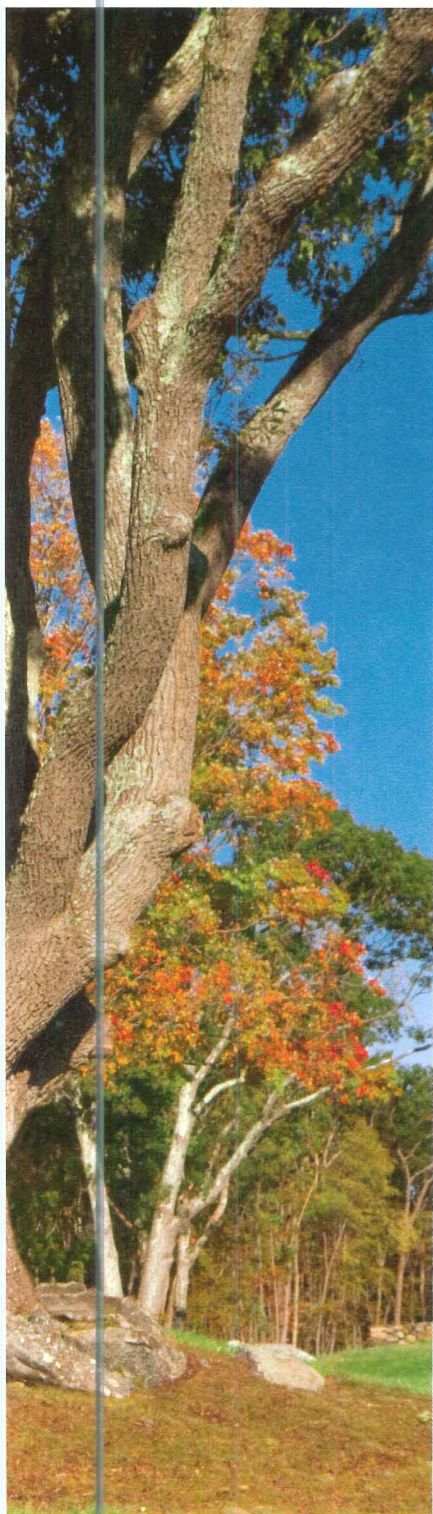


As you approach the front door concealed within burnished steel angles, you could be entering a cottage in the 1920 German Expressionist film *The Cabinet of Dr. Caligari*, whose convoluted sets were designed by Hermann Warm. But this is for real. The soigné elegance imparted by its materials and design make your next reaction all the more surprising: It is cozy. "You need that in a house," says Libeskind.

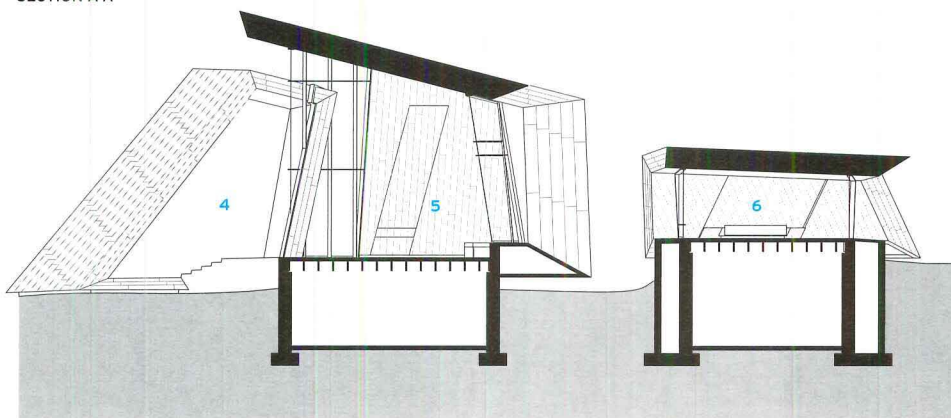
The underneath surface of the stainless steel roof is clad in oak – dark, warm, comforting oak. Once inside, a ramp gradually draws you down to the

living area and the fireplace around which a built-in sofa zigzags. Libeskind designed all built-in furniture, which includes a dining table, banquettes, and numerous fittings, although the clients salted in a few items, such as George III side chairs and traditional lamps, for a bit of contrast.

Owing to the manipulation of the section and plan, private corners and recesses commingle with the open spaces, and glazed openings give on to expansive, but framed and sheltered, views of the landscape. No curtains or shades block your vision. This "interstitial glass," in Libeskind's words, was



SECTION A-A



SECTION B-B

0 10 FT.
3 M.

- 1 ENTRY TERRACE
- 2 DINING
- 3 LIVING
- 4 PATIO
- 5 KITCHEN
- 6 BEDROOM
- 7 MULTIPURPOSE SPACES

ABOVE: From the exterior, the stainless steel panels appear reflective or opaque depending on the position of the observer and the time of day.

RIGHT: At night interior illumination brings out the pattern of the cladding.



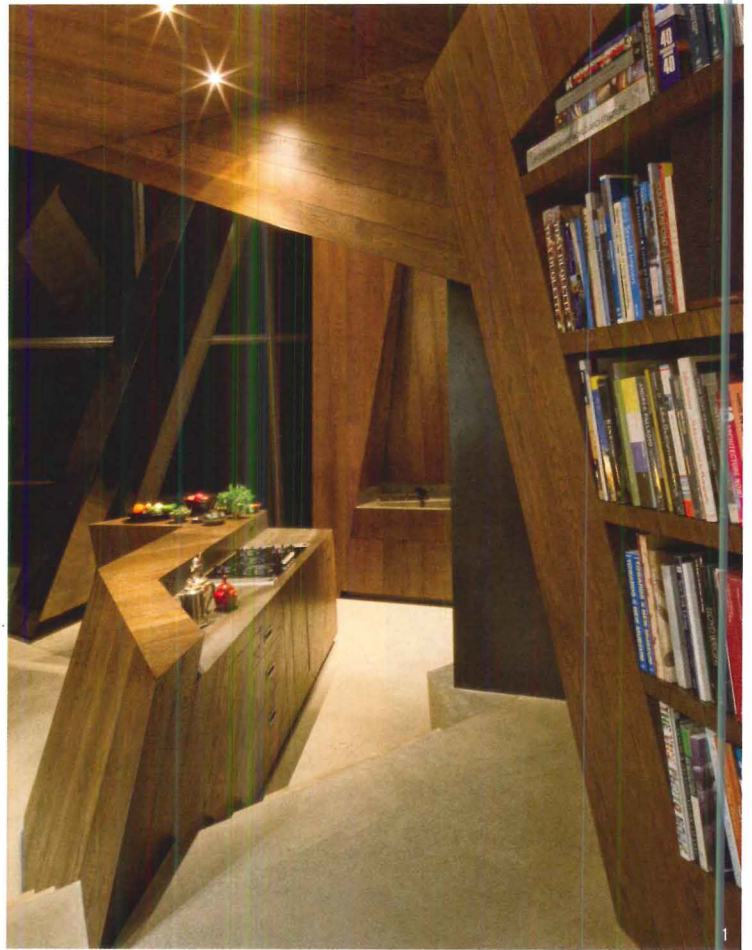
inserted between the folds of the roof. Only one perpendicular wall – behind the kitchen area – stands as an offering to a Euclidean pragmatism. Even the fireplace was tucked into the slanted wall, a remarkable event considering that the clients had forgotten to mention it in the program. (The basement level is more straightforward, and includes a yoga room, storage, and a guest bedroom with a fold-down bed.)

The bronze, stainless steel panels cladding the exterior change in the tones and hues from dark copper to purple to dark brown depending on the position of the observer and the time of day, as do the panels' alternation from a shimmering reflectiveness to a matte opacity.

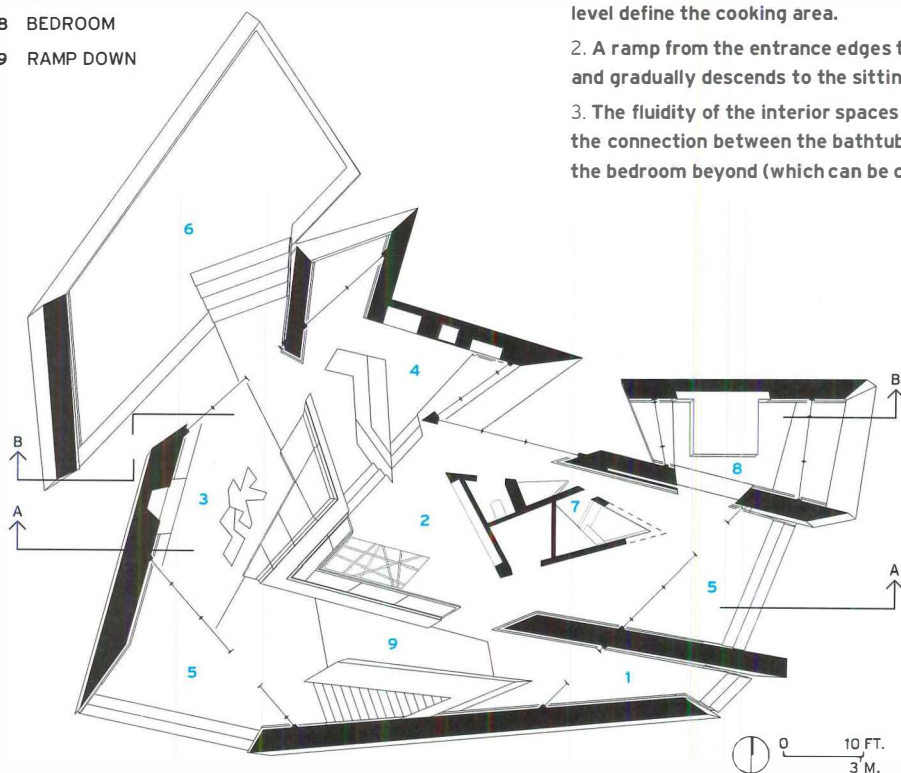
The stainless steel elements are mounted on plywood structural insulated panels (SIPs), with the entirety supported on a steel frame consisting of four angular arches. On the inside, the oak panels are attached to metal studs mounted on the steel frame. Where they extend outdoors, a different finish compensates for the climatic conditions. (The few interior walls not clad in oak are surfaced in Swedish putty.)

In order to keep the rainwater from discoloring the steel panels, gutters follow the low edges of the roof, and downspouts are embedded within the walls. A radiant system in the concrete floor heats and cools the house, although supplementary forced air can be turned on when desired.

All the technical spaces of the house create a handcrafted object that astonishes with its presence, which Libeskind wanted to be "aggressive and soothing." While the custom artifact needs cleaning – much like a boat – the clients have got a radically experimental cozy cottage in which to live and entertain. They also got one of Libeskind's best works. ■



- 1 MAIN ENTRY
- 2 DINING
- 3 LIVING
- 4 KITCHEN
- 5 TERRACE
- 6 PATIO
- 7 SHOWER/TUB
- 8 BEDROOM
- 9 RAMP DOWN



1. Inside, the angular oak planes and a change in floor level define the cooking area.
2. A ramp from the entrance edges the dining area and gradually descends to the sitting room.
3. The fluidity of the interior spaces can be seen in the connection between the bathtub (foreground) and the bedroom beyond (which can be closed off).

CREDITS

ARCHITECT: Studio Daniel Libeskind – Daniel Libeskind, principal; Arne Emerson principal; David Stockwell, associate; Jerry Figurski, job captain; Roy Oei, designer

ENGINEERS: Hage Engineering (structural); P.A. Collins (m/e/p)

CONSULTANTS: Arup Lighting (lighting); Kent Greenhouse (landscape); Simpson Gumpertz & Heger (building envelope)

GENERAL CONTRACTOR: CNR Group

SIZE: 3,027 gross square feet

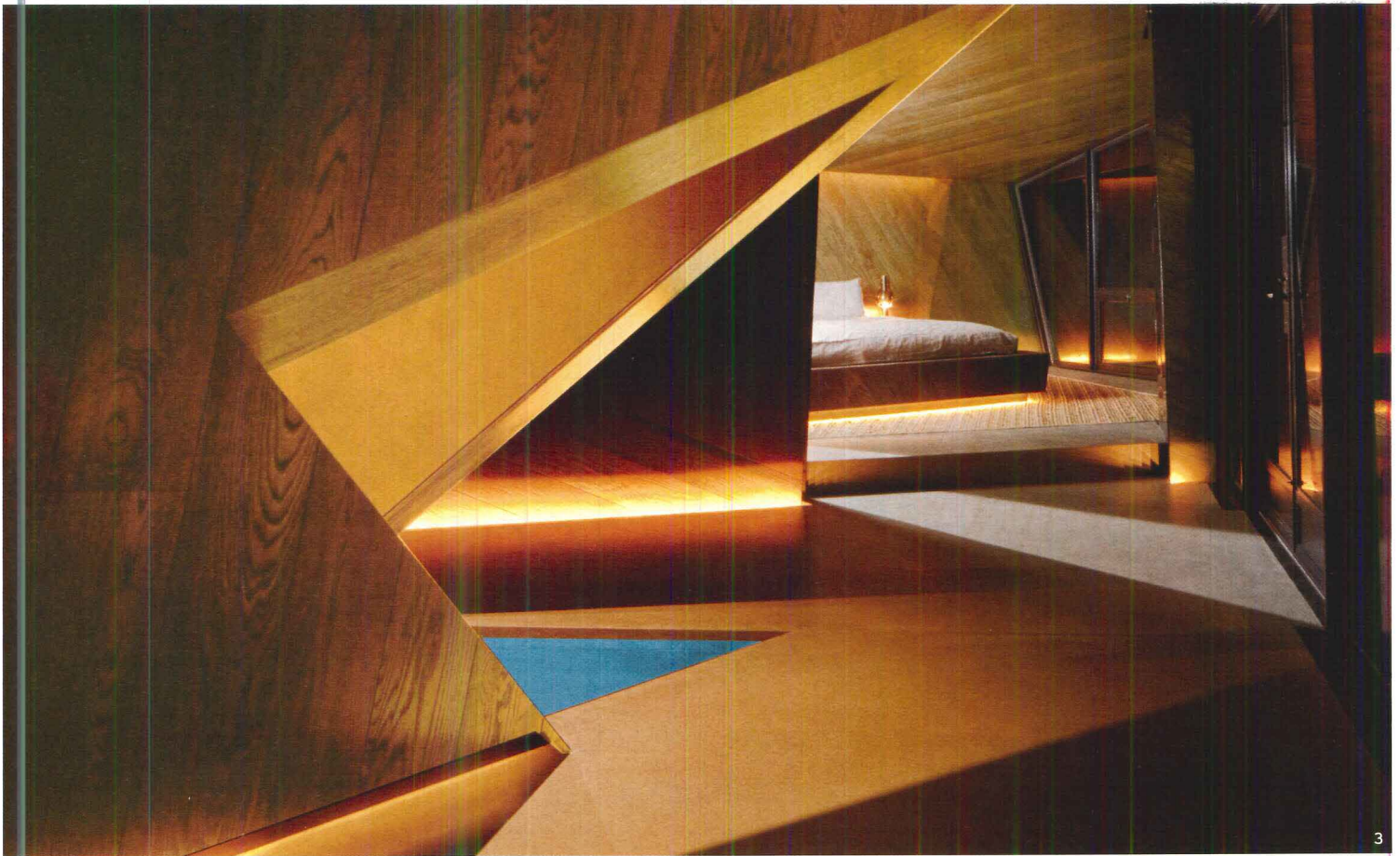
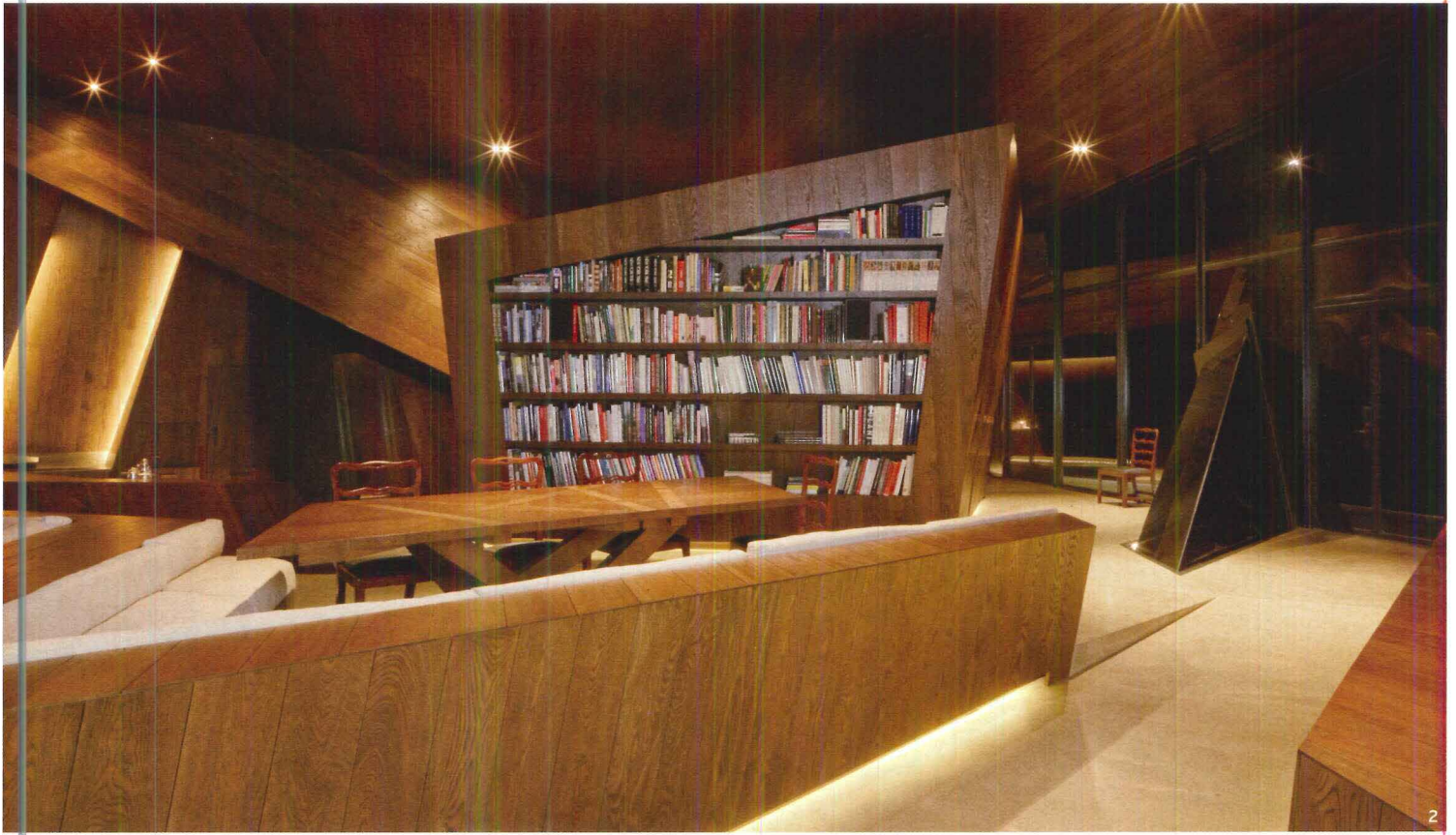
COMPLETION DATE: July 2010

SOURCES

STAINLESS STEEL PANELS: Rimex Metals; Zahner Metals

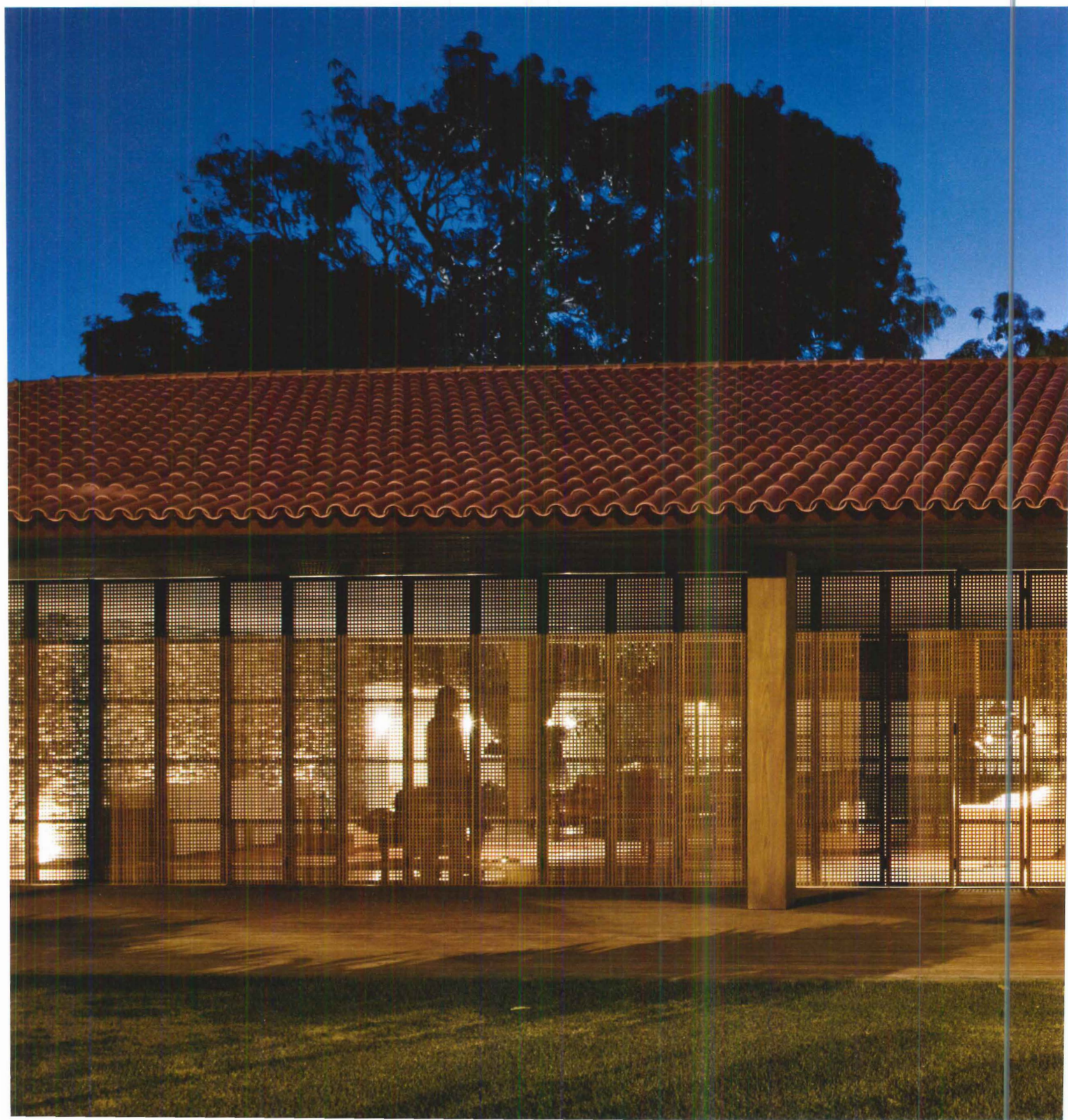
STRUCTURAL INSULATED PANELS: PanelWrights

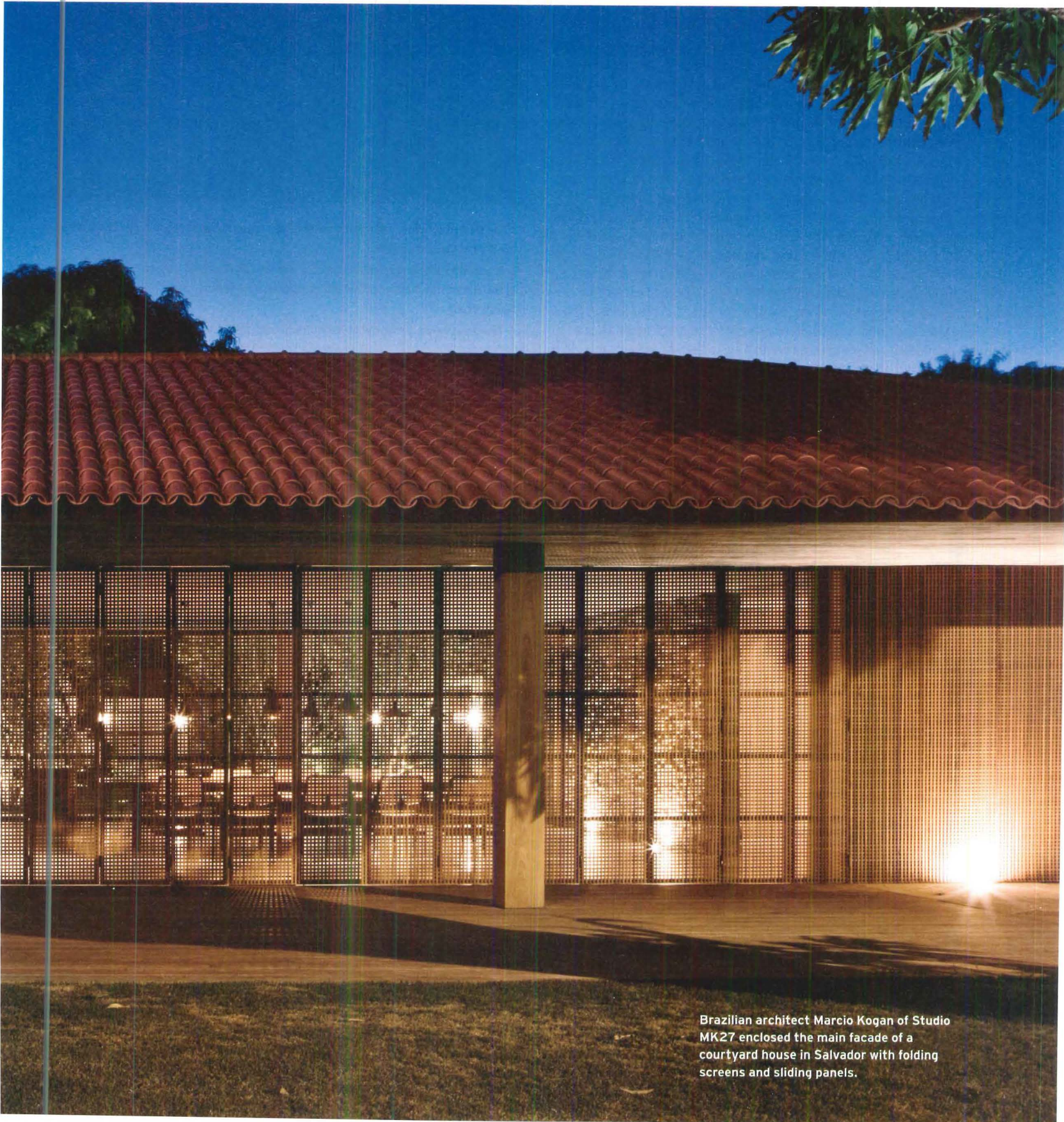
STEEL FRAME: HyWay Erectors



[Daniel Libeskind leads a video tour on our website and our iPad.](#)

PROJECT **BAHIA HOUSE**
LOCATION **SALVADOR, BRAZIL**
ARCHITECT **STUDIO MK27**
BY **GISELA GUEIROS AND THOMAS PIPER**





Brazilian architect Marcio Kogan of Studio MK27 enclosed the main facade of a courtyard house in Salvador with folding screens and sliding panels.

MANY ARCHITECTS CLAIM they build with light, as if they possess an alchemical ability to make the ethereal material. With his Bahia House, the São Paulo-based architect Marcio Kogan, of Studio MK27, does them one better: He builds with breeze. Combining the principles of contemporary design, traditional Bahian siting, and vernacular materials, Kogan produced a fantastically efficient house that seems to breathe with its environment.

Bahia, a state in the northeast part of the country, is essential Brazil – home to many of the country's cultural icons: samba, capoeira (a martial arts-related dance), and *candomblé* (the Afro-Brazilian religion). It is a place where Brazil's colonial past, its history of African slavery, and its native traditions come together in a soulful, languid mix, typified by the extremely laid-back nature of the Bahians. The climate is hot and humid year-round.

Approached by going up a steep hill, in a gated residential neighborhood of the state capital, Salvador, the house, finished by Kogan in 2010, has a square plan built around an open-air courtyard. Three sides of the square are constructed in natural stone, or *moledos*. The fourth side, which faces the street, is an open volume framed by the overhanging roof that rests atop the opposing stone walls, and by a simple floor-to-ceiling *mashrabiya* (an Arabic screen) extending the 67-foot-long elevation. The screens can be folded in accordion fashion to reveal a second layer of 8-foot, 10-inch-high glass panels, which also slide completely out of the way. This design feature means the living/dining space can be entirely open from the street to the courtyard and beyond to the bedrooms contained in the wing on the opposite side. Except for eight wood-clad square concrete columns, the space is unimpeded, allowing cross ventilation to take full advantage of the prevailing winds from the nearby Atlantic Ocean.



1. The bedroom wing, shielded by a sliding screen, is separated from the interior courtyard by a linear pool.

2. A veranda along the front is partly covered by the roof overhang with a soffit of rip-cut unfinished wood, which continues the ceiling plane of the living and dining areas.

3. The house was designed so that living and dining areas open onto a grassy courtyard where two existing mango trees thrive. The Asturias armchairs of recycled wood were designed by Carlos Motta.







The house, however, is not by the sea. It sits in a lush, densely forested setting, immediately adjacent to the city's zoo. As a clue to the house's seamless integration with the natural surroundings, the little sagui monkeys from the zoo are frequent guests, attracted most likely by the three giant mango trees, each over 100 years old, which provide a natural canopy to the property's open spaces.

The owner initially tried to hire Kogan to renovate an existing structure when he bought the site. Kogan declined the offer. "The house was hideous, plus it had bad energy," he recalls. After a series of unappealing renovation proposals from other architects, the owner came back to Kogan and agreed to start from scratch. The mango trees are all that remain. And with two of the three essentially centered on the lot, they helped Kogan to define the shape of the house: "I like single-story houses best," he says. "And since the lot was big enough, we could create the square patio inside, which is a typical Bahian reference."

For three sides of the square, interior walls define the nonsocial spaces – kitchen and service areas, bedrooms and bathrooms, and a den and home office, respectively. A *mashrabiya* along the back courtyard wall screens the bedrooms from the linear swimming pool edging this wing to allow a similar blurring of indoor and outdoor spaces. But Kogan's real

mastery is in transforming the stone walls from traditionally imposing enclosures to delicate dividers of space – nearly equivalent to a sliding glass panel, or folding *mashrabiya* – which invite the interior and exterior landscapes to mingle. The floors of these three sides of the plan are all 15 inches below grade. In Kogan's words, "We sunk the house." From inside, the subtle shift in scale allows the surrounding forest to appear to bleed over the walls and into the interior courtyard.

To accentuate the effect, the first course of stones in each wall are laid flush to the ground, creating the illusion that these portions of the house might still be sinking slowly into the earth. The stones vary in size, but were all selected to be nearly rectangular. As a result, strong horizontal lines are generated that, together with the planarity of the roof line, create a Modernist reference in harmony, not in conflict, with the rustic material.

For the ceiling in the living and dining space, Kogan performs a similar trick with wood that the owner had collected from building demolitions. By rip-cutting every piece to the same narrow width (but leaving them with varied lengths), the ceiling projects a linearity that exaggerates the span, while each board, left otherwise unfinished, retains its individual character – a modern patchwork in wood.

Through attentive, subtle detailing, Kogan gets rustic materials to



1. The living and dining space opens to the street or to the courtyard by sliding back the *mashrabiya* screens and glass panels. Large, comfortable Mole armchairs by Sergio Rodrigues help define the living area.
2. From the moment visitors arrive at the entrance vestibule, they are struck by the way Kogan has laid the stones in the walls to emphasize the horizontality of the wood ceiling plane and the sliding screens. The architect notes that his combination of Modernist linearity with rustic materials is also evident in the work of Brazil's leading 20th-century architects such as Lucio Costa, Oscar Niemeyer, and Lina Bo Bardi.

perform, without a hint of contradiction, in an explicitly Modern context. A stark example is the clay-tiled roof over the front side of the house. Almost every neighbor in the community uses the same roofing material, the ubiquitous symbol of Brazil's colonial architecture. But Kogan points out that the clay tiles are emblematic precisely because they are appropriate to the climate. Despite Salvador's constant sticky weather, the living area in Bahia House contains no air-conditioning at all, not even ceiling fans. Together with the well-thought-out positioning of the house, the tiles create perfect thermal efficiency.

Sitting in the house's living room in classic Brazilian Mole chairs designed by Sergio Rodrigues, with all the *mashrabiya*s folded shut but the glass panels left open, one feels the cool breeze invading the space. The mango trees shade the hot summer sun. The ambience, even inside, is of a lazy veranda. Time slows to a Bahian pace. There is a Bahian custom, to *varandar* – to take a leisurely stroll along the beach, stopping at each and every house's veranda to chat with neighbors. Such a verb could have been created only in Bahia, as Kogan's house superbly demonstrates. ■

Gisela Gueiros is a writer and art historian, and Thomas Piper is a filmmaker; both are based in Brooklyn.

CREDITS

ARCHITECT: Studio MK27 – Marcio Kogan, principal; Suzana Glogowski and Samanta Cafardo, co-designers; Diana Radomysler, interior designer; Beatriz Meyer, Carolina Castroviejo, Eduardo Chalabi, Eduardo Glycerio, Eduardo Gurian, Gabriel Kogan, Lair Reis, Luciana Antunes, Maria Cristina Motta, Mariana Simas, Oswaldo Pessano, Renata Furlanetto, project team; Henrique Bustamante, Sergio Ekerman, collaborators

CONSULTANTS: Renata Tilli (landscape)

SIZE: 7,240 gross square feet

COMPLETION DATE: January 2010

SOURCES

STONE WALLS: Pedras Bellas Artes

WOOD FRAME AND DOORS: Plancus Engenharia

CABINETWORK AND CUSTOM WOODWORK: Brumol

ARMCHAIRS AND TABLE: Carlos Motta

HANGING LAMPS: Tom Dixon

MOLE ARMCHAIRS: Sergio Rodrigues

LIGHTING: Lumini

PROJECT **HOUSE IN LEIRIA**
LOCATION **LEIRIA, PORTUGAL**
ARCHITECT **AIRES MATEUS & ASSOCIATES**
BY **DAVID COHN**





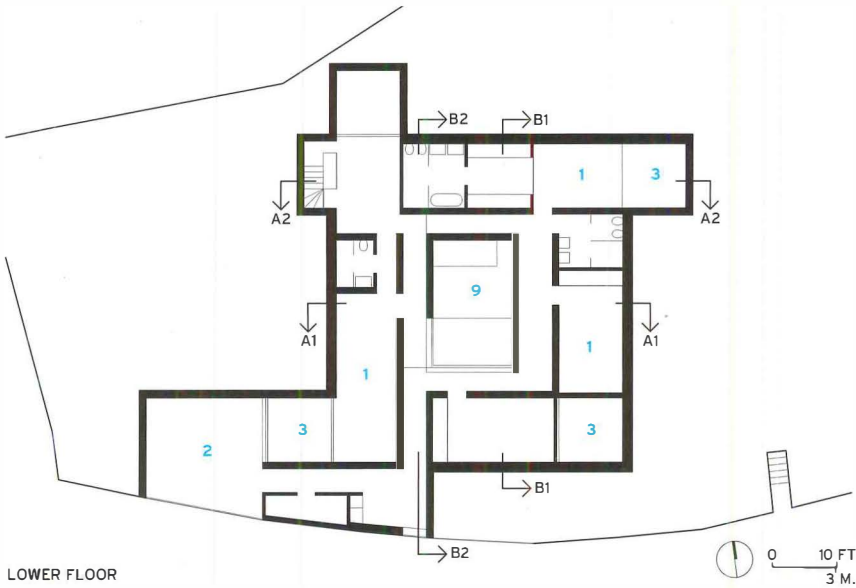
1. The architects cut a courtyard into the land near each of the house's four corners, bringing daylight to the bedrooms on the lower level and creating mysterious glowing squares in the lawn.

2. Wrapped completely in white plaster, the house appropriates the form of a residential archetype or a Monopoly game piece.

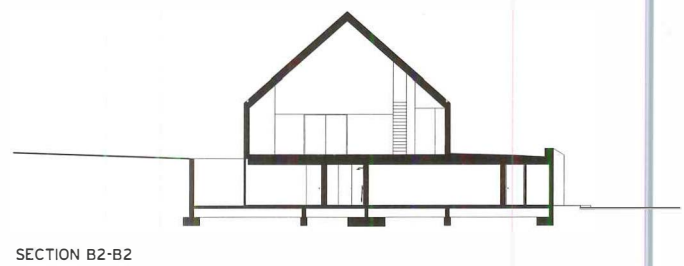
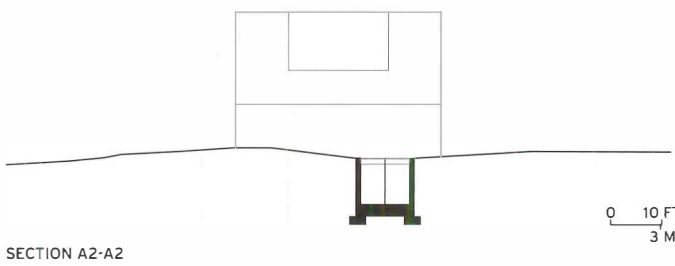
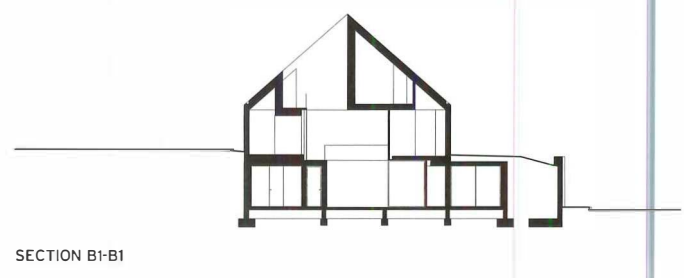
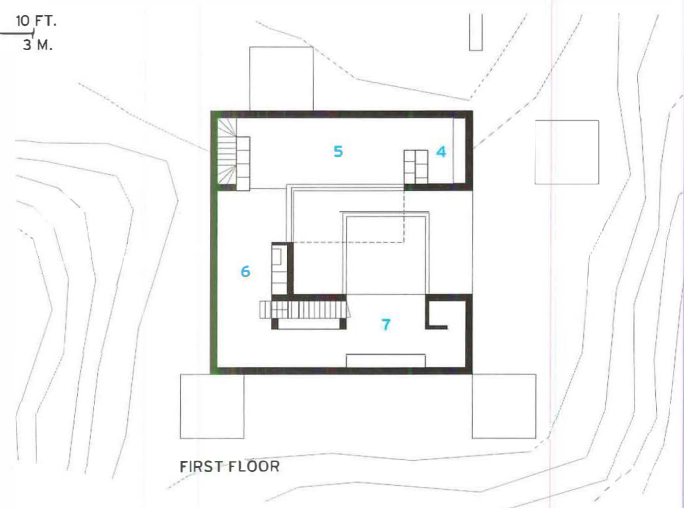
3. Visitors can walk through a gate and up a set of outdoor stairs to reach the main entrance. On the other side of the street edge, a driveway takes cars to the garage on the lower level.

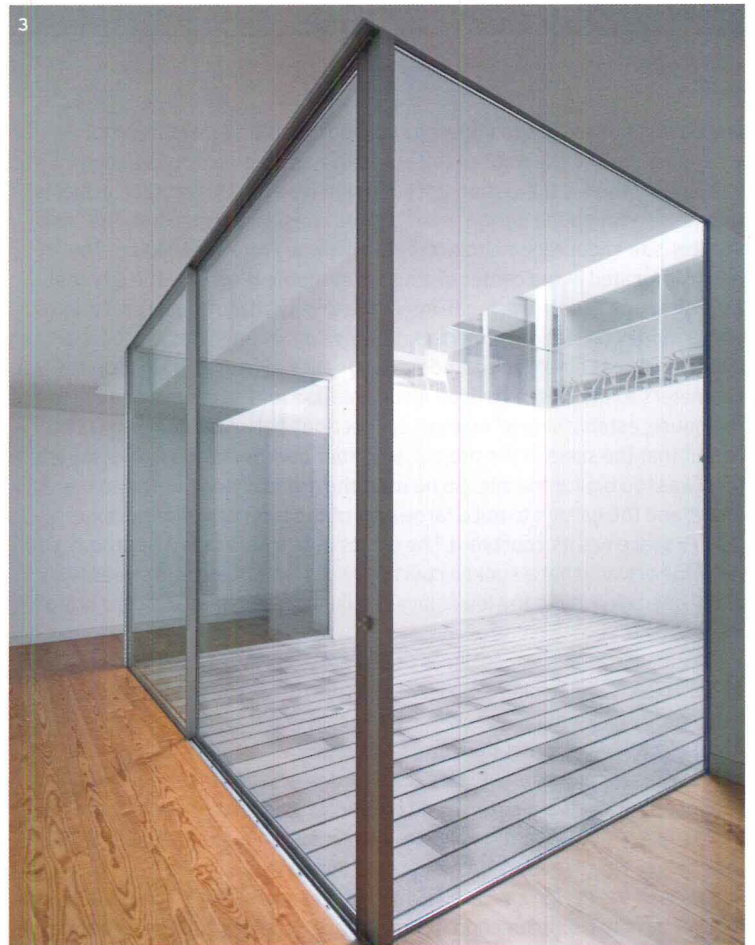
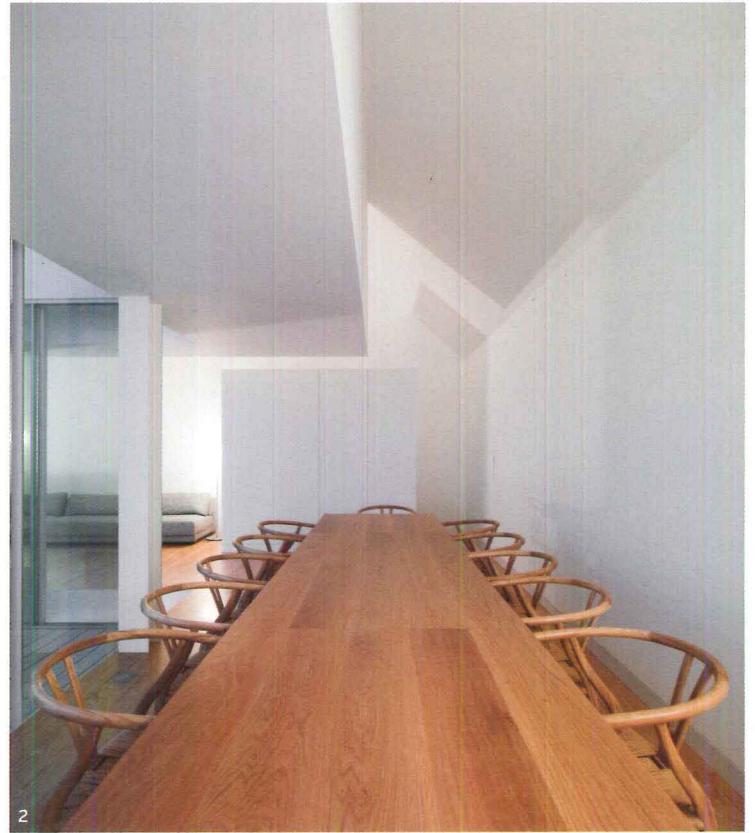
THE LISBON-BASED BROTHERS Manuel and Francisco Aires Mateus push their residential designs out of the realm of the ordinary toward the surreal and dreamlike. In one project, they arranged the living room furniture of a beach house on a floor of deep sand. In another, a renovated winery, they suspended the volumes of the bedrooms over the living space like geometric stalactites. And in this project for a young family outside the small city of Leiria, they created the perfect archetypal form of a house, straight out of a Monopoly game box or a fairy tale. An apparently solid volume wrapped completely in white plaster – pitched roof and all – sits on the green plinth of an extended lawn, sharply profiled under the Portuguese sun.

But the visitor soon discovers that the actual living quarters spill out from this milk-carton house on all sides, while the interior opens to the light and air. A single deep opening in the front of the building reveals living spaces nestled around a diagonal void that cuts through the heart of the residence, extending in steps three stories from the roof to below grade. Adjacent to each of the house's four corners, the architects cut a small courtyard into the

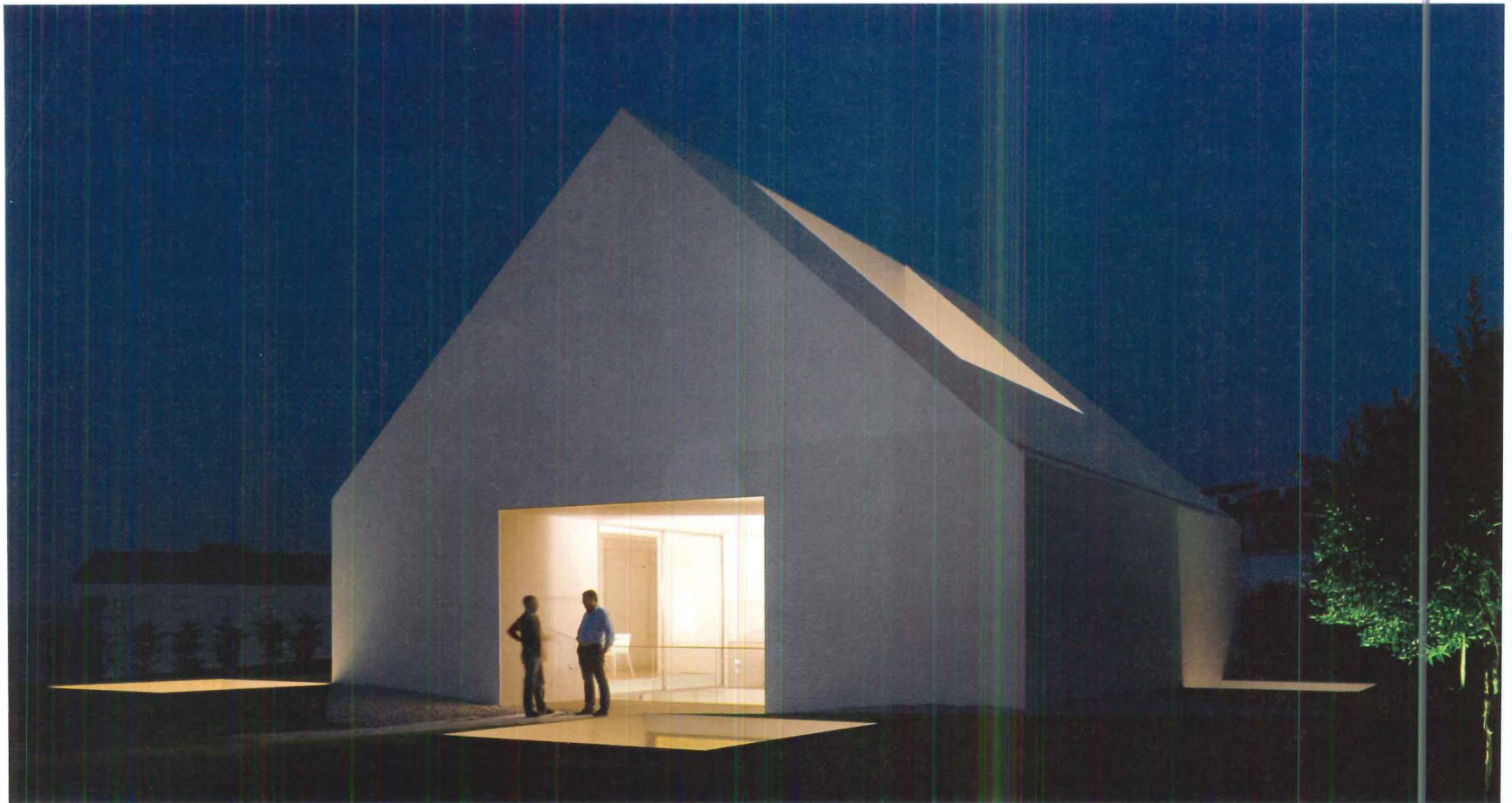


- 1 BEDROOM
- 2 GARAGE
- 3 COURTYARD
- 4 KITCHEN
- 5 DINING
- 6 LIVING
- 7 STUDIO
- 8 GUEST
- 9 PATIO





1. A narrow stair provides access to a guest room on the top floor. Wood treads and risers provide a warm accent to the white walls and ceilings in the house.
2. The large void running through the center of the house means that living spaces – such as the dining room – get squeezed around it.
3. On the lower level, the central patio serves as the spatial anchor around which bedrooms are arranged. The angled shaft of space that runs above the patio and up through the roof blurs the boundaries of indoors and out.



lawn, bringing daylight to underground bedrooms and creating a floor extending beyond the walls of the house like an invisible root system.

Manuel, who led the Lisbon-based design team on this project, explains that he developed the design around three considerations. First, the “not so nice” site encouraged him to create an inward-looking building. The house is located in the center of a hilltop settlement outside the city that, as is often the case in Portugal, mixes the unruly charm of its rural origins with a motley collection of modest new residential buildings. Second, a distant view of Leiria’s chief landmark, a medieval castle on a hilltop several kilometers to the west, provided an orientation for the central opening of the house, establishing a “magical connection” between them. And lastly, he felt that the scale of the project, with four bedrooms and 3,200 square feet, was too big for the site. So he used the grade change between the street and the garden to put a large part of the program underground. “Every space has its courtyard,” he points out. “If you’re in a bedroom, you have the privacy that a sunken court provides.” A garage and street-level entry open directly to the lower level, while a garden gate and stair bring visitors up to the lawn entrance.

The main event in the design is the three-story void above the central patio. This intriguing element “takes the form drawn by the light,” Manuel explains. By alternating glazed, floor-to-ceiling openings and solid walls around this void, the architect emphasized the sculptural quality of the cut, carefully shaping the negative space as it descends from the south-facing roof opening. On the main level, an outdoor deck made of saw-cut granite planks faces the view and overlooks a square opening to the patio on the lower level, which is adorned by a potted lemon tree.

In one of the design’s several quirks – places where the architects allow the logic of form to trump functional convenience – the deck is separated from

ABOVE: Instead of a traditional front door, the house has a rectangular opening on the first floor that brings visitors to a balcony providing access to the living spaces. The sunken courtyards at the four corners of the house currently have no railings or covering to prevent people from falling in. The architects plan to install a nearly invisible safety net over the courtyards.

OPPOSITE: From the third floor, a visitor can look down through the central void and out to the front yard.

CREDITS

ARCHITECT: Aires Mateus & Associates – Manuel Aires Mateus, partner in charge; Maria Rebelo Pinto, project architect; Humberto Fonseca, Luisa Sol, Tiago Santos, design team

SIZE: 3,200 square feet

COMPLETION DATE: 2010

the living area level by an uncomfortably large step, making a fluid link with indoor/outdoor living awkward. This is a consequence, it turns out, of the architects' effort to hide the edge of the floor slab behind a floor-to-ceiling sheet of glass bridging the lower level of the void on its north side, a strategy that affects areas around the patio in a too-scrupulous respect for precision. In addition, the large size of the patio cuts into the living spaces. There is no room for armchairs or a coffee table around the long sofa, which looks out to the castle on one end and at a wall cabinet hiding the television on the other.

Manuel explains that the unconventional roof finish of painted plaster was made possible by modern waterproofing systems, and says it will require no more maintenance than the stucco-finished concrete walls – just periodic painting. For a "real problem," he points to the unprotected courtyards cut out of the lawn, especially since the couple has a young child. He is planning to install a nearly invisible safety net over the openings. How about a glass balustrade or a hedge? "That would be horrible!" he replies.

The house is well crafted throughout, with elegant window frames of solid aluminum made in Switzerland, floors and stairs of local pine in wide strips up to 8 feet long, lacquered built-in closets and cabinets, and bathroom floors of Lioz, a rare Portuguese limestone. The client is building the architect's custom-designed furniture as funds become available. A handsome dining table and the long sofa are in place, but for now the couple's mattress rests on their bedroom floor.

The Aires Mateus brothers graduated from the Lisbon School of Architecture in the late 1980s, and apprenticed with Gonalo Byrne. With its hidden, excavated spaces and labyrinthine plans, the Leiria house brings to mind the Casa Das Mudaz Museum in Madeira by Paulo David, another Byrne disciple [RECORD, May 2007, page 192]. And in its mixture of archetype and sculptural form, it distills the spirit of Aldo Rossi's evocative visions with a fine, minimalist precision. ■



PROJECT **MONTECITO RESIDENCE**
LOCATION **MONTECITO, CALIFORNIA**
ARCHITECT **BARTON MYERS ASSOCIATES**
BY **LAURA RASKIN**



The landscaping, by Rios Clementi Hale Studios, becomes looser and freer farther away from the house.

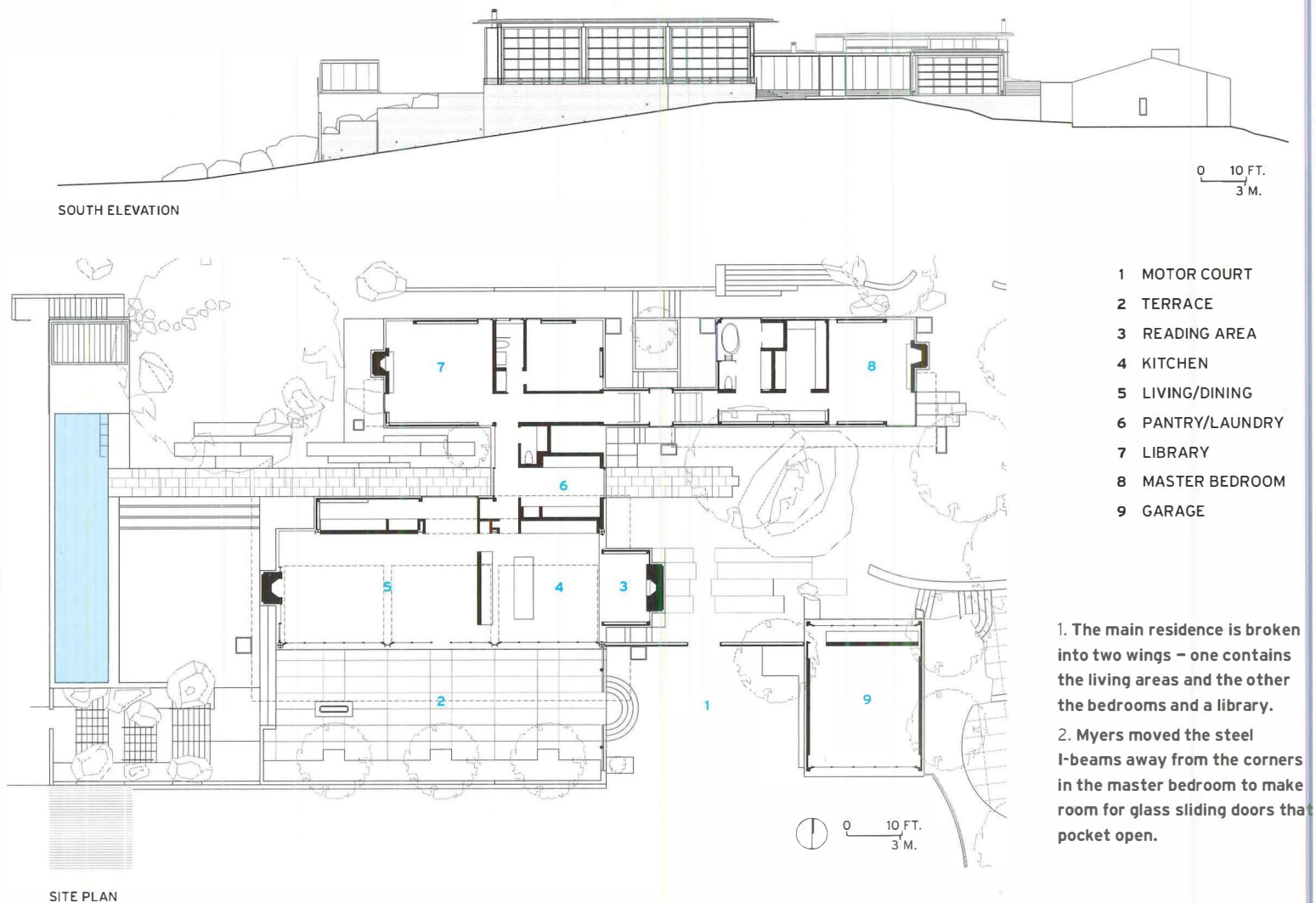
RIGHT: A metal deck roof spans the 20 feet of the main residence, with a 10-foot cantilever over the terrace. Given the climate, three motorized overhead doors often remain open.



"NOW, THE EARLY guys got it. Schindler, Neutra, Wright," says Barton Myers, sitting on a ledge of the terrace outside of his most recent steel and glass house in Montecito, California, completed in 2009. What those guys, the ones Myers reveres, got was the dialogue between the inside and the outdoors. A West Coast house should embrace the garden, not shutter it out. This isn't Canada, where Myers practiced early on in his career. Myers's Modernism here – Barton Myers Associates is based in Los Angeles – is a distinctly regional one, rooted in the mild, bug-less climate of Southern California. It embraces Spanish and Moorish influences that migrated north from Mexico, and the Eastern idea of the garden as paradise.

This is Myers's fourth steel house in California, including his own completed in 1999. It benefits from lessons learned on previous projects and irons out the seam between interior and exterior spaces. The property is "really in our arms," remarks Dorothy Gardner, who owns the house with her husband, John. ("It's a pretty glorious tent," she says.) The house is what Myers calls soft prefabrication – the personalization of off-the-shelf parts, such as 2½-inch steel panels, a metal deck roof, and motorized overhead doors. "What I've tried to do is make a lesson out of this system, which is really a post-and-beam system," says the architect. The industrial, catalogue aesthetic funnels his interests and history – his introduction to technology as an Air Force fighter pilot, his role as the guest editor of the Steel Company of Canada's magazine *STELCO* when he and architect A.J. Diamond had a practice in Toronto in the 1970s, and his architectural education at the University of Cambridge and the University of Pennsylvania, where he studied with Louis Kahn. It's also his interpretation of the legacy of glass and steel, the timeline of which Myers can recite in a few minutes, hopping from the Crystal Palace to Nikolaus Pevsner to the Eames House.

The Montecito Residence sits on a 1-acre site in the hills of Santa Barbara. A steep ravine cuts off the property to the east, ending in a creek. Thomas Schneider, associate in charge, recalls the tons of sandstone boulders that were hauled from the site where a small derelict house once



stood, and the perseverance required to see the adventurous project to completion. Other boulders were saved, melding the house with its coarse site, but the south-facing 3,360-square-foot main residence doesn't attempt to mimic the land. It's distinctly man-made, a transparent living machine, with three 20-foot-wide sectional glass and steel overhead doors. When fully open, as they were on an early February day, the doors rest under the metal deck roof. "These doors are so ingenious," says Myers. "You lift thousands of pounds, and they're beautifully torqued with all the gear chains." Myers insists that it's the doors, which he used in all four California houses, and not the glass, that remove the barriers. "You're fooled that a glass building is totally a transparent building," he said. "It has reflections, it has all sorts of problems. Even if you're inside a glass room, it's not the same as being without that door."

The main residence is broken into two parallel wings connected by a small hallway that contains a pantry and bathroom. The living room and kitchen face a terrace, which is shaded by the metal deck roof's 10-foot cantilever. Steel I-beams and a 6-foot-high clerestory window that spans the length of the living room and kitchen frame views of the Santa Ynez Mountains. "To me, the I-section is such a beautiful column because it's so precise and you get the shade and shadow in them. If you use the right paint, you see the beauty of the steel," says Myers of his adaptation of Mies's corner details. In some corners the columns are pushed aside to make way for glass pocket doors. The Gardners chose a complementary industrial Bulthaup kitchen and asked Myers to create a reading room

with a fireplace off the kitchen for a cozier, denlike space.

The house has no air-conditioning system, and poured-in-place concrete floors feature radiant heating. With photovoltaics on the garage and solar thermal collectors over the library, the Gardners say their electric bill registers in the single digits. "The house has a lot of glass, and that is usually controversial when you talk about sustainability," says Schneider, but in the end it complies with California's energy code, Title 24 – the most stringent in the country. "The client is able to slide windows and doors open and closed as the day progresses to create a comfortable climate in each space."

Myers compares the parti of the house, with the separate bar building for bedrooms and library, to Marcel Breuer's 1940s concept of bi-nuclear houses. "It makes a lot of sense. The acoustical privacy, the sense of moving from a broad public space to a more private space," he says. Bedrooms and bathrooms are located off a grand hallway. Outside, Japanese-influenced courtyards with landscaping by Rios Clementi Hale Studios break up the two sections of the main residence. The firm also added decorative warmth to the interiors to contrast with the industrial finishes. (The Gardners didn't touch a modern adobe-style guesthouse on the property. It had been recently renovated by Neumann Mendro Andrulaitis Architects.)

One gets a peek at the Pacific from the edge of the lap pool in the front of the house. A fountain pours into it but doesn't quite drown out the sound of the occasional car, probably a convertible, whooshing down the road – the California soundtrack. ■



CREDITS

ARCHITECT: Barton Myers Associates
– Barton Myers, principal; Thomas Schneider, associate in charge; Yianna Bouyioukou, project architect; Wayne Thomas, Cheng Zhou, David Karp, project team

STRUCTURAL ENGINEER: Norman J. Epstein

LANDSCAPE ARCHITECT/INTERIORS: Rios Clementi Hale Studios

SIZE: 3,360 square feet (main residence); 500 square feet (garage); existing 715 square feet (guest house)

COMPLETION DATE: August 2009

SOURCES

EXTERIOR PANELS: Kingspan

DOORS: Fleetwood (sliding); Arm-R-Lite (overhead)

WINDOWS/DOORS: Torrance Aluminum, US Aluminum

ROOFING: SikaSarnafil

PROJECT **INBETWEEN HOUSE**
LOCATION **KARUIZAWA, JAPAN**
ARCHITECT **KOJI TSUTSUI ARCHITECT & ASSOCIATES**
BY **NAOMI R. POLLOCK, AIA**



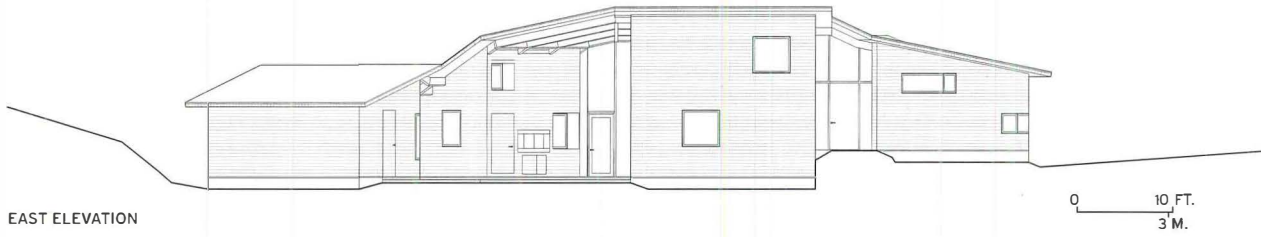
A CLUSTER OF boxes united by irregular, interstitial space, InBetween House mimics the Japanese urban condition on an architectural scale. While the rectangular volumes are like small buildings, the amorphous areas in between are akin to the narrow passageways and odd gaps that crop up almost organically in Japanese cities. A bit of an anomaly, this house is a full-time residence located in Karuizawa, a tony vacation town 95 miles northwest of Tokyo. Yet for the owners, a 40-something couple with jobs in the city, the daily commute by bullet train is a small price to pay for waking up in the country.

The relatively recent introduction of this high-speed train route made the clients' lifestyle logistically possible; it was the economic downturn, however, that made it a reality, since they were able to get a good deal on the 16,000-square-foot property. Situated within a planned second-home development not far from the station, the secluded parcel marks the end of a narrow, winding access road. Though neighboring houses are visible, the plot abuts a protected forest owned by Japan's imperial family. In the hope of attracting a buyer, the developer cut a level strip of land across the steeply sloped, square parcel thirty years ago but was hesitant to unload it until recent financial woes forced his hand.

Thanks to the developer's regrading, the site was basically construction-ready when the clients took possession. Inspired by the



1. InBetween House sits on a plateau on a steeply sloping site. Following Karuizawa tradition, stone pillars mark the property line. A gravel drive leads to the garage, and a covered terrace to the "front door" at the building's rear.
2. The house's north-end elevation consists of the sunroom's glass window wall flanked by the wood-enclosed bedroom, right, and the bathroom, left. While a vertical window supplies the bedroom with fresh air, a horizontal glass strip frames a landscape view visible from the bathtub.
3. Treated with a clear sealant, the siding is made of local karamatsu pine – the species of the trees surrounding the site. The wood's natural color complies with Karuizawa's building code calling for a muted, neutral exterior.

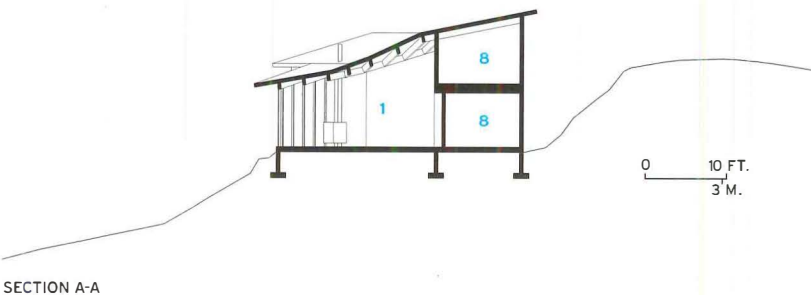
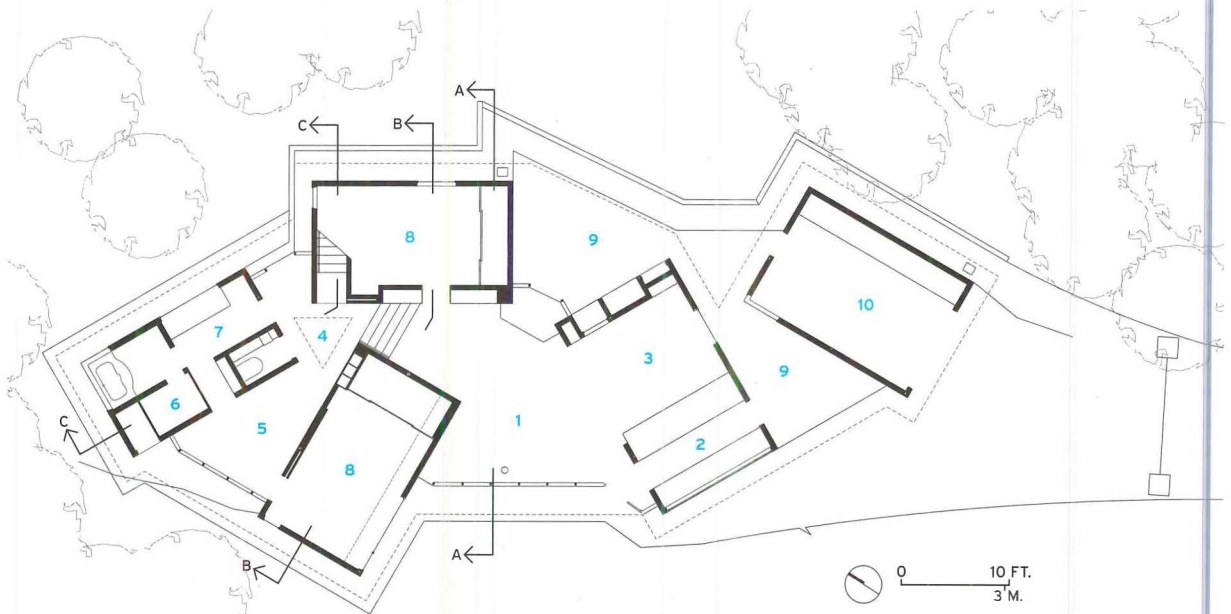


EAST ELEVATION

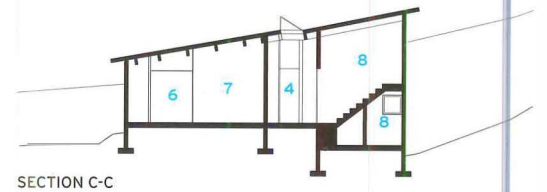


SOUTH ELEVATION

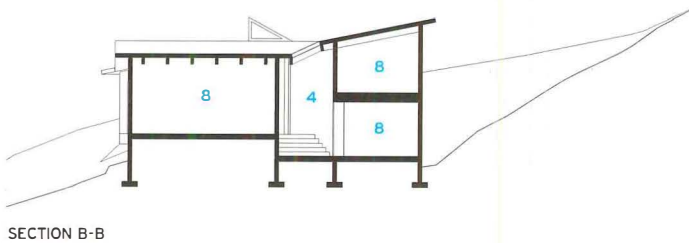
- 1 LIVING
- 2 KITCHEN
- 3 DINING
- 4 SUN HALL
- 5 SUNROOM
- 6 SAUNA
- 7 BATHROOM
- 8 BEDROOM
- 9 PATIO
- 10 GARAGE



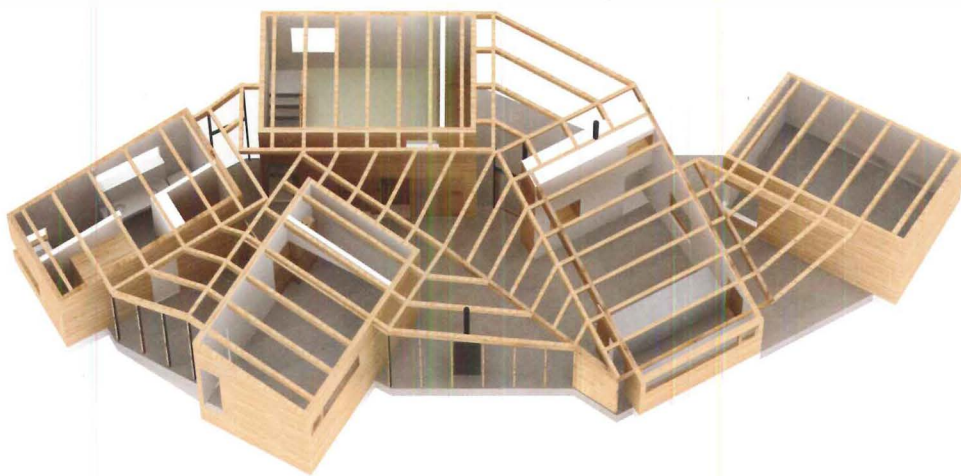
SECTION A-A



SECTION C-C



SECTION B-B



ABOVE: Doubling as an outdoor entertainment space, the entrance terrace is equipped with a built-in wood-burning stove for barbecues. Soaring, 15-foot-high glass panels frame the front door, opening the indoor living area to the activity on the protected patio outside.

LEFT: The timber roof structure is the house's most complex feature. The contractor started its construction by covering the five boxes and then trimming beams and joists to fit in between and cover the infill spaces.

soaring karamatsu pine trees and the alpine scenery, they imagined their new house as a blend of Philip Johnson and Junzo Yoshimura. "It was kind of a contradiction," says architect Koji Tsutsui. "They wanted slanted roofs and they wanted large glass windows."

A city slicker who divides his time between practices in San Francisco and Tokyo, Tsutsui worked for Tadao Ando in Osaka for six years before hanging out his shingle and building rectilinear, concrete homes independently. "This situation required me to design in a freer way," says Tsutsui of InBetween House. Inspired by his own scheme for a Ugandan school and orphanage (2008), for which he created eight modular huts interconnected and shaded by sloping roofs, InBetween House marks a continuation of this dynamic new direction for Tsutsui.

The architect's initial design featured a linear string of rooms topped with roofs that pitch in different directions. But after splitting the volume into discrete boxes and moving them around like chess pieces, he realized that manipulating the interstitial space was the key to enlivening the plan. Many computer-generated iterations followed until the architect and the clients agreed on a loose circular configuration defined by five boxes, glass walls, and a continuous but multifaceted roof.

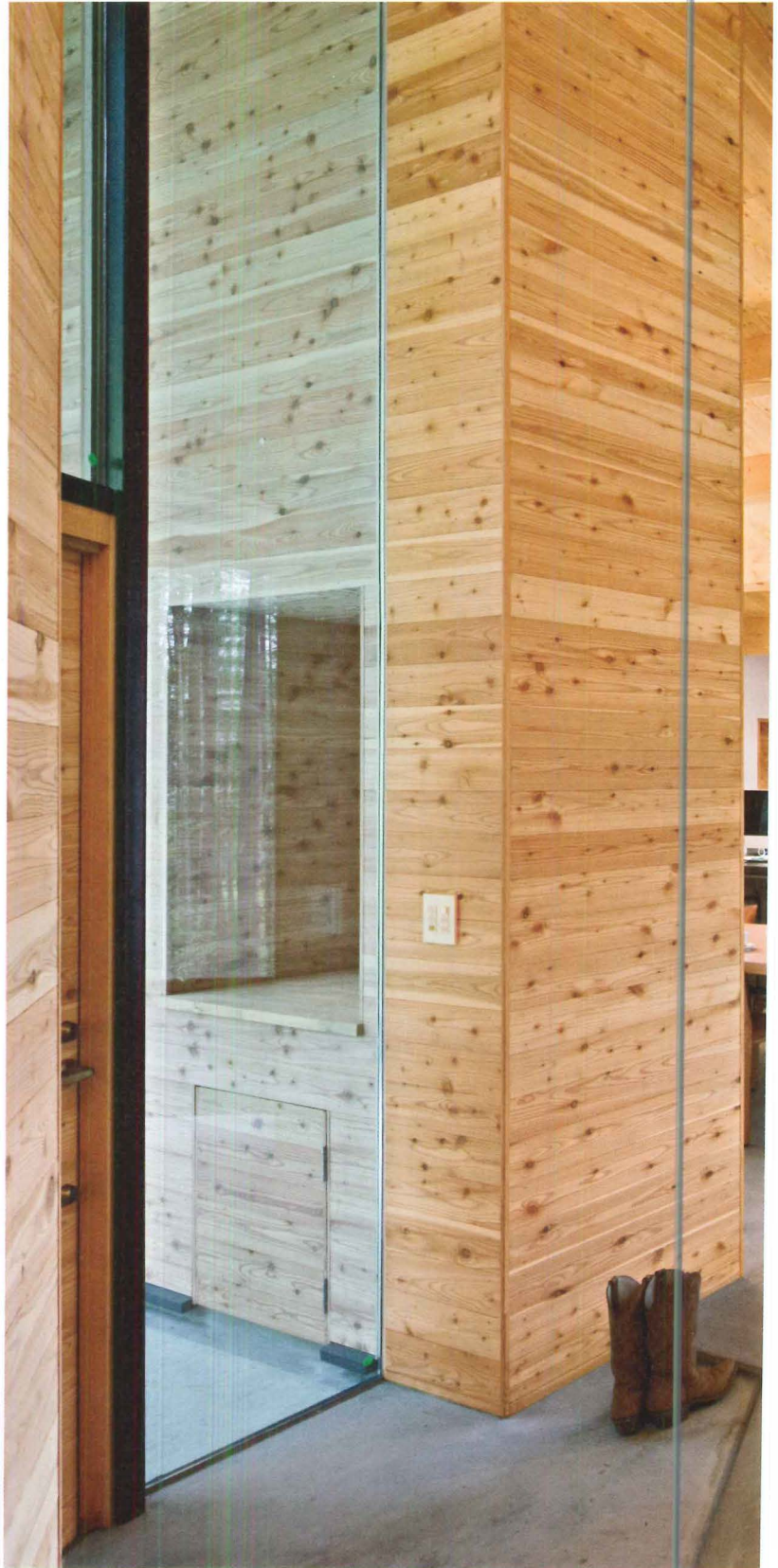
Moving clockwise from the driveway, the boxes house the garage, the combined kitchen and dining room, the master bedroom, the bathroom suite, and two stacked guest rooms – one Western style and one tatami – that occupy the only two-story volume. The resulting infill doubles as the home's circulation system and segues smoothly from one end of the house to the other, starting as an outdoor terrace wedged between the garage and kitchen, then morphing into a second terrace centered on the front door. Inside, the space fans out to become the living room, followed by the "sun hall" and the sunroom, a sequestered sitting area overlooking the tree-studded hillside. "The plan may look random, but even a slight shift would change everything," explains Tsutsui.

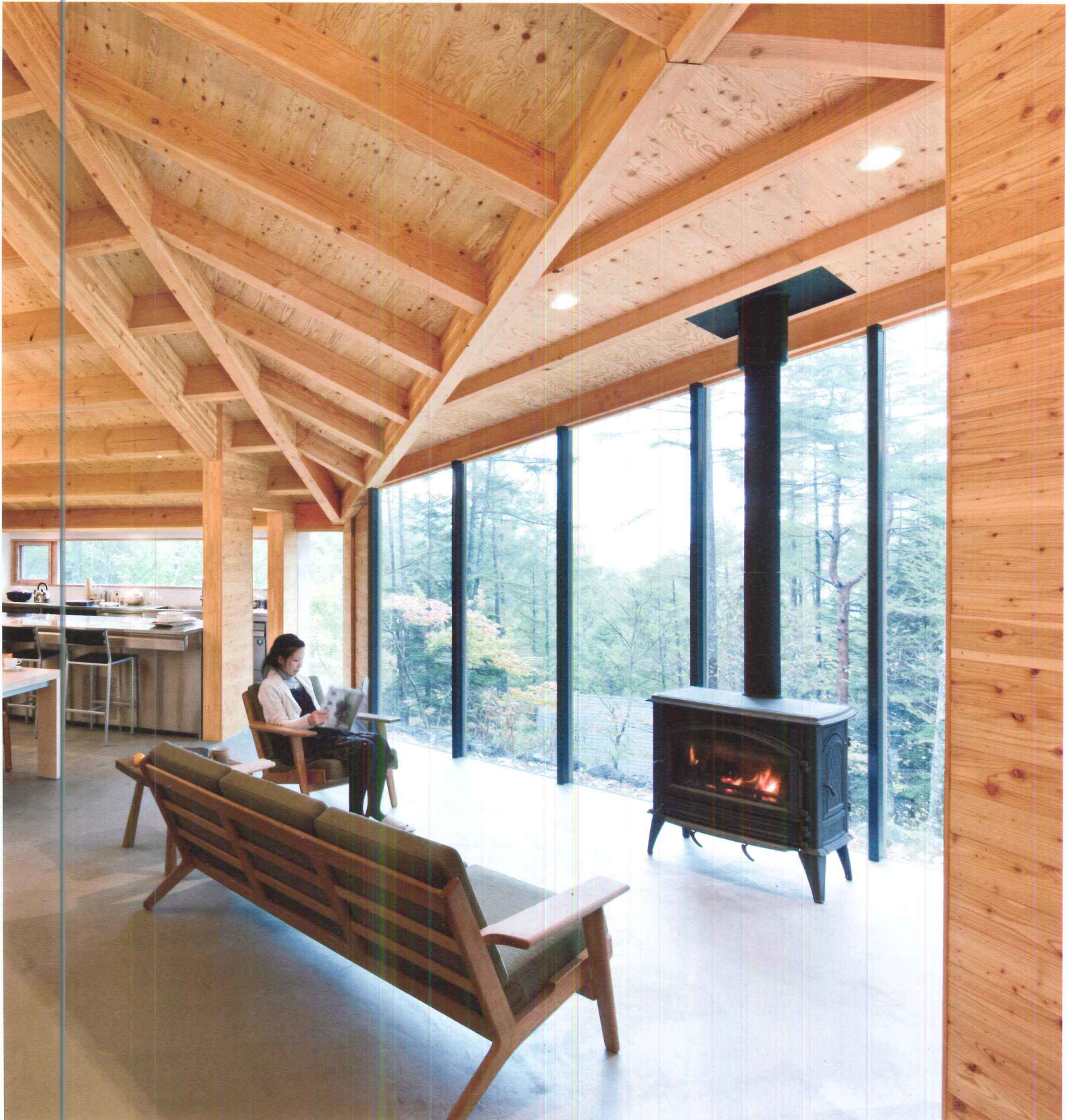
Precisely positioned at 30 or 60 degrees apart, all of the rectangular rooms relate to each other geometrically. Measuring roughly 11 feet by 21 feet apiece, they are also close in size and proportion – like the rooms in a traditional Japanese house. The self-contained boxes clad with local pine on the outside and white gypsum board on the inside hold mostly private places. By contrast, the free-flowing void seems barely enclosed by full-height insulated, double-glazed window walls that blur the boundary between inside and out.

Overhead, the entire house is covered with a 1-inch-thick steel roof composed of sloped planes that slant in multiple directions and at different angles. While the overall strategy complies with the local building code's pitched roof requirement, the specific dips and drops facilitate drainage and respond to internal ceiling considerations. Ranging in height from 6 feet just outside the kitchen to 17 feet above the guest room box, the roof sections accommodate the comfort, climate, and functional needs of the individual rooms. Low ceilings provide an intimate atmosphere in the private quarters, and high ceilings open the living room and sun hall to expansive views of the countryside.

Unsurprisingly, the roof structure was the contractor's greatest challenge. Tackling the easiest step first, he topped each timber-framed box with straightforward beams and joists. They terminate in overhangs that touch the adjacent eaves at discrete points, loosely joining the boxes in a closed ring. Trimmed to fit, additional wood members span the voids, uniting the individual roof sections like a crazy quilt.

Above that, a steel layer consists of five simple rectangles that top the



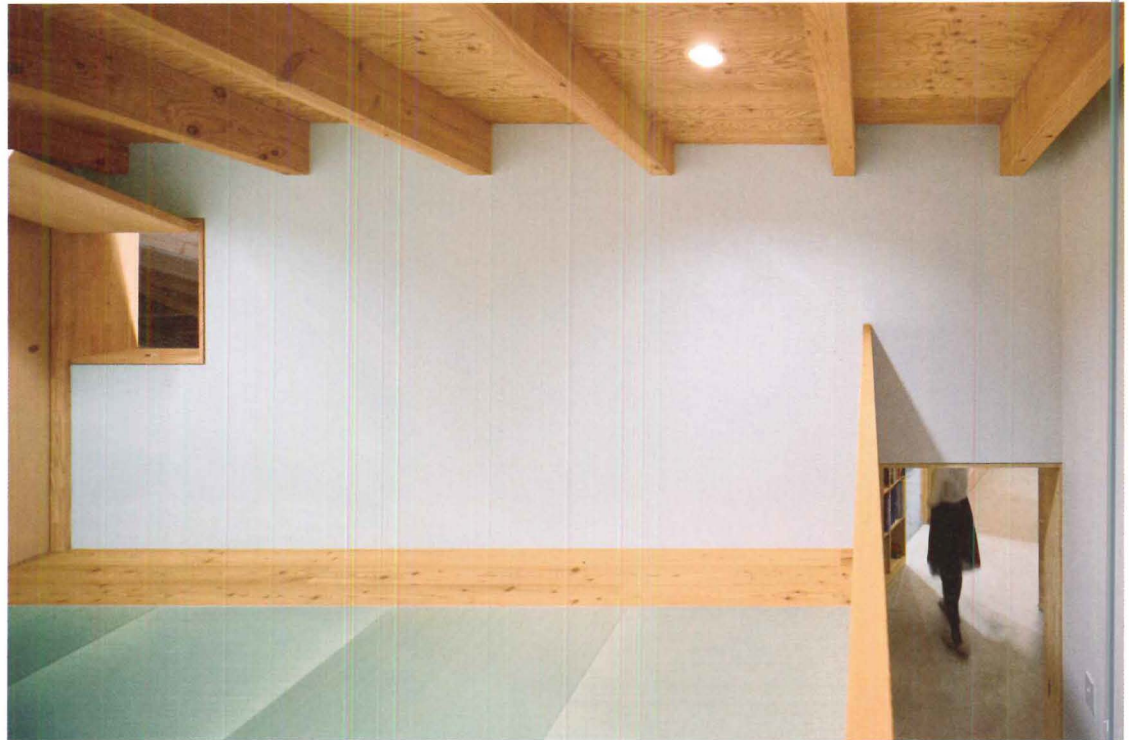


A combined dining room and kitchen adjoins the living room. A wood-burning stove is given prominence before the vast picture window and warms the living room on cold days. A 35-inch-deep, restaurant-grade stainless steel counter defines the kitchen. To preserve sight lines and spatial flow, two low refrigerators and all the cabinets are installed below the counter.

boxes and eight triangles to fill in the gaps. Because the boxes vary in height, slope, and orientation, many of these inserts twist or slant in two directions. To alleviate a complex convergence above the sun hall – the only spot where three boxes meet – the architect installed a skylight. This solution infuses an otherwise shadowy circulation node with soft daylight.

Forming the exposed ceiling inside, the roof's chaotic framing system terminates outside in orderly wood bars inspired by traditional *taruki*, or rafters. Ringing the roof perimeter, they support deep eaves of 2 feet or more that provide the only sunshade. Due to the slanting roofs, the glass walls slope, making curtains or blinds difficult to hang.

Fortunately, Karuizawa summers are mild, and natural ventilation, enabled by well-placed operable



windows, cools the interior. In the winter, when temperatures often plummet to minus-5 degrees Fahrenheit, electric radiant heat panels directly below the concrete floor warm the entire house. Boosting the insulation that blankets the walls and roof, these electric panels warm the soil beneath the house at night, benefiting from the earth's ability to retain heat and from Japan's lower electricity costs during off-peak hours. By day, when the utility price is higher and the owners go to work, the system shuts off. But the rising heat (abetted by a wood-burning stove in the living room when needed) maintains constant, comfortable temperatures throughout the house.

At ease with Karuizawa's climate and topography, Tsutsui's InBetween House takes advantage of its country setting without compromising the comforts of a city dwelling. Its boxy rooms may bow politely to Ando, but the flow of connecting spaces has an urban order that forms a quirky shape uniquely its own.

Naomi R. Pollock is RECORD'S Tokyo correspondent and the coauthor of New Architecture in Japan (Merrell, 2010).

CREDITS

ARCHITECT: Koji Tsutsui Architect & Associates – Koji Tsutsui, JIA, principal in charge; Satoshi Ohkami, project manager

ENGINEERS: Hirotsugu Tsuboi (structural)

CONSULTANTS: Terao Denki (lighting)

CONTRACTOR: Sasazawa Construction

SIZE: 1,818 gross square feet

COMPLETION DATE: October 2010

SOURCES

FENESTRATION: Woodtec Akifu (insulated glazing, windows, doors)

SIDING: Sasazawa Construction (karamatsu pine)

ROOF: Tomasaka (steel)

HARDWARE: Sugatsune

TILE: Marca Corona (stairs, bathroom floor)

LIGHTING: Yamagiwa (downlights); Yamada Shomei (task lighting); Maxray (interior ambient lighting)

SECURITY SYSTEM: SECOM

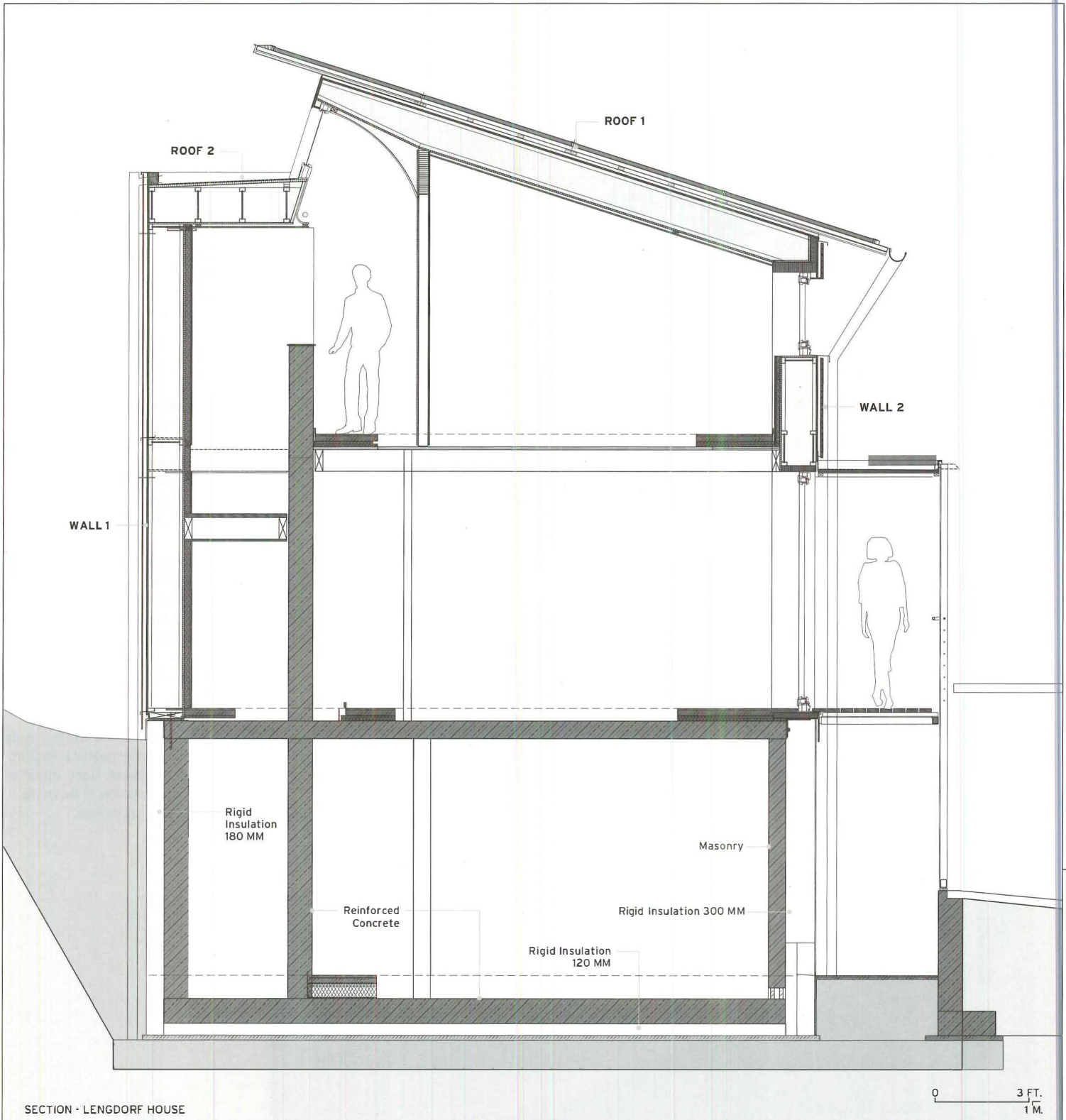


1. Designated for guests or visiting parents, the tatami mat room is the house's only second-floor space, where an expansive window admits fresh air and daylight. An additional small, square internal aperture overlooks the living room, further facilitating natural ventilation.
2. Located within the two-story box containing guest quarters, tile-clad stairs lead up to the second floor from the sun hall. Wherever possible, Tsutsui provided built-in closets and shelves so his clients would not need to add them later.
3. Capped by a slanted plywood ceiling and a web of 17-inch-deep exposed beams, the sunroom is a restful retreat slotted between the master bedroom, left, and the bathroom, right. Intended for quiet contemplation, it faces the densely forested landscape.



Low Energy, but High Impact

The Passive House system, a design and construction concept with considerable traction in Europe, begins to take hold in the United States. *By Michael Cockram*





SOMETIMES IDEAS HAVE to be exported, transformed, and reimported before they take root. Such is the case with the concept of the superinsulated house, which has recently returned to the United States from Germany in a rigorously defined building certification program known as Passive House. Its stringent energy requirements have filled a void for architects and clients looking for tangible performance-based benchmarks.

Beginning with the energy crisis in the 1970s, two threads evolved in the U.S. green building movement. One school advocated passive solar design, which balances south-facing glass with thermal-energy-storing mass. Another group pushed for lightweight, airtight, and superinsulated construction. But, as American political and research priorities moved away from green design in the 1980s, much of the momentum shifted to Europe. In many ways, Passive House is a marriage between the mass-plus-glass passive solar and the light-and-tight superinsulating camps.

The concept of Passive House grew out of the collaborative research of Wolfgang Feist of Germany and Bo Adamson of Sweden, with the first projects built in the early 1990s. In 1996, Feist founded the Passivhaus Institute in Darmstadt, Germany. It oversees the certification process and remains the guiding force behind the movement.

Building to a benchmark

To qualify for certification a building must meet three basic criteria, which are the same for all projects, regardless of location or climate: annual energy consumption for heating and cooling is limited to 4,755 Btu per square foot; air infiltration is set at a maximum of 0.6 air changes per hour at 50 pascals of pressure; and annual primary energy usage (energy consumed by appliances, lighting, and other devices not directly related to heating and cooling) is capped at 11.1 kilowatt hours per square foot.

The Btu and air-infiltration limits are around 10 times more stringent than those for a home built to the

ABOVE AND OPPOSITE: Some European Passive House advocates have adopted typical American construction techniques. Architekturwerkstatt Vallentin's house in Lengdorf, Germany, has an engineered-wood-joint frame, which provides a deep wall cavity for insulation.

WALL 1

FACADE BOARD 8 MM
BATTENS/AIR GAP 40 MM
PERMEABLE SHEATHING 16 MM
ENGINEERED-WOOD JOISTS WITH
CELLULOSE INSULATION 356 MM
ORIENTED STRAND BOARD 15 MM
AIR GAP 60 MM
DRYWALL 15 MM

WALL 2

LARCH WOOD SIDING 24 MM
BATTENS/AIR GAP 30 MM
PERMEABLE SHEATHING 16 MM
ENGINEERED-WOOD JOISTS WITH
CELLULOSE INSULATION 356 MM
ORIENTED STRAND BOARD 15 MM
AIR GAP 40 MM
DRYWALL 15 MM

ROOF 1

PHOTOVOLTAIC PANELS
BATTENS/AIR GAP 30 MM
HORIZONTAL BATTENS 40 MM
PERMEABLE SHEATHING 16 MM
ENGINEERED-WOOD JOISTS WITH
CELLULOSE INSULATION 356 MM
ORIENTED STRAND BOARD 15 MM
AIR GAP 24 MM
DRYWALL 15 MM

ROOF 2

ROOF MEMBRANE
ORIENTED STRAND BOARD 22 MM
ENGINEERED-WOOD JOISTS WITH
CELLULOSE INSULATION 356 MM
ORIENTED STRAND BOARD 15 MM
AIR GAP 24 MM
DRYWALL 15 MM



Along with the intelligent positioning of overhanging balconies and wood screens, which serve as shading devices, recent advances in window technology allowed Vallentin to glaze significant portions of the south facade of a Passive House in Berlin.

International Residential Code, and the primary energy limit is one-third of the average U.S. residence's consumption. Reaching the targets usually requires wrapping the building in a thick, superinsulated overcoat; sealing it in an airtight envelope; taking advantage of passive heating and cooling; and using high-efficiency appliances and fixtures.

Although it's not a prerequisite, a trained Passive House consultant often guides the process. He or she advises on ways to meet the standard, evaluates the building using software in the Passive House Planning Package (PHPP), and prepares project documentation for final certification by the Passive House Institute. Passive House consultants are required to have a basic knowledge of building science and must complete a nine-day intensive course.

In 2008, German-born architect Katrin Klingenberg cofounded the Passive House Institute US (PHIUS) in Urbana, Illinois. Since then, the concept has gone from the green building fringes to a movement with more than 200 PHIUS-qualified Passive House consultants across the country. PHIUS has certified 13 houses to date with at least 40 more in process.

One of the projects awaiting certification is an addition to a 181-year-old farmhouse in Freeman Township, Maine, designed by New York City-based BriggsKnowles Architecture + Design. The new piece makes subtle geometric shifts and is articulated with clean, planar detailing. "The

form of the house, with its simple aggregated volumes, is in keeping with the typology of this area of Maine," says firm partner Laura Briggs, adding that the design's low skin-to-volume ratio helps keep heat loss to a minimum.

A code-built house in this region typically would have walls with a thermal resistance, or R-value, of 20. The roof would be about R-38, and the basement slab around R-10. But the BriggsKnowles project has R-49 walls, a roof that is R-57, and R-74 beneath the concrete-slab floors. To reach those values, the architects used engineered-wood-joint framing filled with blown-in cellulose insulation for both the walls and the roof. Then they wrapped the entire box in 2½ inches of rigid insulation, helping to minimize thermal bridging of the more conductive wood members. Under the floor slab they placed 16 inches of rigid insulation. The amount of insulation keeps surface temperatures close to the interior air temperature, so even the exposed concrete floors, important for thermal mass, don't feel cold to the touch.

One of the biggest issues with early superinsulated houses was indoor air quality. Loose construction allows more fresh-air infiltration and helps to dissipate contaminants that "off-gas" from materials or are emitted from other indoor sources. But infiltration comes at a high price in heat loss. The Passive House system resolves this conundrum with an efficient air-to-air heat exchanger that warms or cools incoming fresh air. The BriggsKnowles team opted for a U.S.-made Energy Recovery Ventilator (ERV), which has the capacity to pull humidity from the incoming air. A simpler Heat Recovery Ventilator (HRV) can be used in climates where humidity is less of a concern. Both HRVs and ERVs need to be at least 75 percent efficient in recovering thermal energy, according to Passive House guidelines.

Letting in the light

Until recently, superinsulated buildings often had very small and very few windows, since glazing can be a significant source of heat loss. But advances in window technology have fostered the production of triple-glazed units with very low U-values (the U-value is the inverse of the R-value and describes how well a building element conducts heat). Triple-glazed units with U-values as low as 0.09 – a level unimaginable just a few years ago – are now readily available in Europe. A few North American manufacturers also make windows that meet Passive House-recommended U-values of 0.14 or less.

Swiss-born architect Tim Eian, who practices on both sides of the Atlantic, asserts that the lapse in U.S. development gave Europe a generous head start in Passive House-related technologies. By now, Europe has much



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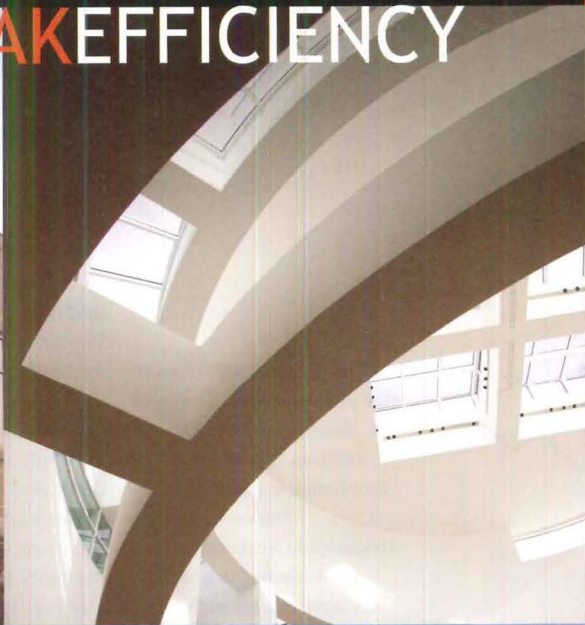
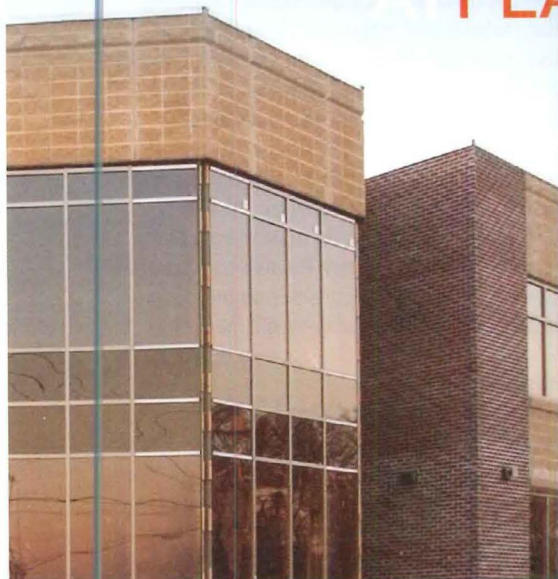
Learning Objectives

- 1 Discuss the goals and history of the Passive House program.
- 2 Outline the Passive House-certification criteria.
- 3 Describe the methods typically deployed for meeting these criteria.
- 4 Explain how the Passive House program differs from the LEED rating system.

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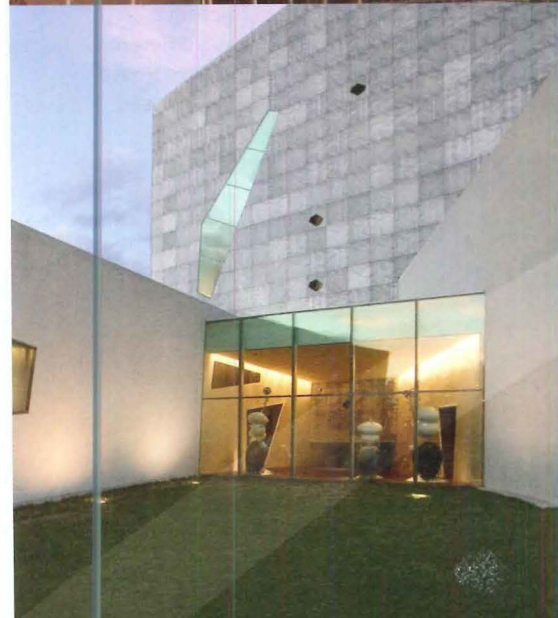


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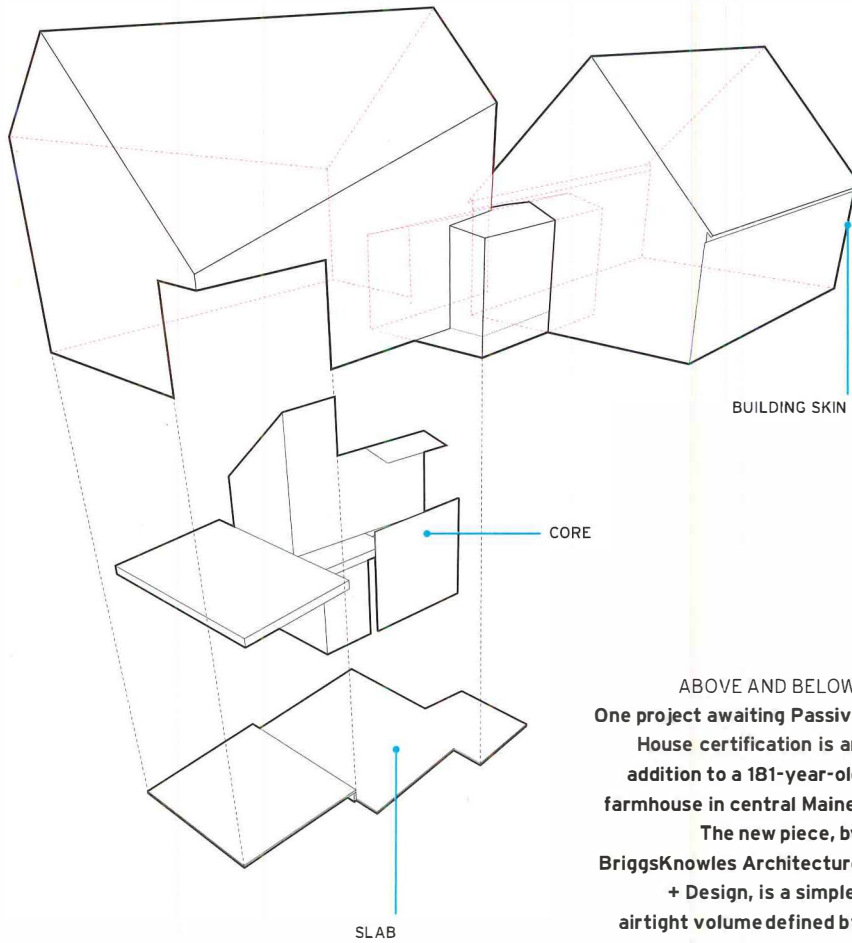
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CIRCLE 43

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FREEMAN TOWNSHIP HOUSE

ABOVE AND BELOW:
One project awaiting Passive House certification is an addition to a 181-year-old farmhouse in central Maine. The new piece, by BriggsKnowles Architecture + Design, is a simple, airtight volume defined by engineered-wood-joint framing filled with cellulose insulation and wrapped with rigid insulation.

greater momentum, with more than 15,000 certified projects, compared with a handful in North America.

But the relationship between the continents is a symbiotic one. To facilitate high insulation levels, many European architects are turning to American wood-frame construction, using engineered-wood joists to create deeper wall cavities. Such is the case for the Dorfen, Germany-based Architekturwerkstatt Vallentin. Principals Gernot and Rena Vallentin have decided to limit their practice to Passive House designs.

A common criticism is that the standard's requirements push houses to be compact and somewhat "boxy." The Vallentins combat this tendency with subtle variations of form, color, texture, and materials. On the interior of their house in Lengdorf they take advantage of double-height spaces and carefully place windows to provide a feeling of spaciousness and balanced daylighting.

Not all Europeans are so gung ho about the system, however. German architect and structural engineer Werner Sobek advocates energy-efficient buildings that rely on active technology, allowing them to be more open and responsive to the environment. He also criticizes the Passive House standard for not considering the embodied energy in elements such as rigid insulation.

Climate adaptations

Feist initially pushed the idea of relying solely on internal gains and the HRV to heat the buildings – a viable strategy in Germany's relatively mild climate. But the United States has much more regional variation with temperature and humidity extremes. The steamy South presents one of the most difficult challenges. While the BriggsKnowles project in Maine can rely on its ERV for cooling, a project in a predominantly hot and humid climate requires a different approach. For his own Lafayette, Louisiana, Passive House residence completed last year, architect Corey Saft used



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CIRCLE 13



superinsulation and passive techniques to reduce heat gain. "Shading and ventilation become crucial in this climate," Saft says. He oriented south-facing windows to take in the predominant winds on the ground floor. A bank of north-facing windows, placed high in a double-height space, takes advantage of cross and stack ventilation. All windows are protected with exterior shades and the exterior is clad with a "rain screen." In this typical Passive House detail, vertical furring strips are attached to exterior rigid insulation so that there is a gap between the insulation and the siding. The space provides a channel for water to escape. But Saft found that venting the space at both the top and bottom dissipates a substantial amount of heat. "On the south elevation I measured a 20 degree temperature drop from the siding to the insulation layer," Saft says. "The rain screen is essentially a whole house-shading device."

RIGHT: Architect Brian Fuentes is building a Passive House for himself on the outskirts of Boulder, Colorado, that combines a modular straw-bale and braced-frame system with structural insulated panels.

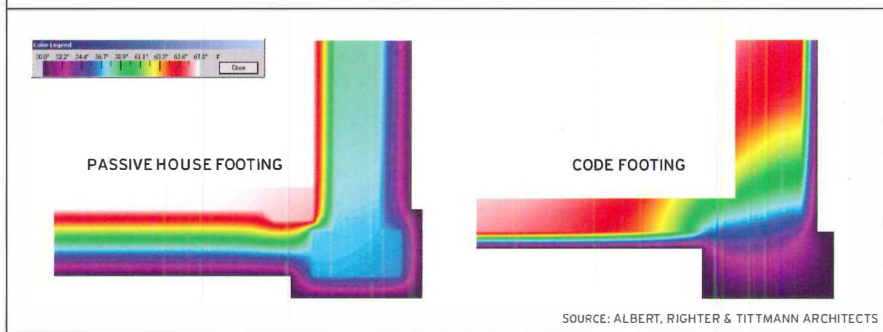


In this climate zone, the glazing should generally have a low Solar Heat Gain Coefficient (SHGC), which means

that the glazing is treated to limit the amount of solar heat transmitted to the interior of the building. The lower the SHGC, which is expressed as a fraction between 0 and 1, the less heat is transmitted. On the Saft house, the SHGC is around 0.29 on all windows. But a Passive House designed for New England, where heat gain is desirable for much of the year, might use glazing with an SHGC of around 0.64. Projects that maximize solar heating in the winter but control heat gain in the summer will sometimes use windows with a high SHGC on the south facade (where the windows can be easily shaded in the summer months) and low SHGC on other orientations where sun controls aren't as effective.

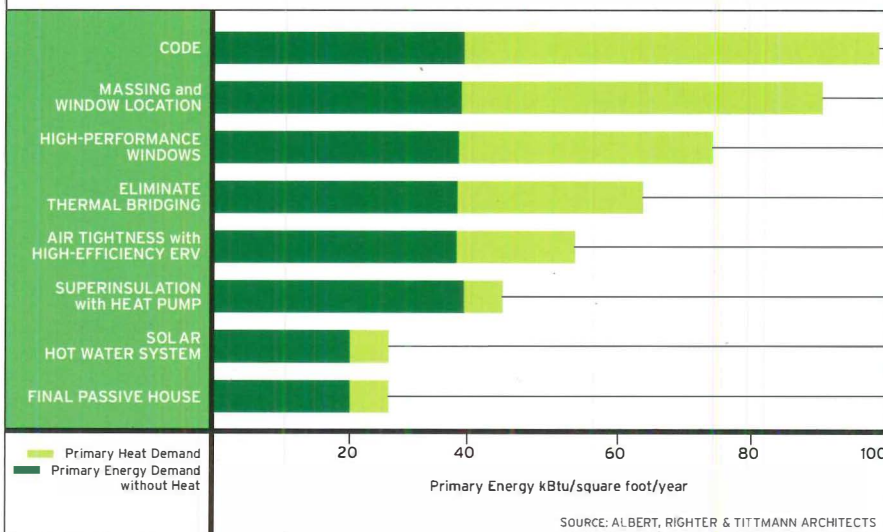
Foundation Thermal Study

Albert, Righter & Tittmann Architects markedly decreased heat loss through the foundation of a house in Charlotte, Vermont, by providing 12 inches of rigid insulation under the slab and 10 inches along the perimeter walls.



Annual Energy-Use Analysis

For the Vermont project, Albert, Righter & Tittmann studied the cumulative energy savings achieved through the deployment of an array of Passive House strategies.



House of straw (and foam)

Boulder, Colorado-based architect Brian Fuentes has six Passive House projects on the boards, including a home he is building for himself on the outskirts of the city from the remnants of a dilapidated 1880 miner's house. He is using an unusual modular system in which straw bales are set into a braced wooden frame and arrive at the site as prefinished wall units. The roof will be made of structural insulated panels (SIPs) supported by glue-laminated beams. Since SIPs are made of solid-foam panels with sheathing bonded to the exterior surfaces, they are a good material for reducing thermal bridging. Also, because SIPs interlock at the edges, they help make the building airtight.

Unlike LEED, Passive House focuses solely on reducing energy consumption. It has no requirements for water conservation or sustainable site development, for example. Fuentes prefers the Passive House system. "LEED has done a good job of getting the idea of green building out there, but Passive House fills in the energy performance side," he says.

Instead of LEED's matrix of points, Passive House certification relies on PHIUS verification in the three benchmark areas. A blower door test is required to demonstrate compliance with the air-infiltration standard while a software program included in PHIUS's PHPP analyzes the Btu and electrical-consumption levels. Some components such as ERVs and windows are pretested and certified by the institute. But others need to be analyzed in the PHPP. For example, BriggsKnowles verified that a specially fabricated skylight for the house in Maine was



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within the overall energy limits by entering the unit's specifications into the PHPP software.

The PHPP software assumes that thermal bridging will be eliminated in the details of the house. When construction details vary from the assumptions of the PHPP, consultants often rely on a supplemental program developed by the Lawrence Berkeley National Laboratory called THERM. This software measures how a particular assembly is performing in terms of heat transmission. It's also a useful tool for studying heat transfer in any exterior element, from window details to foundation designs.

Costs and benefits

Although many architects and clients have voiced concern about the costs associated with the additional materials and products required by the Passive House system, advocates say that much of the added expense of superinsulating is offset by reduced mechanical systems. In Europe, where a quarter of new residences are built to the Passive House standard, costs are now about 5 percent higher than standard construction, according to PHIUS's Klingenberg. Architect and consultant Eian estimates costs for quality construction in the United States at 10 to 20 percent more than average costs. But even at that rate, the payback period for the investment in high-performance components and insulation can be fairly short. BriggsKnowles projects a 5-year payback on the project in Maine.

The long-term affordability of the standard is reinforced by the fact that nonprofit organization Habitat for Humanity has built several Passive House projects. Boston-based Albert, Righter & Tittmann Architects designed the first modular Passive House for the organization's affiliate in Charlotte, Vermont. The house uses only 20 to 30 percent of the total energy of an average code-compliant house. To stay within the primary energy-consumption budget, the firm specified efficient appliances and fixtures. The client paid a bit more for features such as a condensation dryer. It helped conserve energy and eliminated the need for exhaust ducting, which can be a significant source of heat loss.

Passive House adherents are looking beyond new construction to the challenge of renovating historic buildings to meet the criteria. Retrofitting such structures requires finding aesthetically sympathetic methods for reducing air infiltration and adding insulation. Brooklyn-based Prospect Architecture is working to bring a 19th-century brownstone in a landmarked section of the New York City borough up to the Passive House standard.

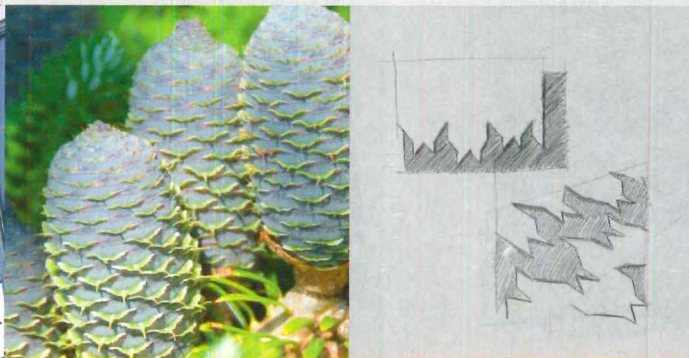
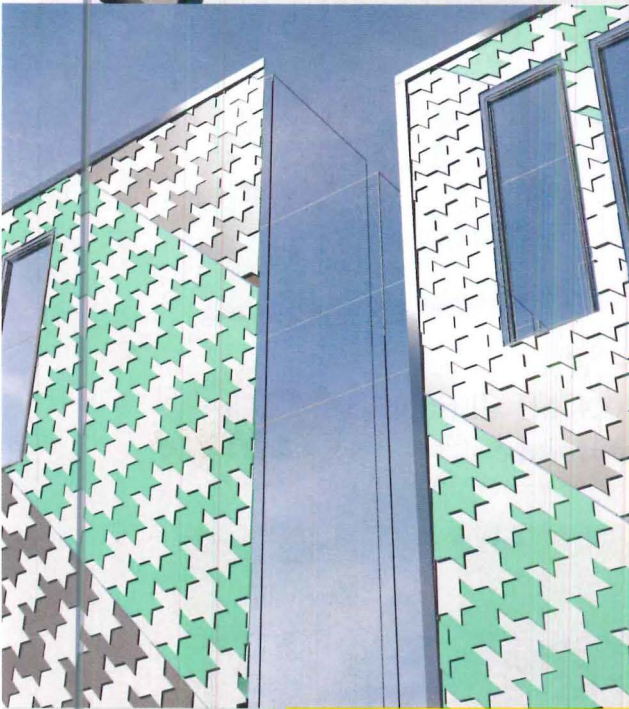
Although Passive House has been primarily a residential program, it's spreading to other building types in the United States. Two schools have recently been completed on the East Coast and an office building for a farm workers union is on the boards at Green Hammer Design & Build in Portland, Oregon. In Europe, Passive House reaches into all building categories, including educational buildings, multifamily housing, and factories.

A resolution passed by the European Union's parliament calls on member states to require that all new buildings meet Passive House criteria beginning in 2012, bolstering growth of the standard. Although the system is still in its infancy in the United States, the recent flurry of Passive House projects is already proving that it's possible to dramatically reduce energy consumption and greenhouse gas emissions at a reasonable cost. ■

Michael Cockram is an architectural designer, educator, and writer who focuses on the environment.

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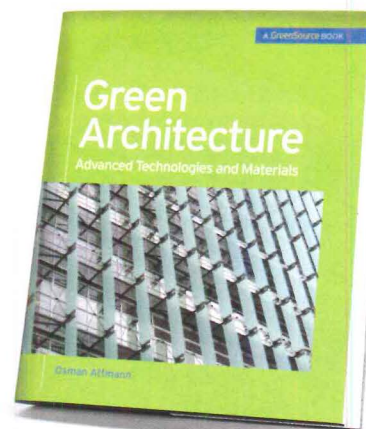
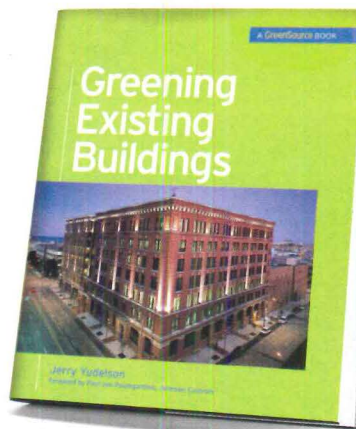
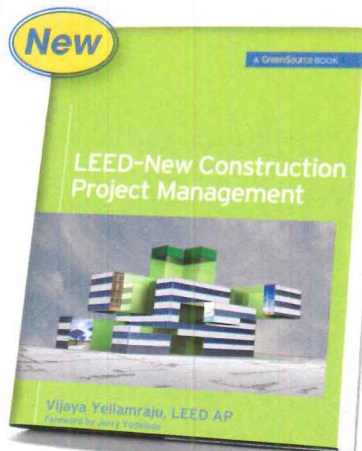
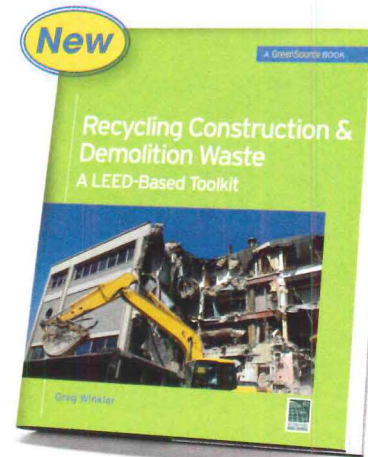
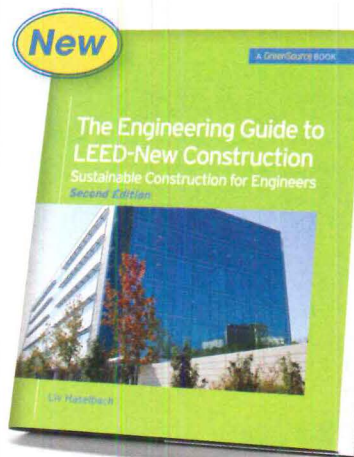


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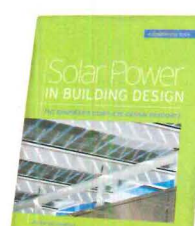
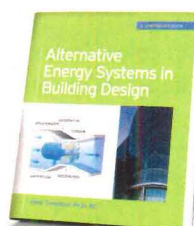
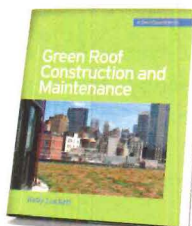
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POINT OF VIEW "We don't build buildings. We sell merchandise and use buildings to do that. If you are going to understand us as an owner of buildings, you have to shed the idea of the core function of a building. For us, it's selling merchandise. That shift completely changed the way I looked at buildings as an architect."

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ECONOMICS. "An architect or engineer typically has a brief relationship with a building – maybe 2% of its lifespan? How does 'economic performance' fit that involvement? What I learned is that the 2% can have a huge economic performance impact that's not always positive for the business. Architects believe the building will be there forever. That can lead to incorrect decisions from the business point of view."

LIFE CYCLE "If you looked to an architect or engineer and say, well, think of what you are doing in relation to lasting only 15 years, they would feel concerned. They are not trained to think of a building as a short-term commodity. However, we may not be able to stay in the building. What if the market shifts? For us to be paying for a 50 or 100 year building would be a disaster. This kind of thinking impacts decisions we make with structures."

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STRATEGY "We don't have prototypes; our buildings are unique because of our real estate deals. We want to be in the best markets, which could be urban, suburban, maybe a historic building in New York, a lifestyle center in Charlotte. When I put together the strategy for a store, I would initially look for local experience. Steel changed that. We have developed an extremely effective relationship with a structural engineer and fabricator. For us, it is more cost effective to ship steel and have them travel to our sites than using local resources."

COLLABORATION "It's complicated. There are certain mind sets in the industry practices that don't benefit an owner. For example, the industry says there shouldn't be direct collaboration with fabricator and structural engineer. It's a kind of chain of command that we grew up with. Now we call them roadblocks. We go around them. Whether or not you believe it, the world is flat; there is a leveling of how people work and without collaboration, you always pay more."

FABRICATORS "A general contractor selected SteelFab on one project when we were building a tough structure. It was overly complicated from a construction perspective. SteelFab hurried to show us how we could save money in the future. That was a magic moment. Over the next year and a half, they were awarded two more stores, under two different contractors. We soon realized they were working together throughout the U.S."

STRUCTURAL ENGINEERS "SteelFab introduced us to Moore Lindner Engineering. It was another magic moment, because Moore Lindner understood we wanted a relationship – not just a dialog going back and forth. You have to find people who want to talk to each other. We are fortunate."

CORE VALUES "We have to have a building that is adaptable. Our deals are all different. From a branding perspective, we don't see our brand as static. We sell change; we bring in new product every year. Our floors shift continually. We want an ever-developing relationship with our customers. If we had a static building in every city, it wouldn't reinforce change as our concept, would it?"

FUTURE "The next fifteen year period will bring more change to buildings than anything we have seen. There is increasing pressure on all of us because no one has the money to build what we have to build. It will be on the AEs and owners to figure out how to get the next generation of buildings built. Steel, as an industry, thinks differently than other industries; it is progressive. It is the most innovative material we build with, far away above other materials when it comes to recycled content. It isn't publicly seen as green, but it is the most strategically green. It will be integral to the future."

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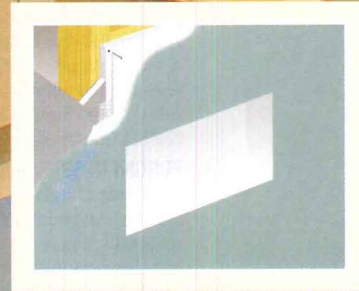
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BRIDGING COST AND CARE:

GLOBAL BENCHMARKS FOR HEALTHCARE ENVIRONMENTS

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Learning Objectives

After reading this article, you should be able to:

- Discuss the economic and demographic factors influencing healthcare facility decisions.
- List three to four issues and solutions adopted by healthcare organizations to improve building design and project delivery.
- Describe building techniques and technologies specifically designed to improve patient recovery (evidence-based design) and building operations.
- Explain how such products as glazing, washroom accessories, lighting and others have successfully supported these techniques.

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Building techniques demonstrate value in improving care while reducing the total cost of healthcare delivery.

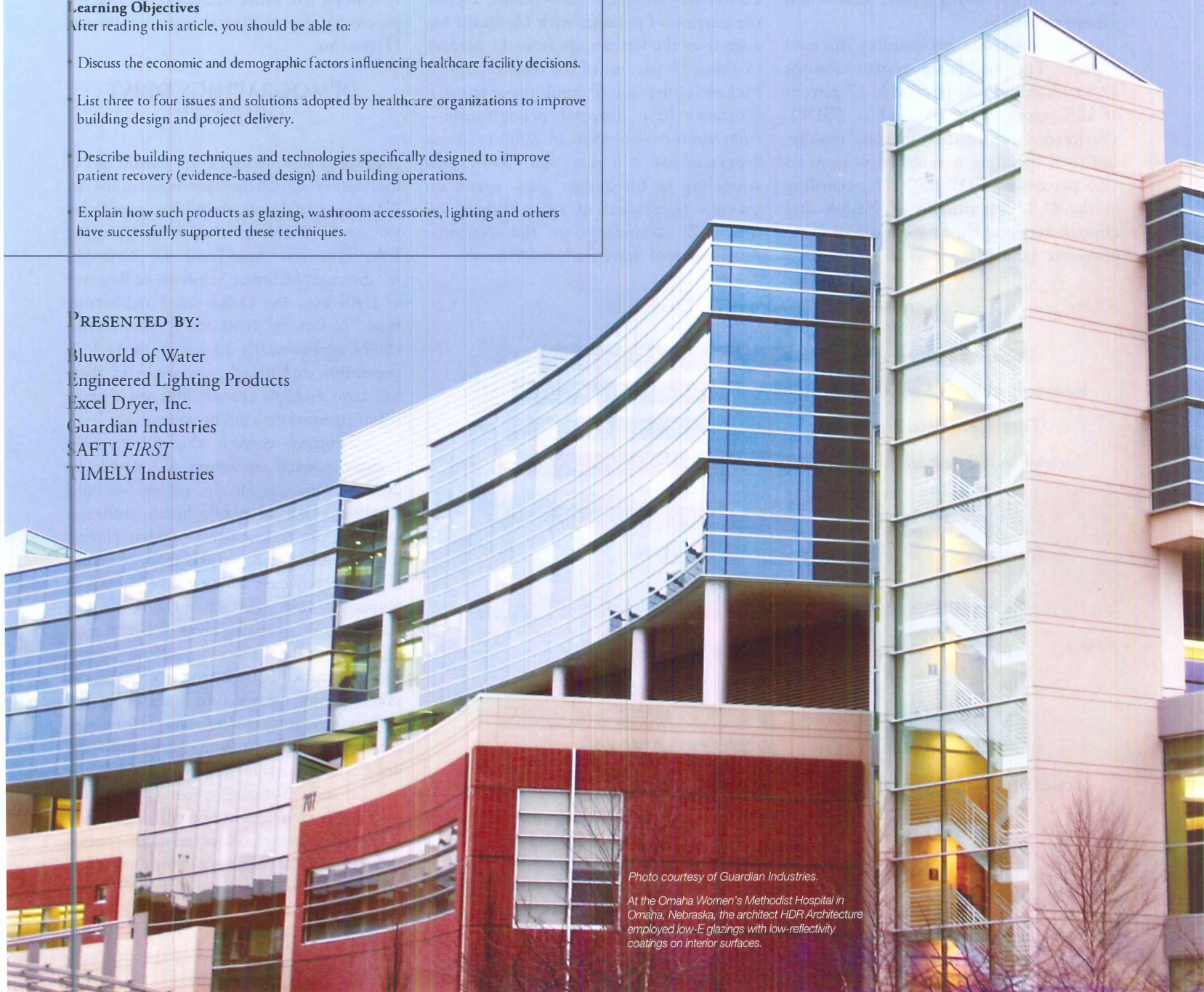


Photo courtesy of Guardian Industries.

At the Omaha Women's Methodist Hospital in Omaha, Nebraska, the architect HDR Architecture employed low-E glazings with low-reflectivity coatings on interior surfaces.

BRIDGING COST AND CARE:

GLOBAL BENCHMARKS FOR HEALTHCARE ENVIRONMENTS

By C.C. Sullivan

Times are relatively good for global healthcare. Life expectancy is at its highest level in history, and new treatments and lifesaving techniques arrive on the scene every day. In the United States, recent legislation—though swirling in controversy—aims to make care more available and affordable. Along with these advances, architects are working to make hospitals and other healthcare buildings a true ally in improving public health and patient treatment.

Yet economics are clouding this rosy picture. The healthcare system absorbs \$2.5 trillion annually or close to 17 percent of U.S. gross domestic product (GDP). Treatment costs tend to increase rapidly, and total spending is expected to grow to 19.5 percent of GDP by 2017, according to the U.S. Department of Health and Human Services. Hospitals and healthcare providers regularly report a shortfall in

payments, which the American Hospital Association (AHA) calculates in the tens of billions of dollars (see Chart 1).

“American hospitals are financially challenged and the trends in revenues and expenses will put and even greater burden on the viability of many hospitals and their ability to fund capital projects,” says Anne McLeod, vice president of finance policy for the Sacramento-based California Hospital Association. While the portion of patients with Medicaid has risen over the last decade from 11 percent to about 14 percent of the total economy, McLeod adds, rates of employer-sponsored insurance have dropped precipitously—from almost 64 percent in 2000 to about 8 percent just two years ago. States, now struggling to fill budget gaps, spend on average 14 percent of their budgets on Medicaid, according to the National Association of State Budget Officers.

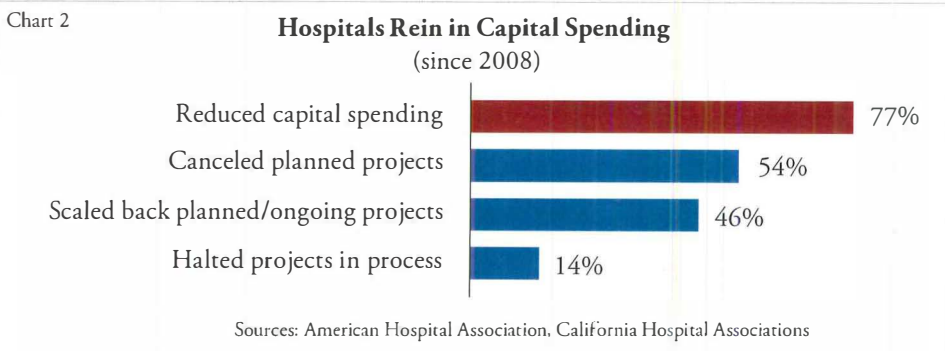
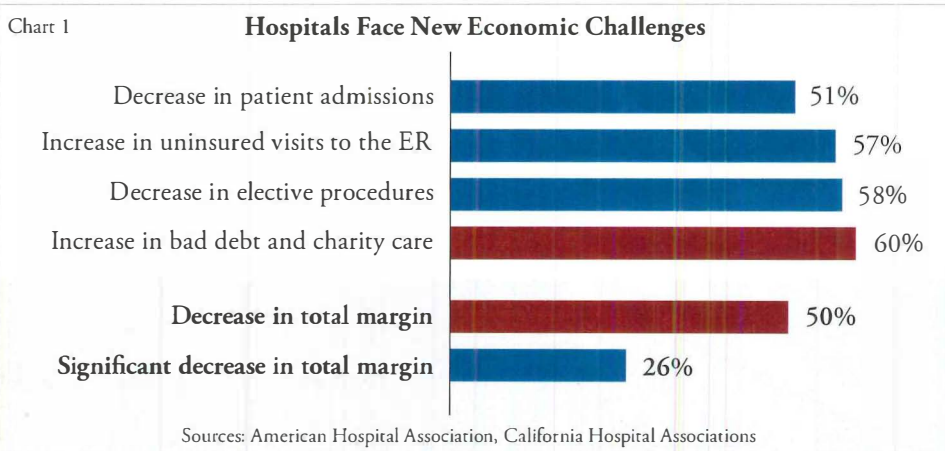
The need for cost control by hospitals and healthcare providers is driving architects to innovate. Based on demographics alone, the growing need for new and refurbished healthcare facilities will continue its upward trend for years. Yet healthcare facility operators will see a softening of demand due to the recent economic downturn, resulting in fewer patient admissions and fewer elective procedures. Based on those numbers—and a resulting lack of capital—providers are revising their projections for construction spending (see Chart 2). About 40 percent of hospitals have halted projects to increase patient capacity or renovate facilities, although the slowdown has more dramatically affected purchases of new clinical technologies and IT systems.

DEMOGRAPHICS DRIVE GROWTH

Still, the healthcare sector will remain one of the brightest stars in the construction universe. “Over the next decade, the 65-plus population will nearly double as a result of the aging Baby Boomers,” says Frank D. Kittredge, Jr., director of Clinical Solutions & Research at HKS Inc., the Dallas-based architecture firm. “In fact, by 2040, the 65-plus market will be approximately 20 percent of the U.S. population and a high percentage of them will have multiple chronic illnesses, thereby requiring more demanding patient care.”

Estimates confirm this driver: Baby Boomer hospital admissions will double by 2030, accounting for 56 percent of total admissions. Several public health challenges will drive this patient flow, including chronic diseases, obesity and geriatric care. Currently, healthcare providers handle about 90 million outpatient visits and 35 million inpatient stays annually, averaging about five days each, according to the Centers for Disease Control and Prevention (CDC), and the outpatient side is growing quickly. Add to this about 120 million emergency room visits—increasingly the only resort for America’s uninsured—and one can assume where the growth will be.

In addition, the aging boomer population means more healthcare-integrated living options, from assisted-living facilities and nursing homes to continuing-care options and such specialized buildings are memory-care clinics.



BRIDGING COST AND CARE

With these issues in mind, the challenge for architects is no longer building faster to keep up with demand, but rather how to bridge healthcare costs and new approaches and concepts in giving care. Creativity in design—fused with intimate knowledge of how healthcare providers work and what challenges they face—add up to winning architectural solutions. According to architects active in healthcare, the following big-picture issues are common themes in recent healthcare building projects:

- **Rightsizing facilities.** Benchmarks of square footage, typical amenities, and standard-of-care equipment are common in the healthcare field. What's changing recently is the focus on reducing total floor area and cost per unit area, as well as accommodating new patient needs without expanding the building footprint.

Bariatric facilities, for example, which serve morbidly obese patients, have recently focused on equipment, safety and facility guidelines for this growing treatment area, says Susana D. Andrade, Assoc. AIA, a designer with Hammel, Green, & Abrahamson in Minneapolis, who has written extensively on the subject. "We need to address these issues with a sustainable and lean approach that considers the differences in ergonomics and proportions of the bariatric patient," she explains. "This can be accomplished by letting ourselves rethink the built environment with an awareness of the direct relationship between environment and behavior and its consequences."

- **Using integrated project delivery and BIM.** Building information modeling, or BIM, delivers a range of benefits to healthcare facility operators, according to experts like John Cooper, AIA, ACHA, principal with Morris Architects. "BIM not only helps in design and construction, it becomes a living repository of all building information," says Cooper, adding that the U.S. General Services Administration has mandated the use of BIM in part because it "gives facility managers easy access to critical building information for operations and maintenance, renovation, and expansion."

- **Incorporating evidence-based design solutions.** Some design leaders see evidence-based design (EBD)—the use of credible

clinical data to influence the design process—as more than an ancillary benefit to conceiving healthcare places. Instead, it is seen as a core design competency for delivering facilities that improve patient and staff well-being, hasten patient healing, reduce stress and boost safety. EBD is "a process for the conscientious, explicit, and judicious use of current best evidence from research and practice in making critical decisions, together with an informed client, about the design of each individual project," writes David Watkins, FAIA, founding principal of Houston-based WHR Architects, and co-author of *Evidence-Based Design for Multiple Building Types*.

- **Employing sustainability and energy efficiency.** Green building has been shown to work in healthcare. Through its success, sustainable design now promises to reduce the cost of facility operations and improve care success, healthcare experts contend.

"Today's hospitals are informed by a new set of questions and challenges," wrote Perkins+Will's sustainable healthcare specialist Robin Guenther, FAIA, in her 2008 book, *Sustainable Healthcare Architecture*. "Healthcare leaders are intentionally connecting buildings to mission and community benefit," by considering such issues as life cycle and healthy materials. Green building approaches, including the LEED program and GGHC, also reduce energy use, improve durability, and positively impact patient and caregiver health.

- **Enhancing care-delivery performance.** In a related arena, quantitative and qualitative assessments of utilization and caregiver performance can be linked directly to architectural decisions. For example, chronically ill patients in Bend, Ore., spent only 10.6 days per year in the hospital, while those in Manhattan spent 34.9 days annually, according to the Dartmouth Atlas of Health Care. To impact those practice patterns,



The use of running water features has affected both the façades and interior layouts of healthcare facilities.

hospital operations and floor plans may be based on cellular care concepts rather than traditional departmental models. Cellular plans increase the number of care activities available in a given station while reducing the amount of patient movement, reducing average patient stays.

These five themes are behind many of the architectural challenges faced in healthcare projects across the country. Leading architects are responding with novel design approaches that are shown to reduce energy use, boost staff productivity, support best-practice operations, and even improve patient response to care.

In many ways, building products and materials are adapting to these changes. A variety of examples show how EBD, sustainability and the workaday pressures of hospital operations and caregiver challenges are influencing healthcare architectural systems. Following are a few areas that have shown the greatest changes or improvement; taken together, they constitute new, global benchmarks for leading healthcare architecture.

DAYLIGHT USAGE AND BENEFITS

One of the most successful healthcare architecture techniques in recent years has been the increased use of daylighting and outdoor views in patient settings. More glass area, however, means that better glazing is required. For improved energy efficiency of the building envelope, architects are specifying new low-emissivity (low-E) and spectrally selective glass with a range of visible light transmission, between 40 percent and 70 percent, while also offering lower reflectivity than was possible in the past.

While energy efficiency is a growing concern, the issue of reflectivity has emerged as a patient issue. “The low interior reflectance lets patients see outside better, which is shown to improve mood and recovery,” says Chris Dolan, director of commercial glass marketing with Guardian Industries Corp. “When it’s dark out, reflected interior lighting makes it difficult to see outside, and instead patients see their own reflections, which defeats the purpose of the windows. Low-reflectance glazings reduce the indoor mirror effect, and that’s typically more comfortable for patients,” and can reduce stress.

Another issue affecting the use of enclosure and interior glazing has been fire safety. Novel fire-resistant and fire-protective glass products allow the use of glass in situations that otherwise limit its use. Fire-protective performance is defined by Fire-Protection Rating—“the period of time that an opening protective assembly” can confine a fire, according to the Glass Association of

North America (GANA). Fire-resistance describes how materials and assemblies prevent or retard “the passage of excessive heat, hot gases or flames,” says GANA.

“How the glass performs, which is how the 2012 International Building Code defines them, is even more important,” says Diana San Diego, director of marketing for SAFTI *FIRST*. Fire-protective glass blocks the passage of flames and smoke, based on testing to NFPA 252 and 257; it is typically used for 20- to 45-minute door and window applications, limited to 25 percent of the wall area. Fire-resistive glass blocks flames, smoke and dangerous radiant heat, based on testing to ASTM E-119; it can be used for wall and door applications rated at 60 minutes and greater. Because it blocks radiant heat, there are no size limits for fire-resistive glass applications.

The bottom line: Hospitals are now able to use glass partitions for rated interior walls, on property line or party walls, or in stairwells to improve visual security, while meeting the requirements of the code. “We’re seeing more and more opportunities for fire-resistant glass to create a greater sense of openness in design or a more relaxed, less institutional feel,” says Jeff Griffiths, director of business development with SAFTI *FIRST*.

Photo courtesy of TIMELY Industries



Greater need for accessibility and transparency within healthcare environments has led to new, barrier-free openings with doorframes that have built-in glass sidelites and transoms. Specialized hardware needs have also called for pneumatic controls and electronic access systems.

door frames. “We have seen an increase in the use of sidelights, borrowed lights and transom frames, many requiring fire ratings,” she explains. “Design professionals can easily manipulate door frames by adding larger glass areas or by including glazed openings to increase the transfer of light and radiant energy throughout interior spaces.”

Bevens adds that door designs are changing to allow for barrier-free travel paths with fewer encumbrances. Pneumatic controls and electronic access hardware are commonly integrated into hospital doors.

Interior assemblies of all kinds have evolved to meet the special operational and economic challenges associated with healthcare interiors. “Healthcare organizations demand easy-maintenance facilities, in part to reduce infections and in part to reduce overhead costs,” says Lee Hedberg, director of engineering with Engineered Lighting Products, “There are new cove lighting fixtures, for example, that are integral to the wall surface so there are no edges to clean, no debris getting caught in the fixtures.”

These fixture types also work well in corridors, where engineers tend to gang HVAC ducts and lines for water, vacuum, air and gas lines, which can’t be routed through patient zones. To allow access and clearance, architects face significant restrictions on lighting, wall rails and other wall- or ceiling-mounted accessories, says Hedberg.

Window / Door Test FIRE PROTECTIVE NFPA 257



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45 minutes and under

Wall Test FIRE RESISTIVE ASTM E119



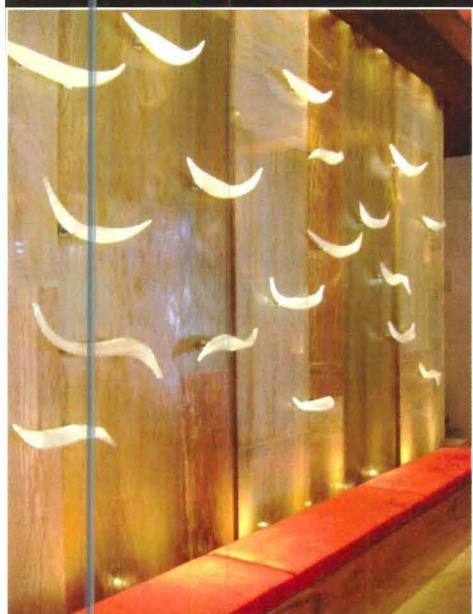
Contains flame and smoke AND blocks radiant heat for applications

over 45 minutes

Fire-protective performance for glass is defined as the period of time an opening can confine a fire. Fire-resistive glass prevents movement excessive heat, hot gases or flames.

OPERATIONAL EFFECTIVENESS

Glazing has become a valuable building element indoors also, with increased application for partitions and interior windows. Improved transparency and interior visibility in healthcare settings is also linked to higher productivity and improved care, says Valerie Bevens, technical services manager with TIMELY Industries, a producer of prefinished



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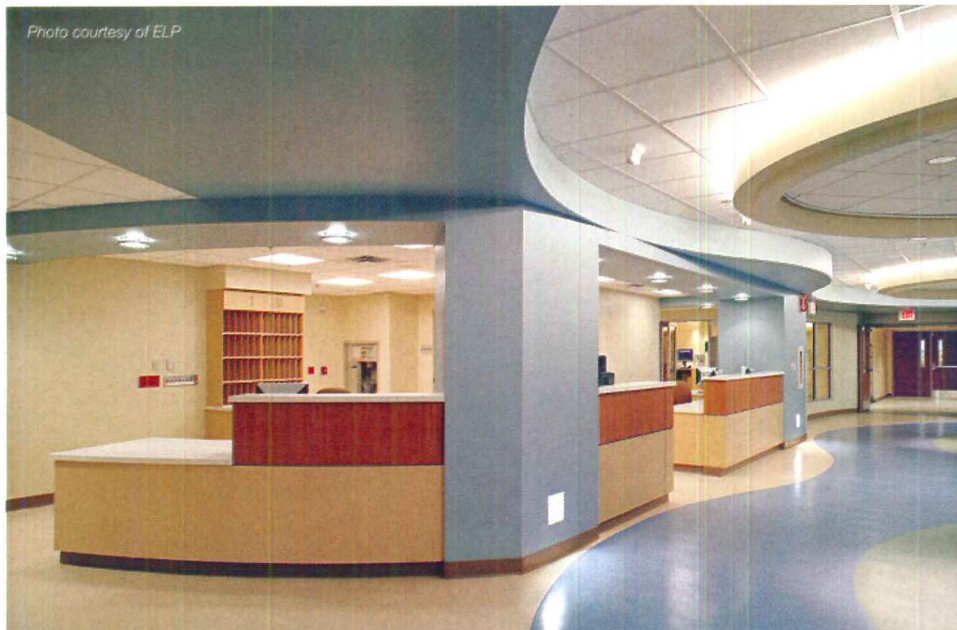


Photo courtesy of ELP

For the Beaman Neonatal Intensive Care Unit at Baptist Hospital, Nashville, cove lighting fixtures shield patients from glare while also easing maintenance needs, because they are built into the walls leaving no slit openings to clean.

INTERIOR HYGIENE AND ABUSE-RESISTANCE

Another public health consideration in hospitals areas with high levels of visitor and public traffic is reducing opportunities for bacterial growth and other sources of nosocomial infections, those that patients are exposed to in healthcare environments. According to CDC, nosocomial infection rates have remained stable over the past 25 years, at about five to six hospital-acquired infections per 100 admissions. However, because of shorter inpatient stays, the rate has actually increased 36 percent over the last 20 years, at a total cost of \$4.5 billion and at least 88,000 deaths.

Awareness among providers and the general public has also increased, bringing attention on indoor maintenance practices and clinical protocols to reduce the spread of viruses and bacteria. While architects play a limited role in this effort, attention to public washrooms has helped, says William Gagnon, vice president of marketing and key accounts with Excel Dryer, Inc. “Architects and facility managers are looking to remove areas where bacteria and viruses can live and grow. For example, used bacteria laden paper towel waste in trash cans or on floors creates a cool, moist environment which can be a breeding ground for bacteria. Many hospitals have opted for the newer fast efficient hand dryers that are hot and dry rather than paper products to create a more hygienic restroom environment,”

he explains. “This eliminates at least one of the environments where MRSAs—the so-called super-bugs—can survive and multiply.”

Gagnon adds that the new age of high speed hand dryers utilize a high-velocity, heated air stream that removes the residual moisture layer on the skin more completely than paper or cloth towels due to evaporation from the heat. Other best-practice washroom specs include hands-free, high efficiency fixtures such as soap dispensers, low-flow faucets, urinal and toilets.



Photo courtesy of Excel Dryer, Inc.

More hospitals are using electric hand dryers in public washrooms and preoperative zones due to hygiene and maintenance concerns.

BIOPHILIC FEATURES: EVIDENCE-BASED AND SUSTAINABLE

In other cases, water is being brought into the healthcare environment deliberately—though in limited and strategic ways, says Rob Morton, director of sales and marketing with Bluworld of Water. “Studies of biophilia and evidence-based design show that bringing various natural elements indoors, such as running water, can lower patient blood pressure and produce negative ions, which are known to enhance the immune system and boost alertness,” he says.

Seminal review articles by the California-based Center for Health Design support the overall notion. Among the most-cited experts is Roger Ulrich, director of the Center for Health Systems and Design at Texas A&M University, whose 2003 study suggested that natural elements and nature art promote “restoration from stress” when the features contain “calm or slowly moving water, verdant foliage, flowers, foreground spatial openness, park-like or Savannah-like properties (scattered trees, grassy undershot), and birds or other unthreatening wildlife.” These natural therapy environments have been shown in clinical studies to affect patients dramatically: “blood pressure drops, respiration slows, muscles relax, and moods brighten,” wrote Ulrich.

Properly designed and maintained, Bluworld’s Morton reports, water walls and “bubble walls” improve ambience in patient areas and recovery rates. In a few cases, he cautions, poorly designed or maintained water features have caused outbreaks including Legionnaires’ disease, as in 2010 at the Milwaukee Hospital Aurora St. Luke’s South Shore. Such issues are rare and preventable: “Filtration technology is very important, everything from ultraviolet light to ozone to ionizers that help combat living organisms within the systems,” says Morton. “A modern water system should be able to combat both living organisms and nonliving contaminants.”

In fact, a variety of new approaches to water features have been used by architects in healthcare settings, including antibacterial recirculating “encapsulated

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designs” with access panels for maintenance, as well as “bubble panels” in which a chamber of distilled water between acrylic panels is fitted with an air pump to produce a soothing, contained effervescence that may be highlighted with color-changing LED light sources.

TECHNOLOGY DRIVES CHANGE

While these improvements to inpatient and outpatient environments contribute positively to care delivery and cost reduction, new and radical departures from traditional hospital organization will challenge architects anew. “Telemedicine will continue expanding physicians’ geographic reach as well as treating patients who live in rural or remote areas—and those that have shortages in select clinical specialties,” HKS’s Kittredge explains. “Virtual ICUs and other virtual strategies will be more commonplace in order to deal with staffing shortages and provide a higher quality of care.”

In spite of these novel remote technologies, healthcare delivery is also more collaborative, leading many hospitals to add new videoconferencing facilities, says ELP’s Hedberg. These rooms demand studio-quality lighting in an architectural environment,

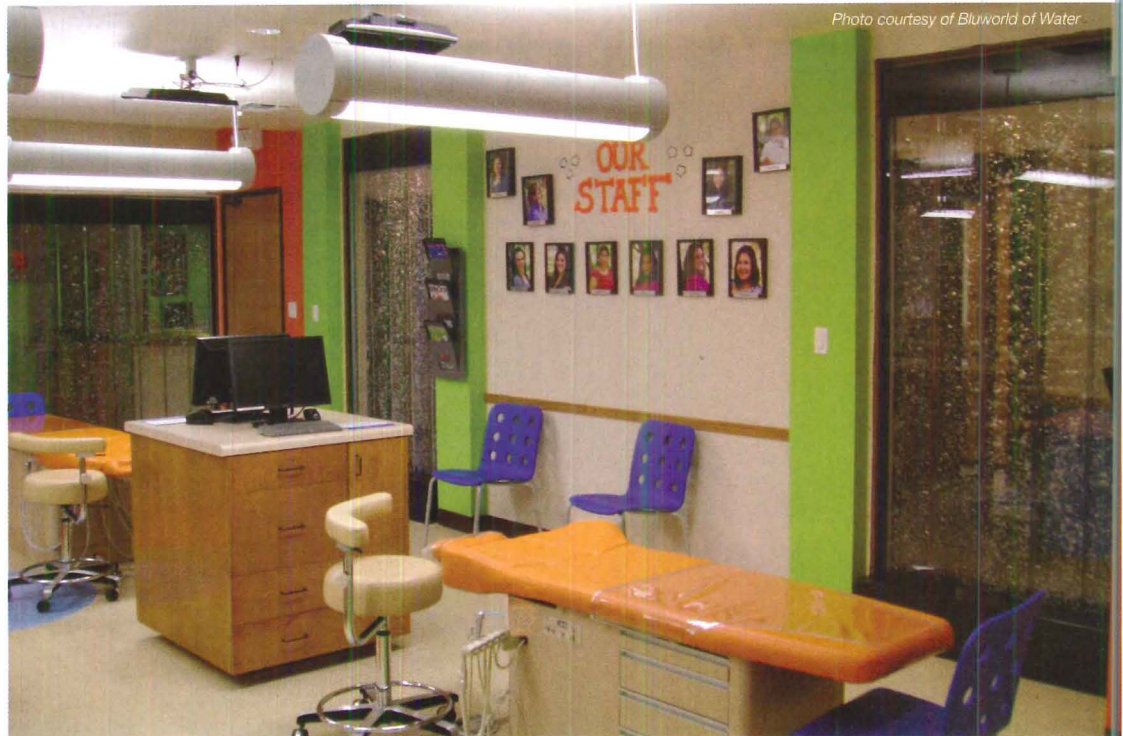


Photo courtesy of Bluworld of Water.

Studies of biophilia and evidence-based design show that bringing natural elements indoors, such as the running water on these glass partition panels, can lower patient blood pressure and produce negative ions, which are known to enhance the immune system and boost alertness.

which can be accomplished with asymmetric-distribution lighting fixtures that provide vertical illumination on the doctor’s face without creating discomfort.

Hospitals are planning other technology upgrades, too, according to recent industry surveys. Among the top five most common are *asset-tracking products* including RFID, bar-coding and instrument management systems, says Kittredge. New *smart-phone applications* are used to direct patient intake

or deliver vital information. This year, for example, the Henry Ford Health System and Detroit Medical Center, have launched no-cost apps to help the public find the nearest urgent care center, complete with estimated wait times. Both medical centers say they are considering launching other smart-phone apps, according to the Detroit News.

“The integration of architecture and technology is critical to creating best-of-class facilities,” says WHR’s Watkins, who partnered several years ago with Genesis Healthcare International, Inc., a specialist in medical technology planning and strategy, to benefit a number of its clients. In addition to architecture and planning, WHR has been able to consult on technology adoption, long-range planning, capital management and operations.

► Continues at ce.architecturalrecord.com

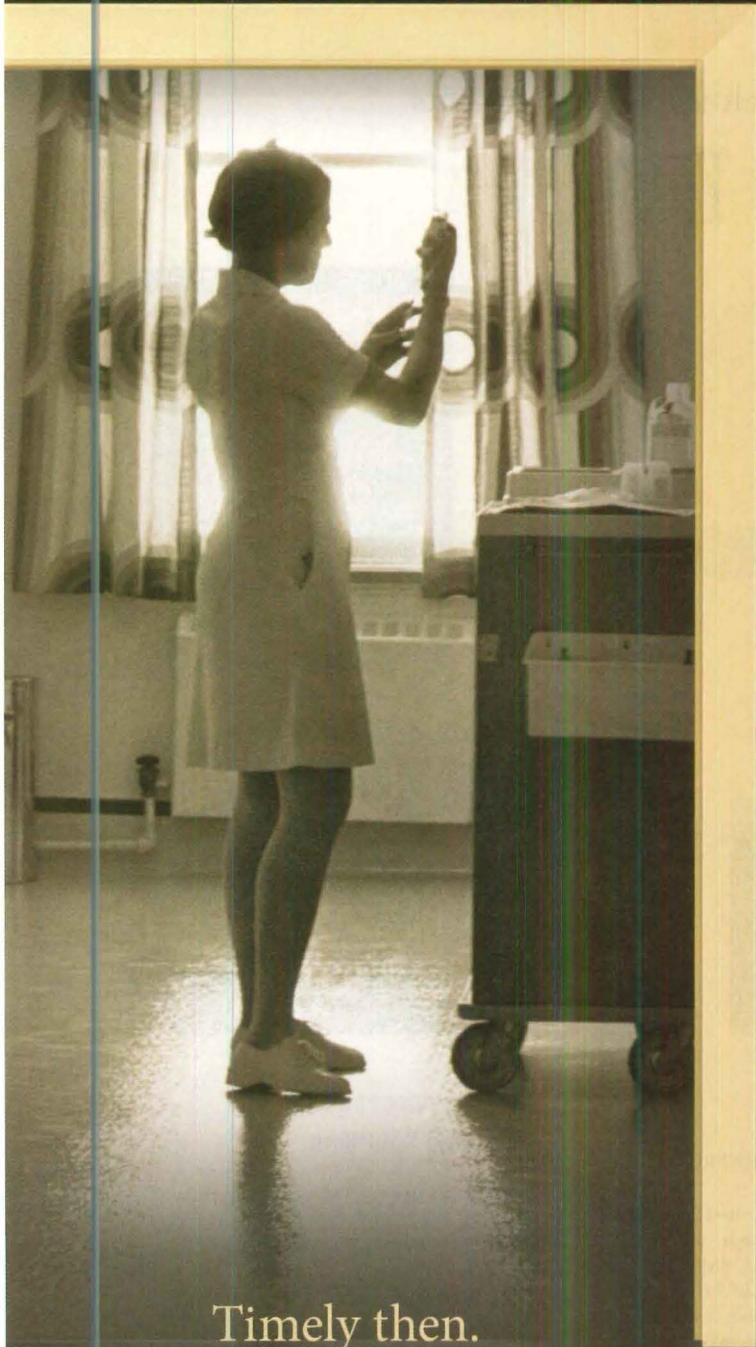
C.C. Sullivan is a marketing consultant specializing in the architecture, design, and construction segments. He is former editor-in-chief of the magazines Architecture and Building Design + Construction.



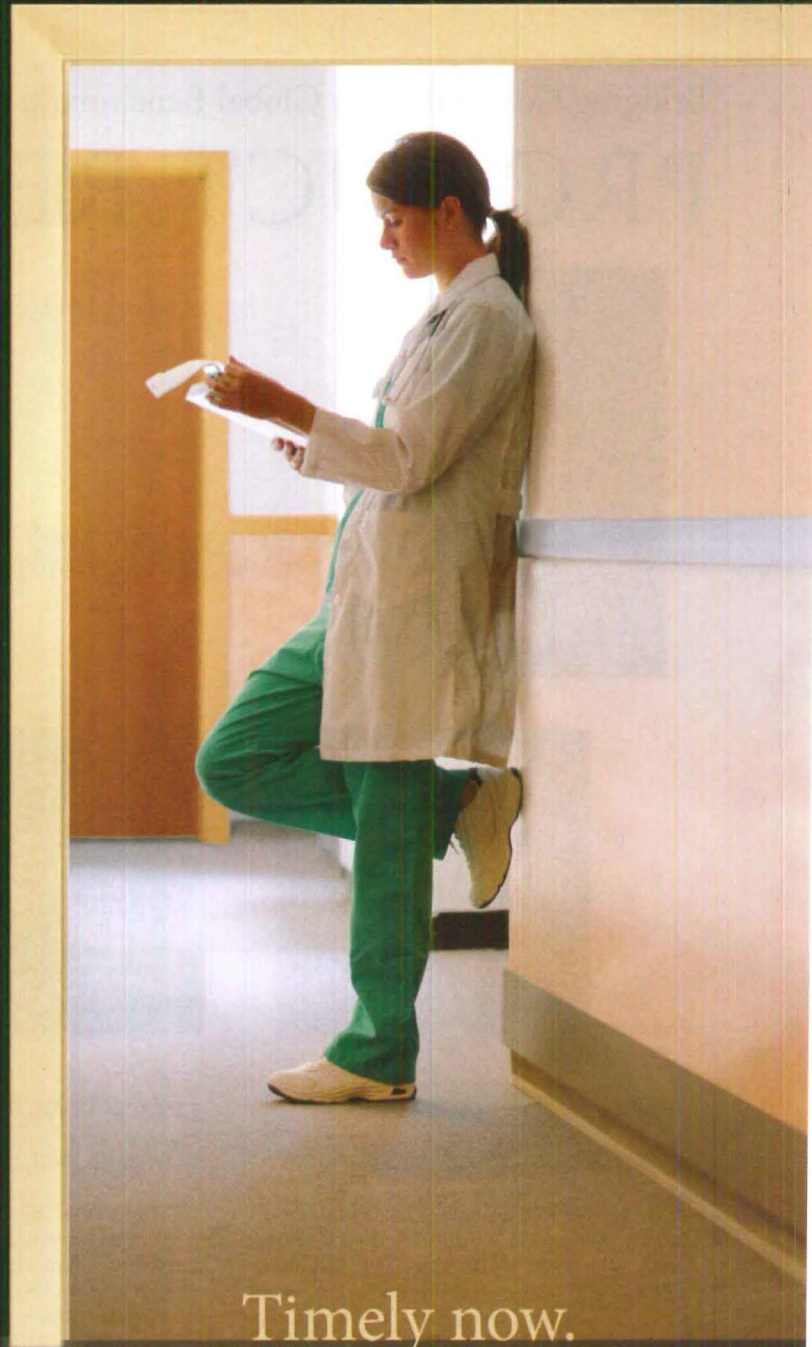
Photo courtesy of ELP

The \$9.6 million expansion of the Neonatal Intensive Care Unit at Nashville’s Baptist Hospital added 25 beds as well as pinwheel-shaped pods for privacy in soft, elegant colors. The architect is Thomas Miller & Partners.

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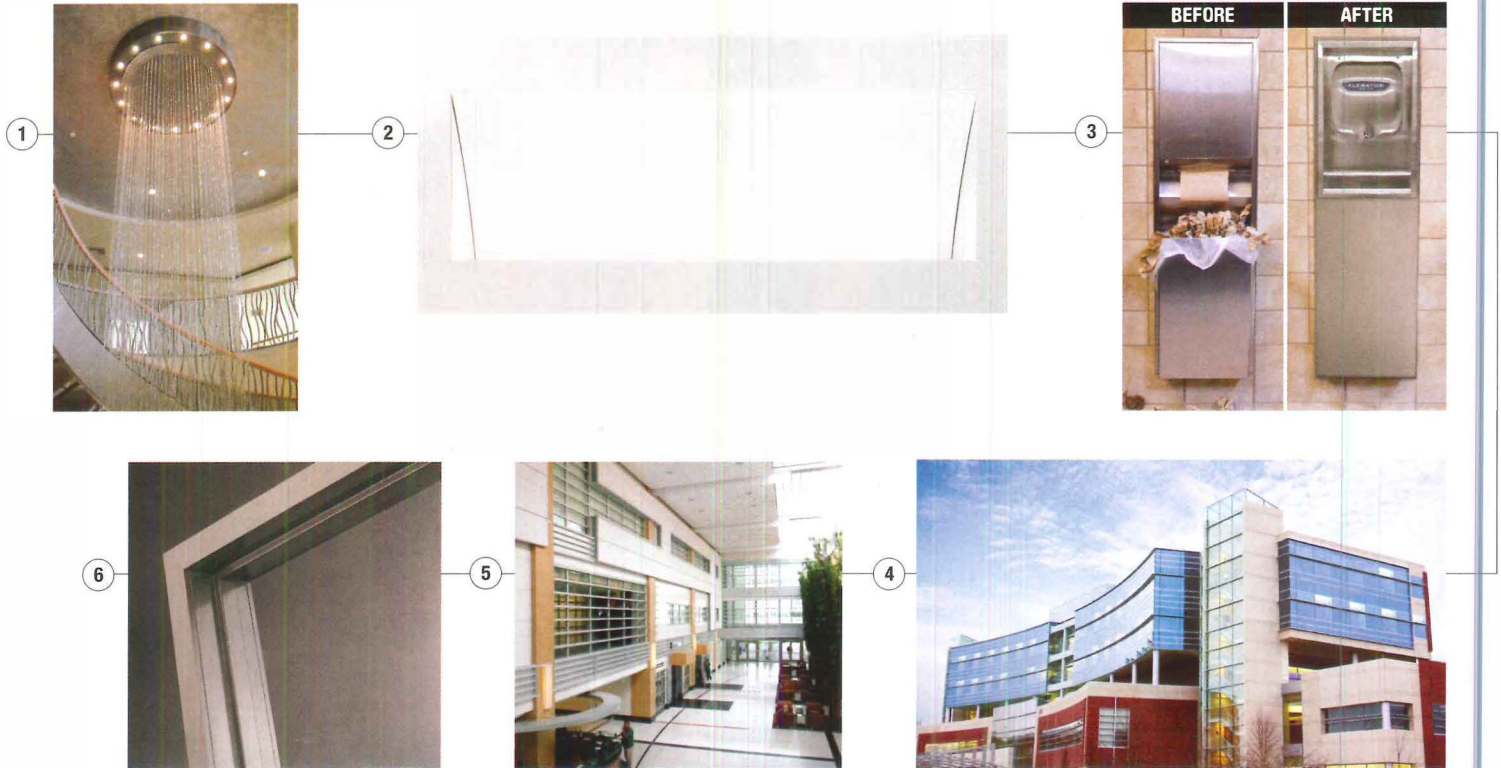
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Bridging Cost and Care: Global Benchmarks for Healthcare Environments

PRODUCT REVIEW

1. **Bluworld of Water**

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www.bluworldusa.com

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2. **ELP**

HOSPITAL-GRADE LUMINAIRES

ELP's Full Face Lens Plate option for gypsum installation minimizes edges where particulates collect and allows easy thorough cleaning. When combined with the "HG" option (Hospital Grade) the lens/fixture is double gasketed to minimize air and dust penetration. Additionally, the Hospital-grade luminaires are supplied standard with anti-microbial paint.

www.elplighting.com

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3. **Excel Dryer, Inc.**

PAPER TOWEL DISPENSER RETROFIT KIT

XLERATOR XL-SB stainless steel retrofit kit provides a simple, cost-effective solution for replacing built-in paper towel dispensers with high-speed, energy-efficient XLERATOR™ hand dryers. An ADA-compliant, stainless steel panel is mounted precisely into the space where the paper towel dispensers once were, leaving restrooms clean and green.

www.exceldryer.com

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4. **Guardian Industries**

ADVANCED ARCHITECTURAL GLASS

Guardian SunGuard Advanced Architectural Glass performance products offer a variety of appearance and light transmission options with outstanding solar energy control. The SunGuard SuperNeutral product line delivers high light transmittance while reducing solar heat gain. Their neutral appearance is the most similar to clear uncoated glass. Shown: Omaha Women's Methodist Hospital. The project used Guardian SunGuard SuperNeutral 68 and Royal Blue 40.

www.guardian.com

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5. **SAFTI FIRST Fire Rated Glazing Solutions**

CLEAR FIRE-RATED SOLUTION

SAFTI FIRST offers SuperLite, advanced fire-rated glass with superior clarity and performance for every application. From fire-rated doors and windows to custom-engineered wall assemblies, you can count on them to deliver high-quality products with fast lead times and competitive pricing made here in the USA.

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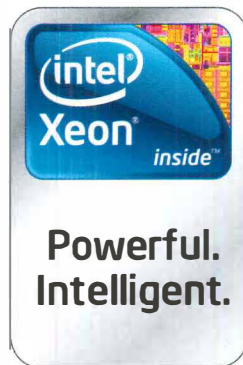
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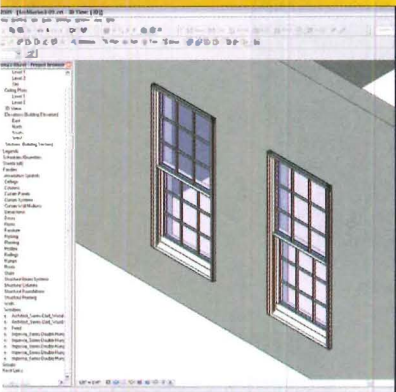
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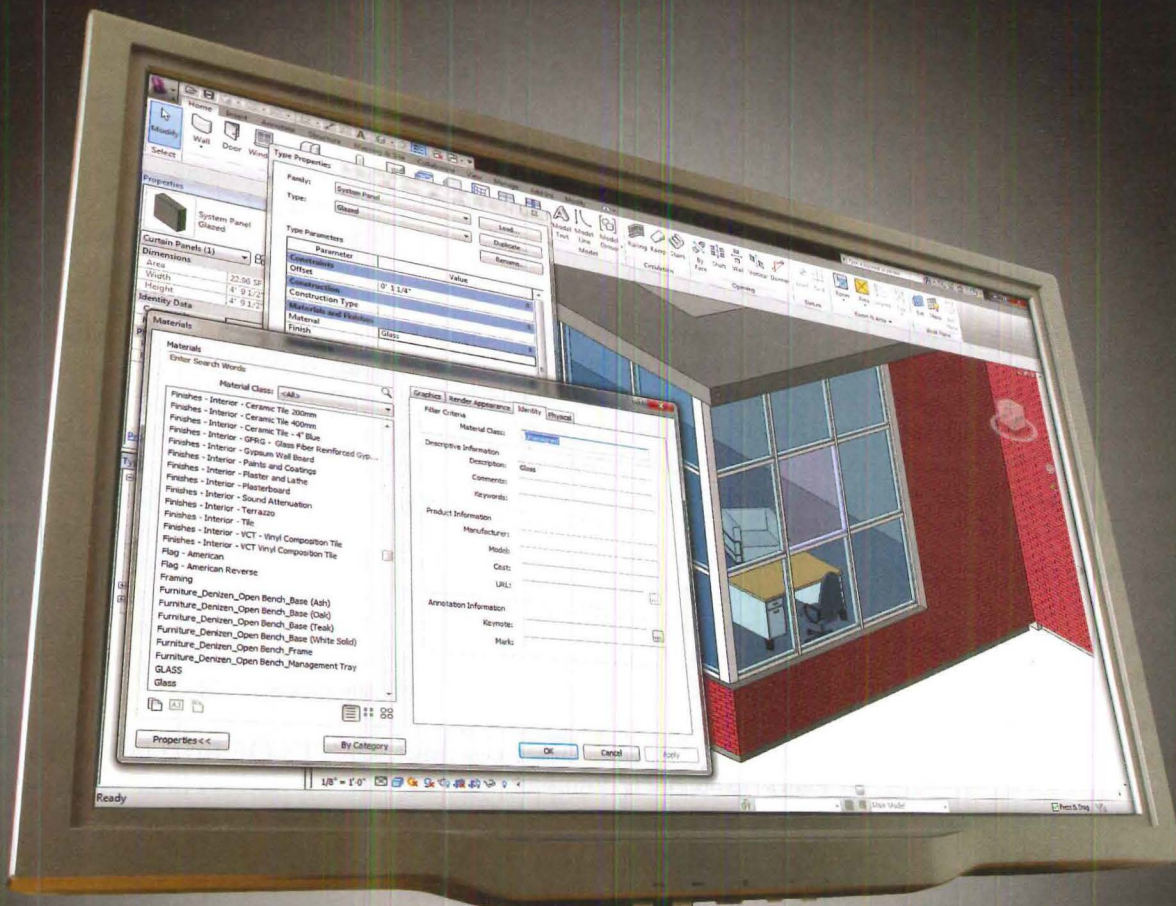
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BUILDING PRODUCTS IN BIM

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Learning Objectives

After reading this article, you should be able to:

- Explain how the graphical and non-graphical data in BIM objects of building products significantly contributes to the effective use of BIM
- Apply principles of this learning to more effective use of BIM
- Summarize efficiently to building product manufacturers the data requirements that are essential in BIM objects of building products in order to improve the reader's future use of BIM
- Assess the quality of BIM objects that the reader is considering for use on a BIM project.

BIM-compliant content for building products, materials and finishes is increasingly critical to the successful future expansion of BIM.

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BUILDING PRODUCTS IN BIM

BIM-compliant content for building products, materials and finishes is increasingly critical to the successful future expansion of BIM.

By Stephen A Jones, Senior Director, McGraw-Hill Construction

Building Information Modeling (BIM) is dramatically changing the process of designing, documenting, constructing, and maintaining buildings globally. A McGraw-Hill Construction survey of North American architects, engineers, contractors and owners published in December 2009 found that:

- 48 percent of these companies were using BIM to some degree
- Over 95 percent of the companies using BIM planned to expand their use of it
- 40 percent of the non-users forecasted they would adopt BIM by the end of 2011

The industry-transforming power of BIM comes from the fact that the physical and functional characteristics of a building are set forth in a relational database format rather than in drawings, which are just a collection of lines, arcs and text that have no native intelligence and require human interpretation to derive meaning.

The BIM data resides inside intelligent objects of building elements and products which are assembled and configured to produce a virtual model of the building. There are a growing number of objects available for:

- Fundamental architectural elements (slabs, exterior walls, roofs, interior partitions, etc.)
- Discrete building products (windows, doors, hatches, chiller units, toilets, furnishings, etc.)

These objects contain highly accurate geometric data which is critical for popular BIM processes such as spatial coordination (also known as “clash detection”) where system interferences are identified virtually and corrected before causing expensive field changes.

In addition to geometry, a BIM object also contains a variety of relevant non-graphical data such as material strength, insulation value, finish, surface reflectivity, light transmission or fire rating. They can also carry links to other associated documentation such as technical data, warranty and maintenance information.

BIM-compliant data is also being made available for a variety of materials, finishes and coatings (glass, paint, etc). Although these don't have the same 3D graphical importance as the other categories, their non-graphical data is increasingly critical to successful use in BIM.

Because both the graphical and non-graphical attributes are stored in a normalized database format inside the objects, they are machine-readable, meaning they can be electronically extracted and used by software programs. There is a rapidly expanding array of model-based programs that leverage these attributes to perform valuable processes, such as:

- Accurately visualizing appearance from a variety of perspectives and environmental conditions
- Conducting analysis or simulation processes such as lighting design or building performance
- Extracting quantity information for budgeting and cost estimating
- Developing specifications
- Evaluating alternatives and substitutions
- Planning tactical project execution

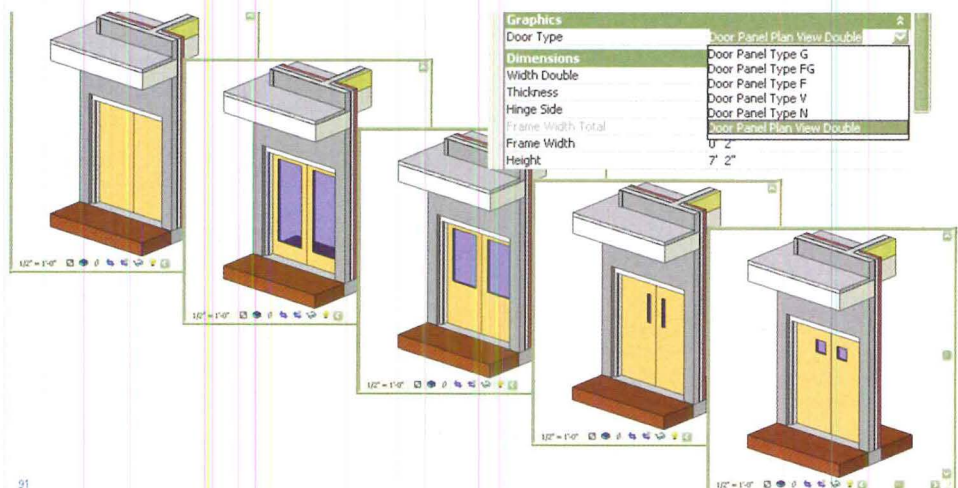


Image courtesy of CDV Systems

91

A parametric BIM model can contain data to generate multiple instances of a product, based on user needs for a particular project.

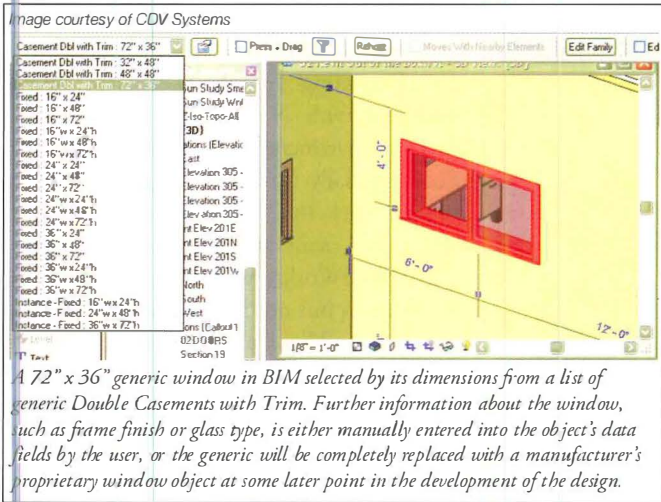
This article will focus on BIM objects of building products and manufactured materials which come to a job site ready to install (as opposed to raw materials that are used at a construction site such as concrete or lengths of conduit). Because they represent a large percentage of the objects in a building that is created in BIM, and they contain both graphical and non-graphical data, the intelligent objects of building products and materials play a critical role in the successful use of BIM from design, through construction and into facility management. Industry consultant and former Construction Specifications Institute (CSI) executive Roger Grant sums it up simply with his perspective that “the building information model is just a big product model.”

TYPES OF BUILDING PRODUCT CONTENT FOR BIM

There are different types of BIM content, related to the characteristics and installed use of the products and materials they represent.

Parametric Objects

Many products are commercially available from building product manufacturers (BPMs) in a wide variety of configurations. For example, doors are available in an almost limitless number of combinations of heights, widths, thicknesses, materials, panels, lites, finishes, hardware options, frame types, fire ratings, sound transmission coefficients, blast resistance, etc. The same goes for windows,



A 72" x 36" generic window in BIM selected by its dimensions from a list of generic Double Casements with Trim. Further information about the window, such as frame finish or glass type, is either manually entered into the object's data fields by the user, or the generic will be completely replaced with a manufacturer's proprietary window object at some later point in the development of the design.

which also involve a vast selection of glass types and thermal properties. While it is possible to develop an individual BIM object for each possible iteration of available features for any product like this, it is not a practical approach.

Because BIM software works as a relational database, it can take advantage of objects that are built to be parametric, meaning they contain enough data to represent more than one configuration of alternative features. These are sometimes referred to as nested product types or product type catalogs. The user can identify which feature set is appropriate for a given project requirement and the software will create an instance of the object that contains just those features, including both the graphical and non-graphical information.

Another advantage of parametric objects is their ability to interact intelligently with other objects. For instance, when a parametric door object is inserted in a parametric wall object, the wall object automatically adjusts itself to create the proper opening, modifying both its graphical and non-graphical properties. So, for example, when the entire BIM model is electronically queried to determine the total surface area of interior partitions, perhaps to determine wall finish quantities, the wall objects know to deduct all the door openings in the calculation. Also, if the BIM software is creating and maintaining a door schedule, any additions, deletions or modifications made to any of the door objects will automatically update the door schedule.

Static Objects

The simplest BIM objects represent just a single product and do not carry any inherent options for alternate features. These static models are

appropriate for product lines that have limited options for dimension, finish, etc.

Materials and Finishes

Although BIM content for materials and finishes is the least plentiful type being provided by BPMs, BIM software often comes preloaded with a number of generic materials which can be modified by users to represent the specific requirements of a project. For sophisticated

visualization, some BIM software applications enable extensive customization of material appearance to a remarkable level of detail, by manipulating the rotation, size, brightness, and intensity of textures, gloss maps (also known as shinemaps), transparency maps, reflection maps, oblique reflection maps, hole maps and bump maps.

Generic and Proprietary Objects

Across all of the types described above there is an important distinction between generic and proprietary BIM objects of building products.

- **A generic object** carries geometric and non-graphical data representing the functional need for the particular product in that project, but does not carry specific information identifying it as a particular manufacturer's product. Final recommendations on manufacturer-specific products are ultimately made by contractors based on bidding and market conditions.
- **A proprietary object** represents a specific manufacturer's product, with its particular dimensional and functional characteristics. These are commonly used when an architect wants to identify a preference or as the Basis of Design, where alternates must be equivalent to be approved.

CREATING BUILDING PRODUCT CONTENT FOR BIM

Most BPMs already create and distribute extensive libraries of CAD-based content about their products, focused primarily on

graphical and geometric aspects. Non-graphical data is usually found in accompanying spec sheets, and other technical product literature.

BIM requires an entirely new kind of content that combines the graphical and non-graphical data into intelligent objects. The process of creating these intelligent objects of building products has been evolving as BIM adoption and implementation have grown over the past decade.

Architects

Architects were the first group that represented large scale adoption of BIM in the U.S. construction industry. Since there was very little BIM content at the beginning, most practitioners had to build their own. This created a variety of problems:

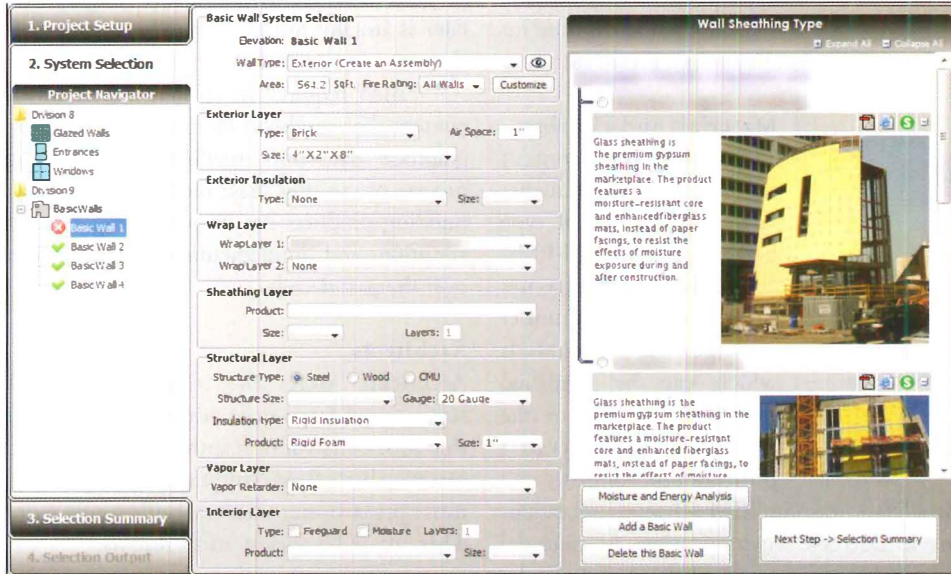
- **Inconsistency.** Each practitioner created objects to suit the immediate needs of a project so the approach to both geometric and property data were not consistent from object-to-object or from project-to-project, and certainly not across firms.
- **Inaccuracy.** Because the information is entered into data fields, mistakes were hard to catch and might not be discovered until much later in a project, or when an object is used by another modeler.
- **File size.** Some BIM software is particularly vulnerable to being overloaded by objects with large file sizes, slowing performance and sometimes crashing the software.

BIM REQUIRES AN ENTIRELY NEW KIND OF CONTENT THAT COMBINES THE GRAPHICAL AND NON-GRAPHICAL DATA INTO INTELLIGENT OBJECTS.

BIM Software Companies

In response to growing customer demand for content, the BIM software companies began creating libraries of generic objects that could be shipped with the software. Many of these companies are still actively expanding their libraries and refining the quality of the objects for optimal performance in their tools. Some BIM software makers also provide templates for users to create their own objects.

Image courtesy of Georgia-Pacific Gypsum and DeMichele Group



BIM content can be made available both as a library of pre-built individual objects that users can download, and through an online configurator (shown here) that creates complete BIM wall assemblies on demand then uploads the full assembly into the user's BIM project.

Building Product Manufacturers

As an increasing number of design professionals began asking for BIM-compliant product information, the BPMs initiated a variety of programs to create and distribute BIM objects. Each is distinctive to the nature and usage of its particular products.

Many BPMs had already recently developed a new type of 3D modeling content for use in Google SketchUp. Warren Barber, Dens® Brand product manager at Georgia-Pacific Gypsum recalls, "We got involved fairly early with 3D models for Google

SketchUp, but we stood at the edge of the BIM pool for a long time." As industry-wide BIM use advanced, his company realized the benefit of "being where the architects are. We know you can never have enough sales people in the field, so we have BIM models out there that can act as a sales person for us." He also recognized the trend towards earlier and more collaborative product decision making that is being facilitated by the assembly of a model. "We want to be at the decision-making table sooner in the process by providing our models. If contractors on BIM projects have influence

on product ideas, we want them to be able to easily introduce our models."

Regarding Google SketchUp, Jurgen Schroeder with NanaWall's Technical and R&D Department says it is still actively used, especially for early design activities by owners. Back in 2006, they also produced models in a manufacturing industry software called SolidWorks, which was effective for visualization but not for technical integration into BIM. These early attempts to create objects for BIM were not very successful. "They were too generic without enough information about the properties of the walls, what the hardware, glass and sill options were, and all the technical aspects," Schroeder recalls. In March 2010 the company released more robust objects with specification information that have been well-received by architects.

According to Tim Aspinwall, National Sales Manager of Nystrom, Inc., a manufacturer must be fully committed to BIM users' technical needs with its "supported content." Nystrom's Product Manager, Kristine Oppong, defines supported content as reliably reflecting the manufacturer's "technical knowledge about how the product functions, its limitations as well as how it operates within a model." To be successful, manufacturers must also actively seek input from the AEC community to expand and improve their product lines.

In reflecting on what inspired his relatively small company to embark on a BIM



Illustrated here is an opening product shown in a BIM-generated rendering. All aspects of its geometry, finish, reflectivity, transparency, etc. are calculated by the BIM rendering tool from the data in the BIM object.

SIMPLIFY

10 Complementary Building Product Lines

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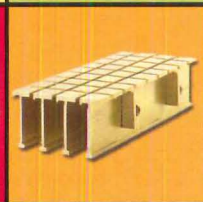
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Expansion Joint Covers **1**



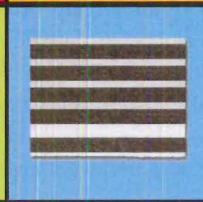
6 Roof Hatches

Smoke Vents **2**



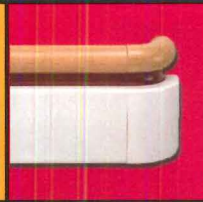
7 Entrance Flooring Systems

Louvers **3**



8 Stair Treads & Nosings

Floor Doors **4**



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Access Doors **5**



10 Fire Extinguisher Cabinets



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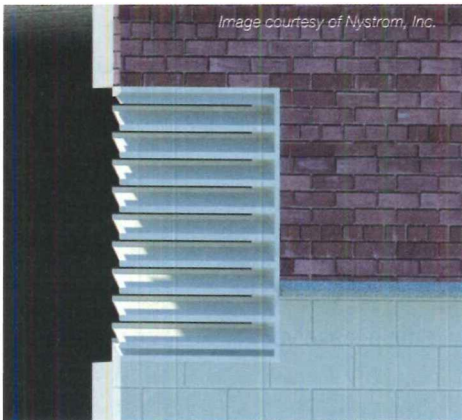


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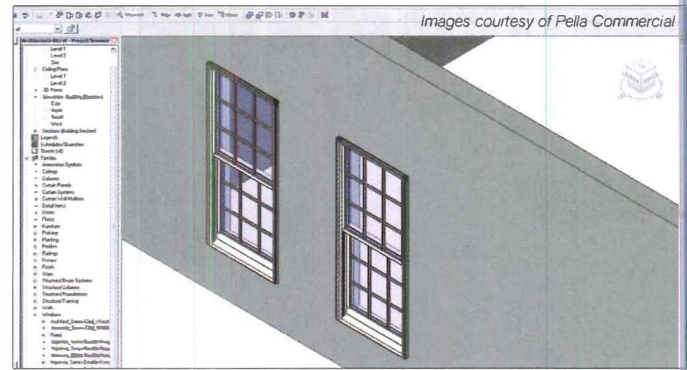
Shown here is a BIM object of a louver in a BIM exterior wall assembly.

content program, James Sable, Executive Vice President at greenscreen®, says “we partner with 80 percent of the top 50 firms in America,” and they are aware of the fact that these firms are advancing along the line of BIM adoption. “We wanted to provide models and we wanted to be part of that dialogue,” he adds. Sable believes offering BIM content “streamlines the process of incorporating our offerings into a façade design,” enabling architects and landscape architects to “grow their palette” of alternatives.

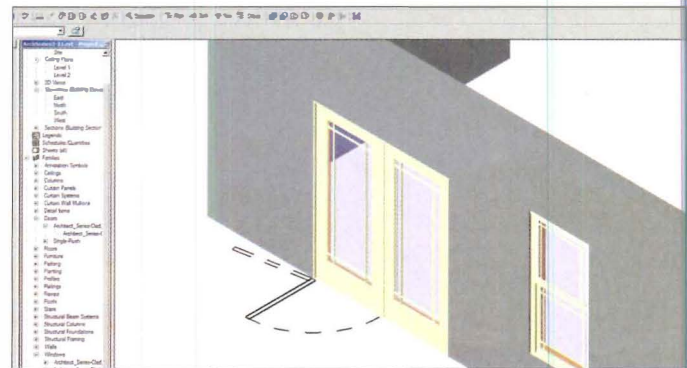
For window and door models, architects want smart objects that prevent them from selecting sizes outside of parameters, provide flexibility with muntin patterns and sizing, include exterior and interior finish options, provide fields for

important data like U-factor and Solar Heat Gain Coefficient, and make it easy to group windows, adjust setbacks, and change interior trim conditions. “BIM was something our commercial customers were asking for so we provided them with the design tools they needed for their projects,” states Terry Zeimetz, AIA, CSI, CCPR, Pella’s Commercial Marketing Manager. Architects are now actively accessing the company’s BIM objects in a variety of product lines. The company chose to offer the ability to either download individual products or what is called a Type Catalog, which is user-configurable across several options.

Joanne Funyak, Market Manager with the Flat Glass Group of PPG Industries is seeing “consistent traffic” to their content and knows that the performance data is definitely providing value to BIM users. She says their company “got into BIM because we believed strongly in making



Images courtesy of Pella Commercial



Shown are BIM objects for double doors and a double-hung window, as well as a pair of multi-lite double-hung windows.

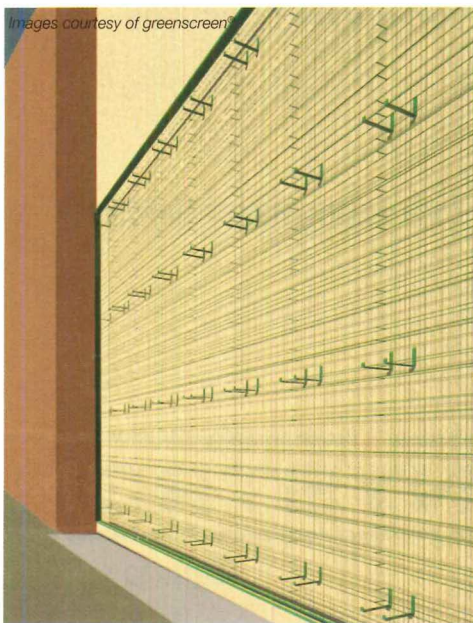
the data about our products available to the applications that want to use it.” The company collects information on lifecycle benefits for its materials (re-paint frequency, etc.) so it can be prepared when applications develop to the point that lifecycle costing can be simulated in BIM. They are also evaluating other product manufacturers whose products are in assemblies with theirs so they can work together on more comprehensive BIM solutions.

Independent Content Creators

Sensing that the emergence of BIM was creating a demand for content skills, a number of service companies began providing outsourcing for:

- Total project BIM modeling for architects and contractors from 2D design files
- BIM content libraries for architects and contractors that can be reused on multiple projects
- BIM objects of building products for BPMs

Many of these service companies were existing CAD and BIM resellers, or were established outsourcers of CAD services to



Images courtesy of greenscreen

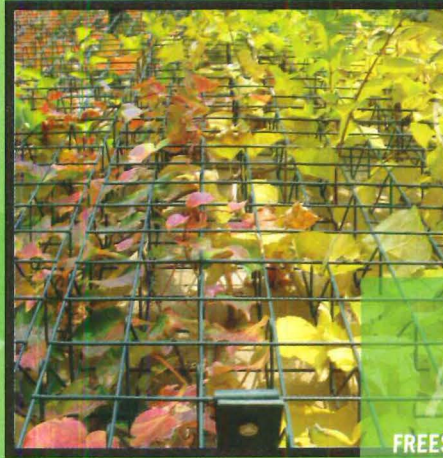


These images show the BIM object (on left) and the final installation (on right).

VERTICAL FACADE
NORTH UNIVERSITY PARKING, CHICAGO



WALL MOUNTED
WHOLE FOODS, LINCOLN PARK

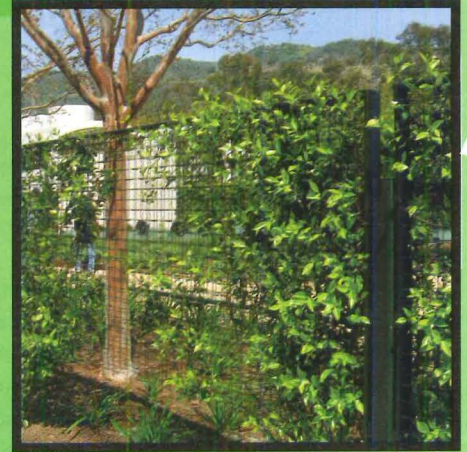


- MULTISTORY
- MODULAR
- FREESTANDING
- WALL MOUNTED
- COLUMNS
- SHAPES
- COLORS



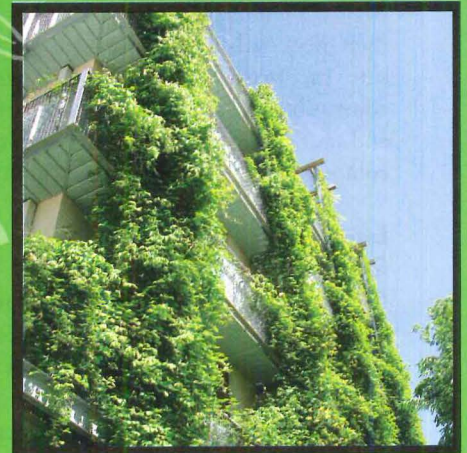
FREESTANDING
GETTY MUSEUM, LOS ANGELES

JACKMAN SUPERBA CLEMATIS, MONROVIA

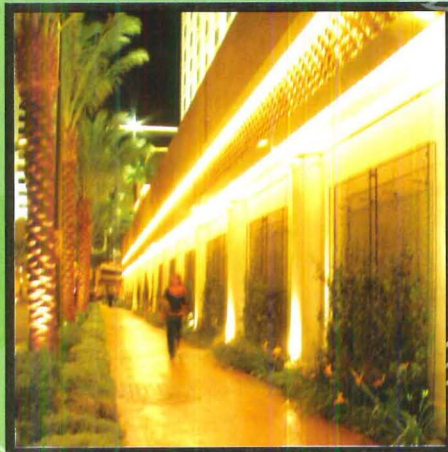


WALL MOUNTED
GOLDEN NUGGET, LAS VEGAS

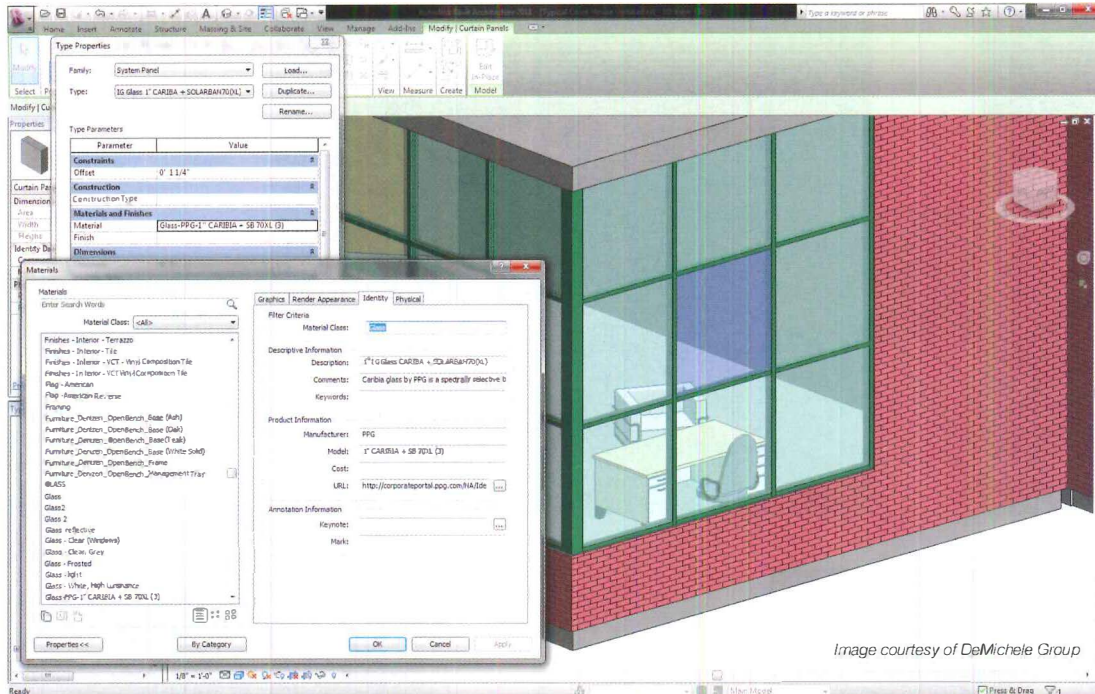
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the POSSIBILITIES are ENDLESS!*



This view of a BIM model shows a generic window system where one pane of glass has been updated as a specific manufacturer's product.

architects and contractors. Many leverage lower cost offshore labor and some are actually headquartered overseas. As this process has matured, the requirement to coordinate closely for successful outsourcing has given rise to a hybrid model known as blend-shoring, where project management and client liaison is handled locally with U.S. staff, but actual production takes place overseas.

Entrepreneurial architects are also leveraging their BIM experience to develop a new source of revenue by providing BIM content creation as a direct service to BPMs. Several are citing this as a core capability on their firm websites, offering to help make sure the manufacturer's product lines are compatible with BIM technology from the end-user's perspective, thereby generating a competitive advantage for those products.

Integrated BIM Content for Multiple Products

BIM is creating a demand for product and material information to be accessible across full building systems and entire buildings. According to Roger Grant, "The goal of having a model is to represent the building and how it performs so we can better simulate performance in advance of physical implementation." The National

Institute of Building Sciences has devoted a comprehensive website to this subject, called *The Whole Building Design Guide* (<http://www.wbdg.org/>), the goal of which is to "create successful high-performance buildings by applying an integrated design and team approach."

This trend is driving demand for BIM content that represents ever-larger subsets of whole building information, which in turn requires integrated information about many products. Several sources are emerging to serve this need.

Building Product Distributors

Some building product distributors are becoming involved in creation and distribution of BIM content by making multi-component systems of BIM objects that represent multiple products that they carry, like a complete ceiling system with grid, tiles, lights, etc., from manufacturers they represent.

The objects are a hybrid of generic and proprietary, allowing them to be generic for an architect or contractor to put in the model initially, but easily updated to represent one of the proprietary products carried by that distributor based on pricing and approvals. The users benefit because the graphical and non-graphical data for the whole system is in

the model so they don't have to deal with individual products. The distributors benefit because final selections are intended to be made from within their line of proprietary products.

Online Configurators and Content Generators for BIM

The recent launch of several online building product configurators that generate BIM content on demand as opposed to using pre-built objects represents an important evolution in BIM content creation, especially for multi-component systems and assemblies. Several BPMs have developed sites that allow BIM users to automatically replace the generic BIM objects in a project with custom-generated objects or complete assemblies of objects, like door/frame/

hardware combinations, or multi-layer exterior roofs and walls. These services are free to users and do not require expertise in the use of BIM software, a great benefit to the industry as more stakeholders need to work with a model, but don't have the skills of experienced BIM software users.

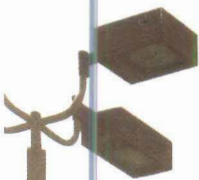
Operating as a toolbar plug-in, the configurator reads the BIM model, identifies the elements to be developed, then takes the user through a structured set of product attribute selections to filter out inappropriate product alternatives and identify one or more that meet the specific needs of that project.

The objects or complete assemblies are then custom-built on demand and inserted in the BIM, replacing any generics that were placeholders.

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

Steve Jones researches, writes and speaks globally about the impact of economic, technological, business and environmental changes on the future of the design and construction industry. He also leads McGraw-Hill Construction's initiatives in developing alliance relationships with major companies for technology and content.

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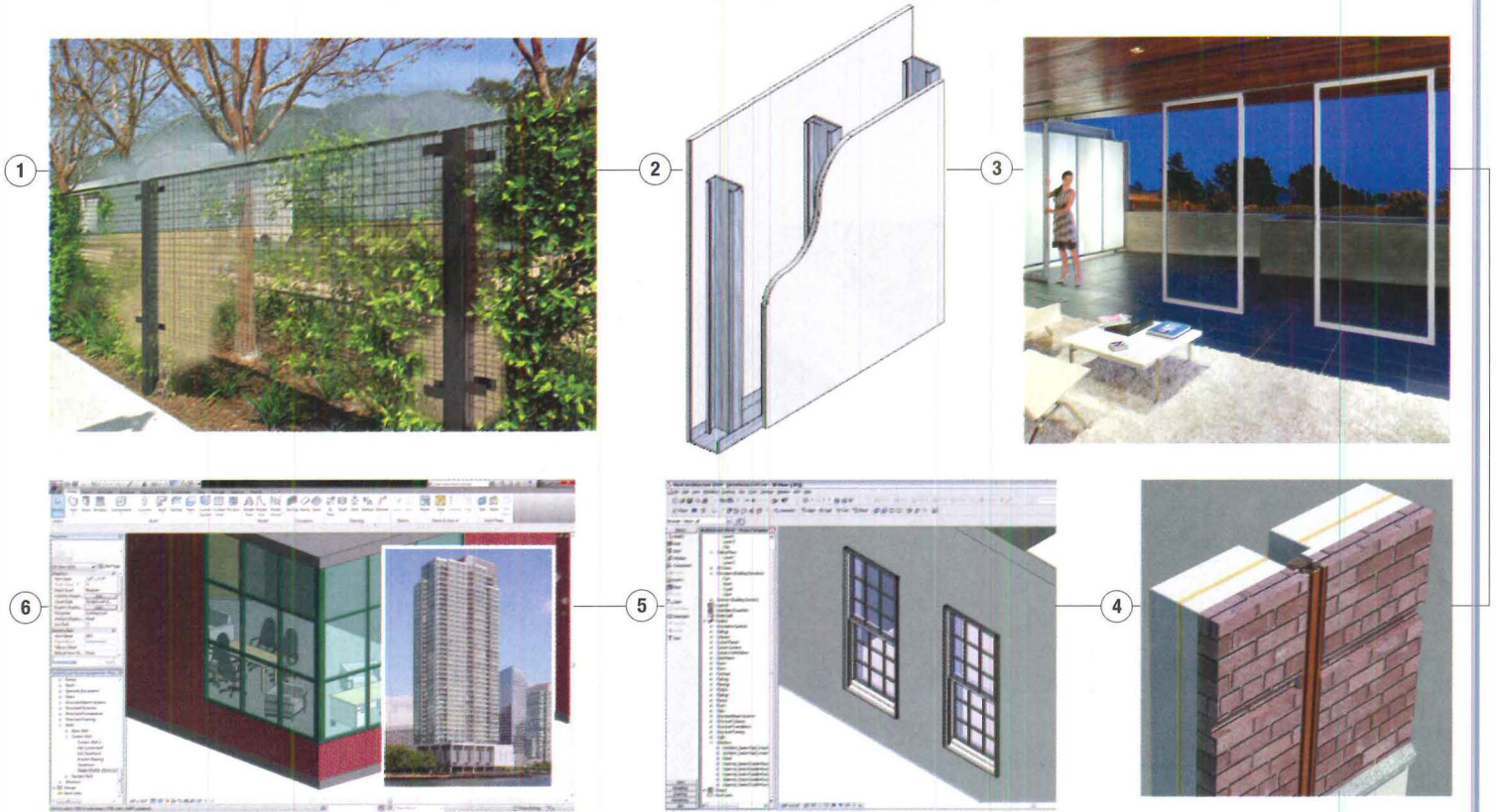
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4. Nystrom, Inc.

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Nystrom offers an online library of BIM families for their 10 complementary building product lines—another way to simplify the construction process. This BIM rendering of a wall expansion joint shows the installed joint and adjacent construction. For additional AIA credits, check out Nystrom’s continuing education course, “Building Movement Joints and BIM,” which can be accessed at: ce.construction.com/article.php?L=192&C=711

www.nystrom.com/Nystrom-BIM-Library

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New and Upcoming Exhibitions

Silent Disco

Los Angeles
April 1–May 15, 2011

Architecture students are the imagined client for this temporary disco installation at the SCI-Arc Gallery. Silent Disco aims to support social and communal experiences. The architectural project here is not limited to the execution of a design and its special effects, but a framework to encourage visual, physical, and social pleasure. For more information, visit www.sciarc.edu.

Ongoing Exhibitions

Neutra VDL House

Los Angeles
Ongoing

Seventy-five years ago, Viennese-American architect Richard Neutra built a radical "glass house" with rooftop and balcony gardens – a project that has since grown into a modern marvel of the architectural world. Saturday tours of the house – a place that saw the beginning of the careers of architects including, among others, Gregory Ain, Raphael Soriano, and Donald Wexler – are offered by architecture students from Cal Poly Pomona and give a unique chance to stay as long as you want and to see the entire house. For more information, visit www.neutra-vdl.org.

Musikerhaus

New York City
Through April 6, 2011

Mounted in celebration of Cooper Union professor Raimund Abraham's singular work as an architect and educator, the Musikerhaus exhibition features full-size reproductions of selected drawings from the construction documents for the Musikerhaus project, a residence and rehearsal space he designed for four musicians in Hombroich, Germany. For more information, visit www.cooper.edu.

The Extraordinary Joseph Urban

Palm Beach, Florida
Through April 17, 2011

With more than 100 objects on display, this exhibition explores the life and work of Joseph Urban (1872–1933), a prolific and innovative Gilded Age artist who, the *New York Herald-Tribune* observed, "did more than any other man to revolutionize the American sense of design." Visit www.flaglermuseum.us.

Iwan Baan

Los Angeles
Through April 16, 2011

This exhibition at ACME gallery presents selected photographs by architecture and documentary

DATES & EVENTS

photographer Iwan Baan from two different mid-20th-century utopian cities. One is Brasília in central Brazil, and the other is Chandigarh in northern India. The photographs in the exhibition are included in a recent publication titled "Brasília - Chandigarh: Living with Modernity" by Lars Müller Publishers. Visit www.acmelosangeles.com.

On Becoming an Artist: Isamu Noguchi and His Contemporaries

Long Island City, New York
Through April 24, 2011

This important exhibition explores the relationship between Isamu Noguchi (1904–1988) and some 40 figures from the worlds of art, architecture, design, and theater. It integrates artworks and documentary materials to examine Noguchi's relationships with figures such as artists Constantin Brancusi and Frida Kahlo, designer and inventor Buckminster Fuller, and architects including Gordon Bunshaft and Louis Kahn. For more information, visit www.noguchi.org.

Counter Space: Design and the Modern Kitchen

New York City
Through May 2, 2011

This exhibition explores the 20th-century transformation of the kitchen and highlights MoMA's recent acquisition of a complete example of the iconic "Frankfurt Kitchen," designed in 1926–27 by the architect Grete Schütte-Lihotzky. In the aftermath of World War I, thousands of these kitchens were manufactured for public-housing estates being built around the city of Frankfurt-am-Main in Germany. Visit www.moma.org.

Frank Lloyd Wright: Organic Architecture for the 21st Century

Milwaukee
Through May 15, 2011

Experience more than 150 objects designed by Frank Lloyd Wright. This exhibition features 33 never-before-shown drawings by the Wisconsin legend, as well as rare home movies. Examining every type of project that Wright designed, along with his plans for suburban communities and American System-Built Homes, the exhibition includes drawings, models, photographs, and more. Visit www.mam.org/frank-lloyd-wright.

Lectures, Conferences, and Symposia

Aftertaste 5: Immaterial Environments

New York City
April 1–2, 2011

This symposium at the New School explores the intangible but physically perceivable aspects of interior space. Designers, physicians, scientists, scholars, and artists will come together to explore

the aspects of the interior that go beyond physical design – light, air quality and flow – and influence the effect they have on our mental and physical experience of a space. Visit www.newschool.edu.

The Edge: Borders and Boundaries in the City

New York City
April 11, 2011

The Bernard and Anne Spitzer School of Architecture at the City College of New York presents its seventh annual Lewis Mumford Lecture on Urbanism. This year's speaker is Richard Sennett, founding director of the New York Institute for Humanities and professor of sociology at the London School of Economics and New York University. Visit www.ccnycunyc.edu/ssa/.

AMT Visiting Artist Lecture Series: Ann Hamilton

New York City
April 20, 2011

Ann Hamilton, who is internationally recognized for the immersive sensory experiences of her large-scale multimedia installations, presents this lecture at the New School. Hamilton creates liminal environments that respond to the architectural presence and social history of their sites. She is a professor of art at the Ohio State University. Visit www.newschool.edu.

Culture Club: Experiencing Architecture through Film and Photography

Pittsburgh
April 21, 2011

Join in a salon-style conversation with Tracy Myers, curator of architecture and organizer of "You Are Here: Architecture and Experience." The exhibition explores how the physical forms of buildings are subject to their designers' control, but the impact the built environment has on us is unpredictable, subjective, and often indefinable. For more information, visit www.cmoa.org.

Architecture and Design Film Festival

Chicago
May 5–9, 2011

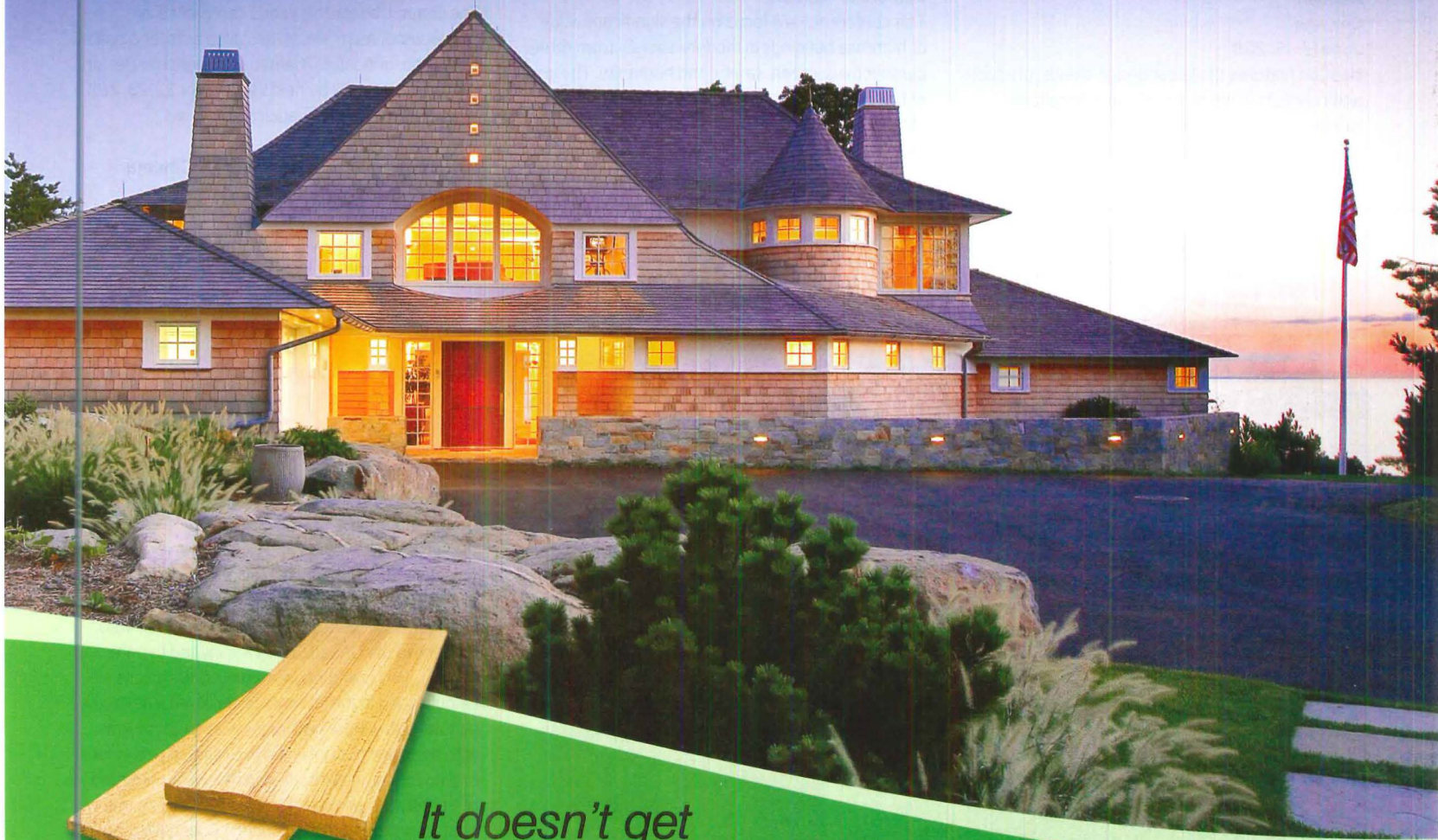
More than 40 films from 11 different countries will be screened at the Art Institute of Chicago. Highlights include *How Much Does Your Building Weigh*, *Mr. Foster?* as well as screenings of *Studio Gang Architects: Aqua Tower*, and *My Playground* with Danish Architect Bjarke Ingels, who will be on hand for a Q&A and book signing. For more information, visit www.adfilmfest.com.

AltBuild Expo and Conference

Santa Monica, California
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CIRCLE 10

building, design, and operational practices. The event features public demonstrations, accredited educational programming for professionals, and small group discussions led by area green building experts. For more information, visit www.altbuildexpo.com.

NeoCon

Chicago

June 13–15, 2011

NeoCon features the latest design trends, products, and concepts in office, health care, hospitality, residential, institutional, and government interior environments from more than 700 exhibitors.

Thousands of commercial furnishings products and services will debut, including architectural products, building products, and more. For more information, visit www.neocon.com.

CTBUH 2011 World Conference

Seoul, Korea

October 10–12, 2011

This conference will focus on the significant value of high-rise buildings in modern society from three perspectives: green, safety, and humanity. The goal of the conference is to provide an opportunity to share information with top industrial and academic experts in the field of high-rise buildings as well as

experience dynamic aspects of Seoul, Korea. For more information, visit www.ctbuh2011.org.

Competitions

4th International Urban Design Conference

Call for Abstracts Deadline: April 29, 2011

The committee for this year's conference in Queensland, Australia, invites abstracts for a paper, workshop, or poster. Themed "Resilience in Design," the conference will be held September 22–23, 2011. Visit www.urbandesignaustralia.com.au.

Changing the Face: Pushkinsky Cinema

Submission Deadline: May 15, 2011

This competition offers architects a chance to give Moscow's Pushkinsky Cinema a design befitting its position at the center of Russia's cultural life. It is also an opportunity to rethink how the theater engages with the public from its prominent position in Pushkin Square. The goal of the competition is to prove that changing the facade of once-great buildings is not a mere superficial change, but one that can revitalize landmarks and change the dynamics of public space. Visit www.architizer.com.

Architectural Record

Cocktail Napkin Sketch Contest

Deadline: July 21, 2011

All you need is a white cocktail napkin and pen to demonstrate that the art of the sketch is still alive. Licensed architects or related professionals who practice in the United States are invited to enter this contest. Two grand-prize-winning submissions will be published in the October issue of ARCHITECTURAL RECORD and winners will receive a box of napkins with their sketch printed on it. Grand-prize winners and up to ten finalists will also receive a collection of Pentel Arts writing instruments. Winners and finalists will be seen in the online Cocktail Napkin Sketch Gallery. Visit www.architecturalrecord.com/call4entries.

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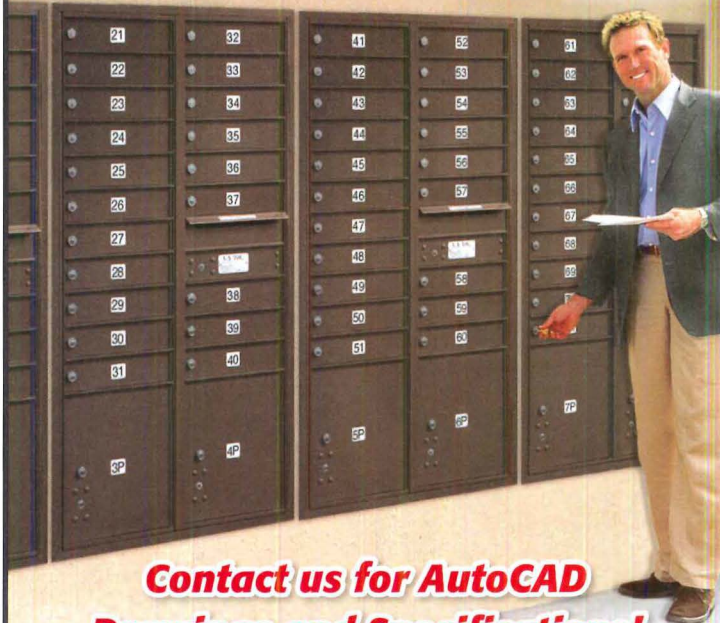
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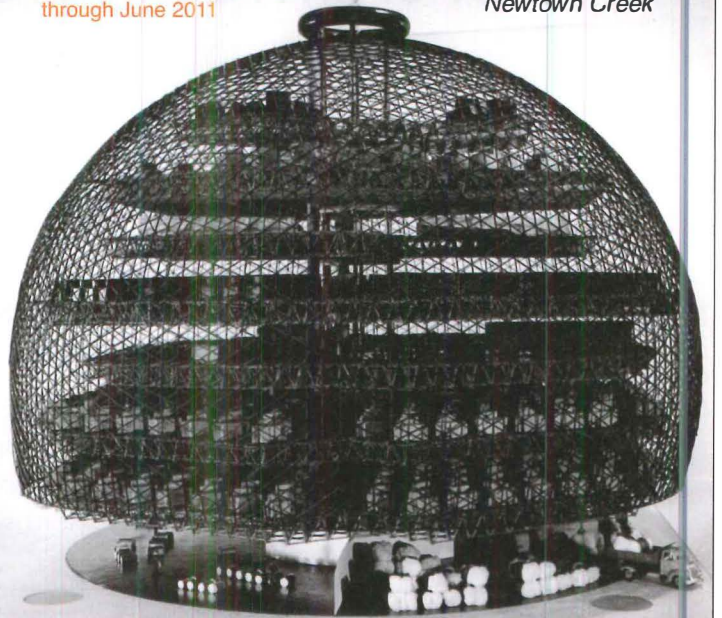
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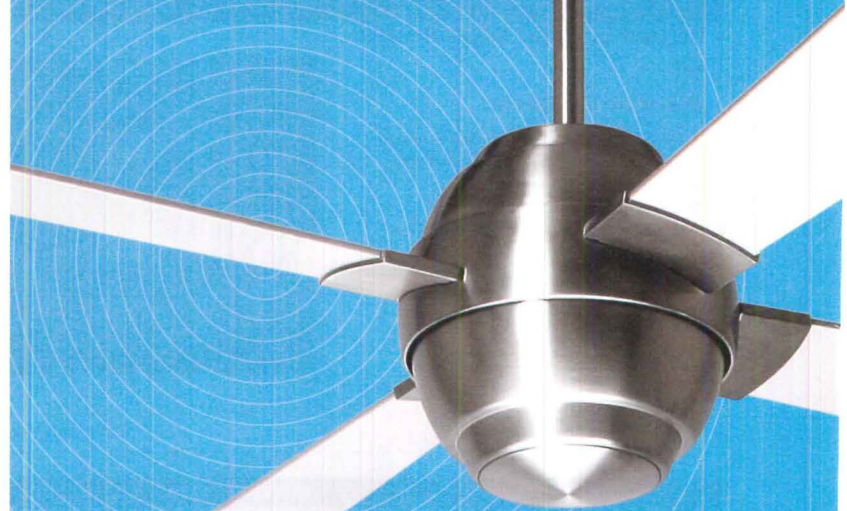
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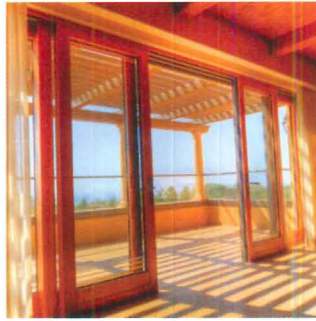
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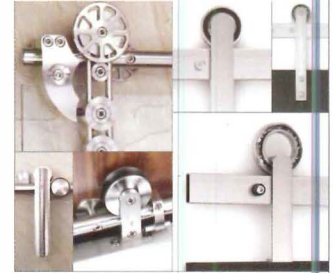
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Circle 151

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▲ 3M™ Fasara™ glass finishes offer the look of etched, cut, sandblasted, textured, and other expensive decorative glass for less.

Performance Data:

- Eliminate waste by transforming existing surfaces
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www.3MArchitecturalMarkets.com



Circle 152

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The Wagner Companies

▲ Wagner Bantam LED Mini Spot Light is designed for wall grazing and pathway illumination with mounting options for railings, walls, decks, and posts. Available in warm white and cool white light.

Performance Data:

- ETL listed for wet and dry locations
- Operates on 24-volt DC

www.wagnercompanies.com
888.243.6914 or 414.214.0444
Contact: James Woggon



AIA Booth #2719

Circle 153

INTERIOR FINISHES, FURNISHINGS

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▲ Walker Display provides an efficient system for exhibiting artwork anywhere.

Product Application:

- Residential or commercial use
- Office buildings, shopping malls, airports, restaurants, hospitals, etc.
- Schools, libraries, museums, galleries, etc.

Performance Data:

- Versatile art hanging system, interchangeable for easy adaptation to various projects
- Not limited to art hanging

www.WalkerDisplay.com
800.234.7614 | Contact: Richard Levey



Circle 154

INTERIOR FINISHES, FURNISHINGS

DECORATIVE METAL CEILINGS

Gage Corporation, Int.

▲ The Gage Corporation International has been designing and manufacturing decorative metal ceilings since 1989. Gage ceilings feature more than 50% post-consumer recycled material and are visually rich, functional, and versatile as a design medium. Custom collaboration is encouraged. Contact the Gage factory for literature and sample requests.

www.gagecorp.net
800.786.4243 | Contact: gage@centurytel.net



Circle 155

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MODERN RESIDENTIAL GRILLES

\$\$\$ | NEW

kül grilles

▲ kül grilles are the perfect finishing detail to your modern residential design. Manufactured with extruded aluminum and available in a wide array of sizes, colors, and finishes.

Product Application:

- Suitable for floor and wall installation
- Perfect accent to hard and soft surface applications

Performance Data:

- Custom sizes available on request

www.kulgrilles.com
877.585.3445 | Contact: Scott Bolduc



Circle 156

MATERIALS

ARCHITECTURAL NATURAL STONE

\$\$\$ | G

Vermont Structural Slate Company

▲ Quarrier and fabricator offering select slates, quartzites, sandstones, limestones, marbles, granites and basalts.

Product Application:

- Floating World Gallery
- S. Conger Architects
- Unfading Mottled Green & Purple Slate exterior wall panels

www.vermontstructuralslate.com
800.343.1900 | Contact: Craig Markcrow



Circle 157

PRODUCT SPOTLIGHTS

Advertisement

MATERIALS

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▲ Fire Lite® with ultraHD™ Technology is a clear choice when you don't want to compromise on aesthetics to meet fire-safety codes.

Product Application:

- Post Road Elementary, White Plains, NY
- Seattle-Tacoma International Airport, Seattle, WA
- Shaklee Headquarters, Pleasanton, CA

Performance Data:

- Fire ratings up to three hours
- Impact safety options, passes hose stream test



www.fireglass.com
800.426.0279 | Contact: sales@fireglass.com

Circle 158

MATERIALS

QUARTERSAWN HARDWOODS

\$\$\$ | G

Frank Miller Lumber Company, Inc.

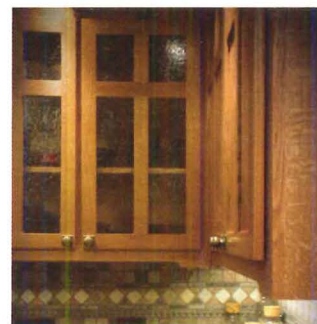
▲ Frank Miller Lumber Co. produces high-quality quartersawn and rift hardwoods. White oak, red oak, Walnut, cherry, and hard maple also available.

Product Application:

- Interior millwork, cabinetry, flooring, furniture
- Hotels, museums, offices, high-end residential
- High Museum, Atlanta, GA; Getty Museum, Los Angeles, CA; Lodge at Torrey Pines, Del Mar, CA

Performance Data:

- Quartered white oak and red oak are durable, stable, and sustainable; FSC certified available



www.frankmiller.com
765.964.3196 | Contact: Criswell Davis

Circle 159

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▲ San Francisco ceiling fan—a GOOD DESIGN Award winner. Whisper quiet, powerful, reliable energy saver.

Product Application:

- Suitable for sloped ceilings up to 30°, can be used on 8-ft. ceilings or on cathedral ceilings

Performance Data:

- Light kit and other finishes available
- Lifetime warranty



www.g2art.com
877.858.5333 | Contact: info@g2art.com

Circle 160

MECHANICAL SYSTEMS, HVAC, PLUMBING

LINEAR DRAIN SYSTEMS

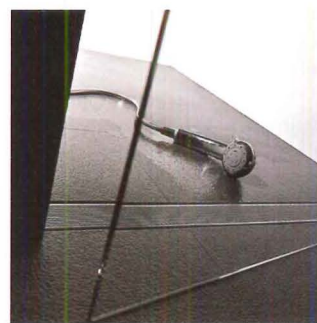
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▲ Infinity Drain offers linear drain systems for the shower, pool, patio or driveway, providing an architectural aesthetic and infinite possibilities.

Performance Data:

- Site sizable, cut to desired length
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- 316 wedge wire stainless steel grate
- Available in kits or individual components



www.infinitydrain.com
516.767.6786 | Contact: info@infinitydrain.com

ICFF Booth #1339

Circle 161

SPECIALTY PRODUCTS

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Architectural Columns & Balustrades by Melton Classics

▲ Melton Classics provides the design professional with an extensive palate of architectural columns, balustrades, cornices, and millwork. They invite you to call their experienced product specialists to assist you with the ideal products for your design, application, and budget. Columns are available in fiberglass, synthetic stone, GFRC, and wood. Their 80+ durable maintenance-free balustrades feel substantial yet have reduced weight. Also, ask about their low-maintenance fiberglass and polyurethane cornices and millwork.



www.MeltonClassics.com
800.963.3060 | Contact: Mike Grimmert

Circle 162

SPECIALTY PRODUCTS

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NEW

Finlandia Sauna Products, Inc.

▲ They manufacture authentic saunas, no infra-reds. They offer precut packages, modular rooms, and heaters.

Product Application:

- Any available space
- Residential or commercial
- New construction or remodeling

Performance Data:

- Uses 1-in. x 4-in. paneling
- Markets four all-clear western softwoods



www.finlandiasauna.com
800.354.3342 | Contact: Tim Atkinson or Reino Tarkiainen

Circle 163

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NEW

Wenger Corporation

▲ Improved acoustical performance and enhanced aesthetics are key features of new SoundLok™ rooms. Active acoustics technology available for music practice. Advanced engineering guarantees sound isolation.

Product Application:

- University of Iowa, Iowa City, IA
- Timber Creek High School, Keller, TX
- Boston University, Boston, MA

Performance Data:

- Modular, relocatable rooms offer flexibility



www.wengercorp.com
800.493.6437

Circle 164

SPECIALTY PRODUCTS

CUSTOM CANOPIES

G

CPI Daylighting Inc.

▲ CPI Lite Brow sun shades provide shelter while allowing glare-free daylight into the area below.

Product Application:

- Moanalua Ctr, Honolulu, HI (LiteBrow sun screen)
- Flexible modular applications
- Suitable for green construction requiring LEED certification

Performance Data:

- Tested as new after 10 years of South Florida exposure
- Maintenance free



www.cpidaylighting.com
847.816.1060 | Contact: Talia Vinograd

Circle 165

All products in this section are accessible on sweets.com. \$\$\$= Premium cost | \$\$= Mid-range cost | \$= Value-oriented cost | WR = Wide range of price points | NC= No charge
G = Product marketed as green | NEW = Released in the past 12 months | 📐 = CAD Details Avail. | 📄 = PDF Avail. | 🖥️ = 3D Model Avail.

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Page Southerland Page, LLP in Dallas, TX seeks Project Architect. Qualified applicants will possess a Bachelor's degree in Architecture and 5 years of experience in the job offered or 5 years of experience in architectural project management, proficient with AutoCAD, Photoshop, Sketch-Up, Illustrator, and Microsoft Project, Word, and Excel, and a registered Architect, including 1 year of experience with REVIT. E-mail resume to: resumes@pspaec.com. Must put job code 2603994 on resume.

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Baker Concrete Construction seeks Project Architect to work in Phoenix, Arizona to operate computer-aided drafting (CAD) equipment to produce designs, working drawings; specializing in Tilt-up construction. Minimum of a Bachelor's in Architecture, Civil Engineering, or Construction Management plus 12 months experience. Submit resume to Gaby Garcia-Williams at garciag@bakerconcrete.com. Must put job code AZPAR on resume.

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Photo courtesy of Studio BSA

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For more information on the *For the Greener Good* series, visit go.nbm.org/fgg

For the Greener Good lecture series is presented by The Home Depot Foundation.

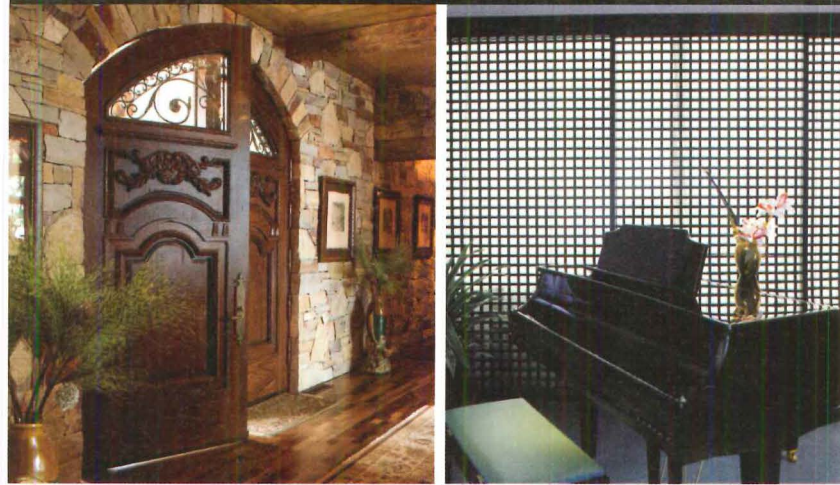


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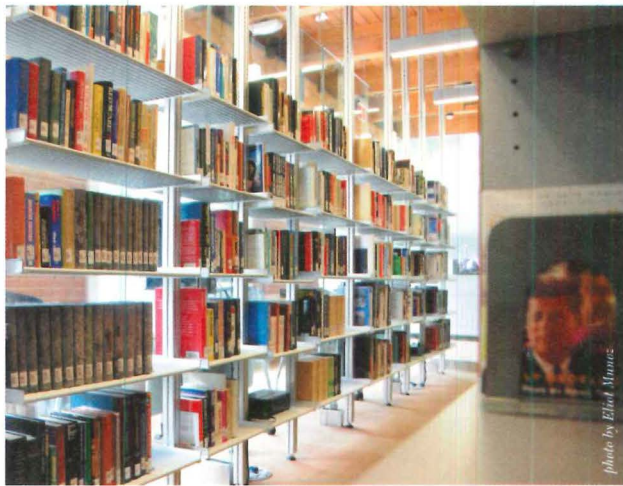


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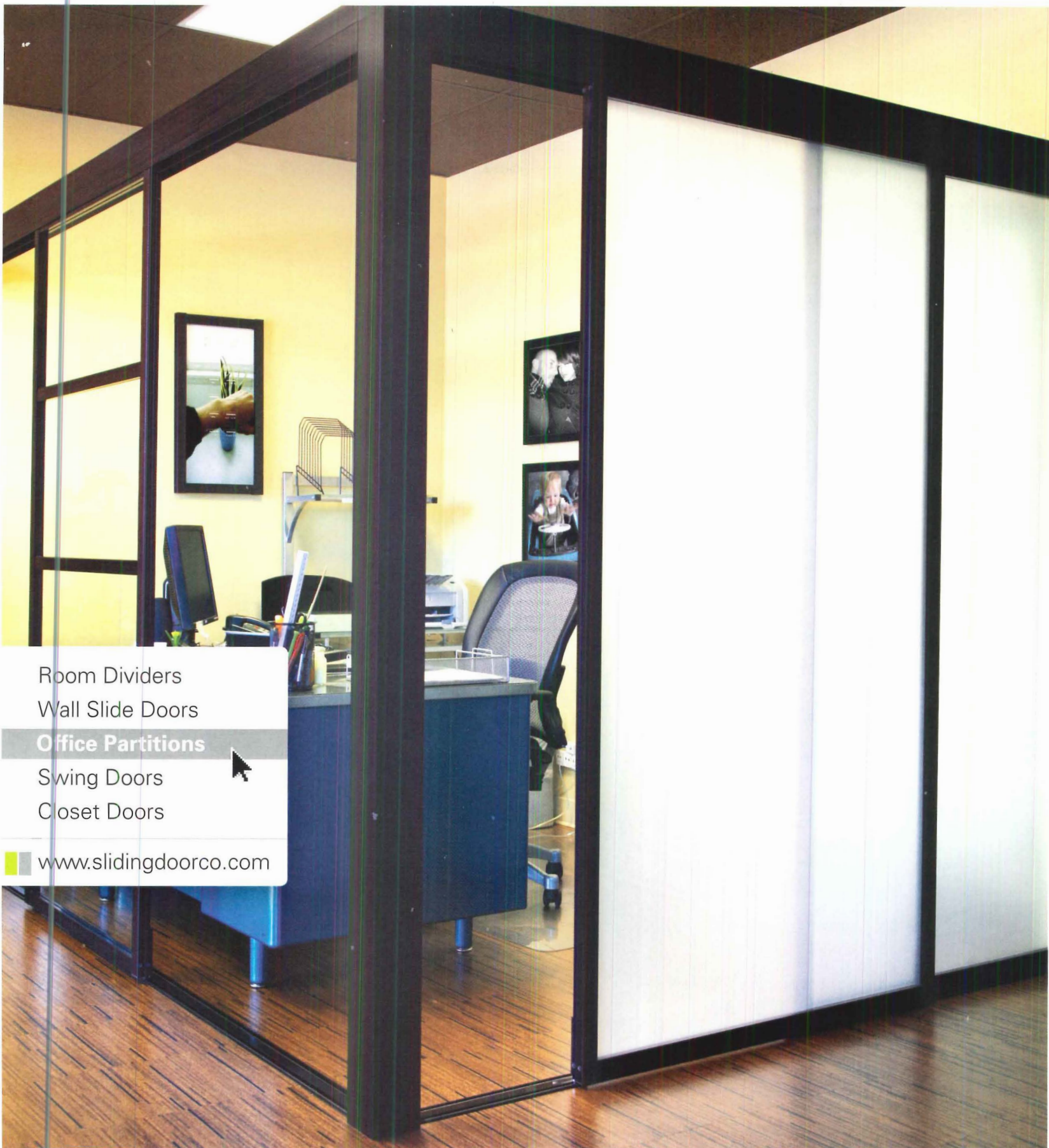
SNAPSHOT

PROJECT TRUFFLE HOUSE
 LOCATION LAXE, SPAIN
 DESIGNERS ENSAMBLE STUDIO



THE APTLY NAMED Truffle House sits on Spain's northwestern Costa da Morte (the Death Coast) in a small fishing village. Madrid-based Ensamble Studio chose the site for an experimental project "to let nature take part in the architectural process," according to principal Antón García-Abril. The adventurous team dug a hole in the ground, piling topsoil around the perimeter. They built a hay bale structure, covered it with concrete, and buried the entire mound in soil. After several months, they excavated the mass to reveal what was essentially a man-made stone. Respecting the rural surroundings, the team then encouraged a local calf named Paulina to munch her way through the hay over the course of one year, revealing the architectural condition. The raw interior of the weekend retreat has just enough room for one bed, simple plumbing, and even a fireplace. The house was inspired by Le Corbusier's Cabanon: "This has the same program the same scale," says García-Abril. "It's our Cabanon of béton [concrete]." *Alanna Malone*

Watch a video of Truffle House's construction at architecturalrecord.com.



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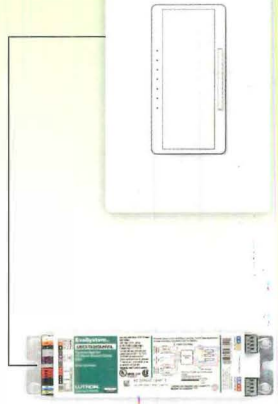
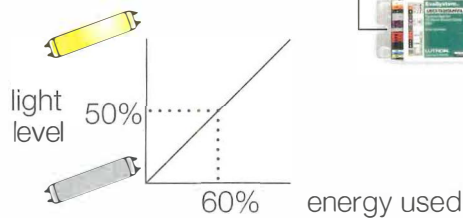
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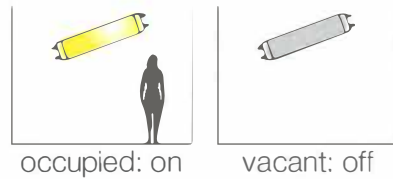
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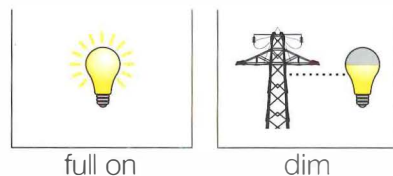
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Year Round Days: close shades to reduce glare and increase employee productivity



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