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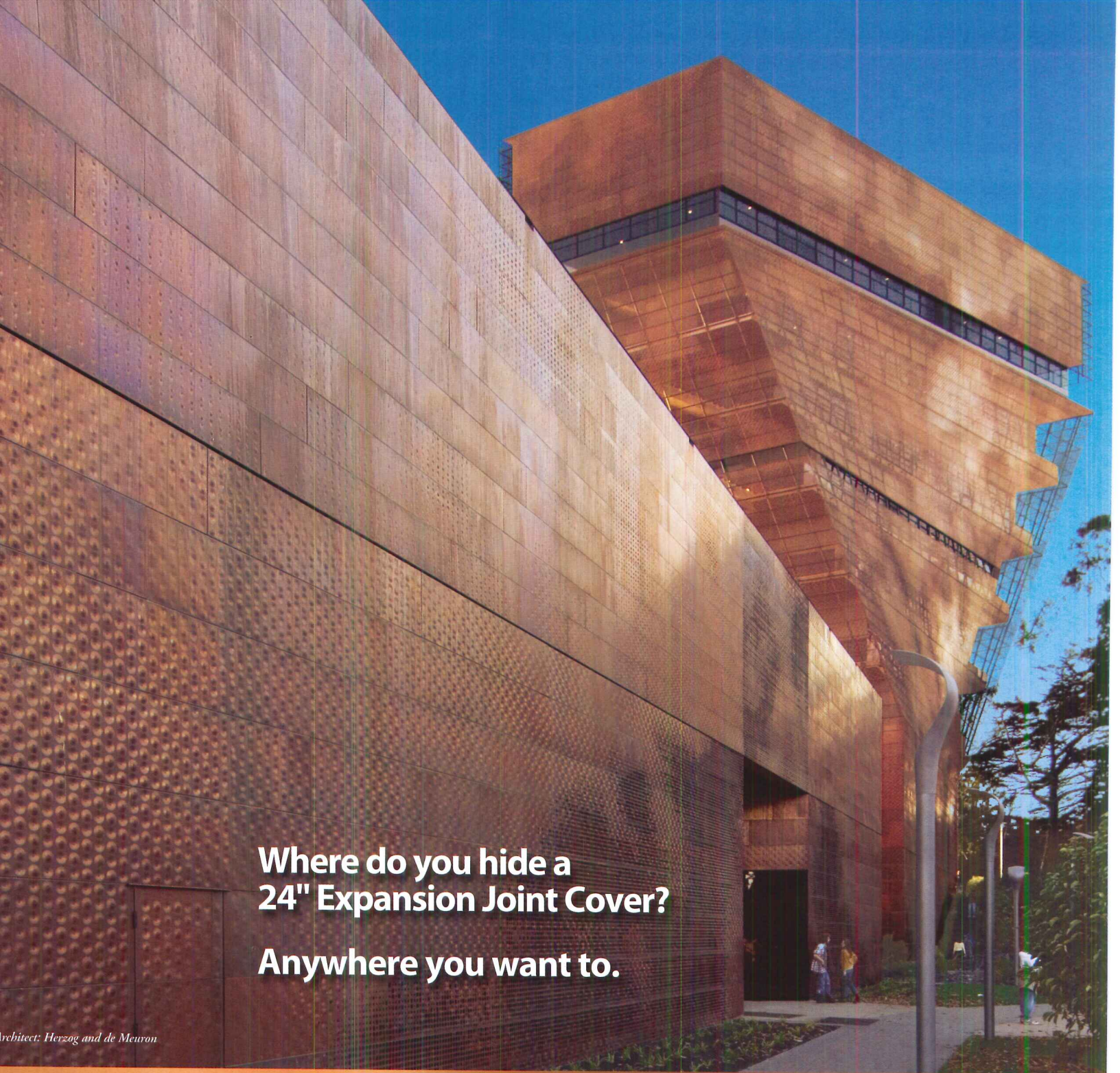
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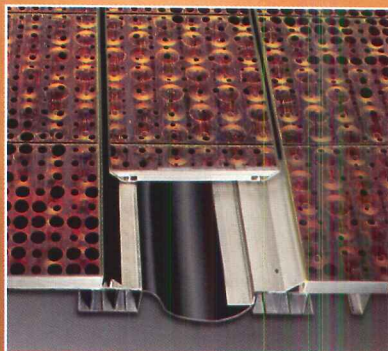
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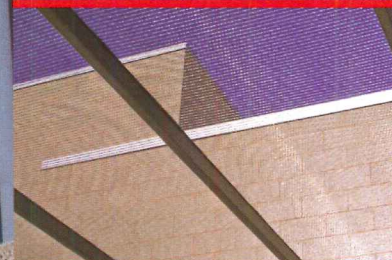
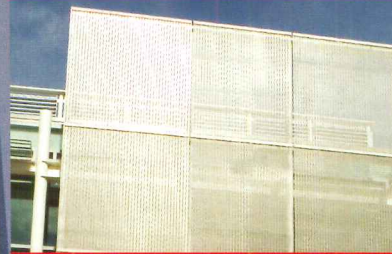
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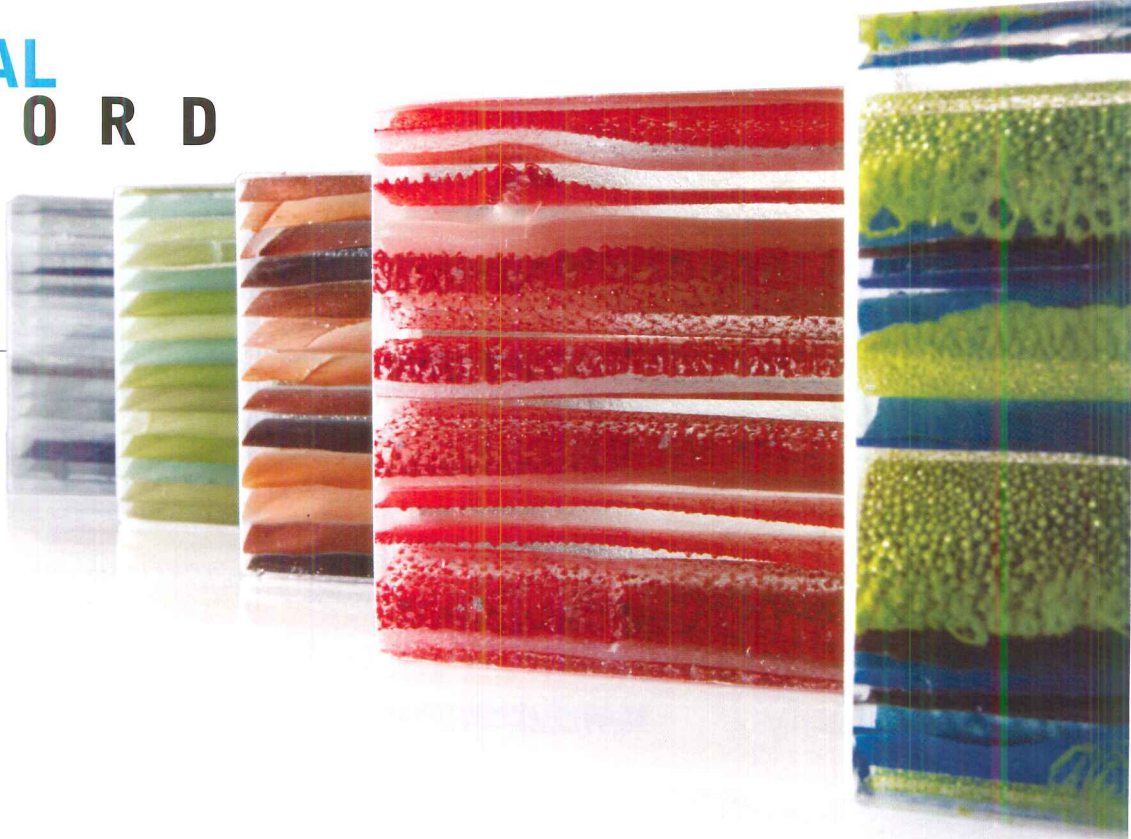
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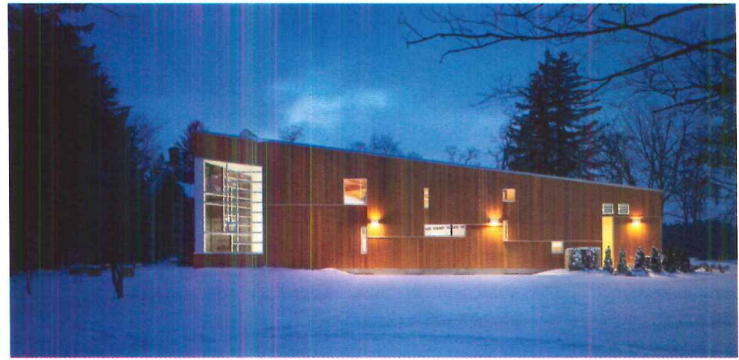


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2. **Rainy/Sunny, Tokyo, by Mount Fuji Architects Studio, page 60.**

ON THE COVER: Tree Hotel, Harads, Sweden, by Tham & Videgård Arkitekter. Photograph © Åke E:Son Lindman.

12.2009
ON THE WEB 

This month, our site features a variety of new **video**, expanded coverage of **Design Vanguard** and **Product Reports** winners, and daily **news updates**. Also, browse our **photo galleries** and submit images of your own work.



Reader Photo: Rock Community Church in Vaughan, Ontario, by C.Y. Lee Architect. It is one of more than 2,000 reader-submitted images in ARCHITECTURAL RECORD's online galleries.

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Record TV

New in our Video Library: We tour Pelli Clarke Pelli's Visionaire, the first high-rise apartment building to receive a LEED Platinum rating.



House of the Month

Seattle-based Domestic Architecture translated a client's childhood memories of summer into a contemporary form.



Greenbuild 2009

We cap our coverage of the USGBC's annual conference with a tour of Arcosanti, Paolo Soleri's experimental Arizona community.

Your Comments

"I definitely think that students attending some of these schools have a much better chance of getting a superior education. In the end, all it means is that if your school isn't on the list, you need to work harder. Your school may not hand you everything that Yale or Columbia hands their students, but that shouldn't stop you from making an effort to get that education."

— Kell on "America's Best Architecture Schools 2010"

Expanded Coverage



Building Types Study

Our roundup of new museums continues on the Web with projects by Tony Fretton (above), Kengo Kuma, and others.



Product Reports

View all of this year's products and read the jury's thoughts on the selection process in the online version of the feature.



Design Vanguard

Read an expanded version of our annual survey of emerging designers and comment on their work (After Hours, by Merzproject, above).



CEU

Read our Architectural Technology story about Building Information Modeling, and then take an online test to earn continuing education credits.

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Smart Appliances for a Sustainable Smart Grid: Hot Water Hybrids Save Energy and Conserve Water

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HVAC for Large Spaces: The Sustainable Benefits of HVLS (High Volume/Low Speed) Fans

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Building Information Modeling (BIM) and Manufactured Complementary Building Products

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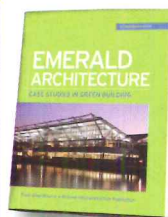
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Workshops for Modernity

The Bauhaus Comes to Life Again at MoMA

BY ROBERT IVY, FAIA

RARELY DOES A MUSEUM SHOW bring the shock of discovery to a familiar topic. Rarer still, when we have studied the subject, even immersed ourselves in its manifestations, and inculcated its lessons in our own worldview. *Bauhaus 1919–1933: Workshops for Modernity*, an exhibition that debuted at the Museum of Modern Art in New York on November 8 and runs through January 25 (a different version was on display earlier this year in Berlin), orchestrates a coup: We see the familiar Bauhaus through refreshed eyes.

Every architect knows the fundamentals, how Walter Gropius devised a school that combined the visual arts in a transforming way, establishing not studios but workshops that had social and cultural goals beyond the mere aesthetic. In a period of rapid technological advancement, set in the days of the Weimar Republic, the school had profound implications in the development of notions of the Modern. We feel its effects today – in architecture, interior design, industrial design, and other disciplines. Yet for all our intellectual knowledge, until this show, many of us had not confronted the Bauhaus viscerally, not felt its freshness or its spirit of inquisitive experimentation or its tangible sense of power and joy.

Now we get it. In structural terms, the curators have organized the exhibition into three parts, which correspond to the institution's three physical locations in Germany (Weimar, 1919–24; Dessau, 1925–32; and Berlin, 1932–33), which in turn roughly correspond to three directors (Gropius, 1919–28; Hannes Meyer, 1928–30; Ludwig Mies van der Rohe, 1930–33). In the galleries, a wealth of work from each period by a who's who of talented mid-century artists, craftspeople, architects, and other designers shares center stage with student work.

The artifacts, overwhelming in diversity and richness, seem immediate in their apparent newness. Space after space offers up a variety of media, from bookbinding and printmaking to industrial and furniture design. Ultimately, the exhibition's primary lesson must be how one school, for a relatively short period of time, engendered so much excitement and high accomplishment within the visual arts. For anyone who has ever taught architecture, or any student of architecture, the exhibition humanizes and makes approachable work that has risen to canonical status.

Inevitably, we are struck by the individual objects, which draw us through the spaces like magnets. Here, we encounter the rhythms and harmonies of Vasily Kandinsky (concurrently featured in a retrospective exhibition at New York's Guggenheim Museum, through January 13), creating internal cosmic music within two dimensions, in canvases such as *On White II* that retain the power to engage us, to plunge us into his world, to electrify and shock us. There, mounted on the wall, we face the shimmering textiles of Gunta Stolzl and Anni Albers – geometric, measured, pieced, woven, and textured. Glowing ahead, the multicolored stained-glass compositions of Josef

Albers, which, though small, draw us closer with gravitational strength. And concentrated and vast, though tiny, the drawings and paintings of Paul Klee force us to approach, breathe, and dive through the looking glass.

Surprise lurks from spot to spot. Earthenware by Marguerite Friedlaender and Otto Lindig has the immediacy and forcefulness of archaic Greek pottery. Puppets by Paul Klee jump into three dimensions. László Moholy-Nagy's photographs pull us directly into the picture plane, with their asymmetrical, immediate perspectives. His unanticipated constructions, like the Dada-esque *Lichtrequisit einer Elektrischen Bühne* (*Light Prop for an Electric Stage*), which is an idealized, even Platonic contraption, could have made Duchamp blush.

Bauhaus works of industrial and furniture design, now part of our everyday lives, were intended to be catalytic, to reflect and to change ways of living, by creating objects that could transition from handcraft to manufacture. Marcel Breuer's tubular steel chairs have become ubiquitous, a fact presaged and encouraged by the first ambitious Bauhaus show, staged by MoMA in 1938, designed by former Bauhaus student and instructor Herbert Bayer, and organized by Gropius himself. Other furnishings, such as a sinuously folded newspaper shelf by Gropius from 1923, resonate in the work of today's architects: The shelf looks like a cover from a recent issue of ARCHITECTURAL RECORD.

Walter Determann's ambiguous, brightly colored drawing walks the line between architectural delineation and fine art; only after reading the descriptive text do we realize that this rendered, stylized icon incorporates an architectural scheme (site plan for *Bauhaus-Siedlung*, or Bauhaus housing settlement). The patterned plan unfolds more clearly when placed in the context of its accompanying elevations for administration and exhibition buildings. On leaving, we dance with another mind-game, in a photograph that presages Photoshop. Eduard Ludwig's *Renovation of the Borchardt Department Store, Dessau*, actually a photograph with drawn and painted additions, mounted on plywood, resembles MoMA's own 1938–39 International Style building by Philip S. Goodwin and Edward Durell Stone. The circle is complete.

In mounting this retrospective of the Bauhaus 90 years after its founding, the Museum of Modern Art – thanks to Barry Bergdoll, its chief curator of architecture and design, and Leah Dickerman, curator of painting and sculpture – returns to its essential Modern roots. More tellingly, the forever-young character of the exhibition demonstrates how the members of one small, experimental school in Germany have influenced a century. Despite the subsequent chastening of the 20th century, their enthusiasm for the power of the arts and the potential they unlocked carries on.

LETTERS

Flexible space

It was good to see the University of Arizona's College of Architecture and Landscape Architecture building featured in the November issue [Record News, page 38], an excellent and highly visible addition to the campus. But I do have to amend one part of the story pertaining to the old Safeway store. This building, long gone and little lamented, served the nascent College of Architecture (founded in 1958 by Dean Sidney Little) as flexible and virtually indestructible studio space, not in the 1980s, as reported, but rather, until the college building on Olive Street opened in 1965, in time for our fourth-year studio. Thankfully, I did not experience the joys of charrettes in the Episcopal church, which was evidently a much later phenomenon. *C. Richard Bierce, AIA
Alexandria, Va.*

Top of the class

I came across *DesignIntelligence's* 2010 rankings of the best architecture schools while reading your November issue [page 85]. Now these are very prestigious schools, of course. I, myself, would probably have enjoyed the experience, but decided to stay local and attended a much smaller, younger school: the Florida Atlantic University School of Architecture in Fort Lauderdale. The school has a very thoughtful director and a diverse, well-educated faculty from around the world. I graduated with a Bachelor of Architecture degree in 2008 and feel that attending "America's Best Schools" will not necessarily make you the professional you are hoping you will be. You have to do that for yourself through interest, love for what you do, making a point of keeping

informed, and having the right plan. *Tabitha C. Ponte, Assoc. AIA
Fort Lauderdale, Fla.*

It is perhaps a sad irony that ARCHITECTURAL RECORD is publishing *DesignIntelligence's* ranking of architecture schools when so many students will be burdened with debt and so few will have a real job when they graduate.

*Jeremiah Eck, FAIA
Boston*

Corrections

The chart in November's story, "2010 America's Best Architecture Schools" [page 86], erroneously stated that Kansas State University's Bachelor of Architecture program was ineligible for ranking in previous years because it was not accredited. The program has been accredited since

1952, and starting in 2003 has regularly been ranked among the top 10 programs in *DesignIntelligence's* "America's Best Architecture & Design Schools" survey. We apologize for the error. Additionally, one of the answers to the survey question asking what students plan to do after graduation [page 90] should have read "Planning to become LEED accredited," not LEED certified. The introduction to the BusinessWeek/Architectural Record Awards coverage [November 2009, page 61] should have included a byline for Jenna M. McKnight. The awards coverage also misspelled the name of the design director at the Toronto office of Stantec Architecture. The correct spelling is Michael Moxam.

Send letters to rivy@mcgraw-hill.com.

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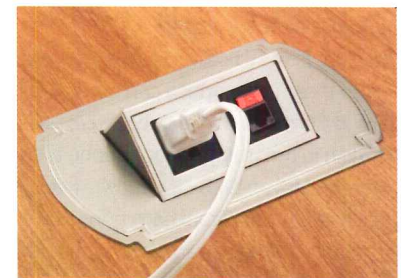
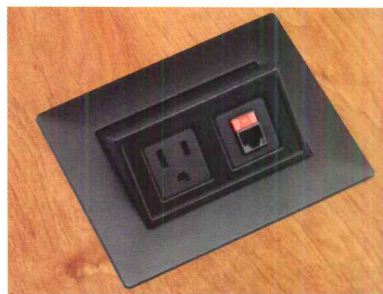
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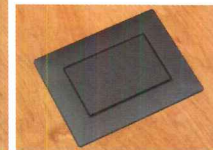
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[JUST ANNOUNCED]

KPF Unveils Design for Korean Super Tower

DESPITE REPORTS OF stalled skyscraper projects across the globe, at least one supertall tower is moving forward: On October 21, Kohn Pedersen Fox Associates (KPF) unveiled its slender, cone-shaped design for what will become one of Asia's tallest buildings. The Lotte Super Tower 123, so named because it has 123 stories, will be built over a transportation hub in the

Jamsil shopping and entertainment section of Seoul, South Korea. The light-toned glass-and-metal-accented structure blends a Modern aesthetic with historic Korean art forms such as ceramics, porcelain, and calligraphy. "The tower's continuous curvature and gentle, tapered form is reflective of Korean artistry," says KPF design principal James von Klemperer, FAIA. "The seam that runs from top to bottom of the structure gestures toward the old city center."

The 1,831-foot-tall building, designed to achieve LEED Silver, will house the corporate headquarters for the Lotte Group, a 66-year-

old, \$50 billion-a-year Korean business conglomerate. In addition, the high-rise will serve as a mixed-use vertical community with five distinct zones: retail, office, residential, hotel, and observation. Construction is scheduled to finish in 2014. If completed as planned, it will be the world's second-tallest building, behind Adrian Smith's 2,684-foot-tall Burj Dubai in Dubai, United Arab Emirates.

KPF is managing to stay busy during the recession with large-scale commissions in South Korea. The New York-based practice developed the master plan for the Songdo International Business District, located on

1,500 acres of reclaimed land along Incheon's waterfront, 40 miles west of Seoul. The \$35 billion, 65,000-resident complex calls for offices, homes, shops, schools, and hotels, in addition to the 100-acre Songdo Central Park, which opened in August.

"Seoul has been a most fruitful place for our practice over the past 15 years," says von Klemperer, who notes that KPF now has a small, three-person office there. "South Korea has an outstanding yield of well-executed, adventurous designs. There is a constant renewal and updating of buildings there, which gives rise to new opportunities for architects." *Tony Illia*

■ While the Lotte Super Tower is proceeding, at least 50 other skyscraper projects are now on hold. Read the full story at architecturalrecord.com/news.



[DEPARTURES]

With Project on Solid Footing, MAM Director Steps Down

IN A SURPRISE move, Terence Riley, AIA, resigned as director of the Miami Art Museum (MAM) on October 26, just days after unveiling the final design for the museum's new home, designed by Herzog & de Meuron.

Riley, who joined MAM in March 2006 after 14 years as chief curator of the architecture and design department at the Museum of Modern Art, said he will return to his practice, Keenen/Riley Architects, based in New York City. Riley plans to remain in Miami and open an office there, where he will work on projects that include a museum in Spain and a resort in Mexico.



He said the timing was right to leave MAM, noting that "a number of important things" had happened in recent weeks. Most notably, Herzog & de Meuron had finished the schematic designs for the museum's new home: a three-story structure sandwiched between an elevated platform and a canopy, with outdoor columns wrapped in tropical plants. The facility is part of the planned 29-acre Museum Park on Biscayne Bay.

With ground breaking for the 120,000-square-foot, \$220 million museum scheduled for this spring, and an opening planned for 2013, Riley says he realized he had two choices: "I could either step down now, or stay another five years." He adds, "I would never contemplate leaving if this project was somehow not in perfect shape."

In a statement, MAM chairman Aaron Podhurst thanked Riley "for placing the institution on a solid footing as it moves toward establishing its new home." Podhurst also announced that the museum would form a search committee to find a new director. *Tim McKeough*

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ON THE WEB

Daily updates and expanded stories are available online at architecturalrecord.com/news.

[IN PROGRESS]

VSBA's Decorated Shed Celebrates Lincoln Highway

VENTURI, SCOTT BROWN AND ASSOCIATES recently completed a schematic design for the Lincoln Highway Experience, a new museum and visitors center that will celebrate the first road in the U.S. to stretch from coast to coast. The Pennsylvania-based nonprofit behind the project is the Lincoln Highway Heritage Corridor (LHHC).

The Lincoln Highway, also known as U.S. Route 30, opened in 1913 and ran from Times Square in New York City to San Francisco's Lincoln Park. Americans began their love affair with the automobile on this road, and from its shoulders sprang entirely new kinds of architecture — gas stations, motels, and of course, roadside attractions.

The VSBA building will sit within 100 feet of the road, in the town of Ligonier, Pennsylvania. "We hope

it will help draw people in to learn about what Lincoln Highway meant to Pennsylvania, and also let them know that it's part of a larger national story," says LHHC's executive director, Olga Herbert.

Visitors will be lured from the road by a billboard-size postcard marked "The Lincoln Highway Experience" that will hang inside a 1,500-square-foot glass atrium. The museum itself will be located in an ordinary, 10,000-square-foot metal building right behind it. The Maude Group and Kissiloff Planning & Design

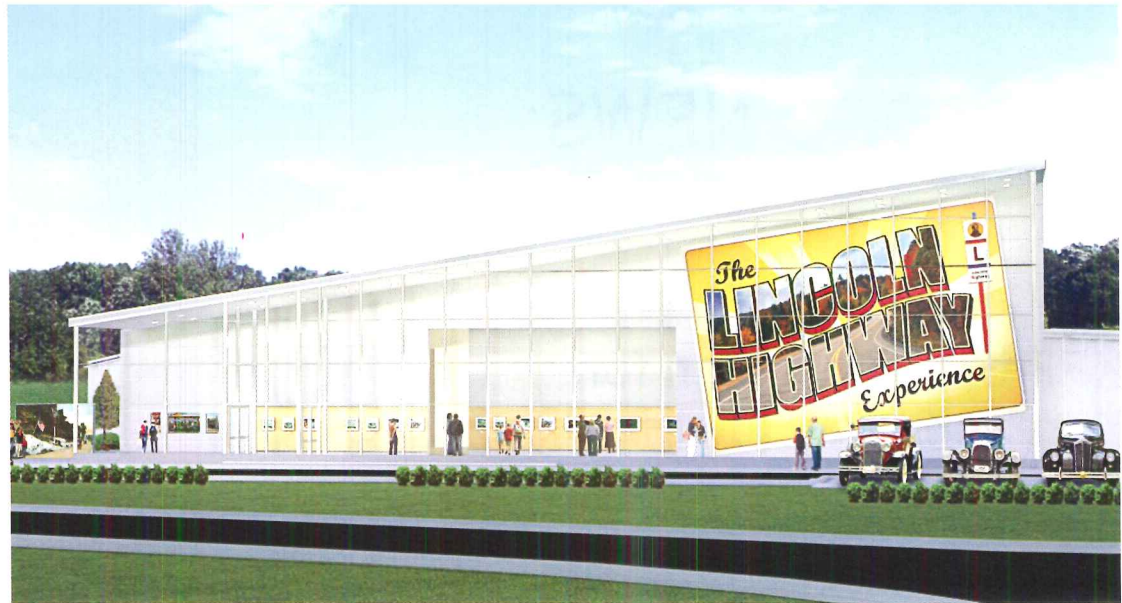
are responsible for the exhibits and interior spaces.

The museum will contain several full-size buildings: a gas station and two tourist cabins from the museum's site, and Serro's Diner, originally located on the highway in Westmoreland County, Pennsylvania. Serro's was built in 1938 and is described as the "pièce de résistance" of the museum. Herbert adds, "People will be able come in and sit at the counter and have a piece of homemade pie and a cup of coffee and really experience it."

In addition to the buildings, exhibits will include a typical Lincoln Highway Main Street, vehicles and other artifacts, an auditorium, library and the organization's offices.

Ironically, Herbert was unaware of VSBA's celebration of billboards, ducks, and roadside attractions when a consultant suggested the LHHC request a proposal from the firm. "Then I went online and read about them. I got so excited," Herbert adds, "I thought, they are a perfect fit for what we're doing!" *Charles Linn, FAIA*

[View a slide show online](#)



[BUSINESS]

Mergers and Buyouts

AECOM TECHNOLOGY'S purchase of Ellerbe Becket puts a major player into the A/E giant's portfolio. Ellerbe has been in business since 1909, and its resume is thick with higher-education, health-care, and sports-facilities work.

MANCINI DUFFY, headquartered in New York, has acquired two firms based in Washington, D.C.: Michael Winstanley Architects Planners and Still & Svitchan Associates. The two will join Mancini Duffy's D.C. office, which will operate as Mancini Duffy/Winstanley.

BURWELL ARCHITECTS, a small Houston firm that specializes in corporate interior design, has merged with Ziegler Cooper Architects, which designed several of Houston's luxury condominium towers.

ON THE BOARDS



Perot Museum of Nature and Science

LOCATION **Dallas** ARCHITECT **Morphosis**

Named after businessman and former presidential candidate Ross Perot and his family, this 180,000-square-foot building replaces a smaller Art Deco structure in the city's historic Fair Park. Renderings show a taut-skinned, six-level cube with cutaway corners, a 150-foot escalator slashing diagonally across one facade, and an undulating landscape of native Texas trees and plants flowing out from the main lobby. Completion is slated for 2013.



Waco Mammoth Site Shelter

LOCATION **Waco, Texas** ARCHITECT **Cotera+Reed**

The Austin-based firm has designed an 8,400-square-foot shelter for an active dig site where portions of Columbian mammoth skeletons, some dating back 68,000 years, have been found. The metal-clad, one-story building contains a suspended catwalk and clerestory windows that bring in natural light. "We tried to humanize what would otherwise be a pretty scientifically derived building," explains Phillip Reed, AIA, firm principal.



Musical Instrument Museum

LOCATION **Phoenix** ARCHITECT **Richard Varga, FAIA, of Target Corporation; RSP Architects**

Bob Ulrich, former C.E.O. of the Target Corporation, is the driving force behind this new, 190,000-square-foot museum, which will showcase musical instruments from around the globe. The design evokes the topography of the Southwest; programmatic elements include galleries, a café, and a theater. The grand opening is scheduled for April 2010.

Speakers include **Marc Angéilil**, ETH Zurich, Switzerland; **Alejandro Aravena**, Elemental, Chile; **Ray Cole**, University of

3rd International

British Columbia, Canada; **Keller Easterling**, Yale University, USA; **Arab Hoballah**, UNEP, France; **Yolanda Kakabadse**,

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WWF International, Ecuador; **Kazuhiro Kojima**, Coelacanth and Associates, Japan; **Sheila Kennedy**, Massachusetts

for Sustainable

Institute of Technology, USA; **Ashok Lall**, GGSU, India; **Amory Lovins**, Rocky Mountain Institute, USA; **Thom Mayne**,

Construction

Morphosis, USA; **Enrique Norten**, TEN Arquitectos, Mexico/USA; **Menghao Qin**, Nanjing University, China; **Jeremy Rifkin**,

Universidad

Foundation on Economic Trends, USA; **Michel Rojkind**, Rojkind Arquitectos, Mexico; **Mike Schlaich**, TU Berlin, Germany;

Iberoamericana

Masanori Shukuya, Musashi Institute of Technology, Japan; **Werner Sobek**, University of Stuttgart, Germany; **Michael Sorkin**,

Mexico City

City College of New York, USA; **Klaus Töpfer**, UNEP, Germany; **Simon Upton**, OECD Round Table on Sustainable Development,

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New Zealand; **Jean-Philippe Vassal**, Lacaton & Vassal Architectes, France; **Muhammad Yunus**, Grameen Bank, Bangladesh.

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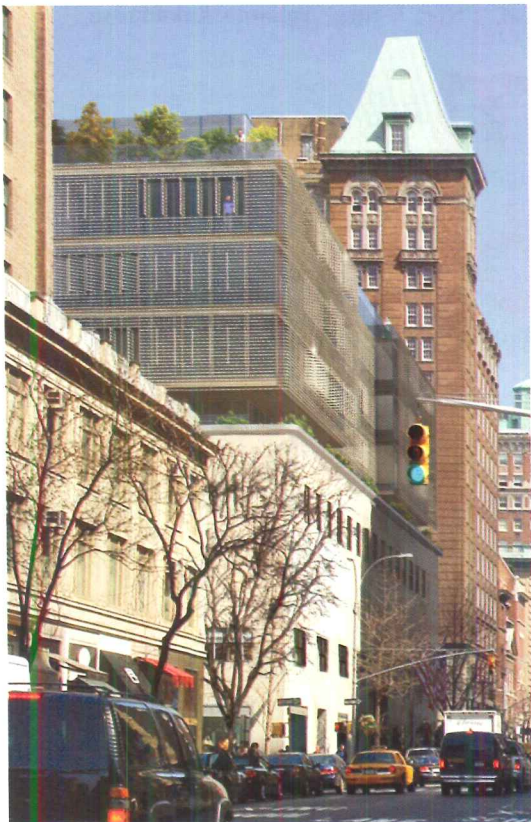
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[HISTORIC ACHIEVEMENT]

At Last, a Green Light

Foster's pared-down 980 Madison scheme gets the go-ahead

AFTER NEARLY THREE years of deliberation and modifications, a project by Foster + Partners at 980 Madison Avenue in New York City has received approval from the city's Landmarks Preservation Commission. Chris Connell, the partner in charge of the project, says he thinks they have found a "positive way" to respond to the commission's comments without compromising the design.

The proposal, an addition atop the 1950 Parke-Bernet Gallery building by Walker & Poor, has been controversial since the beginning. Initially, the developer, Aby Rosen, sought to add a pair of 30-story, intersecting elliptical glass towers (above right) to the limestone building, a scheme that stirred debate

and was rejected by the commissioners. In May 2008, the architect and developer unveiled a significantly scaled-down proposal: a single, five-story, 68,000-square-foot addition clad in a brise-soleil made of bronze-colored rods (top right). The revamped design won over many, but not all, critics.

Another round of changes followed, and a new scheme was put forward this past January, but the commission decided it was still out of scale for the neighborhood. After further changes, the team finally won approval on October 13.

At 48,000 square feet, the addition (above left) will be even smaller, thanks to the elimination of one story, an increased setback for the inner glass facade

(placing it 4 feet behind the brise-soleil), and the inclusion of a 4-foot setback for a glass balustrade on the top level, which includes a terrace. To mimic the shape of the existing building, the corners of the addition are now rounded. The architects also lightened the screen by spacing the rods farther apart and changing the color to a mid-tone bronze. The building's first three levels will offer retail space, and the remainder will be residential.

In a statement, Rosen said that he was "extremely grateful for the opportunity to demonstrate that you can build with distinction in an historic district if you respond responsibly and work collaboratively with the Landmarks Commission."

Tim McKeough

[OPINION]

Why the Profession Needs the AAO

IN EARLY NOVEMBER, more than 150 representatives of architecture and design organizations came to Chicago to hold the inaugural meeting of the Association of Architecture Organizations (AAO). Formation of the group culminated five years of discussions among members of a committee of design leaders led by Lynn Osmond of the Chicago Architecture Foundation. Representatives of five of the 11 AIA chapters currently operating centers of architecture in major cities met formally for the first time ever.

Why does our profession need yet another group? The AAO was founded with the recognition that organizations and associations engage not only with professionals, but the public as well. They have become incredibly important as our profession endeavors to make society understand the many ways it is improved and empowered by good design. Centers of architecture, design museums, schools, and other entities that work to improve the built environment have flourished in recent years. And our ability to reach out has never been better, particularly in increasing the profession's capacity to respond meaningfully to events like the Great Recession, 9/11, and Hurricane Katrina. These have had an impact on many lives; at the same time, they are unprecedented opportunities to create livable and sustainable communities.

But the challenges that confront the people who lead these groups have never been greater, particularly when financial support is not at levels that allow us to provide the programs and services that people, including unemployed and underemployed architects, have come to expect. The AAO will help all of us to share best practices and ideas about how to respond to events that affect our communities, as well as how to put on exhibitions and tours, communicate about our activities, and raise money. The power of architecture starts at the grass roots and grows upward and outward. *Rick Bell, FAIA, executive director of the AIA NY Center for Architecture*

[ONLINE SLIDE SHOW]

Solar Decathlon Taps Brain Power

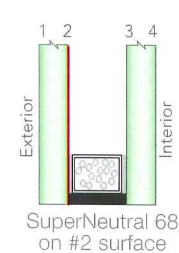
IN OCTOBER, 20 STUDENT TEAMS from the around the world descended upon the National Mall in Washington, D.C., to build energy-efficient, temporary homes for the 2009 U.S. Department of Energy Solar Decathlon. Team Germany placed first; the University of Illinois at Urbana-Champaign took second, and Team California took third.



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RECORD NEWS

[NEWSMAKER]

Saarinen Lands in New York

DONALD ALBRECHT IS the curator of architecture and design at the Museum of the City of New York (MCNY). In recent years, he has also served as curator of the traveling exhibition *Eero Saarinen: Shaping the Future*, the first-ever retrospective of the influential Finnish-American architect. Prompted by the 2002 donation of the Eero Saarinen and Associates office archives to the Yale University School of Architecture, the show opened in 2006 in Helsinki and will be on view at MCNY through January 2010.

ARCHITECTURAL RECORD: How did the exhibition come to MCNY?

DONALD ALBRECHT: This is an exhibition I was hired to do by the organizers: the Finnish Cultural Institute in New York, the Museum of Finnish Architecture in Helsinki, and the National Building Museum in Washington, D.C. I proposed MCNY for the New York venue. It's a bit of a weird situation: I'm basically installing my own show here.

AR: How is the exhibition in New York different from the show's other venues?

DA: We've enhanced certain components. Of course, when we were organizing the show, one option would have been to put all the New York projects together. But the show is organized by building type, so that would have gone against the organization. You find New York work in almost all the categories. Instead of pulling it out, we highlighted it in each of those sections. We have a set of fantastic photographs by Robert Damora, who worked closely with Florence Knoll photographing interiors of the CBS Building. In addition to giving a greater focus to Saarinen's second wife, Aline, a *New York Times* art critic who went on to become a T.V. personality, we increased coverage of Lincoln Center, and added material on the TWA terminal [top right]. Another thing we did is group together the three New York area corporate campuses: the 1952 Time, Inc. headquarters in Rye (that was never built); Bell Laboratories in Holmdel, New Jersey; and IBM in Yorktown Heights.

AR: Your audience at MCNY is less focused on architecture than audiences at the other venues. How did you deal with that?

DA: We have an audience that's interested in architecture, but not dedicated to it. In



response, I've taken photos out of the show and made them into projections. Wendy Evans Joseph, the architect who designed the installation, proposed a mini theater with a slide show. I've focused the slide show on Saarinen's interiors as a way of engaging a public not used to seeing architectural work and working drawings. I added an experiential moment the other venues did not have.

AR: You coedited the catalog with Eeva-Liisa Pelkonen, associate professor at the Yale School of Architecture. Tell us about that.

DA: Much of the research done by scholars and students at Yale for the catalog was used in the exhibition. We used the book as the grounding for the show. We built up a biographical chronology of Saarinen's life in the book, which was useful in terms of sorting out his life and inserting various aspects of it into the exhibition.

AR: What effect do you think this exhibition has had, or will have, on Saarinen's legacy?

DA: It brings it back. And it opens up new questions about Saarinen, which is one of the goals of any scholarly enterprise. It is the first serious effort to catalog Saarinen's work. And we tried to contextualize him through this documentary and interpretive exercise. In the show, we examine his engagement with the media, and his relationship to theater design and to his clients – the movers and shakers of the time. Henry Luce famously said, 'Whatever the end of the war produced, it would certainly be the American Century.' Saarinen gives us an opportunity to look at the architecture of that time, because he is the architect of Luce's American Century. *Interview by Beth Broome*

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CIRCLE 17

RECORD NEWS



[EMERGING TALENT]

Architecture That Performs

AS AN ARCHITECTURAL planner for Bernard Tschumi Architects, V. Mitch McEwen has worked on master plans in Singapore and Abu Dhabi, as well as a museum in Maryland, since earning her M.Arch. from Columbia University in 2006. Her day job keeps her plenty busy. But several years ago, the 31-year-old started conjuring up visions of her own project: a "laboratory to experiment" with the intersection of architecture and other art forms.

So in the spring of 2007, she rented a 950-square-foot storefront in Brooklyn's Bedford-Stuyvesant neighborhood and spent the next few months transforming the space into SUPERFRONT gallery. It opened in January 2008 and has continued to gain traction – and grow. A second gallery, SUPERFRONT LA, opened this fall in West Hollywood.

In planning SUPERFRONT's programming, McEwen aims for the unorthodox. In May, for instance, the Brooklyn gallery

presented an installation executed in conjunction with the group Movement Research, where dancers interacted with temporary, architectonic forms (above) designed by Live Architecture Network and curated by McEwen. Other events have included a presentation by local high school students working in collaboration with Brooklyn's storied Weeksville Heritage Center, and the inauguration of the gallery's first artist-in-residence.

SUPERFRONT is nothing if not lean. There are no paid staff members, and exhibitions are constructed largely from donated materials. A barbecue was held this past Memorial Day to raise funds.

While McEwen has no plans to leave her current job at Bernard Tschumi Architects, she hopes that SUPERFRONT will eventually become big enough to merit a permanent curator. But, she adds, "that full-time position wouldn't be for me. I like to build things."
Sebastian Howard

[HIGH HOPES]

Soleri Bridge

ITALIAN-AMERICAN architect Paolo Soleri became famous for Arcosanti, the urban laboratory he constructed in the Arizona desert in the early 1970s. His first major

design, however, was a bridge for an exhibition in the 1940s. That concept, along with other bridge designs, was never realized. Now, at the age of 90, Soleri might finally get to see one of his bridges built. Work is expected to begin in January on a 100-foot-long pedestrian bridge Soleri designed, in collaboration with Douglas Architects, for the city of Scottsdale, a Phoenix suburb. The bridge will cross a canal in the downtown area. Two 64-foot-tall, brushed-steel pylons will act as a sundial, creating a shadow on the bridge deck that will mark solar events such as the equinox. The project also includes a 22,000-square-foot plaza with a water feature. *Noble Sprayberry*



Go online to watch an interview with Soleri and to take a video tour of Arcosanti architecturalrecord.com/news.



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CIRCLE 18



RECORD NEWS



Rogers Wins Stirling Prize

THE ROYAL INSTITUTE OF British Architects named the Rogers Stirk Harbour-designed Maggie's Centre the winner of the 2009 Stirling Prize. The annual honor, announced on October 17, is the 14th that the U.K.'s professional organization for architects has bestowed on a built work, and the second for Rogers Stirk Harbour. The London-based practice won the 2006 prize for its design of Barajas Airport outside Madrid.

Located at Charing Cross Hospital in West London, Maggie's Centre (above) is one of a series of buildings – by Zaha Hadid, Wilkinson Eyre, and other prominent architects – in varied

locations, commissioned by the architectural theorist and designer Charles Jencks in honor of his deceased wife, Maggie Keswick Jencks.

Rogers Stirk Harbour's design is posited as a noninstitutional counterpoint to Charing Cross Hospital's main facility. An orange partition envelops the two-story, 4,000-square-foot structure, and a bold roof canopy punctuated by unglazed skylights appears to hover above it. A double-height kitchen marks the center of the glass-skinned building; lounge areas, a library, and other rooms surround the kitchen, and partly sheltered, landscaped courtyards occupy the space between the interior building and the colorful outer wall. *David Sokol*

Bauhaus Show Opens in New York

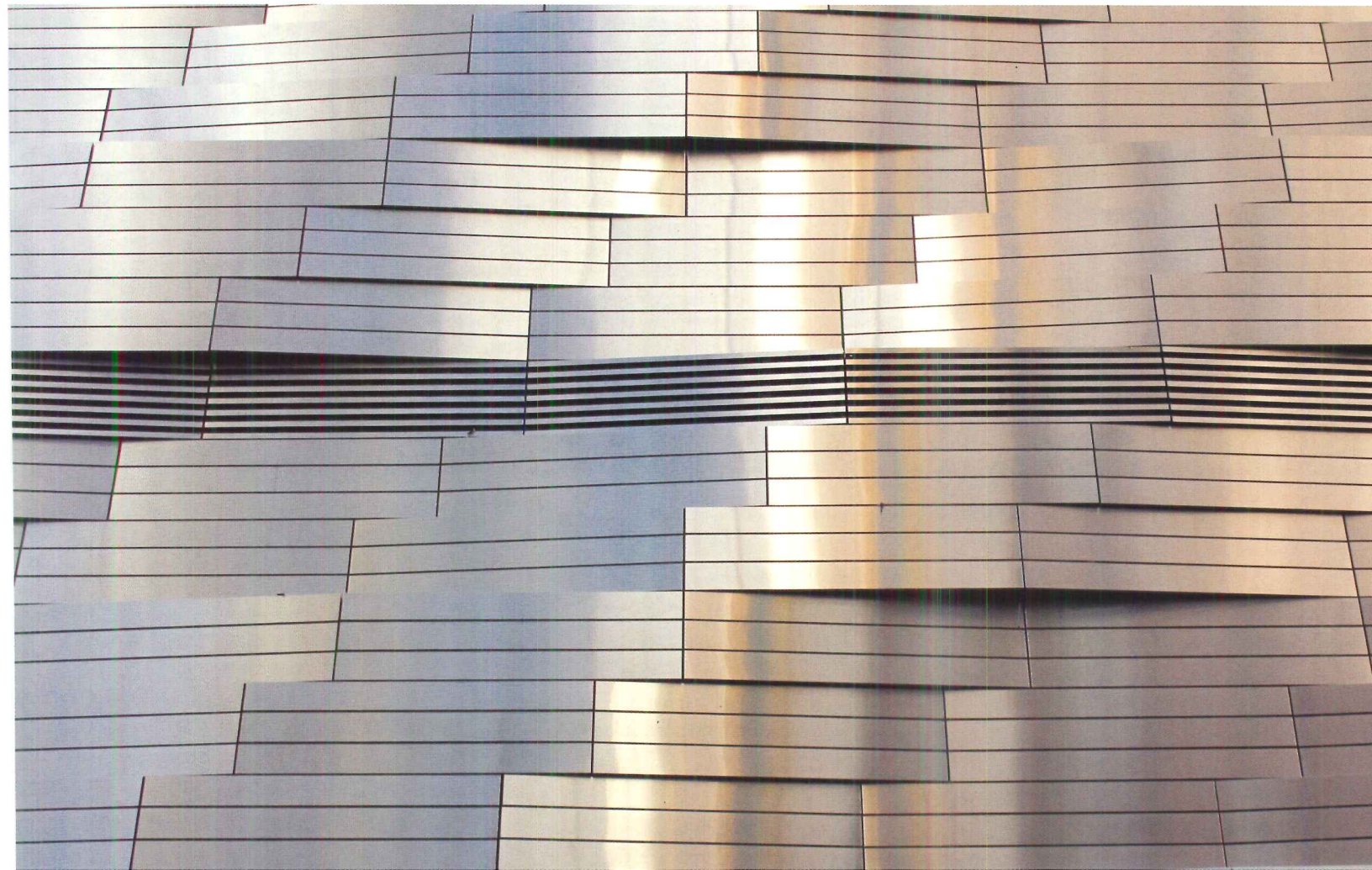


Bauhaus 1919–1933: Workshops for Modernity opened on November 8 at New York's Museum of Modern Art. It is the first time since 1938 that the museum has presented a major exhibition on the influential German school. More than 400 works are displayed, many of which have never been shown in the U.S. The show closes January 25. Look for more coverage in an upcoming issue of RECORD. *Jenna M. McKnight*

Mayne Chosen for Arts Committee

THOM MAYNE, FAIA, is among the 25 people recently chosen to serve on President Obama's Committee on the Arts and the Humanities. Mayne is the founder of Morphosis Architects, cofounder of the Southern California Institute of Architecture, and a professor at UCLA's Department of Architecture and Urban Design. A Pritzker Prize winner, his portfolio includes the San Francisco Federal Building (2007) and the just-opened 41 Cooper Square in New York City.

Another new member with an architecture background is Christine Forester, who earned an architecture degree before switching careers to found Christine Forester Catalyst, a marketing company. Also named to the committee were Anna Wintour, editor in chief of *Vogue*; actress and producer Sarah Jessica Parker; and cellist Yo-Yo Ma, among others. *Jenna M. McKnight*





Stimulus Funds Rev Up Lab Project

A NEW NATIONAL Oceanic and Atmospheric Administration (NOAA) laboratory in La Jolla, California, is back on track after receiving funding under the American Recovery and Reinvestment Act. The \$102 million lab, designed by a team led by GouldEvans architecture, Gibbens Drake Scott engineering, and Architects | Delawie Wilkes Rodrigues Barker, had been on hold since the beginning of 2008 due to a lack of funding.

"NOAA got the stimulus money it needed to move the project forward because it qualified as shovel-ready," says Bob Gould, FAIA, who notes that construction documents were already 65 percent complete when the project was delayed. With the drawings finished, construction is expected to begin in earnest this spring.

The four-story, 215,000-square-foot building will replace the federal organization's existing 45-year-old lab, which is being threatened by cliff erosion. *Tim McKeough*

Tower Completed in Tel Aviv

PEI COBB FREED recently completed its first project in Tel Aviv, the 32-story headquarters of the First International Bank of Israel (FIBI). The \$200 million tower, designed by the firm's Ian Bader with local architect Arie Kutz of Nir-Kutz Architects, was constructed on a 30,000-square-foot lot and involved the preservation of two historic low-rise buildings.



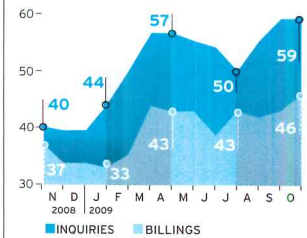
At 423 feet, the building is the exact height of the nearby Shalom Tower (1965), Tel Aviv's first skyscraper. Designed to resemble an ice cube, the FIBI building tapers as it rises and has a crisp, asymmetrical form that is based on equilateral triangles. *Esther Hecht*

Firm Develops City "Decarbonization" Plan

A CHICAGO-BASED FIRM, Adrian Smith + Gordon Gill Architecture, is conducting a study of existing buildings in hopes of ultimately reducing their carbon emissions. As part of its Chicago Central Area Decarbonization Plan, the firm is surveying more than 500 buildings in the Chicago Loop to assess age, use, condition, energy consumption, and more; the information will help guide energy-efficient retrofits and adaptive-reuse projects. This is the start of a "monumental effort," says Smith, noting that he hopes it will serve as a model for other cities. *Nadine M. Post*

RECORD NEWS

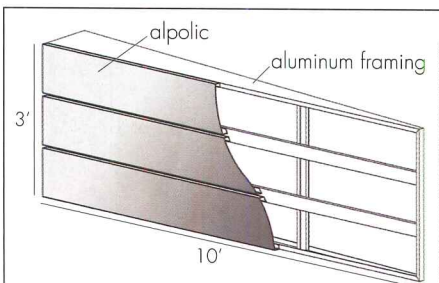
Billings Index



The Architectural Billings Index rose in October to 46.1 – the highest mark since August 2008. The inquiries score was 58.5. "This news could prove to be an early signal toward a recovery for the design and construction industry," says Kermit Baker, chief economist for the AIA, which produces the index based on firm surveys.

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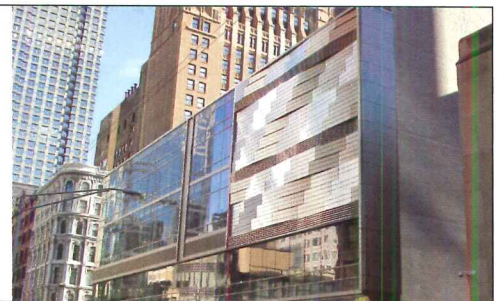


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CIRCLE 20

Fame: A Fickle Mistress

For architects on the edge, early success can be a sword that cuts both ways

BY MARTIN FILLER

EVERY ASPIRING ARCHITECT DREAMS OF a breakthrough project that will establish his or her name soon enough to buy time and offset the geological pace of a creative process often calculated in decades rather than years. But as the career tangents of even the most admired architects demonstrate,

initial acclaim doesn't come with a lifetime guarantee. When Charles Gwathmey died this summer at 71 – scandalously soon for anyone these days, architect or not – more than one observer noted that nothing he did surpassed his brilliant debut: the widely praised Long Island house and artist's studio he designed for his parents more than four decades ago.

Completed in 1966, when Gwathmey was just 28, this superb ensemble – a lively composition of geometric forms that suggested a new vocabulary for the East Coast beach house – won instant raves. It gave Gwathmey's reputation the kick start that in turn increased the influence of the New York Five, of which he was the youngest member, and secured him a thriving practice before he turned 40. But I wouldn't hazard a guess as to why that marked the high point of his career.

Not long ago, I ran into an architect I highly respect but hadn't seen for ages: Donlyn Lyndon, still best known as a principal in the quintessentially 1960s office of Moore, Lyndon, Turnbull and Whitaker (MLTW) in California. They designed the epoch-making Sea Ranch Condominium 1 (1963–65) in Sonoma County, California, a watershed in the emergence of architecture based on vernacular traditions to better connect with the local environment (aided immeasurably

by the site planning of landscape architect Lawrence Halprin, who died in October at 93).

I told Lyndon, who is two years older than Gwathmey, that the similarly premature deaths of his former colleagues Charles Moore and William Turnbull have made Lyndon and the fourth member of their quartet, Richard Whitaker, seem like the two surviving Beatles – such was MLTW's rock-star status when I started writing about architecture 35 years ago.

But rather than lapsing into nostalgia, Lyndon was clear-eyed about their place in history. As he told me, "Nothing any of us later did separately ever came close to the condominium." At the time of its completion, he was 29 and Moore was 40. When MLTW disbanded, Lyndon explained, a crucial factor vanished with it: the partners' forthright critiques of each others' contributions, which brought out the best in each of them at Sea Ranch.

The ensuing absence of that collegial give-and-take affected Moore's subsequent work most visibly. This extravagantly gifted designer, author, educator, and historian was also compulsively peripatetic and incapable of settling down in one location, an odd trait for someone who wrote so evocatively about the spirit of place.

As the dawning Jet Age made travel easier and the nascent celebrity culture spawned the



1. This house and studio on Long Island for his parents set Charles Gwathmey on the path to success.

2. Condominium 1 at Sea Ranch was a highlight in Charles Moore's career.

architectural star system, Moore shuttled between separate professional practices (more complicated than corporate branch offices) and moved from one architecture-school deanship to the next, rarely touching down long enough to maximize his talents anywhere. The best designs of Moore and Gwathmey, as well as the early work of Edward Larrabee Barnes and Arthur Erickson, all responded quite specifically to natural settings and intimate scale that got lost in the shuffle once those men took to long-distance practice.

Above all, none of Moore's ever-younger collaborators challenged him as frankly and constructively as his MLTW partners had. Architects at the start of their careers are often

unconstrained by conventions that inhibit their elders. Though Moore liked to recruit his brightest students for his various firms, and those admiring neophytes learned much from him, their intergenerational dynamic was unbalanced, in contrast to MLTW's interplay of equals.

The iffy economics of a practice based on small-scale, high-style projects also had much to do with Moore's multiple affiliations and constant peregrinations. But the far-flung road show, now a professional commonplace, took a terrible toll on him physically and psychologically.

Early adulation can morph into a fearsome burden, the "how-do-I-top-myself?" syndrome that frequently shadows exceptional

CRITIQUE

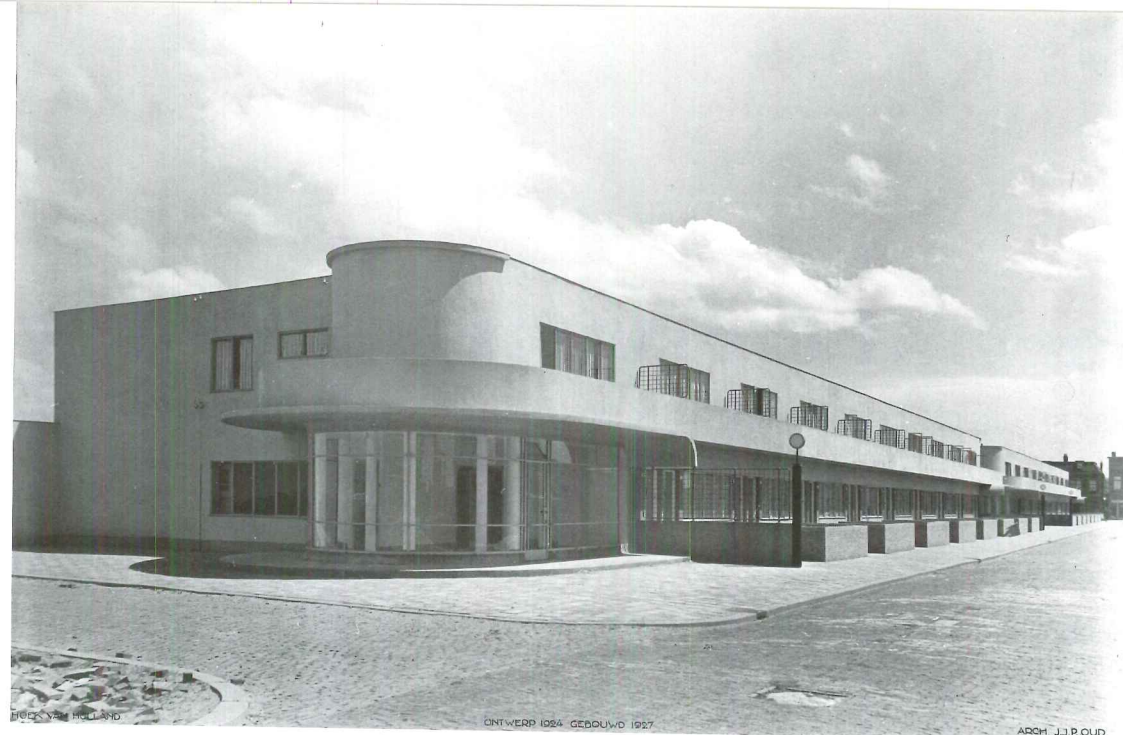
Public housing at the Hook of Holland put J.J.P. Oud on the international map of avant-garde architects in the 1920s.

success. Sometimes external factors interject a negative answer to that question. Shifting trends in taste thwarted the prospects of several early-20th-century vanguard architects, including Louis Sullivan, Charles Rennie Mackintosh, C.F.A. Voysey, and the Greene brothers, all of whom were labeled old hat when a resurgent vogue for Beaux-Arts Classicism – which Sullivan foresaw at the 1893 Chicago World's Fair – reared its neo-Roman head.

Gwathmey prided himself on not jumping aboard the Postmodern bandwagon, unlike his opportunistic colleagues. But he didn't go broke by sticking to his Modernist guns, as did the aforementioned *fin de siècle* mavericks circa 1910. Architects who discover a marketable formula are understandably tempted to mine it as long as demand persists, a tendency shared by many painters, composers, and writers. Why mess with success? However, the pitfalls of coasting on established ideas, even very good ones, can also prompt ambitious artists to veer off in radically different directions.

Twentieth-century architecture holds no more cautionary example of a major talent permanently stigmatized by one resounding flop than J.J.P. Oud, the Dutch master once touted as the Modern movement's great white hope by Philip Johnson and the Museum of Modern Art's founding director, Alfred H. Barr, Jr., who respectively codified and christened the International Style. During the 1920s, Oud's public housing developments in Rotterdam, the Hook of Holland, and at the Weissenhof exhibition in Stuttgart made him a hero of the architectural vanguard thanks to their rare blend of Minimalist elegance and humane purpose.

Major architects' careers don't derail solely because of circumstanc-



es beyond their control. Mackintosh and Sullivan were chronic alcoholics whose drinking increased as their fortunes dwindled. Oud was prone to bouts of severe depression, which forced him to turn down a 1930 Princeton lecture series that went by default to Frank Lloyd Wright, who used the serendipitous opportunity to relaunch his long-becalmed practice.

Oud had made his name with low-cost, publicly financed workers' dwellings, but the Great Depression ended governmental sponsorship of such programs and left him unemployed for much of the 1930s. His big chance for a high-profile comeback arrived in 1937, when he won an invitational competition for a new Shell oil company home office in The Hague. This mid-rise masonry slab was finished during the Nazi occupation in 1942, so only after the Allied victory could it be published abroad.

Instead of the crisp lines, taut volumes, and sleek surfaces that had been Oud's prewar hallmark, his symmetrically massed and quirkily embellished Shell headquarters sported fussy sculptural flourishes and a ground-to-roof panel of eye-popping X-patterned grillwork. "I do not know what to say," a flabbergasted Johnson wrote to the apostate designer, who was 55 and at mid-career when the war ended. "The building looks like a return to Dutch tradition rather than the next

step in international architecture."

An unsigned 1946 *RECORD* review pulled no punches: "Oud himself is resorting to embroidery," it declared. "The very insistent, heavy, separate, imposed pattern of 'decoration' seems [like] ... pleasant reminiscences of peasant art."

In retrospect, this wasn't a building too advanced for its time, even in light of today's more inclusive attitudes or the perspective of historical hindsight. Worse than an ideological volte-face, Oud's unforgivable sin was perpetrating a truly awful design. Little more was heard of him in international circles during his two last decades.

Conversely, a lengthy, arduous struggle for recognition needn't preordain a hopelessly Sisyphean endgame for architects past some arbitrary sell-by date. Among Frank Gehry's notable accomplishments, the most inspiring to his aging coprofessionals might be his role as poster boy for midlife reinvention and late-onset celebrity. He was pushing 50 when he quit cranking out skillful, lucrative jobs for commercial developers in order to follow his vague dream of becoming an artist-architect. This menopausal gamble of epic recklessness and commensurate bravery finally paid off when Gehry hit the jackpot with Bilbao as he approached 70.

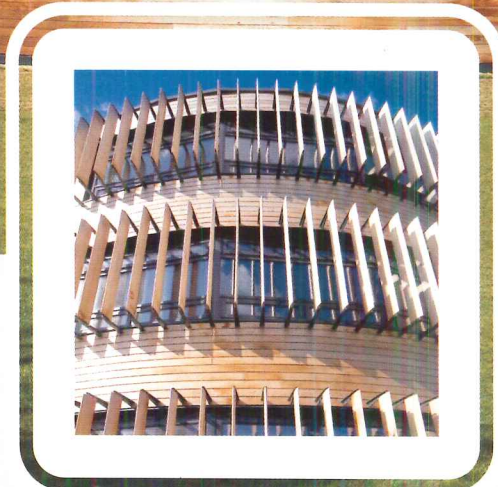
His sizable early output was

nothing to be ashamed of, and the results were often first-rate. Yet hardly any of this work appeared in the Guggenheim Museum's 2001 Gehry retrospective, which was a pity. Not only did starting the show's time line some 15 years after he began independent practice belie a persistent insecurity despite unprecedented critical adulation. The omission also did him a great disservice by downplaying Gehry's phenomenal artistic growth at a stage of life when many of his fellow practitioners are ready to call it a day.

The world's most famous architect may simply believe that almost everything before his breakthrough house for himself in Santa Monica (1978–79) is less interesting than his later efforts. Perhaps this implication that life begins at 50 helps explain the testiness that has crept into his recent public pronouncements, which one old friend of his attributes to Gehry's residual resentment that success came too late for him to reap its full benefits. Among the many myths of creativity is the notion that professional success brings personal happiness. But that phantasm remains as elusive as scoring the next Bilbao, not least if you're Frank Gehry. ■

Martin Filler writes for The New York Review of Books and its recently launched NYRblog (<http://blogs.nybooks.com>)

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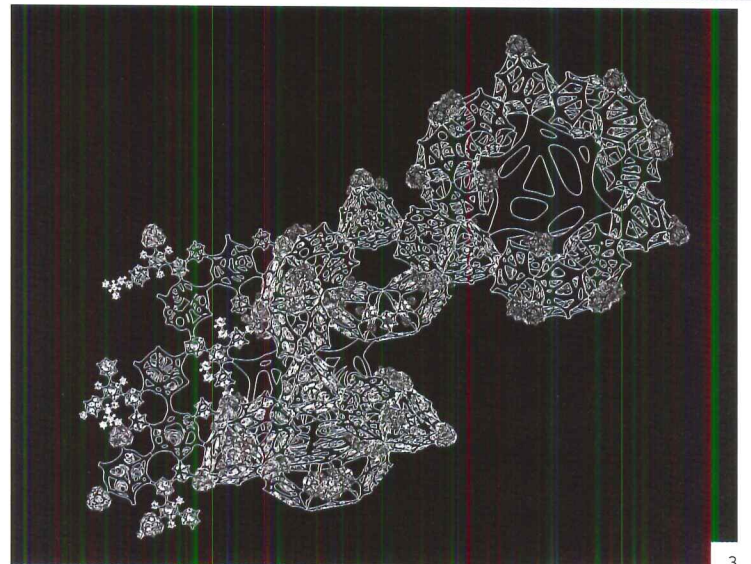
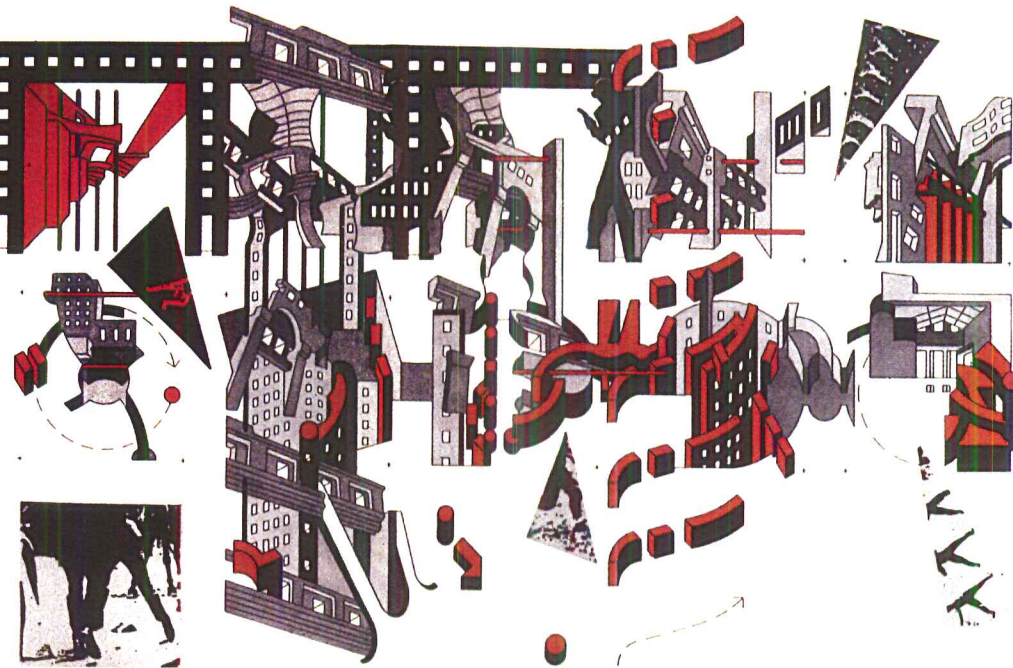
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Drawing, Thinking, and Digitizing: Recession's Modus Operandi

The 1970s downturn famously encouraged drawing. And now? **BY JAMES MURDOCK**

ALTHOUGH THE U.S. economy officially pulled out of the recession during the third quarter of 2009, layoffs and furloughs remain commonplace in design firms of all sizes and specialties. Some architects will leave the profession entirely; but most will stick it out. With less work to go around, how will these designers stay busy? Will we see a new generation of "paper architects" — the archetypal figure from the famous 1970s recession?

Critics coined *paper architect* at the time in relation to *Five Architects*, a book published in 1972 on the work of Peter Eisenman, Richard Meier, Michael Graves, as well as the late John Hejduk and Charles Gwathmey. Although Meier and Gwathmey had won praise for their early built works in the 1960s,

the group, soon called "The New York Five," became best known in the 1970s for its purist vision of Modernism and a penchant for axonometric drawings.

The New York Five had plenty of company. Avant-garde collectives such as Archigram, in Britain, and Superstudio, in Italy, used visionary drawings and collages to provoke serious conversations about the future of cities and the environment. Ideology motivated these groups, but on a more pragmatic level, the 1970s economic malaise meant there was little commercial work for designers outside larger, corporate firms. Conditions today seem similar.

Peter Eisenman, who has since amassed a significant portfolio of built work, believes that the act of drawing is the same as thinking — but

1. *Manhattan Transcripts*, Bernard Tschumi, 1976–81.

2. *The Morning Line*, installation for Third International Biennial of Contemporary Art of Seville, by artist Martin Ritchie, architects Aranda/Lasch, and engineers Arup AGU, 2008.

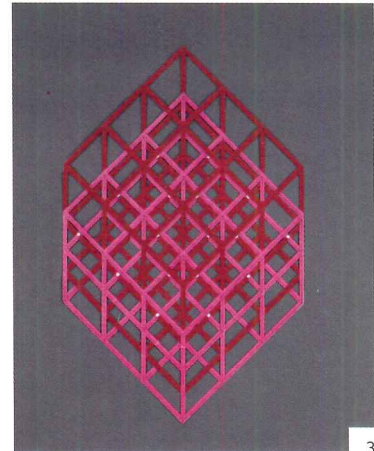
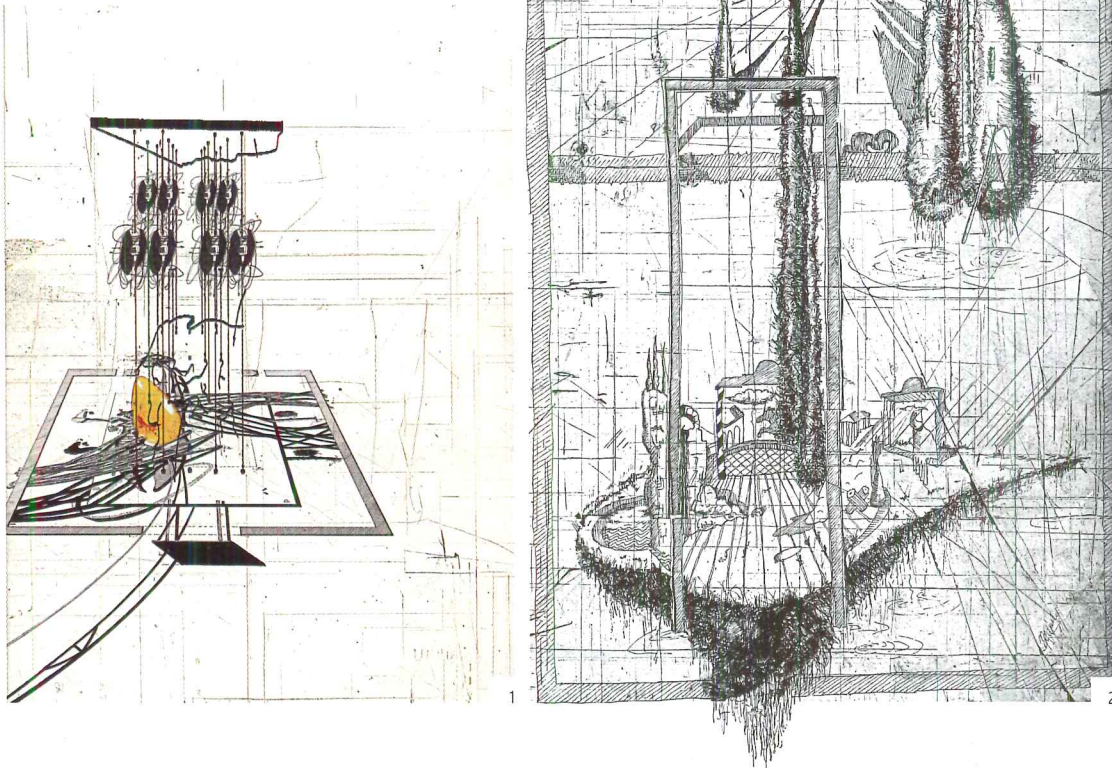
3. *The Morning Line Plan*, Aranda/Lasch, 2008.

"just because there's an economic downturn, doesn't mean that people who haven't been thinking before are going to start thinking now. You're either cut out to think or you're not," he maintains.

Bernard Tschumi likewise uses the act of drawing to question and

challenge orthodoxy. "Most people in my generation didn't have much work, but the questioning was there regardless of the economy," says Tschumi, who taught at the Architectural Association, the influential London school and think tank, during the 1970s. "Is there enough

COMMENTARY



1. *Genetic Gazebo*, Neil Spiller, 2006.

2. *Analysis of Beauty, Part I: Protocell Forms Hung Over Water*, Neil Spiller, 2009.

3. *House VI, Axonometric 14*, Peter Eisenman, 1972.

critical questioning today that will lead to interesting theoretical concerns? I think there is, but it's always easier to define those concerns in retrospect."

Some trends are already apparent, even without the benefit of hindsight, such as an awareness of social justice and a commitment to sustainability. Lebbeus Woods, a professor at The Cooper Union in New York, who is known for his drawings of postapocalyptic visions, has shifted his attention to bettering the urban slums of Africa and Latin America. Noting that his work "is not meant to be built," he draws with the hope that other architects can use his ideas.

"This is the generation of MySpace and YouTube," notes Mark Wigley, dean of Columbia University's Graduate School of Architecture, Planning and Preservation. Emphasizing the engagement of today's students with digital communication, he adds, "The way their work evolves and gets communicated is more interactive." Changes spawned by the computer make one wonder

if the word "paper" still applies. Architects such as Benjamin Aranda and Chris Lasch, based in New York City, design by running algorithms that generate and iterate shapes. "Their projects aren't even a floor plan but a set of instructions for a digital machine. I would call that proto-architecture," observes Barry Bergdoll, chief curator of architecture and design at New York's Museum of Modern Art.

Although Aranda admits he cannot remember the last time he and Lasch sketched with a pencil and paper – "that's not how we flesh out ideas" – he says that the playful and unpredictable qualities of drawing remain central to their work. *The Morning Line*, an installation at the Third International Biennial of Contemporary Art of Seville, is the three-dimensional realization of a hand-drawn sketch by artist Matthew Ritchie. An elaborate series of arches, the 27-ton black-steel sculpture calls to mind petrified cappuccino foam. "No information from the drawing was lost," Aranda says.

"We converted it into a structural system where each line defines a space and carries a load."

When architects link their design software to the computers in fabrication shops, complex forms and geometries suddenly become possible. But the peculiarities of designing with a computer prompt some architects to continue drawing on paper – ironically, even when their work explores technology.

"Whatever software you're using, everyone else has it, too, and that limits what you can do," observes Neil Spiller, whose research at the Bartlett School of Architecture, University College London, combines nanotechnology with construction. Drawn with pen on paper, his *Genetic Gazebo* reinterprets the traditional English garden – a series of outdoor rooms and pavilions – employing a formal language derived from the genetic code of a fossilized prehistoric mosquito as well as Spiller's late pet gerbil.

In his newest drawing, *Analysis of Beauty, Part I: Protocell Forms*

Hung Over Water, Spiller explores how inanimate, self-replicating cells could be cultivated to build protective, coral-like reefs in the Venice lagoon. This project, recently on exhibition at the 2009 World Architecture Festival, in Barcelona, is perhaps Spiller's most commercial work after he ceased practicing and turned to teaching and research during the early-1990s recession. It is almost as though the future, spurred by fears of climate change, has finally caught up with an architect who aspires to be "just the other side" of tomorrow.

Since the volume of business today won't recover for quite some time, design firms will need to compete for what remains – often with smaller staffs. Yet history shows that adversity fuels creativity. That is cold comfort for the overworked and unemployed architect alike, but a silver lining nevertheless. ■

James Murdock, a filmmaker, writes frequently on architecture and design-related subjects.

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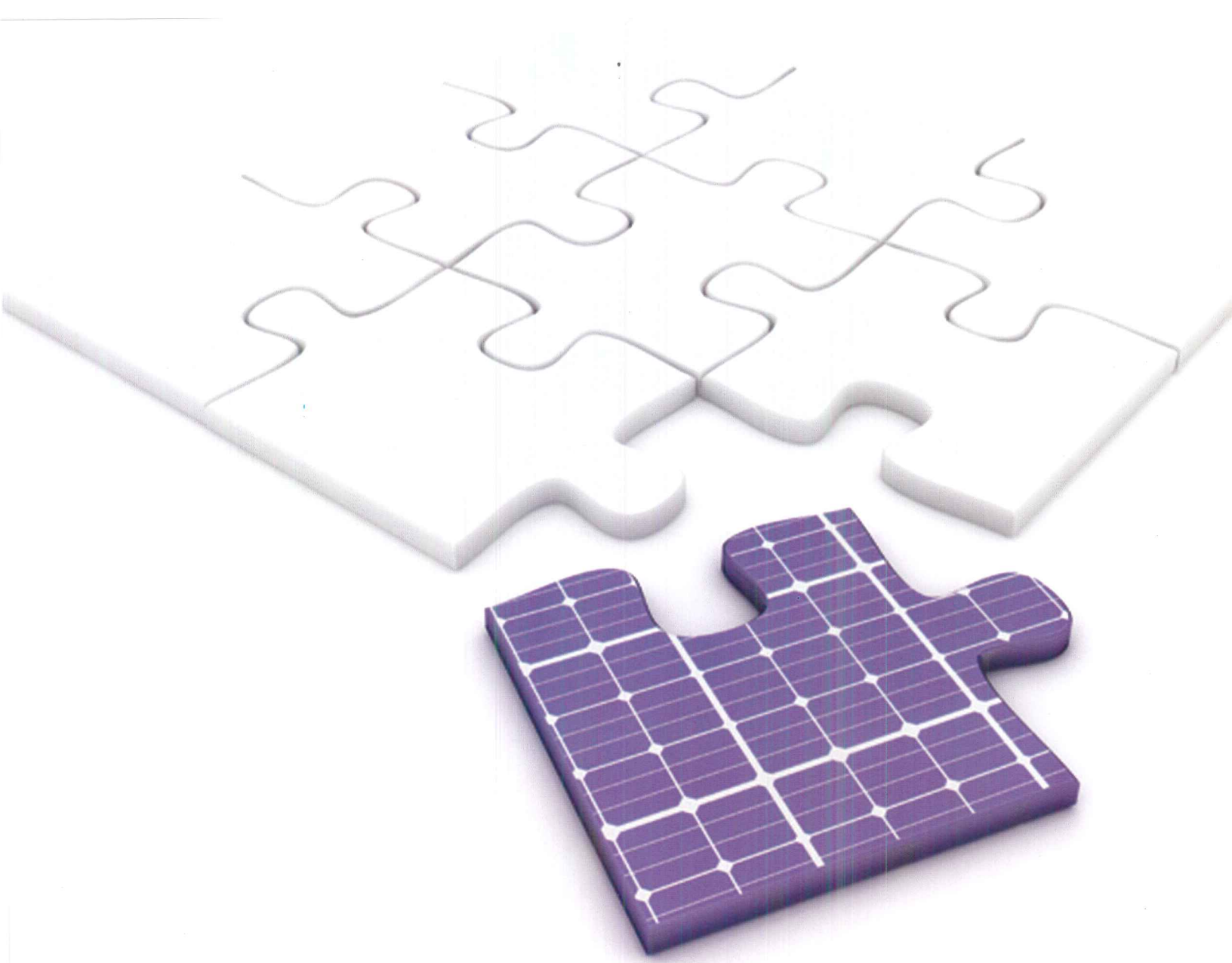
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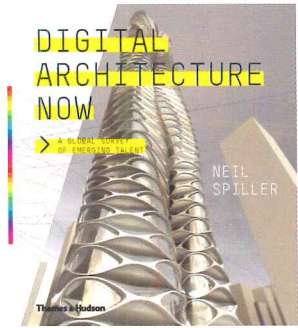


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by Neil Spiller. Thames & Hudson,
2008, 400 pages, \$65.



Digital architecture traces its beginnings to the use of calculation machines just after World War II, which led in the decade following the war to the development of computers (although one can argue that Buckminster Fuller's much earlier work was a harbinger of digital architecture). Nicholas Negroponte's early 1970s Architecture Machine Group at MIT introduced cybernetics to the building process, suggesting a continuous feedback loop between architecture and user. Speed forward to the 1990s, and the term *cyberspace* was coined to describe virtual worlds "constructed" in the digital realm and inhabited in virtual space. Advances in computer-aided fabrication and architectural elements embedded with digital information have brought us to digital architecture that exists between the real and virtual worlds.

This book presents more than 200 projects by more than 40 firms around the world whose design methods are exclusively digital. Demonstrating the latitude of digital architecture, the book closes with the work of eight students at Bartlett University College London (where the author teaches) that portends a "post-digital"

architecture: it takes the digital for granted and will use the computer's synthesizing power to modify architecture as we use it.

The digital architecture on view here is captivating, sensuous, seductive, absorbing, and visionary. But in the tradition of Boullée, Piranesi, and Speer, it has the hallmarks of architectural pornography – the visions presented are often devoid of humanity (in fact, people are absent in many of the drawings). To be more than form for its own sake, digital architecture will need to embrace all of architecture's messy, real-world dimensions. *Michael J. Crosbie*

MAD Dinner: A Monograph on the Beijing-Based MAD Office, Bilingual Edition, by Ma Yansong. Actar, 2008, 350 pages, \$50.

Conceived as a series of "crazy" conversations around a large round table, this volume presents a deeply personalized but grounded view of contemporary architecture in China and an unfiltered glimpse into the workings of the emerging Beijing backstreet office of Ma Yansong. Here, for a change, is a Chinese firm that is at once local and global. It embodies what China is becoming: hybrid, improvisational, experimental, and strategic.

The conversations include the voices of critics, artists, the film director Zhang Yimou, the



local delivery boy just arrived from the countryside, and the ultimate urban planner – a taxi driver. There are outspoken opinions, such as artist Ai Weiwei's response to Ma Yansong's claim that he follows the precedents of nature: "Ma Yansong is an absolute liar."

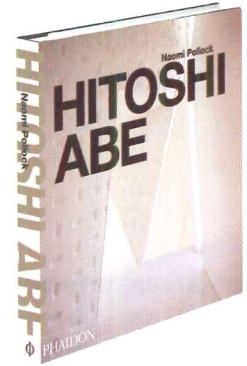
The ideas may not be groundbreaking. What matters, however, is that the book shows the inside workings of the architectural process in China, instead of the pervasive outsider critique and theorizing about Chinese architecture.

For much of the book, MAD is refreshingly critical and light-hearted about its own learning curve. MAD seems most interested in deciphering the broader forces it must contend with as a small office in a city that is, paradoxically, on the cusp of globalization yet extremely tentative and self-conscious as China's capital. Perhaps the conversations will reveal some truth about the firm's design proposals. More broadly, they remind us that architecture can be a process of questioning and discovery while "crazily" conversing around a large, round table. *Guy Horton*

Hitoshi Abe, by Naomi Pollock. Phaidon Press, 2008, 208 pages, \$80.

In 1993, the year after Hitoshi Abe won a competition to design the Miyagi Stadium in Sendai, Japan, he founded his practice in that city, which is also his hometown. The 47-year-old architect is extraordinarily accomplished, having completed more than 40 projects that span a wide range of scales, typologies, materials, and cultural sensitivities.

The monograph, by Naomi Pollock, a RECORD correspondent,



illustrates what she describes as Abe's "compelling architecture, whose elegant, and often dynamic, forms are the fruits of his rigorous, self-styled design process."

Abe's work, represented here by 26 key projects, unfolds in chapters named "line," "surface," and "volume." The first section shows how his use of line responds to environment and program; in the Miyagi Stadium, for instance, the contours of the hilly landscape are extended via the arena's two crescent-shaped roofs.

The surfaces in Abe's work vary from a concrete chessboard wrapping the Sasaki Office Factory for Prosthetics (2004) to the illuminated, perforated-aluminum panels that form a wall graphic for the PTI Pachinko Parlor (2003). Finally, Abe's volumes respond to building regulations in dense urban contexts while attempting to excite the eye, as they do in the dimpled, steel-clad Kanno Museum (2005).

Pollock's lucid text focuses on each project's design process. Carefully framed photographs highlight the vibrancy of Abe's work, but they rarely show how it engages the surrounding urban landscape, and there are no construction photographs describing how he transforms materials. For these, readers should look to *Hitoshi Abe/on-the-spot* (2009) and *Hitoshi Abe Flicker* (2005). *Ken Tadashi Oshima*

Got Work? Get Paid

There are many ways to get a client to pay, starting with frank communication and looking out for red flags

BY B.J. NOVITSKI

HOW DO YOU COPE WITH A CLIENT RELUCTANT TO PAY what they owe?

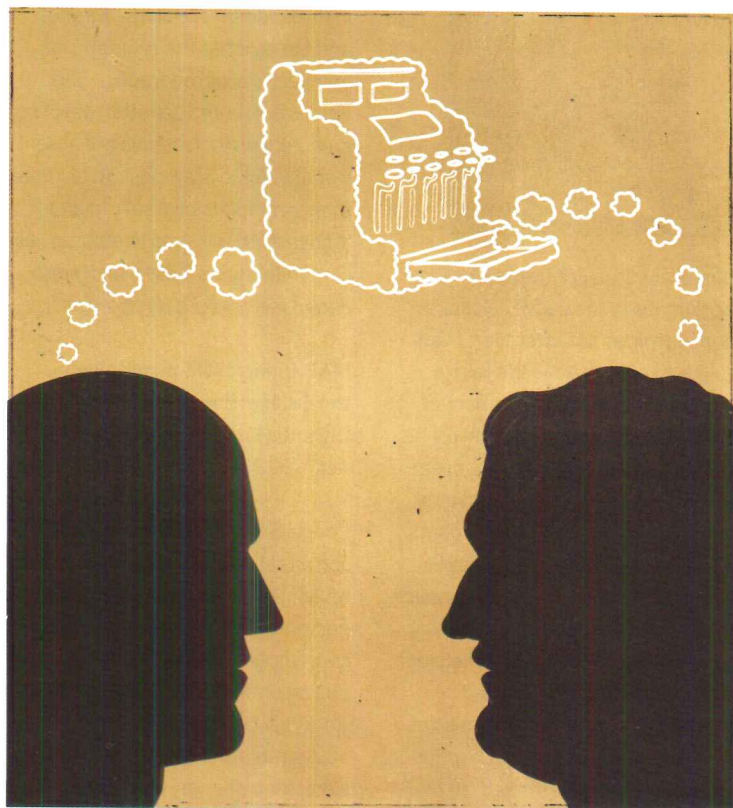
The best advice is to apply certain preventive measures to avoid the problem in the first place. Whether the client is suffering from the slowdown or is simply a deadbeat, paying attention to your business can forestall future headaches.

And yet many architects tend to be more interested in the execution of projects than in managing their firm as a business, says Michael Strogoff, AIA, president of Mill Valley, California-based Strogoff Consulting. Designers may be tempted to jump eagerly into a new project without adequate contract negotiation. But this, he notes, and a general tendency toward conflict avoidance, make architects vulnerable to exploitation. Strogoff recommends frank, up-front discussions with clients about fees to avoid trouble later on. "A big part of negotiation is to address what-ifs," he says. "It should be a collaborative discussion. A lot of architects view that as a negative discussion they want to get beyond."

Rule number one for avoiding problems is "know your client." Public and institutional clients tend to be the most reliable because they typically don't commit to spending money they don't have, according to Kenneth E. Louder, AIA, president and C.E.O. of Salt Lake City, Utah-based FFKR Architects, a firm that has successfully avoided such problems. "The most notorious for nonpayments are developers," Louder says. "It's all speculative, with developers promising they're 'about to get financing,' so the opportunities are attractive. But I've heard

horror stories from architects who did work to get work, and when that work never came about, they didn't get paid." If you're uncertain about the history of reliability of a potential client, you can protect yourself by performing a credit check or simply calling other professionals who may have worked for this client.

Once an architect is selected for a project, but before work begins, it's important to negotiate terms and discuss the many factors that influence fees. According to Strogoff, a client's eventual reluctance to pay may stem from their not understanding the complexity of the design-construction process, and not appreciating why costs may escalate over initial estimates. It is a sensitive subject, he admits, because no architect wants to predict errors and omissions. But a client who understands it will be more likely to provide the necessary contingency funds and less likely to balk at extra payments. Strogoff recommends thorough dialogue – before actual fees are discussed – about the full scope of the work. The list of variables is a long one: project description, roles and responsibilities of architects and their consultants, design and construction, schedules, deliverables, construction-delivery method and number of phases, compensation methods,



Rule number one for avoiding problems is "know your client." The group most notorious for nonpayments are developers.

payment terms, and much more.

Strogoff adds: "After clients understand how each of these parameters affects architects' and engineers' fees, the creative problem-solving part of negotiating can begin. For example, presenting different fees for various numbers of bid packages or for different design schedules might lead a client

to decide that segregated bid packages or an expedited schedule are more important than lower fees. Or discounting a fee if an owner pre-selects a contractor might lead to greater profits for the design professional and a less expensive building for the client." In any case, clients will understand the causal relationship between various factors and

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PRACTICE MATTERS

fees. When the client and architect have agreed on all these matters, it is easier to persuade the client to establish three contingency funds as a hedge against the unexpected. First, an allowance for additional professional fees will compensate for the difficulty in determining ahead of time the precise scope of work by each design professional, and it can head off contentious renegotiations if the scope of work changes. Having to negotiate additional fees for changes as they occur during

Community. Kuehn reports: "When we negotiate a contract, we always talk about getting paid a fair fee, and about how important it is that our cash flow is continuous so we can provide the service they expect." Unfortunately, says Louder, architects may now be feeling especially insecure. He states: "The economic downturn probably makes them increasingly vulnerable to being exploited because the fear of not having any work attracts them to work for which they don't

managers are unable to resolve the matter, the matter will be referred to negotiation between the parties' chief executive officers or managing principals. Only after the chief executive officers or managing principals are unable to resolve the matter shall the matter be submitted to mediation, arbitration, or other legal proceedings." Strogoff notes that resolving arguments at the lowest possible level also helps junior staff develop communication and management skills valuable in deterring future disputes.

Even when architects are engrossed in their projects, they need to take time to review billings and respond quickly in the event of late payments, according to Louder. "It's important to understand the idiosyncrasies of your clients' billing procedures," he says. "If you want to be paid monthly, know what their monthly cycle is and what they need in terms of information backup. There's no one-size-fits-all. Billing the client the way they want to be billed is one way to make sure you have an ongoing cash flow." In Kuehn's firm, the management team looks at the status of accounts receivable every other week, and notifies the principal in charge and the project manager if payments get behind. The firm even goes so far as to establish personal relationships between the architect's accounts-receivable person and his or her counterpart in the client's accounts-payable department. "If there's a late payment, we need to understand what's going on," Kuehn says. "Usually, nonpayment isn't really a contractual remedy, so we make a point of talking. If we have a dispute, let's resolve it, but not paying us will exacerbate the issue."

Louder points out that delayed payments do not necessarily mean nonpayments. He notes that when his firm works for another architecture firm, they're at the end of a chain of dominoes. Payment delays at the top of the chain ripple down to all the consultants.

Even after instituting all these preventive measures, problems still occur. What are the architect's options? Fortunately, there are remedies short of a lawsuit. Strogoff says: "The key is to make it in the client's interest to pay. Make the alternative to not paying unattractive. When it becomes clear that a client does not intend to pay, the first thing is to get someone else in your firm, preferably your partner, to call the client and communicate the urgency and your firm's intent to take whatever action is necessary. Some clients don't expect architects to pursue this and will take advantage. If your contract allows, I'd withhold deliverables until you get paid." The architect can also offer a prompt-payment discount, a relaxed payment schedule, or credit on the next set of services. In the current economy, there are honorable clients who want to pay but who are having their own cash-flow problems. If the architects trust that they'll eventually get paid, they could offer a relaxed payment schedule.

Kuehn says that in rare cases his firm has to hold drawings, noting, "That usually gets some attention." If it doesn't work, they may hire a collection agency or file a lien on the property. But that is a last resort because it destroys any possibility of a long-term relationship. Legally speaking, an architect is entitled to file a lawsuit if nothing else works. But Strogoff points out several reasons this is a bad idea. An architecture firm doesn't want to develop a reputation for suing clients; it is time-consuming and expensive, and, he says, "clients who are really intent not to pay are probably going to outlast most architects." Your best bet, according to these experts, is to maintain close communications throughout the project and stay alert for danger signs before they become serious problems. ■

B.J. Novitski writes frequently about practice and sustainability. She can be reached at bjn@efn.org.

Withholding drawings, filing liens on client property, or hiring a collections agency should only be done as a last resort.

design can place the architect in an uncomfortable position and jeopardize the owner-architect relationship. Second, a contingency fund should be set aside for the inevitable change orders and construction cost increases. This should be either a specified dollar amount or a percentage of the construction budget. Admit to your client that change orders are inevitable!

A third contingency fund should be dedicated to other unexpected project costs such as those caused by delays, changes in agency requirements, or unusual site conditions. With these three funds in place, any cost increases can be dealt with quickly and relatively painlessly. This is particularly helpful with institutional clients, Strogoff points out: "These contingency funds eliminate the need for the owner to obtain formal approvals – a huge barrier for many project managers – because the funding has already been encumbered."

In addition to these contract terms, architects should try to negotiate a retainer and emphasize the importance of getting paid regularly. Scott A. Kuehn, AIA, managing principal of H+L Architecture in Denver, Colorado, also serves on the advisory group for the AIA's Practice Management Knowledge

get paid. But I've always held that working for free is worse than not working at all."

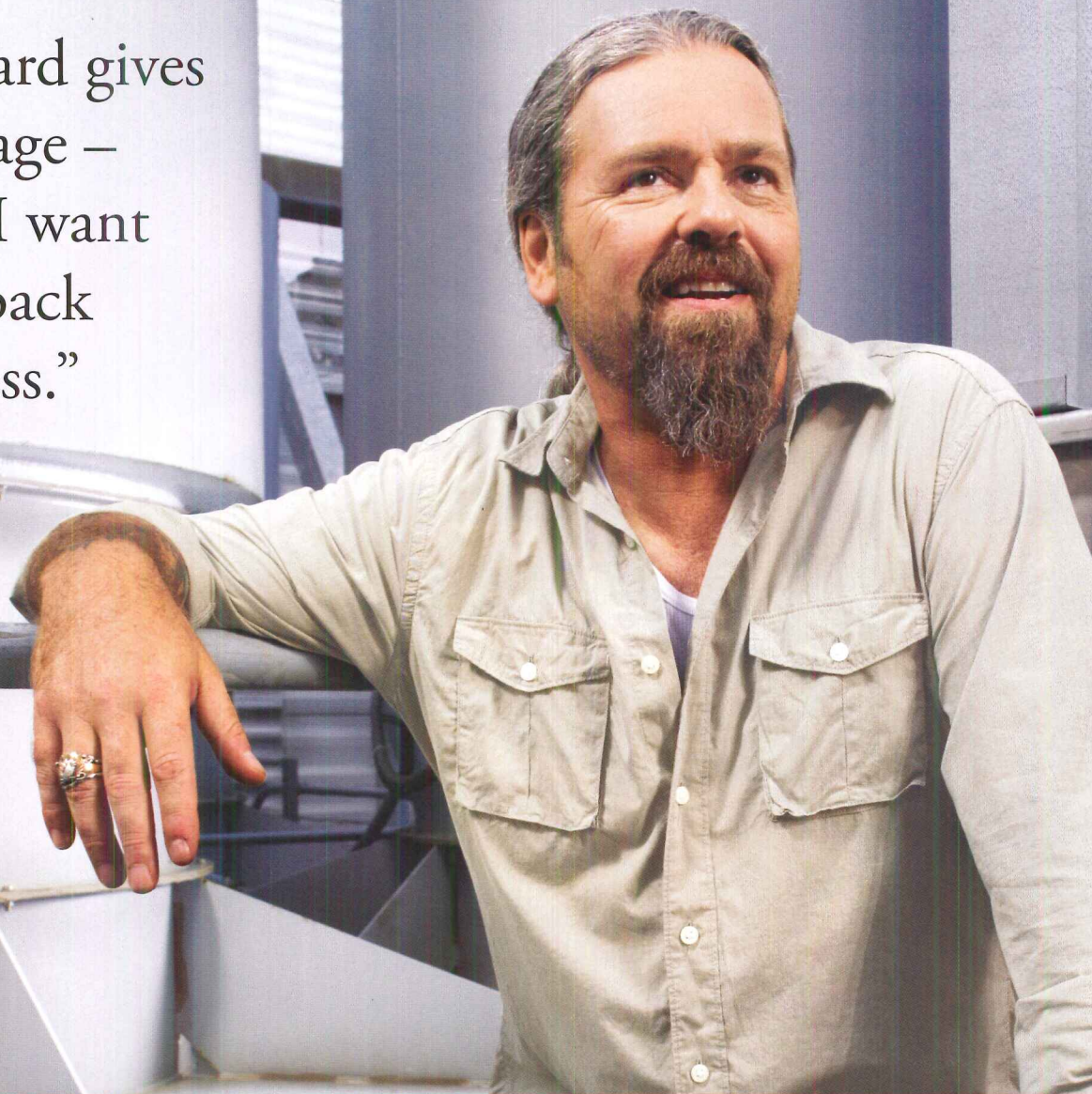
Sometimes, Louder says, FFKR negotiates a "pay-then-work" system whereby the client puts money in the bank up front. "We work till it's almost gone," Louder explains, "then put them on notice. We all understand that if their cash flow stops, so does our work flow." Both Louder and Kuehn agree that if the client is reluctant to talk about finances, this is a red flag.

Regardless of how much you trust your client, it's vital to maintain communications during design and construction. Strogoff recommends following up every bill with a phone call to make sure it was received and understood. Billing more frequently can reveal problems more quickly.

He also suggests contract language stipulating how disputes should be tackled first at the project-manager level, but if they can't be resolved there, between C.E.O.s of the architect and client firms. For example: "Prior to any claim, dispute, or controversy between Owner and Design Professional under this Agreement, the parties shall first attempt to resolve the matter by a negotiation between the parties' designated project managers. If the designated project

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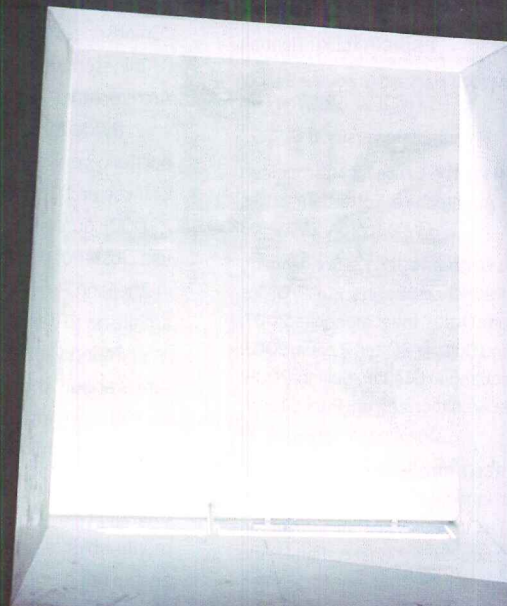
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CIRCLE 25

WHEN WE PLANNED THE FIRST Design Vanguard issue in 2000, we wanted to provide a launching pad for the next generation of architects shaking up the design world. We picked 10 firms that seemed to be looking at architecture from fresh perspectives – incorporating digital technologies, exploring the nature of materials, and rethinking the way fabrication and construction engage design. Today, many of those architects have made significant contributions to the profession. The publication this month of our 10th Vanguard issue offers us a chance to look back for a moment and appreciate the changing landscape of architecture. Back in 2000, seven of the Vanguard firms called the United States home, though a few of the individual architects had been born elsewhere. This year, only three firms are based in the U.S., though a number of partners in foreign studios studied here. This changing geographic mix does not reflect any diminished talent pool in America; rather, it shows a rising tide of innovation and construction in other places. Right now, the large volume of building in Asia alone offers architects there myriad opportunities to explore their ideas and hone their craft, so it's not surprising that we include two firms from China and one from Japan this year. Spain too (and Latin America in previous years) has seen an explosion of talent pushing the boundaries of architectural knowledge.

We never set an age limit for Vanguard architects, because we know that talent rarely can be exercised right out of school. Instead, we use a very rough rule of thumb, looking for firms in operation for 10 years or less. We want this program to showcase emerging architects who have at least some building under their belts but are still approaching design from new directions. These people aren't kids; they're rising stars, provocateurs, and trailblazers. This year's class features some architects who have built quite a lot and a few who are working on large projects with sizable staffs – signs of business savvy, showmanship, and a recent period of enormous economic growth. With the boom over in many parts of the world, we're interested in seeing how future Vanguard firms adjust and turn the new reality to their advantage. *Clifford A. Pearson*



DESIGN VANGUARD 2009

FEATURED FIRMS

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ARCHITECT PORTRAITS BY DAVID JOHNSON

At the Kalmar Museum of Art in Sweden, Tham & Videgård anchored the building with a concrete stair.

DnA_Design and Architecture

DnA founder Xu Tiantian puts down roots in her native China



LOCATION: Beijing, China

FOUNDED: 2004

DESIGN STAFF: 5

PRINCIPAL: Xu Tiantian

EDUCATION: Harvard Graduate School of Design, MAUD, 2000; Tsinghua University, B.S., 1997

WORK HISTORY: Office for Metropolitan Architecture, Rotterdam, 2003; LWA, Boston, 2000–03

COMPLETED PROJECTS: Songzhuang Artist Residences, Beijing, 2009; Ordos Art Museum, Ordos, Inner Mongolia, 2007; Xiaopu Culture Center, Beijing, 2007; Songzhuang Art Center, Beijing, 2006; Jinhua Architecture Park Public Toilet, Zhejiang Province, 2005

CURRENT PROJECTS: Villa by Water, Ordos, Inner Mongolia, 2009; Qingdao Vanke City, 2010; Xixi Leisure Center, Hangzhou Xixi National Wetland Park, Zhejiang Province, 2010; Aquatic Center, Dalian Maritime University, 2011

WEB SITE: www.designandarchitecture.net

AS THE PRINCIPAL OF BEIJING-BASED DnA DESIGN AND ARCHITECTURE, Xu Tiantian is one of the few women to head an architectural practice in China. Yet in many ways, the 34-year-old architect is typical of her generation of compatriot designers, conveying less interest in formal expressions of “Chineseness” than in finding inventive solutions for specific conditions – which happen to be in China. “‘Chineseness’ is too general a term,” says Xu, an alumna of Rem Koolhaas’s Office for Metropolitan Architecture. “I would rather our buildings be rooted in their given locations.”

By deftly negotiating a building’s program and site, Xu has managed to build an impressive portfolio very early in her career. (Prolific building is another attribute she shares with many young Chinese architects.) Since founding her firm five years ago, Xu has completed projects ranging from a 29,000-square-foot art museum in Ordos, Inner Mongolia – its twisting form suggesting a desert viper – to a cluster of public toilets that sprout from the ground like periscopes at the Jinhua Architecture Park in Zhejiang Province, where artist and impresario Ai Weiwei invited 16 emerging and more established architects to design a series of small structures.

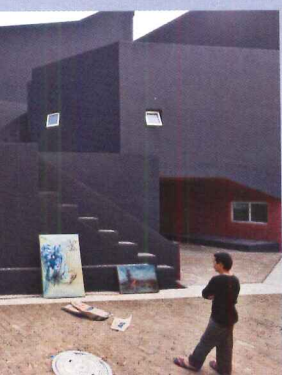
Trained at Beijing’s Tsinghua University and Harvard’s Graduate School of Design, Xu says architecture is about “the program and context influencing behavior and activities and interacting to define the building both inside and out.” It is a straightforward approach. But in Xu’s hands, it is often manifested as a meaningful complexity in which patterns of use maintain constant dialogue with the landscape. Consider Xu’s forthcoming town center for Baixi, a new resort area being built in the mountainous Changbaishan National Park near the North Korean border. Its main elements will include an entertainment hub of faceted, rocklike pavilions and a spa and aquatic center hovering above outdoor pools like an exploded bridge. A third element, a towering information center, will offer multiple views from its zigzagging ramps and platforms while evoking a directional signpost.

But Xu’s context remains China, and so her architectural narratives inevitably address aspects of the country’s sociopolitical condition. A design she has proposed for affordable workers’ housing in Beijing, for example, reconfigures the building type’s conventional layout of long, often dehumanizing rectangular blocks into compositions of overlapping, curvilinear volumes revealing open communal courtyards.

Meanwhile, on the outskirts of Beijing, her Songzhuang Artist Residences encourage both functional and metaphorical readings. Completed last year, its 20 units form a dynamic, random stack of 10- and 20-foot-tall concrete boxes housing, respectively, living and studio spaces. For Xu, the somewhat chaotic arrangement also responds to the area’s recent history as a refuge for artists, many of whom were evicted from their previous enclave near Beijing’s Old Summer Palace. “In such an artist community formed gradually after being expelled by the police, order and discipline have never been key characteristics,” she says. “Rather, violence and anger are more often expressed.”

The Songzhuang Artist Residences further demonstrates the improvisational approach often demanded by China’s tight budgets and even tighter construction schedules – a reality that “hardly allows time to devote to details,” Xu says. Working with a construction team of area villagers, Xu adapted the structure to suit local building techniques, while time and budget constraints required further compromises. “But that’s okay, because the project wasn’t about perfect details or beautiful materials, but creating this space for artists,” says Xu, whose forthcoming projects include an aquatic center for Dalian’s Maritime University and a 54,000-square-foot commercial center in Tsingdao for the Chinese real estate giant Vanke. “This is what I would call very Chinese – the ability to really adapt to a situation,” she says. *Aric Chen*

Aric Chen is a freelance writer based in New York and Beijing.



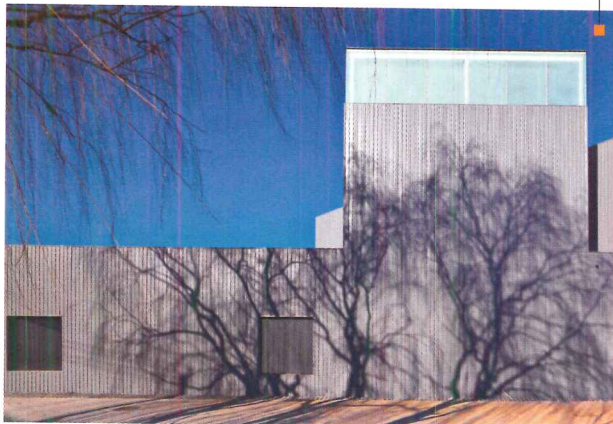
Songzhuang Artist Residences

BEIJING

Completed last year, the Songzhuang Artist Residences are located in one of China's best-known artist enclaves, on the eastern outskirts of Beijing. Its 20 stacked units are composed of 20-foot-tall concrete boxes housing studio spaces and slightly irregular, 10-foot-tall volumes for living areas. Its form reflects both the upheaval experienced by many of the area's artists, whom authorities evicted from their previous homes near Beijing's Old Summer Palace, and the site's former use as an industrial storage lot.

Public Activity Centers CHANGBAISHAN, CHINA

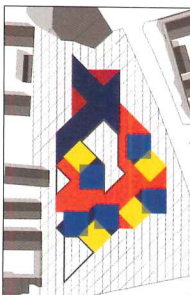
For the forthcoming town center of Baixi, a new resort area being built in the mountainous Changbaishan National Park near the North Korean border, Xu is creating an entertainment hub of faceted, concrete pavilions and a spa and aquatic center hovering above outdoor pools like an exploded bridge. A third element, a towering information center clad in wood, will offer multiple views from its zigzagging ramps and platforms while evoking a directional signpost.



Xiaopu Culture Center BEIJING

For the Xiaopu Culture Center, in Beijing's Songzhuang art district, Xu was presented with an irregular corner lot that formerly served industrial purposes. In negotiating the awkward site with the project's program, Xu took inspiration from tangrams, traditional Chinese puzzles by which players form any number of complicated shapes using a standard set of seven geometric

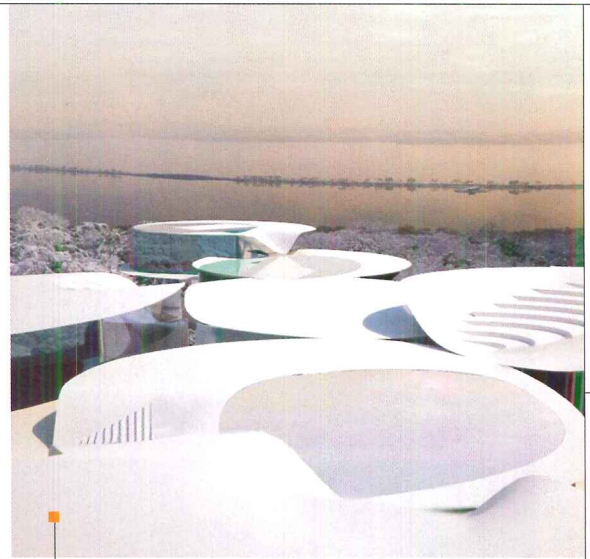
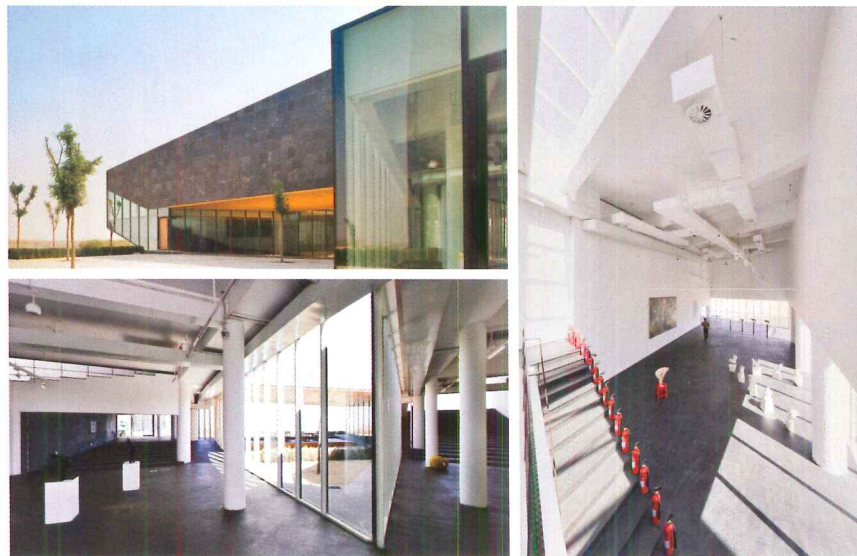
pieces. Unveiled in 2007, the resulting structures form an interlocking composition of voids, courtyards, and corrugated-metal-clad volumes housing galleries, five artist-residency studios, and other spaces. Double-height public exhibition areas intersect with second-story workshops and studios to create visual connections between the production and presentation of art.



Ordos Art Museum

ORDOS, INNER MONGOLIA

Anchoring a new civic center in Ordos, Inner Mongolia, the Ordos Art Museum was conceived as one long, uninterrupted room. Located near Ordos 100, the well-publicized project of 100 villas designed by as many experimental architects, its twisting and lifting form recalls a desert viper winding across the surrounding dunes. Clad in local blue slate, the building, which was completed in 2007, houses 29,000 square feet of exhibition and research spaces punctuated by openings offering natural light and views.



Xixi Leisure Center

HANGZHOU, CHINA

Scheduled to open next year, the Xixi Leisure Center in Hangzhou is part of an arts and culture complex comprising a dozen buildings by leading Chinese architects. Xu looked to the area's natural landscape to create a wetland-inspired scheme of spa rooms, roof terraces, and sunken swimming and bathing pools. All are housed within a multilevel structure of overlapping circular discs that create the impression of walking among water lilies floating on a pond.

Jinhua Architecture Park

ZHEJIANG PROVINCE, CHINA

For the Jinhua Architecture Park in Zhejiang Province – with its other small structures by Herzog & de Meuron, Yung Ho Chang, Toshiko Mori, Michael Maltzan, Liu Jiakun, Tatiana Bilbao, Wang Shu, and other architects selected by artist Ai Weiwei – Xu designed four public toilets that sprout from the ground like periscopes. Built in 2005, each individual unit is a bent concrete tube that maximizes privacy, ventilation, and natural light while minimizing the footprint on the landscape.



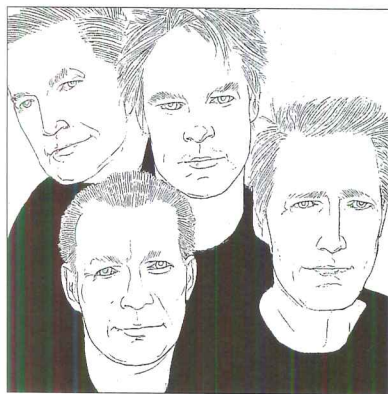


The Mountain

ØRESTAD, COPENHAGEN

Completed in 2008, the 335,209-square-foot complex sits on a canal in the new district of Ørestad, south of Copenhagen's downtown. BIG placed 80 south-facing apartments with 970-square-foot terraces clad with Ipé wood over a 480-slot parking garage to create this 11-story, man-made mountain. Inside the concrete parking structure, a funicular takes residents to designated floors, whose surfaces are demarcated by brightly hued, glossy aluminum panels. Outside, perforated brushed-aluminum panels clad the north and west facades, revealing a pixelated image of Mount Everest. The perforations also allow light and air to enter the parking structure. The project, for the developer Per Høpfner and the Danish Oil Company, has won awards from the Urban Land Institute (2009) and the World Architecture Festival (2008).





BIG

Bjarke Ingels Group

A young Danish architectural firm is living up to its acronym with bold projects home and abroad

WHAT VITAMINS DOES HE TAKE? That might be your first question if you encounter Bjarke Ingels, founder of the four-year-old Copenhagen-based firm Bjarke Ingels Group (BIG). To say that Ingels, who just turned 35, is irrepressibly energetic and optimistic seems like a pathetic understatement. But it might partially explain why BIG is completing its third housing complex executed over the past five years in the town of Ørestad, a newly developing section of Copenhagen. In 2005, Ingels and Julien De Smedt, then partners in PLOT, a firm they started in 2001, completed the VM Houses, a complex of 221 flats in two structures shaped like a V and an M when seen from the air. The two architects parted ways, and Ingels's new firm, BIG, finished a project called The Mountain in 2008, where 80 terraced apartments spill down the top of a parking garage next to the VM Houses. Down the road, 8 House, a mixed-use complex in the shape of an angular double-loop, is nearing completion.

This all sounds a bit ahead of the game; most architects, Danish included, don't get large-scale projects until around age 50. But as BIG's work shows, the bold, unbridled inventiveness in mixing programmatic typologies and forms already sets this architecture office apart from its competitors.

Of course, luck helps invention, no matter how old you are. A few years ago, Ingels met the developer Per Høpfner, who had joined up with the Danish Oil Company to create housing on land purchased from the city-and-state corporation planning Ørestad. Høpfner decided PLOT should design VM Houses, even though Ingels and De Smedt hadn't built anything on that scale before. Per's son Peter Høpfner, who also works in the business, explains that Ingels has a very important trait (besides creativity): "He isn't stubborn. When we would tell him that something was too expensive, he would say, 'Give me two days,' and then come up with something even better." Høpfner adds, "VM may look crazy, but it came in at budget." For his part, Ingels notes that the developer cuts costs by acting as a general contractor and frequently discussing costs with the architect. The project succeeded, and Høpfner and Danish Oil are now clients for The Mountain and 8 House.

Born in Copenhagen, Ingels studied at the School of Architecture at the city's Royal Danish Academy of Fine Arts, where he got his degree in 1999. He also spent a year at the Escola Tecnica Superior de Arquitectura in Barcelona and worked with Rem Koolhaas and OMA in Amsterdam, first as a student, and then right after graduating from the academy. Today, BIG's staff includes 60 designers and architects, including associate partners Finn Nørkjær, Andreas Klok Pedersen, and David Zahle.

The recent book by Ingels, *Yes is More, an Archicomic on Architectural Evolution*, captures the outsize spirit of BIG's approach in any number of projects. Like Robert Venturi's call for a more inclusive architecture in *Complexity and Contradiction in Architecture* (1966), Ingels embraces an architecture "that allows you to say yes to all aspects of human life, no matter how contradicting!" The architects experiment with program, site, and context in their design process, following, as Ingels says, "a Darwinian path to get to the most workable solution." You could substitute "wild" for "workable" for some of the schemes the firm has on its boards in far-flung locations, including Shenzhen and Shanghai in China; Astana, Kazakhstan; and Zira Island, Azerbaijan, which is designed to be carbon neutral resort city. Like so many Danish firms, BIG incorporates green thinking into its work. But Ingels, who is currently teaching a studio, "Engineering Without Engines," at Columbia University's Graduate School of Architecture, Planning and Preservation, is researching ways of responding to differing climates that don't depend on machines. He says his sustainability veers away from the green "neo-Protestant" ethos that "has to hurt." His "hedonistic" and exuberant approach may be the answer. *Suzanne Stephens*

LOCATION: Copenhagen, Denmark

FOUNDED: 2005

DESIGN STAFF: 60

PARTNERS: Bjarke Ingels, Finn Nørkjær, Andreas Klok Pedersen, David Zahle

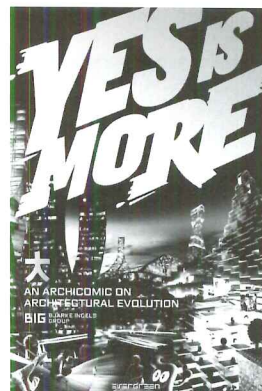
EDUCATION: Ingels: Royal Danish Academy of Fine Arts, School of Architecture, 1999; Nørkjær: Aarhus School of Architecture, 1992; Pedersen: Aarhus School of Architecture, 2004; Zahle: Royal Danish Academy of Fine Arts, School of Architecture, 2003

WORK HISTORY: Ingels: BIG, 2005–; PLOT, 2001–05; Nørkjær: BIG/PLOT, 2001–; BBP Architects 1998–2001; Nova 5, 1995–98; Schmidt Hammer Lassen, 1992–95; Pedersen: BIG/PLOT, 2004–; MVRD, 2001–02; Bonnelycke Architects, 2002; C.F. Møller Architects, 1999–2000; Zahle: BIG/PLOT, 2002–; KHR Architects 1999–2000; Henning Larsen Architects, 1998–99

COMPLETED PROJECTS: The Mountain, Copenhagen, 2008; Sjakket Youth Center, Copenhagen, 2007; Helsingor Psychiatric Hospital, Helsingor, 2006; VM Houses, Copenhagen, 2005

CURRENT PROJECTS: Danish Pavilion, Shanghai Expo 2010; 8 House, Copenhagen, 2010; Superkilen master plan, Copenhagen, 2010; Tamayo Cultural Center, Atizapan, Mexico, 2010; Astana National Library, Astana, Kazakhstan, 2011; Tallinn Town Hall, Tallinn, Estonia, 2012; Shenzhen International Energy Headquarters, Shenzhen, China, 2013

WEB SITE: www.big.dk/





Astana National Library

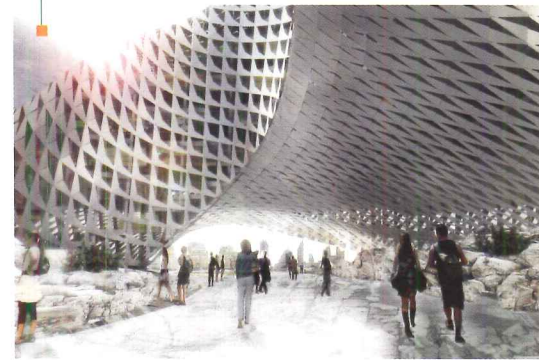
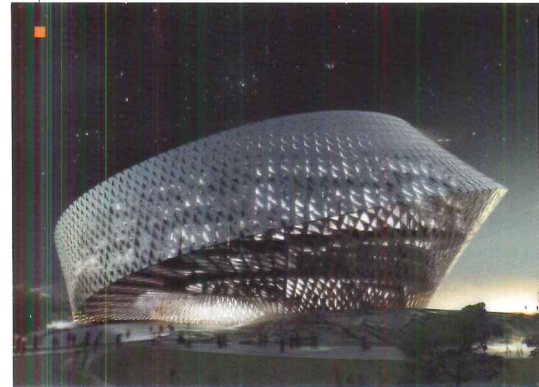
ASTANA, KAZAKHSTAN

In its competition-winning scheme for the new National Library in Astana, the capital of the Republic of Kazakhstan, BIG combined four archetypal forms, the circle, the rotunda, the arch, and the yurt, into a single-surface Möbius strip. The 398,268-square-foot cultural center, museum, and archive commissioned by the Kazakhstan Presidential Office, broke ground in October. Working with Arup's Advanced Geometry Unit in London, BIG designed a circular core devoted to the archive, with public spaces spiraling above. The library core is concrete, while the superstructure is formed of radially arranged transverse steel frames connected by longitudinal beams. The architects hope to clad the facade's triangulated lattices with photovoltaic panels.

VM Houses

ØRESTAD, COPENHAGEN

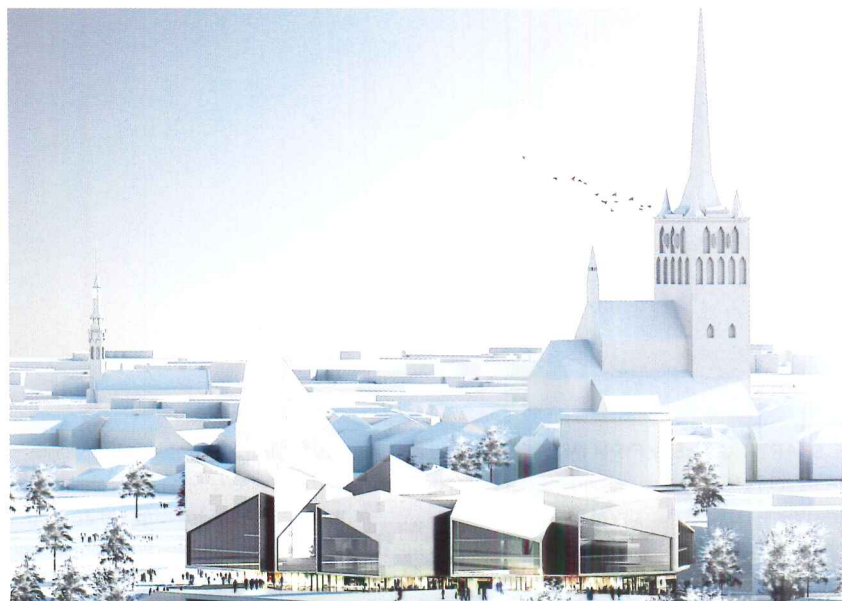
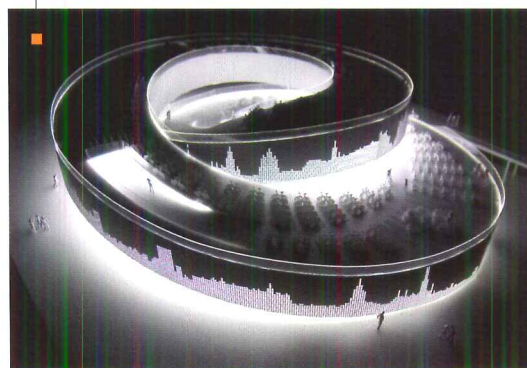
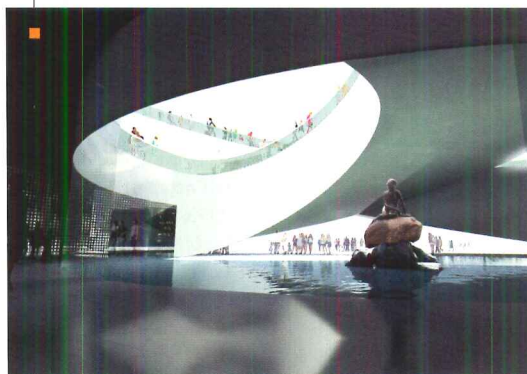
In 2005, Bjarke Ingels, then a partner with Julien De Smedt in the firm PLOT, completed the VM Houses in Ørestad. Built for the development company Høpfner and the Danish Oil Company, the complex is divided into two components shaped like a V and an M when seen from above. The buildings are lifted above the ground on 16-foot-high columns. The angular, aluminum-and-glass-clad structures, situated between two canals on the east and west and next to BIG's Mountain complex, enclose outdoor courts and grassy areas. In the V-shaped building, steel-mesh balconies in the form of little Vs point in different directions for the view, while corridors in the M-shaped building are short. Plans for the 221 apartments vary considerably and feature double-height spaces and ample views.



Danish Pavilion, Expo 2010

SHANGHAI, CHINA

A pavilion for next year's World Exposition in Shanghai, inspired by the Möbius strip, spirals around a pool. BIG conceived the scheme to make a point about Denmark's affinity for bicycle transportation. The country will provide 1,000 city bikes that will be parked atop this steel double-spiral structure. Visitors will pick up bikes on the roof and pedal down the ramp, then visit other pavilions. The pool is to be filled with Copenhagen's famous clean harbor water, shipped over to Shanghai for the occasion. In the middle will sit the *Little Mermaid* statue, created by Edvard Eriksen in 1909. A familiar icon of Copenhagen, the statue alludes to Hans Christian Andersen's tale, which is well known to the Chinese.



Tallinn Town Hall

TALLINN, ESTONIA

Transparency in government can be facilitated by architecture, as BIG shows in its competition-winning design for the picturesque capital of Estonia. Collaborating with London-based engineers Adams Kara Taylor, BIG has designed a 301,389-square-foot complex with Vierendeel trusses in which a geometric cluster of government spaces is elevated over and organized around a public market. The tallest of these is a prismatic tower containing a city council room where a sloping ceiling, finished in a mirrored surface, allows the public outside to see activities within through a large window, much like a periscope.



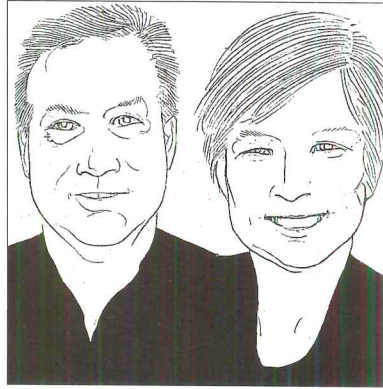
8 House

ØRESTAD, COPENHAGEN

BIG's latest mixed-use project is nearing completion at the southern point of Ørestad, a district edged by the Copenhagen Canal and, beyond that, the open space of Kalvebod Commons – a reclaimed seabed. Designed for Høpfner, the Danish Oil Company, and Store Frederikslund, the 667,362-square-foot, prefab concrete structure assumes a shape of an angular number 8, enclosing two open spaces. The double-loop form is collapsed at one end to allow pedestrian and bicycle access to the complex via broad ramps. About 129,167 square feet of commercial space occupies the lower floors, while 505 apartments sit on top.

Min | Day

A firm finds fertile ground for innovation in the Midwest, as well as on the left coast



LOCATION: San Francisco, California, and Omaha, Nebraska

FOUNDED: 2003

DESIGN STAFF: 5

PRINCIPALS: E.B. Min, Jeffrey L. Day

EDUCATION: Min: University of California, Berkeley, M.Arch., 1993; Brown University, B.A., 1989; Day: University of California, Berkeley, M.Arch., 1995; Harvard, B.A., 1988

WORK HISTORY: Min: Min Studio, 1998–2002; Delaney and Cochran, 1995–99; the Bay Architects, 1993; William Savidge Architecture, 1989–90; Nicholas Allston Architects, 1987–88; Day: Fernau & Hartman, 1996–2000; Lahn Architects, 1995; Burks-Toma Architects, 1989–92; William R. Sepe, 1984 and 1988; CBT, 1987

COMPLETED PROJECTS:

Lakamp Residence, San Francisco, 2009; Spirits Pavilion, San Francisco, 2008; Soft Cube at Bemis Center, Omaha, 2008; Art Farm Red Shed Video Lounge, Marquette, Nebraska, 2008; L Residence, Omaha, 2008; House on Lake Okoboji, Iowa, 2007

CURRENT PROJECTS: Bemis Center, 2010–; Art Farm, 2010–; Antelope Valley Reflecting Wall, 2011; Platte River House, Nebraska, 2011; Meadow House, Nebraska, 2011

WEB SITE: www.minday.com

SINCE STARTING THEIR FIRM IN 2003, Jeffrey Day and E.B. Min have operated in two worlds – the hilly streets of San Francisco and the flat plains of Nebraska. The origins of Min | Day date back to the early 1990s at the University of California, Berkeley, where both partners went to graduate school and shared a love of conceptual art. While working in the Bay Area, the two considered starting their own firm, but the timing didn't seem quite right. Only when Day decided to move to Nebraska with his fiancée and take a teaching position at the University of Nebraska did their talks get more serious. "Most people thought we were crazy to start a firm right when Jeff was leaving for Nebraska," says Min, who stayed in the Bay Area. "But we thought that unexpected opportunities might arise out there."

Over the past six years, their unorthodox move has proved to be one of the firm's largest assets. "A lot of people think that architecture only happens on the coasts," says Day, "but we actually do some of our most experimental work in the Midwest." A good example is a master plan and renovated barn shed they designed for Art Farm, an artist community in Marquette, Nebraska. "There is a lot of romanticism attached to the image of the barn, but we weren't into that," remarks Day. "Farmers repurpose barns all the time, so we had no hesitation cutting into the structure and inserting something entirely new." The architects resurrected the 100-year-old weathered building by inserting a curving, digitally fabricated foam interior where visitors can recline and watch video installations by Art Farm residents.

For Art Farm and other clients with marginal profits, Min | Day often works with its allied practice FACT (Fabrication And Construction Team), a group affiliated with the University of Nebraska's architecture school and staffed by students, research assistants, and paid interns.

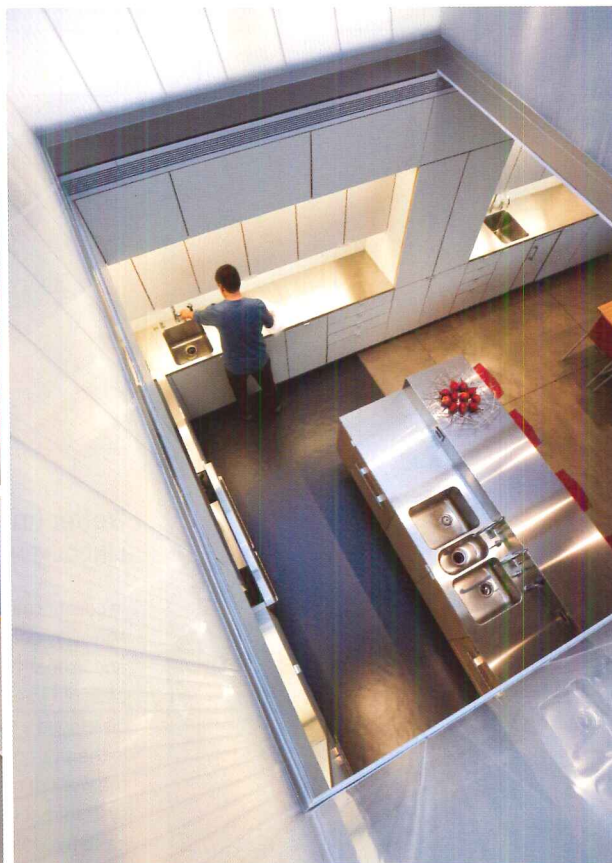
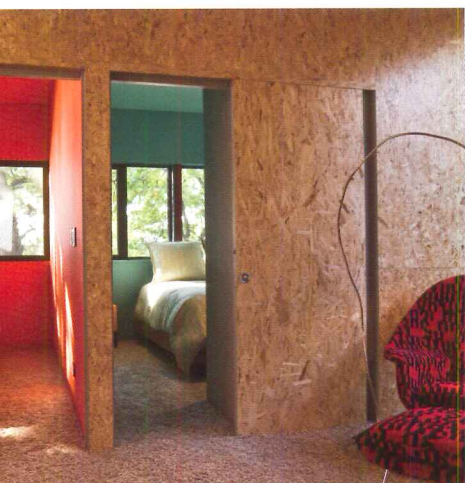
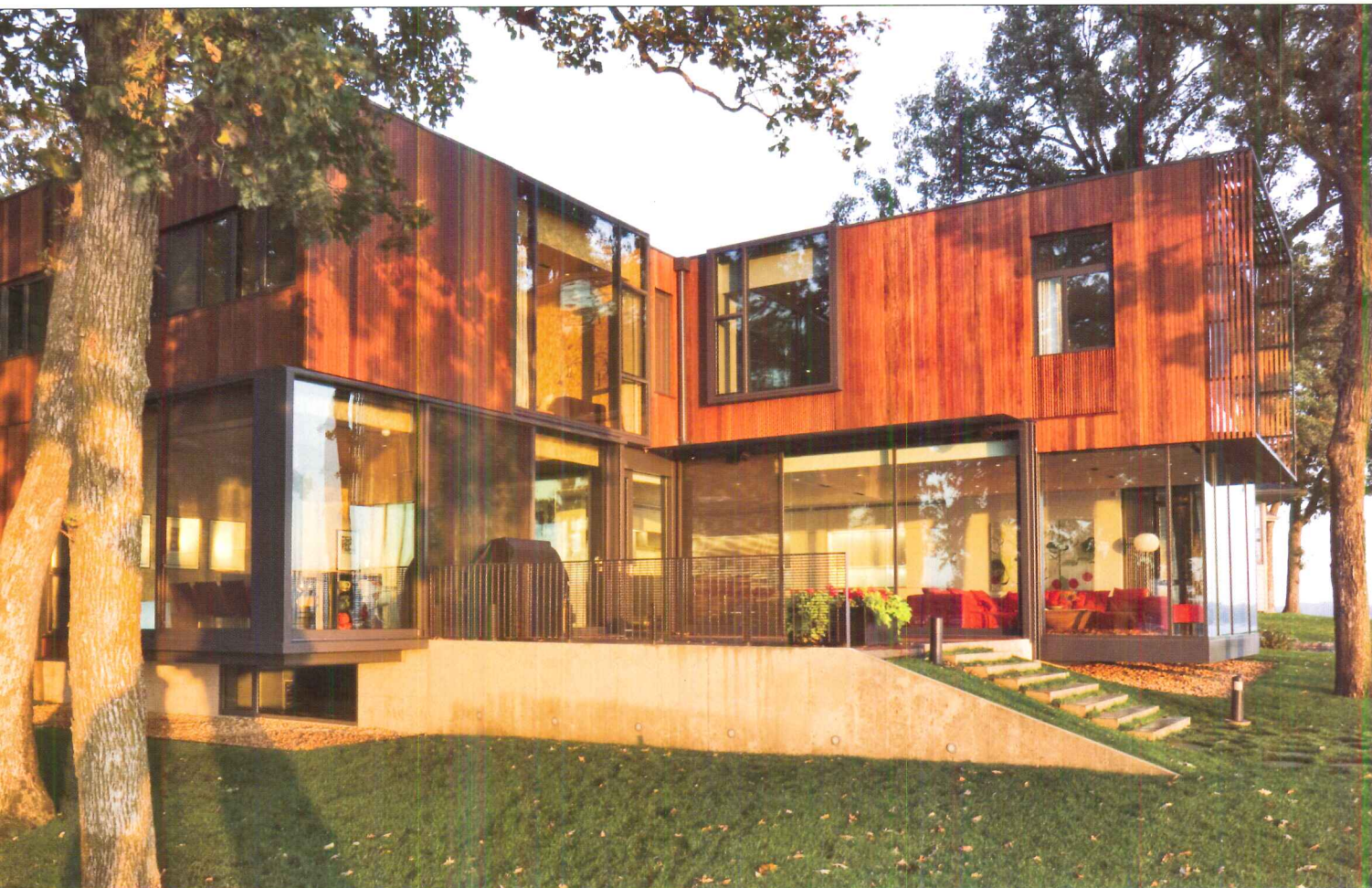
While Min and Day work with a wide variety of clients and at a range of scales, their projects consistently reveal their detail-driven process and technological savvy. For a vacation house on Lake Okoboji in Iowa, a rippling CNC-milled headboard in the master bedroom mimics the nearby lake surface, and the kitchen is filled with custom-designed furnishings. In an Omaha condominium, light filters through digitally fabricated screens designed to look like prairie grass – a nod to the natural world beyond the project's walls.

Throughout the two architects' careers, nature and landscape has seeped into their work. "When I visit Omaha, I love seeing how the landscape changes from rolling hills to foothills to flat farmland," says Min. "It just keeps your eyes fresh." Min's infatuation with nature started when she worked at San Francisco-based Andrea Cochran Landscape Architecture. "In landscape architecture, you deal with color all the time," continues Min. "Seeing how it was used in landscape opened my eyes to using it in architecture."

Vivid shades emanate from much of their work. Color serves as an accent in one project, envelops an entire room in the next, and is completely absent in another. But color is not the defining theme of their practice. "We're not trying to apply a theoretical idea about color when we go into a project," says Day. "Our work always stems from the conditions we're dealing with, not a preconceived framework."

Given the current state of the economy, the firm continues to experiment, but on smaller scales. Recently, it has dabbled in furniture design and created floor plans for Hometta.com, a Web site that sells house plans online. Even though work is slowing down, Min and Day remain hopeful about the future of their firm. "I could see our work looking very different in the next 10 years because we don't have a stylistic agenda," says Day. "We're all about improvising with the conditions at hand and creatively tackling any problems that arise." *Mae Ryan*

Mae Ryan is a New York-based writer and contributor to ARCHITECTURAL RECORD.

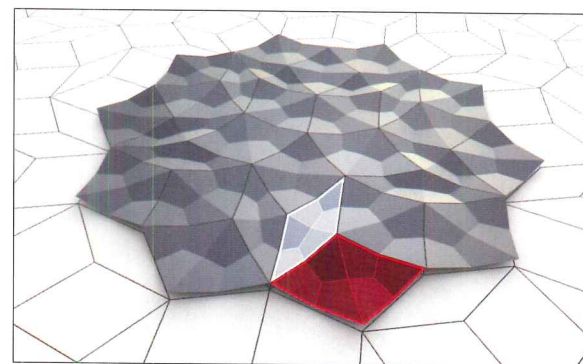
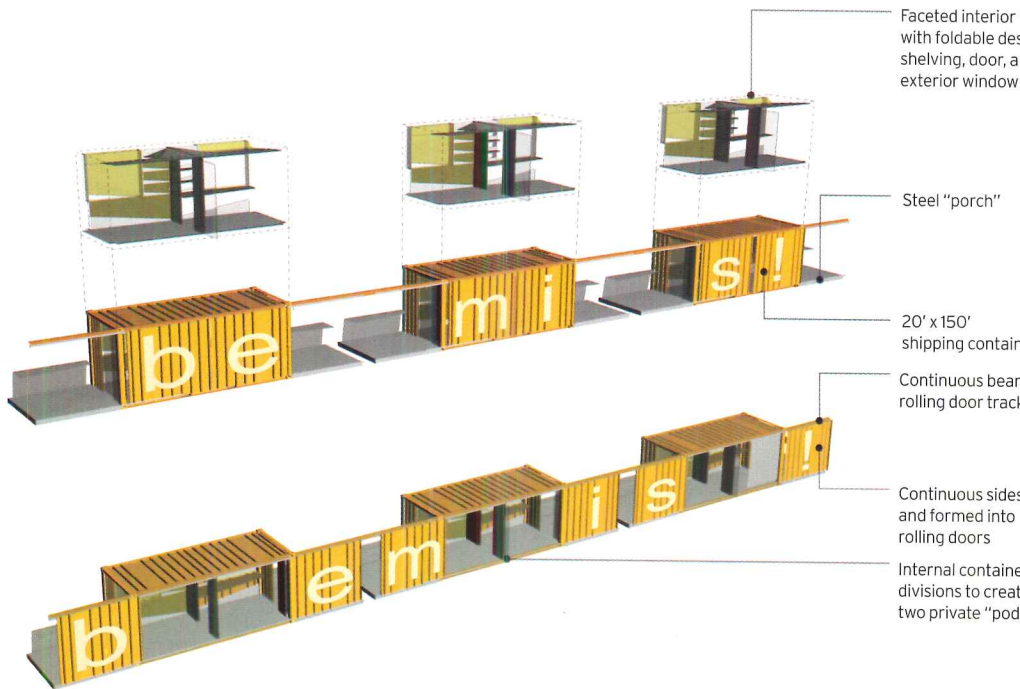


House on Lake Okoboji WEST LAKE OKOBOJI, IOWA

Squeezed onto a small plot of land adjacent to Lake Okoboji, this vacation house maximizes vistas of the lake at every turn while blocking views of neighboring houses. The idea was to create "a series of spatial frames that offer a focused and private experience on an otherwise densely populated shore," say the architects. On the ground floor, the kitchen and living room flow into a large communal space that expands toward the lake on the other side of a large glazed wall. Above the kitchen, a dramatic skylight ringed with opaque polycarbonate transom panels brings daylight into the heart of the two-story house. While the architects used a mostly white color palette for public spaces, they drenched bedrooms and bathrooms, the most private spaces in the house, in color.

Bemis Center for Contemporary Arts OMAHA, NEBRASKA

For an organization founded in 1981 by artists, Min | Day did not want to create a static container for art, but rather a transmutable landscape within which art occurs. Their plan for the Bemis Center – designed in collaboration with FACT (Fabrication And Construction Team) – stems from the ideology of contemporary art practice, which increasingly repudiates objecthood and fixed reference in favor of art that is open to many meanings and experiences. In addition to the landscape-driven master plan, Min | Day proposed a design for the Okada Ceramics & Sculpture Facility, which will contain a studio space with kilns, a ceramics archive, and a large performance space.



Reflecting Wall LINCOLN, NEBRASKA

In collaboration with artists Leslie Iwai and Jamie Burmeister, Min | Day designed the surface treatment for a 1,000-foot-long and 18-foot-high retaining wall that runs along a flood-control plain between a park and the University of Nebraska. The team developed a system of stainless-steel tiles that will reflect changes in the sky, floodwater levels, and activity in the park. Inspired by the work of mathematician Roger Penrose, Min | Day devised a system that uses tiles of only two shapes to create a pattern that has a five-fold rotational symmetry but never repeats.

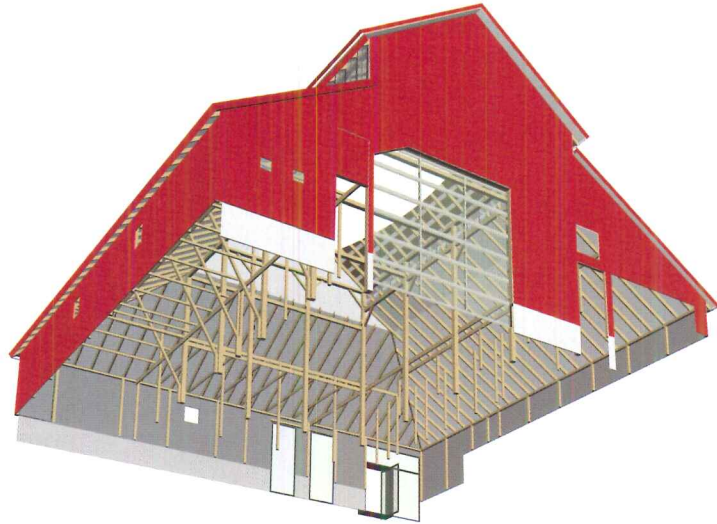


Spirits Pavilion

SAN FRANCISCO

Part of a Slow Food Nation 2008 event, the Spirits Pavilion explored the emerging practices of sustainability and craftsmanship in today's spirits industry. Min | Day designed an environment for sampling cocktails that alludes

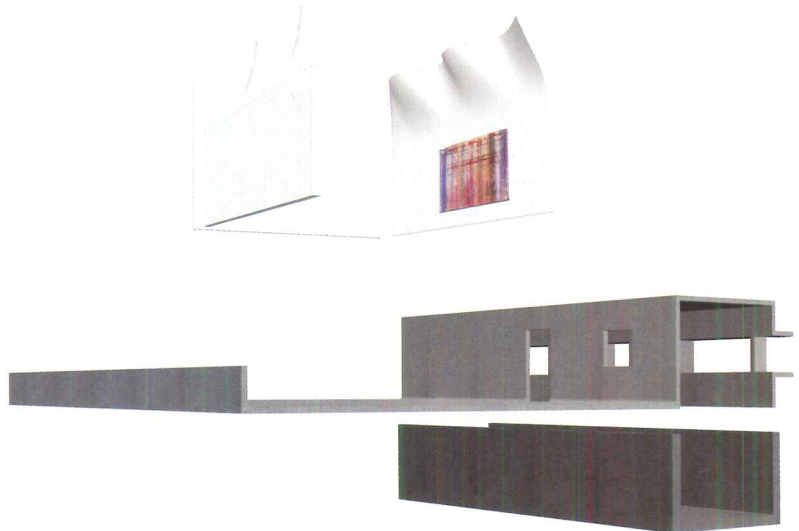
to the alchemical transformation of agricultural sources (such as grapes) into refined products (such as brandy). Colored strips on the floor and walls represent base spirits – whiskey, brandy, rum, vodka, gin, and tequila – and the ingredients they're made from. Paper parasols reminiscent of cocktail umbrellas and clouds add a playful touch and help soften the lighting.



Art Farm and Red Barn Gallery

MARQUETTE, NEBRASKA

In 2003, Min | Day and FACT, a student-staffed design lab led by Jeff Day, began a long-term working relationship with Art Farm, a rural artist-in-residence program in Marquette. The architectural team designed an organizational infrastructure for an expansion of Art Farm over the next 10 years and renovations for salvaged structures that have been moved to the site from other farming communities. The most prominent public space will be the Red Barn Gallery, a salvaged structure with a modern white-walled interior that will display works produced by the Art Farm residents. The architects explain that their design "represents the juxtaposition of the vernacular, place-bound physicality with the abstraction of universal 'white cube' art-gallery space."





Plus
SHIZUOKA PREFECTURE, JAPAN

Located on a steeply sloped site in Shizuoka Prefecture on Japan's main island of Honshu, this second home is composed of two intersecting tubes of space. One faces a protected forest and the other the Pacific Ocean. Clad entirely in white marble, the house has living, dining, and kitchen areas plus an expansive terrace upstairs. The bedrooms and a bath supplied by a natural hot spring are in the lower tube. Distinguished by its graded finish, the white marble becomes increasingly smooth toward the home's extremities, where it reflects the spectacular scenery and merges architecture with nature.





Mount Fuji Architects Studio

A respect for the purity of craft, fused with a deft material hand, help create buildings that seem effortless yet substantial

LOCATION: Tokyo, Japan

FOUNDED: 2004

DESIGN STAFF: 7

PRINCIPAL:

Masahiro Harada, Mao Harada

EDUCATION:

Masahiro Harada: Shibaura Institute of Technology, Tokyo, M.Arch., 1997; B.Arch., 1995; Mao Harada: Shibaura Institute of Technology, Tokyo, B.Arch., 1999

WORK HISTORY: Masahiro Harada: Arata Isozaki & Associates, Tokyo, 2003; José Antonio Martínez Lapeña & Elías Torres Architects, Barcelona, 2001–02; Kengo Kuma and Associates, Tokyo, 1997–2000; Mao Harada: Mount Fuji Architects, 2004–

COMPLETED PROJECTS: Plus, villa, Shizuoka Prefecture, Japan, 2009; Rainy/Sunny, residence, Tokyo, 2008; Sakura, residence, Tokyo, 2007; M³/KG, residence, Tokyo, 2006; Toririn, delicatessen, Shizuoka Prefecture, Japan, 2004; Secondary Landscape, art archives, Tokyo, 2004; XXXX House, studio, Shizuoka Prefecture, Japan, 2003

CURRENT PROJECTS: Tree House, residence, Tokyo, 2009; I-House, residence, Tokyo, 2009; G-Studio, Tokyo, 2010; S-House Project, residence, Shizuoka Prefecture, Japan, 2011; Yotsubako, multifamily housing, Yokohama, 2011; Gothic on the Shore, rental villa, Kanagawa Prefecture, Japan, 2011–; Art Site, museum, Mexico City, 2012–; Football Gusuku, stadium, Okinawa, 2012–

WEB SITE:

www14.plala.or.jp/mfas/fuji.htm

Naomi R. Pollock, AIA, is a Tokyo-based special international correspondent for ARCHITECTURAL RECORD.

ARCHITECTS MASAHIRO AND MAO HARADA, the principals of Mount Fuji Architects Studio, are mountain people. Veteran climbers, they hike parts of the Japan Alps annually with their office staff and named their firm after the country's most venerated peak. With the arrival of bigger commissions, their practice, too, has taken off on a vertical ascent.

Founded in 2004, the husband-and-wife team got their foothold designing and building modest works with their own hands. Named XXXX House (for its crisscrossed frame), their first project was a one-room studio created for Masahiro's father, a retired ship designer turned ceramist. Made almost entirely from laminated sheets of plywood, the building was erected with the aid of able-bodied friends willing to sacrifice a few vacation days. Together they turned the two-dimensional planes into eight three-dimensional, but nonrectangular, frames. Pinned at their cross points, these infrastructural elements add up to a 237-square-foot tube of space with a unique, X-shaped profile.

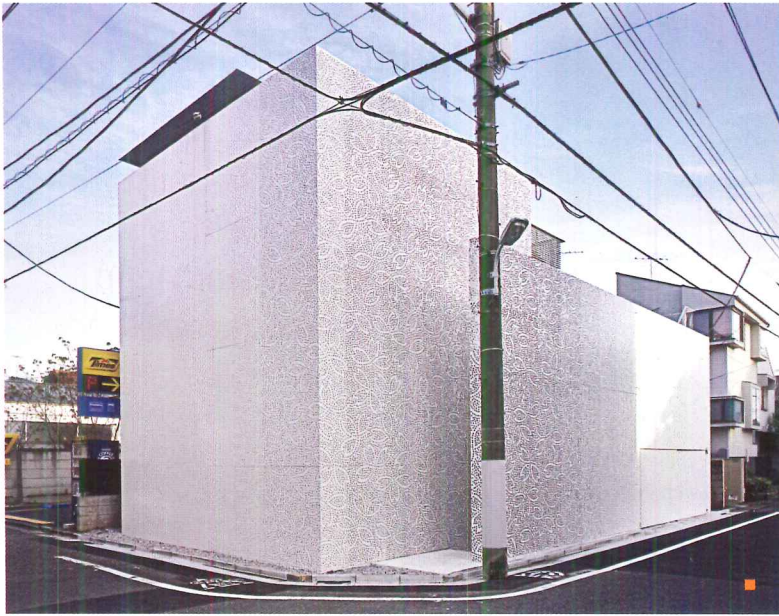
"We used to have a strong tradition of making our entire living environment from readily available materials," laments Masahiro. "That ability was lost, but we hope to bring it back." Mao could not agree more. The daughter of a hands-on architect who crafted a desk, bed, and even window frames for her childhood room, Mao decided to follow her father's career path by studying and making architecture. Masahiro also considered his father's field and even studied nautical engineering alongside architecture. But in the end, buildings beat out boats.

After graduating from the Shibaura Institute of Technology, Mao focused on T-shirt design, art projects, and short stints in architectural offices, at home and overseas. Meanwhile, Masahiro spent three years working for Kengo Kuma, followed by a year and a half in the Barcelona office of José Antonio Martínez Lapeña and Elías Torres. Under Kuma's tutelage, he gleaned firsthand knowledge of bamboo, thatch, and other indigenous construction materials while working on a variety of buildings in Japan.

In terms of career development, however, one of the most pivotal experiences for Masahiro was a competition for a self-built dwelling, for which the young architect united his knowledge of materials and desire to create with his own hands. The result was a biodegradable building supported by arched bamboo ribs blanketed with soil and weeds. Called Spoilable House, the entry took second place and was selected for exhibition, enabling Masahiro to actually test out his scheme by building a version of the house for the display. An implicit goal of this project was to harmonize natural forces and human need – a central tenet of the firm's architecture today. "It's like boat design, where all parts have to balance the pressures of wind and water with function," explains Masahiro. "To me, that kind of object is beautiful."

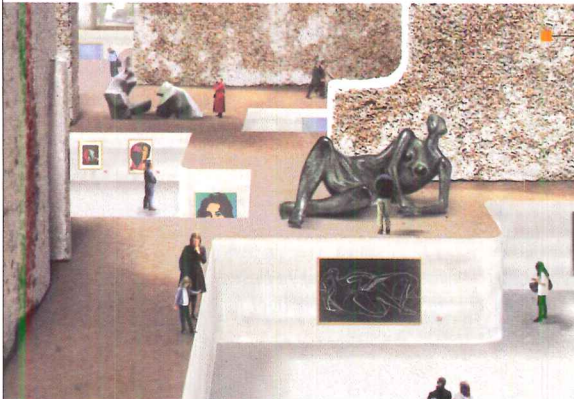
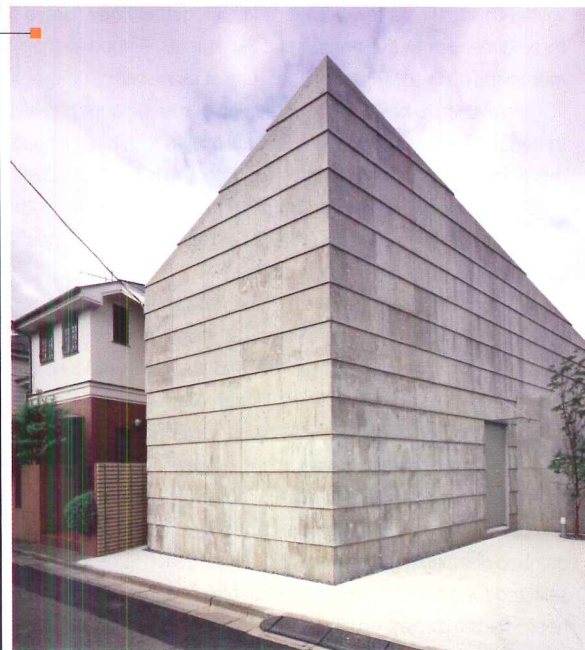
Applying this approach to structural design, the architects use climate, gravity, and other environmental criteria to shape their buildings. For example, wrapped by a concrete wall with a saw-toothed profile, a house dubbed Rainy/Sunny was designed to wear well over time, regardless of the weather. A current residential project called Tree House features a radiating canopy of wood ribs that defy the earth's downward pull. Wrapping around a central, trunklike column that anchors them, the ribs step up sequentially, creating four ceiling heights that correspond with the home's functional quadrants – an updated version of the traditional *ta no ji* square plan named after the Chinese character for "rice paddy."

Today, Mount Fuji Architects Studio continues to produce houses and other small-scale projects, such as street furniture that will be installed in front of the Towada Art Center, designed by Ryue Nishizawa. But a recent spate of larger commissions, including a multistory commercial building in suburban Yokohama, are rapidly elevating the firm to new heights. *Naomi R. Pollock, AIA*



Rainy/Sunny TOKYO

A private residence on the outskirts of Tokyo, Rainy/Sunny stands out from its neighbors but melds comfortably with its physical climate. In Japan, most smooth-surfaced, concrete buildings look great at completion but quickly lose their good looks after exposure to the country's high humidity levels and heavy rains. Instead, this house is enclosed with concrete walls whose shinglelike, saw-toothed profile keeps the water at bay while a full-height window wall on the south side opens onto a garden, bathing the interior with sunshine and daylight.



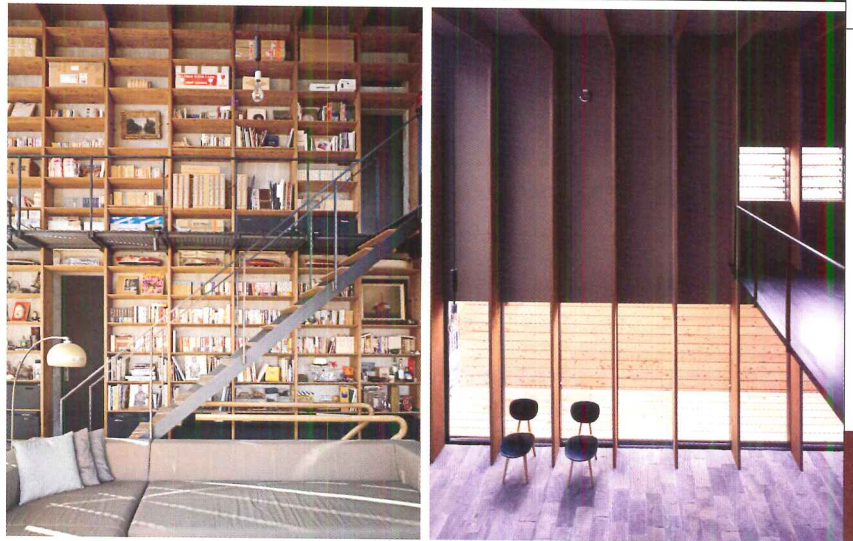
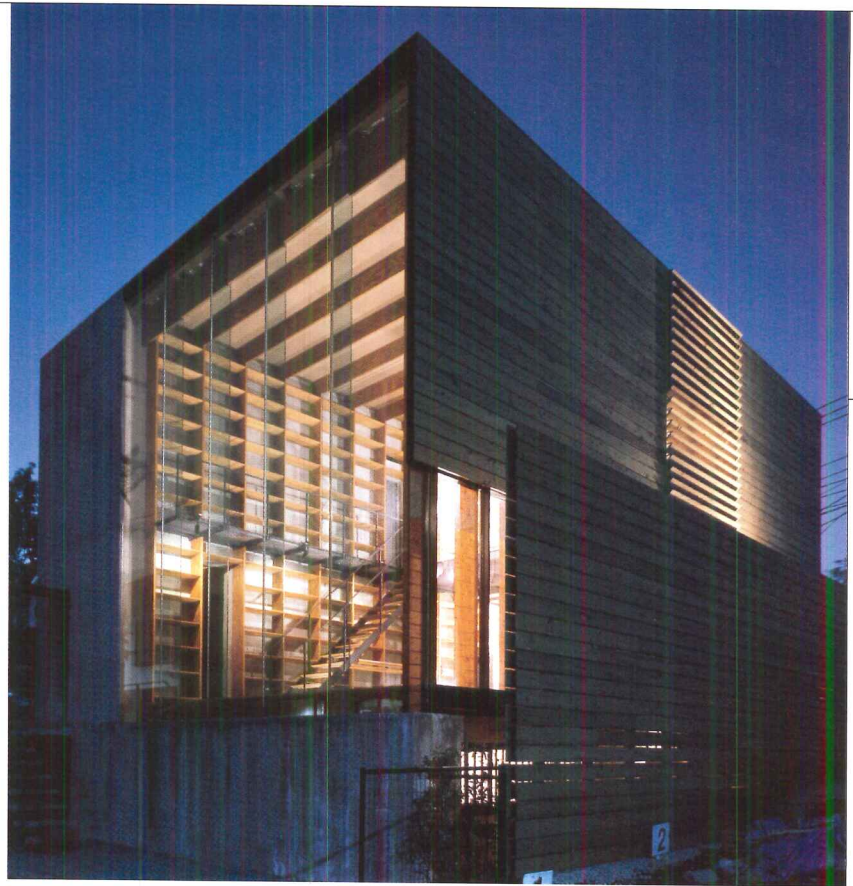
Art Site MEXICO CITY

An entry to a conceptual competition conducted by Japan's *Casa Brutus* magazine, this scheme offers an innovative design for a contemporary art museum in Mexico City. In response to the requirement for a sustainable, low-scale building incorporating a green space, the architects proposed digging a series of holes that would serve as molds for the concrete panels and eliminate the need for wood formwork. Once cured, the concrete panels would stand upright and the excavated spaces would become quasi-independent exhibition spaces.

Sakura

TOKYO

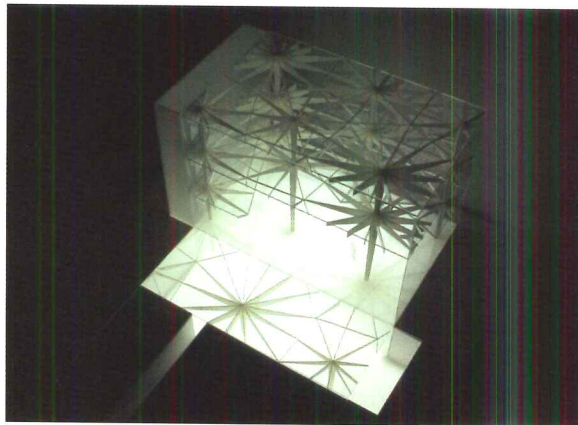
A combined home and office for a couple and their dachshunds, Sakura sits within a densely built, residential neighborhood in the middle of Tokyo. To separate their clients' domain from the surrounding congestion, the architects wrapped two sides of the house with self-supporting walls of lacy steel. Decorated with a punched, floral pattern inspired by a traditional paper stencil depicting cherry blossoms, the metal sheets successfully shield the interior from view but let in plenty of daylight.



M³/KG

TOKYO

A commentary on the abstract, white walls of Modern architecture, M³/KG is a cave-like dwelling made of stone, iron, and textured concrete with a wood-grain imprint. Located in Tokyo's Meguro-ku district, the house was designed for a couple in the movie production business. It consists of two sections: a double-height living room defined by a series of engineered wood frames and an L-shaped concrete block that contains the kitchen, bedroom, gallery, and film archive. Floor-to-ceiling bookcases provide a dramatic visual element to the two-story living room.



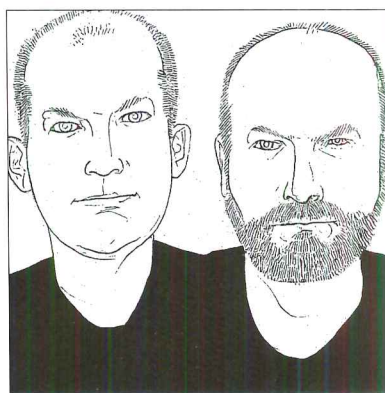
Gothic on the Shore

KANAGAWA PREFECTURE, JAPAN

Planned for the tony second-home community of Hayama, this unbuilt villa fronts the Pacific and backs onto the mountains of the Miura Peninsula. Inspired by the landscape, the architects eschewed a traditional Cartesian coordinate system for an organic series of connected, tree-like frames that blend column and beam together. They then trimmed the "trees," enclosed them in a box, and divided the volume into three floors plus a basement.

Tham & Videgård Arkitekter

A pair of Swedes
shake up the architecture
establishment with
simple design



LOCATION: Stockholm, Sweden

FOUNDED: 1999

DESIGN STAFF: 10

PRINCIPALS: Bolle Tham, Martin Videgård

EDUCATION: Tham: The Royal University College of Fine Arts, Stockholm, 1999; Royal Institute of Technology, Stockholm, 1998; Ecole d'Architecture de Paris-Belleville, 1994–95; International Laboratory for Architecture & Urban Design, San Marino/Urbino, Italy, 1996; Videgård: Royal Institute of Technology, Stockholm, 1997; Universidade do Porto, Portugal, 1996; University College of Arts, Crafts and Design, Stockholm, 1994

WORK HISTORY: Tham: Own practice, 1996–99; Reichen & Robert Architects, Paris, 1994–95; Videgård: Own practice and Wilhelmson Arkitekter, 1997–99; Nyrens Arkitekter, 1995; Berg Arkitektkontor, 1989–90; Can Arkitektkontor, 1987–88

COMPLETED PROJECTS: Humlegården Apartment, Stockholm, 2009; *Crossings: Dialogues for Emergency Architecture*, National Art Museum of China, Beijing, 2009; Kalmar Museum of Art, Kalmar, Sweden, 2008; *The Middle Kingdom*, permanent exhibition, Museum of Far Eastern Antiquities, Stockholm, 2007

CURRENT PROJECTS: Moderna Museet, Malmö, Sweden, 2009; Tellus Nursery School, Stockholm, 2010; Ordos 100, Plot 12, Inner Mongolia, 2010; Tree Hotel, Harads, Sweden, 2010; Housing Västra Kajen, Jönköping, Sweden, 2011; School of Architecture, Royal Institute of Technology, Stockholm, 2013

WEB SITE: www.tvh.se

WHEN BOLLE THAM AND MARTIN VIDEGÅRD opened their Stockholm office 10 years ago, the established architecture in Sweden was, according to them, boring. “We wanted to provide something different from what was out there, something more progressive and contemporary,” Tham recalls. But rather than offering a radical alternative, the twosome relied on subtle shifts in scale and unexpected material choices to create buildings whose surprising simplicity turned out to be a refreshing twist.

Like most young architecture firms just starting out, Tham & Videgård worked mainly on residential projects, developing a niche designing small summer houses in remote locations – a common building type in Sweden, as city dwellers escape to the countryside to enjoy the natural landscape following the long, cold winters. The remoteness of these settings presented both challenges for construction and opportunities for innovative design. For two houses on the outer islands of the Stockholm archipelago inaccessible to car traffic (and thus difficult to supply with building materials), Tham & Videgård built lightweight structures around compact but clever floor plans. For one, on Söderöra Island, the architects wrapped the entire house, like a mummy, in a standard bitumen roofing membrane. “We opted for a solution in which you can see detailing and craftsmanship in the facade,” says Videgård. In the other, they covered the exterior with black-stained plywood planks.

This was not the first time the architects used plywood cladding to create an expressive facade, nor would it be the last. But their decision to clad a museum in this way turned a design for a simple black box containing art into a subversive statement. “This is a ‘low’ material,” admits Tham. “It’s not like stone or glass, which you would typically associate with a public building.” Nevertheless, Tham & Videgård’s proposal for the Kalmar Museum of Art, in the Renaissance city of Kalmar, was selected out of 294 entries in an open, international competition whose theme was “Platform.” Completed in May 2008, the cast-concrete building houses a series of open platforms for art-related activities while providing expansive views of the surrounding park and the historic town’s center.

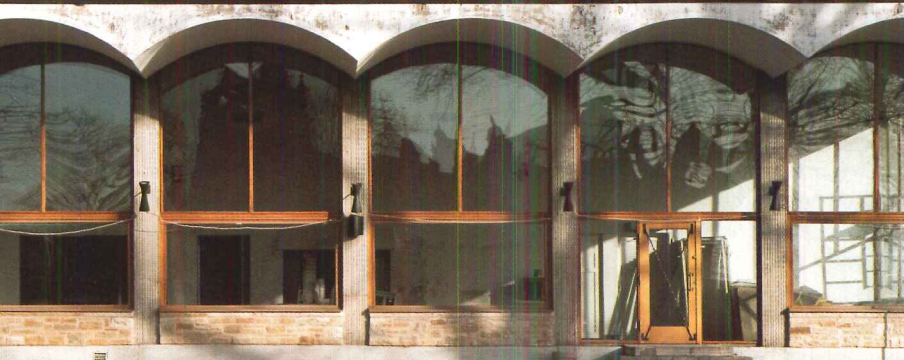
That competition win brought attention to the growing firm, and invitations to competitions soon followed. In a 2007 invited competition – among a field of architects that included the Japanese firm SANAA and influential Swedish architect Gert Wingårdh – Tham & Videgård won first prize for its design of a new School of Architecture building at Stockholm’s Royal Institute of Technology, where both partners had studied. (A new campus entrance building is also part of the commission.) While they jokingly call designing a school of architecture “architecture suicide,” the project is moving forward and is scheduled for completion in 2013. This time, the architects chose to clad the structure in weathering steel, its deep red color matching the dark brick of the surrounding campus buildings, designed in the Nordic National Romantic style of the early 20th century. The building’s rounded form is a departure from the angular geometries the architects employed in their earlier work, but is one they have used again in the design of a nursery school currently under construction in Stockholm. There, the organic layout and common interior plaza encourage movement and interaction among the children around different activities.

While it still designs private residences (including the recently completed Humlegården Apartment), the 10-person firm is presently juggling several projects, many of them public buildings. Its conversion of a former electricity plant in Malmö into a new branch of the Moderna Museet (Museum of Modern Art) is expected to open this winter. “We enjoy doing public projects because they belong to everybody,” Tham says. *Josephine Minutillo*

Kalmar Museum of Art

KALMAR, SWEDEN

Tham & Videgård won an international competition in 2005 for the design of the Kalmar Museum of Art, which opened last year. Located in a Renaissance town in the southeast of Sweden, the simple black cube houses galleries, offices, a public library, and workshops in a series of open platforms. A stair spirals from the entrance lobby up to the fourth floor, where a sawtooth shed roof provides toplit exhibition space for the museum's collection. While the interior features exposed concrete, the exterior is clad in black-stained plywood panels, lending a domestic scale to the public building. Extensive glazed openings on the facades offer views of the surrounding park and nearby lake and castle. At the ground level, the museum connects to a restaurant pavilion dating to the 1930s by Swedish Modernist Sven-Ivar Lind.





Summer House SÖDERÖRA ISLAND, SWEDEN

On a remote island in the Stockholm archipelago, where transport of building materials by car is restricted, the architects had to devise an ingenious solution for the construction of a summer house. The same standard bitumen product that covers the sloping roof runs down the walls. "We wrapped these sheets around the exterior like you would wrap a cast for a broken leg," says Tham. "It creates a nice detail that can only work on such a small structure." Inside the 970-square-foot house, the architects neatly tucked a bathroom, two bedrooms, and a storage space into the four corners of the square floor plan, arranging them around a central open space. Light enters through a large skylight at the roof's summit. Sliding glass doors on the interior of two niches, on opposite sides of the house, also allow light to penetrate the central area (where a kitchenette flanks one wall), and provide sheltered spaces for an entry terrace and indoor-outdoor dining.



New School of Architecture Royal Institute of Technology STOCKHOLM

Tham & Videgård is designing a building for the architecture school where both partners were students. The deep red of the weathering steel facade matches the dark brick of the rest of the nearly 100-year-old campus. Its rounded form on a narrow courtyard site maintains the character of a continuous space. A roof terrace tops six above-grade levels. Below grade, a network of workshop spaces connects to the main library and the campus entrance building (also by Tham & Videgård) like the tentacles of an octopus.



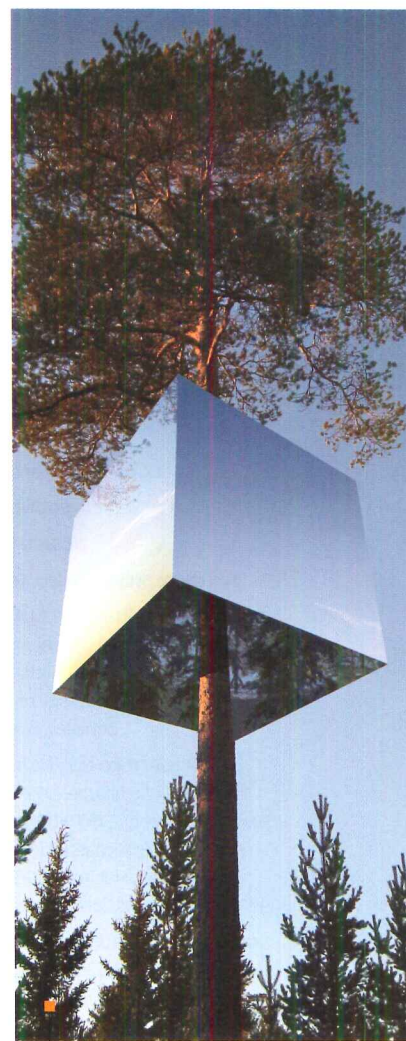
Humlegården Apartment STOCKHOLM

For a Swedish family returning to Stockholm after living abroad in England, Tham & Videgård updated an apartment in a very traditional building not by rearranging the floor plan, but by transforming the floors. Using the colors of autumn, the architects created a vibrant array of wood planks that designate different zones. The architects also selected the furnishings, all in white and all designed by Scandinavian artists and designers. The dining table even takes the shape of Sweden – its long, narrow form a fitting profile around which to gather. The chandelier that hangs above the table is the work of Lagombrå, a Stockholm artist who remakes and recombines objects from Ikea.



Archipelago House HUSARÖ ISLAND, SWEDEN

For another house whose remote location on the Stockholm archipelago limited transport of building materials, Tham & Videgård designed a lightweight structure in wood and glass. Completed in 2006, the 1,400-square-foot summer house – a common building type in Sweden – offers a frame within which to experience nature. Upon a rhomboid-shaped platform, staggered living spaces open onto a wood deck. (Small bedrooms and service areas occupy the back portion of the house.) The geometry of the plan is generated by the site, a flat parcel between mountainous rocks. The zigzag layout creates a series of outdoor spaces that are sheltered from the strong winds while providing views of the Baltic Sea to the west. The black-stained exterior cladding and trellis reference the tall surrounding pine trees.



Tree Hotel HARADS, SWEDEN

Located in the far north of Sweden, the Tree Hotel responds to heightened interest in ecotourism, where travelers can enjoy more direct encounters with nature. Tham & Videgård's design is one of several that will be built this year by Brittas Pensionat, a hotelier in the area. A lightweight aluminum structure is hung around a tree trunk. Its mirrored glass exterior reflects the surrounding trees and sky, creating a camouflaged refuge (with a feature visible to birds to prevent collisions). The 13-by-13-by-13-foot box contains sleeping quarters and a terrace. Access to the cabin will be by a rope ladder or a rope bridge connecting it to other trees. Bathroom facilities are located on the ground.

Neri & Hu Design and Research Office

This husband-and-wife-led firm is crossing boundaries between disciplines and cultures

LOCATION: Shanghai, China

FOUNDED: 2004

DESIGN STAFF: 70

PRINCIPALS: Lyndon Neri, Rossana Hu

EDUCATION: Neri: Harvard, M.Arch., 1992; University of California, Berkeley, B.Arch., 1987; Hu: Princeton, M.Arch. and Urban Planning, 1995; University of California, Berkeley, B.Arch., 1990

WORK HISTORY: Neri: Michael Graves, 1993–2003; Architrope, 1992–93; Steven Harkin, 1992; Team 7, 1987–89; Hu: Rossana Hu, 2000–03; Michael Graves, 1996–99; Ralph Lerner Architect, 1995–96; SOM, 1993; The Architects Collaborative, 1990–92

COMPLETED PROJECTS: The Black Box (88 Yuqing Road), Shanghai, 2009; Bei Restaurant, Beijing, 2008; The Path, Suzhou Cemetery, Suzhou, 2008; The Shoe Box (Pedder Red flagship store), Hong Kong, 2008; Legation Quarter master plan, Beijing, 2005

CURRENT PROJECTS: Julu Lu master plan, Shanghai, 2009; The Water House hotel, Shanghai, 2010; Westin Museum Hotel, Xian, 2011

WEB SITE: www.neriandhu.com



FROM TEACUPS AND BRANDING TO HOTELS and master planning, Lyndon Neri and Rossana Hu have embraced a broad swath of design work since starting their firm, Neri & Hu Design and Research Office (NHDRO), in Shanghai in 2004. Coming from Michael Graves's office, both partners saw nothing unusual in moving from one scale to another – designing ceramic salt-and-pepper shakers one moment, then the plan for the mixed-use Legation Quarter in Beijing the next. "It helps us develop a multifaceted approach," says Neri. "Today, there's a lot more crossover between fields. Marcel Wanders goes from products to hotels. Sejima designs furniture. Even Zumthor does a candlestick for Alessi." Hu adds, "It opens your mind so you don't get caught up in your own world. Doing just a certain type of architecture – with all the theory and history – can trap you in a box."

The husband-and-wife team has taken an entrepreneurial approach to their careers, moving beyond design in 2005 to found Design Republic, a retail company that sells furnishings and furniture from local and international companies to China's emerging middle class. And they helped bring the interiors trade show 100% Design to Shanghai in 2008 and 2009. Recently they completed their own headquarters building at 88 Yuqing Road in Shanghai, which houses a Design Republic store on the ground floor and offices for NHDRO and Design Republic upstairs. Now they have 22 projects on the boards, including a boutique hotel, called The Water House, on the Bund in Shanghai; a Westin hotel and museum in Xian; a seven-story residential complex in Shanghai; and houses in Shanghai, Mexico, Singapore, and the United States. NHDRO's 70-person staff hails from roughly 20 different countries, which is helping the firm tackle more international commissions. "Working globally has created a different dynamic in the office and forced us to rethink how we do things," states Neri. In response to the expanding scale and scope of their work, Neri and Hu have hired an old friend from the U.S. who has experience working on and managing large architecture projects.

"One recurring theme in our work is exploring cultural identity," states Hu, who was born in Taiwan and moved to the United States at age 12. (Neri was born in the Philippines and moved to the U.S. when he was 15.) Since both of the partners are members of the Chinese diaspora and studied and worked in the U.S. for many years, they bring a different perspective on what it means to be Chinese or Asian. "We interpret culture through architecture," she explains. "I think we're becoming more abstract – using signs and symbols and materials to express identity. And we're exploring certain nonvisual vehicles – such as poetry, literature, and storytelling – to do this." Neri and Hu's path from Michael Graves and

Postmodernism to a growing abstraction contrasts with that of architects like Yung Ho Chang, who returned to China in 1993 after studying in the U.S. and took a more Modernist stance until recent years, when he began to incorporate elements taken from China's vernacular and craft traditions. Ironically, both NHDRO and Chang may end up in the same place after coming from different aesthetic directions.

"It's all about the appropriateness of a particular approach to a specific project and place," says Neri. "Sometimes we end up contradicting ourselves, because we're still experimenting. It's both exciting and frustrating." The firm is working on a 35-story tower in Hunan, for example, and wrestling with a new scale and new ideas. "It's a design breakthrough for us, but it's borderline ugly," Neri laughs. "Our only fear is that we'll just become commercial" like so many other Chinese firms. *Clifford A. Pearson*

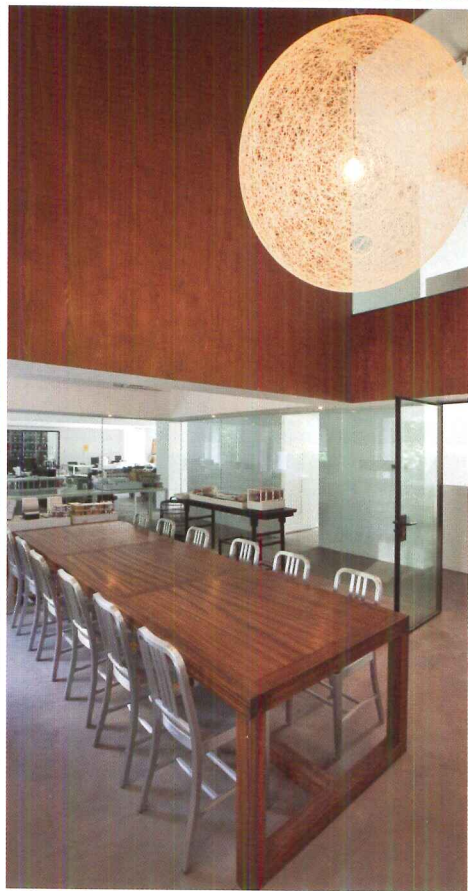


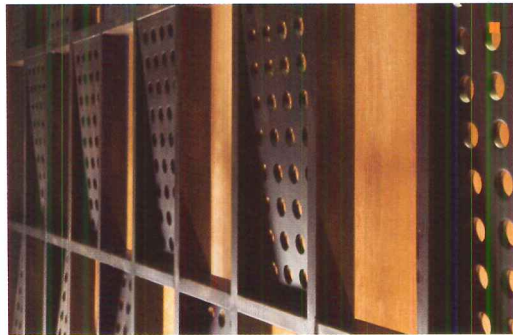


The Black Box (88 Yuqing Road) SHANGHAI

The architects renovated and reskinned a five-story office building on a tree-lined street in the French Concession to create a new headquarters for their architecture firm and their furnishings retail company, Design Republic. They clad the ground floor with wood and inset large windows and glass doors to provide access to a new Design Republic gallery and store. (The original store is on the Bund.) "We approached the store as an extension of the street," states Neri.

Above the ground floor, Neri and Hu treated the building as a flat, black box with projecting steel-framed windows providing shadows and depth to the street facade. The second floor houses a showroom with a full kitchen and offices for Design Republic's 40-person staff. The upper floors serve as the new home for Neri and Hu's expanding architecture firm, which currently has 70 employees. They designed the interiors as a combination of white open spaces and textured boxes clad with materials such as yellow glass (for Design Republic's conference room) and oak (for the architecture firm's conference room).



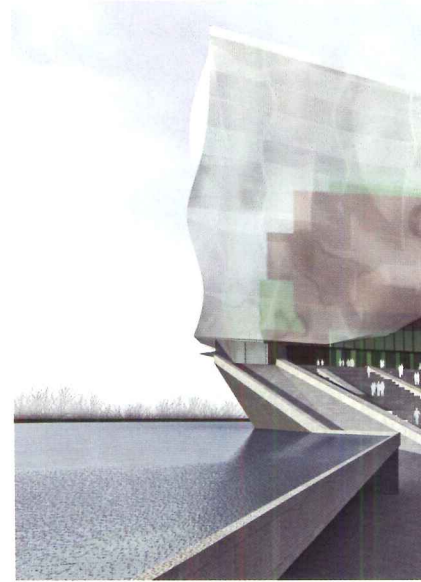


Punk Bar BEIJING

Set in the basement of The Opposite House, a boutique hotel designed by Kengo Kuma, Punk combines heavy materials such as blackened bronze with smoky-glass panels to create an edgy bar targeted at club kids who have grown up and become more affluent. The architects enclosed the bar with a double-layer screen made of perforated bronze plates on the outside and glass and wood on the inside. Colored light between the screen's two layers and wood shelves and booths add warmth to the otherwise industrial palette of materials.

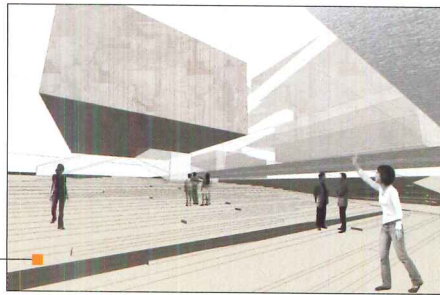
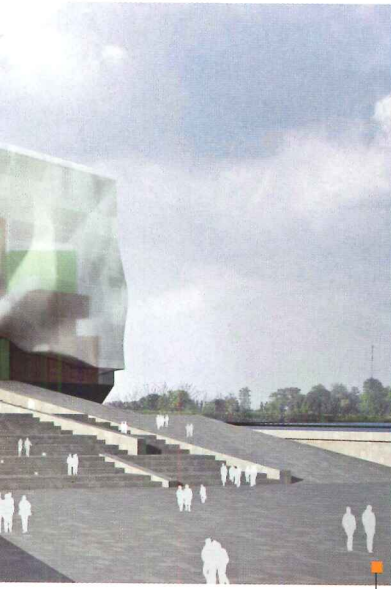
Chengdu Opera House & Art Gallery CHENGDU

In this entry to a design competition, the architects envisioned the project as a "new landscape" with a series of buildings floating above expansive pools of water that serve as an abstract element separating the new from the old. The billowing facades of the buildings reflect and refract light rippling from the surrounding water. Visitors enter the complex from below ground, one level below the datum of water, then can gather in plazas and ascend grand stairs leading to the buildings. Neri and Hu see the new landscape as comprising the ground, the water, and the clouds.



Bei Restaurant BEIJING

The architects envisioned this restaurant in The Opposite House hotel (on the same level as Punk Bar) as a clearing in the forest and wrapped it with a wooden screen evocative of trees. Inside the main dining room, they kept the ambient light level low and suspended naked bulbs at various heights to create abstract "birds" flying above the tables. A raw bar with a long concrete counter anchors one side of the room and draws attention with a large mirror surrounded by a purple-lit wall. The mirror allows diners at the bar to watch the chefs from in front and behind as they prepare dishes. Beyond the main room, five private dining rooms provide an alternative experience, their walls and floors clad in warm oak. These smaller spaces also offer customers a hint of the city beyond the forest – in the form of glass clerestory panels printed with urban scenes and lit from behind.



The Path, Suzhou Cemetery

SUZHOU

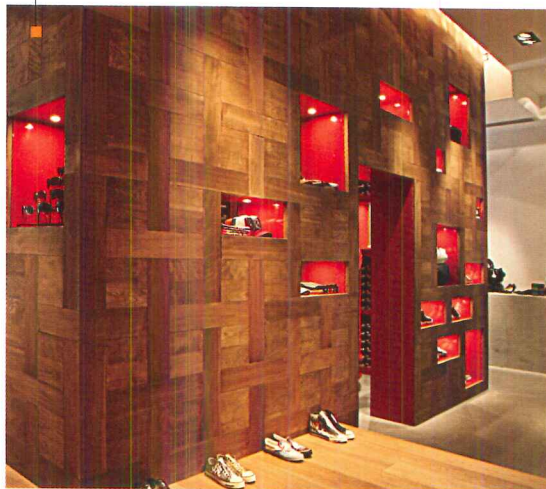
Although a small commission, this memorial site for a family brings together many elements that run through Neri and Hu's body of work – in particular the use of architecture and design to interpret culture. Here they apply their skill at shaping objects and designing furniture to create markers and pavers set within a bamboo grove at Suzhou Cemetery. Carving out a path in the grove, they establish a simple but elegiac procession leading to an outdoor room where an angled metal wall honors the family's dead and looks onto a small lawn where people can gather and remember.

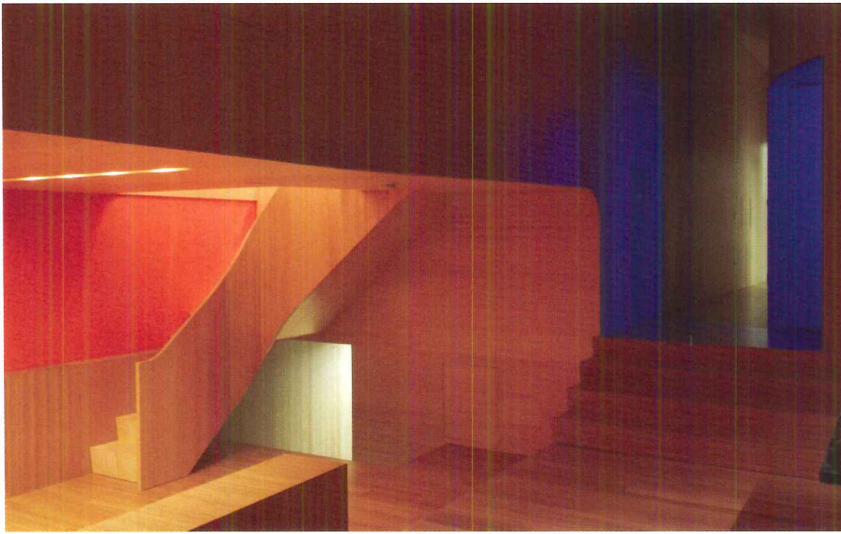


The Shoe Box (Pedder Red Store)

HONG KONG

At this flagship store for the Pedder Red shoe brand in Hong Kong's Central district, Neri and Hu designed a two-story wooden box that provides storage space while also grabbing attention. The architects clad the box with strips of stained-oak arranged in a woven pattern to evoke the stitching found on shoes. Deep niches on the outside of the box are painted red and provide display space for merchandise, while the red continues on the inside where a spiral stair leads to the second level. At most stores the storage area is hidden away, but here it takes center stage. The architects say they wanted to break with retail conventions and make the storage box the heart of the store.



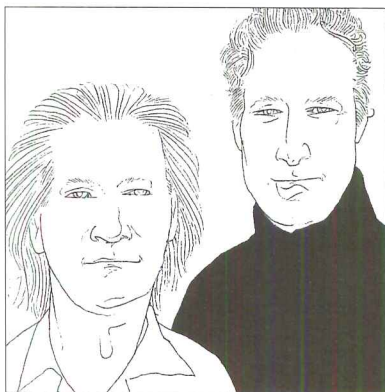


Pull House

GREAT BARRINGTON, MASSACHUSETTS

In their largest built project to date, Taylor and Miller doubled the size of an existing ranch house for an environmentalist and her two children. While an initial design for the project included a new volume nearly separated from the original structure, the architects ultimately opted to largely preserve the house's facade by simply elongating it axially. Making a vertical incision in the facade, they pulled a small second story up and out from the rest of the house. The newly created space contains a semiprivate loft for the mother (one of her few programmatic requirements), which connects to a sunken conversation area downstairs via a curving staircase. In renovating the interior, Taylor and Miller installed bamboo and low-VOC finishes, and added a fully glazed wall at the home's southern terminus to, as Taylor says, "go beyond the prescriptive green notions and establish a connection between the inhabitants and the exterior."





Taylor and Miller Architecture and Design

A Northeast firm finds opportunity in constraint and order in chaos

WHEN JEFF TAYLOR AND B. ALEX MILLER met in a studio class while working toward their M.Arch. degrees at MIT, "It was love at first sight," jokes Miller. "It was one of those weird situations where we had a couple of sit-down conversations after teaching hours, and almost immediately we thought, 'We should work together.'" They founded their firm in 2002, before graduation, and have since completed a number of projects that highlight materiality and craft.

Both from working-class communities in the middle of the country (Miller grew up in Illinois; Taylor hails from Colorado), the pair share an affinity for hand-tooled architecture with conceptual underpinnings. "We developed a good relationship in our studio work and could offer crits to each other in a way that was really productive," says Taylor. That closeness endures – it is especially evident when the two finish each other's sentences. The partners have developed a design process that involves honing a concept verbally until it works. "The more we throw these ideas around, the more comfortable I am with them," says Miller.

On most of their projects to date, one of the two principals will serve as the primary client contact. According to Taylor, his battles with Miller usually "have to do with one of us feeling more concerned or fearful about the client's preconceptions of the provocative ideas we propose. One of us will say, 'You can't do that – the client's going to kill us!' And the other guy will say, 'No, we *have* to do this!'"

Taylor, who had years of experience as a contractor prior to matriculating at MIT, has served as the client liaison on most of their projects in the area of the Berkshires, in Massachusetts, where he lives (Miller lives in Brooklyn, New York). The firm has built several projects in a rural swath of western Massachusetts, where most locals have conservative architectural tastes. When the pair remodeled one school in the Berkshires with a Cor-Ten steel skin, people would drive by and ask when the architects intended to paint it. One neighbor planted a screen of trees between the properties to block his view of the new building; others called building inspectors to complain. "It's not that the work was so radical," says Taylor. "It's just the context. In the end, we're provoking thought about architecture. You come across people who love it, and people who can't stand it. That's feedback that we're doing something successful."

Most of the firm's built work to date has been on small, straightforward spaces – gallery installations, residential additions, a lounge. Taylor and Miller's creative process, then, tends to begin not by discussing function, but by selecting materials. "One of the first questions we ask ourselves is not what the program is, but what it's made of," says Miller.

After determining texture, they move onto tectonics, using both digital design and physical mock-ups to investigate the relationship between a project's parts and its final form. Through careful ordering and repetition, mean materials (for example, cedar slats, strands of hemp rope, or tension cable) converge to make a whole that obscures the individual parts, yet is a pure expression of them. "We don't mind using dumb things to make smart architecture," Miller says. "It's a challenge."

It's also, more often than not, extremely economical. To save money, they do much of their own fabrication in their workshops in Pittsfield, Massachusetts, and Brooklyn, which has the added benefit of giving them more control over each element of their design. The pair is skilled at turning budget constraints into design conceits: "When we're forced to pare things down, there's a lot of care required to amplify the architecture and get it right," says Miller. *Sebastian Howard*

LOCATION: Brooklyn, New York, and Pittsfield, Massachusetts

FOUNDED: 2002

DESIGN STAFF: 2

PRINCIPALS: Jeff Taylor; B. Alex Miller

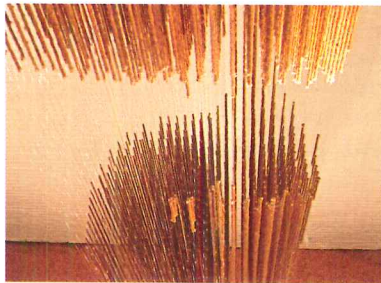
EDUCATION: Taylor: MIT, M.Arch., 2002; Washington University in St. Louis, B.S. in Architecture, 1994; Miller: MIT, M.Arch., 2004; University of Illinois at Urbana-Champaign, B.S. in Architecture, 1999

WORK HISTORY: Taylor: Mesick, Cohen, Wilson and Baker Architects, Albany, New York, 2004; Christine Toupin Architects, Stockbridge, Mass., 1999–2000; Miller: TEN Arquitectos, New York City, 2004; Wilkinson Blender Architecture, Chicago, 1999–2000

COMPLETED PROJECTS: Peel House, Pittsfield, Mass., 2007; Pull House, Great Barrington, Mass., 2008; Linger Lounge, Brooklyn, New York, 2009; Sanctuary Salon and Spa, Brooklyn, New York, 2009

CURRENT PROJECTS: Private day school, the Berkshires, Mass.; Retail display pods, New York City; Chocolate retailer, New York City

WEB SITE: www.taylorandmiller.com



Drawn

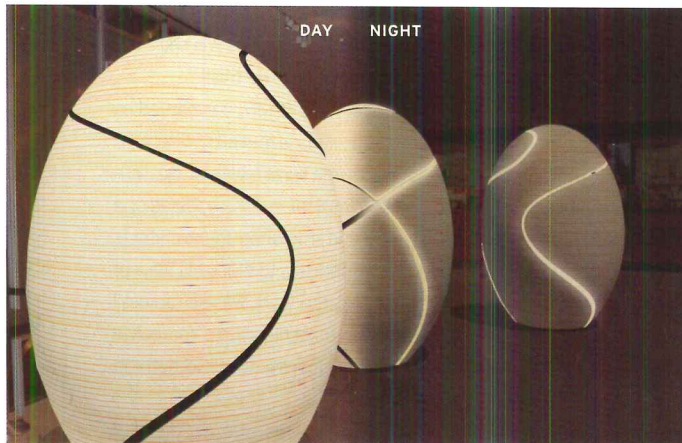
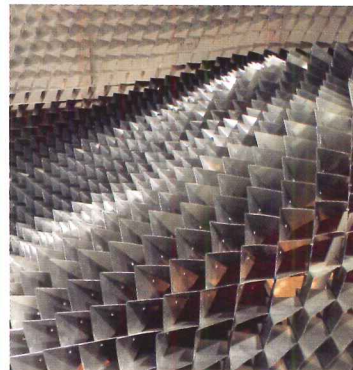
NEW YORK CITY

For under \$6,000, Taylor and Miller designed, built, and installed this ethereal sculpture in the lobby of a residential tower in New York City's Harlem. After fabricating strands of hemp rope and fishing wire in their Berkshires workshop, the pair numbered, coiled, and transported them to New York, where they climbed a 30-foot scaffold and hung the pieces themselves.

Version 3

NEW YORK CITY

This deployable art installation typifies the craft, thrift, and ingenuity often present in Taylor and Miller's work. *Version 3* grew out of an MIT studio project in which Taylor's professor challenged him to create a purely sculptural object evoking lightness, using only metal. The version shown below (the third iteration in a series of similar works) shows the sculpture as installed in Brooklyn's now-defunct Boreas Gallery. With help from an assistant, the architects folded 40,000 pieces of metal flashing and riveted the parts together so that the whole system is completely flexible. ("It can be rolled up like a burrito," says Miller.) An external armature gives it the amorphous shape seen here.



Retail display pods

NEW YORK CITY

A proposed display system for a jewelry designer in Manhattan's Time Warner Center, these retro-futuristic pods look like a hand-fabricated version of something out of James Cameron's *Alien* or Woody Allen's *Sleeper*. Made of laser-cut stacked plywood, the cases would have shown off the jeweler's wares in the upscale mall's open retail area. In the evening, the pods would shut, lock, and illuminate, and when the mall closed for the night, the embedded linear LEDs would turn off to save power. While Miller blames the recession for putting a halt to this project, he says that "with the economy the way it is, pop-up retail is becoming more attractive, so we've been getting some nibbles" from prospective clients.

Sanctuary Salon and Spa

BROOKLYN, NEW YORK

"This project was about overpowering the visual chaos" of a bustling Brooklyn beauty salon, says Taylor. The firm finished overhauling the space in 2009; after going through a number of proposed plans, they settled on a cellular scheme organized around a no-frills plywood shelf. By deploying the boxes on nearly every square inch of the store's walls and ceiling, the design "maintains a very clear architectural form and lets the idea come through," explains Taylor. In addition to the shelves' obvious utility in a place filled with endless bottles of creams and gels, they act as an anechoic chamber, reducing ambient noise in the small space, and enabling private conversations between client and customer. Taylor and Miller also did the millwork on the project.



Private Day School

THE BERKSHIRES, MASSACHUSETTS

Miller isn't quite sure whether or not this proposal for a pre-school through middle school should be called an "addition": The 17,000-square-foot building would be almost double the size of the original structure. The design, which includes classrooms, a library, cafeteria, and multipurpose activity room, would envelop the current building on two sides. The facade's form and window openings would be partially dictated by the size and shape of the factory-produced Cor-Ten steel sheets cladding it. (In 2006, the architects added a Cor-Ten envelope to the existing school building; they found that by using standardized pieces, they were able to minimize construction time and labor.)



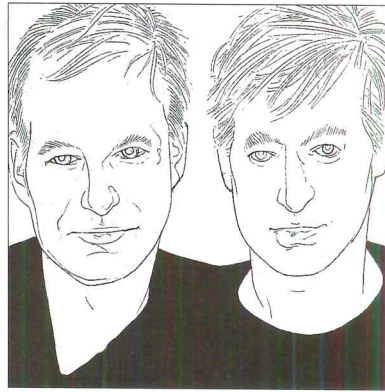
Linger Lounge

BROOKLYN, NEW YORK

Taylor jokes that tenant improvements are always a challenge because architectural design gestures can get subverted the minute the clients actually start using their buildings. "It's not like they're buying Eames chairs," agrees Miller. (The owner of the Linger Lounge specified that Taylor and Miller's renovation "would have to work with the Louis XIV furniture," remembers Miller.) Another constraint, which the pair often grapples with, was the extremely modest project budget. The architects overhauled the lounge's kitchen and bathroom, performed structural work on the old building, and designed and partially fabricated a stunning, severe chandelier in their Brooklyn workshop. They inserted LEDs in steel tubes in the chandelier, which cost under \$10,000, and suspended them from tension cables strung across the width of the space.

Merzproject

A young firm tightly weaves an urban fabric in ever-sprawling Phoenix – next stop, the world



LOCATION: Phoenix, Arizona

FOUNDED: 2004

DESIGN STAFF: 8

PRINCIPALS: Joe Herzog, AIA, Chris Nieto

EDUCATION: Herzog: Arizona State University, M.Arch., 2001; Illinois Wesleyan University, B.A. in international studies and studio art, 1998; Nieto: studied business at Arizona State University

WORK HISTORY: Herzog: Practice – Wendell Burnette, 2003; Will Bruder Architects, 1999–2002; Academic – ASU, studio professor and critic, 2003–; Nieto: managed JFN Mechanical Contracting, 1998–2003

COMPLETED PROJECTS: The Link, Phoenix, 2008; B/S/H Gallery and Training Center, Scottsdale, Arizona, 2008; PTE Real Estate Group Headquarters, Phoenix, 2008; After Hours Building, Phoenix, 2007; Galleries at Turney, Scottsdale, 2007; Hoover House, Phoenix, 2007; Modern Food Market, Phoenix, 2005

CURRENT PROJECTS: Show Low Library, Arizona, 2010; St. Johns City Hall, Arizona, 2010; Duthu Residence, Houston, 2010; Show Low City Hall, 2011; Navajo County Government Center, Holbrook, Arizona, 2011; Carstens Residence, Phoenix, 2011

WEB SITE: www.merzproject.com

WHILE SIPPING BEERS ON THEIR PORCHES in downtown Phoenix in 2003, neighbors Chris Nieto and Joe Herzog, AIA, began brewing up the idea to start their own architecture firm. At the time, Nieto was running his family's contracting company, while Herzog was working for architect Wendell Burnette, following a four-year stint with Will Bruder. "We had a lot of evening conversations about how we wanted to change our city, and our world for that matter," says Herzog.

Those casual chats morphed into a serious venture. In 2004, the duo founded Merzproject – now one of the most popular design studios in Phoenix. In short time, the firm has built a series of economical, sustainable, and urban projects and garnered several honors: Its Galleries at Turney (2007) was Arizona's first project to earn LEED for Homes certification, for instance, and Hoover House was AIA Arizona's Home of the Year in 2008. Moreover, *The Arizona Republic* recently named Nieto one of the state's top entrepreneurs under the age of 35. (Nieto handles Merzproject's business affairs, while Herzog is the creative force.) "I think we're part of a new generation, and people are looking to us for design leadership," says Herzog. "We're now pushing into the establishment, and we're pushing the dialogue."

That dialogue often centers on curbing sprawl. With its abundance of tract housing, golf courses, and swimming pools, Phoenix can be a tough place to campaign for a dense urban fabric. Herzog, an Indiana native, started to take on this challenge while earning his M.Arch. degree at Arizona State University. For his thesis project, he proposed stitching together nodes of activity in the valley's core. He called his scheme "[merz] Phoenix," inspired by a word (*merz*) invented by the 20th-century German artist Kurt Schwitters to describe his collage-style paintings and sculptures. Herzog was particularly struck by Schwitters's *Merzbau*, in which the artist transformed his own home into a giant collage, filling it with a bewildering array of objects. "He started to find connections between different pieces, literally taking a string to make the connections," Herzog explains. "A web started to emerge, and new spaces started to form."

Herzog's own "merz" project won a graduate thesis award, and the idea of connectivity has continued to intrigue him, especially as it relates to urban renewal. His and Nieto's firm, which now totals eight employees (two principals, four directors, and two designers), has completed a half-dozen projects within a six-block area in central Phoenix, including its own office, dubbed The Link. Housed in a refurbished 1950s masonry building, the studio is within walking distance of a new light-rail stop, along with an art museum, library, shops, and restaurants.

Merzproject also has a talent, perhaps even a hunger, for handling constraints. Consider After Hours, a 7,500-square-foot, mixed-use building that required some tricky maneuvers due to a 30-foot and two-story height restriction. After discovering that the city measured building height at the median point of the street-facing elevation, the architects devised a single-sloped roof that meets the requirement, yet peaks at 37 feet on one side. And they scooted around the two-story rule by inserting a mezzanine. "There's nothing you can't figure your way out of," Herzog says. "If you set a project in motion with a strong idea, it's easy to resolve problems as you go forward." He adds that their studio is highly collaborative and egalitarian, noting that clients will ask who conceived a specific feature, "and we don't even know."

While Phoenix has served as a fertile testing ground, Merzproject has set its sights much farther out: It's submitting proposals for projects across the globe, focusing on civic work in particular. "We are open to the world," says Nieto. Indeed, one gets the sense that this eager young firm is just beginning to weave an expansive web. *Jenna M. McKnight*

After Hours Building

PHOENIX

Started in 2004, this project was the firm's first major commission. The 7,500-square-foot concrete masonry building contains a graphic design studio, art gallery, wine cellar, and private residence with a rooftop terrace. Several key features were clever solutions to zoning restrictions. For instance, a 30-foot height limit inspired the single-sloped roof, which meets the requirement at its median point but rises 37 feet at its peak, allowing a higher ceiling in the living quarters on the top floor. Located in central Phoenix near a light-rail stop, the building is one of the first to rise in a newly created transit-oriented-development zone. It recently received an environmental excellence award from Valley Forward, an organization that promotes sustainability in Phoenix.

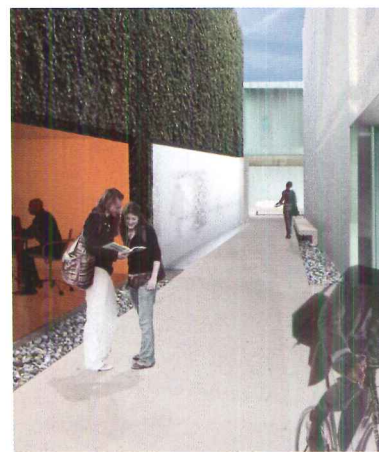
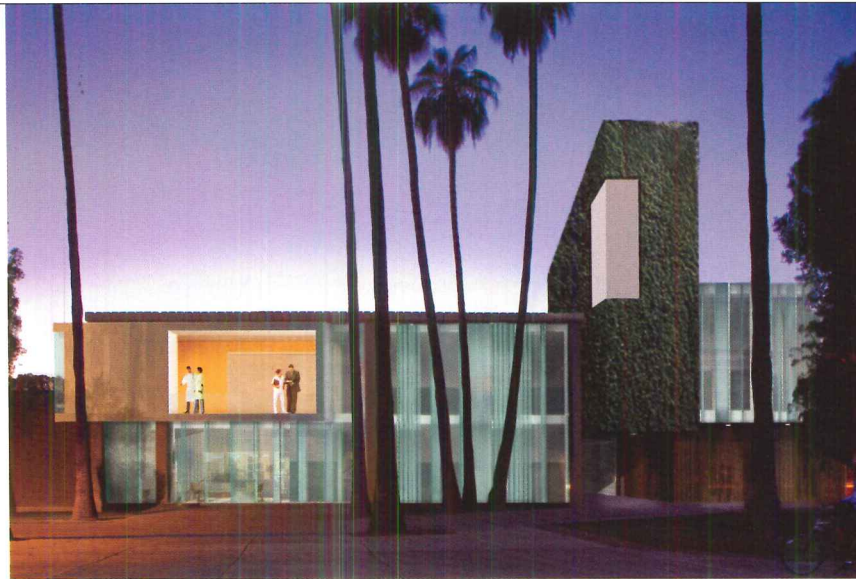




The Link

PHOENIX

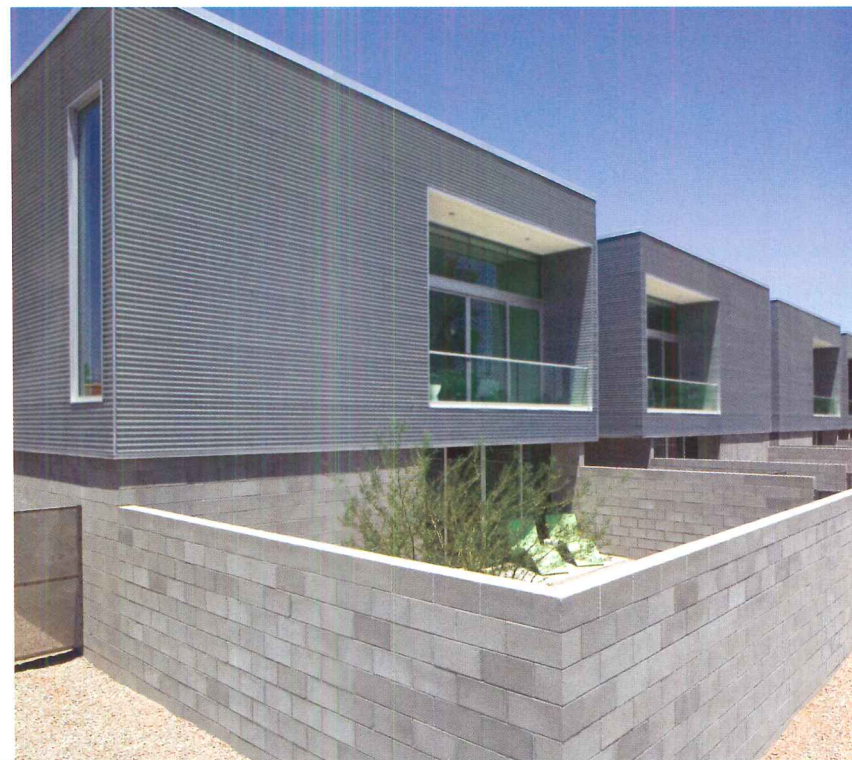
For its own headquarters, Merzproject chose to reuse a 1950s steel-and-brick building in central Phoenix. The architects gutted and renovated the 7,000-square-foot structure and painted the exterior white. Merzproject resides on the upper level, while the ground floor accommodates a coffeehouse, gallery, and office for a nonprofit organization. Polished concrete floors, an exposed concrete ceiling, and an open layout give the space an industrial vibe; glazing on the front facade gives it a powerful street presence. The Link, finished in 2008, is one of six projects by the firm in a six-block area in the Phoenix core, including a tavern, food market, and the mixed-use After Hours Building. A new light-rail stop and the renowned Burton Barr Library, designed by Will Bruder, are within walking distance.



ASU Campus Health Services Building

TEMPE, ARIZONA

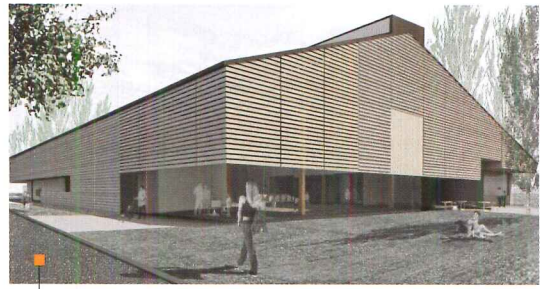
Merzproject designed a 16,000-square-foot expansion to a health-services building on Arizona State University's main campus in Tempe. The proposed scheme, which was part of a campaign to drum up funding for the project, features a two-story structure with a translucent skin; a tall "cooling" tower sheathed in vegetation connects the new building to the old.



Nuss Hotel

SCOTTSDALE, ARIZONA

Located in the heart of Scottsdale and a short walk from shops and art galleries, this boutique hotel is intended to bring the Arizona resort experience into an urban setting. The roughly 60,000-square-foot building will include two restaurants and approximately 75 guest rooms. The top volume will serve as a community space and will look toward Camelback Mountain, one of the valley's most identifiable landmarks. The project currently is in the planning phase.



Show Low Library

SHOW LOW, ARIZONA

For a small town in Arizona, Merzproject has conceived a contemporary library that will add verve to the streetscape. Creating a contextual building was essential to winning support from the community; in response, the architects proposed a design that takes its cue from the lodge construction common in the nearby White Mountains. The facility will be topped by a metal roof and partly covered in a brise-soleil made of cement fiberboard.



Galleries at Turney

SCOTTSDALE, ARIZONA

Completed in 2007, Galleries at Turney was the first project to receive the LEED for Homes certification in Arizona. The complex, built on a 0.62-acre lot, contains eight detached dwellings made of concrete and partly clad in corrugated-zinc panels. The units are organized in two rows of four, with an interior driveway separating the rows and providing access to each home's two-car garage.

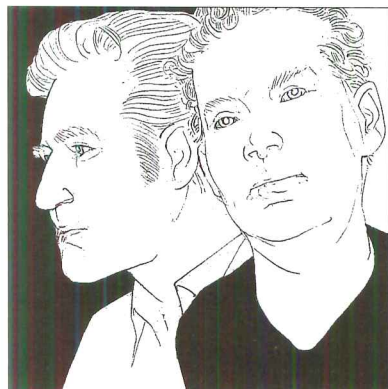
Roughly 2,000 square feet in size, each two-story unit contains all of the amenities a Phoenician might expect to find in a single-family residence: a living room, kitchen, two bedrooms, two baths, two flex spaces, and an outdoor deck. Large windows offer views of the city and surrounding mountains. The architects integrated a number of green elements, such as double-pane, low-E glass and walls finished with low-VOC paint. Moreover, each unit is prepped for 4-kilowatt solar panels. Modern and compact, Galleries at Turney is a striking departure from the sprawling developments so common in the Phoenix area.



Notary's Office Entrance and Reception ANTWERP, BELGIUM

In 2003, Office KGDVS won its first commission – an entrance vestibule and reception area in an 18th-century aristocratic town house in Antwerp. Confronted with a windowless room, the architects tried to make the room's sole inhabitant – a receptionist – forget the bleakness of the original space by inserting a mirrored glass pavilion that acts as visual echo chamber. Geers recalls, "At the time, we were fascinated with the idea of a glass house – like Philip Johnson's – or any late Modernist ideal of a building made of simple glass and almost no profile." With contemporary sustainability and insulation requirements, such a structure would be irresponsible today, but with this space, Geers says, "we thought it would be possible to build an almost utopian version of [the glass house] as an interior." He then describes the ethereal quality of the space: "Because of the mirror foil, the lamps are slightly cloudy. So you have this deep space – you yourself are not so much reflected as much as the lamps are reflected."





Office Kersten Geers David Van Severen

A Belgian firm asks old questions in new ways

LOCATION: Brussels, Belgium

FOUNDED: 2002

DESIGN STAFF: 10

PRINCIPALS: Kersten Geers,
David Van Severen

EDUCATION: Geers: University of Ghent, 1999;
Van Severen: University of Ghent, 2001

WORK HISTORY: Geers: Neutlings Riedijk Architects, 2001–05; Maxwan/Max.1 Architects, 1999–2001; Van Severen: Atelier Maarten Van Severen, 1999–2005; Stéphane Beel, 1999–2004; Xaveer de Geyter, 1999–2004

COMPLETED PROJECTS: *Seven Rooms*, solo exhibition at deSingel, Antwerp, Belgium, 2008; *After the Party*, Venice Biennale, 2008; Exhibition architecture, Bozar, Brussels, Belgium, 2007; Bridge and public space for Handelsbeurs concert hall, Ghent, Belgium, 2006; *35m3* exhibition, Antwerp, Belgium, 2005; Summerhouse, Ghent, Belgium, 2004; Notary's office, entrance and reception, Antwerp, Belgium, 2003

CURRENT PROJECTS: Kortrijk Xpo, master plan, Kortrijk (with Bureau Goddeeris & Joachim Declerck), 2009; Villa Voka, office building, Kortrijk, Belgium (invited competition with Bureau Goddeeris and Bas Smets), 2010; Commercial building, Tiel, Belgium, 2010; Villa in Bugenhout, Belgium, 2010; Public floor for Wiels Art Centre, Brussels (invited competition, 1st prize), 2010; 20 Rooms, town house in Ghent, Belgium, 2011; 25 Rooms, villa in Ordos, Inner Mongolia, China (invited project, selection by Herzog & de Meuron, curated by Ai Weiwei), 2011.

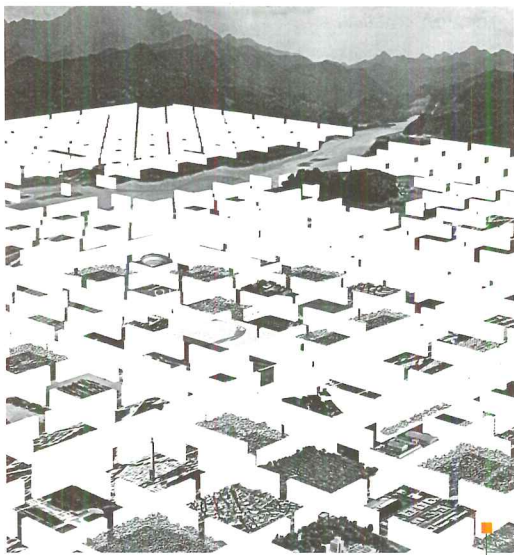
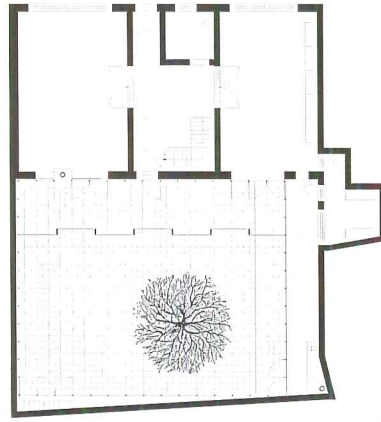
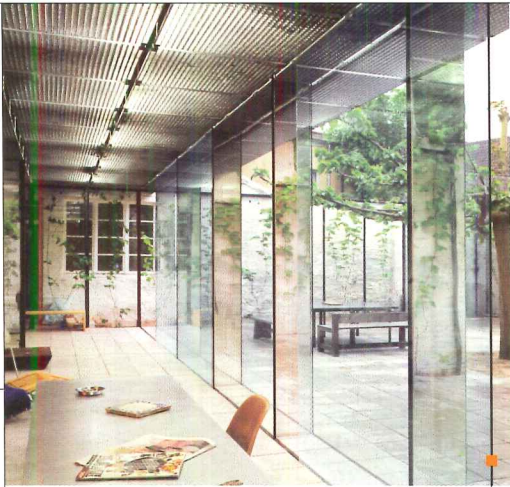
WEB SITE: www.officekgdvs.com

THE WORK OF Office Kersten Geers David Van Severen (KGDVS) demonstrates the firm's search to uncover the essence of architecture – testing the limits of what it means to be a boundary, an enclosure, an entrance, an opening. Often, that line of questioning leads to stark, abstract forms. “Of course there is abstraction in our work; it's hard to deny that, although I sometimes try,” says partner Kersten Geers, laughing at his own contradiction. “But for us, abstraction is more a matter of being precise. I think when you get too many things going, you can become very imprecise.” Geers cites the architectural work of O.M. Ungers and Aldo Rossi, and the urban work of Alison and Peter Smithson and Auguste Perret as precedents. These are old questions – they are arguably the heart of architecture itself – but they have gone unconsidered for some time.

The project that displayed this agenda most clearly was the firm's installation for the Belgian Pavilion at the 2008 Venice Biennale. Not content simply to design an architectural piece, Geers and Van Severen responded to the prevailing architectural (and architectural exhibition) culture of the past 15 years. Geers explains: “We thought, after 10 years of relentless bombarding with nonsensical diagrams and showcases of half-interested journalistic surveys of countries, it was good to show architecture in the most simple, visible, and radical way.” Their answer consisted of a 23-foot double wall, clad in galvanized steel, which created a new courtyard in front of the existing pavilion building. Visitors had to pass through the wall to access the courtyard and pavilion. After doing so, they found that the ground, inside and out, was covered in an even carpet of strewn confetti, with movable black metal chairs here and there. The architects titled the work *After the Party*, a reference to the celebration of the 100th anniversary of the Belgian Pavilion, but also a direct rejoinder to the pervasive architectural strategy that attempts to reduce complex cultural and historical terrain to a simplistic diagram. Office KGDVS practices in another, more elemental language. After the party, they seemed to say, there is only architecture.

But why must “only architecture” sometimes appear so cold? A photograph of a notary's office entrance and reception designed by the firm in Antwerp (opposite), for instance, depicts a space that looks more like an art installation than a workplace. For that project – the first completed work of the firm – the client asked the architects to convert a dank, windowless space into a suitable entrance for the office, which takes up the rest of a historic town house. Office KGDVS's solution consists of a mirrored pavilion with a series of fluorescent lights placed in the cavity behind the glass, producing an endless, deep space. But what would it be like to work there? Geers admits that the room was seen more as a manifesto of their architectural vocabulary – the client was lenient and allowed them to explore ideas that they would develop in subsequent work. Geers adds, “In our defense, the secretary is apparently very happy,” laughing again.

That humor is an integral part of Office KGDVS's work. The partners are asking serious questions but are unafraid to undermine their own solutions. In their work, there is always a moment when the carefully constructed sense of order is uncloaked. At the Venice Biennale, this happened when visitors walked between the perimeter's metal double wall, showing the scaffolding holding up the structure. In the notary's office, the entrance from the hallway allows one to see the back of the glass, revealing the series of materials – cavity, then light, then foil, then glass – that creates the drifting, borderless landscape on the interior. Geers describes this sense of ambivalence: “On one hand, there is the desire of the architect to make the perfect universe. On the other hand, there are all of the tricks you have to perform to make that happen and that, in a sense, fail.” Creating that tension between reality and illusion makes the work of Office KGDVS so alluring, allowing us to see both sides of the curtain. *Aleksandr Bierig*

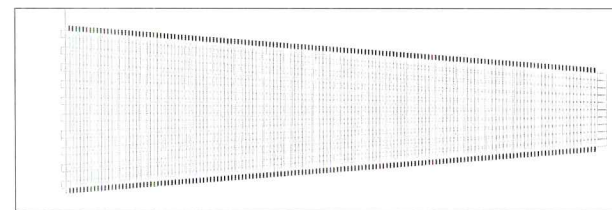
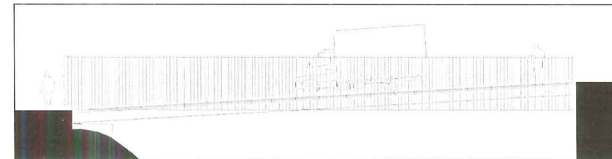


Grammar for the City SOUTH KOREA

This project, developed with the Italian office Dogma, won first place in a master-planning competition for a new city of 500,000 residents. The architects developed a building code that calls for continuous, 100-foot-high structures, creating a series of 590-by-590-foot open public squares. Rather than a prescriptive urban plan, this framework of buildings serves as a catalyst for the activity that happens between them.

Handelsbeurs Bridge GHENT, BELGIUM

Office KGDVS was given the commission in 2006 to design a footbridge to a concert hall in a neglected area that had become more active thanks to planning efforts. Even though an existing bridge stood just 70 feet away, the client asked Geers and Van Severen to design a new bridge leading directly to the hall. Geers says the area was perhaps becoming too dense with public space, so the client wanted a bridge that would assert a domain of its own. "We made a bridge that is an expression of its architecture by defining its space, instead of one that's an expression of its structure, which is so typical of bridges." The notion of clearly framing the space, combined with the need to negotiate a grade change from one side of the canal to the other, led the architects to narrow the bridge at one end and slope it at the same time, creating a fantastic, trompe l'oeil false perspective. Even the gate at one end of the bridge (top) enhances the sense of enclosure.



Merhouse GHENT, BELGIUM

th-century town house in Ghent, a mid-20th-century on had obscured a rear courtyard. Removing the addition moving its kitchen back inside the old house allowed the ects to develop the recovered space free from constraints. nscribing the courtyard with a frame of black steel posts, en which grapevines hang, the architects turned the typical ement sideways – so plant life is on the walls, instead of foot. They also made a strip of space next to the house n intermediary zone that can be closed off with single-pane g glass doors. These doors, along with mirrored glass at the yard’s corners, provide a visual echo within, creating an imve environment entirely apart from the existing structure.

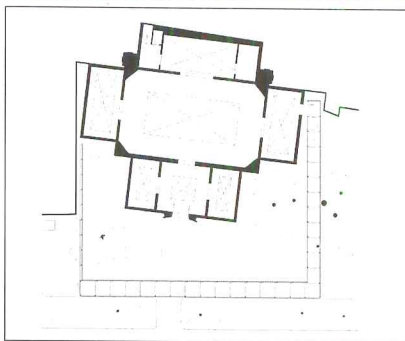
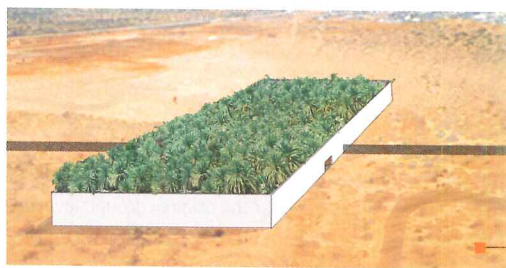


DESIGN VANGUARD 2009

OFFICE KERSTEN GEERS DAVID VAN SEVEREN

Border Crossing MEXICO

This 2005 competition asked entrants to address the treacherous problem of a border station for pedestrians between the United States and Mexico. Working with Wonne Ickx, a Belgian-born architect who is a partner at the Mexico City-based firm Productora, Geers and Van Severen created a severe rectangular frame of 30-foot-high walls, with a single opening on either side of the fence. Inside, they imagine a desert oasis with a grid of palm trees and pavilions for passport control and administration “spread around here and there, becoming a part of the garden.” On a politically untenable site, Office KGDVS offers a solution of willful blitheness, calling into question the problem-solving potential of architectural form.



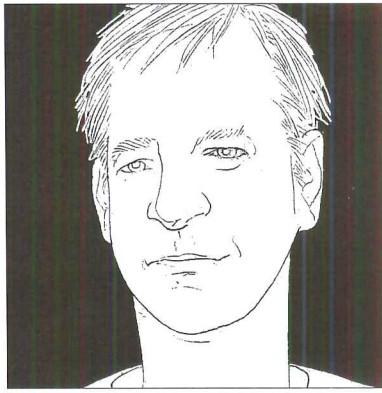
After the Party VENICE BIENNALE 2008

The winning entry in a competition staged by curator Moritz Küng, this project features a 23-foot-high double wall that aligns the Belgian Pavilion’s rotated siting with the prevailing geometry of the street. The walls close off the space from the rest of the Biennale while recasting the existing building as an unusual object within a new frame. The architects spread confetti on the ground in and outside the pavilion, evoking a “party” and creating an unbroken, continuous landscape. Skylights in the building obscured with screens were uncovered to allow daylight in, further diminishing the difference between inside and out.



José María Sánchez García

A spirited, multidisciplinary approach helps this architect engage both historic and natural environments



LOCATION: Madrid, Spain

FOUNDED: July 2006

DESIGN STAFF: 11

PRINCIPAL: José María Sánchez García

EDUCATION: Technical University of Madrid, Superior Technical School of Architecture of Madrid (ETSAM), B.Arch., 2002; M.Arch., 2004

WORK HISTORY: José María Sánchez García Architecture Office, 2006–

COMPLETED PROJECTS: Center for the Technical Development of Physical, Sports, and Recreational Activities, Guijo de Granadilla, Cáceres, Spain, 2009; Agrolab Laboratories, Don Benito, Badajoz, Spain, 2008; Rehabilitation and extension of Obispo Solís Palace, Miajadas, Spain, 2007; Youth Center for Creative Activities, Villanueva de la Serena, Badajoz, Spain, 2006; Pronat Tomato Plant office building, Don Benito, Badajoz, Spain, 2004

CURRENT PROJECTS: Hospedería de Olivenza at San Juan de Dios Convent, Badajoz, Spain, 2009; Hospedería de Alburquerque at Luna Castle, Badajoz, Spain, 2008–; Center for Rowing and Canoeing, Alange, Spain, 2008–; Roman Temple of Diana, Mérida, Spain, 2006–

WEB SITE: www.jmsg.es

THOUGH BASED IN MADRID, where he graduated from the School of Architecture at the Technical University of Madrid in 2002, José María Sánchez García developed his career in his native Extremadura, a relatively poor rural region in western Spain. There he has won a number of competitions for public projects in which the conservation of the region's historic monuments and natural environment are constant themes. In response, his designs often hover over or burrow under their sites. More importantly, his work seeks a formal solidity and directness that interacts with its privileged surroundings as a forceful presence that is never loud in tone.

His attraction to solid geometries was evident in his first private commissions. For the Pronat office building in his hometown of Don Benito, he set the protruding volumes of its southern facade on a large concrete esplanade that underscores the sharply modeled play of light and shadow. For other projects, such as a creative-arts workshop for teenagers in a former water cistern, he has literally drilled through thick concrete and masonry walls to open points of access and light, in a kind of architectural piercing.

He is currently building a publicly sponsored hotel, or hospedería, within the packed-earth bastions of Luna Castle, a National Monument in Alburquerque, slicing through the stone for exterior views. Similarly, Sánchez García is adapting another historic site, the fortified 16th-century convent and military hospital of San Juan de Dios in Olivenza, for use as a hospedería by "clawing" narrow cuts out of packed-earth ramparts that surround the old structure to accommodate guest-room modules. Each room is illuminated by two patios: a light well against the exterior stone wall of the ramparts, and a larger space overlooking the courtyard around the central building. Between the rooms, fingers of packed earth, 18 feet high, house baths and services.

Some of Sánchez García's projects practically skim over delicate sites. When devising a center for rural sports in Guijo de Granadilla in the province of Cáceres near Portugal, he organized a large program into a ring structure 2,000 feet in circumference and raised it on pillars above the flood level of an adjacent reservoir. Seen at close range, the building curves away from view, disappearing amid the trees, while its perfect geometry organizes the landscape around it.

In Mérida, a city rich in Roman monuments, he is wrapping the urban plaza around the Temple of Diana in a structure, L-shaped in section, that floats on slender pillars over the original ground level uncovered by archaeologists. In this competition-winning design, the floor of the structure forms a promenade, and its plain walls and openings discretely house activities, such as cafés and a visitors' center, designed to bring the space to life. According to Sánchez García, "The jury was looking for a syntax, a set of rules that could respond to the changes that came up as the work advanced. The structure forms a clean, neutral facade, without references, but with the massiveness of Roman architecture."

A stint at the Spanish Academy in Rome contributed to Sánchez García's interest in "architecture as something massive that is hollowed out," but he traces this affinity more intimately to the spaces of his childhood. "I always lived in a house with vaulted rooms. My bedroom had no windows. It was one of those traditional alcoves that opened on a corridor for ventilation."

At the same time, he affirms that the perspective offered by Madrid has been crucial to his professional formation, particularly the example of the architect and teacher Alberto Campo Baeza, who instilled in him the importance of "rigor." "You can be very original and take a step forward with every project, but without forgetting the discipline of our profession, which in the end is about knowing how to build, to be coherent, and not get caught up in passing fads." *David Cohn*

David Cohn is ARCHITECTURAL RECORD'S Madrid-based international correspondent.



Center for the Technical Development of Physical, Sports, and Recreational Activities

GUIJO DE GRANADILLA, CÁCERES, SPAIN

Dubbed the Ring, the center provides research and training facilities for water and mountain sports. To minimize its impact on the natural setting, Sánchez García concentrated its programmatic elements (classrooms, workshops, documentation and information centers, guest rooms, cafeteria) in a narrow structure 656 feet in diameter, then finished it in a reflective steel skin. He elevated the building on steel columns, minimizing foundation work, and built it in six months using prefabricated industrial elements. The perfect geometric form is marked at irregular intervals by access porches, while a running track occupies the roof.

DESIGN VANGUARD 2009

JOSE MARIA SANCHEZ GARCIA



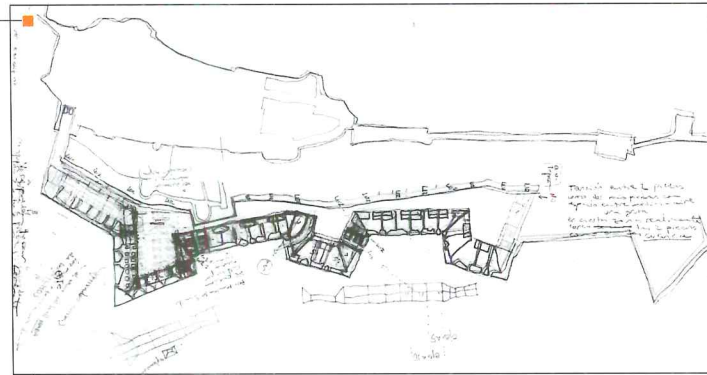


Youth Center for Creative Activities VILLANUEVA DE LA SERENA, BADAJOZ, SPAIN

Sánchez García transformed an obsolete municipal cistern into a youth center for the creation of music, film, theater, and arts and crafts, by boring openings through 11½-foot-thick concrete walls. The minimal but precise intervention reveals a series of churchlike naves, Romanesque in their solidity, and naturally illuminated by a series of round punctures in the vaulted ceilings. A group of cylindrical structures inside the base of the water tower, finished in polycarbonate panels, house mechanical services, bathrooms, a darkroom, and recording studios.

Hospedería, Luna Castle ALBUQUERQUE, BADAJOZ, SPAIN

Historic monuments converted into publicly sponsored regional hotels, hospederías present architects with interesting design challenges. Respecting the integrity of the oldest structure on this site in Badajoz, Sánchez García argued not to build the hotel in the 12th-century castle, as the competition brief suggested, but rather within the 18th-century ramparts below it. He proposed excavating the earth behind the stone walls to create 35 guest rooms, each with a narrow window bored through the stone. The public spaces behind them feature a continuous “crevice” skylight. The overall effect will be “somber, like living in a castle,” he affirms.

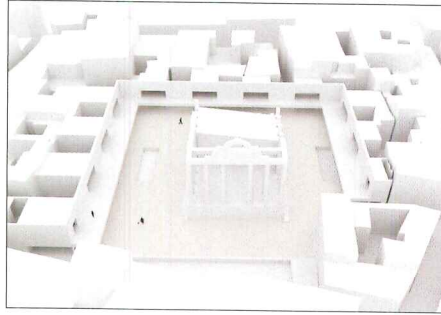




Temple of Diana

MÉRIDA, SPAIN

To consolidate the urban fabric around this ruined Roman temple, the architect proposed a variation on Spain's traditional portico-lined plazas. He encircled the temple on three sides with an unadorned wall and walkway, L-shaped in section, which floats over the site's original ground level (6½ feet below the modern city), supported by a single line of pillars. Behind the wall, the structure accommodates the irregular profiles of the party walls behind it, incorporating different activities between open wells of light.



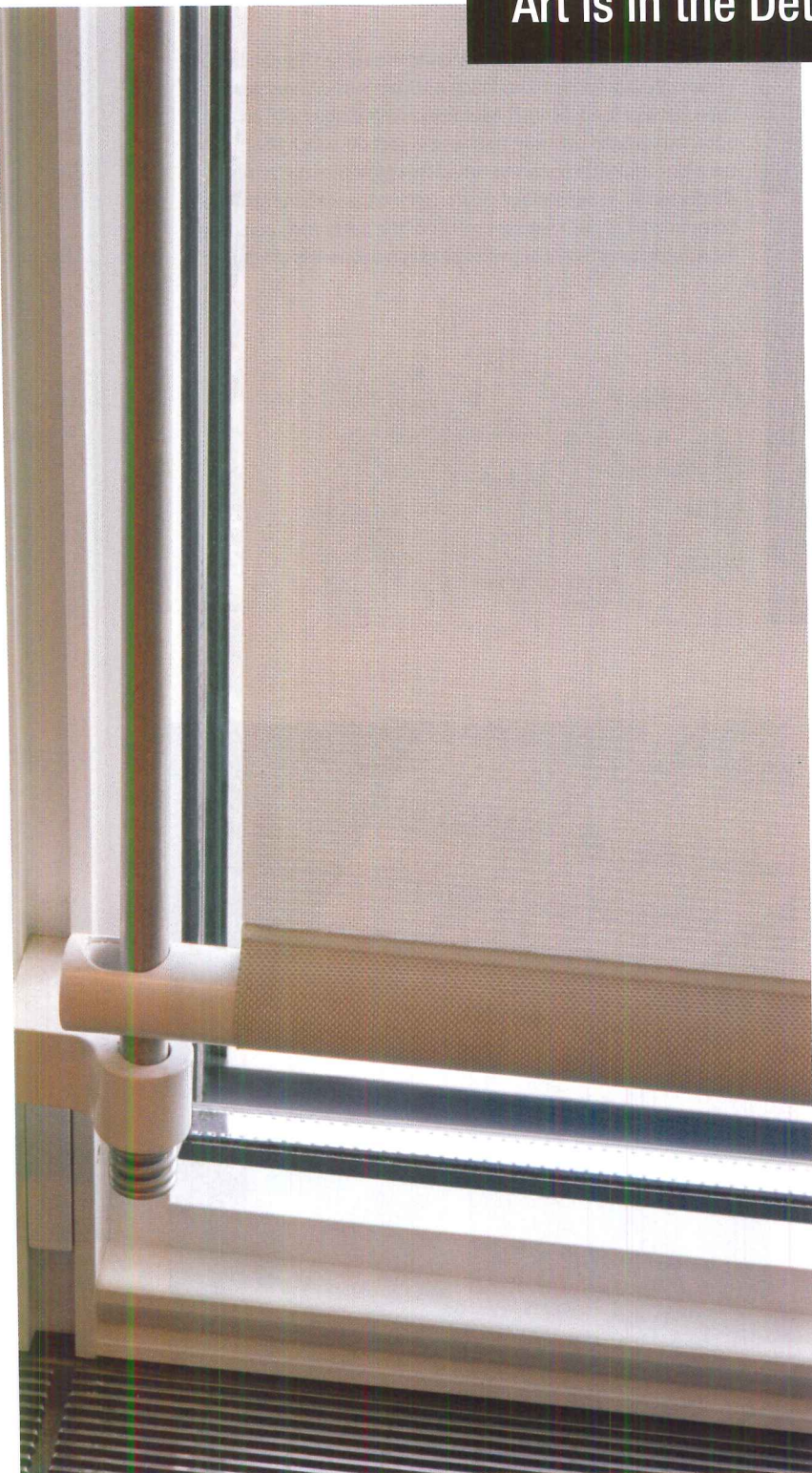
Center for Rowing and Canoeing

ALANGE, BADAJOZ, SPAIN

In this public center for high-performance rowing and canoeing sports near Mérida, Sánchez García designed a trapezoidal-shaped structure that doubles as a lookout platform above a reservoir. Trusses crossing the platform span a multiuse hall and are roofed to provide a porchlike shelter, glazed in part around the entry. Inside, a dramatic switchback ramp, sloped for wheelchairs and suspended from the trusses, creates a sense of movement in the simple space. Sánchez García describes the volume as "like a concrete rock with openings to the views."



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in America**
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Maya Lin creates multiple views of Chinese-American immigration history and culture.

By William Hanley

MORE THAN A DECADE AFTER Frank Gehry's branch of the Solomon R. Guggenheim Museum in Bilbao, Spain, put a small European city on the map, museum designs are frequently expected to incorporate some amount of Bilbao-style spectacle. But as large, city-defining projects in China, Abu Dhabi, and elsewhere generate international attention, a quieter group of noteworthy museums have reached completion. These projects meet focused institutional needs – frequently on modest budgets – and they defer to, rather than try to shape, their respective contexts, while still possessing enough visual appeal to attract visitors.

Allied Works Architects and Integrated Design Solutions tripled the 153-year-old University of Michigan Museum of Art's exhibition space with a new building. An atrium and a glass curtain wall reveal objects and activities in the galleries to passersby with the goal of coaxing them inside, but the addition refrains from overshadowing the museum's original Beaux-Arts building. It also frames and preserves traditional pedestrian circulation through its site.

In San Antonio, Jean-Paul Viguier's expansion of the Marion Koogler McNay Art Museum (with Ford Powell & Carson)

is a prim glass box firmly rooted in the ground behind the museum's original Spanish Colonial mansion turned gallery. The project's strength is in its subtlety. Its white-box galleries – interrupted only by the occasional line of an angular-patterned metal screen – give the museum a more appropriate place to show its collection of 20th-century art than the original building's stucco walls, and a diffused daylighting system creates near ideal conditions for viewing the work.

The defining feature of New York City's Museum of Chinese in America, designed by Maya Lin and Bialosky+ Partners, is not even visible from the street. Lin's scheme revolves around a central courtyard, but she attracts visitors and creates a public face for the institution with a series of storefronts that intrigue but also fit in with the retail character of the building's city block. Inside, a series of galleries wrapping the courtyard demonstrate an exemplary marriage of architecture and exhibition design.

Whether these projects represent a trend away from the sculptural and bombastic in museum design remains to be seen. Cities around the world will no doubt continue to use trophy museum buildings as branding tools and tourism engines. But these projects stand as examples of how a subtle, attuned design can realize the specific goals of an institution. ■

View an expanded Building Types Study featuring additional museum projects at architecturalrecord.com/bts.

University of Michigan Museum of Art

ANN ARBOR, MICHIGAN

An addition adds much-needed exhibition space to a 153-year-old institution and formalizes a campus pedestrian hub

By David Sokol

THE UNIVERSITY OF MICHIGAN

Museum of Art (UMMA) has occupied all or part of the sandstone, Beaux-Arts-style Alumni Memorial Hall since its completion by Donaldson and Meier Architects in 1910. Founded in 1856, it is one of the oldest university art collections in the United States, and since then, it has grown to include more than 18,000 artworks. To accommodate that growth, and to reinvent the institution as a “town square” for the wider campus, UMMA undertook a renovation of the original structure as well as the addition of a 53,000-square-foot wing by Portland, Oregon-based Allied Works Architecture. The expanded facility, which reopened in late March, is an understated yet mature work that defers to Alumni Hall, accommodates existing site uses, and speaks to the institution’s desire to create a community-focused space.

Program

The Allied Works museum addition is a roughly T-shaped volume clad in expanses of limestone panels quarried in Wisconsin. Elsewhere, the double-glazed curtain wall is distinguished by a colonnade of 12-by-4½-inch tubular steel supports, which evokes the proportions and rhythm of Donaldson and Meier’s entry columns. It is located between the north elevation of Alumni Memorial Hall and the Albert Kahn-designed Angell Hall, on the last buildable site on the original



The Frankel Wing (left) adjoining Alumni Memorial Hall.

Architect: Allied Works Architecture – Brad Cloepfil, AIA, principal; Thomas Robinson, project manager; Chelsea Grassinger, project architect; Dan Koch, job captain

Associate architect: Integrated Design Solutions

Client: University of Michigan
Engineers: KPFF (structural); Arup and Integrated Design Solutions (m/e/p)

Consultants: Arup Lighting (lighting/daylighting); Pentagram (graphics and signage); RA Heintges (curtain wall)

Size: 93,814 square feet (total); 53,452 (addition); 40,362 (existing building)

Cost: \$30 million; \$22 million (addition); \$8 million (renovation)

Completion date: March 2009

SOURCES

Exterior cladding: Valders Stone and Marble (limestone)

Windows: Wausau HP Wall

Glazing: Viracon

University of Michigan campus.

“The museum wanted an important building that could work on a campus that hadn’t really supported contemporary architecture,” says Allied Works founder Brad Cloepfil, AIA. “The other charge was to counter the introversion of the historic building.” The new wing is intended to invite students, in particular, into the building.

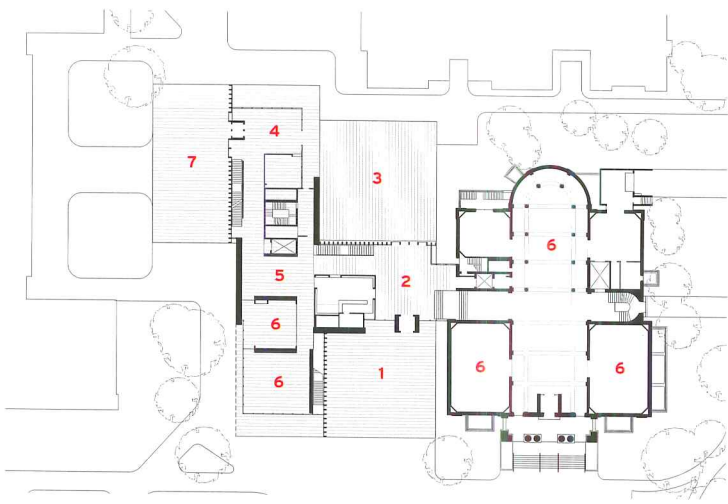
In one respect, the design team had no choice but to welcome the student population. UMMA’s building site directly obstructs the so-called Diag, a major axis for cross-campus pedestrian traffic. “In the middle of the day, a constant flood of students travels diagonally through that space,” says project architect Chelsea Grassinger. “A lot of our initial thinking had to do with respecting the original flow of circulation. The siting and massing of the building tries to integrate with it as much as possible.”

Solution

Officially known as the Maxine and Stuart Frankel and the Frankel Family Wing, Allied Works’ design embraces the Diag by eliminating visual obstructions at grade.

The architects organized the building around three cast-in-place concrete decks. Each one rests on three 6-foot-diameter concrete piers and joins to the steel curtain-wall structure. The limestone panels are clipped to relieving angles. Cloepfil explains, “The intention of the big cantilevers is to maintain some level of transparency [on the ground floor], so it would feel that we were respecting the openness of the site and engaging people as they travel along the Diag and look into the building.”

Cloepfil pushed the curtain wall to the exterior of the tubular-steel colonnade to frame circulation areas. These “lenses” reveal interior activity to potential museumgoers traversing the Diag;



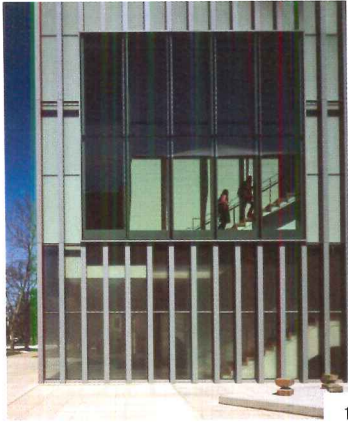
- 1 Entry courtyard
- 2 Entry
- 3 Courtyard
- 4 Common space
- 5 Atrium
- 6 Gallery
- 7 Auditorium



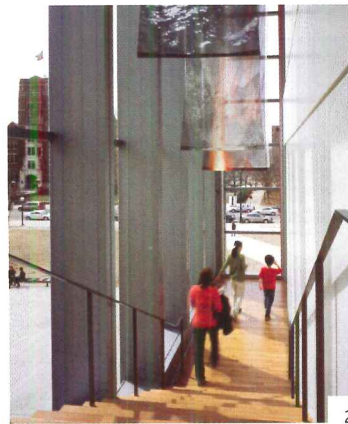
ABOVE: Much of the Frankel Wing's exterior is clad in Wisconsin-quarried "Tiger Stripe" limestone.

BELOW: The addition's steel colonnade echoes the facades of nearby buildings and the existing museum.





1



2

1. The curtain wall reveals exhibitions and museum visitors to passersby.

2. Stairwells create common spaces and draw pedestrian traffic into the building.

3. Three tiers of galleries converge at a central atrium.

for those inside, they provide views to campus without distracting from the work on display.

The trio of decks also fans out in a pinwheel formation around a central atrium that allows students passing through the building to glimpse exhibitions above them. Should they decide to explore the galleries upstairs, they will find three stairwells that support a variety of sequences for repeat visitors. (There is no admission fee.)

The new building not only



3

triples the UMMA's exhibition space, it also accommodates classrooms, conservation labs, a curatorial library, retail, and a 235-seat lecture hall. Yet its entrance clearly feels secondary to the Alumni Hall's front doors.

Commentary

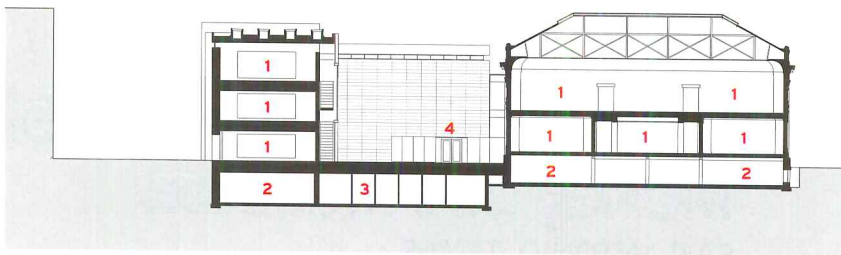
The cantilevering part of Allied Works' design defines three exterior courtyards, and eastern and western portions of the new volume are nipped inward to cre-

ate sheltered porticos bordering these outdoor spaces. But the courtyards are largely unanimated. Hardscaping elements, additional plantings, or arts programming could easily rectify this effect. Up above, the atrium feels truncated. Glazing on the tubular-steel armature that also frames the roof plane would amplify the verticality of this essential feature.

Otherwise, Allied Works has gracefully assimilated the Frankel wing to the well-traversed axis of

the Diag without sacrificing the quiet, contemplative quality of the exhibition spaces. The fritted-glass curtain wall bathes the galleries in diffuse daylight. The effect is moody yet casual, negating a new student's misperception of art viewing as a rarefied activity. The stairwells are particularly successful at striking this mood. Distributed throughout the building in intimately scaled segments, the stairwells are more like rooms that invite student lounging and sketching. ■

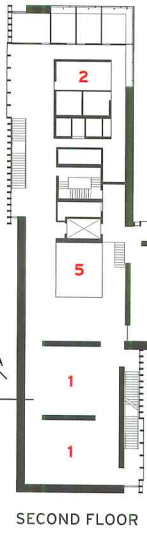
- 1 Gallery
- 2 Administration
- 3 Conservation
- 4 Storage
- 5 Atrium



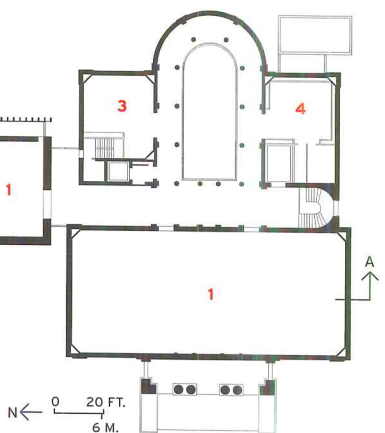
- 1 Gallery
- 2 Collection storage
- 3 Curatorial
- 4 Entry

SECTION A-A

0 20 FT.
6 M.



SECOND FLOOR

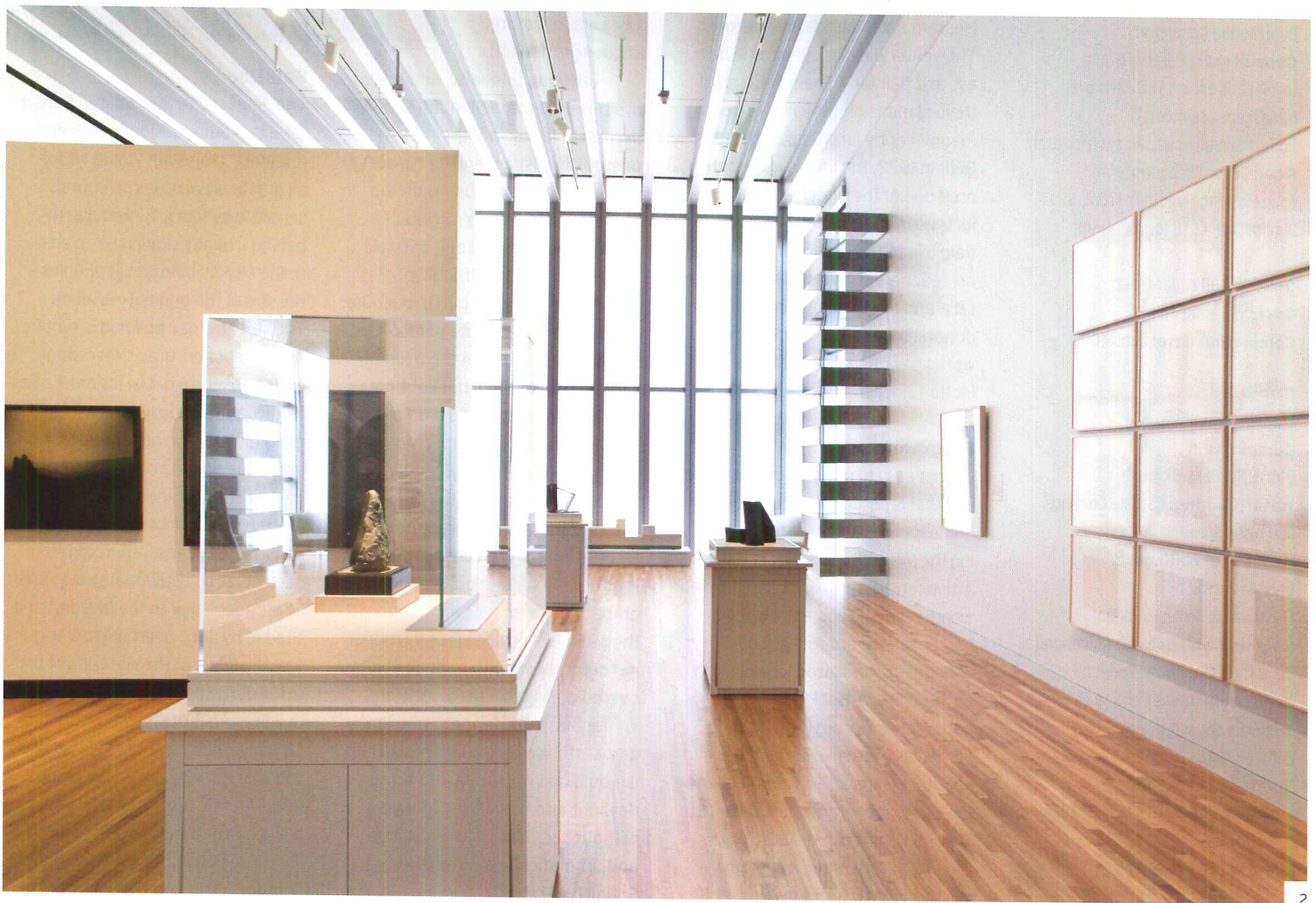


N ← 0 20 FT.
6 M.

1. Allied Works' addition preserves traditional pedestrian pathways through the museum site.
2. Glazing with ceramic fritting and a film interlayer diffuses natural light into the gallery spaces.



1



2

Stieren Center for Exhibitions, McNay Art Museum

SAN ANTONIO, TEXAS

Jean-Paul Viguier's expansion to the McNay Art Museum gives the Spanish Colonial Revival building a Modernist companion

By Charles Linn, FAIA

Architect: Jean-Paul Viguier s.a. d'architecture, in association with Ford Powell & Carson – Jean-Paul Viguier, Hon. FAIA, Blin Vose Trincal (Jean-Paul Viguier s.a. d'architecture); Chris Carson, FAIA, Viola Lopez, AIA, YuLong Yang, AIA, Gary Coombs, AIA

Contractor: Whiting-Turner Contracting Company

Consultants: Paratus Group (project director); TBG Partners (landscape architects); Robert Silman Associates (structural); Altieri Sebor Wieber (m/e/p); Arup Lighting (lighting); Front, Inc. (enclosure); CSTB (daylighting)

Size: 45,000 square feet

Cost: \$33.1 million

Completion date: June 2008

SOURCES

Doors: Ellison Bronze

Curtain wall:

Oldcastle Glass/Skywall

Waterproofing: Carlisle Coatings and Waterproofing

Acoustical ceilings:

Georgia Pacific

Hardware: Schlage; Hagar

Roof and wall panels: Alucobond; Classic Architectural Products

Insulation: Owens Corning

Wire mesh: Acorn Wire and Iron Works

Paint: Sherwin-Williams

Exterior sun control: Via Glass

Skylights:

Oldcastle Glass/Naturalite

MARION KOOGLER MCNAY

gave San Antonians their first taste of Modern art when she opened her private collection to the public in the 1940s. Her collection, developed over the preceding decades, included work by Cézanne, Van Gogh, and other European Modern masters, as well as Americans, including Childe Hassam and Maurice Prendergast. The venue was the oil-fortune heirless and painter's Spanish Colonial Revival mansion, which overlooks magnificently landscaped gardens. Built in 1928, the house is considered one of the finest examples of its type in the city and is a favorite field trip for schoolchildren and their art teachers. Thanks to McNay's estate, and the largess of many other donors, thousands of additional works have been added to the collection since her death in 1950.

Program

It is not easy to make a house a home, and that is particularly true if it is a home for art. As a place for viewing the McNay's collection of Native American art, the mansion's stenciled wood-beam ceilings; extravagant, hand-painted ceramic tile; and wrought-iron grillework could hardly be more fitting. But Modern and postwar works from the collection – particularly the smaller paintings and sculpture – are easily overwhelmed by the abundant detailing and the building's heavily textured stucco walls.

At 45,000 square feet, the existing McNay is modestly sized.

To do its collection justice, a lot more space appropriate for work of varying scales was needed. The mansion's small rooms and wandering floor plan also made organizing exhibitions into coherent sequences difficult.

Daylight, humidity, and heat are three things in plentiful supply in central Texas, and they are the enemy of most art and its conservators. Back in the 1920s, when the museum was a home, architects simply blocked them out, and this is again one of the difficulties of making the mansion into a museum. The problem of climate control was solved long ago when the building was air-conditioned, but lighting was another matter. As a means of drawing out subtleties of color in their purest forms, daylight is unrivaled. Its use also typically reduces the amount of energy required for electric lighting, which in museums is generally second only to the amount used for air-conditioning. If the technical problems of introducing natural light into a space can be overcome, it provides a huge advantage as far as energy-efficiency and aesthetics are concerned. But it would be very difficult to bring daylight into the McNay mansion without sacrificing wood ceilings and dramatically altering the Spanish-tile roof.



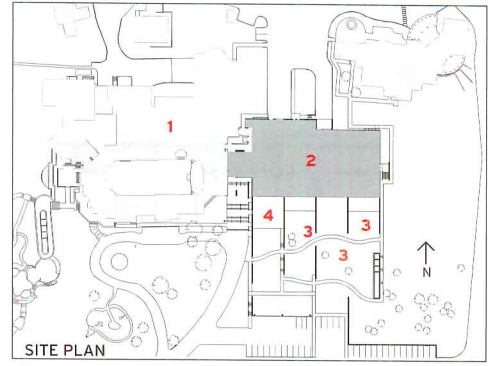
Solution

The Jean and Arthur Stieren Center for Exhibitions, designed by French architect Jean-Paul Viguier, is for all practical purposes an entirely separate building. Tucked quietly behind a gently sloping berm east of the McNay mansion, it doubles the size of the original museum. The steel-framed building is simple: A pair of honed, gray-green stone walls bookend what is, for most of its length, a three-story, south-facing glass facade. Two narrow galleries stacked on top of each other sit immediately behind this window wall and look out to four sculpture gardens. The gardens, separated from each other by additional stone walls, lie perpendicular to the facade, itself shaded by deep overhangs. One enters the lobby at the west end of the extension, where it joins the existing building. An 8,000-square-foot gallery on the opposite side of the lobby satisfies the museum's need for a large, flexible display space for the collection and traveling exhibitions.

The gallery's overhead daylighting system is its most note-

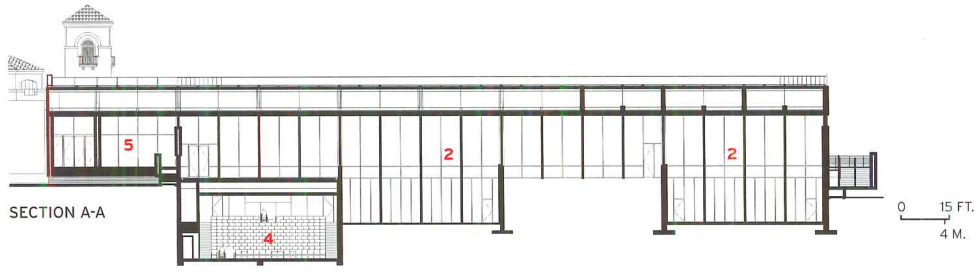


1. The McNay Art Museum is housed in a Spanish Colonial Revival mansion.
2. The Stieren Center's gray-green walls and its position behind a gentle berm tend to make it recede from the original building.
3. Stone walls separate the grassy, sloping area south of the building into a terrace and three sculpture gardens.

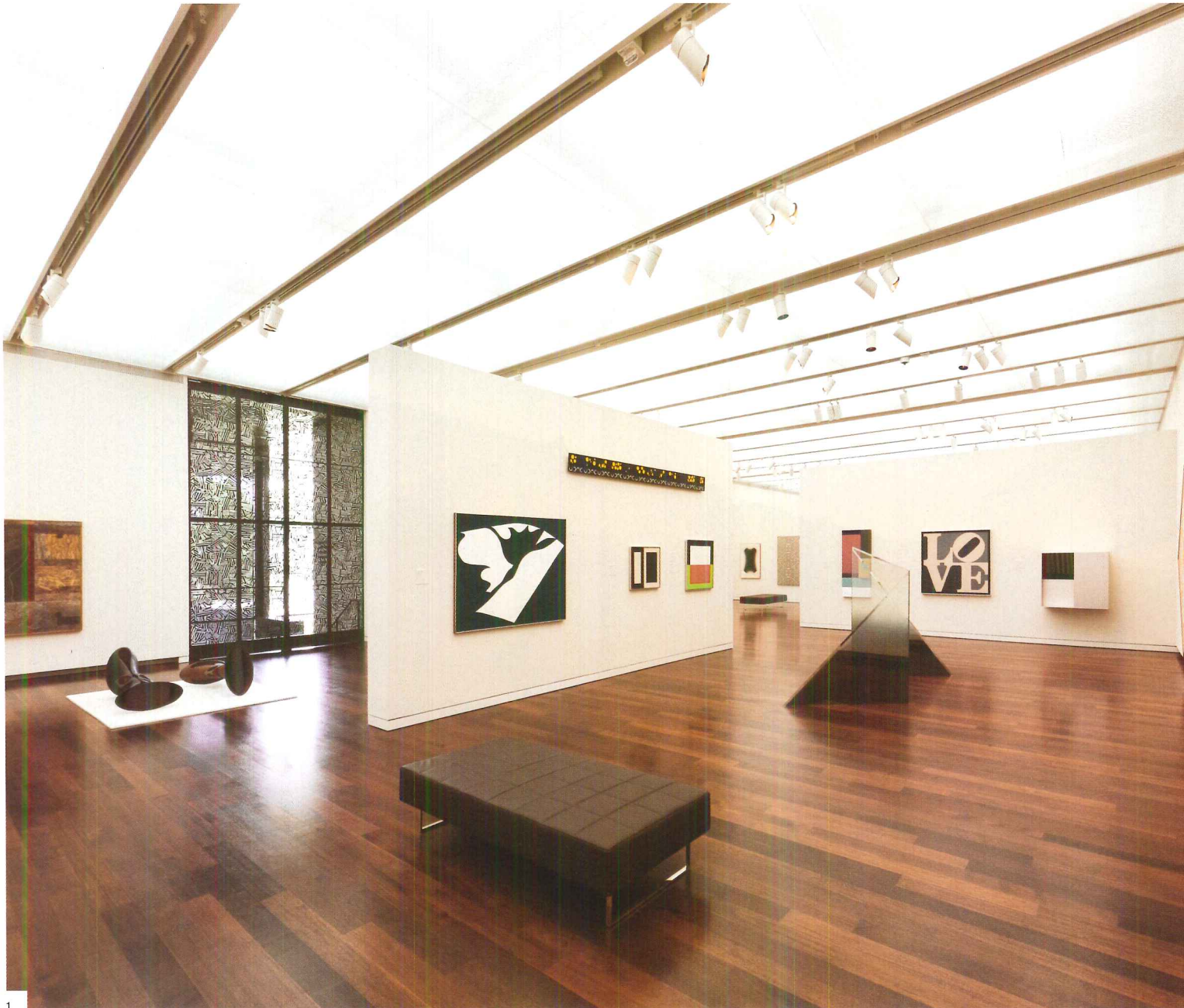
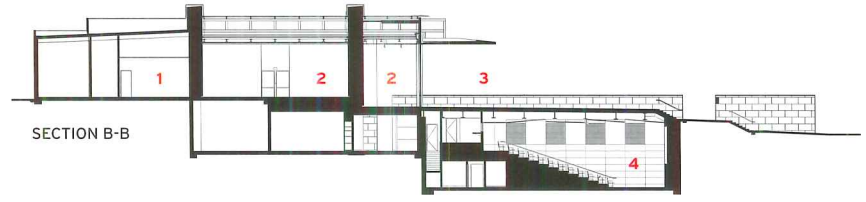


- 1 Existing buildings
- 2 New addition
- 3 Sculpture garden
- 4 Terrace

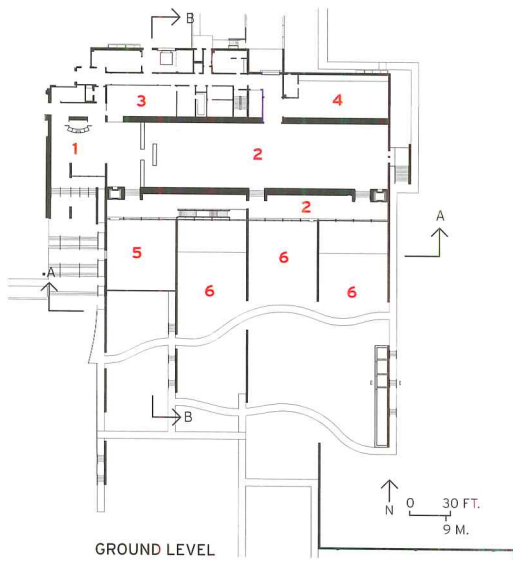




- 1 Museum store
- 2 Gallery
- 3 Terrace
- 4 Auditorium
- 5 Entry



1



- 1 Lobby
- 2 Gallery
- 3 Museum store
- 4 Art receiving
- 5 Terrace
- 6 Sculpture garden



2

worthy feature. The daylights are made from fritted, laminated glass capable of supporting the weight of a person and equipment, necessary during cleaning and maintenance. Located above the daylights are a pair of horizontally mounted roller shades. One is a light-colored, perforated fabric that can be moved when more light is needed. A second, made from blackout cloth, can darken the gallery if required. Steel gables support the exterior glazing, and the whole assemblage is shaded by metal louvers.

Commentary

The program presented to Jean-Paul Viguier was the same as that proposed by museums to many architects: Expand what we have. After that, things got slightly more complicated. Depending on the ambitions of a given museum's director and the ideals of its major patrons, a designer's approach to an existing structure may land anywhere between disciplined, cerebral restraint (think Renzo Piano's Morgan Library in New York) and a spectacular kiss-off (Steven Holl's expansion of the Nelson-Atkins Museum in Kansas City comes to mind). The decision to make a clean break of it in San Antonio, which is not quite as far to the right as Crawford, Texas, but is still very conservative, was surely not an easy one. The safe thing would have been to weld a giant Taco Bell onto the hacienda and call it a day.

- 1. An extremely sophisticated system of louvers, fabric shades, and fritted glass allows beautifully modulated daylight into the new, 8,000-square-foot gallery.
- 2. The stairwell between the upper and lower floors is enclosed by bronze screens designed by Viguier.
- 3. A narrow, two-story gallery overlooks the sculpture gardens.

But taking the easy way out would not in any way have honored the legacy of Marion Koogler McNay. She assembled an enviable collection of contemporary art at a time when even New York collectors were intimidated by some of the work she acquired. Viguier's straightforward and spare solution suits this forward-looking spirit, and integrated into the earth as it is, the addition avoids the sense of weightlessness that many recent U.S. museum projects have turned into a cliché. It is also tightly detailed. The system of louvers and shades fills the main gallery with perfect white, shadow-free daylight. The most difficult part of any extension is the transition between new and old. Here, you cross a threshold just off the Stieren's lobby to find yourself in a minor back gallery deep inside the old mansion. Although a map could tell you *where* you are, it will not tell you *why* you are there. This awkward rear entrance does not live up to the design's overall logic. Admittedly, McNay was independent; maybe she would have approved such an abrupt, albeit surprising, transition. ■



3

Museum of Chinese in America

NEW YORK CITY

Maya Lin channels history with a new home for a growing Chinatown institution

By William Hanley

Architect: Maya Lin, principal; Corinne Ulmann, project manager; Ahti Westphal, Carl Muehleisen, project team

Associate architect: Bialosky+Partners Architects

Client: Museum of Chinese in America

Engineers: Robert Silman Associates (structural); Kam Chiu Associates (mechanical)

Consultants: Matter Architecture Practice, MGMT design (core exhibition design); Brandston Partnership (lighting); Marcus Doshi Lighting Design (exhibition lighting); Beckelman+Capalino (project management); VideoSonic (audiovisual)

Size: 14,000 square feet

Cost: \$3.97 million

Completion date: September 2009

SOURCES

Concrete: Architectural Molded Composites

ACM: Alpolic

Entrances, storefronts: Oldcastle Glass/Vistawall

Acoustical ceilings: Tectum Ceiling Panels

Paneling: Homasote (exhibition paneling)

Office furniture: Haworth

Interior ambient lighting: Mark Architectural Lighting; Lightolier; Halo; Niche Modern

WHAT BEGAN NEARLY three decades ago as the Chinatown History Project, a grassroots organization collecting cultural objects from the sprawling center of Chinese culture in New York, grew into the Museum of Chinese in America (MOCA). It displayed its ever-expanding collection inside a paper-lantern-inspired gallery in Lower Manhattan designed by Billie Tsien, AIA. But as the institution's curatorial agenda expanded to encompass Chinese-American history on a national scale – from New York to California to Kansas – it needed a facility to house more exhibition space and help it develop a national public profile.

Program

MOCA secured a space on the northern edge of Chinatown, and in 2006, it commissioned Maya Lin to turn it into a new home. Not only was Lin a celebrated Chinese-American designer, but she also had a long-standing history with the museum. She, in turn, brought in her associate architect Bialosky+Partners Architects to work on the project.

The midblock amalgam of two buildings with storefronts on both its east and west sides was formerly a machine shop. "The space was really rough," says Lin. The museum would occupy 14,000 square feet on two stories, the street level and a below-grade lower floor. In those spaces, it needed to house galleries for exhibiting its collection of cultural objects – the collection



itself would be stored in the original Mulberry Street building – and to connect its historical holdings to modern cultural production, a gallery for temporary exhibitions of contemporary art. It also required administrative offices, a classroom, a bookstore, and a museum shop. The entire renovation had to stay inside a budget of just over \$3 million.

Solution

Lin's design focuses on an existing central courtyard that rises to the full height of the building. She removed obstructions erected in the space's industrial past, uncovered a tarred-over skylight, and stripped the walls to their original brick. The space, says Lin, refers to both Chinatown's architectural past and a Chinese courtyard house. She also opened four window frames, which look into a series of galleries that wrap around the courtyard on the street level. Glass panels suspended

ABOVE: MOCA's main entrance sits among retail storefronts on Centre Street.

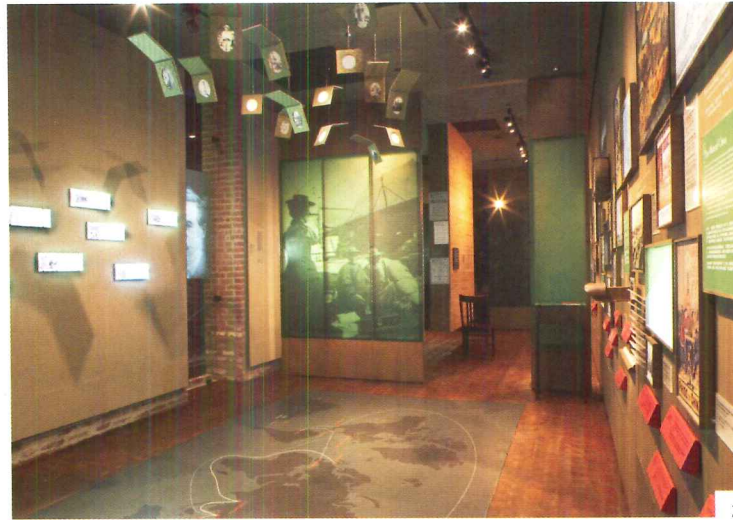
OPPOSITE: A courtyard with windows that open to exhibition galleries is the central move in Lin's design.

in each frame display projected video portraits related to objects on view in the adjacent gallery.

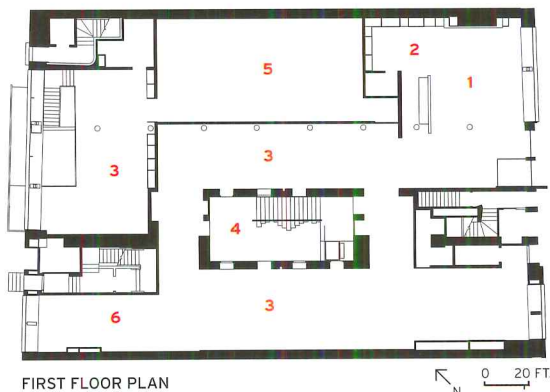
The main galleries allow visitors to move in a chronological sequence through the history of Chinese-American immigration and culture. But Lin also wants visitors to make lateral connections between points in that chronology by standing in the courtyard and looking at sections of the exhibition through the windows. "You should be able to see the changing face of Chinese immigration from the 1820s to the present as a collective," says Lin.

The skylit courtyard allows daylight to penetrate into the classroom and administrative of-





- 1 Entry/Reception
- 2 Bookstore
- 3 Collection gallery
- 4 Atrium
- 5 Temporary-exhibition gallery
- 6 Chinatown store



- 1. A re-creation of a historic Chinatown store has its own storefront and features salvaged and re-created cabinetry.
- 2. Video portraits in the interior windows depict figures and stories contemporary to the objects on view in each gallery.
- 3. Wood panels and celadon-green finishes appear throughout the exhibition spaces.

fices located on the below-grade floor. The lower level is accessible by a set of stairs made from joists salvaged from a removed section of floor. Throughout the project, Lin used only reclaimed or Forest Stewardship Council-approved wood, which, together with daylighting and other sustainable specifica-

tions, has the project on track to be LEED Silver certified.

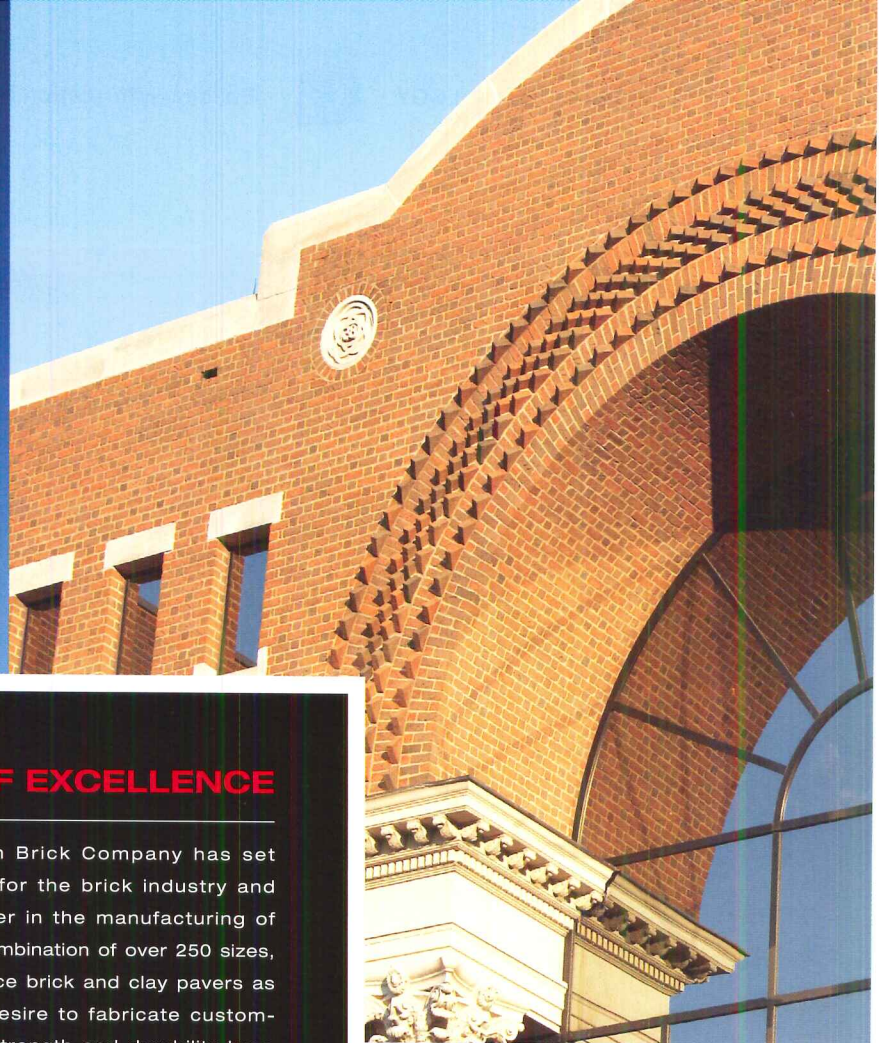
Visitors enter through a reception area on the east side of the building. The entry is flanked by a bookstore and a wall of burnished copper panels emblazoned with the names of museum donors. The panels set the tone for the materials used throughout the project. Wood is everywhere, including the walls of the main exhibition and warm, end-grain flooring. Lin also worked with the exhibition designers Matter Architecture Practice and MGMT design, as well as Michael Bierut of Pentagram Design, on the overall palette. "We banished red from the exhibitions," says Lin of their effort to avoid cliché. "The celadon green that we used is one of my favorite colors originating from Asia."

Commentary

The entire renovation was completed for \$3.97 million, on target with a revised budget. The project's fiscal limitations show in some of the museum's secondary spaces. The temporary exhibition gallery and a lower-level classroom seem conventional and closed off in comparison to the permanent collection galleries. But overall, the marriage of architecture to exhibition design and curating on a tight budget is exemplary. The scale of the galleries and the decision to keep the rough brick visible creates a physical connection between the museum's exhibitions and its Chinatown context. And with the help of a video projection on one of the windows, the multiple store-

fronts allow the museum to have a strong sidewalk presence without interrupting the retail character of the neighborhood.

MOCA was a labor of love for Lin. Early in the project, when fund-raising had stagnated, she became very active in raising money to assure that it would go forward. "I think I raised a million dollars in six weeks," she says. She even joined the museum's board of directors in 2008 – two years after being selected to design the new space. With the active backing of a well-known designer and a new, more accessible home, MOCA seems poised for the next phase in its institutional history and the national profile that it sought when it undertook the project. ■



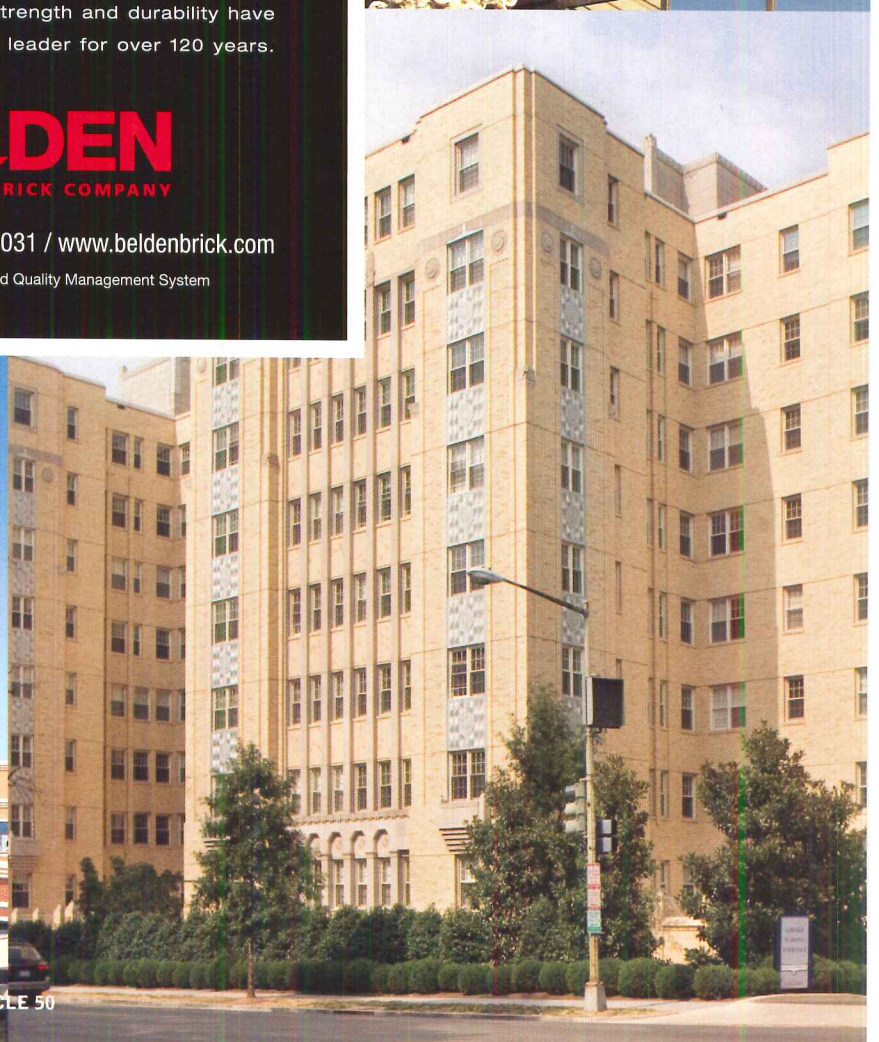
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CIRCLE 50





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Diving Into BIM

For two firms now fully immersed in digital modeling, a group of community libraries proved the ideal medium for trying out new technology

By Joann Gonchar, AIA

ADOPTION OF BUILDING INFORMATION MODELING

(BIM) is gaining momentum as more and more architects, consultants, and builders discover the software's advantages. Because a building information model is a compilation of integrated and dynamic data, rather than just a collection of lines on a screen, design and construction teams are using the technology to perform tasks that were much more difficult with traditional CAD drawings. With BIM, they are readily creating 3D views to better understand complex geometries or present various options to a client, to perform energy simulations and other analyses early in the design process, and to uncover potential conflicts between a building's structure and its mechanical systems.

The technology is definitely taking hold, but estimates of just how deeply it has penetrated architectural practice vary. According to an American Institute of Architects (AIA) survey released this fall, *The Business of Architecture*, more than 34 percent of firms have acquired BIM software, and more than two thirds of those are using it for billable work. Another recent study, *The Business Value of BIM*, conducted by McGraw-Hill Construction (publisher of *RECORD*), included engineers, contractors, and owners, as well as architects. Just under half of all participants reported using BIM or BIM-related tools. The rate of adoption among architects was highest, with 6 out of 10 using the technology. Although the results of the two surveys differ, both demonstrate that the technology has been embraced by a significant chunk of the profession but is not yet a universal part of practice.

Among the uninitiated, there are no doubt many firms that would like to move to BIM but are waiting for just the right project – one that is sufficiently complex to take advantage of the technology's potential benefits, but still straightforward enough to allow team members to become comfortable with unfamiliar tools. For two Seattle-based companies, architect Miller Hull Partnership and contractor BN Builders (BNB), a set of libraries for five small communities in King County, Washington, provided the perfect point of entry. The firms, now both almost fully immersed in digital modeling, won the contract for the group of projects as a design-build team in the spring of 2006. They completed the final library early this year.

For the client, the King County Library System (KCLS), a digital-model-based process was not a requirement. "BIM was a design and construction team initiative," says



Continuing Education

Use the

following learning objectives to focus your study while reading this month's *ARCHITECTURAL RECORD*/AIA Continuing Education article. To earn one AIA learning unit, including one hour of health, safety, and welfare (HSW) credit, turn to page 113 and follow the instructions. Other opportunities to receive AIA/CES credit begin on page 115.

Learning Objectives

- 1 Define a building information model.
- 2 Discuss the benefits of building information modeling (BIM).
- 3 Explain how BIM can be used in the design and construction process.
- 4 Discuss the benefits of deploying alternative project delivery methods with BIM.

Black Diamond Library was bundled with four other libraries serving small communities outside Seattle into one design-build project.



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4



5

Adrienne Ralph, the library system's facilities design coordinator. Instead, KCLS's key priorities were controlling costs during a period of rapidly escalating prices for construction materials, and compressing the design and construction for the five projects into a schedule of about 30 months. The firm also hoped that the individual libraries would have unique features appropriate to their settings, but would share a common layout and organization, allowing staff to move easily among branches. In order to achieve these goals, it bundled the similarly sized facilities (all between 5,000 and 6,000 square feet, with construction budgets ranging from \$2 million to \$4 million) into one project, with BNB as the design-build lead.

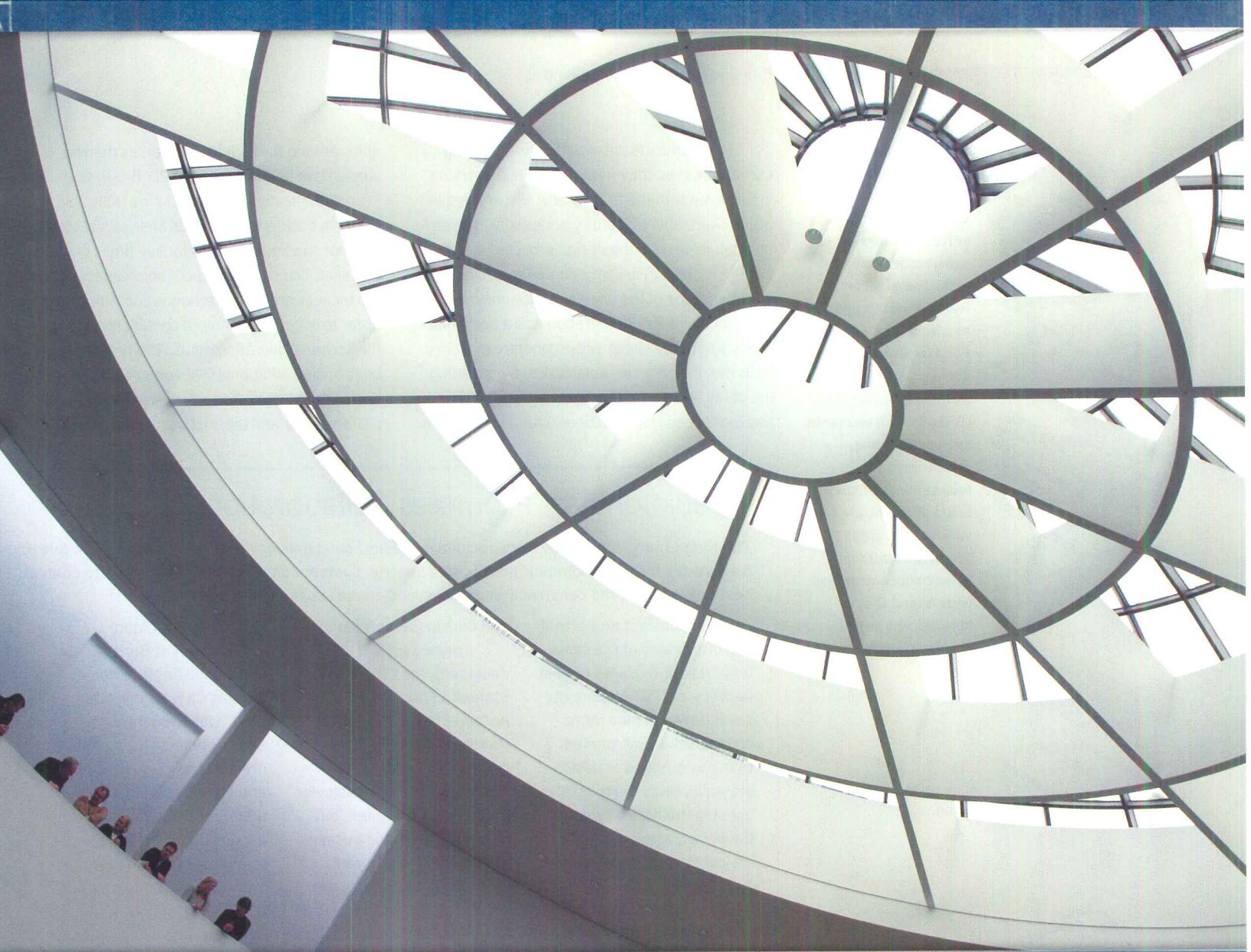
To Miller Hull and BNB, the libraries, for the towns of Black Diamond, Snoqualmie, Carnation, and Fall City, and the Muckleshoot Indian Reservation, presented the ideal opportunity. Their relatively modest scale made them appropriate for trying out new technology. In addition, a shared digital model seemed a

good complement to the design-build process to enhance communication and collaboration among the project participants from the earliest phases of the project through construction.

The buildings' similar features also promised to streamline both the modeling and construction process. All of the one-story libraries have a steel structure and share a common diagram in plan – a large rectangle for the public space, and open stacks attached to a much smaller back-of-house rectangle. But to make the buildings distinct from one another and give them expressions appropriate to their settings, the architects designed generous windows that responded to each site's solar orientation and clad the libraries in different combinations of cedar siding, fiber-cement panels, and concrete masonry. They also created a unique roof-truss shape for each. For example, Miller Hull designed Black Diamond Library so that it resembles a gabled barn because it is surrounded by land that is largely agricultural. But at Carnation, they chose to reinforce a strong existing street edge by bringing the building close to the sidewalk and giving it overhanging eaves.

Working with this adaptable kit-of-parts approach and Autodesk Revit (one of several BIM platforms on the market), the architects could transfer similar elements from one building's digital model to the next. This cut-and-paste strategy helped the team meet the compressed construction timeline. "We could have done this in CAD, but not with the same ease," says Ruth Coates, AIA, a Miller Hull principal.

Miller Hull created a "family" of related, but not identical, libraries for the King County, Washington, towns of Black Diamond (1), Snoqualmie (2), Fall City (3), and Carnation (5), and the Muckleshoot Indian Reservation (4). The buildings share a common plan diagram, have similar structural systems, and rely on the same palette of materials. However, roof shapes and the design of the elevations respond to the character of each library's unique surroundings.

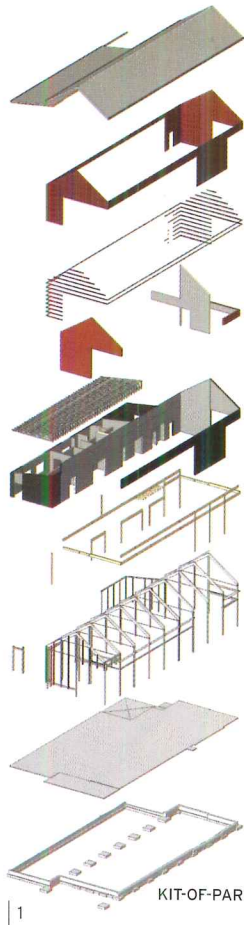


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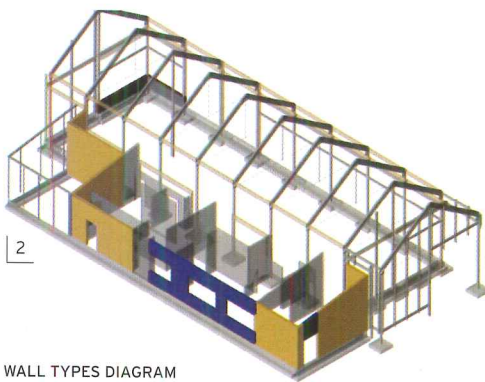
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In the initial phases of the King County libraries project, BNB did not yet own BIM software. However, the contractor could still make use of Miller Hull's model, primarily as a visualization tool. For example, BNB could create exploded axonometric diagrams (1) separating elements such as cladding, structure, and foundations. Or they could differentiate the various wall types (2). The visualizations helped subcontractors understand the libraries and eased construction (3).

KIT-OF-PARTS DIAGRAM

1



2

WALL TYPES DIAGRAM



3

The architects did experience a learning curve. However, they found benefits to working in BIM even with the first library. "By working in 3D, we were able to identify potentially problematic details early in the design process," says Will Caramella, Miller Hull project architect. One such detail was part of the back-of-house enclosure at Snoqualmie. Water penetration was a particular worry where the single-with-the concrete masonry walls met the roof, he explains. But by modeling the detail and generating axonometric views, he was more readily able to understand the relation-

ships among the required materials than he would have been if limited to 2D, he says.

With the digital models, Miller Hull could perform basic environmental analyses, such as exterior shading diagrams for key times of the day and year. The studies helped the architects design the facades and size overhangs and windows in order to avoid interior glare conditions during the libraries' operating hours. The firm has since begun using additional BIM-compatible simulation tools to inform its early design decisions and perform solar and thermal analyses, evaluate

Model Contract Promotes Collaboration and BIM

The King County Library System decided on design-build delivery for the construction of five of its libraries for small communities outside Seattle. System administrators were keen to control costs, streamline the construction process, and compress the schedule.

Another contract model that can offer many of the same benefits is integrated project delivery, or IPD. Proponents say it provides for a more collaborative environment than design-build or design-bid-build, since the main project stakeholders – typically the owner, architect, and the contractor – share risks and rewards. Also, they say, because these parties have a financial interest in a successful outcome, and typically agree to waive claims against each other except under certain circumstances, there is less likelihood that one participant will sacrifice design or construction quality for its own advantage.

To date, only a handful of IPD projects have been completed. In order to help spur adoption, the American Institute of Architects (AIA) has created standard contracts, including the C195-2008, Standard Form Single Purpose Entity (SPE), released in May 2008. Under this agreement, the main design and construction team members form a limited liability company (LLC) for the sole purpose of designing

and building the project.

The newest IPD document, the C191-2009, Standard Form Multi-Party Agreement for Integrated Project Delivery, was released early last month. "Conceptually, C191 is similar to the SPE agreement, but the structure of the business relationships is different," says Ken Cobleigh, managing director and counsel for AIA Contract Documents. Participants do not form an LLC, so they operate as separate entities, he explains.

The documents' creators say that the contractual relationships established by the newer agreement should seem more familiar to project participants. The SPE concept is "a little more foreign" to the design and construction industry, says Howard Goldberg, principal of Washington, D.C.-based Goldberg, Pike & Besche, outside counsel to the AIA's documents committee. "Many people were concerned about insurance, bonding, and financing" with the SPE model, he says.

One critic of the SPE agreement is William

Quatman, FAIA, general counsel at Burns & McDonnell Engineering, Kansas City. He calls the C191 "well thought out" and "detailed." It doesn't present the same licensing and insurance issues as the SPE document "since all the parties play their traditional roles," he says. However, even with the addition of this latest IPD contract, he is uncertain how quickly the delivery system will be embraced. "IPD has to be owner initiated," he says.

But advocates for the delivery method say that it can help project teams harness the full capabilities of building information modeling (BIM), which provides a communication conduit and allows a project to be virtually built before construction begins, helping produce better buildings. Although neither C195 nor C191 require a building information model, the contracts' creators did envision that IPD and BIM would be deployed in tandem. According to Goldberg, "BIM without IPD is a little like using a computer only for word processing." J.G.

A PICTURE IS WORTH A THOUSAND WORDS



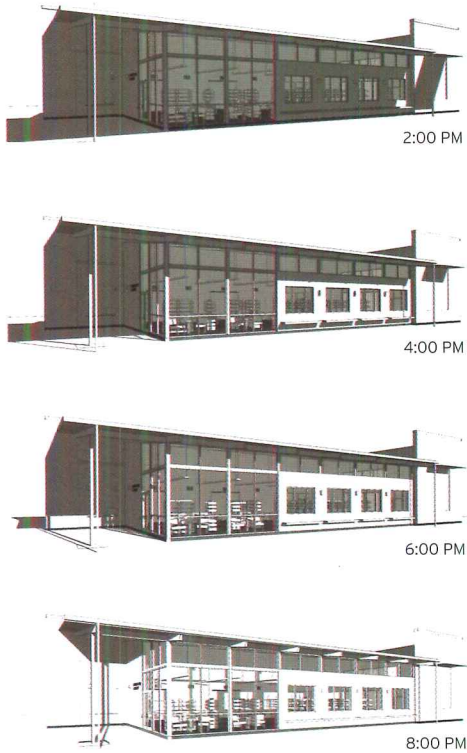
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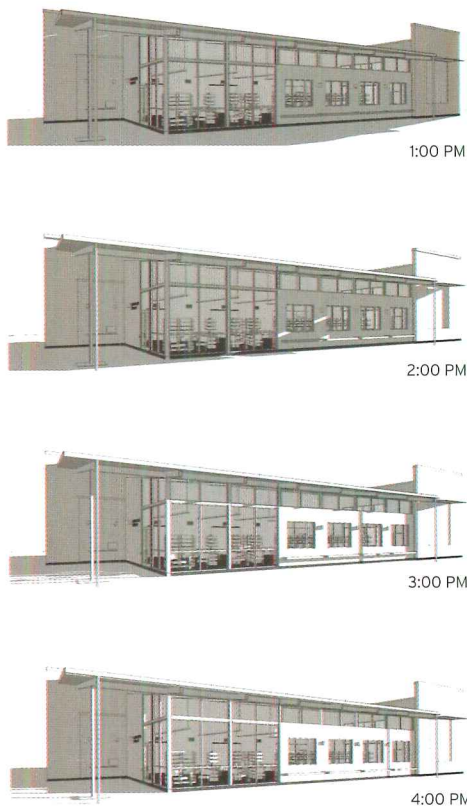
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SUMMER SHADING DIAGRAM



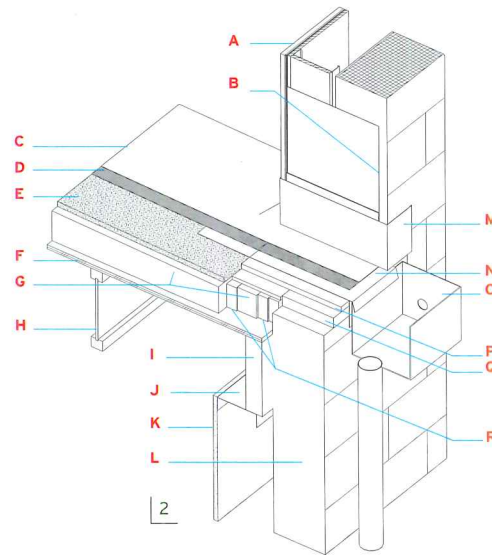
WINTER SHADING DIAGRAM

Within the digital model, the architects created exterior shading studies (1) for key times of the year, such as the summer and winter solstices. The diagrams helped them better understand where they could place generously glazed facades (2) and still avoid annoying glare. With the model, the architects could identify potentially tricky areas early in the design process, such as the juncture of a concrete masonry wall and roof, and then study possible solutions (3).



3

- | | | |
|--------------------|-------------------------|-------------------|
| A Panel siding | G Rigid insulation | M Vertical coping |
| B Vapor barrier | H Joist | N Flashing |
| C Membrane roofing | I 2x8 ledger | O Collection box |
| D Underlayment | J Stud top plate | P Plywood |
| E Protection board | K Gypsum wallboard | Q 2x8 |
| F Plywood decking | L Concrete masonry unit | R 2x4 |



FLASHING DETAIL

components and assemblies, in order to explain the buildings to its own crews and its subcontractors, says Brian Wiersema, BNB's senior project engineer. Part way through the library projects, BNB obtained the software, allowing it to use the "live" BIM files to perform more sophisticated 4D and 5D construction planning tasks, such as calculating quantities of materials, creating animations illustrating the sequence of construction, and making detailed schedules.

According to Wiersema, the models would have been even more useful for the procurement and construction process had they included product-specific information, such as manufacturer names or hyperlinks to catalog cut sheets. But the software was still a bit too unfamiliar and the pace of the projects too fast to incorporate such a level of detail into the model, says Caramella.

Now, however, Miller Hull is regularly creating data-rich digital models. One example is the building information model for a much larger library for a different client. The model for the 85,000-square-foot facility under construction in downtown Vancouver, Washington, incorporates the number of books in the library's collections and their space requirements. In early design phases, the architects relied on this information to quickly evaluate the storage capacity of various schemes, ultimately using it to generate a shelving procurement schedule that includes quantities, dimensions, materials, and model information. If designers chose to change one characteristic, such as a product or size, all affected instances would

ventilation and airflow characteristics, and create interior daylighting studies.

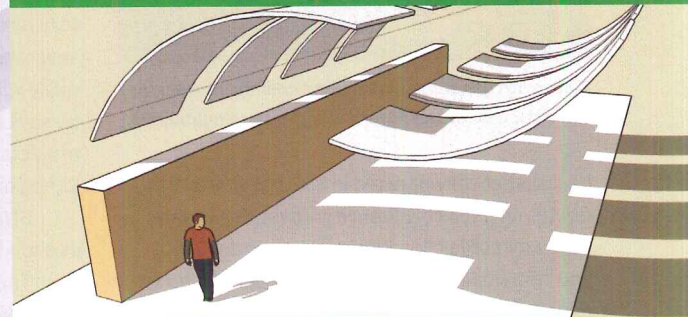
Across the libraries' team, the level of BIM deployment was not consistent. For instance, Miller Hull's consultants worked in 2D CAD. And at the start of the project, even BNB did not yet own BIM software. However, the architect was able to share the model with the design-builder as portable files known as 3D DWGs, or Design Web Format. BNB used these files primarily as visualization tools – to highlight different wall types, isolate the structure, or identify various

Great Designs Require Great Products

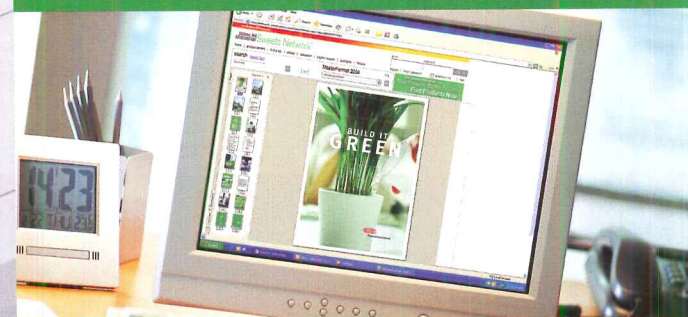
Conceptualize



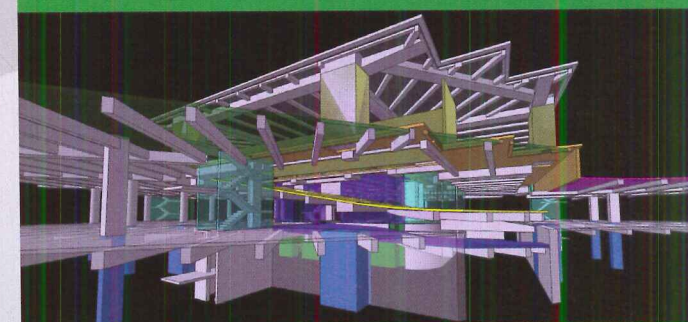
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Walls with generous glazing and ceilings of Douglas fir enclose all of the libraries, including Snoqualmie.

be automatically updated in the model, explains Coates. In a typical 2D environment, these data reside in multiple locations, including drawings and spreadsheets, allowing more opportunity for the introduction of error, she adds.

Both Miller Hull and BNB say that as their BIM projects have become larger and more complex, and their utilization of the software's capabilities more advanced, and as more of

the project team participates in the modeling process, management and organization of the digital model has become increasingly critical. For Revit, Caramella recommends subdividing the model to prevent it from becoming unwieldy and to facilitate multiuser collaboration. These subdivisions can be organized by building components, such as interior partitions, furniture, or lighting. Alternatively, they can be organized according to programmatic zones. For example, a research facility could be divided into a laboratory block and administrative wing. "That way, several users can work on the model simultaneously without stepping on each other's toes," he says. And to ensure consistency among its projects, Miller Hull has a document that outlines in-house modeling conventions and protocols.

BNB has developed its own document intended for the architects and engineers it works with. The list of 10 pointers, which BNB calls its "rules of engagement," includes a description of what types of information should be incorporated into the model, an outline of acceptable file formats, and suggested methods for managing revisions. One of its tips for designers is to model

structural and architectural elements to reflect construction logic. For example, a concrete column for a high-rise building should not be represented as a single element when it is likely to be cast as multiple one-story columns. "The model should reflect how the building is put together," says Dace Campbell, AIA, BNB's integrated project delivery specialist.

With their BIM working methods now well established, neither BNB nor Miller Hull has any interest in returning to traditional 2D CAD. For the contractor, the technology is almost essential to its procurement and construction planning process. So much so that BNB often creates its own digital model when the designers it works with can't provide one. At Miller Hull, all new projects are started in BIM. On a few buildings, the entire consultant team is also using the technology. However, the architect still has some active older projects that rely on traditional documents. Returning to those CAD files, says Coates, "is slightly painful." ■

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To receive one AIA learning unit, read the article "Diving Into BIM" using the learning objectives provided. To apply for credit, complete the test below and follow instructions for submission at right.

- 1 **Which of the following is false regarding building information models?**
 - A they are compilations of integrated and dynamic data
 - B they are collections of lines
 - C they can be used to perform energy analyses early in the design process
 - D they can be used to uncover potential conflicts among building elements
- 2 **Priorities for KCLS on its community library projects included all except which?**
 - A controlling costs
 - B trying out BIM
 - C compressing the construction schedule
 - D creating facilities with shared features
- 3 **Miller Hull and BNB saw the King County libraries as ideal first BIM projects because of which?**
 - A their relatively modest scale
 - B a shared digital model could complement the design-build process
 - C their similar features promised to streamline the modeling and construction process
 - D all of the above
- 4 **Which of the following refers to a project delivery method intended to support sharing of risk and reward among stakeholders?**
 - A SPE
 - B LLC
 - C IPD
 - D design-bid-build
- 5 **Which of the following is true regarding the AIA's IPD contract agreements?**
 - A they require the use of BIM
 - B they are intended to be used in tandem with BIM
 - C they prohibit the use of BIM
 - D none of the above
- 6 **Even before it had acquired BIM software, BNB could use Miller Hull's digital model to do which?**
 - A explain the building to its crews and subcontractors
 - B perform sophisticated 4D and 5D construction planning tasks
 - C generate detailed schedules
 - D all of the above
- 7 **All of the following are true regarding the King County libraries except which?**
 - A the architects used BIM to create shading studies and avoid glare conditions within the libraries
 - B the models included product-specific data, such as hyperlinks to catalog cut sheets
 - C BIM helped the architects identify potentially problematic details early in the design process
 - D BIM allowed the transfer of similar elements from one building's model to the next
- 8 **Which of the following is true regarding Miller Hull's shelving procurement schedule for the library in Vancouver, Washington?**
 - A it was generated from information about the storage requirements for the library's collections contained in the digital model
 - B it includes component quantities and dimensions
 - C when one characteristic changes, the schedule can be automatically updated
 - D all of the above
- 9 **It is recommended practice to subdivide a BIM model in which instance?**
 - A when projects are large
 - B when projects are complex
 - C when the model will be accessed by multiple users simultaneously
 - D all of the above
- 10 **Which of the following is not true regarding BNB's "rules of engagement"?**
 - A they suggest that a multistory concrete column cast in multiple pours be modeled as a single object
 - B they outline acceptable file formats
 - C they suggest methods for revision management
 - D they are intended for the architects and engineers BNB works with

Program title
 "Diving Into BIM,"
 ARCHITECTURAL RECORD
 12/09, page 104.

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117-121

Smart Appliances for a Sustainable Smart Grid: Hot Water Hybrids Save Energy and Conserve Water



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- Identify the components of a hybrid hot water heater that maximize energy efficiency and sustainability.
- Define the ENERGY STAR energy factor (EF) rating and discuss the ENERGY STAR program to choose an energy efficient appliance.
- Summarize the relationship between energy saving and water conservation.
- Discuss the sustainability of smart grid technology.



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Architectural Record

123-127

HVAC for Large Spaces: The Sustainable Benefits of HVLS (High Volume/Low Speed) Fans



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- Explain how the simple physics of moving air makes HVLS fans a low energy, more sustainable alternative to traditional high-speed fan and HVAC solutions.
- Identify the numerous applications where HVLS fans offer an equal or better alternative to traditional HVAC approaches.
- Identify the design aspects and ventilation benefits of HVLS fans that contribute to sustainability and LEED® credits.
- Specify HVLS fans that efficiently meet client and user needs.



129-133

Building Information Modeling (BIM) and Manufactured Complementary Building Products

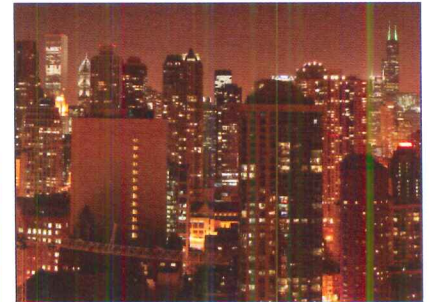


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- Recognize and explain the characteristics and definition of Building Information Modeling (BIM).
- Explore and interpret the various types of BIM object information available from product manufacturers.
- Differentiate between types of embedded product information related to integrated drawings, specifications and shop drawings for a project.
- Evaluate some of the resources available for the application of BIM and assess how it applies to your own work.



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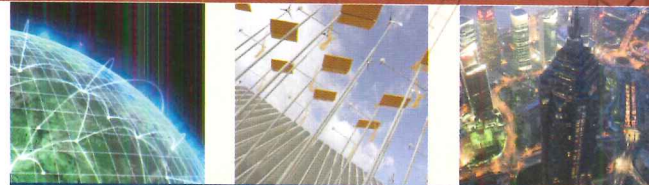
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Smart Appliances for a Sustainable Smart Grid: Hot Water Hybrids Save Energy and Conserve Water

To conserve water and save energy, professionals can now choose an ENERGY STAR electric hybrid heat pump water heater that will work with new smart grid and smart meter technologies.

Provided by GE Appliances

By Celeste Allen Novak, AIA, LEED AP

Your next hot water heater may be among a number of smart appliances in your home that will tell you when the price of electricity is high and silently choose the lower rate for its heating mode. It may be able to talk to you and exchange information about your vacation plans or guest schedules. Your next water heater should be efficient, smart, sustainable and just one of many of the new residential and commercial 21st century products to advance the ENERGY STAR goal of water and energy conservation.

Smart appliances are just one of the results of funding provided by the U.S. Department of Energy (DOE) and the Department of Environmental Quality (DEQ) to stimulate research and development to manufacture sustainable, energy efficient products. Government, universities, businesses, researchers have been working on a "Smart Grid" initiative for the past six years. They met even before this program was spurred on by the 2003 blackout that left Americans from New York to Michigan in the dark and demonstrated the flaws in the U.S. electric grid.

This article will discuss the EPA and ENERGY STAR stimulus program and research criteria that made super-efficient, electric hybrid heat pump water heaters possible. The components of this product will be discussed, including the smart meters that make it an intelligent part of a home's energy budget plan. Professionals will also review the ENERGY STAR energy factor (EF) rating that helps them select the most efficient appliances. The advantages of smart appliances that work with a smart grid network for your



Photo courtesy of GE Appliances

An ENERGY STAR electric hybrid water heater is designed to absorb heat from the ambient air, and transfer it into stored water to a desired temperature for homes or commercial heating.

CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read *Smart Appliances for a Sustainable Smart Grid*. To earn one AIA/CES Learning Unit, including one hour of health safety welfare credit and sustainable design, answer the questions on page 121, then follow the reporting instructions or go to ce.ArchitecturalRecord.com and follow the reporting instructions.

Learning Objectives

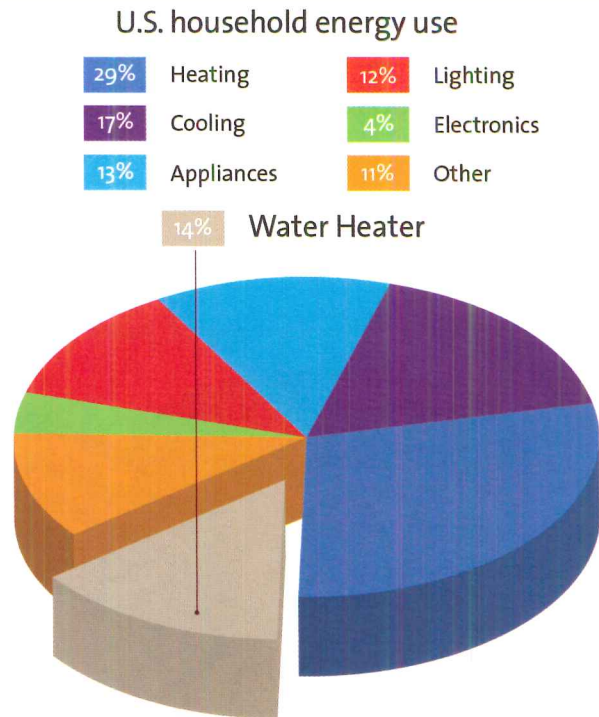
After reading this article, you should be able to:

- Identify the components of a hybrid hot water heater that maximize energy efficiency and sustainability.
- Define the ENERGY STAR energy factor (EF) rating and discuss the ENERGY STAR program to choose an energy efficient appliance.
- Summarize the relationship between energy saving and water conservation.
- Discuss the sustainability of smart grid technology.

home and business will include a discussion of the incentives and savings provided by the American Recovery and Reinvestment Act of 2009.

In closing, The AIA provided a guide to assist professionals with readily available tools and techniques to achieve significant carbon reduction in buildings. In the 50to50 wiki, professionals

Smart Grid: A 2030 Vision Plan



Source: DOE website
www.energystar.gov/index.cfm?c=products.pr_pie

Image courtesy of GE Appliances

In 2003, senior executives representing the electric utility and the Department of Energy (DOE), published “Grid 2030” *A National Vision for Electricity’s Second 100 Years*.¹ This document outlines a vision for a new electrical power grid that will provide “affordable, clean efficient and reliable electric power anytime, anywhere.” This is the electronic superhighway that is planned to modernize all communications.

It was clear to these planners that the entire network that included cables, transformers, storage devices and meters needed to provide intelligent and smart power systems. They created a roadmap that provided timelines and incentives for new technology. In this document are numerous charts, data and fact sheets that forecast the shortage in the U.S. utility capacity and future supply for a growing

electrical demand. Through regional meetings of stakeholders, convened under the Modern Grid Strategy project of the National Energy Technology Laboratory (NETL), the modern grid was identified to provide the following characteristics or performance features:

- Self-healing from power disturbance events
- Enabling active participation by consumers in demand response
- Operating resiliently against physical and cyber attack
- Providing power quality for 21st century needs
- Accommodating all generation and storage options
- Enabling new products, services, and markets
- Optimizing assets and operating efficiently²

Six years later, some of the first products from this analysis, assisted with stimulus funding have arrived to market, including the electric hybrid heat pump water heater. Future grid meters will monitor the electricity usage across the smart grid to distribute electricity as needed to the households and businesses, avoiding the spikes and demand power surges. Demand Response electronics, such as those incorporated by some manufacturers in electric hybrid water heaters, can prevent the homeowner from paying higher rates during peak power periods, by reacting to smart meter signals and going into a maximum energy efficiency mode or cycling off and temporarily altering the tank temperature. This sophisticated form of “load control” allows the water heater to continue to function, even during peak periods.

Utilities are now receiving federal funding to develop smart grid technology that will work with home appliances such as the hybrid electric heat pump water heater. According to the *Boston Globe* on October 28, 2009, “Officials at Central Vermont³ Public Service and other utilities say the \$69 million in federal funding announced Tuesday will move the state closer to having in-home displays of electrical usage and digitally controlled appliances that operate when power demand is light. The grant will pay up to half the costs of \$137 million in improvements across Vermont.” Over one hundred utilities applied for this stimulus funding this year forecasting a future where smart grid technology will be part of every residential as well as commercial utility metering system.

can find guidelines that include the use of energy saving appliances and equipment as a tool to achieve sustainable design. In addition, ENERGY STAR heat pump water heaters will contribute towards credits in rating systems such as the USGBC LEED V3[®] for homes and commercial buildings for innovation and energy efficiency. There is a strong relationship between energy savings to heat water and the conservation of water as a sustainable design strategy.

THE ENERGY STAR CHALLENGE

According to the DOE, water heating currently represents up to 17 percent of national residential energy consumption. The water heater by itself, is the second highest single energy user in the home, behind

heating and cooling in homes. Water heaters make up somewhere between 14% and 20% of the energy usage in the average home. As of 2008, water heating was the only major residential appliance that ENERGY STAR had not classified for an energy rating.

ENERGY STAR is a division of the DOE and its goal is to drive technological change in the market to support the national efforts to reduce electrical consumption. ENERGY STAR products ensure that the established criteria:

- Provide meaningful differentiation between ENERGY STAR qualified products and those that just meet the Federal standard.
- Will result in significant energy savings, both for consumers and the nation as a whole.

- Are cost-effective for consumers as well as manufacturers.
- Provide consumer choice, both in terms of number of models and a wide range of manufacturers.
- Do not compromise functionality or performance of the qualified product.
- Do not rely on proprietary technologies.⁴

When a product manufacturer is registered as an ENERGY STAR partner, they can submit products for testing. Once the product is qualified through third party testing, the manufacturer can place the ENERGY STAR label on the product, a sign to the consumer that they are receiving an approved and tested energy efficient appliance.

Water heating can be provided through a number of technologies, solar, electric and gas and ENERGY STAR, categorizes each separately. Energy consumption is based on DOE test procedures and the criterion includes a minimum energy factor, a minimum first hour rating requirement, a minimum warranty and compliance with the appropriate codes.

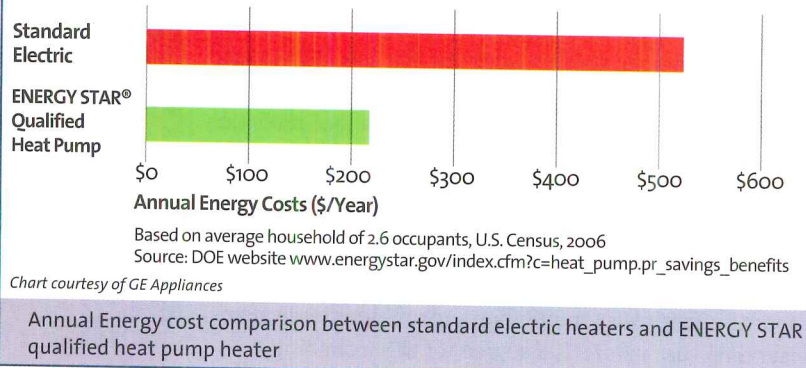
The Energy Factor (EF) indicates the overall efficiency of a water heater based on the amount of hot water produced per unit of fuel consumed over a typical day. Energy factors help the consumer know the recovery efficiency, percentage of standby and water cycling losses of a water heating system. Recovery efficiency is a measure of how quickly hot water will be available after use. Standby losses are the percentage of heat loss from stored water compared to the heat content in the storage tank. Water cycling losses determine how much heat is lost as the water circulates through the tank, inlets and outlet pipes. EF is determined by the DOE test procedure, Code of Federal Regulations, Title 10, Section 430. A high Energy Factor rating means a more efficient water heater.

Energy factors help the consumer know the recovery efficiency, percentage of standby and water cycling losses of a water heating system.

In the 2008 report, standard electric resistance water heaters were not eligible for an ENERGY STAR label. According to ENERGY STAR stakeholders “electric resistance technology is highly inefficient over the fuel cycle and it potentially increases total energy consumption and emissions.”⁵ Although typical electric resistance heaters have energy factors up to .95 percent, the additional energy savings of the perfect resistance water heater would only provide a savings of electricity between 4.8 and 8.7 percent and consume 4,622 kilowatt-hours per year. This did not offer enough savings to meet the new ENERGY STAR challenge for rating hot water heaters. Electric Resistance storage hot water heaters represent about half of all hot water heating appliances and the DOE wanted to drive the largest energy savings possible by creating incentives for new technology.

As part of a national strategy to conserve water and save energy as fuel costs rise, the DOE challenged manufactures to develop new products with much more aggressive energy targets. The DOE provided research grants as an incentive. Some manufacturers entered

Cut water heater energy cost by more than half



into a Cooperative Research and Development Agreements (CRADA) with Oakridge Laboratories in Oakridge, Tennessee and the DOE. A CRADA is a written agreement between a federal research organization and one or more federal or non-federal parties to work together as partners on a research project of mutual interest.⁶

As a result of the ENERGY STAR incentives and discussions with stakeholders, on April 1, 2008, Richard H. Karney, P.E. ENERGY STAR Products Manager, reported the new criteria for energy efficient heat pump water heaters that use vapor compression refrigeration systems to transfer heat from the surrounding air. DOE includes residential as well as commercial drop-in or integrated heat pump water heaters in the program. The final criteria for these systems are:

- A minimum Energy Factor of 2.0.
- A minimum First-Hour Rating requirement of 50 gallons-per-hour.
- A minimum six-year limited warranty on the sealed system.
- Compliance with UL 174 and UL 1995.⁷

ENERGY STAR requires that the heat pump unit has a maximum current rating of 24 amperes, with voltage no greater than 250 volts. In addition, these units must have the heat pump integrated into the storage tank as a stand-alone unit. Units must have extended warranties that can be as high as ten years for some products.

Using the DOE test procedure for calculations, a fifty-gallon heat pump water heater with a 2.0 Energy Factor would consume an estimated 2,195 kilowatt-hours per year. This is a savings of nearly 55%, or 2,662 kilowatt-hours, in comparison to the typical electric resistance water heater.” Even more amazing is the DOE report that “If just 10% of the nation’s 4.8 million electric water heater shipments were heat pump water heaters with an Energy Factor of 2.0 instead of conventional models with an Energy Factor at the Federal standard, the aggregate energy savings would amount to nearly 1.3 billion kilowatt-hours per year.”⁸

Sustainability: Using nature as a heat source

Designed to work with the natural process of heat exchange, an electric hybrid heat pump water heater has at least two modes of operation. It can either work through traditional electrical resistance heaters drawing 4500 watts, or in the heat pump mode

drawing as little as 550 watts of electricity. This new product may appear in size, shape and installation requirements, to be similar to the typical family water tank however, it operates on very different principles.

Janine Benyus, author of *Biomimicry*, discussed the study of nature to find solutions for new technology. She asks designers to think use nature as a resource. Heat pumps extract heat, energy savings and peak load reduction from thin air. Engineers use the thermodynamic properties of nature to compress air through an environmentally safe refrigerant, capturing residual heat and creating condensate. Through heat transfer, whether from the earth as in a geo-thermal heat pump or from air temperature used for the opposite effect in air conditioning and refrigeration systems, heat pumps use nature as a source for this technology.

This electric hybrid water heater is designed to absorb heat from the ambient air to transfer it into stored water to a desired temperature for home or commercial heating. It uses less energy to transfer heat than it does to generate heat, thus creating energy savings. A smart meter monitors the flow of electrical consumption across the grid to maintain the temperature at the most efficient price to the consumer. A combination of thermodynamics and economic planning makes this system work for energy savings.

HYBRID ELECTRIC HEAT PUMP COMPONENTS THAT MAXIMIZE ENERGY EFFICIENCY

An ENERGY STAR electric hybrid heat pump water heater must be an integrated unit. The goal is to provide hot water in the same way as a traditional water heater, but without sacrificing energy efficiency. Hot water is delivered without a warm up period and the units can work either in the heat pump mode or as a resistance water heater. To maximize savings, this hybrid controls water heating through “smart technology.” The components of an electric heat pump water heater include the following.

The water tank

The Hybrid tank is typically an insulated residential fifty gallon tank using the same footprint as the existing heater with water and electrical connections in the same area, key to an easy change out. The unit will fit in the same locations as a traditional water heater, often in the basement near a floor drain. In California, the law requires that residential water heaters must be braced, anchored or strapped to resist falling or horizontal displacement due to earthquake motions. All tank installations should follow local codes and installation is similar to that of a traditional resistance water heater.

The heat pump

In an integrated unit, the heat pump is factory installed on top of the tank and can have easy access for repair as necessary. Some heat pump water heaters have the heat exchange coils immersed in the water tank or circulate water through a heat exchanger and some are integrated into insulation around the tank housing allowing heat transfer through the tank. Separating the heat exchange from the water source reduces the effect of hard water and corrosion that can dramatically reduce efficiency. It also avoids additional maintenance in areas with hard water.



ENERGY STAR approved water heaters are designed to fit in the same locations as a traditional water heater. Photo courtesy of GE Appliances

Condensate collector and filter

The output of a heat pump includes heat exchange and condensate. The typical heat pump water heater can dehumidify up to two quarts of water a day and will require a gravity drain line. A small tube may be provided to tie into a floor drain for condensate collection in existing homes or routed into new drains in new construction. A filter that helps prevent the evaporator from dirt or dust will need to be cleaned periodically to maximize efficiency. Some units provide a filter sensor that determines a restricted airflow, illuminating a “red” light when the filter needs to be cleaned or replaced.

Electrical and plumbing connections and safety

Some manufacturers provide the same plumbing and electrical connections in the same location as a regular electric water heater. Others require plumbing changes either to the side or much higher than a regular water heater. The water heater must be installed in accordance with local codes, utility codes, and the latest version of the National Electrical Code ANSI/MFPA 70. Plumbers must meet the approved plumbing codes and all installation should be in accordance with the manufacturer’s instructions. A separate branch circuit is required with copper conductors, overcurrent protective devices and suitable disconnection safety devices as provided by a qualified electrician.

Continues at ce.ArchitecturalRecord.com.

Celeste Allen Novak, AIA, LEED AP principal at rizzolobrown + novak architects specializes in sustainable design materials and methods and teaches as an adjunct professor at Lawrence Technological University.

See Quiz on the Next Page

or

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Program title: "Smart Appliances for a Sustainable Smart Grid: Hot Water Hybrids Save Energy and Conserve Water" (12/09, page 117). AIA/CES Credit: This article will earn you one AIA/CES LU hour of health, safety, and welfare/sustainable design (HSW/SD) credit. (Valid for credit through December 2011). **Directions:** Refer to the Learning Objectives for this program. Select one answer for each question in the exam and fill in the box by the appropriate letter. A minimum score of 80% is required to earn credit. **To take this test online and avoid handling charge, go to ce.ArchitecturalRecord.com**

1. As a result of regional meetings sponsored by the NETL on smart grid technology the modern grid will provide the following:
 - a. Enable active participation by consumers in demand response
 - b. Provide power quality for 21st century needs
 - c. More efficient operation
 - d. All of the above
2. New ENERGY STAR products must meet the following criteria:
 - a. Meet current Federal standards
 - b. Are cost effective for consumers as well as manufacturers
 - c. Result in some energy savings
 - d. Rely on proprietary technologies
3. The Energy Factor (EF) indicates the overall efficiency of a water heater based on the amount of hot water produced. The Energy Star requirement for electric water heaters is at least
 - a. 2.0 EF.
 - b. 1.5 EF.
 - c. 2.5 EF.
 - d. 3.0 EF.
4. Energy Factors help the consumer know the recovery efficiency, percentage of standby and water cycling losses of a water heating system.
 - a. True
 - b. False
5. The DOE criteria for heat pump water heaters includes:
 - a. a minimum first-hour rating of 50 gallons-per-day.
 - b. vapor compression.
 - c. a minimum Energy Factor of 2.
 - d. a minimum two year warranty.
6. ENERGY STAR requires that the heat pump water heater use the same circuit as a normal water heater with a maximum current rating of:
 - a. 13.6 amperes with 110 volts.
 - b. 24 amperes with 250 volts.
 - c. 16.7 amperes with 90 volts.
 - d. 20 amperes with 250 volts.
7. In an integrated heat pump water heater, separating the heat exchange from the water source reduces:
 - a. corrosion.
 - b. cost.
 - c. maintenance
 - d. A. and C.
8. Smart meters can measure:
 - a. energy factor and amount of hot water used.
 - b. monthly utility costs and efficiency rating.
 - c. load control
 - d. number of wash loads and visitors.
9. The ENERGY STAR recommended water temperature setting for both safety and efficiency is:
 - a. 110 degrees F.
 - b. 120 degrees F.
 - c. 125 degrees F.
 - d. 140 degrees F.
10. For efficiency and maximum hot water delivery, the recommended mode of operation for a heat pump water heater is:
 - a. high demand.
 - b. hybrid mode.
 - c. standard electric.
 - d. heat pump mode.

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Material resources used: This article addresses issues concerning health and safety and sustainable design.

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See Endnotes in online version of this course.



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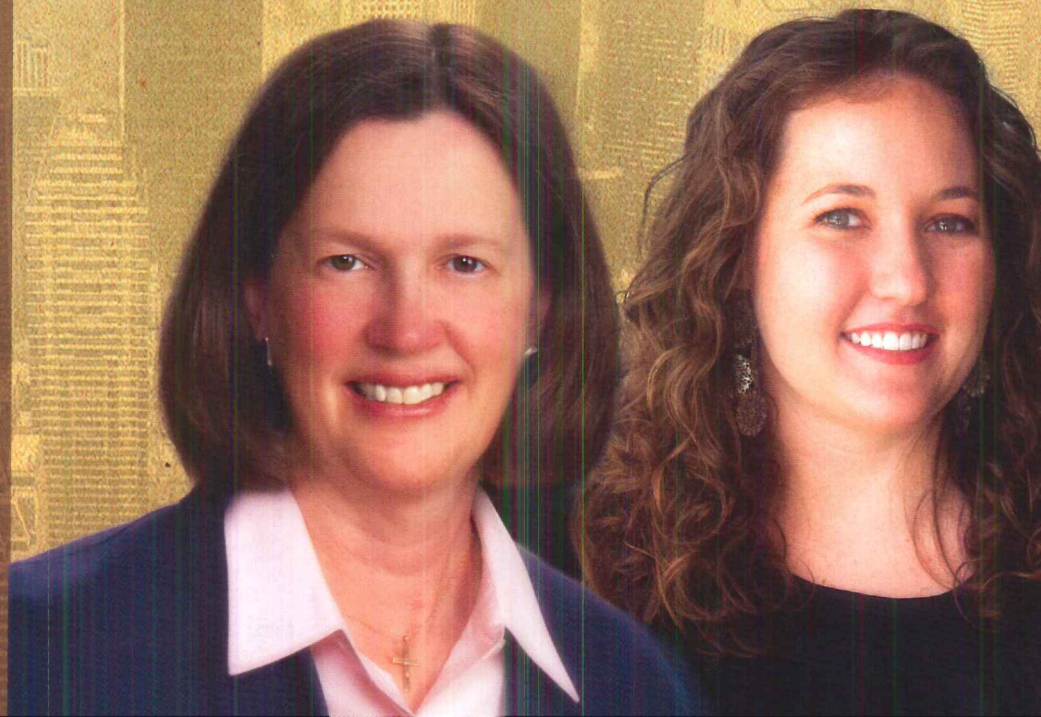
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HVAC For Large Spaces: The Sustainable Benefits Of HVLS (High Volume/Low Speed) Fans

In the face of common wisdom that higher fan speeds deliver better cooling effect, HVLS fans are proven to be considerably more effective and energy efficient for large spaces.

Provided by MacroAir Technologies

By Karin Tetlow

For centuries, people living in hot climates have known the cooling powers of slowly moving air. Large ceiling fans were favored in southern antebellum dining rooms, and in British India, servants used a foot to push overhead swinging fans called punkas.

With the advent of the electric motor, fans were among the first devices to be mechanized. Thinking that moving more air was better for cooling, engineers increased the speed of fans in order to increase air displacement. But as anyone knows, a gentle breeze is cooling, while a wind is unpleasant and disruptive — as unfortunate diners in excessively cooled and draughty hotel banquet rooms will testify. Air speed beyond four or five miles per hour usually offers little, if any, additional cooling benefit. In fact, in very hot, low humidity conditions, very slow moving air cools and ventilates best.

Until a couple of decades ago, large spaces were mostly cooled by small high-speed fans that didn't cover a wide enough area. They were inefficient, consumed excessive and costly energy, and required ongoing maintenance. In 1995 mechanical engineer and race car designer Walter Boyd applied the law of physics to how ceiling fans cool and developed what are now known as High-Volume/Low-Speed, or HVLS, fans for use in large open spaces in commercial, institutional, industrial, and agricultural buildings.

For some designers, raised in the belief that cooling and heating is delivered via HVAC systems or not at all, the application of HVLS fans for cooling large spaces was, and still is, new and virtually unknown. Just as significant for engineers who are aware of the effectiveness of fans is the fact that it is the aerodynamic design of the fan blade itself that impacts airflow.



CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **HVAC For Large Spaces: The Sustainable Benefits Of HVLS (High Volume/Low Speed) Fans**. To earn one AIA/CES Learning Unit, including one hour of health safety welfare credit and sustainable design, answer the questions on page 127, then follow the reporting instructions or go to ce.ArchitecturalRecord.com and follow the reporting instructions.

Learning Objectives

After reading this article, you should be able to:

- Explain how the simple physics of moving air makes HVLS fans a low energy, more sustainable alternative to traditional high-speed fan and HVAC solutions.
- Identify the numerous applications where HVLS fans offer an equal or better alternative to traditional HVAC approaches.
- Identify the design aspects and ventilation benefits of HVLS fans that contribute to sustainability and LEED® credits.
- Specify HVLS fans that efficiently meet client and user needs.

The key metric for evaluating fan effectiveness is the amount of air moved, measured in cubic feet (of air moved) per minute (CFM). Performance is based on the energy cost of moving that amount of air.

The physics of cooling air is relatively simple (for a more detailed explanation see sidebar *The Physics of Moving Air*). Displacement, the amount of air actually moved through a fan, is not the whole story. Instead it is the downstream effects of that air movement that are important. Also important is the fact that a large column of air travels farther than a small one. HVLS fans generate a large column of air that gently flows down to the ground and outward along the floor plane in all directions — if unimpeded — 360 degrees. The large, slow moving air mass moves throughout the space, mixing, circulating and cooling air efficiently, without generating a great deal of noise and dust.

In cooler weather, when the fan is close to the ceiling or when the direction of blade rotation is reversed, the benefits obtained for

cooling are equally applicable to heating. The physics are the same, only in reverse. Warm air is mixed with cooler air and distributed efficiently (Pignet and Saxena, quoted in Aynsley, 23, see References).

BEING GREEN

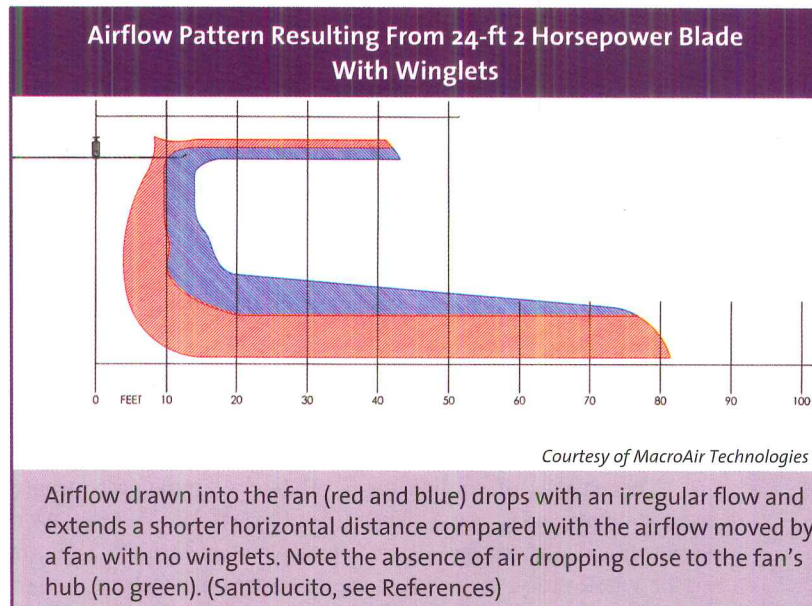
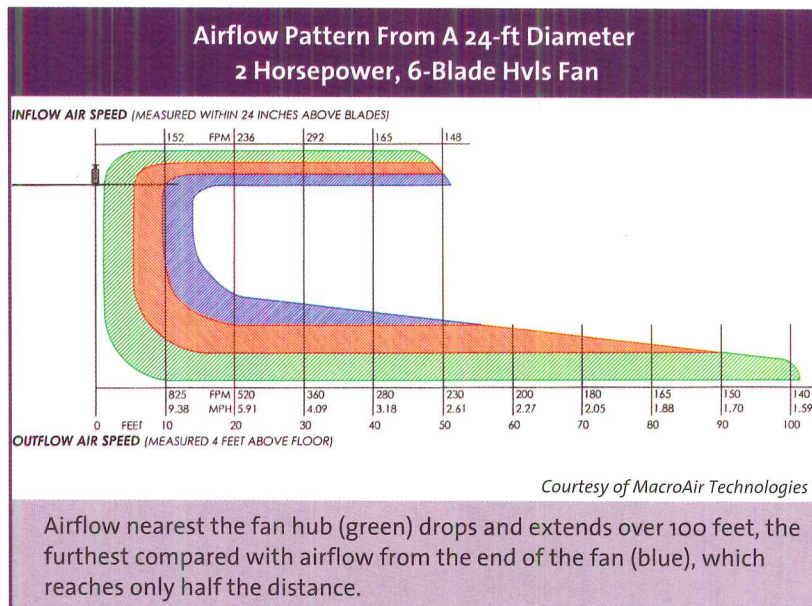
Energy Efficiency of HVLS Fans

Calculations based on ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) data and conservative facility design criteria (see Heat Savings Chart in the Online Section)

HVLS fans are best suited for large, mostly open spaces with a minimum ceiling height of 15 feet. Studies by mechanical efficiency experts (Aynsley, see References) show that HVLS fans are the most energy efficient air circulating fans available. High-speed fans focus on using their speed to increase air displacement. According to the fan laws, a common subset of the laws of physics, the power to drive a fan is equal to the cube of the speed. If you double the speed of a fan, it requires (2 times 2 times 2) or 8 times the amount of electrical power. For example, a high speed commercial fan delivering air at 20 mph requires about 64 times as much power as one of the same size delivering air at five mph. HVLS fans, on the other hand, focus on using size, not speed, to move air. The Air Movement and Control Association International (AMCA), the body that certifies fan performance, defines airflow (CFM) as a function of fan diameter and thrust. Under AMCA's formula, increasing either diameter or thrust results in an increase in CFM; increasing thrust requires more input power, while increasing diameter does not. Regardless of diameter, all HVLS fans in the same series (for example, 1 HP fans) use the same motor and draw approximately the same current through the controller. This means that doubling the size of a fan requires less than twice the power.

A number of independent studies reveal that a few HVLS fans can provide as much air movement in a given space as several high-speed fans. One such study, performed at UC Davis, determined that two 20-ft 1HP fans were as effective as twelve 3-ft high-speed fans at ventilating a 200-cow pen, while providing an 86% reduction in electrical consumption (Shultz, 1). This kind of efficient performance translates into any environment, not just commercial dairies.

Additionally, considering the sheer mechanics of moving air with conventional forced air units in something like a 200,000 sq. ft. warehouse with 30-ft ceilings is very revealing. In addition to the size (tonnage) of the unit required for such a large space, an enormous amount of ducting would be needed for merely adequate coverage. In addition several supplementary fans would be required to move the air nearly 30 feet to the floor and feed it back to the system. All this would create both high initial and high energy costs and make maintenance difficult and costly — all very good reasons why many people choose to go without any air-moving system. HVLS fans, on the other hand, are designed to move air in just this type of space without the huge up-front investment or the follow-on operating and maintenance costs. This makes them an excellent alternative or supplement to forced air units in large spaces.



show a five year return on investment after installing HVLS fans of \$11,530 in Minneapolis, MN, and \$5,350 in St. Louis, MO. In one actual 'before' and 'after' study, data show average energy cost savings averaging 49 percent plus consequent reductions in the generation of CO₂ and carbon (see table: CO₂, Carbon and Cost Savings After Installing HVLS Fans in the Online Section).

HVLS plus HVAC

HVLS fans reduce thermal loads, electricity use, and mechanical heating and cooling times. Because HVLS fans circulate air so efficiently, they reduce the load of a building's HVAC system in many ways. In spaces with large, relatively open floor plans, air-conditioned air can be moved farther with less ductwork and

even reduced tonnage. Heated air from radiant heaters can be circulated more efficiently with HVLS fans reducing or eliminating pooling, and increasing the efficiency of the heaters while potentially reducing the number of heaters required. Thanks to the destratifying effect (mixing of air in order to eliminate layers of air at different temperatures) of HVLS fans, thermostats can be adjusted to more energy-efficient settings. The same number of air exchanges — which means the same air quality — can be achieved with fewer ventilation fans due to the high volume of air moved by energy efficient HVLS fans.

When HVAC systems are required to supplement cooling, HVLS fans are still an energy-saving asset.

Adding solar

In 2010, standalone solar-powered HVLS fans will become available. Energy operating costs of these models will approach zero. In addition to many applications in a range of building types, they could be well suited for facilities that require constant cooling or refrigeration. In cold storage or refrigerated rooms, they can continue to operate during power outages or intentional shutdowns during the hottest times of the day. This can reduce the chance of the product warming above unsatisfactory temperature levels due to stratification (the building up of layers of air at different temperatures.)

LEED® Credits

As of September 1, 2009, 45 states, 194 localities, 13 federal agencies or departments, 17 public school jurisdictions and 39 institutions of higher education have adopted various LEED initiatives and requirement (www.usgbc.org/PublicPolicy/SearchPublicPolicies.aspx?PageID=1776). Since heating and cooling systems make up a large part of a building's energy use, HVLS fans can make a significant contribution to cutting those costs while increasing the

effectiveness of the building's HVAC system. LEED v.3 categories where HVLS fans can contribute to prerequisites and points are: Energy and Atmosphere (35 possible points), Indoor Environmental Quality (15 possible points) and Innovation in Design (6 possible points.)

COOLING, HEATING AND VENTILATION

There are two major categories of HVLS fans: more efficient, lower horsepower (3/8 HP to 1 HP) models specifically designed to enhance the comfort of people, and higher horsepower (1½-2 HP) models best suited for extreme moisture or wet conditions and areas where some turbulence is acceptable.

Cooling

When used as a stand-alone cooling system, HVLS fans can provide a cooling effect equal to a reduction in temperature of up to 8 degrees F. within the fan's coverage area of up to 20,000 sq ft per 2HP 24-ft fan. (Aynsley, 3, see References)

More efficient, lower horsepower HVLS fans. 3/8HP to 1HP, often with six blades, 8-ft to 24-ft in diameter, deliver non-disruptive cooling that helps improve productivity and comfort of the work environment. AMCA testing (non-certified) shows that one manufacturer's 24-foot, 6-blade, 1HP HVLS fan produces 275,694 CFM. When installed at a height of 18-ft, as in the AMCA test, this is an effective coverage area of over 15,000 sq. ft., with an average calculated airspeed of only 609 ft/minute. By comparison, another manufacturer's 30-inch high speed 1HP fan delivers 12,000 CFM at an average calculated airspeed of 4,800 ft/minute. When used in conjunction with air conditioning or evaporative cooling systems, these lower-horsepower HVLS fans can efficiently circulate cooled air throughout the structure.

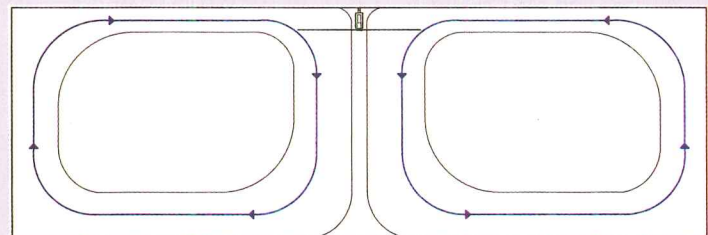
HVLS fans provide superior benefits in many situations:

- For hot months in facilities without air conditioning. Slowly moving air at three to five miles per hour breaks up the moisture-saturated boundary layer surrounding the body; this accelerates evaporation to produce a cooling effect.
- Where an excessive amount of heat has risen and become trapped

The Physics of Moving Air

A large column of air 'travels' farther than a small one. The friction between moving and stationary air occurs at the periphery of the moving column. The perimeter of a column varies directly with the diameter. And while the cross-sectional area varies with the square of the diameter, the large column has proportionately less periphery, and therefore, less 'drag.' The air column from a 3-ft diameter fan has more than 6 times as much 'friction interface' per cubic foot as the air column from a 20-ft fan.

When the down column of air off a HVLS air circulating fan reaches the floor the air turns in the horizontal direction, following the floor, away from the column in all directions. The air flowing outward is called the 'horizontal floor jet.' The height of the floor jet is determined by the diameter of the column of air. The larger the HVLS air circulating fan, the larger the column and the higher the floor jet.



Courtesy of MacroAir Technologies

Called a horizontal floor jet, the deep wall of horizontal moving air is relative to the diameter of a fan and, to a lesser degree, the speed of a fan. Once the floor jet reaches its potential, it migrates outward until it meets a side wall or other vertical surface. There it continues to entrain and circulate additional air. Under ideal conditions, an 8-ft fan produces a floor jet of air approximately 36 inches deep. A 24-ft fan produces a floor jet 108 inches deep.

near the ceiling. Trapped heat stagnates and interferes with proper ventilation. HVLS fans circulate the trapped heat, continually forcing it to circulate down and throughout the structure without creating an uncomfortable windy effect.

- In un-insulated buildings and those with large open doors and/or open-sides.
- For operations which produce smoke or fumes requiring continuous ventilation, such as welding and fabrication, metal casting and forging, or painting and finishing.
- In large, sparsely populated warehouses where air-conditioning would be wasteful.
- Where the dehydrating effect of air-conditioning is undesirable, for example, in commercial bakeries, operations requiring the application of chemicals, or produce handling/packing operations.
- Where the installation of air-conditioning would disrupt operations. For example, renovations in large factories where existing machinery will not be removed, or shipping/receiving operations where conveyor systems would interfere with installing ducting.
- Anywhere the costs of air-conditioning are prohibitive or irrecoverable. For instance, aircraft hangars or facilities over 500,000 sq ft.
- For even-air distribution in buildings with conventional evaporative coolers.

Higher horsepower HVLS fans. 1½ or 2 HP, often fitted with six blades, 20-ft to 24-ft in diameter, are an efficient and cost-effective alternative when higher velocities are required or where extreme moisture, bacteria, mold, mildew, and wet conditions, such as wet floors, exist in, for example, food processing plants.

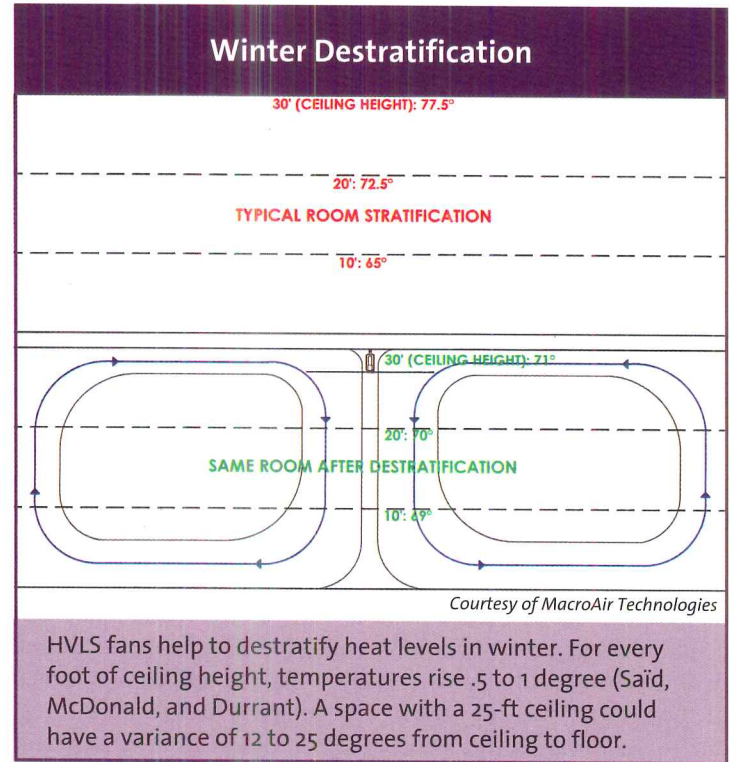
Adding HVAC. Under moderate heat conditions, industrial-size HVLS fans can be run without air conditioning, which reduces energy consumption and cuts operating costs while still producing a pleasant open-air environment. However, they can also be used with more traditional HVAC systems, new or existing, to increase the efficiency of the overall system.

- On hot days, since slow-moving air produces a cooling effect, they can be run with the air-conditioning thermostat set 10 degrees to 15 degrees warmer for equivalent cooling effect (See Chart For 24 Foot Diameter 2 Hp 6 Blade Fan on p.152).
- Due to better air mixing, HVLS fans provide adequate ventilation while requiring less cooled air to be replaced with hot air from outside.
- In a system designed around HVLS fans, cool air distribution costs will consequently be reduced.
- In new construction, the cost of the industrial fans may be completely offset by the elimination of expensive ducting and the reduction in required air-conditioning capacity.

Heating

Cutting heating costs with HVLS fans. In most commercial and industrial buildings heaters are mounted overhead so as to not interfere with working space. Unfortunately, this results in a heat gradient differential or heat stratification of 10 degrees F to 35 degrees F from the floor to the ceiling depending on the height of the ceiling. While running an HVLS fan in forward mode will draw heated air down, more air is drawn in from the sides of the fan than the top, leaving some warm air undisturbed close to the ceiling. On the other hand, an HVLS fan run in reverse clears warm air off the ceiling, pushing it to the walls and down to the floor, which provides

a more even distribution of heat from top to bottom — especially important when employees are working at different levels within a generally open structure.



Following are some of the benefits of HVLS fans for heating:

- More effective and energy efficient than the high-speed fans that are typically used to draw warm air down from high-mounted heaters.
- Thermostats can be lowered and heating costs reduced. According to the U.S. Department of Energy, for each degree the thermostat setting can be lowered, a three percent reduction in fuel consumption can be achieved (http://www.eia.doe.gov/emeu/consumptionbriefs/recs/thermostat_settings/thermostat.html).
- Virtually eliminates the pool of overheated air above the heaters, thus reducing heat loss through roof vents and skylights and increasing heater efficiency.
- Provides adequate ventilation while requiring less heated air to be replaced with cold air from outside.
- Mixes air to eliminate hot and cold spots on the floor as well as overall stratification — especially important in buildings where people are working at different elevations.
- Quiet and non-disruptive operation.
- In new construction, the cost of HVLS commercial fans may be completely offset by elimination of ducting, HVAC tonnage, and auxiliary system fans.

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

See Quiz on the Next Page

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Program title: "HVAC For Large Spaces: The Sustainable Benefits Of HVLS (High Volume/Low Speed) Fans" (12/09, page 123). AIA/CES Credit: This article will earn you one AIA/CES LU hour of health, safety, and welfare/sustainable design (HSW/SD) credit. (Valid for credit through December 2011). **Directions:** Refer to the Learning Objectives for this program. Select one answer for each question in the exam and fill in the box by the appropriate letter. A minimum score of 80% is required to earn credit. **To take this test online and avoid handling charge, go to ce.ArchitecturalRecord.com**

1. **What cooling benefit does air speed beyond four or five miles per hour usually offer?**
 - a. Little additional benefit
 - b. Benefit only begins when air speed is 8-12 miles per hour
 - c. Great deal more after reaching 14 mph
 - d. Air needs to be turbulent to provide cooling benefit
2. **HVLS fans are best suited for mostly large open spaces with a minimum ceiling height of:**
 - a. 8 feet
 - b. 12 feet
 - c. 15 feet
 - d. 20 feet
3. **Higher power-model HVLS fans with six blades 24 ft in diameter:**
 - a. Have a higher solidity ratio than fans with 10 blades
 - b. Cannot be used with sprinkler systems
 - c. Best perform with winglets on the blades
 - d. Are best used in conditions of extreme moisture, bacteria, mold, mildew, and wet conditions
4. **During hot months in more sustainable facilities without air conditioning, slowly moving air:**
 - a. Circulates air up through the structure
 - b. Breaks up the moisture-saturated boundary layer surrounding the body and causes a cooling effect
 - c. Reduces temperature 12 degrees F
 - d. Increases dehydrating effect
5. **A fan delivering air at 20mph requires how many times more power (energy) than one delivering air at 5 mph?**
 - a. 4
 - b. 48
 - c. 64
 - d. 128
6. **Adding HVLS fans to HVAC systems:**
 - a. Increases thermal load
 - b. Increases heating and cooling times
 - c. Reduces electricity use
 - d. Decreases the horizontal floor jet of moving air
7. **One horsepower-model HVLS fans fitted with six blades, 8-ft to 24-ft in diameter:**
 - a. Are only suited for spaces with ceilings below 15-ft
 - b. Help improve productivity and comfort of the work environment
 - c. Cannot be used in conjunction with HVAC systems
 - d. Are generally used for outside applications where additional turbulence is acceptable
8. **When evaluating HVLS fans, design professionals should be aware of:**
 - a. EMI and RFI compliance
 - b. CFM performance
 - c. Length of warranty
 - d. All of the above
9. **Depending on the height of the ceiling, the heat gradient differential or heat stratification from the floor to the ceiling ranges in degrees F from:**
 - a. 10 to 35
 - b. 15 to 20
 - c. 6 to 32
 - d. 20 to 32
10. **The accepted method of measuring HVLS fan performance (CFM):**
 - a. Does not involve complex systems such as dynamometers
 - b. Is to measure the speed of the air produced by the fan and use a formula to convert that number to CFM
 - c. Is to measure the thrust produced by the fan and use a formula to convert that number to CFM
 - d. Is currently used by AMCA International to certify HVLS fans larger than 12 feet in diameter

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Material resources used: This article addresses issues concerning health and safety and sustainable design.

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Founded by Walter Boyd, the inventor of HVLS commercial fan technology, and a family-owned company since its inception in 1995, MacroAir combines technology with a unique application of the laws of physics to produce air-circulating fans for use in large industrial, commercial, and agricultural/farm buildings. For more information about MacroAir Technologies visit: www.macro-air.com



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Building Information Modeling (BIM) and Manufactured Complementary Building Products

Integrating design, drawings, specifications, and shop drawings in a BIM model



Photo courtesy of Nystrom, Inc.

BIM and Complementary Building Products are used in virtually all buildings.

Provided by Nystrom, Inc.

by Peter J. Arsenault, AIA, NCARB, LEED-AP

The process of designing, documenting, constructing, and maintaining a building is changing. Instead of treating these as separate steps, a truly more integrated way of thinking is emerging and, in many cases, being demanded by building owners. Building Information Modeling or BIM is one big part of that change and has been regarded as a central tool that has been bringing together architects, engineers, contractors, building owners,

specialty consultants, product manufacturers, fabricators and others to look and think differently about the information that they use and the role that they each play in the design, construction and operation of buildings.

BIM DEFINITION AND CHARACTERISTICS

In order to better understand the nature of this important tool, let's take a closer look at how BIM is defined. According to the National Institute of Building Sciences (NIBS);

“A Building Information Model (Model) is a digital representation of physical and functional characteristics of a facility. As such, it serves as a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life cycle from inception onward.”

The key here is that the BIM model becomes a long term shared resource for a building or facility from the earliest design conception, through construction, during the years it is operated and maintained, through any alterations, additions or adaptive re-use, all the way through to the end of its useful operating life and eventual demolition or deconstruction. Further, NIBS goes on to point out the following:

“Some have identified BIM as dealing with only 3D modeling and visualization. While important and true, this description is limiting. A more useful concept is that a Model should access all pertinent graphic and non-graphic information about a facility as an integrated resource. A primary goal is to eliminate re-gathering or reformatting of facility information; which is wasteful.”

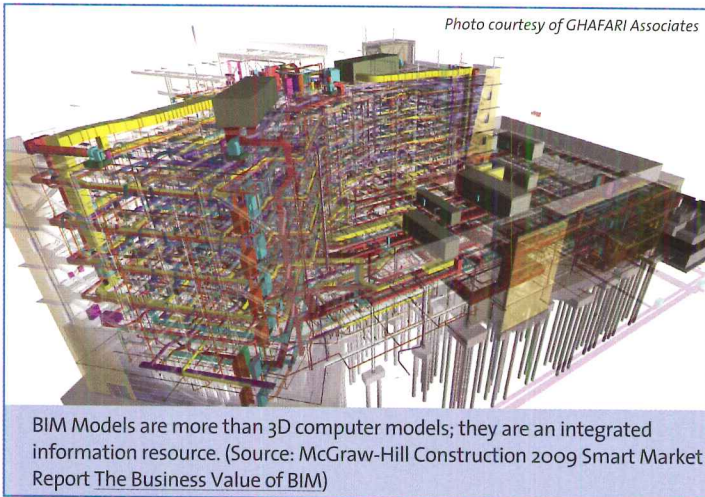
CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **Building Information Modeling (BIM) and Manufactured Complementary Building Products**. To earn one AIA/CES Learning Unit, including one hour of health safety welfare credit, answer the questions on page 133, then follow the reporting instructions or go to ce.ArchitecturalRecord.com and follow the reporting instructions.

Learning Objectives

After reading this article, you should be able to:

- Recognize and explain the characteristics and definition of Building Information Modeling (BIM).
- Explore and interpret the various types of BIM object information available from product manufacturers.
- Differentiate between types of embedded product information related to integrated drawings, specifications and shop drawings for a project.
- Evaluate some of the resources available for the application of BIM and assess how it applies to your own work.



The integration of both graphic and non-graphic information in one place gives the Model much more value as a resource that can be accessed by many people instead of wasting time and money to duplicate. The current wastefulness and redundancy in building design and construction work, while difficult to accurately quantify, is estimated by NIBS at a figure approaching \$400 billion annually, without taking operating processes into account. Eliminating this waste has been a key motivator on the part of owners and others who seek a superior building outcome by incorporating a more coordinated non-redundant methodology.

NIBS has also launched a specific initiative known as the buildingSMARTalliance™, which has compared the rise in the use of electronic modeling for buildings to similar changes that have preceded it in the aircraft, microprocessor and automotive industries. Based on those other industry successes, BIM is usually characterized as having several key features:

- **Digital or electronic format.** The Model is created entirely on computers.
- **Parametric object-based.** The information in the Model is not a series of lines and shapes as in many Computer Aided Design (CAD) applications, rather it is a collection of three-dimensional “objects” that are inserted or virtually “built” into the Model. The objects are often selected or created generically in BIM software programs or custom created by design professionals. Parametric objects are those that automatically adjust to other objects in a model, such that if a change is made to the model that affects the size or location or spacing of the object, it moves and adjusts accordingly.
- **Embedded information linkage.** Beyond the physical representation of an object, the functional data (e.g. specifications, warranty, manufacturing information, etc.) associated with that object is embedded or linked to the BIM object and readily accessible and readable.
- **Interoperable.** With information coming from multiple sources, the ability to openly and easily share that information in generic formats without the restrictions of proprietary software becomes critical. This point is common among a number of computer-based activities and has strong precedent elsewhere. In fact, the Institute

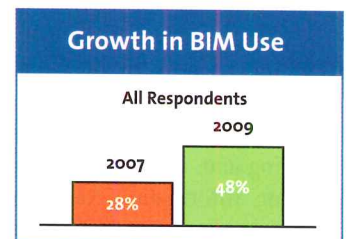
of Electrical and Electronics Engineers (I-triple E) has spent a considerable amount of effort looking at this topic and offers this definition of interoperability: “The ability of two or more systems or components to exchange information and to use the information that has been exchanged.”

A Model that incorporates all of these features lives up to the true definition of BIM and its ability to deliver desired results.

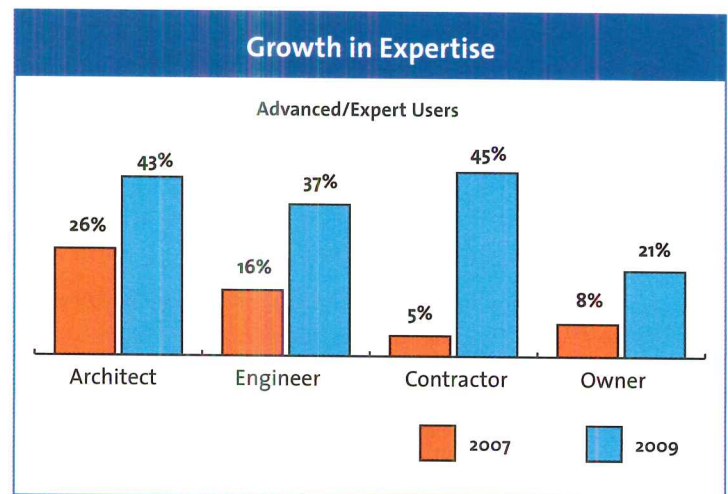
THE GROWING USE OF BIM

Of course, any tool is only of value if it is actually used and put into practice. In order to understand the current and projected usage trends and perceived value of BIM in practice, McGraw-Hill Construction has undertaken a series of objective studies in partnership with NIBS, the American Institute of Architects (AIA), and others and published the findings as a “Smart Market Report — The Business Value of BIM” (see www.aia.org/ipd). The 2009 printing of this report updates the findings of the prior 2007 edition and reveals some insights into who is using BIM and why. This study is based on input from information gathering surveys from literally thousands of participants that came from all parts of the Architecture, Engineering and Construction (AEC) spectrum across North America. Some of the highlights of this study are summarized below:

- **Almost half (49%) of the total AEC industry is now using BIM.** This usage level is up considerably since 2007 when the same study revealed that only 28% of the total industry was using BIM or BIM related tools at that time. This represents some dramatic recent growth — a 75% increase in two years. Further, proficiency is up dramatically too with three times as many users characterizing themselves as advanced or experts — 42% in 2009 compared to only 14% in 2007.



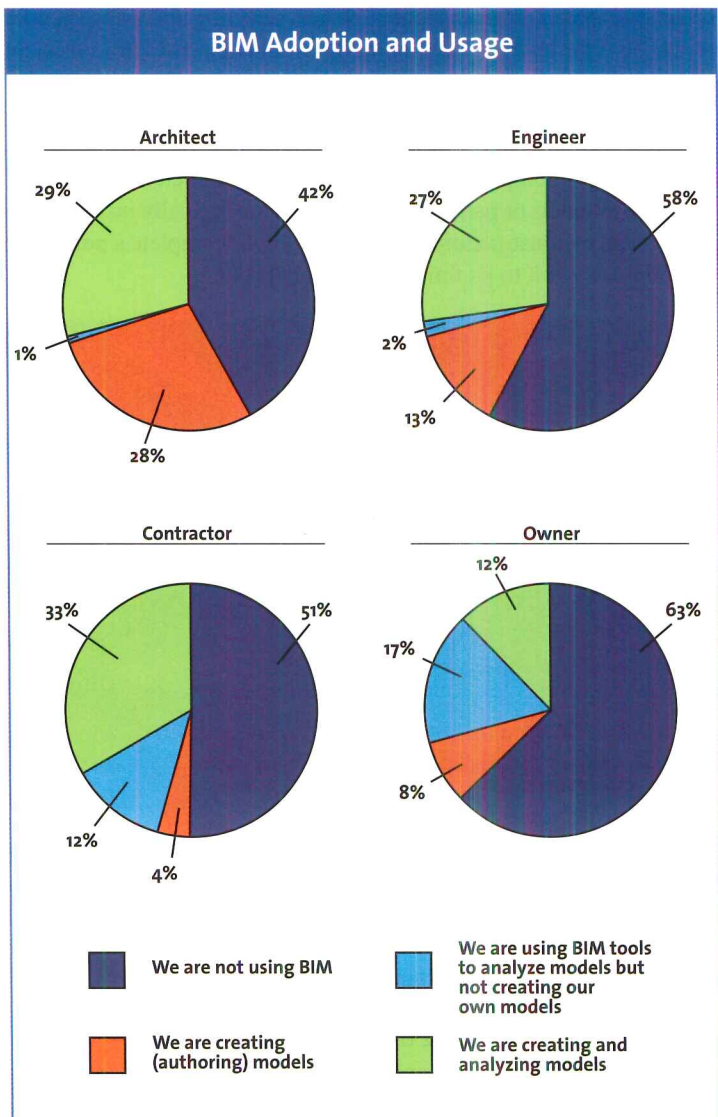
Source: McGraw Hill Construction 2009 Smart Market Report *The Business Value of BIM*



Source: McGraw Hill Construction 2009 Smart Market Report *The Business Value of BIM*

In light of these findings, Steve Jones, one of the co-authors of this report from McGraw-Hill Construction has said, “With about half the North American AEC industry already up off their beach chairs and at least wading ankle-deep in the BIM surf, we can stop hyperventilating about “BIM” and just do BIM as a regular course of business.”

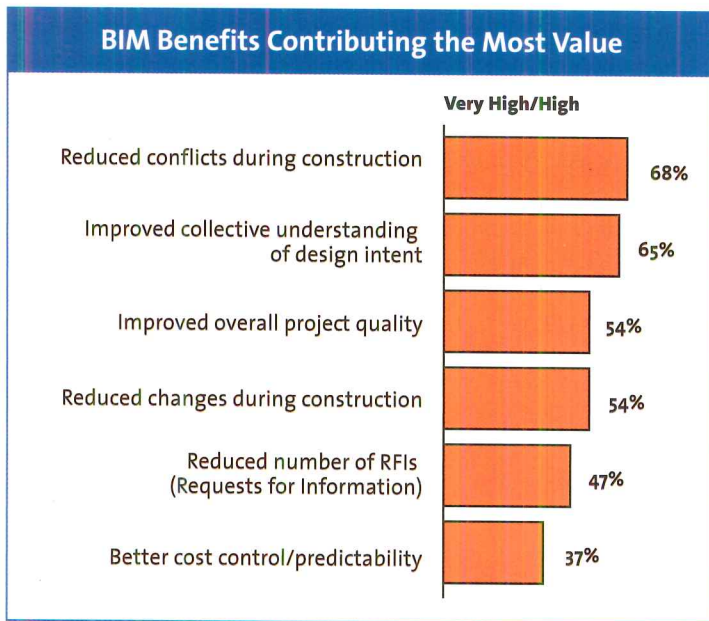
- **All BIM users plan significant increases in utilizing BIM.** Fully one third of all current BIM users surveyed report employing BIM on 60% or more of their projects today, but twice as many users expect to be at that level in the next two years. Of those not yet using BIM, half have yet to try it, although they are open to it, and at least 42% of non-users believe that BIM will be either highly or very highly important in the next five years. The trend of increased usage observed during the past two years appears that it will continue based on these survey results.
- **Different groups of users have differing usage levels, but the majority of users overall are seeing real business benefits directly attributable to BIM.** The report breaks down some interesting observations about the different groups using BIM:



Source: McGraw Hill Construction 2009 Smart Market Report *The Business Value of BIM*

- **Architects:** BIM used in the AEC industry is credited to have gotten its start within the architectural community and this early adoption has architects still reigning as the highest users of BIM. As many as 60% of architects report creating some form of BIM Model in their practice and two thirds of those report that they find high value in the core design development and construction document phases of a project. This value is based on higher productivity and a reduction in the need to re-work designs.
- **Engineers:** Overall, this group of design professionals lags behind architects with only 42% of engineers reporting using BIM, which is actually lower than the usage percentage of contractors. Among the common resistance expressed by engineers is the availability of sufficient engineering content that is BIM compatible or a perception that this approach doesn't apply to their particular practice of engineering. On the positive side, engineers see the reduction of conflicts and changes during construction as the top ways that BIM adds value to a project.
- **Contractors:** This group is growing faster in usage than any other with 50% currently reporting using BIM or related tools compared to only 13% in 2007 — a fourfold increase in only two years. This growth is likely fueled by the finding that nearly 70% of contractors that are using BIM are finding high value with greater chances of avoiding errors and omission problems during construction, enhancing productivity, avoiding conflicts, and improving performance on both budget and time schedule.
- **Owners:** As a group, approximately 37% of building and facility owners report using BIM, even though many have yet to realize the long term operations and maintenance benefits. Nonetheless, 70% of those utilizing BIM for design and construction projects see positive value through such benefits as lower overall project costs, clash detection, avoiding rework, and a generally overall better construction outcome.
- **Material Fabricators:** Accurate information and dimensioning are the keys to successful material fabrication in any construction project. By bringing fabricators into the design and construction process earlier rather than later, they can collaborate with the rest of the team to provide input and extract data from the BIM Model rather than recreate it separately. In this way the project can benefit from improved overall quality, easier constructability, the reduction of waste, better timeliness in fabrication schedules and a resulting improvement in affordability.
- **Building Product Manufacturers:** This group is just beginning to realize the potential benefits of incorporating BIM into the way that they communicate and interact with all of the other players above. Some are developing their own libraries of their products as complete BIM objects. Commercial services are also working with a steadily growing number of manufacturers to make BIM objects of their products available to those creating and using BIM models.

Overall, then, the report points out that “the ability of teams to create richer models and share more data with BIM has helped foster more collaborative decision making on projects. BIM has proven an effective tool for this [integrated project] delivery method, breaking from the tradition of handing off completed work from one team member to the next with little or no input from others.” It also summarizes the resulting overall benefits related to saving time and money through 1) conflict avoidance/resolution, 2) increased productivity/ efficiency and 3) the avoidance of rework/



Source: McGraw Hill Construction 2009 Smart Market Report *The Business Value of BIM*

changes. Beyond saving time and money, however, there are other overall benefits for all parties including 1) a better understanding of the project throughout the phases or stages, 2) better collaboration, and 3) better visualization. Some future trends also noted include the potential to reduce the need for submittals and shop drawings while allowing more time for design and less time for documenting/processing.

THE ROLE OF MANUFACTURED, COMPLEMENTARY BUILDING PRODUCTS IN BIM MODELING

As previously noted, building product manufacturers are beginning to become increasingly involved in providing their product information as fully developed BIM objects. This is coming about for a variety of reasons including:

- **Recognizing change.** Manufacturers are beginning to see that BIM is quickly replacing CAD as the preferred design tool by the architectural, engineering, and construction community.
- **Filling a need.** The creation of libraries of specific objects is time consuming and often not cost effective for design firms, particularly for objects of multiple manufacturers. Having readymade objects that are accurate, up to date, and customizable to suit a particular project helps architects realize the full potential of BIM through greater efficiencies of time and integration of data.

- **Staying current.** Products change and so does BIM software. Manufacturers who are in for the long term recognize the reality of needing to keep their information and data updated with new product offerings and changes as well as maintaining full compatibility with changing software programs. Adopting and maintaining a BIM approach to conveying their product information provides manufacturers with the best way to integrate with the AEC community.

Understandably, some project owners do not allow the pre-selection of a single manufacturer, favoring instead the open bidding approach of providing the design criteria in drawings and specifications for multiple manufacturers to demonstrate compliance with. In other cases, owners have prior experience or even standing accounts for particular products and manufacturers and want to ensure that those products get used again. In either case, a discussion with the owner at the outset of a project is important to ascertain what the basis of design will be in the project regarding manufactured building products. With more product information becoming readily available in BIM format and more collaboration of designers, constructors, suppliers, and manufacturers earlier in the design and construction process, the trend is clearly heading toward making specific product selections sooner rather than later. Hence, selecting and using specific products in the overall building model would appear to be consistent with that trend.

Certain building products fit into the category of “complementary building products.” The term comes from the definition of “acting as or providing a complement (something that completes the whole).” They are products or parts of buildings that are typically installed late in the stage of construction that complement or complete a portion of a building to get it to its finished functional state.



Photo courtesy of Nystrom, Inc.

Complementary building products include integrated parts of buildings such as entrance flooring and expansion joint covers.

Peter J. Arsenault, AIA, NCARB, LEED-AP is an architect and green building consultant focused on sustainable design solutions based in Upstate New York.

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Program title: "Building Information Modeling (BIM) and Manufactured Complementary Building Products" (12/09, page 129). AIA/CES Credit: This article will earn you one AIA/CES LU hour of health, safety, and welfare credit. (Valid for credit through December 2011). **Directions:** Refer to the Learning Objectives for this program. Select one answer for each question in the exam and fill in the box by the appropriate letter. A minimum score of 80% is required to earn credit. **To take this test online and avoid handling charge, go to ce.ArchitecturalRecord.com**

1. **The definition of BIM includes:**
 - a. 3D digital representation of a building.
 - b. A shared information resource.
 - c. A tool for the life cycle of the building.
 - d. All of the above
2. **Characteristic BIM features include all of the following EXCEPT:**
 - a. Electronic representations
 - b. CAD lines and shapes
 - c. Embedded information linkages
 - d. Interoperable format
3. **Between 2007 and 2009, the use of BIM has increased:**
 - a. 75%
 - b. 49%
 - c. 60%
 - d. None of the above
4. **The professionals found to be the highest users of BIM are**
 - a. Contractors.
 - b. Engineers.
 - c. Owners.
 - d. Architects.
5. **The value of BIM is found only in saving time and money**
 - a. True
 - b. False
6. **Complementary Building Products that can be incorporated into a BIM model include:**
 - a. smoke vents.
 - b. fire Extinguishers.
 - c. air louvers.
 - d. All of the above
7. **The best place to find up to date BIM objects from a building manufacturer is on a CD in the catalogue in your office library.**
 - a. True
 - b. False
8. **The term interoperability means:**
 - a. the ability to access complete and accurate information regardless of the source.
 - b. the ability to collaborate with the rest of the project team.
 - c. the ability to use the BIM Model over the life cycle of the building.
 - d. the ability to share BIM objects online.
9. **National BIM Standards are being developed by**
 - a. The American Institute of Architects.
 - b. The Construction Operations Building Information Exchange.
 - c. The buildingSMART alliance™.
 - d. The General Services Administration.
10. **An annual source that highlights proven strategies and the latest trends in design and technology in the building industry is**
 - a. The National Institute of Building Sciences (NIBS).
 - b. The Whole Building Design Guide.
 - c. The AIA BIM Awards given by the Technology in Architectural Practice. Knowledge Community
 - d. None of the above

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2009 PRODUCT REPORTS

Despite the year's economic slump, manufacturers continued to produce outstanding new building products, although in smaller numbers. Our annual review includes 71 new offerings you should know more about. [RITA CATINELLA ORRELL](#)

p. 153

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p. 143

IN A BUSINESS YEAR THAT SOME WOULD sooner forget, several building-product manufacturers chose to take advantage of the economic lull to launch new lines into a quiet, but listening, marketplace. The introduction of PuraVida, an exciting new bathroom-fittings and -furnishings collaboration from Duravit and Hansgrohe, designed by Phoenix Design (page 161), was a good example. PuraVida is one of more than 70 new products selected by our jury to appear in this year's Product Reports, our annual collection of the best new product offerings for architects and specifiers.

Looking for more than decorative objects "that happen to light up," the lighting-designers jurors worked as a team to focus on the importance of performance, scale, detail, and relevance of LEDs in lighting products. A favorite? Wide-Lite's VizorLED parking-garage fixture, noted for its "innovative use of new technology in a 'workman' fixture." In Furnishings, Lerival's JACK table, designed by the architectural firm Della Valle Bernheimer, was selected for its "sexy CNC routing that creates a unique approach toward

wire management." In the Woods, Plastics + Composites category, Stone Source's Textured Reclaimed Woods was a favorite for its "strong design direction that is often overlooked by material manufacturers."

The jury was impressed by the number of quality entries in Thermal + Moisture Protection, which included architect Ward Blake's Rammed Earth, a material that utilizes "lost building techniques updated with current technology." Another product that took a new approach to an old idea was Boon Edam's Human Powered Revolving Door, a "really clever" design that stores energy from the push of the door to power the door's LEDs. What was missing? The jury told us they would have liked to review more products that address real performance and sustainability issues.

The following pages include many other introductions that, by luck or careful planning, were launched in a soft market and found an opportunity to be noticed. We hope they serve as a resource, and inspiration, for you throughout the coming year.

JURORS | All jurors are based in New York City, except as noted.**1 Robin Reigi**

Reigi is the founder of Robin Reigi Inc., a firm specializing in the sourcing, development, and marketing of innovative architectural materials. Reigi and partner Jennifer Daly provide material consultation to corporations such as Herman Miller, BMW, Jaguar, and the Andalucía, Spain, Trade Commission.

2 Josiah Stevenson, AIA, LEED AP

Stevenson is a principal with Leers Weinzapfel Associates in Boston. He has been a Boston Society of Architects member since 1984 and served as a coordinator and lecturer for "The New American Courthouse," a course in Harvard's Executive Education program, in 2008 and 2009. He has also served as a juror for the Rotch Traveling Fellowship in 2006 and for the AIA Product Awards in 2009.

3 Nathalie Rozot

Rozot is an award-winning, multidisciplinary planning and design consultant whose work for large-scale public-space projects encompasses lighting design, exhibition design, architecture, landscape architecture, and urban planning. She teaches thesis at Parsons' lighting-design graduate program and workshops in landscape architecture master's degree programs in France at l'Ecole Nationale Supérieure du Paysage de Versailles and l'Ecole Nationale Supérieure d'Architecture et de Paysage de Lille.

4 Michael Castelli, IES

Castelli is a trained architect and a design principal with HDLC Architectural Lighting Design. He has served as an expert for the USGBC, Clinton Climate Initiative, and IALD. His product work includes a design for the Neoray Nuage, the world's first fully perforated metal, indirect pendant light fixture. Recent projects include the HBO Shop and the Bank of America tower in New York City.

5 Granger Moorhead, AIA

Moorhead is a partner at Moorhead & Moorhead, the architecture and industrial design studio he formed in 2000 with his brother, industrial designer Robert Moorhead. Their work has been widely exhibited and was included in the Cooper-Hewitt's *Design Life Now: National Design Triennial 2006*. In 2008, the brothers were named "Emerging Voices" by the Architectural League of New York.

6 Allison H. Reeves, AIA

Reeves is an architect with Polshek Partnership Architects who focuses on construction documentation, technical detailing, and construction administration for cultural and educational clients. Previously, she worked at Tsao & McKown Architects and Rogers Marvel Architects in New York City, and Scogin Elam and Bray Architects in Atlanta.

7 Shoshanna Segal, LC, IESNA, IALD, LEED AP

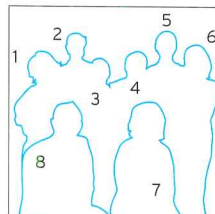
In addition to her design work, Segal has worked as a manufacturer's representative and as a sales manager for an international lighting manufacturer. As the controls team leader in Horton Lees Brogden Lighting Design's Daylighting & Sustainable Design Studio, Segal is committed to providing clients with sustainable, energy-efficient lighting solutions that make use of today's rapidly evolving technology.

8 Phu Hoang

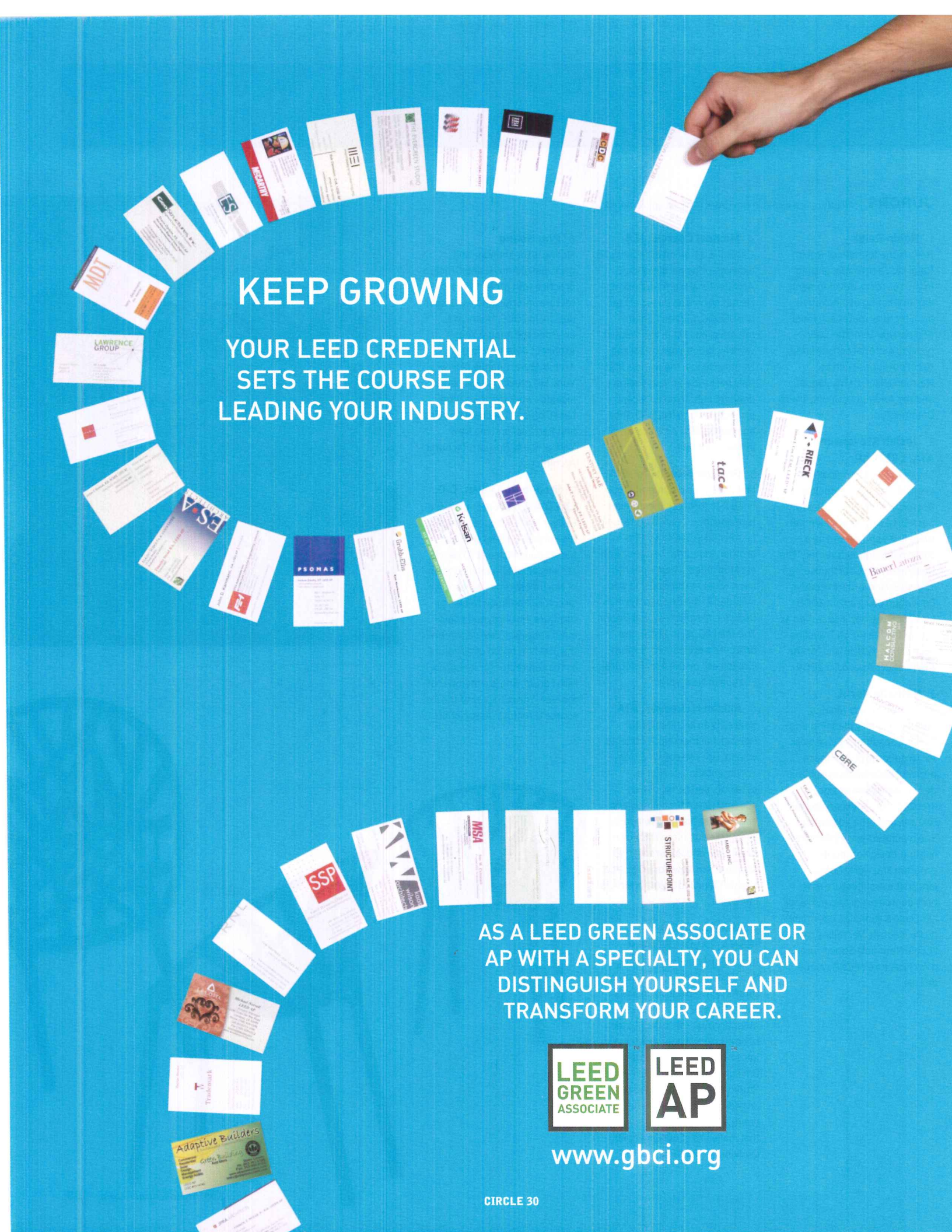
Hoang is the founder and principal of Phu Hoang Office, a practice with projects in architecture, interior, and exhibition design. In 2009, Hoang was awarded the annual Young Architect Award from the Architectural League of New York. His previous experience includes work in the London-based office of Michael Hopkins and Partners and the New York office of Bernard Tschumi Architects.

9 Stephanie Ebeyer, CID, LEED AP, IIDA (not pictured)

Ebeyer is the resource director for Polshek Partnership. Her background includes 10 years at Gensler, holding the position of Northeast regional resource director, in addition to being a furniture, finishes, and equipment specialist. She serves on the IIDA N.Y. board of directors as the codirector for its Corporate Forum. She is a member of the New York Chapter of the Resource Directors' Association.

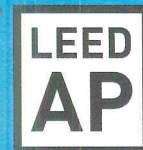


p. 158



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TOP 10 GREEN | This year's group includes the most exciting products drawn from recent additions to the *GreenSpec Directory* and coverage in *Environmental Building News*, both published by BuildingGreen.



1 | PRODUCT Pozzitive Plus CMUs and Concrete Block
MANUFACTURER **Kingston Block & Masonry Supply**
kingstonblock.com

These CMUs and concrete facing brick are manufactured using up to 30% postconsumer recycled glass as a portland cement substitute, and an average of 50% postconsumer recycled masonry aggregate from local sources in the Northeast. According to the manufacturer, compared to conventional CMUs and brick, they require less energy to produce, are stronger, and have greater moisture and chemical resistance. **CIRCLE 200**

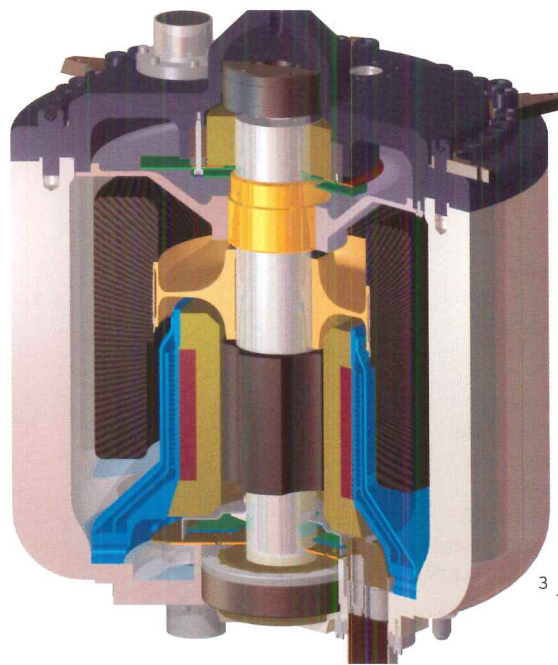
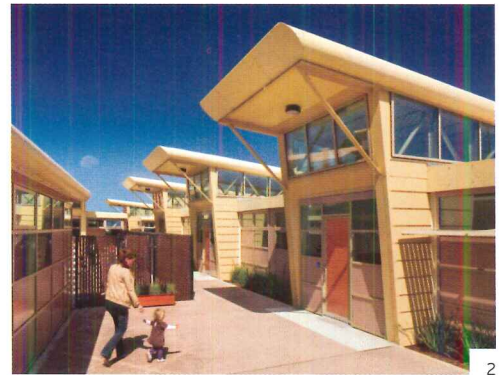


5 | PRODUCT Silva Cell Subsurface Tree Protection and Stormwater System
MANUFACTURER **Deep Root Partners**
deeproot.com

The Silva Cell is a modular system that holds soil for tree growth and stormwater management while supporting paved surfaces. Growing trees in urban areas can reduce the urban heat island effect, pollution, and flooding, while replenishing oxygen and connecting inhabitants to the natural environment. This system creates a void space that holds 10 cubic feet of soil per unit, protecting tree roots from compaction and providing room for stormwater infiltration and surrounding utilities. **CIRCLE 203**

2 | PRODUCT Project FROG Modular Green Classroom
MANUFACTURER **Project FROG**
projectfrog.com

Project FROG designs and custom-fabricates modular classrooms and buildings that feature high-performance envelopes, natural daylighting, high-efficiency mechanical systems, and green materials and components. They can be assembled quickly with almost no construction waste, yet they are sturdy enough for Zone 4 seismic areas and 110-mph winds. **CIRCLE 201**

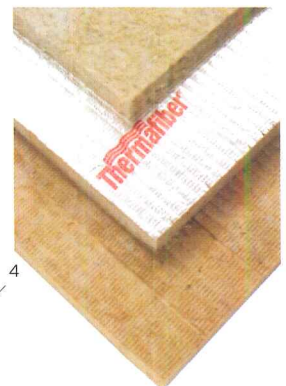


3 | PRODUCT Pentadyne GTX Flywheel Energy Storage
MANUFACTURER **Pentadyne Power Corporation**
pentadyne.com

Pentadyne's GTX flywheel is a short-duration energy-storage product used to replace uninterruptible power-supply batteries in data centers, health care, manufacturing, and other applications. It utilizes a graphite-composite flywheel magnetically levitated in an argon-filled, vacuum-sealed unit to store kinetic energy for use when the normal power supply is disrupted and before a backup generator starts or power is restored. **CIRCLE 202**

4 | PRODUCT Thermafiber Mineral Wool Insulation Products
MANUFACTURER **Thermafiber**
thermafiber.com

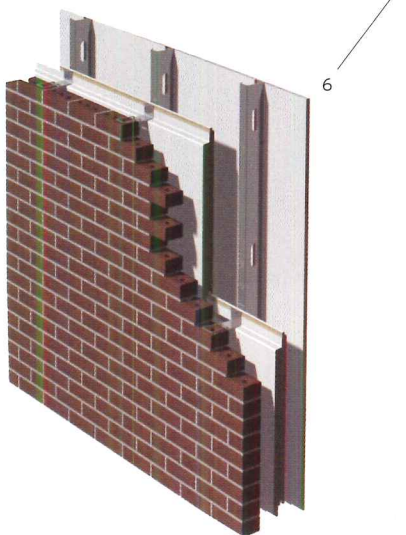
Thermafiber makes a variety of mineral-fiber insulation products from preconsumer recycled iron-ore slag for commercial and residential thermal, sound-attenuation, and fire-resistant construction applications. Formaldehyde emissions are far lower than the most stringent CARB Phase II levels for wood-panel products. **CIRCLE 204**



6 | PRODUCT **Invelope Integrated Wall Insulation and Rainscreen System**

MANUFACTURER **CENTRIA**
 buildbetterwalls.com

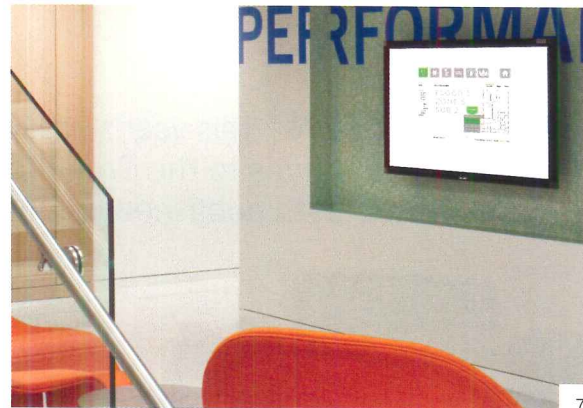
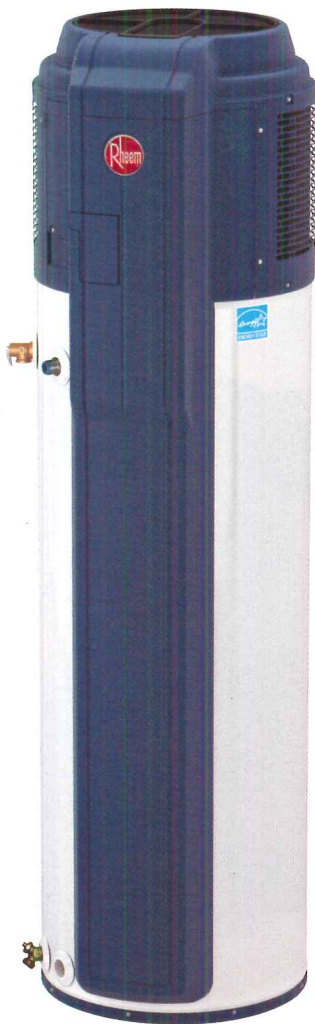
Invelope steel-and-foam panels create a weather-tight backup wall system for metal-framed commercial buildings. It provides a moisture and vapor barrier, drainage plane, and insulation – as well as a mounting system for brick-veneer or terra-cotta cladding – all in one panel system. Made from corrosion-resistant steel wrapped around a polyisocyanurate foam core and similar to CENTRIA's Formawall, Invelope comes in 32"-wide interlocking panels and is available in 12' and 20' lengths and in 2" (R-14) and 3" (R-21) thicknesses. **CIRCLE 205**



9 | PRODUCT **Recycled/Biobased-Content Office Furniture**

MANUFACTURER **Baltix Sustainable Furniture**
 baltix.com

Baltix commercial furniture is made with green materials, including sunflower and other seed hulls, wheat straw, FSC-certified MDF and veneers, and recycled plastics and paper, using low-emitting, UV-cured clear coats, linoleum, and biobased PLA edge banding. BioSurf, introduced this year, is a new biobased laminate made from corn and soy. **CIRCLE 207**



7 | PRODUCT **Convia Energy-Management Infrastructure**

MANUFACTURER **Convia**
 convia.com

***E** Convia has partnered with Wiremold to offer a modular energy management platform that integrates lighting, switches, occupancy sensors, timers, and other devices and links them to sophisticated controls capable of monitoring and adjusting a building's overall energy performance. Energy consumption data from the components and zones are gathered and displayed on monitors for easy analysis. **CIRCLE 206**

8 | PRODUCT **HP-50 Heat-Pump Water Heater**

MANUFACTURER **Rheem Manufacturing Company**
 rheem.com

Intended for residential use, this Energy Star-listed heat-pump water heater features an integral 50-gallon tank. While not the highest-efficiency heat-pump water heater on the market, it is the first relatively affordable, integral storage offering from a large national company to enter the North American market. It is also the market's quietest (rated at 49 dB), and has the longest warranty. **CIRCLE 208**



10 | PRODUCT **Mobile Solar Power Generator**

MANUFACTURER **Mobile Solar Power**
 mobilesolarpower.net

Used as a silent, more environmentally responsible replacement for portable diesel generators, this range of portable, solar-powered generators integrate PV panels, inverters, charge controllers, and lead-acid storage batteries into a self-contained trailer that keeps all components other than the PV modules fully protected and out of the elements. **CIRCLE 209**



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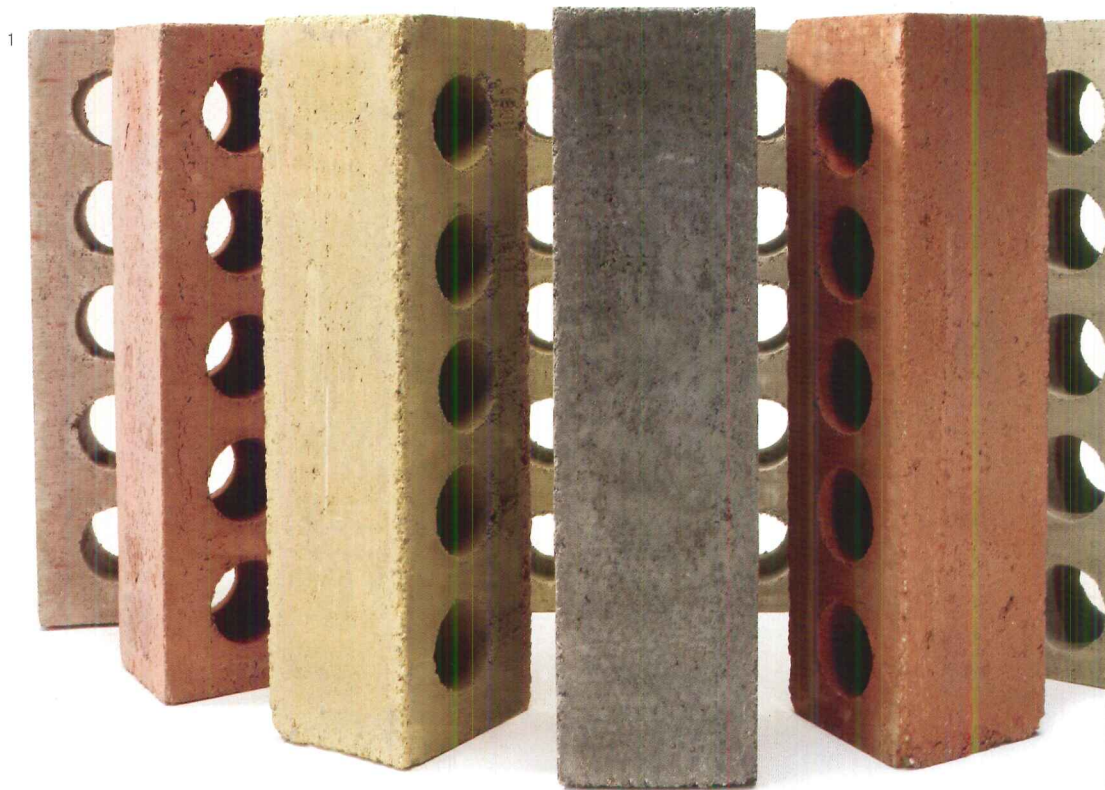
ustile.com

Cradle to Cradle • Cool Roof Rated • 100% Recyclable • No Fade • No Mounting
CIRCLE 31

CONCRETE, MASONRY + EXTERIOR IMPROVEMENTS | [Cast-in-place concrete](#) • [Glass-fiber-reinforced concrete](#) • [Brick masonry](#) • [Unit paving](#) • [Manufactured stone masonry](#)

1 & 2 | PRODUCT **Fly Ash Pavers and Brick**
 MANUFACTURER **CalStar Products**
calstarproducts.com

***E** Fly Ash Brick (right) reduces the high carbon footprint of brick masonry by approximately 90% versus fired clay brick. Fly Ash Pavers (below) reduce the high carbon footprint of unit paving by approximately 90% versus fired clay pavers, and 80% versus concrete pavers. Both products are made from up to 40% preconsumer recycled content, including Class A fly ash. Both are manufactured with greatly reduced energy-consumption and associated CO₂ emissions. **CIRCLE 210**



3 | PRODUCT **Quikrete Green Concrete Mix**
 MANUFACTURER **The Quikrete Companies**
quikrete.com

Suitable for general concrete work, this concrete mix contains 50% recycled materials, including recycled aggregates, fly ash, and/or slag cement, and offers set-time and strength characteristics similar to the manufacturer's standard mix. **CIRCLE 211**

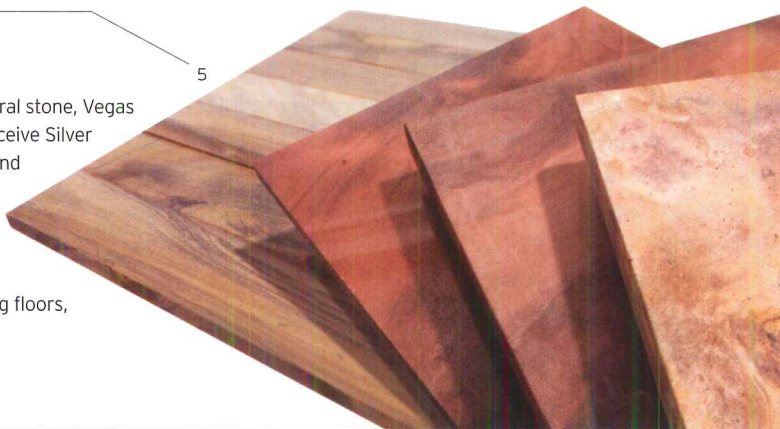
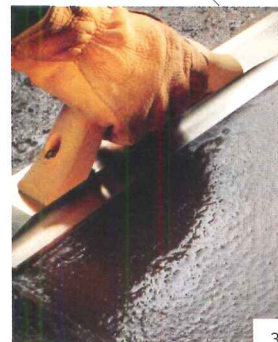


4 | PRODUCT **Formtique**
 MANUFACTURER **Formsquare**
formsquare.com

Formtique is a line of concrete panels and surfaces made from glass-fiber-reinforced concrete (GFC). GFC products can be formed into sections as thin as .3" and used for slab-work applications such as kitchen work tops, bathrooms, reception desks, and retail counters. A range of standard patterns and colors as well as custom designs are available. **CIRCLE 212**

5 | PRODUCT **Vegas Rock**
 MANUFACTURER **Stone Source**
stonesource.com

Made of metaquartzite, a rare type of natural stone, Vegas Rock is the world's first natural stone to receive Silver Cradle to Cradle certification from MBDC and produces zero waste in manufacturing. Available in three colors and finishes, the structurally sound stone can be used for landscaping, exterior cladding, exterior pavers, or any interior application, including floors, walls, and kitchen counters. **CIRCLE 213**





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Bison Massaranduba Wood Tiles are FSC Certified (SCS-COC-002585) and used for installing sophisticated modular decks on rooftops, green roofs or over occupied space. Made of exotic hardwood, Massaranduba Tiles are durable, lightweight and pre-assembled to a size of 2ft x 2ft. Integrates with **Bison Deck Supports** and Fastening Kit (patent pending) to secure tiles and create a sturdy and monolithic deck.



DECK SUPPORTS & WOOD TILES

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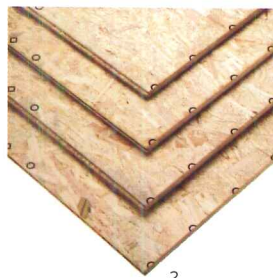
www.BisonDeckSupports.com

CIRCLE 32

WOOD, PLASTICS + COMPOSITES | Sheathing • Wood decking • Wood paneling

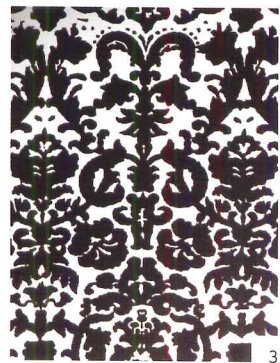
1 | PRODUCT **Bison**
Massaranduba Wood Tiles
 MANUFACTURER
Bison Deck Supports
 bisondecksupports.com

E These commercial-grade, FSC-certified wood tiles are lightweight and preassembled to measure 2' x 2'. They work with Bison Deck Supports and fastening kits on rooftops, terraces, and green roofs. They offer a Janka Hardness rating of 3190 and have a scuff-resistant surface. No mechanical fasteners are visible from the top, keeping the look clean. **CIRCLE 214**



2 | PRODUCT **AdvanTech Flooring and Sheathing**
 MANUFACTURER **Huber Engineered Woods**
 advantechperforms.com

AdvanTech has greater water-resistance, design-bending strength, and stiffness than commodity OSB and plywood. Certified by the Sustainable Forestry Initiative, the flooring and sheathing is made of sustainable, fast-growing tree species and formaldehyde-free resin. All waste is reused in the manufacturing process. **CIRCLE 215**



3 | PRODUCT **Serigrafia Longline**
 MANUFACTURER
Abet Laminati
 abetlaminati.com

Designed by Paola Navone, this new line of high-pressure laminate for interior vertical and horizontal surfaces is Greenguard certified for low-VOC content. The 16 silk-screened patterns are reproduced on a deeply textured laminate. Applications include counters, tabletops, furniture, wall panels, doors, toilet partitions, and elevator-cab interiors. **CIRCLE 216**



4 | PRODUCT **Textured Reclaimed Wood**
 MANUFACTURER **Stone Source**
 stonessource.com

Suitable for interior walls, this line of FSC- and Rainforest Alliance-certified, textured reclaimed wood is made from salvaged parts of deconstructed buildings. The wood paneling is available in various lengths and widths, depending on the type of species (seven are available, including American Chestnut, North Faced Oak, and New England Hemlock). Textures include sculpted, burnished, raked, dry-brushed, and unfinished. **CIRCLE 218**

5 | PRODUCT **GreenGlass**
 MANUFACTURER **Temple-Inland**
 greenglassinfo.com

GreenGlass fiberglass-faced gypsum sheathing is moisture- and mold-resistant as well as SCS-certified to contain at least 90% recycled content, setting a new industry standard. Developed for application under a range of exterior veneers, it complies with ASTM C1177 and conforms to the code-referenced standard for acceptable wall-bracing materials. **CIRCLE 217**



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*Reed Construction Data, June 27, 2008

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1 | PRODUCT **Solé Power Tile**
 MANUFACTURER **US Tile, powered by SRS Energy**
 ustile.com

***E** Solé Power Tile is the first building-integrated photovoltaic roofing product in the U.S. designed for curved roofing systems. The electricity-generating “barrel-style” tiles are specifically designed for installation in steep-slope roofs alongside US Tile’s traditional clay roofing. Constructed with durable performance polymers commonly used in car bumpers. **CIRCLE 219**



2 | PRODUCT **Rammed Earth**
 MANUFACTURER **Ward Blake Architects**
 wardblakearchitects.com

Ward Blake Architects’ innovative use of rammed earth combines 20th-century posttensioning steel technology with the ancient material of rammed earth – a recipe that could include, for example, 10% on-site soil, 10% cement, and 80% locally sourced crusher fine (a by-product of gravel production). The result is a seismically stable building technology that is aesthetically consistent with the surrounding landscape. **CIRCLE 220**

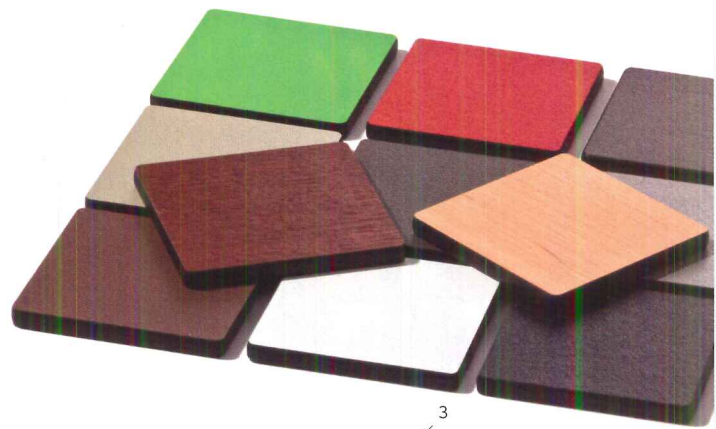


5 | PRODUCT **Spectro360**
 MANUFACTURER **Carlisle Energy Services**
 carlisleenergy.com

Consisting of cylindrical solar tubes and Carlisle’s Energy Star-qualified roofing membranes, the Spectro360 PV system brings a third dimension to the rooftop PV world with up to 20% of the energy production attributed to light that is reflected off the roofing membrane onto the underside of the cylindrical tubes. **CIRCLE 222**

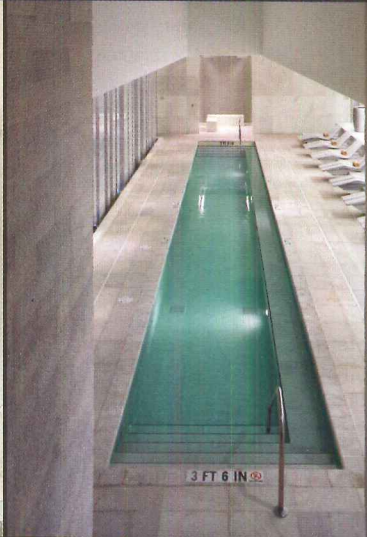
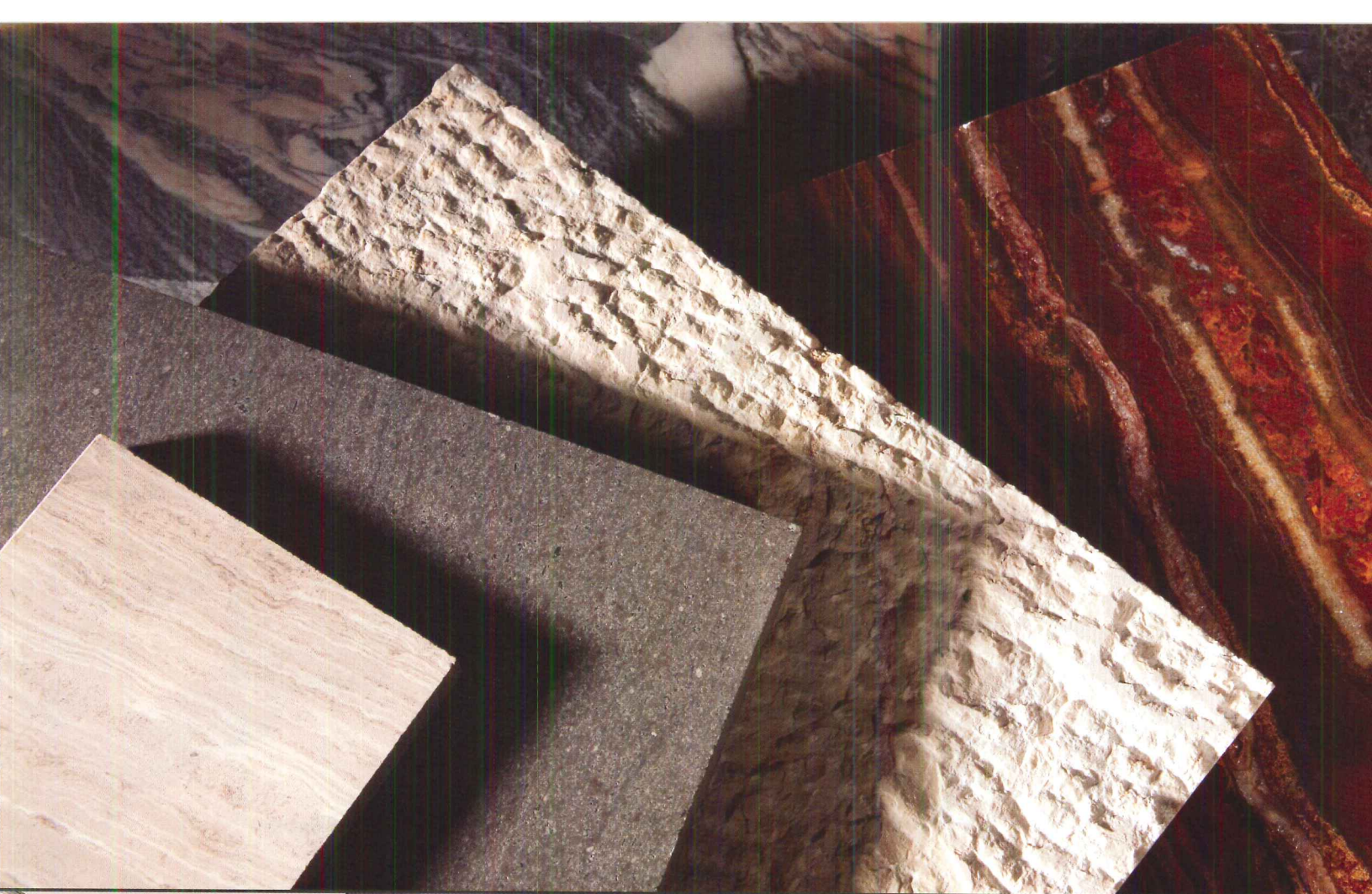
4 | PRODUCT **Ecocell**
 MANUFACTURER **Cellulose Material Solutions**
 cmsgreen.com

Ecocell batt and blanket insulation are Class-A fire-rated cellulose products made from recycled and renewable fibers, mostly postconsumer recycled newspaper. Ecocell is entirely recyclable and creates zero waste in its manufacturing. **CIRCLE 221**



3 | PRODUCT **EcoClad**
 MANUFACTURER **Klip Bio Technologies**
 kliptech.com

***E** EcoClad exterior siding is made from a fifty-fifty blend of FSC-certified postconsumer recycled office paper and wood fiber, and plantation-grown bamboo fiber, bound together by a 100% water-based copolymer resin. UV-resistant, Class-A fire-rated, and VOC-free, it can contribute to seven different LEED credits. **CIRCLE 223**



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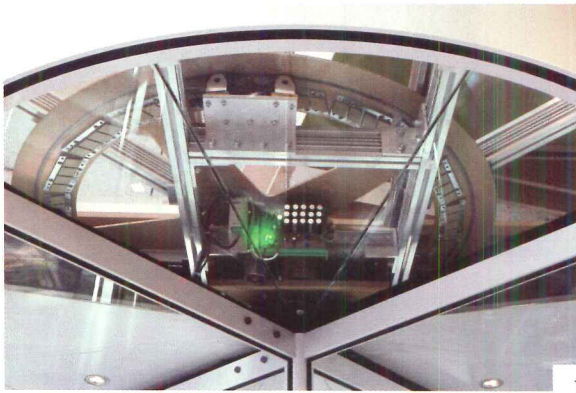
CIRCLE 34

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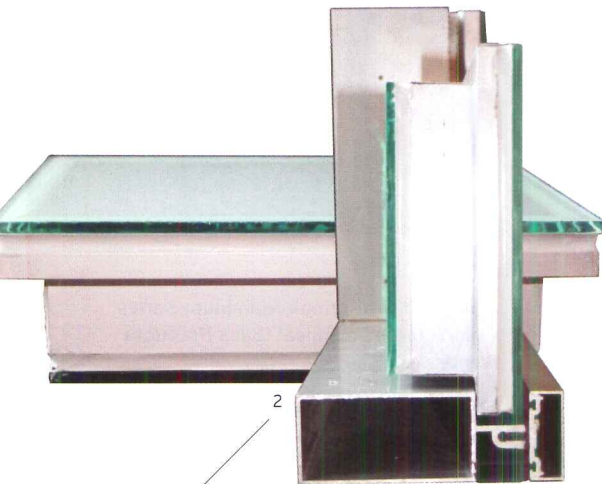
NATURAL STONE
 CERAMIC TILE
 GLASS TILE
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OPENINGS | Doors & frames • Curtain wall & glazed assemblies • Revolving door entrances • Windows • Glazing



1 | PRODUCT **Human Powered Energy Revolving Door**
 MANUFACTURER **Boon Edam**
 boonedam.us

E The HPE TQM Door is intended not only to save energy but to actually generate energy each time it is used. The door is equipped with a special generator driven by human energy applied to the door while controlling its rotating speed. A set of supercapacitors store the generated energy as a buffer and provide a consistent supply for the low-energy LED lights in the ceiling. **CIRCLE 224**



2 | PRODUCT **Solera + Nanogel**
 MANUFACTURER **Advanced Glazings**
 advancedglazings.com/data

Advanced Glazings claims that Solera + Nanogel produces the highest thermally insulated glass unit in the world. By diffusing full spectrum light, Solera Insulating Glass Units provide glare-free, highly illuminated spaces and are compatible with any standard framing system. The unit offers superior thermal insulation and can be custom-engineered to provide specific daylighting intent by diffusing and evening out natural daylight. **CIRCLE 226**

3 | PRODUCT **SageGlass With PV Power Options**
 MANUFACTURER **Sage Electrochromics**
 sage-ec.com

Sage Electrochromics electronically tinting glass products are now available with photovoltaic power options. The addition of PV enables SageGlass to use solar energy to tint the glass, blocking glare and unwanted solar heat gain without blocking the view. The PV strip is installed on the exterior along the bottom of a window envelope or a skylight. **CIRCLE 225**





1 | PRODUCT **Active Solar Glass**
 MANUFACTURER **ARCH Aluminum and Glass**
 archaluminum.com

Available in red, green, and blue tones, Active Solar Glass (ASG) is the next generation of building-integrated-photovoltaic (BIPV) products. In addition to actively generating power, ASG can also incorporate passive solar technologies, including low-E coatings. While traditional BIPV technologies are effective only on horizontal surfaces, ASG can collect energy at up to 70% off-axis, making it effective on both horizontal and vertical surfaces. **CIRCLE 227**



3 | PRODUCT **Luminance Light Shelf System**
 MANUFACTURER **YKK AP America**
 ykkap.com

The Luminance Light Shelf System improves interior daylighting with reflective surfaces that diffuse natural light deeper into the occupied space. A modular assembly process allows the unit to be applied with a wide variety of systems and includes a 90-degree tilt-down feature to ease the maintenance of the light-reflecting surface and the glazing above it. **CIRCLE 229**

2 | PRODUCT **Advanced Facade**
 MANUFACTURER **Kawneer**
 kawneer.com

***E** At GreenBuild 2008, Kawneer displayed an advanced facade that integrates the manufacturer's energy-efficient 7500 Wall, thermally broken 512 Ventrow ventilator, and a modified version of the 1600 sunshade and InLighten light shelf, along with Mechoshade's motorized shading system and light-shelf louver, Viracon's VE1-2M triple-insulating glass, and Suntech's See Thru solar panel. **CIRCLE 228**



4 | PRODUCT **Fireframes Aluminum Series**
 MANUFACTURER **Technical Glass Products**
 fireglass.com

Offering a modern alternative to traditional aluminum hollow-metal frames for fire-rated applications, these frames incorporate precision engineering to create narrow profiles and crisp sight lines. Combined with Pilkington Pyrostop glass, the frames provide a barrier to radiant and conductive heat transfer, allowing for unlimited areas of glazing in fire separations. They carry 60-minute fire ratings as a wall assembly, and may incorporate 20-, 45-, or 60-minute fire-rated doors. **CIRCLE 231**



5 | PRODUCT **Glamour and Groove Series Flush Door**
 MANUFACTURER **Modernus**
 modernus.com

Claimed to be the only flush door on the market built specifically for American construction codes, this door's minimal design has no reveal or aluminum details framing the panel, making it adaptable to a variety of designs. The 100% recycled aluminum frame saves 60% on installation costs compared to other solutions on the market. Available in wood, steel, aluminum, glass, and custom finishes. **CIRCLE 230**

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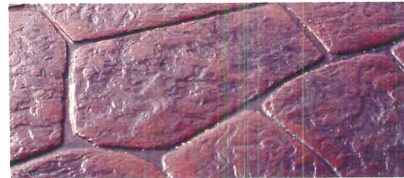
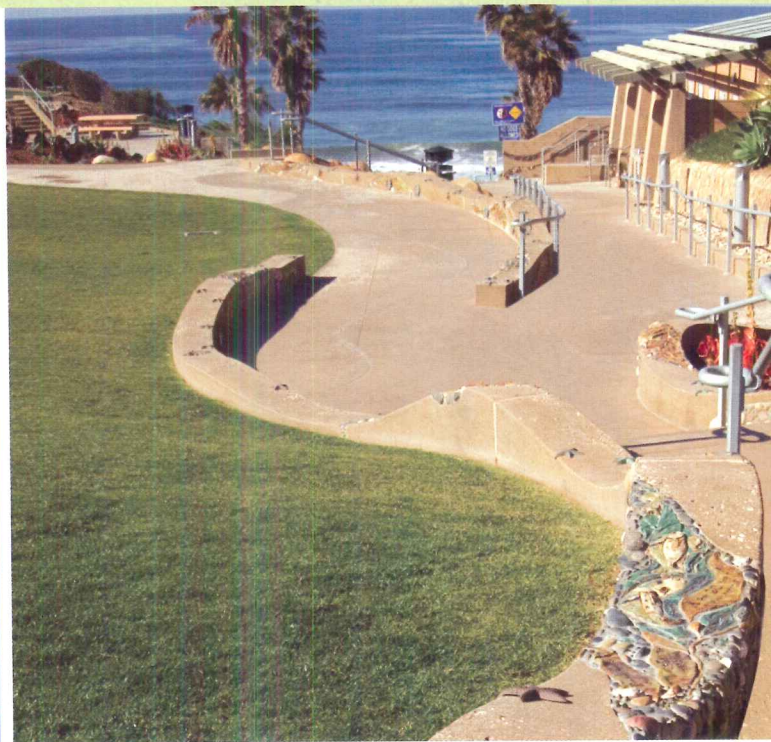
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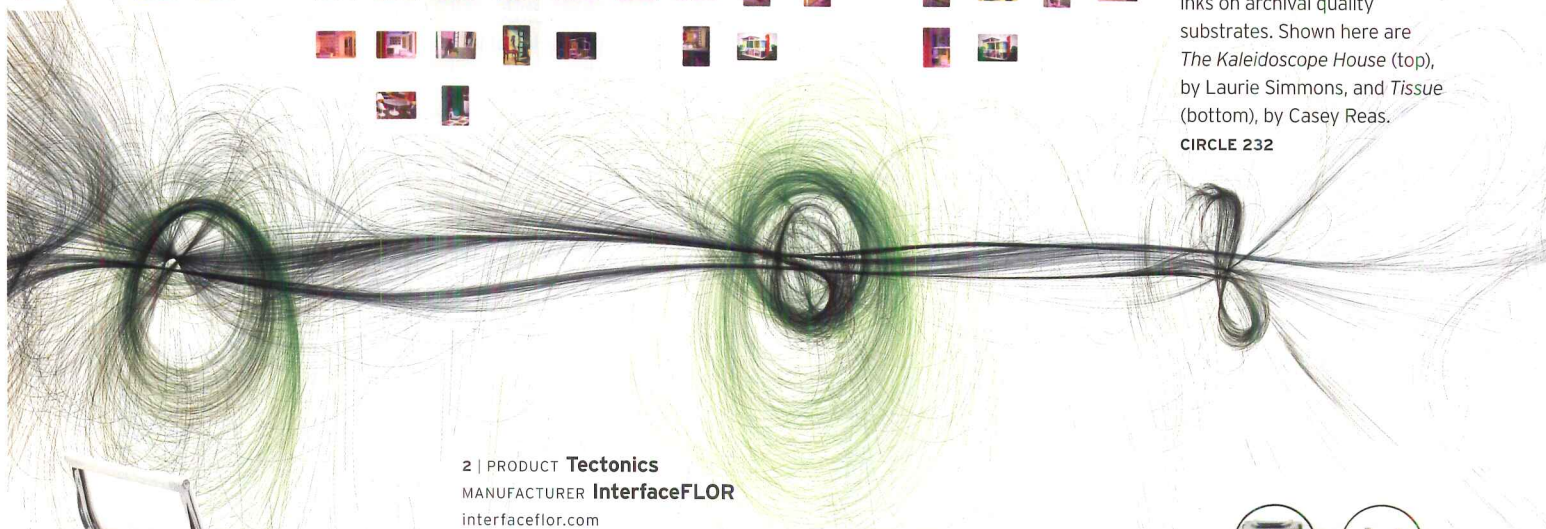
FINISHES | Ceramic tiling • Acoustical ceilings • Wood flooring • Carpeting • Access flooring • Wall covering



1 | PRODUCT **Maharam Digital Projects**
 MANUFACTURER **Maharam**
 maharam.com

Maharam Digital Projects are wall-covering installations intended to replace art typically used as large-scale focal points in residential and commercial applications. The series will include the work of emerging and established artists, including photographers, illustrators, and graphic designers. The scalable works are printed in high resolution with UV-resistant, pigment-based inks on archival quality substrates. Shown here are *The Kaleidoscope House* (top), by Laurie Simmons, and *Tissue* (bottom), by Casey Reas.

CIRCLE 232



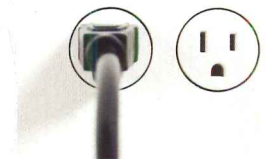
2 | PRODUCT **Tectonics**
 MANUFACTURER **InterfaceFLOR**
 interfaceflor.com

Designed by David Oakey of David Oakey Designs, Tectonics incorporates linear patterns in mixed widths in a design that can be installed nondirectionally. Inspired by metals and metallic finishes, it is available in 16 colors for a uniform look or dramatic statement. The carpet lends itself to pattern by tile designs of different shapes and sizes using the TacTiles glue-free installation method. Fully recyclable, Tectonics features a minimum of 33% postconsumer recycled carpet content (as much as 38%) and a total recycled content of 66% to 71%.

CIRCLE 233



2



3

3 | PRODUCT **22**
 MANUFACTURER **Bocci**
 bocci.ca

***E** 22 is a complete suite of CSA- and UL-approved interior wall accessories that challenge the ubiquitous cover-plate concept. A minimal alternative, 22 is designed to "mud in" directly into drywall, millwork, or any wall surface, without a visible cover plate or trim. **CIRCLE 234**



1 | PRODUCT **Wood-Veneer Wall Coverings**
 MANUFACTURER **Trove**
 troveline.com

***E** Trove's new line of Class A fire-rated wood-veneer wall coverings is manufactured from among 90 varieties of high-quality, FSC-certified wood, including maple, oak, cherry, walnut, birch, and bamboo. Projects can earn 10 LEED points for the natural veneer and six points for the reconstituted veneer. Similar in thickness to conventional wall coverings, the low-VOC wood veneer has a clay-impregnated, cotton-back fabric backing and is installed using Trove's exclusive system of primers and adhesives formulated specifically for the product. **CIRCLE 236**



2 | PRODUCT **Tate Hardwood Access Floor Tiles**
 MANUFACTURER **Tate**
 tateaccessfloors.com

Tate's engineered hardwood tiles are a 3-mm natural-wood laminate bonded to an 11-mm Versacore wood-veneer backer. Available in four standard patterns, the new laminate can be made from a variety of species of hardwoods in optional strip sizes. The core is made from a minimum of 75% recycled content, and some designs contain more than 90% recycled content. The tiles are recyclable, VOC-free, and are finished with a UV-cured ecological oil that penetrates deep into the wood. **CIRCLE 238**

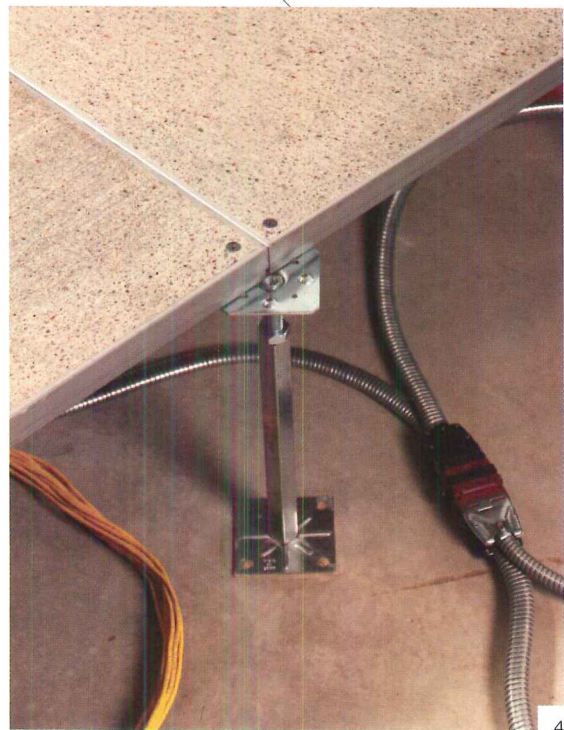
3 | PRODUCT **Phonstop Ceiling and Wall Tile**
 MANUFACTURER **pinta acoustics**
 pinta-acoustic.com/phonstop

***E** Phonstop ceiling and wall tiles are made from 100% postconsumer recycled glass sintered to form rigid, lightweight, and porous sound absorbers. Phonstop V tiles are made for adhesive applications on walls and ceilings and offer a noise-reduction coefficient (NRC) of up to 0.90. Phonstop E tiles are made for ceiling-grid applications and feature an NRC of up to 0.70. **CIRCLE 235**



4 | PRODUCT **TecCrete**
 MANUFACTURER **Haworth**
 haworth.com

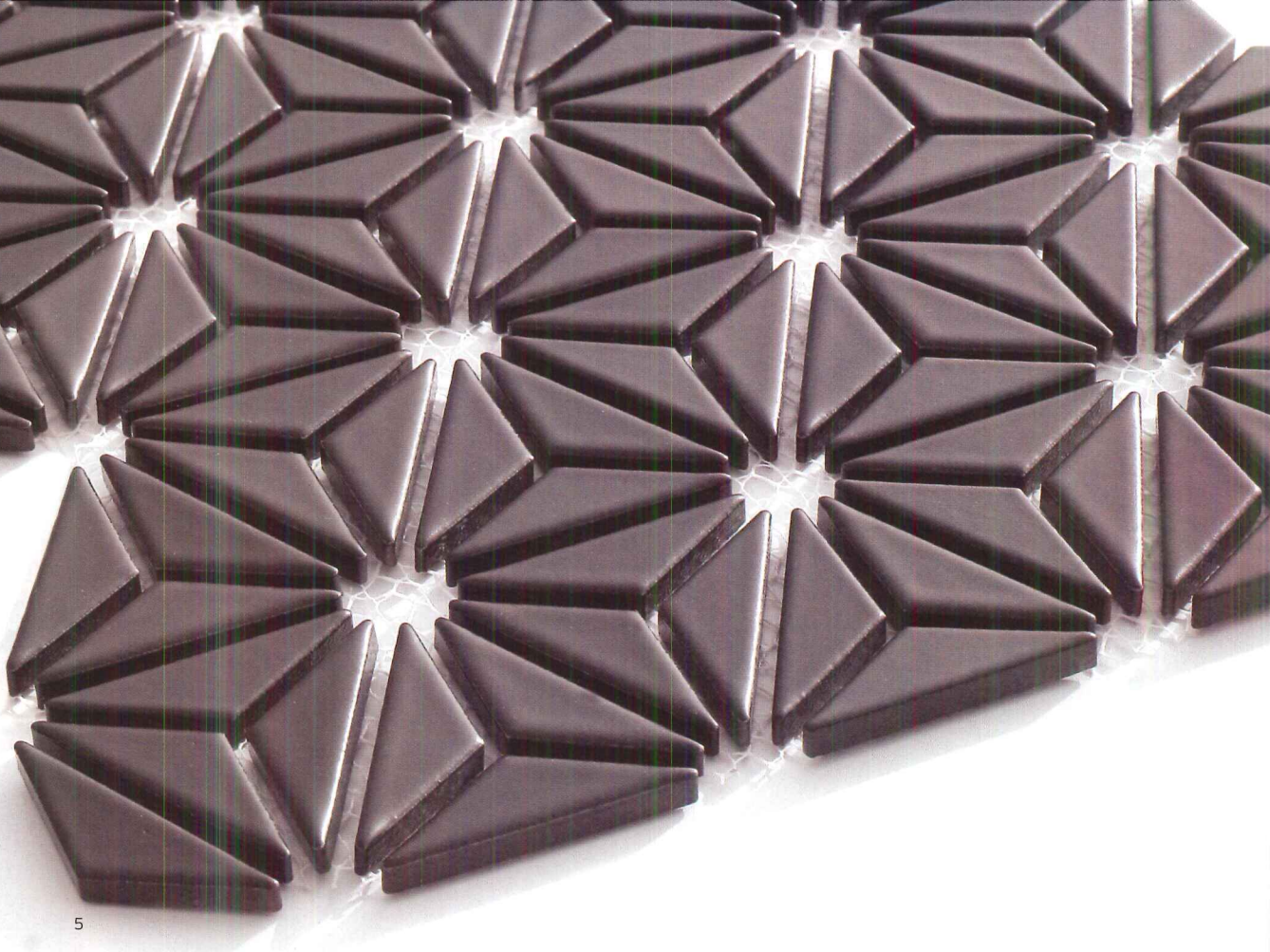
TecCrete is a raised-access floor that feels rock solid underfoot. When combined with Haworth's Power Web modular power, preterminated zone-voice and data-cabling system, and underfloor air, this completely redesigned product creates an adaptable utilities distribution platform that integrates seamlessly with Haworth systems furniture and movable walls. When used for underfloor air, TecCrete can contribute significantly to attaining LEED points. **CIRCLE 237**



5 | PRODUCT **Hoshi Ceramic Mosaic Tile**

MANUFACTURER **SOLI Architectural Surfaces**
soliusa.com

Available in matte and metallic finishes, Hoshi ceramic interlocking mesh tile has a shape inspired by Japanese design and architecture. In stock in black and white, clients can specify from over 20 colors to create a custom mosaic installation. Suitable for floors and walls in commercial and residential applications. **CIRCLE 239**



5



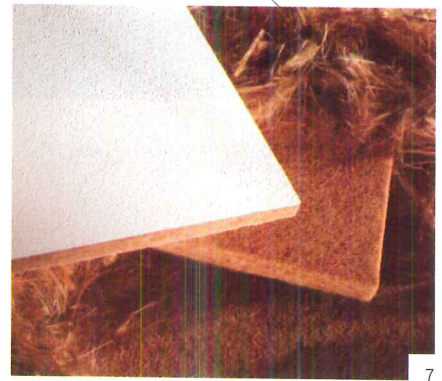
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6 | PRODUCT **Natura**
MANUFACTURER **Benjamin Moore & Co.**
benjaminmoore.com

***E** The VOC level of Benjamin Moore's Natura zero-VOC interior acrylic latex paint is unaffected by the addition of colorant because the paint is based on the manufacturer's patented waterborne colorant system. The range includes a primer plus flat, eggshell, and semigloss sheens in nearly 3,500 colors. **CIRCLE 242**

7 | PRODUCT **Tierra Ceilings**
MANUFACTURER **Armstrong Ceiling Systems**
armstrong.com/ceilings

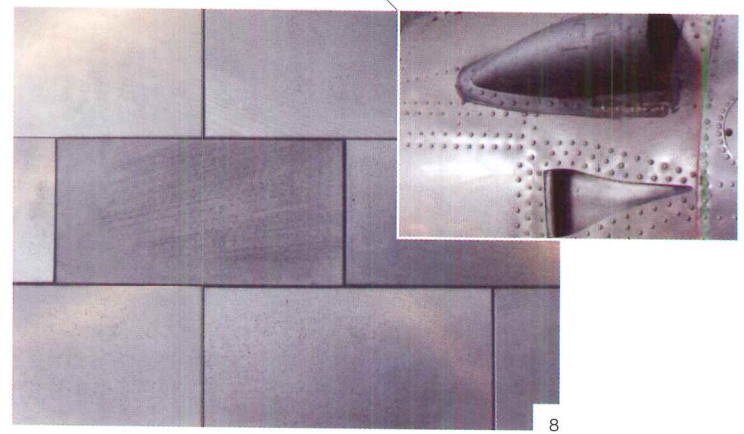
***E** Due to its unique substrate made from jute, a natural fiber that grows from seed to harvest in 90 days, Tierra has the highest rapidly renewable content in the industry at 45%. It is also recyclable at the end of its service life, has a high postconsumer recycled content of 23%, and is Cradle to Cradle Silver-certified. **CIRCLE 241**



7

8 | PRODUCT **Bio-Luminum**
MANUFACTURER **CoveringsETC**
coveringsetc.com

***E** Made from aircraft aluminum retrieved from decimated military sites, Bio-Luminum tiles are both 100% recycled and 100% recyclable. Airplane parts are melted into blocks and then sliced to create a lightweight tile with a textured surface in 3" x 12", 6" x 12", and 3" x 6" dimensions. Appropriate for both indoor and outdoor cladding applications. **CIRCLE 240**



8

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CONSTRUCTION Construction Stimulus Special Section

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The 2009 Stimulus Package is the most important piece of legislation in the history of the AEC industry—and we are with McGraw-Hill Construction's ability to help you benefit from it. Our special section includes news and analysis from over 17 organizations, plus background and analysis of how you can get the most comprehensive list of stimulus projects and in-depth market forecasts and economic research.

Featured Reports

- White House Announces Stimulus for AEC Firms** - 1/27/09
- ASCE Asks for \$200 Billion in Stimulus for Construction** - 1/27/09
- Report: Stimulus Money Mostly for Low-End**
- Resilient Flooring**
- Wood Flooring**

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The new stimulus act has 208 shovel-ready projects for energy and water. See the full list at www.dodge.construction.com.
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Specifications Practice

Likelihood to Approve Contractor "Or Equal" Submittal for Resilient Flooring than for Wood Flooring or Carpeting when they have written a multi-brand or equal specification.

Architects are more likely to approve a contractor's "or equal" submittal for resilient flooring than for wood flooring or carpeting when they have written a multi-brand or equal specification.

Material	Most of the time	About half and half	Most of the time / About half and half (net)
Resilient Flooring	29%	45%	74%
Wood Flooring	24%		

Top 10 States in Education Construction 2007-2009 (3-Year Forecast Total - Value in \$000's)

1	\$25,000,000
2	\$20,000,000

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1

1 | PRODUCT **Shower Booth Hardware Series 8102 Type**
MANUFACTURER **Sugatsune America**
sugatsune.com

This shower-room hardware hinge features a magnetic self-close feature that closes the door softly and smoothly and provides a longer life cycle compared with regular spring-loaded hinges. Services a maximum glass weight of 88 pounds and a maximum glass size of 78³/₄" high x 39³/₈" wide. **CIRCLE 244**

2 | PRODUCT **NuTone NM Series Intercom System**
MANUFACTURER **Broan-NuTone**
nutone.com

The small-scale, full-function NuTone NM series intercom and music-distribution system is available for new construction and retrofit applications. Providing communication, security, and in-home entertainment, the system supports up to 15 remote stations and up to three door speakers. The master station footprint is 40% smaller than that of a traditional intercom, and the backlit liquid-crystal display shows the operation mode, audio source, radio frequency, volume setting, and time. **CIRCLE 243**

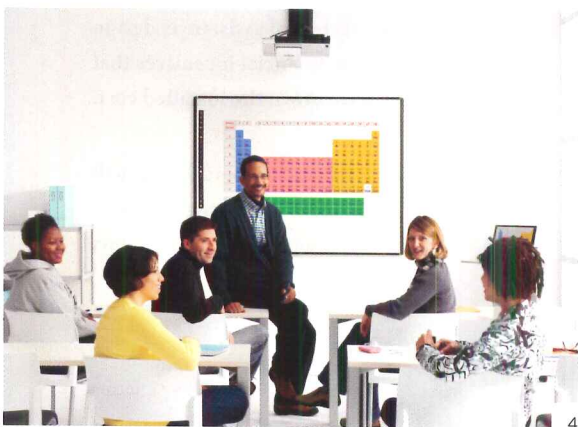


2

3 | PRODUCT **Simplicity Hand Dryer**
MANUFACTURER **American Specialties**
americanspecialties.com

Exceeding ADA accessibility guidelines, this automatic hand dryer is the only fully recessed model on the market, according to the manufacturer. It features a built-in infrared sensor for "On" and "Off"; a crisp, seamless design; durable stainless-steel construction; and fixed directional air vanes. **CIRCLE 245**

3



4

4 | PRODUCT **eno Interactive Whiteboard**
MANUFACTURER **PolyVision**
polyvision.com

***E** Claimed to be the world's first "three-in-one" interactive whiteboard, eno incorporates dry erase, digital media, and magnets, and requires no cords, cables, or power. It also offers the longest warranty of any interactive whiteboard (10 years on the overall product lifetime warranty on the writing surface) and is the only Cradle to Cradle Silver- and SCS Indoor Advantage Gold-certified interactive whiteboard on the market. **CIRCLE 246**

5 | PRODUCT **Enclose Enhancements**
MANUFACTURER **Haworth**
haworth.com

Enclose offers tilt-up construction on segmented panels and modular walls that can be moved with ease, unlike conventionally constructed walls. Haworth walls have a sister line that shares components, such as finish options, work surfaces, and storage, and is designed for acoustical properties. Recent enhancements to the line include additional heights and surface options, such as marker-board and magnetic properties. **CIRCLE 247**



5

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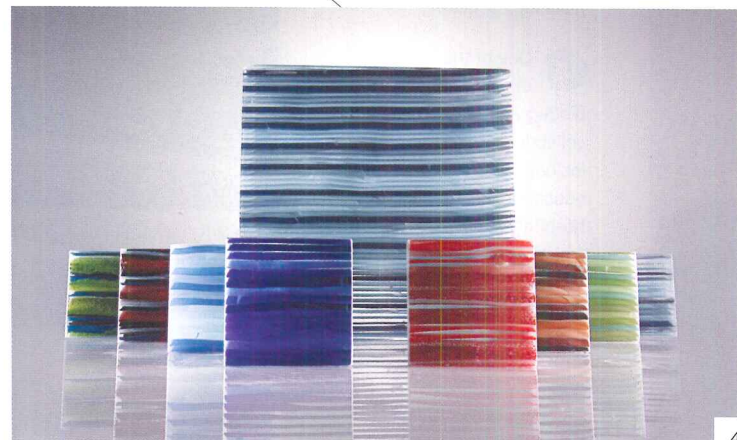
1 | PRODUCT **Houdini**
MANUFACTURER **e15**
M2Lcollection.com

Available through M2L, the CH04 Houdini chair was designed by Stefan Diez with the use of lacquered, oak-veneered plywood. The chair's back and seat are constructed from .18"-thick oak-veneered plywood slabs stretched to harmoniously curve around a complexly milled solid wood base to form a comfortable seat shell. **CIRCLE 248**



4 | PRODUCT **Ribbon Glass**
MANUFACTURER **Stone Source**
stonesource.com

Made from approximately 30% recycled glass, Ribbon Glass fuses slivers of glass removed or left over from other fabrication jobs to create undulating bands of color. When backlighting is used, the light will pass through the bands of opaque pigment creating a dramatic effect. Available in lengths up to 14', Ribbon Glass is suitable for walls, kitchens, countertops, and vanities. **CIRCLE 251**

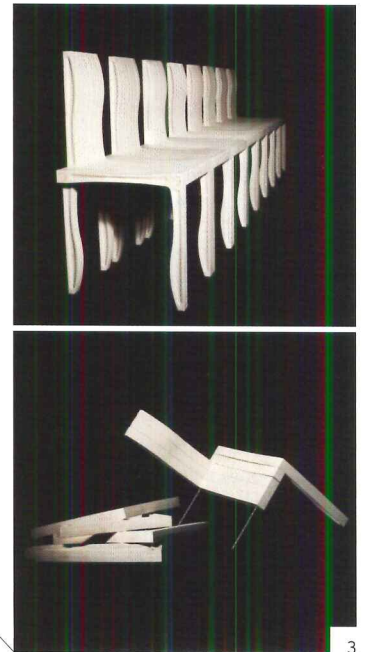


2 | PRODUCT **M2 Flat Panel Monitor Arm**
MANUFACTURER **Humanscale**
humanscale.com

While competing adjustable monitor arms utilize a bulky, failure-prone gas cylinder to counterbalance the weight of the monitor, M2's automatic spring mechanism offers the same level of adjustability but without the shortcomings. Made of 52% recycled and 99% recyclable materials, the unit ships in 85% recycled packaging and contributes to a number of LEED credits. **CIRCLE 249**

3 | PRODUCT **10-Unit System**
MANUFACTURER **Artek**
artek.fi

***E** Artek's new furniture range, the 10-Unit System, was designed by Japanese architect Shigeru Ban. Manufactured from UPM ProFi wood-plastic composite material, the fully modular furniture range is based on the use of one fundamental element – an L-shaped unit. This unit can be assembled in various positions to form a chair, a table, or a bench. The UPM ProFi material, made mainly from surplus paper and plastic left over from the production of self-adhesive label materials, is hard-wearing and resistant to UV light and humidity. **CIRCLE 250**



5 | PRODUCT **Reclaimed Red Wine Vat Oak Countertops**
MANUFACTURER **Endurawood**
endurawood.com

Reclaimed from red wine vats, this material originated as select French oak before years of service imparting flavor to red wine. Once deconstructed, the stained oak staves leave behind a rich, red color providing a distinct pattern and texture. Available in side grain, end grain, or plank style. Tops are finished with low-VOC or water-based finishes. **CIRCLE 252**





1 | PRODUCT **Vegetal**
MANUFACTURER **Vitra**
vitra.com

Vegetal, one of the hottest chairs of the year, is the latest piece from the fraternal design duo Ronan and Erwan Bouroullec for Vitra. Made of durable die-cast fiber-reinforced polyamide, Vegetal features flat branch structures woven in three layers to form a round, slightly irregular seating shell. On the underside, the chair is stabilized by ribs that grow out of the supportive legs. **CIRCLE 253**

2 | PRODUCT **Compose**
MANUFACTURER **Haworth**
haworth.com

Haworth's Compose furniture system is designed to work seamlessly with a flexible system of interchangeable components by Unicell, the firm's health-care partner. Appropriate for the laboratory, pharmacy, or exam room, Compose is offered in phenolic, stainless-steel, or chemical-resistant laminate work surfaces. **CIRCLE 254**



2

3 | PRODUCT **JACK Table**
MANUFACTURER **Lerival**
lerival.com

***E** The JACK table was designed by Della Valle Bernheimer for Lerival, a Web-based store and gallery dedicated to selling and showcasing furniture designed by today's top architectural talent. JACK's legs are replications of the same part, eliminating variations within forms required to cast each leg, and its CNC-milled solid-surface work surface can be customized. **CIRCLE 255**



3

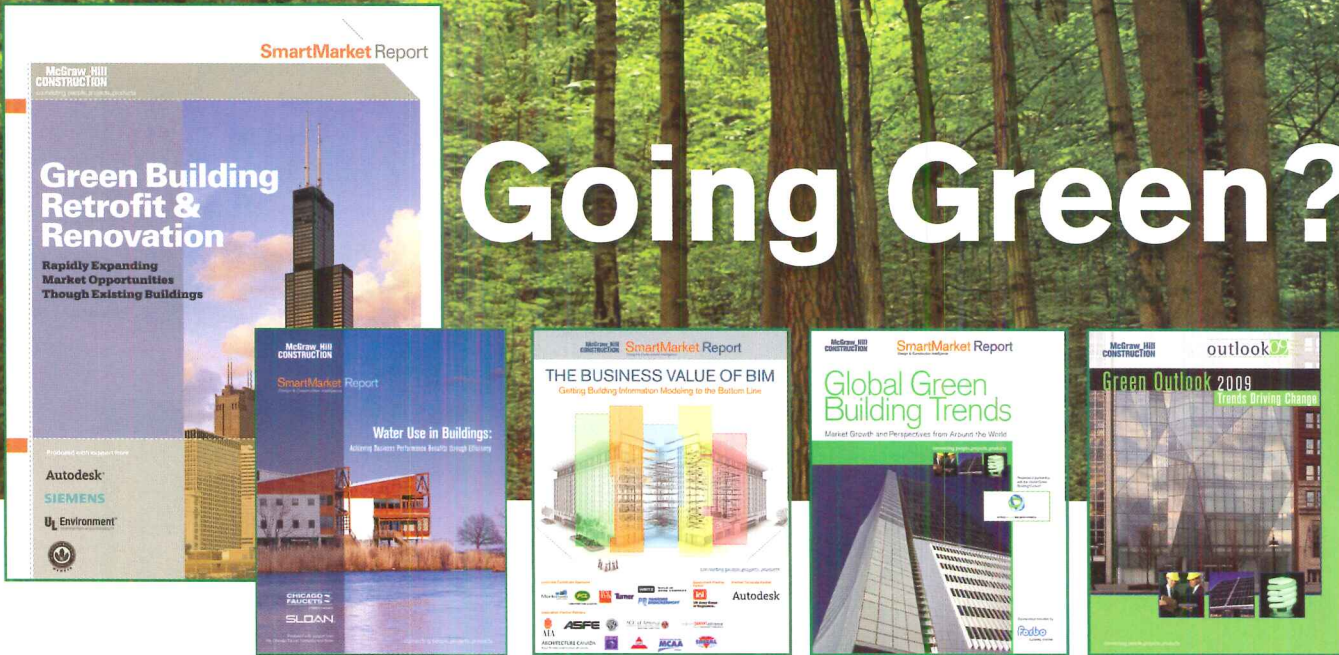
4 | PRODUCT **Ground Breaking**
MANUFACTURER **Pallas Textiles**
pallastextiles.com

***E** One of the industry's first 100% biodegradable polyurethane collections, Ground Breaking includes 18 SKUs for corporate, education, health-care, or hospitality spaces. Made from a biodegradable polyurethane face with a low-VOC content, the line is PVC-, antimony-, and heavy-metal-free. **CIRCLE 256**



4

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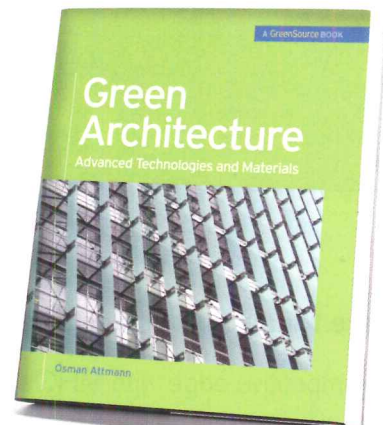
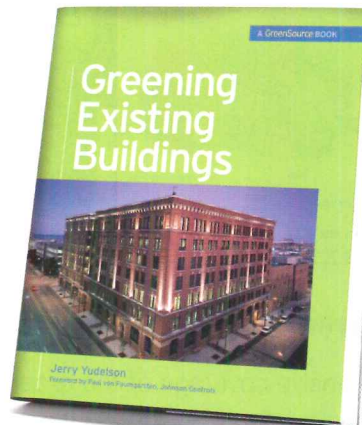
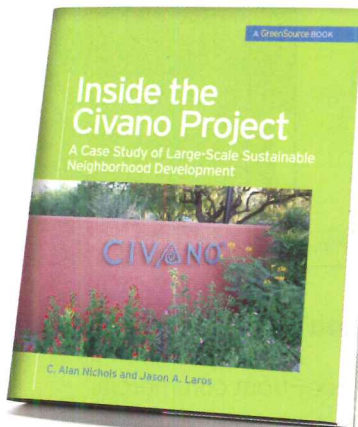
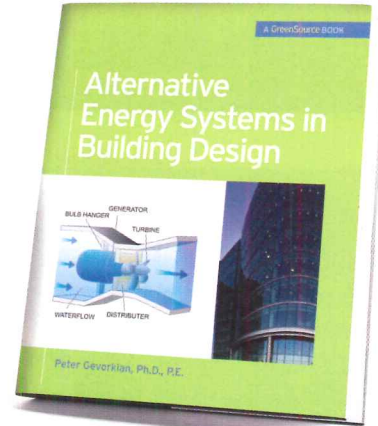
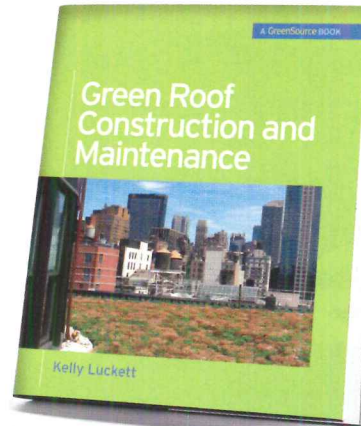
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- 70% of home buyers are either more or much more inclined to purchase a green home over a conventional home in a down housing market
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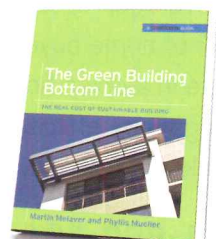
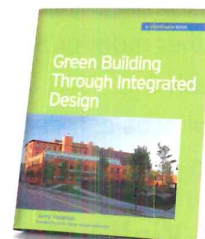
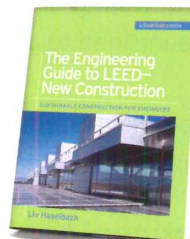
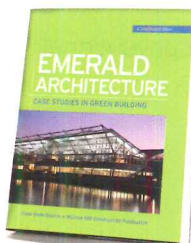
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1,2 | PRODUCT **PuraVida**
MANUFACTURER **Hansgrohe**
hansgrohe-usa.com

E A new manufacturing technique allows the PuraVida bathroom collection of faucets and showers, designed by Phoenix Design, to feature a combination of white lacquered surfaces and glistening chrome—sometimes seamlessly on the same piece. Matching ceramic bathroom furnishings from Duravit, also by Phoenix Design, are available (sink shown). **CIRCLE 257**



3 | PRODUCT **Belay**
MANUFACTURER **Kohler**
kohler.com

This integrated shower handrail avoids the bleak institutional look of most grab bars. The Belay is recessed into the wall, creating an easily manageable gripping surface that blends into the clean line of a bath or shower. It comes in one, two, or three wall configurations in standard 30" or 54" lengths that can be cut down to size. Several finishes are available. **CIRCLE 258**



5 | PRODUCT **Uplift Cabinet**
MANUFACTURER **Robern**
us.kohler.com

E Opening up—rather than out—this cabinet can be installed flush with bathroom countertops, and even directly behind faucets and pendants. The mirrored, 27"-tall door opens with the touch of two fingers on an aluminum handle and, thanks to a position-hold mechanism, can be stopped anywhere along the track. **CIRCLE 260**

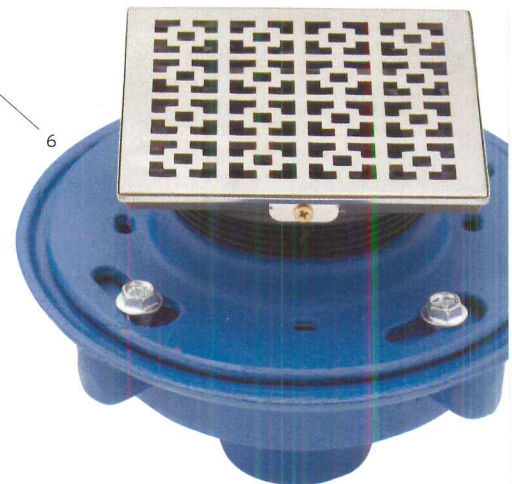


4 | PRODUCT **Recess_Lav**
MANUFACTURER **AF New York**
afnewyork.com

Designed by Katherine Chia, with Desai/Chia Architecture in New York City, this unit offers an integrated, seamless bathroom sink/backsplash/storage unit that works well in small spaces. It can be recessed into a standard stud wall without any additional build-out, and its durable resin construction eliminates the need for additional tiling at the backsplash area. An ADA-compliant version is available. **CIRCLE 259**

6 | PRODUCT **StyleDrain**
MANUFACTURER **California Faucets**
calfaucets.com

Claimed to handle water flow at the highest level of efficiency, StyleDrain's flush grill-plate design eliminates any bulky, unsightly screws on display. Since it is easier to cut tile to accommodate a square drain than a round one, the drain's square shape also helps ease installation. **CIRCLE 261**



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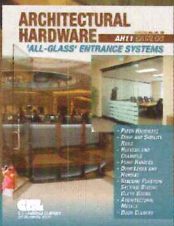
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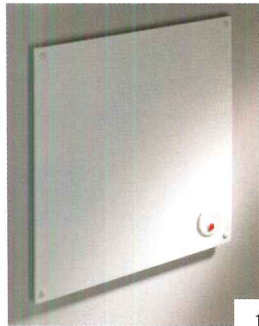
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1 | PRODUCT **ECO-heater**
MANUFACTURER **ECO-heater**
eco-heater.com

E ECO-heater's 23¼" wall-mounted, square electric panel unit uses convection technology (90% from the panel back and 10% from the front) to heat a room up to 10' x 12' without fans, warming the cold air pulled through its bottom vent. The manufacturer claims the device uses 75% less energy than conventional space heaters. **CIRCLE 262**



2 | PRODUCT **Humanair**
MANUFACTURER **Humanscale**
humanscale.com

Ideal for office, health-care, or home environments, the Humanair air cleaner operates in virtual silence, produces no ozone, and creates no noticeable draft, allowing it to be positioned near the user so that clean air can be directed right where it's needed. The unit exceeds Energy Star requirements by 275%. **CIRCLE 263**



3 | PRODUCT **Eliosolar Thermal Shade Structure**
MANUFACTURER **Eliosolar**
eliosolar.com

Offering the advantage of a simultaneously passive and active solar system, Eliosolar Thermal Shade Structures include sunshades, facade sun shields, or canopies that contain an integrated solar thermal collector. While the shade cools the building, the solar energy is collected to generate hot water for the building's usage. **CIRCLE 264**



4 | PRODUCT **30"-Wide Designer Series Sealed Gas Burner Range**
MANUFACTURER **Viking Range Corporation**
vikingrange.com

E The Viking Designer series gas range features a continuous grate cooking service, an exclusive combination of single U-shaped bake burner and infrared broil burner, and one of the largest oven capacities in the industry. It also features six different functions, including convection dehydrate. **CIRCLE 265**



5 | PRODUCT **Mr. Slim Hyper-Heat Systems**
MANUFACTURER **Mitsubishi Electric Cooling and Heating Solutions**
mehvac.com

The next generation of Hyper-Heat pumps operates down to minus-30 degrees Fahrenheit, surpassing previous heat-pump technologies. The inverter-driven compressor varies its speed to match the zone load requirements for year-round comfort and effective energy usage. **CIRCLE 266**



The Essentials Of Designing Green

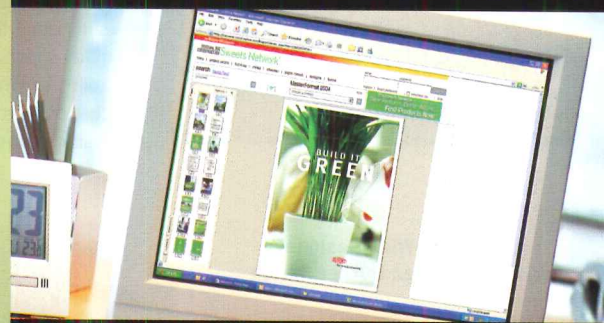
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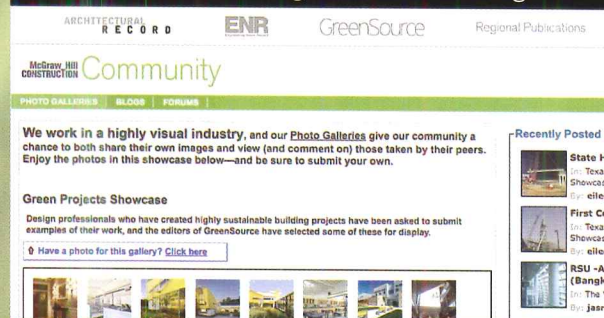
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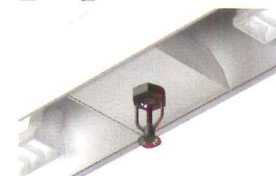
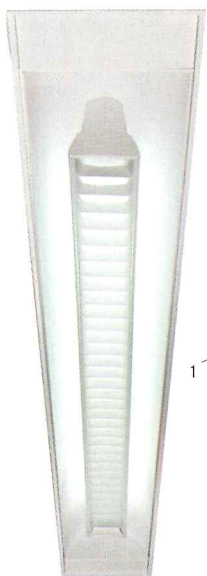
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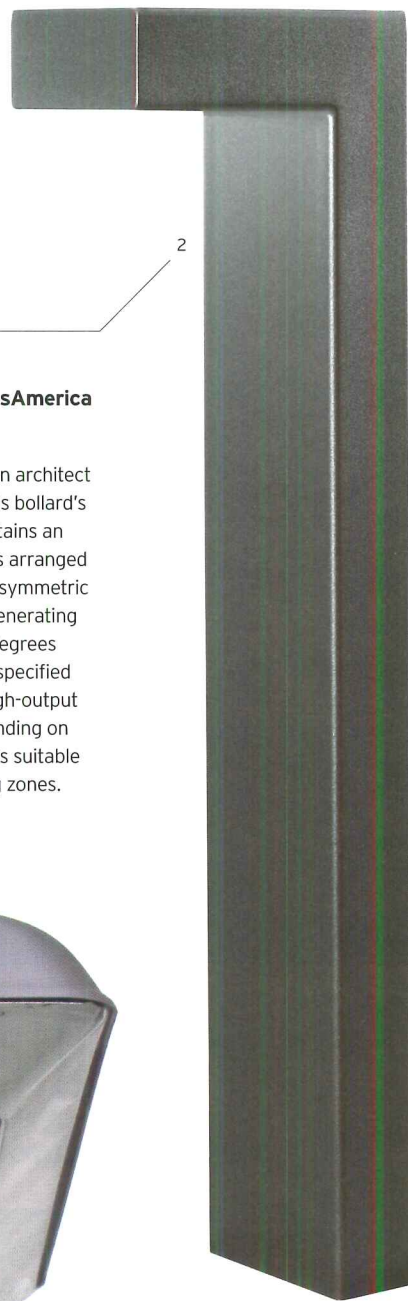
1 | PRODUCT **Neo-Ray Versys**
MANUFACTURER **Cooper Lighting**
cooperlighting.com

Integrating vital building systems and high-efficiency lighting into one, this fixture's modular design features a single lamp filtered by a floating, lensed microlouver on 1" centers with separate end utility compartments to house occupancy sensors, daylight sensors, air returns, speakers, or an available MR16 downlight. **CIRCLE 267**



2 | PRODUCT **Linea**
MANUFACTURER **HessAmerica**
hessamerica.com

Designed by German architect Karsten Winkels, this bollard's simple housing contains an array of 1-watt LEDs arranged to provide a wide, asymmetric distribution while generating no light above 90 degrees horizontal. May be specified with medium- or high-output light engines, depending on requirements, and is suitable for all LEED lighting zones. **CIRCLE 268**



3 | PRODUCT **LIM**
MANUFACTURER **Haworth**
haworth.com

***E** LIM (Light in Motion) is a multipurpose, multi-task LED lighting platform with a simple, elemental structure that uses magnets and other simple attachment methods to offer the user adjustment with few parts. Manufactured in the U.S., LIM is available in various mounting styles and is more than 98% recyclable. **CIRCLE 269**



4 | PRODUCT **VizorLED**
MANUFACTURER **Wide-Lite**
widelite.com

"An innovative use of new technology in a 'workman' fixture," according to our jury, this ceiling-mounted ambient light for parking garages and low-bay installations features a faceted 94% reflective, indirect optical system with hidden LEDs – an industry-first approach that reduces glare. **CIRCLE 270**



June 21st | 11:00 a.m.

Lutron shades automatically position to let in useful daylight - Lights near windows dim to save energy



December 21st | 11:00 a.m.

Shades automatically lower to block harsh low-angled winter sun

intelligent shading

Hyperion™ automatically adjusts Lutron® shades based on the position of the sun

Save energy by optimizing daylight with intelligent automated shading that responds to the sun's changing position throughout the day and year.

- Increase comfort and productivity, while reducing dependency on electric light
- Reduce electric lighting load by up to 60% by integrating with Lutron's Quantum Total Light Management to control both shades and lights

save
energy
with
Lutron™ 

 **LUTRON®**
© 2009 Lutron Electronics Co., Inc.

Explore the online demo of Hyperion and Quantum Total Light Management at www.lutron.com/quantum or call 1.866.289.7073



Georgian College in Ontario, Canada saves \$137,000 on energy costs each year using a Lutron system.

To Reduce Your Carbon Footprint —Dim the Lights

Lutron light controls lower energy bills while improving comfort and productivity.

When it comes to reducing your carbon footprint, little things can mean a lot. Take dimmers, which save electricity by cutting the amount of power that flows to lighting fixtures. The lower the light level, the less power is used, and a very small cut in power can translate into very big results.

"We estimate that installed Lutron dimmers save over 9 billion kilowatt hours of energy per year, and that prevents 17 billion pounds of CO₂ from entering the atmosphere," says Michael W. Pessina, president of the Office of Product Development at Lutron Electronics, a light control manufacturer. "That's a savings of over \$1 billion in energy costs each year."

"The amazing thing is that this number is just the tip of the iceberg," adds Pessina. "In the commercial sector, dimmers and other controls can reduce lighting electricity use dramatically."

According to the U.S. Department of Energy, lighting is by far the largest user of electricity in commercial buildings. It consumes 38% of the total—more than space

The More You Dim, the More You Save

	25%	50%
Energy savings	20%	40%
CO ₂ prevented per year	1,438 lbs	2,876 lbs
Five-year savings per dimmer	\$393.56	\$787.13
Payback (with productivity gain)	less than 1 year	less than 1 year

Figures are based on using a dimmer on nine fluorescent fixtures with three 32-watt lamps, running 12 hours per day, at an energy cost of \$0.104 per kwh. Savings calculations are compared with energy use of lights that are switched on. Payback based on lighting energy savings, product costs, and a 1% productivity increase.

heating, cooling, ventilation, equipment, and computers *combined*. Lutron light controls can radically reduce that appetite through scalable solutions. Here's how.

Dimmers alone can easily reduce lighting electricity use by 20%. Add Lutron's new *Radio Powr Savr* wireless occupancy

sensor and you can cut lighting electricity use up to an additional 35%. Larger-scale total light management systems combine dimming, occupancy sensing, and daylight control to produce even more dramatic savings: Lutron systems in The New York Times Building (New York), Bently Reserve (San Francisco), and Georgian College (Ontario, Canada) are each saving more than 65% in lighting electricity use annually.

Dimmed lights also keep the air cooler. Many buildings require cooling year-round, so the energy savings can be significant. As a rule of thumb, cooling usage is reduced by one watt for each three watts of lighting that are cut. In addition, Lutron's electronically controlled window shades automatically raise and lower to maximize efficient use of daylight while minimizing heat gain and glare.

Light control also enhances the visual environment while conserving energy. Commercial spaces are usually over-illuminated, and the ability to dim lights to the appropriate level for the job at hand can improve productivity and reduce eyestrain and computer glare. In fact, research by the Light Right Consortium found that employees are 6% more comfortable when they have individual control over their lighting environment. Another study by lighting expert Peter Boyce showed that "people with dimming control reported higher ratings of lighting quality, overall environmental satisfaction, and self-rated productivity."

"The productivity link is huge," says Pessina. "Human resources cost \$318 per square foot, which is more than six times higher than any other operating cost. If better light control can help people work more effectively for five minutes—which is equal to 1% of the work day—the investment in light controls will pay for itself in less than a year." •

save energy with Lutron™



To find out how much you can save, visit: lutron.com/green.

LUTRON®

The Challenge: High-Performance Buildings The Solution: Bentley

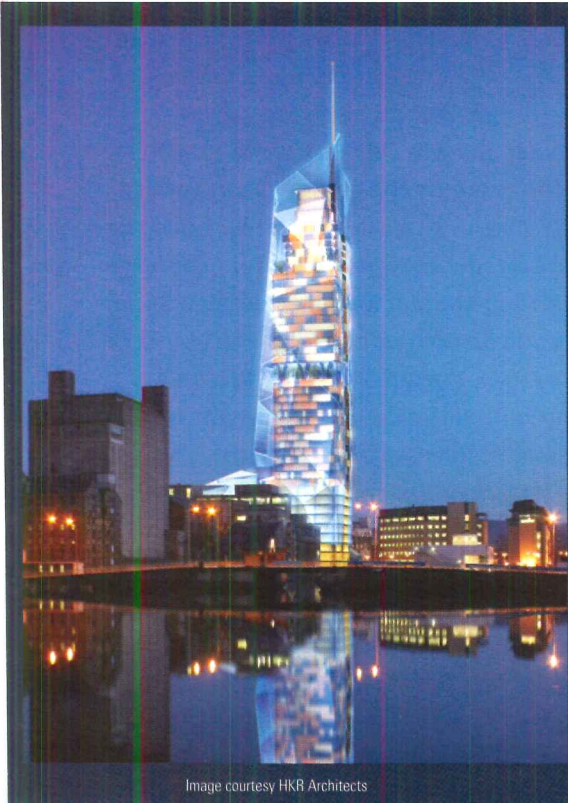
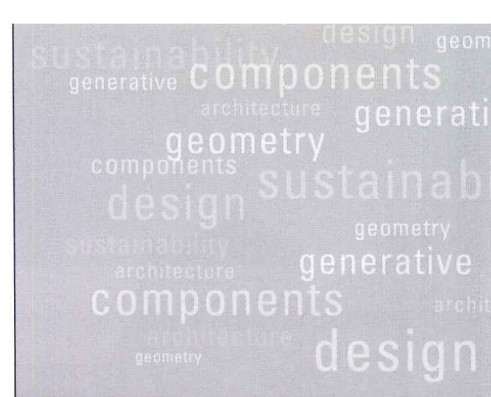


Image courtesy HKR Architects

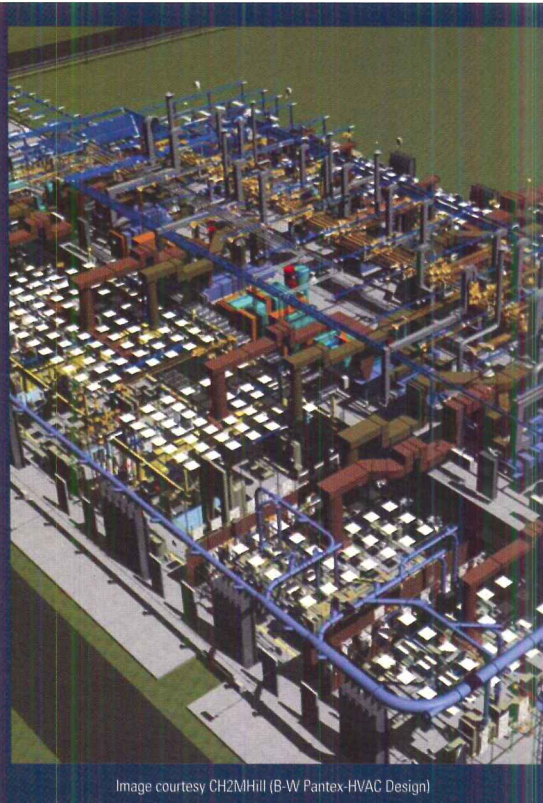


Image courtesy CH2MHill (B-W Pantex-HVAC Design)

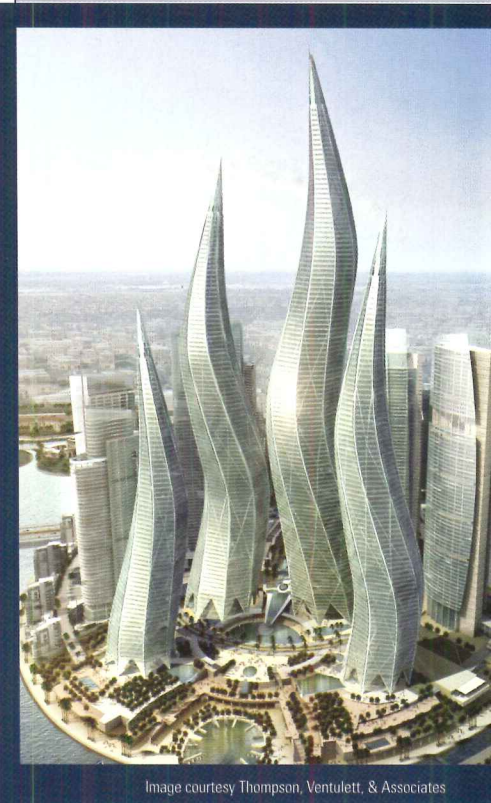


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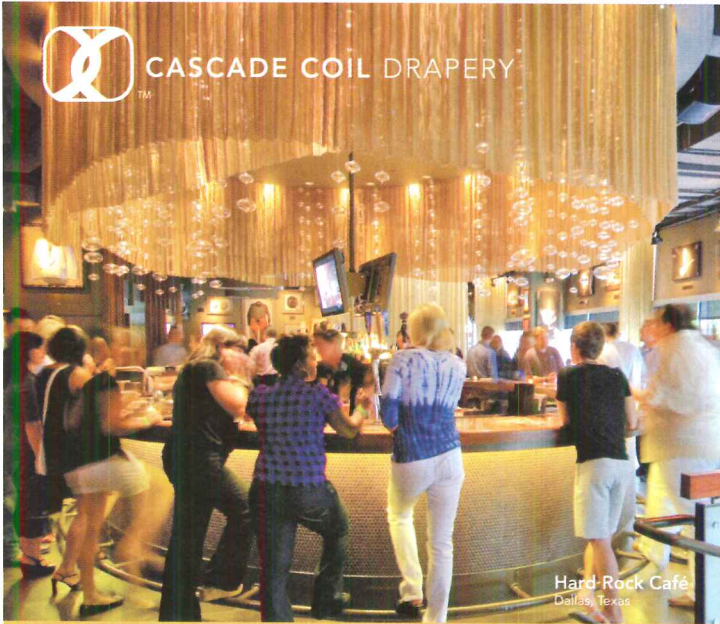
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The New York Times Building, N.Y. Architecture: Renzo Piano Building Workshop with FXFowle Partners; Architectural interiors: Gensler.

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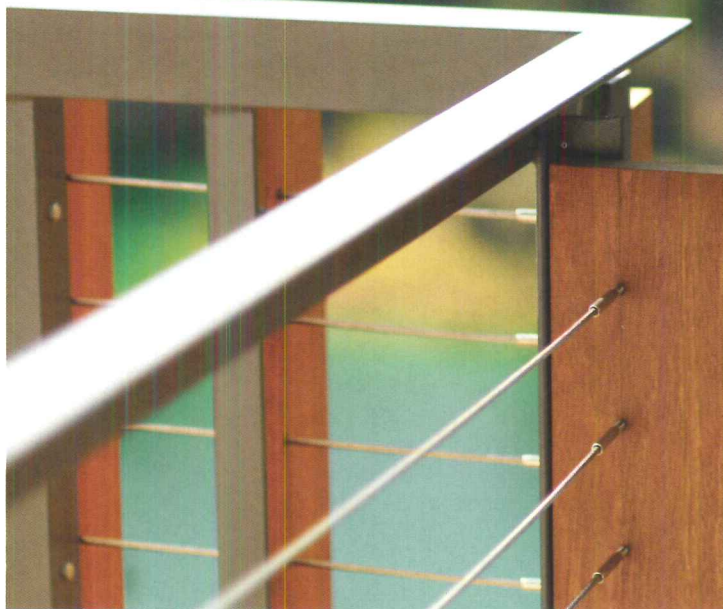
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DATES & EVENTS

New and Upcoming Exhibitions

Detour

New York City
December 3, 2009–January 10, 2010
This show documents notable architectural projects along Norwegian tourist routes that have gained national and international attention. The exhibition design is marked by a large cylindrical construction that transports the visitor to the Norwegian landscape through the use of films and models. For more information, call 212/229-8919 or visit newschool.edu/events.

DesCours

New Orleans
December 7–13, 2009
This contemporary architecture-and-art event explores the latest in design and technology through the presentation of innovative, large-scale architectural installations in the private courtyards, rooftops, and abandoned buildings of New Orleans's French Quarter and Central Business District. Visit www.aianeworleans.org.

Ongoing Exhibitions

Relics of the Cold War

Berlin
Through January 15, 2010
This exhibition features Martin Roemers's photographs of underground tunnels, abandoned control centers, old barracks, wrecked tanks, and ruined statues. In his images, the arms race appears ongoing and vivid, serving as a reminder for a future of peace. For more information, visit www.willy-brandt-haus.de.

Bauhaus 1919–33: Workshops for Modernity

New York City
Through January 25, 2010
A must-see at New York's Museum of Modern Art, the exhibition cel-

brates the 90th anniversary of the influential school's founding. Visit www.moma.org.

Palm Springs Modern: Photographs by Julius Shulman

Pittsburgh
Through January 31, 2010
This exhibition features almost 100 original photographs of iconic designs by Modernist architects such as Richard Neutra, Albert Frey, and John Lautner. Also presented are 20 original drawings and renderings of three key projects by Neutra. For more information, call 412/622-3131 or visit www.cmoa.org.

House of Cars: Innovation and the Parking Garage

Washington, D.C.
Through July 11, 2010
For more than 100 years, the parking garage has provided design and engineering solutions to the parking problem; this is the first major exhibition to explore the history of this familiar structure and to open conversations about innovative designs and parking solutions for the future. Call 202/272-2448 or visit www.nbm.org.

Lectures, Conferences, and Symposia

China Eco Expo

Beijing
June 3–5, 2010
Featuring green-building products, technologies, and services from around the world, this high-level conference addresses China's need for more sustainable, ecofriendly growth. For more information, visit www.ecoexp.com.

Glenn Murcutt International Architecture Master Class

Sydney
July 11–25, 2010
This intensive, two-week design-studio program involves a group

design project and culminates with a design presentation by participants and a critique by Australia's best-known architect, Glenn Murcutt. The annual Master Class has created an active, international alumni network that includes practicing architects, academics, postgraduates, and senior students. For more information, visit www.ozetecture.org.

Competitions

The SHIFT**oston** Ideas Competition

Submission deadline:
December 11, 2009
Submit your most innovative, provocative, and radical ideas in this competition that seeks to collect new visions for Boston's urban environment. Eligible topics include renewable energy, ecological urbanism, creative redevelopment, municipal involvement in the field of design, and the city as a cultural center and cultural force. Visit www.shiftboston.org.

Southeast Wood Design Awards

Nomination deadline:
January 8, 2010
This competition recognizes and celebrates buildings that display a commitment to reducing their environmental impact and highlights the benefits of working with wood, including its strength, beauty, versatility, and cost-effectiveness. Visit www.woodworks.org.

Construction Excellence Awards

Submission deadline:
January 15, 2010
Recognizing the outstanding achievements of professionals in the design, fabrication, and functionality of acoustical and specialty ceilings as well as in interior systems construction, these awards also further their contributions to the architectural industry. Call 630/584-1919.

Tradewell Fellowship with WHR Architects

Submission deadline:
January 22, 2009
The Tradewell Fellowship was created to build the careers of aspiring health-care architects. Each year, the Tradewell Fellow is involved with clients in early master planning and design with a particular focus on healing environments and collaborative design methods. The fellowship begins and ends in July and includes employment at WHR Architects in Houston. Visit www.whrarchitects.com.

Ceramic Tiles of Italy Design Competition

Submission deadline:
February 19, 2010
This competition, now in its 17th year, recognizes the exceptional work of North American architects and designers who feature Italian ceramic tiles in their institutional, residential, or commercial/hospitality spaces. For more information, visit www.tilecompetition.com or call 718/857-4806.

Atlantic City Boardwalk Holocaust Memorial Design Competition

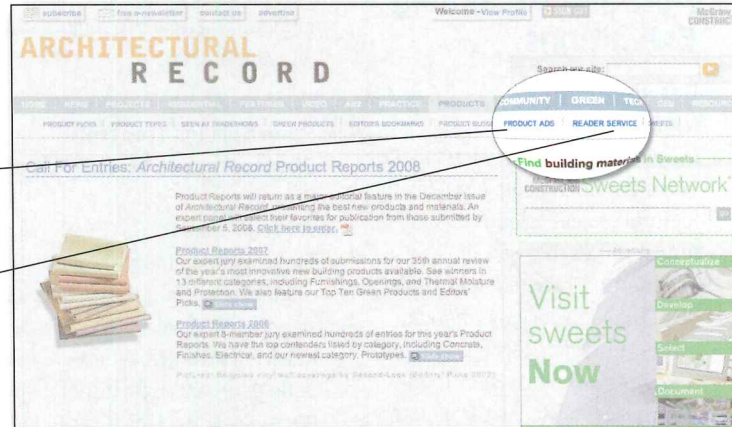
Submission deadline:
April 1, 2010
This is a two-stage international design competition to choose a winning proposal to build a fitting and compelling memorial to the Holocaust – and genocide in general – which has the potential to raise the consciousness of millions of visitors each year. Entry is anonymous and open to professionals and students in architecture, design, and the visual arts. Visit www.acbhm.org.






















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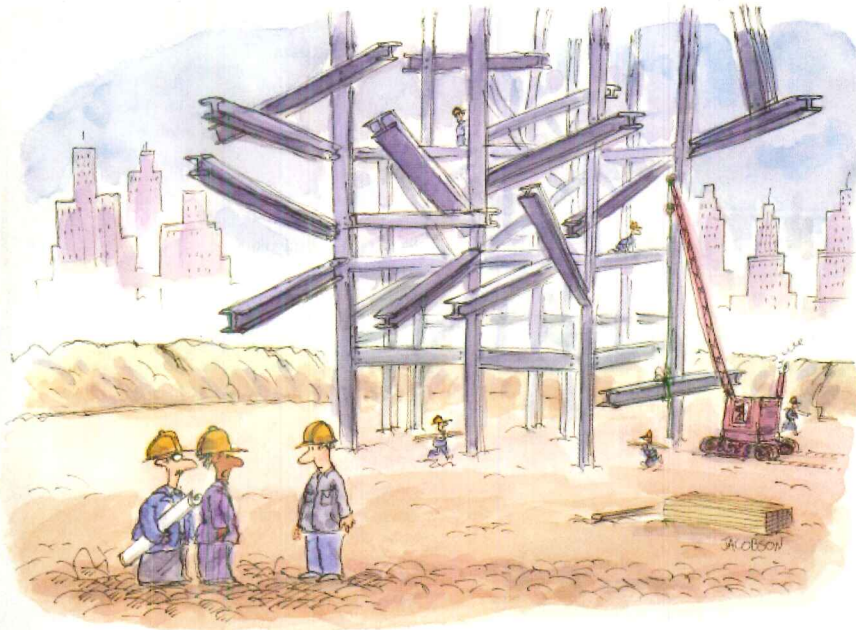
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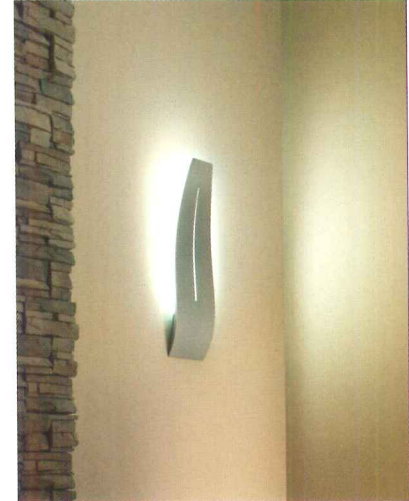
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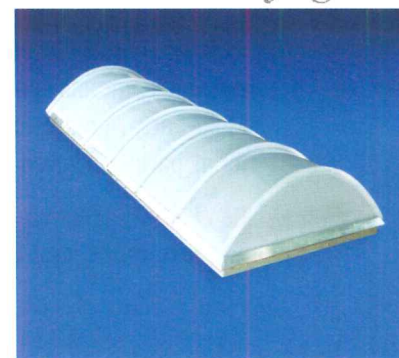
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Contact: Talia Vinograd

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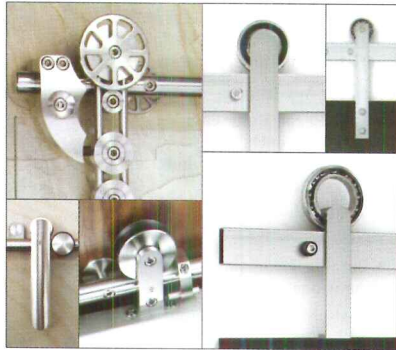
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Major Industries, Inc.

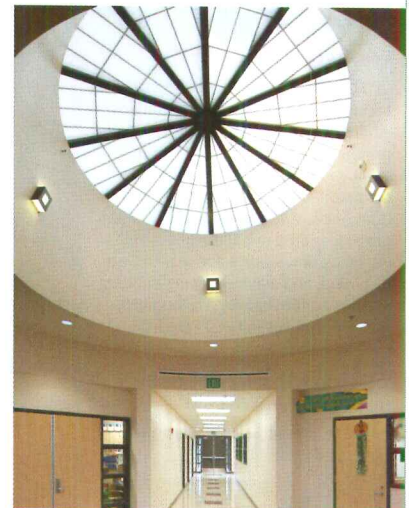
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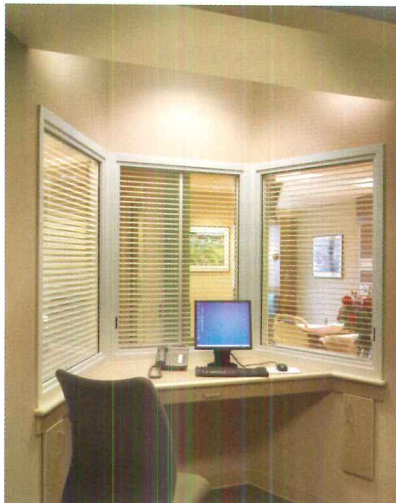
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Product Application:

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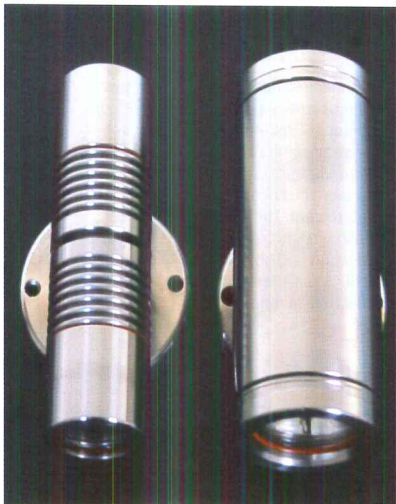
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ELEGANT OUTDOOR SCNCES

Hunza Lighting USA

Hunza offers a choice of two pillar lites designed to light both upwards and downwards on an exterior wall or pillar. The standard pillar uses twin MR16 lamps while the Euro Pillar offers distinctive, machined styling and more compact dimensions with two MR11 lamps. The Euro Pillar is available in a choice of 316 stainless steel or natural copper. The standard pillar is available in stainless steel and copper plus the added option of powder-coated aluminum. All Hunza luminaires are engineered in New Zealand from the finest solid metals.



www.hunzausa.com
888.578.6005

Circle 160

ELECTRICAL, LIGHTING

CYLINDER PENDANT

SS | G | NEW

MP Lighting

MP Lighting's L96 LED pendant can be used for both commercial and residential applications.

Performance Data:

- Pendant down light illumination
- Horizontal double, vertical double, single and dual circuit rails
- Canopy mount
- 50,000 hours product lifetime
- Energy efficient and environmentally friendly



www.mplighting.com
604.708.1184

Contact: David Brick

Circle 161

INTERIOR FINISHES, FURNISHINGS

CHANGING THE RULES OF ENTRANCE FLOORING FOREVER

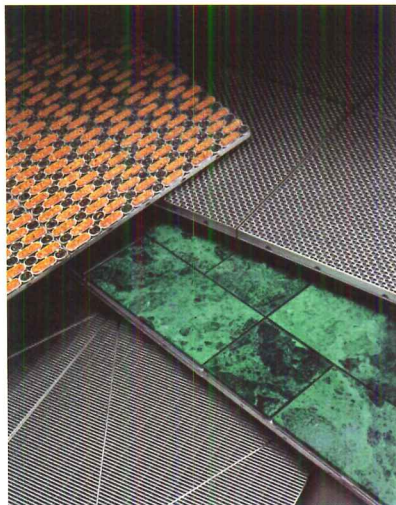
G | NEW

Construction Specialties™

▲ Floorometry products offer architects hundreds of exciting visual possibilities. Each of the four Floorometry products is manufactured in 18-in. x 18-in. modules that are designed to be installed flush to the surrounding floor finish. All Floorometry products are engineered to handle heavy rolling loads and feature a recess to trap dirt, mud, and water, keeping building interiors clean and dry. Floorometry also contributes to LEED® credits.

Performance Data:

- LEED IEQ credit 5 contribution (Pollutant Source Control)
- LEED MR credit 4 contribution (Recycled Content)



www.c-sgroup.com
800.233.8493

Circle 162

INTERIOR FINISHES, FURNISHINGS

CAST METAL PANELS

\$\$\$ | G

The Gage Corporation, Int.

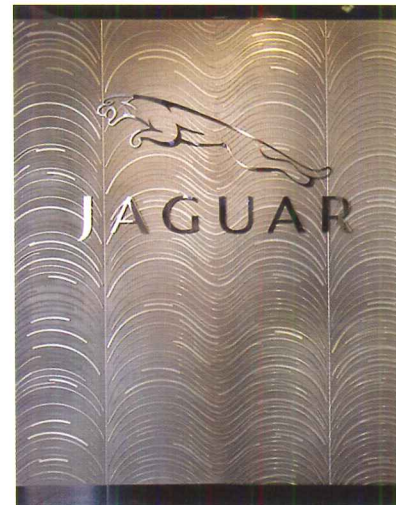
▲ Gagecast is a cast metal wall surfacing material suitable for a variety of interior applications.

Product Application:

- Palm Beach Motor Cars, West Palm Beach, FL
- Lowe's Corporate Headquarters, Mooresville, NC
- Microsoft Corporate, Redmond, WA

Performance Data:

- Durable, low-maintenance dimensional surfacing
- Cost-effective installation systems



www.gagecorp.net
608.269.7447, 800.786.4243

Circle 163

INTERIOR FINISHES, FURNISHINGS

EASY APPLICATION, HIGH PERFORMANCE

\$\$ | G

The Sherwin-Williams Company

▲ SuperPaint® provides one-coat hide with outstanding durability, flow, leveling, and spatter control.

Performance Data:

- Enhanced flat, satin sheens produce less drag
- Easy application, touch-ups and cleanups
- Improved washability, scrubs to resist stains
- Durable formula for long-lasting performance
- Low-odor, low-VOC formula meets green standards



sherwin-williams.com
800.321.8194

Contact: Terry Makowski

Circle 164

INTERIOR FINISHES, FURNISHINGS

ORNAMENTAL PLASTER CEILING TILES

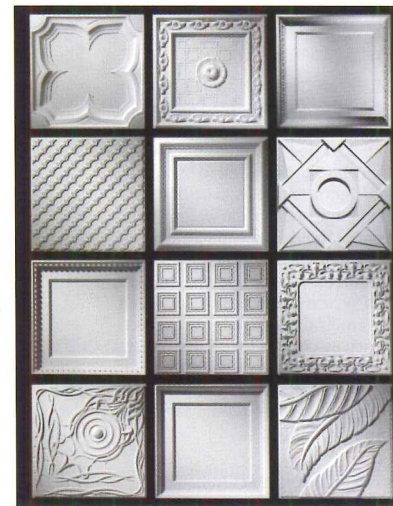
G

Above View Mfg., By Tiles, Inc.

▲ Ornamental plaster ceiling tiles fabricated from a non-toxic, non-combustible, proprietary composition.

Performance Data:

- The tiles drop into any standard 15/16-in. T-Bar grid system.
- The design line consists of more than 60 standard designs.
- Custom design work, custom colors, and faux finishes are available.



www.aboveview.com
414.744-7118

Circle 165

LANDSCAPING, SITEWORK

THREE-DIMENSIONAL MODULAR TRELLIS

G

greenscreen

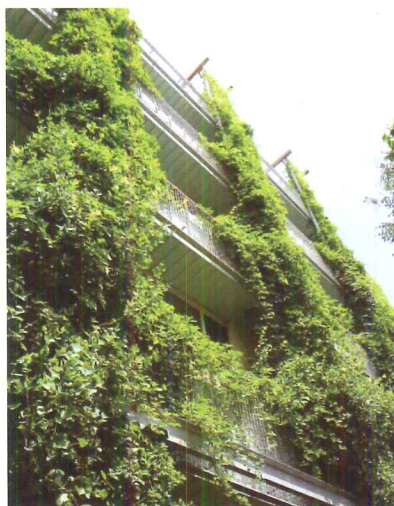
▲ Use for green walls, freestanding fences, enclosures, and landscape elements.

Product Application:

- Valley Metro Light Rail, Phoenix, AZ
- US Census Bureau parking structures, Suitland, MD
- Rush University Medical Center, Chicago, IL

Performance Data:

- Recycled content steel
- Complete system of attachment hardware



www.greenscreen.com
310.837.0526

Contact: sales@greenscreen.com

Circle 166

MATERIALS

BEAM SPLITTER

Glas Trösch AG

▲ Unlimited design options with this non-absorptive partly mirrored glass in interior and exterior applications, i.e., coverage of information displays, TVs, teleprompters, etc. Available in 3mm to 12mm thickness to meet any project requirement. There are two standard versions: light transmission (LT) 70%, reflection (LR) 30%, and LT 50% with an LR of 50%. Other light transmission and reflection on request.



www.luxar.ch

Contact: hytechglass@glastroesch.ch

Circle 167

MATERIALS

ARCHITECTURAL NATURAL STONE

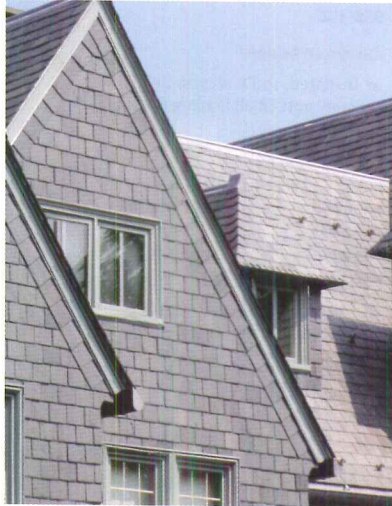
\$\$\$ | G

Vermont Structural Slate Company

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

Product Application:

- McKelvy House, Lafayette College
- Hendricks Slate Roofing
- Roofer: Timothy Spillane Inc.



www.vermontstructuralslate.com
800.343.1900

Contact: Craig Markcrow

Circle 168

MATERIALS

FIRE-RATED VERSION

G | NEW

Technical Glass Products

Technical Glass Products offers a valuable course for AIA HSW credit: "Burning Issues: Understanding Today's Fire-Rated Glass and Framing."

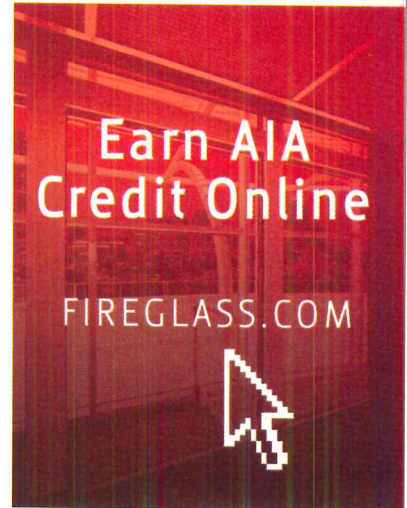
Products featured:

- FireLite® family of fire-rated glass ceramics
- Pilkington Pyrostop™ safety-rated glass firewalls

Also contains:

- New trends in fire-rated glazing materials
- Assessment and liability issues
- Recent code changes and how they impact design

www.fireglass.com
800.427.0279



Circle 169

MATERIALS

GENUINE STONE TILES

Architectural Products by Outwater

Hand sorted by color, size, and thickness, Outwater's Genuine Stone Tiles comprise 100% natural stones that are individually adhered in mosaic or stacked patterns onto mesh-style backings to create easy-to-install, seamless interlocking 12-in. x 12-in. and 4-in. x 12-in. tiles. Ideally suited for interior or exterior use in a vast range of residential and commercial new construction or renovation projects, they are offered in a variety of exotic and traditional round and flat stones in numerous styles and colors to suit a wide assortment of vertical or horizontal applications. Free 1,000+ page master catalog.



www.Outwater.com
800.835.4400

Circle 170

ROOFING, SIDING, THERMAL & MOISTURE PROTECTION

TRANSPIRED SOLAR COLLECTOR

WR | G

ATAS International, Inc.

To provide supplemental heating, the InSpire™ system utilizes solar energy to preheat fresh air using perforated metal wall panels.

Performance Data:

- Converts up to 80% of solar energy
- Lowers heating costs by \$3-5 per sq. ft. of panel per year
- Qualifies for LEED credits
- Payback generally within three years
- Heats fresh air and utilizes free solar energy

www.atas.com
800.468.1441

Contact: info@atas.com



Circle 171

ROOFING, SIDING, THERMAL & MOISTURE PROTECTION

BUILDING INSULATION

WR | G

Johns Manville

JM Formaldehyde-free™ building insulation helps you build sustainable, energy-efficient structures.

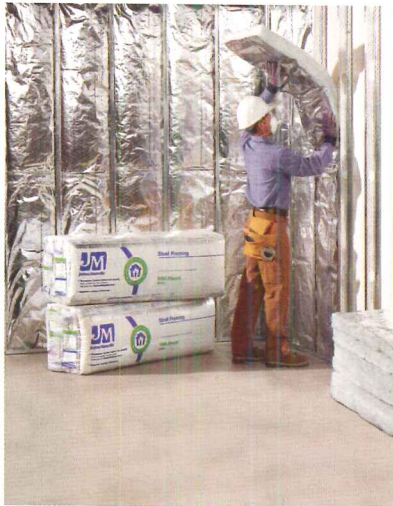
Product Application:

- Solano County Government Center, Fairfield, CA; LEED certified
- US Environmental Protection Agency Region 8 Headquarters, Denver, CO; LEED Silver; Gold expected

Performance Data:

- JM helps promote the safety, health, and well-being of those who construct and occupy the buildings you create with improved indoor air quality.
- JM products can help you earn points to qualify for LEED® certification.

www.SpecJM.com
800.654.3103



Circle 172

ROOFING, SIDING, THERMAL & MOISTURE PROTECTION

SUSTAINABLE METAL ROOFING & WALL SYSTEMS

WR | G | NEW

Fabral, Inc.

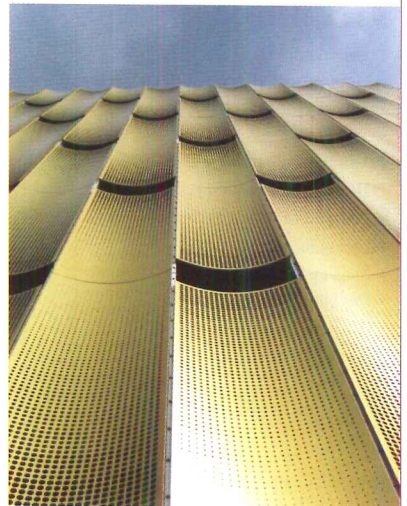
Fabral, a premier supplier of metal roofing and wall systems, brings a new vision to architectural metal with a new array of specialty colors and finishes on aluminum.

Performance Data:

- The natural beauty of aluminum in a wide range of color tints
- Semi-transparent clear coats and extraordinary metallics
- Iridescent finishes that combine the reflection and refraction of light
- Varying patina, natural wood, stone, and nature-inspired designs

www.fabral.com
800.884.4484

Contact: Donna Berryhill



Circle 173

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 = CAD Details Avail. | PDF = PDF Avail. | 3D = 3D Model Avail.

SPECIALTY PRODUCTS

BALUSTRADES, COLUMNS & CORNICES

Architectural Columns & Balustrades by Melton Classics, Inc.

▲ Melton Classics' extensive selection of maintenance-free balustrades provides the design professional with over 100 balustrade designs, and the ability to incorporate radius stairs and balconies to enhance the beauty of their projects. Balustrades are offered in synthetic stone, fiberglass/marble composite, polyurethane, cast stone, and polyvinyl and are engineered to reduce weight and meet IBC structural codes. They also offer a comprehensive selection of architectural columns, fiberglass cornices, and polymer millwork.



www.meltonclassics.com
800.963.3060

Contact: Mike Grimmett

Circle 174

SPECIALTY PRODUCTS

COPPER CHIMNEY POTS

\$\$\$ | G

European Copper

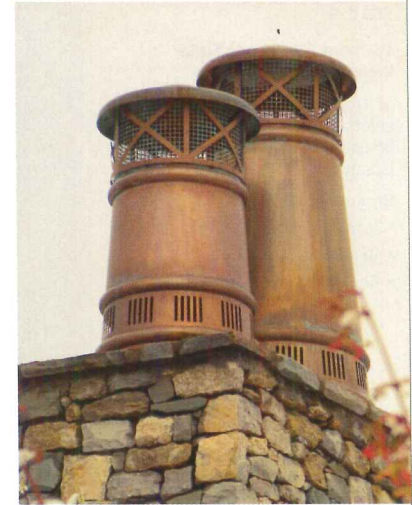
▲ UL-listed, 100% recyclable chimney pots fit all leading fireplace systems.

Product Application:

- Utica Place, Tulsa, OK
- Cacia Hall Preparatory School, Tulsa, OK
- Private residence, Tulsa, OK

Performance Data:

- UL listed for both masonry and pre-engineered fireplaces
- Certified by OMNI Testing Laboratories



www.europeancopperchimney.com
800.391.0014

Contact: Pat Keegan

Circle 175

SPECIALTY PRODUCTS

GLASS SUPPORT SYSTEM

\$\$ | NEW

Glass and Glass

▲ Proven and tested glass hardware exceeding FBC requirements. NOA in progress. Flextech Frameless Glass Railing Brackets: go from straight to curved glass.

Product Application:

- For exterior and interior use. Commercial, residential, hospitality.
- Use Flextech mode of attachment for glass railings, columns, walls, furniture, etc. (patent pending).

Performance Data:

- Their frameless brackets don't need additional support and save time and installation costs.



www.glassandglass.com
305.796.2226

Contact: Rolando Serra

Circle 176

SPECIALTY PRODUCTS

FULL EXTENSION & TWO-WAY TRAVEL

\$\$\$ | G | NEW

Accuride International

▲ A full-extension, two-way travel slide designed to provide access from both sides of installations.

Product Application:

- Kitchen islands, dining or entertainment bars
- Supply carts or kiosks
- Indoor/outdoor access for reception stations, pharmacies, or banks

Performance Data:

- Full extension in both directions from center detent
- 100-lb. load rating; tested to 80,000 cycles



www accuride.com
888.459.8624

Circle 177

SPECIALTY PRODUCTS

HAND DRYER

\$\$\$ | G

Dyson B2B, Inc.

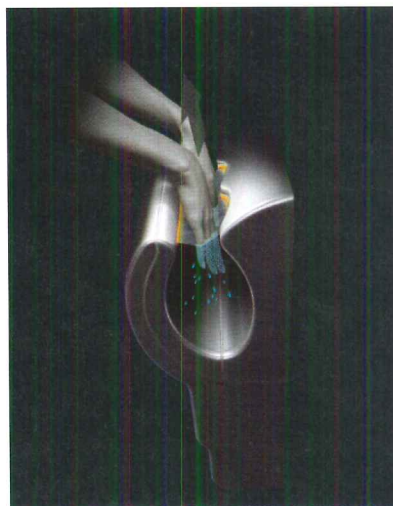
▲ New CE course: "Hand Dryer Technology: Sustainable, Hygienic, and Cost Effective."

Product Application:

- The Gherkin, London
- Dodger Stadium, Los Angeles, CA

Performance Data:

- Uses up to 80% less energy
- Qualifies for LEED



www.dysonairblade.com
888.DYSON.AB

Contact: Matthew Cool

Circle 178

SPECIALTY PRODUCTS

TRANSLUCENT WALL SYSTEM

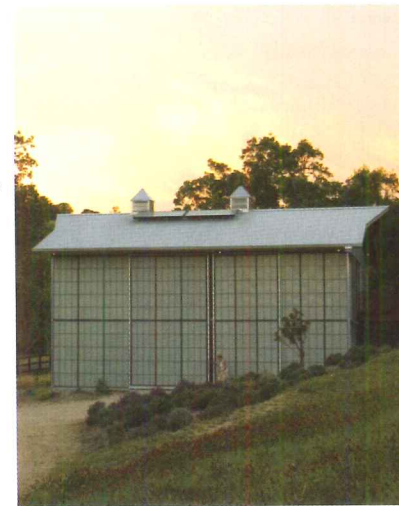
WR | G

Kalwall Corporation

▲ Renowned for balanced, diffuse natural light that fills any space with glare-free, shadow-free daylighting.

Performance Data:

- Meets or exceeds all building codes
- Can contribute as many as 42 LEED points under v3 2009
- U-value options from .53 to as low as .05 with Kalwall+ Nanogel
- Light transmission of 3% to 50%
- Solar heat gain coefficients from 1.0 to under 0.4



www.kalwall.com
800.258.9777

Circle 179

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the ability to establish and maintain the confidence of faculty, students, staff, alumni, and the professional community. Candidates must possess a terminal master's degree in architecture and architectural registration or a Ph.D. in architecture. Rank and salary shall be commensurate with experience. Lawrence Tech is a NCA accredited private university founded in 1932 and located in southeast Michigan. The College of Architecture and Design is the largest school of architecture in Michigan and one of the largest in the United States. College programs in architecture, urban design, interior architecture/design, graphic design/digital imaging, and transportation design hold accreditations from NAAB, CIDA, and NASAD. Review of applications will commence on Dec. 15, 2009 and will continue until the position is filled. This appointment will commence July 2010. Applicants should send a resume or curriculum vita, a one page statement of educational and administrative philosophy, a portfolio of academic and/or professional work, and the names of three references to: Search Committee Chair, College of Architecture and Design, Lawrence Technological University, 21000 W. Ten Mile Rd., Southfield, MI 48075. E-mail questions to the dean's office at gleroy@ltu.edu or call 248-204-2805. EOE

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" 2009 Shenzhen & Hong Kong Bi-City Biennale of Urbanism\Architecture "

Opening Date: 06.12.2009 **Main Venue:** Shenzhen Civic Square
Sponsored by: Shenzhen Municipal Government
Organized by: Shenzhen Municipal Commission of Urban Planning and Land Resource | Shenzhen Municipal Bureau of Culture, Sport and Tourism | Shenzhen University | Shenzhen Press Group | Shenzhen Media Group **Supported by:** Shenzhen Public Art Center | Shenzhen Exploration & Design Association | Zhubo Architectural & Engineering Design Co.,Ltd
Chief Curator: Ou Ning **Curators:** Beatrice Galilee | Kayoko Ota | Wei Wei Shannon | Pauline J. Yao



www.szhkbiennale.org

READER'S GALLERY

Every month, our online readers vote for their favorite images from our Web galleries. The photo with the most votes and two runners-up appear on this page. To vote for photos and to share your own, visit architecturalrecord.com and click on Community.



1. **First Place:** Kasian Architecture Interior Design and Planning's train station at Vancouver International Airport. Photo submitted by "derek."

2. **First Runner-up:** Eliel and Eero Saarinen's Kleinhaus Music Hall in Buffalo, New York. Photo submitted by "wardthompson."

3. **Second Runner-up:** Brian Weber Architecture's Caribou Ridge House. Photo submitted by "dalbrandt."



2



3

The Very Best Amenity of the World



Crystal Lagoons

New Concept and Technology: Crystalline Lagoons of Previously Unimagined Dimensions

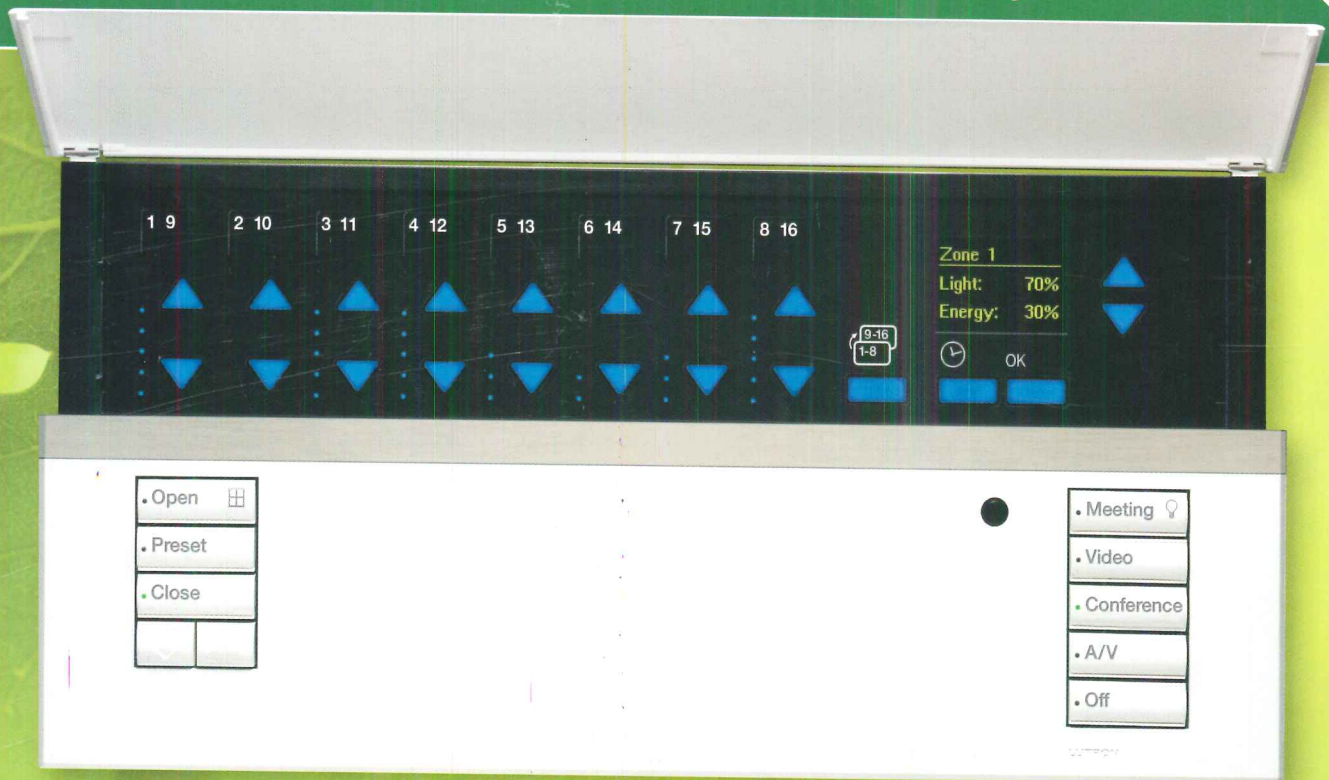
The innovative concept and sustainable technology that enables the implementation of unlimited-sized crystalline water lagoons almost anywhere surrounded by white sands,

recreating a full tropical-beach environment for swimming and water sport activities, at very low construction and maintenance costs.

www.crystal-lagoons.com

GRAFIK Eye® QS Wireless with EcoSystem®

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Lights, shades, energy savings.

Lutron® GRAFIK Eye QS Wireless with EcoSystem is the premier energy-saving light and shade control system.

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NEW Wireless communication

- Lutron Clear Connect RF Technology™ reliably connects sensors, shades, and keypads
- Simplified installation saves time and associated costs

Learn more at www.lutron.com/qs

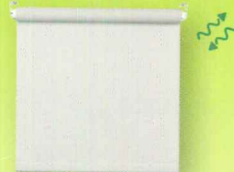
Energy-saving components:



EcoSystem digital addressable ballasts and Hi-lume® LED drivers



Occupancy/vacancy and daylight sensors



Sivoia® QS Wireless shades



Pico™ wireless controls



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