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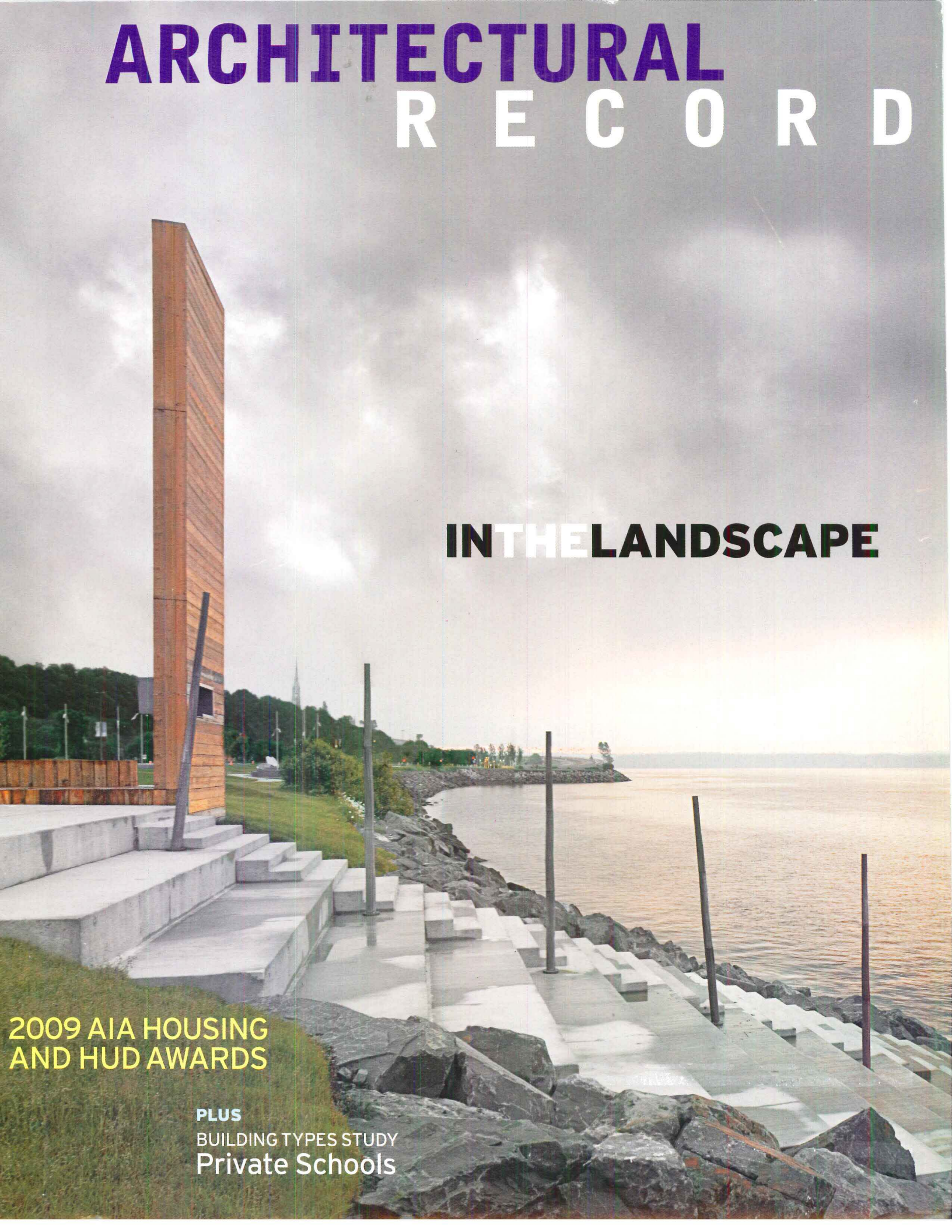

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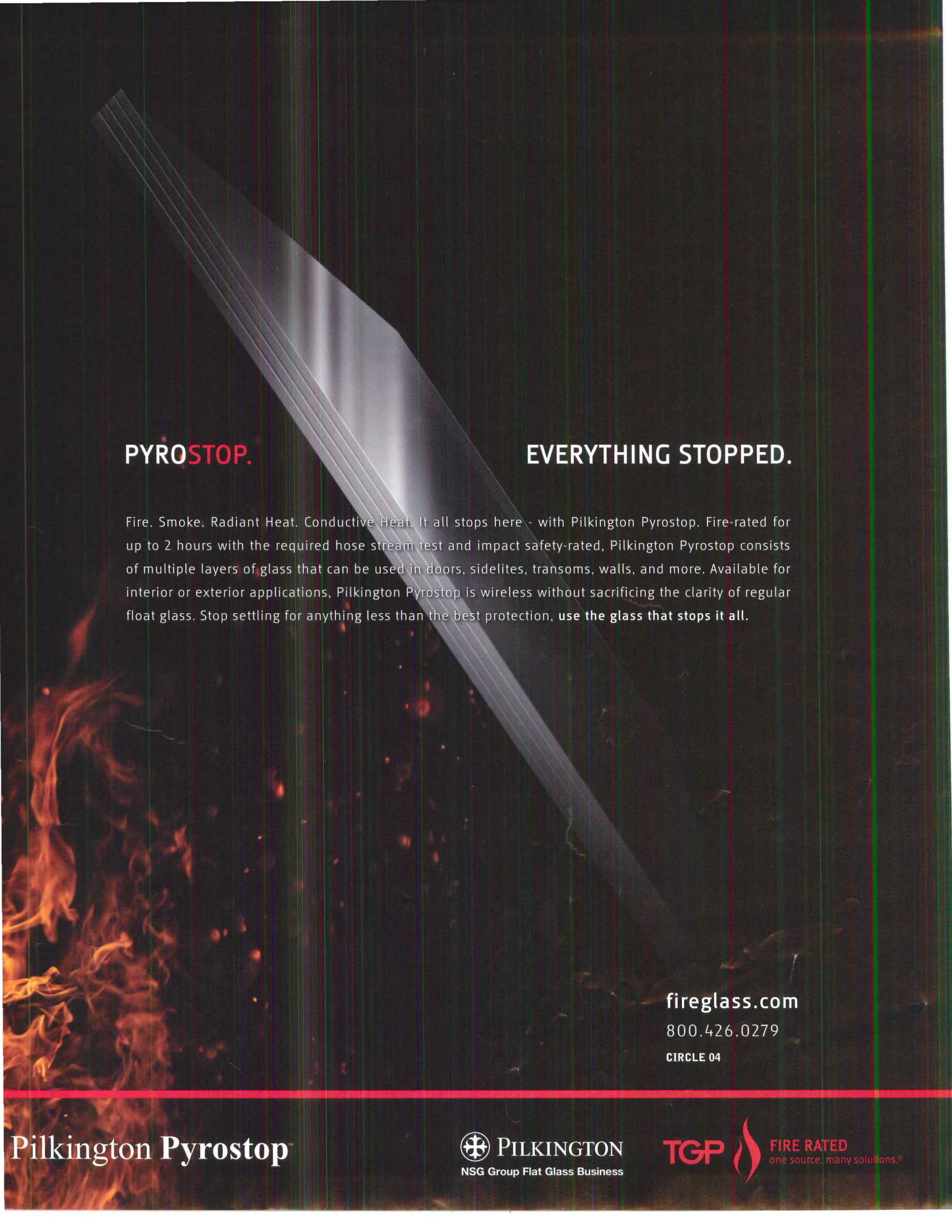
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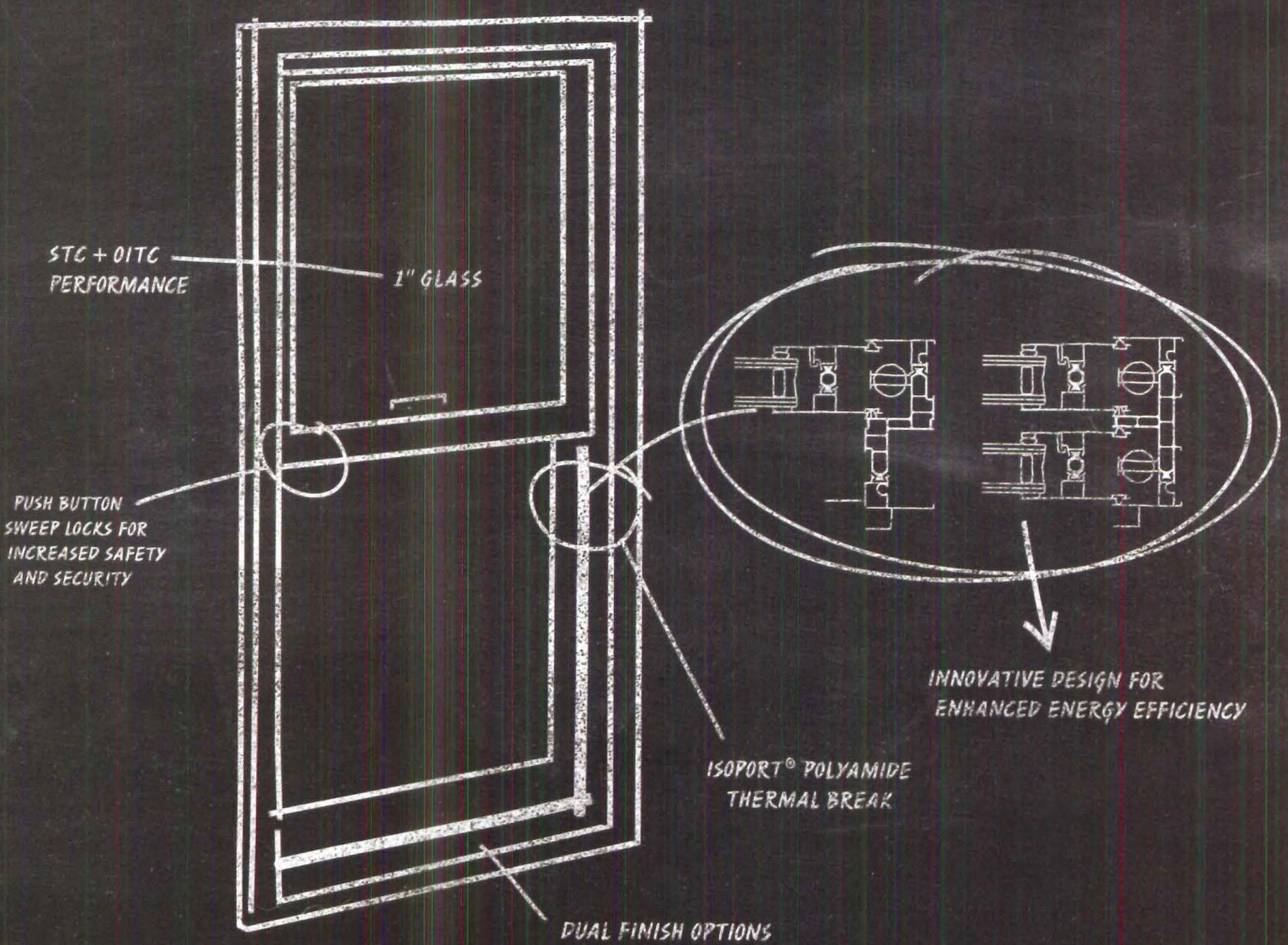

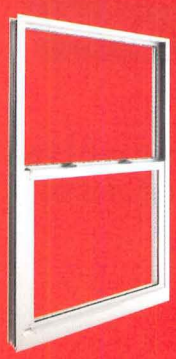

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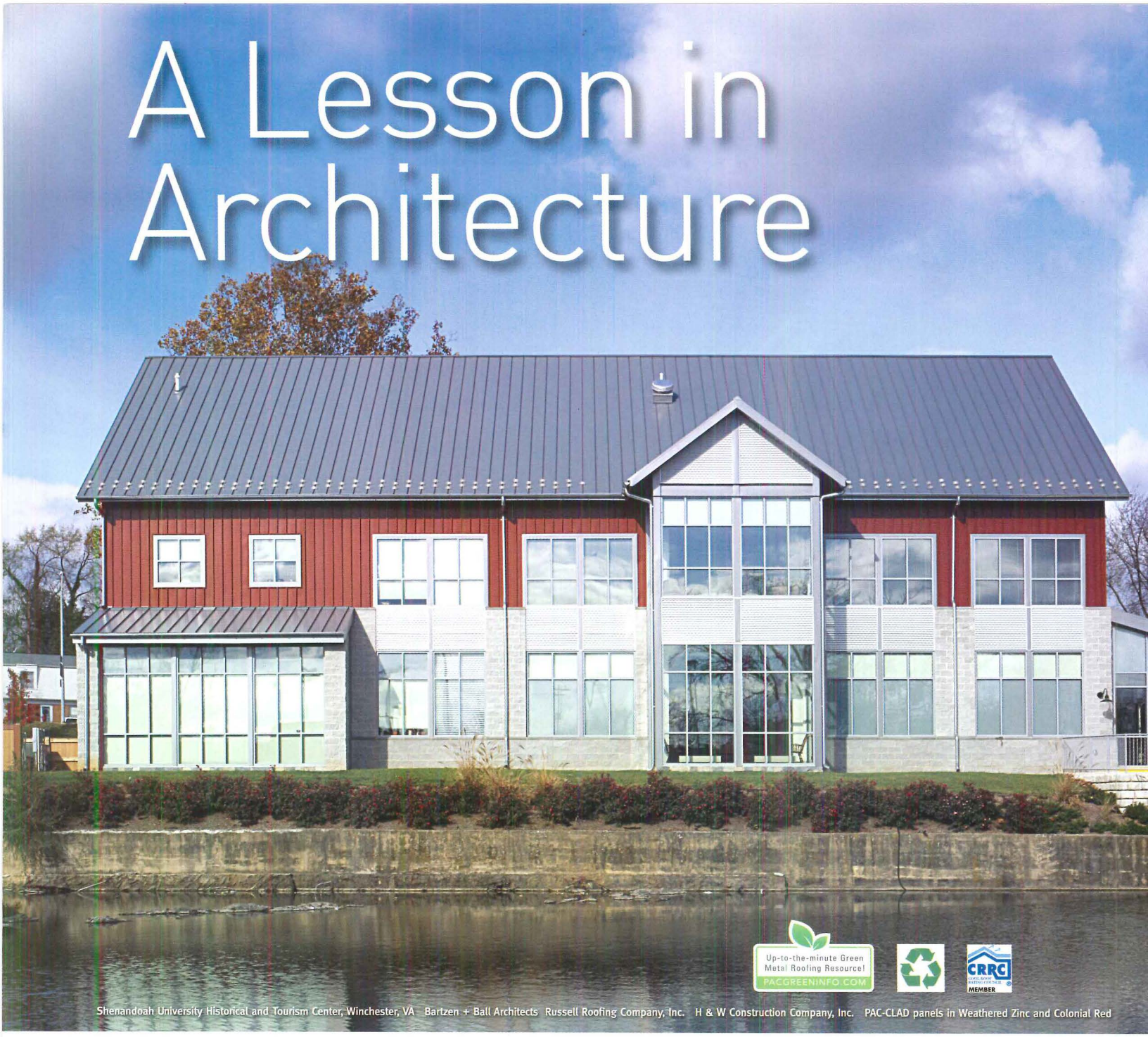
CIRCLE 06

A Lesson in Architecture



Shenandoah University Historical and Tourism Center, Winchester, VA Bartzen + Ball Architects Russell Roofing Company, Inc. H & W Construction Company, Inc. PAC-CLAD panels in Weathered Zinc and Colonial Red

PAC-CLAD roof panels illustrate architectural vision.

The architectural goal of this Convention and Visitors Bureau: capture the industrial and agricultural heritage of the area. Goal achieved via PAC-CLAD roof panels' numerous options. To integrate with its historic surroundings, a palette was developed based on the regional landscape. Finished in Weathered Zinc and Colonial Red, the PAC-CLAD standing seam roof and board-and-batten metal cladding, make that all important first impression a strong one.

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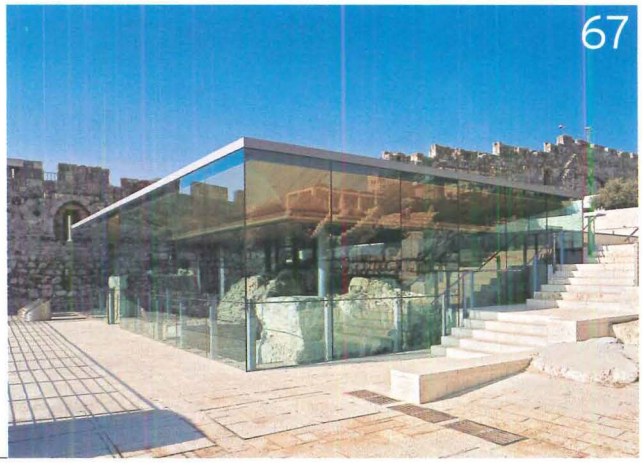

On the Cover: *Inujima Art Project, by Sambuichi Architects; photo by Marc Cramer.*
Clockwise from top: *Davidson Center, by Kimmel Eshkolot Architects; photo by Amit Giron. Cappellini's Bac chair, by Jasper Morrison. Charles Jencks's Garden of Scottish Worthies; photo courtesy Charles Jencks.*

News

Departments

Features

Projects

Building Types Study 890

Architectural Technology

Housing Awards

Products

Expanded coverage of Projects, Building Types Studies, and Web-only features can be found at ***architecturalrecord.com***.

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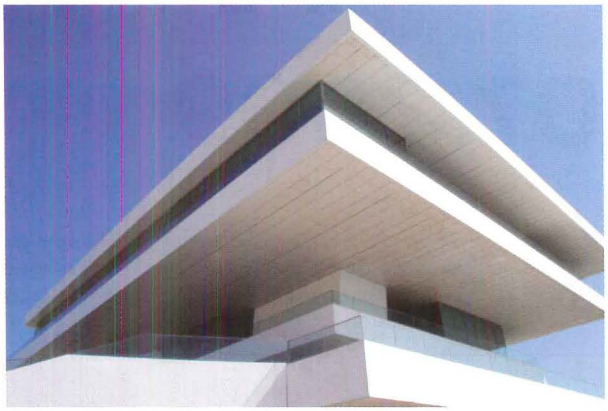
07.2009
On the Web

School may be out for the summer, but we continue this month's look at **private school projects** with an expanded Building Types Study on the Web. Plus, our video library now contains **more than 100 videos.** Watch them all at *architecturalrecord.com.*



Reader Photo: This image of the America's Cup Building in Valencia, Spain, by David Chipperfield Architects is one of more than 2,000 reader-submitted images in ARCHITECTURAL RECORD*'s online galleries.*

Online Only

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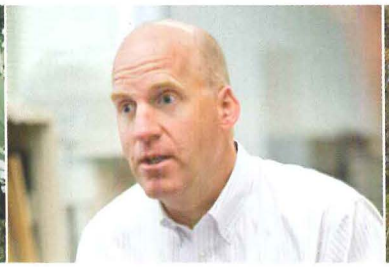
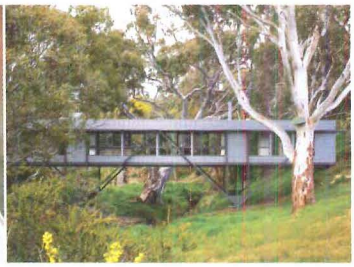
New in our video library: Take a tour of Renzo Piano's California Academy of Sciences from the green roof to the subterranean aquarium.



Newsmaker Interviews
Architect Chris Downey discusses continuing to design despite losing his sight as well as his current project with SmithGroup.



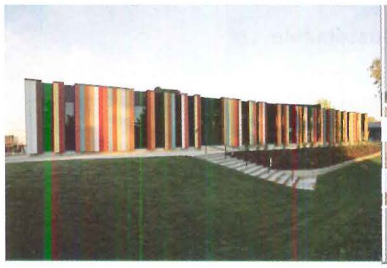
House of the Month
Visit a house by Australian architect Max Pritchard that is literally in the trees—spanning a creek and sitting on two steel trusses.

Your Comments

"Too bad for all of us. The banks do it again. There is no room for creativity now—even for the 16 stars. Gehry can join the rest of the profession, as well as the country, to sleep it off in our mall parking lots."

—Bob M., on "Gehry Loses Atlantic Yards Arena to Ellerbe Becket."

Expanded Coverage



BTS
View six additional K-12 private schools in the extended Web version of this month's Building Types Study.

Exhibitions
Take a video tour of the exhibition *Frank Lloyd Wright: From Within Outward* at the Solomon R. Guggenheim Museum in New York.

AR2
Berlin's Gilbert Wilk and Ana Salinas design the impossible. And 23-year-old Lukas Petrash launches a career with leftover building materials.

CEU
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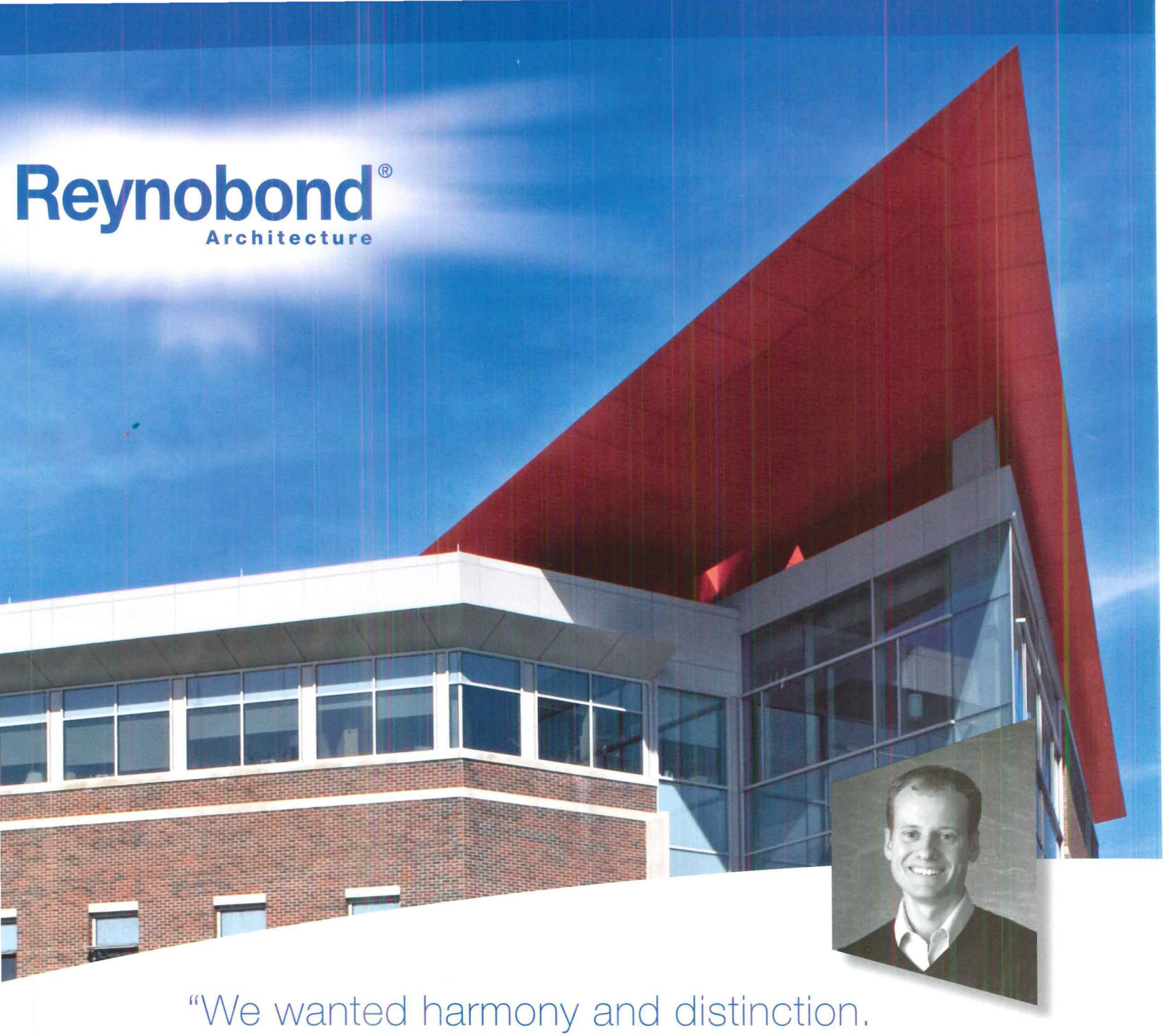

"We wanted harmony and distinction. The right material gave us both."

Purdue University counts 22 astronauts among its graduates, including the namesake of its new engineering facility, Neil Armstrong Hall of Engineering. Chris Boardman of RATIO Architects, Inc., of Indianapolis designed the new facility's roof color to match the deep, rich red of terra cotta tiles found throughout the historic campus. Reynobond® ACM not only matched the color precisely, it also provided the distinctive, streamlined visual aesthetic the university wanted. From inspiration to implementation, no one's dedicated to your success like the people of Alcoa Architectural Products.

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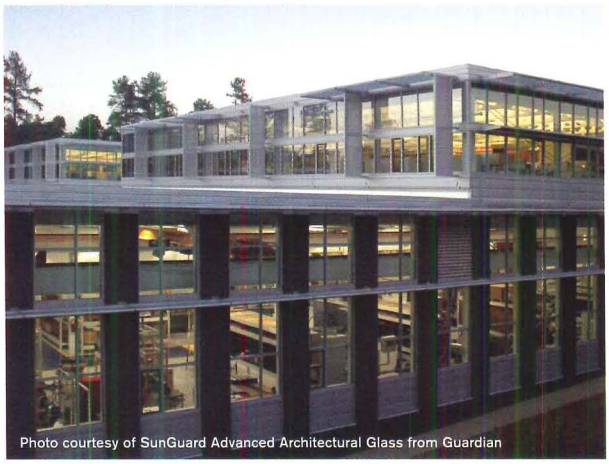
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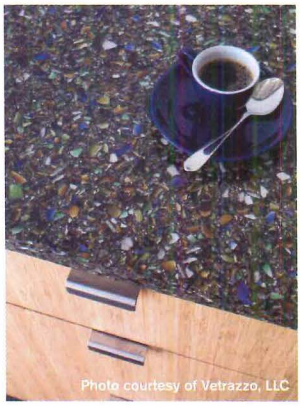
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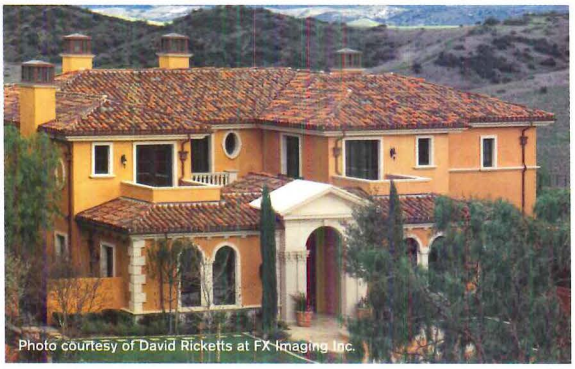
Roofing Strategies Reach New Heights: Sustainable Options for a Key Building Element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CIRCLE 10

Drawing, ca. 2009

Editorial

By Robert Ivy, FAIA

What has happened to drawing? This recently posted rhetorical question on the Internet produced a torrent of responses, an ironic commentary from our digital age. Yes, we primarily draw electronically now. Yes, our several generations of active architects employ different media to think, to design, and to represent their ideas. Yes, our students and future architects still use hand drawing, but frequently as one tool in a kit that includes physical modeling and three-dimensional virtual manipulation. Yes, the architect's world has changed. There should be no tears, only a glint at reality.

And yet, and yet … a new exhibition in New York tears us away from the brave new world and reminds us what drawing can do. Co-organized by the Solomon R. Guggenheim Foundation and the Frank Lloyd Wright Foundation for the 50th anniversary of Wright's death and the opening, six months later, of the museum itself, the show, entitled (inelegantly) Frank Lloyd Wright: From Within Outward, displays more than 200 drawings, some never before exhibited, all from the architect's studio, as well as models and digital animations of 64 projects.

"Quiet." That word seemed to characterize most people's response to the large sheets elegantly displayed within vitrines in a space that can gobble up all but the most histrionic displays. For the Wright aficionado, or the architect in love with drawings, the museum and the foundation have produced a summer swimming pool of a show: You have to dive in and take a deep breath.

The range of techniques and the craft present in the sheets of handwork remind us what we have lost in our transition to the electronic. The analogy lies in the piano's transition to the electronic keyboard, where technical ability has thrived but dynamics has disappeared along the way. Rather than the subtle variations in tone, or the slight tremolo and the staccato attack, the nuance that lies in variation of technique, pianists found little but loud and soft in the new technology, resulting in the tonal equivalent of hitting the same key, forcefully, over and over—banging, rather than playing. Regrettably, our own drawings, too, often hit the same key.

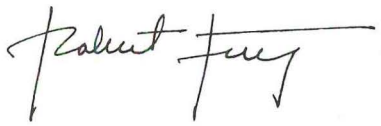
The Wrightian drawings (Wrightian because few can claim his sole authorship), however, fly across a range of techniques, attracting us with traditions that extend back to the caves at Lescaux. Some exhibit pure idea or form conveyed by line; others appeal to the senses through texture or tactile effects or color. Nature frames images, creating layered perspective, while the human form and furnishings lend scale. The media vary from ink lines and washes to gouache and watercolor. Within the range, it is arguable that nothing conveys the immediate link between human cognition, the kinesthetic sense, and intention more effectively than the handheld graphite pencil.

At Wright's own Oak Park Studio (1897), for example, the image of house and workshop set in the parklike setting fairly pulses. The media are simple: graphite pencil and sepia ink on paper. Employing those tools, however, the lines display contained energy—inexact, discontinuous, but almost electrically charged. A minimum of rendering defines the shades and shadows. The human-made elements, particularly the fenestration, seem capable of machinelike motion, while nature envelops the studio and weds the constructed environment with the natural. All with a few, intentional lines.

Ink offers the delineator opportunities for heightened drama. The Larkin Building (1902–06), drawn with sepia ink on paper, throws the blocks of the urban office into relief. Unity Temple (1905–08), ink and watercolor on paper, fairly jumps from the sheet, strongly set apart from its background. And most famously, in the Robie House in Chicago (1908–10), the sepia ink on art paper has been reduced to a pattern of blacks and neutrals in which all seems to be thrusting planes, all shadow and light.

In black-and-white and colored drawings, we are aware of the maker. Can that be a distinguishable characteristic—the inevitability, even the presence, of the person behind the image? The individual lines of colored pencil bubble and bump their way into a chromatic whole, causing lines of contour to flow, like the drawing for the Taliesin farmlands (1925–59) executed with colored pencil and ink on tracing cloth. Washes and watercolors of the Willets House (1902–03), for example, add an ocher-laced fluidity that ties the structure to time and place, an ensemble related to Wright's love of Japanese printmaking and the influence of late Art Nouveau. White, the presence of all color, applied as gouache to the Thomas Gale House (1909), pops the static structure out from the picture plane with calculated boldness.

Plans (Wright's patterned two-dimensional representation of flowing interior space related to the larger world), and details (sometimes a quick working-out, sketched, or refined), underscore how the prolific master thought and represented his thought. For contemporary audiences, elegiac about the sea change currently taking place, the medium at the Guggenheim becomes the message. Architects today are embarked on mental wonders, thanks to our computer-generated imagery, our parametric modeling, and our seemingly endless abilities to conceive and construct. Confronting Frank Lloyd Wright, sheet after sheet, we have to ask: What has happened to drawing?



Letters

Back to the future

Thank you for your well-done feature, "Breakthroughs and Obstacles" [May 2009, page 28]. However, if this article had been published 20 years ago, I believe we would have seen most of the same architects that are featured here. This is virtually the same article that gets published every few years, with some updated statistics. Why not talk about the fact that these articles have to recycle the same architects from 20 years ago? Why not talk about the fact that even though our numbers have exponentially increased, there is still a dearth of African-American architects starting their own firms or becoming partners in established firms? What will the future of architecture really look like in 20 years?

Carol Corr, AIA
Oakland, Calif.

Architectural assimilation

I appreciate that the AIA and ARCHITECTURAL RECORD have publicly welcomed the value of diversity while simultaneously acknowledging that the profession is lagging behind popular and demographic trends ["Minding the Gap," May 2009, page 77]. The goal of adding more people of color to the profession is indeed a symbol of the discipline's affirmative attitude toward inclusivity and the future. However, I am apprehensive about embracing a diversifying strategy that focuses on the "pipeline." If we concentrate all of our resources on encouraging the next generation of architects to fit in to architecture, then we are allowed to leave unexplored architecture's educational and professional culture, to which we are all expected to assimilate. The most difficult question has to be: What is it about the dominant ideology and pedagogy of architecture that precludes a diverse graduating class and workforce?

Carla Corroto
Radford, Va.

No competition

I was glad to see the RECORD News piece on the planned demolition of Paul Rudolph's 1958 Riverview High School in Sarasota, Florida. I still hope we can save it. However, the article did not mention that the reason for demolition was that the developer/architect competition held to save the building was a failure. The competition program was poorly written and the competition organization was badly run with meager participation. Architect/developer competitions are held to find a developer with funds to build the best architectural solution. The competition program did not require that the funds for best design and use be secured. The Sarasota School Board had no other choice but to reject the winning design for which the money was not available.

Peter Lizon
Sarasota Architectural Foundation
Sarasota, Fla.

Corrections

A June 2009 News Brief [page 30] about the Architectural Billings Index incorrectly referred to scores for March and February. In fact, the scores were for April and March. June's Reader's Gallery [page 160] inexcusably misspelled Louis I. Kahn's name. Also in June, a caption [page 57] incorrectly placed Richard Neutra's Cyclorama in Getty, Pa., instead of Gettysburg, Pa.

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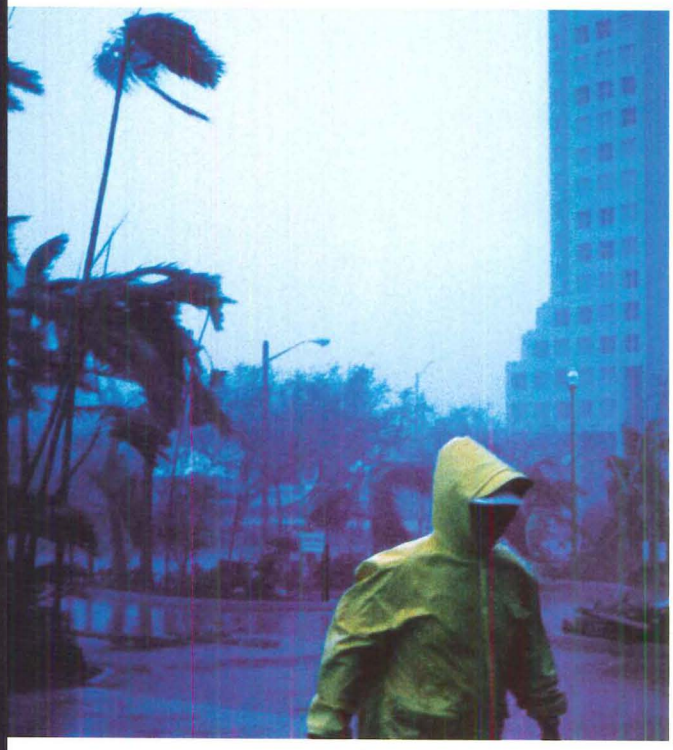

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CIRCLE 145

Record News

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At Cornell, ground breaking could mark end of 12-year saga

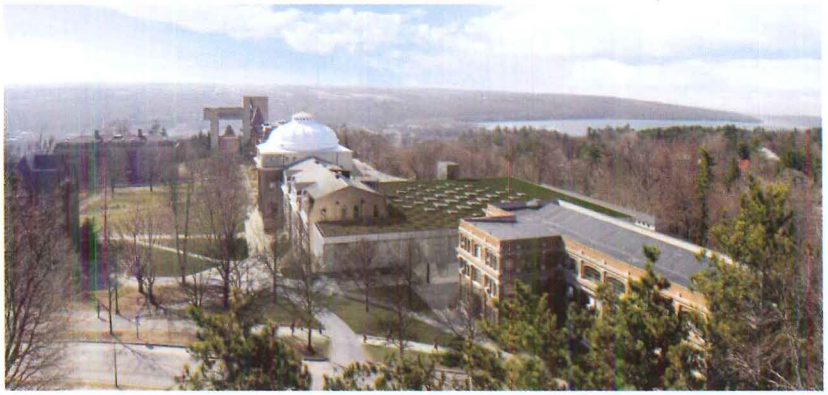
For more than a decade, Cornell University has grappled with its plan to construct a new facility for its College of Architecture, Art and Planning (AAP). On June 8, however, a backhoe began digging up dirt at the building's proposed site – the north edge of the Arts Quad – perhaps marking the end of an epic drama that has involved a large cast of characters, a global financial crisis, and the looming threat of academic decertification.

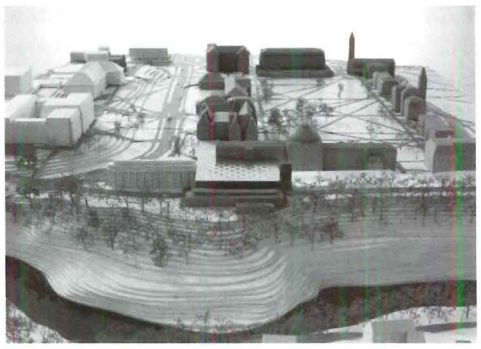
Scheduled to open in the fall of 2011, the Paul Milstein Hall, designed by the Office for Metropolitan Architecture (OMA), will contain studios for the architecture program, along with a 275-seat auditorium, space for juried critiques, and a gallery to be shared by all AAP departments. The two-story, 47,000-square-foot building, whose design has faced a fair amount of opposition, survived the last stretch of the approval process with its Miesian box not only intact but extravagantly cantilevered.

The odyssey began in 1997, when the National Architectural Accrediting Board (NAAB) reprimanded the AAP for its insufficient and out-of-date facilities. The college is spread among four buildings (Rand, Sibley, Tjaden, and the Foundry), none of which had been purpose-built for the architecture department.

The college promised to rectify the situation and commissioned Boston-based Schwartz/Silver Architects to design a new arts library to make way for expanded architecture studios. The scheme was never approved. Next came proposals for new buildings by Steven Holl, and later, Barkow Leibinger – both of which hit roadblocks and were never realized.

OMA was hired in 2005 to devise a new plan. Rem Koolhaas proposed a rectangular box for an unoccupied area between Rand and Sibley Halls, thus connecting the two buildings. The glass-and-steel box would float above a domed crit space, and the northern edge of the building would reach across the street toward the historic Foundry, which houses sculpture studios. No architecture can please everyone, says Shohei Shigematsu, director of the OMA New York office, "but our original aim was really to create a place where the college can fulfill its ambition."





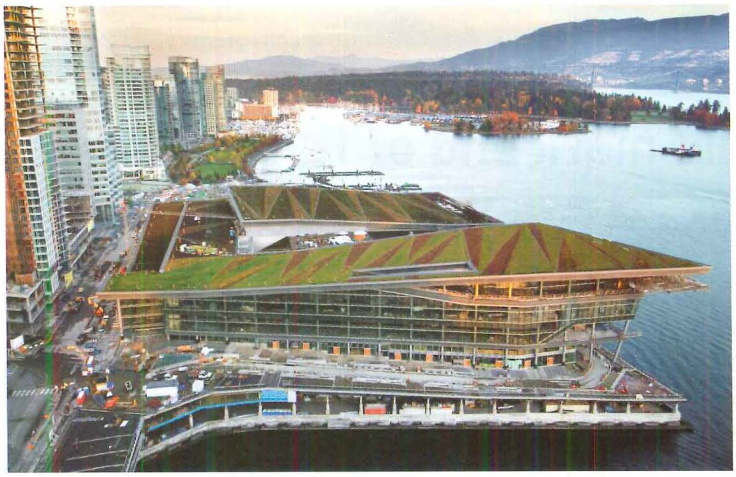
The OMA-designed Milstein Hall will connect two existing buildings on the north edge of the campus Arts Quad (left). A cantilevered, glass-and-steel volume (below left) will extend over a street, toward Fall Creek (below).

The scheme triggered an avalanche of preservation concerns and objections. In response, OMA scaled back the design, lessening the building's visibility, and cantilevered the second floor, reducing its impact on the Foundry's sight lines. More problems ensued. The city-planning commission disputed the university's right to build above the street. Meanwhile, the NAAB returned in 2008 to evaluate the undergraduate program and delivered a loud no-confidence vote on the facility's lack of progress, granting a reduced accreditation period of three years. It also canceled a 2009 review of the school's new master's program. Then, last fall, the university's endowment was hit by the collapsing banking system, and all capital projects were put on hold.

This spring, however, with the threat of another NAAB rebuke on the horizon, and with some financial stability returning, the university trustees at last relented, voting on May 23 to proceed with construction of Paul Milstein Hall (named after the New York developer and philanthropist, whose children attended Cornell). "It would have been very easy for them to say we just can't do this, the economy has hit us hard and we just have to wait," says Kent Kleinman, dean of AAP.

But Cornell's 138-year-old architecture school, whose undergraduate program is consistently rated one of the nation's best, might have lost its accreditation. The NAAB is scheduled to conduct its next on-site review next spring, and if construction continues as planned, it should see the shell of a new studio building in place. "The [architecture] program is a gem in Cornell's crown," Kleinman says. "It has fabulous teachers and fabulous students. You can overcome bad facilities with that, but you can't overcome them indefinitely." *Stephen Zacks*

Olympic expansion for Vancouver expo center



The 338,000-square-foot addition is topped by a 6-acre green roof.

In comparison to the building boom that was the 2008 Beijing Olympics, the 2010 Vancouver Games have elicited little architectural fanfare: Most of the venues are existing stadiums, either left alone or renovated. Even accounting for the lesser requirements of a Winter Games, the Olympics won't leave much of an architectural stamp on its host city.

A notable exception is the large addition to the Vancouver Convention Centre (VCC) that opened on April 3. Designed by Seattle-based LMN Architects in association with Canadian firms Musson Cattell Mackey Partnership and DA Architects and Planners, the new structure will serve as the International Broadcast Center during the Olympics (scheduled for February 12 to 28, followed by the Paralympic Games, March 12 to 21).

The $720 million expansion adds 338,000 square feet of space to the existing 133,000-square-foot expo center – a tensile-roof structure designed by DA Architects, Musson Cattell Mackey Partnership, and Zeidler Roberts Partnership and completed in 1986 for the World's Fair. A bridge connects the two buildings.

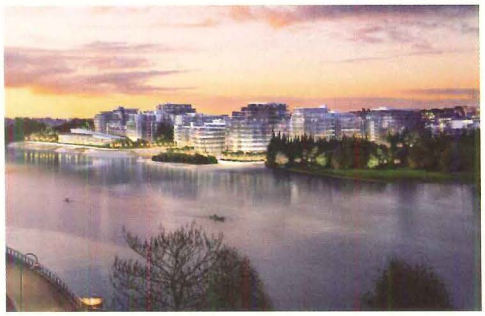
The expansion's signature feature is a 6-acre green roof, the largest of its kind in Canada. Other sustainable elements include a system that uses the harbor's seawater to heat and cool the building, gray and black water recycling, and an artificial reef that extends into the Burrard Inlet.

Sustainable initiatives were central to the project from its inception, according to Mark Reddington, a design partner at LMN. "Vancouver has a very community-focused process for making a project like this," he says. "There's a strong belief in protecting the natural environment and in sustainability in the general culture." LMN worked with a number of local boards, including a city-appointed sustainability advisory committee.

The community was also instrumental in pushing for public access to the site, which takes up the equivalent of four city blocks. Throughways, a park, and retail storefronts define the edges of the new building, whose roof and connected landscape extend an emerald necklace of parks that sweeps around the harbor to the iconic Stanley Park, which lies directly to the northwest.

Visually, the new building was intended to complement the iconic, sail-like roof of the older structure. "It makes the existing building stronger," Reddington says, "because before we did this, the site was sort of a leftover piece of the waterfront that was incomplete." *Aleksandr Bierig*

Athletes' village aims high on sustainability scale



The 100-acre complex overlooks False Creek.

Beijing made headlines last year for building sustainable facilities for the Olympics. Now, Vancouver is continuing that trend by going for LEED Gold.

All 16 residential buildings in the city's 2010 Winter Olympics athletes' village will meet the USGBC's Gold-level standards, according to Ian Smith, manager of the development office for Southeast False Creek, the district where the complex is located. Additionally, a 30,000-square-foot community center will be certified LEED Platinum.

Master planned by the Canadian architect Norm Hotson, the 1.4-million-square-foot complex is being constructed on Vancouver's last strip of undeveloped waterfront, on an abandoned industrial site. Designers of the buildings – mostly mid-rise structures made of glass and steel – include Merrick Architecture, GBL Architect Group, Lawrence Doyle Young Wright Architects, Walter Francl Architect, Nick Milkovich Architects, and the late Arthur Erickson, all based in Vancouver.

The project exemplifies sustainable design. The 100-acre site faces west, maximizing daylighting and natural ventilation strategies. Green features include rainwater harvesting, a sewer-heat-recovery system, and intensive green roofs. One of the buildings is designed to generate as much energy as it uses.

Perhaps the most sustainable attribute is the long-term plan for the site: After the games, the village will be converted into a mixed-use development. Ground-level units that will serve as training, dining, and health-care facilities for athletes will be transformed into restaurants and shops, while living quarters will become private residences. In total, 737 condos will be offered for sale. *Brian James Barr*

Future use central to stadium design

For three sports venues designed for the Vancouver Olympics, there was one major goal: staying power.

The 8,000-seat Richmond Olympic Oval (below), by Cannon Design, is the largest of the trio, at 512,000 square feet. Completed last fall, it houses a 400-meter speed-skating track and is topped by a 6.5-acre roof made of pine-beetle "kill wood" harvested from British Columbia forests (a first-time use for the maligned lumber). Post games, the facility will morph into a community fitness center.

Designed by Hughes Condon Marler: Architects, the new Vancouver Olympic Center features a 108,000-square-foot arena and a 66,500-square-foot aquatic center. It will host curling matches during the Olympics, and afterward will be converted into a library, preschool, and ice rink. Similarly, the expanded UBC Thunderbird Arena, by Kasian Architecture, aims for longevity. It contains one furbished rink and two new ones (for ice hockey events). Its success post-games seems like a hat trick, given that ice hockey is Canada's no. 1 sport. *Tim Newcomb*

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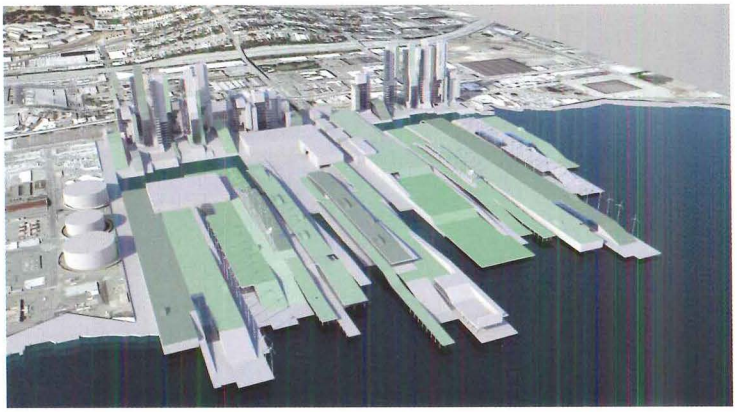
CIRCLE 13

Winners of Green Community competition announced



A team from the California College of the Arts won for *Urban Reef*.

On June 12, the Association of Collegiate Schools of Architecture (ACSA) announced the winners of its Green Community competition, which drew 260 entries from 15 different countries.

The competition was conducted in collaboration with the National Building Museum (NBM) in Washington, D.C., whose current exhibition of the same name (on display through October) features examples of 14 green communities located throughout the world. Taking its cue from the exhibition, the competition asked students to reimagine a specific area in their towns, considering issues such as remediation, conservation, sanitation, and other elements in contemporary sustainable planning.

The entries submitted represented 1,322 students and 200 faculty members from 76 universities. U.S. teams won the first-, second-, and third-place awards. The jury also named two honorable mentions and nine citations. The winning teams will present their projects at a July 28 ceremony at the NBM.

The Green Community program is the latest in a tradition of competition planning that extends back 50 years, explains ACSA project manager Eric Ellis. ACSA conducts about four competitions a year, and recent ones have tended to focus on sustainability, but from a smaller-scale, architectural perspective. Green Community, says Ellis, was an opportunity to "focus not just on a single discipline," but to encourage interdisciplinary collaboration.

Though not mandatory, the brief suggested that projects be produced by teams, promoting dialogue between the sometimes insular domains of architecture, planning, and landscape architecture. Breaking down these barriers "mimics what is happening in the field right now," explains Scott Kratz, the NBM's vice president of education.

The jurors for the competition were Ivan Harbour, of Rogers Stirk Harbour + Partners; Robert Ivy, RECORD's editor in chief; Rachelle Levitt, of the Urban Land Institute; and Harry Van Oudenallen, of the University of Wisconsin-Milwaukee. Ivy was impressed with the global scope of the submissions, noting that he and other jurors were "heartened to see so many students from around the world engaged in a topic of vital importance for our future." *Aleksandr Bierig*

WINNERS

FIRST PLACE: *Urban Reef*
Students: Dylan Barlow, Kyle Belcher, Geoffrey Gregory
Faculty sponsors: Mona El Khafif, David Fletcher – California College of the Arts

SECOND PLACE: *edgEcology: Change the Edges, Change the City*
Students: Chris Hardy, Tomoki Takebayashi, Chris Gruber, Rachel Kunreuther
Faculty sponsor: Jamie Vanucchi – Cornell University

THIRD PLACE: *Urban Green Community: Revitalizing the South Nebraska District*
Students: Amalia Bamis, Kirsten Dahlquist, Li Yu
Faculty sponsor: Vikas Mehta – University of South Florida

HONORABLE MENTION:
The Virtually Customised Community
Student: Andrew Cook
Faculty sponsor: Colin Pugh – Manchester School of Architecture

HONORABLE MENTION:
The Greenest Brick
Students: Alex Libengood, Eric Six, John Simenic, Sylvia Piszczor, Lauren Wetula
Faculty sponsors: Thomas A. Dutton, Scott Johnston, John Blake – Miami University

View additional images and the full list of winners online.

AR RECESSION REPORT

Gehry shrinks staff as projects hit snags

Gehry Partners, like many firms, has been pounded by the recession. The Los Angeles–based architecture practice recently lost one of its largest commissions, an arena in Brooklyn, New York, and had another project, the Grand Avenue complex in L.A., sidelined due to financing problems.

The setbacks have led the company to lay off half its staff: Today, it has 112 employees, down from 250 a year and a half ago. "Every economic cycle brings with it a unique set of challenges and opportunities," explains Frank Gehry, FAIA. "We've worked hard over the years to build a firm that is nimble enough to adapt quickly to changing circumstances, and that is able to produce and embrace consistent innovation. These qualities are serving us well right now."

One of the firm's major projects, Grand Avenue (above), is delayed.

Gehry made headlines in early June when he was ousted as the designer of the Barclays Center – a sports arena in downtown Brooklyn that would be home to the New Jersey Nets – and was replaced by Ellerbe Becket. The stadium is part of the Atlantic Yards project, a 22-acre mixed-use development that Gehry designed. (He remains the master-plan architect.) In a prepared statement, the developer, Forest City Ratner Companies, cited the bad economy as the reason for its decision, saying the arena "is undergoing a redesign that will make it more limited in scope."

Meanwhile, construction of the Grand Avenue complex in downtown L.A. has been delayed until 2012 because of difficulty obtaining construction loans. Gehry designed two towers and a retail pavilion for the 3.8-million-square-foot development.

There is some good news: Construction is progressing on the Beekman Tower in Lower Manhattan, and despite rumors that its height would be cut in half, the building will rise 76 stories as originally designed. The 867-foot-tall tower is slated to be finished in 2011. It will be Gehry's first skyscraper in New York City.

Gehry adds that his team is working on several sizable commissions, such as the Guggenheim Museum in Abu Dhabi and the Eisenhower Memorial in Washington, D.C. These projects, he says, "will help keep us busy and inspired hopefully through the duration of this global downturn." *Tony Illia*

IMAGES: COURTES ACSA (TOP); GRAND AVENUE COMMITTEE (BOTTOM)

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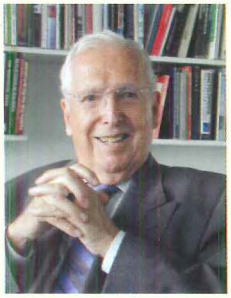
CIRCLE 14

Record News

Arthur Erickson, lauded Canadian architect, dies



Canada's most influential architect, Arthur Erickson, died on May 20 at the age of 84. The only Canadian ever to be awarded the AIA's Gold Medal (1986), Erickson built to acclaim in Japan, Kuwait, England, and up and down the U.S. West Coast. His legacy, however, is most evident in the city of his birth and death, Vancouver.

One has to go all the way back to Daniel Burnham's shaping of Chicago to find another North American architect who so dominated a large city's architectural culture. Like Burnham, Erickson was celebrated both for his technically innovative and elegant buildings and his progressive urban ideals and schemes. Many regard Erickson as the intellectual author of "Vancouverism" – an approach to city building characterized by developments that are high-density, high-amenity, socially inclusive, and respectful of nature.

Erickson's talents were honed early. He had a gallery show of his paintings while still a teenager; studied Japanese; and spent World War II serving with the British Intelligence in India. Inspired to study architecture after reading a profile on Frank Lloyd Wright in *Fortune* magazine, Erickson graduated from McGill University in 1950. He extended a Pilkington Glass traveling scholarship into a 30-month architectural tour around Europe, and then returned to Canada.

Two 1960s designs (with former partner Geoffrey Massey) in Brutalist concrete established his reputation: the megastructural Simon Fraser University and the waffle-framed MacMillan-Bloedel office tower. In the 1970s, he implemented his trademark ideas of new modes of public space, integration of nature into city centers, and buildings as landforms in his three-block-long Robson Square in Vancouver. In 1976, he completed his masterwork, the Museum of Anthropology at the University of British Columbia.

For much of his career, Erickson was more admired than supported in Vancouver. He was the sole designer of no major design commissions there between the 1983 Vancouver Art Gallery and the 2002 Waterfall Building (designed in association with Nick Milkovich). Unpaid Middle Eastern work, along with the strains of commuting between offices in Toronto, Vancouver, and Los Angeles, led to a high-profile bankruptcy in 1992.

Carving out a role as public intellectual that few architects risk, Erickson constantly called for better designs from his peers, and for Vancouver to make the investments in transportation, housing, and institutions befitting its inevitable fate as a world city. His pronouncements doubtlessly scared away clients and cost him financially, but their legacy has galvanized Vancouver and provided a template for architects everywhere struggling to reconcile form-making, city-building, and living with nature. *Trevor Boddy*

RECORD NEWS NOTED

Ed Feiner, FAIA, former chief architect of the U.S. General Services Administration (GSA), has joined the Washington, D.C., office of **Perkins+Will** as principal. Feiner founded the GSA's Design Excellence Program and was instrumental in developing the agency's green-building standards.

Robert P. Madison, FAIA, who in 1954 opened Ohio's first practice owned by a black architect, was chosen to deliver the commencement address at the Mandel School of Applied Social Sciences at Case Western Reserve University in Cleveland. Madison, a World War II veteran, holds an M.Arch. from Harvard and studied at the L'Ecole des Beaux-Arts in Paris as a Fulbright scholar. In 1982, he founded the Ohio Association of Minority Architects and Engineers.

The **AIA** has announced the four recipients of the **2009 Jason Pettigrew Memorial ARE Scholarships**: Jill C. Finn, Venesa Alicea, Melissa Kegan Tom, and Ha Pham. The award covers the cost of the Architecture Registration Exam.

The American Academy of Arts and Letters hosted its annual award ceremony on May 20. **Stan Allen**, **Wendell Burnette**, and **Jeffrey Kipnis** received the $7,500 prizes given in the architecture category; **Juhani Pallasmaa** received the $5,000 Arnold W. Brunner Memorial Prize in Architecture. Additionally, architect **Tod Williams** was inducted into the 111-year-old academy.

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CIRCLE 16

Record News Online

John Holabird, Jr., FAIA, died on February 16 at the age of 88 after battling health problems, including intestinal cancer. He was the grandson of architect William Holabird, who in 1880 founded the Chicago firm that became Holabird and Roche and was reestablished after World War I as **Holabird & Root**. The firm shaped such landmarks as the Marquette Building and Chicago Board of Trade Building. While the Harvard-educated Holabird, Jr. (above), became a firm partner in 1970, he was more than a link in a family dynasty: He parachuted with the 82nd Airborne Division in World War II, worked briefly as a set designer for CBS and NBC, mentored young architects, and charmed listeners with tales of his grandfather and architect father, John Holabird. He directed a range of projects before retiring in 1987. Survivors include his wife, Janet. *Blair Kamin*

On May 8, the **Holcim Foundation for Sustainable Construction** announced the winners of its second Global Holcim Awards competition. Selected from about 5,000 entries from 121 countries, the four winners

include a river remediation scheme in Morocco, a **greenfield university campus in Vietnam** (bottom), a rural planning strategy in China, and a shelter for day laborers in the U.S. Sponsored by Holcim Ltd, a multinational supplier of cement and aggregates (and its group companies), the Swiss-based Holcim Foundation was created in 2003 with the mission of promoting sustainable construction across the globe. *Beth Broome*

Big changes are in store for the nearly 18,000 people enrolled in the Intern Development Program, administered by the **National Council for Architectural Registration Boards**. Starting July 1, interns have additional options for gaining needed training units and have to meet much tighter deadlines. *Bruce Buckley*

This year marks the 10th anniversary of the **MoMA/P.S.1 Young Architects Program**, which invites emerging architects to create a temporary installation in P.S.1's concrete courtyard in Queens, New York, home to its *Warm Up* summer music series. For 2009, the winning concept (above) is by the Cambridge, Massachusetts–and New Haven–based firm **MOS**. Dubbed *afterparty*, it was chosen from a pool of roughly 40 invited nominees. The music series kicks off July 4. *Anya Kaplan-Seem*

The Van Alen Institute (VAI) announced on May 26 that its executive director, **Adi Shamir**, is stepping down. Shamir cites a desire to focus on her family and finish several book projects as the reason for her resignation. **Joan Ockman**, a VAI trustee and associate professor

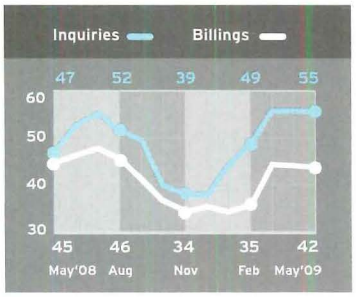
at Columbia University's Graduate School of Architecture, Planning and Preservation, will serve as interim director during an international search for Shamir's replacement. *John Gendall*

While employment figures and revenue reports can **quantify the recession's impact** on the architectural profession, its effect on nonprofit organizations is less understood. But many of these groups are reporting that they face budget shortfalls. "Every one of our sources will likely be challenged," says Rosalie Genevro, executive director of The Architectural League. *John Gendall*

The University of Arkansas recently opened its archive of work by **Fay Jones**, the noted Arkansas architect who combined the traditions of the Southeastern United States with a Wrightian sensibility, producing such masterpieces as Thorncrown Chapel (1980). The collection, which includes 22,000 drawings, spans

Jones's career between the founding of his studio in 1954 and his retirement in 1998. The opening coincides with the renaming of the university's architecture school as the **Fay Jones School of Architecture**, honoring the man who defined the school for decades. Jones taught there for 35 years and served as its first dean. *Aleksandr Bierig*

The AIA has announced the 2009 winners of the **Small Project Awards AIA/HUD** and the **Secretary Awards**. Now in its fifth year, the Small Projects program bestows awards in three categories: objects, structures (*Dar Luz*, below), and "accessible" residential design. The HUD program is organized by the AIA's Housing and Custom Residential Knowledge Community in conjunction with the U.S. Department of Housing and Urban Development. View the winners online. *Jenna M. McKnight*



While it is no longer sinking, the **Architectural Billings Index**, a leading economic indicator, barely moved between April (42.8) and May (42.9). However, the May inquiries score was 55.2, the third consecutive month it has landed in the mid-50s. (A score above 50 denotes an increase; below 50, a decrease.) "The design and construction marketplace is extremely competitive right now," says **Kermit Baker**, the AIA's chief economist. "Prospective clients are casting a wider net, causing numerous firms to bid for the same project, which is why the high level of inquiries is not necessarily resulting in billings for project work." *Jenna M. McKnight*

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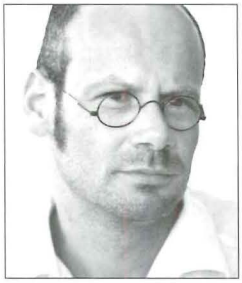


design

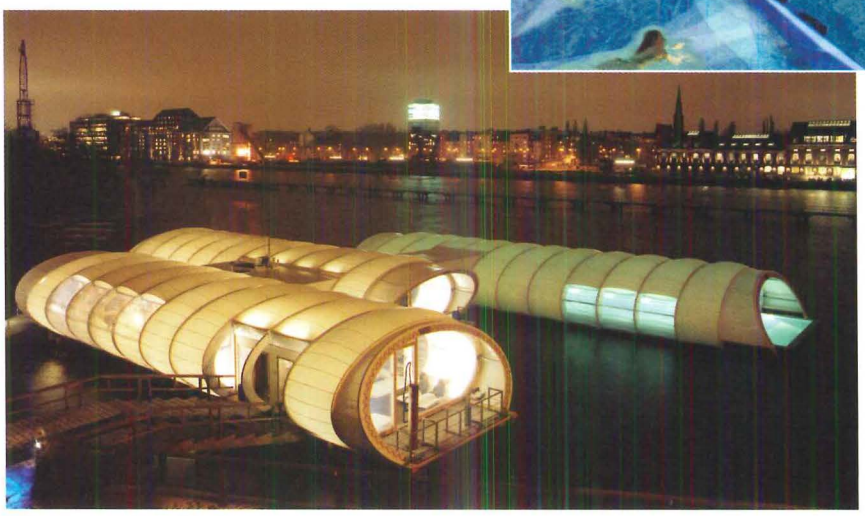
Wilk-Salinas

Filling Berlin's lost spaces with realized visions

"Stupid projects." The phrase comes up repeatedly in conversation with German-born Gil Wilk and Spaniard Ana Salinas, whose studio, Wilk-Salinas, is based in Berlin. "It is something that is fun for us," Wilk explains, but he adds, "These are projects that everyone says will not work."

The architects teamed up earlier in the decade while both were working at Tenerife, Spain–based AMP Arquitectos, where they hatched eccentric ideas and entered competitions on nights and weekends. During normal business hours, Wilk oversaw a seemingly impossible AMP proposal to fruition in Berlin: the Badeschiff, a pool floating in the Spree River composed of a converted barge linked to two pine decks. After its successful launch in summer 2004, the client commissioned Wilk to create a removable cover that would permit the Badeschiff to stay open in winter. "Then Gil phoned me that I had to come to Berlin," Salinas recalls. "It is an accident that we are here, but a good one."

Admiralsbad, Berlin, Germany, 2011 *A public pool on the roof of a theater in the center of Berlin is a terraced water landscape, with glass, water, and lights creating a glowing urban environment of shadows, reflections, and movement.*



Winterbadeschiff, Berlin, Germany, 2006 *With AMP Architects and artist Susanne Lorenz, Gilbert Wilk transformed a barge on the River Spree into a swimming pool, lounge, and sauna. To maintain the venue's business through the winter, Wilk-Salinas and Thomas Freiwald created a roof consisting of three connected tubes constructed from elliptical wooden trusses and a translucent PVC membrane.*

To transform the river pool into its cold-weather version, a series of bowed glulam beams line the long sides of each of the three floating platforms. Two layers of PVC are stretched over that lightweight armature, and iron tubing and crisscrossing steel cables provide lateral bracing. Each piece (some comprising multiple components), can be assembled by hand, and the resulting loaf-shaped volumes enclose swimming pools as well as a sauna and cafeteria. Whereas working in the orthogonal geometry of the barge would have made patrons feel cramped, the Winterbadeschiff's elliptical form, Salinas says, "maintains the original relationship with the river." It began defying the elements in 2005.

Wilk-Salinas officially opened the following year, and today the firm employs four. The consortium of retired actors that owns and operates Badeschiff went on to commission the team to design Klangkörper, a temporary performance space for Berlin's Royal Court Opera while its original house underwent restoration. Before the project halted prematurely, the architects had planned to insert a dainty, paper-thin stage and cantilevered risers in an industrial-era shed. "Opera is very classical, and I think this would have been a kind of experiment," Wilk says of provid-

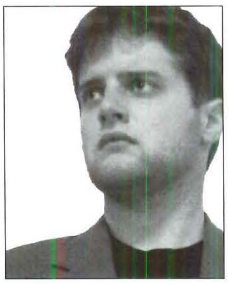
PHOTOGRAPHY: COURTESY WILK-SALINAS

Octopus, Berlin, Germany, 2008
Tentaclelike functional features—cabinets, bookshelves, a table, and bed—extend through this two-story home and serve as storage, light-bringing elements, and ways to separate public from private spaces.

ing an unpolished, almost tenuous context for the traditional entertainment. Meanwhile, other clients have approached the architects to design more pools – a crisp addition to a recreational lakeshore in Hamburg, for example, and a fanning, multilevel configuration of indoor pools inspired by the Fellini film *La Dolce Vita* and inserted into the upper floors of a historic Berlin theater.

The good accident suits Wilk-Salinas's creative process. "Berlin is full of lost spaces few people see the potential of," Wilk says of the firm's local work. Salinas says that, more generally, "We don't usually start with a form; we will work with an idea or a narrative from the beginning." In other words, a spirit of stupidity unites much of their oeuvre. Indeed, the duo recently won government approval to convert a historic, decommissioned railroad bridge into a hotel. In what may be its biggest what-if project yet, now all Wilk-Salinas has to do is to find a developer to realize it. *David Sokol*

View additional projects online at **architecturalrecord.com/archrecord2**.



work

Lukas Petrash's MCD House

Trash becomes a family's treasure

To describe the house Lukas Petrash designed and built for his aunt Mary Coronis-Dros and her two children in Huntsville, Texas, requires a certain breathless tone. MCD House cost only $24,500 to build, with $10,000 of that forgiven as a federal homesteading grant. It measures only 484 square feet, and Petrash was only 23 years old when he finished it. The project began when local artist and president of the Sustainable Builder's Guild in Huntsville Dan Philips issued Petrash, then approaching his fifth year at the University of Southern California, a challenge: If Petrash would build a sustainable home only as big as the legal minimum size, Philips would give the student access to his cache of scraps. Calling MCD House the "culmination of a lifetime of making things out of nothing, and of wanting to design very nice houses at low cost," Petrash, now 26, signed on.

Accepting Philips's terms meant seeking his approval on design decisions. It also meant hitting the jackpot. "The scrap was basically leftovers from Houston homes – very expensive scrap, but scrap nonetheless," he says. Petrash estimates that purchasing these materials could have added roughly $40,000 to the price. Yet he also concedes, "Building a house out of scrap is extremely labor-intensive, and you have to know how to, say, splice beams so they stand at the height you want." As well as splicing, Petrash also applied his expertise to the overall engineering. To provide Coronis-Dros with more usable space without crossing the 484-square-foot threshold, Petrash attenuated the volume to make room for a loft, and transformed the elevations into a zigzag of bay window–style projections that contain everything from bookshelves to a bathroom sink. He also rethought the domestic lifestyle, relegating the less frequently used dining room to the house's semi-enclosed southeast corner, and, in the opposite corner, placing the heat-producing refrigerator in a similarly exposed stairwell made of pallets. Additional outdoor decking hugs a 65-foot-tall sweet gum tree that shades the house; water from a bathroom sink runs through filtration pipes to a planter; the translucent marble that shields the bathroom from neighbors is actually a trombe wall; ventilation points all around the house sustain stacking and create Venturi effects. With occasional use of a bedroom-window air conditioner or a space heater, Coronis-Dros says her maximum monthly electricity bills range from $45 to $75. And Petrash? He just graduated from Harvard's GSD with a master's in design studies, he's involved in several Italian projects including developing a small ecofriendly village for a charitable organization near Milan, working on a book, starting his own architectural firm (called Adia), etc. His aunt's home may be his smallest project, but to her family, it's his best and brightest. *David Sokol*

Petrash salvaged materials such as posts and beams, roofing, flooring, double-glazed windows, doors, tile, and framing lumber from Houston construction sites and contractors' rejects to construct the 484-square-foot home.

View additional images and information online at **architecturalrecord.com/archrecord2**.

PHOTOGRAPHY: COURTESY WILK-SALINAS (TOP); LUKAS PETRASH (BOTTOM TWO)

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One good fit and one bad in New York City

Critique

By Robert Campbell, FAIA

What is it that makes the Frank Lloyd Wright show at the Guggenheim Museum such a disappointment? [See page 43 for another view of the Guggenheim show.]

Once you notice, it's obvious. The contents and the container – the exhibition and the museum – have nothing to do with each other.

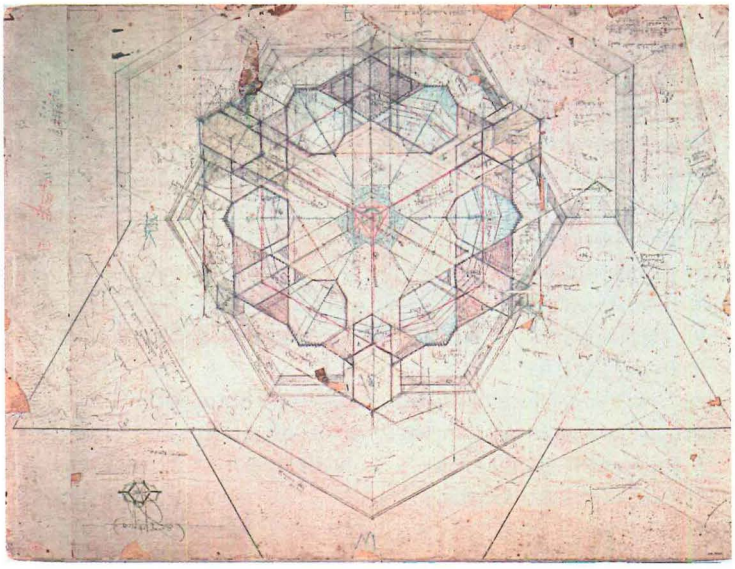
It would be hard to imagine an exhibition less well suited to the space of the Guggenheim than this display of the architecture of the Guggenheim's own architect. The work fits the setting the way a hand fits a shoe.

What makes this all so poignant is the fact that Wright, of all major architects, was perhaps the one most deeply concerned with harmonizing his architecture with its contents, its interior art and furnishings. As everyone knows, he carried this urge to extremes, as in the famous case where, staying at the house of a former client, he hated the living-room furniture so much that he got up at night and, with the help of his student apprentices, dragged it out to the front yard and drove off.

Most of the Guggenheim show consists of big, glass-topped steel tables containing drawings. I feel about these boxy vitrines much as I think Wright would have felt about them. Someone should drag them out to Central Park and restore the Guggenheim to its pristine beauty.

I'm not saying don't see the show. There can never be an unrewarding exhibition of the work of this magical genius. The heart of the show is a collection of more than 200 drawings from the great archive at Taliesin West. The drawings are all from Wright's studio and most are by his own hand. They range through the whole 60-year history of his work, from the early houses to the late, unbuilt extravaganzas, such as the amazing, sci-fi-like redesign of much of Baghdad. Again and again, I was astonished. Just to name one item: You could spend all afternoon admiring the incredible garden plan and spec for the Darwin Martin House in Buffalo.

The drawings are permanently sealed in sleeves of mylar, which certainly makes sense from the point of view of preservation, but that's where the problems begin. The Guggenheim curators realized that you couldn't hang them vertically, because the light from the atrium would reflect off the mylar, thus obscuring the drawings. So the drawings are laid horizontally in those steel-and-glass vitrines, either flat or tilted up like old-fashioned drawing boards. A parade of dark boxy vitrines climbs the Guggenheim's curving ramp like an invading army. The alcoves that line the ramp are largely ignored. An exhibition that might look fine in an orthogonal warehouse feels hopelessly out of place at the Guggenheim.



Wright's 1926 design for a Steel Cathedral in New York was never built.

The exhibition presents drawings and models on or in tablelike vitrines.

Spaces for art

The failure here raises interesting issues about museum design. It makes you realize, for example, why a museum like the Museum of Modern Art prefers galleries that are totally lacking in architectural character. Such spaces will never conflict with their contents. MoMA's architect, Yoshio Taniguchi, is reputed to have said that if given enough money he would make the architecture disappear. He pretty much succeeds at that dismal task, creating a series of nonspaces in which the artworks on the wall feel not like physical reality but rather like projections on anonymous white screens. Given no place in which to exist, they float in a white Nowhere.

Well, Frank Lloyd Wright was not about to create a Nowhere

Contributing editor Robert Campbell is the Pulitzer Prize–winning architecture critic of The Boston Globe.

PHOTOGRAPHY: © THE FRANK LLOYD WRIGHT FOUNDATION (TOP); DAVID HEALD/THE SOLOMON R. GUGGENHEIM FOUNDATION (BOTTOM)

The High Line (renderings, above and left) transforms an elevated rail line into a linear park running through New York City's West Side.

space, here or anywhere else. He created one that is itself a work of art. That places a special burden on the curators. They must do something that will resonate with the space. Art and architecture must combine to create something larger than either. When this is done, it's wonderful. In the work of artists who use bold color – like Kandinsky, Miró, Calder – the artworks seem to signal one another across the space like semaphores. They charge the air with energy. A recent show by David Smith worked well, too, where mostly black silhouettes occupied the white volumes of the building's bays. In such shows, you felt the art and the architecture needed each other in order to feel complete.

The Guggenheim is a physical place, and MoMA is a spatial abstraction. We've heard a lot about the unimportance of place in recent years, with gurus like Rem Koolhaas informing us that it's one big global culture now, in which we're all privileged to share in the collective aesthetic of shopping in anonymous airports. Nothing could be further from my own view of architecture. Architecture, for me, is the art of making places, places that are specific and memorable. The Guggenheim may be tough to work in, but it's worth it.

Curating Wright

The Wright show disappoints in other ways, too. There's no sense of a governing critical intelligence. The exhibition is simply a haphazard attic of Wrightiana, certainly fascinating for Wright buffs, but lacking a clear point of view. The title is the giveaway: *Frank Lloyd Wright: From Within Outward*. The idea is that Wright designed his buildings by first planning the interior spaces, and only then shaping the exterior appearance around them. Well, sure he did, but so what? This is a tired cliché, not a stirring theme for a new exhibition. It's an idea for an old-fashioned show on a new-fashioned artist, because the truth is that Wright is as relevant today as ever. I'd rather have seen an exhibition on *Frank Lloyd Wright: Environmentalist*. Wright believed in building from local materials, not from costly stuff shipped halfway around the world. Often his buildings grow from the trees and rocks of the site they're built on. And in a world that today is sinking into universal sameness, Wright was hypersensitive to the nature of place.

A friend recently came up with a definition of "place" I hadn't heard before. "Place," he said, "is space with meaning." That's a pretty good nutshell. The same week I visited the Guggenheim, I had another encounter with a "space with meaning," when Ric Scofidio gave me a tour of the High Line, the transformation of an overhead New York City rail line into a linear park.

Part of the meaning of the High Line is its place in a larger narrative. The new park is a chapter in the story of the evolution of New York from an industrial seaport economy to a culture of leisure, culture, ideas, and tourism. The High Line becomes an emblem of that transformation. It's a place in touch with both the past and the future.

It's rich, too, in associations. It reminds you of the great Promenade Plantée in Paris, which helped inspire it. It recalls the great builder and destroyer Robert Moses, who constructed the High Line as part of the West Side Improvement project in the 1930s. It recalls, too, Jane Jacobs, who stopped Moses from building another overhead connector, the Lower Manhattan Expressway, and who would have loved to see his High Line transformed into a garden. One characteristic of good places is that they open a lode of connecting memories and associations. (MoMA gets another zero for this.)

THE HIGH LINE BECOMES AN EMBLEM OF NEW YORK'S EVOLUTION FROM AN INDUSTRIAL SEAPORT TO A CULTURE OF LEISURE.

This isn't the place to review the High Line's design, which isn't yet finished (the first section, which runs from Gansevoort Street in the West Village to 20th Street in Chelsea, opened to the public on June 9). But as far as I could tell, the architects (it's a collaboration between Diller Scofidio + Renfro and Field Operations) were getting everything right. Nothing has been sentimentalized; nothing looks "designed." The planting is carefully contrived to look as if it just happened by chance, maybe when passing birds dropped the seeds. Nothing feels imposed. Your path is subtly directed, though, so that you're intensely aware of the remains of the fading industrial world, where bold elements of concrete and steel still frame views of the city and the Hudson River. You're equally aware of the essential three-dimensionality of urban space, too often ignored.

The seemingly accidental planting brings other associations to mind. One is with the similar rooftop gardens of Le Corbusier, like the one at his Carpenter Center at Harvard, where the original plan was to let the roof seed itself randomly over time. Another is a poem by William Carlos Williams, *Spring and All*, where the poet writes of weeds and grass in spring struggling for life on the road to a hospital:

Still, the profound change
has come upon them:
rooted, they grip down
and begin to awaken. ■

IMAGES: COURTESY DILLER SCOFIDIO + RENFRO AND FIELD OPERATIONS (THIS PAGE)

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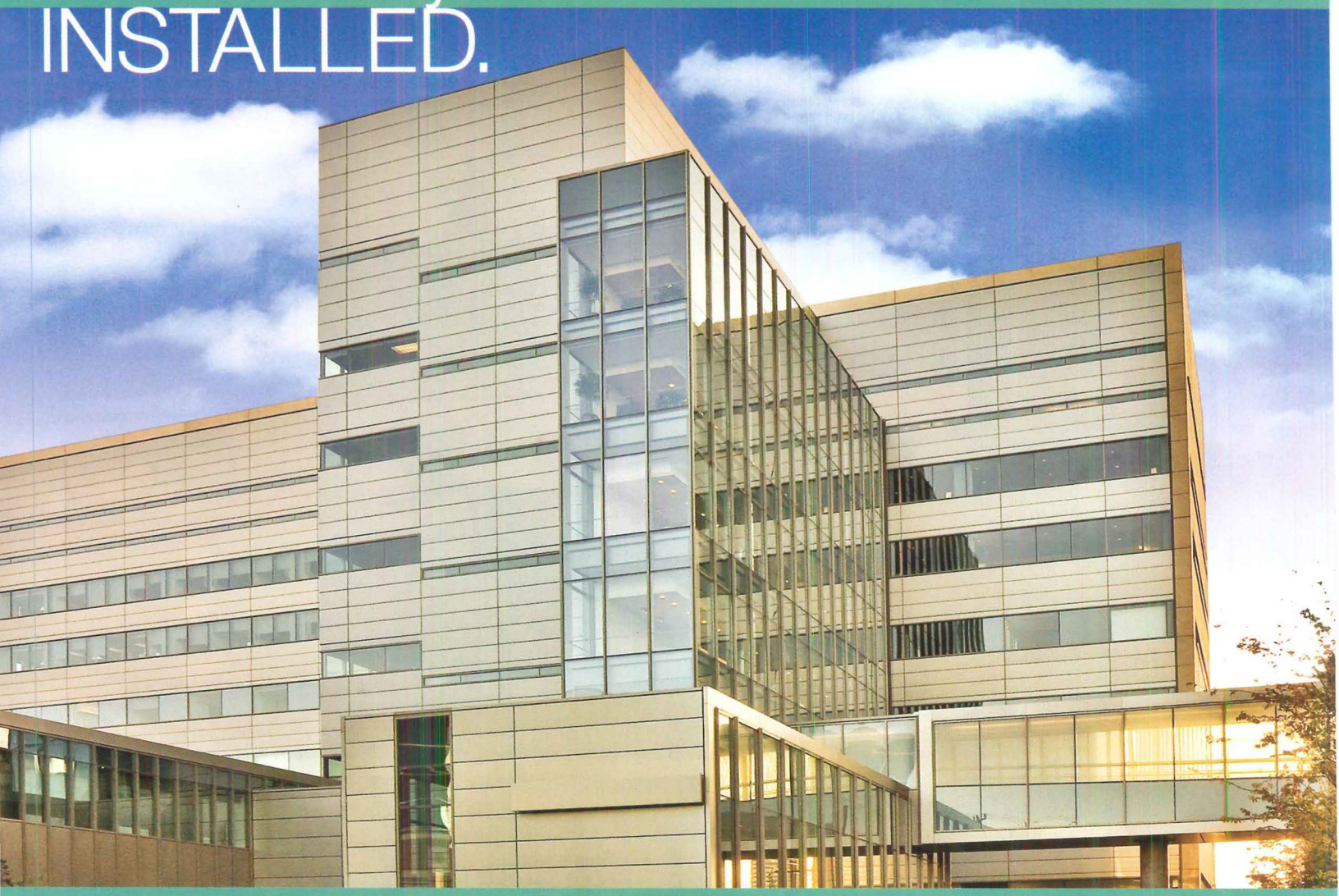

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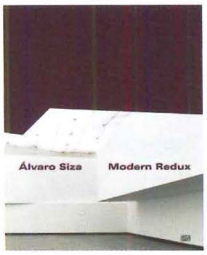
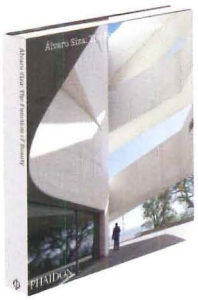




Álvaro Siza: Modern Redux, *edited by Jorge Figueira, text by Alexandre Alves Costa and Hans Ibelings. Ostfildern, Germany: Hatje Cantz Verlag, 2009, $60.*

Álvaro Siza: The Function of Beauty, *by Carlos Castanheira, with Álvaro Siza and Nuno Higino. London and N.Y.: Phaidon, 2009, $90.*

Álvaro Siza's fame as Portugal's greatest architect and a major Modernist globally has been slow in arriving. He was nearly 60 when he won the Pritzker Prize in 1992, and only this year did the Royal Institute of British Architects bestow on him its Gold Medal. As author Hans Ibelings notes, Siza's work is quintessentially Portuguese, so it "was less amenable to international distribution than the work of some other superstars." That insight and numerous others are contained in *Álvaro Siza: Modern Redux*, one of two wide-ranging new books about the past decade of Siza's creativity.

The volume was designed as a catalog to accompany an exhibition of Siza's 12 most representative recent projects at the Instituto Tomie Ohtake in São Paulo, Brazil. One of the projects immediately overwhelms: the Ibere Camargo Foundation Museum, built on a steep slope between a busy urban avenue and a river in Porte Alegre, Brazil [RECORD, November 2008, page 130]. It features a continuous ramp extending from inside to out, where it detaches from the white concrete volume of the building in graceful bands like ribbons unfurling in the wind. The museum, housing work of the Brazilian painter Ibere Camargo, is itself a triumph of art. It embodies the architect's quintessentially Portuguese sensibility, while being influenced by Wright, Le Corbusier, and Aalto. It is mysteriously unsettling, like contradictory moods in the poems of Portugal's great litterateur, Fernando Pessoa, and as austerely exhilarating as Portuguese fado, the hypnotic folk blues. The book supplements dramatic photographs with Siza's cryptic scribbles, exacting models, and final plans, clearly outlining the evolution of a building as potentially crucial to 21st-century museum architecture as Wright's Guggenheim Museum was to the 20th. Several pavilions Siza constructed in Portugal have that same wavy, musical spirit of poetic Portuguese lyricism, and that stately serenity. The scholarly essays framing exquisite photographs reveal the continuity of Siza's style, one reverently nested in Portugal's landscape and history.

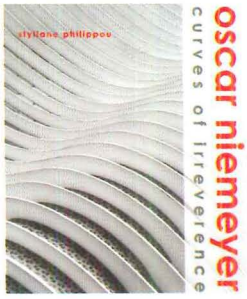
Álvaro Siza: The Function of Beauty collects images and commentaries focusing on 21 projects, nine more than Figueira's book, but 10 of the projects appear in both books. This volume might seem to trump its competitor by including Siza's writings, along with generous appraisals by architect Carlos Castanheira, who worked alongside Siza for years. There is also commentary by Nuno Higino, a Portuguese sociologist whose doctoral dissertation analyzed Siza's drawings. Yet this ambitious volume is uneven. Siza offers quick, bland jottings about his buildings. Castanheira devoutly heralds the greatness of his former employer. Nuno Higino hijacks Siza's architecture to praise Derrida's philosophy. But the architectural photography by Fernando Guerra is beguiling and revelatory, and this tome offers twice as many photos as Figueira's. Both books make you want to experience Siza's masterworks firsthand. *Norman Weinstein*

Oscar Niemeyer: Curves of Irreverence, *by Styliane Philippou. New Haven: Yale University Press, 2008, 414 pages, $65.*

With over 800 entries for books on Oscar Niemeyer listed on Amazon.com, you might wonder if another book about the 101-year-old, still-practicing master is really necessary. *Oscar Niemeyer: Curves of Irreverence* examines the most representative, well-known works among Niemeyer's hundreds of projects, plus some less well-known ones, and provides a broader context than previous books while arguing for situating Niemeyer's work in its "otherness."

Styliane Philippou carries out her mission quite successfully in chapters discussing the origins of Modernism in Brazil; its influence on Niemeyer and his influence on it; Pampulha, the most pivotal work of his career; Niemeyer's urban vision and how it flourished to become Brasília; and his idea of the monumental and its translation into his recent works. Philippou covers all this ground with insight, intellect, and literary grace, supported by a strong set of high-quality images.

The author retells in abundant detail the blistering critique of Niemeyer's work by Max Bill and other self-appointed, 1950s European guardians of the Modern flame. Niemeyer defended his curvilinear forms and Brazilian Modernism as just that – "Brazilian" – steeped in self-expression, exuberance, hedonism, and an unapologetic sensuality so foreign to the Swiss Calvinist Bill. Niemeyer, though a Communist, did not believe in art and architecture as agents of social reform; he believed in their autonomy. He once said, "Le Corbusier thought that architecture can change life ... I don't agree at all with that view. I believe exactly the opposite is true. It is life that influences architecture." At the core of Niemeyer's architecture is a life-affirming joy, a quality that ensures the endurance of his work, and perhaps the secret to his own longevity. *John A. Loomis*



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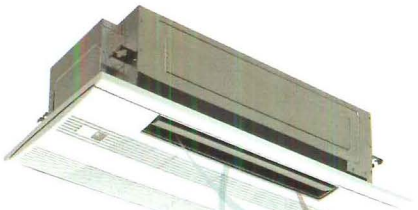

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CIRCLE 23

Top 250 firms' 2008 revenue up 9 percent—say what?

Practice Matters

By Charles Linn, FAIA

"Recession? What recession?" If Rip Van Winkle, AIA, awoke today with no knowledge of the near collapse of the economy last year, and he decided to start catching up on news of the profession by checking ARCHITECTURAL RECORD's Top 250 Firms list, he might be skeptical of the rumors that we're in one. Those architects who have not been sleeping much lately might also think he was delusional unless they just looked at the total architecture revenue for all firms on the list. Last year, it gained nearly 9 percent over 2007, going from a total of $11.5 billion to $12.5 billion. Although in most industries 9 percent growth would cause the spontaneous consumption of copious cases of champagne, the extent that individual architecture firms are unique makes it simplistic to assess the overall health of the profession by just totaling up all revenues across the board.

The trouble is that the recession never hits all firms equally. Those that rely too much on housing, commercial, and hospitality work (if you don't know who you are, check below) got hit hard in the back of the head this year, and their pain was swift and severe. Headaches for architects who work in the hospital and education markets may have been more psychosomatic than not so far, but few were spared them.

Other misdiagnoses arise from the fact that the profession's perceptions of how we're doing have become distorted by year-after-year double-digit growth. Revenues for 2007 were a ridiculous 25 percent higher than they were in 2006. This is obviously unsustainable, and nearly all of the profession's elder statesmen knew it. They just didn't know exactly when the party would be over. Now the few who stopped expanding while work was still coming in have gone from being derided as paranoid to lauded as prophetic.

In fact, the worst may not be over, so don't give *all* the aspirin to your developer and banker friends just yet. Bad news from the AIA's Architectural Billings Index has abated only slightly in recent months, and the pressure on firms that do institutional work is building. In these markets, the suffering comes on more like a migraine: The blinding pain builds slowly, gaining relief is quite complicated – and it takes a very long time, too. ■

See all 250 architecture firms ranked by design revenue at **architecturalrecord.com**.

The companies included in ARCHITECTURAL RECORD's list of the Top 250 Firms are ranked according to revenue for services performed in 2008 in $ millions. The list is derived from a survey of firms conducted this spring for *Engineering News-Record*'s annual Top Design Firms. The McGraw-Hill Companies publishes both ARCHITECTURAL RECORD and *ENR*.

KEY TO FIRM TYPES

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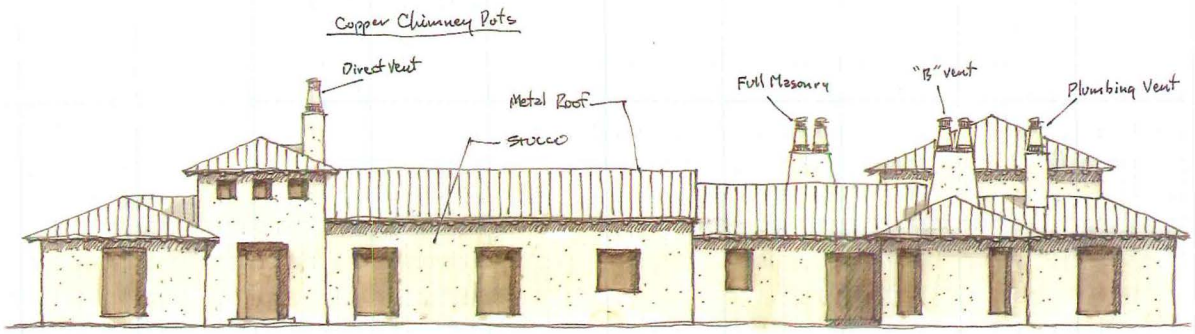
AP = ARCHITECT-PLANNER
EA = ENGINEER-ARCHITECT
AEC = ARCHITECT-ENGINEER CONTRACTOR
(NOT ALL COMBINATIONS LISTED)

ARCHITECTURE FIRMS RANKED ACCORDING TO 2008 REVENUE	Type of firm	Total architectural revenue	Domestic architectural revenue	International architectural revenue	Total design revenue	2007 Rank	2007 Total architectural revenue
1 **AECOM Technology,** Los Angeles, Calif.	EA	**912.70**	643.60	269.10	5,215.80	1	658.20
2 **Gensler,** San Francisco, Calif.	A	**648.29**	516.38	131.91	775.46	2	650.63
3 **HOK,** St. Louis, Mo.	AE	**585.00**	358.00	227.00	752.00	3	504.20
4 **URS,** San Francisco, Calif.	EAC	**435.40**	365.40	70.00	5,206.10	4	482.20
5 **HKS,** Dallas, Tex.	AE	**419.46**	379.52	39.94	419.46	5	379.26
6 **Perkins+Will,** Chicago, Ill.	A	**409.50**	325.10	84.40	409.50	6	330.50
7 **HDR,** Omaha, Neb.	EA	**340.60**	281.50	59.10	1,280.30	10	194.80
8 **Skidmore, Owings & Merrill,** New York, N.Y.	AE	**279.43**	133.02	146.41	382.57	7	268.90
9 **RMJM,** New York, N.Y.	A	**220.32**	78.25	142.07	220.32	9	199.70
10 **RTKL Associates,** Baltimore, Md.	AE	**216.19**	152.11	64.08	278.77	8	203.20
11 **NBBJ,** Seattle, Wash.	A	**194.80**	149.79	45.01	194.89	12	139.60
12 **Callison,** Seattle, Wash.	A	**185.00**	129.50	55.50	185.00	11	150.00
13 **Leo A Daly,** Omaha, Neb.	AE	**156.83**	149.82	7.01	194.28	N/A	N/A
14 **Perkins Eastman,** New York, N.Y.	A	**150.50**	120.40	30.10	150.50	13	130.00
15 **Zimmer Gunsul Frasca Architects,** Portland, Ore.	AP	**148.77**	143.93	4.84	148.77	14	127.48
16 **CH2M HILL,** Englewood, Colo.	EAC	**144.63**	112.98	31.65	3,730.65	N/A	N/A
17 **Burt Hill,** Washington, D.C.	AE	**117.24**	61.93	55.31	167.41	30	73.90
18 **SmithGroup,** Detroit, Mich.	AE	**113.00**	112.70	0.30	166.10	18	104.20
19 **HNTB,** Kansas City, Mo.	EA	**109.98**	108.92	1.06	857.74	25	76.86
20 **Cannon Design,** Grand Island, N.Y.	AE	**106.43**	86.36	20.07	141.91	19	95.40

Firms listed by 2008 architecture revenue as reported to ENR *in its TOP 500 DESIGN FIRMS survey.*



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BY JACK ARNOLD

CIRCLE 24

Trade Show Review · Milan Furniture Fair

As expected, attendance was down at Milan's **Salone Internazionale del Mobile** this April following several years of astronomical growth. While still the world's premiere design event, the sobering times had manufacturers scaling back, and designers looking back. *Josephine Minutillo*

Playing it safe, designers turn to familiar forms and trusted materials, with many offering a nod to Midcentury Modern design.

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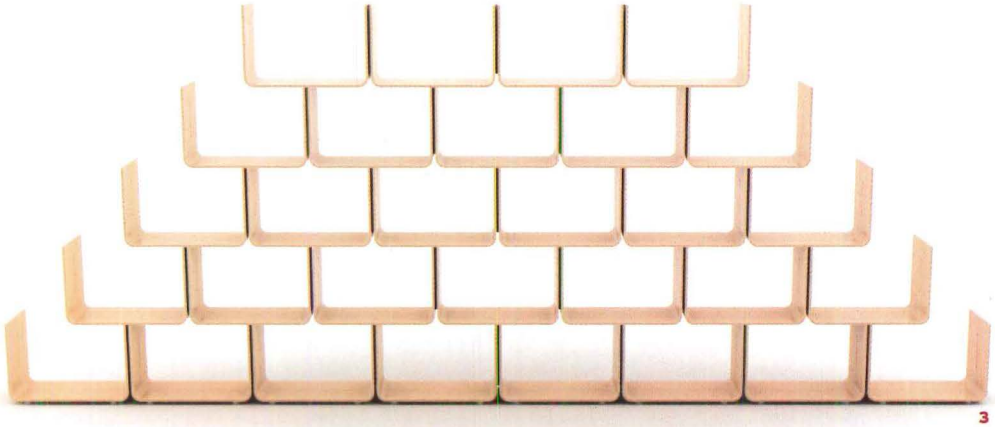

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5

1 Taking a bac seat With Bac, Jasper Morrison appears to draw inspiration from Hans Wegner's iconic midcentury dining chairs. The handsomely simple, solid ash wood frame is paired with a seat that is available in a variety of finishes. Cappellini, New York City. www.cappellini.it **CIRCLE 200**

2 Three easy pieces Cassina reached into its treasure trove of design classics to reintroduce Italian architect Franco Albini's Tre Pezzi armchair, designed in 1959 with Franca Helg. A tubular frame supports the deep seat, ring-shaped backrest, and half-moon headrest. Cassina, New York City. www.cassina.com **CIRCLE 201**

3 French folds The late Pierre Paulin, a leading Midcentury Modern protagonist in France, enjoyed newfound fame recently, teaming up with Magis for several projects. Elysée is a modular, bent-plywood shelving system that reinterprets a design Paulin created for Paris's Elysée Palace. Moss, New York City. www.magisdesign.com **CIRCLE 202**

4 Masters degree Philippe Starck pays homage to the leading figures of midcentury design with his Masters chair. The Masters backrest combines the familiar profiles of Eero Saarinen's Tulip chair, Arne Jacobsen's Series 7 chair, and the Eameses' Eiffel chair. Kartell, New York City. www.kartell.it **CIRCLE 203**

5 Softening the edges Swedish girl-group Front were the darlings of this year's fair. For Moroso, they created a series of trompe l'oeil seating, including Soft Wood. Photographic images printed on the upholstery make this cushioned sofa look like a hard bench. Moroso, New York City. www.moroso.it **CIRCLE 204**

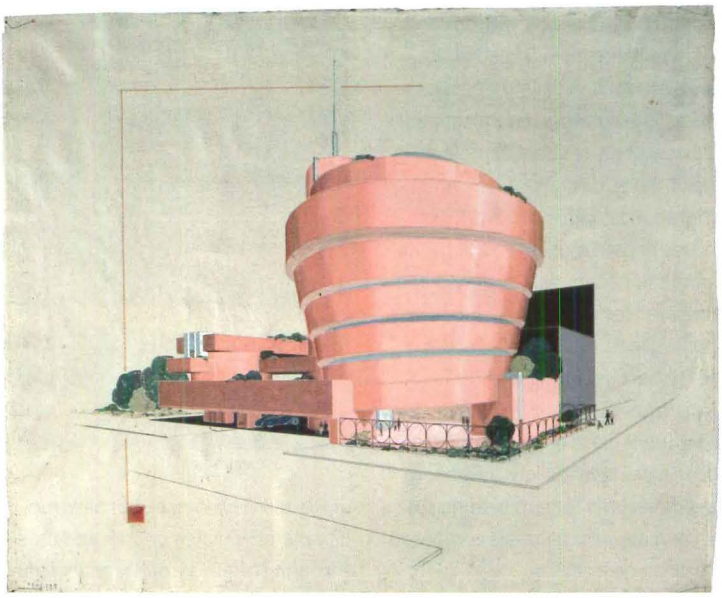
View more furniture from the Milan Furniture Fair at **architecturalrecord.com/products**.

The Guggenheim celebrates 50 with a Frank Lloyd Wright show

Exhibitions

By William Hanley

Frank Lloyd Wright: From Within Outward. *At the Solomon R. Guggenheim Museum, New York, through August 23, 2009.*



One of Wright's studies for the Solomon R. Guggenheim Museum (left) shows its familiar form with a car parked in the present-day museum store. Wright (right) died six months prior to the Guggenheim's October 21, 1959, opening.

In Bilbao, the Guggenheim Museum invented the contemporary strain of iconic, even city-defining, museum buildings, where the architecture threatens to outshine the artwork. But the struggle between collection and container dates back even further to the museum's flagship building in New York City. From its 1959 opening, critics of Frank Lloyd Wright's design – the Guggenheim's then-director James Johnson Sweeney among them – complained that the spiraling ramp swallowed the art displayed on its perimeter. But for all the resistance that the design imposed on showing art, Wright's museum took a building type formerly defined by warrens of galleries and, with open sight lines across a light-filled rotunda, turned it into a dramatic public space that put the experience of viewing art on equal footing with the work.

With that history in mind, it is fitting that the museum is marking the recently restored building's 50th anniversary (and the 50th anniversary of Wright's death, just six months prior to the museum's opening) with an exhibition that privileges the architect's public and commercial buildings. *Frank Lloyd Wright: From Within Outward* shows Wright using light as well as compressed and expanding spaces to transform places where people congregate – for work, for worship, for education, for fun.

The curatorial team behind the show includes former Solomon R. Guggenheim director and current curator and senior adviser of international affairs Thomas Krens, assistant curator of architecture and design David van der Leer, and curatorial assistant Maria Nicanor from the museum. They worked with Bruce Brooks Pfeiffer, director of the Frank Lloyd Wright Archives; Margo Stipe, curator and registrar of collections for the archives; assistant director of the archive Oskar Muñoz; and Mina Marefat, a Wright historian and designer. The group sifted through the foundation's immense holdings to produce a rotunda-filling, but tightly edited show of drawings, renderings, photographs, models, and other materials.

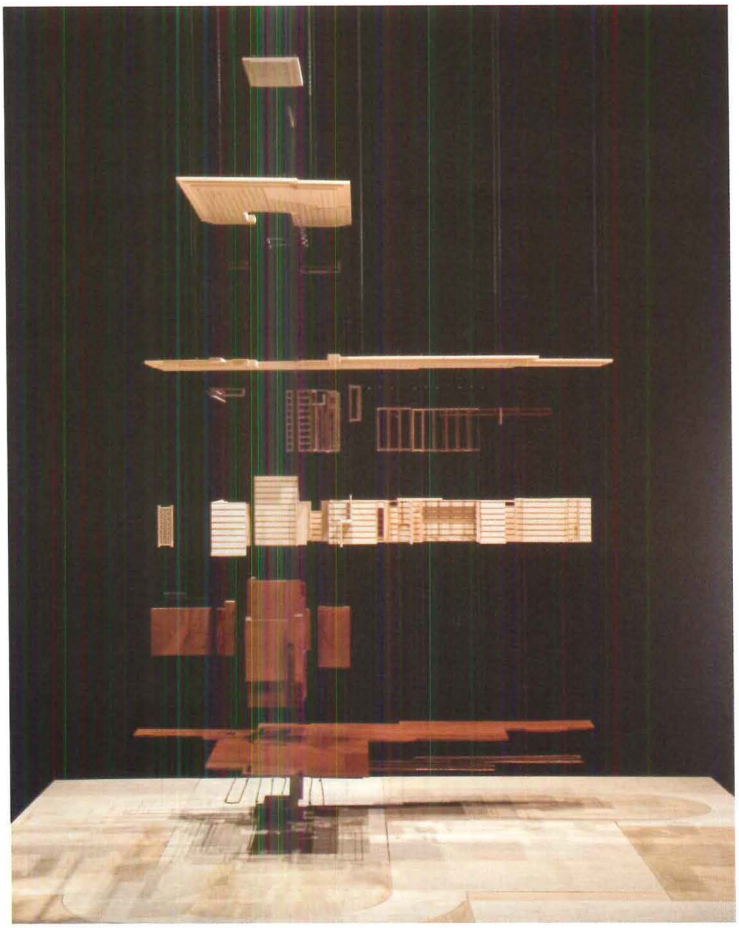
The exhibition flows more or less chronologically up the museum's ramp, pausing in three ancillary galleries along the way. In the first of these hangs a curtain (1952, fabricated 1955) that Wright created for a theater inside Taliesin III, the compound he developed on his family's Wisconsin homestead.

Moving up the ramp, Wright's early triumphs appear in a progression of drawings and tempera renderings placed in angled display cases abstracted from drafting tables, a reminder of the objects' origin in the days of a hand-drawn design process. A narrow perspective drawing for the now-demolished Larkin Company Administration Building (1902–06) in Buffalo, shows Wright playing with openness and luminosity as he plots the vertical volume rising above a desk-filled atrium and creating sight lines in between tiers of perimeter offices. A newly created model of the Unity Temple (1905–08) in Oak Park, Illinois, encloses an interior that not only opens up to light and air but allows worshipers, like Larkin office workers, views to one another.

The exhibition makes the strongest case for Wright as a designer of great communal spaces when it looks at his urban work. Off the rotunda, a gallery groups together plans for civic centers, high-rises, and other urbanistic projects. They show the famously density-opposed designer attempting to escape the disorder of the city with centers of activity distributed across the countryside.

His Broadacre City project presents a sprawling series of campuses connected by America's then-emergent car culture or even saucer-shaped helicopters. In the

Exhibitions



At the entrance to the exhibition, a theater curtain (left) from Taliesin III is a surprisingly three-dimensional patchwork of thread and fabric squares that mimic the Wisconsin countryside. A model of the Herbert Jacobs House (right) by Situ Studio is suspended in a gallery of residential work.

same gallery, renderings for a civic complex in Pittsburgh illustrate sweeping public plazas stacked in layers along one of the city's rivers. The unbuilt but influential design has echoes in contemporary work. The tentlike mast rising over the upper plaza could be the progenitor of Helmut Jahn's Sony Center in Berlin, while an aquarium enclosed in two subterranean orbs presages Renzo Piano's California Academy of Sciences.

The show supplements the urban schemes with digital animations, interpretations of drawings – complete with whirling helicopters – by Harvard University Graduate School of Design students. The curators took a risk by reimagining the work as sexy fly-through renderings. Executed differently, the video could have distracted from the static and comparatively quiet drawings, but the LCD screens are no more than roughly 10 inches wide and always slightly removed from the drawings. Perfectly tailored to the size and orientation of the installations, the animations add an enlivening sense of depth to the presentation.

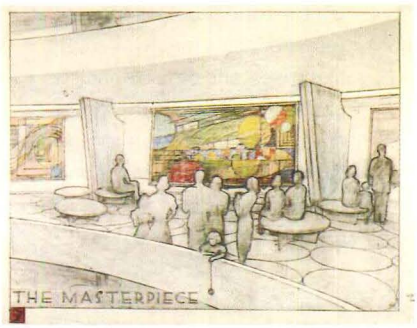
While the main thread of the exhibition follows Wright's public spaces, the curators have arranged a survey of his residential projects in one of the auxiliary galleries. Among Wright's most influential work, his houses benefit most from the newly commissioned models designed and fabricated for the show by Brooklyn's Situ Studio. For example, a model of the Herbert Jacobs House (1936–37) in Madison, Wisconsin, exploded into constituent parts and suspended above a plan etched into a wooden base, reveals its radiant heating system and organic materials composed into clean geometries.

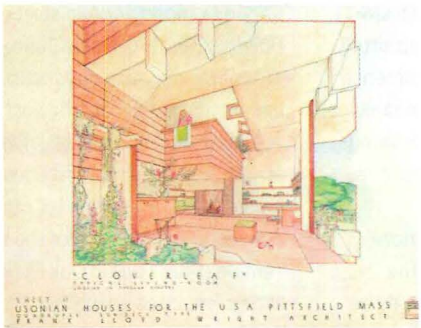
The penultimate section of the exhibition shows Wright working with public space on a grand scale with his master plan for Baghdad, Iraq (1957). A selection from the hundreds of drawings that he produced for a constellation of cultural and civic buildings straddling the Tigris River include large, vivid tempera renderings of an opera house, university campus, and a monument to the 8th-century caliph Haroun al-Rashid. The lateral, barrier-free city plan circulates people and cars through spirals of roads, pedestrian ramps, and circular plazas stacked in ziggurat-inspired forms. We see the wide-open vistas surrounding towers, campuslike plazas, and other social spaces seen in Wright's earlier urban work evolve into a network of public temples.

The show concludes with Wright's best-known (albeit inverted) ziggurat, the Guggenheim itself. At the top of the rotunda, studies for the museum show Wright working out its smooth facade in multiple colors.

With a series of drawings, the exhibition makes clear that not only does Wright's architecture create a novel space for viewing art, it opens the traditionally didactic configuration of the gallery to turn viewing into a public, social experience. In one interior perspective titled *The Masterpiece* (1943–59), people congregate around a painting hung along the ramp, while a child unspools a yo-yo over the side and into the rotunda.

Over five decades, artists and curators have contended with the museum's idiosyncratic spaces with varying results. But since Bilbao's success, the Guggenheim's administrators have seemed to look beyond the New York building, proposing a string of franchise museums in locations from Brazil to Abu Dhabi that boast equally attention-grabbing forms. For the Wright building's 50th anniversary, it is heartening to see the institution going back to the original museum and examining not only how it functions as a historically innovative form and a New York icon, but also its success as a public space – even if that success still tends to compete with the art. ■





In *The Masterpiece* (left), art viewing is more cocktail party than contemplation. A perspective drawing (right) for the Cloverleaf Quadruple Housing project.

Take a video tour of this exhibition at **architecturalrecord.com/architecturevideo.**

PHOTOGRAPHY: © DAVID HEALD (TOP LEFT AND RIGHT)

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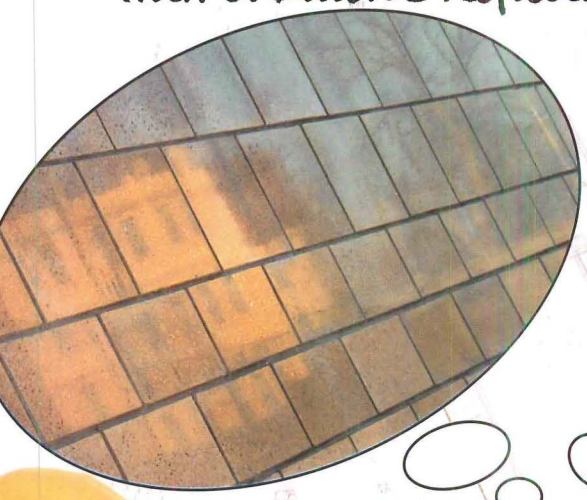

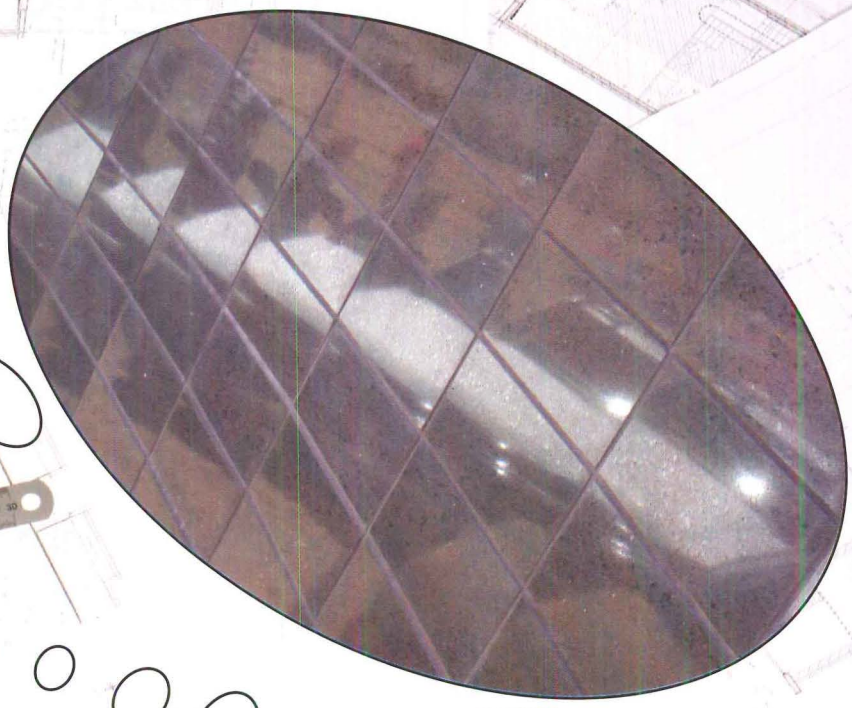

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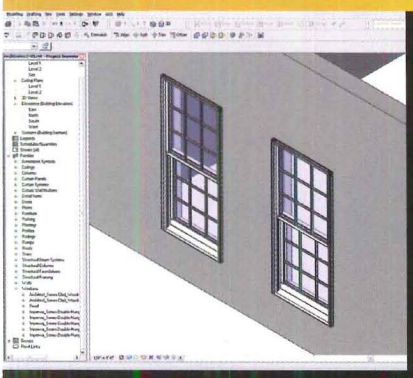

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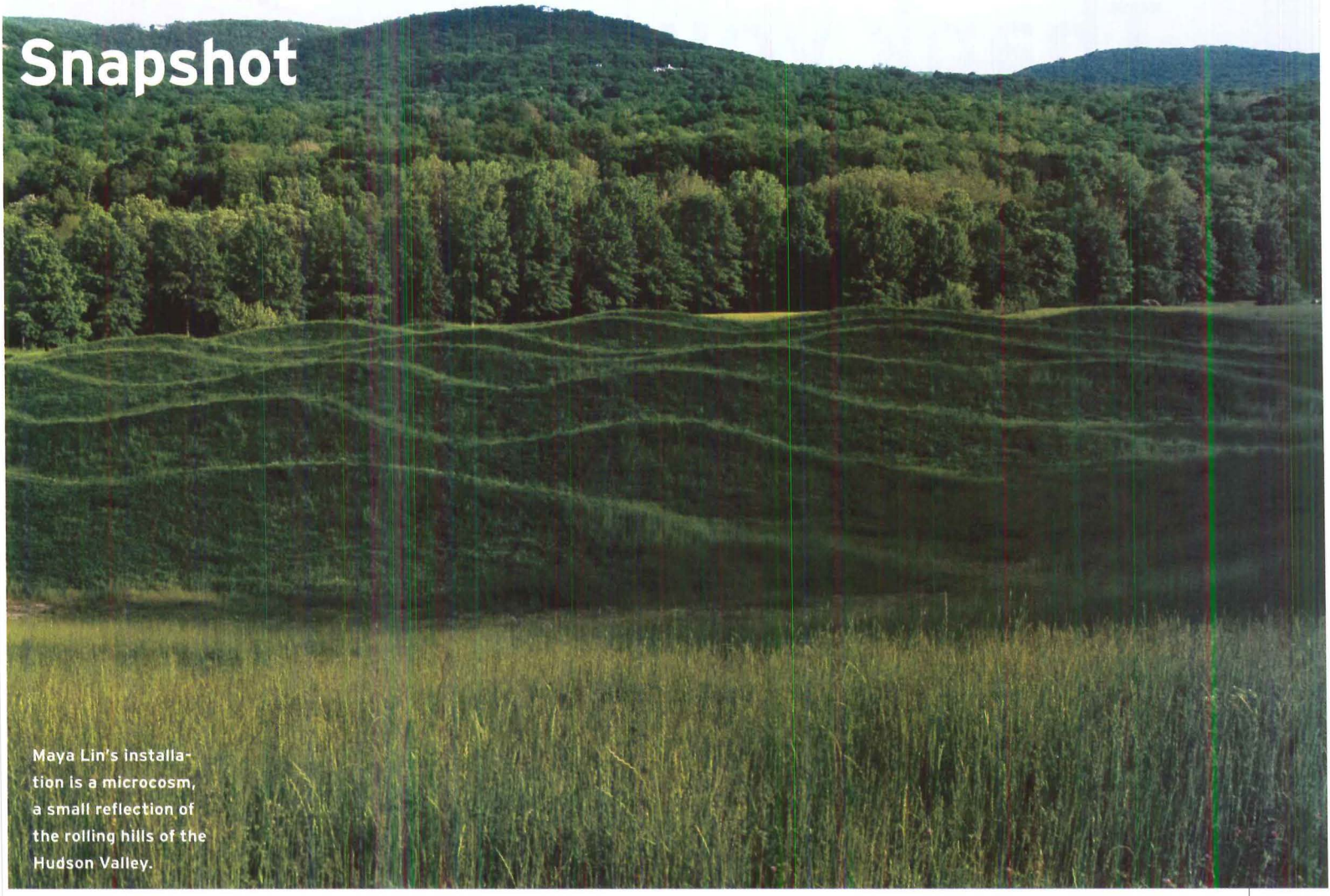
CIRCLE 27

Snapshot



Maya Lin's installation is a microcosm, a small reflection of the rolling hills of the Hudson Valley.

Walking amid waves of grass

By Sebastian Howard

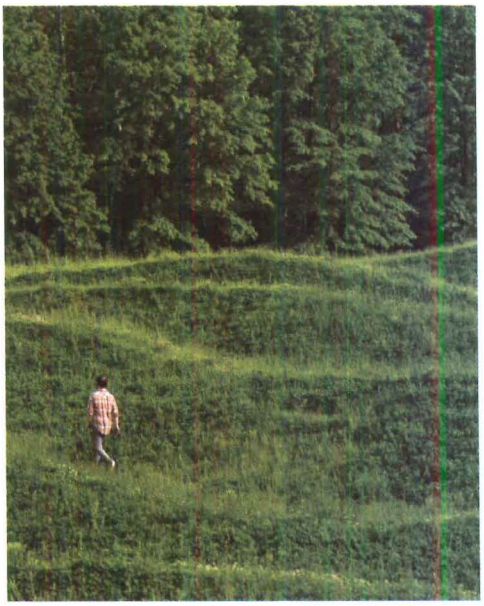
Maya Lin's *Wavefield* – the latest installation at the Storm King Art Center in Mountainville, New York, comprises a sequence of grass hillocks mimicking the form of ocean waves. The project, which covers nearly 6 acres in an 11-acre site, is the third and final part of a series of similar, smaller installations in Ann Arbor, Michigan, and Miami, Florida.

Wavefield was completed in June 2008 after about a year of construction. A local contractor (and what Storm King's director and curator David Collens calls "one very good machine operator") shaped piles of overburden rocks and gravel into waves, which were covered with a foot of topsoil and then seeded with a mix of five warm-weather grasses. The result is compelling. What was once a gravel pit has been transformed into a rhythmic, pastoral installation that appears at once willful and effortless.

After observing the early stages of construction, Lin decided that her original plan to make each wave 11 feet high would not have the impact she was aiming for. The revised blueprints called for a series of hills up to 15 feet high at their peaks – tall enough that those walking through the installation temporarily lose sight of their surroundings.

Lin, the artist and architectural designer best known for her plan for the Vietnam Veterans Memorial in Washington, D.C., has said that she hopes that the project "will focus visitors' attention on the landscape in which the work is sited." In this, *Wavefield* succeeds. The mounds closely echo the gentle curves and lush green of the Hudson Highlands that surround the 500-acre sculpture park.

Visitors are encouraged to walk amid the waves, but not, at this early stage, on their crests, since the grasses haven't yet developed a root structure hardy enough to withstand much foot traffic. Collens notes the difficulties of maintaining the installation: "It's a living situation here, unlike with our steel or stone sculptures. There's a lot to learn – no one has ever built a wave field on 11 acres before." ■



Watch a video of this project at **architecturalrecord.com/architecturevideo**.

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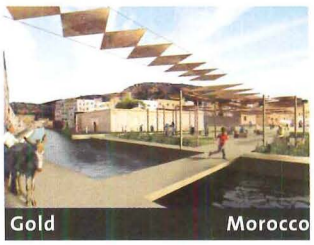


Gold Morocco

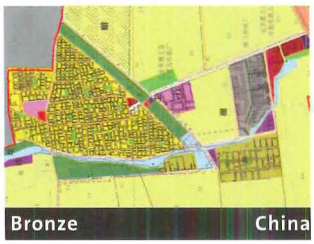
River remediation and urban development scheme (Fez, Morocco) is a multi-sited, multi-functional project that is centered upon the recovery of a river. Work on restoring it triggers a range of interventions in the Medina. Core components are the rehabilitation of the old city's architecture, revitalizing public spaces and traditional tanneries, and creating new pedestrian zones.

Main author: Aziza Chaouni
Extramuro
Fez, Morocco

Silver Vietnam

Low-impact greenfield university campus (Ho Chi Minh City, Vietnam) aspires to achieve harmony with all elements of the surrounding ecosystem in the middle of the Mekong River Delta: the waters of the river and the flooding of the rice fields, the mangroves, the winds and their patterns as well as with the seasonal changes of light and shadow.

Main author: Kazuhiro Kojima
Coelacanth and Associates
Tokyo, Japan



Bronze China

Sustainable planning for a rural community (Beijing, China) intelligently addresses the more efficient use of precious land by gradually lifting quality of life and living density, improving the living conditions for rural families as a harmonious and balanced response to urban development, and reducing the ecological footprint by improved resource management and use of renewable energy sources.

Main author: Yue Zhang
Tsinghua University
Beijing, China

"Innovation" USA

Self-contained day labor station (San Francisco, USA) is a minimal physical urbanistic intervention with maximum social equity and neighborhood enhancement effects. The project is a small structure that functions as a labor-market and service delivery platform for day laborers who wait for casual work every morning at customary gathering points.

Main author: Liz Ogbu
Public Architecture
San Francisco, USA

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CIRCLE 29

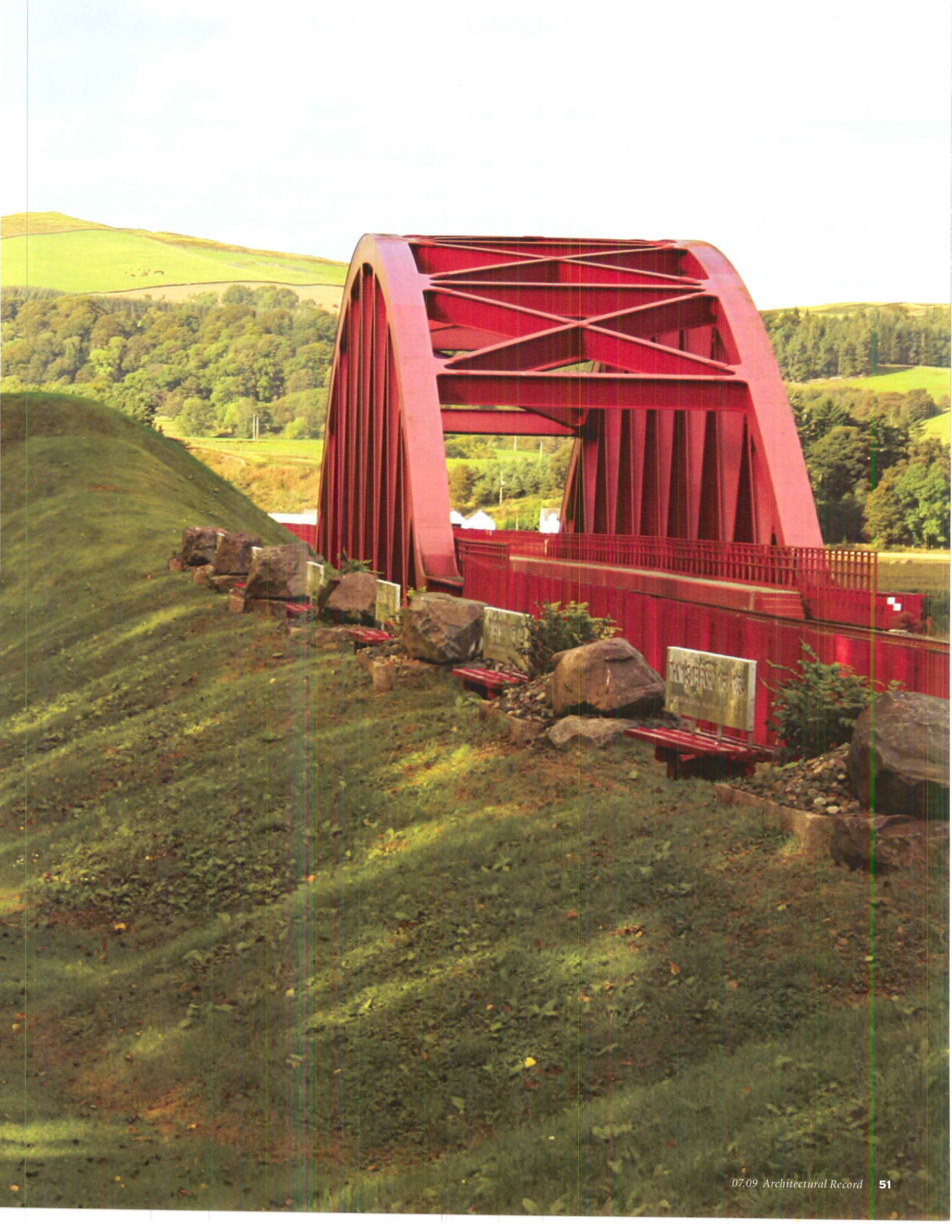
In southwest Scotland, Charles Jencks's 2-linear-acre garden borders active railroad tracks (right) and features rising mounds and a new bridge integrated into a symbolic program.

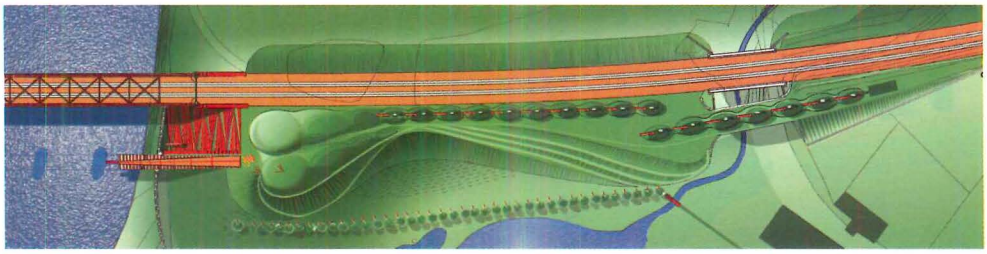
machine in the garden:

Charles Jencks's Garden of Scottish Worthies

BY PAULA DEITZ

Unlike architecture, which requires solidity to provide shelter over time regardless of style, landscaped gardens are ephemeral by nature. They may possess a degree of flamboyancy and fantasy expressive of the philosophical tone of their times and their creators without concerns for function. This is particularly true among the rolling hills of southwest Scotland, where in Portrack, just north of Dumfries near the English border, Charles Jencks, the American theorist, architect, and (increasingly) landscape architect, and his late wife, Maggie Keswick, created a 30-acre garden on a family estate that





New tracks are bordered by 17 small mounds (right) that cover the former rail bed. The mounds terminate in the new bridge and larger mounds, ending at the river (site plan, below right).

engages both the mind and the senses. Known as the Garden of Cosmic Speculation, it was completed for the most part in 2002. Every landscape design by Jencks, no matter how bucolic in appearance, incorporates a symbolically loaded theory, since for him, traveling and creating gardens is a challenging and liberating intellectual pursuit.

In this pastoral setting at Portrack, however, suddenly one hears the long drone of a train whistle as freight cars rattle by just beyond the garden. Although Keswick's father had screened out Railtrack's right-of-way across his property with a double row of poplars that rustle soothingly in the wind, the London–Glasgow line makes its presence felt as trains speed along the garden's edge before crossing the River Nith.

When Railtrack, now Network Rail, announced in 2002 that the 1845 bridge over the Nith and a sandstone viaduct leading to it were dangerously weakened by heavier loads of coal freight, Jencks was faced with the company's proposition to move the tracks 98 feet farther east, still on the property. With his customary ingenuity, Jencks offered, and Network Rail accepted, a counterproposal: He, along with engineers Scott Wilson Group, would design the new bridge across the river if the company would construct and fund a 2-linear-acre garden for him along the original tracks using the detritus from the old bridge and the railroad bed. This garden would encompass the spirit of Leo Marx's "noise clashing through harmony," from his book *The Machine in the Garden* (1964), where he quotes Ralph Waldo Emerson's journal entry: "I hear the whistle of the locomotive in the wood. Wherever that music comes it has its sequel. It is the voice of the civility of the Nineteenth Century saying, 'Here I am.' "

Jencks sees the rail garden as a continuation of his adjacent Garden of Cosmic Speculation, only on a new theme. For the earlier garden, Jencks devised the Snake and Snail grass mounds (the latter wrapped around with pathways in the form of a double helix) interpolated with paisley-shaped lakes. Reflecting Keswick's expertise in Chinese gardens, a series of seven fanciful, bright red bridges cross the streams and rivulets channeled into this former swampland.

For the theme of the new garden, Jencks pays tribute to his adopted country by saluting the events and forces responsible for the evolution of Scotland from a bellicose clan culture into an autonomous region with sophisticated urban centers. After reading Arthur Herman's *The Scottish Enlightenment: The Scots' Invention of the Modern World* (2002), he discovered, he writes, a "narrative adequate to the impact of trains on social progress"—hence, The Garden of Scottish Worthies. Jencks took his cue from William Kent's Temple of British Worthies at Stowe

Paula Deitz is the editor of The Hudson Review. *Her book,* Of Gardens: Selected Essays, *will appear in 2010 from University of Pennsylvania Press.*

"Jencks pays tribute to his adopted country by saluting the events and forces responsible for the evolution of Scotland."

The bridge cantilevered from ruins of the old one (far left) now acts as a viewing platform. Between it and the new bridge is a real rail garden of rusted rails, red ballast, and strawberry plants.

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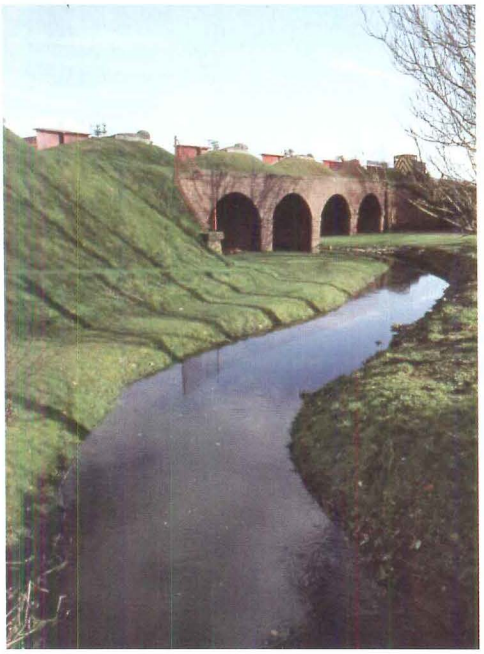
CIRCLE 30

in Buckinghamshire (circa 1734), a Roman-style masonry screen with 16 busts of Whig heroes set in niches.

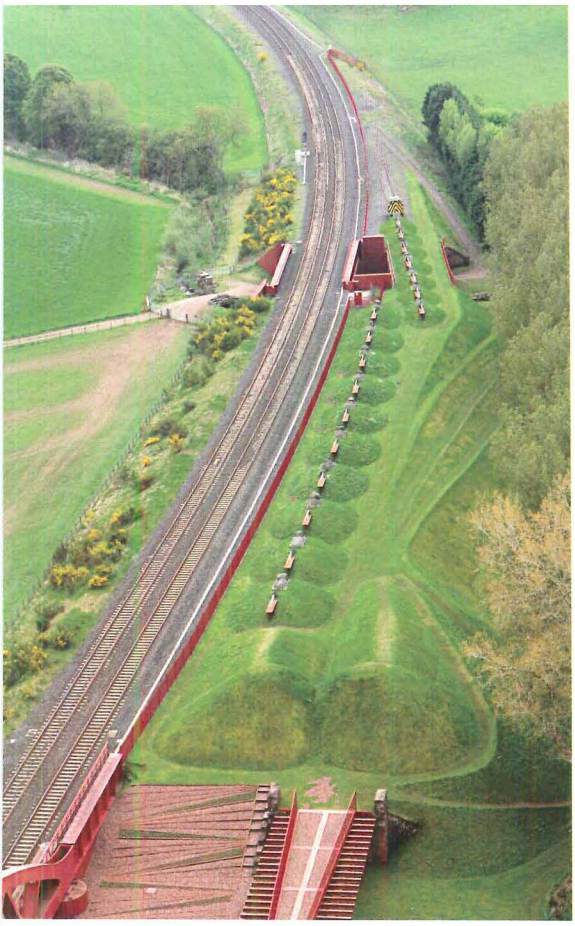
One need only travel through the Dalveen Pass in Scotland on the way to Jencks's garden to perceive how the soft green hills sloping into valleys have created a mound culture. In lieu of niches and busts, Jencks has constructed 17 moundettes on the old rail bed parallel to the new one, each a tribute to a man or woman who influenced the Scottish Enlightenment. They contributed to the rational, creative, even poetic aspects not only of Scottish society but the world at large from the 18th to the late 20th century. Planted with yellow-blossomed *mahonia japonica*, each animal-like mound is secured by a boulder head, concrete beam, and ballast shoulders. A red flange element from the old bridge supports a raised, 10-foot, brushed-aluminum sign where the name, dates, and a saying of the worthy are laser-cut in open letters and read against the sky. Taken together, these "epigrams" compose a single train of thought over time. At the head of this chain of progress, a petite yellow, green, and red engine, contributed by Network Rail, appears to be pulling the mounds and their "passengers" into the landscape. The philosophers Frances Hutcheson and David Hume, and the political economist Adam Smith, lead off, followed by the poet Robert Burns (who lived near Portrack), industrialist Andrew Carnegie, and writer Rebecca West.

Pathways wind down from the mounds—the high road—through green slopes to the original screen of 40 poplar trees along the low road. Dangling from each tree is a red aluminum banner with a plain aluminum cut fringe demarcating events over 1,700 years, which Jencks calls The Bloodline—blood referring to clan and tribal vendettas and later warfare, as well as intermarriage.



The 19th-century sandstone viaduct (right) is restored. Nearby, a row of 40 poplars (called The Bloodline) carry metal banners incised with Scottish names or incidents (below right).

"The garden, so evocative of Scotland and its industrial landscape, shows how Jencks has delved deeply into the character of place."



As the culmination of the garden's design, the first moundette gradually transmutes into two long, sloping mounds like legs that terminate in a hillock-cum-derrière, a lookout point over the swift-flowing Nith and the new railroad bridge. A splendid piece of industrial architecture, the single-span arches and zigzag trusses of the 295-foot-long bridge are painted rust red, as are the massive fluted concrete piers on land, relating them to the small bridges in the Garden of Cosmic Speculation. A remaining section of the old bridge, also painted red, cantilevers out as a walkway over the river, offering views of the natural contours of the Scottish hills beyond. The true rail garden, with a crisscross of rusted rails in a field of red ballast and interplanted with zigzag rows of wild strawberry plants, is on an incline between the two bridges.

The restored 19th-century sandstone viaduct, with its four arches along a meandering stream, lives on for Jencks, like a ruin in the Roman campagna of Poussin's paintings. A third bridge, a new red flange connecting two berms, serves as a gateway to open meadows.

With all these endeavors, Jencks acknowledges the assistance of his head gardener and master craftsman, Alistair Clark. In framing the theoretical concept behind the garden, Jencks refers to landscape historian John Dixon Hunt's three natures of gardens, from his *Greater Perfection: The Practice of Garden Theory* (2000): first the wilderness, then farming and husbandry, and finally the development of the art of gardening. To this sequence, Jencks adds a precursor, the underlying laws of nature, and a successor, today's landscape of industrial waste. By artfully using and reshaping the remains of the railway, and incorporating rather than camouflaging the speeding trains in the pastoral setting, he designed the new rail garden to complement in structure and technique his earlier achievement. Jencks clarifies his goals, saying, "I don't do ornament, I do symbolism." He has delved so deeply into the character of place that he seems to have adopted the epigram of one of his worthies—Sir Walter Scott's "This is my own, my native land." ■

The new tracks border the large mounds (lower right in photo, left) and run parallel to the smaller mounds above them. From there, pathways lead to the screen of poplars facing the low road.

View additional images of Charles Jencks's Rail Garden of Scottish Worthies at **architecturalrecord.com/features**.

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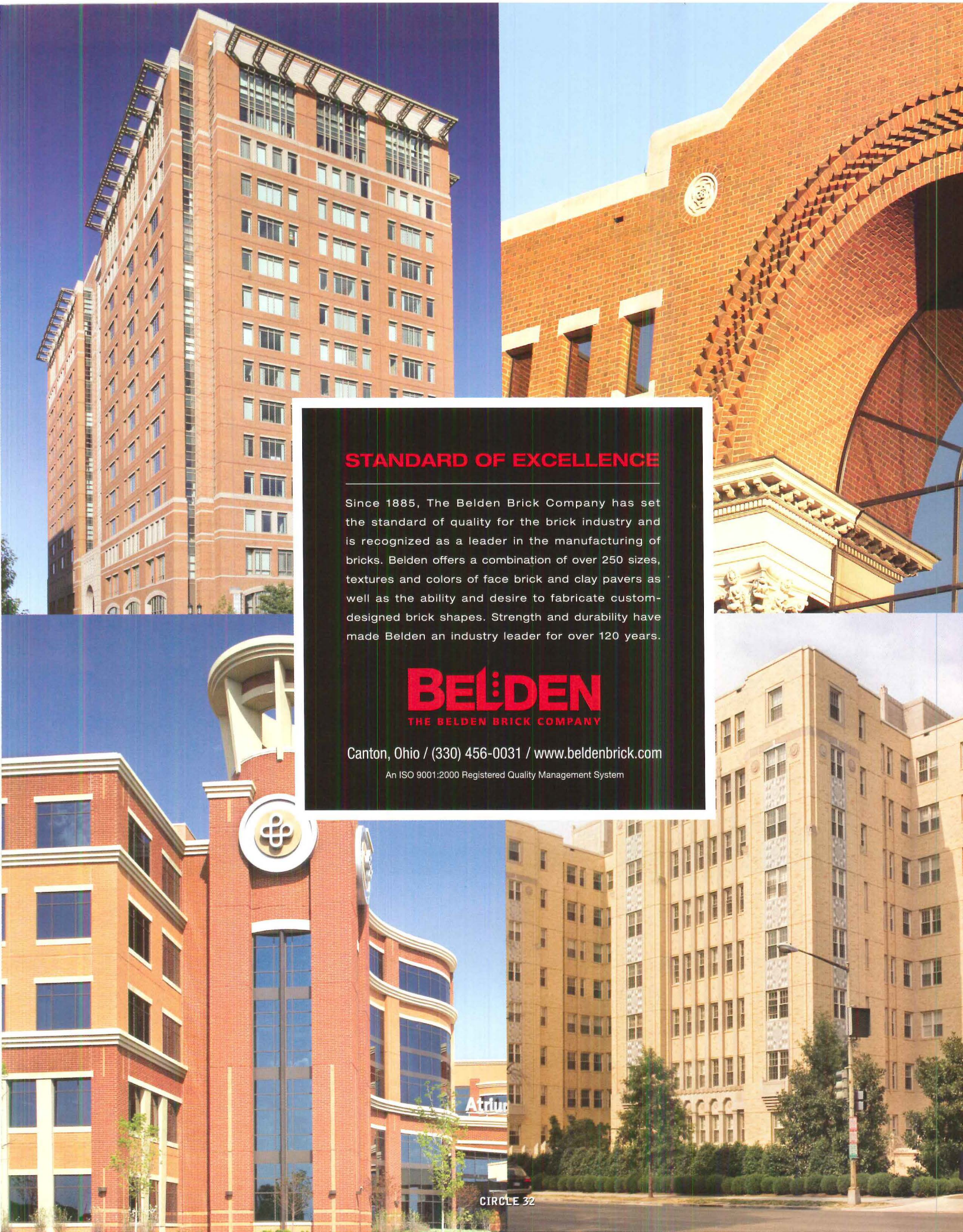

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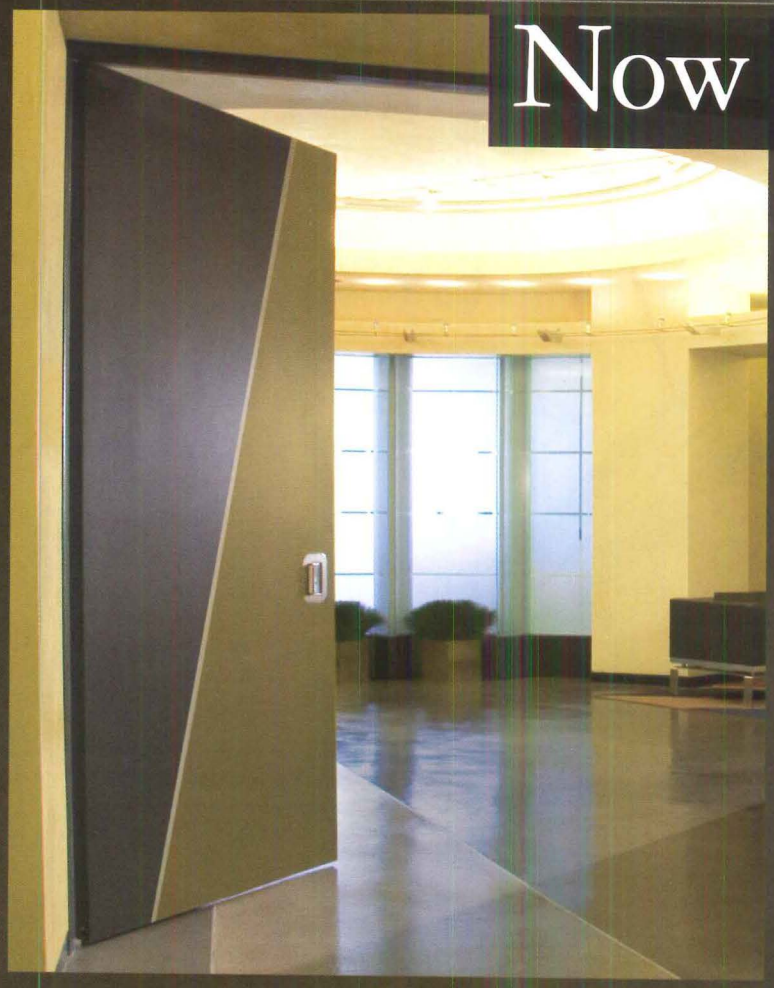

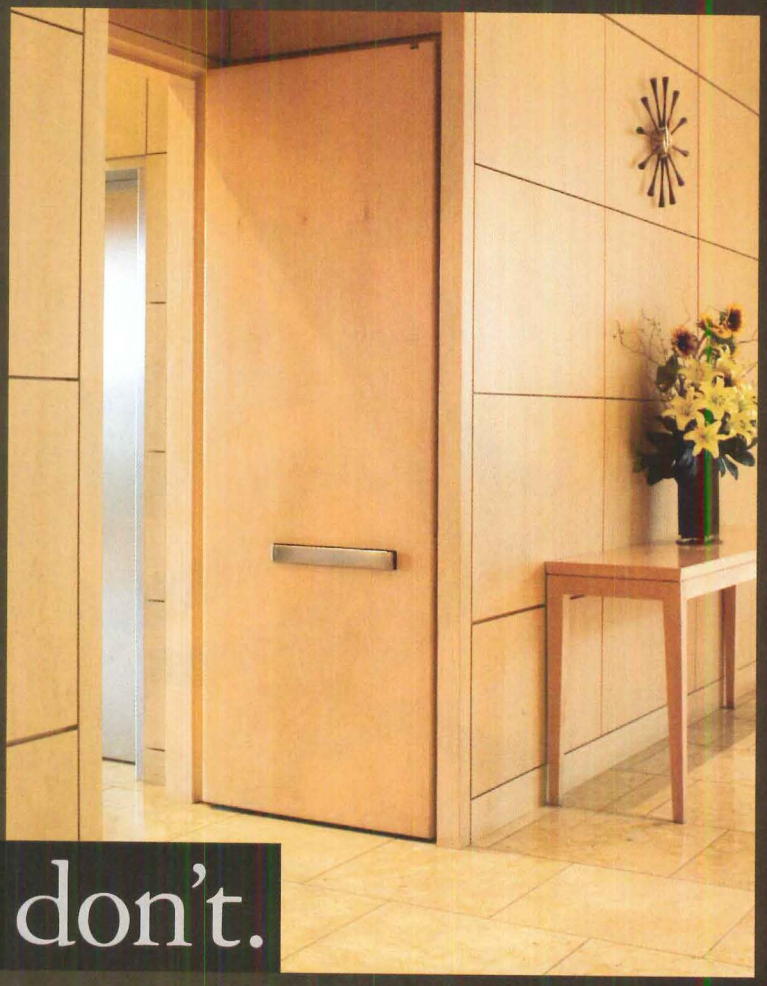

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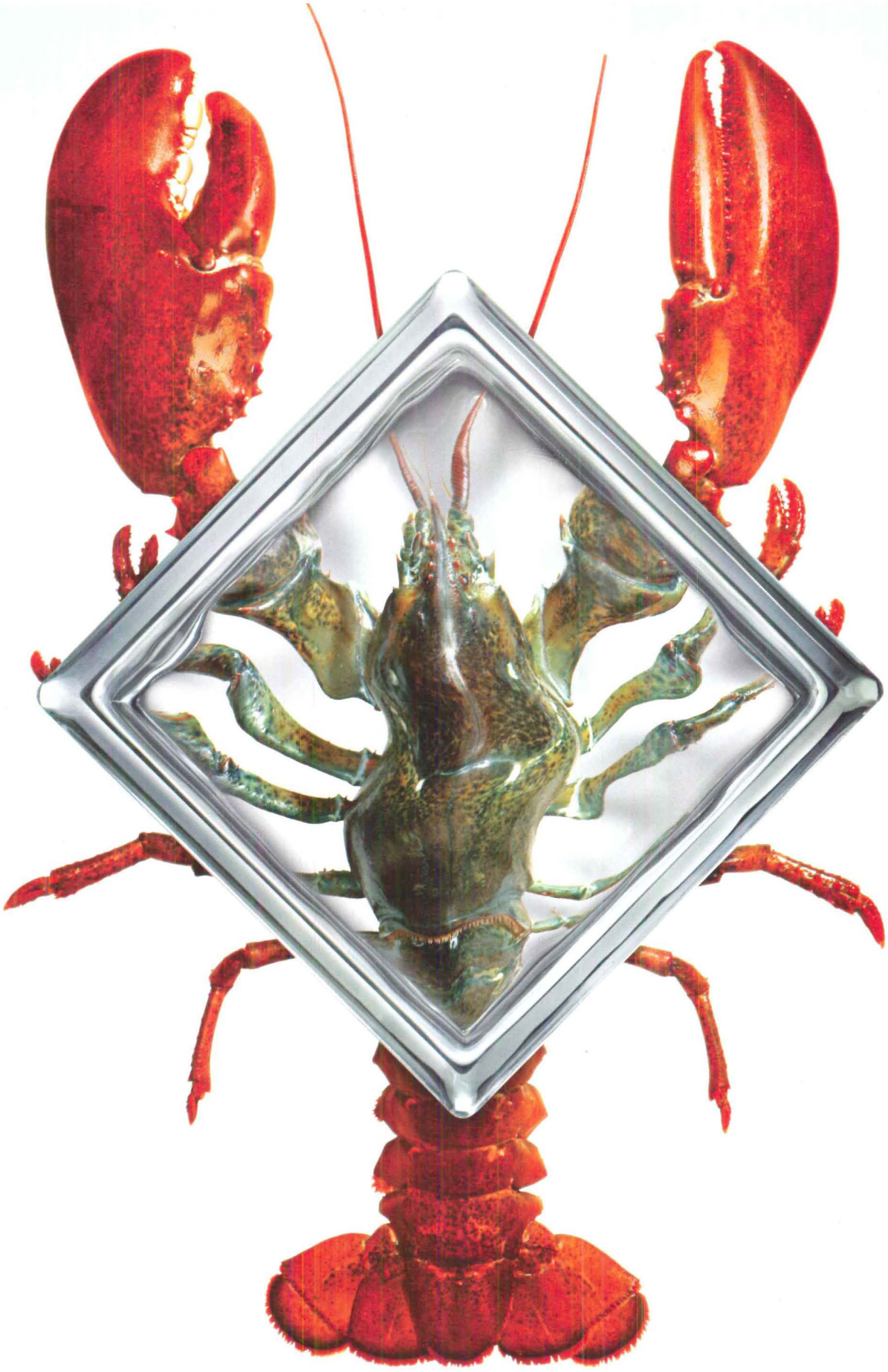

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CIRCLE 34

TERRA ARCHITECTONICA

Sunset Park Urban Nucleus, Santa Monica, California (unbuilt, 1965), by Cesar Pelli for Daniel Mann Johnson Mendenhall.

Developments in landform buildings have a long history

These days, the land under your feet may turn out to be a building, even if partially concealed by a grassy roof. Frequently we find architecture and landscape in some sort of symbiotic union: Architecture emulates the land's soft rolling contours, or carves with aggressive force into the natural terrain, or uproots it to simulate geological tectonic plate formations – all to integrate built form with the earth. This interaction of constructed and natural environments can be seen in projects RECORD has published in recent years and ones on the following pages. But the interaction is not new.

We need only look back to the monuments of the past, such as Babylonian ziggurat temples, Egyptian tombs embedded in the rocky slopes, or Mycenaean beehive tombs – not to mention vernacular underground abodes – to see the extent of this obsession.

Even the masters of Modern architecture – such as Frank Lloyd Wright, with his organic, low-rise, horizontal houses stretched across the prairie, or Le Corbusier and his designs for sod-roof houses beginning in 1930 – showed an affinity for melding architecture and land. In the 1960s, the interest in megastructures yielded landform architecture at a new, vast scale: One of the most riveting schemes of the era was the unbuilt Sunset Mountain Park in Santa Monica, California, of 1965, designed by Cesar Pelli and Anthony Lumsden for Daniel Mann Johnson Mendenhall. Its architectural terraces spilling down the mountainside may have inspired its inversion – the earth-berm architecture of ecologically minded practitioners in the 1970s.

In 1982, Zaha Hadid's unrealized competition-winning scheme for The Peak in Hong Kong conceived of a new terrain built up from excavated material on the mountaintop on which horizontal beamlike buildings were placed. While it rivaled the Pelli scheme for visual impact, it was more combative with the earth. Similarly, Peter Eisenman's City of Culture in Galicia, Spain, begun in 1999, features a series of buildings that respond to planning devices (a medieval street plan and a Cartesian grid) along with the topographical mapping to create an architecture that erupts like tectonic plates out of the earth. Combining topography and infrastructure, the Olympic Sculpture Park in Seattle by Weiss Manfredi [RECORD, July 2007, page 110] melds grassy slopes with concrete ramps and railroad tracks in a hillside art park that cascades down to a reclaimed waterfront.

Stan Allen, dean of Princeton University's School of Architecture, notes that since the 1980s and '90s computer research in design and fabrication has enabled more and more investigations into landforms at the urban scale. Weiss Manfredi, along with Vicente Guallart of Guallart Architecture in Barcelona, among others, participated in a working conference, "Landform Building: Architecture's New Terrain," that Allen held at Princeton in April. As Allen explains, the principles of landscape urbanism, including "the way constructed ground changes over time and works with an indeterminate or flexible program," goes beyond formal exercises. Its programmatic flexibility and implications for saving energy promise new forms of architecture and urban design that work with the land, not against it. The focus on architectural land deepens as it evolves. *Suzanne Stephens*

Anchored by a 100-year-old smoke-stack, the Inujima Art Project's galleries are buried beneath the hardy landscape.

Sambuichi Architects breathes new life into an old refinery to create the Inujima Art Project on a secluded island in Japan

By Naomi R. Pollock, AIA

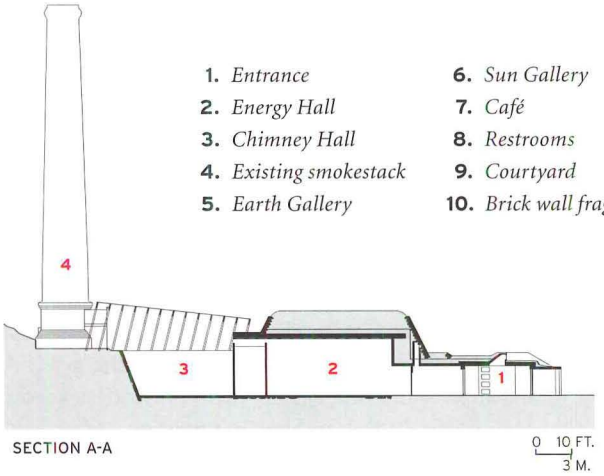
An isolated island amid many that dot the Seto Inland Sea, Inujima once helped fuel Japan's early industrialization. Close enough to Honshu, the country's main island, for easy transport yet far enough to keep noxious fumes at bay, Inujima reached its productive pinnacle in 1909 when a copper refinery opened on its rocky shores. But after a mere 10 years, the factory was abandoned and its brick edifice left to crumble until its rebirth some 80 years later as the site of the first of several planned Inujima Art Projects.

Aptly named the Seirensho, or "refinery," the new facility follows the path set down by Tadao Ando's Chichu Museum on the neighboring island, Naoshima [RECORD, October 2005, page 116]. Having successfully resurrected one forgotten factory outpost as a flourishing center of art and architecture, the Naoshima Fukutake Art Museum Foundation decided to take on another. This time they invited conceptual artist Yukinori Yanagi to create a permanent installation, and the Hiroshima architect Hiroshi Sambuichi, known for his ecological buildings, to design a structure that would memorialize Japan's industrial past without adding to its energy expenditure.

"I thought it was incredible that a landscape like this still existed in Japan," mused the architect upon seeing Inujima. Accessed from Hoden Port on the outskirts of Okayama city, the island is a five-minute ferry ride from Honshu, but feels worlds away. Home to just 64 elderly residents, the 0.21-square-mile island is distinguished by the haunting remains of the refinery's six chimneys and the mazes of brick wall fragments fanned out around them. Though mellowed after years of exposure, the stark, man-made forms contrast elegantly with the gentle swell of the land and its wild overgrowth. Partially buried in the ground, Sambuichi's building barely stands out against this dramatic backdrop.

But that was precisely the architect's intention. After taking stock of the refinery's remains, Sambuichi designed his building

Naomi R. Pollock is RECORD's Tokyo-based correspondent.



1. *Entrance*
2. *Energy Hall*
3. *Chimney Hall*
4. *Existing smokestack*
5. *Earth Gallery*
6. *Sun Gallery*
7. *Café*
8. *Restrooms*
9. *Courtyard*
10. *Brick wall fragments*

SECTION A-A

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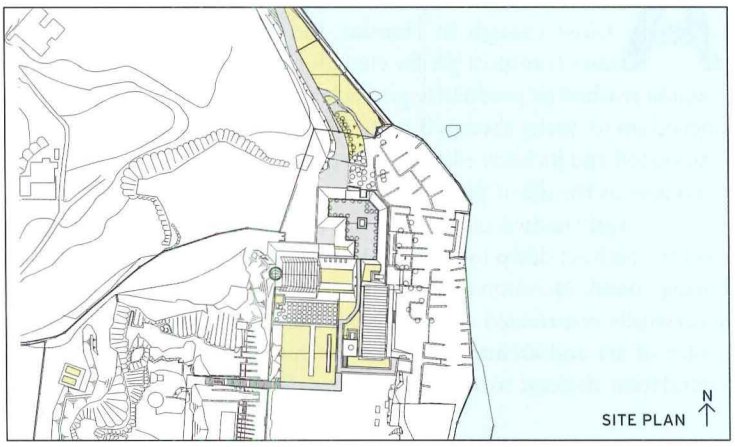
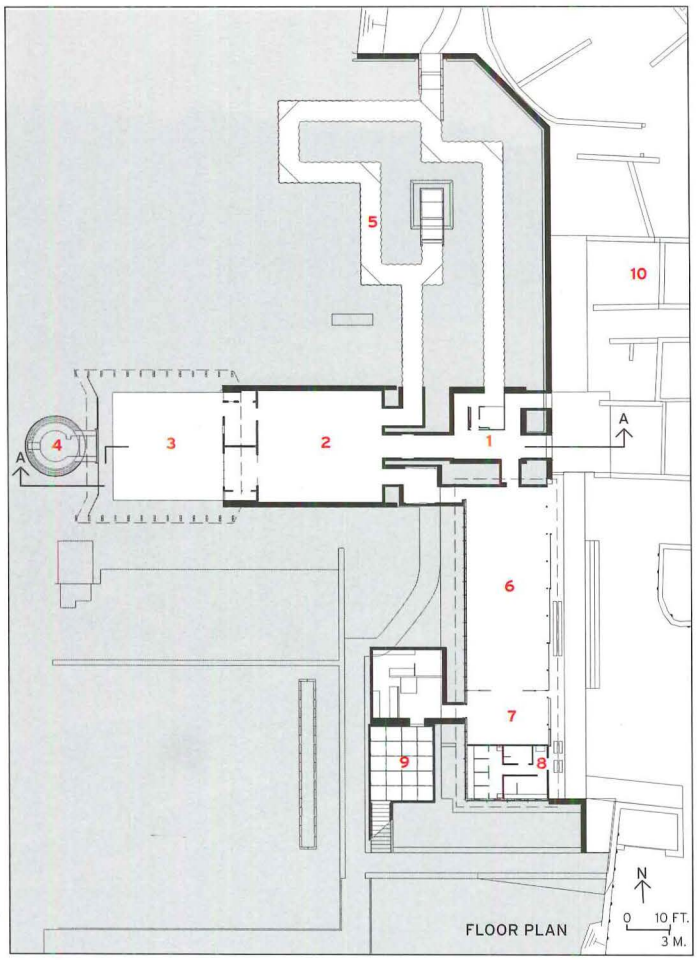




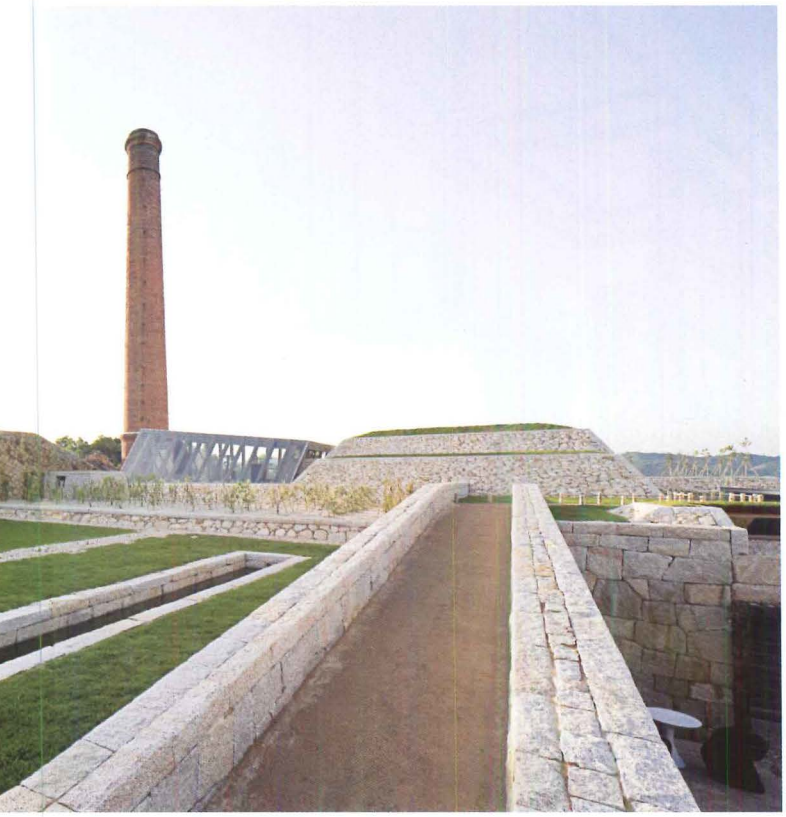
around the tallest of the smokestacks. "I always look for the site's 'sleeping energy,' " he explains. Despite its advanced age, the 98-foot-high brick funnel was intact enough to draw air in at the bottom and expel it out the top. If he exploited this function, Sambuichi could ventilate his building without any machines. Enlisting the help of the sun and earth, he could naturally heat and cool it, too.

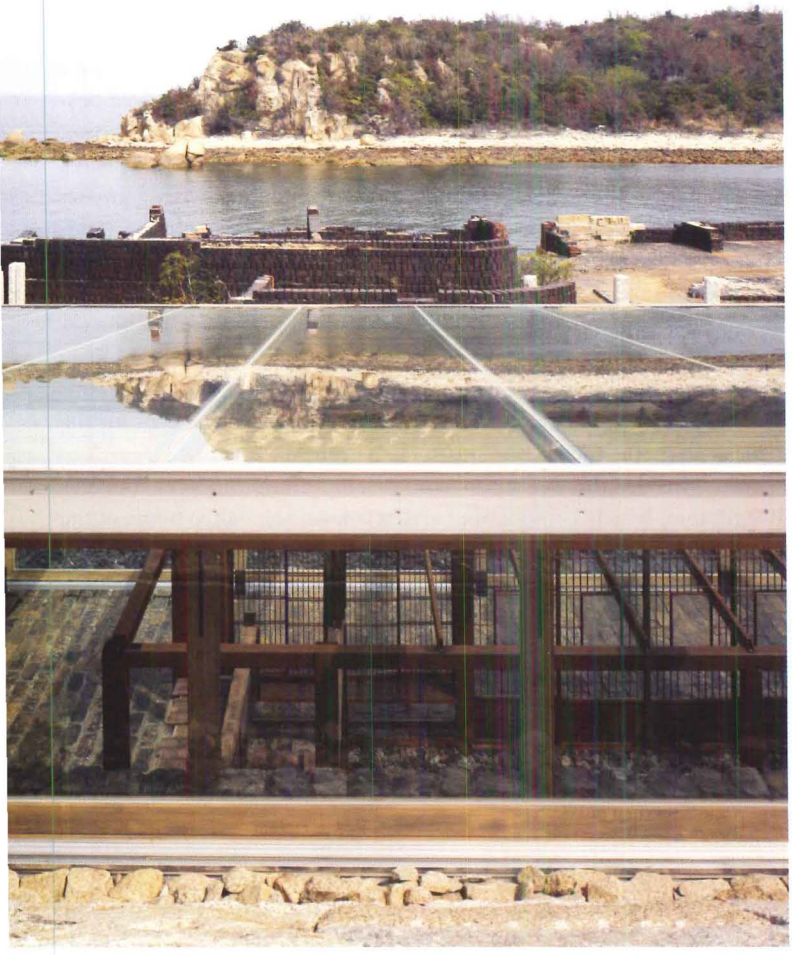
Consequently, air movement and energy exchange inspired Sambuichi's T-shaped plan. Aligned with the opening at the chimney's base, the Seirensho's unmarked entrance admits people, as well as wind, into the foyer. A square vestibule at the intersection of the building's axes, it unites the tunnel-like Earth Gallery where air is chilled, and the greenhouselike Sun Gallery, on the opposite side, where air is heated. Perpendicular to that, and past the vaulted Energy Hall and sun-drenched Chimney Hall, the smokestack draws out the naturally conditioned air. Interspersed between the galleries, internal doors and windows act as dampers that modulate the flow.

Unsurprisingly, the rooms required different materials and structural systems to fulfill their respective thermal roles. The subterranean Earth Gallery is encased with welded ½-inch-thick steel plates that withstand the weight of the surrounding soil and conduct its coolness. To slow the speed of the air and increase its contact with the frigid earth, the labyrinthine corridor bends and turns along its 262-foot length. Angled mirrors in each corner reflect the sun's rays from a centrally placed skylight, the corridor's only illumination.

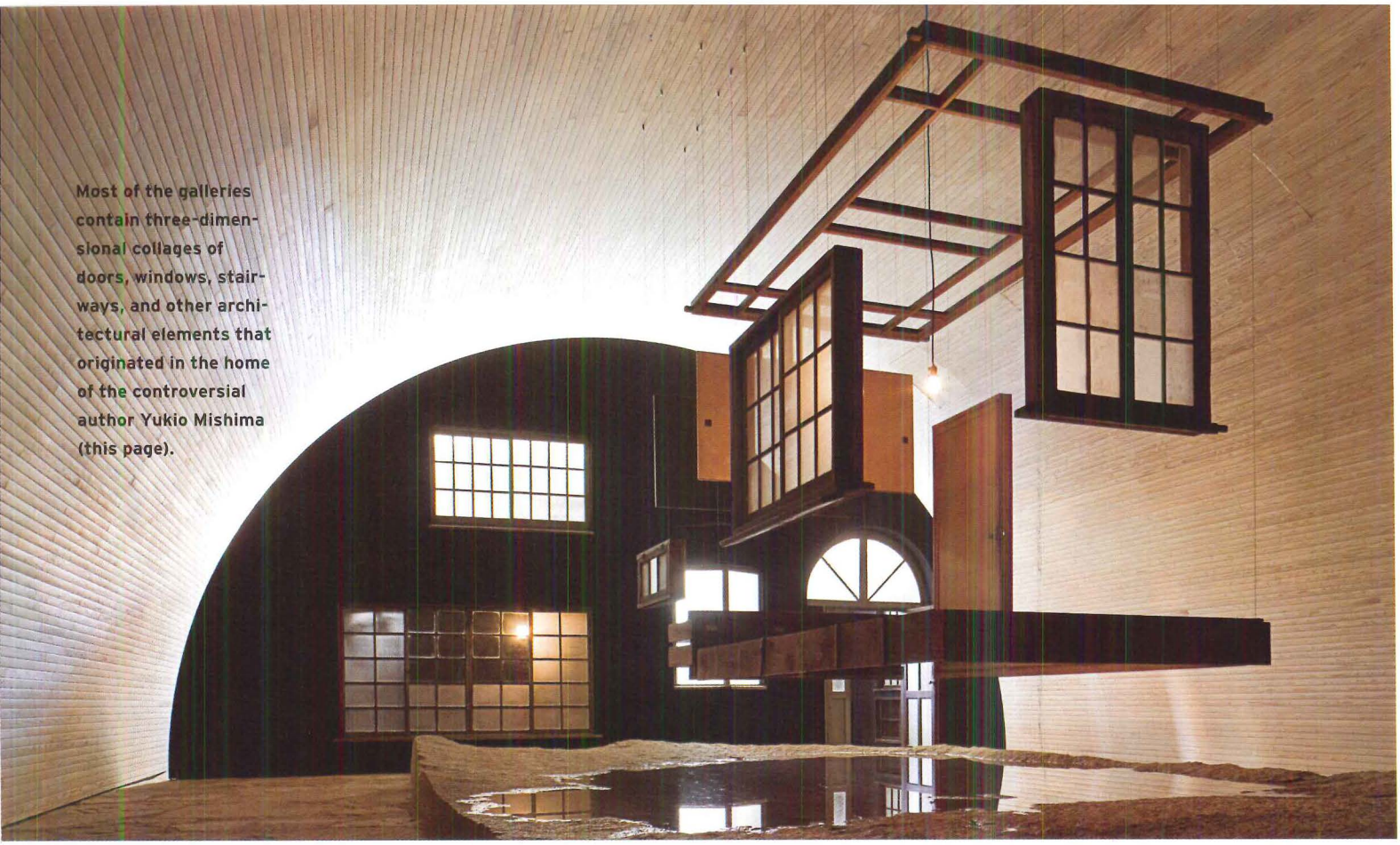
By contrast, the Sun Gallery is a glazed, wood-framed shed whose floor and rear wall of karami brick soak up solar heat. Salvaged from the sea, the metallic blocks were produced from refinery waste but today are one of the Seirensho's most beautiful, as well as functional, treasures. Because of the smokestack's potential instability, it had to be isolated in a shed of its own and the Energy Hall blanketed

PHOTOGRAPHY: © IWAN BAAN (PRIOR SPREAD AND OPPOSITE, TOP LEFT AND BOTTOM RIGHT);





The island's many smokestacks are a reminder of the site's industrial past (opposite). Pedestrian paths tie the site to the Seirensho (top left). The unmarked entrance is on axis with the tallest of the smokestacks (top right). The floor of karami brick is visible in the greenhouselike Sun Gallery, which houses one of Yukinori Yanagi's art installations (below).



Most of the galleries contain three-dimensional collages of doors, windows, stairways, and other architectural elements that originated in the home of the controversial author Yukio Mishima (this page).

with a protective 7-foot-thick layer of soil that could shield its cedar-lined steel vault from falling debris.

Yet that was a small price to pay for recycling the antique tower—Sambuichi reused or sourced local materials wherever possible, and the completed building runs without man-made power (aside from electricity for emergency lighting). To eliminate the effect of wastewater on the surrounding sea, Sambuichi planted hardy grasses and citrus trees to filter harmful chemicals from the polluted effluence—yielded primarily by the restrooms—and then reused the purified water to irrigate new landscaping.

Taking root above, below, and around the Seirensho, the orderly plantings help blend the architecture with the old growth. Keen to let nature continue on its course, Sambuichi left the indigenous greenery in its untamed state and the ruins untouched, except for the pedestrian paths that tie the site to the Seirensho.

Inside, the Seirensho comfortably accommodates Yanagi's installation, largely composed of artifacts from the Tokyo home of the controversial author Yukio Mishima, who criticized Japan's rapid modernization in the 1970s. Most of the galleries hold three-dimensional collages of doors, windows, and stairways accompanied by disturbing quotations from Mishima. Together, the art and architecture remind us to slow down and appreciate the past as we contemplate the future. ■

Project: *Inujima Art Project, Japan*
Architect: *Sambuichi Architects—Hiroshi Sambuichi, principal*
Engineer: *Arup Japan*
Landscape consultant: *Okayama University Faculty of Environmental Science and Technology*

SOURCES
Metal: *Sansyu*

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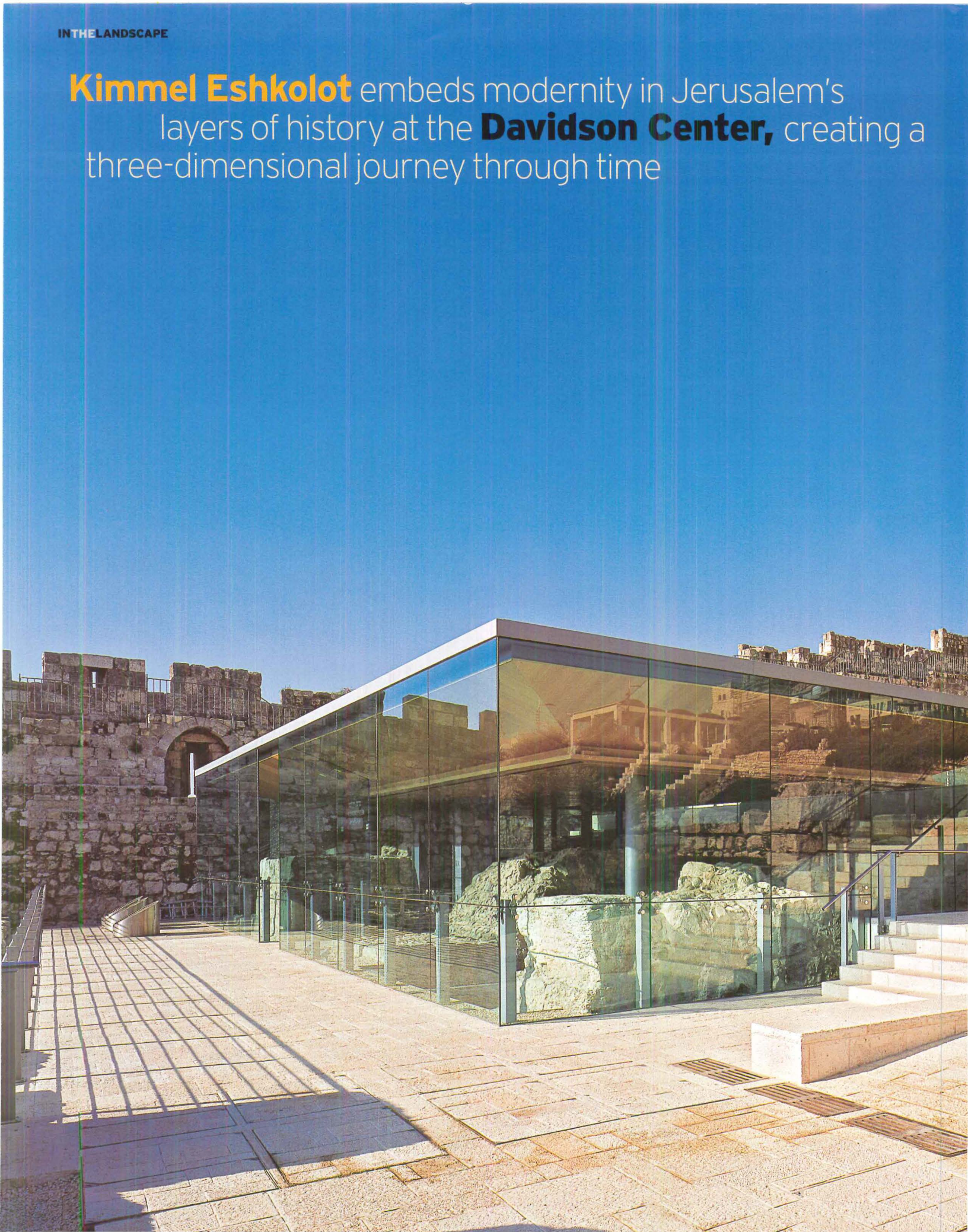
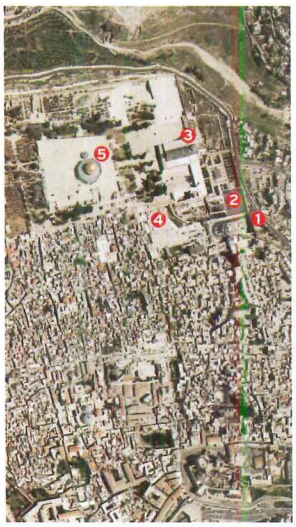
PHOTOGRAPHY: © IWAN BAAN (TOP); DAICI ANO (BOTTOM AND OPPOSITE)

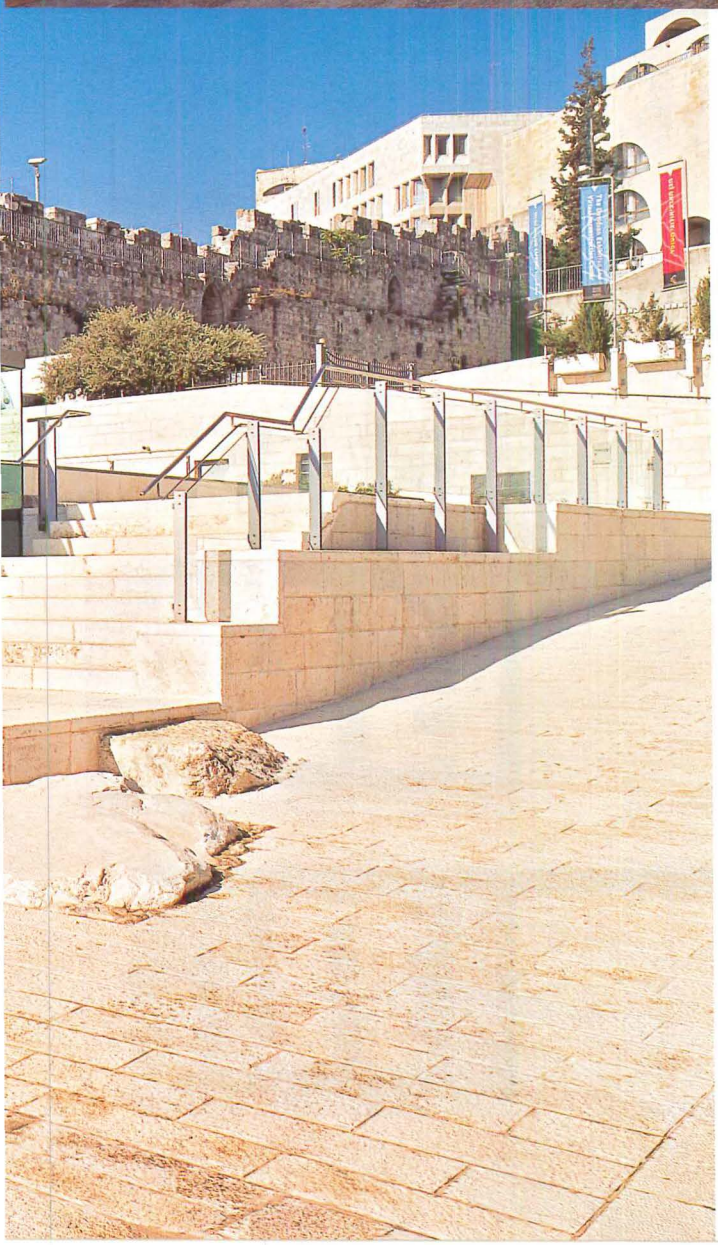
The tunnel-like Earth Gallery is encased in steel plates to withstand the weight of the soil above it.

Kimmel Eshkolot embeds modernity in Jerusalem's layers of history at the **Davidson Center,** creating a three-dimensional journey through time



1. *Old City wall*
2. *Davidson Center*
3. *Al-Aqsa Mosque*
4. *Western Wall*
5. *Dome of the Rock*





PHOTOGRAPHY: © AMIT GIRON

By Ruth Jacobson

Passing through the Dung Gate on the south end of Jerusalem's Old City walls, visitors walk down a Herodian street built 2,000 years ago and get a breathtaking view of an archaeological park overlooking the Temple Mount, the site of the Second Temple (destroyed in 70 A.D.) where the Dome of the Rock and Al-Aqsa mosques now stand. The park sits above and around the ruins of four Umayyad palaces built by the city's Islamic rulers in the 7th and 8th centuries and serves as the home of the Davidson Center, a museum designed by Kimmel Eshkolot Architects that tells the story of the site's transformations throughout history.

Jerusalem's role as a holy place for three major religions has made it a battlefield and object of conquest. The city has been built, destroyed, and rebuilt numerous times, and the archaeological artifacts displayed in the Davidson Center bear silent witness to these events. (The museum is named for its main benefactor, Michigan industrialist William Davidson, who until his death four months ago owned Guardian Industries, one of the largest manufacturers of float glass in the world.) In Jerusalem, relics from the Second Temple era (516 B.C.–70 A.D.) reveal the city's glory days, when King Herod transformed the Temple Mount and its surrounding areas into a lively, social center. Excavations from the Byzantine period (330–638) attest to the early Christian character of the city, then give way to Umayyad rule, from 638 to 750, when the Arab Caliphate constructed a monumental government center at the foot of the Dome of the Rock and Al-Aqsa mosques.

The 10,800-square-foot museum sits just inside the Old City's wall (left) close to the Temple Mount and Dome of the Rock (top right). Visitors enter from a landscaped plaza near the top of the building (top left).

Building on an archaeological site with so much historical, political, and cultural

Ruth Jacobson is an art historian and journalist who owns Hamigdalor Gallery in Old Jaffa, Tel Aviv.

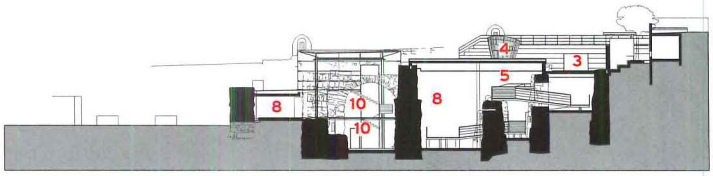
A 2,000-year-old street from the time of King Herod runs along the eastern edge of the Davidson building (above) and overlooks exposed ruins from the 7th and 8th centuries.

significance posed a tremendous challenge. "How often is an architect granted the opportunity to work on a site considered one of the holiest places in the world?" asks architect Etan Kimmel. Meeting the challenge occupied Kimmel and his partner Michal Eshkolot for more than a decade, from their competition-winning design in 1996, when both architects were in their 30s, to the opening of the museum's first phase in 2001 and its completion in 2007. Since winning the Davidson competition, the Tel Aviv–based firm has grown to become one of the most important in Israel today.

Kimmel Eshkolot's strategy for the 10,800-square-foot Davidson was to make much of it transparent and keep its height as low as possible, so it wouldn't rival the presence of the archaeological park or the Old City walls. As built, it rests mostly underground, with its roof level with the ancient palace floors and integrated with the park's walkways and landscaping. "The key to the design lay in setting up a fine balance between the complete submergence of the structure underground and the marking of new traces on the surface—hints of the subterranean levels below," write the architects in a book on the project.

Kimmel and Eshkolot designed the building as a journey that starts at the entrance level of the Umayyad palaces, then descends to the old buildings' cellars and foundations. But instead of creating a hermetic experience for visitors as they move three levels below the roof plaza, the architects connected the building to the outdoors and the rest of the ancient city with large glass walls and a "periscope" topped by an elliptical glass lantern. From the outside, the lantern announces the presence of a modern structure on the historic site; from inside, it brings daylight below and offers a view of the Al-Aqsa Mosque.

While connecting with the outdoors and integrating itself



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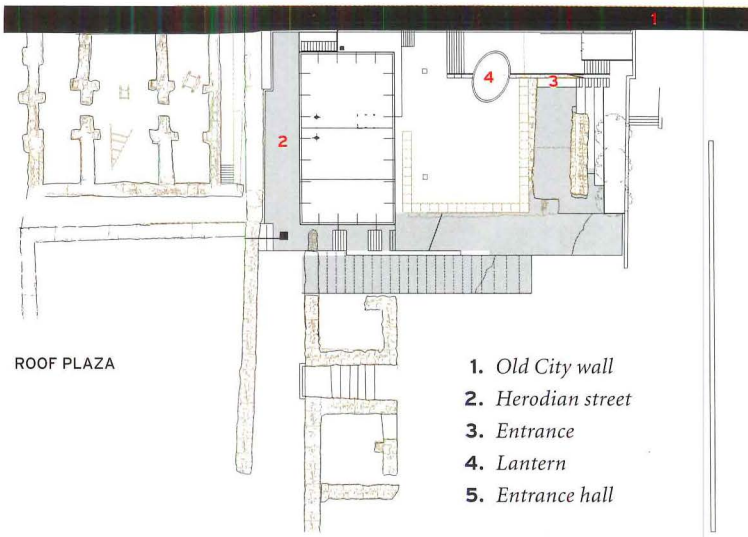
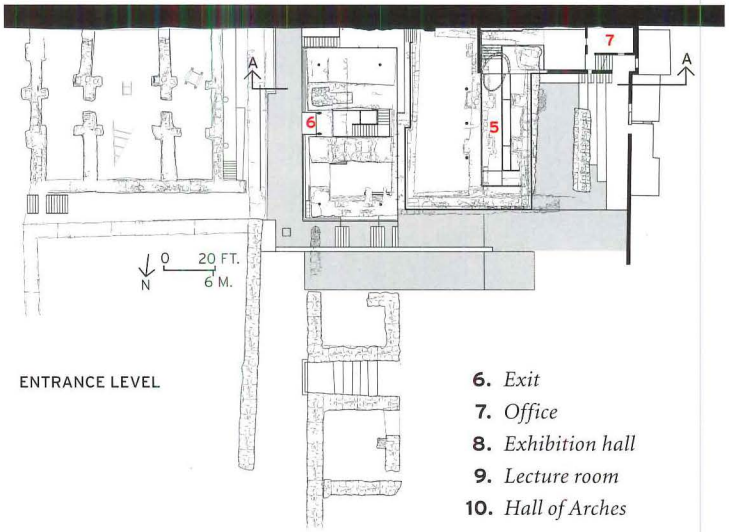


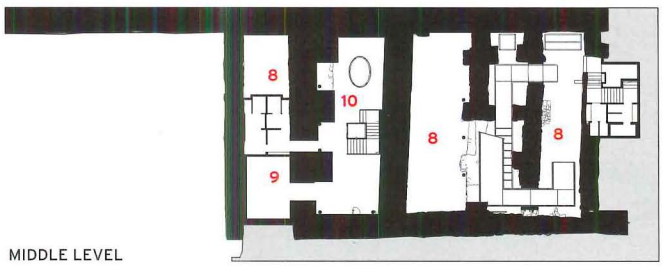
ROOF PLAZA

1. *Old City wall*
2. *Herodian street*
3. *Entrance*
4. *Lantern*
5. *Entrance hall*



ENTRANCE LEVEL

6. *Exit*
7. *Office*
8. *Exhibition hall*
9. *Lecture room*
10. *Hall of Arches*



MIDDLE LEVEL

LOWER LEVEL

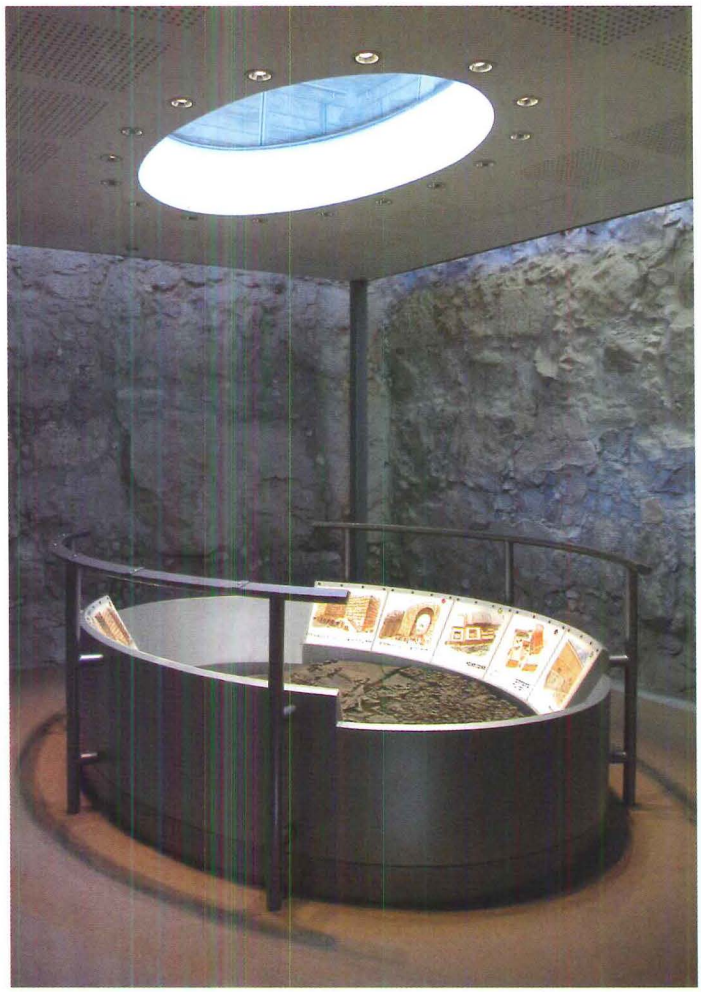
The architects contrasted refined materials such as glass and steel with the thick, rough stone walls of the Umayyad palaces.

with its setting, the new building is set apart in terms of materials and architectural expression. Butt-glazed curtain walls, for example, envelop the thick stone walls of the old palaces, and glass-and-steel walkways cross from one side of the museum to another. "We tried to emphasize the beauty of these juxtapositions of old and new," says Kimmel.

Kimmel Eshkolot worked with designer Dorit Harel to create the museum's interior, using a series of wood-floored ramps to take visitors down 26 feet to the Hall of Arches in the ancient cellars. The strategy was to initiate a cross-generational dialogue between old and new materials, as well as ancient and modern sensibilities. In addition to its role as a museum, the Davidson serves as a center for historical research and learning.

Kimmel says that in a place "where each epoch had eradicated the marks of its precursors, we were looking for the possibility of reconciliation." As it takes us through layers of time, the Davidson Center offers the hope that understanding brings acceptance, if not reconciliation. ■

Kimmel Eshkolot tried to float the new structure inside and around the old building fabric, so modern columns and ceilings don't quite touch ancient walls (above and right). Glass curtain walls on the eastern part of the building offer views of the Al-Aqsa Mosque in the distance (above left).



Project: *Davidson Center, Jerusalem*
Architect: *Kimmel Eshkolot Architects—Etan Kimmel, Michal Kimmel Eshkolot, Ilan Carmi, project team*
Consultants: *Dorit Harel Designers and Renee Sivan (museological design); LTK (lighting)*
Engineer: *Joseph Gordon Engineers*

SOURCES
Curtain wall: *Phoenicia America-Israel*
Acoustical ceilings: *Lignoform*
Task lighting: *Targetti*

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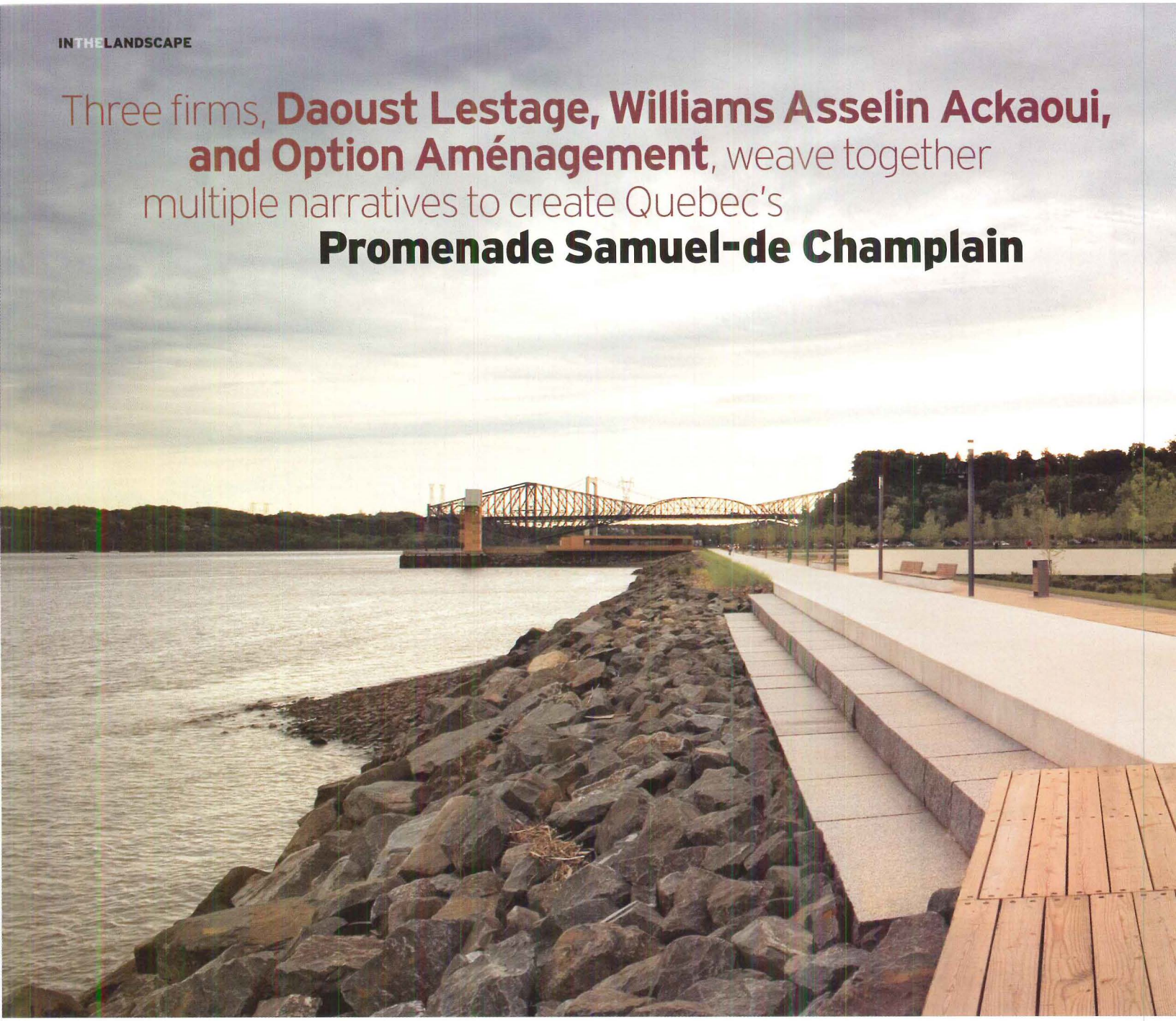
Although the museum takes visitors 26 feet below the entry plaza, the architecture retains a strong connection with the outside and surrounding buildings.

Three firms, **Daoust Lestage, Williams Asselin Ackaoui, and Option Aménagement**, weave together multiple narratives to create Quebec's **Promenade Samuel-de Champlain**



PHOTOGRAPHY: © MARC CRAMER

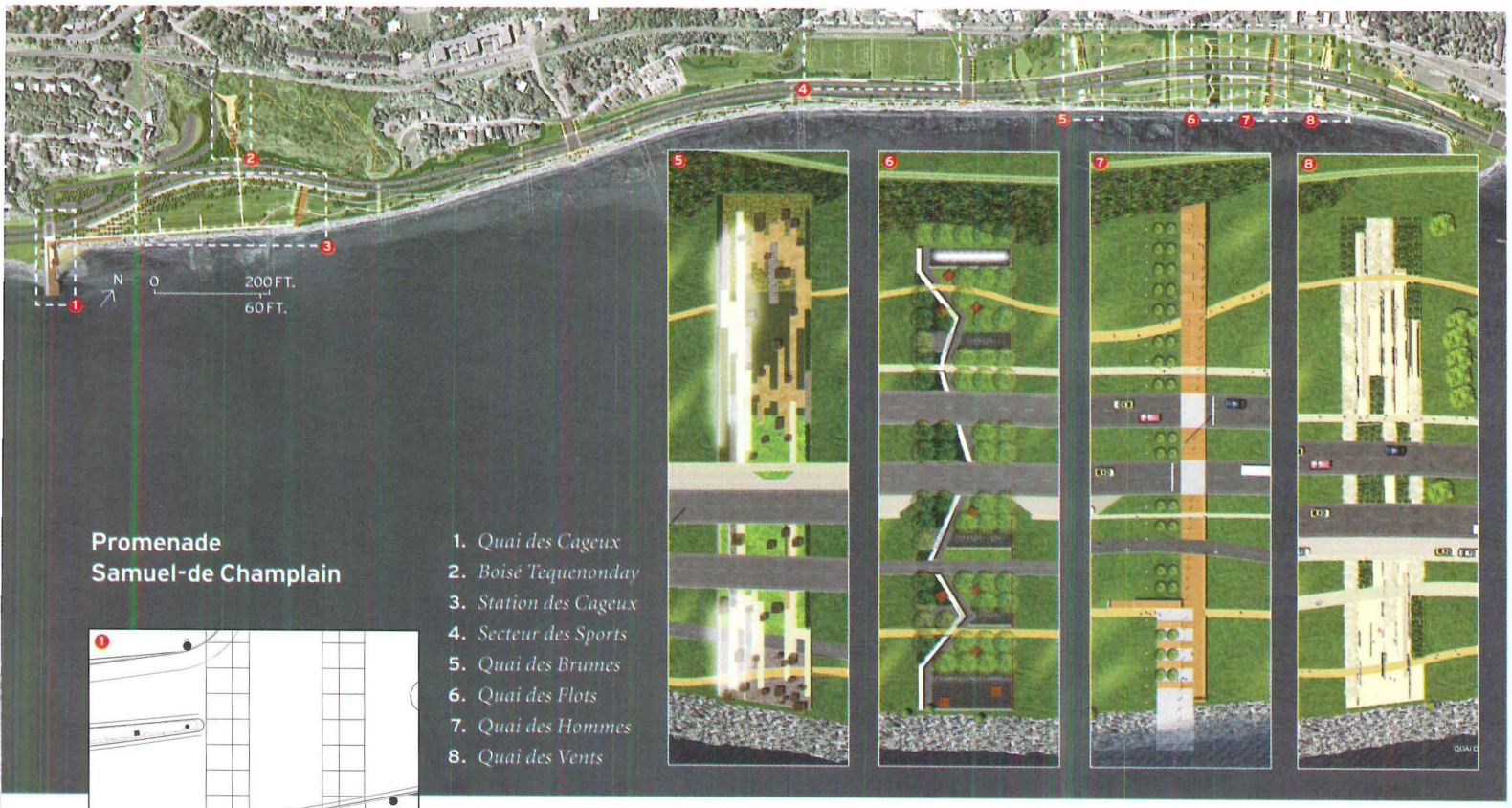
By Joann Gonchar, AIA

Travelers visiting Quebec City this summer who haven't been there for some time, and who approach by car along the Saint Lawrence from the West, will find a stretch of the river's waterfront completely transformed. Just past the Pont de Québec and the Pont Pierre-Laporte, what had once been a largely industrial landscape dotted with petroleum storage tanks is now a leafy linear park filled with pedestrians, runners, and cyclists. This 1.5-mile-long, $63 million (U.S.) section of the Promenade Samuel-de Champlain is part of a vision for a continuous emerald swath that will eventually extend another 6 miles to an area of shoreline near the fortified walls of the Old City.

Completed in June 2008, this first phase was designed by a multidisciplinary consortium of Daoust Lestage and Williams Asselin Ackaoui, both of Montreal, and local firm Option Aménagement, for the Commission de la capitale nationale du Québec, a planning and development agency. One of the project's primary programmatic objectives was to provide access to the riverfront where there had been none. With this goal in mind, the designers' first major move was to relocate the existing roadway that had previously hugged the water's edge. By introducing gradual curves and pulling the four-lane artery away from the shore at a few key spots, the team was able to recover significant stretches of the waterfront for public use, explains Réal Lestage, the consortium's project director. The introduction of these curves, along with the integration of parallel parking spots, also helps slow traffic so that drivers can enjoy the view, adds Renée Daoust.

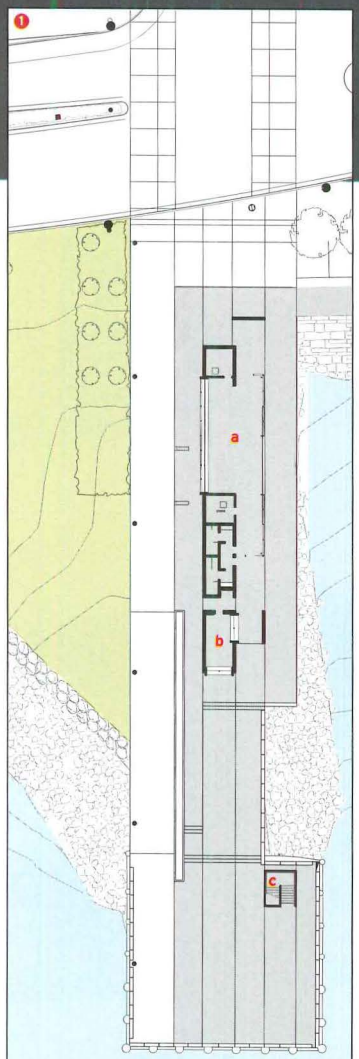
Naturally, the designers wanted to create an environment that could be admired not only from behind the wheel, but also at closer range, on foot or by bike. So, in order to make the immense, 50-acre

A pavilion and 64-foot-tall observation tower (bottom) mark the western end of the Promenade Samuel-de Champlain. Simple shelters (below), which mimic the construction of the tower and pavilion, are located at strategic points in the linear park and frame views of the river's opposite bank.



Promenade Samuel-de Champlain

1. *Quai des Cageux*
2. *Boisé Tequenonday*
3. *Station des Cageux*
4. *Secteur des Sports*
5. *Quai des Brumes*
6. *Quai des Flots*
7. *Quai des Hommes*
8. *Quai des Vents*



a. *Multipurpose space*
b. *Concession*
c. *Observation tower*

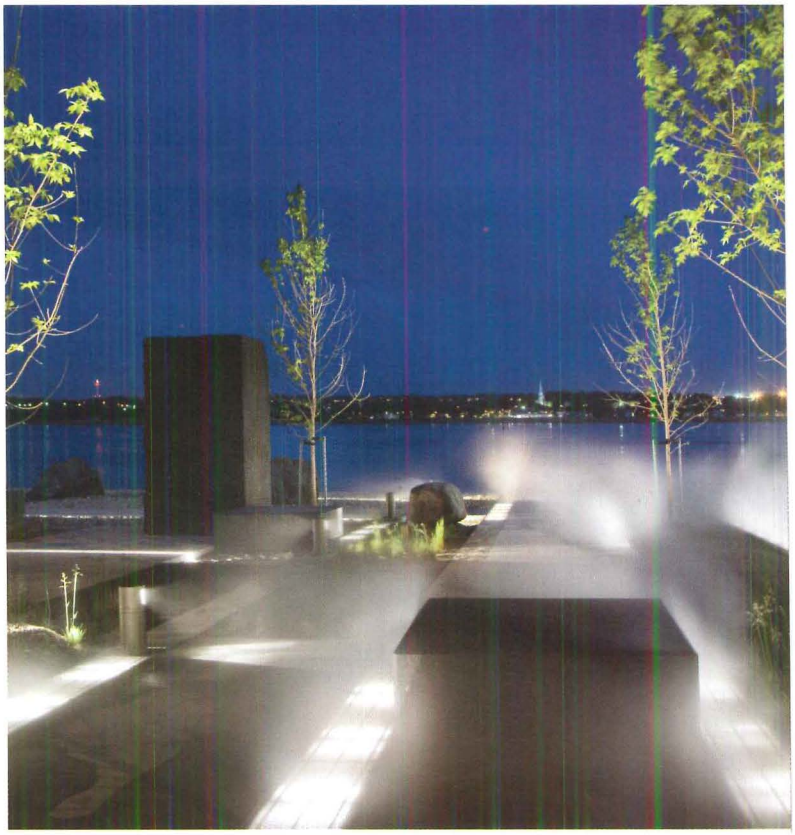
N 0 20 FT. 6 M.

site suitable for activities at slower speeds, they defined several distinct zones along the promenade's length, treating these areas like episodes in a narrative, but providing plenty of breathing room between them.

The first zone is dominated by a 64-foot-tall observation tower that marks the western end of the promenade. The tower and the low-slung, multipurpose pavilion that share a pier jutting out into the river are clad in rough-hewn cedar boards. According to Daoust and Lestage, this treatment is intended to recall *cageux*, the stacks of logs transported down the Saint Lawrence by raft in the 19th century, when shipbuilding and wood export were the main staples of Quebec's economy. The metaphor even extends to the pavilion's roof, which is visible from the top of the tower. Instead of covering it with a conventional membrane, architects clad this fifth facade in the same cedar as the walls. "It is a total wood volume," points out Daoust.

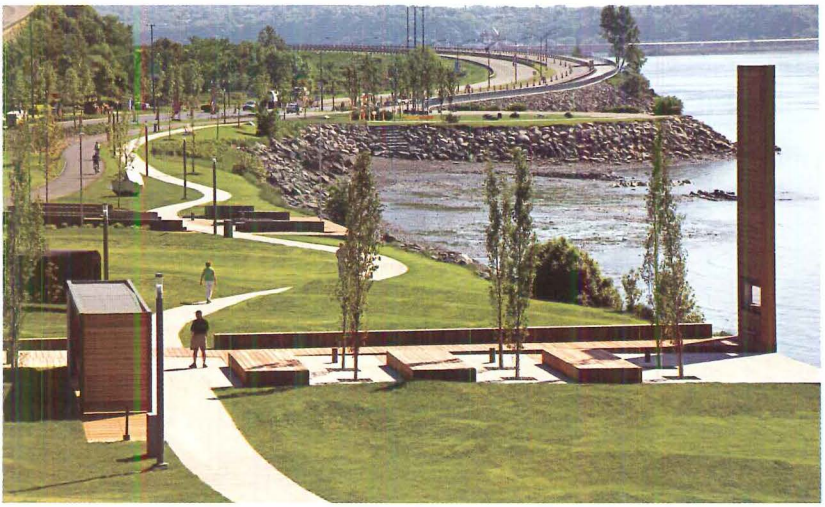
The tower and pavilion are the promenade's most prominent architectural features. It logically follows, then, that the adjacent landscape, called the Station des Cageux, is given the most architectural treatment, with striplike concrete surfaces alternating with areas of wood deck and lawn. Eventually, this rectilinear organization gives way to one that is more organic and meandering, with serpentine paths leading visitors past sports fields on the north side of the roadway, and shelters placed at strategic points along the water's edge. These almost shoe-box-shaped structures are cedar-clad, like the Cageux tower and pavilion, and have voids that frame views of the river's opposite bank.

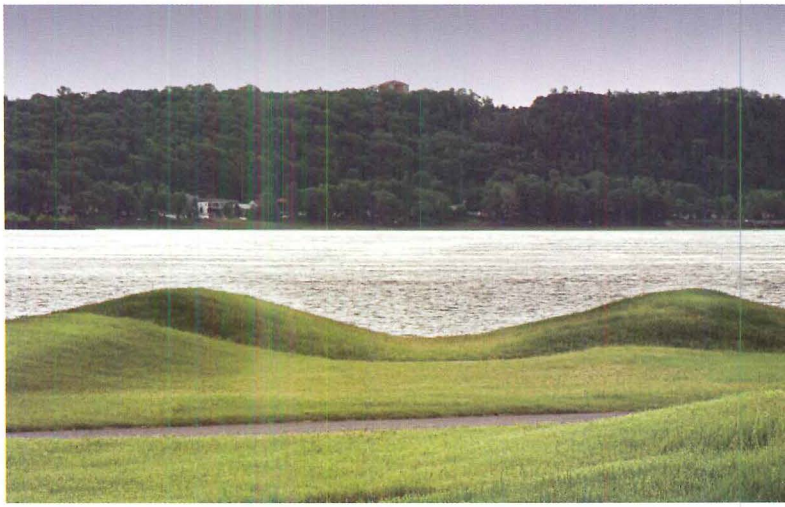
At the eastern end of the promenade, a subtly sculpted lawn evoking waves covers an approximately 20-acre area. This "green tide"



In the Station des Cageux (opposite), at the western end of the park, the landscape is composed of striplike surfaces of concrete that alternate with wood deck and lawn. At the eastern end, four thematic gardens represent different aspects of the Saint Lawrence. The Quai des Brumes (above) re-creates the veil of mist that sometimes covers the water. The Quai des Flots (left) includes several sets of water jets and a paving pattern inspired by thawing river ice floes.

A serpentine path (below left) leads park visitors through the subtly sculpted, wavelike grass carpet (below right) that surrounds the Quai des Hommes (above), and the three other thematic gardens. The easternmost garden, the Quai des Vents (opposite), contains aluminum wing-shaped elements that pivot atop tall poles, tracking the direction of the wind.





reminds visitors that the promenade sits on landfill, says Daoust. "Prior to having land here, there was water," she says.

Crossing the wavy grass carpet and oriented perpendicular to the water's edge are four narrow, rectangular gardens, each representing a different aspect of the river, explain the designers. In the Quai des Brumes, mist emerges from the ground surrounding mammoth pieces of granite. In the Quai des Flots, a wood platform seems to float on the surface of a shallow reflecting pool created when its water jets are turned on. In the Quai de Hommes, a long wood path transforms into a totemlike wall at the shoreline. And in the last garden, the Quai des Vents, tall grasses rustle in the wind and wing-shaped aluminum elements pivot atop tall poles, tracking the direction of the gusts.

The promenade also incorporates important artifacts already present on the site. To lead visitors from the Station des Cageux to the Boisé Tequenonday, a hilly wooded area containing Native American archaeological finds, the designers created a long wood stair terminating in a lookout point. The new access to the historically significant spot adds another dimension to the already rich and varied project. And it is an example of the scheme's sensitivity to the potential of the site.

Although no timetable has been set for the promenade's remaining 6 miles, the client has acquired almost all the necessary land. The part that is already realized sets a high bar for what is yet to come. ■

Project: *Promenade Samuel-de Champlain, Quebec*
Design: *Daoust Lestage, Williams Asselin Ackaoui, Option Aménagement*
Consultants: *GENIVAR, SNC-Lavalin (engineering); Éclairage Public (lighting)*

SOURCES
Granite: *Polycor; Granicor*
Wood: *Goodfellow*
Lighting: *Cooper; Lumascape; Sistemalux; WE-EF*
Urban furniture: *Équiparc; Tremca*

View more detailed plans and additional images at **architecturalrecord.com/projects**.

Marc Rolinet shapes a light-filled sanctuary using technology and craft in his design for the **Chapel of the Deaconesses of Reuilly** in Versailles

By Tracy Metz

A study in contrasts, French architect Marc Rolinet's Chapel of the Deaconesses of Reuilly brings together all the classical functions of a church in two pure forms: a stark triangle of glass and, inside it, a rounded, egglike structure made of wood. A recent addition to the central Versailles home of this French order of Protestant nuns (founded in 1841), the chapel was completed in March 2008. It resides on parklike grounds—quite serene in spite of being located next to a train station—that accommodate several buildings, including the original grand manor, a hospital, a conference center, and a small complex, also by Rolinet, of arts studios and rooms for novices (2001).

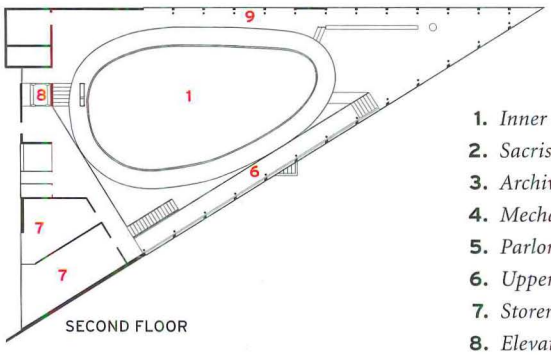
For years the deaconesses, who attach great importance to social service and exchange, would come from their small group homes all over the world for meetings and prayer, holding their services in a tiny century-old chapel and in a stationary tent erected for the typical overflow of visitors. Although not particularly comfortable, the tent had the advantage of not requiring a building permit. But when it was demolished by a storm in 1999, the deaconesses realized it was time for a larger and more permanent structure.

But, *eh bien*, what about the building permit? In Versailles there is an architect in charge of preservation for the famous château and its surroundings. In practice, says Rolinet, the whole town qualifies as "surroundings," and the deaconesses needed this architect's permission to demolish the old chapel and build a new one. With audible relief, Rolinet recounts that the project was immediately approved.

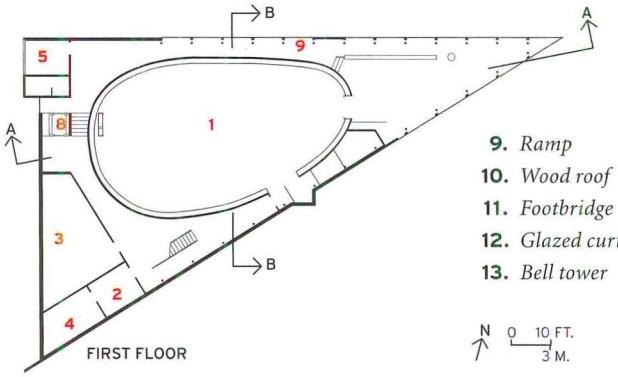
"I had two main concepts for the design of this chapel," recalls Rolinet, who has offices in both Paris and Geneva. "One was that it had to consist of strong, simple shapes with roots in Christianity, even though Protestants are not strong on symbols. The other was the use of a second skin to separate the actual chapel from the building around it." His solution is an ethereal glass envelope that protects its precious package. He fitted the design with wood slats and finely woven metal-mesh panels along the facade facing an adjacent train station to provide privacy without diminishing the transparency. This outer

Tracy Metz is RECORD*'s Amsterdam-based correspondent.*

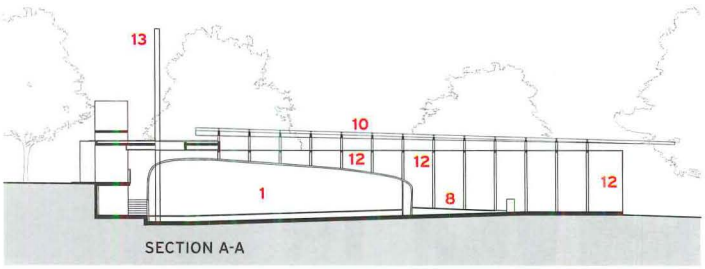
Marc Rolinet's Chapel of the Deaconesses of Reuilly emerges out of the hillside as a stark glass triangle (opposite). Its high-tech exterior encloses a handcrafted inner chapel of curved wooden slats (this page).

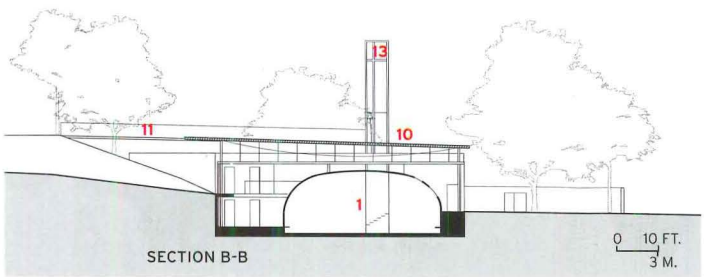


1. *Inner chapel*
2. *Sacristy*
3. *Archives*
4. *Mechanicals*
5. *Parlor*
6. *Upper walkway*
7. *Storerooms*
8. *Elevator*



9. *Ramp*
10. *Wood roof*
11. *Footbridge*
12. *Glazed curtain wall*
13. *Bell tower*





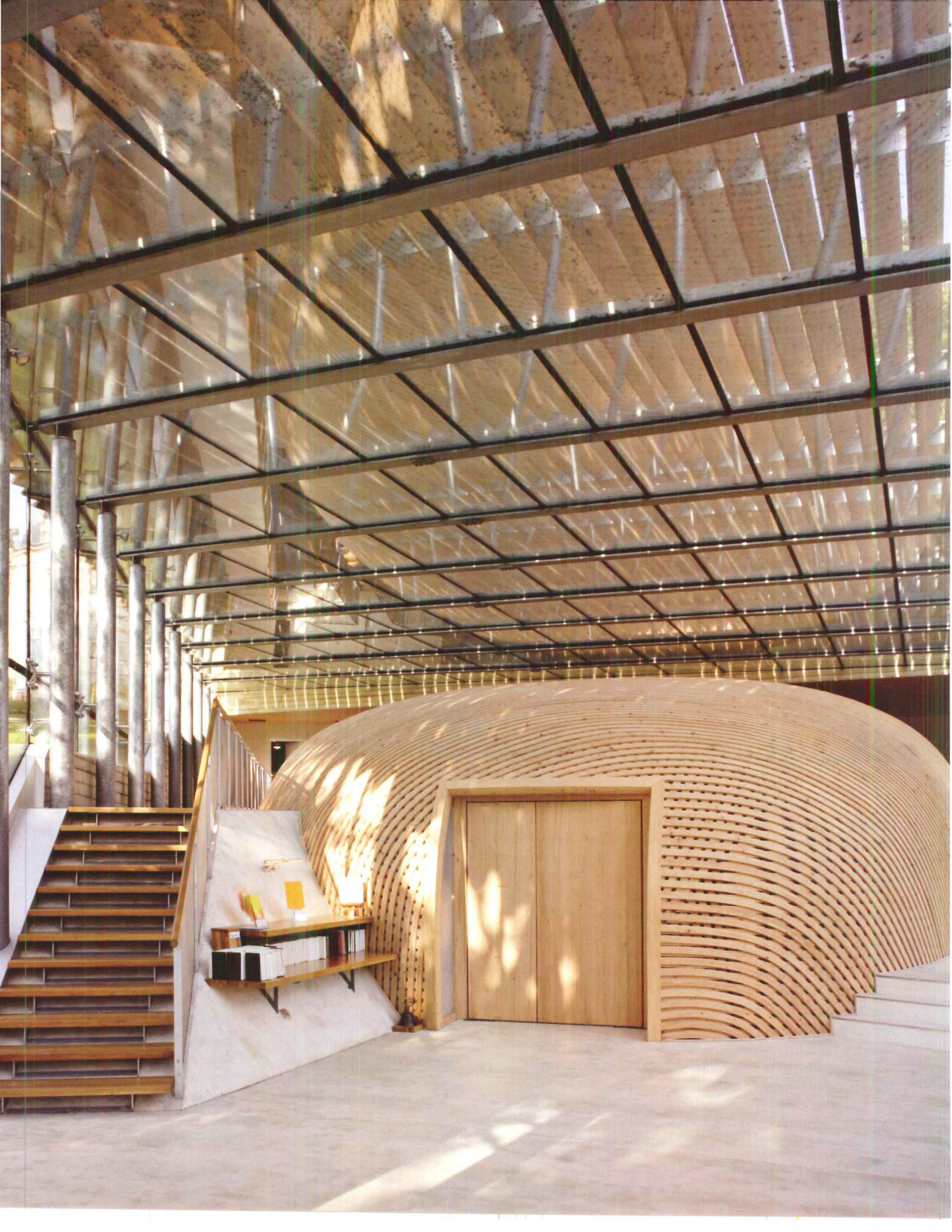
The spaces between the wooden interior chapel and the glass facades serve both as circulation and social space (top left). A stair leads down from the upper-level back entrance. Light passing through the slats of the wooden chapel dapple the rear wall (above). A pitched wood-slat Corbusian brise-soleil shades the transparent volume and wooden chapel within it (opposite).

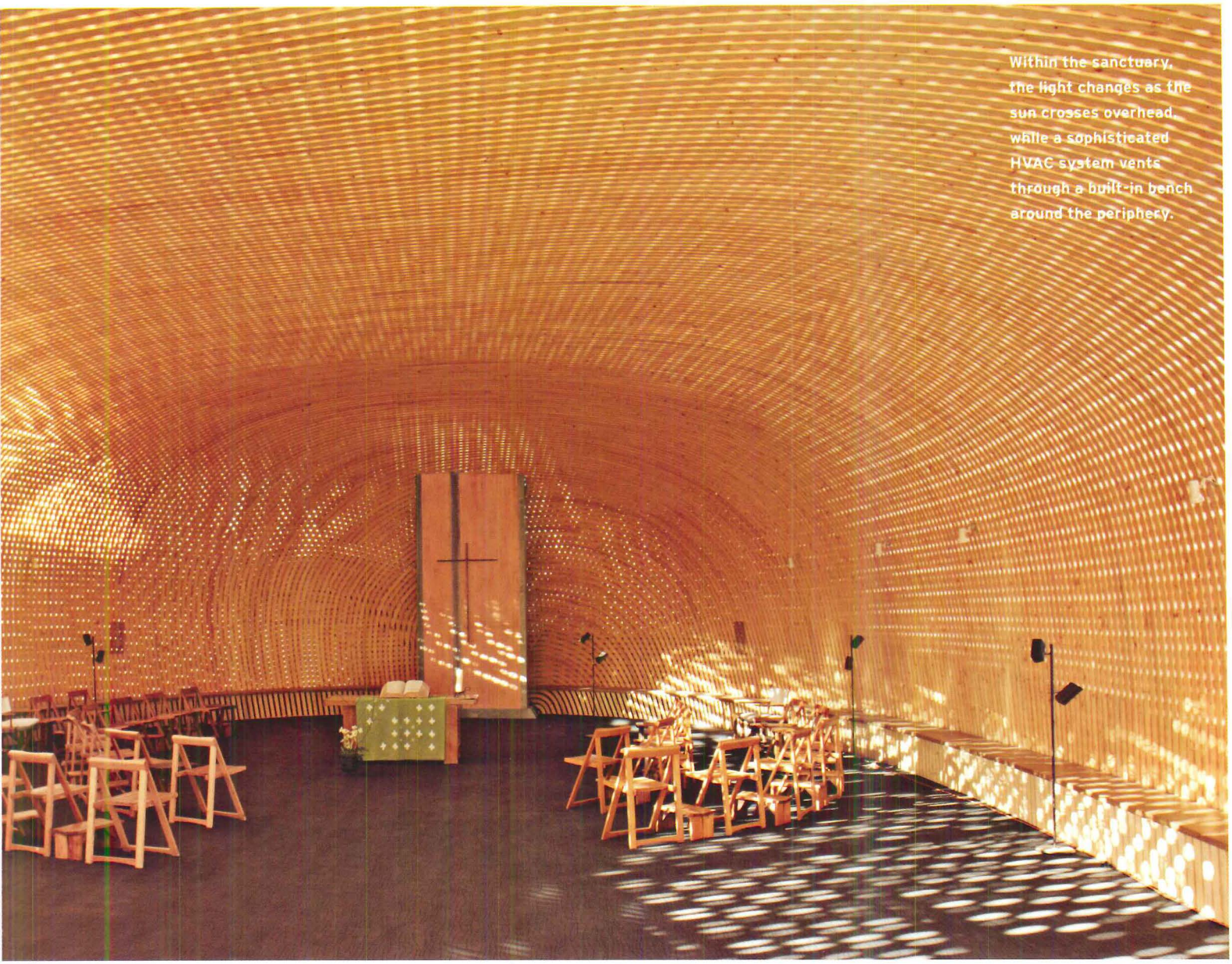
layer of glazing also minimizes noise.

Following the uneven topography of the site, the chapel nestles into a hill that the architect shaped into a series of terraces to emphasize the contrast between the landscape as a natural phenomenon and the chapel as a man-made intervention. He carved the slope behind the building to allow daylight in and create space for an emergency exit. A footbridge here leads to a rear entrance used by the nuns. The public enters via a path through wooden doors near the apex of the triangle.

The 6,675-square-foot chapel is not an inward-looking cloister, but a volume that is sheltered yet open and welcoming. It is also in harmony with its environs. "The chapel's social function had a major influence on the materials and costs," says Rolinet. "I suggested thinner glass for the facades and roof, but the sisters insisted that it be warm enough inside to use all year. That meant we needed special glass."

The laminated glazings selected, for both the facades and roof panels, are layered compositions (with different configurations for the vertical and horizontal surfaces) of tempered glass of varying thicknesses, with air gaps in between, some of which are fortified by a struc-





Within the sanctuary, the light changes as the sun crosses overhead, while a sophisticated HVAC system vents through a built-in bench around the periphery.

tural interlayer that provides strength and stability to the overall construction. This allows the building to be lighter and stronger than with other glazings, and made it possible to use 7.2-foot-long trapezoidal panels for the roof's glass base, which at 2.15 inches thick is supported by galvanized steel columns running along the inside of the facades. To control solar heat gain and shed rainwater, Rolinet placed a pitched layer of angled wood planks on galvanized steel tubular supports above the glass triangle like a Corbusian brise-soleil.

Supplementing the insulating properties of the laminated glass, Rolinet installed radiant floor heating and a heat pump, which captures and recycles the heat from the outside air. Keeping mechanical intrusion to a minimum, he devised a clever venting system whereby fresh air enters from under the benches around the perimeter inside the wooden structure. As it heats up, air rises and exits through the interstices between the wooden slats.

The warm, cocoonlike inner sanctuary—made possible by sophisticated materials and systems—establishes a thoughtful balance between technology and craft. Built by hand, the wooden egg features strips of pine curved piece-by-piece in a steam tank created for the project. The floor slopes gently toward a simple altar. Instead of fixed pews, the architect specified a few sturdy chairs for the deaconesses, folding chairs for the congregation, and the continuous benches built into the sides of the rounded walls. The informality of the seating enhances the intimacy of the space. The filtered light, too, is marvelous, with the sun throwing ever-changing, dappled patterns on the floor as it moves across the sky. "Throughout history, church buildings have been transformed by light entering their windows," Rolinet remarks. "Here, the building itself is the window." ■

Project: *The Chapel of the Deaconesses of Reuilly, Versailles*
Architect: *Marc Rolinet & Associes—Marc Rolinet, Sylvain Vogt*
Engineer/contractor: *Polkop*

SOURCES
Glazing: *Eckelt Glass; Saint Gobain Glass; DuPont (Sentry Glas ionoplast structural interlayer)*
Insulation: *Rockwool*

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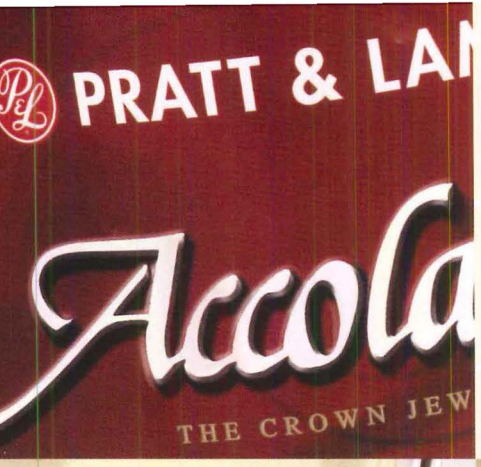

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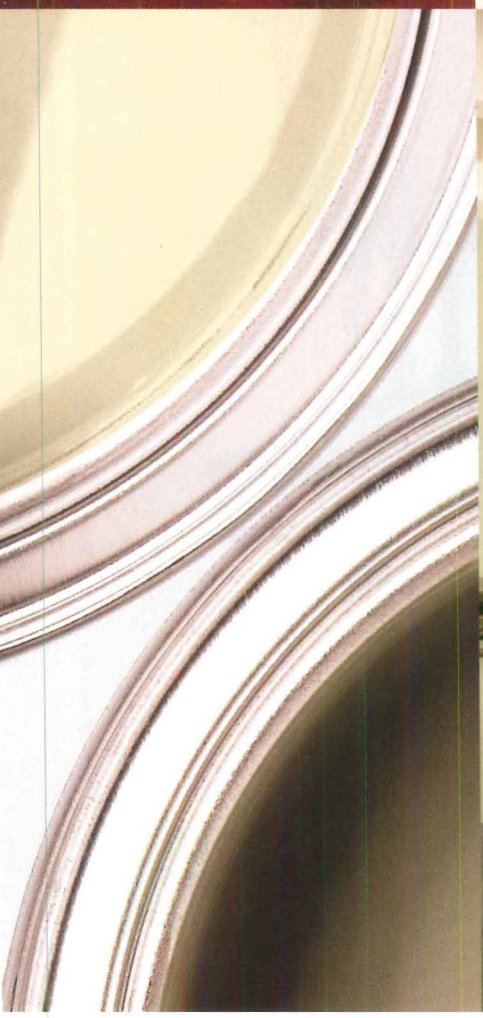

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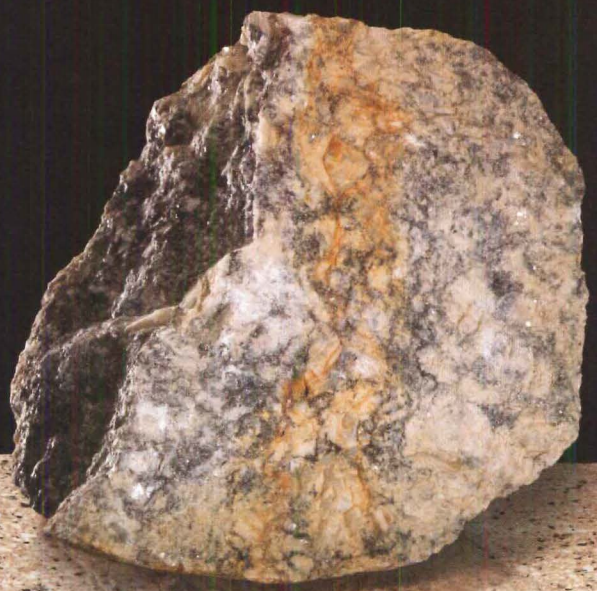

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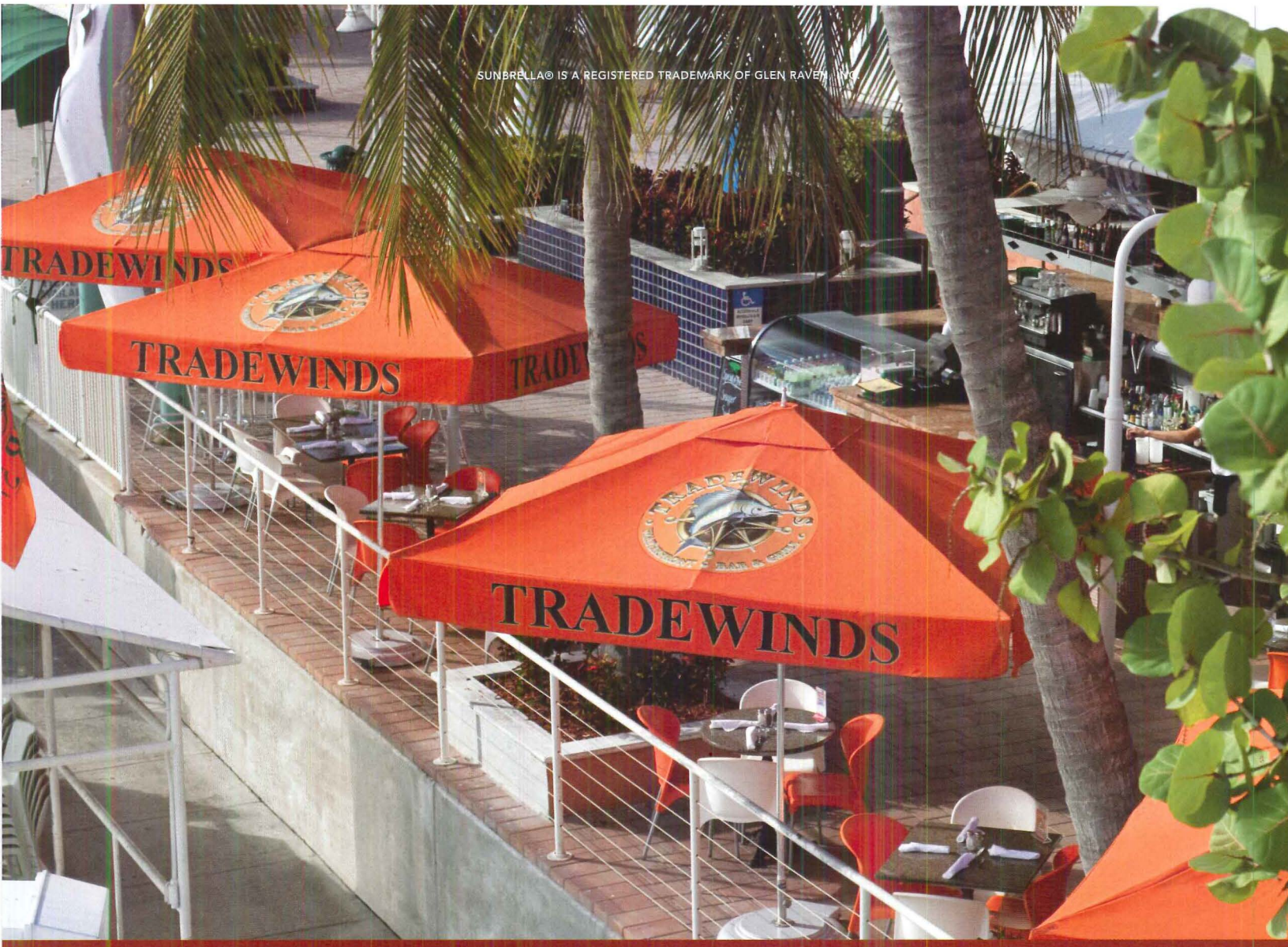

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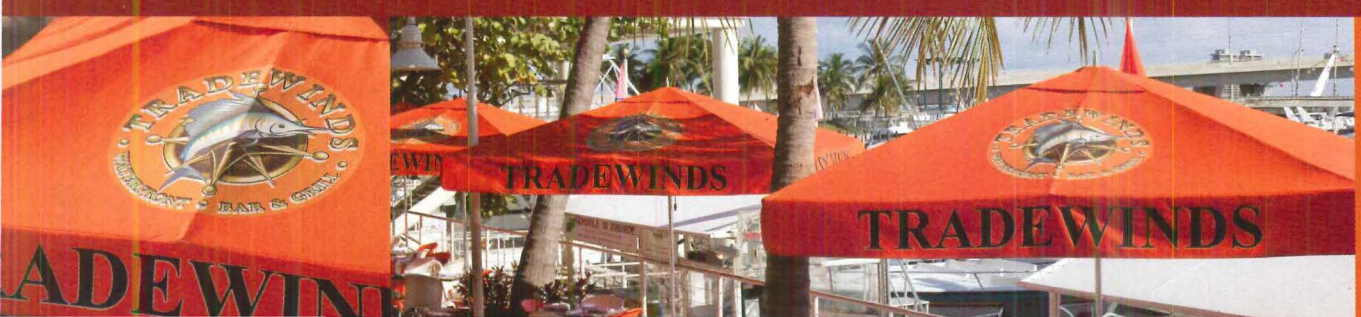

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CIRCLE 38

Building on the Past

Three design teams get high marks for resourceful plans that expand and update schools while respecting the architectural integrity of existing campuses and buildings.

By Linda C. Lentz

Though considered an excellent example of Modern, regional architecture and a progressive educational facility when it was built in 1958, Paul Rudolph's Riverview High School in Sarasota, Florida, is set to fall victim to the wrecking ball this summer [RECORD, June 2009, page 22]. Technology and age caught up with the building, and they were exacerbated by shoddy enhancements over the years and a need for more parking. So the local school board decided to tear down the structure and put up a new one, taking an approach that is all too typical in a country where the past is often seen as a burden rather than a resource. Although a design competition last year offered alternatives to demolition, the school board said it couldn't afford any of them.

The schools featured on the following pages struggled with similar issues, though on a smaller scale. Each had a growing student body that required state-of-the-art facilities, and each had a rich architectural legacy. Yet in every case, when renovation and/or expansion became necessary, the client considered and balanced the historic context of the campus with the demand to be current.

When the Texas firm Lake/Flato and the Los Angeles office of Gensler got the job to devise a master plan to improve St. Matthew's Parish School in Pacific Palisades, California, they absorbed the design ideas of the school's original architects, mid-20th-century Modernists A. Quincy Jones and Frederick Emmons. Instead of starting from scratch, Lake/Flato and Gensler chose to celebrate the legacy of their predecessors.

At the Wheeler School in the historic College Hill area of Providence, Ann Beha Architects inserted a contemporary, two-story glass structure between 19th-century and early-20th-century buildings, connecting them both inside and out. For this first piece of a three-phase plan, the firm expanded and enhanced the school's eclectic 120-year-old campus, employing transparency to avoid overwhelming the older buildings or mimicking their styles.

In Norway, the partners at Jarmund/Vigsnaes respected the 1960s-era modular construction at the Oslo International School—leaving the structure largely intact, freshening the interiors, and adding a series of pavilions to satisfy the school's need for larger facilities.

There will always be debate over whether to hold on to the past or build anew. But architects and clients need to consider all alternatives before making plans. History—both social and architectural—lives in our old school buildings, and children can learn from them. ■

ST. MATTHEW'S PARISH SCHOOL
Pacific Palisades, California
Lake/Flato and Gensler celebrate the spirit of Jones and Emmons in campus enhancements made to a lower school designed, in part, by that mid-20th-century California firm.

THE WHEELER SCHOOL
Providence, Rhode Island
Ann Beha Architects tackles a delicate program for a progressive K-12 school that includes a green addition to and renovation of historic properties on an urban campus starved for space.

OSLO INTERNATIONAL SCHOOL
Bekkestua, Norway
Jarmund/Vigsnaes updates a tired 1960s-era K-12 school with wit and imagination, replacing temporary structures and building out on the institution's spacious grounds.

View six additional private school projects at **architecturalrecord.com/projects/bts**.

PHOTOGRAPHY (FROM TOP TO BOTTOM): © BENNY CHAN; DAVID LAMB; IVAN BRODY

One: St. Matthew's Parish School
Pacific Palisades, California

Lake/Flato and Gensler collaborate to devise a 21st-century campus, building upon a foundation established by Jones and Emmons.

By Sarah Amelar

Architect: *Lake/Flato Architects—David Lake, FAIA, Matt Morris, FAIA, Tenna Florian, AIA, Kenny Brown, Trey Rabke, Jay Pigford*
Architect of record: *Gensler—Robert Jernigan, AIA, Arpy Hatzikian, Melanie McArtor, AIA, May Lau, Konstanze Valdez, AIA*
Client: *St. Matthew's Parish School*
Engineers: *VC Engineers (civil); Oxford Engineering (structural, remodel); BP Consulting Engineers (structural, new building); Building Solutions Group (m/e/p)*
Consultants: *[place] (landscape); Newson Brown Acoustics (acoustical)*
General contractor: *Dreyfuss Construction (remodel); Winters Schram Associates (new building)*

Size: *24,500 square feet*
Cost: *Withheld*
Completion date: *September 2006*

SOURCES
Concrete: *Shaw & Sons*
Lighting: *Lithonia Lighting*
Paint: *Benjamin Moore*
Cabinetry: *S&H Cabinet and Manufacturing (custom)*
Furniture: *Ki*
Locksets: *Schlage*

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Inspired by the landscapes and climate of Southern California, the quintessential work of A. Quincy Jones, most notably his houses, emphasizes simple, open forms, with thin roof planes floating above clerestory windows, and interiors interwoven with the great outdoors. In his academic buildings, such as the St. Matthew's Parish School, in Pacific Palisades, California, a similar sensibility emerges.

In the early 1950s, after St. Matthew's moved its chapel from downtown Pacific Palisades to a rural, woodland property nearby, the parish hired Jones and his partner, Frederick Emmons, to expand the chapel and design a larger church for future construction. Though that new church was never realized, the architects transformed the chapel (which burned down 25 years later), devised a master plan for the 30-acre site, and erected several buildings there for a pre- and elementary school, including classrooms and a freestanding library.

By the turn of the millennium, this thriving Episcopal day school, with 325 students from prekindergarten through eighth grade, needed significant campus improvements. St. Matthew's hired Gensler's Los Angeles office to create new athletic facilities and, about five years later, invited the firm back, with Texas architects Lake/Flato as the design architects, to produce an updated master plan (the Jones and Emmons document was lost long ago) and a much-needed larger library with new classrooms.

Sarah Amelar is a contributing editor at RECORD.

Set in a canyon's cleft, with scarce level ground, the campus suffered from disconnected parts. And ADA requirements, plus stringent mudslide-protection codes, all developed since Jones's day, needed serious attention. Architecturally, the greatest challenges stemmed from the complex demands of the steep hillsides.

Program

Lake/Flato and Gensler proposed replacing the original modest, and therefore woefully inadequate, library with a larger one, envisioning a flagship for the entire campus.

Phase 1 would convert the 3,400-square-foot library into a kindergarten classroom, low-tech science lab, and small computer center. Phase 2 would demolish two modest, single-story classroom structures (not by Jones and Emmons) and replace them with a 21,100-square-foot building housing a 9,850-square-foot library, four classrooms, and music, language-arts, and multipurpose rooms.

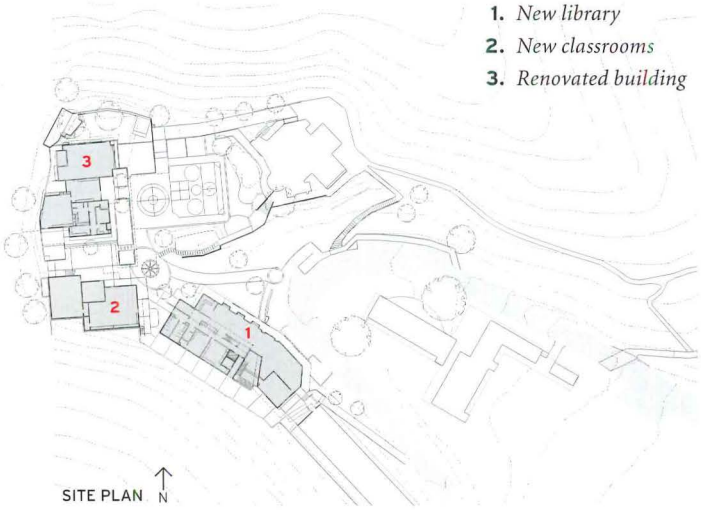
St. Matthew's academic buildings have always been clustered at the campus's steep northwest end, uphill from the parking lot, gymnasium, and parish church (by Moore Rubell Yudell, following the fire). Enlightened landscaping, pathways, and outdoor play areas, the architects realized, would be key to integrating the disjointed upper campus.

Solution

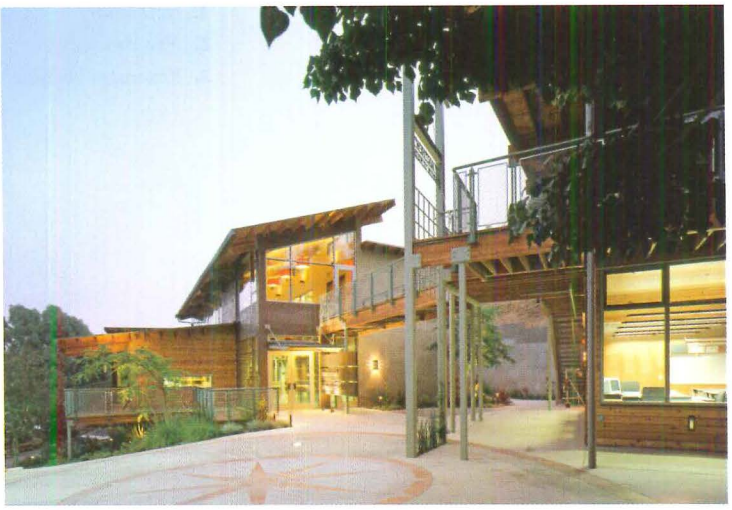
"This project was a Rubik's Cube when it came to inserting new construction without intruding on campus life," recalls Lake/Flato principal David Lake. The goal, he adds, was "a quiet architecture that fit with the landscape and the original buildings."

Because the old library's fascia had partially rotted and seismic upgrades were necessary, the architects took the one-story building down to its posts and beams. They removed various accretions, restoring the massing's original simplicity. The spirit of Jones and Emmons, rather than slavish reconstruction, guided the adaptation of the old library to new uses, with skylights added and windows adjusted to enhance the quality of light and visual connection with the outdoors.

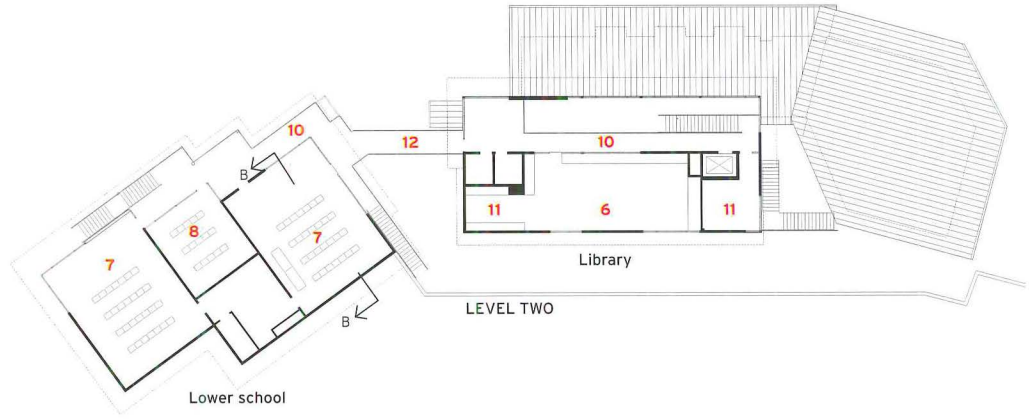
Along the facing canyon wall, just a few yards away, the design team sited the new library and classroom building. A hinged pair of volumes flanking an upper-level bridge, it has classrooms on one side and the new library, with music and multipurpose rooms below, on the other. Like a treehouse hovering at the tree canopy, the structure – clad in cedar with stucco to blend with the surroundings – perches lightly on the ground, the library not exceeding the pad of its demolished predecessor. Long and horizontal, the new building continues the spine of the existing classroom structures, stitched along the canyon's face.

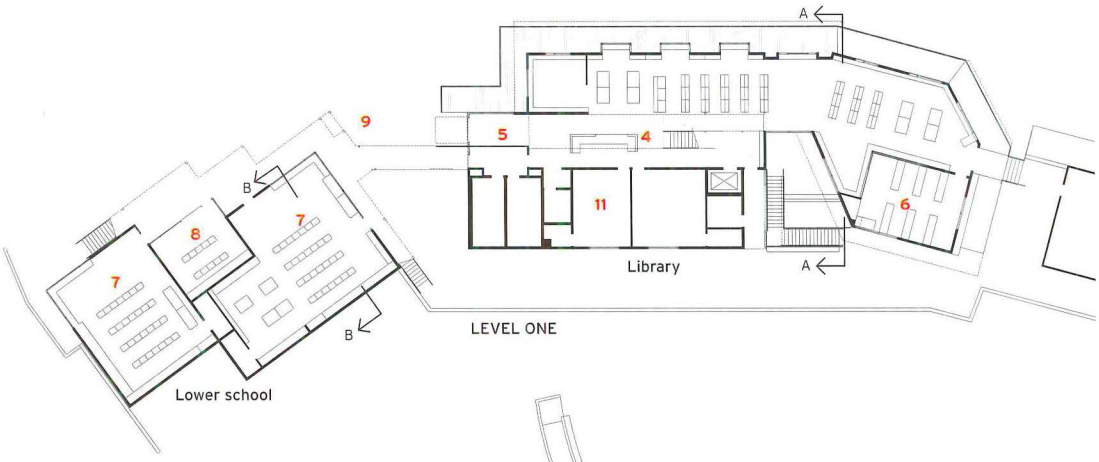


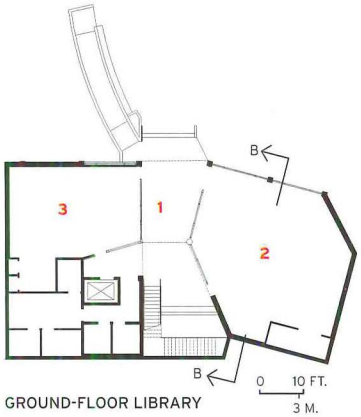
The new library/student center is clad in cedar and stucco to blendwith its environs (this page). The ground-level entrance is located on the campus drive (above).



The new library/ student center and classroom buildings are connected by an outdoor commons and catwalklike bridge that transitions into a balcony (left).







1. *Entrance*
2. *Multiuse room*
3. *Performing arts*
4. *Library*
5. *Second-floor lobby*
6. *Resources*
7. *Classroom*
8. *Breakout room*
9. *Commons*
10. *Porch*
11. *Office*
12. *Bridge*

While the original classrooms were accessed from the back, via a path between the buildings and canyon wall, the new structure offers entry from generous porches along its front, as well. Replacing single-story buildings, the new one rises three stories to accommodate the grandeur of double-height library space inside. The result is an architecture fully engaged with this small canyon, yielding views across it while inviting activity to flow between interior and outdoor realms.

Paths, extending from outside in, thread through the upper campus. Gentle switchbacks, amid native, drought-resistant plantings, now replace a straight road uphill. The building's bridge feeds into its porches. Steel-grate rails and wood planks underfoot bring the language of the porches inside, through a long stair in the library's double-height space.

Where students once trudged uphill to class from the car drop-off, an entry sequence now traverses the slope, through open-air stairs integrated into the building. The introduction of an elevator also enhances circulation (and ADA compliance).

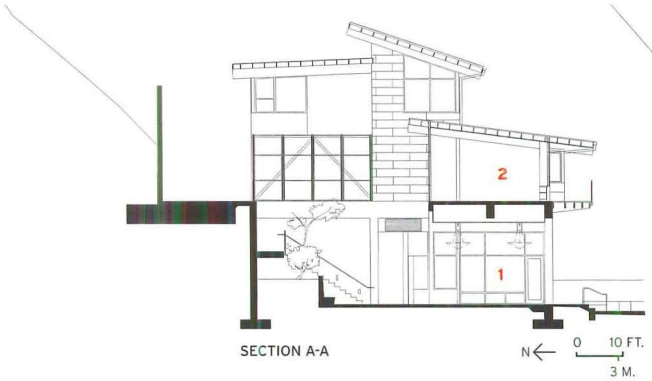
With its lofty interior, the library, a magnet on campus, addresses all of the children, with a storytelling nook, stacks, and worktables. The airy new classrooms have clerestories and large operable windows, primarily north facing, with deep overhangs, reducing glare and heat gain.

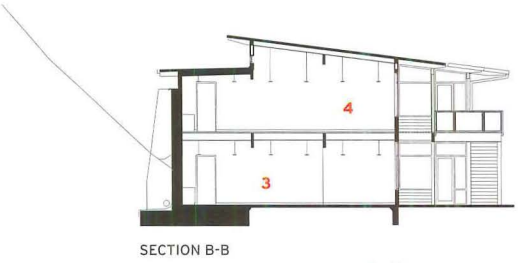
Commentary

Taking advantage of a climate so mild that the students eat outdoors, not in a cafeteria, the architects transformed difficult terrain into an asset. Reminiscent of jungle rope bridges, long porches provide intimate tree-canopy views, as well as classroom-spillover spaces, now accented with bins of colored balls and hula hoops. Taking cues from the campus's original design, Lake/Flato and Gensler went even further to merge the interiors with the landscape.

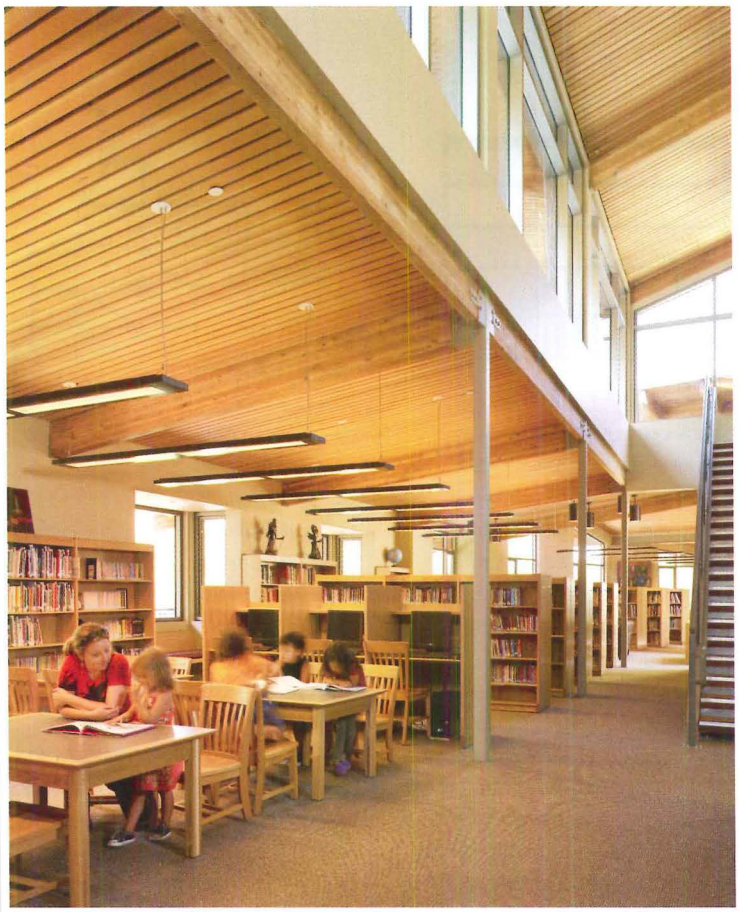
"We wanted the place to be fun," says Lake, "with an informality that celebrates the spirit of play, combined with a serious discourse of learning." Judging by the activity on campus, it seems they've achieved that. ■

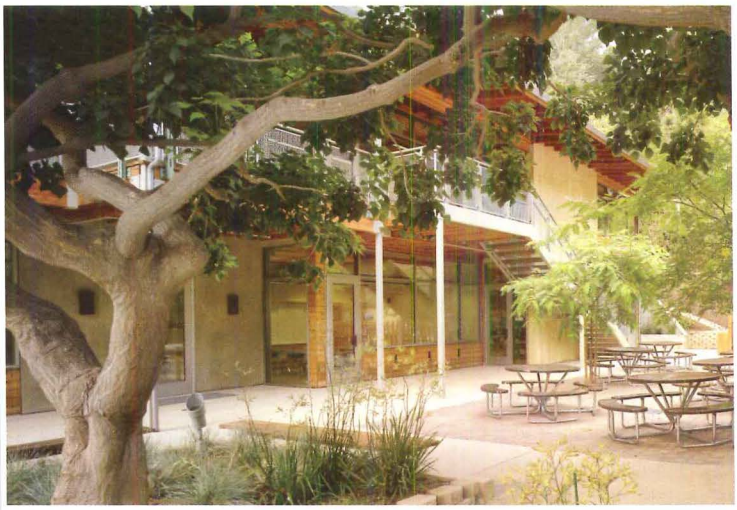
Sunlight floods the library (below left). A balcony and resource room overlook the stacks (below right). Grades 1 to 4 are housed in the new adjacent classroom building (bottom right). The commons in front is where the children eat (bottom left).





1. *Entrance*
2. *Library/study*
3. *1st-grade classroom*
4. *3rd-grade classroom*





Two: The Wheeler School
Providence, Rhode Island

Ann Beha Architects creates a transparent link between the past and present with a contemporary glass student-union addition.

By Linda C. Lentz

Architect: *Ann Beha Architects—Thomas M. Hotaling, AIA, principal in charge; Steven Gerrard, AIA, Jason Bowers, AIA, Lindsey MacDonald, design team*
Client: *The Wheeler School*
Engineers: *Odeh Engineering (structural); Wilkinson Associates (mechanical); Ramsey Loqua (code/fire protection); Gaskell Associates (electrical); Geisser Engineer (civil)*
Consultants: *Pressley Associates (landscape); Sladen Feinstein Integrated Lighting (lighting); Acentech (acoustical); ArchWorks (exterior tech detailing); Wil Spec (specifications); Crabtree McGrath Associates (food service); Queastor Group (cost estimator)*
General contractor: *Agostini Construction*

Size: *10,000 square feet (new building and renovation)*
Cost: *$3.8 million*
Completion date: *March 2009*

SOURCES
Metal/glass curtain wall: *Efco*
Metal cladding: *Zinc by Rheinzinc*
Glazing: *OldCastle*
Roofing: *TPO by Carlise (elastomeric); Yardworks (green roof)*
Ceilings: *Ceilings Plus (wood); Armstrong (new vestibule/classrooms)*

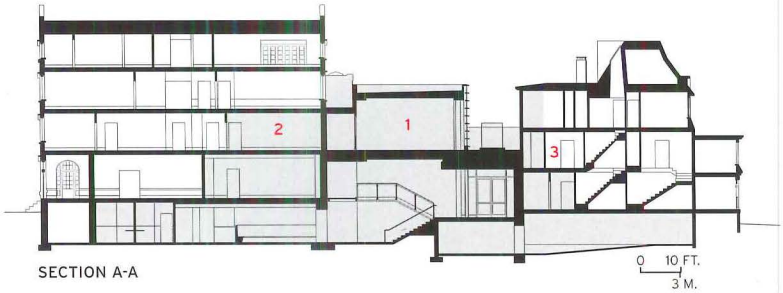
Rate this project and access additional sources at ***architecturalrecord.com/bts***.

Located on a steep hill rising from the east bank of the Providence River, the College Hill neighborhood in Providence was the site of the first permanent colonial settlement in Rhode Island. Primarily residential, it currently constitutes one of the city's most extensive enclaves of historic architecture, as well as being home to Brown University and the Rhode Island School of Design – all carefully monitored by the Providence Preservation Society. Yet the Wheeler School's new two-story Nulman Lewis Student Center, a contemporary glass building that adjoins early-20th-century brick and 19th-century wood-frame structures on either side, has won the respect of both the school and local communities with nary a protest from traditionalists.

This warm welcome stems largely from a sensitive design that balances both the historic urban context and the demands of an independent coed day school easing into the 21st century.

Program

Founded in 1889 by educator and artist Mary Wheeler, her eponymous institution had grown over the years from its original 10 girls to a student body of more than 800 boys and girls, ranging from nursery school through grade 12. Its physical plant had also evolved from one building (still in use) into an assemblage of properties and eclectic structures from various eras that lacked cohesiveness and the sense of belonging to one campus. Additionally, says school business manager Gary Esposito, "Our enrollment was demanding more space. Our dining service was crowded, and the kids needed space to relax and socialize."



SECTION A-A

1. *Nulman Lewis Student Center*
2. *Hope Building renovation*
3. *Clark Alumni House renovation*

A call for master plans in 2003 generated several remedies, one of which would have built on precious outdoor space used for children's activities. The school's building committee ultimately selected a resourceful scheme developed by Boston-based Ann Beha Architects in 2006. This three-phase plan identified underutilized or seemingly unusable plots on the city-block-size main campus as potential new-build sites – integrating new structures with adjacent older ones that could be renovated in the process.

One of these targeted areas was a 30-foot-wide plot allocated to the school's dumpsters, between the wood-frame Clark Alumni House (1887), where the administrative offices reside, and the brick Hope Building (1910), home to the student union, cafeteria, school shop, and middle school. According to Ann Beha principal in charge Tom Hotaling, it was a piece of prime real estate, narrow but buildable. So he and his team filled this gap with the Nulman Lewis Student Center, the first phase of their master plan, abutting the two older structures and forming a bridge between them. This simple, 10,000-square-foot intervention set the stage for a radically improved redistribution of space among the three very different buildings.

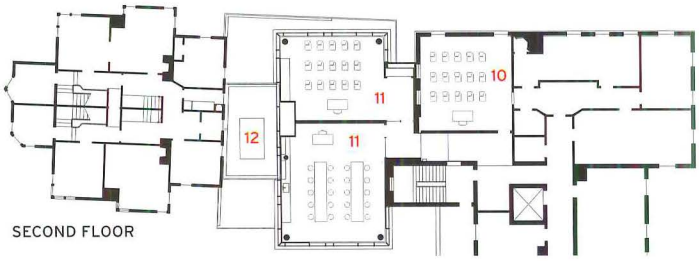
Solution

Rather than mimic the style of one of the structures they were linking to, the designers devised a modest, cast-in-place concrete construction that wouldn't compete with or overwhelm either of them. They designed the new building's ribbed-glass-and-aluminum curtain wall to be in proportion with the existing buildings' fenestration. They also specified zinc to sheathe the junctures of the buildings so as to echo the school's zinc-clad gym, which is across campus.

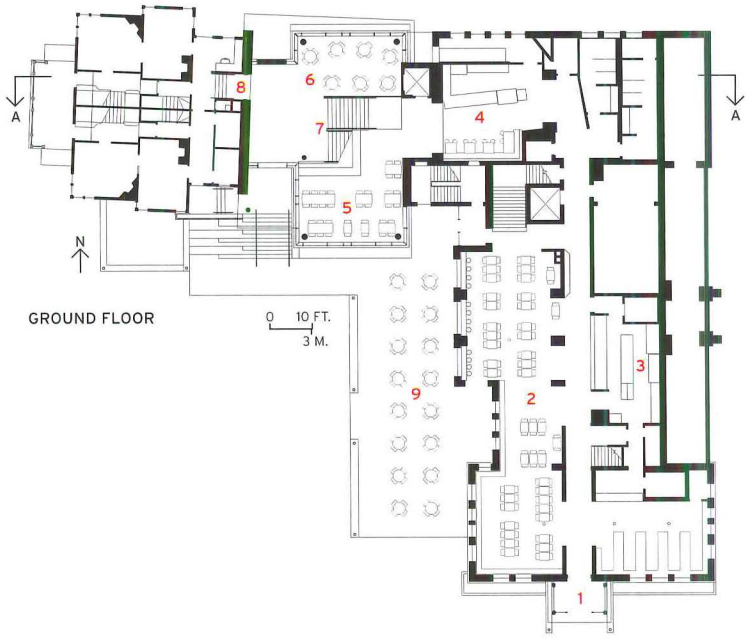
"The new building is tucked

The Wheeler School's Nulman Lewis Student Center, tucked into what was once a dark side street, greets students and visitors with its welcoming signage.

A class gathers on concrete piers in the student center (above left). Nearby, the café flows into the Hope Building (above right).



1. *New lobby*
2. *Enlarged cafeteria*
3. *Existing kitchen*
4. *New café*
5. *Café seating*
6. *Drop-off/ pick-up area*
7. *Connecting stair*
8. *Connection to Clark Alumni House*
9. *Garden seating*
10. *Renovated classroom/ Hope Building*
11. *New classroom*
12. *Mechanicals on lower roof*



into a side street, which made its Modern style less objectionable to its tradition-bound neighbors and city authorities," Hotaling explains. "The design also made sense to people."

School head Dan Miller asked for an environmentally sustainable building, so Beha's team shaded the student center by extending the curtain wall's aluminum ribs 8 inches outward and 8 inches into the interior. The designers positioned panes of fritted glass to reduce heat gain and alternated them with transparent and back-painted opaque sections, balancing areas of visibility with ones for privacy. Operable windows minimize the need for air-conditioning, as does an insulating green roof, which also reduces water run-off. Finally, high-efficiency HVAC and daylighting systems curb energy usage.

Inside, the three buildings function as one. The Hope Building's ground-floor cafeteria, enlarged by the relocation of the school shop to an upper floor, funnels through a newly created café and spills into the addition's double-height glass atrium fitted with additional seating. An open stair leads to the lobby – the school's new pick-up/drop-off point, and the entrance to the once-isolated offices – and up into the middle school. Renovated and new classrooms in the Hope Building and on the top floor of the addition address the school's need for improved computer and science facilities.

Commentary

What at first glance appears to be a simple addition subtly transforms a school community. The Nulman Lewis Student Center serves as the Wheeler School's gateway, greeting visitors with its updated signage and soft colorations that morph from green to blue to gray depending on the atmosphere and time of day. At dusk, the light it transmits illuminates the otherwise dark street, making it friendly and safe for children waiting to be picked up. Already a hub for students, faculty, and parents drawn to its contemporary vibe, comfortable gathering spots, and panoramic views, this small project is adapting to the school's needs – not vice versa. ■

Interior finishes include wood veneer and white acoustical ceilings, plus exposed, polished concrete (near right). Trays of seedum plantings line the green roof (far right). A contrast of translucency and opacity, the glass building illuminates the campus and the street (below).

Three: Oslo International School
Bekkestua, Norway

Jarmund/Vigsnaes Architects transforms a worn 1960s-era school building into a vibrant learning environment.

By Peter MacKeith

Architect: *Jarmund/Vigsnaes—Einar Jarmund, Håkon Vigsnaes, Alessandra Kosberg*
Client: *Oslo International School*
Engineer: *AS Frederiksen*
Consultants: *Grindaker (landscape); Norconsult (acoustical); Ingénia/Ing, Per Rasmussen/Heiberg, Tveter (mechanical); NEAS Brannconsult (fire)*
General contractor: *Oslo Byggentreprenør*

Size: *41,979 square feet (new construction); 35,521 square feet (renovation)*
Cost: *About $335 per square foot*
Completion date: *January 2008 (Phases 1 and 2)*

SOURCES
Cladding: *Materialbanken (wood); Eternit Swisspearl Carat (fiber-cement panels)*
Windows: *Velfac; Schüco*
Skylights: *Everlite*
Flooring: *Freudenberg Noraplan Uni (rubber)*
Ceilings: *Danoline (acoustical)*

Rate this project and access additional sources at **architecturalrecord.com/bts**.

"History," observes architect Håkon Vigsnaes, "is important for an architect: the history of a place, of an institution, of a building." Vigsnaes, principal at the Oslo-based Jarmund/Vigsnaes, is speaking of his firm's renovation of and additions to the Oslo International School, a private comprehensive school located in the Oslo suburb of Bekkestua. The architect is also making a declaration of principle for his practice. For while a prosperous Norwegian economy has fueled many new cultural and civic buildings, such as Snøhetta's National Opera House [RECORD, August 2008, page 84], Vigsnaes and partners Einar Jarmund and Alessandra Kosberg think that the preservation and renovation of existing buildings is essential for a greater sense of cultural continuity. With its work for the Oslo International School, the firm proves that such an economy of means can produce a maximum effect.

Program

The Oslo International School was founded in 1994 as the successor to the Oslo American School – itself a successor to the American and British Schools of the 1950s and '60s, which served families living on the local NATO military bases. It also inherited its predecessors' 1960s building in Bekkestua, a one-story, rectilinear perimeter block bordered on the north by community sports fields and facilities and on the south by a residential neighborhood. Drawing enrollment from embassy, corporate, and Norwegian families, the school's 500-plus students (from more than 50 different countries) attend kindergarten through secondary programs. The intense, well-rounded education and small class sizes make the school highly desirable throughout the Oslo metropolitan area.

With an eye on increasing enrollment and expanding programs amid a spatially limited building in need of repair, Head of School Barbara Carlsen approached Jarmund/Vigsnaes to assess the school's facilities and provide design assistance. The quiet, wooded locale and the architectonic qualities of the existing structure appealed to the architects. Its single-story, modular structure provided clear circulation patterns, flexibility for expansion, good daylight, and contact with the outdoors. Additionally, the architects saw that the school's identity was clearly connected with its site and building. Their suggestion – to renovate and expand, rather than relocate and build anew – addressed budget constraints

1. *New entrance*
2. *Reception*
3. *Main lobby*
4. *Library*
5. *Study*
6. *Classroom*
7. *Office*
8. *Science lab*
9. *Kindergarten*
10. *Preschool*
11. *Atrium/garden*
12. *Future sports/drama/music wing*

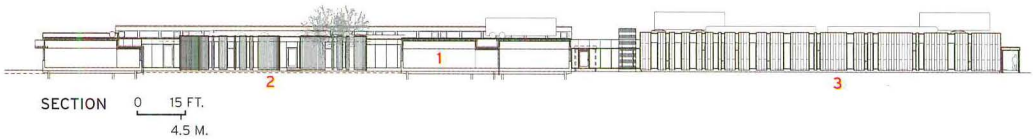
Peter MacKeith is associate dean of the Sam Fox School of Design & Visual Arts at Washington University in St. Louis.

PHOTOGRAPHY: © IVAN BRODY

Children play in the courtyard bordered by the new early childhood wing (left). It is brightly sheathed in a rainbow of thin, multicolored fiber-cement panels (left and below).

Skylights, glass-lined atria, and vivid floors brighten classrooms and corridors (left and above). Older students gather in front of the new pavilions (below).

1. *Classrooms*
2. *Science labs*
3. *Lower school*



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and allowed the school to remain open and in operation throughout a three-phase construction sequence.

Solution

Vigsnaes describes his team's design intention as seeking "a new atmosphere for the school through a gentle transformation of the existing building." The project's initial renovation phase involved installing new mechanical systems on the roof and applying bold colors in corridors, classrooms, and service spaces. The scheme also expanded entry areas and corridors within the existing structure to foster gathering for study and discussion.

The architects then erected curvilinear, wood-battened pavilions, housing a new library/media center and science laboratories. These push out dynamically from the existing building into its white-graveled, tree-shaded atrium, reconceived for upper-level students as a place for quiet activities. These additions reoriented the school's circulation system, so the entrance shifted from the southeast corner of the building to the northwest.

Phase 2 added a large pavilion at the front of the existing building, sheathed in a rainbow of thin, multicolored fiber-cement panels. Here, new classrooms and offices for the kindergarten wrap around a softly curved, rubber-lined internal playground.

For the third and final phase, yet to be realized, the designers envision performance and gymnasium spaces opposite the lower-school addition.

Commentary

The school's new exterior sheathing and entry canopies signal an energetic presence in the neighborhood. Expanded corridors and new courtyards are animated by students of all ages talking, playing, and studying – creating a place of purpose. Each space is light-filled, layered with color or texture, and expanded by views to the outside. Underpinned by an economy of means, the organic forms and sense of materiality – growing from and contrasting with the existing building – assert a renewed identity for the school. If architecture is to be gently didactic, then Jarmund/Vigsnaes' design embodies such aspiration. ■

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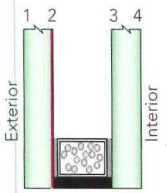

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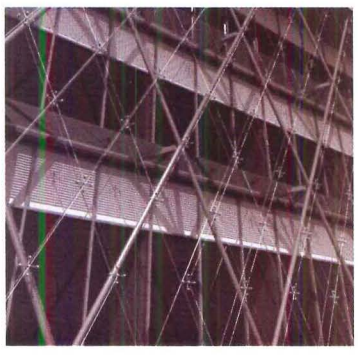
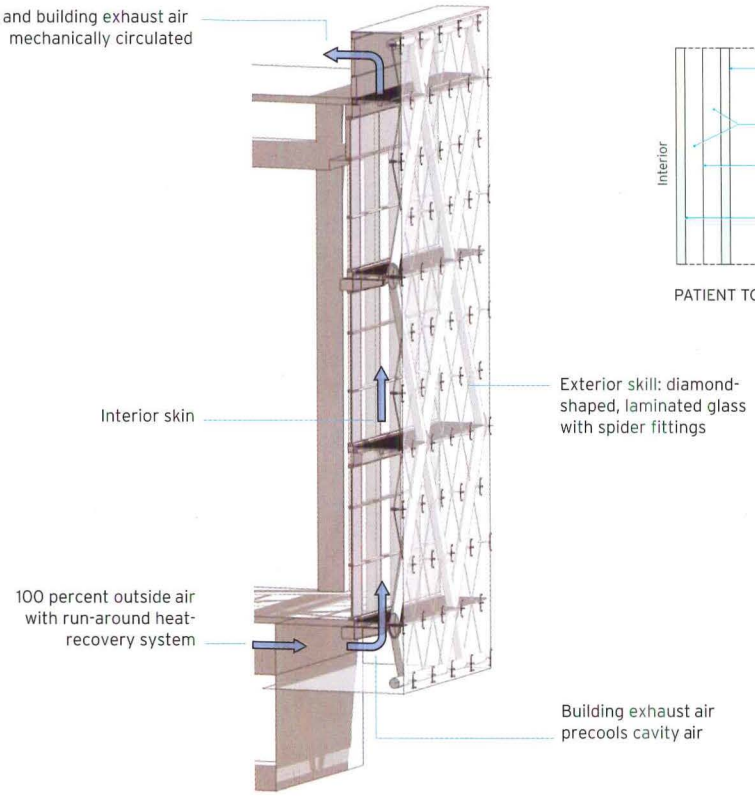
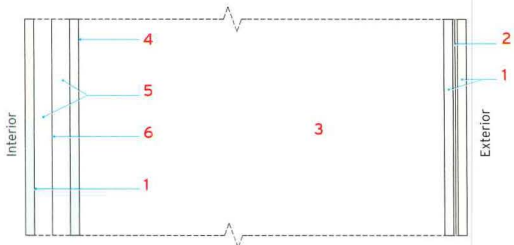
CIRCLE 39

A double-skinned curtain wall (below) will wrap the patient tower (above) of the Cleveland Clinic's new building in Abu Dhabi. Recovered exhaust air circulating through its roughly 5-foot-wide cavity will help insulate the interior from the harsh desert climate.







PATIENT TOWER GLAZING DIAGRAM

1. *Low-iron glass with antireflective coating*
2. *Relfective film*
3. *Five-foot-wide air gap*
4. *Clear glass with low-E coating*
5. *Argon-filled ½-inch gap*
6. *Low-E film*

Transparency: Literal and Sustainable

DON'T CONFUSE THE HIGH-PERFORMANCE GLASS FACADES OF THESE NEW BUILDINGS WITH TEXTBOOK EXAMPLES FROM EARLY MODERNISM

By Russell Fortmeyer

In 1929, when Le Corbusier set about designing the double-skinned glass curtain wall for the Cité de Refuge in Paris, he had no facade consultant to write the glass specification. It wouldn't have mattered anyway, since the spec would have been one word: clear. Two panes of clear glass defined a cavity, in which Le Corbusier had planned to supply tempered air with a mechanical ventilation system. Think of it as transparent insulation. However, the client eliminated the double skin, kept the single glass layer sealed tight, and instead fed the air directly into the building. With no return-air path, it didn't work. And the single layer of glass, totally exposed to the sun, failed miserably. Years later, the architect added a brise-soleil to cut the solar heat gain and prevent occupants from overheating.

"Le Corbusier didn't have access to [software like] EnergyPlus," jokes facade consultant George Loisos, AIA. Loisos's comments are part of his explanation of the myriad tools for specialized analysis he and his colleagues at Berkeley, California–based Loisos + Ubbelohde (L+U) have applied to building design. EnergyPlus—the U.S. Department of Energy's free software for modeling high-performance green buildings—is only one of those many tools.

Loisos's partner, Susan Ubbelohde, likens the firm's energy modeling and daylighting work on a new hospital in Abu Dhabi for the Cleveland Clinic, designed by HDR Architecture, to a technological update of Le Corbusier's approach. "The building science and energy worlds are quite worried about the glass building syndrome," she says, adding that architects have moved beyond the glass box and are becoming more interested in complex and layered facade systems.

History demonstrates that, at least since Joseph Paxton, building designers have been fascinated with transparency. What's changed since Paxton built the Crystal Palace in London in 1851 and Modernism emerged in the early 20th century is how architects and their consultants achieve transparency and how they measure success. As glass has evolved, so has its expression. The Cleveland Clinic exemplifies this shift as its 360-bed patient tower appears firmly rooted in the Bauhaus tradition with spandrel panels articulating each slab level, a continuous glazing system wrapping the corners, and with its diagrid curtainwall system explicitly revealed. And yet, this reading relates only to the building's structural and envelope systems, not to an understanding of the intangible performance of those systems.

Glass in the desert

Creating a high-performing, but transparent, building requires coordination among a broad range of conventional design fields, including facade design, mechanical engineering, lighting design, thermal analysis, and architecture. The parameters that determine occupant comfort and performance—solar heat gain coefficients, daylight factor, visible light transmittance, U-values, and reflectivity—are highly interdependent and never considered in a linear fashion. An integrated design process is more or less mandatory.

For the Cleveland Clinic, slated to open in 2012, the project team settled on the double skin because it satisfied the client's desire for transparency, clarity of design, and optimization of daylight. At the same time, the strategy responded to concerns about glare control and maintenance (exterior sunshades or louvers in Abu Dhabi can present problems, particularly during frequent dust storms). Ted Jacob, whose Oakland, California–based Ted Jacob Engineering Group led the project's mechanical design, says a conventional approach to a double skin relying on operable windows and a natural stack effect wouldn't work in Abu Dhabi's extreme climate.

CREATING A HIGH-PERFORMING, BUT TRANSPARENT, BUILDING REQUIRES COORDINATION AMONG A BROAD RANGE OF DESIGN FIELDS.

Since a hospital's clinical areas require full outside air, even the slightest reduction in the ventilation air's temperature prior to passing it over the air-handling unit's cooling coils can amount to significant energy savings. The design temperature Jacob used for Abu Dhabi was

Russell Fortmeyer, an engineer and former ARCHITECTURAL RECORD *technology editor, is based in Sydney, Australia.*

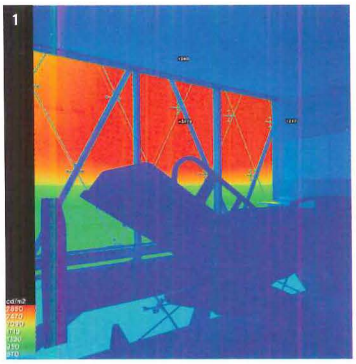
CONTINUING EDUCATION

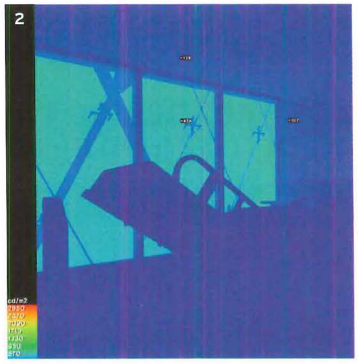
Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA *Continuing Education article. To earn one AIA learning unit, including one hour of health, safety, and welfare/sustainable design (HSW/SD) credit, turn to page 106 and follow the instructions. Another opportunity to recieve AIA/CES credit begins on page 109.*

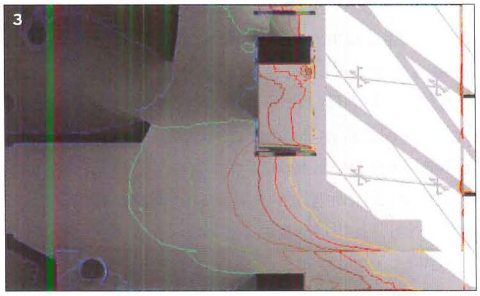
LEARNING OBJECTIVES

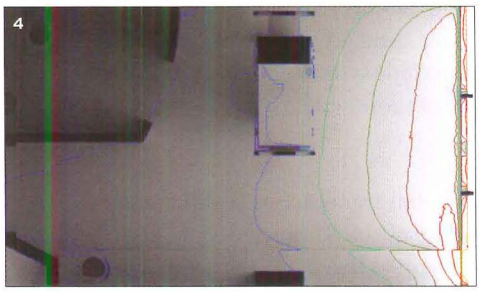
After reading this article, you should be able to:

1. *Explain the physical properties of glass that affect transparency and environmental performance.*
2. *Identify recent technical advances in glass production.*
3. *Describe facade design strategies that can optimize transparency, energy efficiency, and daylighting.*
4. *Identify analysis and simulation tools used in facade and daylighting design.*









The facade consultants for the Cleveland Clinic project looked at patient-room daylighting conditions with Radiance. As part of this analysis, they examined the effect of various sky conditions at different times of the day and year. Shown here are luminance studies (1, 2) and illuminance studies (3, 4) for March 21, at 9 a.m., under clear skies, with roller shades open (1, 3) and closed (3, 4).

115 degrees, with a patient-room supply-air temperature of 55 degrees, and exhaust air at around 75 degrees after picking up solar, occupant, and equipment loads. Jacob's design exploits the 40-degree difference between the outside and exhaust air by passing recovered exhaust air in pipes through the intakes for the hotter, more humid outside air. The exhaust air warms to about 96 degrees and is then released into the curtain-wall cavity, where it picks up more heat and is vented through louvers at the roof. In conventional practice, that exhaust air would be dumped, but Jacob wrings one more use out of it to provide an invisible layer of insulation between the outer and inner curtain-wall skins.

Solar heat gain and U-values

The solar load on a facade has two primary modes of transfer to the building's interior: radiation and conduction. Radiation is the heat passing through the building envelope in the form of ultraviolet, visible, and infrared light, while conduction occurs from hot to cold surfaces and through air. The solar heat gain coefficient (SHGC), expressed as a percentage, measures the transmission of heat directly through the glass. Glass with a SHGC of 0.30 blocks 70 percent of the solar heat load. The shading coefficient (SC) is more or less the same idea, only it expresses performance against a benchmark of a single ⅛-inch sheet of clear glass set as 1.0. A SHGC of 0.30 would roughly equate to a SC of 0.35. The SHGC directly affects a glass's U-value, a measure of conductive heat transfer over a given area under standard conditions. A low U-value means very little heat is conducted, either gained or lost, through the glazing. Glass manufacturers provide what they call "center of pane" U-values that address the free-hanging sheet of glass; these are combined into the envelope construction to establish an assembly's overall U-value. The inverse to this is the R-value, a measure of the building element's thermal resistance, or its effectiveness as an insulator.

After first reducing internal loads, designers set about minimizing radiated and conducted loads on the facade. The American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) publishes data on expected solar gain loads for nearly every climate on the planet. These data set the baseline for sizing a mechanical system, but cooling alone won't shield a building from the effects of the harsh Abu Dhabi sunlight. Reducing glazed surfaces, increasing external reflectivity, providing shading devices, and introducing a low-emissivity (low-E) coating can all limit radiation. For the clinic, the architects introduced an opaque spandrel element on the inner glass skin, in addition to coatings, to reduce radiated heat gain. "The air cavity in the double skin removes some of the conductive heat from the outer skin through a convective means," says Warren Cheng, a project engineer with Ted Jacob. "And because the inner skin is a double pane with an air gap, it's even less sensitive to conductive gain."

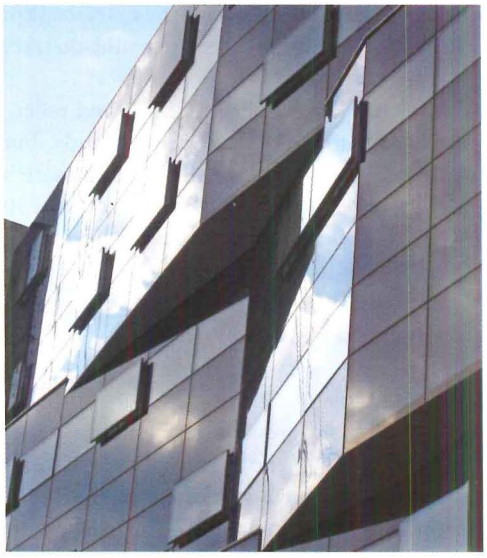
Visually, the clinic's facade has two layers, but in reality it is composed of nine. From the exterior working in there are two layers of low-iron glass laminated with a reflective film and applied with an antireflective coating; a nearly 5-foot air gap; a layer of clear glass with a low-E coating; a half-inch argon-filled gap with a suspended coated film; and a final layer of low-iron glass. The outer glass has an SHGC of 0.51 and a visible light transmittance (VLT) of 74 percent, while the inner glass has an SHGC of 0.186 and a VLT of 42 percent.

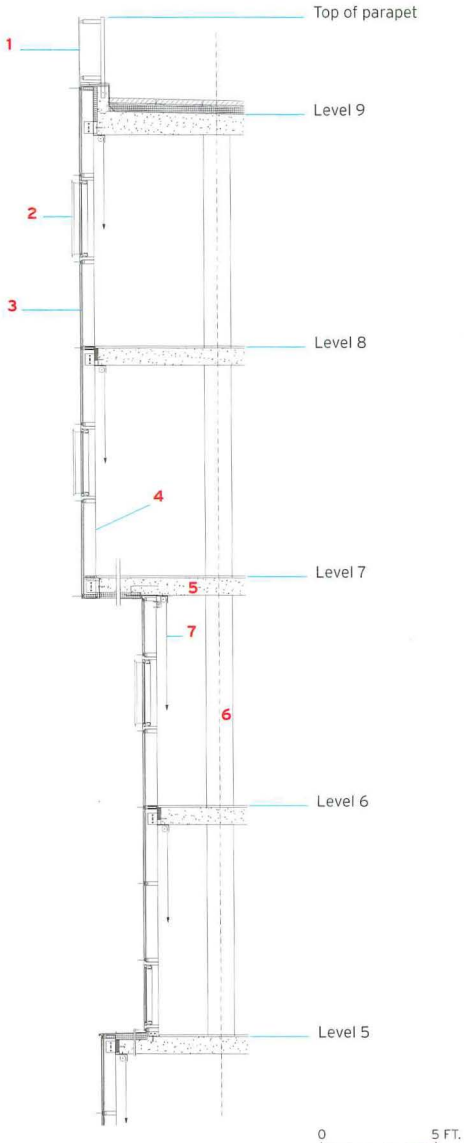
L+U modeled the glass construction in EnergyPlus to measure the thermal performance. "About half of the solar heat gain is short-wave infrared, which is basically waste heat," says Loisos. "With the coatings, we filter all of the short-wave infrared and nearly all of the ultraviolet." The first layer of reflective film reflects ultraviolet and infrared radiation at the outer skin, thus a smaller amount of heat is absorbed and reradiated by the glass into the cavity, while the spectrally selective suspended film in the inner skin reflects a significant amount of what remains. Both films are clear and don't compromise the envelope's transparency. Coupled with the novel heat-recovery system, the facade design helped the building improve on ASHRAE 90.1-2004 standard by 14 percent.

Of course, not all project budgets have room for a double skin. An increasingly common approach to all-glass facades is to use multiple types of glass with varying performance characteristics. Such a strategy was employed by New York City–based Audrey Matlock, AIA, for the design of the Chelsea Modern, a 47-unit residential building on a tight midblock Manhattan site. She developed the primary facade as a series of stacked bands, accentuated with layers of clear and blue glass, that evoke a sense of lateral movement across the elevation. Jeffrey Ng, AIA, an architect and facade consultant in the New York office of Thornton Tomasetti, says although site constraints permitted only one all-glass facade, the project's thermal design benefited greatly from the balance of glass types. The clear glass has an SHGC of 0.38 and covers 30 percent of the main facade, while the blue-tinted glass has an SHGC of 0.28 and covers the rest. It follows that the actual performance of the total facade lies somewhere between the two.

Daylighting, glare, and reflectivity

Good thermal performance does not automatically translate into good daylighting performance. Concurrent with its energy studies for the Cleveland Clinic, L+U developed a model with the software Radiance

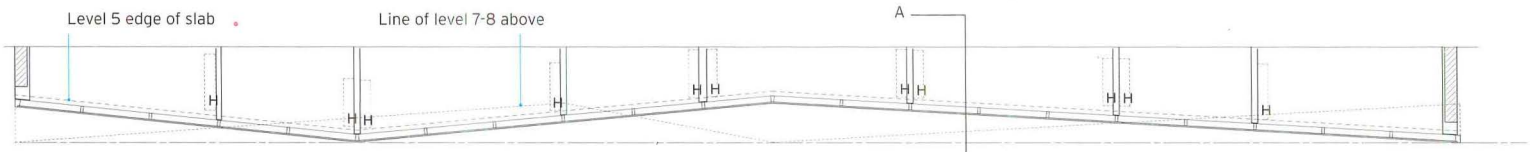




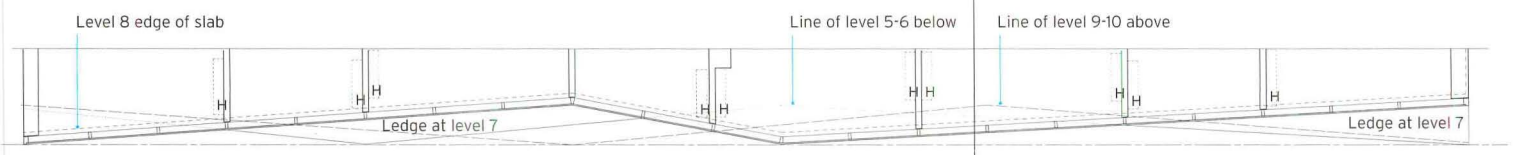
PARTIAL CURTAIN-WALL SECTION A-A

The street-facing elevation of the Chelsea Modern, a 47-unit apartment building in New York City, combines different types of glass with varying performance characteristics. The facade is composed of a series of stacked, zigzagging bands (both photos left). The glazing at each floor level includes both tinted and clear glass. Some panels are operable (below).

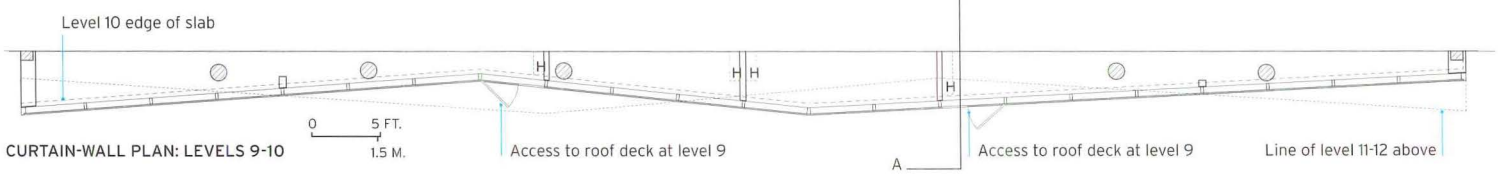
1. *Glass railing*
2. *Operable panel*
3. *Insulated glazing*
4. *Aluminum framing*
5. *Floor slab*
6. *Column*
7. *Interior roller blind*



CURTAIN-WALL PLAN: LEVELS 5-6

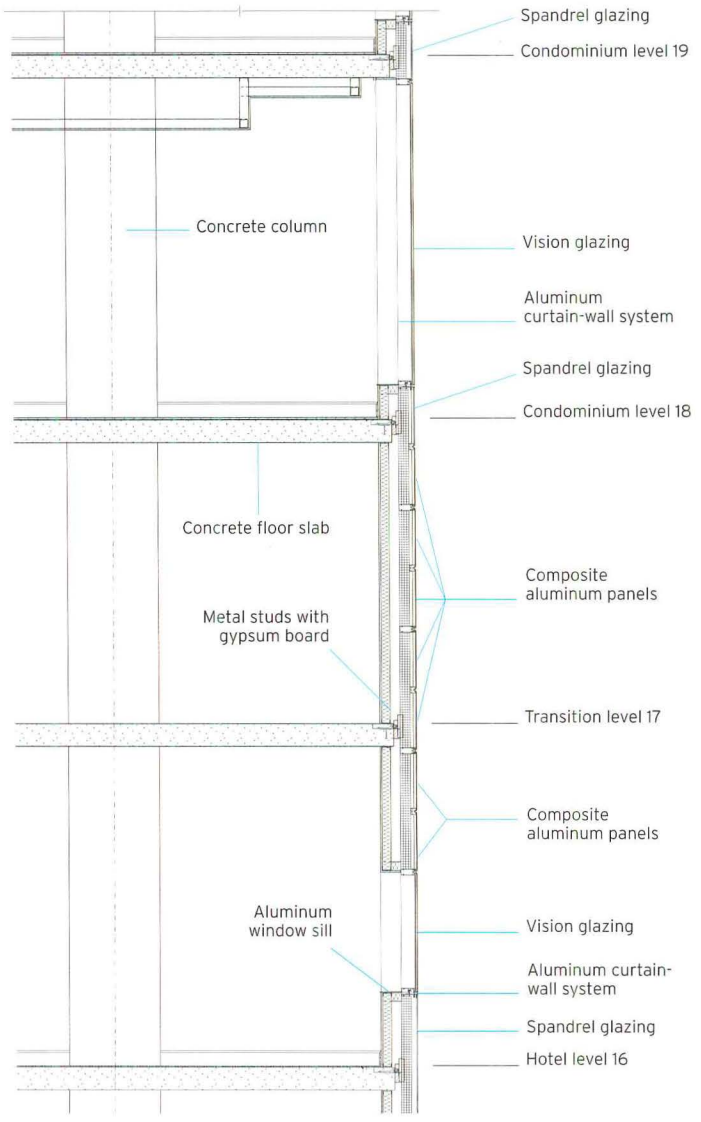


CURTAIN-WALL PLAN: LEVELS 7-8



CURTAIN-WALL PLAN: LEVELS 9-10

The cladding strategy for Block 21, a hotel and condominium project under construction in Austin, Texas, includes a glass and aluminum curtain wall with large spandrel panels for the building's lower floors. The tower's upper levels have larger expanses of clear glass balanced with areas of higher reflectivity glass.



WALL SECTION AT HOTEL / CONDOMINIUM TRANSITION LEVEL

(available for free at http://radsite.lbl.gov) to measure illuminance, or the density of luminous power, across the plan and section of a typical patient room. They also looked at daylight factor (DF), which describes the ratio of outside illuminance to inside illuminance. The calculation is based on an overcast, or "design sky," but designers find it helpful for gauging the performance of a building's envelope, and generally target a DF between 2 and 5 percent.

Ubbelohde says L+U tests mainly for best and worst cases, pinpointing when sunlight becomes too much of a contrast with the room interior and when automatic blinds may be needed to prevent glare. The firm tries to minimize reliance on blinds, according to Ubbelohde, since it can detract from the transparency of the facade. For the clinic, L+U also analyzed the reflectance of the exterior skin to gauge how it will read in full sun and whether it could distract drivers in passing cars.

GOOD THERMAL PERFORMANCE DOES NOT AUTOMATICALLY TRANSLATE INTO GOOD DAYLIGHTING PERFORMANCE.

Optimization of characteristics like SHGC, VLT, and reflectance requires not only extensive simulation and careful study, but also a good sensibility for daylighting design, according to Tomasetti's Ng. "You have to understand the psychology of the eye, which sees 50 to 60 percent VLT as transparent," he says. The Chelsea Modern's blue glass has a VLT of 31 percent, but at the vision plane, with the clear glass, it's closer to 70 percent. "An architect has to become engaged in modulating this concept of absolute transparency," he says.

Transparency and technology

The Modernist obsession with glass put pressure on industry to improve the material's performance. One of the first responses was the bronze, titanium, and gold mirror glasses developed in the 1960s and '70s. Mirror glass is great in terms of reducing solar loads, with an SHGC in the 0.20 to 0.30 range or lower, but awful for daylighting, with a VLT often less than 10 percent. In the 1980s, low-E coatings were introduced to reduce reflectivity and improve VLT while still controlling the SHGC. These coatings have evolved to the point where, as with the Cleveland Clinic, an architect can specify glass with a VLT in the 40 to 50 percent range without significantly increasing solar heat gain.

Only a short time ago, glass with a VLT greater than 40 percent had a minimum SHGC of 0.40. But over the past decade, manufacturers have been able to reduce the SHGC first to 0.35, and then down to 0.30. These numbers correspond to glasses that appear clear, as opposed to green, gray, or blue/green. Low-iron glass typically has less of a greenish tint than float glass.

Many manufacturers also produce fritted glazing. This type of glass includes a silk-screened ceramic pattern that helps reduce glare and the SHGC, even if only by a small amount. Although frit is not new, architects are finding new ways to use it, such as in Gehry Partners' frosted white InterActiveCorp building, not far from the Chelsea Modern, on New York City's west side [ARCHITECTURAL RECORD, October 2007, page 114].

Another option is electrochromic glazing, otherwise known as switchable glass. Dane Sanders, an engineer with Boulder, Colorado–based daylighting consultant Clanton and Associates, originally proposed electrochromic glazing for Block 21, a 35-story ho-

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tel and condominium project under construction in Austin, Texas. The glass appears clear, but becomes darker when exposed to sun, reducing VLT but improving thermal performance by as much as 80 percent. But "it's expensive, and it's another thing you have to supply with electricity," says Sanders, which perhaps explains why it is not part of the building's final design. Instead, the Block 21 project team, which includes Andersson Wise Architects and BOKA Powell as architect of record, focused on reducing east and west exposures, introducing a more conventional glass-and-aluminum curtain wall with large spandrels for the hotel. Then, for the condominium portion at the top of the tower, the designers chose larger expanses of recessed, clearer glass balanced with areas of higher reflectivity glass. The overall effect is glassy, but the variety of constructions should ensure a high enough level of performance to help the project achieve its LEED Platinum goal.

BUILDING DESIGNERS NOW HAVE LARGELY INVISIBLE METHODS FOR DEALING WITH ENVIRONMENTAL CONDITIONS.

Architecture by numbers

Building designers now have largely invisible methods for dealing with environmental conditions that were only intuitively understood by the early Modernists. And glass and coatings manufacturers have quantitative methods for describing product performance. They feed the numerical specifications of their products into the International Glazing Database, which itself is embedded in the Optics 5 and Window 6 software developed by the Lawrence Berkeley National Laboratory (both free at http://windows.lbl.gov). Optics 5 allows designers to build their own glass type, specifying nearly every property, which then can be used to assemble a complete glazed unit—frame and all—in Window 6. These programs give designers precise performance data to feed directly into modeling software such as EnergyPlus or Radiance. In theory, any glass type is possible. Ubbelohde says L+U has often created an ideal glass and then asked a manufacturer to make it. "We're not bound by what's in Window 6," she says. "It's only the laws of physics holding us back." Le Corbusier's original Cité de Refuge may not have been entirely possible in the 1930s, but he imagined it anyway. ■

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- Complete the questions below, then fill in your answers on the next page.
- Fill out and submit the AIA/CES education reporting form on the next page or take the test online at **continuingeducation.construction.com/** to receive one AIA learning unit.

QUESTIONS

1. The two primary modes of transfer of the solar load through a facade are which?
   a. radiation and conduction
   b. convection and radiation
   c. conduction and convection
   d. none of the above
2. Which of the following uses the performance of a ⅛-inch sheet of clear glass as a benchmark?
   a. the SHGC
   b. the SC
   c. the VLT
   d. the U-value
3. The R-value is the inverse of which?
   a. the SHGC
   b. the SC
   c. the VLT
   d. the U-value
4. A low U-value means which?
   a. little heat is lost through the facade
   b. little heat is gained through the facade
   c. both A and B
   d. none of the above
5. Glazing with a SHGC of 0.30 blocks how much of the solar load?
   a. 30 percent
   b. 35 percent
   c. 70 percent
   d. none of the above
6. All of the following describe the Cleveland Clinic's double curtain wall except which?
   a. it relies on the natural stack effect for ventilation
   b. its inner skin has an opaque spandrel element
   c. some of the heat transferred through the outer skin is removed from the cavity by convective means
   d. recovered exhaust air provides a layer of insulation between its inner and outer skins
7. The mirror glazings introduced in the 1960s and '70s had which characteristics?
   a. a low SHGC and a high VLT
   b. a low SHGC and a low VLT
   c. a high SHGC and a low VLT
   d. a high SGHC and a high VLT
8. Calculation of the DF is based on which kind of sky conditions?
   a. overcast
   b. clear
   c. partly cloudy
   d. mostly sunny
9. Which software did L+U use to measure illuminance levels in the Cleveland Clinic's patient rooms?
   a. EnergyPlus
   b. Radiance
   c. Optics 5
   d. Window 6
10. All of the following are true regarding electrochromic glazing except which?
    a. it becomes darker when exposed to the sun
    b. it is also known as switchable glazing
    c. it requires a supply of electricity
    d. VLT increases when it is exposed to the sun

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Program title: "Transparency: Literal and Sustainable," ARCHITECTURAL RECORD (07/09, page 100).

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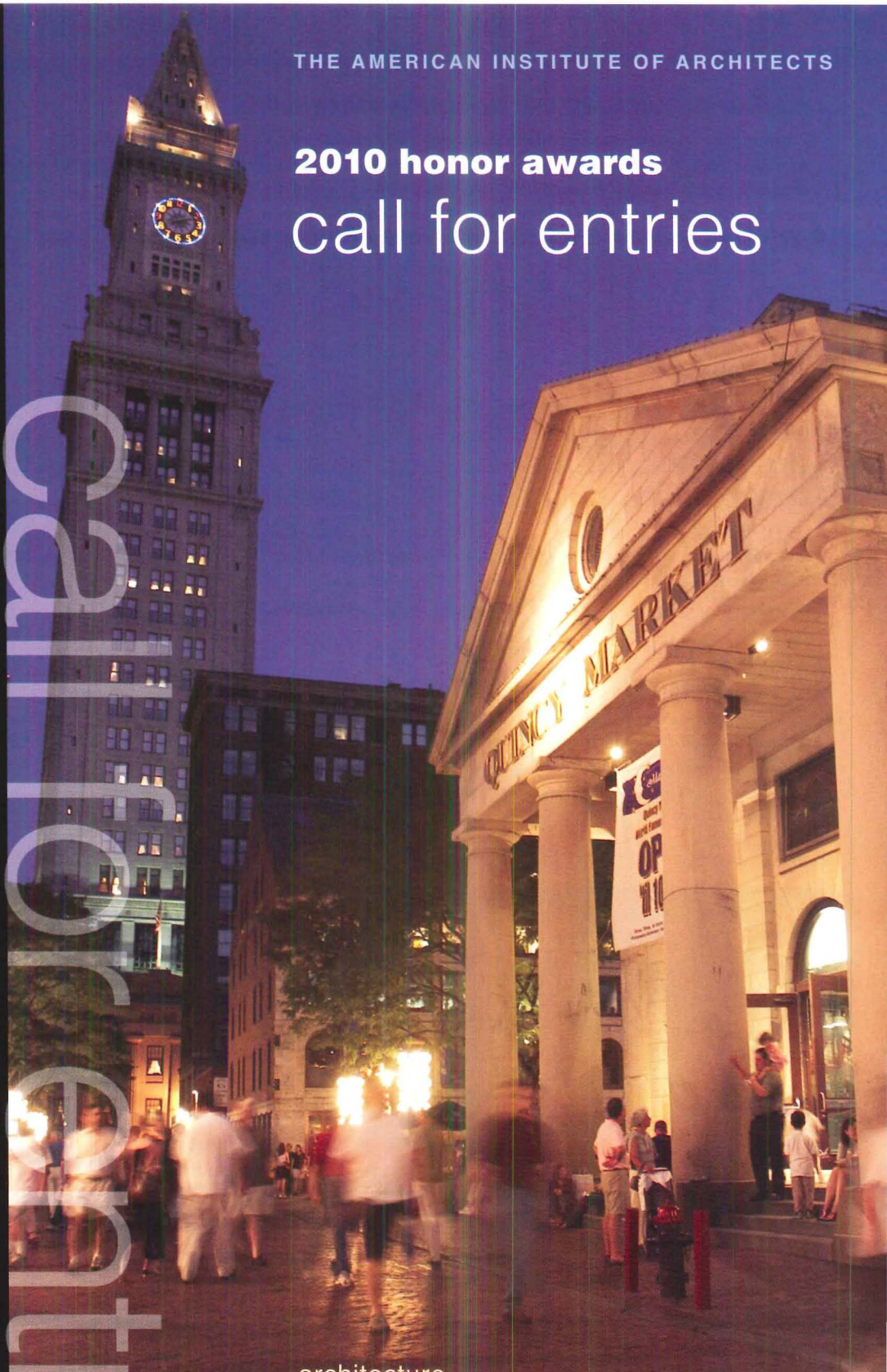

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PHOTO: Faneuil Hall Marketplace, Boston; 2009 AIA National Twenty-five Year Award recipient; architect: Benjamin Thompson + Associates; photo: © Steve Rosenthal

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Roofing Strategies Reach New Heights: Sustainable Options for a Key Building Element

Presented by
- Quest Construction Products
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A natural tile roof is an aesthetic and sustainable choice. Photo credit: David Ricketts at FX Imaging Inc.

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Use the learning objectives below to focus your study as you read **Roofing Strategies Reach New Heights: Sustainable Options for a Key Building Element.** To earn one AIA/CES Learning Unit, including one hour of health safety welfare/sustainable design (HSW/SD) credit, answer the questions on page 116, 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 some characteristics of a sustainable roof
- Discuss sustainable roofing options for low- and steep-sloped roofs
- Articulate the importance of prefabricated roof curbs
- Define the characteristics of a "cool roof"

Roofing Strategies Reach New Heights: Sustainable Options for a Key Building Element

Offering far more than mere protection from the elements, a roof can define a building's aesthetics, and add beauty, drama and distinction to the look and feel of any project. Today's roofs can also be sustainable building elements in their own right, upping the green quotient of the structure they cover.

Sustainable roofs share several characteristics: some are built with materials created with minimal energy consumption and that have no negative impact on the environment. They require limited maintenance, are easily repaired and generate limited waste throughout their life cycle — and they're designed for long-term performance and extended life spans. These key goals are even more vital in light of current statistics. The U.S. Department of Energy (DOE) estimates that over a building's lifetime, some roofs need to be replaced an average of four times. Nearly three quarters of the roofing work done in the United States, in fact, is re-roofing, with old roofs pegged as the second largest contributor to solid waste generation, as well as being the second most prevalent castoff found in the nation's landfills. According to the Oak Ridge National Laboratory, most of this waste is from asphalt built-up roofing and modified-bitumen roofs removed prior to re-roofing — though tons of waste is generated by other types of roofing systems during both installation and tear-off.

Sustainable roofs also conserve energy through the thermal efficacy of materials used — an area which has received considerable attention. Just as dark clothes make you warmer, dark surfaces in the sun can become up to 70 degrees Fahrenheit hotter than the most reflective white surfaces. Dark roofs can also transfer some of that heat inside the building, boosting air-conditioning demand and energy bills. What's more, dark roofs jack up the temperature around them, adding to the heat island effect.

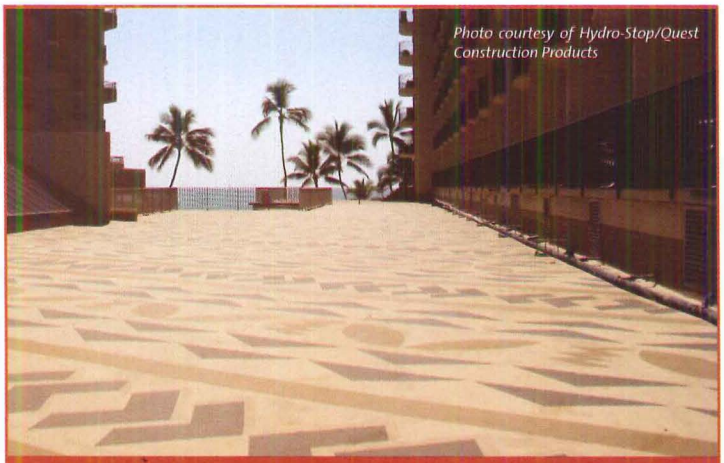


Photo courtesy of Hydro-Stop/Quest Construction Products

A fluid-applied roof can be both waterproof and beautiful as in the example at the Waikiki Beach Walk Outrigger Hotel in Honolulu.

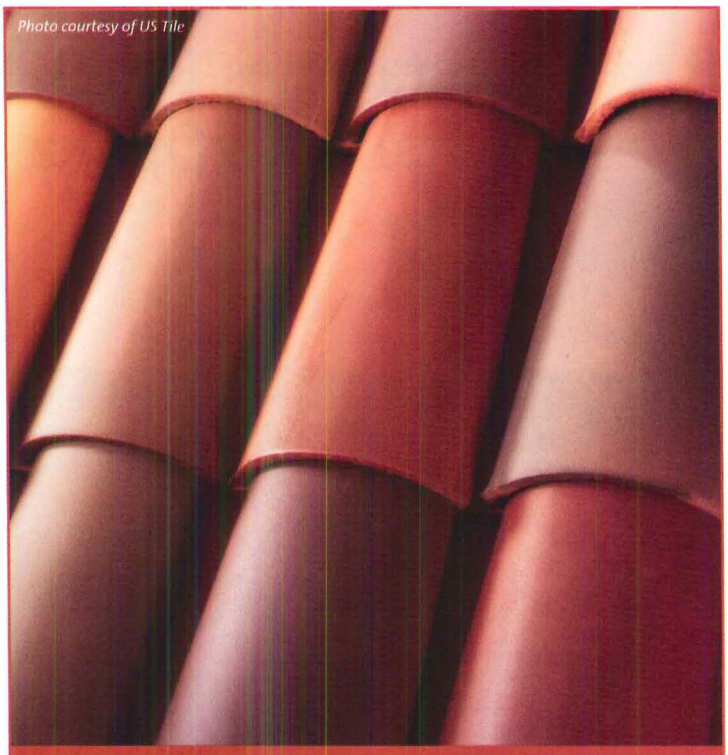


Photo courtesy of US Tile

In this "cool roof" blend, all clay tiles have an SRI value of greater than 29.

The solution is a cool roof — defined by the Cool Roof Rating Council (CRRC) as one that "reflects and emits the sun's heat back to the sky instead of transferring it to the building below." A growing list of states and cities are already mandating cool roofs. "What's driving the change in roofing systems is cool roof legislation, but also a growing concern for the environment and a sustainability awareness that didn't exist twenty years ago," says Nick Causey, executive vice president for Quest Construction Products and former president of Hydro-Stop, noting that architects and users alike are increasingly interested in roof systems that last longer and promote green goals. "A roof is one of the most important building elements in terms of sustainability," says Rich Thomas of the US Tile Company. With so much at stake, it behooves architects to make the right choice for a particular project. This article will discuss roof systems, roof flashings and curbs and new sustainable roofing products that represent sustainable options for today's buildings.

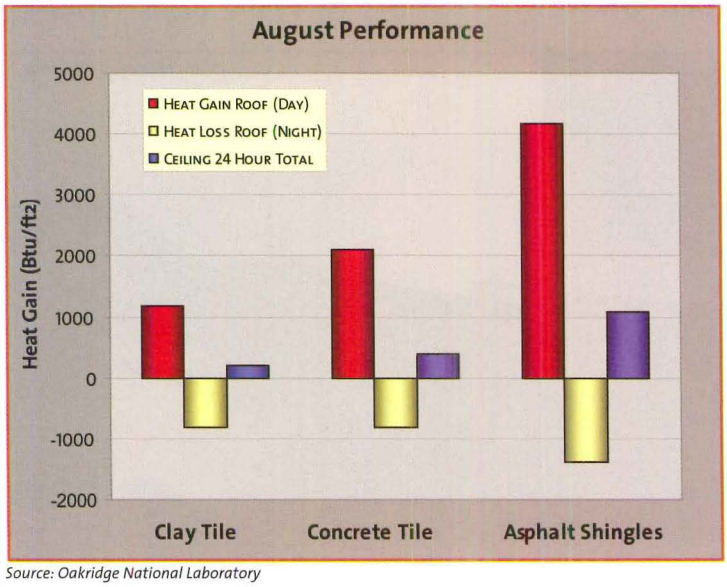
CLAY TILES FOR STEEP SLOPES

Clay is one of the oldest roofing materials in existence, with clay tiles dating back as far as 3,000 B.C. in ancient civilizations in China and the Middle East. Clay's staying power stems from the fact that it is fire resistant, non-combustible, low maintenance, will not rot, and can stand up to strong winds, temperature changes, and freezing and thawing. Clay tiles made of naturally occurring materials will not fade over time. "They're 99 percent dirt and water," says US. Tile's Thomas, noting that natural clay tiles are 100 percent recyclable, and can contain as much as 59 percent recycled materials. Because it contains complex inorganic color pigments that boost its reflectance in the infrared spectrum, clay is said to have a natural reflectivity.

The color in natural clay tiles is determined by the natural occurrence of trace elements such as iron, chrome and nickel, as well as by the kiln temperature, and oxygen present during the firing process. Alternatively, tiles can be coated during manufacturing, a somewhat easier and less expensive option than obtaining different clay sources to produce specific colors, the tradeoffs being authenticity and susceptibility to fading. Firing can be energy intensive, though natural clay tiles can utilize a quick fire method using a roller hearth kiln that cures the tiles in 60 to 110 minutes, lowering firing times and saving energy. Other manufacturers, particularly those that glaze tiles, use other types of kilns that can take up to one week to fire products. Over the past decade, the industry has been able to reduce energy usage significantly — some manufacturers claiming up to 27 percent — by continually upgrading equipment and process and utilizing alternative energy sources, such as solar energy or purchasing certificates for renewable energy off the grid.

Clay roofs can be used in any climate, and have a wide range applications on residences, small and large businesses, and academic buildings. Properly maintained clay roofs — either natural or coated — have life expectancies of 100 years or more. "The main reason for most roofing products' degradation is water absorption," says Thomas. "Products with the best longevity are typically those with low water absorption rates." To gain that property, all clay tiles, like bricks, are vitrified, meaning they are kiln fired to 2000 degrees Fahrenheit to achieve the density that will lock out water absorption. Very fine particle size also helps eliminate voids in the body of clay tile that limit water absorption even further. Clay tiles so fired are appropriate for any climate condition including salt intrusion experienced in coastal areas, severe freeze thaw action, and snow loads of harsh climates.

Depending on their color, natural reflectivity and glaze, some of today's clay tiles are rated "cool" by the Cool Roof Rating Council. A cool rated roof differs from a non-rated roof in two aspects: it reflects the sun better and dissipates heat more effectively. To measure reflectivity, a machine is used to take readings on six different random areas of an installed tile, with reflectivity based on an average of the readings. Emissivity is measured by a specialized emissometer machine that measures the amount of heat that travels through the product. Clay can reflect 53 percent of the sun's energy — vs. 10 percent for asphalt shingles — and emits 86 percent of the heat, allowing the roof surface to stay relatively cool compared to the ambient temperature. That, in turn, minimizes the heat island effect and interior heat fluctuations at the top of the building next to the roof. Clay has been shown to deliver up to 36 percent less ceiling heat fluctuation than concrete tile, and 75 percent less than asphalt shingles, reducing dramatic swings in ceiling temperatures, which saves energy and reduces the strain on building cooling systems, especially during peak expensive rate periods.



Source: Oakridge National Laboratory

Properly maintained clay roofs — either natural or coated — have life expectancies of 100 years or more.

A cool roof doesn't *have* to be a white roof. Even darker colored clay tiles can have an innate reflectivity that eliminates the need for paints or additives to reach an SRI (Solar Reflectivity Index) rating of 29 or greater, the magic number for LEED compliance on steep slope roofs. "Because of this natural reflectivity, clay colors that meet the LEED cool roof requirements are typically going to have darker and richer colors than other products such as concrete or asphalt," says Thomas.

In specifying clay tiles, architects will want to examine the manufacturers' warranties to be sure that they cover fading for at least 20 years. Another point to look for is Cradle to Cradle certification granted by MBDC (McDonough Braungart Design Chemistry), a consultancy founded in 1995 by architect William McDonough and chemist Michael Braungart to reorient the design of products, processes and systems to provide financial, environmental and societal benefits. C2C provides manufacturers with a means to measure achievement in environmentally intelligent design and helps customers purchase and specify products that are pursuing a broader definition of quality. Within the terms of the C2C program, this means using environmentally safe and healthy materials design for material reutilization, such as recycling or composting energy efficiency and the use of renewable energy efficient use of water, and maximum water quality associated with production; and instituting strategies for social responsibility. If a candidate product achieves the necessary criteria, it is certified as a Silver, Gold or Platinum product and can be labeled as Cradle to Cradle. In April 2007, the U.S. Green Building Council established an innovation point for specification of products certified under the Cradle to Cradle℠ (C2C) Certification program. "C2C is another opportunity for clay tiles to earn LEED points," says Thomas. "Clay tile roofs have the potential to help in seven or eight LEED categories, whereas other roofing systems may be able to help in two to three."

The extra LEED point for Cradle to Cradle certification helped push the 39,000-square-foot athletic building on the Santa Margarita Catholic High School campus in Rancho Santa Margarita, California, closer to LEED silver certification. Architect Jon Gomer LEED AP of tBP/Architecture in Newport Beach specified a "cool" clay tile

Image courtesy of Dougherty + Dougherty Architects LLC

The Westminster, California, Chamber of Commerce building features a barrel tile roof that contributes to LEED Gold certification.

roof to match surrounding buildings. "We chose a through-color tile rather than one with a painted-on surface because it would last throughout the building's life cycle," says Gomer. "That it was also a 'cool' roof product made it the right choice to pursue LEED credit points. And as an added bonus, the Cradle to Cradle certification qualifies the building for an additional Innovation Design point — and that's a plus you don't currently find with other clay tile."

In its new Chamber of Commerce Building, the City of Westminster, California, sought to set a standard for contextual and sustainable design as a community-wide goal, and targeted LEED Gold certification from the outset. An integral part of the strategy was a sustainable roof. Dougherty + Dougherty Architects LLP of Costa Mesa specified a clay tile roof with the barrel profile and variegated texture prevalent in the community and consistent with city's traditional design preferences. "The roof was self venting, exceeded LEED SRI criteria and was cost competitive, which is where the rubber meets the road," says Dougherty + Dougherty Partner-in-Charge Betsey Olenick Dougherty, FAIA, LEED AP. "To achieve a green advantage with what is considered to be a traditional material is truly a breakthrough." The project is in construction, with LEED criteria embedded into the specifications. "Architects are in an extremely powerful position to implement a green agenda," Dougherty adds.

Clay Goes Solar

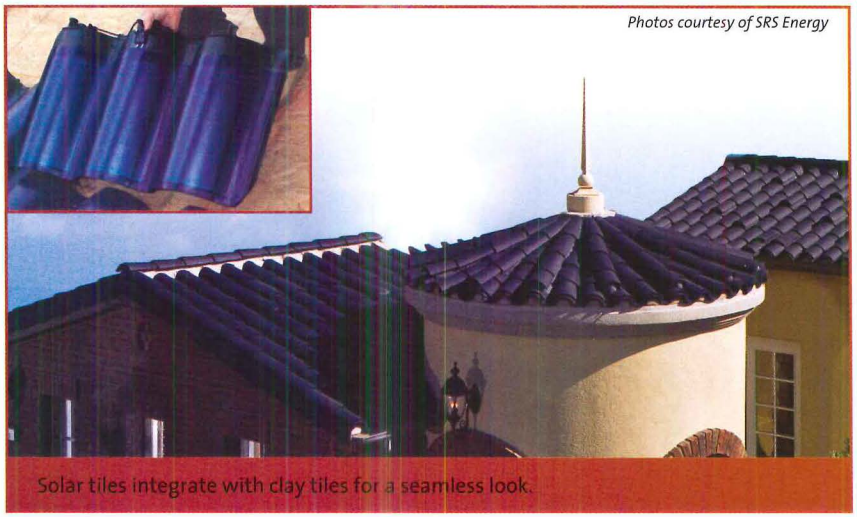
The newest innovation in clay tile roofing is a recently launched building-integrated photovoltaic roofing product (BIPV) that uses flexible thin film solar cells. The thin film laminate is bonded to the polymer tile with a proprietary adhesive material and process to produce the first curved solar tile to be introduced to the U.S. marketplace. They look like standard Mission clay tile and are light weight and easy to install. The thin film solar tiles are currently available in a "solar blue," barrel-shaped profile that mesh seamlessly with blue-glazed tiles of a similar profile, or in a profile-only integration with clay tile of earthen hues. They have been tested under harsh conditions for durability, including UV stability, color fastness, wind resistance, electrical output, safety, and extreme mechanical stresses. UL and ICC code approvals are anticipated this fall. "It's a quantum step for solar energy," says Thomas. "The question has always been: how do you incorporate a solar cell without sacrificing curb appeal."

While solar systems are typically installed by the watt, energy is generated and billed by the kilowatt hour (kWh). The value of a solar system then, or its rate of return, is dependent on how many kilowatt-hours it generates, offsetting electrical consumption. In order to determine how much energy the solar system will generate the following must be considered: solar capacity of the system, peak sun hours, system efficiency, and time. Based on these considerations, over a year period, the thin film technology allows the tile system to produce an estimated 10 to 15 percent more energy than silicon panels. "This thin film technology is comprised of three layers of semi-conductor material," says Abby Nessa Feinstein of SRS Energy in Philadelphia, noting that each layer absorbs a different spectrum of light, allowing the cells to convert a broader spectrum of light into electricity. "The light spectrum at dusk is different than that the spectrum at 10 o'clock, noon, so and so forth. And the spectrum is different under cloudy conditions. In essence these cells are 'less picky' than traditional silicon wafers with regards to which light they convert to electricity," Feinstein adds.

With regard to determining the system size, a number of factors come into play, including location, electrical equipment, demand, etc. According to Feinstein, the average American home uses over 10,000 kWh per year. Assuming this and other typical parameters, in California, an estimated 25 percent of the roof covered by these thin film solar panels could reduce the dwelling's energy bill by 75 percent.

FLUID-APPLIED SYSTEMS FOR FLAT ROOFS

On the opposite side of the roofing spectrum are fluid-applied roof systems. Rather than roof-applied tile-by-tile or shingle-by-shingle systems, fluid-applied roofing is a monolithic system used mostly in commercial settings. Primarily a flat or low-slope roofing solution, these systems are water-based elastomeric acrylic membranes



Photos courtesy of SRS Energy

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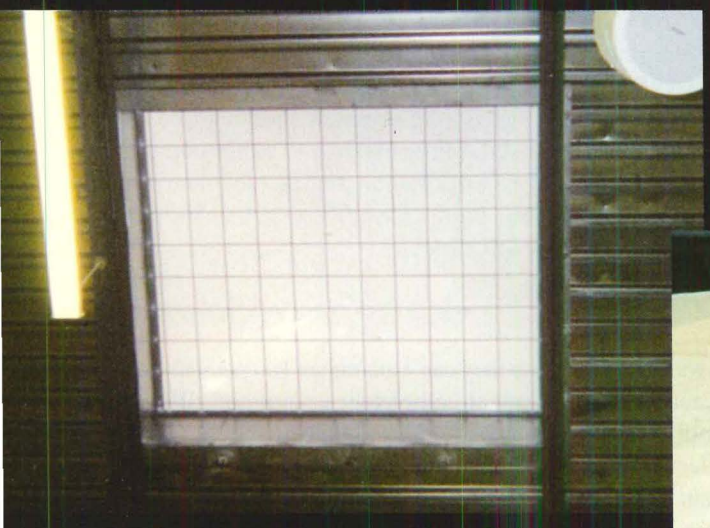

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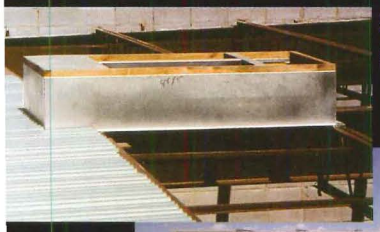

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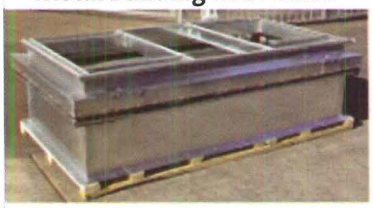
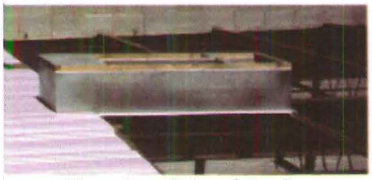


Isolation Curbs

Equipment Supports



Structural Roof Curbs

Platform Roof Curbs

When it comes to roofing, selecting a sustainable strategy means designing a roof that will endure with minimal repair — and that means a watertight roof. Roofs can be sabotaged by leaks which can result from many factors including accumulated water or snow, punctures caused by flying debris, deterioration of the roofing material, and faults in the flashing around chimneys, vents, fans and the skylights. For those roofs that do need flashings and curbs, another cause of leaky roofs are improperly manufactured or installed roof curbs, the square metal boxes that surround penetrations to assure that the roof remains watertight.

A big question here is who is responsible for roof curbs. Equipment manufacturers do fabricate roof curbs, but they don't design them with leak prevention in mind. They concentrate on supporting the unit they manufacture, and often they don't have the knowledge of proper roofing practices or the requirements of a particular roof. Usually, their standard roof curbs do not mate with the many kinds of roof deck situations being specified. Improper curb design for rooftop HVAC units, exhaust fans and other equipment can all mean roof leaks down the line.

Leaving the job of building curbs to on-the-job contractors is also problematic. Contractors typically build curbs to roof-opening size, not to the size of the actual equipment . Many times scrap material available on the job site is used to build the curbs. When this happens, the equipment being mounted on the job-built curb can be larger than the opening, leaving a gap between curb and equipment cap — and an opportunity for water to seep in. Using tar to meld it all together can result in further problems down the line as tar can crack in winter and melt in summer, opening the way for leakage.

In many instances, custom prefabricated roof curbs offer a more effective alternative. These curbs are fabricated to fit the exact units selected after bid, rather than an approximate roof-opening size plugged in during design. They're also designed for the specific type of roofing condition involved, including standing seam metal roofs, membrane roofing, different roof slopes and difficult roofing conditions.

Prefabricated curbs are installed before the roofer is required and therefore become part of the roofing system. If they are mounted properly beneath the insulation, most roof leaks will be eliminated — they should never be installed on top of the roofing or insulation on new or existing construction. Prefabricated curbs are also available with raised cants to allow the roofer's insulation to mate, that is, the roof cant starts at the finished roof and not below the insulation thickness. Prefabricated curbs are also available in all sizes and custom configurations.

Continues in online section of this course.

reinforced with a non-woven polyester fabric. A base coat is applied and reinforced by the fabric and subsequent layers of coating. "It all cures as one monolithic system and forms its own flashings," says Quest Construction Products' Causey. Some manufacturers claim their fluid-applied systems waterproof all surface areas associated with the building's roof substrate including the interior and exterior parapet walls and caps, scuppers, drain bowls, through-roof protrusions and decks — and that when properly installed and maintained, fluid-applied systems can remain 100 percent waterproof regardless of weather conditions or age, with virtually no leak points. Roofing systems thus qualified can be covered by up to 20-year warranties on most roofing applications, which can be extended at the conclusion of the warranty period for additional 10-year periods under a prescribed maintenance schedule. In contrast, traditional roofing systems require leak-prone accessories such as sealants, tapes, adhesives, clamps, termination bars, drain rings or counter-flashings. In some cases, manufacturers of traditional roofing systems write exclusions into their warranties because they can't guarantee 100 percent waterproofing capabilities and cannot completely waterproof all areas above the roof substrate — a situation that architects should fully examine in selecting roofing options. "Other roofing manufacturers tend to warrant only their roofing product itself, as flashing is required and they do not manufacture those parts," says Causey, noting that with fluid-applied systems, the flashing *is* the product. The flashing is covered under the warranty, in all climates and conditions, provided the product is applied according to the manufacturer's specifications by an approved applicator and the proper inspections have been made before, during, and after the installation. Manufacturers may be able to supply years of successful applications as research data.

Continues at ce.ArchitecturalRecord.com.

See Quiz on Page 116

or

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CIRCLE 43

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Program title: **"Roofing Strategies Reach New Heights: Sustainable Options for a Key Building Element" (07/09, page 109).** 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 July 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. In the United States, how much roofing work is re-roofing?
- ❑ **a.** nearly three quarters
- ❑ **b.** approximately one half
- ❑ **c.** only a small percentage
- ❑ **d.** two thirds

2. One of the oldest roofing materials in existence is:
- ❑ **a.** stone.
- ❑ **b.** brick.
- ❑ **c.** concrete.
- ❑ **d.** clay.

3. The main reason for most roofing products' degradation is:
- ❑ **a.** UV exposure.
- ❑ **b.** the freeze-thaw cycle.
- ❑ **c.** water absorption.
- ❑ **d.** high winds.

4. The newest innovation in clay tile roofing is a recently launched building-integrated photovoltaic roofing product (BIPV) that uses:
- ❑ **a.** solar panels.
- ❑ **b.** recycled glass.
- ❑ **c.** flexible thin film solar cells.
- ❑ **d.** special pigments.

5. Fluid-applied roofing is:
- ❑ **a.** a monolithic system used mostly in residential settings.
- ❑ **b.** a monolithic system used mostly in commercial settings.
- ❑ **c.** a roof coating used on steep slopes.
- ❑ **d.** a roof coating used on flat roofs.

6. Roofing systems are tested for:
- ❑ **a.** exterior fire exposure.
- ❑ **b.** wind uplift resistance.
- ❑ **c.** fading.
- ❑ **d.** all of the above

7. Prefabricated roofing curbs are fabricated to fit:
- ❑ **a.** the approximate roof-opening size plugged in during design.
- ❑ **b.** the exact units selected after bid.
- ❑ **c.** standard size units.
- ❑ **d.** contractors' specifications.

8. Cool roofs can reduce the roof surface temperature of the roof by up to:
- ❑ **a.** 20 degrees.
- ❑ **b.** 50 degrees.
- ❑ **c.** 100 degrees.
- ❑ **d.** none of the above

9. "Coolness" is measured by:
- ❑ **a.** solar reflectance and thermal emittance.
- ❑ **b.** solar reflectance and albedo.
- ❑ **c.** thermal emittance.
- ❑ **d.** thermal emittance and ambient temperature.

10. Topcoating the SPF with an elastomeric coating is a must to protect the roof from:
- ❑ **a.** dirt.
- ❑ **b.** water absorption.
- ❑ **c.** high winds.
- ❑ **d.** UV degradation.

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

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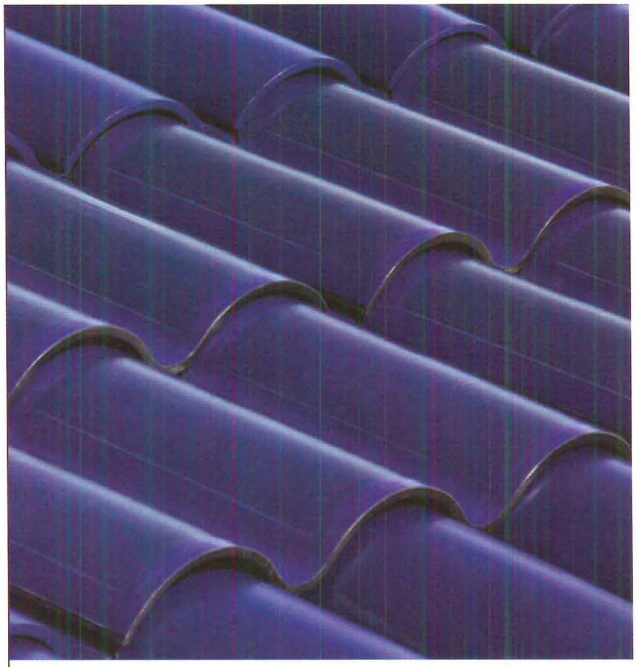
Roofing Strategies Reach New Heights: Sustainable Options for a Key Building Element

Product Review



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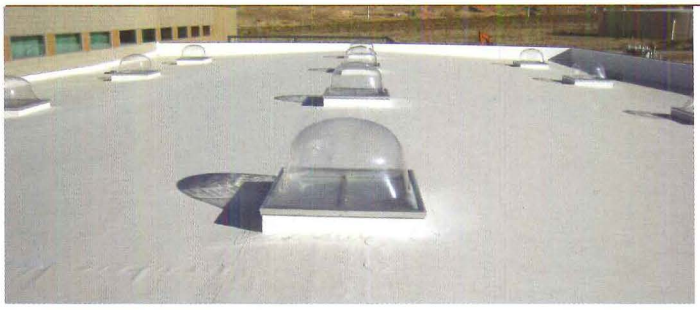

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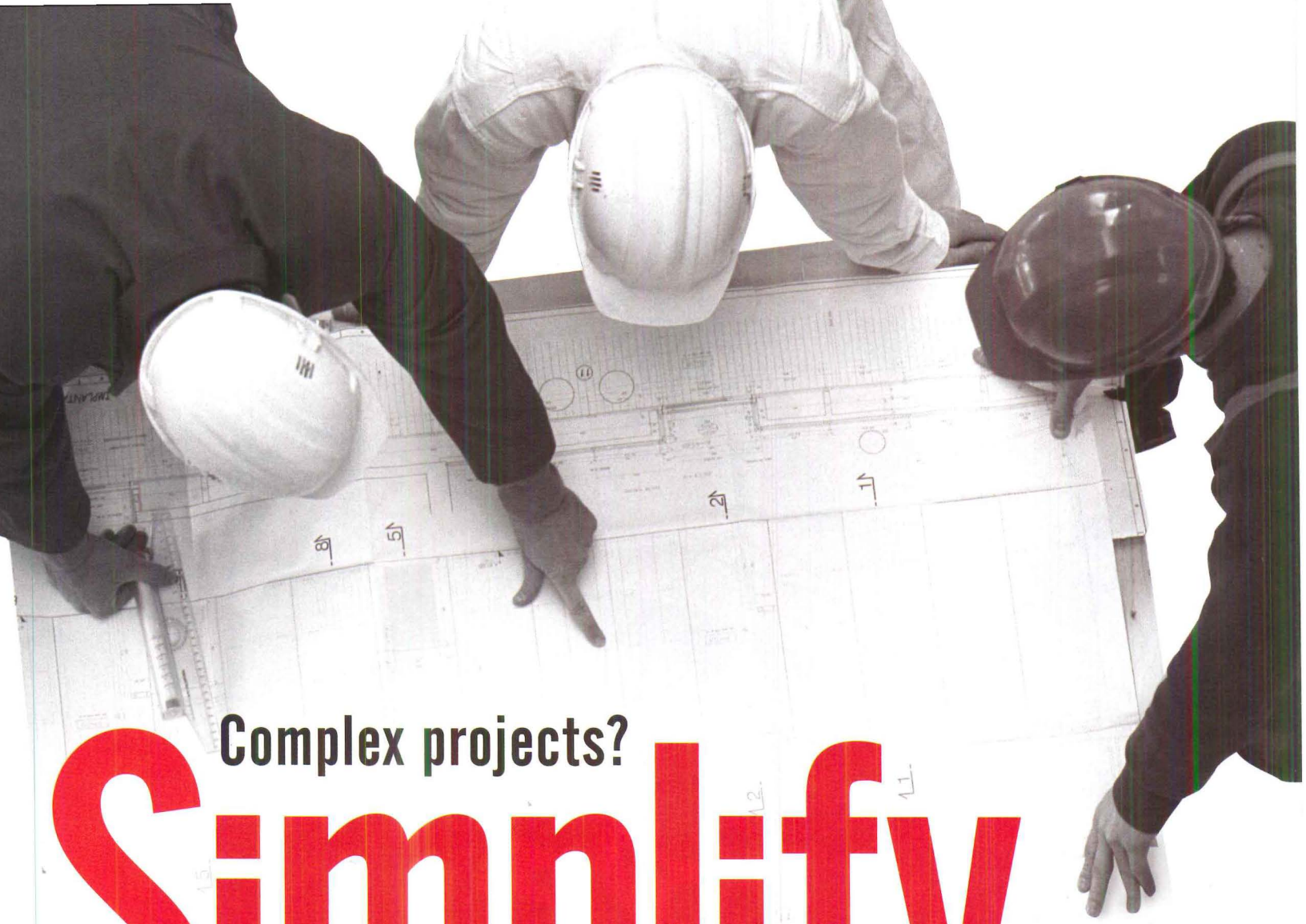

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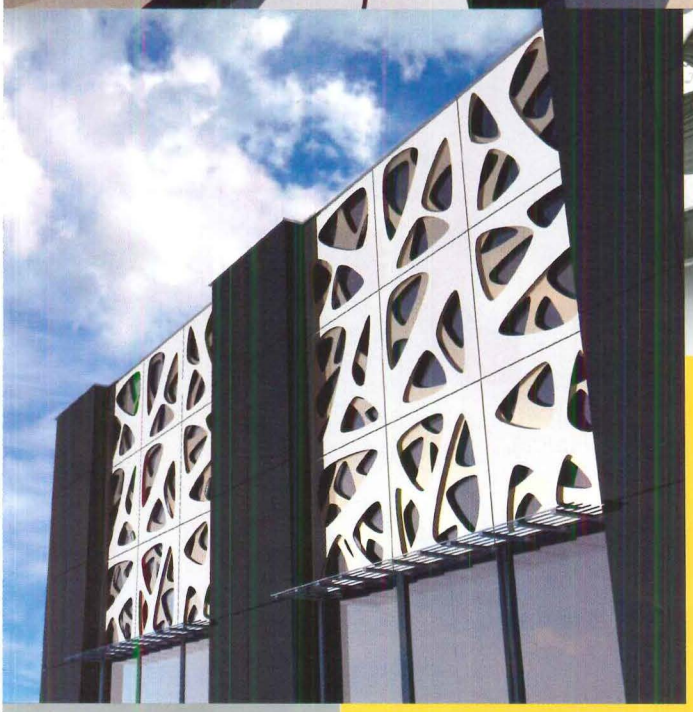

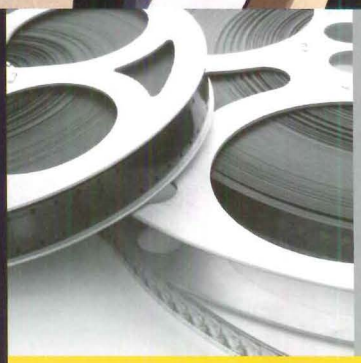

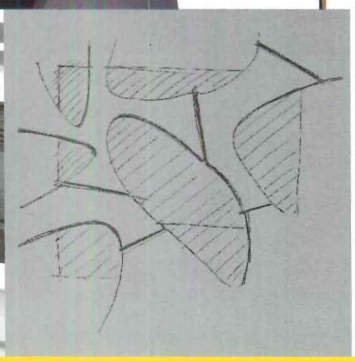

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* United States Conference of Mayors (2008). *Current and Potential Green Jobs in the U.S. Economy.*

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The AIA Housing and HUD Awards Programs Honor 21 Projects

AIA ONE/TWO FAMILY CUSTOM HOUSING

HOUSE ON HOOPER'S ISLAND
Church Creek, Maryland
David Jameson Architect

This 2,200-square-foot house on an estuary separates the program into a series of discrete pavilions, allowing the owners to expand or contract their use depending on the number of guests and weather conditions. Raised gently off the ground according to zoning regulations following Hurricane Isabel, the simple forms recall local precedents such as fishing shacks and barns. The jury commended the project's balance of informality and rigor, saying that despite the seemingly random scattering, the "overall plan is regimented."

700 PALMS RESIDENCE
Venice, California
Ehrlich Architects

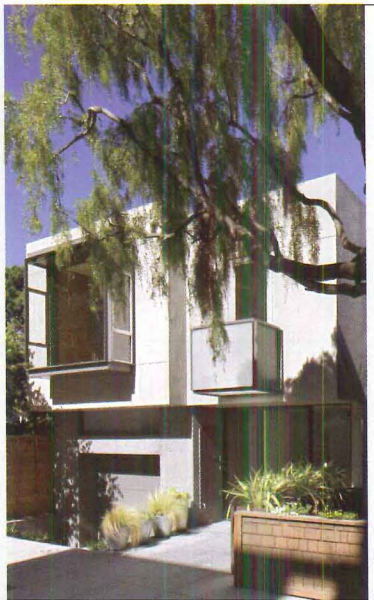
The consistently temperate climate of Southern California allowed the architects to thoroughly dismantle barriers between inside and out in this house on a narrow urban lot. Material selections such as exposed steel supports and basic canvas shades – which are "just what they are," according to the jury – give the house an air of simplicity. Sustainability also played a central role in the design, which uses natural ventilation and other methods to achieve net zero energy use.

OUTPOST RESIDENCE
Bellevue, Idaho
Olson Sundberg Kundig Allen

An artist's dwelling and studio in the high desert plains of Idaho, this spartan structure stands like a ruin in the landscape, open to mountain views beyond. Simple materials, including concrete block and plywood, require minimal maintenance and are able to withstand the range of temperature variation on the remote site. The adjacent "paradise garden" – a similarly austere arrangement of two rows of trees – is set apart from the surroundings by a set of high concrete walls.

MONTECITO RESIDENCE
Montecito, California
Olson Sundberg Kundig Allen

Steel, concrete, and glass make up the primary materials for this house in the fire-prone Toro Valley. A broad roof shields the interior from direct sunlight while the exterior walls are oriented to take advantage of breezes. According to the clients' wish to have the house reflect the region, the steel will be allowed to oxidize and color the concrete, gradually merging the structure with its surroundings.



LAIDLEY STREET RESIDENCE
San Francisco, California
Zack / de Vito Architecture

This project challenged the architects to create an urban house friendly to the environment and to kids. Clear visual expressions of structural tectonics and materials give the house an air of integrity. The central staircase, fabricated of transparent acrylic and supported by water-jet-cut steel, was described by the jury as "poetic."

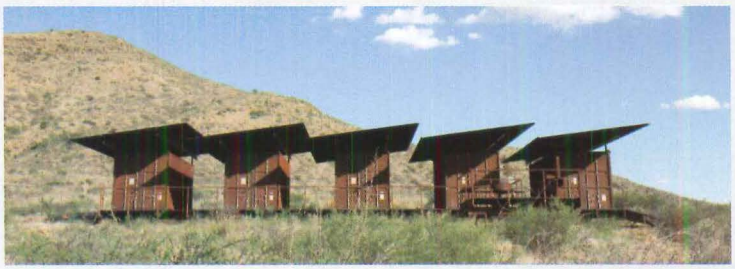
The 2009 AIA Housing and HUD Awards went to a mix of dwellings, from frugal desert encampments to urban infill projects. Sustainability, no longer auxiliary, was a consideration in every building selected. Many of the projects required architects to perform balancing acts, negotiating issues such as historical context, the environment, and social concerns. *Aleksandr Bierig* To view additional images and infomation visit **architecturalrecord.com**.

CHUCKANUT DRIVE RESIDENCE

Bellingham, Washington

The Miller | Hull Partnership

The jury called this coastal residence "playful and clean; it doesn't take itself too seriously." Modest in size at 1,400 square feet, its large windows face views of Washington's San Juan Islands. The design breaks function into two volumes: a lower, sloping form for the kitchen and entry, and a two-story tower for the living room and bedroom.



CINCO CAMP

Brewster County, Texas

Rhotenberry Wellen Architects

The perennial design trope of repurposed shipping containers is used here in a particularly raw and honest manner, with the architects keeping much of the boxes' character and allowing them to rust naturally. Five of them, customized off-site with MDF paneling, interior furnishings, and a large rear window, were brought to this West Texas ranch two at a time and set down with a crane. Forty-five minutes from the nearest town, the only nearby structures are occasional freight trains carrying such containers.

LOW COUNTRY RESIDENCE

Mount Pleasant, South Carolina

Frank Harmon Architect

This kinetic house reacts dynamically to local environmental conditions. A picturesque creek to the west dictated large windows in that direction, but the summer afternoon sun meant adding a series of operable shading devises on that exposure, set off from the glass facade to create a long porch. The entire building floats over the landscape, but its exterior horizontality belies the complex sectional variation within.

GLADE HOUSE

Lake Forest, Illinois

Frederick Phillips and Associates

Set in a Frederick Law Olmsted–designed landscape in suburban Chicago, this house synthesizes traditional and Modern forms. Subject to strict municipal review in this district of historic house types, the structure echoes the forms, color palette, and textures of typical barn typologies once present in the area, but long forgotten in favor of large suburban mansions. The jury wrote that any house that pulls off this balancing act with grace "deserves accolades."

HOUSE AT SAGAPONAC

Wainscott, New York

TsAO & McKOWN Architects

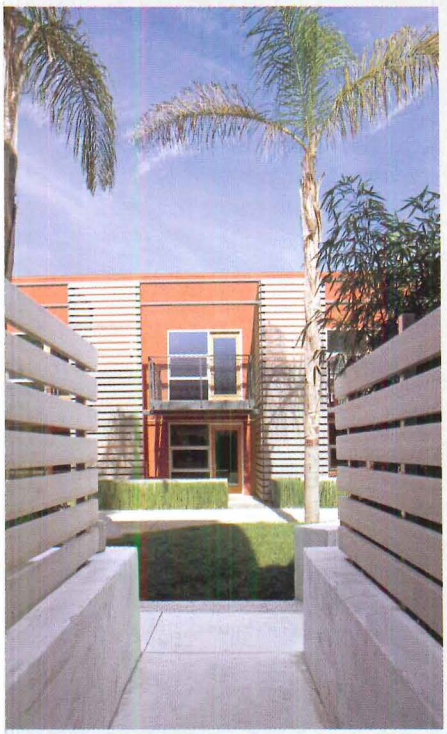
After encountering this flat site next to a young-growth forest, the architects decided to reshape the land, allowing for functions and daylight both above and below grade. Part of a community master planned by Richard Meier on the eastern end of Long Island, the house, for an imagined client, explores "the universal human desire for both orderliness and spontaneity." Its layout allows occupants to expand or contract use based on the number of guests, changing from an intimate retreat for a couple of inhabitants to a larger dwelling for a group.

KARANI (MIDDLE RIGHT); MICHAEL MORAN (BOTTOM)

AIA MULTIFAMILY HOUSING

FORT POINT LOFT CONDOMINIUMS
Boston, Massachusetts
Hacin + Associates

This large development encompasses 140,000 square feet, including the adaptive reuse of two structures, a new building on an adjacent lot, and a striking rooftop structure that rests atop the entire ensemble. A multi-use facility, it includes housing (99 condominium units, including eight affordable units), two levels of restaurant and retail facilities, and an art gallery. Though the rooftop addition presents an overtly contemporary image, it borrows details, proportions, and materials from the context of the existing structures. The jury lauded the architects' handling of public space within the building, as well as the structural challenge of placing the addition above the existing elements.



COURTYARD LOFTS
Long Beach, California
Interstices and Studio One Eleven at Perkowitz+Ruth Architects

This downtown Long Beach development combined adaptive reuse, planning, and sustainable approaches in a community of residential lofts. Two abandoned commercial buildings were skillfully reimagined into these open-plan dwellings. The area's context of low-rise commercial buildings contributed to the team's approach, which the jury cited for its humane scale and respect for the surroundings. The units are all organized around a central courtyard, providing a communal gathering area for tenants, as well as a verdant oasis among surrounding parking lots.

ICON
San Diego, California
TannerHecht Architecture

The remediation of a brownfield site and the preservation of historic building facades were both primary considerations in this mixed-use project. TannerHecht transformed an abandoned 55,000-square-foot plot into a development with 327 residences in four towers. Ranging from 5 to 24 stories, the towers are connected by bridges and terraces, and interpolated with a series of gardens. The summit of the tallest tower is graced with the "SkyBox," a rooftop pavilion that overlooks nearby Petco Park, the San Diego Bay, and the city beyond.

AIA ONE/TWO FAMILY PRODUCTION HOUSING

CONOVER COMMONS
Redmond, Washington
Ross Chapin Architects

This small development in Washington State provides an excellent example of suburban infill planning and construction. A group of modestly scaled houses are tucked into a forest and organized around a "commons" – a central garden shared by all residents. The placement of the houses attempts to balance the needs of shared space and privacy. The 13 homes share a common parking lot. Traditional in form, the houses were awarded a 4-Star rating by the Master Builders Association's Built Green program, which awards architects and builders for use of energy-efficient appliances, climate-effective insulation, weather sealing, materials selected for environmental sensitivity, and minimal construction waste.

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CIRCLE 51

AIA SPECIAL HOUSING

MADISON @ 14TH APARTMENTS

Oakland, California

Leddy Maytum Stacy Architects

A mixed-use project with social goals, this complex provides 79 apartments, ranging from 400-square-foot studios to 1,100-square-foot three-bedroom apartments, for low-income residents and former foster youth at risk of becoming homeless. Ground-floor retail space encourages pedestrian use, and the second floor contains spaces shared by residents, including a kitchen, conference rooms, and a podium garden. The jury noted the building's natural ventilation and the use of green materials. They also applauded the facade's "great play of transparency and vibrantly colored opacity."

SAINT JOHN'S ABBEY AND MONASTERY GUESTHOUSE

Collegeville, Minnesota

VJAA

The jury characterized this "simple and rich" project as "a serene complement to the existing campus," a collection of 10 cast-in-place concrete structures designed by Marcel Breuer in the 1950s. The new structure includes conference rooms, meeting areas, a library, meditation room, dining facilities, and administrative offices, along with 30 guest rooms that all face neighboring Lake Sagatagan. The architects took cues from the environmental precepts of the Benedictine Order to guide their sustainable building strategies, including "environmental stewardship, integrity and durability, frugality, hospitality, comfort, and balance."

AIA SPECIAL HOUSING AND HUD COMMUNITY-INFORMED DESIGN

THE BRIDGE

Dallas, Texas

Overland Partners and CarmargoCopeland

For this center for the homeless near downtown Dallas, the architects employed a number of strategies to link the building to the surrounding community. Built from a reclaimed warehouse, a temporary shelter occupies the bottom floors, with transitional housing above. Translucent walls in the sleeping areas highlight the structure's purpose: To make the public more aware of the city's homeless population. An artist collaborated with the occupants to create a street-level mural.

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HUD EXCELLENCE IN AFFORDABLE HOUSING DESIGN

BRIDGETON NEIGHBORHOOD

Bridgeton, New Jersey

Torti Gallas and Partners

Located in a small town in southern New Jersey, this development represents the maturation of the HOPE VI program, which was initially aimed at public housing in large cities. The revitalization plan included a careful evaluation of the site – considering where to build and where not to build – resulting in the demolition of a former public housing project. That site was restored as a park, providing a new social center for the neighborhood. At the same time, vacant, postindustrial lots in the community were built upon to create a consistent architectural fabric.

IRVINGTON TERRACE

Fremont, California

McLarand Vasquez Emsiek and Partners

This 108,000-square-foot complex contains 100 units of low-income housing and shows that Modernist forms and materials – which came to be associated with soulless, overscaled urban housing projects – can be successfully used for sensitive and humane social housing. The development is oriented around a traditional village square, with long blocks of rental units articulated into individual dwellings with bold, rectilinear massing. Street-conscious detailing includes stoops and porches to promote outdoor social gathering. The project also features underground parking and a variety of public green spaces, as well as connections to the nearby Irvington Village, a market-rate development designed with similar themes.

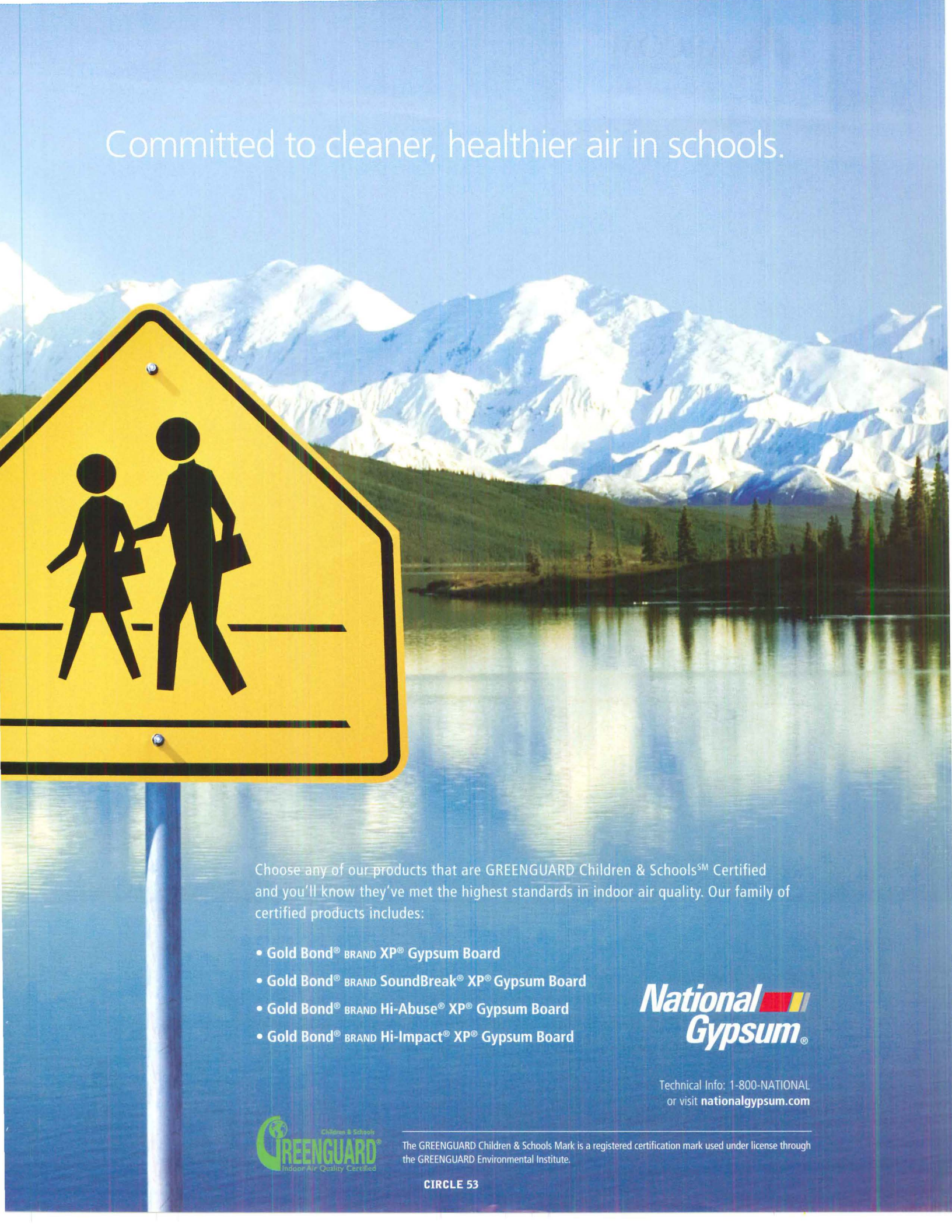
HUD CREATING COMMUNITY CONNECTION

SOUTH END SRO HOUSING

Boston, Massachusetts

Hacin + Associates

This six-story mixed-use building was developed with a nonprofit agency that supports homeless individuals by offering job training, work experience, education, housing, and services. Fourteen single-room occupancy (SRO) units are located on the top two floors, above a multipurpose community meeting space and a ground-floor commercial restaurant, which subsidizes the rent for the building. In addition to promoting the social programs, the clients and architects worked toward environmental goals by utilizing geothermal heating and cooling throughout the structure. The building awaits LEED certification for these efforts.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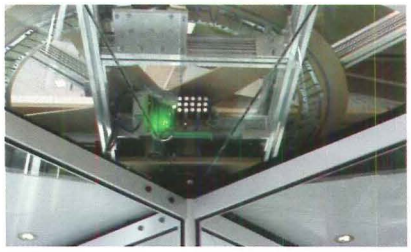
Product Focus Doors

As our lead story illustrates, a door isn't one single product, but a **kit of parts working together**. This month we present some updates, including a sleek handle, Victorian-inspired glass, an ADA-compliant sill, and **greener skins, cores, and trim**. *Rita Catinella Orrell*

Clockwise from right: Passengers at a Dutch railway station create energy as they pass through the revolving door; an LED scale indicates the amount of energy produced per push; a green light signals that enough energy has been generated.



Revolving door harnesses human energy while generating awareness

Completed last October, the Natuurcafé La Porte, located in the Driebergen-Zeist railway station in the Netherlands, is a multifunctional space incorporating a restaurant, exhibition space, and visitor center. To help meet the goal of an energy-neutral restaurant – with the use of a geothermal pump, solar collectors, a wind turbine, and other technologies – the Amsterdam-based architectural firm RAU collaborated with the door and turnstile manufacturer Boon Edam to develop the world's first Human Energy Powered (HPE) revolving door.

Located directly adjacent to the station platform, the HPE TQM door is intended not only to save energy but to actually generate energy each time it is used. Compared to the 4,600 kwh per year saved by using a revolving door (as opposed to the energy loss associated with sliding or swing doors), the energy *generated* with human power is roughly 10 to 30 kwh per year. "These figures put the potential of generating energy with human power a bit more into perspective," says Dirk Groot, product manager, door systems at Boon Edam.

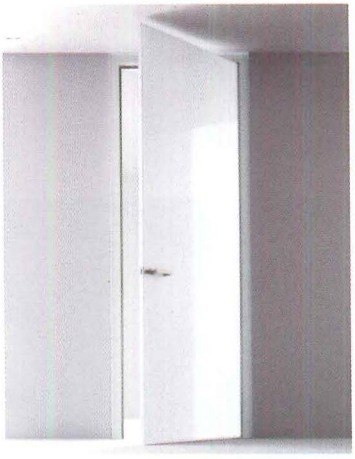
The HPE TQM door is equipped with a special generator driven by human energy applied to the door while controlling its rotating speed. A set of supercapacitors store the generated energy as a buffer and provide a consistent supply for the low-energy LED lights in the ceiling. In case the LEDs have used up all of the stored energy, the unit will switch to the alternative mains supply of the building, ensuring the door is illuminated even when passenger flow is minimal.

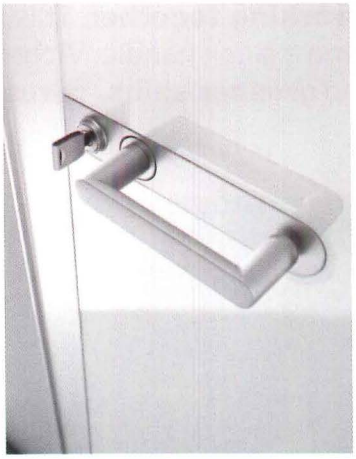
LED scales inside the door indicate the amount of energy that is generated: When someone passes through the door at a slow speed, the scale will end up in the red or orange zone, while a "normal" or fast pace pushes the scale in the green zone, indicating that significant electric energy is generated. The ceiling of the door is made of safety glass and gives a clear view of another LED indicator at the control unit that shows when the illumination of the revolving door is powered by human energy or by the mains supply. To help make users aware of their contribution to the green building, "Human Powered Energy" stickers are displayed on the door, and the total amount of energy generated is accumulated and shown on a large display inside the building. Groot estimates the number of daily users at 100 people per hour, 12 hours a day.

With the HPE TQM prototype a success, Boon Edam has decided to take the door into production. "At the moment, we are not sure what the market potential is," says Groot. "The strength of the door is not a competitive price or a large amount of energy that can be generated, but the fact that the appearance of the HPE TQM draws attention to the sustainable issue." Boon Edam, Lillington, N.C. www.boonedam.us **CIRCLE 205**

For more information, circle item numbers on Reader Service Card or go to **architecturalrecord.com/products**.

Products Doors



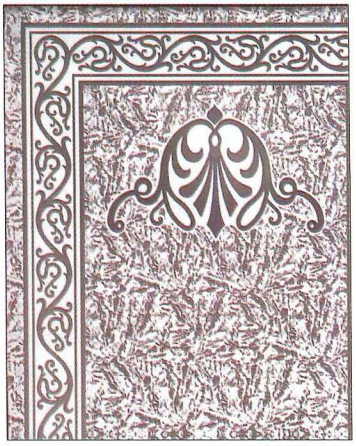


▲ **Sleek entrance** Rimadesio manufactures closet systems, sliding-door systems, shelving units, and doors using innovative technologies and materials including gray oak, aluminum, and lacquered, satined, and acid-etched glass in a variety of vivid colors. Link (left) features a door panel in milk-white lacquered glass, with jambs and frame in white aluminium. The door features an exclusive Rimadesio handle (right), which is now available in a keyed version. Rimadesio, Boston. www.rimadesioboston.com **CIRCLE 207**

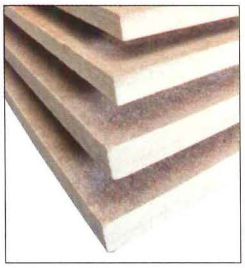
◄ **Greener skin** Jeld-Wen claims to be the first window and door manufacturer to offer all of its interior molded door skins with no-added formaldehyde (NAF), meeting the most stringent formaldehyde requirements in the nation. While some manufacturers eliminate only urea formaldehyde, Jeld-Wen has eliminated all forms of added formaldehyde for its door skins. The company's wood composite garage door skins are also NAF surfaces. Jeld-Wen, Klamath Falls, Ore. www.jeld-wen.com **CIRCLE 209**

► **ADA-compliant sills** Wausau's terrace doors now offer low-profile sills on both in-swing and out-swing models for improved accessibility. The components will meet ADA accessibility criteria as per Fair Housing Act Regulations 24 CFR 100.205 Chapter 4, "Thresholds and Accessibility Routes at Exterior Doors." When improved accessibility is required, Wausau's extruded aluminum sill with ribbed insert fits its single-leaf and French double-leaf, project-out and project-in doors. Wausau Window and Wall System, Wausau, Wis. www.wausawindow.com **CIRCLE 211**

► **Touch of glass** Therma-Tru has introduced two new decorative glass designs to help add affordable curb appeal. The new Central Park decorative glass (shown) is available for Therma-Tru's Classic-Craft Oak and Mahogany collections and features an intricate frosted glass pattern to complement Victorian-inspired homes. The glass is available in a variety of doorlite, sidelite, and transom sizes. Therma-Tru, Maumee, Ohio. www.thermatru.com **CIRCLE 206**



▼ **Crafty contents** Craftmaster Green doors from CMI come with a standard hollow core construction or a solid GreenLite fiberboard door core. The rigid, lightweight core provides the properties of a solid wood door and is made from SFI-certified wood. The doors made with the solid core contain a minimum of 65 percent by weight, preconsumer-recycled content, while the hollow core doors contain a minimum of 50 percent by weight preconsumer content. All versions have no added urea formaldehyde. CMI, Chicago. www.cmicompany.com **CIRCLE 208**



▼ **Sliding doors** TerraSpan lift and slide doors match Kolbe & Kolbe's full line of premium, aluminum-clad wood windows and doors. The doors can incorporate up to 10 panels per unit with a 12' maximum panel height. Each panel is 2¼" thick, requiring minimum space when open – either by nesting behind one another or recessing into a pocket. A range of sustainably harvested wood species can be chosen for the interior trim. Kolbe & Kolbe Millwork Co., Wausau, Wis. www.kolbe-kolbe.com **CIRCLE 210**

Read about additional products at **architecturalrecord.com/products**.

Product Briefs KBIS Review

Big-brand no-shows may have tempered the buzz of this year's Kitchen & Bath Industries Show, but **the prevailing mood was surprisingly upbeat**. Many manufacturers played it safe by expanding existing lines or reengineering them to improve water and energy efficiency, **while others embraced superficiality**: new finishes, textured surface treatments, and an emphasis on flush installations. *Jen Renzi*

► **Royal flush** Blanco expanded its Steelart line with Precision MicroEdge, a suite of drop-in sinks that offer the look of custom flush-mount styles. Credit German engineering for its exceedingly minimal .05"-thin rim, which rises almost imperceptibly above the countertop. Sinks can be installed with mounting clips or in a traditional flush-mount manner. The nine designs, including single and double-bowl versions, are crafted from satin-polished stainless steel muffled by sound-dampening technology borrowed from the auto industry. Blanco America, Lumberton, N.J. www.blancoamerica.com **CIRCLE 212**

◄ **Uplifting news** Robern's Uplift cabinet opens up rather than out, allowing the cabinet to 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. The 6"-deep unit comes in 30", 36", or 48" widths and accommodates six outlets plus an LCD flat screen. Robern, Bristol, Pa. www.robern.com **CIRCLE 213**

► **Black is back** The vogue for black finishes in the bathroom continues unabated. Venerable U.K. label Samuel Heath went to the dark side, unveiling a beautiful obsidian finish option for its contemporary Xenon suite of faucets, shower components, and bathroom accessories. Crafted from sturdy hand-polished, chrome-plated European brass, the rich metal has a decidedly transitional character and a warm, matte finish that pairs well with wood or stone. Samuel Heath & Sons, New York City. www.samuel-heath.com **CIRCLE 214**

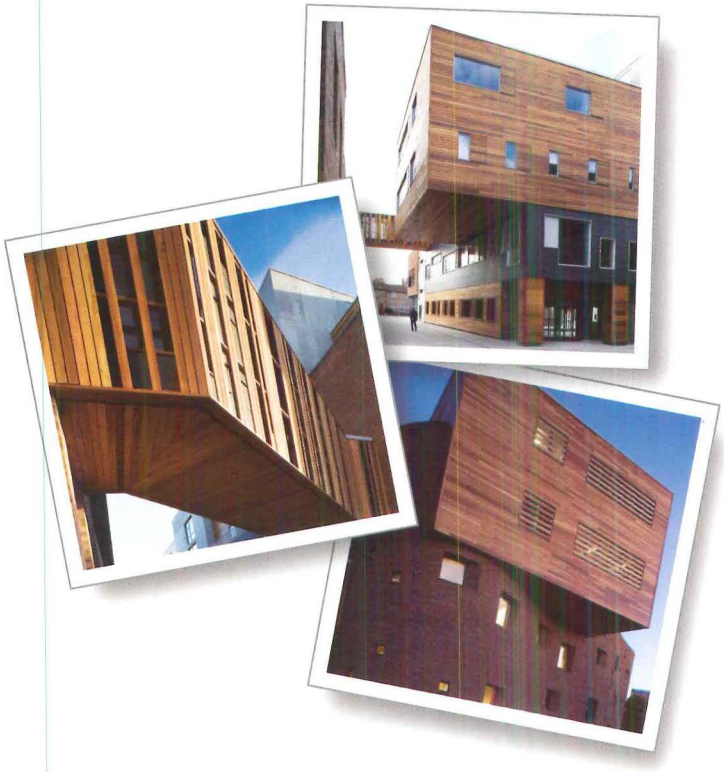
◄▲ **Sinks in** The downturn didn't squelch Kohler's creativity – or its productivity. Among its introductions were a high-tech yet price-conscious four-in-one showerhead, an evocative matte-white finish for sanitary ware, and innovative kitchen sink designs. Most striking was the Iron/Occasions (above), a monumental 39" x 63" cast-iron countertop with an integrated trough sink serviced by a pullout faucet. The weighty unit sits on standard cabinetry or a stainless-steel base. Kohler also gave its Alcott farmhouse-style sinks a makeover (inset), exploiting the apron front as a canvas for decoration: The fireclay forms are carved with geometric relief patterns in a variety of translucent glazes. Kohler, Kohler, Wis. www.kohler.com **CIRCLE 215**

◄ **Dry times** Reducing paper-towel consumption, Japanese brand Toto's recessed Clean Dry high-speed hand dryer uses a proprietary air-wicking technology to do its job in under 12 seconds. The brushed-chrome unit shuts on and off via an infrared sensor and uses a quarter less energy than traditional models. It is also ADA-compliant and quiet, too, with a low decibel rating of 62 decibels. Toto USA, Morrow, Ga. www.totousa.com **CIRCLE 216**

For more information, circle item numbers on Reader Service Card or go to **architecturalrecord.com/products**.

York St. John University
Architect: Rivington Street Studio; Photo: Sarah Blee

Beautiful, versatile, sustainable
western red cedar



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CIRCLE 56

ARCHITECTURAL RECORD
09 INNOVATION
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The Net-Zero Energy Buildings Conference II

Technologies, Materials, and Systems for Getting to Zero

GETTING TO ZERO.

Architects, engineers and their clients continue in their quest to achieve net-zero energy buildings – a feat requiring both great design skill, and technical sophistication. The 2009 Innovation Conference will continue to build upon the ideas introduced at last year's highly acclaimed Net-Zero Energy Buildings Conference. Presentations will include engineering fundamentals, groundbreaking case studies and more of the new technologies that will help the profession get to zero.

Register today for the Net-Zero Energy Buildings Conference II to explore what it will take to fulfill the worldwide mandate for ultra-energy-efficient architecture. We'll study topics such as micro smart-grids, the new generation of super-efficient HVAC systems, dynamic window shading, carbon-fiber and eco-ceramic building skins, vegetated surfaces for air purification, and more.

CASE STUDY PRESENTATIONS WILL INCLUDE:

- IDeAs Office Building, Santa Clara, California, EHDD Architecture
- Merck Serono, Geneva, Switzerland, Murphy/Jahn Architects
- Okhta Center Tower, St. Petersburg, Russia, RMJM Hillier

KEYNOTE SPEAKERS

Helmut Jahn
President and CEO
Murphy/Jahn Architects

Dr. Colin G. Harrison
Director, Corporate Strategy
IBM Smart Cities Initiative

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Dates & Events

Ongoing Exhibitions

Santiago Calatrava: World Trade Center Transportation Hub
New York City
Through August 31, 2009
Santiago Calatrava will be the subject of a new exhibition showcasing architectural models along with a multimedia presentation. At the Queen Sofia Spanish Institute. For more information, call 212/628-0420 or visit the Institute's Web site, www.queensofiaspanishinstitute.org.

Richard Neutra, Architect: Sketches and Drawings
Los Angeles
Through September 6, 2009
This exhibition is an outstanding selection of travel sketches, figure drawings, and building renderings from Richard Neutra, one of Modernism's most important architects. The works range from early drawings from Neutra's student wanderings, in 1913, to later renderings of his Los Angeles houses from the 1950s. For more information, call 213/228-7500 or visit www.lfla.org.

Charles Kaisin: Design in Motion
Hornu, Belgium
Through September 27, 2009
This exhibition will present all the work and research of designer Charles Kaisin from 1999 to 2009 linked to two themes: motion and recycling. Each subject will be presented by explaining the process of conception, the way of developing the objects, and their production process. At the site of the Grand-Hornu industrial mining complex. For more information about the exhibition, call +32 (0)65/65.21.21 or visit www.grand-hornu-images.be.

Design for a Living World
New York City
Through January 4, 2010
This exhibition features objects created by leading designers and made from sustainable, natural materials. It explores the transformation of organic materials, such as wood, plants, and wool, into beautiful and useful objects. At the Smithsonian's Cooper-Hewitt, National Design Museum. You can obtain further information about the show by calling 212/849-8300 or visiting the Cooper-Hewitt Web site at www.cooperhewitt.org.

Lectures, Conferences, and Symposia

DesignDC 2009
Washington, D.C.
July 14–16, 2009
Attendees have the ability to satisfy all 18 continuing-education units required each year as an AIA member through seminars and tours while browsing through a trade show with more than 60 exhibitors and vendors. At the Walter Washington Convention Center. Visit www.aiadesigndc.org.

Radical Nature: Contemporary Visions
London
July 23, August 2, and October 8, 2009
A series of conversations concerning contemporary architectural responses to ecological imperatives. Spread over three evenings, the series will invite responses from practitioners working in areas as diverse as São Paulo, Abu Dhabi, and Antarctica; and at a scale ranging from the tabula rasa master plan to one-off buildings made from salvaged materials. At the Barbican Centre. Visit www.architecturefoundation.org.

11th International Alvar Aalto Symposium: Edge – Paracentric Architecture
Finland
August 7–9, 2009
A group of African, Asian, South American, and Finnish architects embark on a joint search for new architectural approaches to improving living and housing conditions around the world. The symposium will take place in the main auditorium of the University of Jyvaskyla, which was designed by Alvar Aalto. Visit www.alvaraalto.fi.

Cityscape Dubai World Architecture Congress: A Survival Guide for Architects, Recession, and Recovery
Dubai
October 5–7, 2009
Set against the backdrop of the recent unprecedented calamity in the global economic arena, this international conference aims to put forward innovations and solutions in order to spark positive and proactive plans toward securing the future of construction, architecture, and design. Architects and developers from around the world will discuss today's rapidly changing economy and what is on its horizon for recovery. Call +9714 335-2437 or visit www.cityscape.ae/wac.

Dates & Events

Competitions

Design It: Shelter Competition
Deadline: August 23, 2009
A global, online initiative that invites the public to use Google Earth and Google SketchUp to create and submit designs for virtual 3D shelters for a location of their choice anywhere on Earth. Everyone from students to amateur designers to design and architecture professionals can visit the Design It: Shelter Competition Web site for information on how to enter the competition and download Google Earth and Google SketchUp. Visit www.guggenheim.org/shelter.

The Deutsche Bank Urban Age Award
Deadline: September 11, 2009
This award recognizes creative solutions to the problems and opportunities that face more than half of the world's population that now lives in cities. Accordingly, it focuses on projects that benefit communities and local residents by improving their urban environments. Visit www.urban-age.net.

The AIA Diversity Recognition Program Call for Submissions
Deadline: September 16, 2009
The program seeks exemplary efforts to diversify the architecture profession. The jury will select up to 12 submissions each year as diversity best practices. For more information on the program, call 202/626-7352 or visit www.aia.org.

BSA Research Grants in Architecture
Application deadline: September 18, 2009
Designed to expand the architectural knowledge base, grants may be made to individuals, collaborative teams, students, or organizations and institutions. Visit www.architects.org/grants.

Advanced Architecture Contest
Deadline: September 28, 2009
Under the theme of "Self-sufficient Cities," the third annual International Architecture Contest emphasizes the importance of innovation for future environments. The jury will look for compelling innovations that reflect the ecological and technological needs of our future. Visit www.advancedarchitecturecontest.org.

E-mail information two months in advance to sebastian_howard@mcgraw-hill.com. For more listings, visit architecturalrecord.com/news/events.

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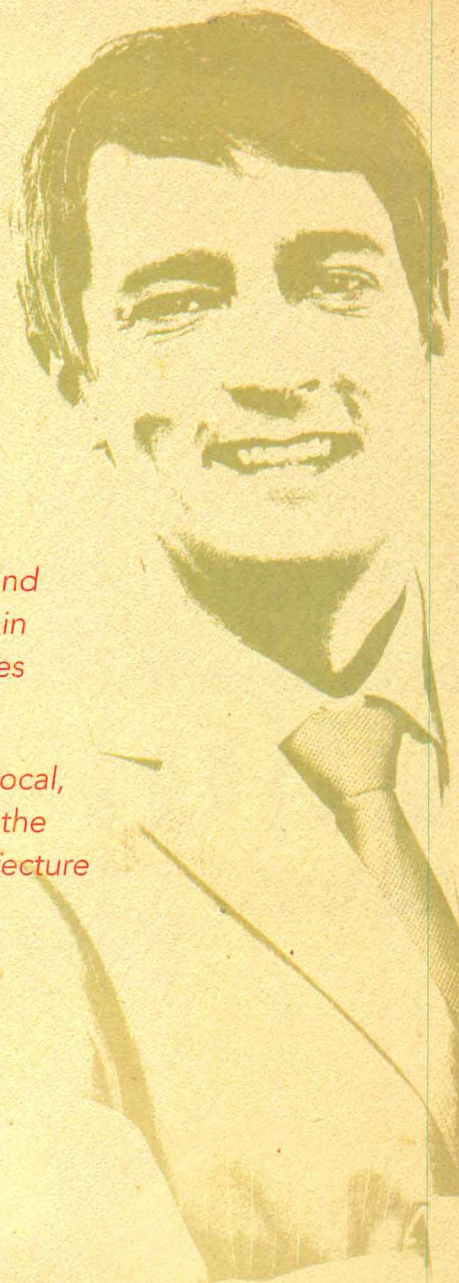

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Performance Data:

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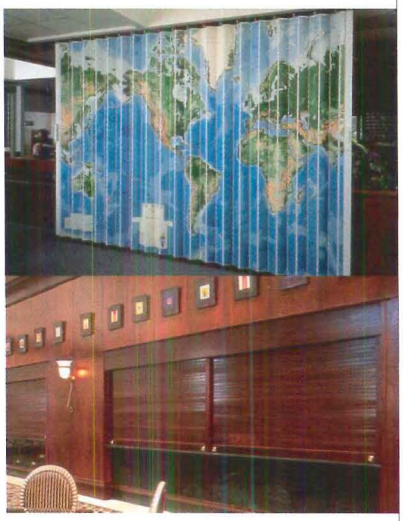

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Circle 150

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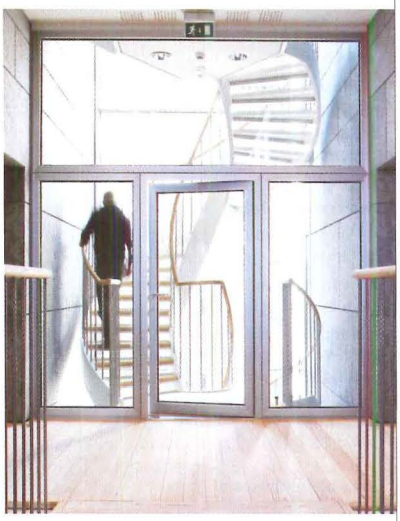
- Varsity Athletic Facility, Dartmouth College, Hanover, NH

Performance Data:

- Many finishes available including clear/bronze anodize, Kynar/Duranar, powdercoating



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Major Industries, Inc.

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Product Application:

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Wall or path, BKSSL™ technology, long life, significant energy reduction, exceptional thermal management, LED source.

Product Application:

- Architectural lighting
- Landscape design

Performance Data:

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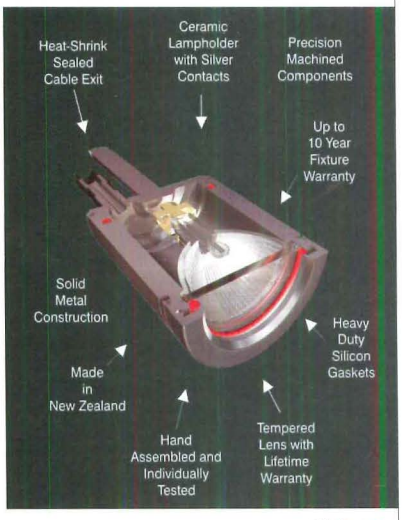

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Circle 155

$$$= Premium cost | $$= Mid-range cost | $= Value-oriented cost | WR = Wide range of price points | NC= No charge
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- Comprehensive selection of engineered wood subfloor systems
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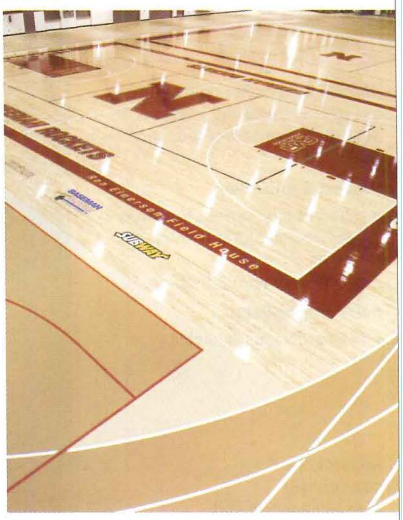

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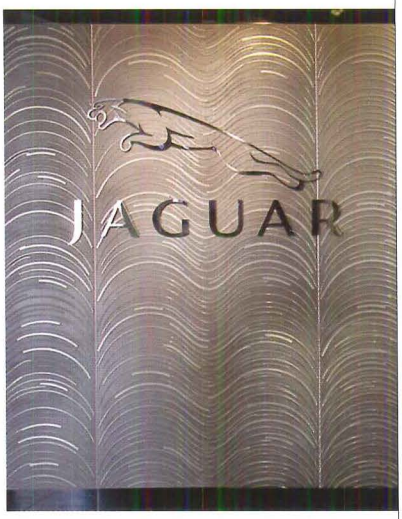
- Microsoft Corporate, Redmond, WA

Performance Data:

- Durable, low-maintenance dimensional surfacing
- Cost-effective installation systems



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INTERIOR FINISHES, FURNISHINGS

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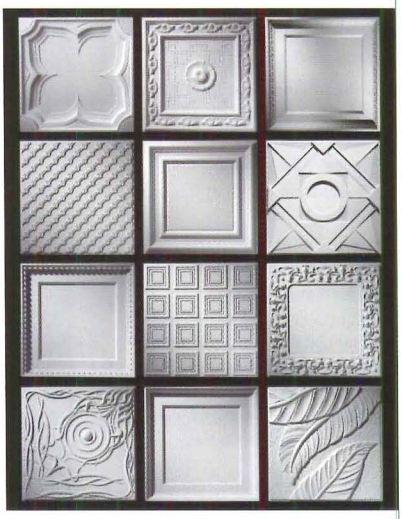

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Architectural Products by Outwater

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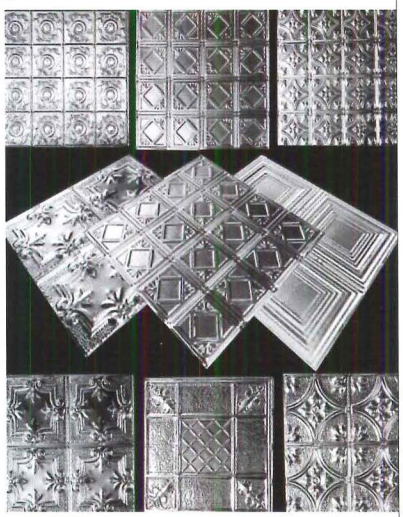

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VGM modular greenwall panels make greening buildings simple. Rely on them to make buildings green.

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- Roof garden & roof equipment screening
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- Structuring space in public areas

Performance Data:

- Attaches with a stainless frame & rail system
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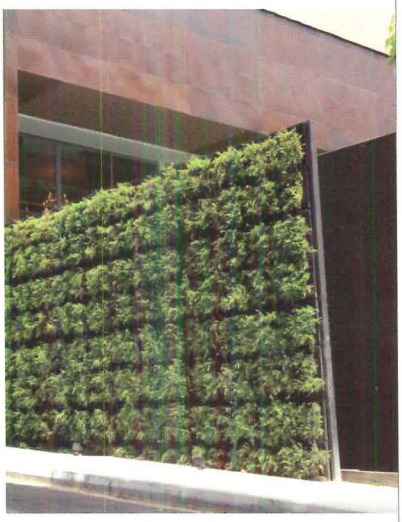

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Circle 162

LANDSCAPING, SITEWORK

VERSATILE CITY BOLLARDS

$ | NEW

FAAC International, Inc.

FAAC offers two versatile styles of bollards for traffic control and parking deterrent solutions.

Performance Data:

- Automatic, semi-automatic, and fixed versions. Master slave capability up to nine slave units.
- Model 275 hydraulic version has a duty cycle of up to 5,000 cycles a day. All bollards have finishing options to match surrounding architecture.

Model 275

Model 220

www.faacusa.com
800.221.8278
Contact: Dan Ollar, General Manager

Circle 163

MATERIALS

ARCHITECTURAL NATURAL STONE

$$$ | G

Vermont Structural Slate Company

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

Product Application:

- Swiss Re USA

Architect: Schnebli Ammann Menz Architects

Unfading Green Slate flooring (Photo credit: Eduard Hueber)

www.vermontstructuralslate.com
800.343.1900
Contact: Craig Markcrow

Circle 164

MATERIALS

FIRE-RATED VERSION

G | NEW

Technical Glass Products

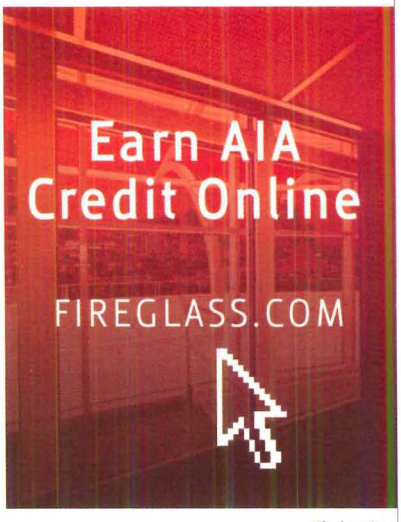
Technical Glass Products offers a valuable course for AIA HSW credit: "Burning Issues: Understanding Today's Fire-Rated Glass and Framing."

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 165

MECHANICAL SYSTEMS, HVAC, PLUMBING

WATERPROOF SHOWER BASE

$$$ | G | NEW

Noble Company

Introducing ProBase™, a waterproof, pre-sloped shower base that is ready to be tiled. There is no need for a mortar bed over the base. ProBase is a composite made from high-strength polypropylene honeycomb with a Noble Sheet Membrane laminated to the top. ProBase is packaged with everything needed to ensure a watertight installation.

Performance Data:

- UPC listed: IAPMO File #4339
- Compressive strength (bare) ASTM C 365

www.noblecompany.com
800.878.5788
Contact: Richard Maurer

Circle 166

MECHANICAL SYSTEMS, HVAC, PLUMBING

SOLAR HOT WATER

WR | G

HELIODYNE Solar Hot Water

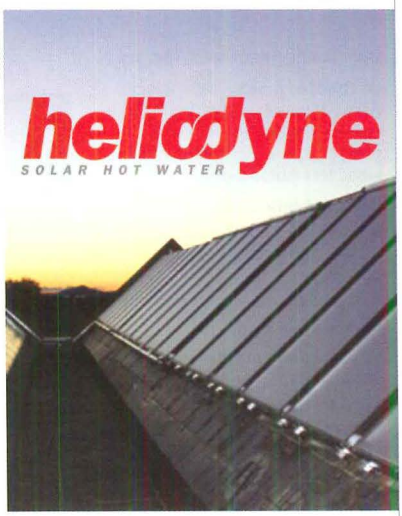
HELIODYNE, Solar Hot Water since 1976. Innovative design, superb product lines. Made in the USA.

Product Application:

- Commercial: Fenway Park, Boston, MA
- Commercial: Stanford University, Palo Alto, CA
- Single-family to residential developments

Performance Data:

- Collectors with sleek design and outstanding durability
- Unique plug & play components for ease of installation



www.heliodyne.com
888.878.8750
Contact: Alexandra Wexler

Circle 167

$$$**= Premium cost | **$$**= Mid-range cost | **$= Value-oriented cost | **WR** = Wide range of price points | **NC**= No charge
G = Product being marketed as green | **NEW** = Released to market in the past 12 months | =CAD Details Available | =PDF Available | =3D Model Available

ROOFING, SIDING, THERMAL & MOISTURE PROTECTION

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WR | G | NEW

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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
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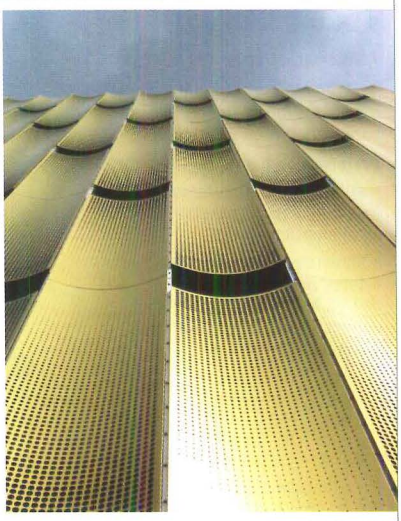


www.fabral.com
800.884.4484
Contact: Donna Berryhill
on sweets.com

Circle 168

ROOFING, SIDING, THERMAL & MOISTURE PROTECTION

TRANSLUCENT SKYLIGHT SYSTEM

WR | G

Structures Unlimited, Inc.

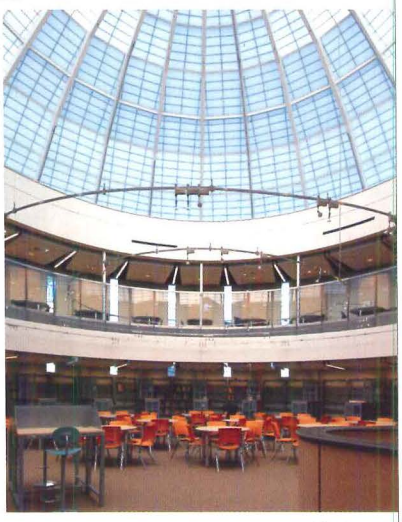
Glare-free, diffuse daylight eliminates glare and shadows. Reduces lighting and HVAC costs. Superior structural integrity. Potential LEED contribution up to 42 points. Manufactured in the USA to meet or exceed all local building codes.

Product Application:

- New Yankee Stadium, Bronx, NY
- Academy of Information Technology & Engineering, Stamford, CT

Performance Data:

- Clearspans over 100 ft.
- Up to R-20 insulation values (U=0.05)



www.skylightinfo.com
800.225.3895
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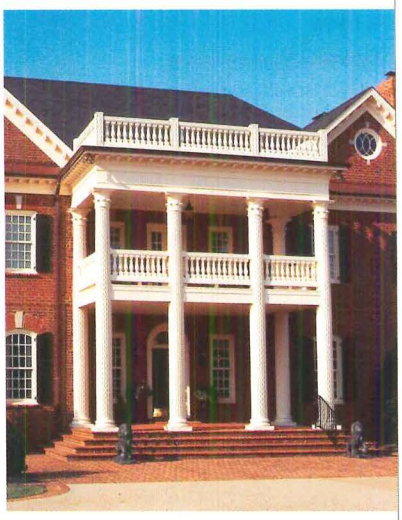

www.meltonclassics.com
800.963.3060
Contact: Mike Grimmett
on sweets.com

Circle 170

SPECIALTY PRODUCTS

CUSTOM TRANSLUCENT CANOPIES

G

CPI Daylighting Inc.

CPI translucent canopies provide excellent shelter and allow glare-free daylight into the area below.

Product Application:

- Mercy Hospital entry canopies and walkway covers, Miami, FL
- Suitable for green construction requiring LEED certification

Performance Data:

- Tested as new after 10 years of South Florida exposure
- Attractive Pentaglas Nano-Cell glazing system is affordable
- Maintenance-free

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Dale Travis Associates, Inc.

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Product Application:

- The Folk Art Museum, New York, NY
- All 550 offices of UBS around the country
- Hayden Planetarium, New York, NY

Performance Data:

- Installation available in all states and territories
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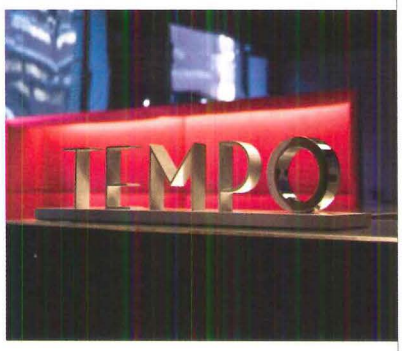

www.daletravis.com
212.243.8373

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WR

Finlandia Sauna Products, Inc.

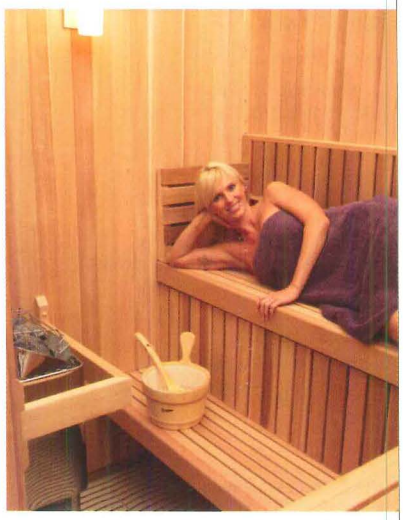
They manufacture authentic saunas, no infrareds. They offer precut packages, modular rooms and heaters.

Product Application:

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

Performance Data:

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



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800.354.3342
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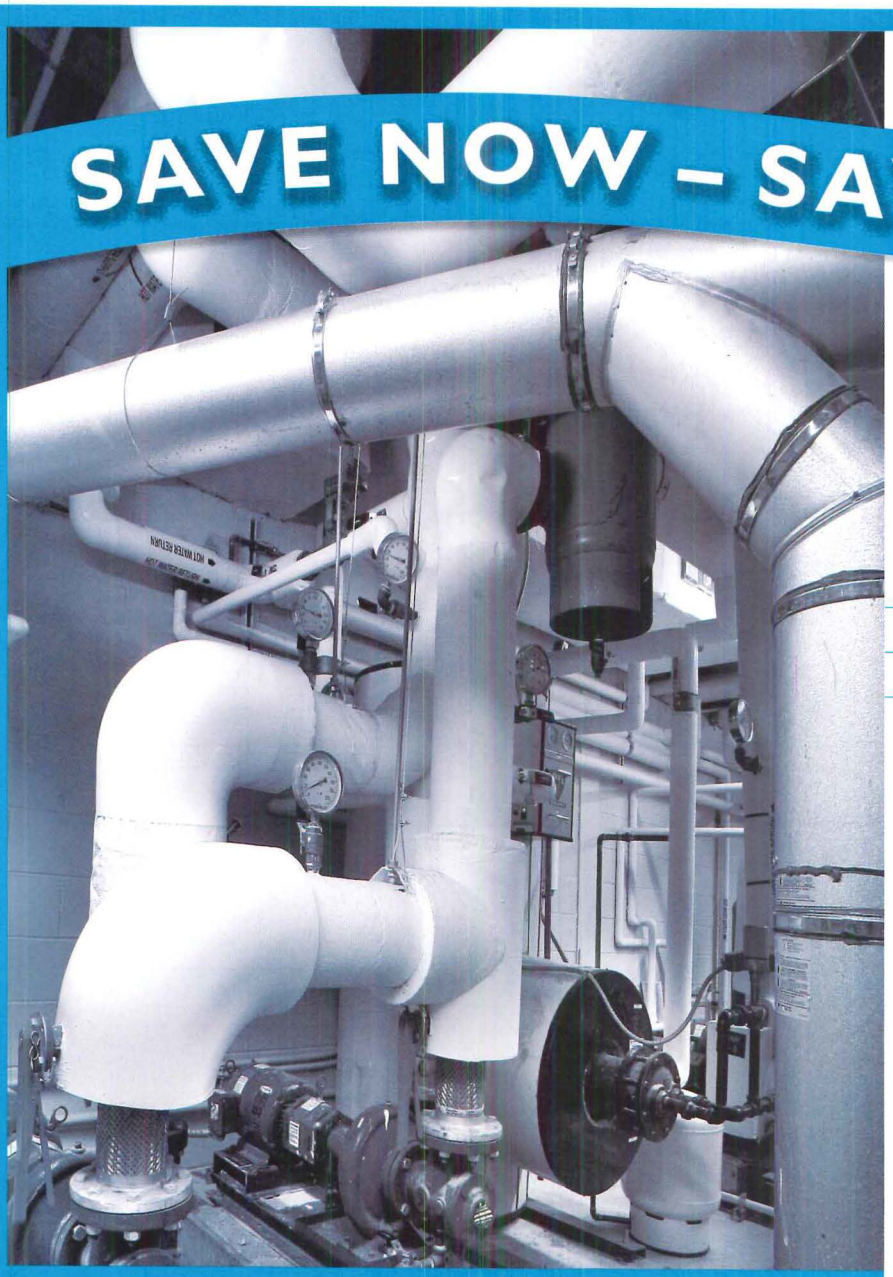

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CIRCLE 60

2009 **Product Reports** call for entries

All materials must be postmarked by Friday, September 11, 2009.

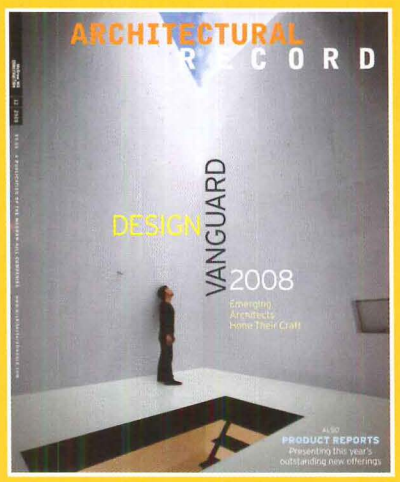
Submit your new building products to ARCHITECTURALRECORD's**2009Product Reports**, a special editorial feature in the December issue presenting the best and most innovative building products available to architects, specifiers, and designers in 2010.

A panel of architects, design professionals, and editors will select products for publication. There is no entry fee. For **submission instructions** and to **download the entry form** visit **architecturalrecord/call4entries.com**.

ARCHITECTURAL RECORD

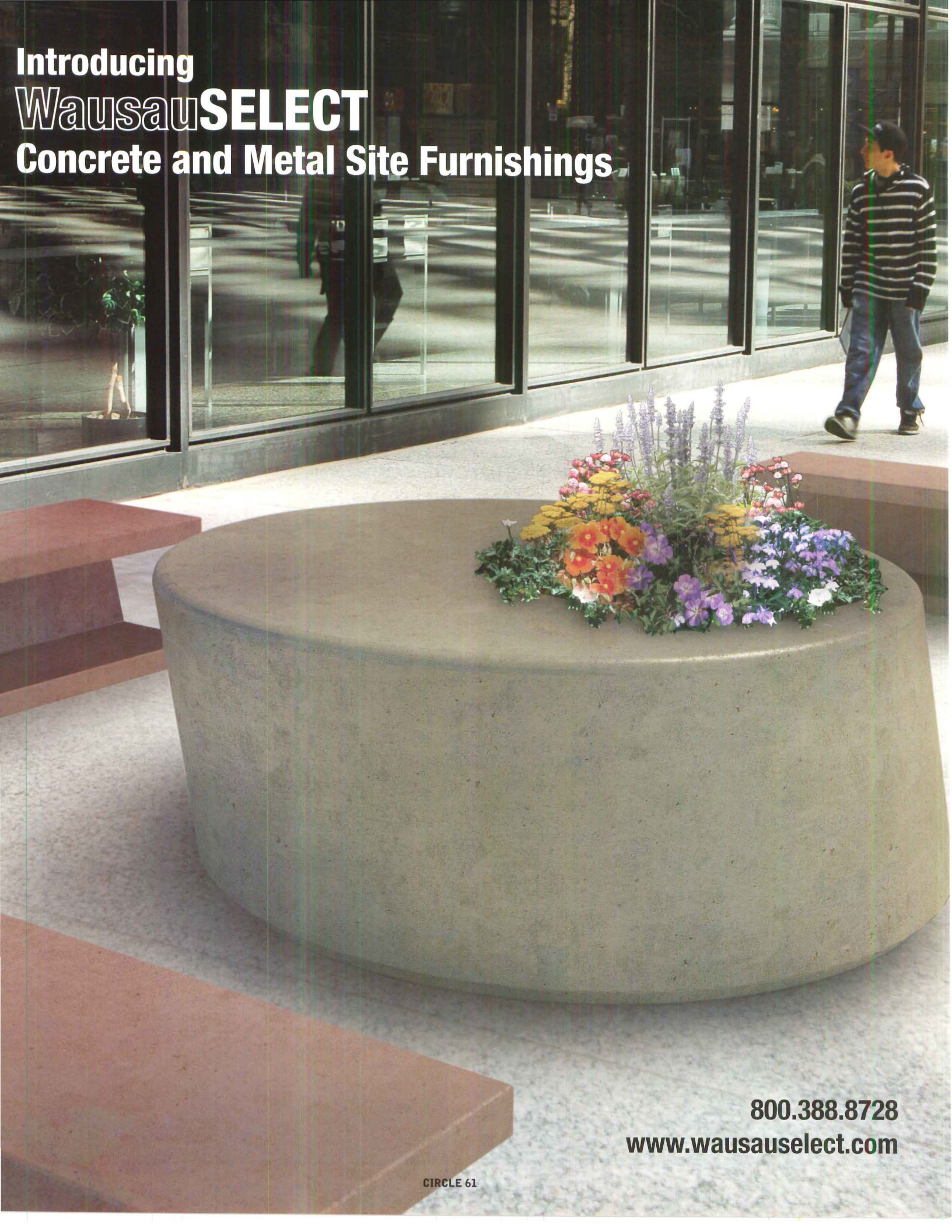
Design Vanguard 2009

CALL FOR ENTRIES



2009 will be the 10th year ARCHITECTURAL RECORD has published its **Design Vanguard** feature. We are looking for a great group of **10 emerging firms** from around the world to celebrate this anniversary. Although we do not have an age limit, we try to select architects who have had their own practices for less than 10 years.

For instructions and to download the entry form visit **architecturalrecord.com/call4entries.**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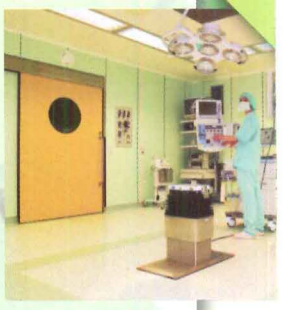


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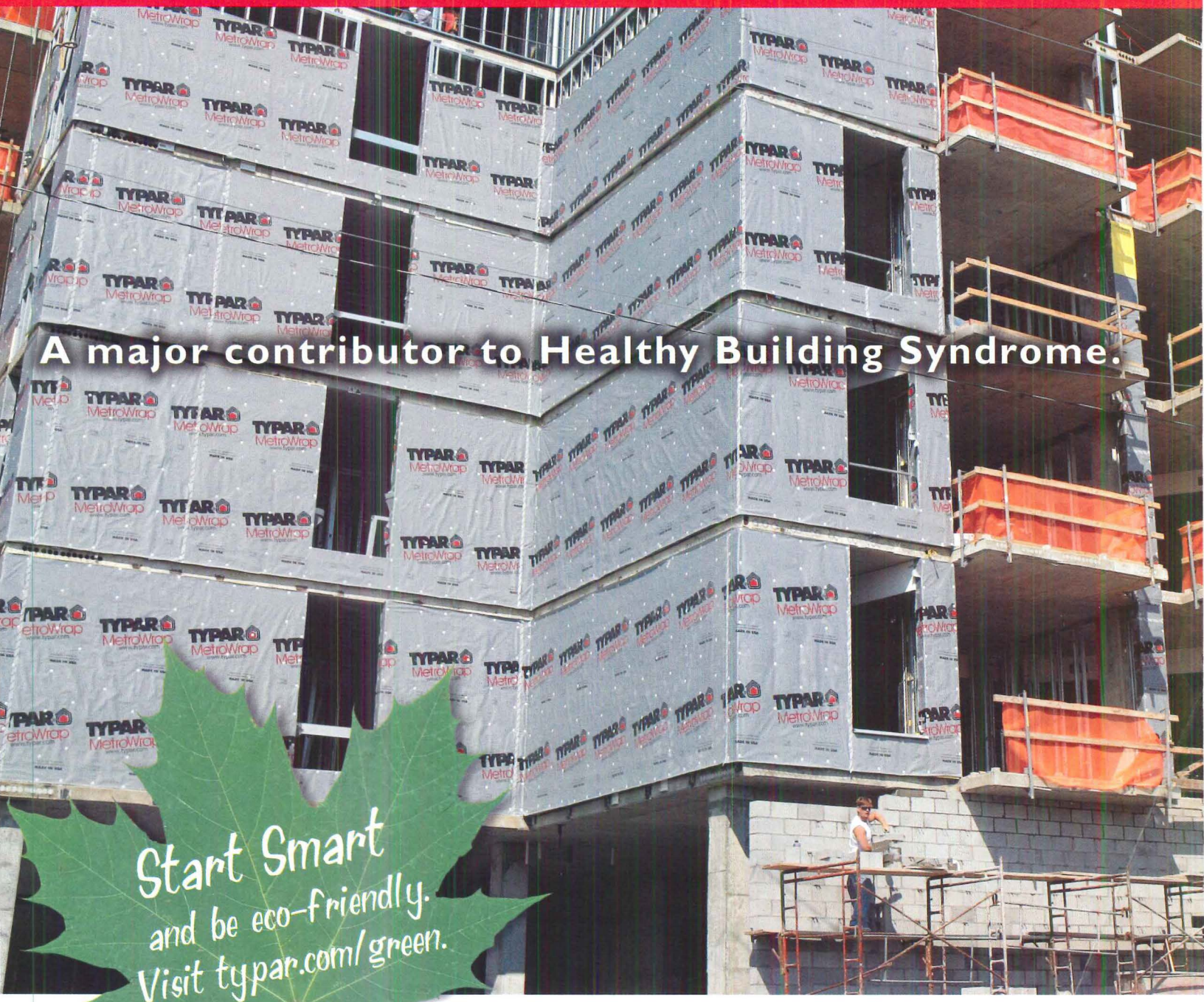
For complete event information please visit: www.hcarefacilities.com

For information on exhibits and sponsorships, please contact Nancy Jo Wiggin at 203-371-6322 or nj@jdevents.com

Reader's Gallery

To share images in our galleries, visit architecturalrecord.com and click on Community.

Bradley Shanks contributed this evening shot of Oscar Niemeyer's National Congress of Brazil to our reader galleries. A Massachusetts- and Colorado-based architect, Shanks took the photo while in Brasília on a travel fellowship. He says that the city, designed by Niemeyer in the 1950s (with Lúcio Costa as principal urban planner), fascinates him because it was built so quickly "from nothing, with no context to respond to." It provokes the question, "What would you do if you had that opportunity?" he says.



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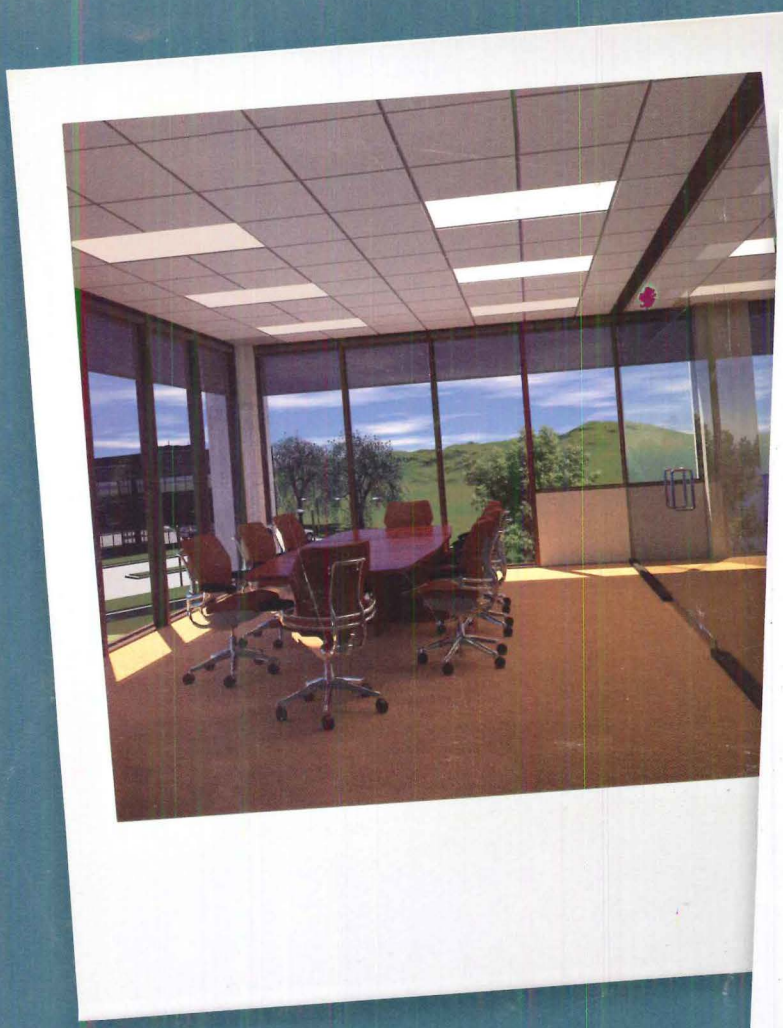
CIRCLE 67



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