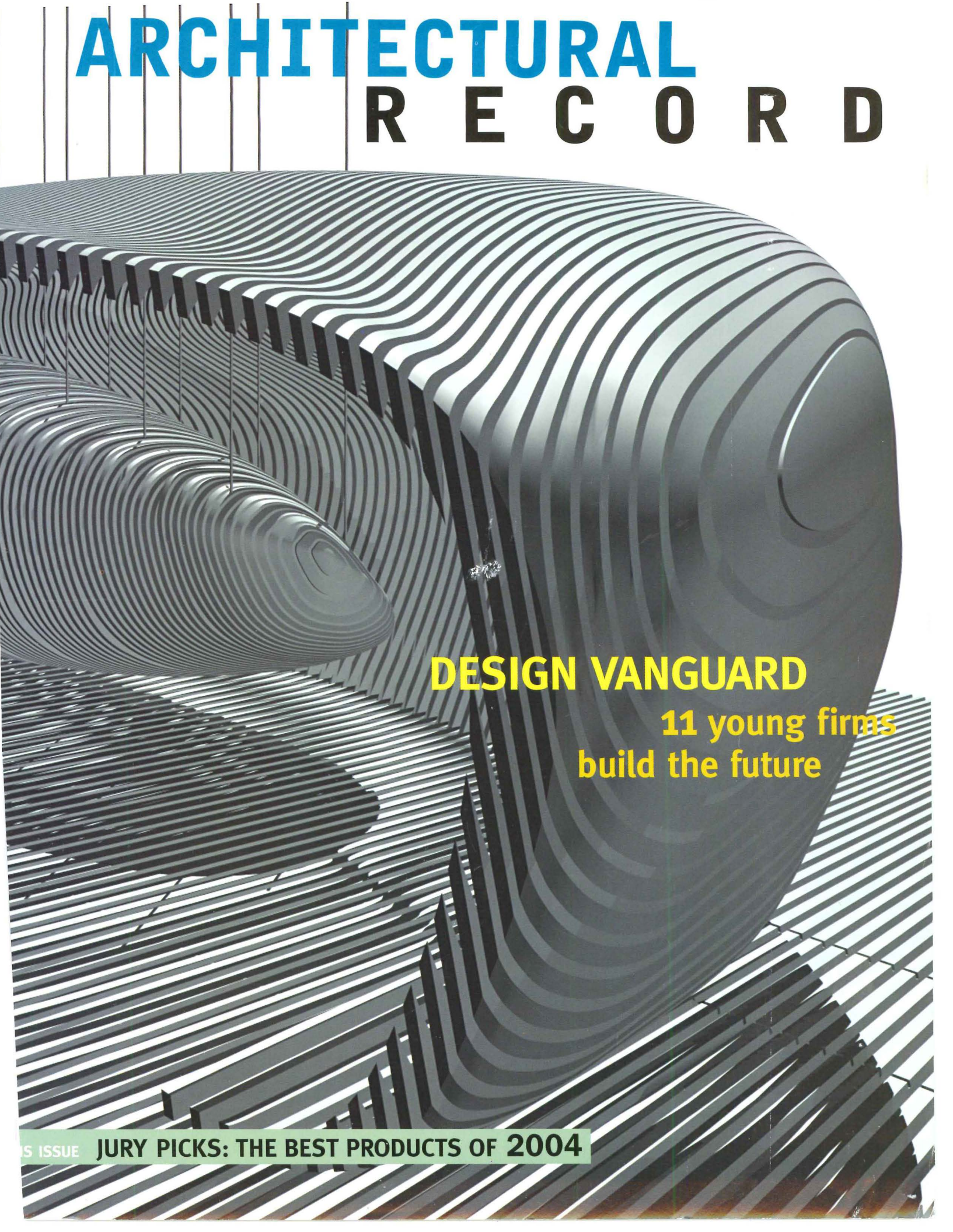


ARCHITECTURAL RECORD

An abstract architectural sculpture composed of numerous thin, dark grey, curved plates. The plates are arranged in concentric, wavy layers that create a sense of depth and movement. The overall form is rounded and organic, resembling a large, stylized eye or a futuristic architectural element. The lighting is dramatic, highlighting the curves and creating strong shadows.

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THIS ISSUE JURY PICKS: THE BEST PRODUCTS OF 2004

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Editorial

By Robert Ivy, FAIA

Not all buildings need to shout. If you are a typical reader of *ARCHITECTURAL RECORD*, you might conclude that most contemporary architecture speaks assertively, even independently of its surroundings. Bold, inventive architecture maintains ascendancy, while finesse or urban fit seem to have been relegated to second-class status. What has happened to the refined, respectful urban solution? New York's recently reopened Museum of Modern Art proves that skill and subtlety are still thriving.

In weaving together a disparate smattering of parts that the Modern had become, including the Philip Johnson and Cesar Pelli additions, the architect, Yoshio Taniguchi, faced formidable obstacles. Initially, he lacked recognition by a star-crazed public; few in the United States knew his work, since the architect had built almost nothing outside Japan. But his patience and tenacity, legendary among his peers, had produced a painstaking body of work, significant for its perfection of detail and devotion to scale and proportion. Taniguchi's work has refined the International Style, forged in Europe (and at the Modern), and honed it into a classic, minimal language that clarifies Modernism. His projects, like the Museum of the Horyuji Treasures [*RECORD* June 2002, page 90], unfold like origami, offering a procession of sensory experiences in three-dimensional, interlocking space.

His pared-down material palette deepens the architectural dialogue. The list is brief, but pungent: translucent fritted glass; walls of black granite and gray glass; silver anodized aluminum panels; simple white interior walls; green-slate and light-oak flooring. Here, the architect employed the materials to maximum effect, allowing glass to glow or rounded walls to hunker into solidity.

Taniguchi's client, a foremost repository and expositor of the Modern movement, needs no forceful declamation, no statement of identity as have its newer rivals like the Guggenheim Bilbao, in Spain. Instead, the Modern needed significant expansion, coherence of multiple parts, which had grown through the years, and a functional shake-up. The world had shifted since Abby Aldrich Rockefeller's early galleries confronted a new century. Today the Modern's collections and support, unrivaled and superb,

warranted a kind of understated hegemony that this new museum would provide.

Blissfully, the Taniguchi design, executed with the skills of the associate architects, Kohn Pedersen Fox, transcends its brief. Visitors now enter and rise to the fifth floor via escalators to commune with Matisse or Jackson Pollock, then descend toward a voluminous atrium, where zooming spaces intersect and project out toward the sculpture garden. From 54th Street, the rising floors offer an urban drama.

Galleries provide intimate moments away from the hype and scale, appropriate to the art they contain. If the largest spaces seem overwhelming for their installations, overall, the Modern seems to resolve the dichotomy between spectacle and privacy outlined in an interview with Victoria Newhouse in this magazine in January 2004 [page 80], offering both quiet and sociability in due measure, all bound within a single, unified plan.

The highest compliment may reside within the visitor's experience. Upon completion of a tour, the art is what remains memorable—the chromatic, glowing canvases or the parametric curve of a bronze sculpture, attesting to a welcome lightness of touch. Few architects today, outside of a handful, including Renzo Piano, would have the confidence to allow the objects contained to outshine the container.

During the recent opening days, some cognoscenti grouched about the Modern's apparent lack of "newness" or innovation, as if every structure should advance architecture intellectually or formally. Rather than a theoretical display, today's MoMA represents a culmination, a mastery of idiom that we seldom witness in the United States. Replete with its own ideas, the new Modern's translucent unfolding sets a standard for a new century's ideas, and works of art yet to come.

A lot went into making this project environmentally friendly.





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Letters

It's what's inside

I was pleased to see the copy that accompanied the image of Daniel Libeskind's Danish Jewish Museum on ARCHITECTURAL RECORD's October cover. I agree the "debate continues" over museum design, and the cover photo says it all: more bombastic architecture from Libeskind preying on art. I no longer feel these solutions are completely driven by the architect. Rather, buildings like this fill a gap in the curatorial mission of some institutions. If a museum can't tell engaging stories with its collection, then it builds a provocative box around it.

Fortunately, the October issue also showcases some redeeming projects. James Stewart Polshek's design for the Brooklyn Museum

[page 116] is a wonderful front door, although the museum has significant problems that remain to be addressed (for example, many galleries aren't even air-conditioned). Richard Gluckman's Picasso Museum in Malaga [page 132] seems to be a scheme that lets the curatorial interests and architectural context take precedence. It's a sensible model that is also reflected in Ando's project in Aomori [page 124].

I believe that great architecture and a great museum experience can coexist if those responsible—trustees, museum directors, and architects—remember that these projects are more about the contents than the container.

*Ken Carbone
Manhattan*

Diversity resolution

Your facetious October Record News headline, "Will Number Crunching Fix Architecture's Diversity Crisis?" [page 40], dismisses the sad reality that after 30 years of minority scholarships, mentoring, programs aimed at attracting underrepresented middle and high school students, and curricular interventions, we have only inconclusive anecdotal data on why our profession still fails to reflect the demographics of the society we serve. Other professions, such as law and nursing, have diversified as they undertake systematic quantitative and qualitative studies to determine who is attracted to their fields, how underrepresented groups fare in professional schools, what happens during internships

and the early stages of practice, and why people drop out of professional tracks before becoming licensed.

Architects often speculate that a lack of early exposure to design professionals, low pay, or workplace practices may be driving qualified people of color, women, and those who are physically challenged out of architecture, but we have not self-assessed our practices in a systematic way. Such speculation begs the question of why so many white males are willing to accept the challenges of our profession while others are not. The AIA's Diversity Resolution is designed to bring together all the groups involved with this profession, in order to capture both statistical data (longitudinal "num-

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Letters

ber crunching”) and qualitative information. We invite comments and recommendations through the Diversity listserve on the AIA’s Web site. This will enable us to introduce effective and focused programs to address what you rightly call a “diversity crisis” as the world evolves dramatically around us, but the demographics of our profession change only minimally. *Ted Landsmark, Assoc. AIA, M.Ev.D, J.D., Ph.D. President, Boston Architectural Center Chair, AIA Committee on Diversity*

Steely resolve

I certainly wish to congratulate the concrete industry on the accomplishments highlighted in Sara Hart’s article, “Slender, Robust, and Very Tall,” in the *Innovation* supplement to the November 2004 ARCHITECTURAL RECORD [page 36].

Concrete certainly has made progress as it seeks to emulate the strength, aesthetic appeal, design flexibility, cost effectiveness, and schedule benefits of structural steel.

Regretfully, the article echoes some misleading assertions of the concrete industry with respect to structural steel. It is critical that owners, architects, developers, structural engineers, and developers make informed decisions based on accurate information, not misrepresentations being spread by representatives of competing systems.

H. Louis Gurthet, P.E. President American Institute of Steel Construction

Set and setting

Robert Campbell [Critique, November 2004, page 75], citing lines of Londoners awaiting the opening of

Norman Foster’s Gherkin, a work of commercial architecture, says, “It’s hard to imagine that kind of interest ... in the U.S.” Perhaps, but on April 22, 1939, 26,000 people (over one third the population of Racine, Wisconsin, where the work was located) waited for two hours in lines two blocks long to experience the interior of the Johnson Administration Building, a strictly for-business work of architecture. Frank Lloyd Wright, waxing confident, had predicted the project would attract spectacular attention—and more—for his client.

Given that both projects serve private business interests, this may be more of a commentary concerning the quality and attraction of public spaces within the vicinity of both.

J. Spencer Lake San Diego

Thanks for the memories

I’d like to compliment you on the October issue—it is probably the best edition I have ever seen in the many years I have been reading

ARCHITECTURAL RECORD. The issue truly expresses the design of the international architects you have honored.

Additionally, in reading the obituaries [Record News, page 31], I find it difficult to contain my admiration for some of the great architects who helped develop our industry over the past 50 years. Max Abramovitz has never gotten his due. Certainly, Ed Barnes has left his mark on American architecture, and Irwin Miller of Cummins Engine Company in Indiana was one of the first individuals who appreciated the quality of good design. *Marvin A. Mass Consentini Associates New York City*

Corrections

A November News item about a new building for New York’s Cooper Union [page 30] failed to name the project’s associate architect, Gruzen Samton.

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New law gives significant tax cuts to architects

On October 22, President Bush signed the new JOBS tax bill into law, representing \$137 billion in corporate tax cuts. As part of the law, architecture and engineering firms will receive a \$358 million tax break.

For the 2005 and 2006 tax years, firms—including sole proprietors, partnerships, LLCs, subchapter S corporations, and C corporations—will be allowed to deduct 3 percent of their net revenues from

projects undertaken in the U.S. That percentage increases to 6 percent in 2007, 2008, and 2009. After 2009, it becomes 9 percent.

"This is a great victory for us," says AIA C.E.O. Norman L. Koonce, FAIA, whose organization lobbied hard for the legislation. "Our members will receive a tangible benefit for years to come."

Responding to fiscal doubts, Ron Facheaux, vice president of

governmental advocacy for the AIA, makes it clear that the benefit for architects "has nothing to do with increasing the deficit." He notes, "If architects and engineers didn't get the money, it would have been used for other corporate tax benefits." Because of the way the bill was structured, he adds, every new tax cut had to be paid for by a revenue offset, including repealing the \$50 billion export tax break and elimi-

nating \$60 billion in tax shelters and tax avoidance practices.

Many architects relished the law's benefits to their companies. But others, like Ron Viergutz, an architect at Jones Studio in Phoenix, have concerns about who will not benefit: "While I'm all for saving money, I'm not willing to sacrifice money in the system that could be spent for education, social security, environmental protection, health care, troops' body armor, or homeland security," he says. *Sam Lubell*

Praise and questions for Ground Zero cultural center choices

While significant praise has been given for both the choice of cultural institutions at Ground Zero and the selection of Frank Gehry, FAIA, and Snøhetta as project architects, some community members and architects have voiced concerns.

One of the biggest sources of anxiety is whether the chosen architects—particularly Gehry, who is designing the theater complex—will connect their designs with the accumulating architectural pastiche that is the new Ground Zero. Gehry, critics point out, is well known for his sculptural prowess, formal originality, and powerful statements. He is not, however, known for his ability to fit seamlessly into a larger urban framework, particularly one that must address mourning. Beverly Willis, director of Remake Downtown Our Town (RDOT), a Lower Manhattan neighborhood group, is happy about the wide variety of architecture developing in her area. But she wonders if any of the buildings, designed by very distinctive architects like Gehry and Santiago Calatrava, will be developed into a unified plan.



Some wonder if Gehry's boisterous designs, like "Ginger and Fred" in Prague (left) and the Disney Concert Hall in Los Angeles (right), will add to architectural cacophony at Ground Zero.

"Without an overall vision, without some similarity in terms of color or materials, there's not going to be anything there to identify the buildings that are being designed as part of a larger place," she notes, echoing sentiments from a few local architects, who rumble that the site may become an "architectural World's Fair" instead of a World Trade Center. Design guidelines for the site, not officially released, are not clear or forceful enough to maintain such unity, adds Petra Todorovich, associate planner at the Regional Plan Association.

Gehry could not be reached for comment, but Linda Shelton, executive director of the Joyce Theater,

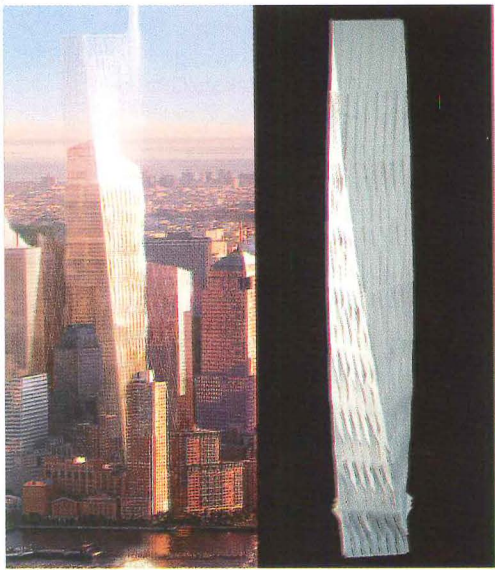
who along with the Signature Theater hired Gehry, wonders if meshing their building with the others is the point. "These arts institutions have been brought in as a catalyst for redefining this neighborhood. If you put in a square cement box, will people rush down to see that? We are, after all, in the business of generating audiences." Still, she adds, "we are right across the street from the memorial, and we have to be sensitive to that." Meanwhile, the directors of the Drawing Center and the Freedom Center say the exterior of their building, designed by Snøhetta, will almost certainly be Minimalist, con-

sidering its close proximity to the memorial.

Others, including Calatrava himself, question the location of the museum complex. At a recent book event in New York, he claimed the building's location just in front of his Transit Hub would block light from entering the structure, and he suggested that the museum be moved elsewhere. Master planner Daniel Libeskind,

AIA, quickly rejected this idea in an interview with *The New York Times*, stating that the move would isolate the museum center and hurt the tone of the area. Lastly, questions have arisen over whether the small-scale arts groups moving downtown could present a substantial draw to bolster the neighborhood at all times. Groups say they plan to host events day and night, while Shelton adds that it would have been impossible to find an "elegant solution" to fit a huge institution like City Opera on the site. The audience for downtown institutions, she adds, will be much more "adventurous" than one coming from Lincoln Center. *S.L.*

Architect sues SOM over design of Freedom Tower



Freedom Tower (left) and Shine's project (right) twist in a similar fashion.

Brookline, Massachusetts-based architect Thomas Shine has pitted himself as an architectural David versus Goliath in a battle with David Childs, FAIA, and Skidmore, Owings & Merrill over the design of the World Trade Center Freedom Tower.

Shine claims in a lawsuit filed on November 8 in United States

District Court in New York that Childs copied a project Shine had developed while he was a master's student at Yale University School of Architecture. Shine claims to have presented the project to Childs in the fall of 1999.

The project, named "Olympic Tower," is a twisting tower with a symmetrical diagonal column grid, expressed on the exterior of the building, following the twisting surface created by the floor plates' geometry. Shine copyrighted the idea last spring and is suing for copyright infringement under the United States Copyright Act.

"From the first time I saw the design of the Freedom Tower," which also features twisting surfaces, a diagonal exterior grid, and other similarities, "I was very surprised at how close it was to mine," says Shine.

Shine, who says he has always been fascinated by the twisting forms in ceramics, says he came up with the idea while attending a

1999 Yale studio course with architect Cesar Pelli. Childs was one of the jurors who reviewed the final proposals. As part of the law suit, Shine, now a partner at his own firm, Choi + Shine, which he runs with his wife, has presented his original drawings and models next to SOM's. He admits having reservations about the suit.

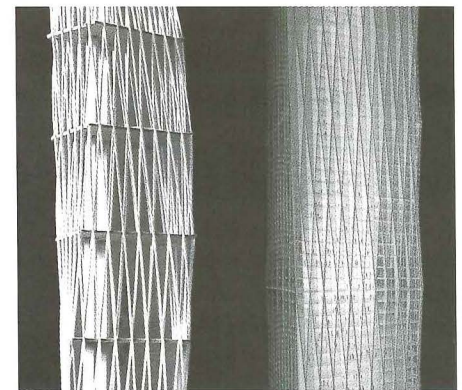
"No one undertakes suing a multinational corporation lightly, and you can't help but feel vulnerable," notes Shine, who was born in England but is now a U.S. citizen. "But it's not easy for me to just walk away and let it go." He mentions that he and his lawyer, Andrew Baum of New York firm Darby & Darby, tried several times to settle the issue with SOM outside of court, but that the firm was unresponsive.

Baum stresses, "We're not trying to interfere with the construction of this building, and we're not trying to change the plans. We're looking for fair recognition of Thomas's contribution and fair compensation for his original work," he says.

SOM spokesperson Elizabeth Kubany quickly responded to the suit's filing with a lengthy statement, which stated: "The

suit that Thomas Shine filed against SOM for copyright infringement is specious. While Mr. Shine's building and Freedom Tower share some common design elements, most of these elements have been industry standards for decades. The diagrid structural system combined with shaped geometry, for example, was first used by SOM in Chicago's John Hancock Center in 1970 and has been widely used since.

"This is a high-profile project and a number of people have made claims that they were the inventors of various parts of Freedom Tower's design. However, SOM and its team of engineers has combined these elements in a unique way that reflects the special nature of the building's site and its importance." S.L.



Shine's (left) and SOM's (right) projects both feature diagonal exterior grids.

Interim results of World Trade Center Investigation "exonerate" twin towers design

The structural steel of the World Trade Center (WTC)'s Twin Towers was stripped of its fireproofing by debris from the aircraft impact and weakened by the resulting fires, eventually causing the towers to collapse, according to interim findings released in late October by the National Institute of Standards & Technology (NIST).

The findings say the region of dislodged fireproofing was determined from the predicted path of the debris. "Had the fireproofing not been dislodged, the temperature rise of the structural components would likely have been insufficient to cause the global collapse of the towers," says NIST in the October 19 release of the interim report, part of its \$16-million study of the WTC destruction on September 11, 2001.



"Fireproofing dislodged by debris left the components

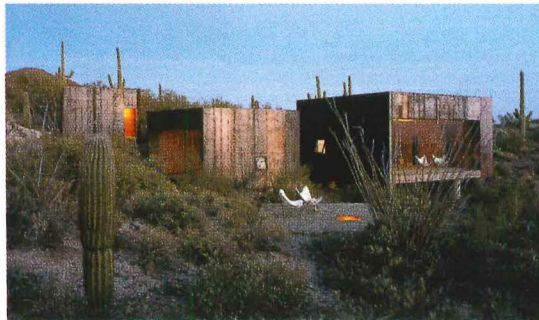
more sensitive to heat than any areas where there was missing or thin fireproofing before the aircraft impacts," says the report.

Many experts familiar with the Twin Towers' design are not surprised by the findings. But they are worth noting, say sources, because both structural engineers and fire experts have questioned whether the design by Skilling Helle Christiansen Robertson in some way contributed to the collapse. According to S. Shyam Sunder, NIST's lead investigator for the study, an ordinary office fire would likely have resulted in burnout, not collapse. In addition, NIST has determined that the majority of the steel was stronger than minimum requirements. "The safety of the towers was most likely not affected by the small percentage of steel below the minimum," says the report. In fire tests in August (pictured, left), NIST also determined that the floor systems in the towers met the New York City building code of the time.

NIST plans to release its final draft of the Twin Towers report in December or January. A four-to-six-week public comment period will follow. The final release is expected in May. The draft report on 7 WTC is set to be released in May. The final report is expected out in July. Nadine M. Post



Polshek's Center for the Arts Theater in San Francisco (left). Joy's Casa Jax project in Tucson, Arizona (below left).



Cooper-Hewitt honors Polshek Partnership and Rick Joy

Rick Joy, AIA, and Polshek Partnership were awarded the 2004 Cooper-Hewitt National Design Award for Architecture Design, marking the first time in the award program's five-year history that two winners were honored in that category.

Joy, based in Arizona, is renowned for his

original, often poetic use of natural materials and for his projects' environmental awareness. Recent works include his Catalina House and Casa Jax, both in Tucson, Arizona. He is now working on a luxury resort in Utah and several residential projects in the Southwest.

New York City-based Polshek Partnership, whose William J. Clinton Presidential Library opened in November, has long been a dynamic force in educational and cultural design. Other recent projects by the firm include an expansion of the Brooklyn Museum of Art and Zankel Hall, at Carnegie Hall, in New York.

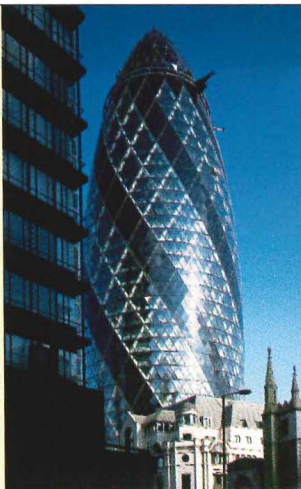
The National Design Awards were conceived in 1997 by the Smithsonian Institution's Cooper-Hewitt, National Design Museum to honor excellence, innovation, and enhancement of the quality of life. Winners in other categories included Milton Glaser for Lifetime

Achievement; Yeohlee Teng for Fashion Design; Yves Béhar for Product Design; and Amanda M. Burden, chair of the New York City Planning Commission and director of the Department of City Planning, who received the Design Patron Award. *Audrey Beaton*

"Gherkin" takes Stirling Prize

London's first environmentally advanced tall building, 30 St. Mary Axe, widely known as the "Gherkin," has won this year's RIBA Stirling Prize, the U.K.'s premier architectural award. Foster and Partners designed the 40-story tapering structure for the Swiss Re insurance firm. The structure has been a popular icon in the capital since its completion earlier this year. Award judges acknowledged its success in terms of facility, ambience, and intelligent internal division of space. The relatively small footprint of the aerodynamic structure and the discretion of its siting were huge assets, they also felt. The building takes many ideas about naturally ventilated tall structures, like drawing fresh air through the light wells that spiral up the building, from Foster's Commerzbank in Frankfurt.

Although unanimous in their decision, the judges acknowledged the stiff competition presented by five other British projects: the Kunsthau, Graz, by Peter Cook and Colin Fournier; The Spire, Dublin, by Ian Ritchie Architects; Imperial War Museum, Manchester, by Studio Daniel Libeskind; the Phoenix Initiative, Coventry, by MacCormac Jamieson Prichard; and the Business Academy Bexley, also by Foster and Partners. *Lucy Bullivant*



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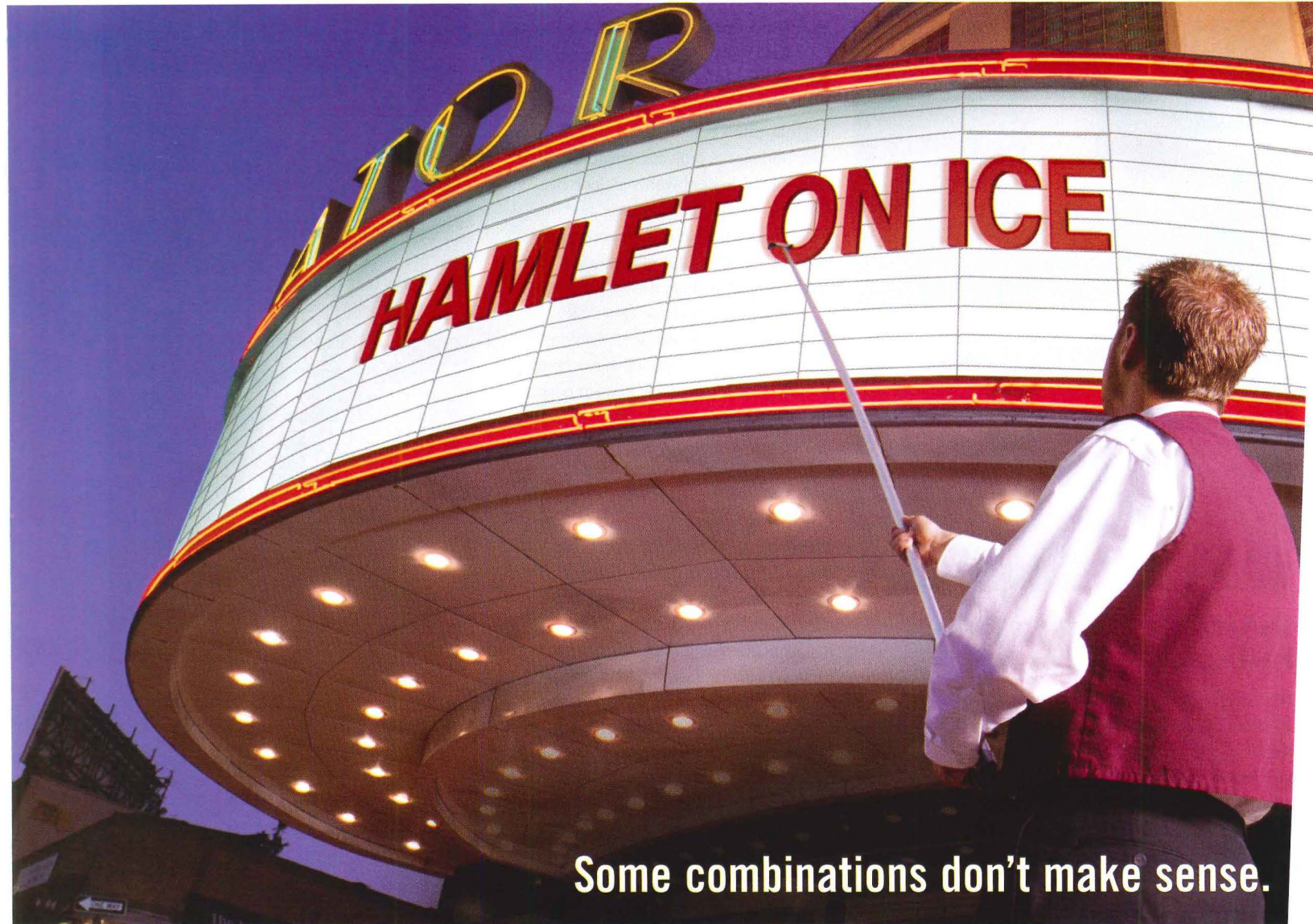
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7 World Trade Center tops out

On October 21, Tishman Construction topped steel for 7 World Trade Center, the last building at Ground Zero to collapse on September 11, 2001, and the first on the site to be rebuilt. The 750-foot-tall, 1.7-million-square-foot tower is designed by David Childs of Skidmore, Owings & Merrill.

The original building, designed by Emery Roth & Sons and completed in 1985, stood 641 feet tall but contained more floor space than the new building, which is narrower to accommodate a restored street. According to Ken Lewis, SOM project manager for the building, construction is about two months ahead of schedule, and 7 WTC will likely open in October 2005.

"It was pretty powerful to watch the last beam



The final beam is lifted at 7 World Trade Center.

go up," says Lewis, whose office at SOM is just blocks from the Trade Center site. "Especially given the fact that so many of us watched as the [original] building came down." That collapse destroyed an electrical substation housed in the base of the building. The need to replace the station hastened construction for 7 WTC, which was not a part of the master plan competition.

The new building will have a dense, 2-foot concrete core and a steel skeleton. The stairs, contained in the core, will be 20 percent wider than the original building's, and the staircase will be pressurized. World Trade Center developer Larry Silverstein has yet to find tenants for the new building.

Kevin Lerner

Architectural photographer Ezra Stoller dies

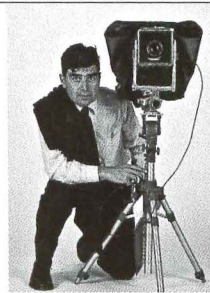
Renowned architectural photographer Ezra Stoller died on October 29 at his home in Williamstown, Massachusetts, at the age of 39 from complications due to a stroke.

Attending architecture school at New York University as Modernism took hold in the 1930s, Stoller came along just at the right time to become one of the preeminent pioneers of Modernist architectural photography. By 1939, he shot the New York World's Fair, creating images that, as in many of his pictures, now commemorate the buildings and even define them in our mind's eye. During an active career that would last until the early 1980s, Stoller photographed many of the remarkable new

According to his daughter, Erica Stoller, who runs ESTO, the architectural photo agency her father established in 1966, he said that he didn't just "take" photographs, but "made" them. Using a highly laborious process that involved a car laden with suitcases and ladders, he strategized shoots by mapping views on plans and stalking buildings for optimal sun angles and shadows.

The images often provide the lasting record of a building understood in the way the architect intended, revealed in a chiaroscuro of light and shade that explained its form, spatiality, and sensibility. In a way, his aesthetic of crisp delineation, often achieved through the sculpting effects of natural light, provoked architects to design for the same effects, so that he affected the designs that he would capture. Great architects—Eero

Saarinen, Paul Rudolph, Louis Kahn, Mies van der Rohe, Richard Meier—regularly sought out his services. Asked to advise how Stoller should shoot one of his buildings, Frank Lloyd Wright said not to worry, "Ezra will know." *Joseph Giovannini*



Stoller (right) shot classics like Saarinen's TWA terminal (above).

ventions of the postwar era.

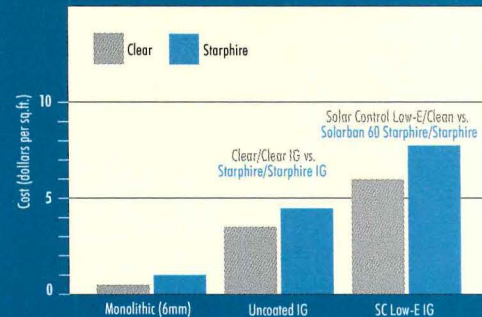
It took a Modernist eye to see Modernist buildings, and Stoller framed views that, in their vivid transparency, always clarified the structures. He did not simply document a building.

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Record News

Whitney Museum unveils model for its expansion

Just when all eyes were focused on the Museum of Modern Art's elegant addition, the Whitney Museum of American Art on November 9 released model images of Renzo Piano's design for an expansion and renovation of the institution's space on New York's Upper East Side. Piano was chosen for the project early this summer and has since been developing a comprehensive vision for the site.

The understated expansion plan, which the museum stresses will be "scaled to the residential buildings" in the area, will add new permanent and special exhibition galleries, education space, an auditorium, research center, a paper study room, library, and administrative space.

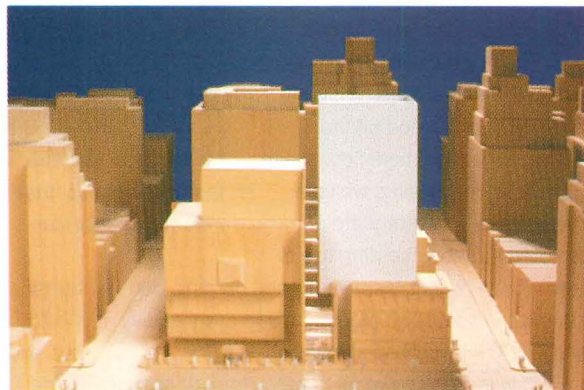
The new structure will sit among a group of brownstones on Madison Avenue and 74th Street, connected to the Whitney's Marcel Breuer-designed building by transparent, enclosed bridges between galleries on each floor.

Piano's cubical exterior, says museum director Adam Weinberg, will likely be covered in a cast-alloy skin and rise higher than the Breuer building. It will emphasize the art inside with elegant, muted exhibition spaces.

Weinberg adds that the design will not alter the forms of Breuer's building, nor will it affect the museum's adjacent storefront buildings and nearby town-house office buildings. The design contrasts markedly with an earlier plan by Rem

Koolhaas, whose flamboyant addition would have altered the building's image significantly. That plan was canceled in spring 2003.

The project will also include significant renovation of the museum's current galleries, sculpture courtyard, and facilities for art handling, while adding new retail and restaurant facilities. It comes



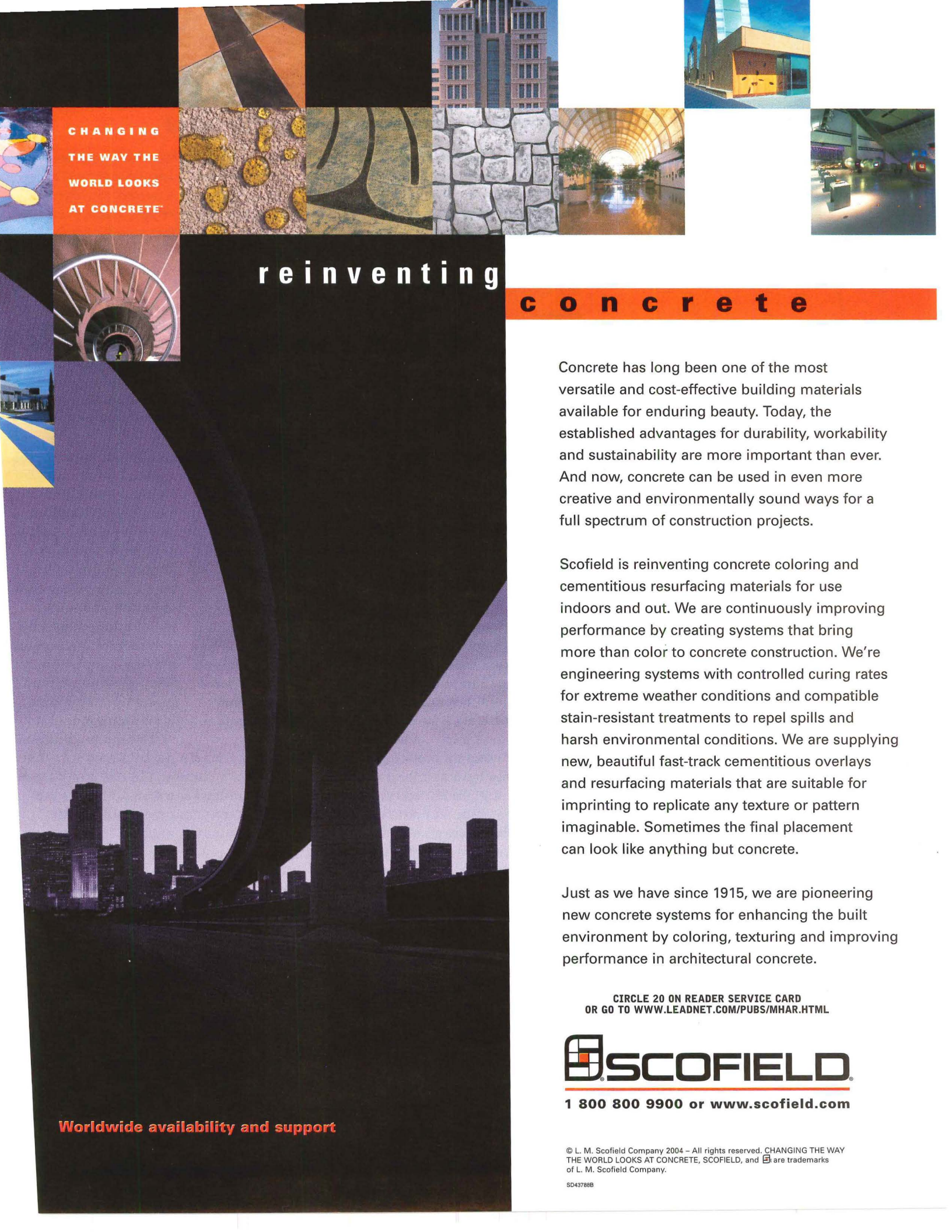
Piano's "respectful" addition (right) will rise above the Breuer building (left) and will likely include an alloy facade.

at a crucial time, Whitney officials point out. The museum's permanent collection has grown by more than 65 percent over the past 10 years, ballooning to almost 15,000 works, but because of space constraints, the museum has been able to exhibit less than 2 percent of the collection. The design will be presented to the city in the next few months, says Weinberg, while dates for construction and completion will be announced in the near future. S.L.

Economic outlook for 2005 is upbeat

Economists were upbeat at McGraw-Hill Construction's Outlook 2005 Executive Conference, held on October 28 in Washington, D.C. David Wyss, Standard & Poor's chief economist, says that the nation's economic recovery is finally accelerating, with capital spending on the rise, despite excess capacity in the manufacturing sector. Robert Murray, McGraw-Hill Construction's vice president for economic affairs, noted that McGraw-Hill Construction estimates new construction starts will be up a total of 9 percent by the end of 2004. It is projected that single-family construction starts will increase 8 percent in 2004 to an all-time high of 1.53 million units. On a dollar-volume basis, income property construction will be up 11 percent.

According to Construction Outlook 2005, a report that is released at the conference annually, this favorable climate should continue into next year. The report estimates that on a dollar-volume basis, construction of institutional building will be up 7 percent, and income properties up 9 percent. Single-family residential construction starts, however, will retreat 7 percent. Murray notes that although this might appear to be a significant decline, single-family starts have grown so rapidly in recent years that even if the market decreases by 7 percent, this would still be 1.425 million units the second-highest number in history. Charles Linn



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
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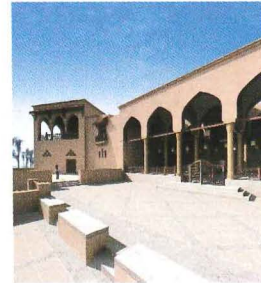
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Record News

Now opening: new projects around the world

La Scala, Milan Two years and \$67 million later, Milan's La Scala, one of Europe's premier opera houses, will reopen in early December, renovated, restored, and reinvigorated. According to project architect Mario Botta, the work involved mostly stripping away detritus, linoleum floors, and bad carpeting that had obscured the 1778 original. Behind the scenes, Botta was much more forceful,



La Scala reopens after renovation (top left). Cairo gets a much-needed new park (top right). Caltrans headquarters adds to L.A. dynamism (bottom left). Taipei 101 is the new height champion (bottom right).

clearing out rehearsal and staging areas and constructing two new buildings at the rear of the structure that, at 50 and 130 feet tall, rise above the height of the facade. After work began in 2002, local conservation groups protested the demolition, temporarily halting work with a lawsuit. But the project eventually resumed and proceeded at a brisk pace. On December 7, Riccardo Muti will inaugurate the renovated theater by directing Antonio Salieri's *Europa Riconosciuta*, which was performed at the opening of the building 230 years ago. *Paul Bennett*

Al-Azhar Park, Cairo Al-Azhar Park, created by the Aga Khan Trust for Culture, provides one of the world's densest cities with its largest green space to date. Its 74 acres of rolling hills, bounded to the west by Cairo's 12th-century city wall and the historic Darb al-Ahmar district beyond it, had been the city's dumping grounds for more than 600 years. The park design, by Boston's Sasaki Associates,

with Sites International, a Cairo-based landscape firm, uses elements common to gardens of the Islamic world: a mix of orchards and naturalistic landscapes, and formal open spaces, including fountains and water features with a strong emphasis on symmetry and geometric design.

Park buildings—a rectilinear Lakeside Café by Serge Santelli and an arcaded Hilltop Restaurant by Rami al-Dahan and Soheir Farid—are strikingly different, reflecting the trust's concern with exploring Islamic architecture, addressing questions of tradition and modernity. *Seif El Rashidi*

Caltrans Headquarters, Los Angeles

On September 27, the new Caltrans District 7 headquarters in downtown Los Angeles opened. Designed by Morphosis Architects, the 13-story, L-shaped building was completed on a fast-track schedule of just over two years. The design integrates a unique exterior skin composed of operable aluminum panels that shield the east and west facades from direct sunlight. On the south wall, a series of photovoltaic cells generate an

electrical output of 92 kw, contributing to the building's overall sustainability. LEED has given it a Silver rating. Consuming an entire block in the heart of the Civic Center, the building is approximately 750,000 square feet. *Allison Millionis*

Taipei 101, Taiwan Taipei 101, now the world's tallest building, is set to open in December. The 1,667-foot-tall, 101-floor, \$700 million office tower was designed by local firm C.Y. Lee & Partners. It was developed by Taiwan Financial Corporation and built by Turner Construction. The building's sloping walls are divided into eight parts, incorporating the Chinese pagoda form and the shape of growing bamboo flowers. In October, the Council on Tall Buildings and Urban Habitat officially certified the building the tallest in the world, surpassing the 1,483-foot Petronas Towers in structural height, habitable floor height, and rooftop height. Sears Tower in Chicago still holds the record for pinnacle antenna height. *S.L.*

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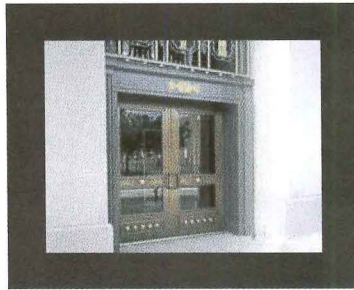
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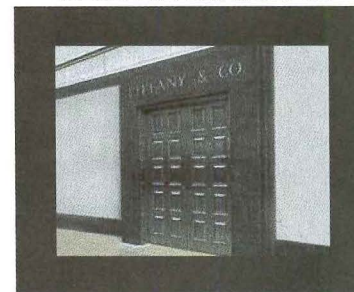
EDUCATIONAL



Tufts Dental School, Denver, Colorado

Architect: Perry, Dean & Associates

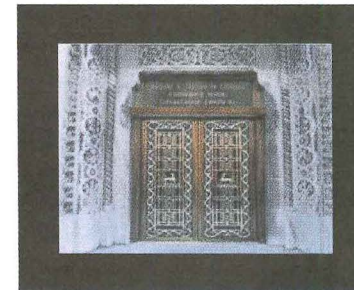
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Tiffany's, Beverly Hills, California

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RESTORATION



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Record News

Initial plan for New York East River project nears completion

While New York City's West Side waterfront has seen extensive improvements, particularly along the impressive Hudson River Park, the East Side waterfront has remained a relatively neglected eyesore, largely subjugated to the noisy tyranny of the FDR Drive.

Until now. Last February, the New York City Planning Department hired local firm SHoP and London-based Richard Rogers Partnership to master plan a new East Side waterfront area. The first-stage "concept plan," a vision for uses and amenities in the area, is expected to be complete by February 2005.

The new park will stretch from Maiden Lane to Old Slip in Lower Manhattan, south of the Brooklyn Bridge. Short-term work, including pavilions—possibly made of glass—hosting public amenities under the FDR, is expected to be completed in three to five years. Long-term projects, including several acres of new park space, should be completed in five to fifteen years. The price for the development has not been released yet, says the planning department.

"Now there's a possibility of creating a



Amenities could include pavilions under the FDR and new greenspace.

stronger sense of intimacy in the city by drawing its outer edge out to the water," says SHoP partner Chris Sharples. City planning officer Michael Samuelian notes that final plans would include 5 to 10 acres of new open space built directly over the water on caissons and piles. New high-rise housing may also be built within the inner lanes of the FDR to help pay for development, he adds.

Other entities involved with the project include the New York City Economic Development Corporation, the New York State Department of Transportation, and various local community boards. The developments, explains Samuelian, couldn't come at a better time. "We expect up to 15,000 new units of housing to go up in Lower Manhattan between 2000 and 2010. At some point, they're going to demand amenities." S.L.

U.S. back at the World's Fair, but without government help

The Kyoto Accord is not the only major global initiative without the full-fledged support of the United States. At the 2005 World Exposition in Aichi, Japan, which opens in March, the U.S. pavilion is one of the few not receiving government financial backing. Instead, U.S. Pavilion World Expo 2005, a nonprofit group, is shouldering the task of showcasing American ingenuity. The U.S. once aggressively participated in world's fairs, but government interest has waned since the end of the cold war, and in the late



1990s, Congress prohibited the use of federal funds for the events. "The U.S. was king of the world," says Alfred Heller, author of *World's Fairs and the End of Progress*, "and Congress and the executive branch didn't feel we needed to burnish our image."

Bud Hollomon, AIA, a Jackson, Mississippi-based architect, has designed an immense wave-shaped American flag, stretched over an aluminum frame, for

the pavilion's facade. Behind the flag, LED screens will display iconic images of storied American landscapes (above). Hollomon says his design takes its cue from U.S. tourist attractions. "It's show design—it's Disney World, it's Times Square, and it's trying to get people to us," he says.

When the Aichi Expo ends, the prefabricated warehouse-style pavilions for the estimated 125 participating countries will be dismantled, the building materials recycled, and the park that the fair will be held in will be restored to its original state. In keeping with the exposition's sustainable design themes, the U.S. pavilion will be partially powered by a hydrogen fuel cell. Alex Ulam

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Record News

Miami Modern, or MiMo, making a big comeback

Move over, Art Deco. MiMo is making a name for itself.

Miami's South Beach brags about its signature Art Deco style, but Miami Modernism, fondly referred to as MiMo, is making a splash in the area, with its boasting boomerangs, corrugated walls, and Swiss-cheese-looking windblock. Popular in the 1950s and '60s, MiMo, the once-futuristic style, is one of Miami Beach's three predominant architectural styles, with roots in the early Bauhaus movement. Many people confuse MiMo with Art Deco. But asymmetrical designs, kidney shapes, and delta wings characterize the style, while Art Deco features symmetrical square buildings with piping and ornamental accents.

A quiet movement to save postwar MiMo architecture got under way about six years ago. Today, that movement has escalated to a full-blown commotion. A MiMo photography exhibition has made its way to New York City and a book, *MiMo: Miami Modern Revealed*, has just been released. More shows and books are in the works. "Great cities are layers of their past," says Randall Robinson, executive director of the North Beach Community Development Corporation, who coined the term MiMo. "It only makes sense to preserve the best buildings in every era."

Unfortunately, South Florida lost some real beauties before the public-backed preservation efforts began. The Bel-Aire Hotel's facade has been destroyed, the Royal York is long gone, and the only part of the Carillon left standing is its historic tower. But those demolitions have served to spark a renewed interest in saving the region's MiMo treasures. "Along with Los Angeles, we have the most diverse collection of MiMo in the U.S. It's all over the place," says Don Worth, vice chair of the Urban Arts Committee, an organization devoted to saving the best of Miami's MiMo collection.

All over the place is right. North Beach, Sunny Isles Beach, the Bay Harbor Islands, and Biscayne Boulevard all sport classic MiMo. And the preservation movement is beginning to bear fruit. The Miami Beach City Commission approved the North Beach Resort Historic District, located on Collins Avenue from 63rd to 71st Street, in the spring of 2004. The



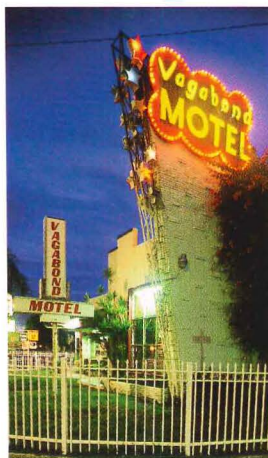
Sherry Frontenac, 1946, by Henry Hohauser, one of the first MiMo hotels.

new district protects the Sherry Frontenac Hotel (above), a Casablanca-style building that greets visitors with a row of genies wearing turbans, and the Deauville Hotel, which hosted the Beatles for their 1964 performance on The Ed Sullivan Show.

The MiMo movement has sparked what Worth calls a "real estate boom" in North Beach. Canyon Ranch, a luxury spa group, is renovating what's left of the Carillon Hotel. And André Balazs recently opened a new Standard Hotel in the Lido spa, a revitalized MiMo landmark. That momentum is expected to continue as North Beach

completes a master-planning process that could include various historic districts to protect MiMo buildings.

While North Beach is leading the way, nearby MiMo preservation victories include the Vagabond Motel's (pictured, left) designation as historic by the City of Miami's Historic Preservation board in the spring of 2003. The Bay Harbor Islands will celebrate "MiMo Day" next year in an effort to bring awareness to its unique collection of MiMo apartment buildings; Ft. Lauderdale is now showing interest in preserving its MiMo buildings, and even South Beach is making room for MiMo with



1957 Vagabond Motel, the first MiMo building to get historic designation.

a newly refurbished 1953 DiLido Hotel that now serves as the Ritz-Carlton South Beach.

"There's a growing respect here for architecture that gives the city character," says Miami-based architect Allan Shulman, who rehabbed the DiLido. "We have to consider the urbanism of the period and focus on saving the most significant buildings." *Jennifer LeClaire*

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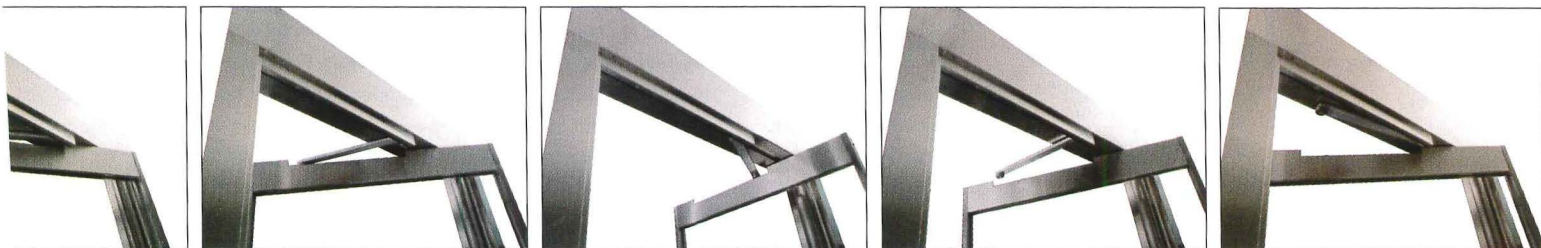
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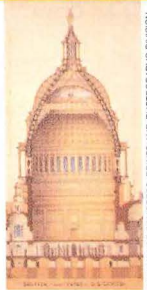
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Record News

Web site eyes Beijing's "bad" architecture

Think of Beijing architecture these days, and you're likely to conjure up impressive new images like Rem Koolhaas's CCTV tower, Paul Andreu's National Theater, even the Forbidden City, now undergoing a multimillion-dollar overhaul. But beside these grand plans is a very different sort of design style, best summed up in the name of a new Web site that showcases it: badarchitecture.org.

The site, a collaboration of architecture aficionados in Beijing, skips the commentary and lets the pictures speak for themselves. These include garish office towers lining the city's main boulevard, a series of gaudy, Greek-inspired buildings from across the city, and an artist's rendering of a planned structure that looks "like a giant ball on top of a toaster oven," says Daniel Elsea, a RECORD contributor who cofounded the site with Jeremy Wingfield, Connor Wingfield, and Daniel Shupp.

The project is "not a critique, but an observational exercise" designed to highlight some of Beijing's tackiest facades, Elsea says. "China has a beautiful heritage, and wonderful buildings from over the centuries. A lot of detail, craftsmanship, and elegance went into them, but something happened to those ideas along the way."

Now the Chinese capital houses an often jar-



Two of the site's many featured architectural monstrosities.

ring mishmash of architectural styles. Meanwhile, many of the city's traditional courtyard homes have been demolished to make space for rows of hulking high-rises, white-tiled facades, colored-glass windows, and an abundance of neon accents.

"It seems a lot of people who create these buildings are copying an idea," Elsea adds. "They see a picture from a book or a movie, but they don't see the details." Since the site's official launch in mid-September, online traffic has risen to a steady 18,000 page views per week from fans eager to see what the next featured monstrosity will be. "We've only covered a tiny fraction of what's out there," Elsea says. "There's literally mile after mile of these buildings. And the rest of China is even worse." *Betsy Lowther*

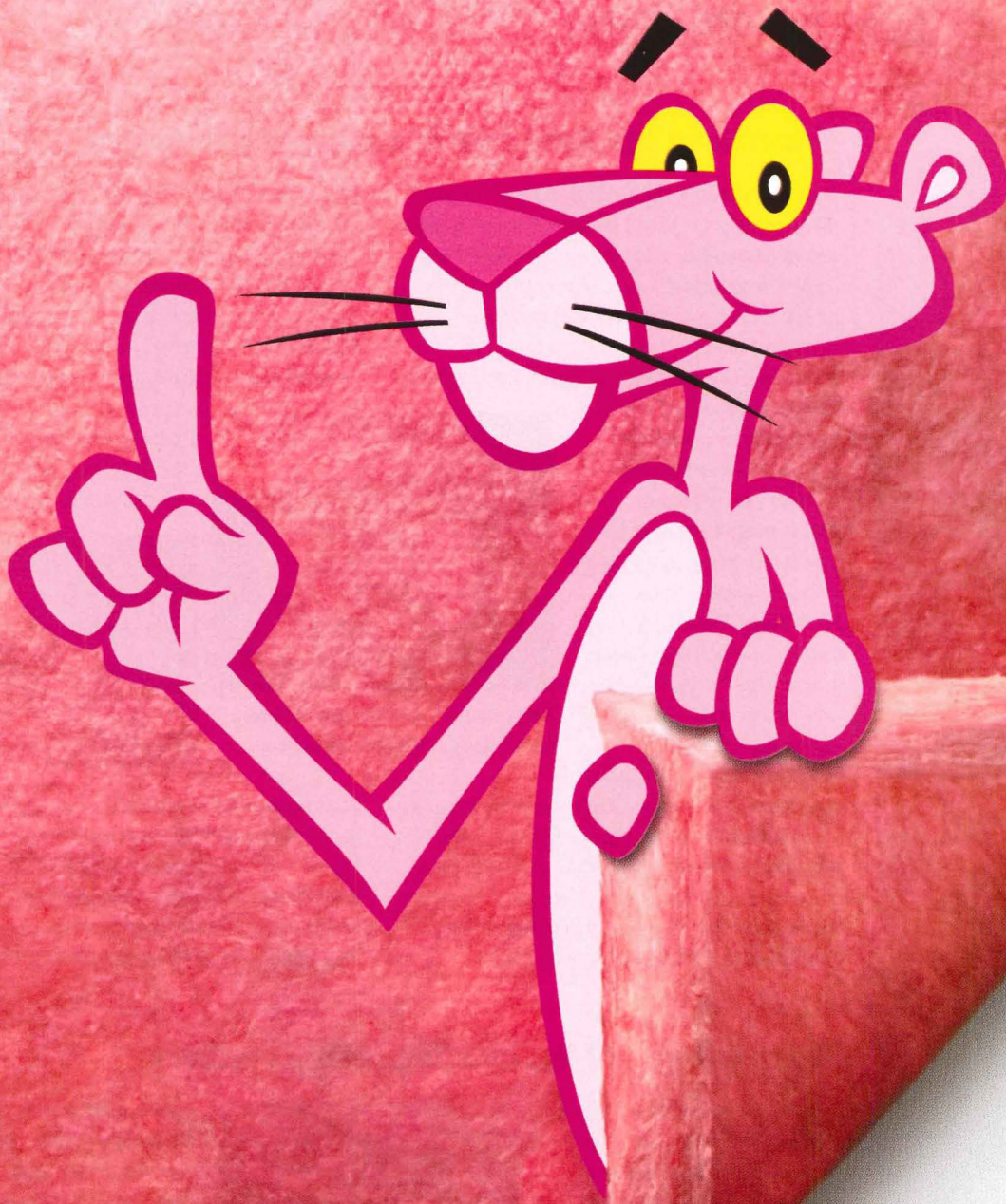
China's art schools begin to offer architecture programs

Many a visitor to China's cities has bemoaned the lackluster high-rise buildings that have gone up in recent years (see story above) as the economy has boomed. Some suggest that a Chinese architect's education might be to blame: Traditionally trained at engineering schools, architects develop a technical aptitude for building that places little emphasis on aesthetics. But some architects believe that is set to change now since art institutes across the country, with the mission of beautifying the skylines of China's cities, have started architecture departments.

Three top art schools in the country—Central Academy of Fine Arts, the China Art Academy in Hangzhou, and the Sichuan Fine Arts Institute—have begun to offer bachelor's and master's degrees in architecture in the past two years. About a dozen other art schools in the country have expressed interest in following suit, says Lu Pingjing, dean of the architecture school at Central Academy of Fine Arts. Such programs signify a shift from a system in which "architects have only emphasized the practical side of architecture," says Wong Shu, architecture chair at the China Art Academy in Hangzhou.

A 2001 decision by China's ministry of education to give universities more autonomy allowed art schools to open architecture departments, which since the Communist takeover in 1949 had been solely the domain of engineering schools. Such programs have traditionally taught that "thinking differently is not as valuable as being efficient," says Juan Du, a visiting Fulbright scholar based at Tongji University in Shanghai. "The outcome is that architects reproduce buildings that they have seen." Art school administrators say that more attention is placed on sketching and drawing in their programs. Unlike in engineering schools, "We see architecture as an art," says Lu. *Jen Lin Liu*

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Record News

Urban Land Institute awards superior development

The Urban Land Institute (ULI) recently named its 2004 Excellence Award winners. The competition recognizes quality land-use projects based on design, resourcefulness, and relevance, as well as community and environmental sensitivity.

Winners include:

Baldwin Park, a mixed-use community in Orlando, Florida, located on a former naval base, consisting of homes, retail, office, and recreational amenities.

Fall Creek Place, a public-private urban renewal project in Indianapolis, Indiana.

First Ward Place, a run-down public-housing project in Charlotte, North Carolina, redeveloped into a market-rate residential community.

Fullerton Square, a historic civic center in Singapore, has been transformed into a world-class hotel with a commercial complex.

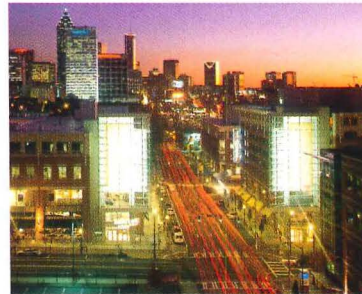
Playhouse Square Center in Cleveland, Ohio, underwent a 10-year effort to restore five historic theaters to their original architectural condition.

The Plaza at PPL Center in Allentown,

Pennsylvania, the city's first major new downtown business development in a decade.

Technology Square at Georgia Institute of Technology was a blighted three-block area in Atlanta, remade into a vibrant urban campus.

University Park at MIT, Cambridge, Massachusetts, was a blighted 27-acre-site redeveloped into a mixed-use campus with biotechnology research facilities, as well as office, residential, retail, and hotel uses.



A Playhouse Square Center theater (right). Technology Square (above).



Walt Disney Concert Hall in Los Angeles has become a catalyst for downtown revitalization as well as a tourist destination since its 2003 opening.

WaterColor in Seagrave Beach, Florida, is a 500-acre mixed-use community dedicated to preserving the natural setting of the Gulf Coast. *Tony Illia*

New coating for Mies building ruffles feathers

When is a new finish more than a new finish? When it is used on the Cor-Ten steel facade of a little-known building by the Office of Mies van der Rohe. The building in question is the American Life Building in Louisville, Kentucky, built in 1969, just two months before Mies's death. Nana Lampton, a member of the family that commissioned the project, insists that Mies designed the building, completed after his death by Bruno Conterato.

It is the only one by Mies or his successor firm to use Cor-Ten. The material was supposed to oxidize for seven years, creating a self-sealing, rusty patina. After more than 30 years, however, the rusting had continued, and had become streaked by chemicals used to clean the windows. "We were getting a lot of complaints," says Lampton, "including from prospective tenants." Lampton consulted experts at US Steel and Turner Construction before deciding to coat it in a sealant called Shur-Cryl,



Witness the offending brown finish.

leaving a flat, milk-chocolate-brown finish. "I think of it as a rust unifier," she says. "The oxidation will continue, but it will be more even and stable."

The move has caused some controversy locally and among Mies experts. Dirk Lohan, a Chicago architect and grandson of Mies, attributes

the building to Conterato entirely, and disputes the need to tamper with the Cor-Ten: "The material is self-sealing, and I don't think it would be a good idea to coat it." Barry Bergdoll, an art historian at Columbia University who has worked extensively on Mies, agrees. "Surface was very important to Mies. But I suppose this is a question to be asked of the whole Cor-Ten moment in architecture."

Lampton is unfazed. "I think Mies would have approved. I love the gutsiness of the building, and I'm so proud that it's here, with its ancient proportions, that it will root Louisville here at the river for decades to come." *Alan G. Brake*

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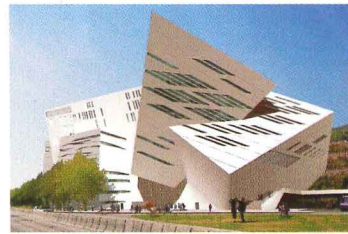
Record News On the Boards

Libeskind designing first project in China

The City University of Hong Kong has awarded Studio Daniel Libeskind a \$100 million commission to build a multimedia facility, the firm's first project in greater China.

The building (right) will house classrooms and laboratories for the school's media technology, computer engineering, and information technology departments. It will also include a multipurpose theater, an exhibition area, café, and restaurant.

The nine-floor, crystalline building's form reflects the ancient Chinese character for creativity, composed of the cutting tool and the plough, according to David Luther, the firm's director of pub-



lic relations. The building will serve as a "lighthouse," radiating its message and intent to the campus. The interior has been "designed to encourage collaboration through the openness and connectivity" of spaces, adds Luther.

Libeskind became involved in the project because of his interest in the performing arts, having been a professor at the Center for Art and Media Technology in Karlsruhe, Germany. The firm, which has focused on projects in Europe and the United States, has recently been short-listed in a Taiwan competition to build the southern branch of the National Palace Museum. *J.L.L.*

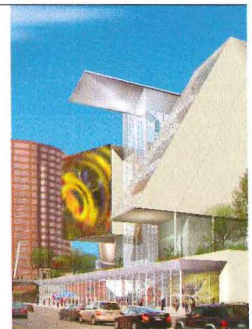
"Eye-catching" museum by Pelli under way

Cesar Pelli & Associates was recently awarded the commission for the Connecticut Center for Science & Exploration in Hartford, Connecticut.

The project is a major part of Adriaen's Landing, an initiative to reconnect downtown Hartford with the Connecticut River. The site is an existing brownfield, situated next to a major highway and railroad tracks. By placing the building as high as possible, Pelli's plan carefully negotiates these conditions, linking the facility with an existing riverwalk, and creating remarkable views. The building's forms are simple, but dynamic, with wings that extend to dominate the site. "The building will catch your eye from wherever you arrive," says Pelli. A 50-foot-by-60-foot LED

screen on the western wall of the north wing projects images out toward the main street, further beckoning visitors toward the excitement within.

The glazing on the eastern wall of the south wing, overlooking the river, is slanted downward in order to protect against direct sun. The western wall of the south wing, meanwhile, slopes upward, bringing sunlight into the greenhouses inside the facility. The \$150 million project is expected to open in late 2007. *Audrey Beaton*



Adjaye's plans for Denver unveiled

The Museum of Contemporary Art/Denver (MCA) recently unveiled designs for its new permanent facility in Denver's Central Platte Valley. Designed by London architect David Adjaye, the 25,000-square-foot MCA will be a space where architecture supports, rather than defines, the display of art.

Located in the historic LoDo lofts district, the MCA will house five galleries, educational and children's areas, and an outdoor garden and sculpture/event space.

Design of the \$5 million project calls for a glass-and-polypropylene curtain-wall system that encloses simple, discrete gallery spaces. Adjaye, who admits that he "likes to break the rules when ever possible," says the design of the museum's skin will underscore his interest in using light in surprising and unconventional ways.

The project will be the first in the U.S. for Adjaye, who was selected in April 2004 after a seven-month process. Construction is expected to begin mid-2005, with a projected opening in late 2006. *Mark Shaw*



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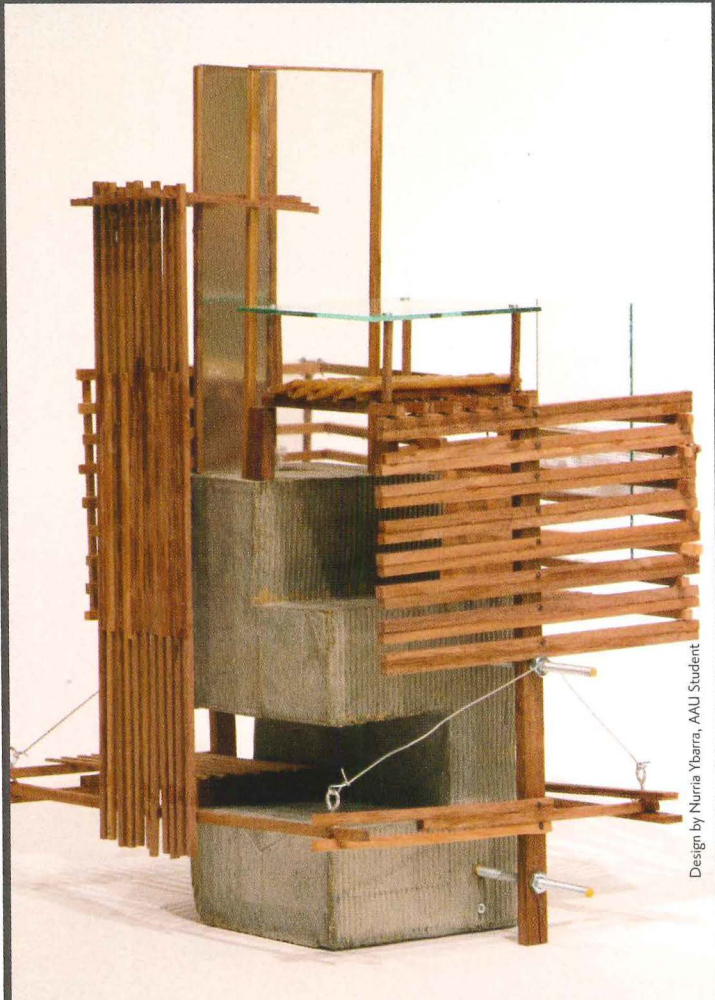
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News Briefs

Boston ICA breaks ground

The Institute of Contemporary Art (ICA) in Boston recently broke ground on its new home, a 65,000-square-foot waterfront building designed by Diller Scofidio + Renfro. [Record News, October 2002, page 31]. Slated to open in 2006, the



Rendering of the Boston ICA.

museum will incorporate gallery space, a 325-seat performance hall, an education center, and digital media facilities.

The firm's first freestanding building project in the U.S., the glass, metal, and concrete structure features natural lighting and extensive water views. Its upper levels will project over and merge with the Boston Harbor walkway. The cantilever allowed the designers to fit the museum's gallery space on a single floor, explained principal Charles Renfro. "The form isn't gratuitous. It's a response to the demands of the program and opportunities of the site." *Ted Bowen*

Miami architect sues Trump

Paul Oravec says he was "shocked and dismayed" to see design photos of the Trump Grande Ocean Resort and Residences in newspapers. That's because the Miami architect claims Trump turned down similar concave-convex concepts he created in 1996. So dismayed is Oravec that he filed a copyright violation suit against the billionaire hotel developer asking a judge to halt construction and order the destruction of the two Trump-

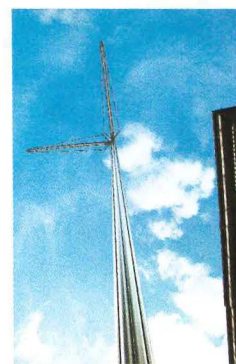
branded condo towers. Oravec is also seeking unspecified damages.

Intellectual property attorney David Tener, a partner with Caesar, Rivise, Benstein, Coehn & Pokotilow in Philadelphia, says that, while architects cannot completely avoid such disputes, they can take steps to discourage design theft. Trump legal counsel wasn't immediately available for comment. *Jennifer LeClaire*

Phifer wins streetlight competition

New, modern streetlights designed by New York's Thomas Phifer and Partners, the winner of an international design competition, may soon grace New York City streets. The City Lights competition, sponsored by the city's Department of Design and Construction and the Department of Transportation, sought innovative designs that incorporate the latest technology to replace the circa 1963 "cobra head" lights.

The firm was named the winner in October for its sleek design that integrates light-emitting diodes (LED) and photovoltaics in a slender

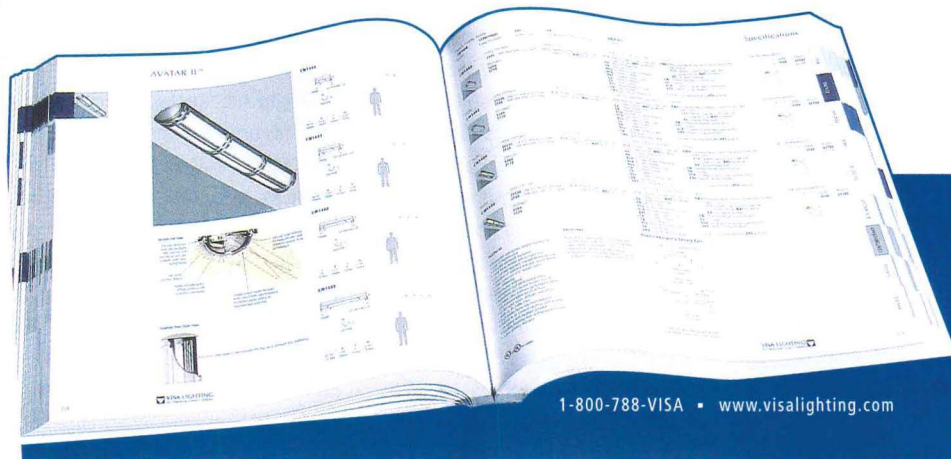
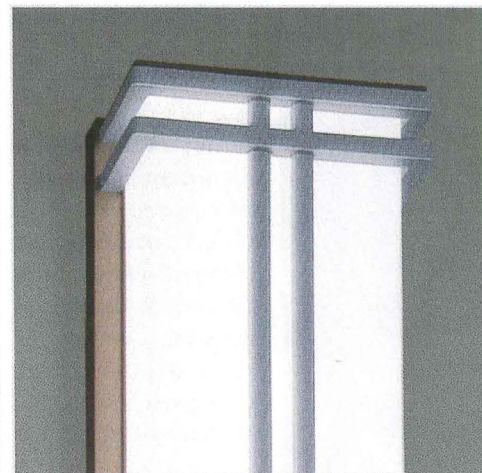
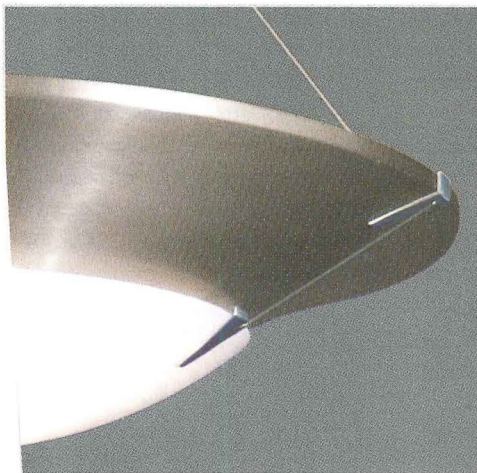
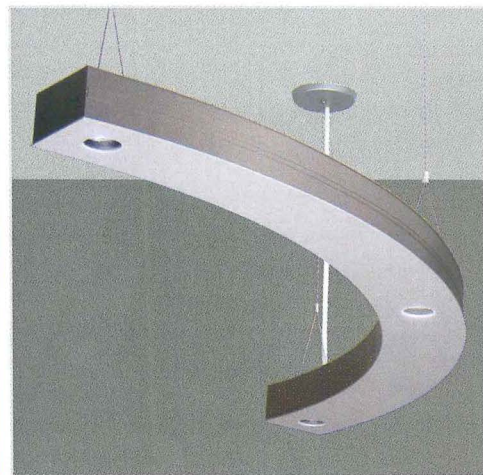
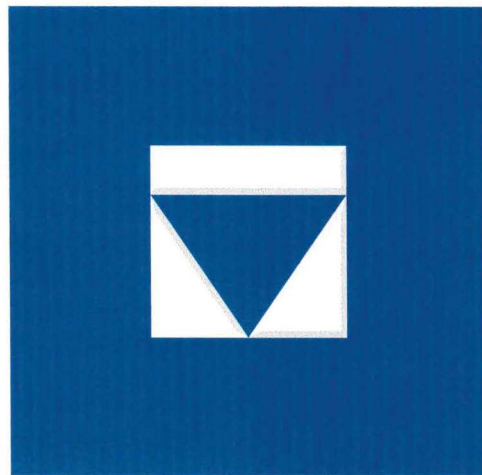
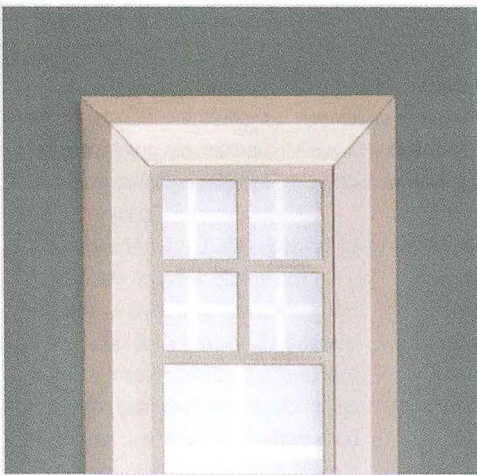
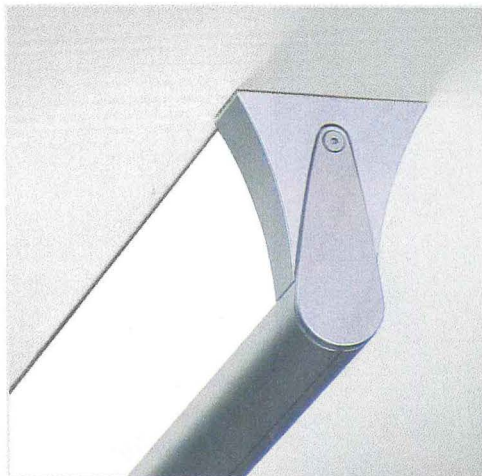
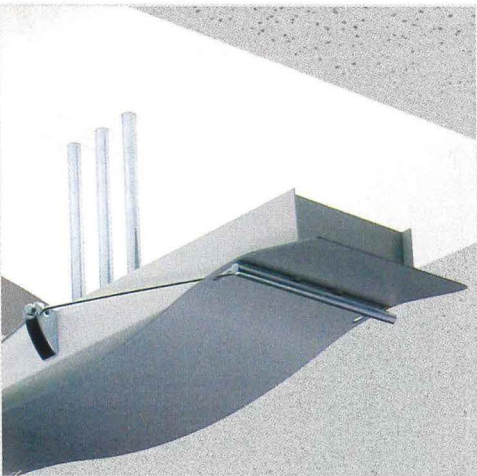


Phifer's lights integrate LED and photovoltaics.

lamp's arm. The arm is connected to an aluminum base pole by two, thin stainless-steel rods. T-shaped slots in the post's fluted base will allow signage and other elements, such as street and traffic signals, additional lighting, traffic control boxes, and pedestrian push buttons, to be integrated in the design.

The pole's geometry, and a nonstick Teflon paint, will make it difficult for stickers and tape to be permanently affixed to the pole. New York City will add the Phifer design to its street-lighting catalog which includes about 15 lamps from which Business Improvement Districts can choose.

John E. Czarnecki, Assoc. AIA



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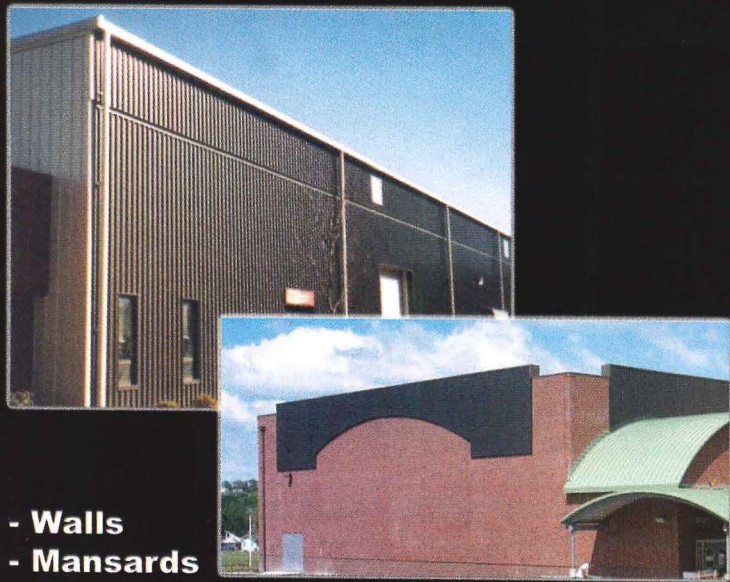
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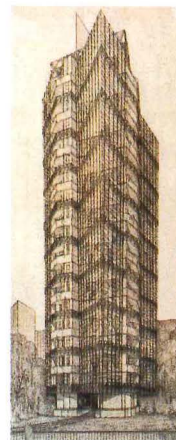


News Briefs

A look at Wright's skyscraper ideas

Frank Lloyd Wright: The Vertical Dimension, at the Skyscraper Museum in New York City, through January 9, examines how the architect took his vision of organic architecture into the design of tall buildings, a subject that captivated him throughout his career. Curated by architectural historian Hilary Ballon, the show includes drawings of projects like the ambitious Mile-High

Project of 1956 and the intricately drawn St. Mark's Towers in New York City (above). While Wright designed dozens of skyscrapers, only two—the Johnson Research Tower in Racine, Wisconsin (1944), and the Price Tower in Bartlesville, Oklahoma (1956)—were ever built, making the show a rare look at how Wright's designs parted significantly from the prevailing current. S.L.



Wright's sketch for "St. Mark's Towers" in New York City.

the American Planning Association, and several corporate and philanthropic organizations.

Allison Millionis

RIBA and V&A open new architecture gallery

Two of the U.K.'s most illustrious cultural institutions, the Victoria & Albert Museum and the Royal Institute of British Architects, in November marked the launch of a new partnership uniting their collections by opening a new architecture gallery, the first

of its kind in the U.K., at the V&A.

The space, located near the main entrance to the V&A, and designed by Gareth Hoskins Architects, features drawings, models, photographs, and fragments from both institutions' archives, as well as a number of important loans, such as a model of the Lloyds Building by Richard Rogers. The space offers over 180 exhibits featuring some of the world's famous architects and buildings. Thematic displays introduce architecture styles, function of buildings, and the design process. A new archive and study room in the V&A's Henry Cole Wing, designed by Wright



The RIBA V&A Architecture Gallery.

& Wright Architects, includes over one million drawings and manuscripts from RIBA's and V&A's archives, at a total cost of \$18.5 million. The new facility will form the world's most comprehensive architectural resource, representing ever major British architect from the 16th century to the present, and it will contain the national collection on British architecture. Lucy Bullivar



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Dates & Events

New & Upcoming Exhibitions

The Pei Architectural Legacy Sarasota, Fla.

December 15, 2004–February 25, 2005

An exhibition of renderings, photographs, and working drawings of the designs created by Pei Partnership Architects (PPA). The event will pay tribute to renowned architect Chien Chung Pei, who founded PPA in 1992 along with his brother Li Chung. Among Pei's achievements as designer in charge and project architect are the Grand Louvre in Paris, with its emblematic 70-foot tall glass pyramid, and the West Wing extension of Boston's Museum of Fine Arts. At the Museum of Asian Art. Call 941/954-7117 or visit www.museumasianart.com.

The Furniture of Poul Kjaerholm and Selected Art Work

New York City

December 10, 2004–January 22, 2005

The first major American survey of the important Danish designer. The exhibition will combine Kjaerholm's spare, elegant furniture with selected contemporary works of art in an exploration of the vibrant dialogue that has existed between contemporary art and Modernist furniture collectors throughout the 20th century. At Sean Kelly and R 20th Century. Visit www.skny.com or www.r20thcentury.com.

Brininstool + Lynch: Process Chicago

December 10, 2004–January 29, 2005

This exhibition on the work of the Chicago architecture firm includes drawings, models, photographs, and installations of building details, portraying projects that are in progress,

as well as those that have recently been completed. At I Space. Call 312/587-9976 or visit www.ispace.uiuc.edu.

ARCHLAB: New Experiments in Architecture, Art and The City

Tokyo

December 21, 2004–March 13, 2005

The exhibition explores revolutionary designs by international architects from the 1950s to the present, uncovering the origins of radical and visionary approaches to building design and urban planning that have changed the way we look at the city. At the Mori Art Museum. Call 813/5777-8600 or visit www.mori.art.museum.

Experiments with Truth Philadelphia

December 4, 2004–March 12, 2005

An international survey of contemporary filmmaking intended to reassess the influence of cinema and the use of documentary within contemporary visual art practices. Architects Elizabeth Diller and Ricardo Scofidio, as well as Paul Kuranko, media arts specialist at the Guggenheim Museum, will assist in designing experimental spaces between gallery and theater that balance the conceptual and practical demands of each artist's installation. At the Fabric Workshop and Museum. Call 215/568-1111 or visit www.fabric-workshopandmuseum.org.

Ongoing Exhibitions

Arti & Architettura, 1900/2000

Through February 13, 2005

This exhibition documents forays into the field of architecture made by artists as well as architects who

have trespassed into pictorial exploration during the 20th century. The protagonists, artists, and architects ranging from Kazimir Malevich to Vladimir Tatlin, Antonio Sant'Elia to Giuseppe Terragni, Ludwig Mies van der Rohe to Piet Mondrian, Le Corbusier to Frederick Kiesler, Frank Gehry to Claes Oldenburg, have designed ideal spaces, volumes, and pathways based on forms and colors, born of pure creativity. At the Palazzo Ducale. Call 010/557-4004 or visit www.palazzoducale.genova.it.

Precarious Idyll: The Hinzert Document Center by Wandel Hoefer Lorch + Hirsch Ljubljana, Slovenia

Through December 19, 2004

Coming a year before the completion of the prize-winning project by Wandel Hoefer Lorch + Hirsch, this exhibition highlights the tension between architecture and landscape. The Hinzert Document Center, which will include archives, a research library, and seminar and exhibition spaces, is intended to question the political and territorial deformations of the landscape. At Dessa Architectural Gallery. For information, call 386-1/421-7970.

34 Los Angeles Architects Los Angeles

Through February 22, 2005

An exhibition illustrating the spirit and enterprise of a group of 34 Los Angeles architects and the issues that they feel are important in their current work. At the Architecture + Design Museum. Call 310/659-2445 or visit www.AplusD.org.

SocioPolls: Project for a City of the Future

Through January 31, 2005

A new and unique city is rising on the periphery of Valencia, Spain.

Fulfilling the three prerequisites of enabling social interaction, the linking of architecture with nature, and the integration of new information technology in the living space, 12 internationally active teams of architects have—based on Vicente Guallart's master plan—formulated responses to the most pressing topics for current and future urban planning. The exhibition provides an overview of the planning zone and an introduction to the architects' designs. At Architekturzentrum Wien. Call 431/522-3115 or visit www.azw.at.

A Highlight of Vienna's Ringstrasse: James Turrell and Targetti Light Art Collection

Vienna

Through January 16, 2005

MAKlite, a unique permanent light installation by American artist James Turrell, provides the MAK building with a new dimension of visibility, accentuating the overall architectural impression. The technology for the project was developed by the Florence, Italy-based architectural lighting specialist Targetti, whose Targetti Light Art Collection, Mehr Licht, will be on exhibit in the MAK Upper Floor Exhibition Hall. Visit www.MAK.at for further information

Ezra Stoller Architectural Photography

Williamstown, Mass.

Through December 19, 2004

Ezra Stoller was an architect before he was a photographer, and with his stunning black-and-white photographs helped create a public for Modern architecture, making it seem heroic. The exhibition consists of approximately 50 photographs representing six icons of Modern architecture: Rudolph's Yale School of Art and architecture; Kahn's Se



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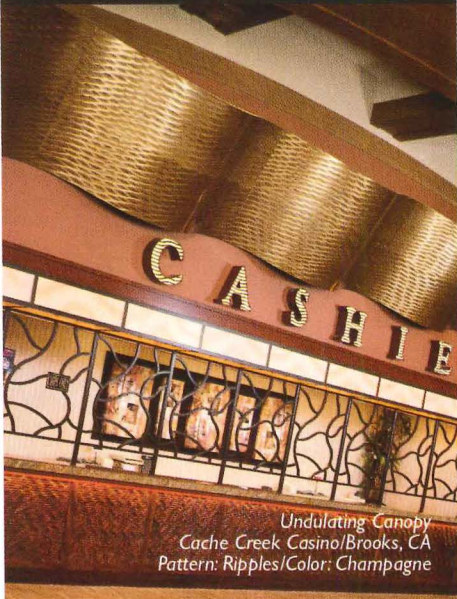
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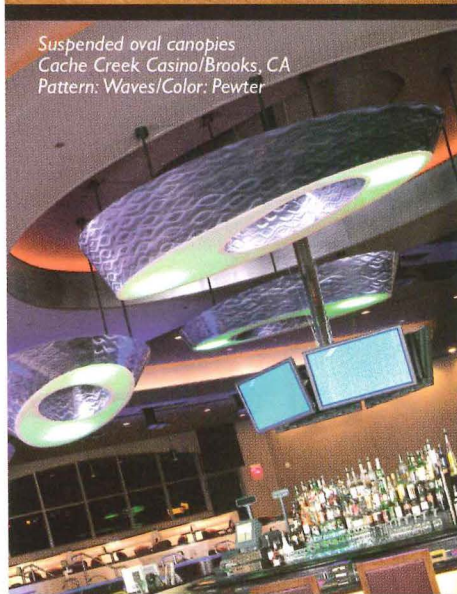


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Michael Wesely: Open Shutter at the Museum of Modern Art New York City

Through January 2005

This exhibition presents a unique photographic project inspired by the construction of the new Museum of Modern Art. At the Museum of Modern Art. Call 212/708-9400 or visit www.moma.org.

Glamour: Fashion, Industrial Design, Architecture San Francisco

Through January 17, 2005

The concept of glamour is based on a notion of excess and has been glorified in the discipline of fashion. Conversely, glamour has been marginalized in industrial design and even reviled in architecture, where the pared-down aesthetics of Modernism and Minimalism have prevailed since the middle of the 20th century. On view are haute couture by Dior and Versace, automobiles from Jaguar and Bentley, architectural works by Philip Johnson and Herzog and de Meuron. At the San Francisco Museum of Modern Art. Call 415/357-4000 or visit www.sfmoma.org.

Paul Rudolph: The Florida Houses & The Cannon Chapel Atlanta

Through December 31, 2004

Paul Rudolph, a pioneer of 20th-century architecture, began his career designing intimate beach houses on the west coast of Florida. This exhibition celebrates the innovation and drive that propelled him to international renown in the 1960s. At the Museum of Design Atlanta. Call 404/688-2467 or visit www.museumofdesign.org.

Lebbeus Woods: Experimental Architecture Pittsburgh

Through January 16, 2005

One of the most innovative experimental architects working today, Lebbeus Woods combines an extraordinary mastery of drawing with a penetrating analysis of architectural and urban form, and social and political conditions, that is nourished by his wide knowledge of fields ranging from philosophy to cybernetics. At the Heinz

Architectural Center. Call 412/622-3131 or visit www.cmoa.org.

Lectures, Conferences, & Symposia

31st Annual New York Housing Conference and National Housing Conference Awards Luncheon New York City

December 7, 2004

John Zuccotti, the chairman of both Brookfield Properties and the Real Estate Board of New York, will receive the Lifetime Achievement Award at this annual luncheon. The event, the largest annual gathering of the affordable-housing community in the country, will be held at the Sheraton New York Hotel and Towers. For further information visit www.nhc.org.

Protecting Water Resources: Smart Growth and Low Impact Development Washington, D.C.

December 15, 2004

John Tippet, executive director of Friends of the Rappahannock, will present current practices in the integration of low-impact development design techniques with smart projects. At the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

The U.S. Capitol: Its Lessons for Today Washington, D.C.

December 15, 2004

Henry Hope Reed will discuss the design history of the U.S. Capitol, often regarded as an example of American Neoclassical architecture. At the National Building Museum in collaboration with the Institute of Classical Architecture. Call 202/272-2448 or visit www.nbm.org.

The Architectural League of New York Lecture Series New York City

December 2, 9, and 16, 2004

Collaborations between designers, scientists, and artists, and consensual design approaches are blurring professional boundaries and creating new fields of overlap and design exploration. This series presents architects, landscape architects, artists, and engineers in lectures, dialogues, and panel discussions, to probe how these ideas are being developed in contemporary practice. At the Great Hall, Cooper

Dates & Events

Union. For more information, call 212/753-1722 or visit www.archleague.org.

The Harvard Design School Lecture Series Cambridge, Mass.

December 1, 7, and 14, 2004

Lectures by Alan Berger, associate professor in the department of landscape architecture, Jeanne Gang, who leads Studio Gang Architects located in Chicago, and Brian Healy of Brian Healy Architect, Boston are scheduled in the Piper Auditorium. Call 617/495-5453 or visit www.gsd.harvard.edu/events.

Architecture and Identity Berlin

December 6-8, 2004

The conference will bring together an international group of academics and practitioners of architecture and the social sciences to explore the "own" in a context of globalization vs. regionalization, as well as the "foreign" in the construction identity in architecture. At the Technische Universitat Berlin. Visit www.architecture-identity.de for further information.

NFBA Frame Building Expo Louisville

February 25-27, 2005

The National Frame Builders Association's (NFBA) event brings post-frame industry professionals from across the nation together to share ideas, as well as architects, builders, building material dealers, building component manufacturers, and engineers. At the Kentucky Convention Center. For more information, call 800/557-6957 or visit www.nfba.org.

Competitions

National AIDS Memorial Design Competition San Francisco

Registration Deadline: December 24, 2004

Entry Deadline: January 7, 2005

The National AIDS Memorial Grove is sponsoring an international design competition to identify an outstanding artistic feature that will memorialize those who have died of AIDS and honor those who continue to fight the pandemic. The competition is open to students and professionals in the disciplines of art, architecture, and landscape architecture. Visit www.aidsmemorial.org.

Buzzards Bay Design Competition Bourne, Mass.

Deadline: April 19, 2005

A single-phase, open International Design Competition seeking proposals for a 17-acre park with extensive frontage on both the Cape Cod Canal and Main Street, Buzzards Bay. The main objective is to create an intergenerational recreation area and cultural amenity for the use of local residents, while encouraging downtown economic redevelopment. Visit www.buzzardsbayvillageassociation.org.

The 2005 Latrobe Fellowship

Deadline: February 4, 2005

The purpose of the fellowship is to support research that will increase the knowledge base of the architecture profession. Sponsored by the AIA College of Fellows. Visit www.aia.org/fellows_latrobe_2005 for detailed information.

Flight 93 National Memorial Design Competition

Deadline: January 2005

The response to the violent acts in the skies over Southwestern Pennsylvania on September 11, 2001, will be a national memorial to the people who died in what has become known as the first civilian act of defense in the war on terrorism. The design competition welcomes all submissions of ideas that will commemorate the 40 heroes of Flight 93. For additional information, visit www.flight93memorialproject.org.

Ceramic Tiles of Italy Design Competition

Deadline: January 30, 2005

North American architects and interior designers are invited to submit residential, commercial, or institutional projects featuring Italian ceramic tile completed between January 2000 and January 2005. To learn more about the competition, visit www.italiatiles.com or www.italytile.com.

E-mail event and competition information two months ahead of event or submission deadline to elisabeth_broome@mcgraw-hill.com



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For and about the new generation of architects

archrecord2

FOR THE EMERGING ARCHITECT

DEPARTMENTS

This month, archrecord2 invites you to review this year's Design Vanguard Architects (some of whom have formerly appeared in archrecord2) to discover the newest in architectural talent that spans the globe; coverage begins on page 111. In Work, learn more about an in-house competition held by RTKL, where young talent designs for other young talent. Also this month, we feature a listing of upcoming student and open competitions.

WORK

Designing space for designers

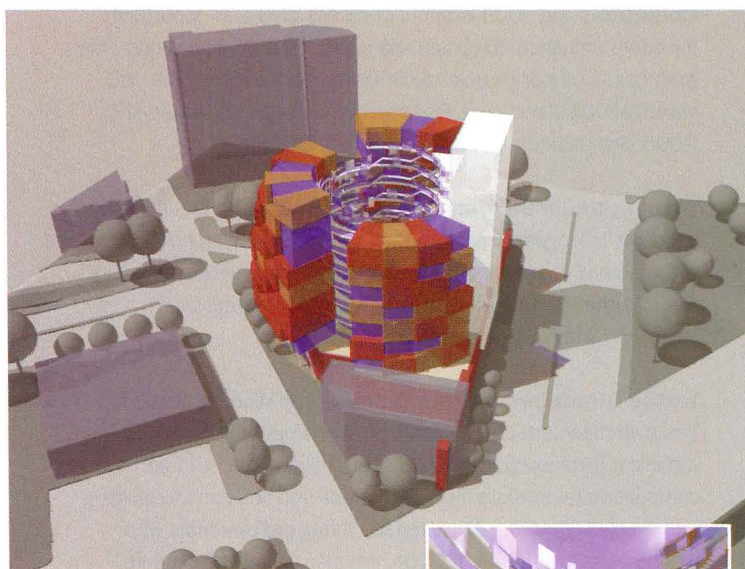
An old alliance between the architectural firm RTKL and the Maryland Institute College of Art (MICA) recently impacted the young designers of the multinational firm. In the early 1990s, RTKL designed a visiting artist's sculpting studio on MICA's campus—so when the board of MICA decided a new dormitory was necessary, they approached the firm that had assisted them years ago. RTKL chairman Paul Jacob, AIA, describes the timing of MICA's request as serendipitous. "Every year we hold a companywide design conference for selected young employees to foster a culture of collaboration while creating a dialogue on design," he explains. "For the conference in October, we used the competition's process as this year's topic."

Seven of RTKL's offices chose the young designers who would work on the creation of the new dormitory, whose program would also include a black-box performance space, a campus café, meeting facilities, and a career development center. While young designers spearheaded and ultimately presented the projects, entire offices would collaborate on the "after work hours" project.

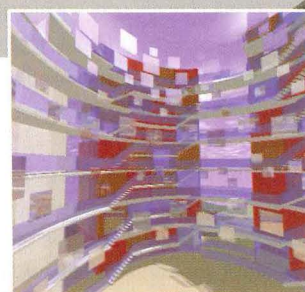
After the allotted two months, the designers presented their schemes to a panel of jurors at MICA's Brown Center. Jacob says, "We were absolutely blown away by the results." However, it was the London-office entry, led by Grant Armstrong and Christy Wright, that was overwhelmingly chosen as the winning proposal. "There is a certain playfulness to the design that successfully resolves a lot of problems in a tight site," comments Jacob. The circular design comprises three residential "pods" that are anchored by a vertical spine of studio spaces. The scheme, including the ground-level glass-walled public spaces, breaks up the scale of the building and also acts as a gateway to the campus.

The members of the jury were not the only group enthusiastic about the work of the London team: MICA's board of trustees and members of the local community approved of the complex design. Currently, Armstrong, Wright, and the Baltimore-based office of RTKL are finalizing the design and setting up time lines that will have this project completed in the fall of 2007. *Randi Greenberg*

See the other entries from the RTKL design competition, go to archrecord.construction.com/archrecord2/



While the London office's entry, consisting of a circular structure with an enclosed courtyard (top and right), was the unanimous winner, the jury agreed that every entry, like those from Madrid (below) and Baltimore (bottom right), had innovative elements.



COMPETITIONS

A subject frequently explored in the pages of archrecord2, competitions are often a good opportunity to sharpen one's craft, create collaborations, and attract attention to a burgeoning career. We've done a little digging to bring several competition listings to your attention. For easy access to more information on the competitions listed below, visit archrecord.construction.com/archrecord2/, where we've linked to the sponsor's page. Good luck!

Student Competitions

2005 Berkeley Prize Essay Competition Awarding excellence in architectural writing and thought among undergraduate architecture students in accredited schools worldwide. Finalists will be awarded a cash prize and be eligible to compete for the Berkeley Prize Travel Fellowship. For more information, including the competition question, go to www.berkeleyprize.org.
Submission Deadline: December 10, 2004.

Extreme: Creating Space in Extreme and Extraordinary Conditions UIA 2005 Istanbul Congress offers an opportunity for future architects to design spaces for extreme conditions. One grand prize winner receives \$7,000. For more information, visit www.uia2005istanbul.org.
Registration Deadline: January 27, 2005. Submission Deadline: June 13, 2005.

Student Union Building This ACSA/AISC Student Design competition challenges students to design a student union building for their campus or a campus of their choice. Visit www.acsa-arch.org.
Registration Deadline: February 8, 2005. Submission Deadline: May 3, 2005.

Textile Structures for New Building The Working Group for Textile Architecture and Techtexil, the International Trade Fair for Technical Textiles and Nonwovens, are holding their 8th annual competition to promote innovative ideas and solutions to building with textiles or reinforced materials. Young professionals who graduated after January 1, 2004, are also invited to compete. More information is available at www.textile-architecture.com.
Submission Deadline: February 28, 2005.

Enlightening Learning Environments The International Association for Humane Habitats' third annual design competition call for entries to create a program for facilities of learning. More details are available at www.humanehabitat.org.
Submission Deadline: January 27, 2005.

Student Suburban Design Competition Kennesaw State University is sponsoring a competition on suburban design and looking for innovative ideas on how suburbs can be organized and constructed. Students are invited to submit plans for new forms of housing, transportation, commerce, amenities, and/or recreation. For more information, contact Dr. Fein at mfein@kennesaw.edu.
Submission Deadline: January 14, 2005.

Open Competitions

2004–2005 Young Architects Forum The Architectural League of New York's call for entries to architects and designers 10 years or less out of undergraduate or graduate school. Winners of the competition receive a cash prize, exhibit their work, and present lectures at the League in New York City. For more information, call 212/753-1722 or visit www.archleague.org.
Submission Deadline: February 4, 2005.

The Parachute Pavilion: an Open Design Competition for Coney Island The Van Alen Institute and the Coney Island Development Corporation announce their competition for designers to create a project in Coney Island. The inaugural New York Prize of \$20,000 will be awarded to the first-place winner. More information on the competition can be found at www.vanalen.org.
Registration Deadline: February 25, 2005. Submission Deadline: April 18, 2005.

A Door to Paradise designboom and COCIF have announced an open competition to design an interior residential door. The design must take into account technological innovation, ease of use and manufacturing, and may include a variety of materials. Cash prizes go to five winning entries and four honorable mentions. More information can be found at www.designboom.com.
Submission Deadline: January 25, 2005.

Places of Work In their sixth annual architectural photography competition, architekturbild is seeking a series of four photographs on the topic of the workplace. Cash prizes will be awarded. For more information, go to www.architekturbild-ev.de.
Submission Deadline: January 28, 2005

Kyrl's Quay Design Ideas Cork City Council and the RIAI are seeking design ideas for a group of prominent waterfront sites that stretch from Cornmarket Street along Kyrls Quay. More details can be found at www.cork2005.ie.
Submission Deadline: April 1, 2005.

Buzzards Bay Design Competition A competition seeking conceptual proposals for a 20-acre park adjacent to waterfront, commercial, and residential areas. For further details, go to www.buzzardsbayvillageassociation.org.
Submission Deadline: April 19, 2005.

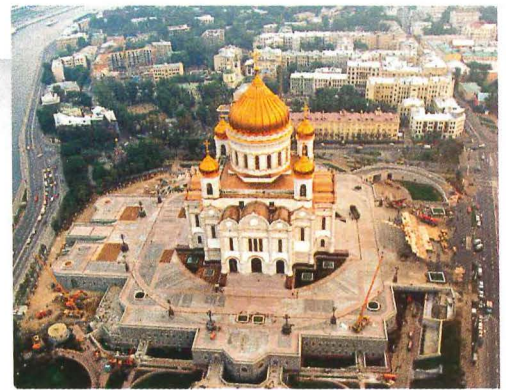
Without government support, trying to save Moscow's architectural heritage is a difficult task

Correspondent's File

By Paul Abelsky

DEPARTMENTS

In May of this year, at Arch-Moscow, Russia's most prominent architectural exposition, one of the central pieces on display was an eloquent tribute to several torn-down historic buildings. Three stylized gravestones, accompanied by photographs and epitaphs, acknowledged the loss of the Manezh Square gates, the Voentorg (a famous Soviet-era department store), and the famous Hotel Moskva, which embodied a spectrum of more than a hundred years of architectural history. These edifices represent the microcosm of the preservation crisis unfolding in Moscow amid one of the largest construction booms in city's history.



Historic areas in Moscow, such as St. Nicholas Gate Square (top, turn-of-the-20th-century photo), have been all but destroyed. Church of Christ the Savior (left, 1930s) was destroyed and recently rebuilt (above).

Paul Abelsky is a writer based in Petersburg, Russia. He studied European history at Yale University.

Correspondent's File

ties bind the city administration to developers and the real estate industry. Elena Baturina, the mayor's wife, is the co-owner of the Inteko construction firm, one of the largest in the Moscow market. The city government is closely associated with similar companies, and the business interests of government functionaries blend imperceptibly with their official duties. As if more proof were needed, this summer the mayor sued Aleksei Komech, the director of the State Institute of Art History and a member of the city's architectural council, for defaming his "business reputation."

Another way to subvert the protection of buildings has been to put pressure on preservation agencies, many of which are branches of the city administration. For years, a number of such commissions have been compiling lists that identify historically important structures. Such buildings were accorded the rank of

"newly disclosed monuments" and offered temporary protection. The fragility of this status became apparent in August 2003, when the Voentorg was torn down by the city (which had recently taken over ownership), despite its position as a "newly disclosed monument."

For the first time since the years of the Perestroika, a major civic movement has emerged in defense of the city's architectural heritage. Two prominent groups have come forward. The first is an Internet project called Moscow That Is No More (www.moskva.kotoroy.net; unfortunately, the Russian characters don't translate to normal Web browsers), which attempts to make public the loss of historic buildings and compiles the documentation and images of old Moscow. Konstantin Sumarokov, the site's curator, says that his goal is "to create a virtual museum of what has been lost." Also, three foreign journal-



Sovetskaya Square (top, 1930s), built in 1792 as a parading ground for the guards

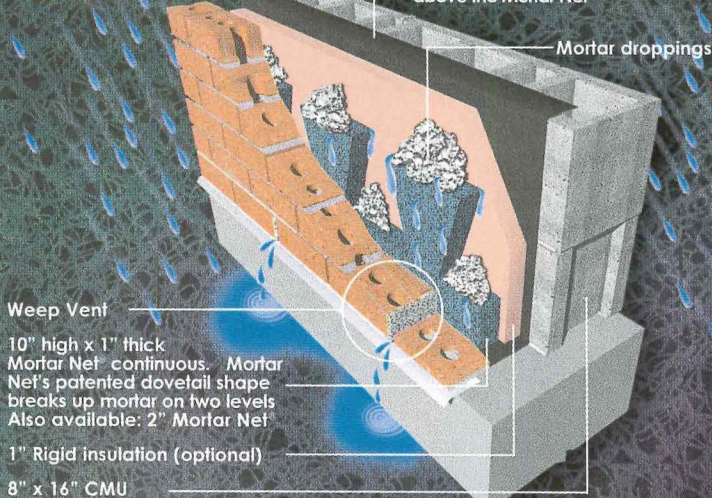
in front of the General-Governor's house, has a long history of "historic reconstruction."

The iconic Moskva Hotel (bottom, 1930s) was demolished in July 2003.

Mortar Net vs. Straight Strip

The Competition Just Doesn't Shape Up

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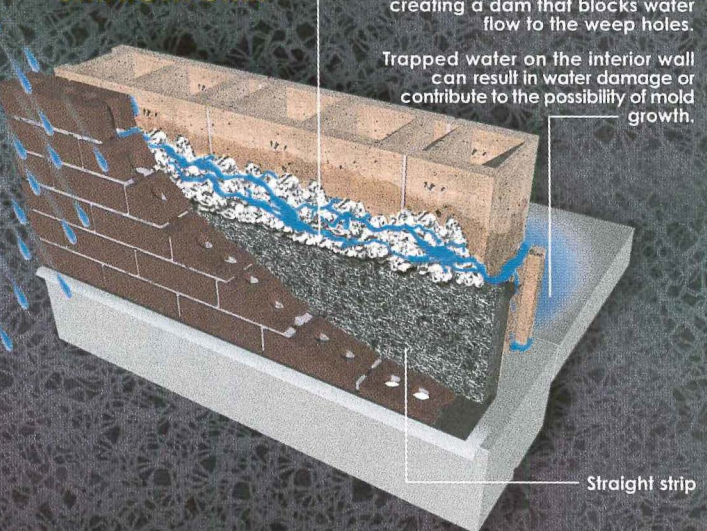
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The Polivanov House (top, early 1900s) was damaged in a 2001

fire and hasn't been repaired. Streets may be repaved in front of

The Historical Museum and Alexander Gardens (bottom, early 1900s).

ists residing in Moscow recently launched the Moscow Architectural Preservation Society to publicize the situation and involve the international media. Indeed, the clearest example of preservationists' success is the raised public awareness of the crisis. Heritage issues are a constant subject of discussion in newspapers, on TV, and in private, and protests in front of buildings like the Polivanov House (pictured, left) have been seen on the national news.

Still, while the public often laments the loss of high-profile landmarks, lesser-known but equally significant buildings have suffered in recent years. The Einem House, built between the 17th and 19th centuries, contained halls in Naryshkin Baroque style with well-preserved interiors and a statue gallery. After the last inhabitants were evicted, the building suffered several fires and was bulldozed in November 2000. Two prerevolutionary movie theaters, the Uran and the Neoclassical Orion, both built in 1910s, were demolished between 1994 and 1997. And the

Trubetzkikh House, with its 19th-century interiors, underwent reconstruction after a 2001 fire using modern techniques, effectively erasing its historic value.

The administration's compromise solution has been to demolish original structures and replace them with enlarged replicas that feature new elements like underground parking and modernized facilities. The city is thus lined with fake duplicates, deprived of old Moscow's historic fabric. An example of heritage groups' influence is the recent decision by the city government to carry out a more careful, if hurried, reconstruction of the Neoclassical Manezh gates, with their intricate wooden support structures.

Meanwhile, the imperative for preservationists, says David Sarkisyan of the Moscow Museum of Architecture, is "to resist the authorities at every step." The real aim, he adds, "is to convince the city officials that an authentic building is inherently more valuable than a replacement or a fake copy." ■



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Playing the name game: A short primer on what it all means

Commentary

By Aric Chen

DEPARTMENTS

What the heck is an Iterae, dECOi, or Servo? SHoP, the little O notwithstanding, we can understand. We also know—we think—what a Sumo is. But Emergent is an adjective, not a proper noun. Nevertheless, these make up just part of a semantic whirlwind of offbeat appellations that architects have lately been giving themselves. Whatever happened to the trusty surname?

At a time when exhibitions called *Archilab* and *Metamorph* present “episodes” and “interventions,” rather than mere projects, it’s no surprise that emerging—or emergent—architects have taken up abstract names. Many, like Ply, Plot, Peel, and Manifold, allude to the relationship between process and form. Some are unabashedly techie, like Plasma and nARCHITECTS, its first letter referring to the notation for a mathematical variable. Others imply collaboration and creative convergence, like Mesh and Graft (though that last one can have a less savory meaning as well, especially for a firm that may have to deal with politicians or certain trades). More confounding, and perhaps overzealously punctuated, have been the likes of LE.FT and X-ING.PHX.LAX.

What these firms generally have in common is a desire to place the collective idea above the individual. “If we work with others in the future, they can feel part of some-

thing other than ourselves,” explains Eric Bunge of nARCHITECTS.

“Our name allows us to change and grow.”

Such dynamic, collaborative strategies go back at least to the 1960s, when experimental groups like Archigram, Archizoom, and Superstudio rebelled against the Modernist myth of the singular genius. Later, Thom Mayne’s Morphosis, Rem Koolhaas’s Office for Metropolitan Architecture, and others tried to keep the spirit alive, though they’ve since been overshadowed by their founders’ names.

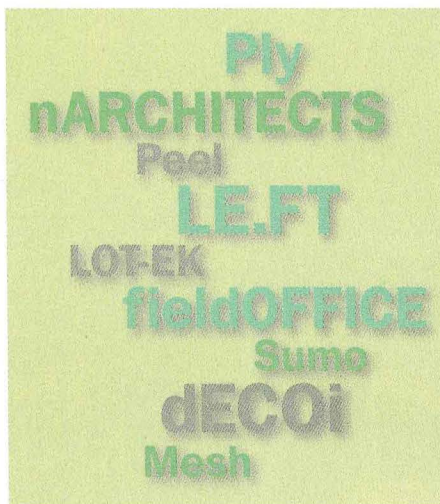
Who’s that?

Then came the 1990s. That’s when partnerships called Foreign Office Architects, fieldOFFICE, Architecture Research Office (ARO), Open Office, and Design Office began to appear. Besides occasional confusion (was that project by Foreign Office, Open Office, or Design Office?), these names imparted a seriousness of purpose and represented a reaction against, among other things, the previous decade’s Postmodernist grandstanding. “The anonymity of our name comes from the idea that the built element is something on its own, beyond what the designer puts forth,” says ARO’s Adam Yarinsky, who cofounded that firm in 1993.

At the same time, these names were as coolly minimalist and fashionably ironic as those of the trendy eateries (for example, Cafeteria and Canteen) and hotels (The Hotel) that helped define the

90s’ own self-indulgences. Design was hip, and many designers began branding themselves accordingly.

Thus, it makes perfect sense that at the height of the late-90s Internet bubble, when the most current crop of firm names began to surface, they would express an infatuation with technology. “In physics, plasma is described by a state that is wholly governed by



external conditions,” explains the London-based Eva Castro of Plasma Studio, which was established in 1999 and has one partner based in Italy. “We wanted to work in a model that responded to technologically induced transformations.”

Keeping up with the times

Such responses can be contagious, and even some of architecture’s most established players have caught the bug. In 1967, Hugh Hardy teamed up with Malcolm Holzman and Norman Pfeiffer. Their practice would become known for its icono-

clasm, but it was rather reliably named Hardy Holzman Pfeiffer Associates. Last summer, when the three founding partners decided to go their separate ways after 37 years, Hardy, now 72, christened his new venture H3 Hardy Collaboration Architecture.

Too much theory perhaps

Hardy’s latest moniker may be an unfortunate mouthful—“We just call ourselves H three,” he offers—but such names are often penetrating, thoughtful, and even witty. They place their firms at the cutting edge, while speaking of a discipline that is probing its peripheries with brio. However, they also carry risks. “Architects are often seen as parodies, speaking in pretentious jargon that keeps others out of the conversation,” says Scott Hamrah, a semi-

otics expert who specializes in naming products and companies. “And these names don’t help.” They also become dated.

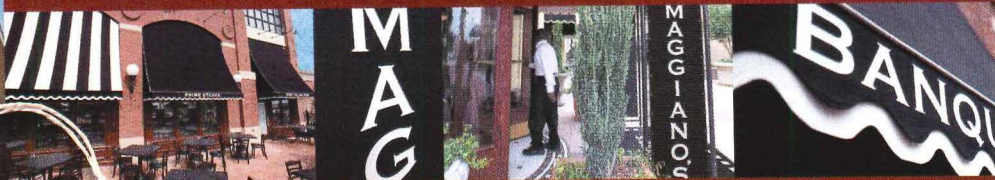
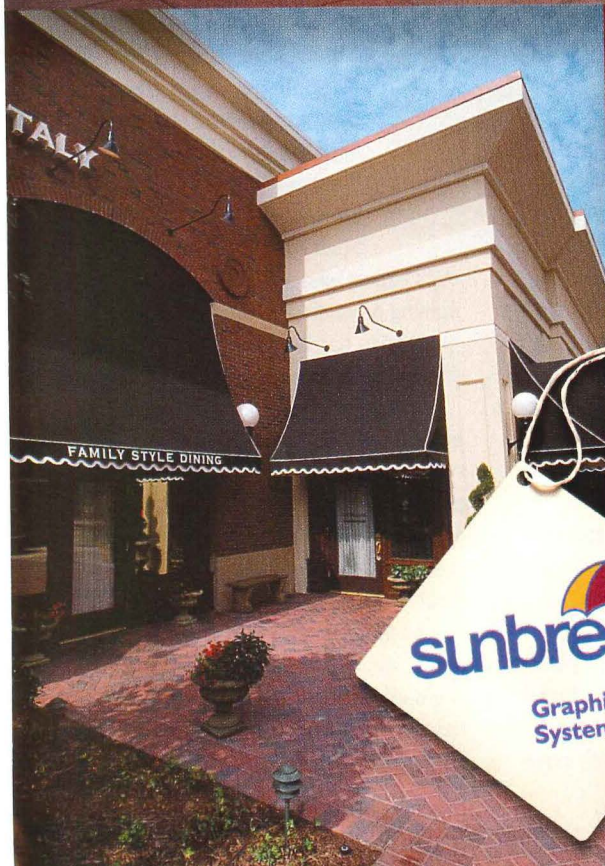
“Things like slashes and parentheses are really passé”—note to Coop Himmelb(l)au—and prove only that you’ve been reading old Postmodern theory,” explains Hamrah. “However, I would consider hyphens sort of emergent,” he concedes of the old-school mark. “Anything low-tech like that is emergent.” As it happens, the New York firm LOT/EK fairly recently switched to LOT-EK. ■

Aric Chen is the gossip columnist for *The Architects Newspaper* and a contributing editor for *I.D.*, *Surface*, and *Interior Design*.



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Let a thousand flowers bloom: Cuban Modernism's short moment in the revolution's sun

Critique

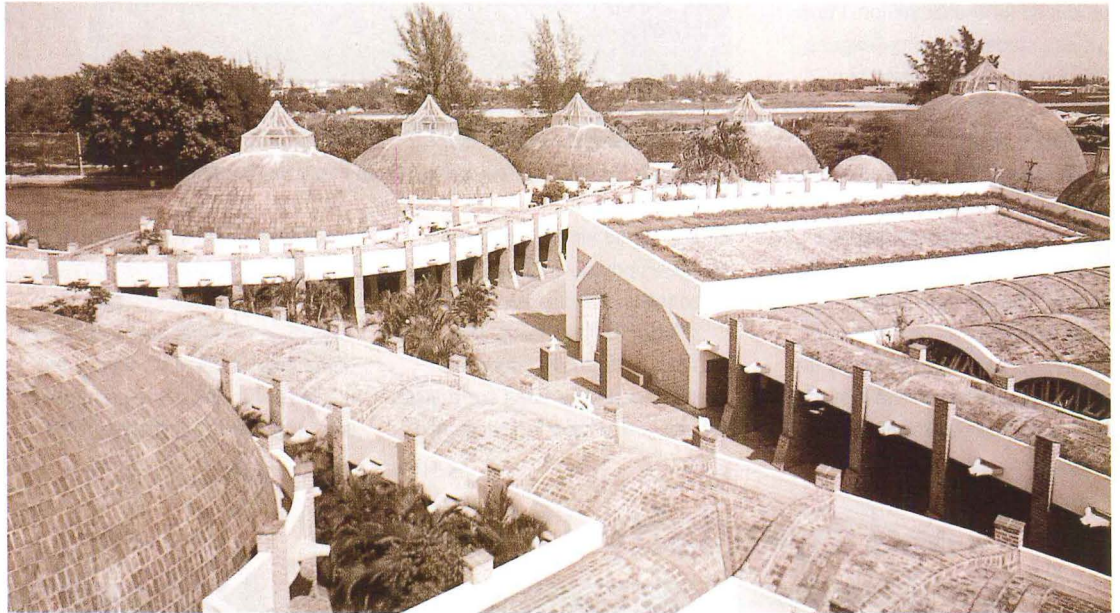
By Michael Sorkin

DEPARTMENTS

Every revolution has a creative half-life. The Russian Revolution begat Constructivism before its slide into totalitarianism. In France, the architecture of Boullée and Ledoux represented a moment of confidence that was too soon displaced by the Terror. In Cuba in the late 1950s and early '60s, a brief halcyon period of intense architectural and artistic creativity soon gave way to dreariness as the country's economy collapsed and politics became increasingly repressive.

Architecture and Revolution in Cuba, a show at Storefront for Art and Architecture in New York City, curated by Eduardo Luis Rodriguez, documents the efflorescence of architecture in Cuba following the overthrow of the Batista regime. This was a time when Cubans embraced the optimistic promise of bread and roses, reflected both in the range of programs encouraged by the new government—schools, housing, cultural centers, hospitals, ice-cream parlors—and in the flamboyance and freedom of their architecture.

Perhaps the best known and most magnificent of these projects is the complex of art schools—for music, drama, modern dance, ballet, and the plastic arts—begun immediately after the Bay of Pigs invasion in 1961 as a cultural riposte to Yankee designs on the island. Personally initiated by Fidel Castro and Che Guevara and sited on the



The National School of the Plastic Arts (above) by Ricardo Porro and the Coppelias Ice Cream Parlor (left) by Mario Girona exemplify the flowering of a humanistic spirit and sense of architectural adventure that took place in Cuba in the first years after the Communists took power.

grounds of what had been a posh country club, these buildings—designed by the Cuban Ricardo Porro and Italians Roberto Gottardi and Vittorio Garatti—embody the best of a compassionate revolution, one in which artistic expression is seen as indispensable to human development and success is

marked by expressive freedom.

The buildings themselves are sinuous, complex compositions—each an urbane little village—laid out with tremendous sensitivity to the lush, undulant landscape, and built in a common materiality of brick, tile, and concrete. They share, too, a technology of hand-built

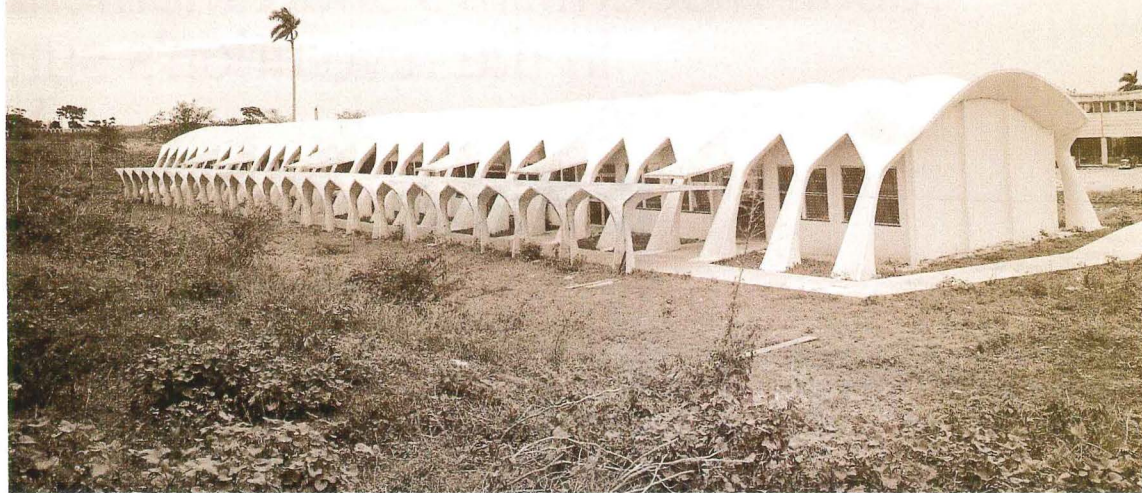
Catalan vaulting—supervised by an elderly Spanish master of the art—that yielded an amazing Xanadu of domes and arches. Both individually and as ensemble they represent one of the great architectural creations of the century, rich in influences but ultimately sui generis. A piece of good news is

Michael Sorkin practices architecture in New York and is the director of the graduate urban design program at the City College of New York.

Critique

that portions of the complex—much of which is in a state of ruinous deterioration—are slowly being restored.

The star of the Storefront show is Ricardo Porro. He holds center stage not simply because of his leadership of the Art School project and his astonishing architectural work (continued in Europe after his exile from Cuba), but thanks to his beguiling appearance in a film of interviews produced for the exhibition. Porro (whose students and colleagues affectionately nicknamed him Porbusier and Porromini) is an enthusiastic and articulate sensualist, and his sexualized and ethnic description of his work is unabashed. In the art schools, Porro sought to express the Afro-Cuban culture he thought held the island's soul. Unfortunately, this sensibility was at the core of the project's fall from favor. As the revolution grew more Stalinist in its suppression of diversity, the schools



The Center for Construction Research and Experimentation in Havana by Hugo D'Acosta, built in 1967.

were charged with a variety of bourgeois crimes: individualism, irrationality, idealism, and luxury.

But in the beginning, what a time it was! Porro describes this "utopian" period as "*mas surrealista que socialista*," and the sense of

adventure throbs from accounts of a moment when all seemed possible. Utopia is the ultimate erogenous zone of architecture, and the merger of the discourses of revolution and pleasure was one of the great promises of the time—certainly part of

the initial ideological armamentarium of the long-haired, cigar-chomping progenitors of the Cuban revolution, before their slide into Puritanism and homophobia. Indeed, the cover shot for the exhibition (a 1959 photo of an elegant group of architects in suits

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and ties mingling with bearded revolutionaries in baggy military fatigues) suggests a conflict that was to return.

Describing the Art School project, Porro recalls the "victorious and almost epic atmosphere" and the directive from Fidel to create "the most beautiful art school in the world." He speaks of making a symbol of fertility and evokes Ochun—the Afro-Cuban fertility goddess—as the muse of the building, and female sexuality in general as intrinsic to the Cuban national character. "Cuba es una mulata," he declares, and the three (albeit male) architects of the schools deliver on this description of the feminine in terms that, however regressive they may seem to us nowadays, were the conceptual medium for producing work of curvaceous sensuality and often frank symbolism (including Porro's famous water-squirting papaya sculpture).

Those happy days were all too brief, and the schools were never fully completed and only partially occupied. Porro describes the dis-

couraging atmosphere engendered by what was to become a permanent political and economic crisis. There is a striking moment in the film when Porro describes the arrival of Soviet panelized housing as the death knell for the creative period that produced the art schools. (In 1964, the Russians sent a gigantic factory for production of the "Gran Panel" system as a gift to the Cuban people.) As Porro speaks, the camera angle widens to reveal a terrible—and terribly out of place—panelized building for student dorms looming in the background. In its grim rectilinearity, mindless siting, and shabby detailing, the building is the antithesis of the organic, humane approach of the schools.

The art schools were not alone in representing this approach. A striking revelation of the show is the numerous examples of post-revolutionary Cuban architecture embracing progressive design practices that were international in their appeal and very much parallel to directions contemporary in the U.S.

and elsewhere. Experiments in modularized housing, cement-asbestos prefab pods, standardized school construction, and integrated housing developments have a wonderful familiarity to those of us who were in U.S. schools back then.

A place without development

Although the narrative of a small island caught in the rivalry between two colossi is by now the standard issue, it was crucial in shaping Cuba's architecture. A visit to Cuba nowadays is filled with awful contrasts. There are few places where the gap between education and income is so great. Terrible scarcities of goods and services (public transit, for example, is in ruins) dominate one's impression of the island. This is an economy in tatters because of bad and authoritarian choices, sclerotic bureaucracy, misplaced alliances, and, of course, unending U.S. pressure.

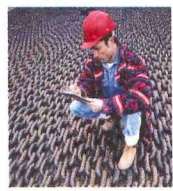
Ironically, the dire situation has had some fortuitous effects. Crumbling Havana—one of the

most beautiful cities on the planet, with centuries of wonderful buildings—remains relatively unscathed by development, because there isn't any. But once Fidel departs the scene, there will likely be a new set of risks. However much one wishes the Cuban people to enjoy lives of freedom and prosperity, the onslaught of U.S.-style urbanism—with its domination by the car, its fast-food effluvia, its insensitivities to history, its suburbanization—will likely put the coherence of the city and its very public atmosphere and vibrant, if stoic, solidarity at risk.

Although Porro may be the star of the film, the best line comes from Mario Girona, architect of the fabulous Coppelia Ice Cream Parlor. Girona recalls that in designing the project—a wonderful and complex prefab dome—he was struck by a program that asked for a place where "a thousand people could eat ice cream." That's my kind of revolution.

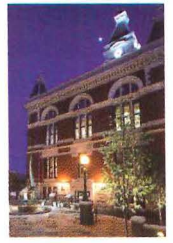
For those interested in the art schools, *Revolution of Forms* by John A. Loomis is the definitive work. ■

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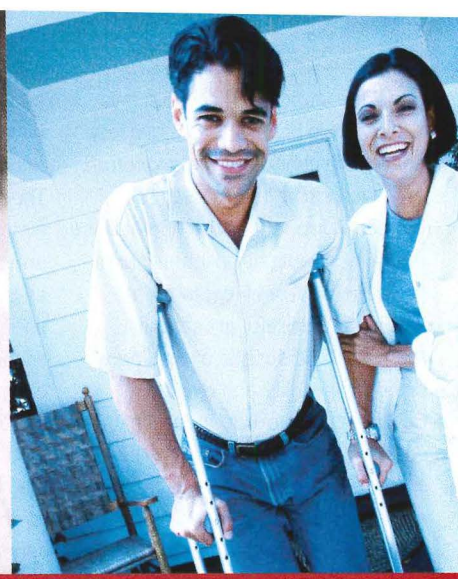
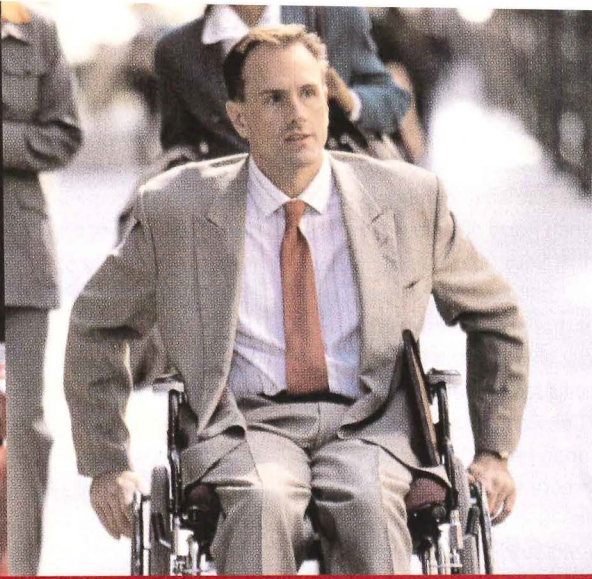
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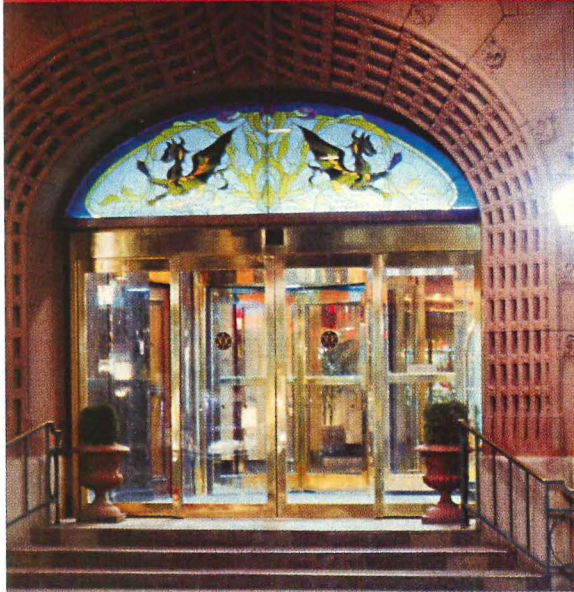


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Three years later, a quartet of books examine the efforts to rebuild at Ground Zero

Books

Up From Zero, by Paul Goldberger. New York: Random House, 2004, 288 pages, \$25.

During the first musings about future designs for Ground Zero, a dark joke circulated through New York's architectural community. It went like this: If the downtown rebuilding effort were a board game, all architects would start at square one, except for SOM, the firm with connections to the developer; it would start at the finish line. Some two-and-a-half years later, after thousands of meetings and as many proposals and skirmishes, it came to pass. How did this happen?

Paul Goldberger, the *New York Times* architecture critic for 25 years, and the *New Yorker's* for the past seven, knows most of the issues that shape New York's architecture, and most of the players. *Up From Zero* is colored, for better and worse, both by his long view and his insider status.

Goldberger tells the history, more or less, of the official process, aiming for an unbiased account that is both critical and sympathetic. This stance enables him to move freely through the complexities of the story, but it does not allow him to engage much with its intensity. Still, soberly documenting this narrative is no mean feat. Thousands wrangled a seat at the table—the Port Authority and its planners, the developer and his architects, community boards, civic groups, 9/11 families, two New York mayors, the governor, the president, various henchmen, and the leading designers, for starters. Not to mention the hype! When was an

architectural process covered so extensively or breathlessly by the press? Architecture had arrived, and its coverage had all the cannibalistic mania of the era's Big Stories: O.J. Simpson, Monica Lewinsky, the elections.

It's oddly pleasurable to relive the mad carnival ride in the reading. Time is compressed, many of the gaps are filled in, and questions answered as we return to now-familiar surprises: the soaring promises and scary free falls. Remember the high hopes and wild visions followed by Beyer Blinder Belle's rushed plans with their curious mongrel authorship, the public's horrified response, the competition that dared not speak its name, the apotheosis of Libeskind and his slow dismemberment, the triumph in the memorial competition of Michael Arad, an unknown? All that kinetic energy exerted itself against the downward pull of the governor's unstated political imperatives and the developer's intent to rebuild 10.5 million square feet of unnecessary office space, which finally ended in a ravaged master plan and a jumble of designer buildings—downtown's own Columbus, Indiana.

This baffling tale is what Goldberger chronicles. It is the canonical story, our riddle and our myth, and it will be repeatedly retold. It has historic character because of 9/11, but it also describes a philosophical process of dense, indeterminate causality. Goldberger shows us the cogs grinding at Ground Zero, revealing ancient mysteries: repetition (the

towers' gigantism), free will (the public input), predetermination (the 10.5 million square feet, SOM), the role of great men, the cultural and political zeitgeist, how process and accidents have a way of subverting intention.

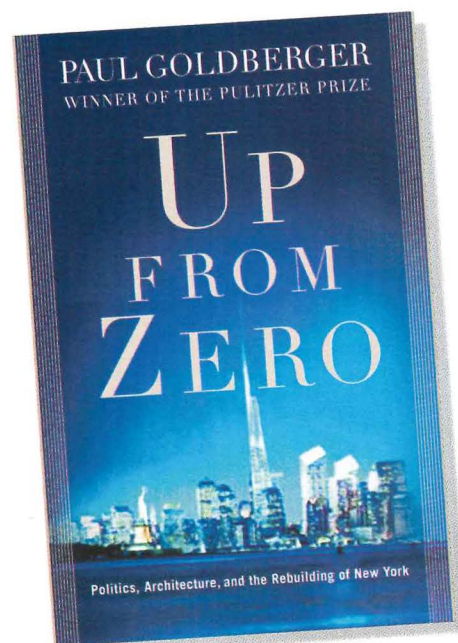
As in Tolstoy's *War and Peace*, Goldberger's hero is not the glamorous leader, like Napoleon, imposing his will on the world, but an anonymous figure—in this case, Alexander Garvin, an empiricist and impresario who was attuned to the whirlwind and orchestrated the planning effort. As if to prove the devouring power of process and the press, it appears that Goldberger's admiration for Garvin contributed to the planner's downfall. After Goldberger wrote a *New Yorker* article praising Garvin's role, a board member of the Lower Manhattan Development Corporation apparently became incensed that the governor was not given more credit. Several months later, Garvin resigned.

The other great figure in this story is Jane Jacobs, New York's most influential empiricist. Her presence is off-stage but ubiquitous. Goldberger sees her epic battles against Robert Moses as the template for the public's determination to have a say in the design of Ground Zero, and he credits her 1961 classic, *The Death and Life of Great American Cities*, with most of the big ideas that should have shaped the rebuilding: creating vitality through mixed-use, 24-hour neighborhoods, recognizing the street grid as the essential urban

space, and the importance of appropriate scale.

But, as in most epic struggles, nobody ever seems to win for good. Goldberger ends his book on a note of resignation, saying, "Idealism met cynicism at Ground Zero, and so far they have battled to a draw."

Laurie Kerr



Sixteen Acres: The Outrageous Struggle for the Future of Ground Zero, by Philip Nobel. New York: Metropolitan Books, Henry Holt and Co., 2005, 304 pages, \$25.

Philip Nobel's account of Ground Zero presents a broader, messier, and more disturbing story than Goldberger's in *Up From Zero*. Nobel ventures beyond the vast, official three-year process to show how the design of Ground Zero cap-

Books

tured the world's imagination, with more than 9,000 designs submitted for the master plan and the memorial. He explores how the inherent limitations of Modern architecture became evident when so much—everything!—was asked of design. Nobel's narrative has the wonderful raw edginess of a handheld camera—zooming in, panning, pulling back—trying to capture it all.

Nobel is a relatively new kid on the block among New York's architecture critics, a contributor to numerous publications and a columnist for *Metropolis*. He is a younger Tom Wolfe of the architectural world, puncturing the smug, self-congratulatory pieties of the in-crowd by

the street grid into one of New York's most notoriously problematical superblocks, labeling it "voguish urban planning dogma." Is nothing admirable? Indeed, the only ones who come off well are those who counsel doing nothing, at least for a while: Ada Louise Huxtable, Frank Gehry, Robert Stern.

Of course, one of the process's most disturbing features was the addiction to haste—our society's headlong rush to react, to do something. We are reaping the sad results in Ground Zero's muddle. Goldberger also decries the haste, but Nobel goes further in dissecting exactly how Andrew Cuomo's challenge to George Pataki in the 2002

revolution, it had forsaken the possibility of forging a common language.

The process breaking down, politics driving policy, our architects failing us ... If Jane Jacobs the mid-century urban critic creates the background of Goldberger's book, Nobel's Jane Jacobs is the current one, whose *Dark Age Ahead* (Random House, 2004) warns of a potential collapse of our society's pillars, a breakdown in our professional and other fundamental processes.

But, despite Nobel's justifiable concerns, maybe the wacky, suspect process worked, after all—and this may constitute its most outrageous aspect. Somehow, everybody got what they needed, if not what they wanted, and isn't that sort of, well, democratic and urban? True, we did not get a singular, visionary masterpiece, but the survivors got

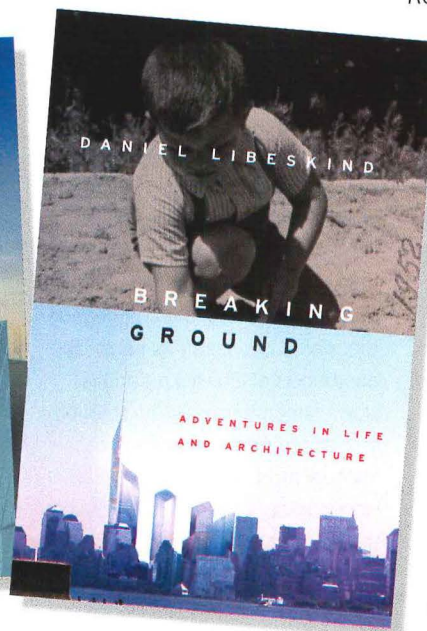
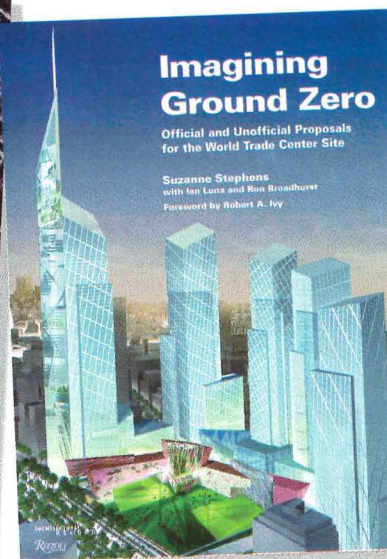
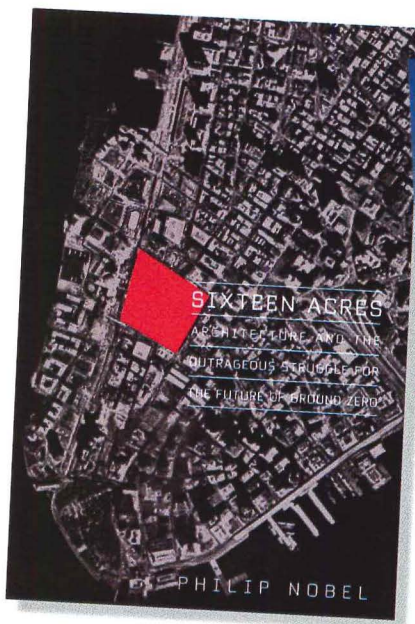
space, as civic groups have wanted all along. Alexander Garvin, anyone?

Nobel's final insights into the relationship between process and architectural solutions are among his most compelling. In the end, we are left with bastardized forms that exactly embody the tortured procedures that created them. The Freedom Tower, he writes, "was the perfect product of an imperfect process. It had a thousand authors and none at all." And later, "architecture is never frozen music ... architecture is frozen conflict." Could we have expected anything else in this polarized era? *L.K.*

Imagining Ground Zero: Official and Unofficial Proposals for the World Trade Center Site, by Suzanne Stephens, with Ian Luma and Rod Broadhurst. New York: Rizzoli and Architectural Record, 2004, 252 pages, \$60.

Just when you thought you couldn't stand seeing another plan for Ground Zero, Suzanne Stephens's lavishly illustrated, annotated collection of more than 250 designs for the site draws you right back in. There's something riveting about seeing all these projects together, image after image.

Stephens, an architectural historian, longtime New York critic, and RECORD special correspondent, sees her book as serving two purposes. The world's architectural community responded to the destruction of the World Trade Center with an unprecedented outpouring of creative energy, almost all of which will remain on paper, never to be built. This book will act as a repository of nascent concepts, some of which may contain the germs of future masterpieces. It is also a snapshot of the global profession at this moment, as was the collection of entries to the Chicago Tribune competition, some 82 years ago. Stephens made the canny decision to go backward in time, presenting the latest, polished, crystalline



zeroing in with devastating detail and hip lingo against the hip. His writing has provided a welcome tonic for a discipline that often teeters on the verge of narcissism.

What works splendidly in short pieces is somewhat dicey at book length, and at times during this witty, thorough, but relentlessly urgent critique, the gentle reader starts to long for a more sympathetic commentary, a few admirable actors, or a truly compelling idea. Nobel can seem just plain ornery, for example, when he criticizes the decision to reintroduce

gubernatorial election and the looming 2004 Republican convention set the pace—politics driving policy.

The other great failure, Nobel believes, was architecture's inability to deliver when we most needed it. Perhaps the dialogue had become too self-involved during the largely peaceful years of economic boom, or perhaps the problem was more fundamental. Maybe Henry Russell Hitchcock was right when he argued that Modern architecture can't express monumentality because, in embracing an ideology of continual

their sanctified tower footprints and the neighbors ensured the product wasn't too lugubrious. The urbanists got their partial street grid and transit hub, the Port Authority held on to its power, the nation got its tower and symbol of defiant rebirth—hopefully safer with uninhabited upper floors—and the quixotic environmentalists got windmills in a spot that had once epitomized dependence on foreign oil. And now, with Silverstein short of capital after losing his lawsuit, market forces may build residential rather than office

visions first, unpeeling the layers, returning, like psychoanalysis, to the initial, raw response to the trauma. Many of the early projects seem like the monsters unleashed in Goya's etching *The Sleep of Reason*, with lurid, writhing forms towering over the defenseless city—or a collective *Guernica*—an agonized shout protesting the cruelty of civilian death. Unlike the serene proposals of the Chicago Tribune competition, those for Ground Zero responded to an unprecedented urban catastrophe.

Philip Nobel contends that modern architecture has difficulty clearly conveying ideas without the crutch of a written text, but Stephens's collection shows us that modern architecture alone is capable of expressing feelings such as horror. Ironically, the architects' texts often belie their emotional content with boosterish commentary about the City of the Future or ultra-rational conceptual explications, based in biological/cyber-genic processes. But many of these visions are profoundly

disturbing, and as we weigh the relative merits of the visionary against the compromised products of process and pragmatism, we have to ask whether these visions, to paraphrase Giuliani, might have been more than we could bear.

Collections enable us to study themes and their variations and the evolution of form. The designs contain a number of recurring images, many of which found their way, diluted, into the official Innovative Design Study and even into the final design. There are numerous clusters of towers, often twisted, tapered, or writhing, which merge at points. Justified in structural terms, or as a way of providing multiple means of egress, it's hard not to see these huddled forms anthropomorphically, leaning on one another in grief. Another theme is the tenacity of gigantism. Then, there is the impulse to balance the defiant or transcendent skyward gesture with the Orphic descent into the dark, damp earth. There are also blobs and bridges spanning the towers, displaying, perhaps, a compulsion to relive

the dreadful moments when the airplanes struck.

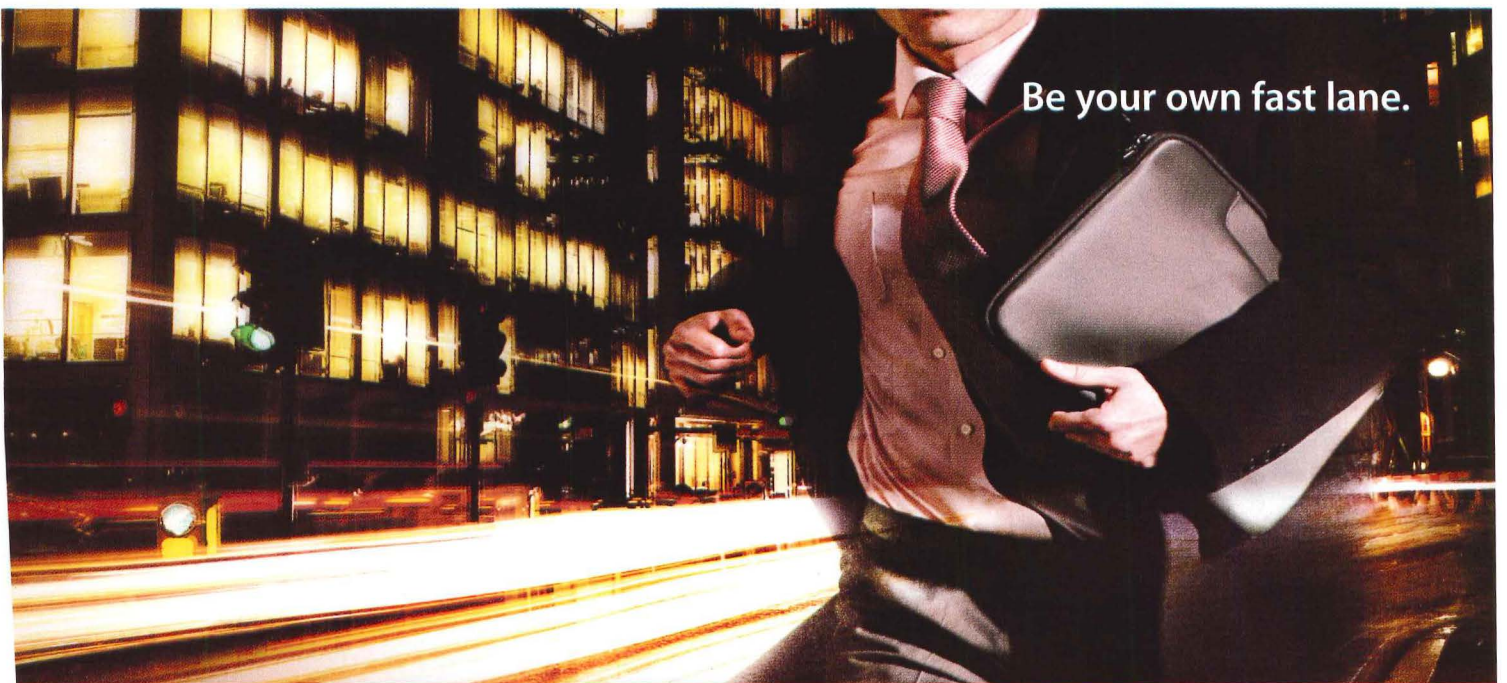
It is also interesting to ponder what is not in this collection. The designs are almost exclusively futuristic, with hardly a backward or a sideways look at the unique character of downtown Manhattan, with its thrilling cavernous streets framed by the now-modest 20-to-40-story skyscrapers from the turn of the last century. James Wines's scheme is one of the few that harnesses this remarkable urban fabric.

Little has been made of the fact that the two nominal winners, Daniel Libeskind and Michael Arad, are both children of Holocaust survivors. Having grown up in the shadow of catastrophe, it seems they were uniquely capable of expressing horror, sorrow, and then the necessary optimism of daily life. *L.K.*

Breaking Ground: Adventures in Life and Architecture, by Daniel Libeskind and Sarah Crichton. New York: Riverhead Books, 2004, 288 pages, \$28.

For most of the 1990s, Daniel Libeskind was known for one building, the Jewish Museum in Berlin—where every crease and crevice seemed a stirring (and appropriate) reminder of destruction and dislocation. But by decade's end, when the same forms turned up in other contexts—from an art museum in Denver to a shopping mall in Switzerland—it was natural to wonder whether they were simply personal fixations. No one asked Edward Durell Stone whether his octagons were rooted in childhood fantasies, or Frank Lloyd Wright whether his cantilevers signified repressed risk-taking. But in Libeskind's case it's natural to wonder what subconscious urges led him to use acute angles no matter what the brief.

Tellingly, his memoir is as shardlike as his buildings—flashbacks within flashbacks within flashbacks. Can anyone read the story of Daniel's father's imprisonment in 1928 (as a suspected Communist), and the coda in which



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Books

he met the occupant of the adjacent cell 20 years later, without being moved? The sentiments aren't "cornball" (a word Libeskind uses to describe himself), and the prose (with Sarah Crichton) is cogent.

Indeed, if Libeskind had written his recollections without mentioning architecture, they might have formed a memoir on the order of *Angela's Ashes*. Libeskind's parents, Nachman and Dora, were Polish Jews who escaped the Nazis only to find themselves imprisoned in Russian hard-labor camps; released in 1942, they waited out the war in the Kyrgyz Mountains. In 1946, they fought their way back home to Lodz, where they had lost everything (and nearly everyone). Yet incredibly, pogroms aimed at the few surviving Polish Jews continued. In 1957, when Daniel was 11, the family left for Israel; trau-

matically, the possessions they had packed, including fine china they had hoped to sell in Israel for a foothold, had been smashed "to dust" in transit. Dora resumed her trade, stitching intricately constructed brassieres and girdles, a kind of engineering that the young Daniel admired. "She put me to work inserting whalebone props into the finely sewn garments." Two years later, the family left for New York, where Nachman became a photo-offset print stripper. Daniel notes, admiringly, that his Dad didn't need rules or T-squares to get things absolutely level.

And yet the son eschewed right angles. He had thought of becoming an artist, until his mother told him, "You can always do art in architecture, but you can't do architecture in art." He enrolled at Cooper Union, and then, as a teacher and theorist, roamed the

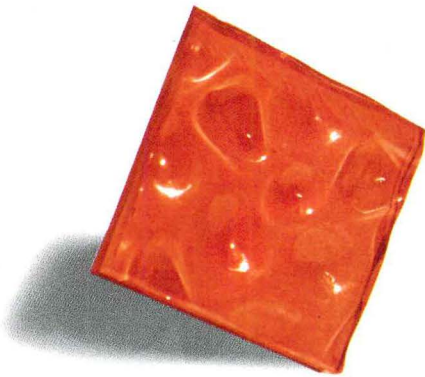
world until he won the Berlin competition. To get the museum built, his wife Nina convinced him they would have to live in Berlin. They ended up staying 12 years. During all that time, Libeskind, priding himself on his outsider status, never learned to speak German. No wonder there were skeptics when, in his bid to win the World Trade Center commission, he styled himself a New Yorker and invoked memories of seeing the Statue of Liberty when he arrived at dawn by boat.

So much for biography. It is in the discussions of architecture that the boat starts to capsize. Libeskind describes his buildings as preordained. Yet his list of inspiration includes an unfinished opera by Arnold Schoenberg, the light and geology of the Rockies, a shattered teapot, an author's palm print, Michelangelo, and Groucho Marx—for starters. He writes ungraciously about his colleagues, characterizing his early jobs with Richard Meier as "mindless, robotic" and with Peter

Eisenman as "a forced act of submission." He describes Yoshio Taniguchi's MoMA as "an aggressive expression of corporate power" and Tadao Ando's Modern Art Museum at Fort Worth as "an anonymous concrete box." But Libeskind reserves his strongest opprobrium for David Childs of SOM, whose architecture he excoriates ("It hurts to look up at the Time Warner building on Columbus Circle"), and whose character he describes the way his parents might have talked about their captors.

But he also concedes that his plan for Ground Zero was chosen, over the selection committee's objection, because his lawyer had softened up Governor Pataki with a photo of Libeskind as a boy, in front of a haystack; supposedly, it reminded the governor of a similar childhood photo of his own. Coming from a man who repeatedly says that the 21st century calls for a new architecture "based on democratic ideals," that's a startling admission. *Fred Bernstein*

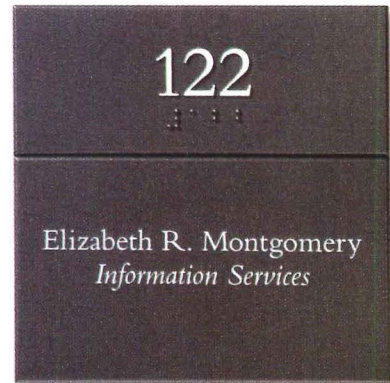
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Architectural time warp: Eisenman lays his own planes of meaning onto a historic site

Exhibitions

By Fred A. Bernstein

DEPARTMENTS

ects, but by a room-size installation in the Italian pavilion. That plywood-and-steel-pipe construction, Eisenman says, was intended to embody 500 years of architectural history—from Palladio to Peter. But it was, at best, a trifle compared to the architect's tour de force 90 miles away, in Verona, an installation also curated by Biennale director Kurt Forster.

The setting was the Castelvecchio, a 14th-century fortress, rebuilt after World War II, on the Adige River. Between 1958 and 1964, Carlo Scarpa turned the decrepit castle into a museum of antiquity, and he did so with a skill that is difficult to appreciate from photos. Scarpa began by carving a cavernous space into an enfilade of five square rooms. To separate foreground and background, Scarpa left a 10-inch gap between his new concrete floors and the building's hoary walls—the floors thus read as a series of platforms. On these platforms, Scarpa installed the museum's collection on a series of steel pedestals and shelves. His sensibility, which deals in puzzle-piece asymmetry and doubled lines, is so distinctive that it is possible, walking around the museum, to identify his contributions down to the last bracket or hinge. To Eisenman, Scarpa's architecture is all about connections, about "how the pieces fit together. He's small-scale," Eisenman says, adding, "I'm large-scale."

Invited to install a show in the museum, Eisenman visited it for the first time in more than 30 years,



Copying the dimensions of rooms inside the Castelvecchio, Eisenman created five

outdoor "rooms" with slanted planes and overlapping grids (above and below).

The Garden of Lost Footsteps: An Installation at the Museo di Castelvecchio, Verona, Italy. Curated by Kurt Forster and Cynthia Davidson, through January 23, 2005.

Peter Eisenman, who has been a part of all nine Venice Architecture Biennales, was better represented this time than ever before, not only by photos and models of his proj-

*Fred A. Bernstein is a New York-based journalist who writes on architecture and design and is the author of the book *Renovate* (Filipacchi, 2004).*



Exhibitions

and decided “you can’t compete with Scarpa.” Instead, he asked permission to build on the lawn outside the museum, but inside the castle walls. And he began with the five platforms—because, despite Scarpa’s focus on details, Eisenman

he created another grid, shifted about 12 degrees from Scarpa’s, which shoots through the courtyard like a river that has unexpectedly changed course. The tension between the grids (no less the two philosophies) created fissures;

THE EISENMAN-SCARPA INTERACTION IS LIKE A CHARLES IVES PIECE IN WHICH TWO ORCHESTRAS MERGE THEN SEPARATE.

said, “The structures have an overall idea about them—so they’re the mediating device between my work and his.”

Reprising Scarpa’s plan precisely, Eisenman placed five platforms of concrete, stone, and steel in front of the museum. Then

within them, Eisenman located an archaeological survey of his own career. Among the motifs: red steel I-beams, from his IBA Social Housing in Berlin; contoured topography from his City of Culture in Santiago de Compostela, Spain; and square holes from his Cannaregio

Town Square project for Venice. The builders did an extraordinary job of capturing architecture seemingly in motion; for those who can’t make it to Verona, the handsome catalog by Cynthia Davidson (Eisenman’s wife) includes working drawings. Eisenman said the installation cost about \$300,000.

Eisenman didn’t entirely shun the museum interior; he installed a series of architectural fragments in the trenches around Scarpa’s platforms, as if inhabiting the gap between the ancient and the modern. Eisenman says his intent was “to confound the relationship of time to place by questioning which was the original project: the castle, Scarpa, or Eisenman?”

Of course you know, but the Eisenman-Scarpa interaction is like a Charles Ives piece in which two orchestras merge, then try to sepa-

rate. Eisenman’s own allusions are more often literary: His catalog essay includes references to Proust, Italo Calvino, and Jorge Luis Borges, and there are the usual puns (Scarpa means foot, one of the reasons, he said, that he called the installation *The Garden of Lost Footsteps*.)

Forster, for his part, describes the installation as both lucid and ludic—wordplay being de rigueur when architecture is treated as “text.” But Eisenman insists it isn’t necessary to understand the intellectual underpinnings to appreciate the result. “We have photos of children rolling on the lawn,” he says. “They love it.” Besides, if Eisenman’s installation does nothing more than get a new generation of architects to take a close look Scarpa’s work, it will have been a success. ■



In the Galleria della Scultura, Eisenman inserted fragments representing some of his key projects in the narrow space between Scarpa’s floor slabs and the old fortress walls (above). The same red grid alluding to Eisenman’s IBA housing project in Berlin runs through the outdoor displays (left and top left).



Snapshot



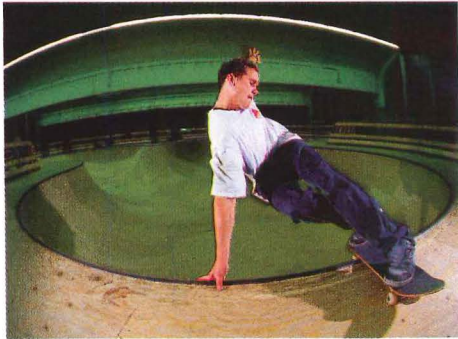
By Beth Broome

On the outskirts of Eindhoven, the Netherlands, in the belly of a decommissioned hangar, a totally different kind of flying machine has made its home. The MU Bowl is a pine and birch skateboarding facility that, thanks to a wealth of resources, has taken the design of such structures to another level. From miles around, skaters—the rippers and the wannabes—come to grab and grind, and hopefully, perfect their nosegrabs, madonnas, and ollies.

The project was spearheaded by Ton van Gool, director of Eindhoven's MU Art Foundation, who in organizing an exhibition on skate culture was seeking "the most perfect wooden skatebowl ever"—one that had both sculptural qualities and practical uses. To design the bowl, van Gool turned to the young Eindhoven husband-and-wife team Marc and Nicole Maurer of Maurer United Architects (MUA), who have experience with youth culture projects.

MUA's primary concern was to make a bowl that the skateboarding community—a community defined by their independent-mindedness—approved of. If the skateboarders did not endorse it, they realized, the facility would remain little more than a cerebral exercise. So MUA formed a collaboration with 20 students at the Eindhoven University of Technology, many of whom were enthusiasts themselves. American skateboarder Jocko Weyland hit the scene as a guest lecturer, spending three weeks coaching the students on the nuances of the sport and the prerequisites of a good bowl. Twenty different schemes resulted, from which a panel of Dutch skateboarders selected a final design: two

Bowl takes skateboarding to new heights



Snapshot

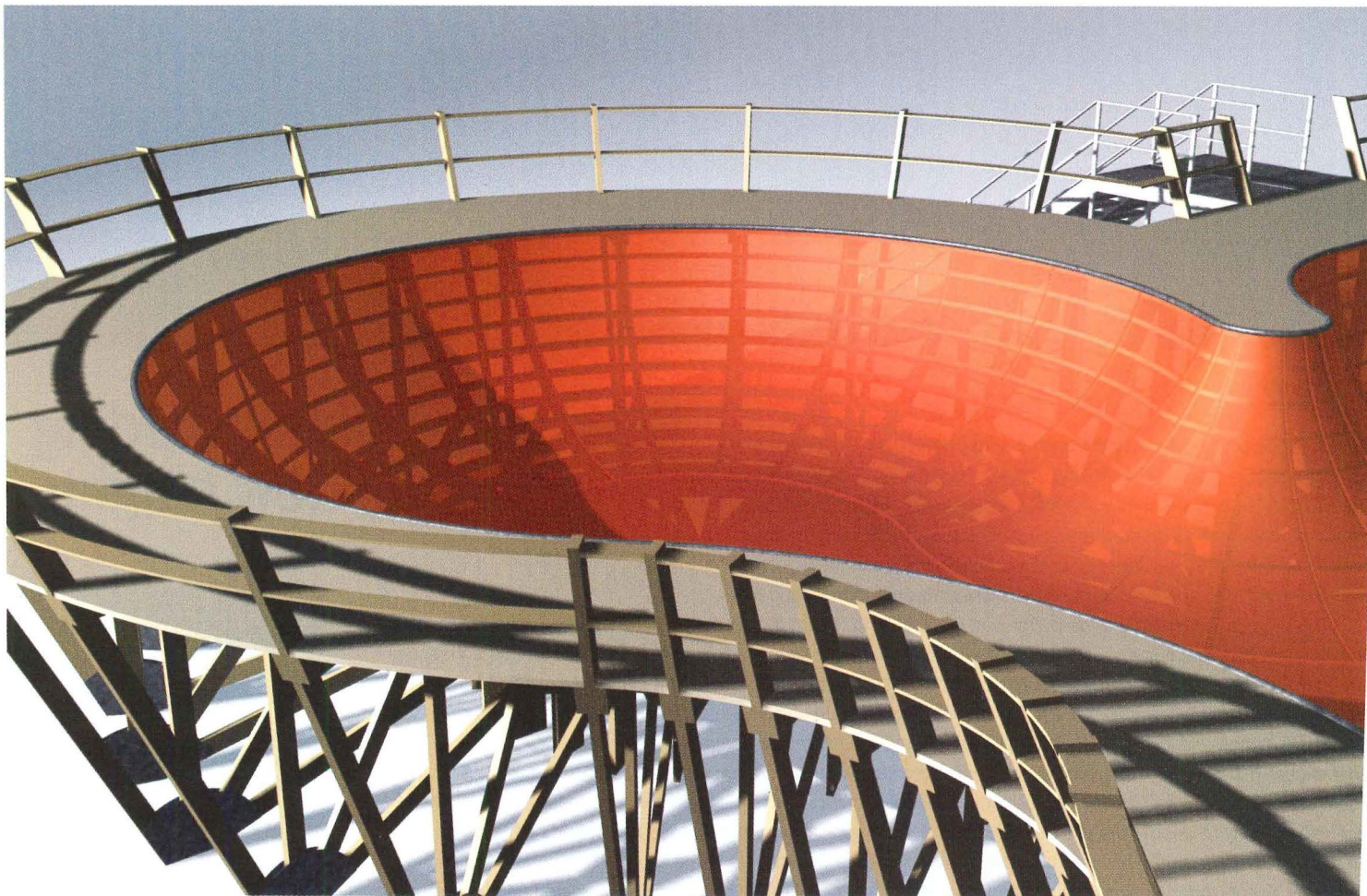
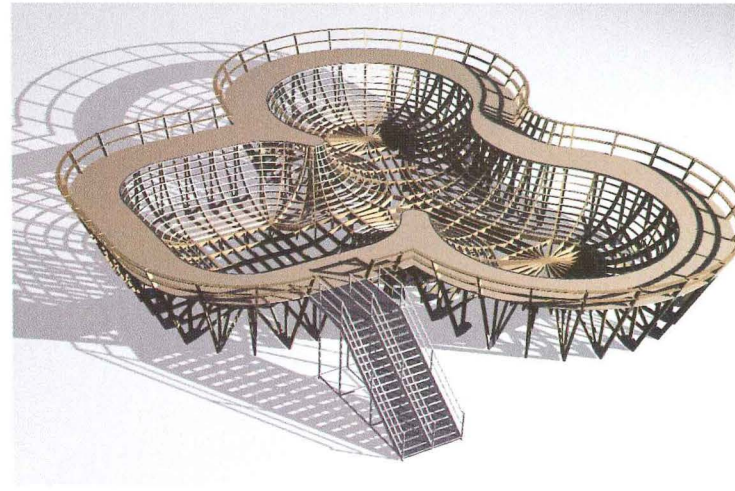
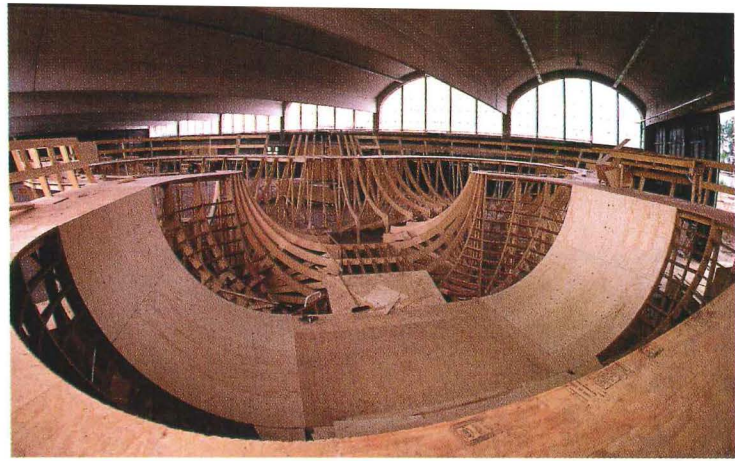
Lending new meaning to the word *radical*, MUA applied three layers of $\frac{1}{2}$ -inch plywood sheets to the bowl's frame to achieve the convex-concave terrain.

round sections connected by a "waterfall" to a rectangular deep end.

Input from the community continued into the construction phase. With religious dedication, skateboarder Marcus Kamps oversaw the carpenters who, using CAD/CAM, created the prefabricated wooden trusses and ribs that were later assembled on-site. Though a wooden surface is preferable to concrete because of its resiliency, it presented the challenge of creating double curved surfaces for the convex-concave terrain. The effect was achieved by installing two layers of $\frac{1}{2}$ -inch pine plywood in a patchwork style across the frame, topped off by a layer of $\frac{1}{2}$ -inch birch plywood.

The form, which not surprisingly takes its inspiration from the empty California backyard swimming pools where skateboarding began to flourish in the 1970s, addresses the skateboarder's principal demands. According to Weyland, the shape has good "transitions" (the curve of the walls), and good "flow," which allows for many different "lines," or paths for traversing the bowl. In short, he says, it is very "skateable," making all kinds of tricks possible, like salad grinds, feebles to fakie, and backside disasters.

Since the MU Bowl opened in 2002, it has become a central meeting place for Eindhoven's suburban youth, illustrating how basic shapes and building blocks, and the efforts of a dedicated team, can serve as a launch pad for an infinite number of future choreographies. "It works," reports Weyland, "as a beautiful object that serves its purpose to the utmost." ■

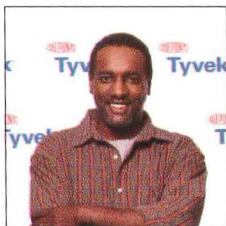
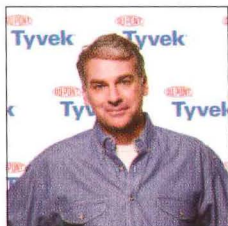
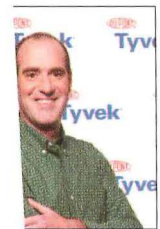


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Snøhetta discusses its new role at Ground Zero as well as input, inspiration and an often unorthodox design process



Interview by Sam Lubell

FEATURES

With its commission to design the museum complex at Ground Zero, Norway-based Snøhetta has quickly received worldwide media attention. But the firm hasn't come out of nowhere. Formed in 1989, Snøhetta (named for a mountain in Norway) has completed a variety of well-received projects, including the Alexandria Library in Egypt, which recently won an Aga Khan Award for Architecture (page 96), the Norwegian Embassy in Berlin, and the Lillehammer Olympic Art Museum in Norway. The firm is now working on the Norwegian National Opera House, in Oslo, due to open in 2008, noted for a sloping roof that descends to the ground, inviting visitors up to view spectacular local vistas. Known for its innovative use of materials and for smooth integration of its projects into the landscape, the firm has also proved adroit at accommodating the needs of diverse clients, one of the reasons it got the museum complex commission, note officers from both participating museums.

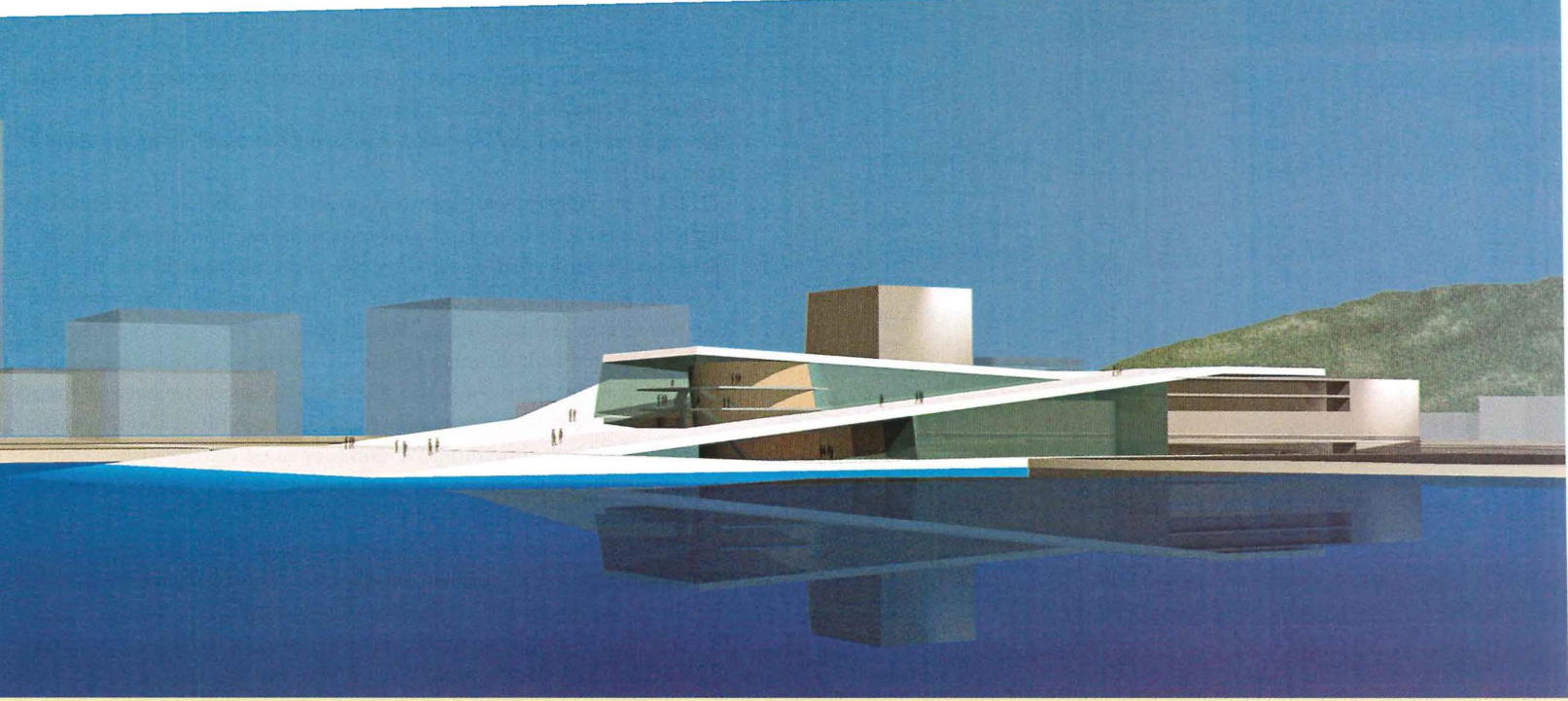
RECORD recently sat down with two of Snøhetta's partners, Craig Dykers and Kjetil Thoresen, to discuss their firm, their goals and ideals, and their plans for the Trade Center site. The discussion also included the subject of a flexible design process, which may be the wave of the future.

ARCHITECTURAL RECORD: Congratulations on winning the museum complex commission at Ground Zero. Now comes the hard part: How will you incorporate the desires of so many parties into your World Trade Center design?

Craig Dykers: We faced similar problems when we worked on the Alexandria Library project [in Egypt], which also had several levels of political influence, all the way from global and national politics to local Alexandrian needs. First of all, the architecture shouldn't try to dictate an atmosphere; it should try to allow multiple understandings to grow or exist within it. Process is a key issue—that people work together to create something. Some say this would diffuse the architecture. We believe precisely the opposite. If more than one person has to use a building, then why not have more than one person design it?

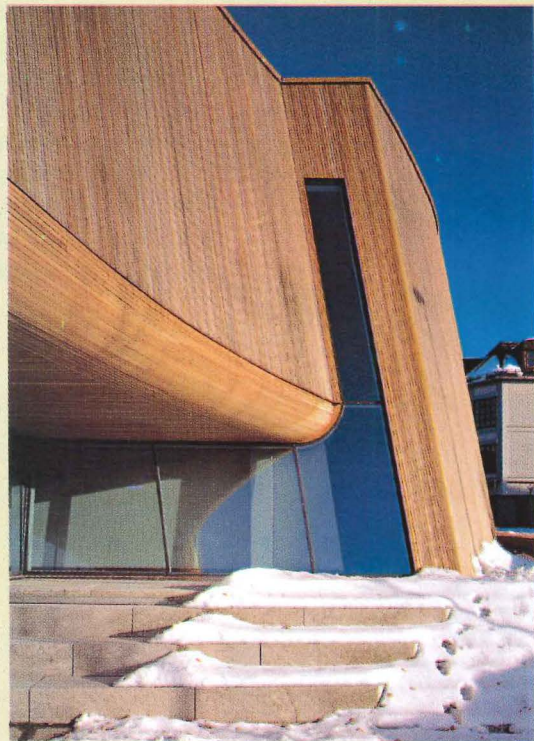
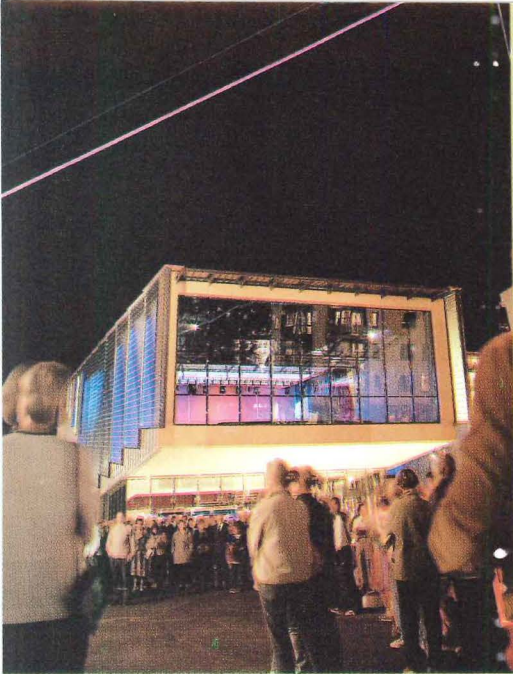
Kjetil Thoresen: This is what creative processes are about. Creativity is a game of tensions between people sitting at a table, or people living in a city.

CD: We see ourselves as facilitators. This isn't to suggest that we don't have strong architectural ideas. Our heads are full of them. But you're trying



The planned Turner Contemporary museum in Margate, England (opposite), will literally be built into the local seascape. The new Norwegian National Opera House, in Oslo (above), will welcome the local population onto its expansive, sloping roof, designed to echo the surrounding fjord. The Alexandria Library, in Egypt (bottom, dramatically lit at night), emerges from beneath the urban landscape, appearing on the outside more intimate than its large, partially buried interior space would suggest.

Other Norwegian projects include the Sandvika Cultural Center, with a foyer and rehearsal rooms that reach out into the street (left), while the Karmøy Fishing Museum (below), on an island facing the North Sea, juts into the open landscape. The Lillehammer Olympic Art Museum (bottom) utilizes local materials.



ing to find which one is appropriate and how it can merge with other peoples' ideas about the same task at hand.

AR: *Have you started designing the museum complex? What are some of your plans?*

KT: It's very dangerous to start work already. We have to force ourselves not to have plans or to make shapes and forms, because then we'll be limiting ourselves to a small group of people and their perceptions. You have to widen your understanding. We're having a workshop tomorrow with the user groups and the clients. We will certainly have several more with groups affiliated with the memorial, with our engineers and design team, with the community. We will also meet with artists, as we have on many projects. This helps you sweep away some preconceptions about how you might understand something. We don't try to be experts in everything. We're trying to allow those people that are best at what they do to provide direct input into the design.

AR: *Can you describe any of your preliminary thoughts on the new building?*

KT: The space has to be respectful and mediate between two worlds. It is a transition away from the hectic pace of life in the city. When you come through the building, you reduce your speed, but you have to pay respects to the city and accelerate on the way out. We will also look at New York's very strong local topography and urban landscape, and of course we have to stress remembrance, perhaps more than anything, while the building must complement the memorial and the site.

CD: Within the building, the importance is not just to see things on a wall, but to develop an intimate interaction between visitors and the institutions.

AR: *Architects today, like Frank Gehry [just commissioned to design the performing arts center at Ground Zero] often create so-called signature architecture, imposing a certain style onto their buildings. Do you have a firm style?*

KT: We don't have a signature style. What we do is to evolve every project from its context and its content.

AR: *Can you describe your design process?*

CD: We call it organized chaos. Today we have no agenda, for example.

KT: The agenda is a powerful tool, because if you put together an agenda, you've told people what to talk about, especially in early design meetings. We don't like to tell people what to talk about. People talk about anything, basically. You start your design process just by trying to get under your own skin and under the skin of others.

CD: Words are very important. I think many architects either ignore or misuse language. We tend to rely on objects and models. But before that process begins, there needs to be at least some common understanding with language. Being able to talk about what's important to you.

AR: *What are some defining characteristics of your present work?*

CD: I believe there is a dialogue between nature and human nature.

KT: Whatever you do and everywhere you turn, you have to deal with nature. There's a big difference between reacting to it and physically immersing yourself in it. Where engineers have traditionally built walls between construction and the sea, our Turner museum [due for completion in 2007], for instance, is built within the seascape. To actually interact with nature directly is a change of mind-set.

AR: *What do you find most interesting about architecture today?*

CD: That we have the chance today to interact across borders much more than we have in the past, and in a much different way. People like Mies van der Rohe came to America 40 or 50 years ago. But it was very different. It was about exporting ideas. Now we're talking about interacting.

AR: *When will you have a preliminary design? Is the timeline too tight?*

KT: We have been asked to have a design by February. Sometimes strict deadlines are good. The pressure, the tension that you feel in a group can help. In reality, everything can be doubted. There is not only one solution to every problem. ■

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2004 Aga Khan Award for Architecture:

Promoting Excellence in the Islamic World

By Sam Lubell with James Murdock

FEATURES

The Aga Khan Award for Architecture, which since 1977 has encouraged successful building practices and promoted local culture in the Islamic World, was at press time scheduled to announce its 2004 winners on November 27 in Delhi, India.

The seven victorious projects were chosen from a field of 378 nominees by a nine-person jury (listed below). In choosing the winners, notes juror Farshid Moussavi, of Foreign Office Architects in London (and an Iranian native), the panel considered the project's social impact, the integration of private and public spheres, and expressions of power, individuality, and historical memory. But by far the chief component was simply architectural excellence. "It's about how do you crystallize the forces that shape an architectural project into form?" says Moussavi, who was impressed with the overall quality of the work she saw in a volatile region where architecture is often ignored by the western public. Short-listed projects are visited by jurors after being narrowed down by various architects, engineers, and scholars with intensely detailed research on performance, cost, and design concepts, among other criteria.

This year's winners, says awards secretary general Suha Özkan, included more experimental and contemporary work than in past cycles (the prizes are given out every three years), marking a concerted effort to expand the program's boundaries. These included a prototype for sandbag structures, a school building in Burkina Faso, and a sleek, highly adapt-

able modern house in Turkey.

"The awards are not only about celebrating the heritage of a certain culture, but celebrating the new ventures coming out of a place," notes Moussavi, who also points out that the jury had the benefit of a very diverse membership that included philosophers, artists, engineers, architects, and historians. "I think it was very healthy to have different perspectives. It becomes tougher to talk about design when faced with a nonarchitect, and I think that's very exciting."

The awards were originally established by His Highness the Aga Khan, the Imam of the Shia Imami Ismaili Muslims. Awards total \$500,000, making this the largest architectural prize in the world. Winners can include projects in contemporary design, social housing, community improvement, restoration, reuse, area conservation, landscape design, and improvement of the environment.

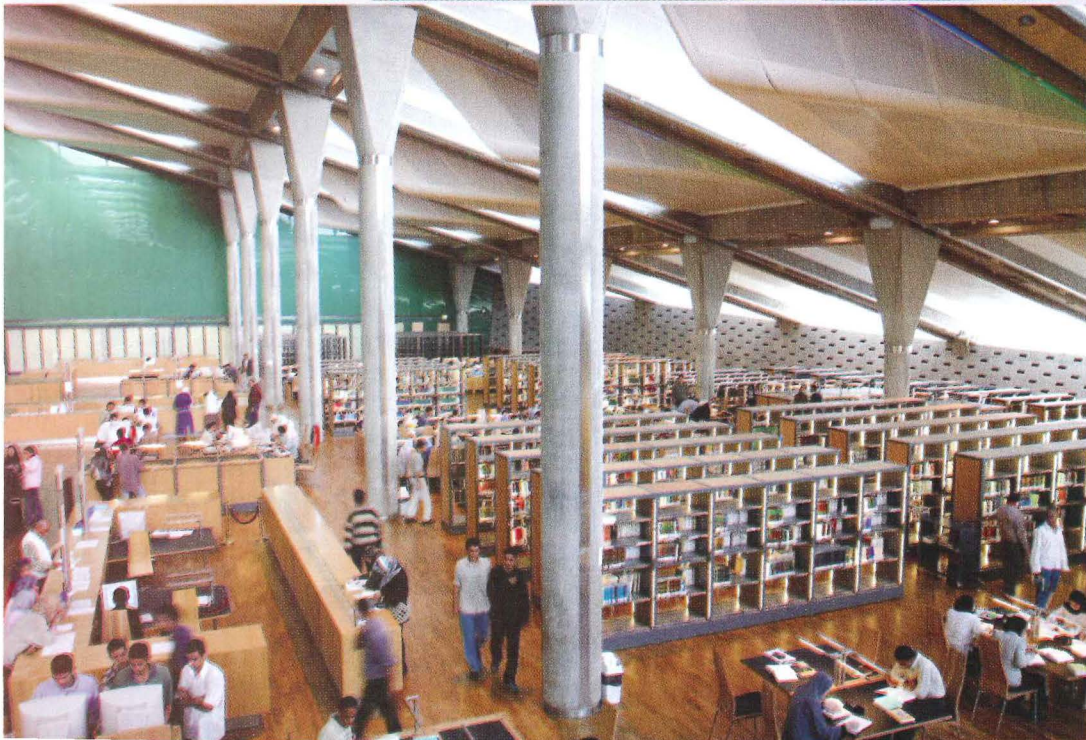
Master Jury

Ghada Amer, artist, New York; **Hanif Kara**, partner, Adams Kara Taylor Structural and Civil Engineering Consultancy, London; **Rahul Mehrotra**, executive director, Urban Design Research Institute, Mumbai; **Farshid Moussavi**, partner, Foreign Office Architects, London; **Modjtaba Sadria**, professor of Cross-Cultural Relations and East Asian Studies, Chuo University, Tokyo; **Reinhard Schulze**, professor of Islamic Studies, University of Bern; **Elías Torres Tur**, partner, Martínez Lapeña-Torres Arquitectos, Barcelona; **Billie Tsien**, partner, Tod Williams Billie Tsien Architects, New York; **Jafar Tukan**, principal, Consolidated Consultants for Engineering and the Environment, Amman.



Primary School, Gando, Burkina Faso. Diébédo Francis Kéré

Diébédo Francis Kéré, the first person from the village of Gando to study abroad, was convinced that education would be the cornerstone of his people's advancement; so he decided to design a school for his village and raise the money to build it himself. The building's design and construction was as simple as possible to avoid the need to transport materials to the rural site. Three classrooms are arranged linearly and separated by covered outdoor areas. Load-bearing walls are made from earth blocks. Concrete beams run the width of the ceiling, and lightweight steel trusses support a corrugated metal roof, which overhangs the building to provide shade and help regulate indoor temperatures.

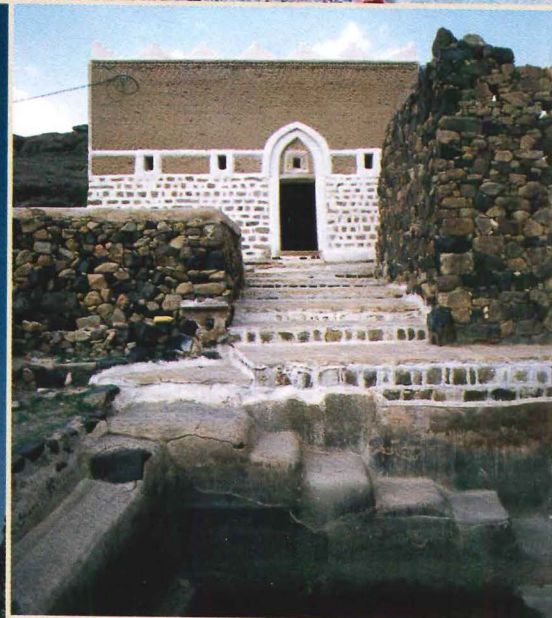


**Bibliotheca Alexandrina,
Alexandria, Egypt. Snøhetta
Hamza Consortium**

Commissioned in 1988, the Bibliotheca Alexandrina is a revival of Alexandria's legendary ancient library. Its basic form is a tilting disc, with four levels below ground and seven above ground, which helps minimize the building's scale so visitors are not overwhelmed by it. The exterior wall is clad in 4,000 granite blocks that are carved with letters from the world's alphabets. The circular diaphragm wall, 541 feet in diameter and 115 feet high, is among the largest of its kind in the world.

Restoration of the Al-Abbas Mosque, Asnaf, Yemen. Marylène Barret

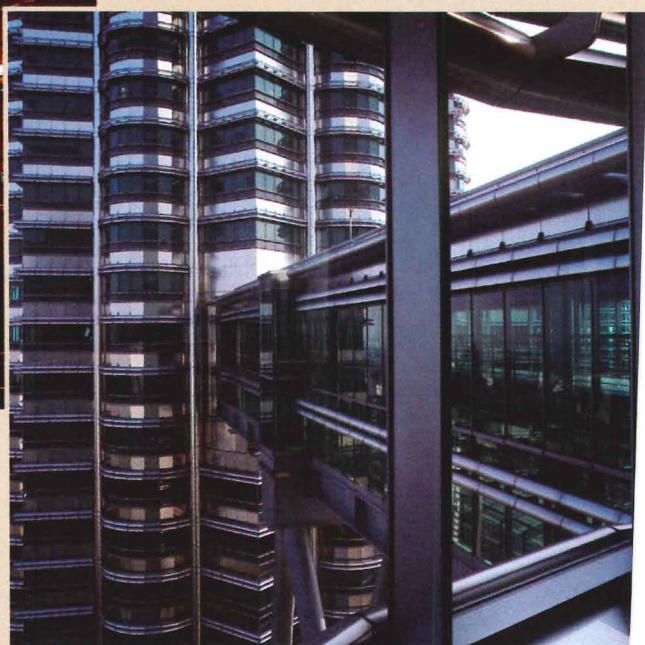
The mosque's modest stone and mud-brick exterior walls conceal a spectacular sacred interior, the highlight of which is an elaborately painted and gilded ceiling. But the mosque, nearly 875 years old, was showing its age: Its ceiling was warped and suffered from rot. Traditional construction techniques and materials—such as a mortar made of lime and volcanic aggregate—were used throughout the restoration. Pieces of the ceiling that couldn't be conserved were transferred to a museum, their memory marked by leaving the spaces plain.





**Petronas Towers,
Kuala Lumpur, Malaysia.
Cesar Pelli & Associates**

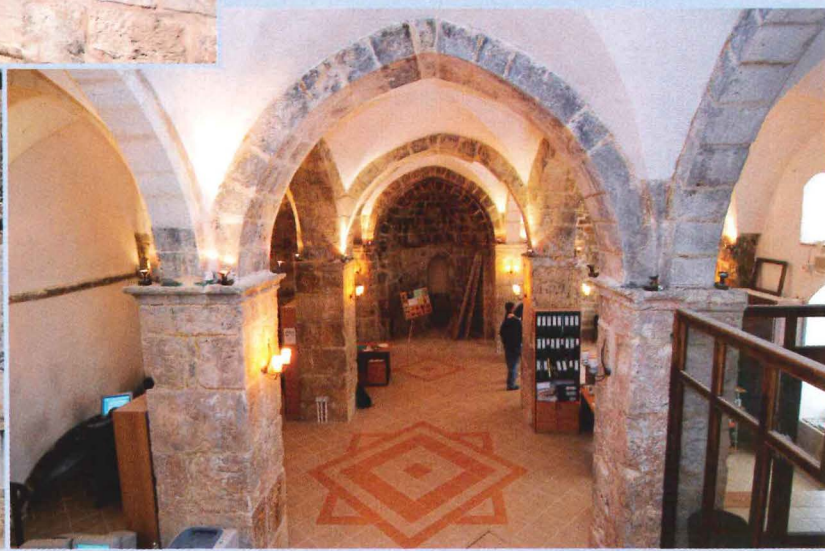
The most significant landmark in Malaysia, and until recently the world's tallest buildings, the Petronas Towers represent traditional Islamic forms mixed with local building materials and technological know-how. The footprint of each tower is an interlocking square that forms an eight-pointed star, which has religious significance for Muslims. Conceived of in 1981, the towers are located in the heart of Kuala Lumpur's commercial district; they have become symbols of contemporary architecture in Malaysia.

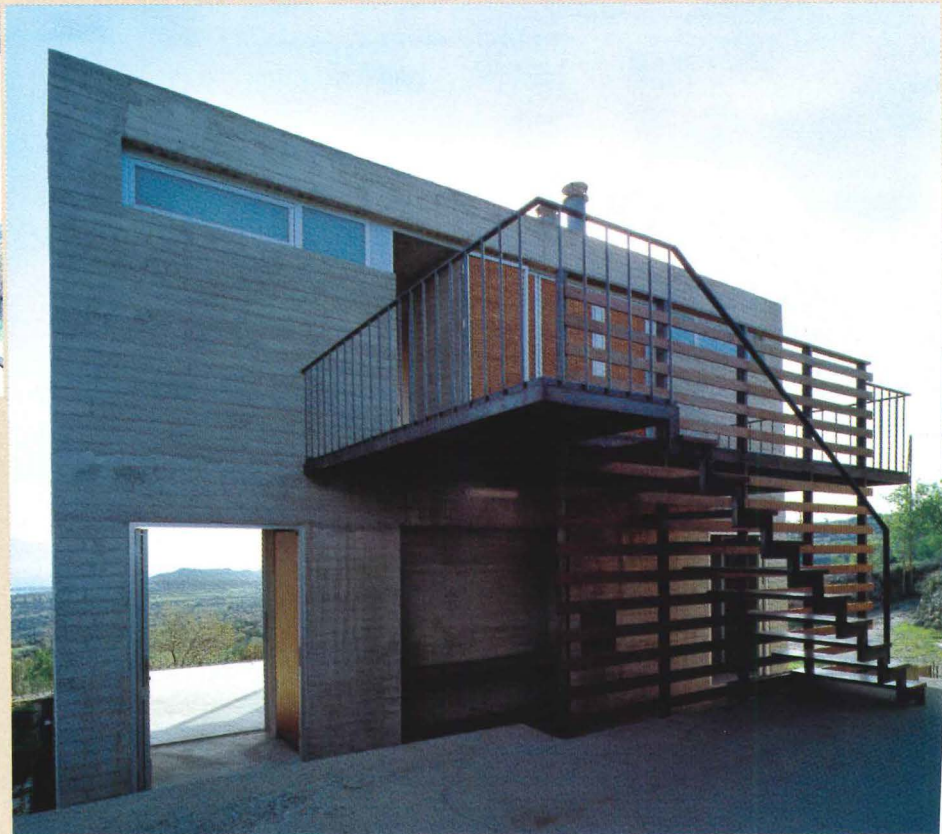
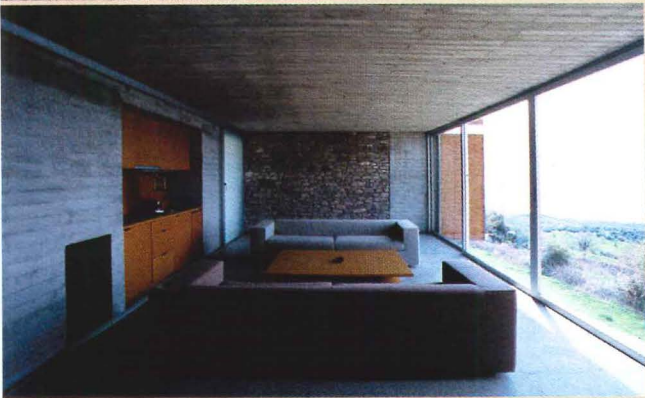
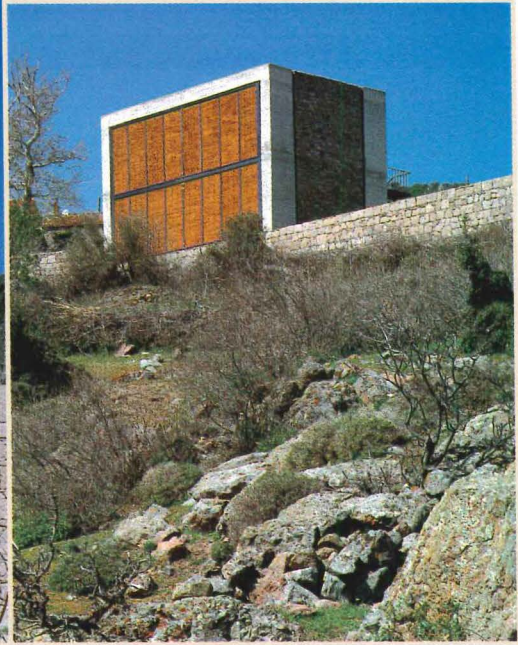




Old City of Jerusalem Revitalization Program. OCJRP Office

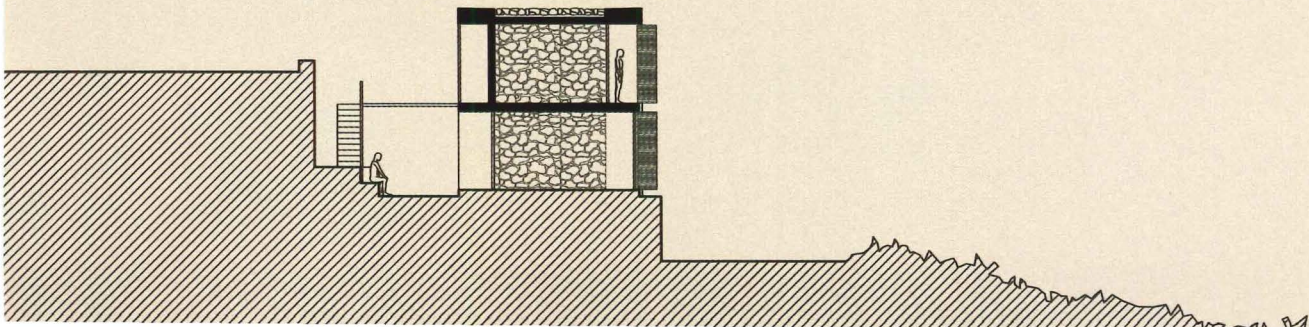
The revitalization is a comprehensive project designed to restore the urban fabric as well as improve the quality of life for residents in Jerusalem's Old City. Since 1995, more than 160 buildings—half of them residential, the remainder a mixture of public and commercial structures—have been stabilized or completely restored throughout the 215-acre district. Buildings are selected for restoration based on the severity of their physical condition. Local architects and engineers are being trained in preservation to ensure the buildings are properly maintained following restoration.





B2 House, Ayvacik, Turkey. Han Tümertekin

Two brothers wanted to build a weekend retreat where they could find beauty, tranquility, and seclusion. Their two-level house is embedded in the slope of a mountainside. A living room dominates the bottom level, while two bedrooms occupy the top; the levels are connected only by an external staircase. Glass sliding doors form the back wall of the house and allow sweeping views down to the Aegean coast. Judges felt that the house embodied a sense of perfection and well-being.



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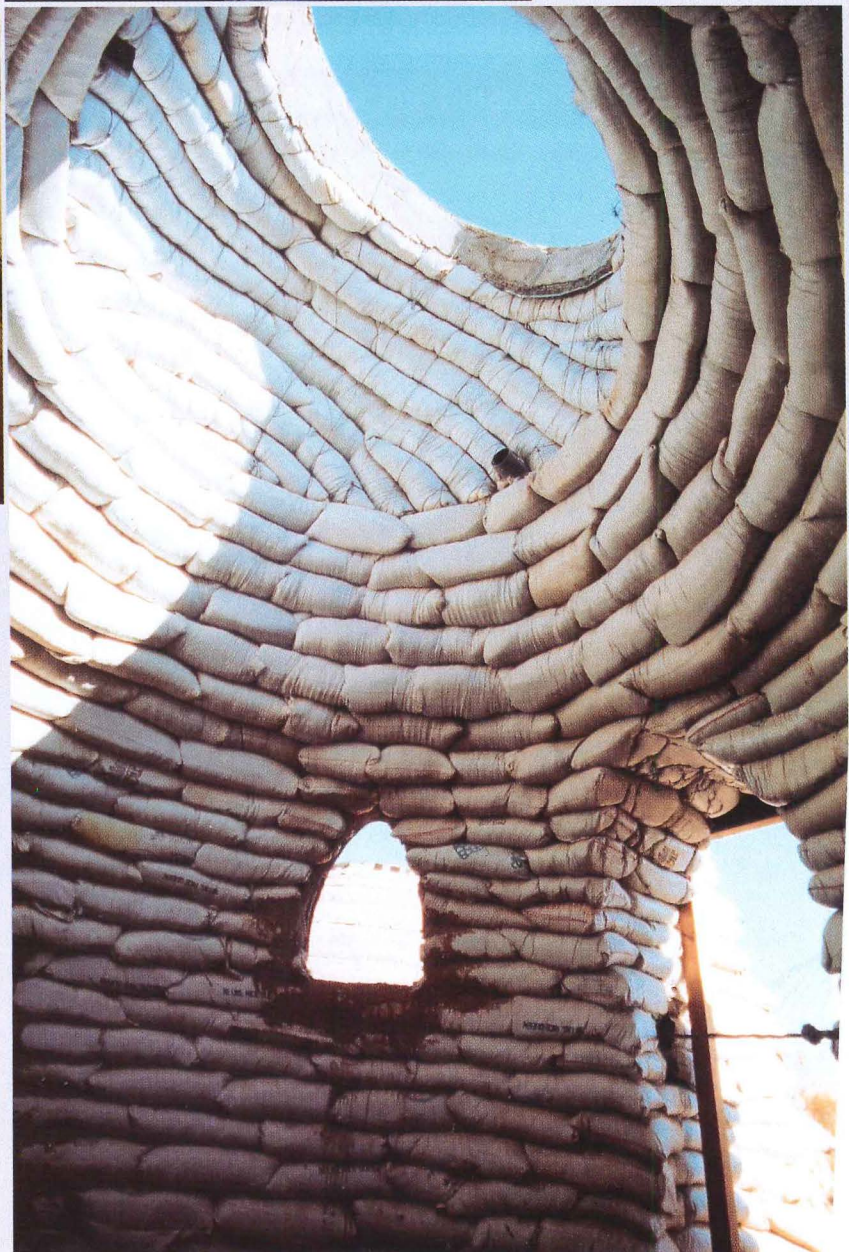
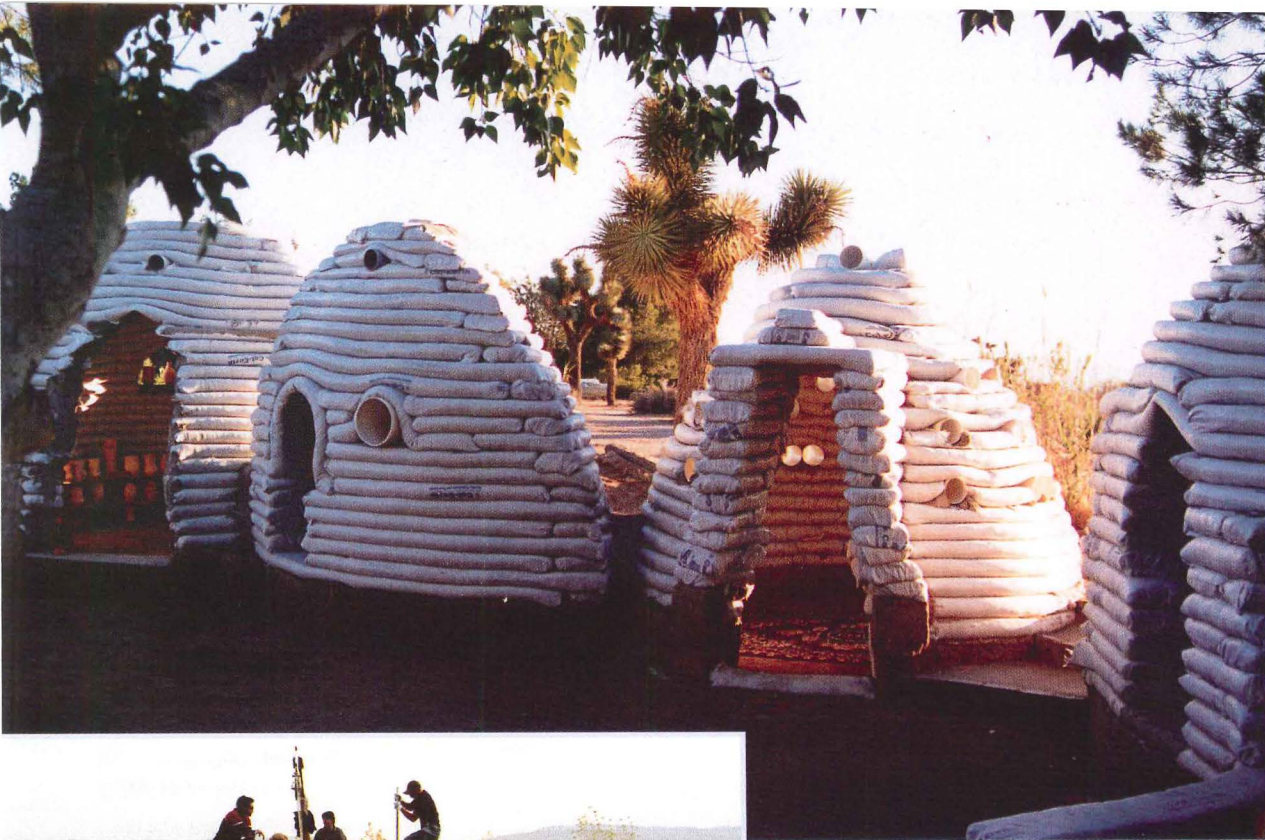
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Sandbag Shelter Prototypes, various locations. Cal-Earth Institute, Nader Khalili

The sandbag shelter prototype is a modern take on a timeless construction method. Similar to adobe or ice blocks, the sandbags are filled with earth and arranged in a circular course that is corbeled at the top to form a dome. To prevent shifting, the sandbags are secured with barbed wire. If covered with stucco, the shelter can become a permanent building. Sandbags and barbed wire are often the materials of war, but used in this context they can provide housing for refugees. The judges felt this project was so important that they changed the competition's rules (which didn't include prototypes) to recognize it.

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Neon Tigers

Photographs by Peter Bialobrzeski

With streaking tail lights and ghosts of fleeting figures, Peter Bialobrzeski's recent photographs portray the rapidly emerging megalopolises of Southeast and East Asia. Taken mostly at dusk, his images register the chillingly pale luminosity and surreal hues of neon, tungsten, and fluorescent sources glowing through waning daylight and milky smog.

"The Tiger Cities mushroom like metastases," observes Florian Hanig in the introductory essay to *Neon Tigers* (Hatje Cantz Verlag, 2004), a book of Bialobrzeski's Asian images. Unlike the relatively low-lying sprawl of Los Angeles or Tokyo, the burgeoning urban phenomena of Hong Kong, Shanghai, Singapore, Bangkok, and Kuala Lumpur, Hanig notes, "do not expand only in width, but also in height." Threaded with networks of raised thoroughfares and sky corridors, they exist as cities literally on many levels.



The Blade Runneresque, speeding, techno-utopian character of these high-density, high-rise places—marked by jolting contrasts between the old and the continually evolving new—inspired Bialobrzeski. Before working on Neon Tigers, the German photographer embarked on an assignment to illustrate a magazine article by the sci-fi author William Gibson. As Bialobrzeski recalls, “I realized at that point that I wanted to hoot Bangkok the way Gibson writes.”

Then and in Neon Tigers, the photographer captured visions of the future using, ironically, an old-fashioned, analogue technique, relying on a 4-by-5-inch view camera and long exposures. He says he never manipulates his images on a computer, but instead favors “shooting in weird light,” catching these megacities in the fleeting moments before they transform themselves even further. Sarah Amelar

Kuala Lumpur (opposite)

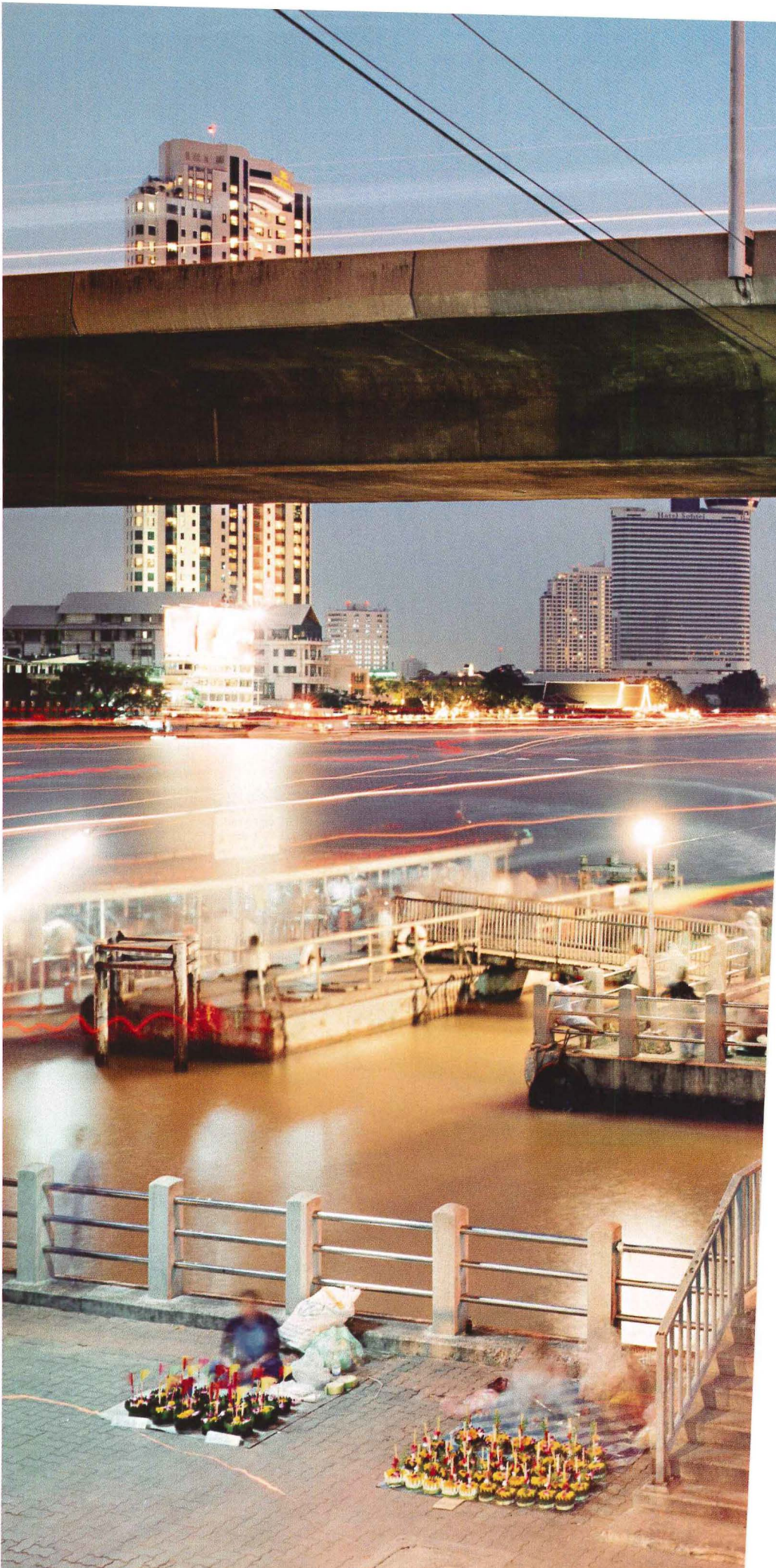
Hong Kong (above)

Shanghai





Bangkok





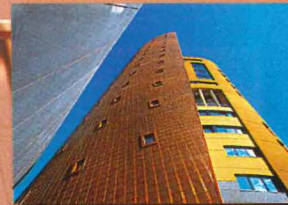
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Design Vanguard 2004

Shifting terrain in an Emergent World

Architects remap the line between nature and culture

PROJECTS INTRO

By Mark C. Taylor

With the death of Jacques Derrida, an era formally came to an end. For almost four decades, those French veterans of 1968 set the terms for critical debate and profoundly influenced artistic practices. Cultural critics found in the writings of Derrida, Gilles Deleuze, Jacques Lacan, and Jean Baudrillard resources to develop theoretical interpretations of what architects had labeled *post-modernism* more than a decade earlier. Theory became the rage in departments of humanities and triggered culture wars still echoing through halls of power. Nowhere was this more evident than in architecture. In classrooms and journals as well as at conferences throughout the world, architects discussed philosophy as never before. The 1988 *Deconstructivist Architecture* exhibition at the Museum of Modern Art in New York made clear how deeply theory influenced the practice of many leading architects. Whether you were for it or against it, theory was unavoidable.

By the 1990s, the rapid proliferation of computers and network technology in design studios led to a shift in the critical terrain. Derridean interventions gave way to Deleuzian folds in structures and works that were driven as much by software as architectural program. As information systems and technologies spread, biological models and metaphors displaced the mechanic paradigm. The importance of this development extends beyond any fascination with biomorphic forms and morphing blobs. What is at stake is a fundamental change in our understanding of the infrastructure of both the natural and artificial world. For example, in recent years, we have discovered that biological systems and information systems share a common

Mark Taylor is a visiting professor at Columbia University and author of *Confidence Games: Money and Markets in a World Without Redemption*.



1

Design Vanguard 2004:

1. nARCHITECTS
2. Patterns
3. Architecton
4. Alejandro Aravena
5. Contemporary Architecture Practice
6. Byoungsoo Cho Architects
7. Christoff:Finio Architecture
8. Masaki Endoh/EDH
9. Antón García-Abril
10. dECOI
11. Plasma Studio



2

structure and operational logic. This insight makes it necessary to reconsider the relationship between nature and culture. In a world of genetic engineering, cloning, and implants, where does the natural end and the artificial begin? The generation of 1968 has little to offer as we attempt to answer these questions.

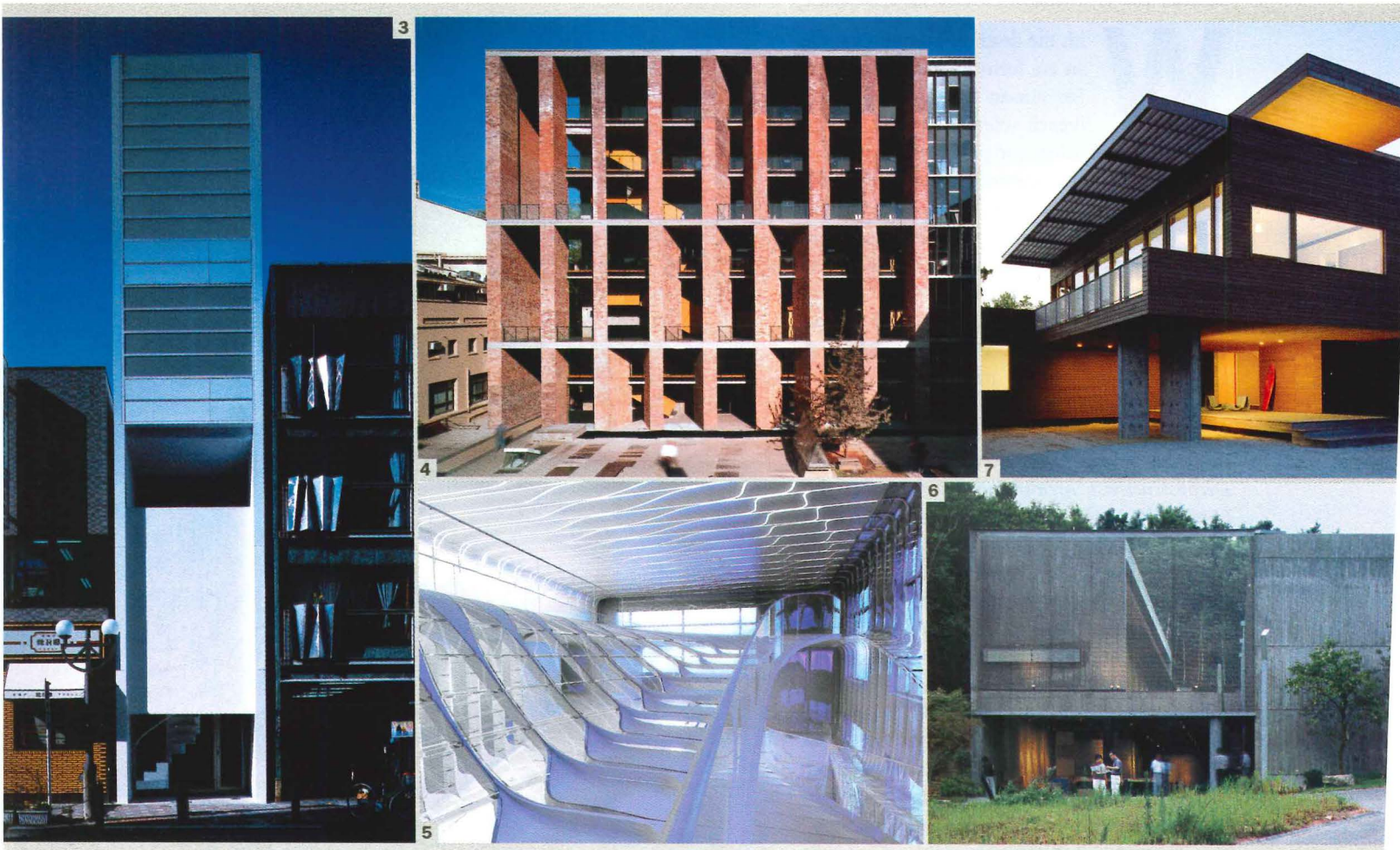
This year's Design Vanguard architects come from six countries, but share many common concerns. They do not

merely break with the simplicity and rectilinearity of Modernism, but adapt it to meet different needs and changing circumstances. They tend to prefer complexity rather than simplicity, horizontality rather than verticality, continuity rather than discontinuity, open rather than closed systems, and emergent rather than fixed structures. These architects are critically informed without being driven by theory. Moreover, their use of software in design is much more subtle and sophisticated than their immediate predecessors'. This work is not architecture for the sake of software but software for the sake of architecture.

When surveying the work of these 11 firms, what is most striking is their sustained investigation of the interrelation of natural and built environments. They are not merely trying to develop green architecture but are involved in the much more difficult and important exploration of the isomorphism—formal or structural similarity—between natural and artificial systems. If physical, chemical, and biological processes are actually information processes, then natural and artificial environments can enter into genuinely interactive relationships. The nature of the inter-

as well as concrete and wood. In some cases, concrete is grained to suggest slats of wood; in other cases, Cho uses raw plywood to create an effect as different from Gehry as natural stone is from chain-link fence. Christoff:Finio's Beach House both extends and complicates Cho's use of materials and exploration of the interplay between outside and inside. Artfully situated on a thickly wooded dune near the ocean, this house makes effective use of wood to form stacked volumes that create enclosed outdoor spaces. By bringing the outside in, the interplay between exteriority and interiority becomes considerably more.

Though the work of nARCHITECTS differs significantly from that of Cho and Christoff:Finio, *Canopy*, an installation in the courtyard of P.S. 1 Contemporary Art Center in New York, and *Dune Terrace*, a proposal for a museum in the Egyptian desert near the pyramids, both present thoughtful investigations of nature and artifice. *Canopy* creates a "deep landscape" that is, in effect, an artificial natural environment. Made of 1,100 bamboo poles carefully bent into slender arcs, the project gives one the feeling of being beneath a breaking wave or in a rain



action in these projects varies from the simple to the complex.

The work of Byoungsoo Cho Architects shows sensitivity to the interplay between natural topography and building morphology that is also characteristic of several other Vanguard firms. The continuity between structure and setting is so subtle that the buildings are almost inconspicuous. In structures that recall Ando's work, Cho effectively integrates exterior and interior

forest. In rooms open to the sky—housing a wading pool and a gravel beach—the architects simulated different climatic environments by producing intermittent showers and misty fog. In the arid sands of Egypt, they formed waves not with flexible bamboo and mist but with rippled sand that seems to float the Koolhaas-like geometric structure rising above it. Ancient pyramids appearing on the horizon beneath the museum seem no

more permanent than the drifting sands.

The interaction between form and topography functions differently in the work of dECOi. In the design for an exhibition center overlooking the caldera of Taal volcano in the Philippines, dECOi principal Mark Goulthorpe creates a series of flowing spaces carefully crafted to fit the contours of the terrain. “A series of curling vaults,” explains Goulthorpe, “folds the building softly back into the terrain, creating a protective carapace to volcanic debris and a filter to the harsh environment, allowing penetration of morning light and afternoon breeze.” The figure of the fold has, of course, been a preoccupation of architects ever since they discovered Deleuze over a decade ago. The deployment of the fold in contemporary architecture suggests the importance of continuity and even integration rather than discontinuity and fragmentation. The rectilinearity of Modernism and the angularity of Deconstructive architecture give way to supple convolutions that enrich rather than erase differences.

Ali Rahim uses open structures to create the context for “emergent behaviors and events.” In his Reebok store in Shanghai,

The most imaginative and suggestive project among this year’s Vanguard firms is a work of sculpture rather than architecture—Marcelo Spina’s *Snake-Rice*, realized in Icheon, Korea. Though the relation between art and architecture has always been uneasy, several of the Vanguard architects freely appropriate sculptural works. Masaki Endoh and Masahiro Ikeda, for example, explore the geometry of the ellipse to build what appears to be a live-in sculpture. This flexible form is defined by elliptical rings placed along a horizontal elliptical orbit. The outside wall, which is made of fiber-reinforced plastic, produces a sense of ephemerality and impermanence. The work of Antón García-Abril, by contrast, appropriates sculptural precedents in buildings whose monumentality insists on permanence. The use of massive blocks of granite ashlar whose rough-hewn surfaces bear the marks of quarrying and cutting in his Musical Studies Center is reminiscent of Michael Heizer’s signature work. His 4,000-seat Bull Ring, located in Pinto, Spain, looks like an architectural rendering of Richard Serra’s *Torqued Ellipses*.

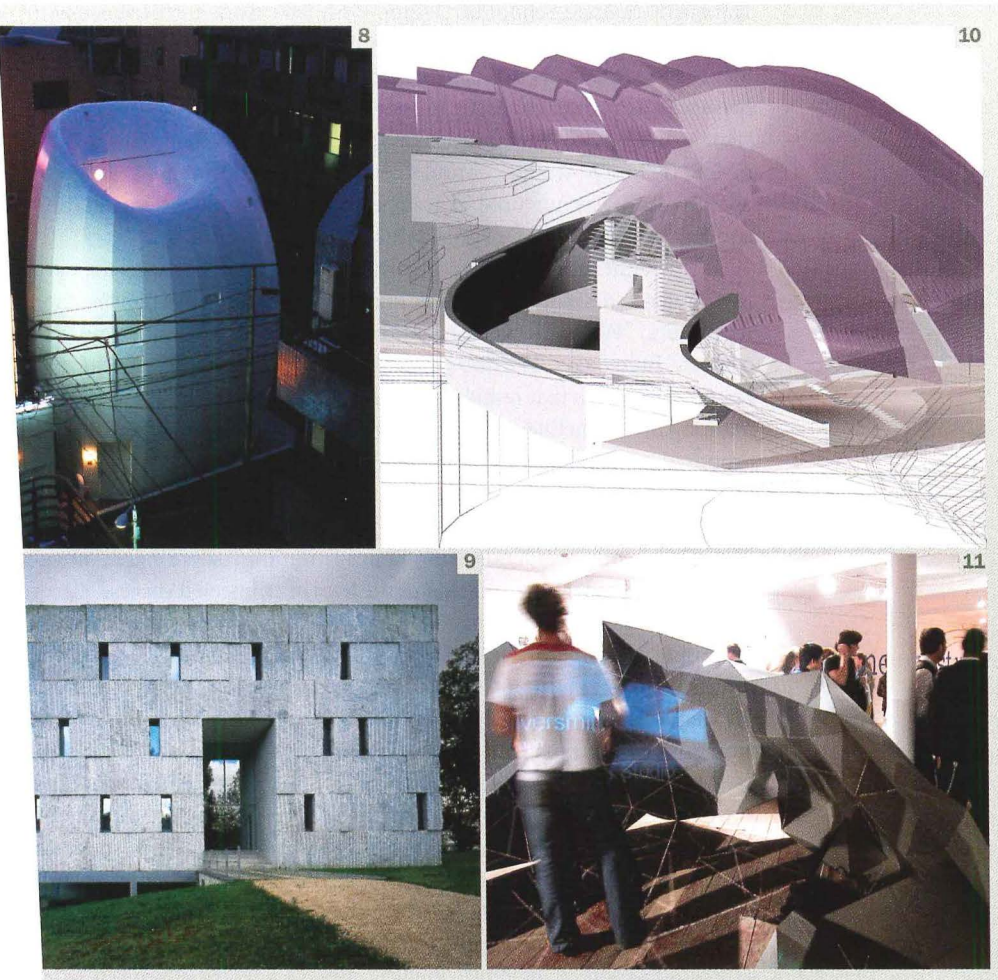
While some architects appropriate sculpture to create architecture, Plasma Studio expands architecture to fashion sculpture. The firm’s installation in London, entitled *Crumple Zone*, circumvents a linear design process to create structures that seem substantial yet appear to float. These novel forms are intriguing prototypes for architecture.

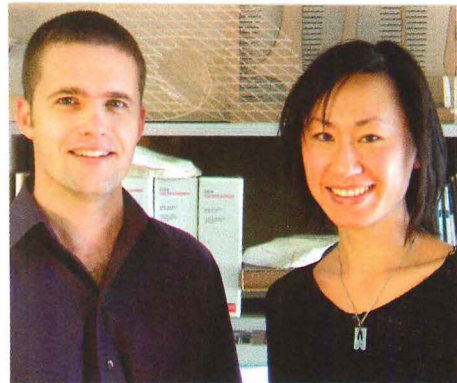
What sets *Snake-Rice* apart from other projects, though, is Spina’s successful creation of a work that is both interactive and emergent. The sculpture consists of 11 polished aluminum elements assembled by lateral combinations and positioned on a gentle slope of a valley with dense foliage. This work produces the effect of rippled waves that suggest the green rice field landscape characteristic of this part of Korea. Spina explains, “Generically, *Snake-Rice* could be understood as an emergent and flexible system of sculptural assembly. Its snakelike modular pieces insinuate the possibility of growth, expansion, reconfiguration, and proliferation.” This work is not merely the setting for emergent events, but is itself an emergent event. *Snake-Rice* might best be understood as a laboratory experiment for a new kind of architecture in which structure and site interact to create emergent forms that constantly adjust and adapt to the environment.

In today’s climate of fear, disaster always seems near. Though the threat of political turmoil and religious fundamentalism cannot be minimized, the greater danger to our future is environmental disaster. These problems are global but solutions must be local.

While the projects recognized this year do not explicitly address issues like global warming, pollution, and dwindling water supplies, their concern about them is evident. In the absence of responsible theoretical reflection on these pressing issues, it is encouraging to see a new generation of architects wrestling so creatively with new ways to reconfigure the increasingly complex interrelation between natural and built environments. ■

he modulates surfaces and continuously varies structures to articulate spaces where programmed and unprogrammed events can emerge. In an ecologically sensitive project, Rahim has designed a weekend home in London to regulate interior and exterior flows. The gradient of performative spaces controls circulation in the house, and a system of troughs and channels irrigates the surrounding land according to seasonal conditions.





nARCHITECTS pursues the variables of building types, finding hybrid solutions

By William Weathersby, Jr.

Architect: nARCHITECTS

Location: New York City

Founded: 1999

Design staff: 4

Partners: Eric Bunge, AIA; Mimi Hoang

Education: Bunge: Harvard GSD, M.Arch., 1996; McGill University, B.Arch., 1991; Hoang: Harvard GSD, M.Arch., 1998; MIT, B.S.Arch., 1993

Work history: Bunge: Practice—Diller + Scofidio, 1999; Kennedy & Violich Architecture, 1996–98; Paul Andreu/Aéroports de Paris, 1993–94; Academic—Parsons School of Design, 2002–present; Columbia University, 2001–2003; Rhode Island School of Design, 2000–2001; Hoang: Practice—Steven Holl Architects, 1999–2001; Leers Weinzapfel, 1998–99; Teun Koolhaas, 1993–94; Academic—Yale University, 2003–present

Key completed projects: *Canopy*, MoMA/P.S.1 Young Architects Program, Queens, New York, 2004; Renovation, The Kitchen, New York City, 2004; Broadway penthouse, New York City, 2004; First Street house renovation, Brooklyn, New York, 2004; Installation, *New Hotels for Global Nomads*, Cooper-Hewitt, National Design Museum, New York City, 2003; Sculpture installation, *Second Means of Egress* (artist Sarah Sze), Washington, D.C., 2003; Installation, *Slot Machine*, ArchiLab, Orleans, France, 2002; Window-Box-Wall, New York City, 2001; Floor installation (artist Do-Ho Suh), Lehman Maupin Gallery, New York City, 2000

Key current projects: Residential condo building, New York City, 2005; Exhibition design, *Earth from Above*, American Museum of Natural History, New York City, 2005; Installation, Artists Space, New York City, 2005; Installation, Henry Urbach Gallery (with artists Aziz+Cucher), New York City, 2005; Varick Street loft renovation, New York City, 2005

Web site: www.narchitects.com

Evoking the language of mathematics, in which n represents an indefinite number, partners Eric Bunge and Mimi Hoang named their firm nARCHITECTS to suggest the variable dimension of their work. “It’s meant to show that our designs can be responsive and flexible, open to change,” Bunge says. Hoang adds that n also represents the fluctuating number of design team participants on each project: With their staff recently doubled to four, the principals often work in collaboration with other firms (such as fieldOFFICE) or contemporary artists, including Do-Ho Suh, Barbara Steinman, and Sarah Sze.

Bunge and Hoang met in the mid-1990s as students at the Harvard Graduate School of Design. Both later gained experience with progressive Manhattan firms known for their strong conceptual bent—Steven Holl Architects in Hoang’s case, Diller + Scofidio for Bunge, where he served as project manager for that firm’s Blur Building. Conceptual rigor paired with methodical research remains a hallmark of the nARCHITECTS studio, complemented by the principals’ ongoing exchange of ideas nurtured in academia: Bunge has taught at Columbia and Parsons School of Design, while Hoang teaches at Yale.

Rather than focusing on formal architectural language, the partners prefer to develop hybrid building types and innovative construction techniques. “We challenge conventional notions of program, type, and context,” Bunge says. The duo’s audacious competition entries include an Egyptian museum that rethinks circulation patterns, the building’s length marking off a timeline of ancient history. Hotel Pro Forma, meanwhile, proposed a permanent home for a Danish performing arts group that merges hotel and theater spaces, with passage and admission fees among areas controlled by an electronic card system. “We like to carefully think through the complex identities of public institutions,” says Hoang, “imagining unexpected events and uses in the lives of connected spaces.”

nARCHITECTS made a big splash last summer with *Canopy* (opposite), a temporary installation in Queens, New York, that was the winning entry in the annual Museum of Modern Art/P.S. 1 Contemporary Art Center Young Architects Program. Though the elegant structure was built from a simple material with basic tools, the architects had engineered its complex structure and geometry on computer (including a dazzling virtual walkthrough that plotted changing light conditions and the venue’s use by five patron types, from party animal to art lover). They spent six weeks testing each arc type to determine maximum span, minimum bending radii, and overlap dimensions. Via thorough legwork, the architect achieved maximum effect with an economy of material means.

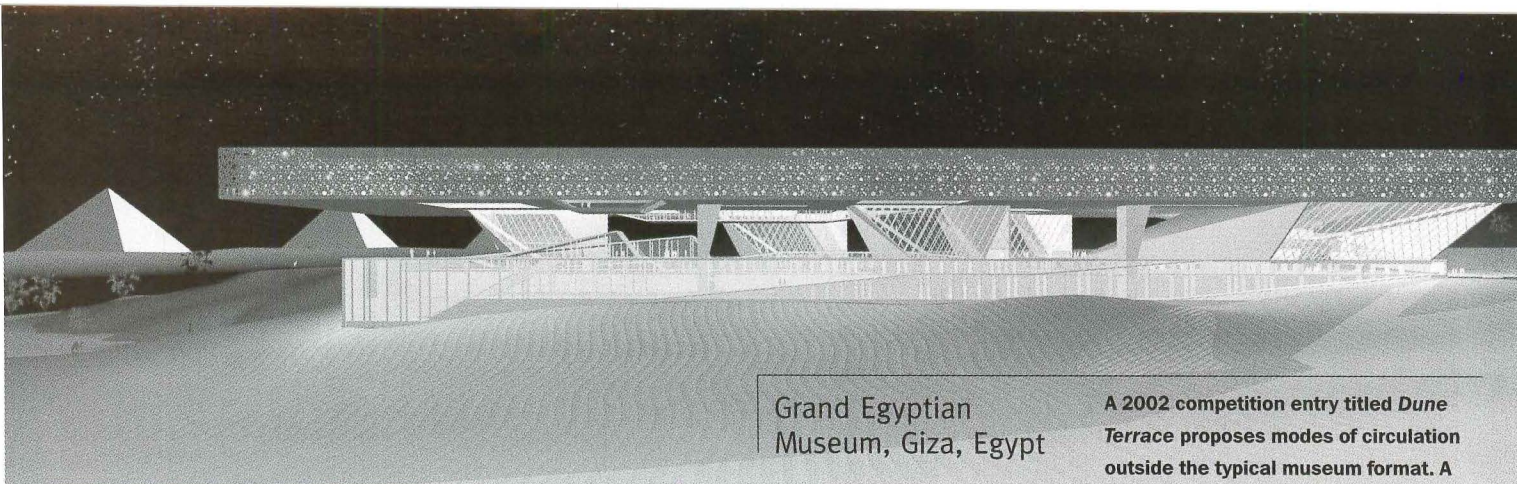
To support the office, the firm pursues residential projects from loft renovations to furniture designs. Its first commission for a freestanding building is a six-story condominium complex in New York City. One recent project, Window-Box-Wall, synthesizes the partners’ experimental approach to program and form by compressing a variety of audiovisual equipment into one reconfigurable media center. Dubbed by the client his “digital fire place,” it is a sculptural collage of wooden containers and mesh screens. The unit’s 1,600 pieces were modeled in 3D, and the spacing of its slats is based on the Fibonacci sequence. That’s detailing to the n th degree. ■



*Canopy, MoMA/P.S. 1,
Queens, New York*

To turn the art center's courtyard into an outdoor party and play space for 10 weeks, a grid of arched bamboo poles was constructed on-site over seven weeks by Hoang, Bunge, and a team of students, recent grads, and friends who volunteered. The structure used 30,800 linear feet of freshly cut bamboo, spliced and bound together by 37,000 linear feet of stainless-steel wire.





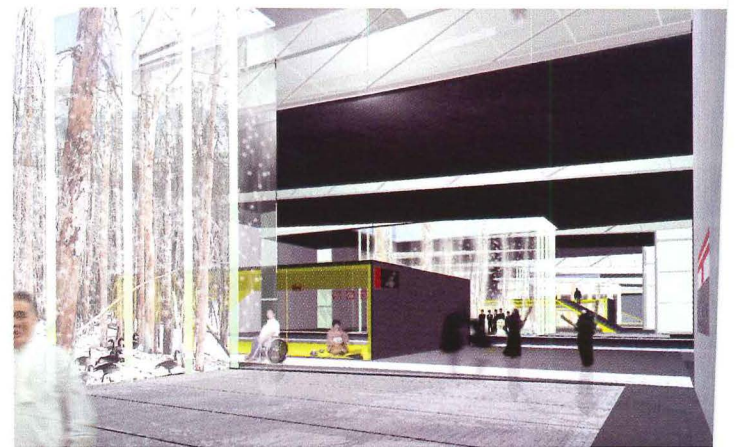
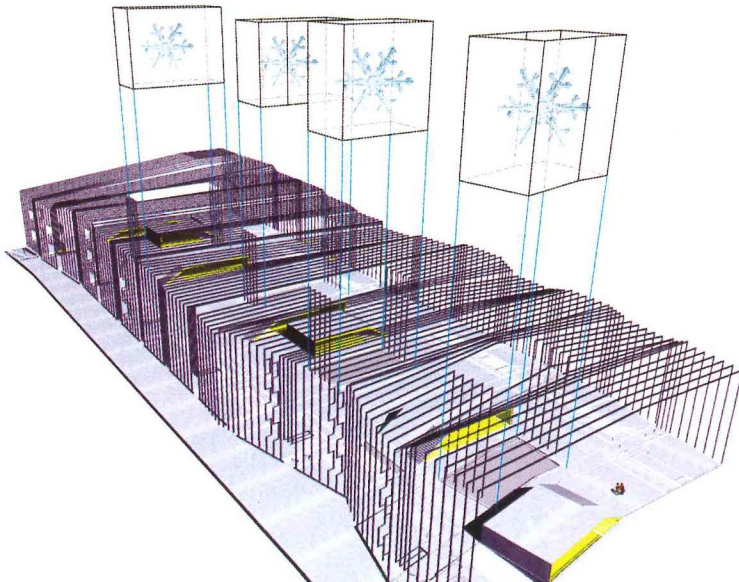
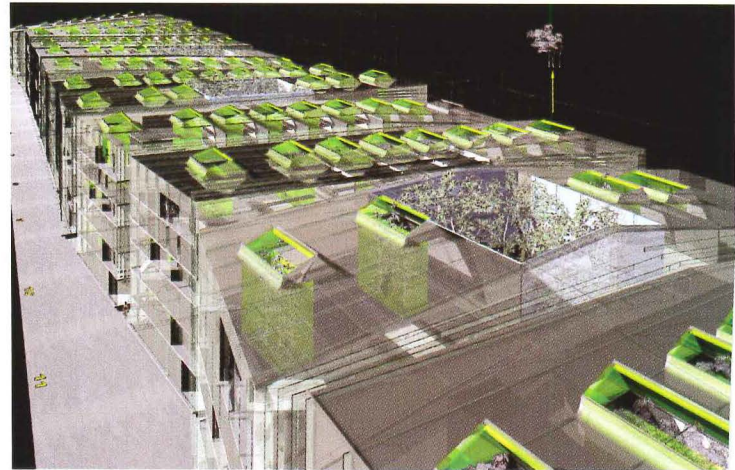
**Grand Egyptian
Museum, Giza, Egypt**

A 2002 competition entry titled *Dune Terrace* proposes modes of circulation outside the typical museum format. A 1,000-foot exterior terrace offers views of the nearby pyramids. Five lobby galleries lead to permanent collections in a floating bar (above), or to a temporary gallery, convention center, and sculpture gardens (left). The collection is organized chronologically from west to east.



**Thermal Bridge,
Aomori, Japan**

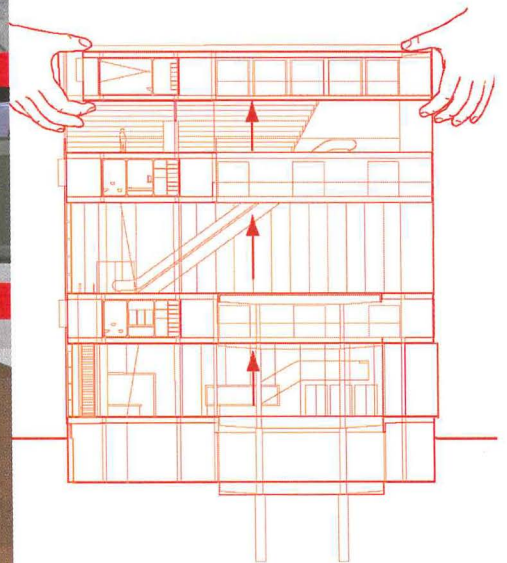
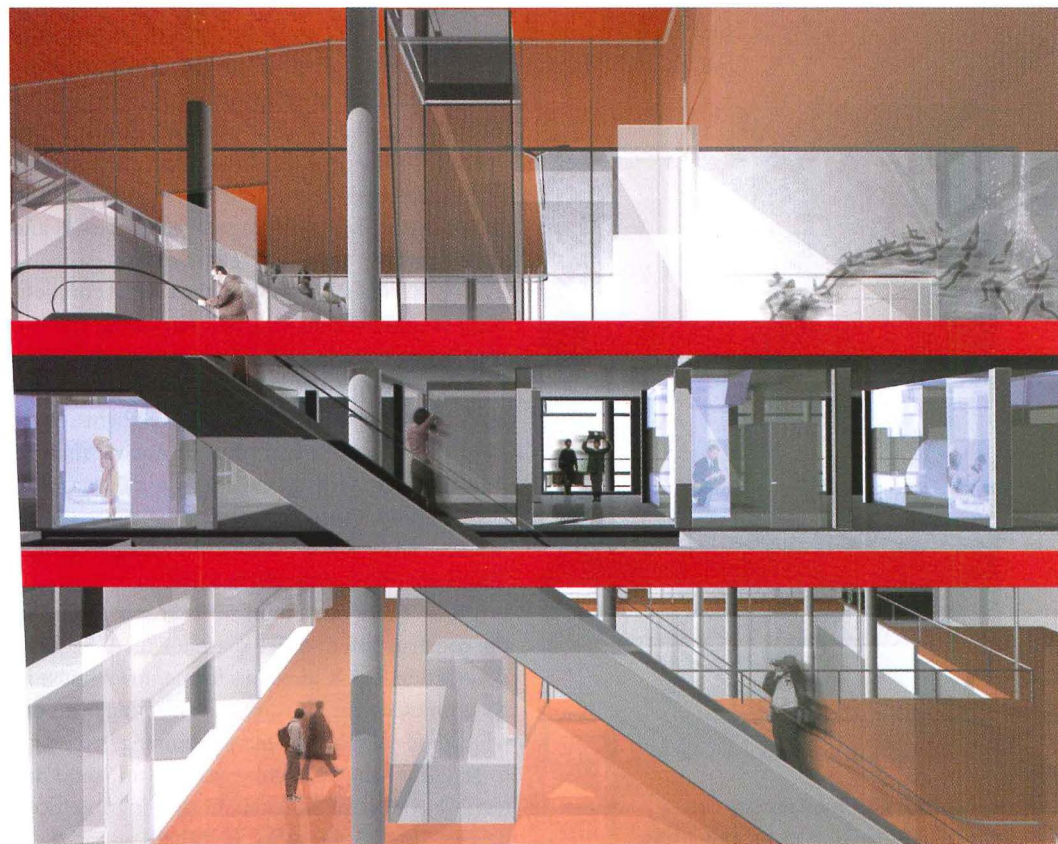
A proposed 200-unit housing complex for a region of Japan with heavy snowfall “balances a suburban desire for seclusion with an urban desire for density,” says Bunge. An insulating layer of housing spans above an interior landscape covering the maximum allowable footprint. All apartments receive light and ventilation from three sides, with views both outward and to interior courtyards.

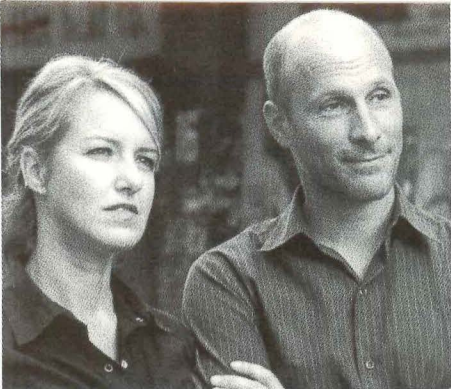




Hotel Pro Forma,
Ørestad, Denmark

Collaborating with fieldOFFICE on this competition entry, Bunge and Hoang designed a hybrid hotel and entertainment venue for the Danish performance group Hotel Pro Forma. The building balances the specific and flexible requirements of hotel and exhibition functions. A hydraulic stage interconnects floors, permitting simultaneous presentations and social interactions.





Christoff:Finio Architecture is building a New York practice by building

By Charles Linn, FAIA

Architect: Christoff:Finio Architecture

Location: New York City

Founded: 1999

Design staff: 5

Principals: Martin Finio and Taryn Christoff

Education: Finio: Cooper Union, B.Arch., 1988; Christoff: Illinois Institute of Technology, B.Arch., 1984

Work history: Finio: Practice—Tod Williams Billie Tsien and Associates, 1990–99; Academic—Yale University, 1999–present; Columbia University, 1996–99; Christoff: Practice—Freelance, 1993–97; Paul Segal Associates, 1988–93; Swanke Hayden Connell, 1984–85

Key completed projects: Store for Catherine Malandrino, New York City, 2004; Fort Greene Residence, Brooklyn, N.Y., 2003; Angelo Donghia Foundation Materials Study Center, Parsons School of Design, New York City, 2002; Beach House, Long Beach Island, N.J., 2001

Key current projects: Photographer's Penthouse, New York City, 2004; Heckscher Foundation for Children, New York City, 2005; Private House, Sullivan County, N.Y., 2005; Calypso Store, Paris, 2005

Web site: www.christofffinio.com

Christoff:Finio Architecture's principals, Martin Finio and Taryn Christoff, aren't the least bit esoteric when it comes to speaking about the influences and ideas that underlie their work. "The thing that binds our work together," says Finio, "is that both of our educations [at IIT and Cooper Union] were based on a culture of craft and making things. Architecture is most manifest in construction."

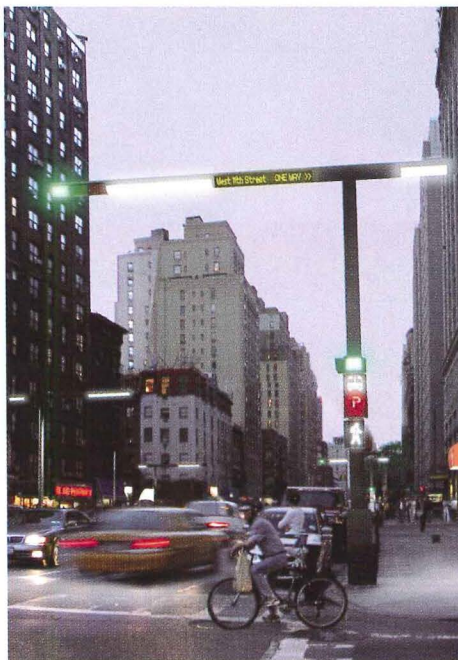
After school, the architects both got jobs in firms that taught them much about building things. At Swanke Hayden Connell and Paul Segal Associates, Christoff worked in all phases of the design and construction. "I got a strong enough core that I could move forward with my own work," she explains. Finio spent 10 years working at Tod Williams Billie Tsien and Associates, which he describes as "my graduate school education." That exposed him to everything that goes on in an office where a premium is placed on the exploration of materials and construction systems. That said, the partners agree that they don't approach their projects with any one particular set of ideas. They cite Eero Saarinen as an influence because, as Finio says, "you never knew what was going to come out of him. That is remarkably different than someone who finds their own niche and plows ahead with it."

The firm's attention to craft in construction is especially visible in two of its built projects: the Beach House, in Long Beach, New Jersey, and the Angelo Donghia Foundation Materials Study Center at the Parsons School of Design, in New York. For example, at the Beach House (opposite), they eliminated all the moldings that normally border windows, door frames, and corners, pushing the level of craftsmanship to a height seldom

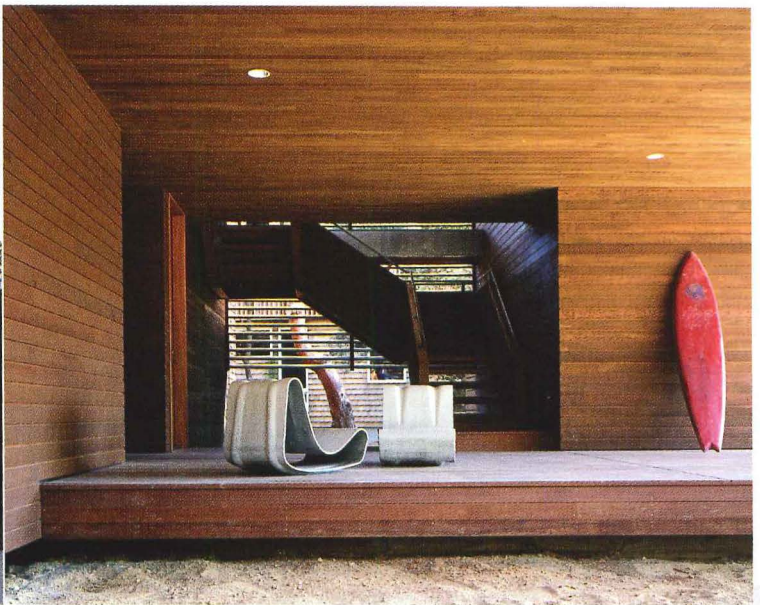
seen in builder-constructed houses. At the exhibition space in the Donghia Materials Study Center (page 120), the resin display-support surfaces hang from sheet metal sleeves that are recessed into ceiling pockets. Glass partitions are also recessed into ceiling pockets and anchored by suction cups.

The firm has also done several competitions as a way of exploring new directions, and two have brought it attention. The team's entry for City Lights, a competition to find alternatives to the city's ubiquitous cobrahead-style streetlights, made finalist (left). Their entry for an Aqua Center in Aalborg, Denmark (page 121), didn't place, but later it found its way into the *Liquid Stone* exhibition currently at the National Building Museum. That's not a bad consolation prize.

These days, the firm is keeping busy on the construction of office space for the Heckscher Foundation for Children in a former town house in New York City. And it's doing what young firms do: what Finio calls the "on-the-job training" necessary to stay in business. "You're exposed to some not terribly wonderful things about running an office," he says. "But it's *our* office, and that's great." ■



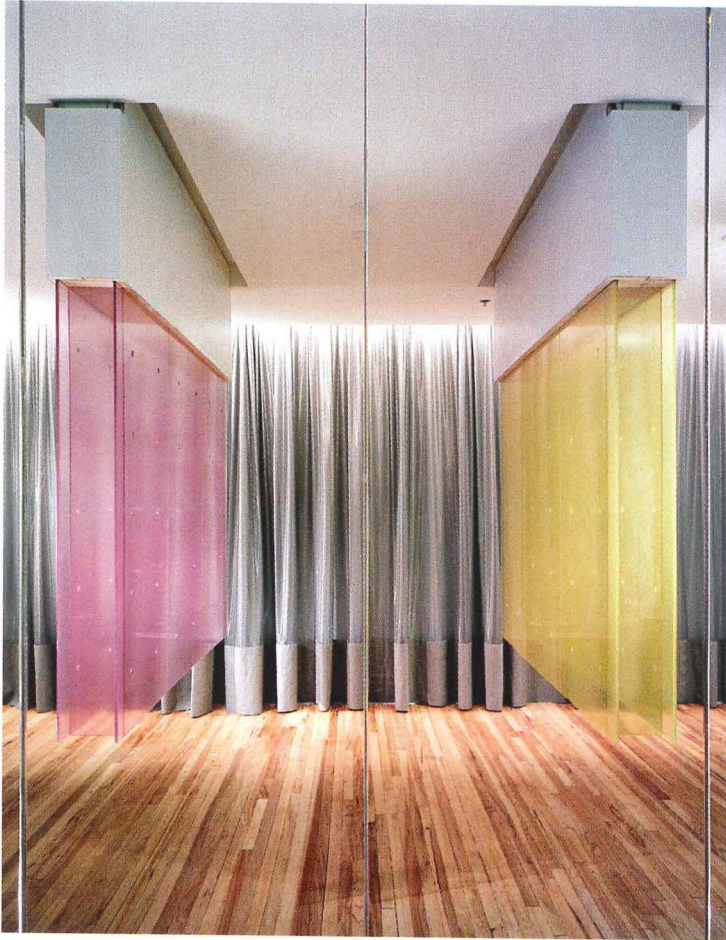
Christoff:Finio's entry for City Lights, a competition to redesign New York's streetlights.



Beach House,
Long Beach Island,
New Jersey

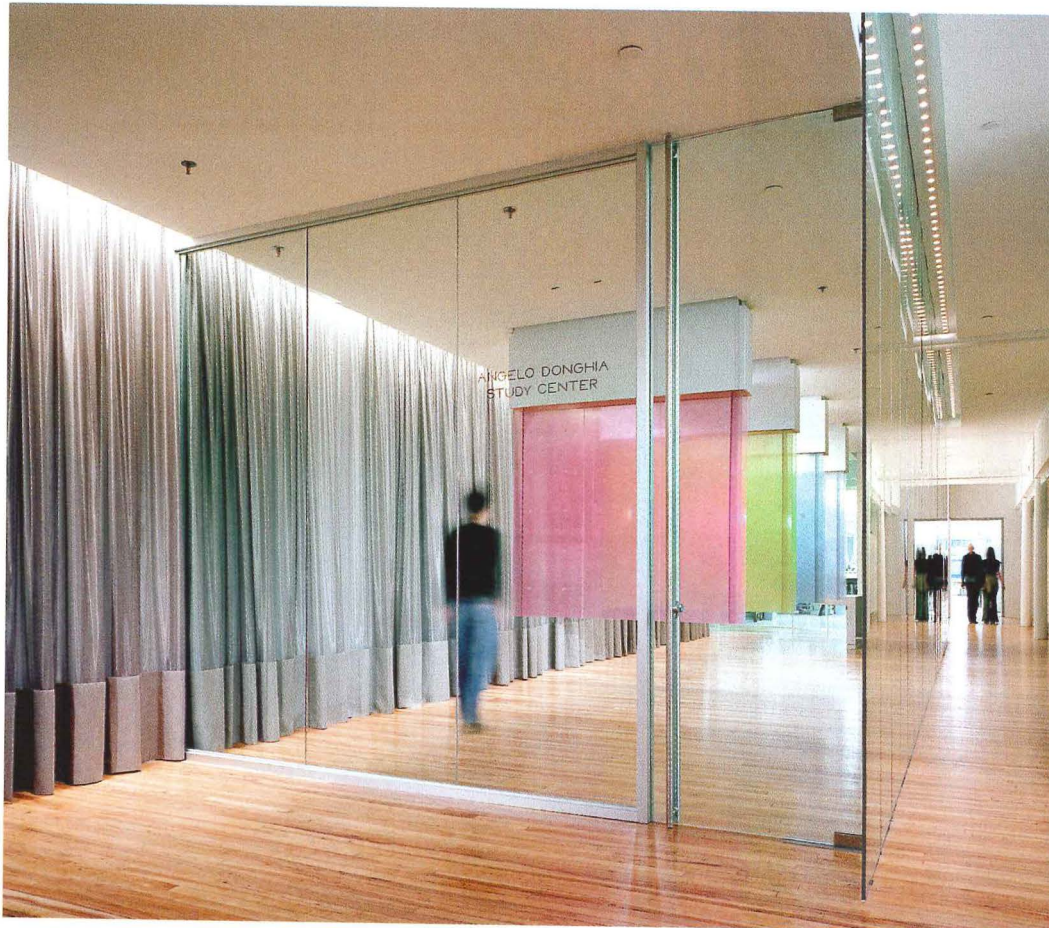
Almost every successful new practice has had a project that prompted its principals to quit their day jobs. The Beach House is the one that started it all for Christoff:Finio. Wetlands restrictions and a jammed program led them to stack rectangularly shaped spaces on top of each other. These volumes were punctured, divided, and separated to form decks, balconies, and view corridors.





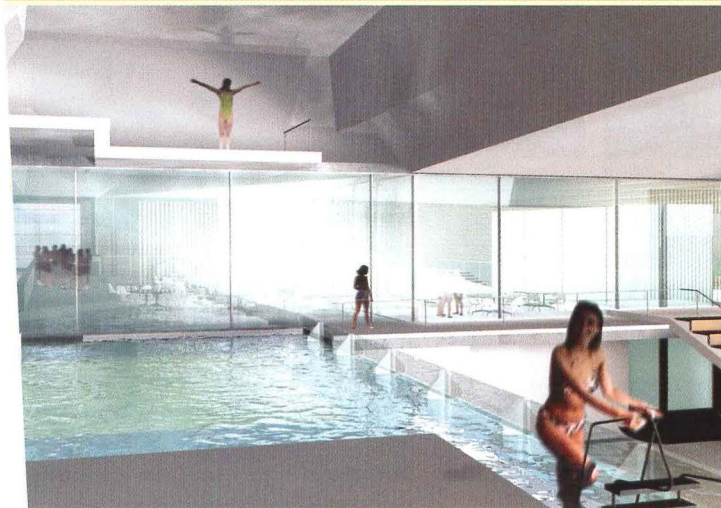
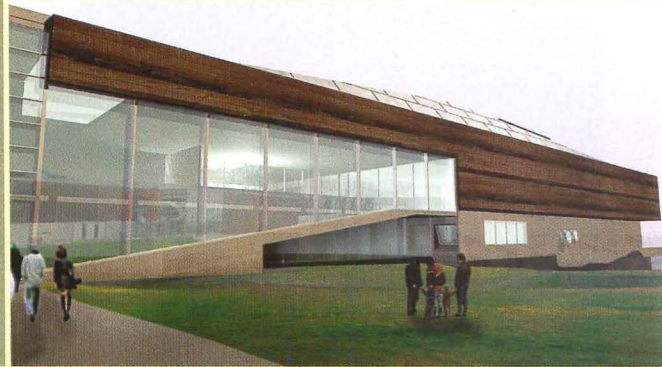
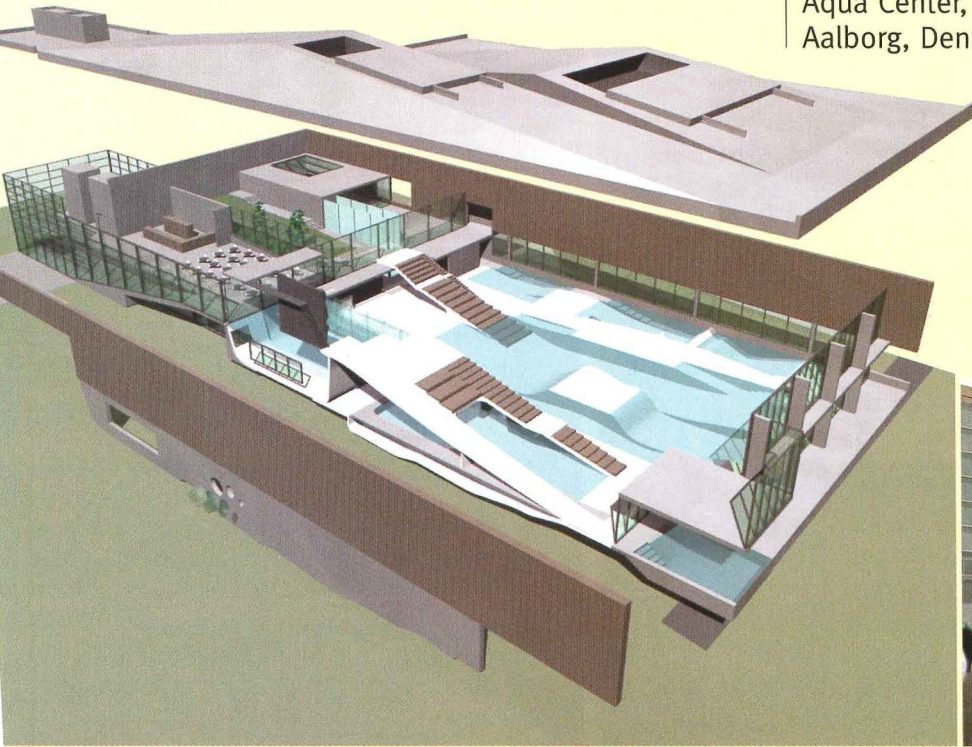
Donghia Study Center,
New York City

When the Angelo Donghia Foundation gave the Parsons School of Design a grant for a new Materials Study Center, Christoff:Finio set to work transforming a dull studio into a space that includes a computer lab, classroom, offices, and this gallery space. Resin panels with colored interlayers are used to support display boards. The metallized polyester curtain can be drawn for exhibitions.



Aqua Center,
Aalborg, Denmark

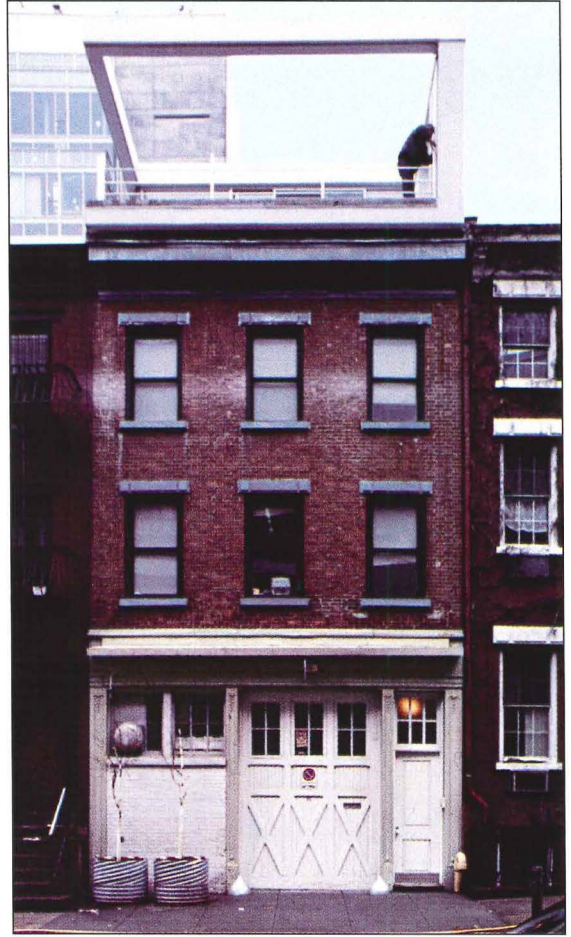
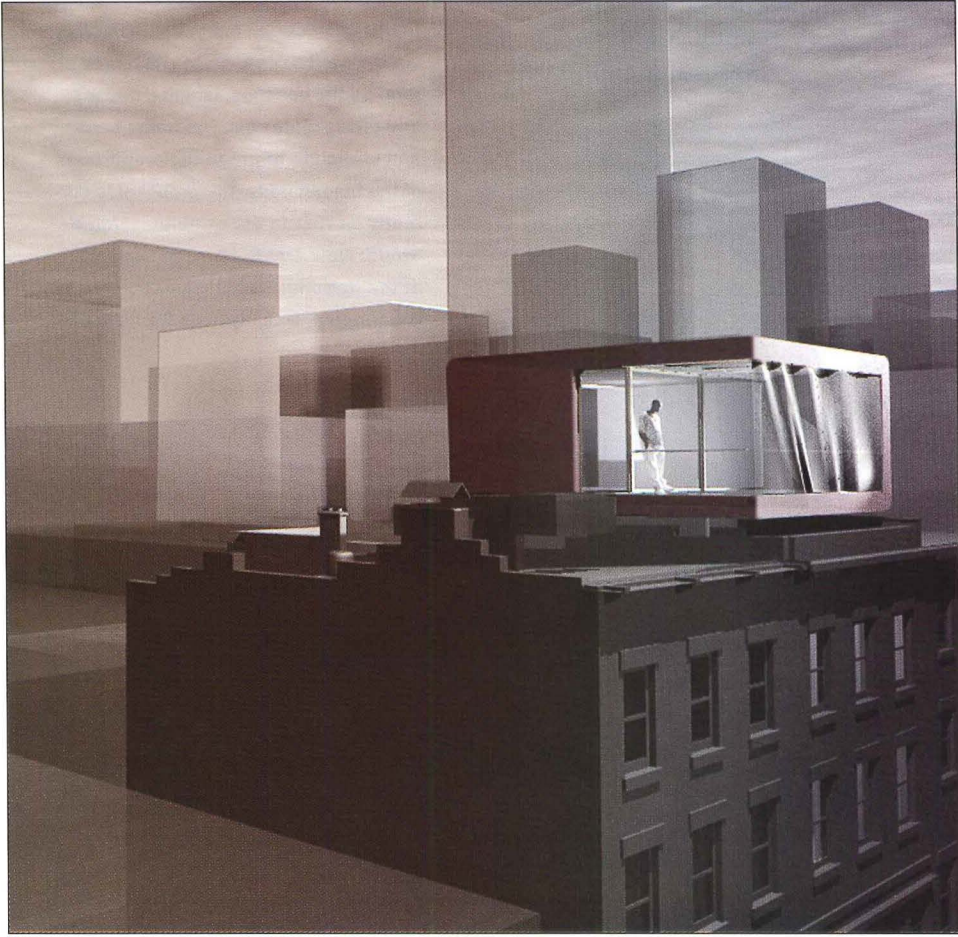
In this competition entry, the architects used a series of concrete ribbons to form pools, beaches, islands, bridges, and diving platforms. The forms bend and stretch to relate to the proportions of the human body. The proposal is currently on view in the exhibition *Liquid Stone: New Architecture In Concrete* at the National Building Museum, in Washington, D.C., through April 2005.



World Trade Center
Memorial, New York City

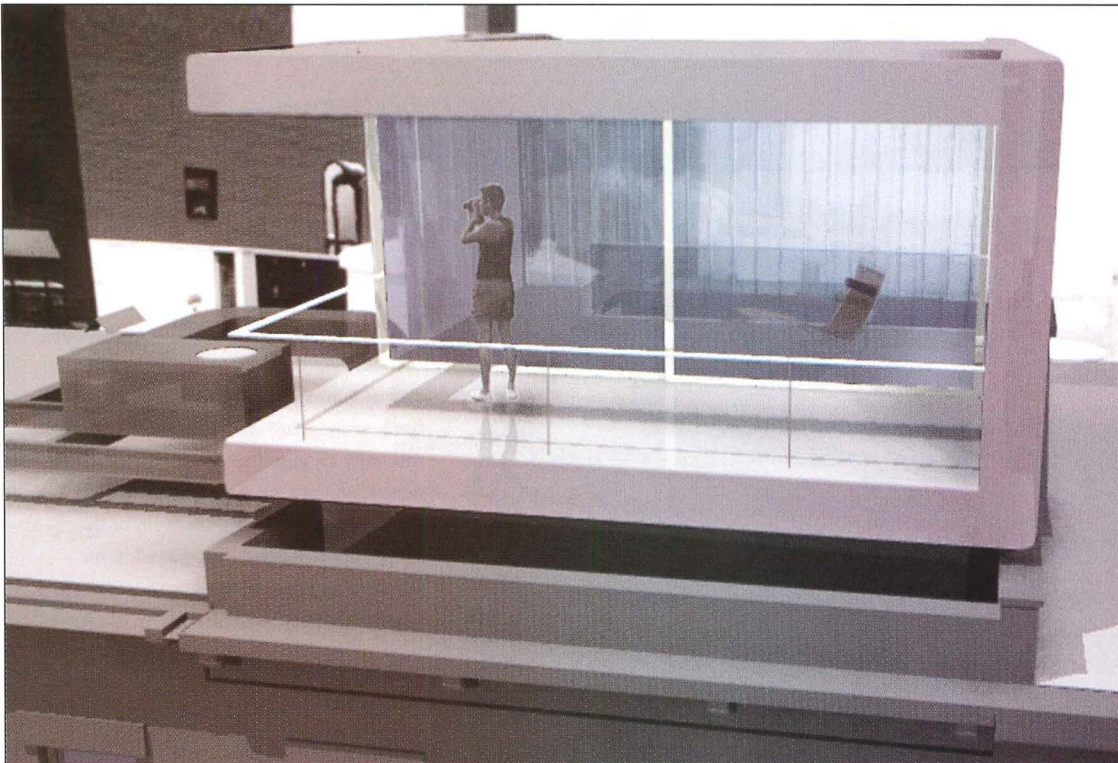
The firm's World Trade Center Memorial competition entry engaged the entire city at a public policy level. The architects wished to "use the opportunity to radically change the economic, emotional, and physical texture of the city," said Martin Finio. One element of the proposal involved the use of wind turbines, "equating memory with a visible sustaining source of energy."





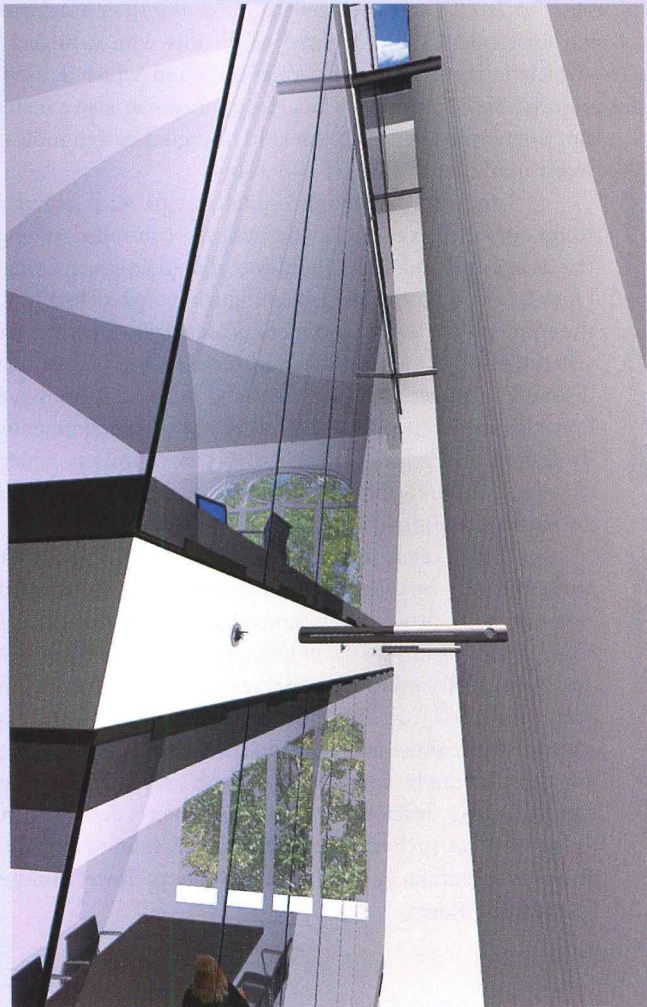
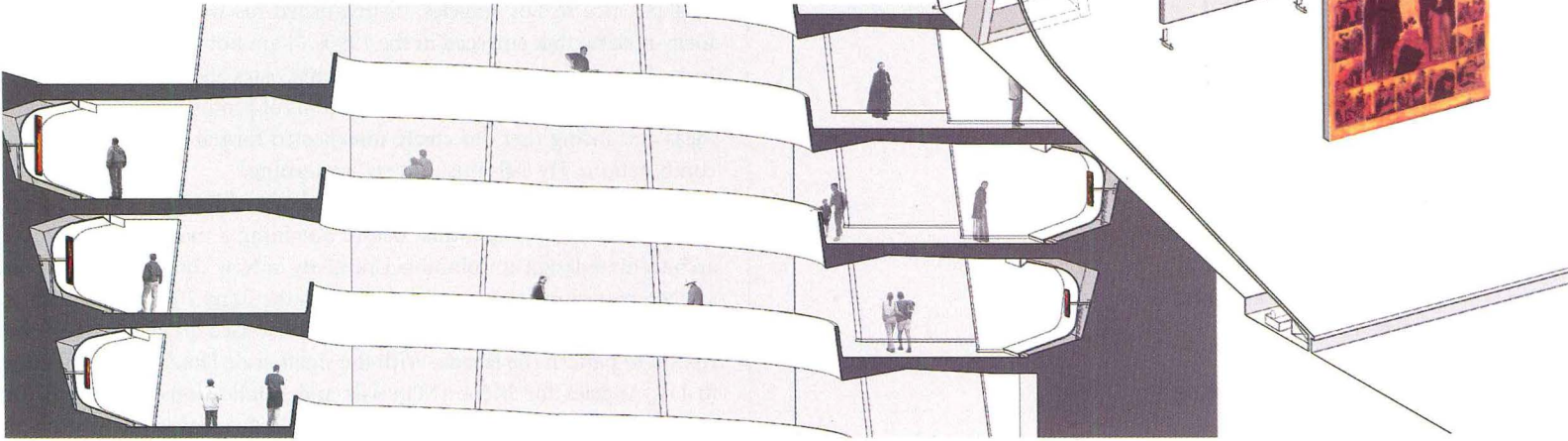
Photographer's
Penthouse,
New York City

When the owner of this West Village town house found that a portion of his Hudson River view would soon be blocked, he commissioned a rooftop pavilion that would allow him a new view over adjacent buildings. The as-yet-unrealized project is a combination of indoor and outdoor space. Motorized screens are incorporated into the structure to allow privacy indoors and out.



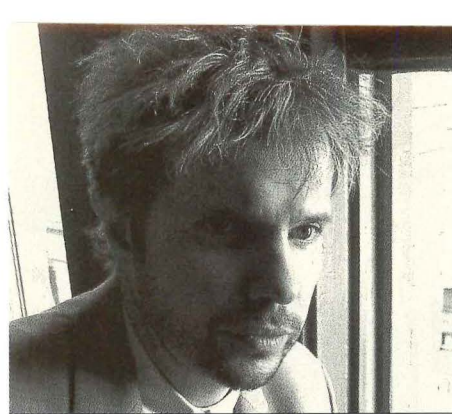
**Exhibition Design,
New York City**

The architects won an invited competition for the design of an exhibition of Russian icon paintings at the Solomon R. Guggenheim Museum, in New York City. Their system of cantilevered mounts allowed the paintings to float in front of the museum's curved walls. Unfortunately, the exhibition was canceled after the post-9/11 security measures made it difficult for couriers to accompany artworks into the U.S.



**Heckscher Foundation,
New York City**

The architects are converting a 1900s town house that architect Samuel Trowbridge built for himself into offices for a philanthropic organization. While the building's footprint barred the designers from making complex interventions, they successfully sliced a five-story atrium into the space adjacent to the building's stair by creating a clever structure from which floors were hung.



Marcelo Spina and his firm Patterns shake things up by fusing materials and program

By Michael Speaks

Architect: Patterns

Location: Los Angeles

Founded: 1999

Design staff: 4

Principal: Marcelo Spina

Education: Columbia University, M.S., Advanced Architectural Design, 1997; National University of Rosario, Argentina, B.Arch., 1994

Work history: Reiser + Umemoto 1997–98; Keller Easterling Architects, 1997; Gerardo Caballero Architects, 1993–94

Key completed projects:

Jujuy 2056 Apartment Building, Rosario, Argentina, 2003; *Snake-Rice*, Icheon, Korea, 2003; *Land.Tiles*, M&A, Los Angeles, 2003

Key current projects: SCI_Arc Café and Boardroom, Los Angeles, 2005; FYF Residence, Rosario, 2005

Web site: www.p-a-t-t-e-r-n-s.net

In a recent conversation in his downtown Los Angeles studio, Marcelo Spina, the head of Patterns, a design research architecture practice in Los Angeles, distinguished his work from the blobby form-making that emerged in the 1990s. “I am not interested in making formal experiments or cultural statements,” says Spina. Instead, he has a special interest in the practical implications of prototyping materials and ideas and fusing them to create unexpected formal and programmatic combinations. He calls this process “patterning.”

Spina, who studied at the School of Architecture, Planning, and Design in Rosario, Argentina, before obtaining a master’s in advanced architectural design at Columbia University in New York City in 1997, has applied patterning to his built projects. In the Jujuy 2056 Apartments in Rosario, Argentina, completed in 2003, Spina used an exterior concrete ribbon to pattern the facade. With the small-scale *Land.Tiles* installation in Los Angeles for M&A (Materials and Applications), a gallery and research center, he deployed 144 concrete tiles to create a micro-ecological irrigation control system, designed to change according to environmental conditions. As both these projects suggest, Spina is engaged in experimentation and research as an interactive performance, where the results of testing materials feed directly back into the design process itself. “In *Land.Tiles*, I wanted to make the design a form of research and experiment, but I wanted to do this with a material—concrete—which is very familiar in Argentina, and which I used in previous projects,” Spina explains. “Concrete is, of course, also a material not often associated with the kind of digital design tools that many in my generation are now using.”

Indeed, employing digital design and fabrication techniques such as computer-numerically-controlled milling in the design of *Land.Tiles*, Spina was able to test each concrete block by rapid prototyping, reconfiguring the blocks and thus the entire installation according to predetermined performance criteria. This kind of interactive, material prototyping blurs the distinction between abstract ideas and material form that has long plagued discussions about architectural experimentation. By testing and refining formal and programmatic systems, which are woven together, each project becomes an iteration of the patterned approach that defines the office’s work.

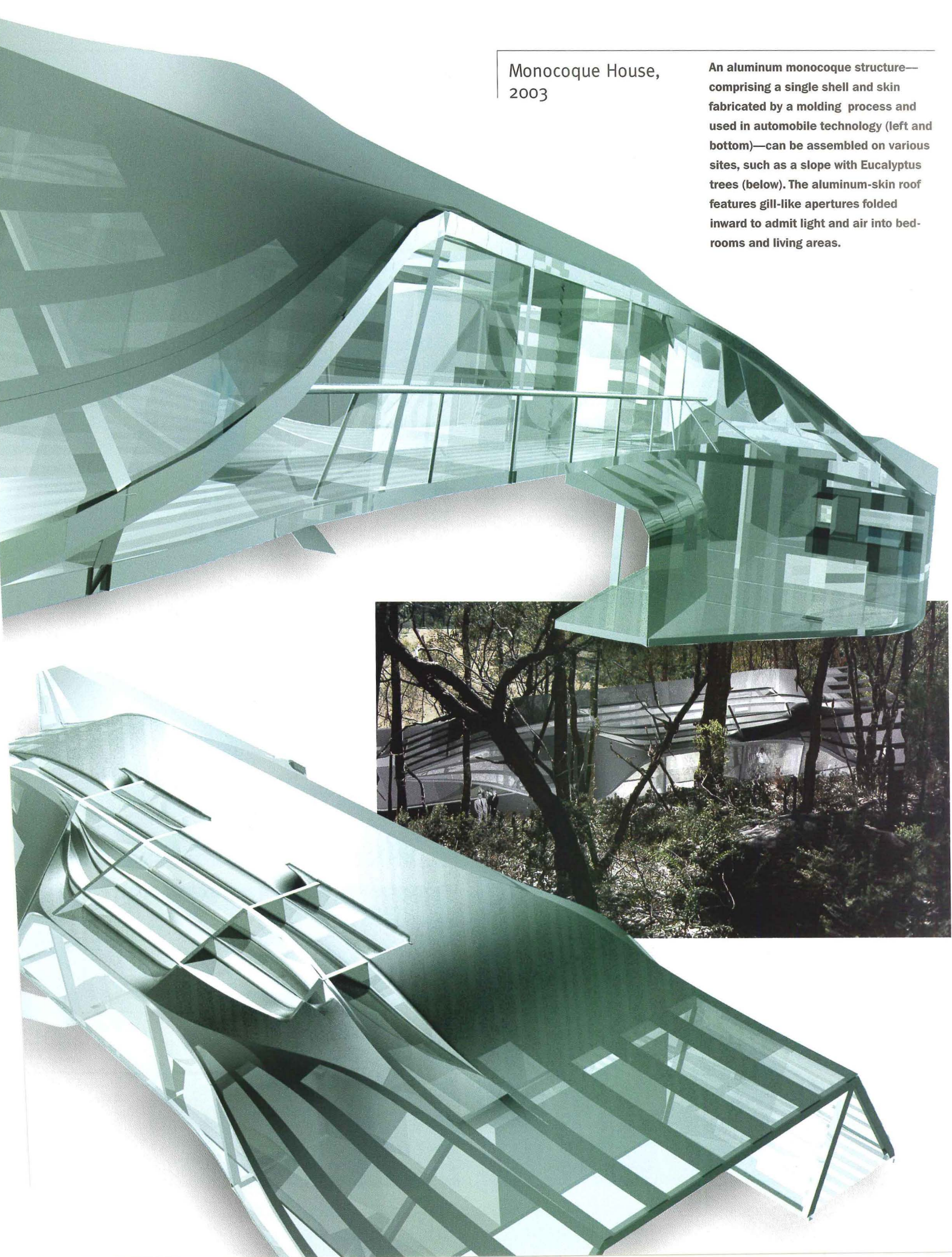
Spina often structures small-scale projects, such as a prototype for a bus shelter, as repetitions of previous or contemporaneous projects. He considers this acquired design intelligence a means for developing new techniques and material research. His approach underlies the winning competitor entry for the SCI_Arc Café; here, he patterns uses—library and café—with furniture and shelving components for an elegant solution that can be constructed cheaply and quickly. In turn, the patterning developed in the café project has informed recent projects, such as the FYF Residence, soon to be built in Rosario, Argentina, and the futuristic Busan Tower competition entry in Korea.

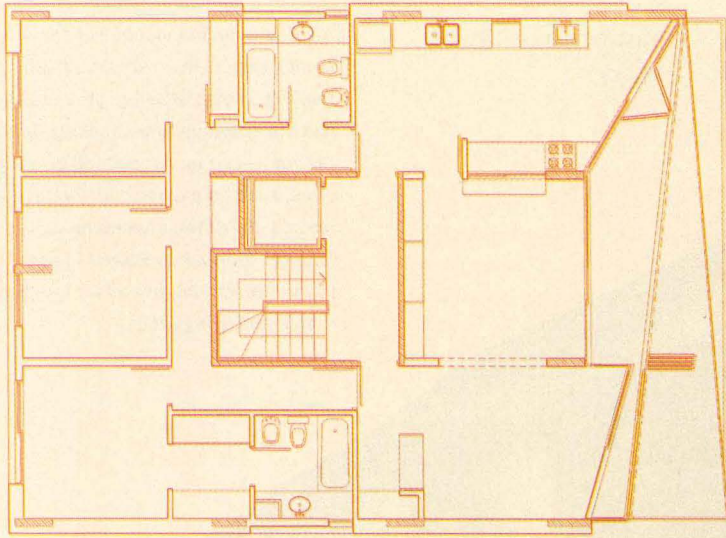


Spina explores materials and form in *Land.Tiles* (top) and *Snake-Rice* (above).

Monocoque House,
2003

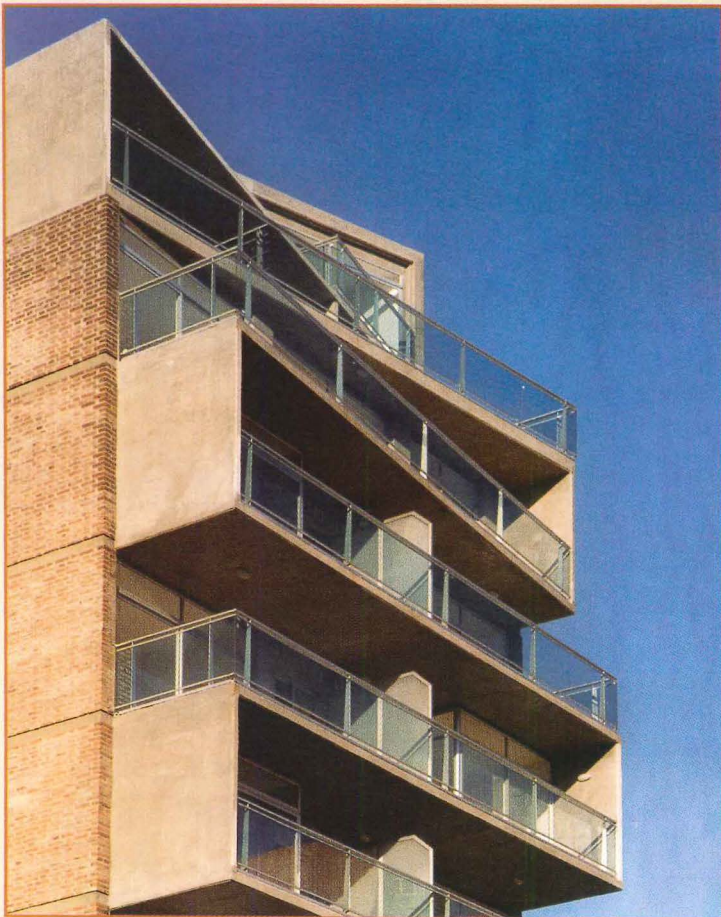
An aluminum monocoque structure—comprising a single shell and skin fabricated by a molding process and used in automobile technology (left and bottom)—can be assembled on various sites, such as a slope with Eucalyptus trees (below). The aluminum-skin roof features gill-like apertures folded inward to admit light and air into bedrooms and living areas.





Jujuy 2056 Apartment Building, Rosario, Argentina

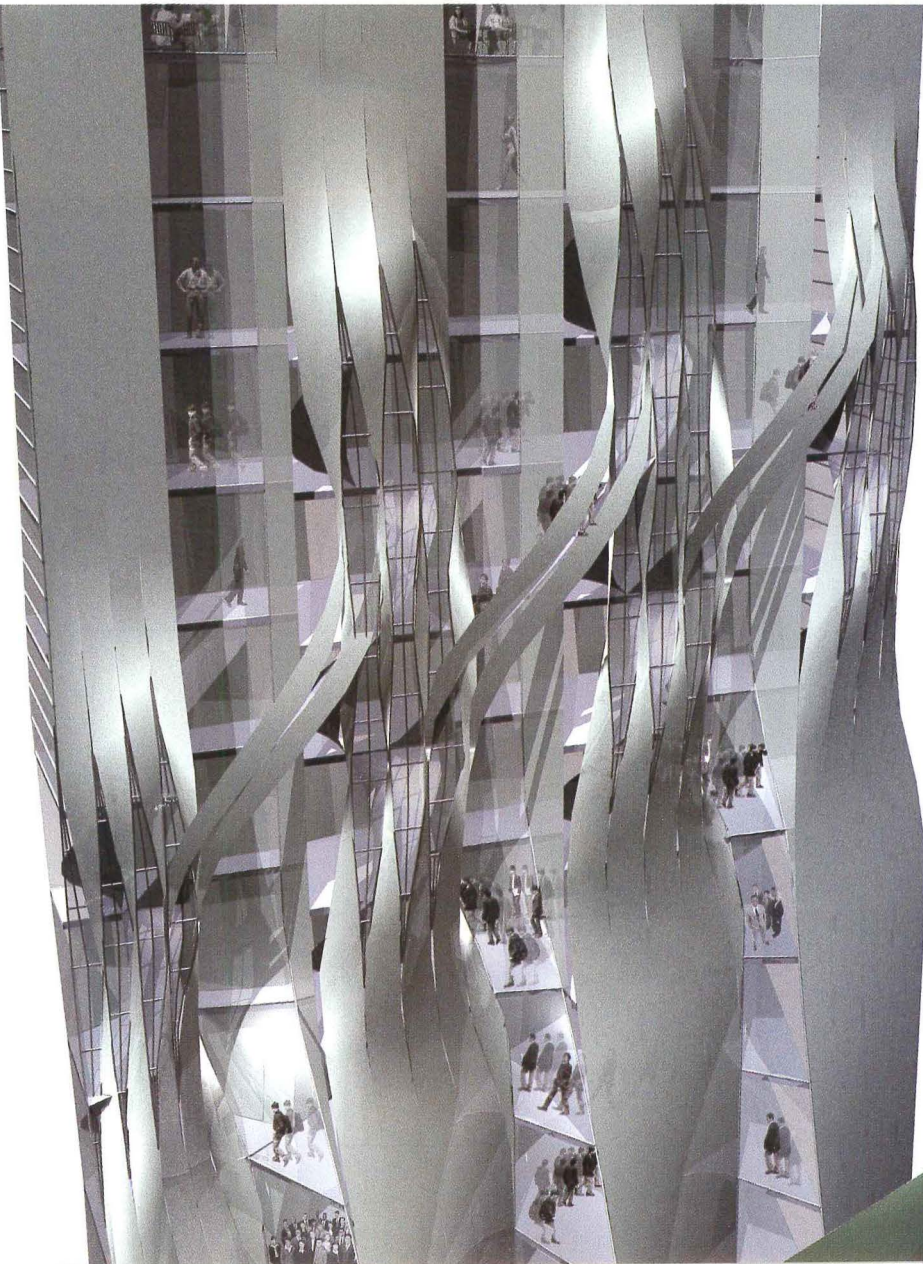
For a 12-story-high, 18-unit apartment building (right), Spina devised a poured-concrete system where slabs and end walls follow a bent ribbon pattern. The structure is enclosed by brick infill walls and a partially angled glazing system. Cantilevered concrete balconies form a canopy for the lobby (bottom right) and recede at top (below, and ninth-floor plan, above) in deference to zoning.





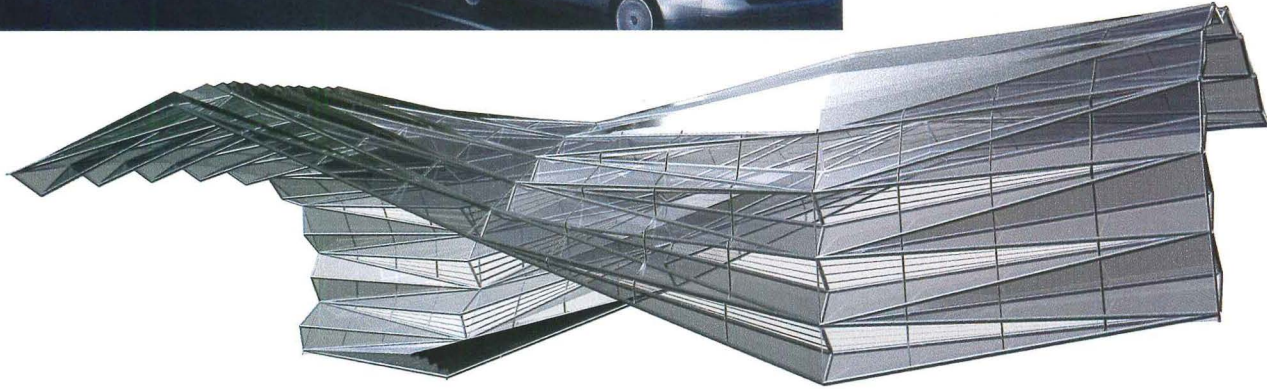
New Busan
Observation Tower,
Busan, Korea

The aerodynamically inspired shaft of the tower (above) includes a lower portion for community facilities (below), a middle one for business activities, and an observatory at the top. The attenuated form is held together by cantilevered floor plates, spiraling stairs (right), structural ribs, tendons bonded together and to the slabs, plus hydraulic jacks anchored to the ground.



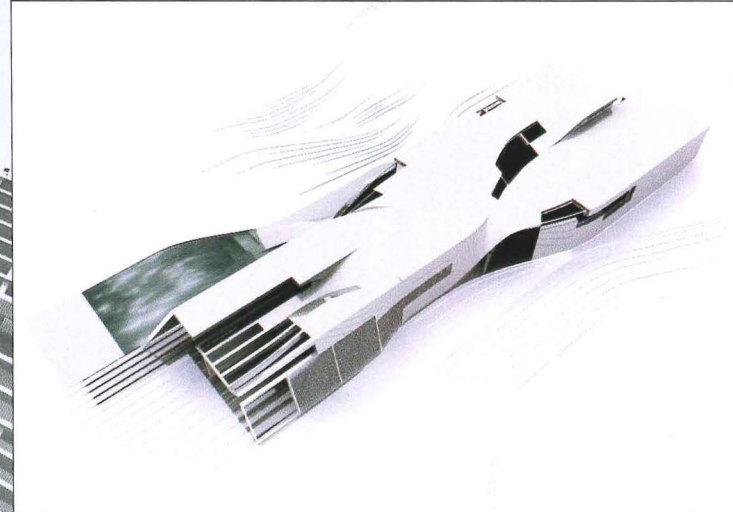
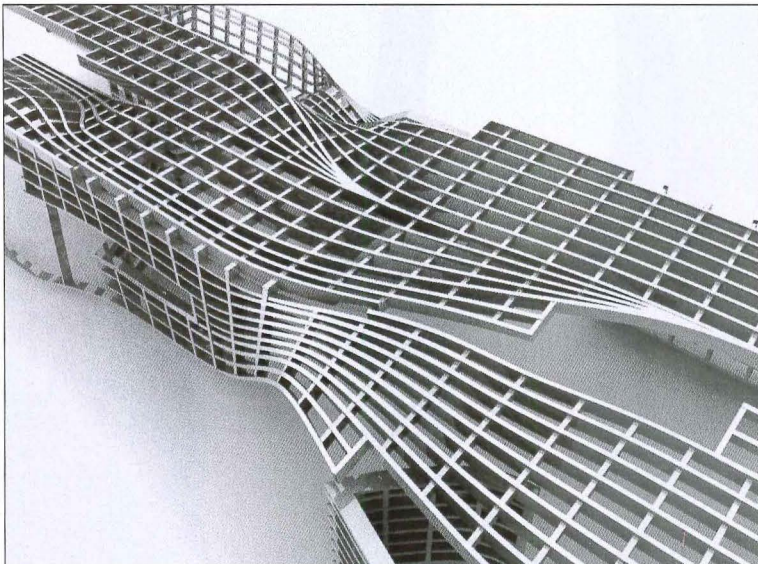
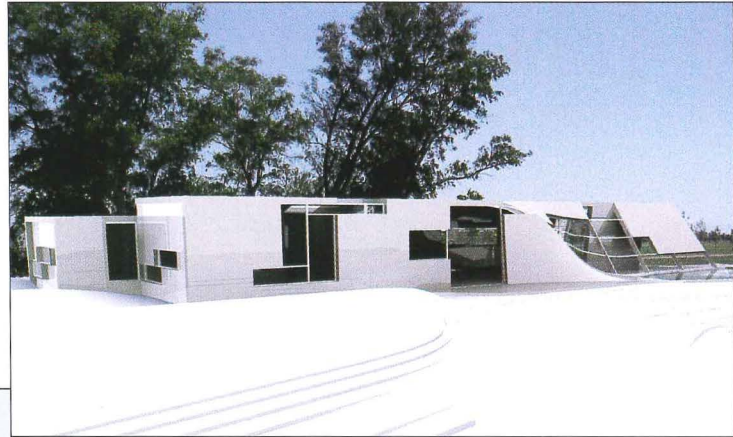
Bus Shelter Prototype

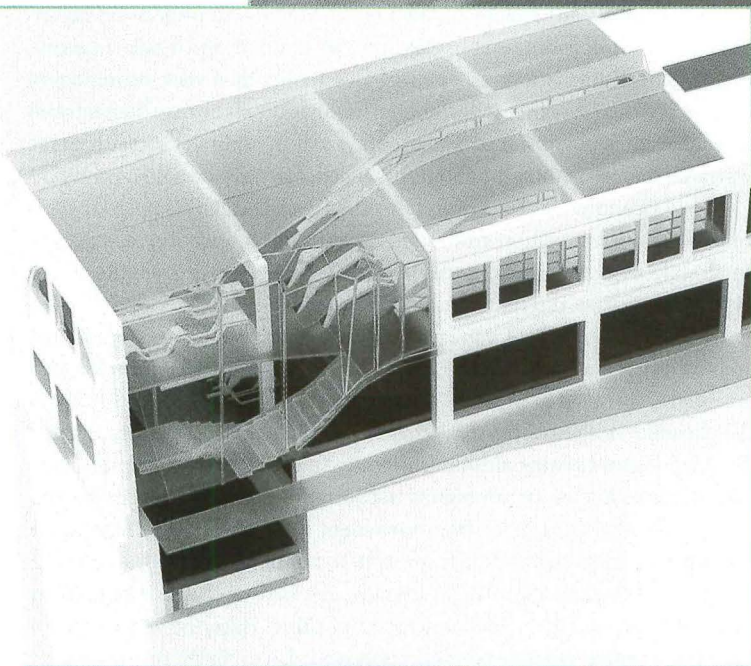
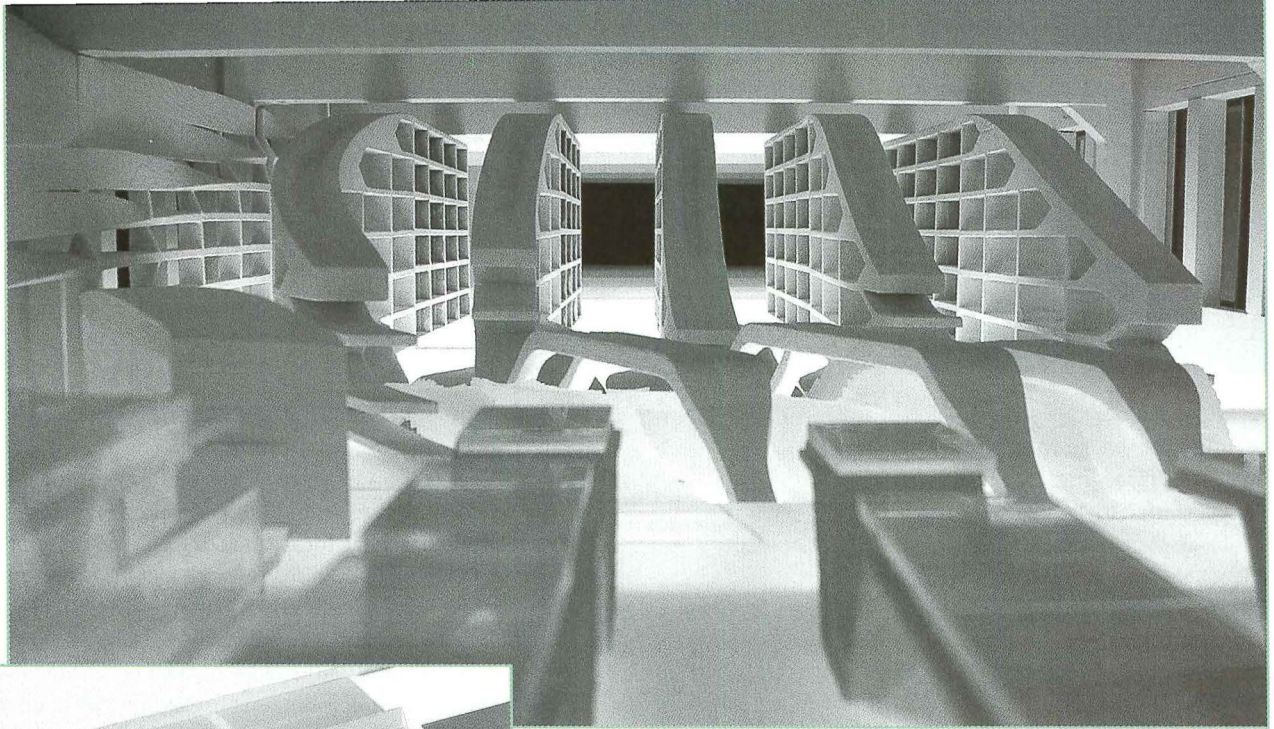
A folded and triangulated steel structure provides seating while waiting for a bus, and affords views out to the landscape (left). Custom laser-cut metal louvers clad the triangulated tube structure, which is supplemented with a secondary structural system of lateral tension members, a tertiary structure of metal members, along with an external skin of continuous plastic and an internal skin of faceted plastic (below).



FYF Residence, Rosario, Argentina

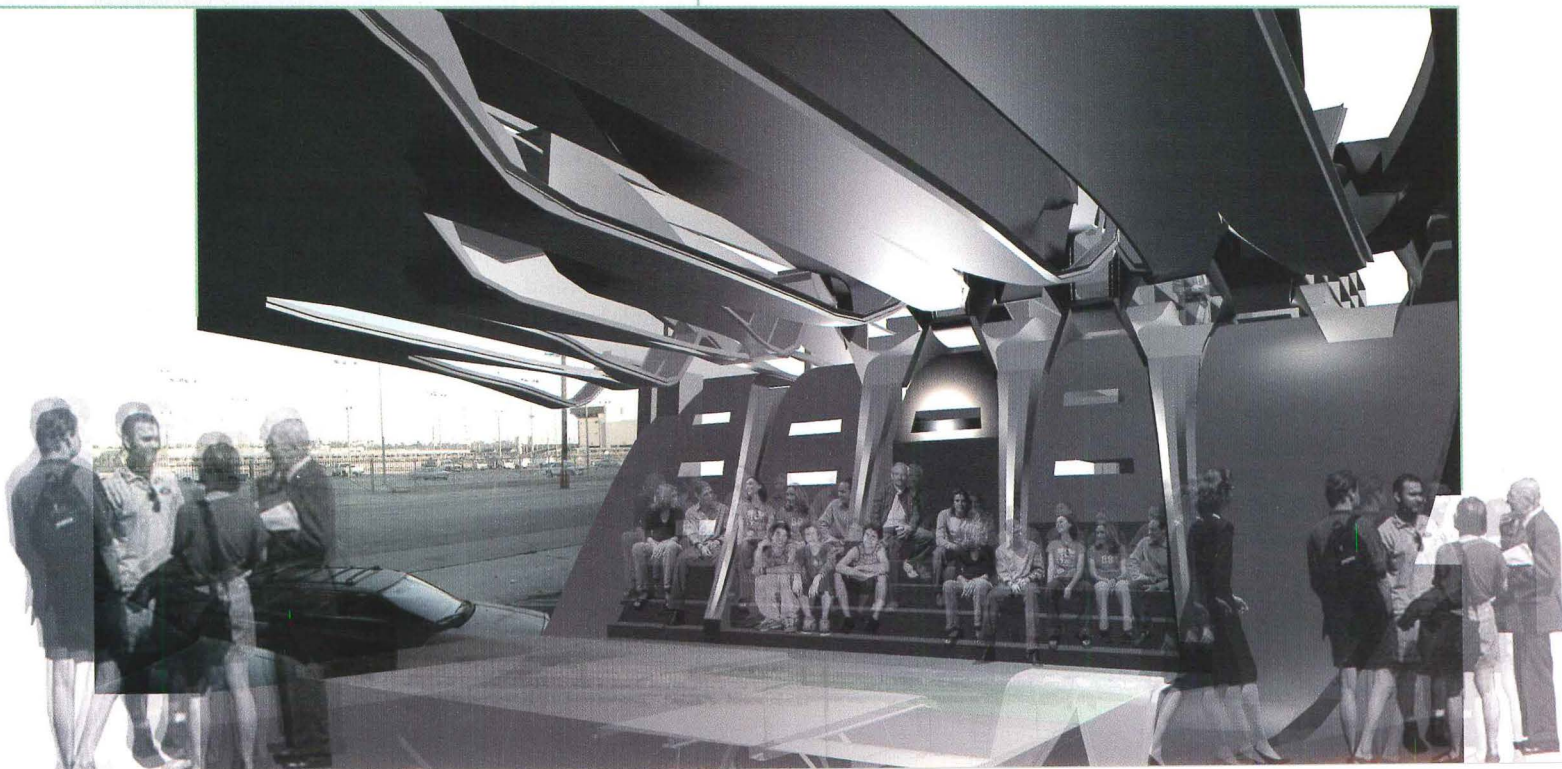
A basic box (right) is deformed according to topographical features of the site for a house to be built on the outskirts of Rosario, Argentina. The 1,507-square-foot concrete-shell structure folds and bends to provide a greenhouse, solarium, and swimming pool (right two) for an agricultural engineer and landscape designer. The lattice (below) illustrates the flowing geometry.

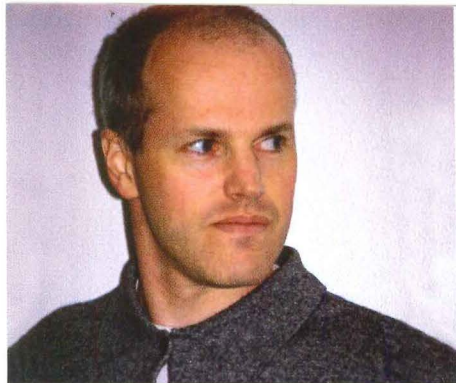




New SCI_Arc Café and Boardroom, Los Angeles

Patterns won a competition to design these spaces in the existing SCI_Arc building, a long linear concrete former depot near downtown L.A. (left). On the second floor, Spina hopes to bring the café and library together through new aluminum library shelves that are sloped and inflected toward the café space. The café tables (above), which are aluminum single-shell structures, seem extruded from the shelves. The boardroom (below), slightly above grade, is given views to the outdoors through a new faceted-glass wall.





Architect: dECOi

Location: Cambridge, Mass., and Paris, France

Design staff: 3 to 4, typically

Principal: Mark Goulthorpe

Education: University of Liverpool, B.Arch., 1987; University of Liverpool, B.A., 1984

Work history: Richard Meier & Partners, 1988–91

Key completed projects:

Glaphyros Apartment, Paris, 2003; Blue Gallery, London, 2001; *Aegis Hyposurface*, Hanover, Germany, 2000; *Ether/I*, Geneva, Switzerland, 1995; *In the Shadow of Ledoux*, Grenoble, France, 1993

Key current projects: Miran

Galerie, Paris and Beijing, 2004; Excideuil Folie, France, 2005; St. Andrew's Loft, 2005–2006; *Aegis Hyposurface*, MIT, Cambridge, Mass., 2005–2006

Web site: www.newitalianblood.com/category/open/519.html

dECOi releases the potential energy of digital technologies in the architectural realm

By Sarah Amelar

Although dECOi's written descriptions of its work have the ring of meticulous scientific abstracts, the projects often convey an elegant and expressive dynamism through still forms. With, say, a metal sculpture resembling windblown fabric or a penthouse akin to a spiraling crystal formation, dECOi's poetic aesthetics are inseparable from the digitally based research and processes that generate them.

But when Mark Goulthorpe founded dECOi in 1991, the potential of digital technologies was just emerging. As this British-born (and until recently Paris-based) architect joined forces to work on projects and competitions with collaborators as far-flung as London and Kuala Lumpur, digital networking became an essential tool. Rather than view technological change as a mere advance in technique, he envisioned the new digital realm as a means to "a philosophical and cognitive shift ... entirely requalifying the way architecture is thought about, practiced, formally created, and built."

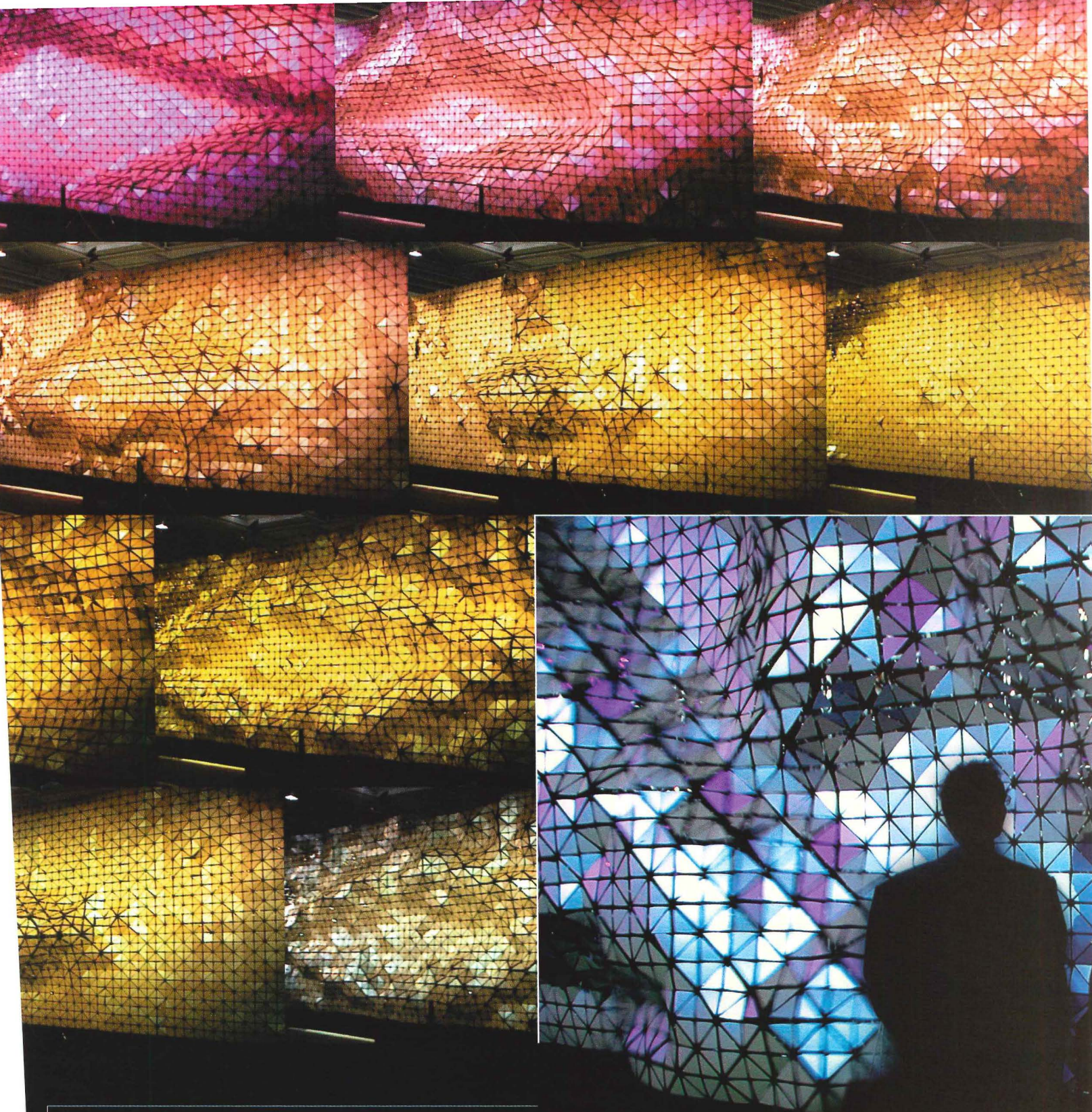
Grandiose as such ambitions may sound, dECOi's projects typically integrate innovation from concept through fabrication, albeit on a small scale, engaging the computer to cross-pollinate between architects and experts from such disciplines as mathematics. (Goulthorpe, currently an associate professor at MIT, can now pursue his complex interests at both the architecture school and Media Lab.) dECOi's cross-disciplinary trajectory emerged early on, as in *Ether/I*, which translates the trace of two dancers—the ghostlike vestiges of movement, invisible to the naked eye but recorded on video—into twisting aluminum mesh. An evocatively undulant sculpture, it creates intentional ambiguity between image and surface and object.

Again striving "to trap movement in 3D form," the firm more recently designed Bankside Paramorph, a London toweptop apartment extension. The term *paramorph* literally describes a crystal whose form varies without change to its chemical composition. Here, the word refers to a faceted, spiral, crystalline configuration, and also to the parametric modeling—based on relational geometry's alterable parameters—that permits quick and economical analysis of formal variations, factoring in energy efficiency, ease in fabrication and assembly, optimal views out, costs, and so on.

Paramorph also challenges the existing logic of architectural fabrication, which treats structure, skin, and insulation as separate entities, and must then orchestrate various contractors and suppliers. Eliminating skeletal frames and intermediary formwork, Paramorph's multifunctional honeycomb panels—precision-cut and drilled with dowel-fit holes—perform as finished surface, insulation, and structure, ready for quick assembly by a sole contractor. In "collapsing multiplicity into singularity," dECOi rejects the idea of designing an object and then applying computer-numerically-controlled (CNC) methods to its fabrication, instead integrating the range of technological implications from the start.

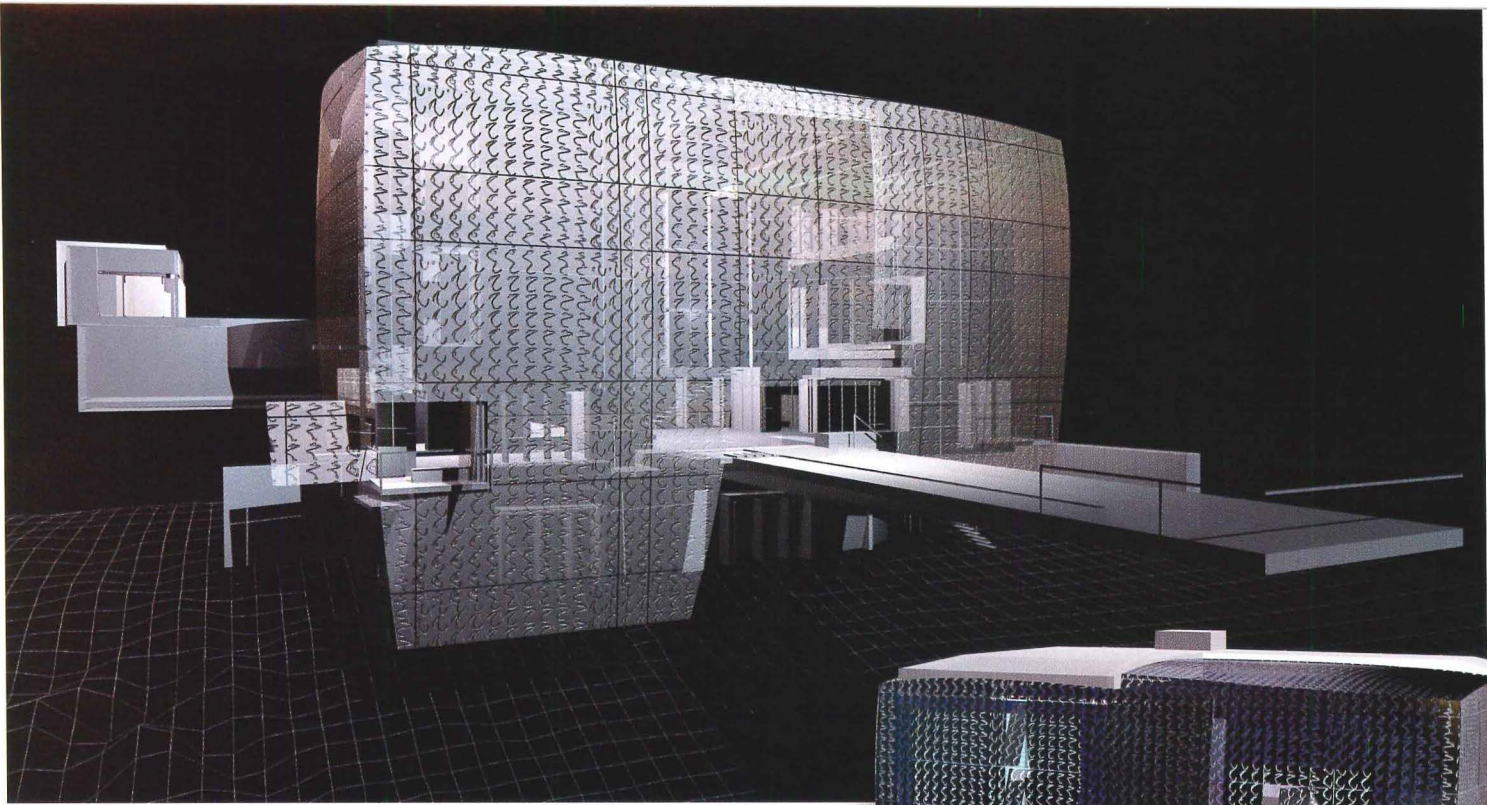
Other dECOi explorations include *Aegis Hyposurface*, a dynamic interactively reconfigurable 3D screen that reacts to motion and sound, presaging fully kinetic and environmentally responsive architectural surface:

The realization of these projects remains "time consuming admits Goulthorpe, "but it's getting quicker, and will undercut standardization. Highly complex forms, efficiently and economically produced, with the potential for infinite variance—that's the revolution of digital technology."



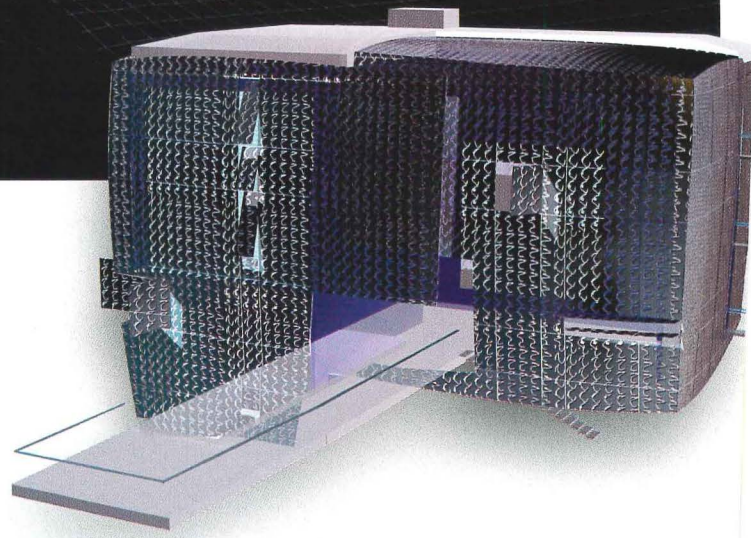
Aegis Hyposurface,
Hanover, Germany

This interactive, dynamically reconfigurable 3D screen reacts in real time to surrounding motion and sound, transforming *Hyposurface's* complex topography and colors. This project, which dECOi continues to research at MIT's Media Lab, presages fully kinetic and environmentally responsive architectural surfaces, sensitized to changes in, for example, climate or security needs.



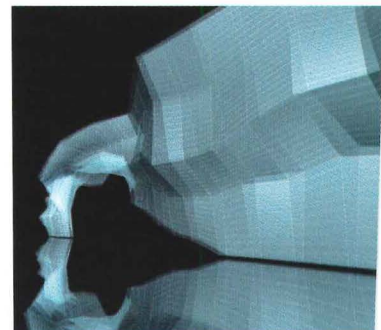
Pallas House,
Kuala Lumpur,
Malaysia

Sited on steep jungle terrain in Malaysia, the single-family Pallas House proposes a curiously monolithic form wrapped in a breathable skin, following the tropical precedent of layered filters protecting against solar gain and rainfall. The exterior cast-aluminum panels bear a mathematically generated pattern of perforations, poised on the cusp between an industrial and postindustrial aesthetic.



Ether/I,
Geneva, Switzerland

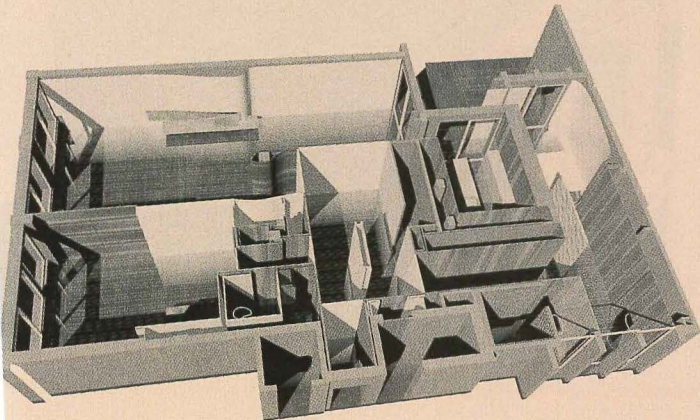
Marking the 50th anniversary of the U.N., *Ether/I* translates the trace of two dancers—ghostlike vestiges of movement, invisible to the naked eye but recorded on video—into twisting aluminum mesh. Goulthorpe has described this 67-plus-foot-long sculpture—intentionally ambiguous in image, surface, and object—as “a threshold, an energetic phase ... [near] the point of liquefaction.”

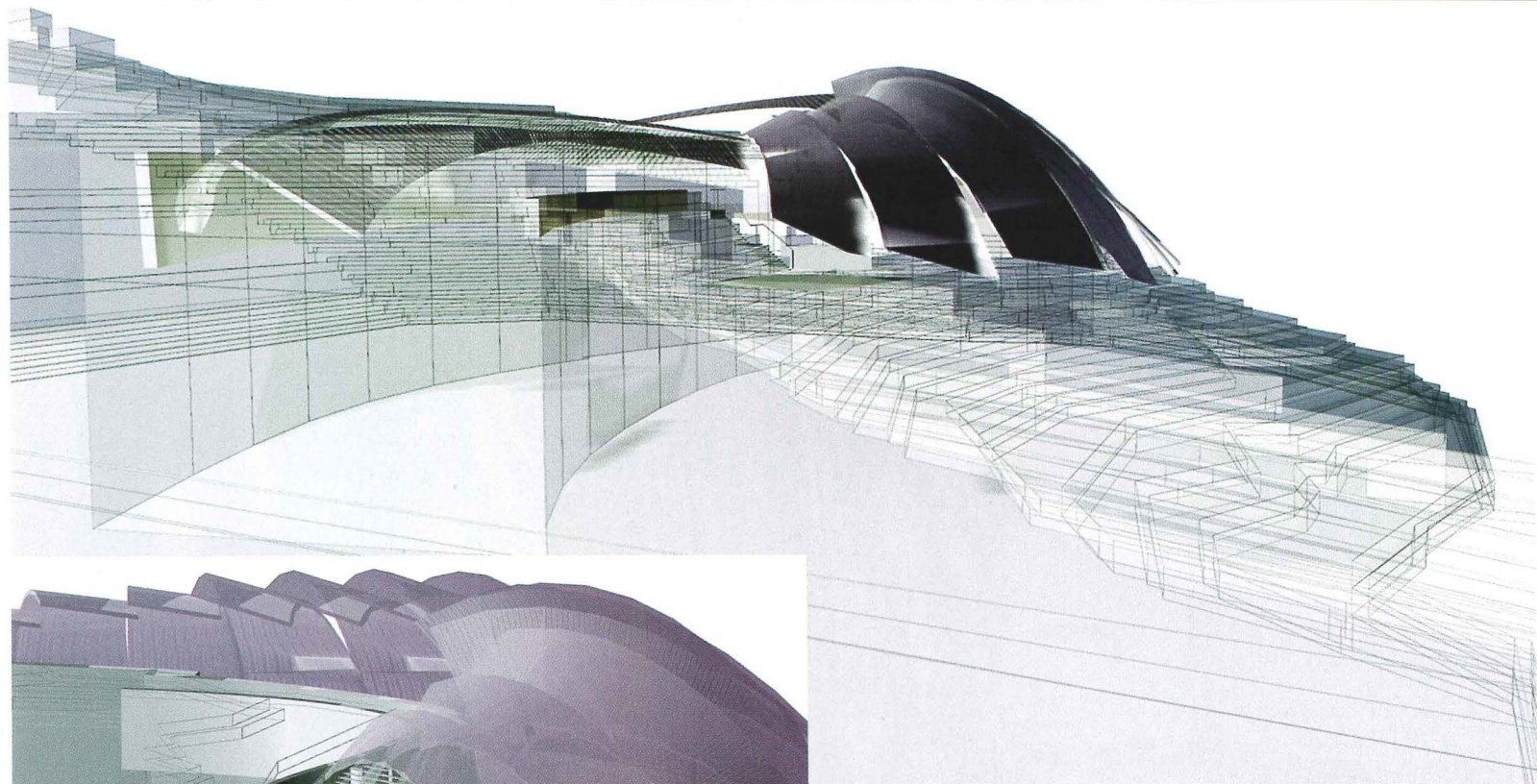




**Glaphyros Apartment,
Paris**

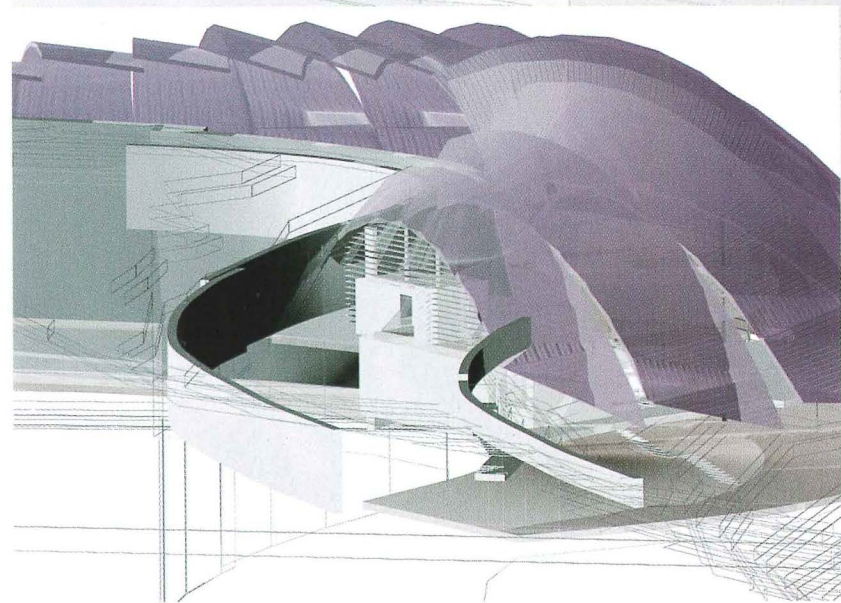
In this residential project, every component—including metal door handles, space-dividing screens, and wash basins—represents a unique experiment in mathematically generated digital production. Even while producing such highly customized elements, rich in complex curves, dECOi manages to keep the fabrication reasonably inexpensive by strategically applying technologies.





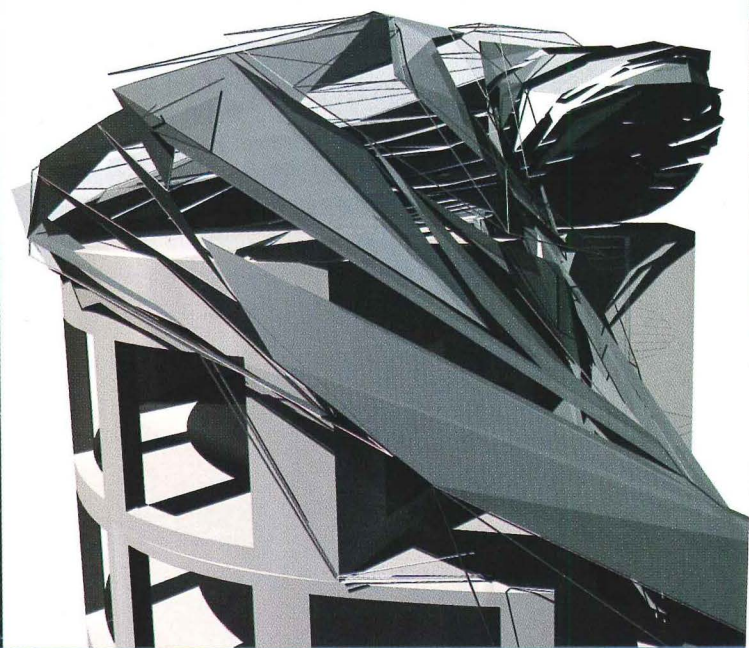
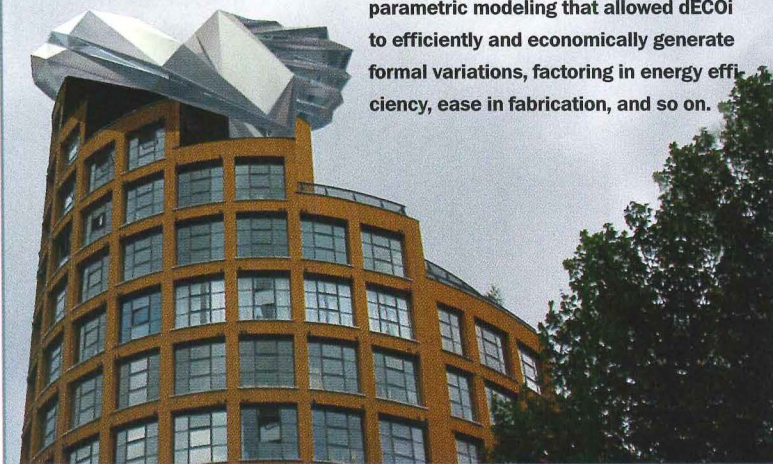
**ECO Taal Ecological
Center, Philippines**

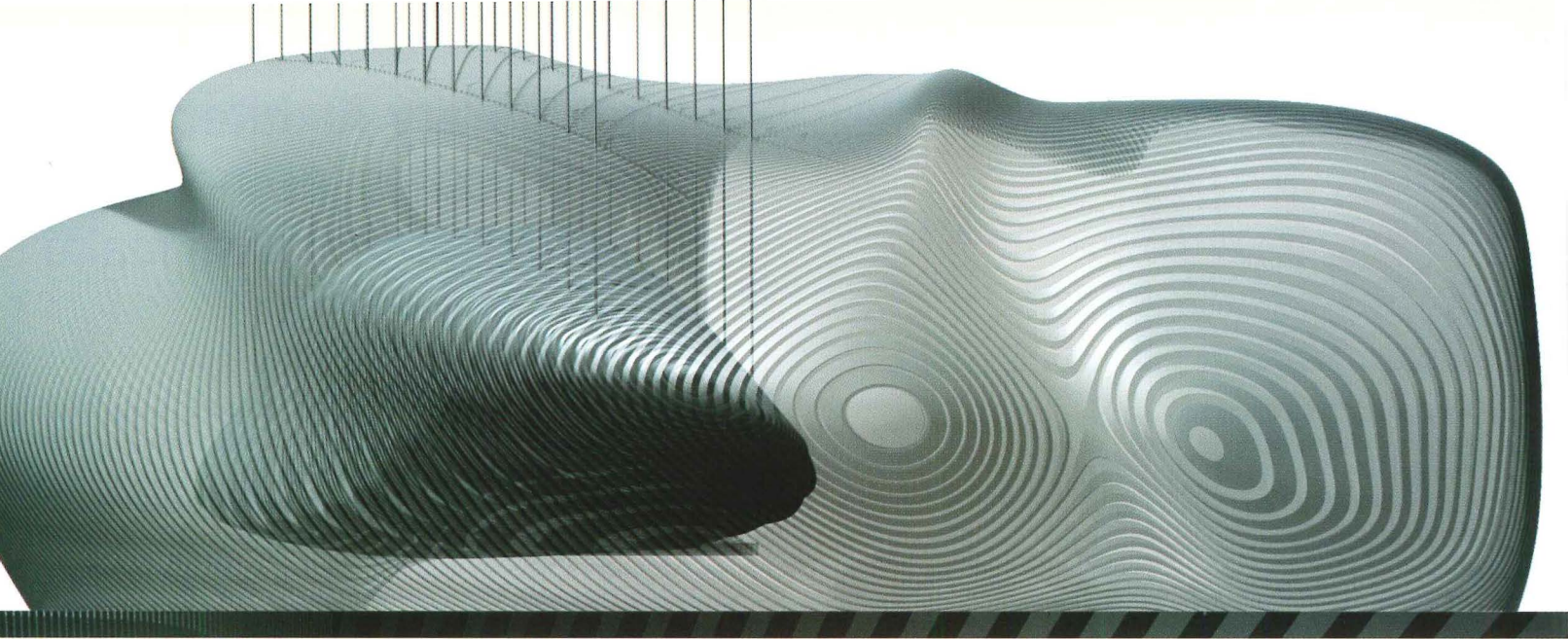
For the key elements of a complex intended for the Taal Volcano crater, dECOi gave ECO Taal a form designed to disappear into the land while simultaneously leaving a strong, clear visual impression. In response to a deeply wooded site, the architects conceived a structure with a carapacelike shell, swelling from the earth. Integral to the terrain, this shelter's jointed slats bend and turn with site contours.



**Bankside Paramorph,
London**

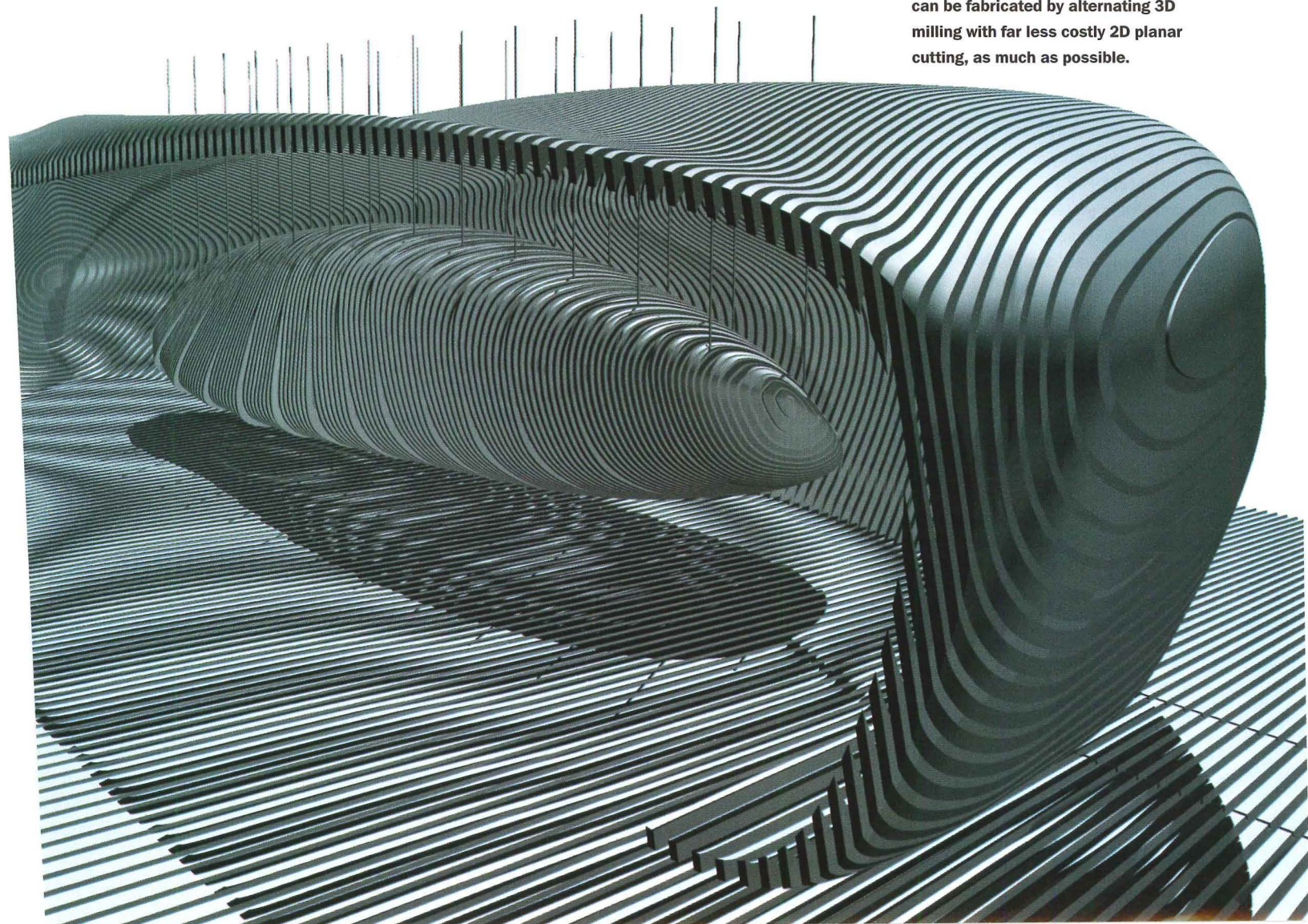
Paramorph literally describes a crystal whose form varies without change to its chemical composition. Here, the word refers to a faceted, spiral, crystalline penthouse extension, and also to the parametric modeling that allowed dECOi to efficiently and economically generate formal variations, factoring in energy efficiency, ease in fabrication, and so on.





Miran Galerie, Paris
and Beijing

This fashion press showroom, with a suspended display system, offers an interior inserted within a larger space. Here, dECOi overcomes the prohibitive costs of 3D CNC-machine routing by using plywood as the primary material and intelligently devising a design that can be fabricated by alternating 3D milling with far less costly 2D planar cutting, as much as possible.





Contemporary Architecture Practice pushes technology and unfolds a seamless realm

By Sam Lubell

Architect: Ali Rahim and Hina Jamelle / Contemporary Architecture Practice

Location: New York City

Founded: 1999

Design Staff: 6

Principals: Ali Rahim and Hina Jamelle

Education: Rahim: Columbia University, M.Arch., 1996; University of Michigan, B.S., 1987; Jamelle: University of Michigan, M.Arch., 1997; Denison University, B.A., 1993

Work history: Rahim: Practice—Payette Associates, 1987–93; Academic—University of Pennsylvania, 1998–present; University of Michigan, 1996–98; Jamelle: Practice—Razorfish, 2000–2002; MGA Partners, Architects, 1998–2000; Academic—University of Pennsylvania, 1999

Key completed projects: Catalytic Furnishings, Multiuse Chaise, Sublime American Design, New York City, 2003; Olympic Leisure Center, Athens, Greece, 2003; Residence for a Fashion Designer, London, 2002; Residential/Recording Loft, New York City, 2000

Key current projects: Light Fixture Series, Ivalo Lighting, 2005; Reebok Flagship Store, Shanghai, China, 2005; Residential Housing Tower, Dubai, U.A.E., 2007

Web site: www.c-a-p.net

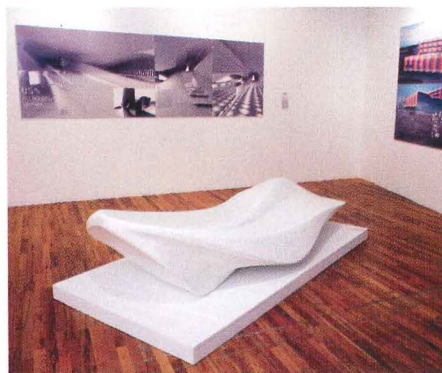
At the Soho studio of Contemporary Architecture Practice (CAP), partner Ali Rahim notes that his firm strives for a “seamless investigation of the potential of digital media.” Seamless indeed. Computers here seem to be hardwired into designers’ brains. “We’re actually holograms,” jokes Rahim. Not quite, but the company uses digital technology every step of the way, from design research to exploration of user scenarios to fabrication. The process produces dynamic forms and projects that are shaped equally by software and human intervention.

CAP is now designing a Reebok flagship store in Shanghai whose sleek, curvilinear contours evoke the aerodynamics of futuristic cars and airplanes. For its design studies, the team utilized 3D modeling programs, such as Alias Studio, Maya, and Rhino (used by the automobile and movie industries), to develop thousands of virtual models whose forms evolved on-screen over time. “You shape it over and over again until you develop the right sensibility,” says Rahim. The final result is a store that curves and unfolds seamlessly into overlapping zones as visitors move through it. By varying the lighting and using composite materials (mostly fiberglass) of different opacities, the firm differentiates the character of each zone and adjusts its “intensity.” Each space, meanwhile, accommodates a variety of uses. For instance, stairs can double as display shelves or seating areas.

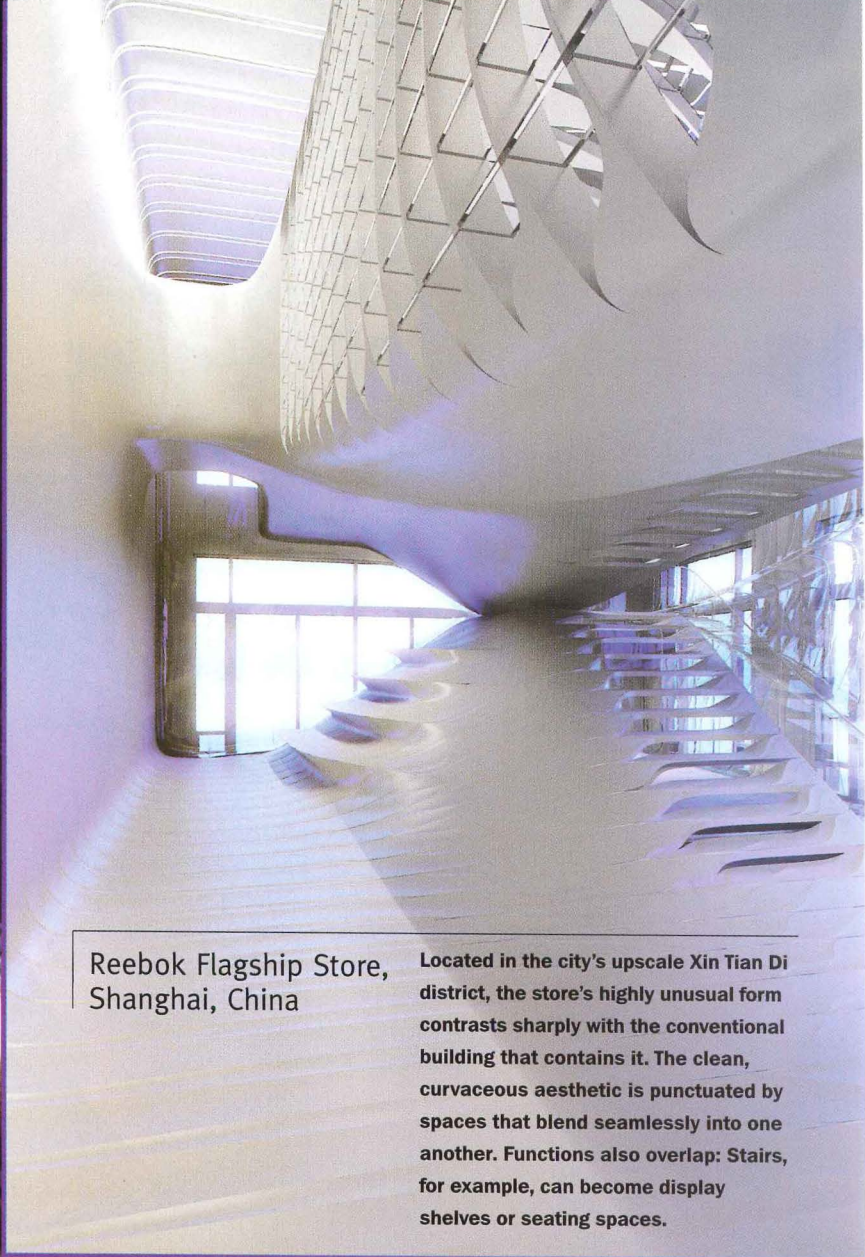
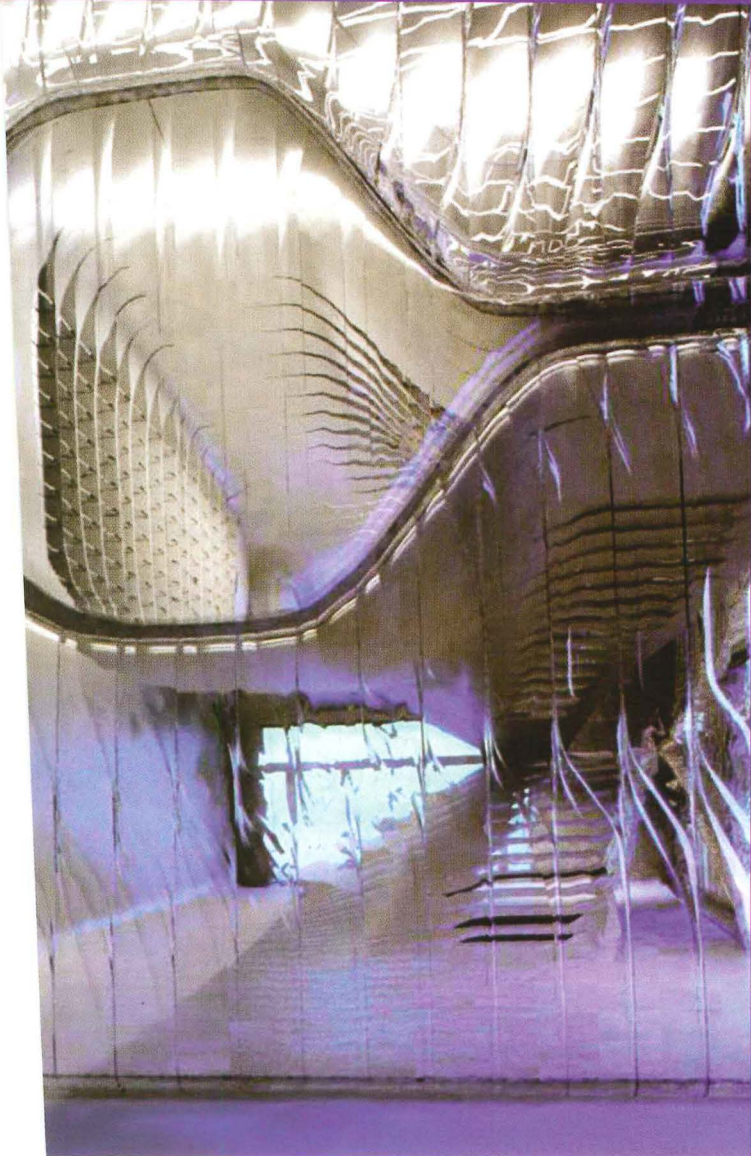
The team makes such diversity of uses a defining characteristic of its work. Its Multiuse Chaise, for instance, curves in several directions to accommodate many ways of reclining. “We want people to find uses that we haven’t even anticipated,” says Rahim. “Who says a couch has to be used only as a couch?” To produce the chair, the firm worked with a manufacturing company to utilize a “variable mold system” that employed a digitally controlled robotic arm to shape the forms.

Rahim, who grew up in the U.K., started CAP in 1999 and joined forces in 2002 with Hina Jamelle, an architect who had been a marketing specialist at Razorfish, a firm that designs Web sites and other Web-based systems. In addition to designing, she shapes the firm’s marketing strategy, using phrases like the “seamlessness between brand strategy and spatial strategy.” Rahim and Jamelle hope to apply such concepts as they progress from winning competitions to building projects. The firm has won five competitions—one for a “performative leisure center” for the 2004 Athens Olympics—but none has moved into construction. The team built a loft for a European pop star in New York, but the client’s desire for privacy has prevented its publication.

One project close to moving forward is a residential tower in Dubai, which features curvaceous pods, each customized for the needs of the clients. The firm has also modeled a fashion designer’s residence in England with rows of minute openings that create a dramatically illuminated hallway doubling as a catwalk for runway shows. Meanwhile, as CAP evolves, Rahim and Jamelle will continue to unlock the potential of the computer, exploring the rich spatial tensions created at the intersection of thought, technology, and form. |

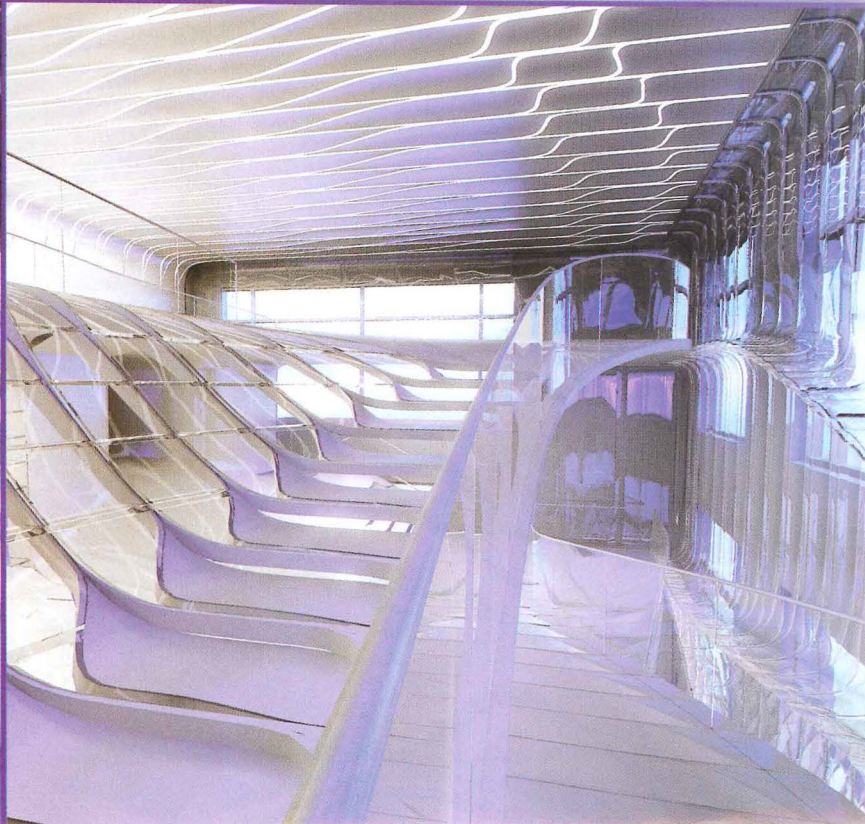


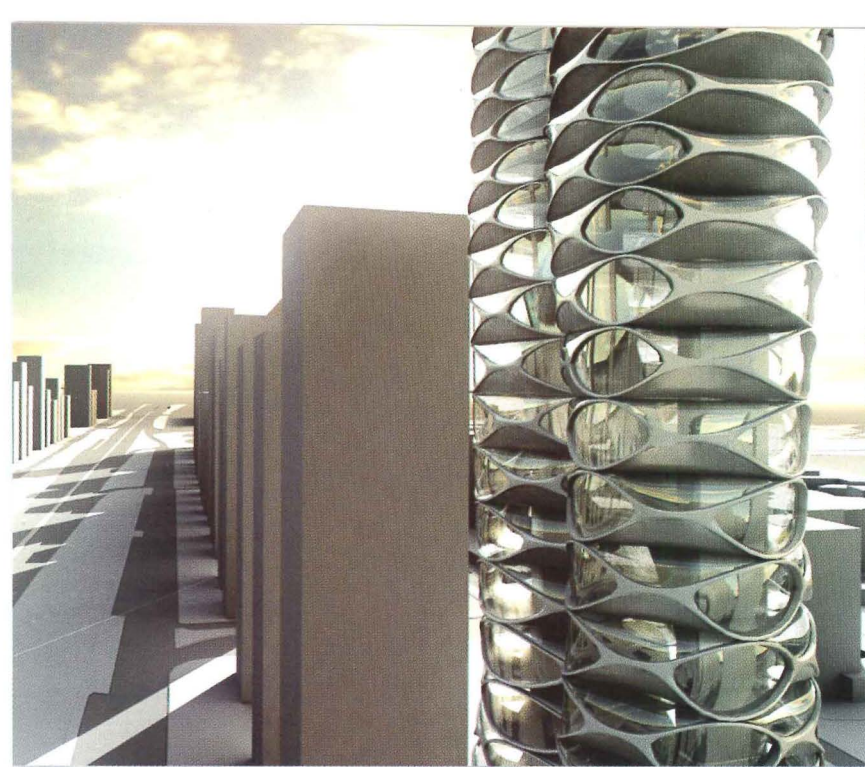
The firm’s Multiuse Chaise accommodates several modes of reclining.



**Reebok Flagship Store,
Shanghai, China**

Located in the city's upscale Xin Tian Di district, the store's highly unusual form contrasts sharply with the conventional building that contains it. The clean, curvaceous aesthetic is punctuated by spaces that blend seamlessly into one another. Functions also overlap: Stairs, for example, can become display shelves or seating spaces.





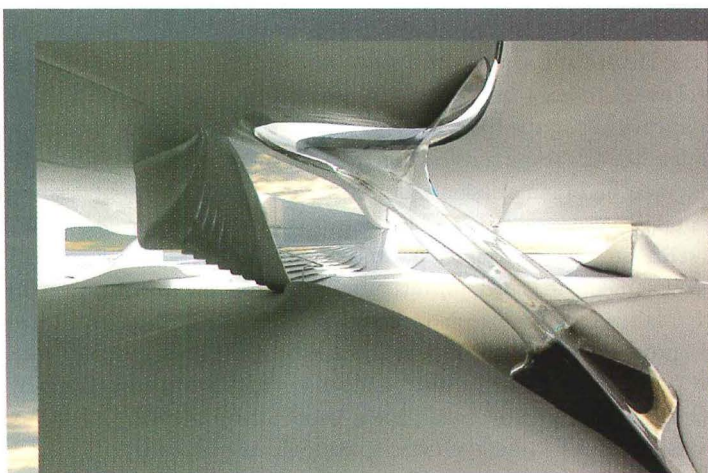
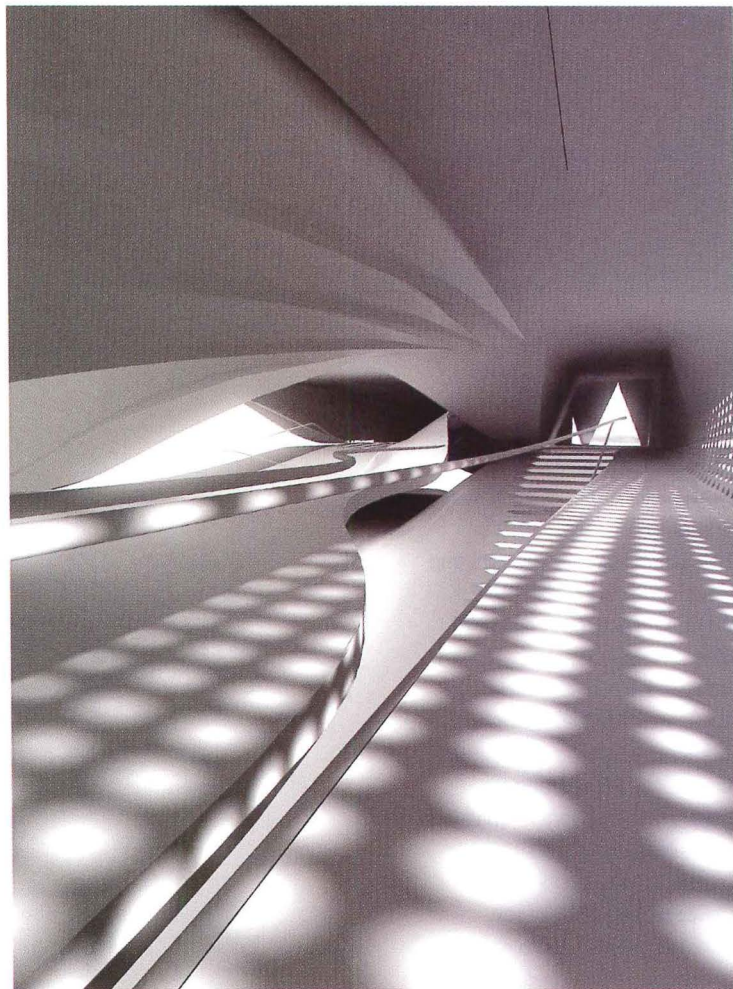
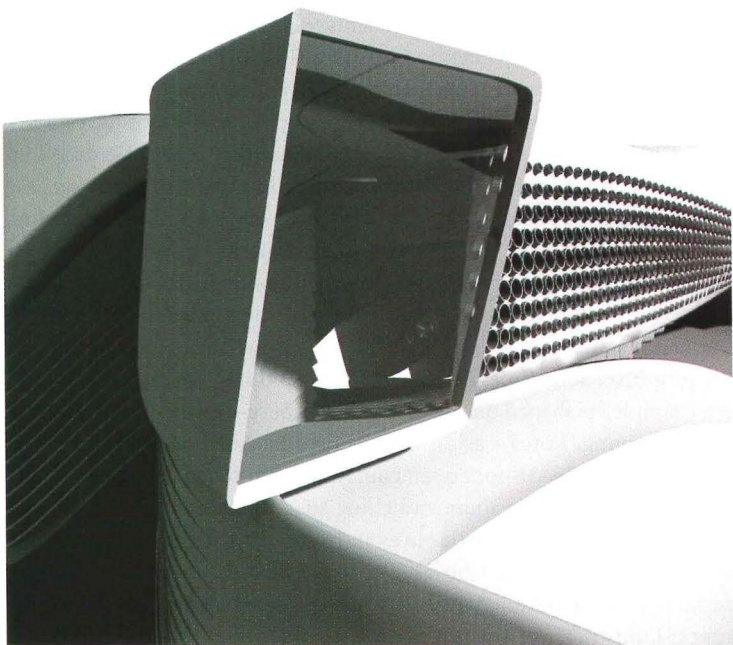
Residential Housing
Tower, Dubai, U.A.E.

This proposed residential tower in Dubai, located on one of the city's busiest thoroughfares, features flexible units whose shapes are dictated mostly by the amount of space they require. Their forms, in turn, affect the layout of the entire floor. This variability results in a highly malleable design for the building as a whole.



Residence for a Fashion Designer, London

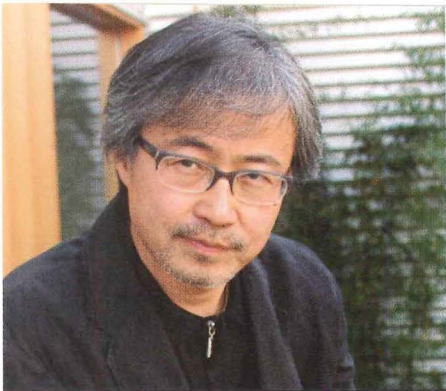
In keeping with its vision of dramatic spaces, the firm designed continuous rows of small exterior windows to create highly variable and intense lighting inside the house. Characteristically, function also varies: A hallway can become a catwalk, while stairs can serve as benches. Each room's layout has a considerable impact on the next, creating an unfolding sequence of spaces.



Olympic Leisure Center, Athens, Greece

The firm's penchant for multiuse forms was well suited to the design of this space, meant to encourage many types of leisure activity for athletes and spectators at the 2004 Athens Olympics. The mostly fiberglass structure's dynamic forms impressed competition jurors like Zaha Hadid and Hani Rashid. But Olympic security costs diverted funds, and the plan was canceled.





Byoungsoo Cho challenges norms in the way design and construction work together

By Clifford A. Pearson

Architect: Byoungsoo Cho
Architects

Location: Seoul, Korea,
and Bozeman, Montana

Founded: 1994

Design staff: 10

Principal: Byoungsoo Cho

Education: Harvard, M.Arch. and
M.Arch., Urban Design, 1991;
Montana State, B.Arch., 1986

Work history: Practice—Junglim
Architects, 1992–94; Gruen
Associates, 1991–92; Donham and
Sweeney Architects, 1986–88;
Academic—Montana State,
1999–present; Kyonggi University,
1996–present; Universität
Kaiserslautern, 1995–96

Key completed projects:
Camerata Music Studio and W.
Residence, Paju, Korea, 2004;
Sukokri Studio House, Yangpyoung,
Korea, 2004; C-Shaped Metal Roof
House, Bockpori, Korea, 2003;
Village of Dancing Fish, Facility for
Mentally Challenged, Paju, 2000

Key current projects: PaiChai
University, College of Fine Arts and
Architecture Building, Daejeon,
Korea, 2005; Soemi Furniture
Gallery and Café, Jai-dong, Korea,
2005; Ramp Building, Seoul, Korea,
2006; Wire Museum, Yang-San,
Korea, 2006

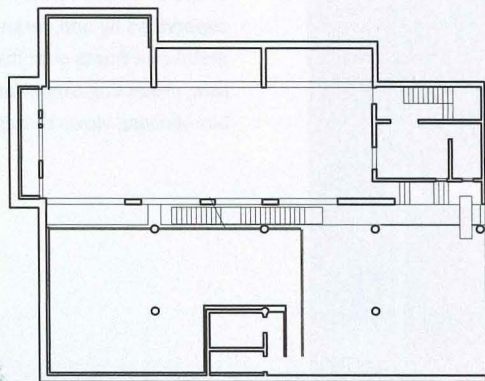
Web site: None

Millions of years ago, Montana and Korea were next to each other. That's what one of my students told me that he saw in a geology book," says Byoungsoo Cho, trying to explain his attraction to Big Sky Country. Cho, who teaches architecture at Montana State University, first felt Montana's pull in the 1980s when, inspired by the writings of Mark Twain, he set out on a road trip through the American West. He ended up studying architecture in Bozeman and returned 13 years later, after earning a master's degree at Harvard and setting up a practice in his native Seoul. Now he shuttles back and forth, teaching in Montana and running a firm with its main office in Seoul and a satellite in Bozeman.

"I'm fascinated by the industrial, agricultural buildings of Montana," states Cho. "In my work, I try to contrast the contemporary and the primitive. Sometimes I intentionally keep things rough, not refined." For example, he shaped the Sukokri Studio House—overlooking rice fields in Yangpyoung, Korea—as a simple square box, 46 feet by 46 feet, and carved out a 16-by-16-foot open courtyard in the center. "I designed the hole in the center as a moon-watching space. Keeping the primitive in mind puts mystery back in our lives and lets us experience subtle changes in nature," he explains. Cho also kept the house's details very simple, designing steel doors and windows without frames on the outside, so they appear industrial, and creating a frameless skylight in which 3-inch-thick laminated glass is set directly into concrete.

Growing up in Korea, Cho studied pottery before discovering architecture. To this day, his work retains the imprint of the hand in its materiality and details. Most of the time, he builds as well as designs his projects and has set up a construction arm within his firm. "The building process has become so specialized today, with each player having a different role. I want a more organic, more open process," says Cho, who takes pleasure in challenging the basic tenets of project-delivery management. For example, the day before construction was to begin on the Sukokri house, he threw away his original design and started from scratch—without delaying the building process. "I realized that a two-story structure made the site's hill seem too small. So I came up with a more primitive one-story square." Of course, being the client for this project gave him the freedom to make such a last-minute change. Now he's talking about subverting the usual work process even further, hoping to construct three 10-foot-square concrete boxes and then invite three different architects to create works by cutting openings into the solid planes. "I call this 're-finding,'" says Cho, "reversing the design-build process, so it's build, then design."

While this may sound like some high-art concept, Cho's architecture has a strong base in social responsibility. When he started his firm in Seoul in the early 1990s, most of his projects were houses for poor families. Using his students as free labor, he helped his clients build small courtyard houses on narrow alleys. Now Cho is working on larger projects, including a commercial building in Nonhyun-dong, an architecture building at PaiChai University, and a museum for a wire manufacturer in Yang-San. When asked about his transcontinental life, he says, "I grew up in Korea but learned architecture in the U.S. So I'm like a chef who learned to cook in America but uses ingredients from Korea." ■



Camerata Music Studio
and W. Residence,
Paju, Korea

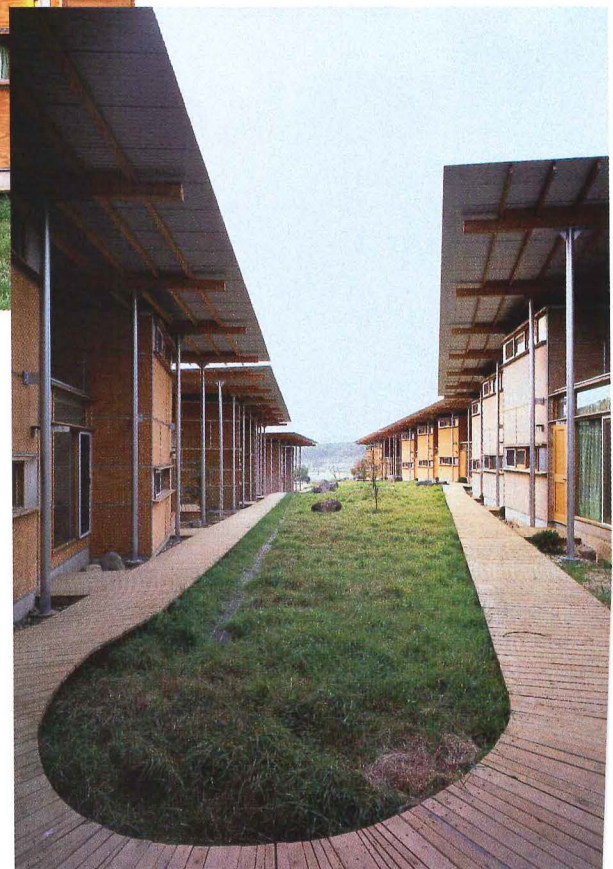
Designed for a television anchorman and his family in a suburb of Seoul, this residence includes a large studio for listening to the client's extensive collection of music. Cho tried to capture the feeling of a Montana barn with its tall interior space and limited fenestration. Daylight penetrates the building in dramatic fashion, adding a spiritual dimension to the experience of listening to music.

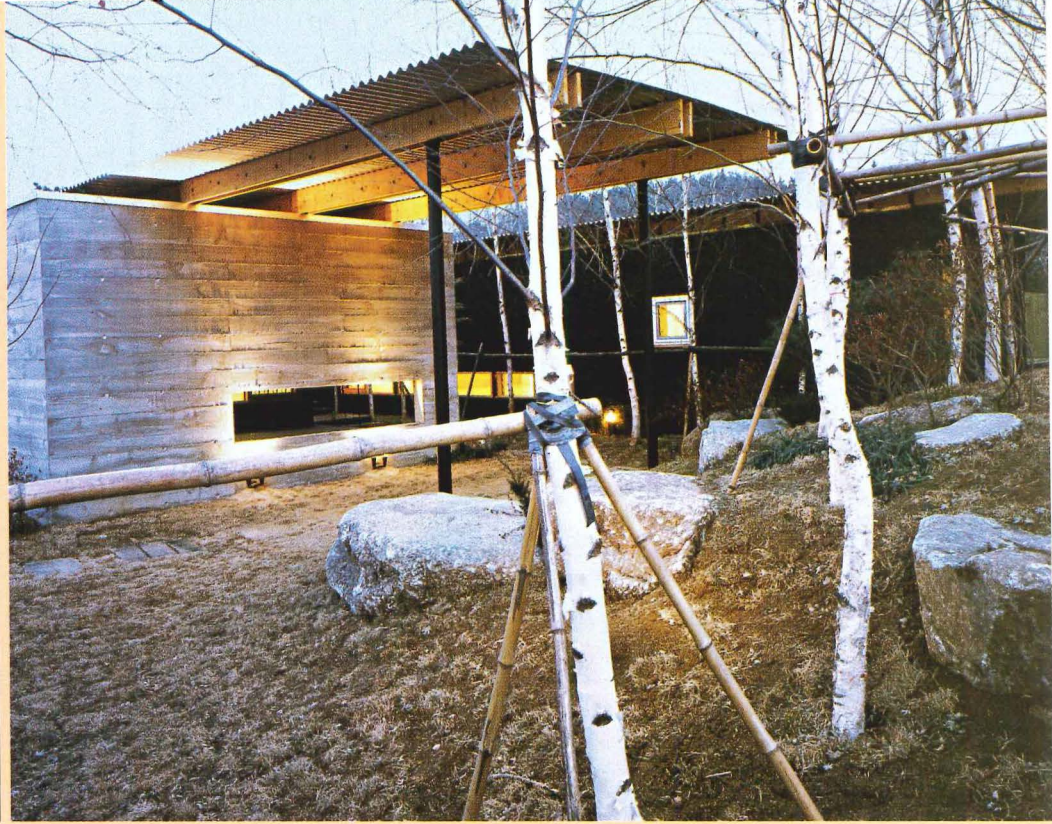
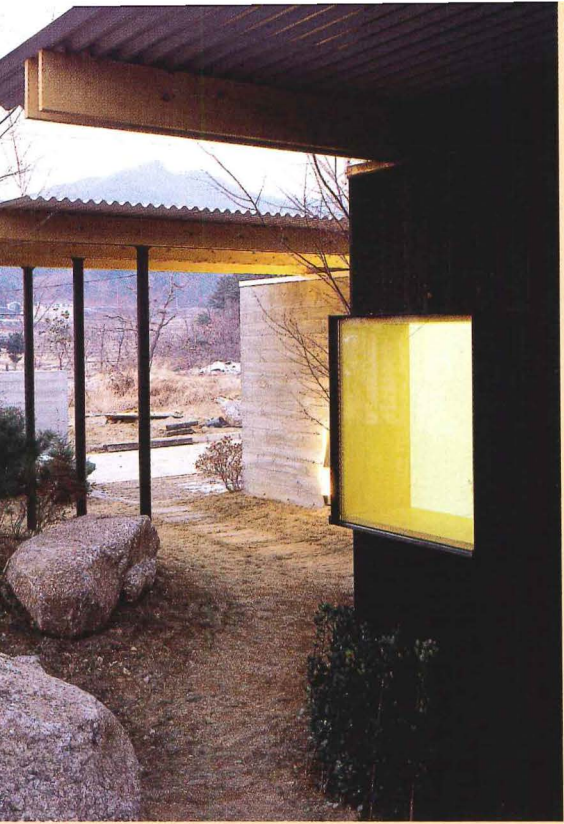




Village of Dancing Fish,
Paju, Korea

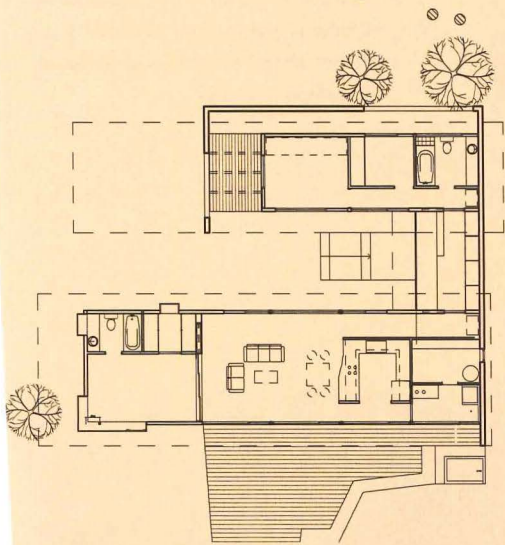
Part of a complex for the mentally handicapped, this dormitory embraces its hillside site and forms an enclave for people who have little sense of direction. Cho broke the building into clusters of two or three rooms, which can be supervised by one person. A continuous metal roof floats over the plywood clusters, protecting them from the elements but allowing views through the building.





C-Shaped Metal Roof House, Bockpori, Korea

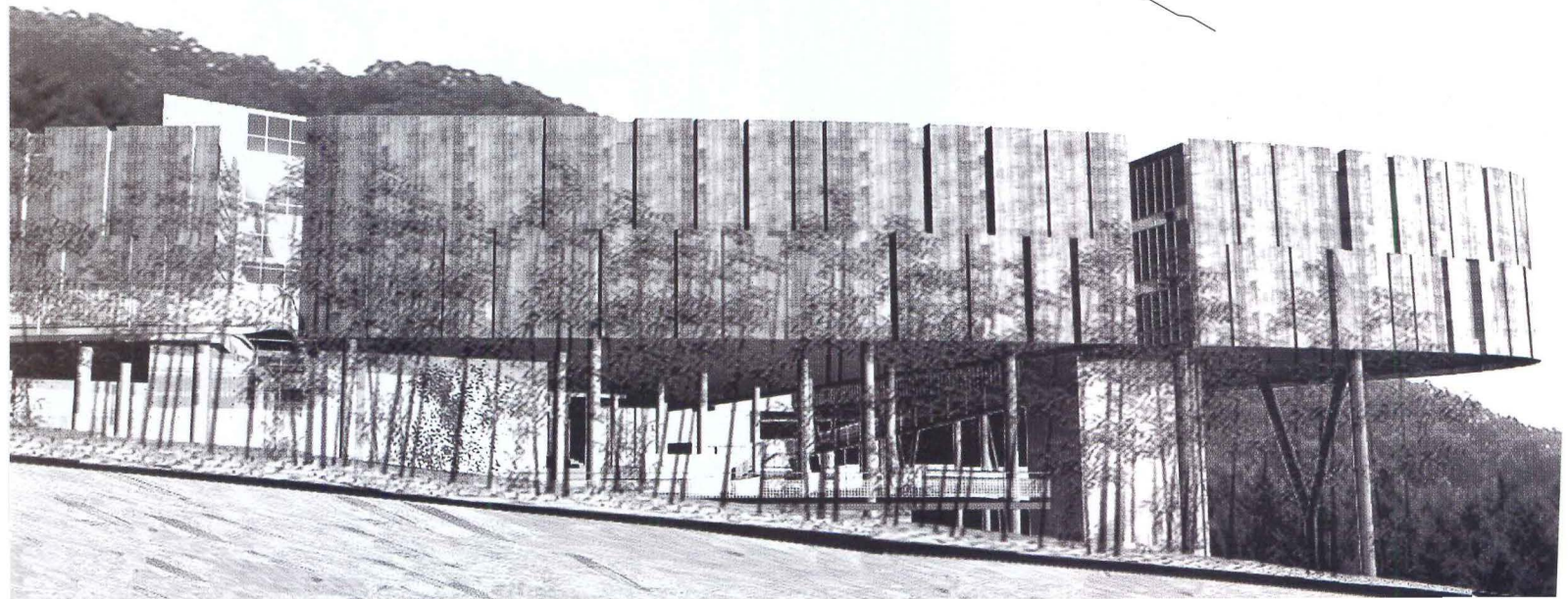
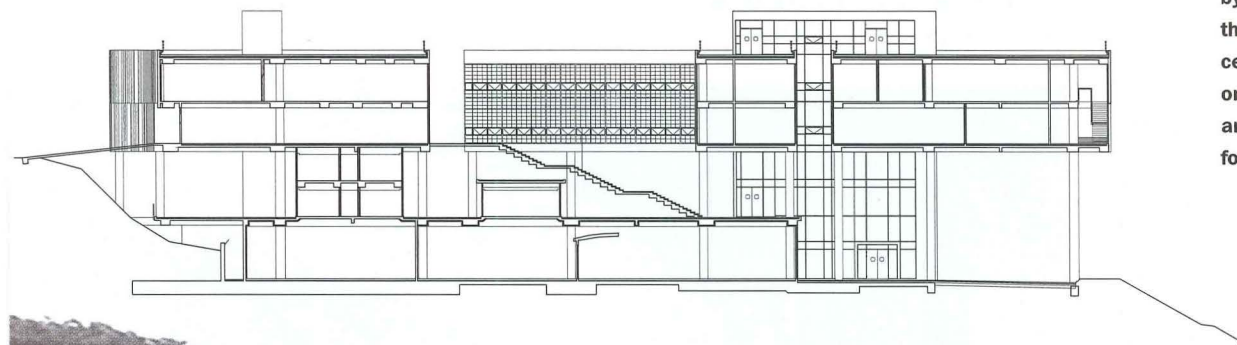
Years of agriculture and development had flattened the site of this house, so Cho decided to “heal” the property by adding a small hill and designing a simple house that hugs the earth. The flat roof expresses the beauty of the horizon, and the C-shaped plan forms a central courtyard that brings daylight inside. Concrete and timber work together to create a rough but sensual palette.

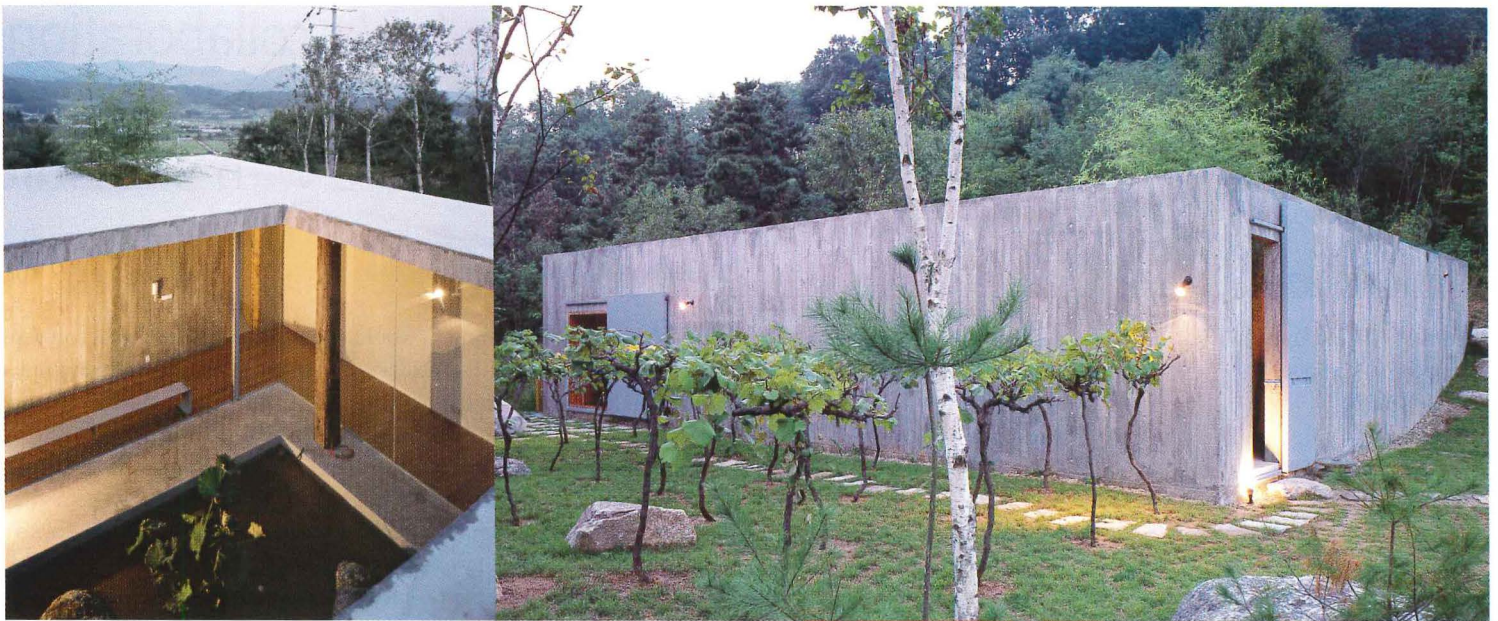




PaiChai University
College of Architecture,
Daejeon, Korea

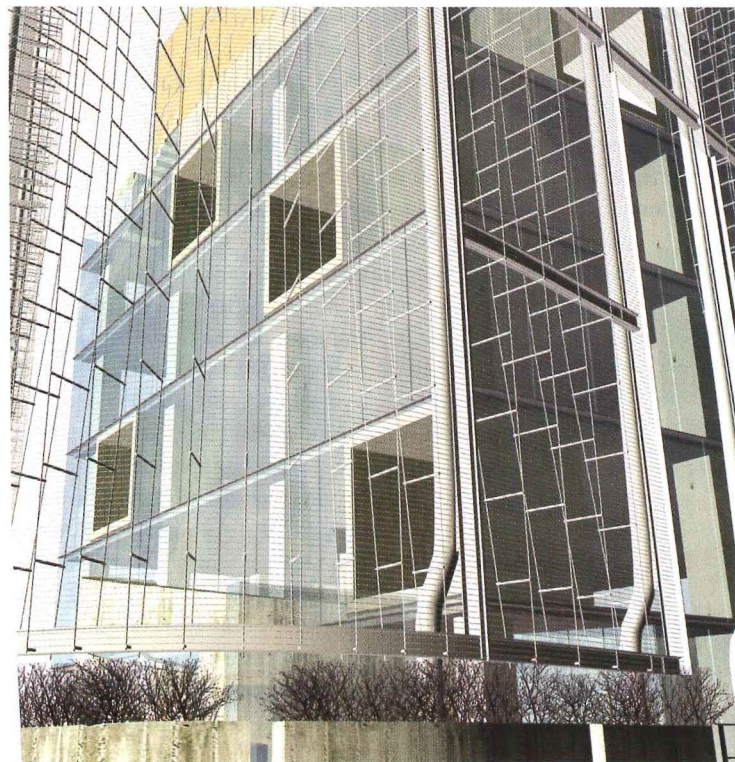
To connect the college's three components—art, architecture, and music—Cho designed a dark corridor around the perimeter of the building penetrated by tall narrow windows. Classrooms, on the other hand, look onto a light-filled central courtyard. Lifting the building on columns above the hillside site, the architect created spaces underneath for outdoor learning.





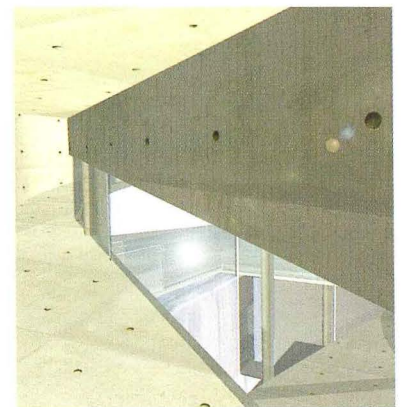
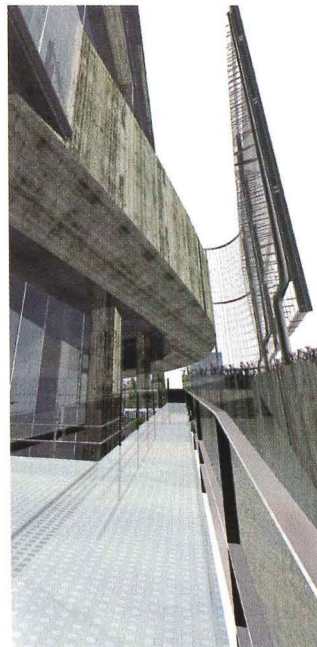
**Sukokri Studio House,
Yangpyoung, Korea**

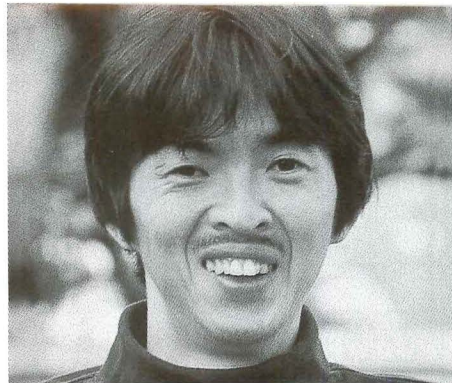
Overlooking quiet rice fields, this house—designed by Cho for himself—provides a welcome retreat from the hectic pace of Seoul. Cho wanted the house to appear industrial on the outside but engage nature from within, so he used simple concrete for the exterior and carved out a “moon-viewing” courtyard in the center. He also kept details such as window frames very simple.



**Ramp Building,
Seoul, Korea**

A dark, “cavelike” ramp winds its way up and through this mixed-use office building in a busy part of Seoul. A long, low window provides limited views of the city from the ramp, giving visitors a new perspective on the urban context. Cho wrapped the corner of the site with a “penetrable blanket” of wire mesh that contrasts with the heavy ramp. Below grade, a wine bar overlooks a waterfall.





Masaki Endoh's collaborations with his engineer creatively fuse architecture with structure

By Naomi R. Pollock, AIA

Architect: Masaki Endoh/EDH

Location: Tokyo, Japan

Founded: 1994

Design staff: 4

Principal: Masaki Endoh

Education: Tokyo University of Science, M.Arch., 1989, B.Arch., 1987

Work history: Practice—

KAI-Workshop, 1989–94;

Academic—Tokyo University of Science, 2000–present

Key completed projects: Natural Seam, Ichikawa, Chiba, Japan, 2004; Natural Strata, Kanagawa, Japan, 2003; Natural Wedge, Tokyo, 2003; Natural Ellipse, Tokyo, 2002; Natural Slats, Tokyo, 2002; Natural Illuminance, Tokyo, 2001; Natural Shelter, Tokyo, 1999; Natural Unit, Kanagawa, 1999; Hatudai Apartment, Tokyo, 1997

Key current projects: C-House, Tokyo, 2005; Y-House, Nagoya, Japan, 2005; Natural Seam 2, Ichikawa, Japan, 2006

Web site: www.edh-web.com

If he could, Masaki Endoh would wave a wand and make all columns and beams disappear. Collaborating with the engineer/architect Masahiro Ikeda, Endoh has been conjuring ways to minimize structural elements—whether by rendering them as thin as possible or by disguising them as wall panels and shifting loads to hidden roof trusses.

The pair already holds a patent on a structural system they devised for Natural Seam, a model house-turned-art-gallery on Tokyo's outskirts. Beneath a ceiling-embedded, 16-inch-deep steel truss, the architect was free to rearrange the 1.6-inch square structural columns within any 52-square-foot area. This flexible system adapts readily to most plan shapes, currently allowing Endoh to apply it to an 18-unit apartment complex with an irregular profile, generated by the surrounding natural landscape.

Though Endoh and Ikeda have separate firms, they maintain an ongoing dialogue about the fusion of architecture and structure, extending far beyond the standard designer-consultant relationship. It began when Endoh was working at KAI-Workshop, an architectural firm specializing in residential work, and Ikeda at the office of structural engineer Mutsuro Sasaki. When Endoh launched his solo practice with the creation of his own home, he sought Ikeda's input. The two agreed that they "didn't like columns," explains the engineer. So they put the vertical supports outside the exterior walls, yielding column-free quarters for Endoh and his family on the third floor, above column-free spaces for his office and his parents, as well as a ground-floor rental unit.

The duo went on to design Natural Unit, a home for an acoustical engineer and a concert pianist that blends living space with a music studio by creating a single large room inside a 4-inch-thick, concrete-hyperbolic-paraboloid shell. The dramatic shape, secured by a steel-plate deck with noise-absorbing panels, yields an echo-free and structurally sound interior.

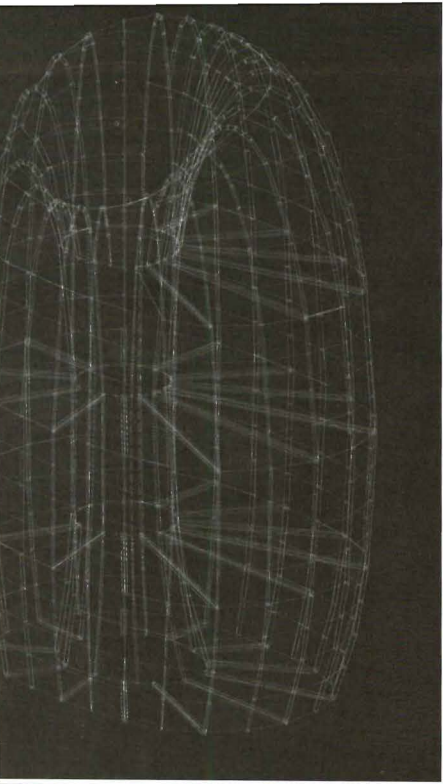
Whereas Natural Unit stands out in suburbia, with plenty of open space setting off its unique geometry, Natural Ellipse fills a tiny site in the heart of Tokyo's Shibuya entertainment district. "Usually clients prefer suburban houses with gardens, but this owner likes shopping, restaurants, and playing in the city," says Endoh, grinning widely. On a site hemmed in by bars and love hotels, where rooms rent by the hour, windows weren't a real option, so Endoh created a toplit form: a duplex, clad in a rigid, fiber-reinforced plastic shell, puffed out like a giant white balloon.

Taking advantage of the virtually windowless outer enclosure, the designers distributed structure at its perimeter. Though the unusual oblong shape looks complex, it is secured by just 24 elliptical steel rings carrying vertical and horizontal loads. The frame construction simply entailed standing laser-cut steel hoops on end and tying them together with horizontal bands.

Currently, the twosome is working on C-House (left), a small structure supported by only two columns and a bold steel box, made of 0.6-inch-thick steel sheets. Both a load-bearing element and an enclosure of habitable space, the box deftly blends architecture and structure—epitomizing the Endoh-Ikeda collaboration. ■

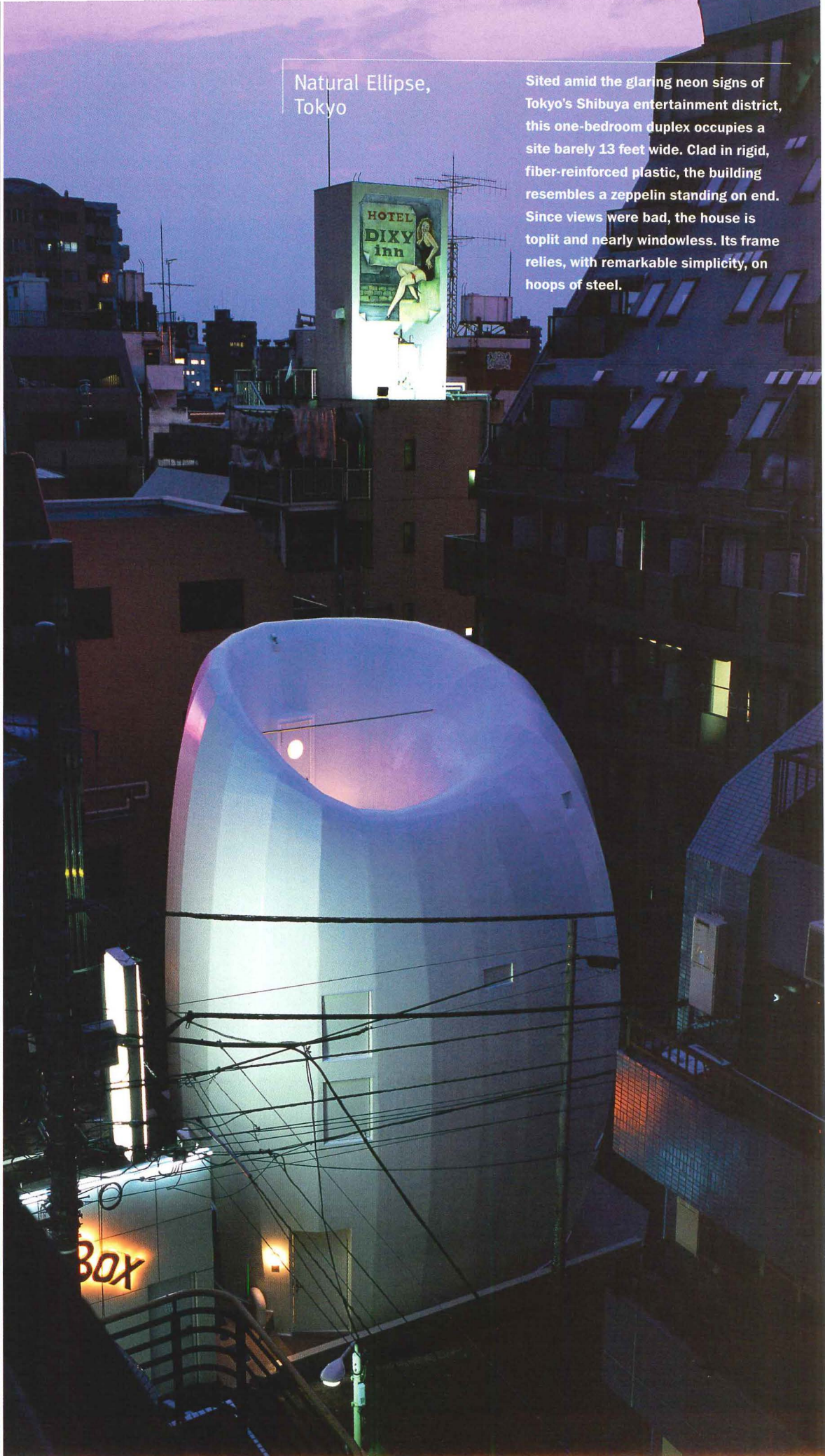
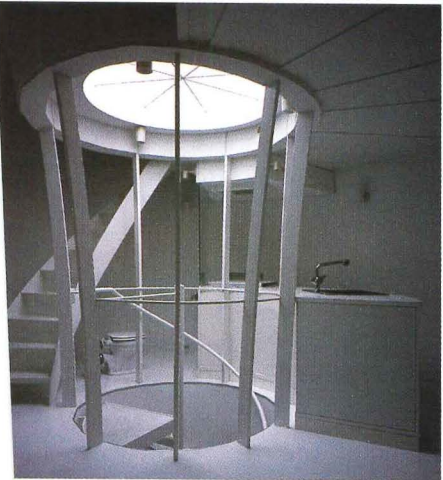


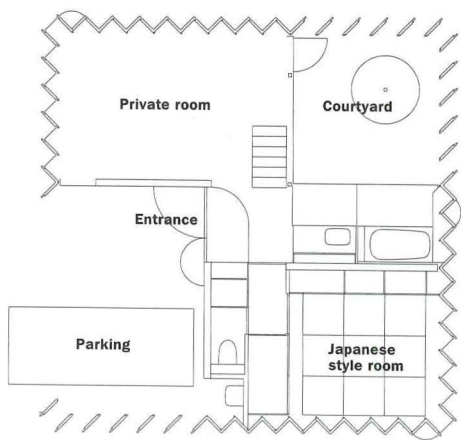
The 850-square-foot C-House (above) will rise in a Tokyo commercial zone.



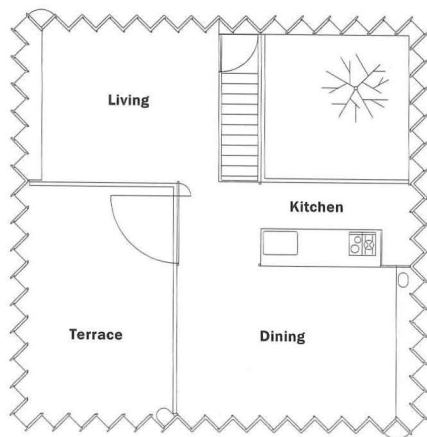
Natural Ellipse, Tokyo

Sited amid the glaring neon signs of Tokyo's Shibuya entertainment district, this one-bedroom duplex occupies a site barely 13 feet wide. Clad in rigid, fiber-reinforced plastic, the building resembles a zeppelin standing on end. Since views were bad, the house is toplit and nearly windowless. Its frame relies, with remarkable simplicity, on hoops of steel.

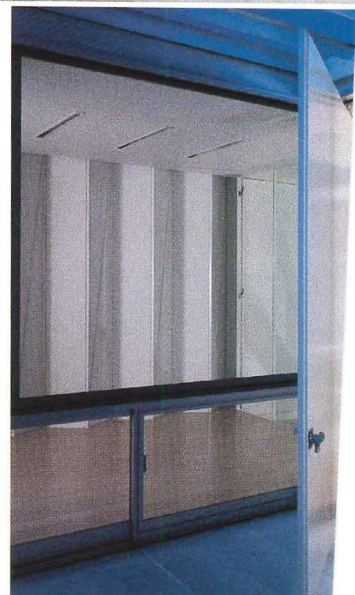




FIRST FLOOR

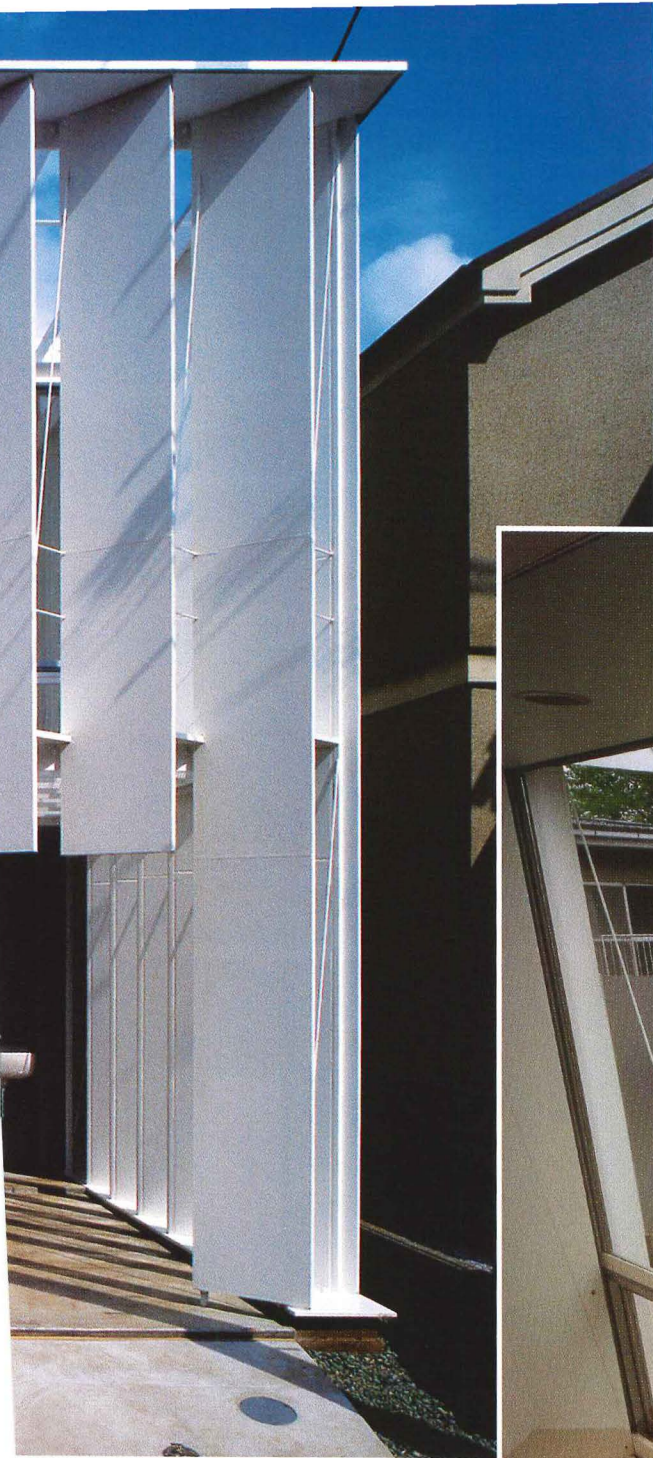


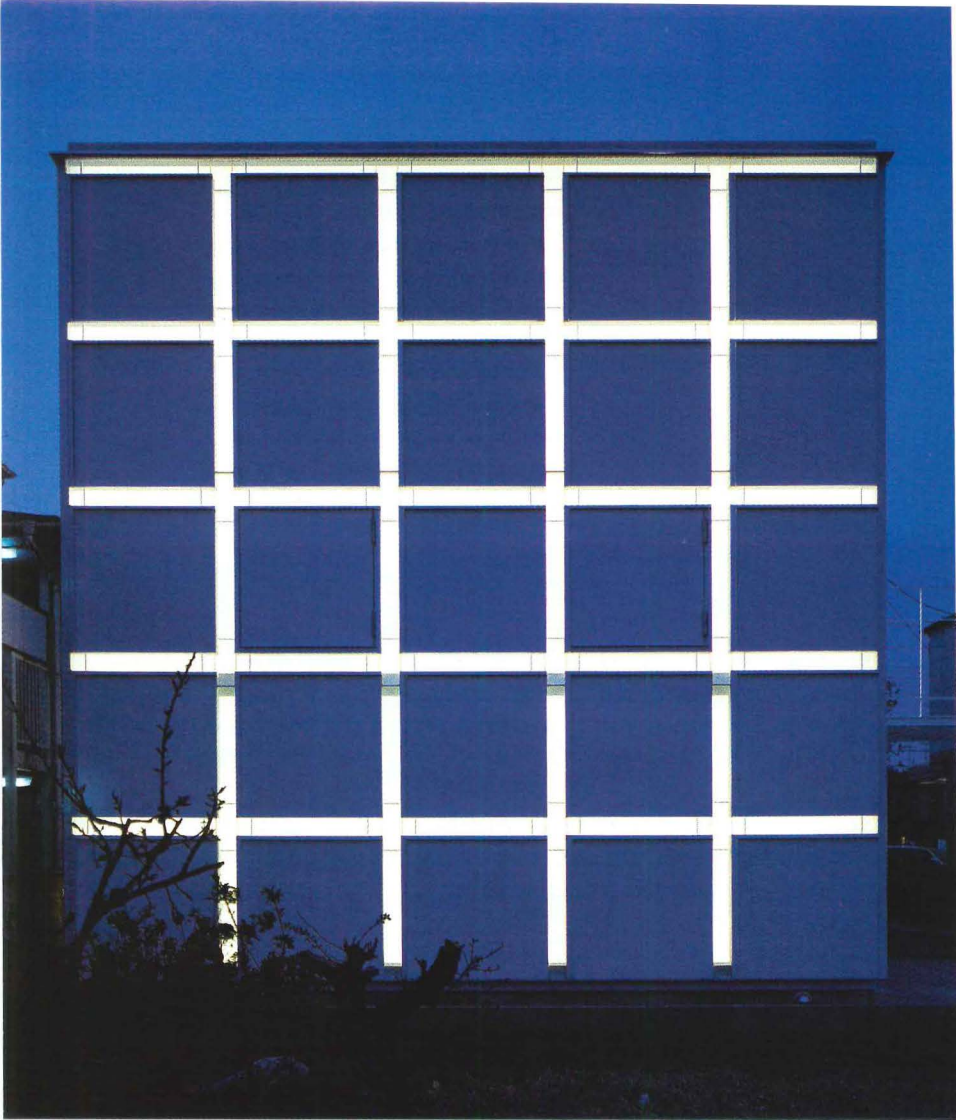
SECOND FLOOR



Natural Slats,
Tokyo

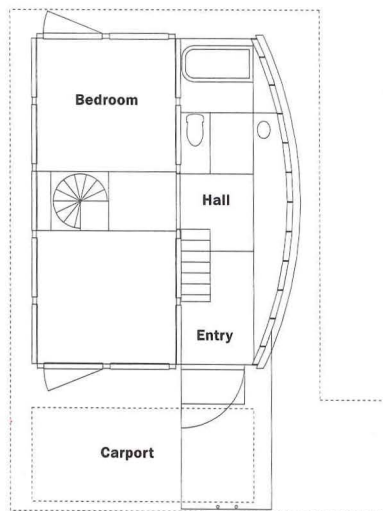
For a residential site measuring less than 1,000 square feet, the architect filled the entire suburban Tokyo lot, rather than leave odd swatches of land around the house and its sole parking space. Endoh's solution engages a system of vertical slats that wrap indoor space, as well as such semi-outdoor areas as a driveway and roof deck. Here, the simple, single large volume projects a stronger presence than a set of more diminutive elements might have.



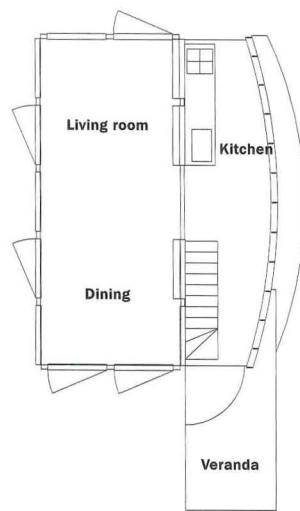


Natural Illuminance,
Tokyo, Japan

This challenging urban site offered a narrow strip of land in a densely packed Tokyo residential district. Endoh addressed issues of privacy and boundaries with a gridded facade. Here, light enters only between square wall units of insulated steel, some of which incorporate storage. The house includes greater expanses of glazing on other elevations.



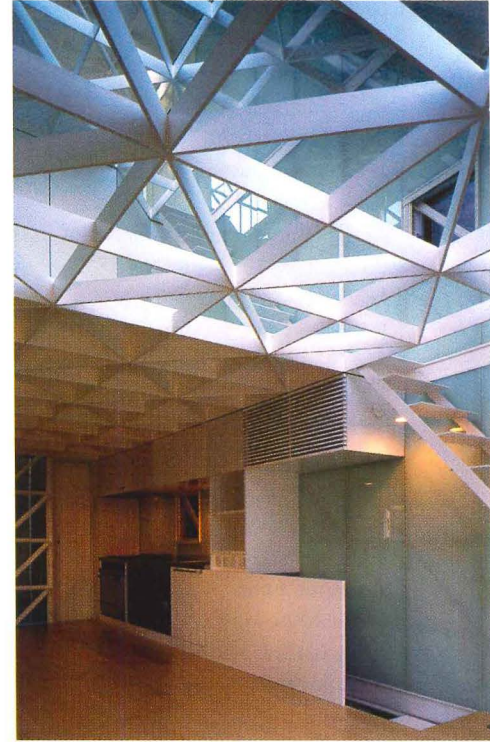
GROUND FLOOR



FIRST FLOOR

Natural Wedge,
Tokyo

For a Tokyo site with a narrow frontage and footprint measuring less than 650 square feet, Endoh designed a 45-degree-wedge house. The shape complies with legal height restrictions while optimizing daylight entering the north-facing structure. Maximizing space and energy efficiency, Endoh devised a thin, translucent skin—a polyester insulating material mounted on a steel frame.



Natural Seam,
Ichikawa, Chiba, Japan

This model house-turned-art-gallery established a prototype for a flexible structural system. Beneath a steel truss, the building is supported on structural columns, which could have been repositioned to fit nearly any plan shape.





Inspired by a fascination with stairs, Akira Yoneda's projects step in ever-new directions

By Naomi R. Pollock, AIA

Architect: Architecton
Location: Tokyo, Japan
Founded: 1991
Design staff: 4
Principal: Akira Yoneda
Education: Harvard GSD, M.Arch., 1991; Tokyo University, M.Eng., 1984, B.Eng., 1982
Work history: Practice—Takenaka Corporation, 1984–89; Academic—Kyoto Institute of Technology, 2004–present
Key completed projects: HP, Tokyo, 2004; Conoid II, Tokyo, 2004; BLOC, Kobe, Japan, 2002; Conoid, Tokyo, 2002; Beaver House, Tokyo, 2002; nkm, Tokyo, 2001; Ambi-Flux, Tokyo, 2000; House E, Kanagawa, Japan, 1999; White Echoes, Tokyo, 1998
Key current projects: White Base, Tokyo, 2005; M House, Tokyo, 2005; BLOC II, Kobe, 2006; BLOC III, Kobe, 2006

A device that introduces movement into static space” hooked Akira Yoneda on design, he recalls. That device was the stairway. So his graduate studies in architectural graphics at Tokyo University culminated in a thesis on Le Corbusier’s use of stairs. But then, Yoneda’s education and training shifted mode. “Those initial studies were,” he explains, “very interesting, but a little removed from architectural design.”

After a five-year stint—and lots of hands-on experience—at Takenaka, the construction giant, he remedied his design deficit by earning an M.Arch. degree at Harvard’s Graduate School of Design.

Upon returning to Japan, Yoneda got his chance to try his hand at stairs in White Echoes, a 1998 Tokyo house for a couple with three children and a live-in grandfather. Though small, the property straddled two zoning areas: one low-scale residential and the other higher-scale commercial. Capitalizing on this disparity, Yoneda’s firm, Architecton, conceived of the building in section, with a tall vertical volume housing a stair around a central void, and a lower volume containing most of the living spaces.

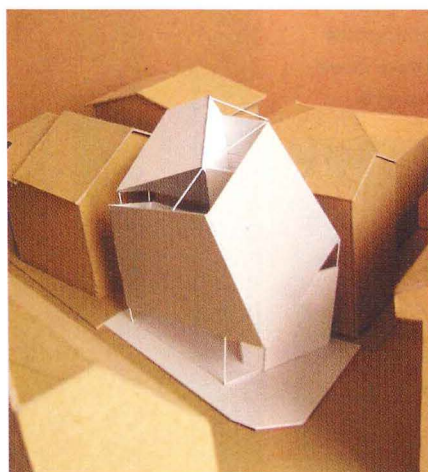
But the architect’s talents really stood the test with Ambi-Flux, a so-called pencil building in the heart of Tokyo. A five-story structure, it stands on a 13-foot-wide site, squeezed between a bicycle repair shop and a Japanese greasy spoon. The building rises from two floors of rental offices to the owner’s three-story quarters, plus roof garden. At the home’s core, a 39-foot-high void extends up to a glass roof. A folded-metal stair winds around this light-filled court, ascending to a bath and bedrooms.

Ambi-Flux marked a turning point for Yoneda: his first collaboration with Masahiro Ikeda, the structural engineer of choice for many young Tokyo designers. An architect himself, Ikeda is prized for his willingness to investigate new, often unheard of ways to make buildings stand.

The Yoneda-Ikeda team later produced BLOC, a house in Kobe’s Rokko Mountains. Taking advantage of the site’s spectacular Inland Sea view, while editing out neighboring buildings, the architect raised and dramatically cantilevered the main volume, hovering it over a glass-enclosed stair that anchors the structure to the ground.

In HP, a hybrid post-and-beam house, Yoneda and Ikeda created a “twisted” wall: a hyperbolic paraboloid of dry-wall construction that is sculptural, functional, and structural, creating an outdoor, off-street parking spot and, indoors, a huge reflecting panel for the abundant rays filtering through a skylight overhead.

Yoneda’s current projects on the boards include a four-unit apartment building and a 6,000-square-foot house for a 30-something illustrator with a strong cult following. Inspired by the client’s futuristic cartoons, the designers stacked four boxy volumes, placing living spaces at the top, a studio below grade, and a pristine garage for the owner’s DeLoreans and Ferraris in between. Big and brawny, the building bends skyward. With a scale jump from Yoneda’s previous work and structural innovation that let the top story hang from the back of the house, the architect seems to be stepping in new directions. ■

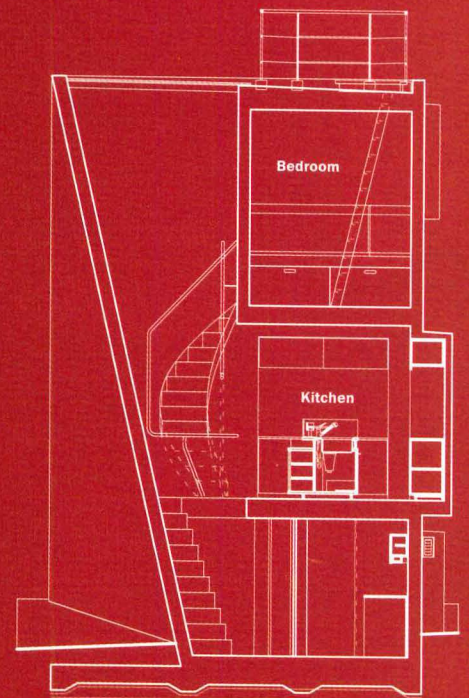


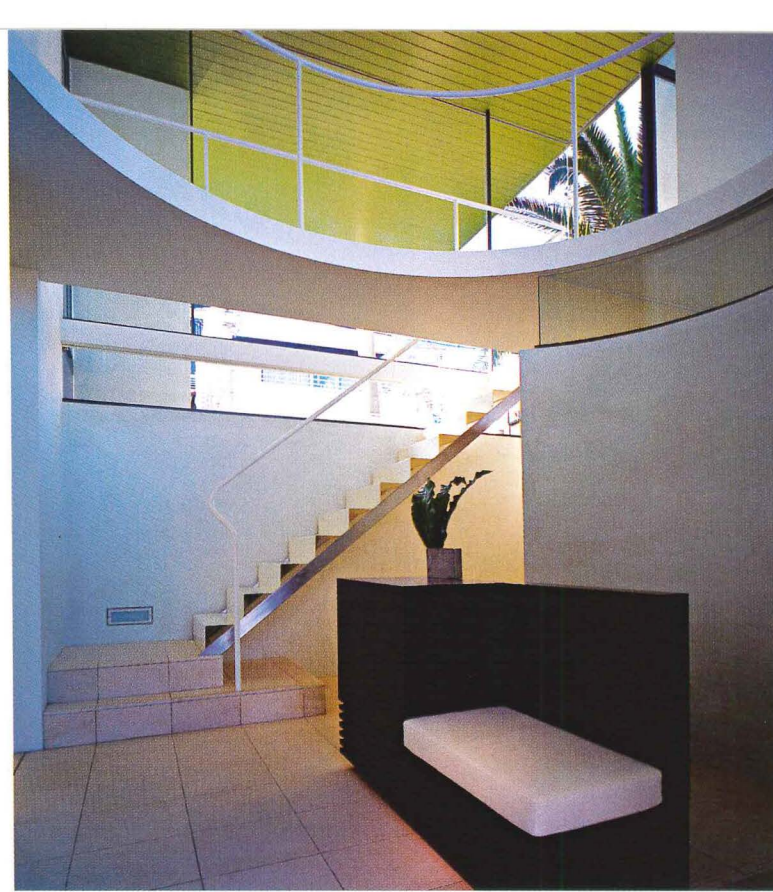
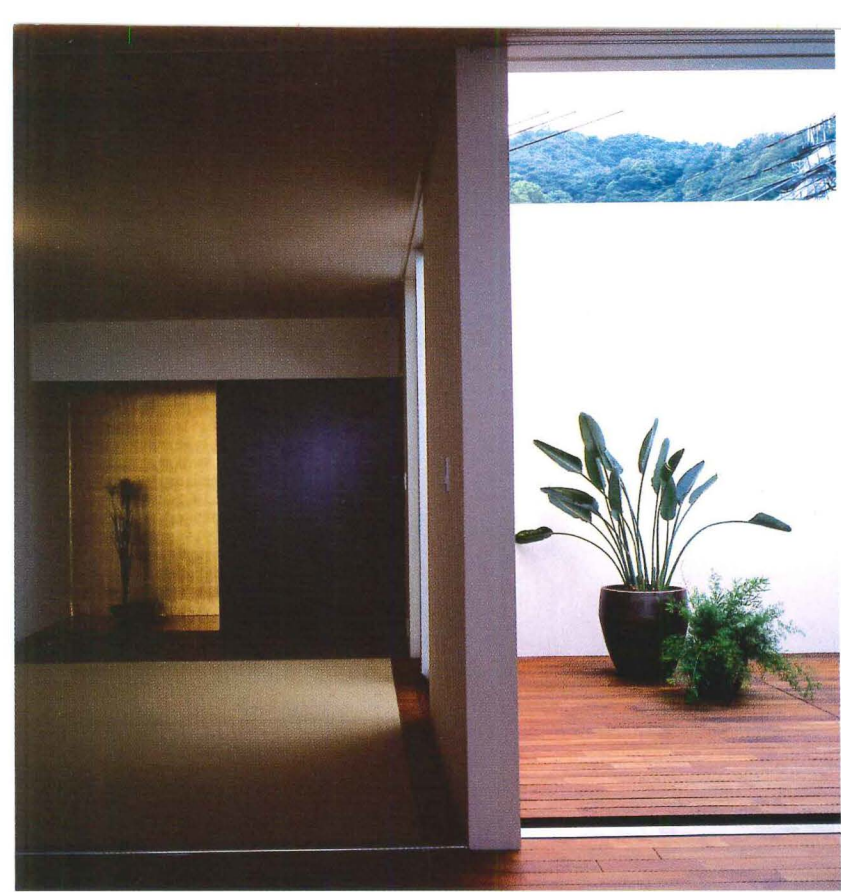
M House, in Tokyo (above), is slated for completion in 2005 or 2006.



HP,
Tokyo

For this 664-square-foot timber-frame house, a hybrid post-and-beam structure, Yoneda and Ikeda created a “twisted” exterior wall. With this sweeping gesture, the hyperbolic-paraboloid (HP) surface performs sculpturally, functionally, and structurally, creating off-street parking and a three-story reflecting panel for rays passing through the skylight.







**BLOC,
Kobe, Japan**

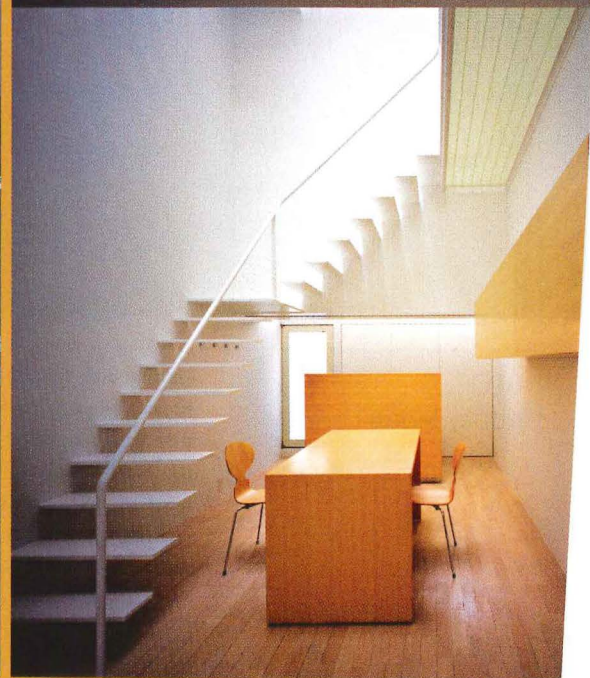
Yoneda built this 2,610-square-foot house for a woman who had lost her family homestead in the Great Hanshin earthquake of 1995. Taking advantage of spectacular sea views, while editing out neighboring structures, the architect raised and dramatically cantilevered the main volume, allowing it to hover over a glass-enclosed stair that anchors the building to the ground.





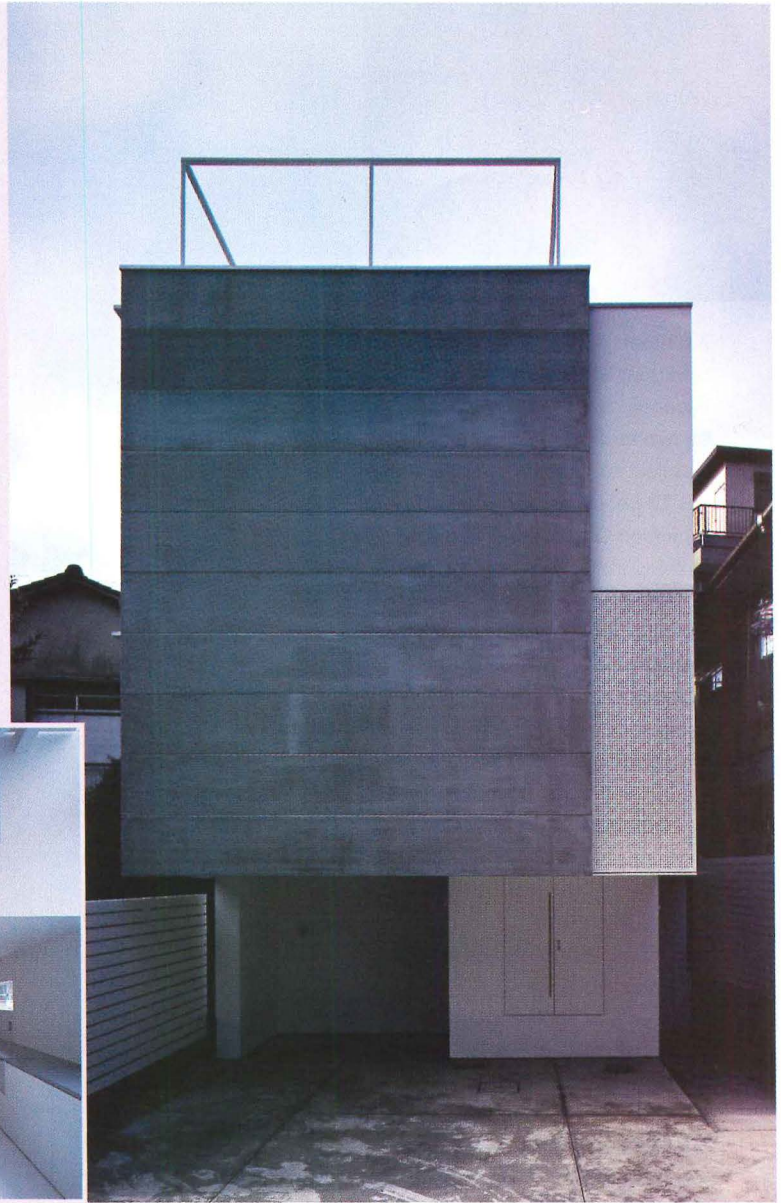
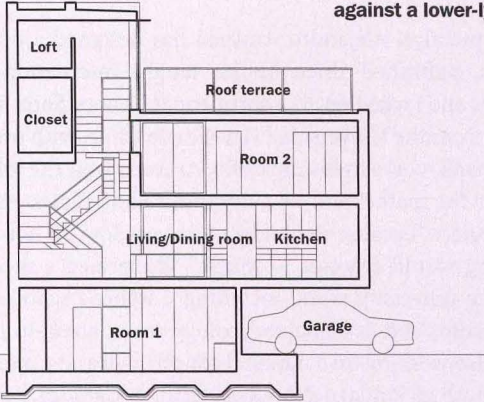
**Ambi-Flux,
Tokyo**

Ambi-Flux, a five-story pencil building in the heart of Tokyo, stands on a 13-foot-wide site, squeezed between a greasy spoon and a bicycle repair shop. This structure marks the first collaboration between Yoneda and Ikeda. The owner's three-story quarters, with a roof garden, rises above two floors of rental office space. At the home's core, a 39-foot-high void extends up to a glass roof.



White Echoes, Tokyo

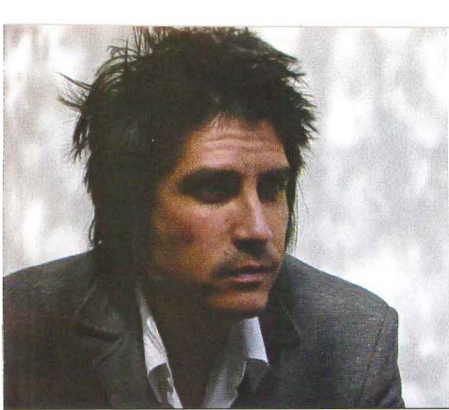
After returning to Japan from his studies in the U.S., Yoneda designed White Echoes, a Tokyo house for a couple with three children and a live-in grandfather. The small property straddles a low-scale residential and a higher-scale commercial zone. Capitalizing on the disparity, the scheme plays a tall vertical volume against a lower-lying one.



White Base, Tokyo

This 6,000-square-foot house, in Tokyo's dense urban outskirts, will provide a young illustrator with a home and studio. Inspired by the client's futuristic cartoons, the scheme offers dramatic cantilevers. Here, a stack of four boxy volumes place living spaces at the top, a studio below grade, and a pristine, white garage for DeLoreans and Ferraris in between.





Alejandro Aravena pursues a dual path: high-profile projects and low-income housing

By Nancy Levinson

Architect: Alejandro Aravena

Location: Santiago, Chile

Founded: 1994

Design staff: None. Hires people on a project-by-project basis. Currently has 10 people working in office.

Principal: Collaborates with other architects on a project-by-project basis: Fernando Perez (Medical School); Luis Lucero (Medical, Mathematics, and Architecture schools); Lorena Andrade (Architecture School); Claudio Blanco (Montessori School); Jorge Christie and Victor Oddó (Pirehuevo House); Charles Murray, Ricardo Torrejón, Alfonso Montero (Siamese Towers and Elemental); Andres Iacobelli (Elemental)

Education: Universidad Católica de Chile, B.Arch., 1992

Work history: Academic—Harvard Graduate School of Design, 1999–present; Universidad Católica de Chile, 1994–present

Key completed projects: Medical School, Universidad Católica, Santiago, 2004; Montessori School, Santiago, 2001; Mathematics School, Universidad Católica, Santiago, 1999; Sculptor's House, Santiago, 1998

Key current projects: Architecture School, Universidad Católica, Santiago, 2004; Elemental Quinta Monroy, Iquique, Chile, 2004; Pirehuevo House, Pirehuevo Lake, Chile, 2004; Siamese Towers, Universidad Católica, Santiago, 2005

Web site: www.elementalchile.org

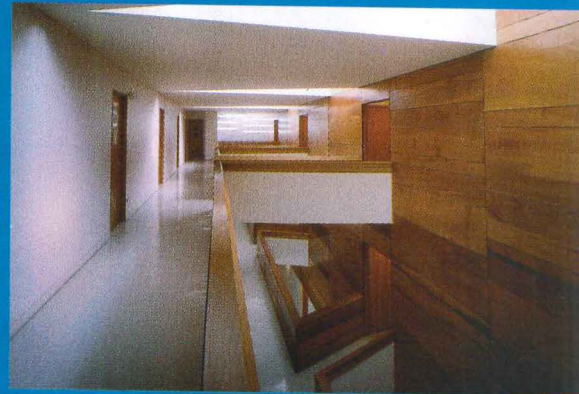
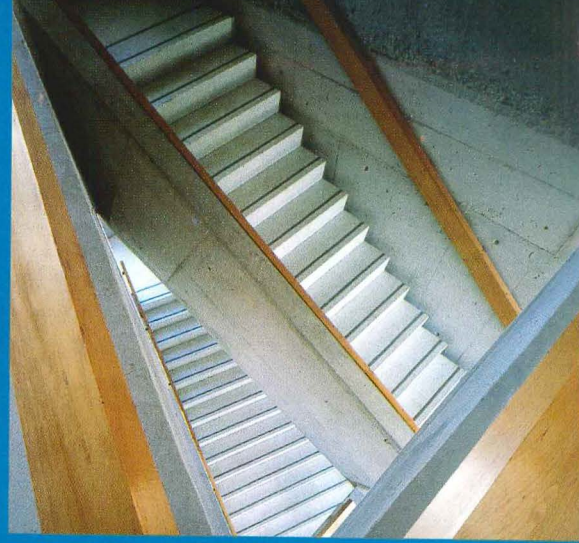
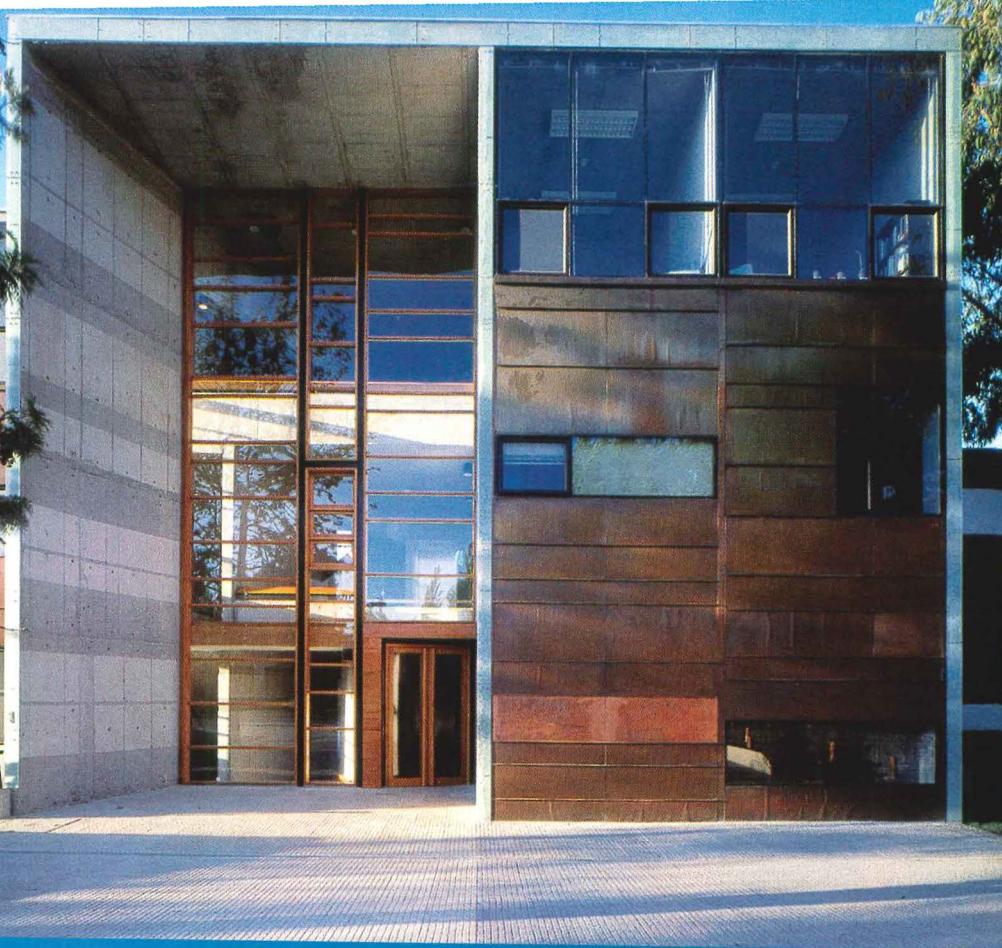
In a decade of practice, Alejandro Aravena has designed a dozen major projects, published three books, taught internationally, exhibited widely, and racked up an assortment of honors. Soon after his 1992 graduation from the Universidad Católica de Chile, with only a few residential and retail works in his portfolio, Aravena won the job to design a building for the mathematics faculty of his alma mater. As he recalls, he got the project “because the budget was very low, so nobody expected the building would amount to much.” The project’s success earned Aravena more university work, including Católica’s schools of medicine and architecture, and its digital technology center, about to start construction. He is also working on a national concert hall and a metropolitan promenade, both in Santiago. Now a professor at Católica, he has also been a visiting professor at Harvard for the past five years.

Yet what especially excites Aravena these days is not his growing international profile, but rather his ongoing involvement in the design of low-cost housing. In 2001, along with fellow Chilean architect Pablo Allard and engineer Andrés Iacobelli, Aravena founded Elemental, a non-profit organization dedicated to solving the problems of what they term “scarcity housing.” And as part of the group Taller de Chile, Aravena helped design the Quinta Monroy community for 100 families in northern Chile; the new housing, which replaces an illegal development, is a prototype for Elemental’s ambitious social housing agenda. “In Chile, more than 10 percent of the population is without housing,” says Aravena. “This is a problem that really matters.” Inspired by the 1927 Weissenhofseidlung housing exhibition in Stuttgart, Elemental organized an international competition for the design of seven communities of about 200 units each in cities throughout Chile. The competition attracted more than 730 entries, even though the constraints were daunting: Housing units could cost no more than \$7,500, and their designs had to anticipate the owner-occupants’ do-it-yourself expansions. In November 2003, the jury selected seven winners. Construction is to start next year. Elemental has allowed Aravena to satisfy his longstanding goal of “using architecture to solve nonarchitectural problems.” As he says, “I’m not running the race that will lead to publication in *El Croquis*. I’m more interested in connecting with readers of *The Economist* and *Time*.” Nowadays, he is as likely to be meeting with World Bank executives and government ministers as with design-world colleagues.

Publication venues aside, Aravena’s focus on bare-bones housing is not counter to but rather part of his ongoing exploration of form and tectonics. While traveling in Venice as a student, Aravena spent his days out in the field, sketching and measuring buildings. “I needed to connect very directly with the body of knowledge of my discipline.” The architect’s connection with this knowledge informs both his professional practice and his public work. And so it’s no surprise that Aravena believes that good design will be essential to Elemental’s success. As he puts it, “In social housing, good design is good policy.” ■

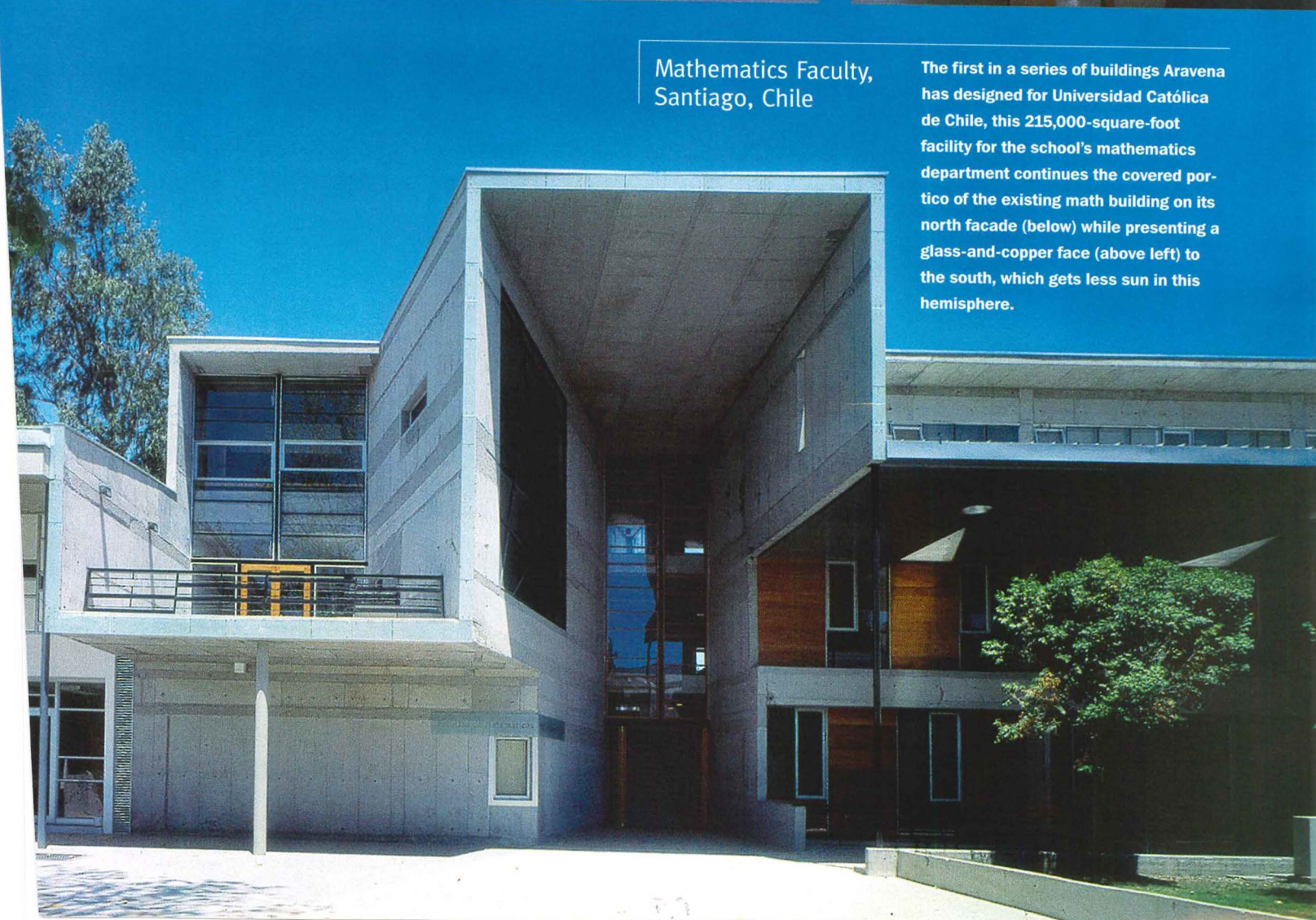


Elemental is building this low-income community in Iquique, Chile, for 100 families.



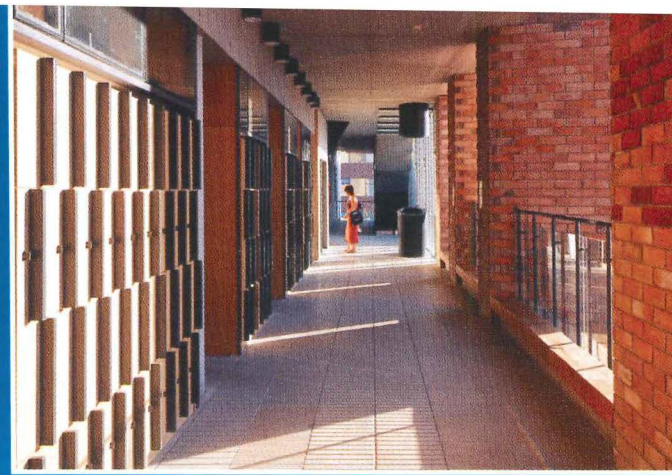
Mathematics Faculty, Santiago, Chile

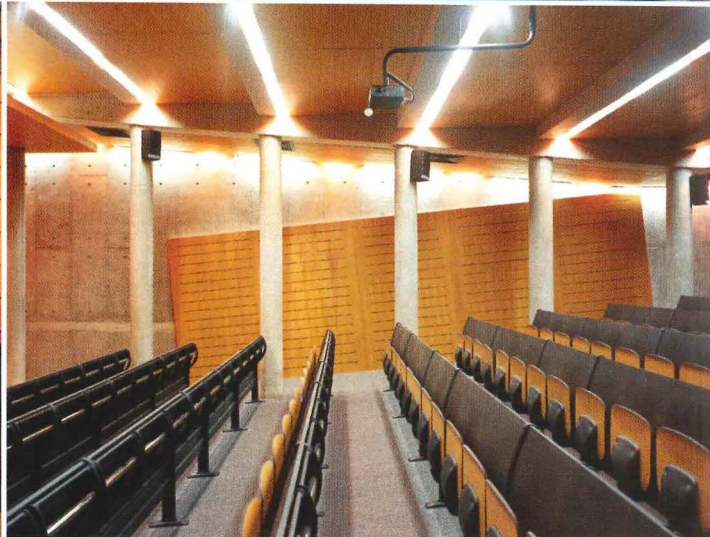
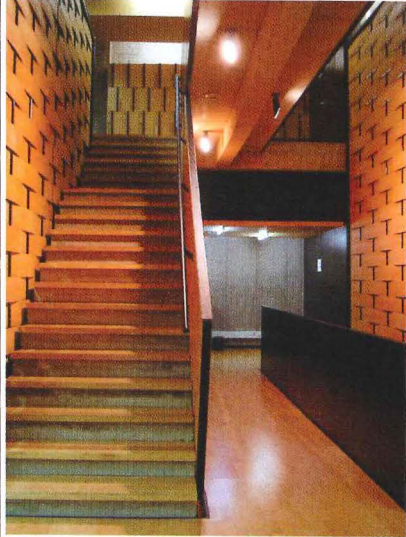
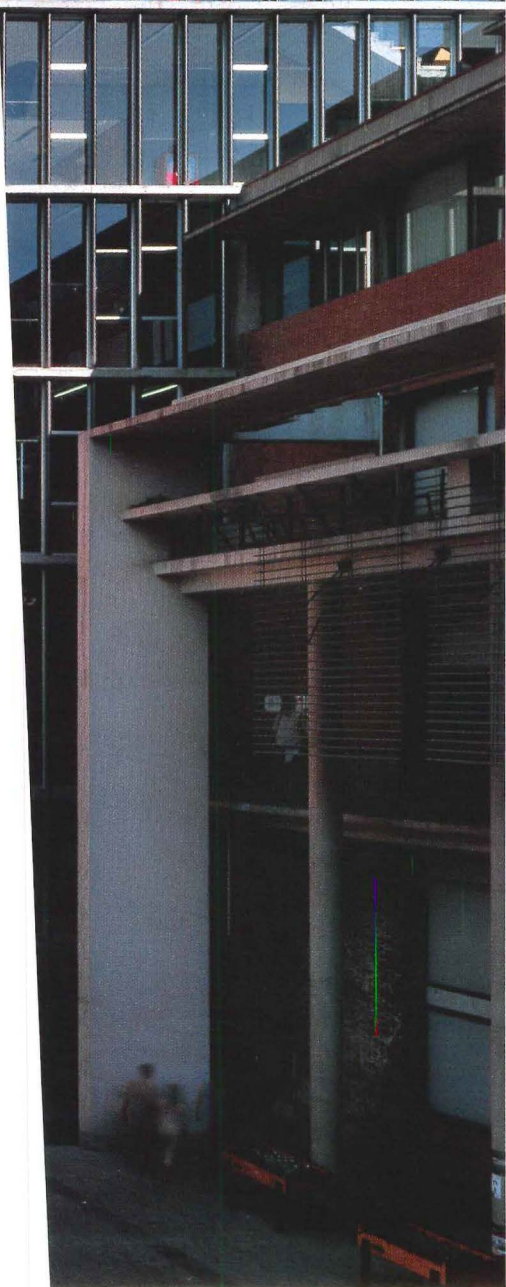
The first in a series of buildings Aravena has designed for Universidad Católica de Chile, this 215,000-square-foot facility for the school's mathematics department continues the covered portico of the existing math building on its north facade (below) while presenting a glass-and-copper face (above left) to the south, which gets less sun in this hemisphere.

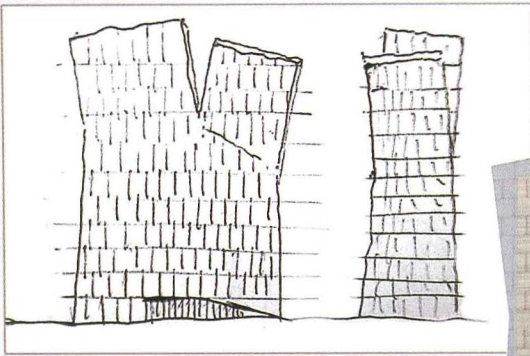


Medical School,
Santiago, Chile

Aravena calls this 975,000-square-foot building a “vertical cloister” because it stacks a dense set of seminar cells, classrooms, labs, lounges, and auditoriums. The building completes an important courtyard on the campus, providing a sculptural redbrick facade as the fourth side. Although the tight program didn’t allow any double- or triple-height spaces, the architect carved out large “voids” to bring in light, and cantilevered a glass lounge over the south entry.

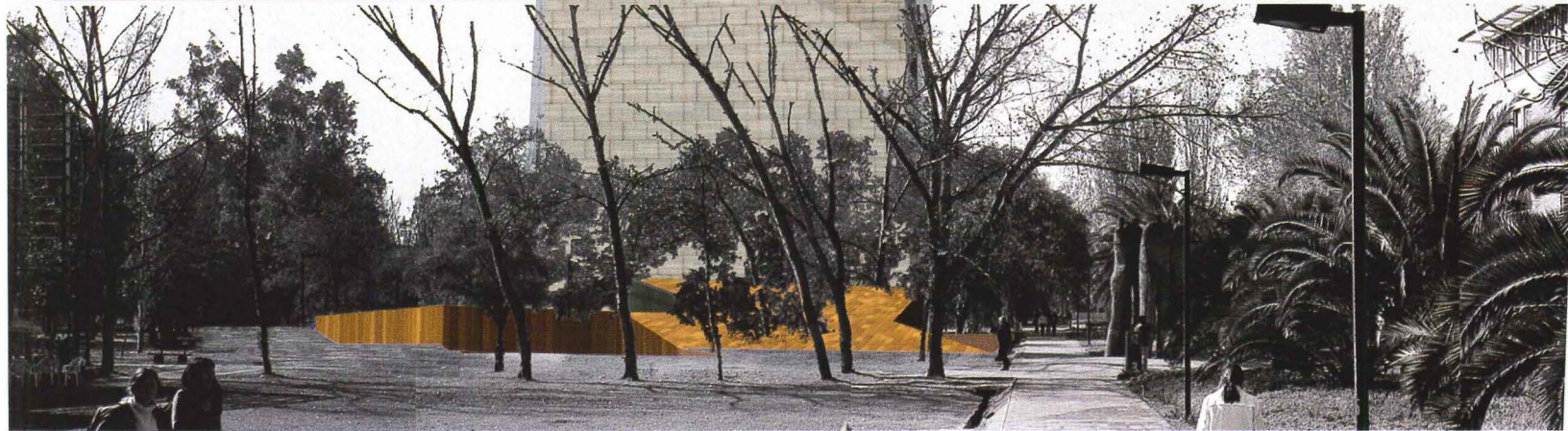






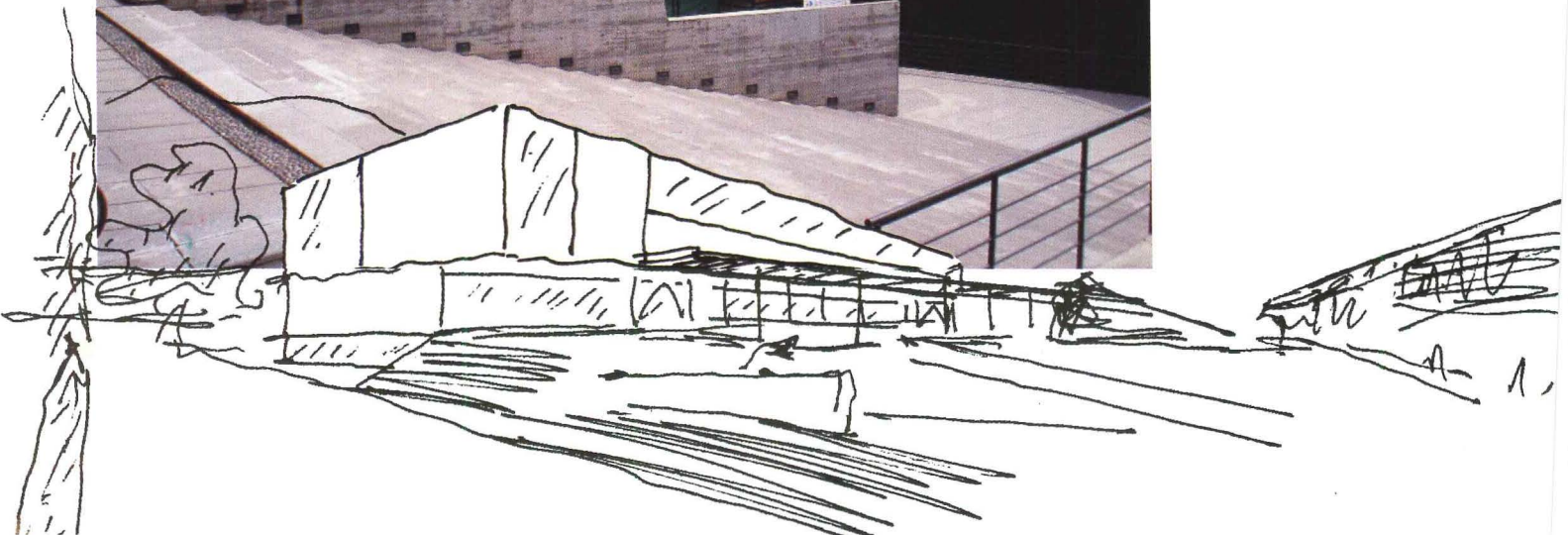
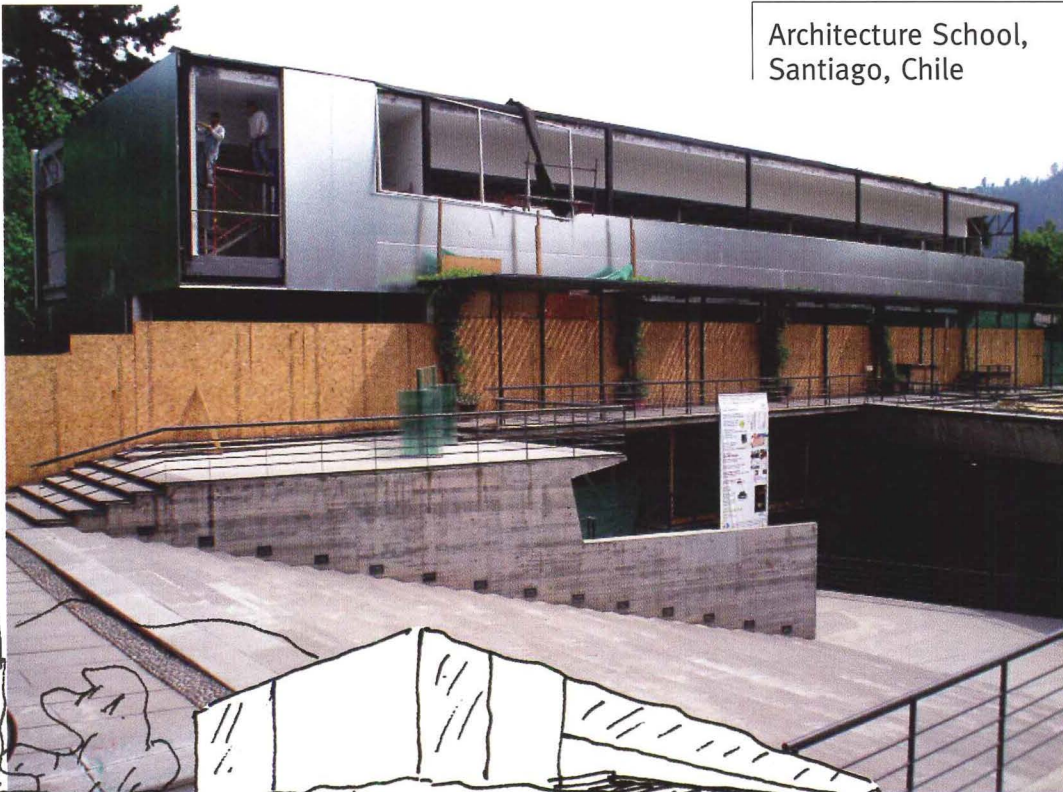
Siamese Towers,
Santiago, Chile

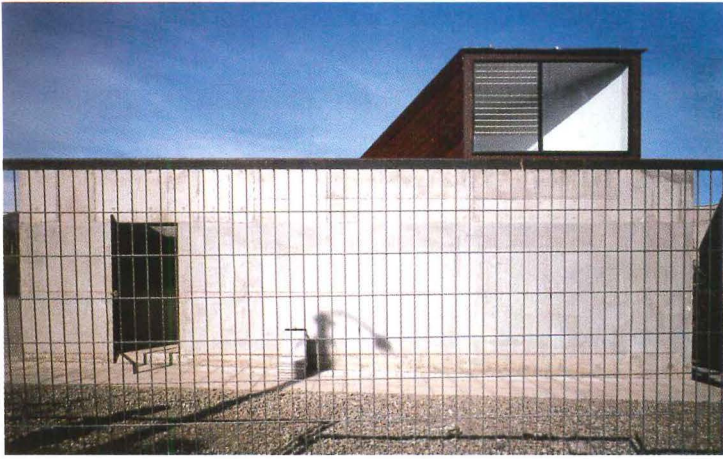
Another project for Universidad Católica, this building will be a computer center with offices, research spaces, classrooms, and of course, lots of computers. To give the structure a sense of height, Aravena split the mass into conjoined towers. Scheduled to be completed in 2005, the 54,000-square-foot building will have an outer skin of glass and a more solid inner membrane.



Architecture School,
Santiago, Chile

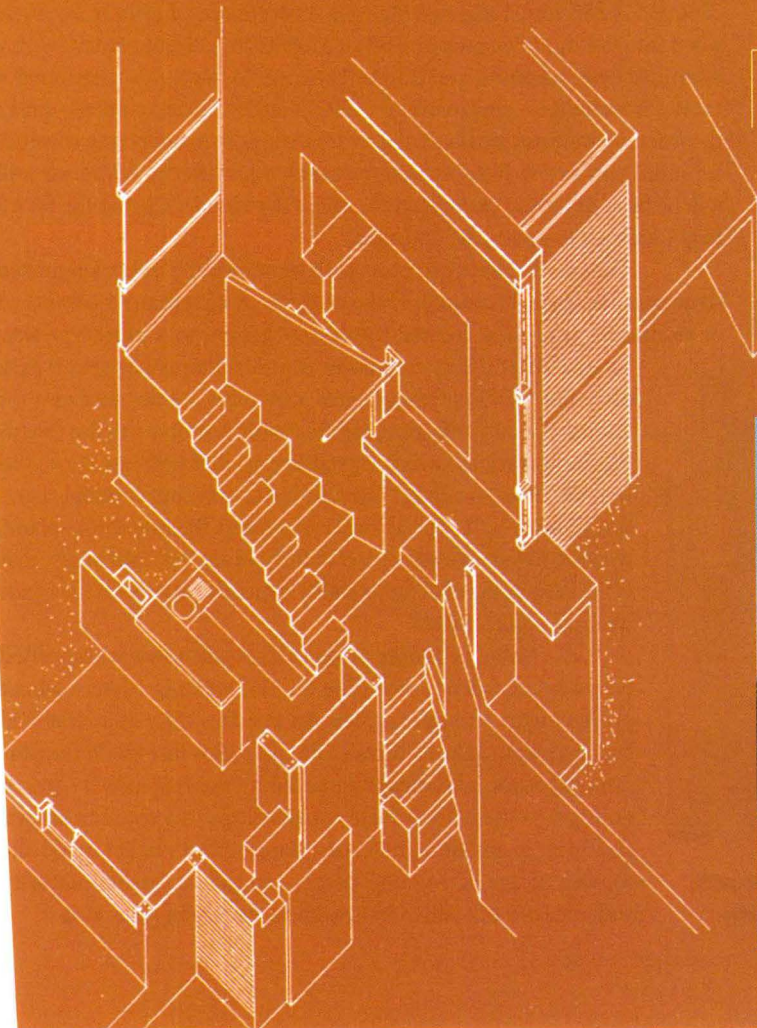
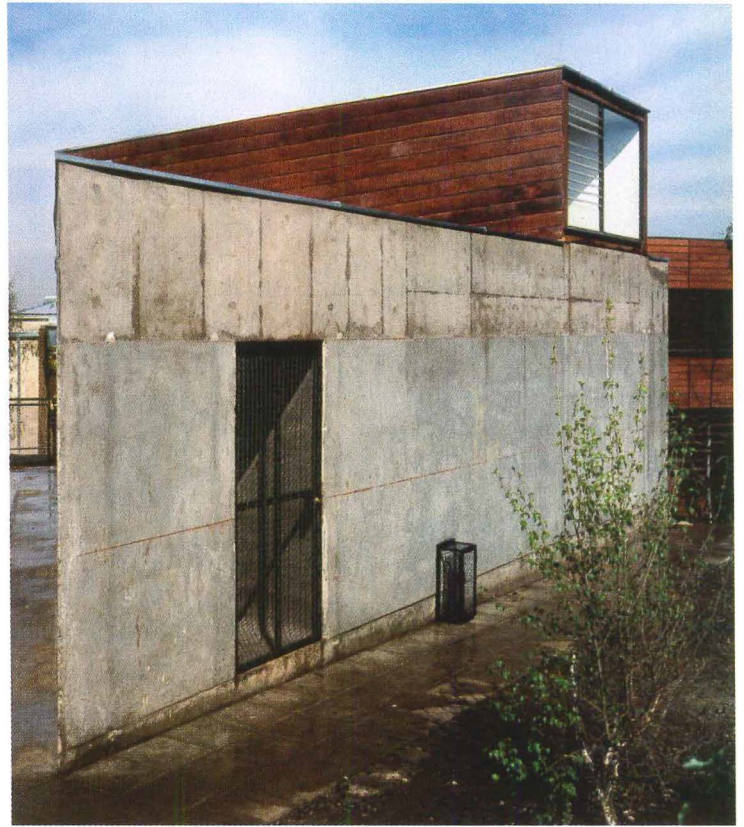
To entice students to spend more time on campus, Universidad Católica hired Aravena to renovate a building completed in the early 1990s. Reducing the size of studios by half will provide a more secure environment for students who now work on computers. Smaller studios won't have room for pinups, so these exercises will take place in areas just inside the new zinc-clad envelope.





Montessori School, Santiago, Chile

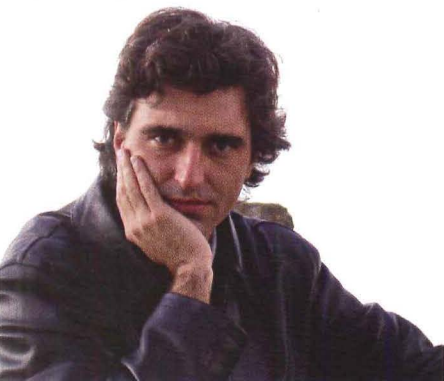
Given just four months to design and build a low-budget renovation and addition to an existing school, Aravena performed what he calls “emergency architecture.” The client insisted that he use fake-wood siding, so the architect explored new ways of applying the artificial material, treating it like wallpaper and revealing “clouds of regularity” in its patterned surface.



Sculptor's House, Santiago, Chile

Designed for a woman who lives by herself but entertains often, this 1,300-square-foot house picks up the brick of the client's nearby sculpture studio. A tight budget kept the rooms small, but Aravena made them feel bigger by having visitors enter them at the corners and first viewing them on the diagonal. He kept the forms simple to match the skill of the bricklayers.





Spain's Antón García-Abril finds freedom in materials on the outer fringes

By David Cohn

Architect: Antón García-Abril and Ensemble Studio
Location: Madrid
Founded: 1995 (Antón García-Abril); 2000 (Ensemble Studio)
Design staff: 7
Principal: Antón García-Abril Ruiz
Education: ETSA Madrid, Doctorate, 2000; ETSA Madrid, M.Arch. and Urbanism, 1995
Work history: Alberto Campo Baeza, 1990–94; Santiago Calatrava, 1992
Key completed projects: Concert Hall and Music School, Medina del Campo, Spain, 2003; Musical Studies Center, Santiago de Compostela, Spain, 2002
Key current projects: Martemar House, Málaga, Spain, 2004; SGAE Central Office, Santiago de Compostela, 2005; Príncipe Pío Theater, Madrid, 2007
Web site: Under construction

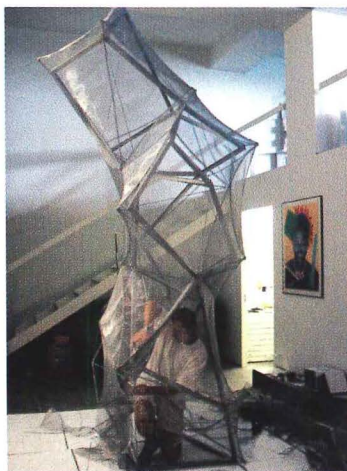
While Spanish architects are known for seamlessly melding design aesthetics and construction know-how, Madrid-based Antón García-Abril carries this love for what he calls “the fragrance of the constructive” to a new level, building much of his work through an in-house contracting firm. This gives him the freedom to experiment with new building systems that traditional contractors would shun, he explains, including materials on the outer fringes of solidity and fragility—from boulder facades to partitions built of plastic CD cases.

García-Abril worked in the studio of Alberto Campo Baeza as a student, while family friend Rafael Moneo gave him personal critiques of his student projects. He describes these two mentors as working from opposing extremes of poetic and intellectual inspiration, influences reflected in his own work. His first building, a music school in Santiago de Compostela, is a tour de force in the use of local granite. Conceptually, it is a solid half-cube of stone with public spaces hollowed out of its center along three axes. Its primitive density is underscored by the massive blocks of the facades—each weighing up to 11,000 pounds—with their rough, drilled, and split faces exposed to the exterior.

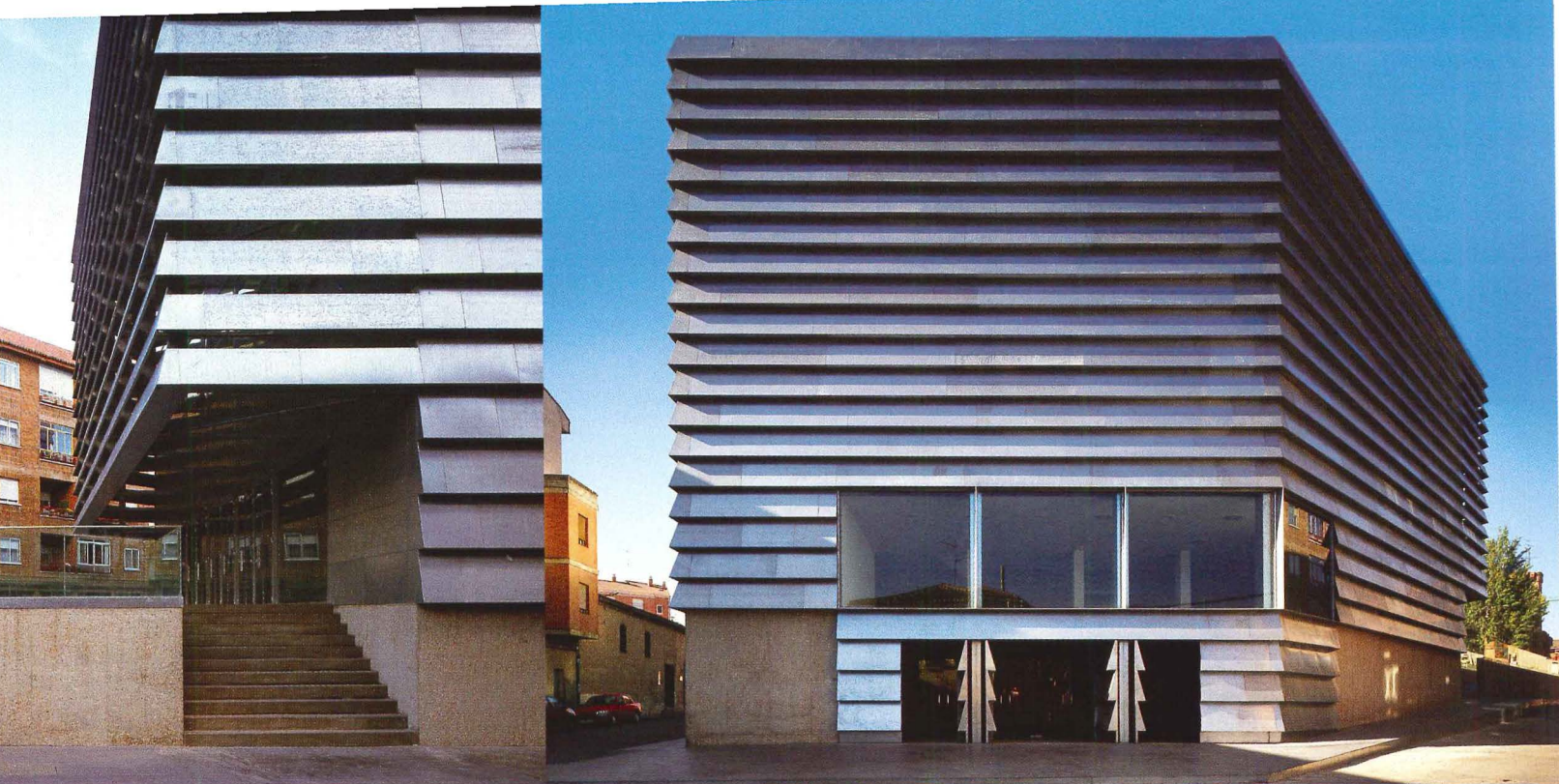
The architect has carried experiments with heavy masonry a wild step further for Spain's General Society of Authors and Editors (SGAE). A 285-foot-long curving wall is composed of granite boulders piled into the modular proportions of a “Palladian double order,” with a primitive base, columns, and lintels. The tumbledown construction also recalls Stonehenge—a reference to Galicia's ancient Celtic culture—and a disordered bookcase, symbolizing the SGAE's role in collecting royalties for musicians and writers. At an opposite extreme, the main interior wall will be built of plastic cases from the 400,000 pirated CDs that the SGAE helps authorities confiscate annually.

García-Abril's experiments with geometrically free, triangulated structures dominate his studio. These range from light fixtures composed of aluminum studs and colored fluorescent lamps, to a prototype skyscraper (left) rising irregularly around a flamelike vertical axis. He points out that triangulated structures are the strongest for torsional loads, and compares his tower prototype to the chassis of a motorcycle, in which crystal-like smaller units are encrusted into the main structure. “The problem with conventional structures,” he says, “is that in order to inhabit the horizontal plane, we have invented a structural deformation, the right angle, that is the least stable of all. Its stability depends entirely on the rigidity of its connections.”

Among ongoing projects, a seaside house is suspended below heavy trusses, including an 80-foot-long I-beam whose profile forms a rough cornice. An artist's studio at a rehabbed factory, meanwhile, features walls and patios lined with translucent polycarbonate sheeting backed by fluorescents. It's worth noting that these are private commissions in a country known chiefly for its public architecture. García-Abril's career marks the coming of age of a young talent, and the increasing maturity and audacity of Spain's architectural culture in general. ■

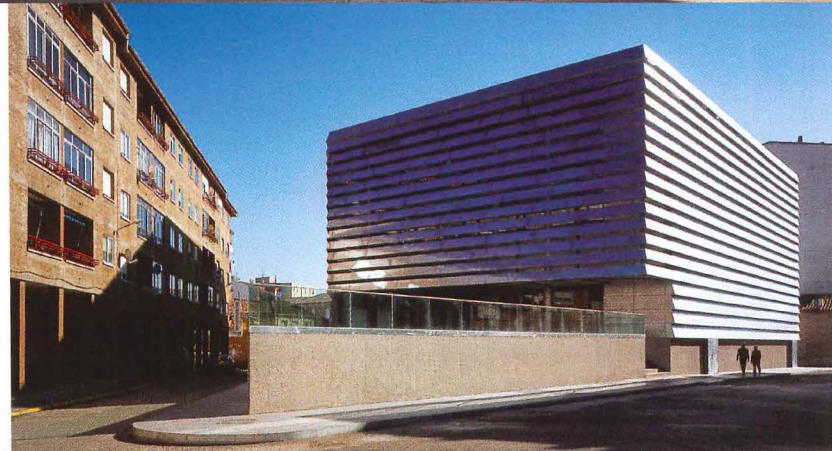


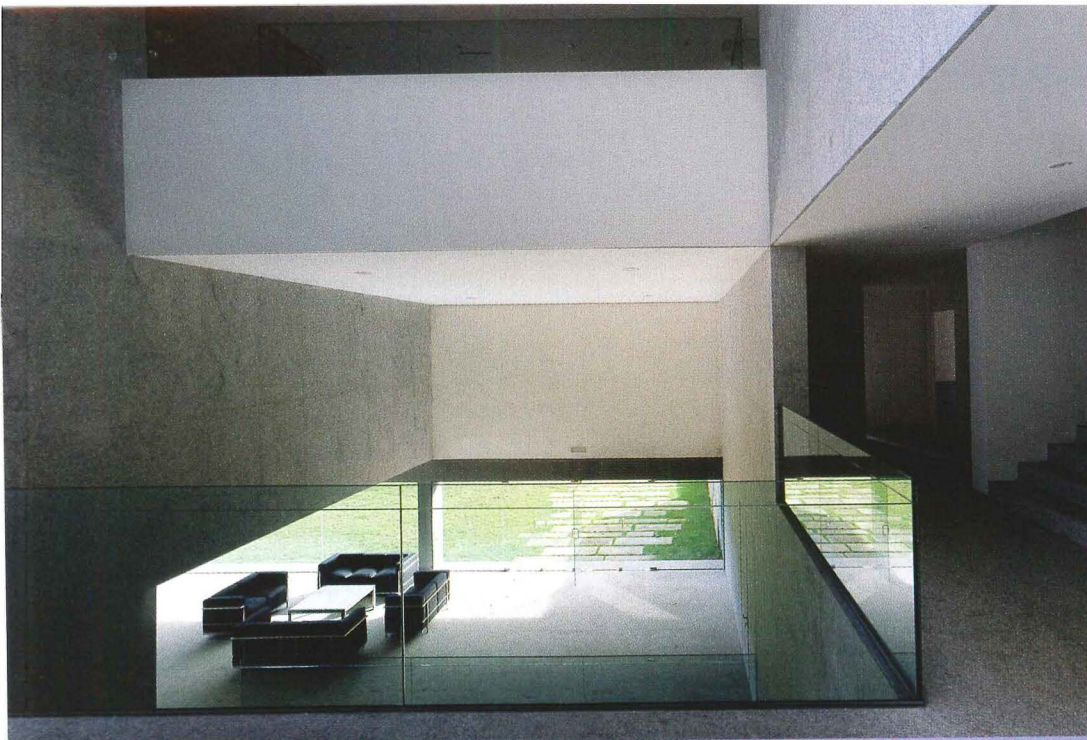
A model for a skyscraper has pride of place in García-Abril's studio.



Concert Hall and Music School, Medina del Campo, Spain

García-Abril won a competition for a concert hall on a small trapezoidal site facing Segovia Square. The building sits on a concrete base, which forms an open public anteroom above street level. An outer skin, which the architect likens to a "suit of armor," is a series of horizontal steel scales that are projected out from the lattice of steel structural members. The auditorium has the classical proportions of a double cube, its folded walls dotted with light.

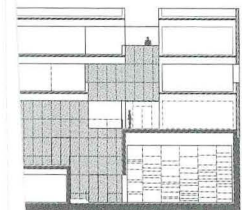
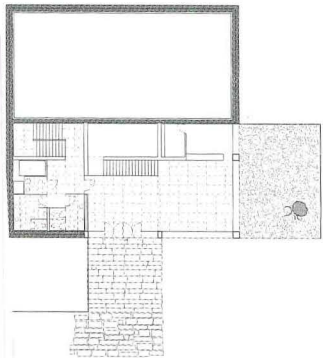
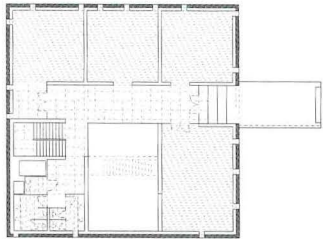
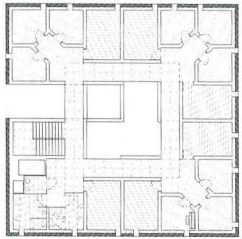


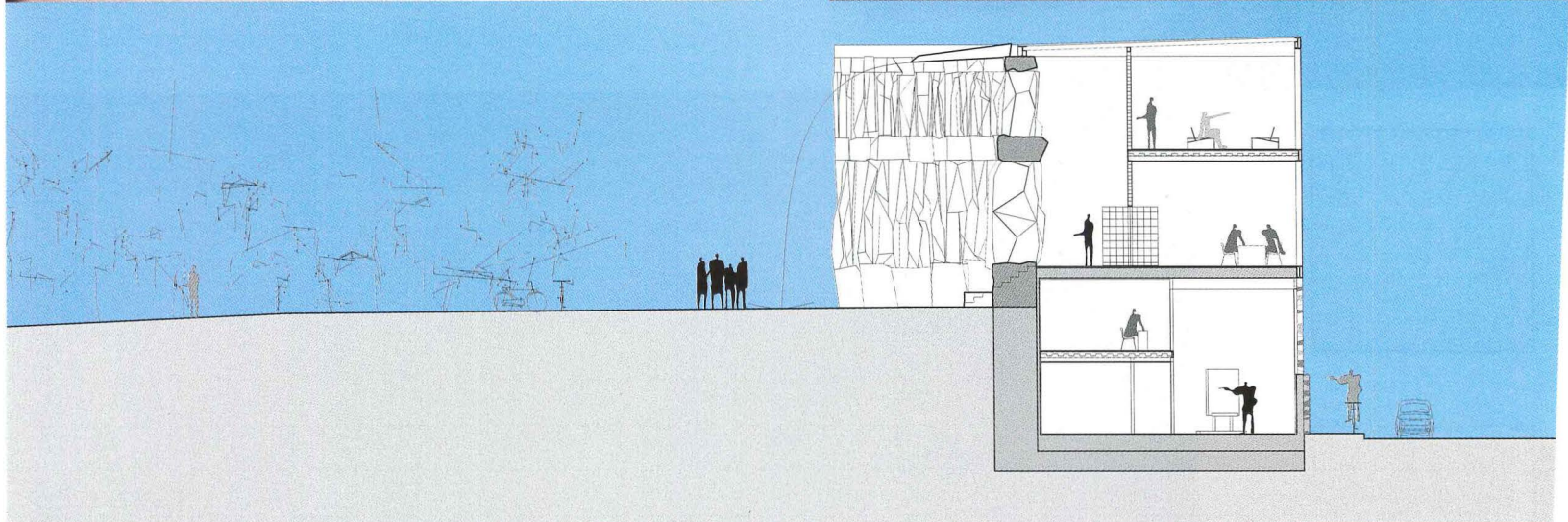
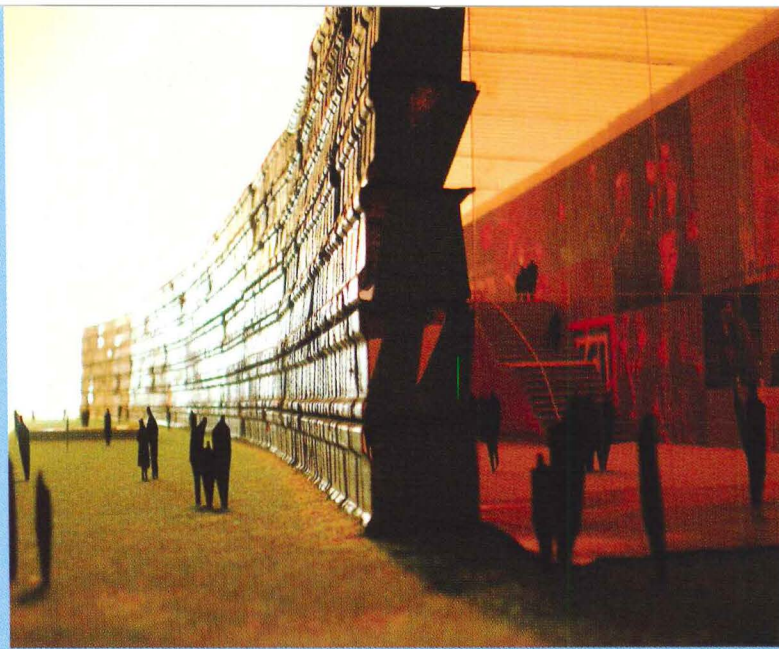
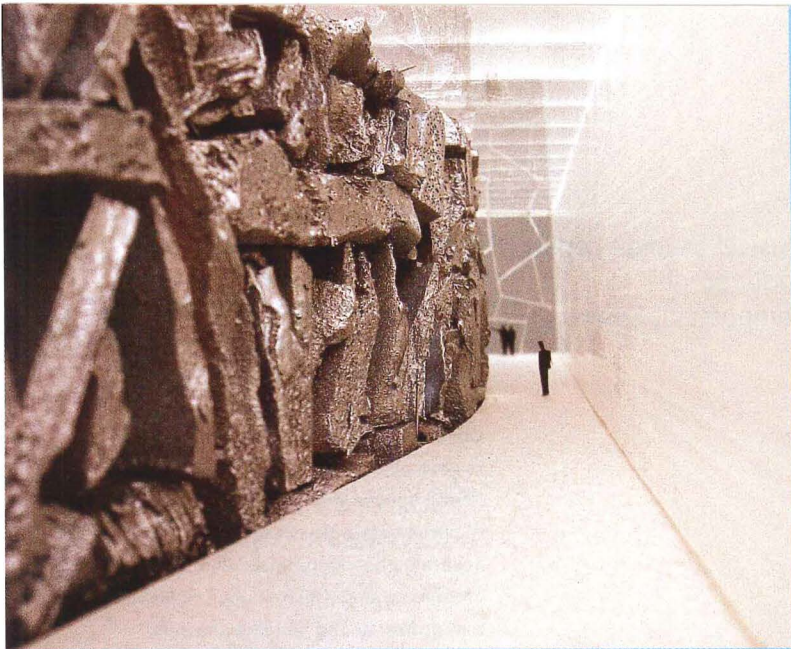




Musical Studies Center,
Santiago de
Compostela, Spain

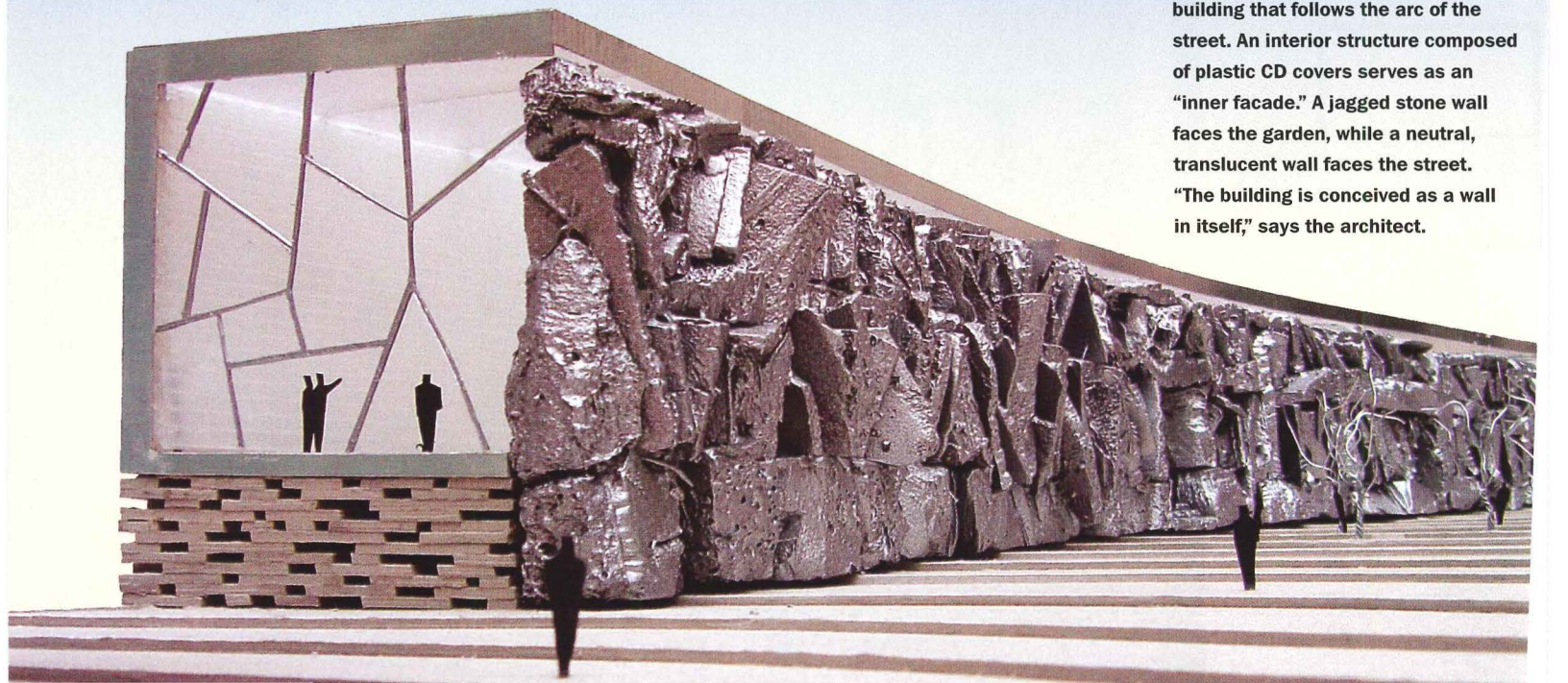
Employing ancient stone-cutting techniques, the granite facade is composed of stones presenting the rough-hewn sides along which they have been split. García-Abril explains that this high-relief surface gives the tenuous light of Galicia “the chance to trap the volume, to grab hold of it and allow it to reveal itself.” Spaces with specific acoustic requirements were constructed over a concrete basement. Upper floors are ordered around wheel-shaped walkways that narrow as the building ascends.

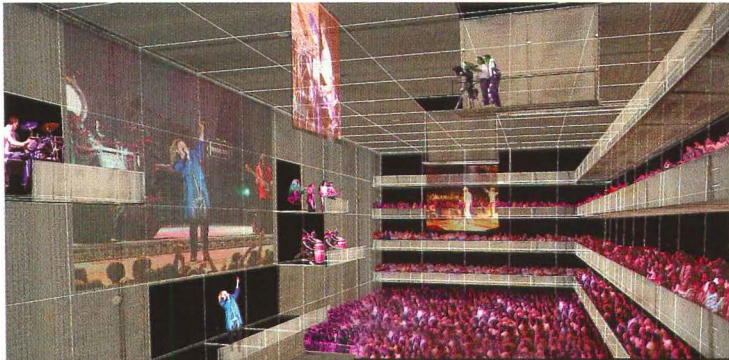




SGAE Central Office,
Santiago de
Compostela, Spain

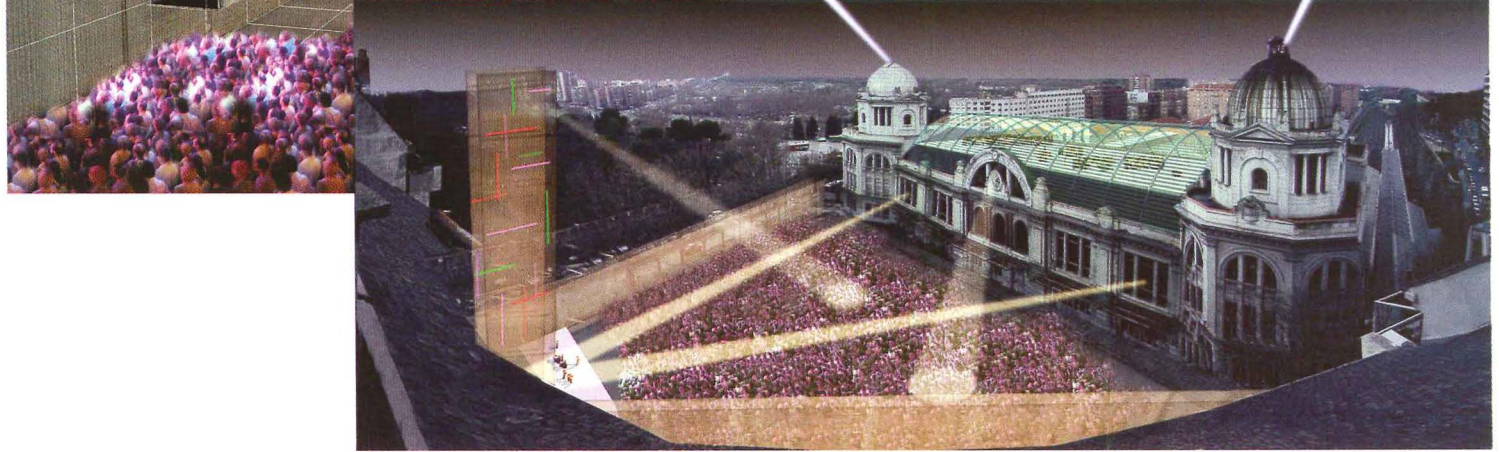
For the headquarters of Spain's General Society of Authors and Editors, the architect juxtaposed three walls running the length of a long, curved building that follows the arc of the street. An interior structure composed of plastic CD covers serves as an "inner facade." A jagged stone wall faces the garden, while a neutral, translucent wall faces the street. "The building is conceived as a wall in itself," says the architect.





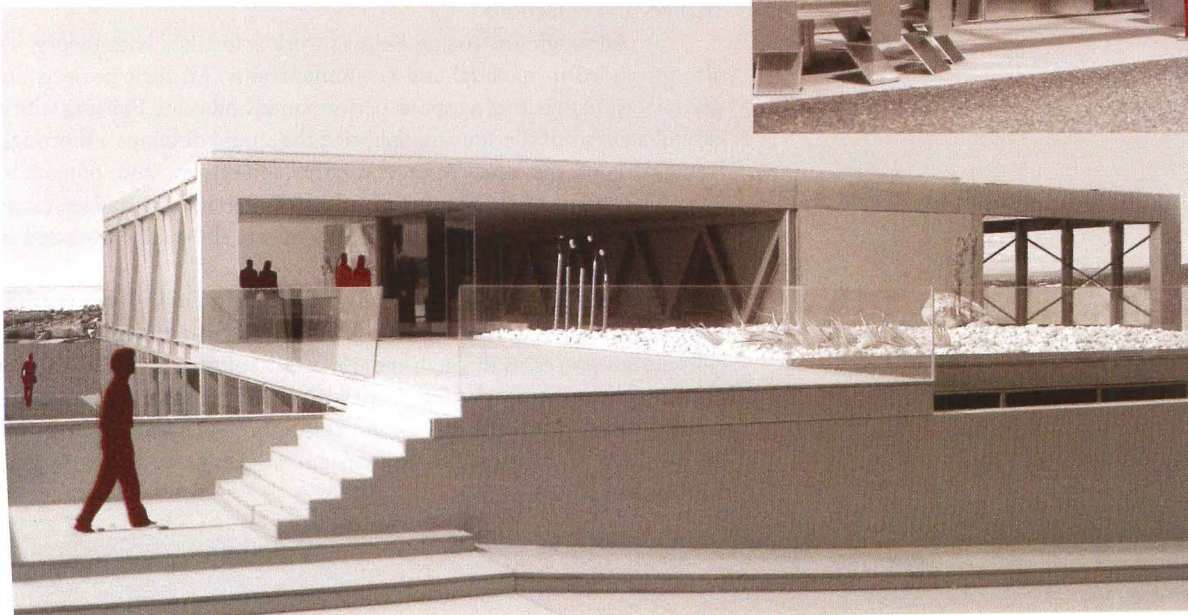
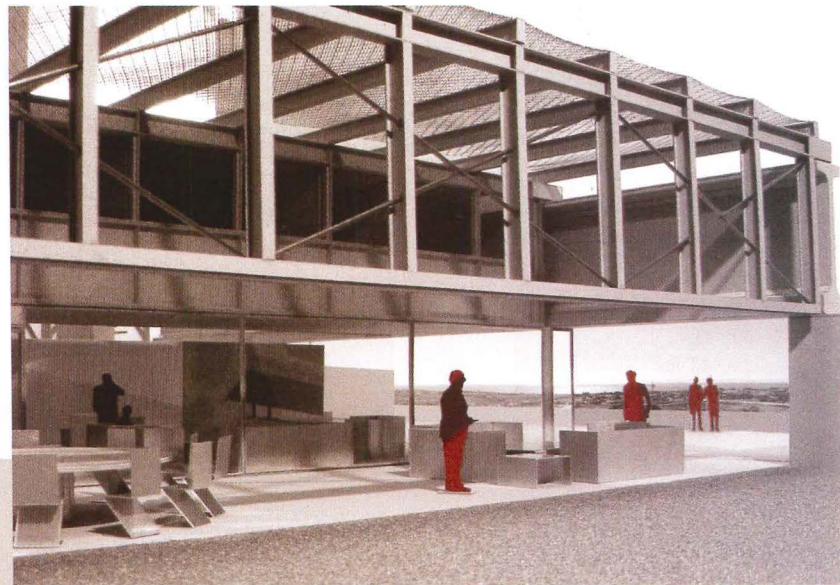
Príncipe Pío Theater, Madrid

An experimental theater facility will occupy the interior of a landmark-protected railroad station. A large, flexible black-box structure, which García-Abril calls a “hybrid theater room,” features stages and performance platforms at different levels with retractable seating. The project is financed by actor Antonio Banderas and the SGAE.



Martemar House, Málaga, Spain

For a private residence on a sloping seaside site, García-Abril has organized the program of living zones with the structural system. Two main portal frames, one concrete along the garden facade, the other steel overlooking the entrance, support five steel cross trusses. Masonry and glass walls are juxtaposed to create a progression of public and private spaces that relate to terraces surrounding the house.





Plasma Studio eschews iconography in favor of ambience and relevance

By Sara Hart

Architect: Plasma Studio

Location: London and Sesto, Italy

Founded: 1999

Principals: Eva Castro, Holger Kehne; Ulla Hell (associate)

Education: Castro: Architectural Association, AAGDG, Grad Des Dipl (AA), 1996; Universidad Central de Venezuela, Diploma Arquitectura & Urbanismo, 1994; Kehne: University of East London, Dip Arch, 1998, BSc (Hons), 1996.

Work history: Castro: Plasma Studio, 1999–2005; Chora, 1997–98; Ocean, 1996–97; Kehne: Plasma Studio, 1999–2005.

Key completed projects: Minerva Street, London, 2003; Circus House, London, 2003; Musician's Home, London, 2001; 25 London Lane, London, 2001; 186 Camden High Street, London, 2000; 136 Old Street, London, 1999

Key current projects: Hotel Puerta America, Madrid, 2005; Hotel Cristall, Sesto, Italy, 2007.

Web site: www.plasmastudio.com

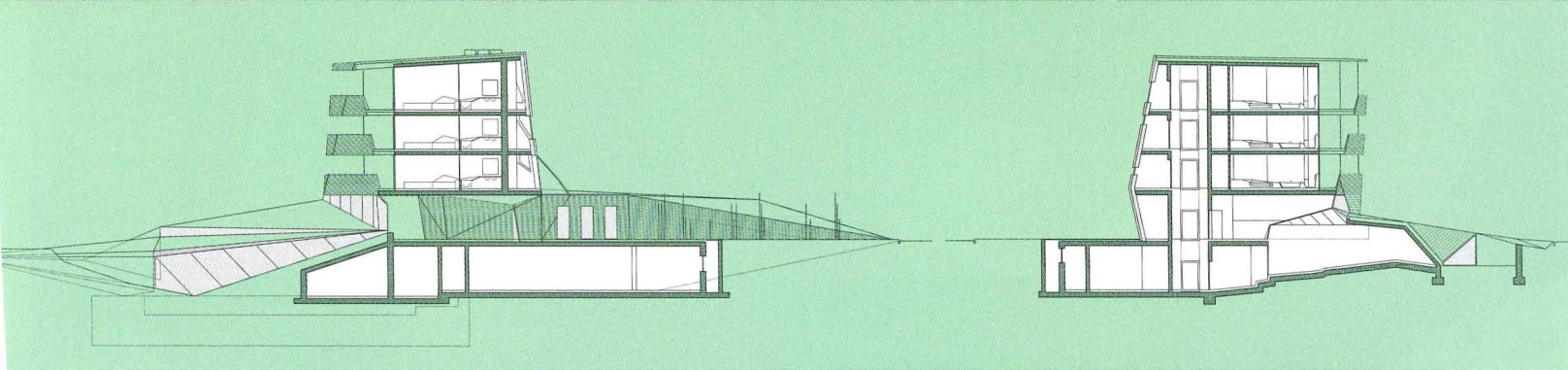
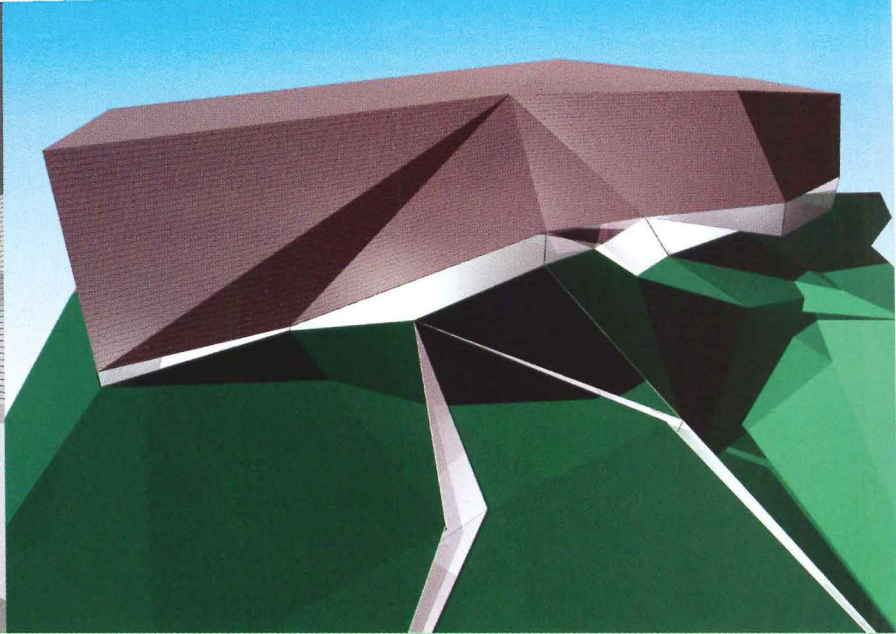
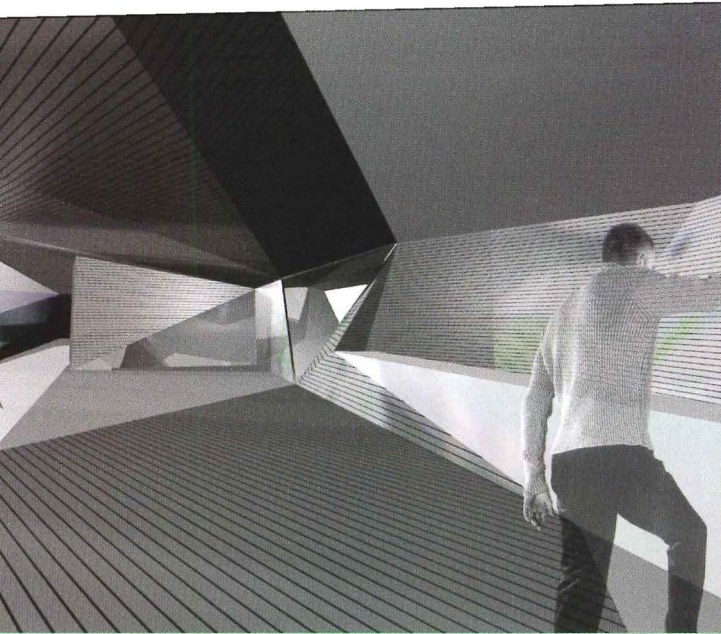
It takes a lot of confidence to name an architecture firm Plasma. It could end up in the telephone book under “night clubs.” The firm’s founders Eva Castro and Holger Kehne have earned the necessary confidence, as their growing portfolio of completed commissions confirms. The concept behind the name is worth noting. Looking for a metaphor to wrap their design philosophy around, they turned to physics. By naming their practice Plasma, after the fourth state of matter, they seek to separate themselves from convention, even from the parameters of Cartesian construction. If one were to think of most architecture as falling, at least metaphorically, into the other, better-known states of matter—solids, gases, and liquids—the firm’s differentiation becomes apparent. Castro and Kehne make the distinction by describing the plasma state as “a unique condition of matter arising from a complex overlay of external forces.”

During the past five years, Plasma has pursued a variety of building types, mostly in London. These include office renovations, retail, artists’ studios, and various live/work conversions. In addition, the practice has designed several exhibitions, installations, and furniture. Two current hotel projects, the interior of a radical design hotel in Spain and a newly built mountain resort in Italy, are contributing to the practice’s current expansion: They have recently opened a new branch in Sesto, Italy.

Plasma is often described as the most energetic of the four states of matter. Plasma, the firm, matches that by being intellectually agile, and it has won awards and commissions for its creative use of form and geometry. Not bound to the x and y axes, the designers use shifts, folds, and bends to create surface continuities that are never arbitrary, but part of the overall spatial and structural organization. “Our projects seek to expand from such traditional orthogonal patterns. Their advantages (in terms of human scale, clarity, and versatility, for instance) are capitalized and used as modeling instruments in the design process,” they explain. A reduced palette of materials and colors with Minimalist detailing is used to emphasize such ephemeral occurrences as light changes and reflections.

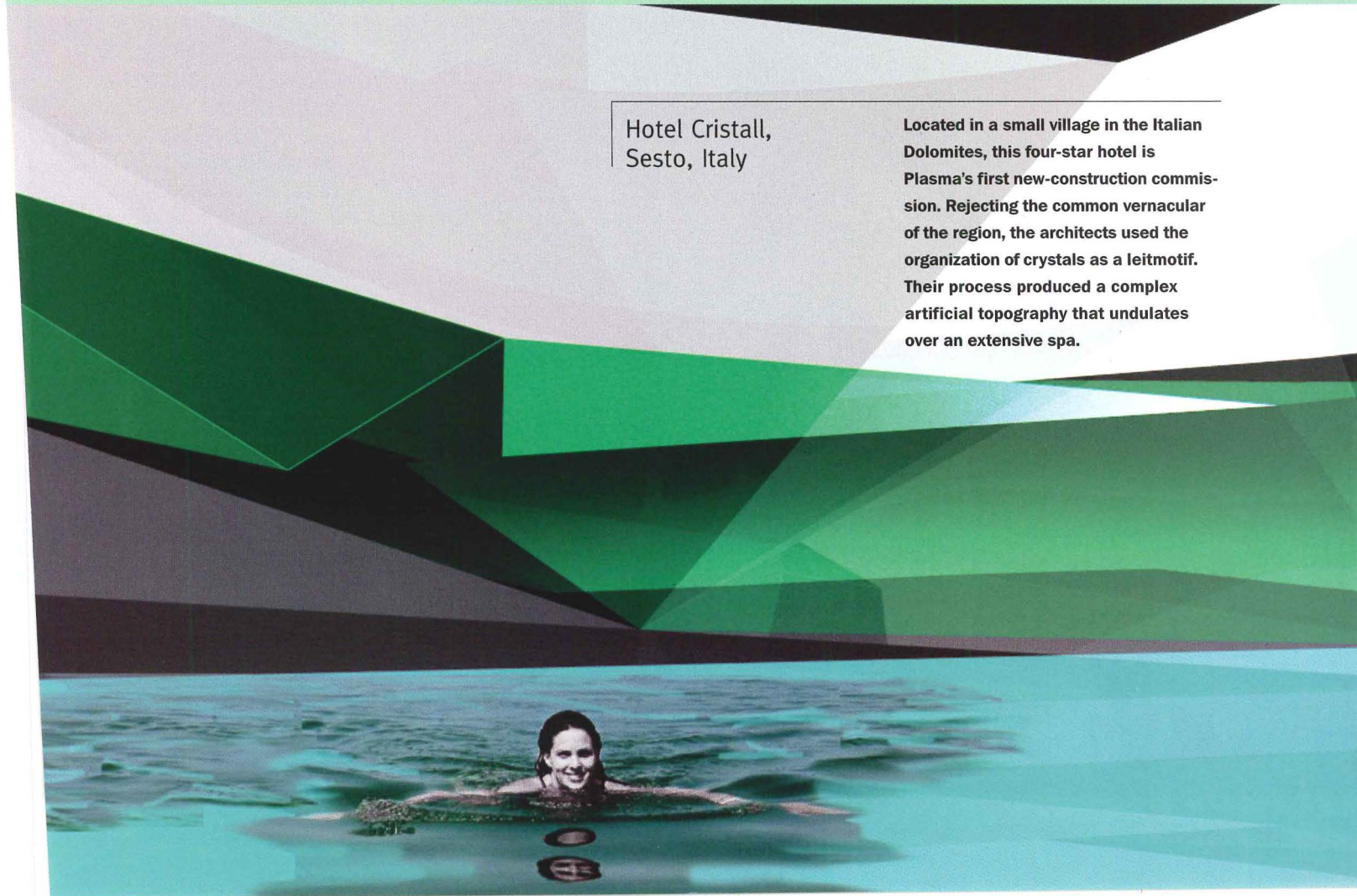
Although Castro and Kehne’s work is fortified with theory, it’s also grounded in material and economic reality. All their projects are geared toward maximizing space, performance, and value. Starting with a careful analysis of the site and the brief, the studio develops a thorough framework of the underlying constraints, objectives, and potentials. Tangible and intangible parameters, such as material, light, budget, usage patterns, atmosphere, weathering, and so on, are all equally processed as determining forces.

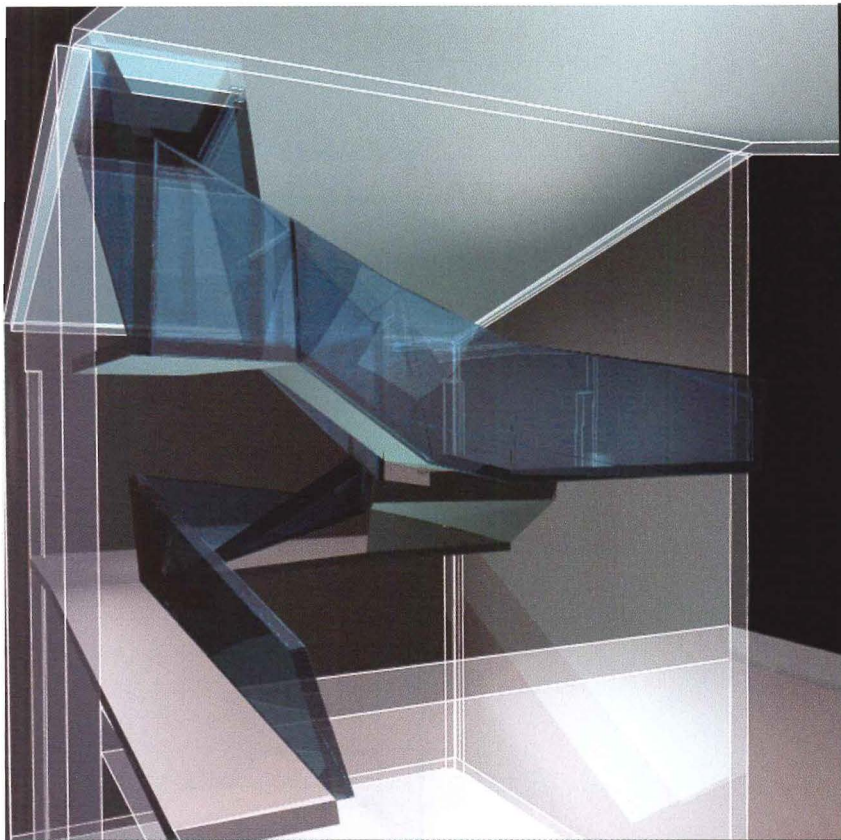
They also exploit every available technological innovation. Castro and Kehne are researching and developing parametric and emergent design processes through the use of 3D software and CAD-CAM modeling at the Architectural Association. They emphasize that these investigations make the design process more inclusive, interactive, flexible, and transparent for the designers, clients, consultants, and fabricators alike. ■



Hotel Cristall,
Sesto, Italy

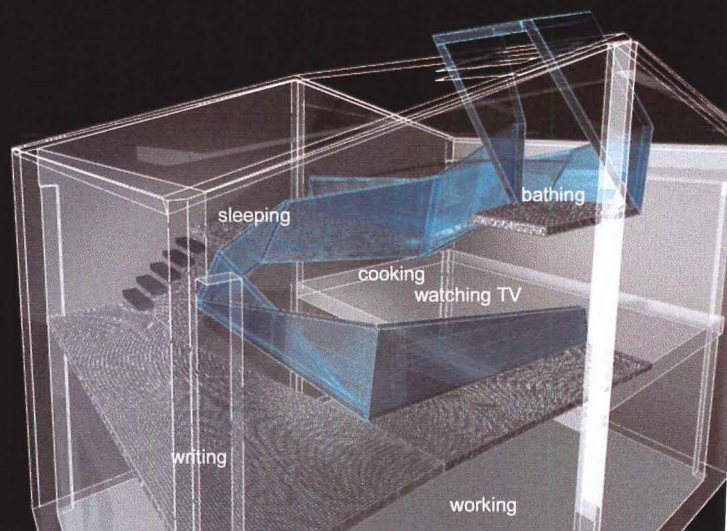
Located in a small village in the Italian Dolomites, this four-star hotel is Plasma's first new-construction commission. Rejecting the common vernacular of the region, the architects used the organization of crystals as a leitmotif. Their process produced a complex artificial topography that undulates over an extensive spa.





25 London Lane,
London

The client, a silversmith, needed distinct spaces sculpted within his expansive live/work loft, without losing any of the natural light provided by an existing skylight. The solution involved creating spaces out of industrial-steel grating, which both transmits and deflects the light. The truss that supports the spiraling surfaces also acts as the balustrade.





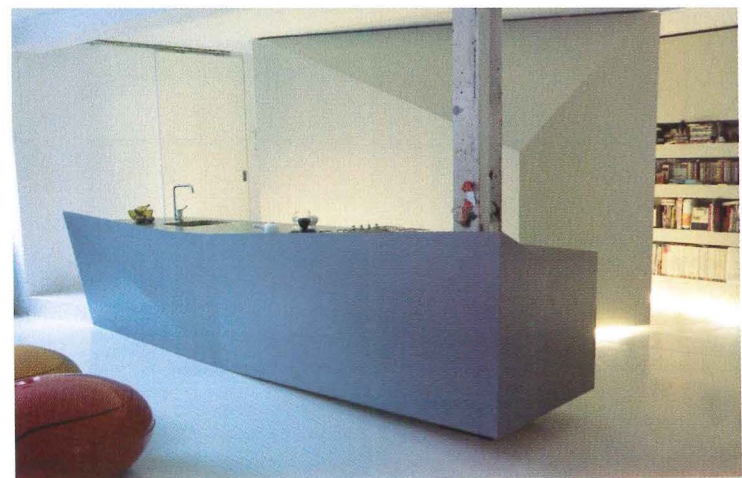
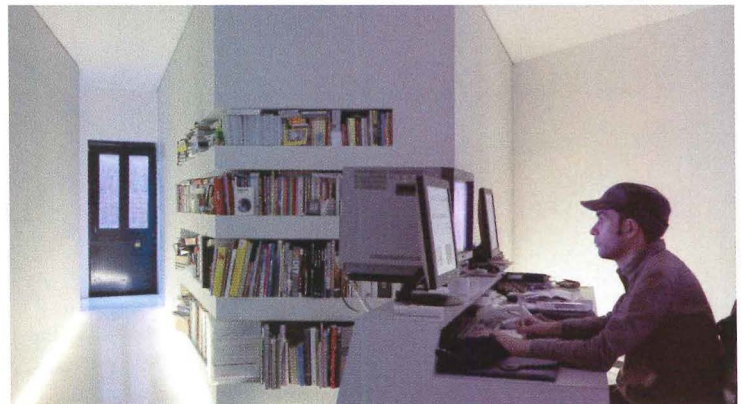
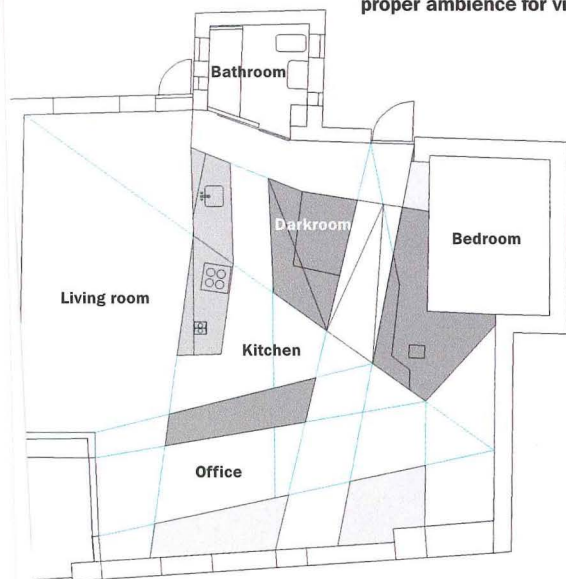
Crumple Zone,
London

Crumple Zone, a site-specific installation, utilized CNC-punch-pressed steel with projected imagery to create a work that challenges the preconception of the Vitruvian principles of stability, utility, and beauty in the inaugural exhibition by Fractio, a not-for-profit curatorial collective supporting British fashion, art, design, and architecture.



Minerva Street,
London

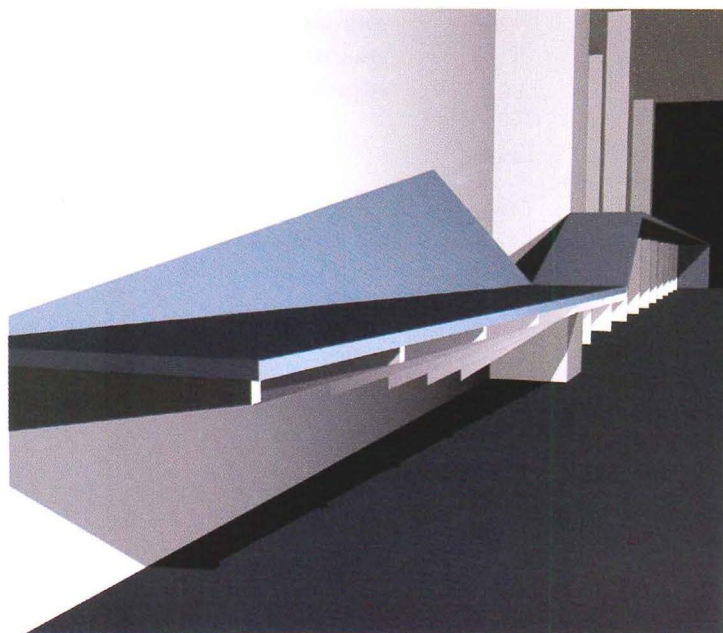
In this conversion of the ground floor of an old industrial building, the architects introduced pods, finished in different shades of gray, which organize the space into zones with varying degrees of openness and enclosure. Fluorescent tubes along the bottom of the walls create the proper ambience for video production.





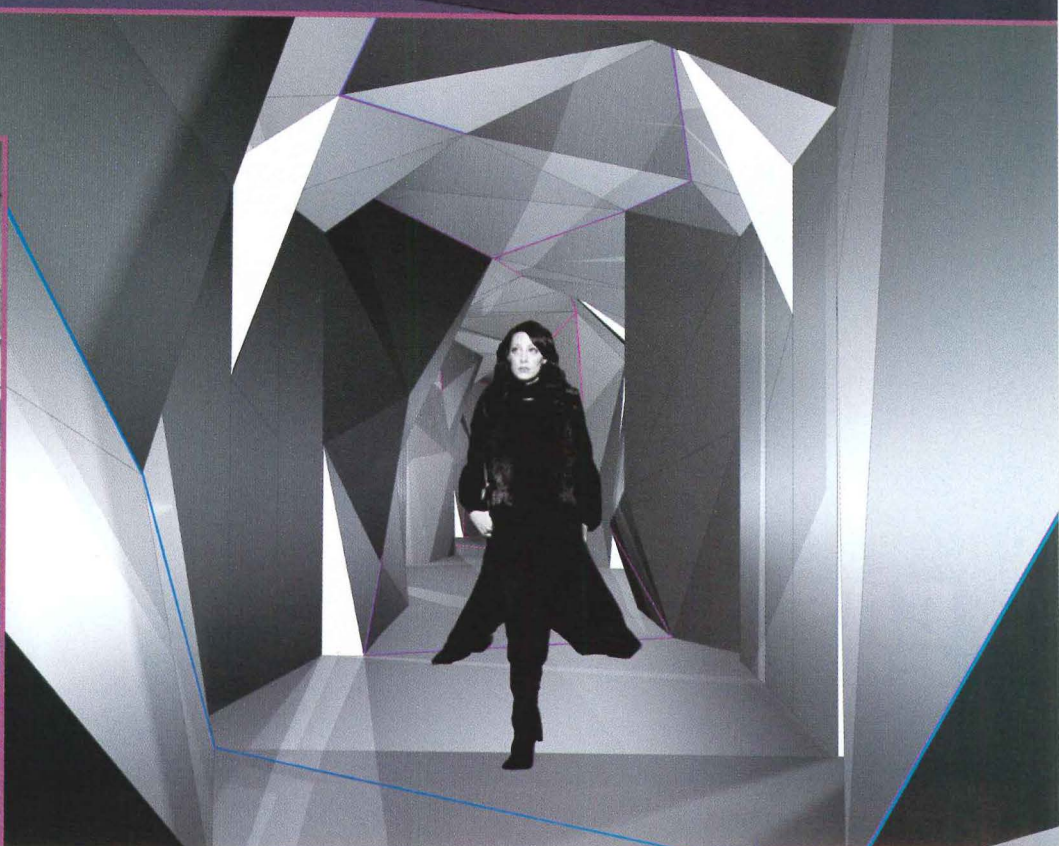
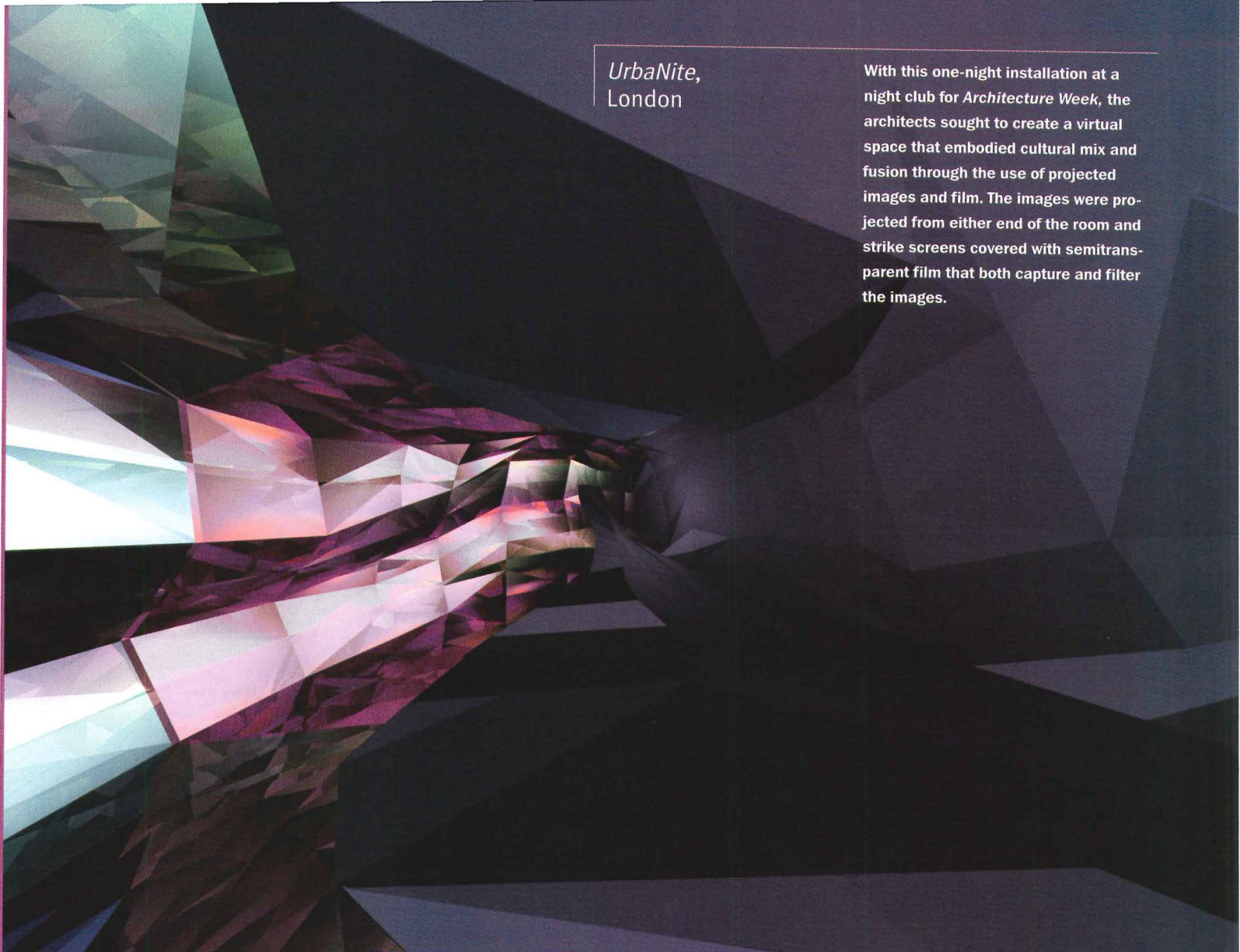
Circus House,
London

This redesign for Feiden Clegg Bradley Architects provides for maximum flexibility. The overall flow pattern is a U with the corridors displaced on both levels, and a new internal staircase connecting them. The stair consists of solid slabs of plywood suspended from full-height Perspex screens, corresponding with an extensive Perspex display system.



UrbaNite,
London

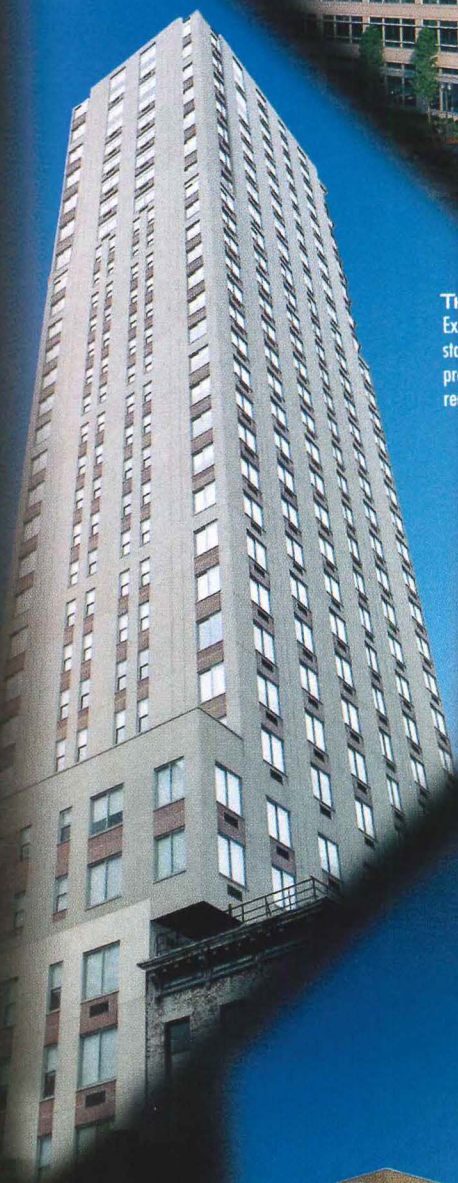
With this one-night installation at a night club for *Architecture Week*, the architects sought to create a virtual space that embodied cultural mix and fusion through the use of projected images and film. The images were projected from either end of the room and strike screens covered with semitransparent film that both capture and filter the images.



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MARRIOTT EXECUTIVE, NEW YORK, NEW YORK

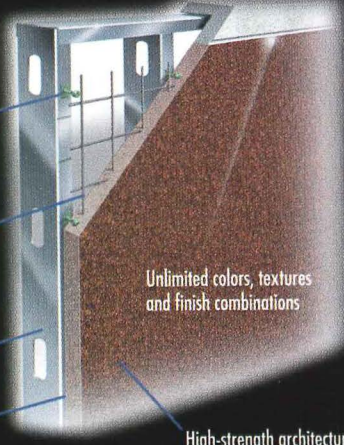


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The Boom Goes On

COLLEGES ARE BUILDING MORE, AND THEY ARE BUILDING BETTER. WITH STATES UNDER STRESS AND WORK DEMANDS RISING, WE MAY NEED TO BUILD FASTER AND BETTER YET.

By James S. Russell, AIA



1.

Waltham, Massachusetts

Charles Rose placed the Shapiro Campus Center at the crossing of a network of pathways, erecting a sun-dappled atrium over the intersection.



2.

Cambridge, Massachusetts

Reworking a former hotel, Jonathan Levi offers housing-pressed graduate students at Harvard University a variety of accommodations.



3.

Poulsbo, Washington

Miller/Hull interpreted Scandinavian style for Olympic College, constantly called on to adapt to the needs of a fast-growing, semirural area.



4.

Swarthmore, Pennsylvania

Margaret Helfand used new construction to stitch together out-dated science buildings, creating a revived, more socially engaging whole.



5.

Santa Monica, California

Filtered daylight enlivens the three-story computer commons that Anshen+Allen dropped into Santa Monica College's dour 1970s library.

Projects from higher education institutions, both plebian and elite, have poured into RECORD's offices this year. With such powerful evidence of the nation's commitment to college, RECORD was able to devote much of its August issue to a range of high-ambition projects and still be able to offer a rich mix this month. We saw not only quantity, but quality: designs that are sensitive to budgets yet still transcend the painted drywall and dropped-ceiling norm.

With too many students relying for their social life on iPods, video games, and e-mail, institutions are building to ease the stresses of meeting new people and fitting in. Charles Rose supplied the center that Brandeis University never had. (It's hardly alone.) Jonathan Levi responded to Harvard University's desire to lift graduate-student housing out of its customary squalor. Miller/Hull integrated plenty of meeting places into a small community-college campus of mostly part-timers.

Math and science remain high priorities, but many institutions, saddled with the legacies of a gigantic building boom of the 1950s and 1960s, are looking for ways to fix old facilities, not just replace them. Margaret Helfand gracefully accommodated both growth and renovation at Swarthmore. Hers is a work of urban design as much as of architecture.

Community colleges often get orphaned by fiscally overstretched states. But legislators are increasingly paying attention to these systems, because meeting the demand for qualified workers has become a key factor in business expansion and relocation decisions. Anshen+Allen gracefully expanded an aging concrete-block hulk of a library at Santa Monica College, creating in the process a campus magnet, with reading areas beautiful enough to incite envy from far wealthier schools.

Olympic College is well-attuned to the fast-changing workforce desires of employers in its fast-growing, semirural region. Miller/Hull delivered a facility capable of rapid adaptation.

For all the good news, plenty of institutions face dire cash crunches. Many states remain fiscally stressed, incapable of meeting the needs of institutions where student bodies are growing just as fast as facilities are deteriorating. There's no doubt that future economic growth and global competitiveness rely on the nation's higher education system. The big question remains: Is America up to the challenge? ■

For more information about these projects, go to Projects at www.architecturalrecord.com.

Shapiro Campus Center

Waltham, Massachusetts

1 CHARLES ROSE PLACED A LIGHT-DAPPLED ATRIUM WHERE FOUR CAMPUS PATHS COLLIDE AND WRAPPED IT WITH A HIVE OF ACTIVITY.
By Nancy Levinson

Architect: Charles Rose Architects
Client: Brandeis University, Waltham, Massachusetts
Consultants: Arup (structural engineering, m/e/p); Stephen Stimson Associates (landscape); Accentech (acoustical); Judith Nitsch Engineering (civil)
General contractor: William H. Berry and Son

Size: 65,000 square feet
Cost: \$21 million
Completion date: October 2002

Sources

Masonry cladding: Cenia Limestone (Kenneth Castellucci and Associates, fabricator)
Metal cladding: Revere Evergreen Copper
Roofing: Firestone (single-ply membrane)
Window wall, entrances: Kawneer; Viracon (glazing)
Millwork: American Architectural Woodwork
Custom railings: Cape Cod Fabrications
Terrazzo: Depauli Mosaic
Elevators: ThyssenKrupp

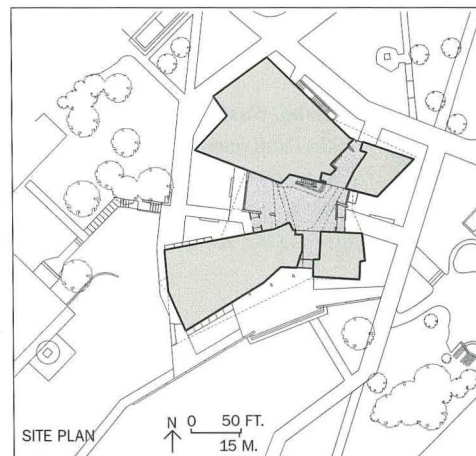
For more information on this project, go to Projects at www.architecturalrecord.com.



Brandeis University welcomed its first students in the fall of 1948, and since then the institution has been more or less under construction. In the past half-century, the wooded campus in Waltham, Massachusetts, has grown from a 90-acre site with a motley group of existing buildings—purchased from a defunct medical school—to more than a hundred structures on 235 acres.

Given the rapid pace of development, it's not surprising that functional imperative at times ran ahead of planning logic. By the mid-1990s, it was apparent that the pastoral postwar campus of the early years had long since grown into what the school's Web site describes as a "dense, more urban place." The question of how to deal with that growth spurred a 1997 planning and design charrette. One

Nancy Levinson, a RECORD contributing editor, lives in Cambridge, Mass.



of its key recommendations produced the Shapiro Campus Center, designed by Charles Rose Architects. "At the charrette there had been general agreement that the campus lacked a real center," says Peter French, the university's executive vice president and chief operating officer. French notes that the center of the campus was then occupied by a nondescript redbrick

Protected by a broad overhang, a café and bookstore open to a sunny lawn on the south side of the Shapiro Center. Louvers shade a two-level library.

building—one of the structures bought when the school was founded—and a big parking lot. "The location was a major campus crossroads," says French, "but it sent all the wrong signals."

Program

The new campus center would augment an existing student center to the north, and it would house





diverse tenants: the university bookstore, an electronic library, a 250-seat theater, the school radio station, the school newspaper, administrative offices that oversee student life, assorted student organizations, a café, and exhibition space. And beyond its program, the new facility would need to answer to evolving campus lifestyles: It had to

be open and available round-the-clock, and it had to provide what the school had long lacked, a vital center worthy of both the name and location.

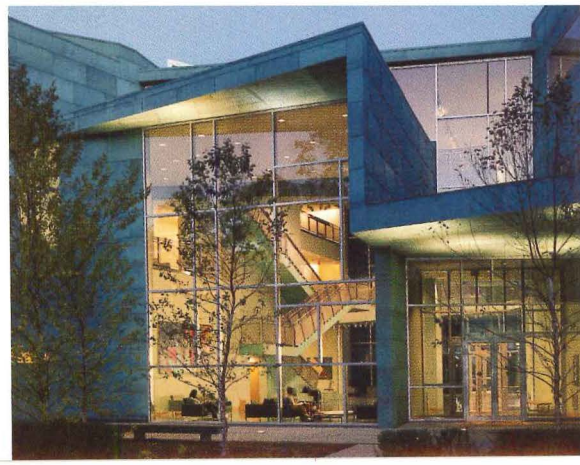
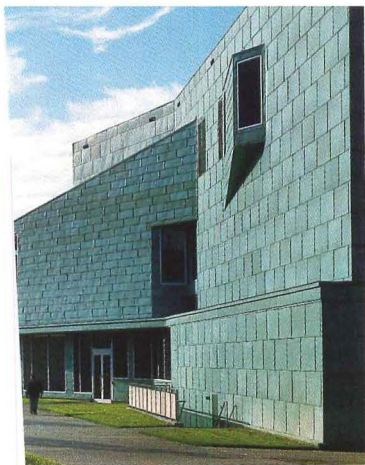
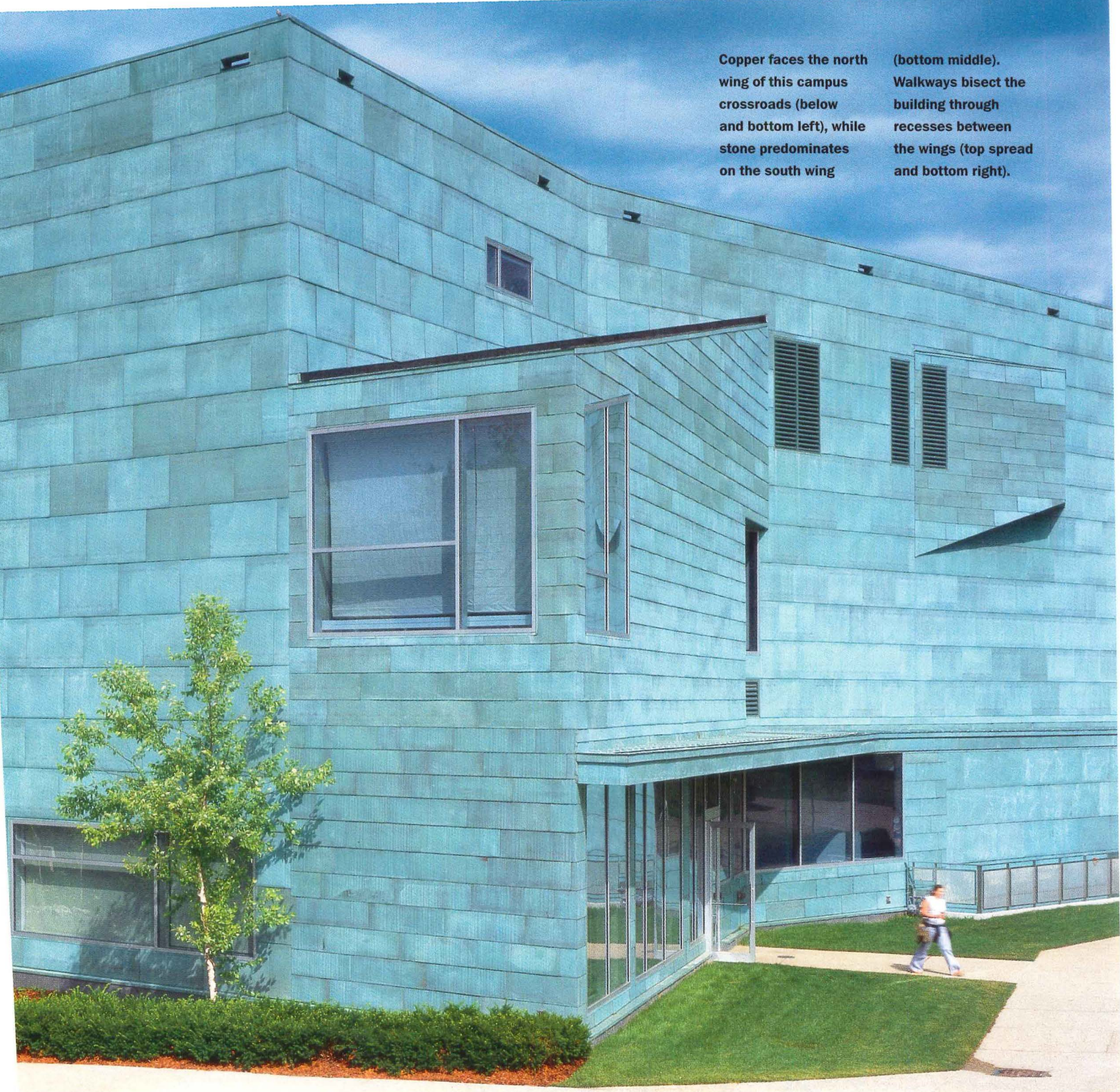
Solution

For Rose, who has training and experience in landscape architecture, the opportunity to enhance

cross-campus connections was compelling. So too was the chance to create outdoor spaces that would enliven and extend the interiors. To the south, these include ground-level and second-floor terraces and an expansive green lawn; and to the west, a quiet and shady courtyard defined by Shapiro and the adjacent Faculty Club.

The Faculty Club, designed by Harrison & Abramovitz, is Modernist. In this, it's like much of the postwar campus: Eero Saarinen created the initial site plan, and the roster of campus architects also includes The Architects Collaborative, Hugh Stubbins, Benjamin Thompson, Hideo Sasaki, and Edward Larrabee Barnes. Before beginning Shapiro, Rose stud-

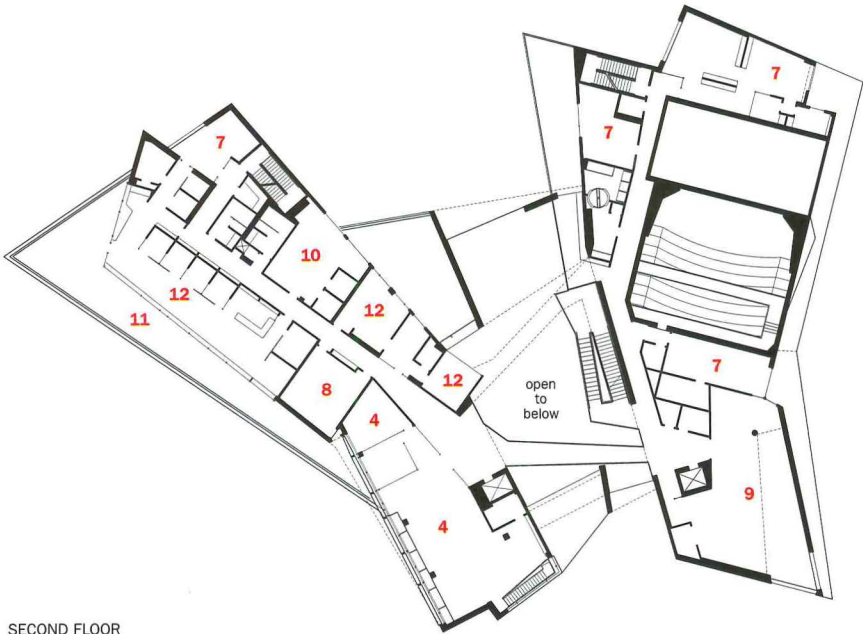
Copper faces the north wing of this campus crossroads (below and bottom left), while stone predominates on the south wing (bottom middle). Walkways bisect the building through recesses between the wings (top spread and bottom right).



In plan (left), it looks as if the two wings, like tectonic plates, have floated apart, leaving behind a great open space where many paths can cross. The upper-floor bridges, like tendons, unite the two wings, while enlivening the great atrium with activity on three levels and on the stair (opposite).



THIRD FLOOR



SECOND FLOOR

- 1. Atrium
- 2. Café
- 3. Bookstore
- 4. IT Library
- 5. Theater
- 6. Lounge
- 7. Club offices
- 8. Function room
- 9. Multipurpose
- 10. Mechanical
- 11. Terrace
- 12. Staff office
- 13. Gallery



FIRST FLOOR





ied the campus carefully, noting the patterns and characteristics of its buildings and open spaces, and as a result he has made a strong, clear structure that neither mimics nor clashes with its context. In its forms and materials, Shapiro is by turns Minimalist and bold. The south facade, clad in limestone and pre-patinated copper, with windows of tinted glass, is gently inflected toward the large lawn. The sculptural north facade features large expanses of glass and copper. The copper is especially striking. "We wanted to add texture to the building," says Rose. "The copper, which we've used in small and large panels, seemed a good, interesting way to do that."

The 65,000-square-foot building provides for its numerous users in two wings connected by a three-story atrium. The atrium is more than the literal center of the building: With large glass walls to the north and south and bridges crisscrossing the upper levels, the space is energetic and inviting, and it has become the nonstop scene of assorted events, including art exhibitions and craft sales, dances and concerts, midnight buffets and slumber parties. And with its strong north/south and east/west axes, and entrances on all sides, the atrium is a major campus circulation link, drawing students and faculty to and through Shapiro both day and night.

Commentary

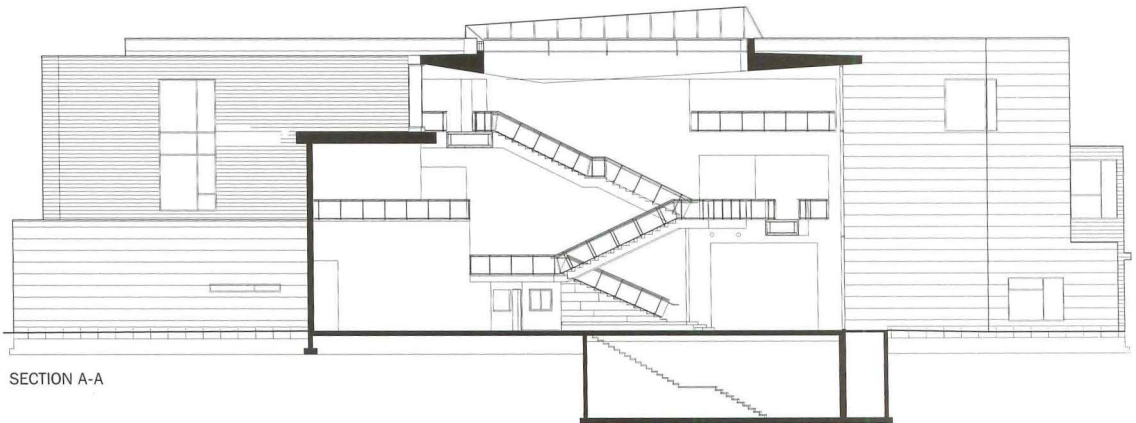
The Shapiro Campus Center clearly appears to be fulfilling its mandate to serve not merely as the geographic but also the functional and perceptual heart of campus. On a recent visit, the place was bustling: The library was standing room only; the atrium was hosting a poster sale; the café was packed. Administrators and students enthusiastically described how much they liked the building and how well it accommodated activities ranging from peer counseling to tango lessons. And one junior was especially effusive: "I practically live in this building," she said. Brandeis and its architect have given her a great place to live in. ■



Skylights and broad planes of glass (above) scatter light across stairways and bridges to make the great atrium space luminous and active. Wood faces a two-level lounge (left).



Light from many sources bathes the stair (above) that vertically unites the central atrium, touching each floor at different points (section, right).



29 Garden Street

Harvard Graduate Housing

Cambridge, Massachusetts

2

JONATHAN LEVI ARCHITECTS CREATES AFFORDABLE UNIVERSITY HOUSING THAT ENCOURAGES A SENSE OF COMMUNITY AMONG GRADUATE STUDENTS.

By Nancy Levinson

Architect: Jonathan Levi Architects—Jonathan Levi, FAIA, partner in charge; Matthew LaRue, AIA, project architect

Associate architect: Bergmeyer Associates—Darryl Filippi, project manager; Doug Coots, project associate

Client: The President and Fellows of Harvard College

Engineers: Weidlinger Associates (structural); Cosentini Associates (mechanical/electrical); Green International Affiliates (civil); Richard Burck Associates (landscape); Lam Partners (lighting); Acentech (acoustics)

General contractor: Suffolk Construction; Bond Brothers

Size: 114,000 square feet

Cost: Withheld

Completion date: August 2004

Sources

Curtain wall: Kawneer; Reynolds

Roofing: Genflex; Hydrotech

Windows: Efcó

Glass: Solarseal

Doors: Blumcraft; Kawneer; Lambton Doors; Total Door

Door hardware: Schlage; Hager; LCN; Von Duprin; Blumcraft

Acoustical tile: Armstrong

Paints: ICI; PPG

Lighting: Lithonia; Nulux; B-K Lighting; Hydrel; Sylvania

For more information on this project, go to Projects at www.architecturalrecord.com.

Undergraduate life at Harvard has long revolved around the network of houses the university built in the 1930s—imposing neo-Georgian residences that accommodate communal dining and common rooms as well as living quarters. Graduate student life, however, has enjoyed no comparable amenity. For years, the majority of graduate and professional students who arrived in Cambridge had little choice but to hunt for a good deal on a rental—a nerve-racking pursuit in a market where limited supply and inflated prices meant that most settled for crowded housing in dumpier neighborhoods far from campus.

With the reopening of 29 Garden Street, designed by Jonathan Levi Architects, with associate architect Bergmeyer Associates, the choices have been happily enhanced. A thorough renovation of an undistinguished hotel from the 1920s, 29 Garden features well-appointed student apartments. It also includes a variety of shared spaces intended to encourage a sense of community, a first for the university's graduate apartment-house system.

Program

Harvard converted 29 Garden to housing years ago, but the renova-

Contributing editor Nancy Levinson is a writer and architect based in Cambridge, Mass.



tion was modest in concept and effect, and the building needed upgrading. According to Susan Keller, vice president of residential real estate at Harvard, the motivations for this latest project were both economic and political. "Because of the tight and expensive housing market, and because of municipal pressure on the university to house more students," says Keller, "we wanted to increase

the number of affordable apartments close to campus." The university also wanted to enrich its housing-type mix, adding the "double studio," consisting of two private living spaces that share a kitchen and bath.

Solution

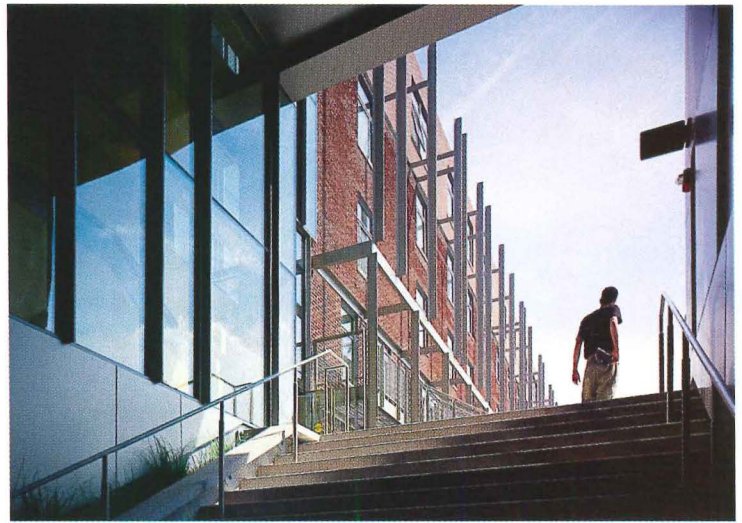
Jonathan Levi Architects responded to the university's requirements with two kinds of double studios. In the

A newly constructed opening on Garden Street (opposite) connects Arsenal Square with the courtyard garden designed by Richard Burck Associates (right and below). The garden covers the roof of the apartment building's parking garage, a space that was formerly covered with blacktop.



Each of the three-bedroom, third-floor faculty apartments is accessed via stairs leading from the courtyard garden.





Entrances to faculty apartments are joined by a balcony that extends the entire length of the building (left and opposite).

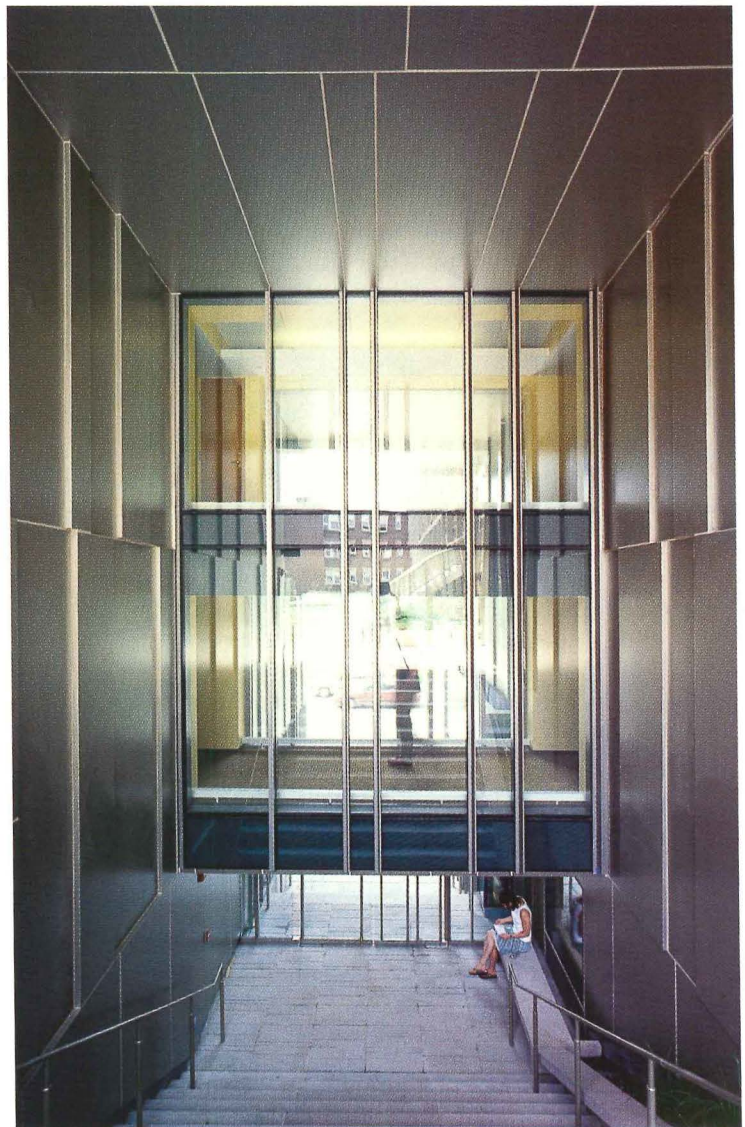
newly created exterior passageway and grand stair lead from Garden Street (below) to the courtyard garden (top), one level above.

smaller, students share a kitchen and bath; in the larger, each has a private bath. Three other residence types—one-person studios and two- and three-bedroom apartments—complete the mix. And for each type, the architect has designed stylishly contemporary living quarters. Built-in shelves, tables, and desks “ease the move-in transition for new students,” in Levi’s words, and the birch-veneer cabinetry visually warms the rooms. Kitchens feature translucent-front cabinets (manufactured by Ikea, but with custom-designed hardware) and undercounter refrigerators that allow for maximum counter space. Ceiling-mounted convection heating/cooling valances are sleek, quiet, unobtrusive, and energy efficient, and allow residents to control their thermal environment. (Opening the window automatically switches off the mechanical system, another efficiency touch.)

But Levi did more than satisfy the basic program; ultimately, he convinced the university to expand its understanding of 29 Garden’s programmatic and urban potential.

Early on, the architect envisioned a project that would be more than just another university-owned apartment house. “We became interested in the idea of a ‘graduate house’—something akin to the undergraduate houses, a place that would spur a sense of community,” says Levi. “Since residents would be drawn from different schools and programs, we saw it also as fitting in with the academic trend toward greater mixing of disciplines.” 29 Garden fully satisfies the university’s quota for beds (increasing the number from 121 to 143). It includes a ground-floor buttry/convenience store with an adjacent dining/common room, and light-filled, double-height lounges on alternating residential floors. Especially impressive is a new garden (designed with the landscape architecture firm Richard Burck Associates) located on what had been the blacktop roof of the building’s one-story garage.

Levi’s design expands the urbanistic potential of 29 Garden, too. The building fronts Arsenal Square, a small green space where





The single-student studio units (above left) have built-in shelves and concealed lighting. Large double studios (above right) feature built-in dining tables and dual refrigerators. The dining commons (left) provides multi-functioning space that can be used for eating, studying, or seminars.

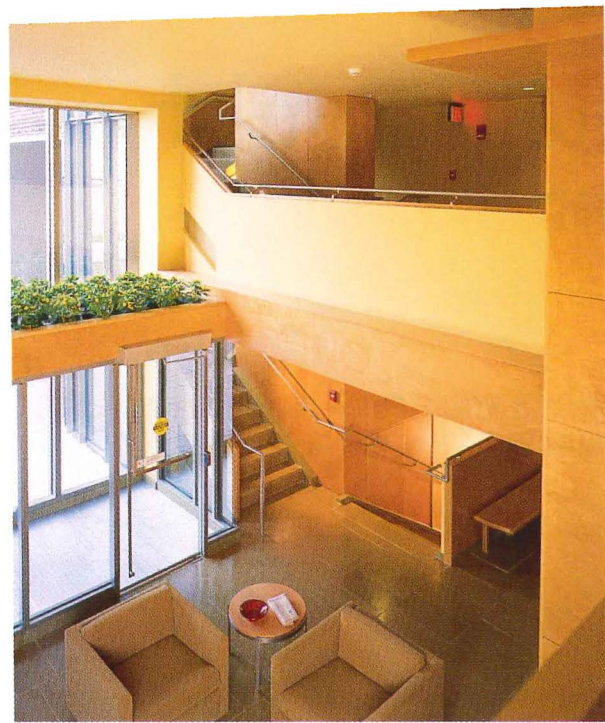
two major streets converge, just beyond Harvard Square. The architect saw this as “a significant urban moment” that demanded an architectural response. In the middle of the Garden Street facade, the architect cut a three-story entryway into the volume of the building; from here, residents can access the ground-floor lobby or ascend a grand stair to the garden. If the gesture is monumental, the materials are modern: The garden entry is a glass curtain wall, and the side walls are clad in metal panels offset to create a sculptural pattern. With this architectural move, the architect transformed a nondescript facade into a graceful and elegant civic presence.



1. One-person studio
2. Double studio
3. Three-bedroom apartment
4. Two-bedroom apartment
5. Lobby
6. Large double studio

Commentary

At 29 Garden Street, Levi and his associates have programmed and designed a residence that fits the transitional nature of graduate student life, that time between the college dorm and the first mortgage. And in reinvigorating a tired and dreary building, they have produced a place that respects its historic Cambridge context while avoiding any banal imitation of older motifs. At a university that has lately seemed to favor a dull neotraditionalist approach to architecture, 29 Garden is an exemplary blend of old and new. ■



The main stair (near left) connects the first-floor lobby (far left) with the second-floor lobby and main corridors. Windows in the ground-floor lobby (below) look into the dining commons.



Olympic College Poulsbo Poulsbo, Washington

3

MILLER/HULL INTERPRETED SCANDINAVIAN STYLE FOR A COMMUNITY COLLEGE SERVING A REGION THAT'S GROWING QUICKLY FROM RURAL TO URBAN.

By James S. Russell, AIA

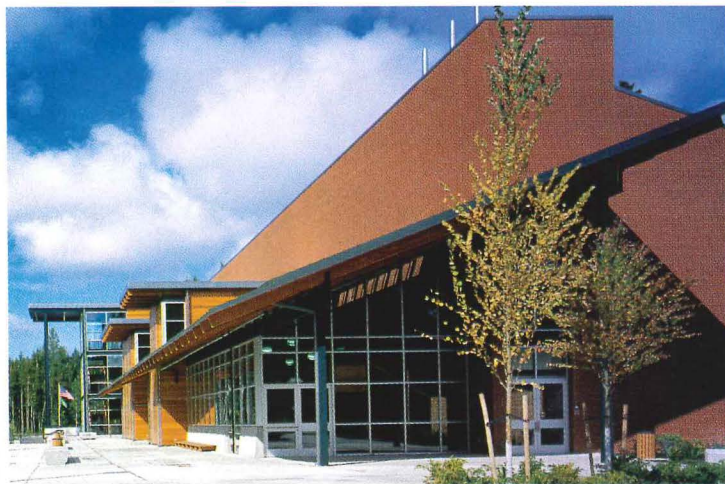
Project: Olympic College Poulsbo, Poulsbo, Washington
Architect: Miller/Hull Partnership—Craig Curtis, AIA, Scott Wolf, AIA, Bill Franklin, AIA, Norm Strong, FAIA, Rob Hutchison, Amy DeDominicis, Ruth Coates, Daniel Mihalyo, Annie Han, Laurie Fanger
Engineers: AKB Enineers (structural, civil); Sparling (electrical); The Greenbush Group (mechanical)
Consultants: Edaw/Site Workshop (landscape); Sparling (lighting); The Greenbush Group (audio/visual)

Size: 40,000 square feet
Cost: \$8.6 million
Completion date: Spring 2004

Sources

Masonry: Mutual Materials
Curtain wall: EFCO
Metal roofing: AEP Span
Windows: Quantum (wood); EFCO (metal); PPG, Milgard, Pilkington (glass); Evergreen House (skylights)
Cabinets and millwork: W.W. Wells
Flooring: Dex-O-Tex (epoxy); Dal-Tile (tile); Armstrong (resilient); Blueridge (carpet)
Marine-grade exterior stain: Sherwin Williams

For more information on this project, go to Projects at www.architecturalrecord.com.



One building at 40,000 square feet comprises the entirety of Olympic College's new branch. Such a small facility makes sense in a largely rural area that's quickly growing urban, with commuters hustling along the tree-lined highways to nearby military facilities or rushing to catch ferries to jobs in Seattle, a few miles across Puget Sound.

Kelly Woodward, the director of Olympic College Poulsbo, explained that the main Bremerton campus was not only inconvenient to reach, but it was densely built out, with little room to expand. With the new structure, she added, the school can serve students who would otherwise have to make laborious commutes to facilities elsewhere.

Program

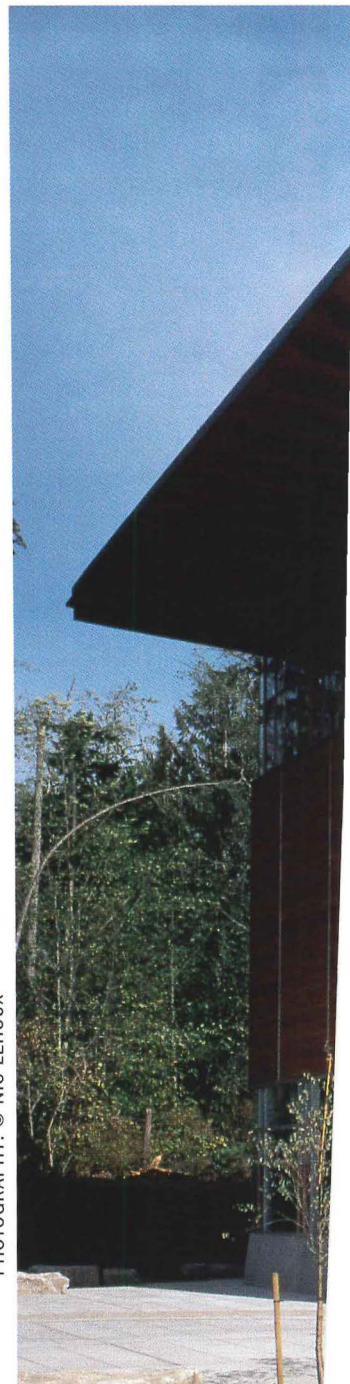
The building offers conventional two-year degrees, adult continuing

education, and distance learning in a combination of 14 classrooms, seminar rooms, and labs. It needed to adapt readily to changes in curriculum proposed by an ongoing local Workforce Advisory Committee.

An overstretched state funding system put Olympic College in a bind. Seattle-based architect Miller/Hull started planning for the project in 1996. (It had just completed another small branch of the same college, in Shelton, 40 miles to the south [RECORD, November 1996, page 90], which went on to win a national AIA award.) The college secured state aid for the Poulsbo campus after a local developer donated 20 acres of a 220-acre commercial tract. A local gift also signaled the community's commitment to the project.

The highway-oriented commercial development raised local ire,

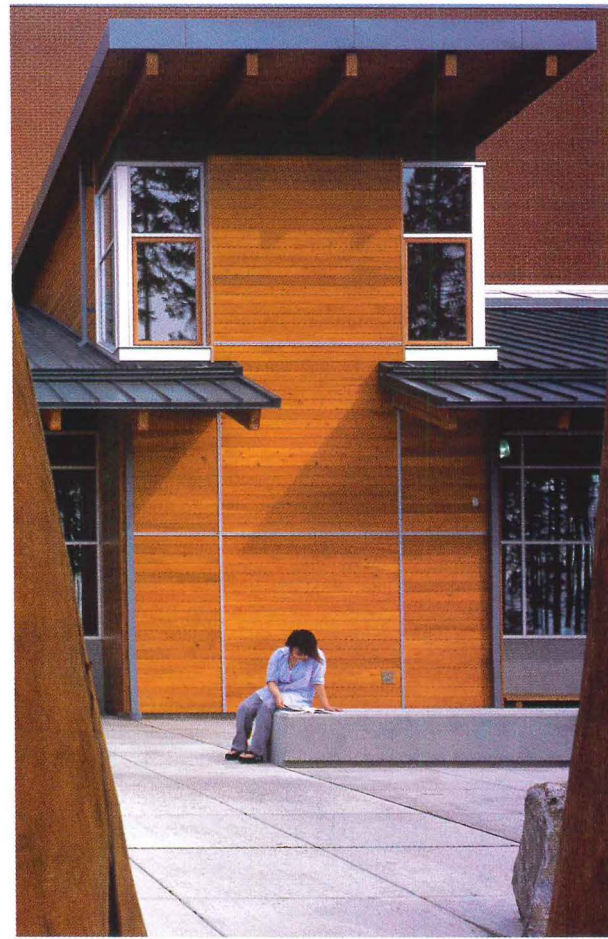
PHOTOGRAPHY: © NIC LEHOUX





A broad porch faces the auto drop-off (opposite, left). From lower-level parking, a stair tower beckons like a campanile (below and top left). Shedlike structures enclose spaces to meet and relax (top right).





Judiciously bringing the exterior stained wood into the public areas (left, entrance from south-facing plaza, above) enhances the experience even within the tight \$215-per-square-foot budget (which included extensive site infrastructure).

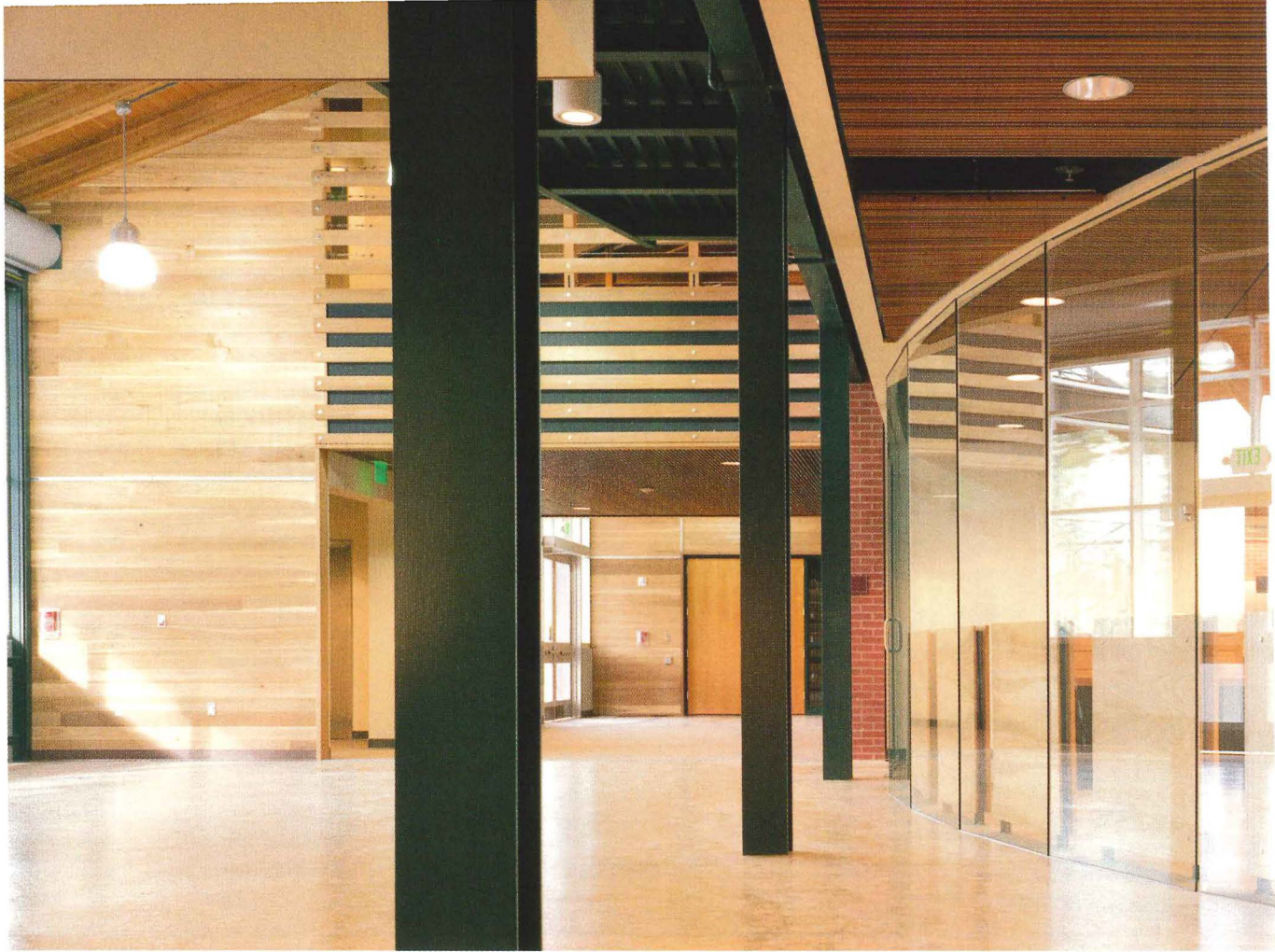
however. Opponents claimed it (and especially a planned Wal-Mart) threatened Poulsbo's center, which locals have lovingly nurtured by affixing a faux version of Scandinavian style to ordinary storefronts. The development row remains unsettled, but the college finally opened earlier this year.

Solution

The donated site, unfortunately, offered only one amenity, its shaggy cover of second-growth firs. So Miller/Hull tucked the classroom building tightly to the side of the site that faced a protected woodland.

Partner Craig Curtis, who lives nearby, says the firm welcomed the chance to work with a community that was "both active and vocal." In the program, a requirement to recognize the town's Scandinavian roots was spelled out. It was challenging, Curtis admitted, to help people understand that Scandinavia's design heritage is Modern, not just vernacular-style carpentry. "We showed them that it wasn't neces-

The lobby opens to the full-height glass of the computer lab (right), giving it particular visibility. Pivoting doors (below) unite classrooms with the commons (beyond doors in photo) for meetings, receptions, and parties.





The glass-enclosed main stair (left) offers a nighttime beacon and encourages students to use stairs, not the elevator. The computer lab (opposite, top) is the academic heart of the building, since writing labs and distance-learning classrooms open directly into it (plans, below). Second-floor lounge alcoves (opposite, bottom left) and the double-height commons (opposite, bottom right) are appealing places to gather.

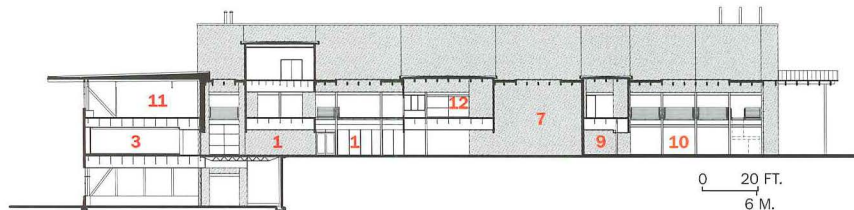
sarily the images, but the handling of light and the climate, which are very similar.”

Curtis’s team packed classrooms tightly against each other on the north side. Shedlike volumes with clerestories and high window walls open to the south to grab low winter light. They shelter quiet places to study and eddies of space for socializing in the simple, double-loaded corridor plan. The lobby and the porched commons are double-height gathering spaces that bookend the structure. A long plaza, like an external corridor, parallels the building. The sense of spatial generosity doesn’t just add visual appeal; the opportunities to see and be seen ease the social isolation common to colleges with mainly part-time students.

Commentary

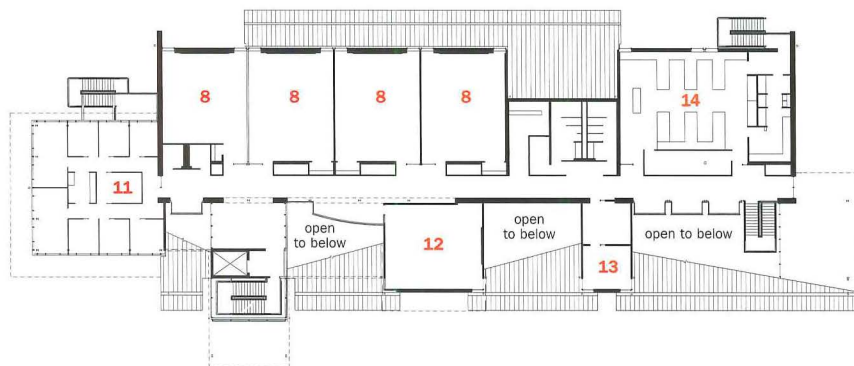
The focus on easy sociability is important for a structure that operates day and evening to serve both adult-education and degree-earning programs. Many students take courses both in Poulsbo and Bremerton, but director Woodward says students can complete several programs, including nursing and office technology, entirely within the building already. It attracts 350 full-time-equivalent students. (Capacity is 800.) “Our Workforce Advisory Committee has recommended changes in the curriculum, like the addition of culinary arts,” says Woodward. “We can accommodate this because of the flexibility of the classrooms.”

The architect was constrained by the unfortunate site. It is well away from the main road and invisible to passersby, so there was no opportunity to develop a civic image for a campus that will probably grow. The developer that donated the site also unwisely scraped clean its 200 acres, creating an appalling eyesore. It is not surprising that activists have kept development from materializing. Luckily for Olympic College, the fast-growing local flora should quickly obscure whatever gets built next door. ■

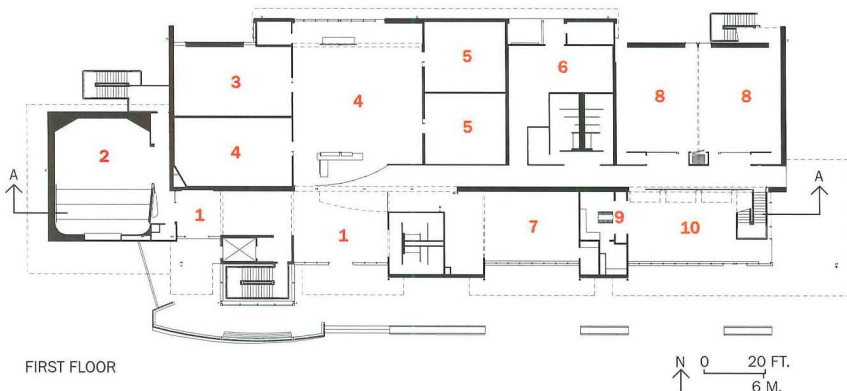


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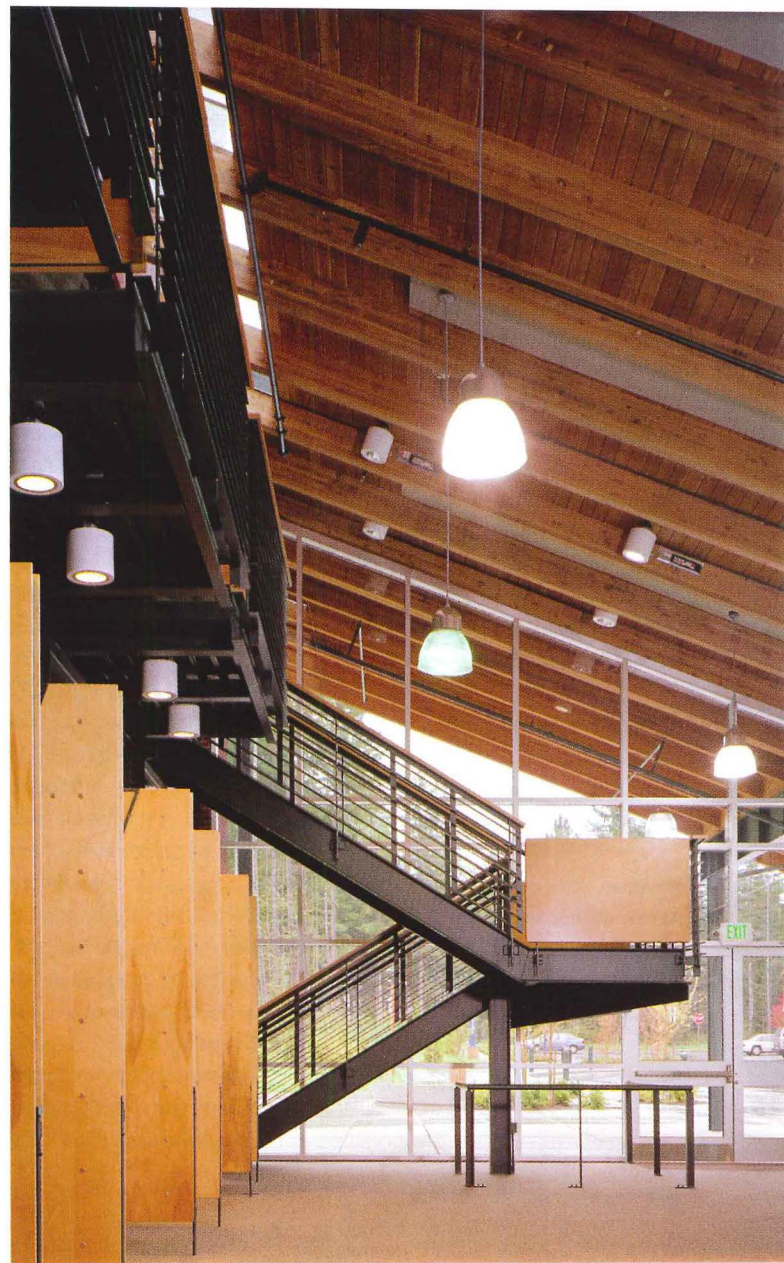
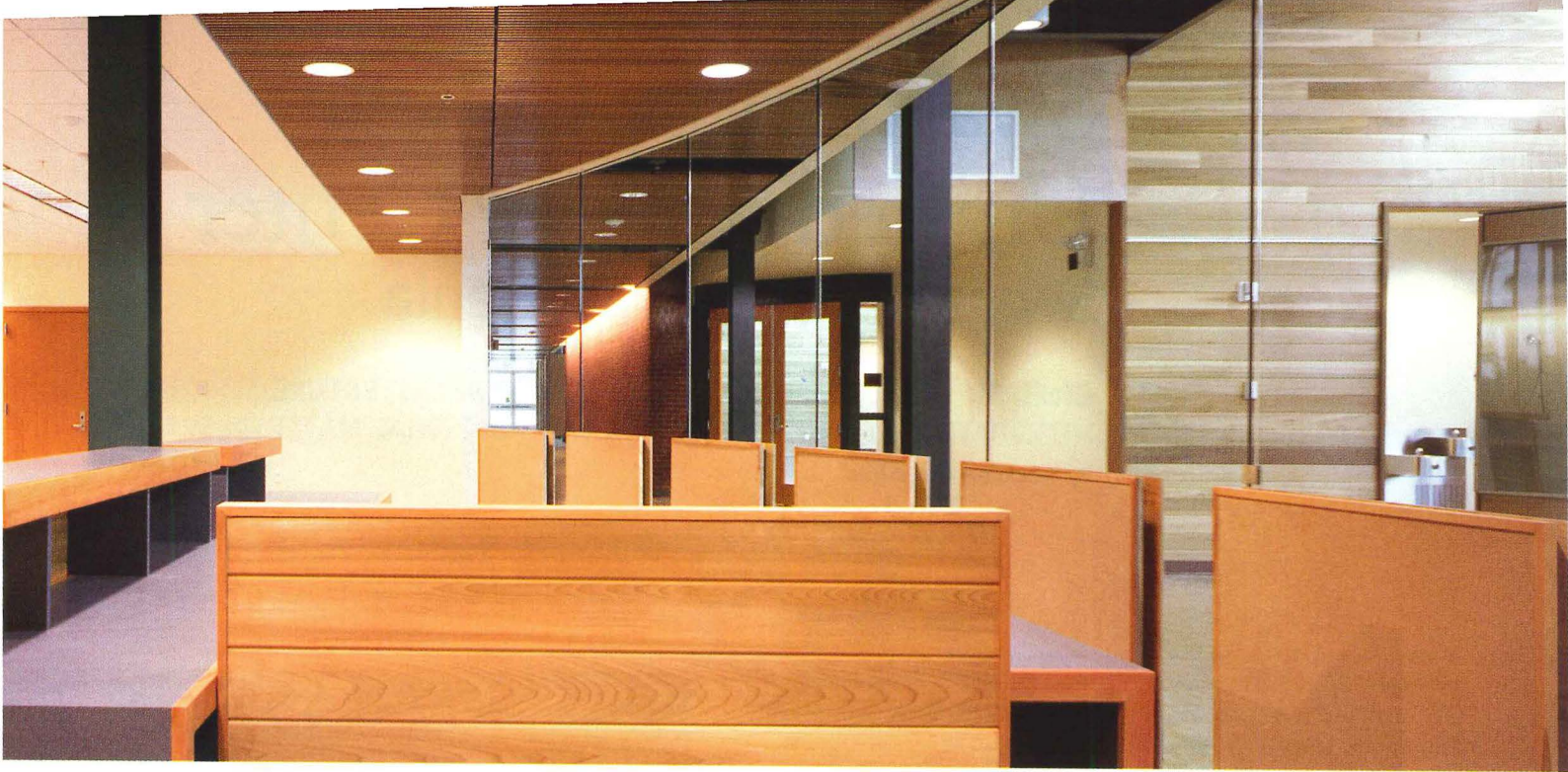
1. Lobby
2. Auditorium
3. Writing lab
4. Computer lab
5. Distance learning
6. Receiving
7. Lounge
8. Classroom
9. Food service
10. Commons
11. Office
12. Seminar
13. Director
14. Science lab



SECOND FLOOR



FIRST FLOOR



Swarthmore College Unified Science Center Swarthmore, Pennsylvania

4

EINHORN YAFFEE PRESCOTT AND HELFAND ARCHITECTURE SMOOTHLY INTEGRATE MODERNIST FORMS WITH TRADITIONAL MATERIALS.

By Suzanne Stephens

Architect: *Einhorn Yaffee Prescott (EYP) and Helfand Architecture (HA; formerly Helfand Myerberg Guggenheimer), architects in association—Cahal Stephens, AIA (EYP), principal in charge; Margaret Helfand, FAIA (HA), design principal; Kip Ellis (EYP) project manager; Jennifer Tulley Stevenson, John Tinmouth (HA), Lila Khalvati, AIA (EYP), project architects; Yelena Lembersky, AIA, Jay Hallinan, AIA, Nikolas Dando-Haenisch, AIA (EYP), Elisa Testa, Tom Chang (HA), design team*

Client: *Swarthmore College—Lawrence Schall, vice president for administration; Janet Semler, director of planning and construction; Rachel Ann Merz, planning committee*

Engineers: *Christakis VanOcker Morrison (structural); Einhorn Yaffee Prescott (m/e); Robert W. Sullivan (plumbing)*

Landscaping design: *Gladnick Wright Salameda; ML Baird & Co.*

Size: *69,000 square feet (renovation); 75,000 square feet (new construction)*

Cost: *\$48.2 million*

Completion date: *Summer 2004*

Sources

Ashlar stone: *Wissahickon schist*

Metal and glass curtain wall: *Kawneer*

Aluminum windows: *Wausau*

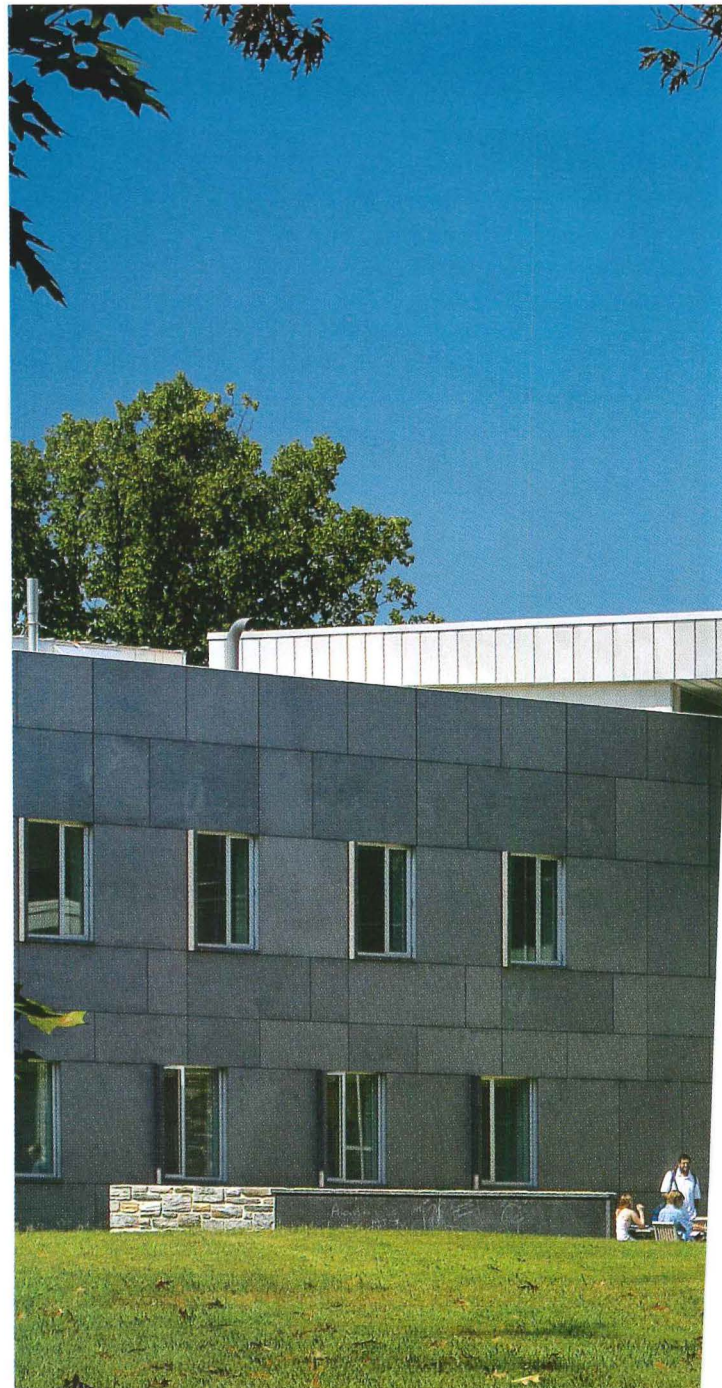
Glazing: *Pilkington*

For more information on this project, go to Projects at

www.architecturalrecord.com.

In renovating and adding onto an existing science facility, Swarthmore College faced an old dilemma. The college wanted to create a contemporary architectural response befitting an evolving program, yet not jeopardize the cohesion and spirit of the campus's historic architecture. Located on the edge of a 200-acre woods, the college, founded in 1864 by the Hicksite Quakers—the more liberal branch of the Society of Friends—was, and still is, coeducational and fiercely intellectual. “Architecture is vitally important in expressing this tradition as well as inspiring imagination and creativity,” says its president, Alfred Bloom.

The campus displays its fair share of architectural styles, including the central building, Parrish Hall, a Second Empire-style, mansard-roof affair dating to 1881, plus superbly iconic examples of Collegiate Gothic buildings by Karcher and Smith, such as Clothier Hall, designed in 1929, and Worth Hall, a dormitory built in 1924. Although Swarthmore's architecture has taken on a variegated look over the years, the campus buildings are unified by the pervasive use of local stones, most notably Wissahickon schist, glinting of silver and gold mica. Yet the DuPont Science Center, designed by Vincent Kling in 1958, egregiously diverged from the campus mien. The Modern rectilinear center, clad in a yellow-tan precast-concrete aggregate panel, has always struck a jarringly



PHOTOGRAPHY: © JEFF GOLDBERG/ESTO



In keeping with the college's stone buildings, the architects clad new spaces in the local Wissahickon schist, alternating it with granite (this page).

V-shaped roofs are sheathed in terne-coated stainless steel (below). Ceramic fritted glass creates a partly gauzy curtain wall (below center).



tacky note. Fortunately, it needed to be updated and expanded.

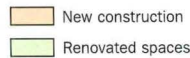
Program

For economic reasons, the college wanted to keep most (69,000 square feet) of DuPont, adding 75,000 square feet of new construction for science classrooms, laboratories, offices, and a student commons. The new addition would also link physically to an adjacent library, along with Martin Hall, a handsome, Moderne-style stone biology building, designed in 1937 by Cram and Ferguson.

The college first brought in Einhorn Yaffee and Prescott (EYP) of Boston to program the spaces. As Larry Schall, vice president of administration at Swarthmore explains, the school was impressed by the architecture and engineering firm's previous work on large science buildings at other college campuses. But Swarthmore also valued the design sensibilities of Margaret Helfand, FAIA, of Helfand Architecture (HA; formerly Helfand Myerberg Guggenheimer), who in 1996 had designed the Modernist stone-clad Kohlberg Hall [RECORD, February 1997, page 70]. "Helfand's design talents and our experience in working with her before proved so successful, it made us want to do that again," says Schall. So the college (Schall, Bloom, and the Science Center Planning Committee) proposed an arranged marriage between the two firms for the job. Cahal Stephens, AIA, of EYP would be the principal in charge, and Helfand the design principal.

Solution

The architectural team decided to place the new additions to the science center along the eastern and southern edges of the renovated buildings, where they would create an outdoor courtyard, with the Kling structure forming the rear backdrop. A second outdoor court carved out of the slope to the west allows daylight to be admitted into physics laboratories placed under the student commons. Two V-shaped, terne-coated stainless-steel roofs,



SITE/FLOOR PLAN

1. Gateway entrance
2. Lecture hall
3. Chemistry
4. Math, statistics, computer science
5. Physics and astronomy
6. Main (upper) court
7. Lower courtyard
8. Student commons
9. Science library
10. Biology building
11. Chiller plant

essentially rectangles folded on a diagonal, define indoor and outdoor areas through their projecting cantilevers. Although the existing Kling building's precast-concrete aggregate panels and its poured-in-place concrete frame would remain, the architects installed a new, sleek glass curtain wall at its base, and fully revamped the interiors. In addition, new steel-framed blocks for laboratories, auditoriums, and classrooms, clad in glass, aluminum, and stone, are cranked slightly so that their front elevations become a series of inflected planes: "This was

to foster a path of movement from the parking lot—the new primary visitor entrance—on the east down to the center of the campus on the south," says Helfand.

Inside and out, HA combined vibrantly natural materials—the Wissahickon schist in an ashlar (squared) pattern, black and gray granite, cherry wood, and slate—to great effect. Details diverge from the usual fast-and-cheap school specifications; for example, granite lines the window sills indoors and provides brise-soleils outside. "These are cost effective and low maintenance,"

states Helfand. The stairs have slate treads and blasted-stainless-steel banisters, while sintered aluminum fiber over perforated masonite provides acoustical surfaces inside classrooms and auditoriums. To dramatically shape the indoor space of the commons, the social heart of the science center, the architects designed a glue-laminated timber-truss roof that cantilevers from poured-in-place concrete piers and wood columns. The furnishings in this meeting place appear comfortably noninstitutional, with chairs by Dakota Jackson and Cassina, and



Honed black granite is used as outdoor chalkboards for science classes (left); a lighter granite clads the new chemistry wing on the eastern end of the

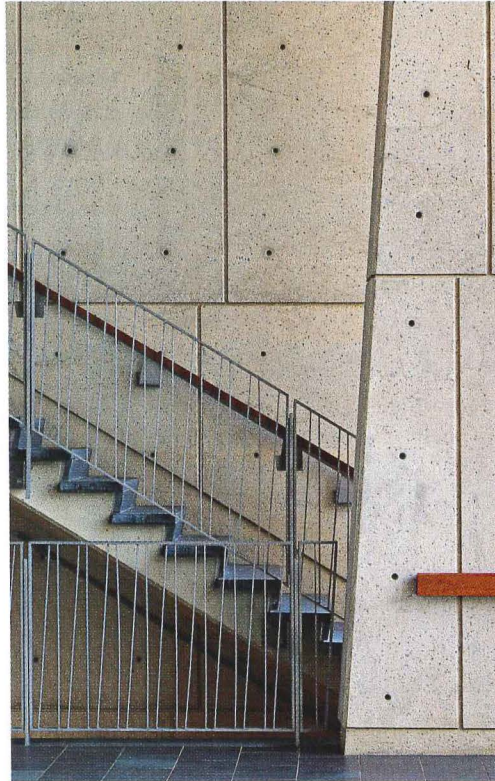
complex (below), articulated by granite brise-soleils. The entrance canopy (bottom) frames a courtyard edged at the rear by the renovated science buildings.





Fritted glass keeps birds from crashing into the panes (above). The student commons (below and opposite) is dynamically charged by a ceiling with a glue-laminated wood truss (below), one

leg of which extends 41 feet 4 inches, cantilevered from concrete piers. Slate covers the commons floor and the treads for the stairs inside and outside (right).



solid cherry tables by Ted Boerner. Elsewhere, HA combined durability and comfort with high design in its conversational groupings and niches for studying and socializing, while EYP attended to creating crisp state-of-the-art laboratories and classrooms. Corridors may often end in inglenooklike alcoves with built-in high-backed cherry wood benches. The professors' offices come with small conference areas lined with walls of slate for chalkboard discussions. The effect is pure Cy Twombly.

Since both the college and the architects were interested in sustainability, the team went after a silver LEED rating. Accordingly, the architects specified products for wood ceilings and walls, as well as carpets and tile, that are derived from recycled materials. Operable windows, local temperature controls, and single-loaded corridors make the most of natural light and ventilation. To deter birds from crashing into the glass, the architects consulted an ornithologist. The result: Gauzy screenlike panes of ceramic fritted glass alternate with clear glass to signal a "no flying zone" to the birds.

Commentary

The architects' handsomely detailed synthesis of Modernist forms and traditional materials for this complex of buildings brings to mind Louis Kahn's houses in the area, from the Oser House in Elkins Park (1942) to the Fisher House in Hatboro (1967). Although the south elevation for the grouping of buildings appears more stretched out horizontally and episodic than the tightly composed forms of other stone buildings on the campus, it does a good job of concealing, or at least mitigating, the sore-thumb aspect of the precast-concrete aggregate panels of the 1958 building. The Unified Science Center is aptly named in its use of clean geometrical forms and its interrelation of the outdoor and indoor spaces, particularly in such a sylvan setting. More important, it offers meticulously elegant places in which to study, work, or socialize. ■





Santa Monica College Library

Santa Monica, California

5

ANSHEN+ALLEN LOS ANGELES RENOVATES AND EXPANDS AN OUTDATED LIBRARY, DOUBLING SPACE AND CREATING A CAMPUS SOCIAL CENTER.

By Morris Newman

Architect: Anshen+Allen Los Angeles—L. Paul Zajfen, design principal; Andrew Labov, project architect; Fabian Kremkus, Edward Anastas, Claudia Larrain, Ramon Klein, Candace Taira, David Consbruck, project team

Client: Santa Monica College District

Consultants: Arup (structural/mechanical/electrical engineering, telecommunications, acoustic); Ashba Engineers (civil); Linda Demmers (library programming); Katherine Spitz Associates (landscape architect); CNI Design (interior design); Carol Cambianica (furnishings); ILD (lighting); Tait Solar (solar design); FHT (hardware)
General contractor: Nielson Dillingham Builders—C.W. Driver

Size: 54,000 square feet (renovation); 41,000 square feet (expansion)

Cost: \$21.95 million (construction)

Completion date: September 2003

Sources

Curtain wall, windows: Werner Systems

Skylights: Supersky

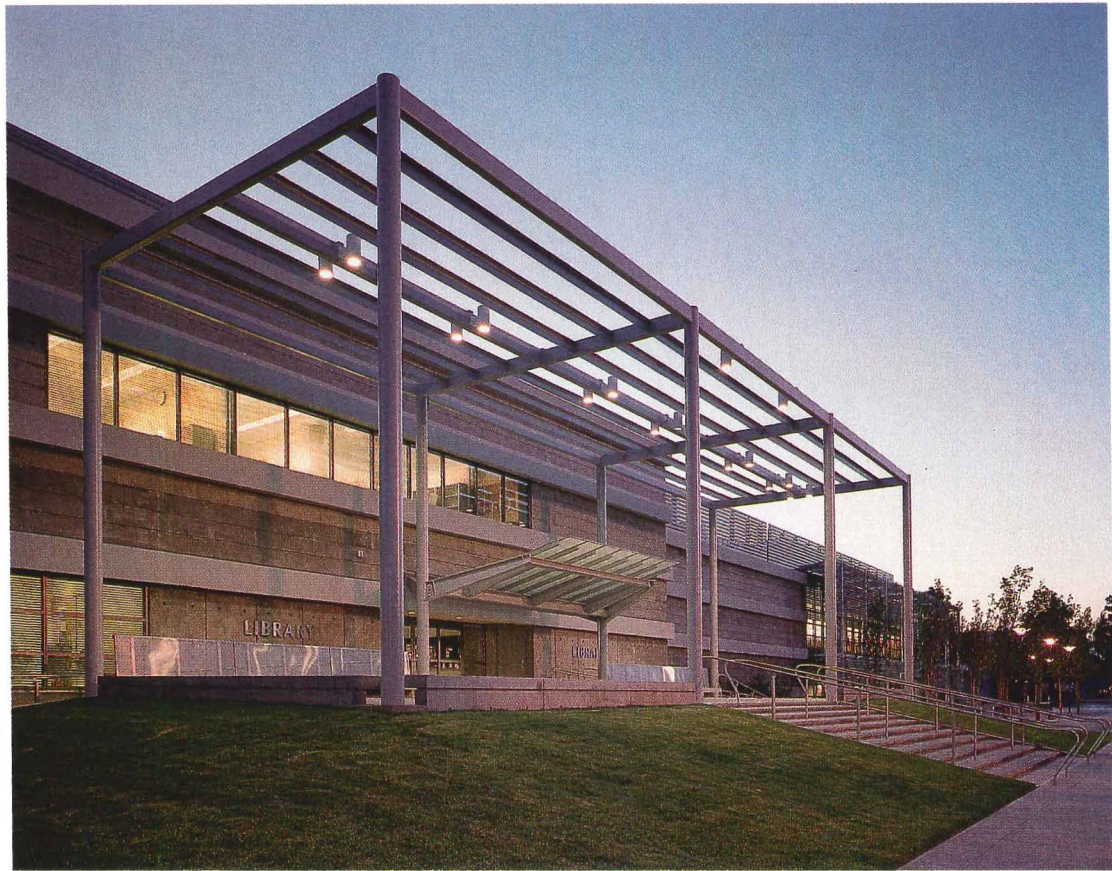
Doors: Horton Automatic; Mohawk

Hardware: Schlage; Rixon; Von Duprin

Acoustical ceiling: Armstrong

Shades: MechoShade

For more information on this project, go to Projects at www.architecturalrecord.com.



For decades, the Santa Monica College Library seemed like a missed opportunity. Though sited on the main pedestrian mall, the massive, windowless concrete structure took little advantage of its strategic position to create a social center on campus. After a recent renovation and expansion by Anshen+Allen

Los Angeles, the 1970s building has been reconfigured as an inviting information center and student gathering place. While the size of the facility has doubled, it has been seismically strengthened after damage suffered in the 1994 Northridge earthquake. Newly centralized, upgraded electronic systems and learning centers are now showcase elements of the college's information technology master plan.

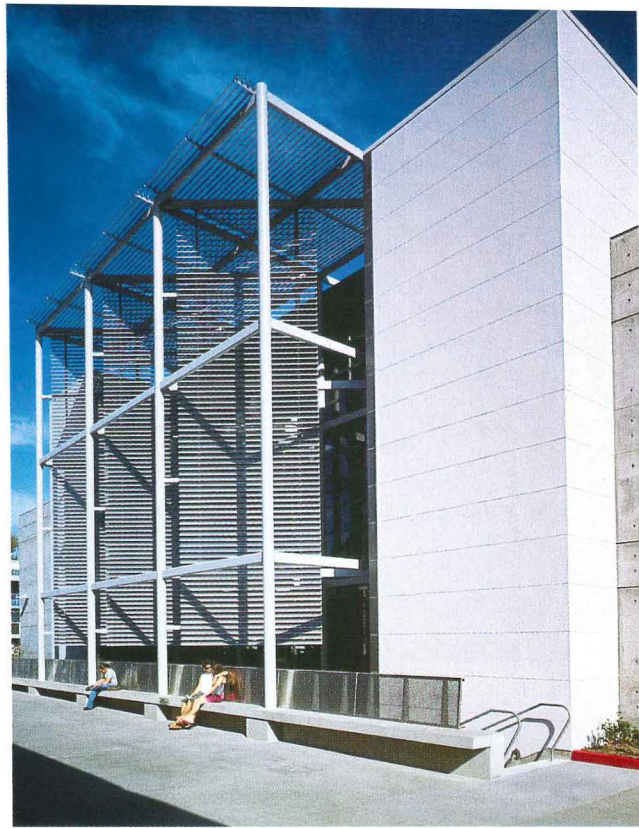
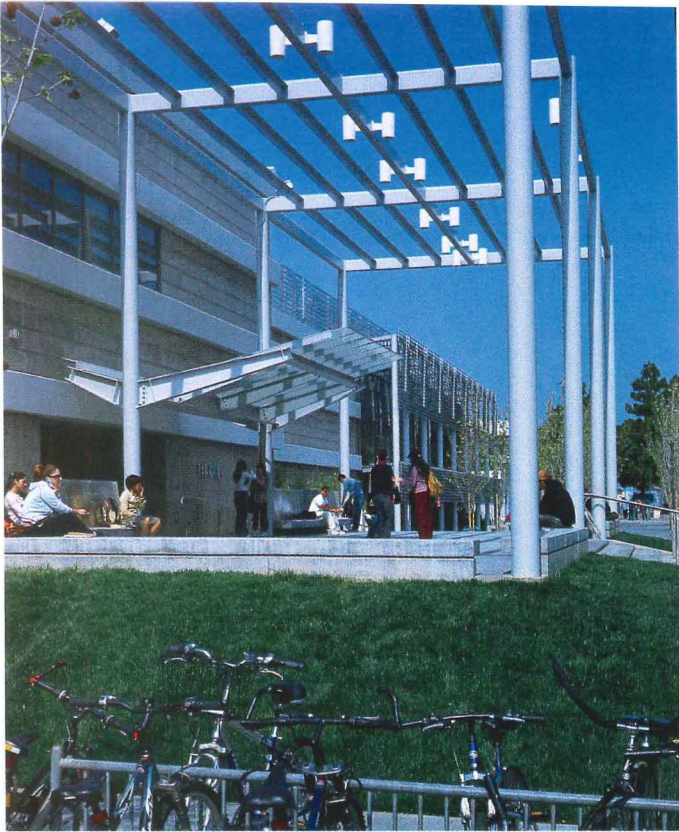
Program

The existing library was dark, noisy, outdated for computer use, and far too small for the 28,000 students enrolled in this two-year community college. "We were finding students sitting on the floor around the elevator because there was no other place to study," says Mona Martin, assistant dean of learning resources. Overcrowding got worse because the building was one of the few places

Morris Newman is a writer based in Los Angeles.

The Brutalist appearance of the original windowless library has been transformed with extensive glazing that fronts a main pedestrian mall (right and below). Exterior sunscreens provide partial shade for interior spaces. A new cagelike "front porch" with seating encourages social interaction at the library's entrance (opposite).





On the south elevation (top right), fixed vertical louvers made of extruded aluminum provide sun control for a new central core. In similar fashion, horizontal louvers along the glazed addition (left) minimize striated shadows falling on book stacks. The “front porch” visually unifies the addition with the existing structure (top left). The exploded axonometric view and floor plans (opposite) illustrate the library’s new islandlike core for computer-based work.

on the 23-acre campus where students could meet to collaborate on projects.

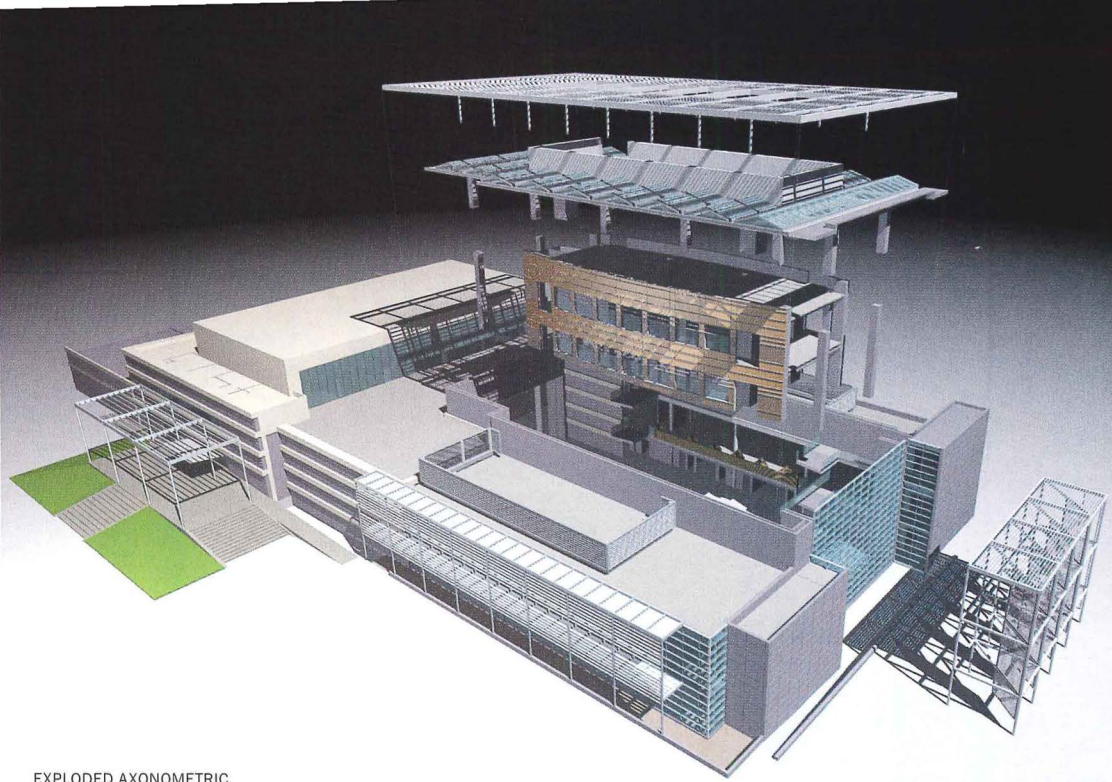
Solution

To open up the building, the architects added a new glass wing, maximizing daylighting while providing sun control. To accommodate the need for computer-based library research, the architects devised an islandlike building-within-the-building that concentrates cabling and mechanical services beneath a raised floor. And drawing on the the library's setting as a popular gathering hub, the architects went beyond the technical requirements of the interior program to enhance the social quality of the entrance with outdoor seating and a heightened presence on the mall.

Although the existing library was undistinguished, project architect Paul Zajfen decided not to greatly alter the facade of the 48,000-square-foot structure. A canopy was added above the entrance to aid wayfinding. A four-posterlike cage structure outlines the "front porch," provides overhead lighting, and partially masks the front elevation.

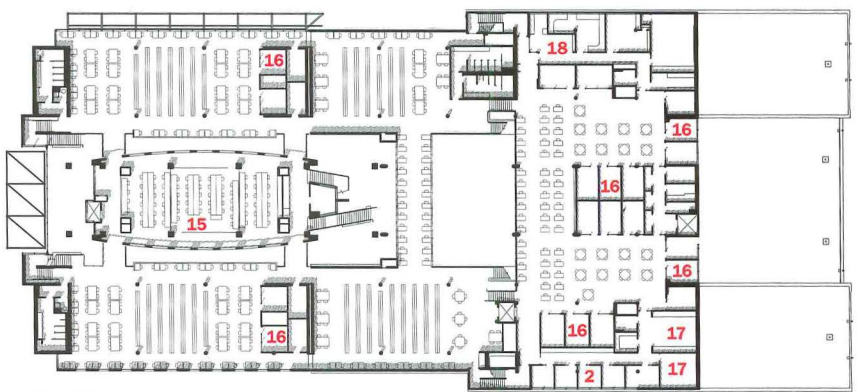
The new addition is a largely glass structure that opens the library to the mall, allowing passersby to see inside and casting a glow from within at night. Initially, the addition was conceived as a glass box attached to the concrete mass. Requirements for shear walls and the need to screen the interiors from sunlight led to changes in the original design. The west elevation became a poured-in-place-concrete wall with minimal punched windows that protect the building from the afternoon sun. Embracing a strategy of passive sun control, the front elevation is now shaded by external louvers. The south elevation is protected with three fixed vertical louvers that are two stories in height and made of extruded aluminum channels.

With a budget of only \$23 million, the architects reserved most of their firepower for the interior, where they provided new lighting and a

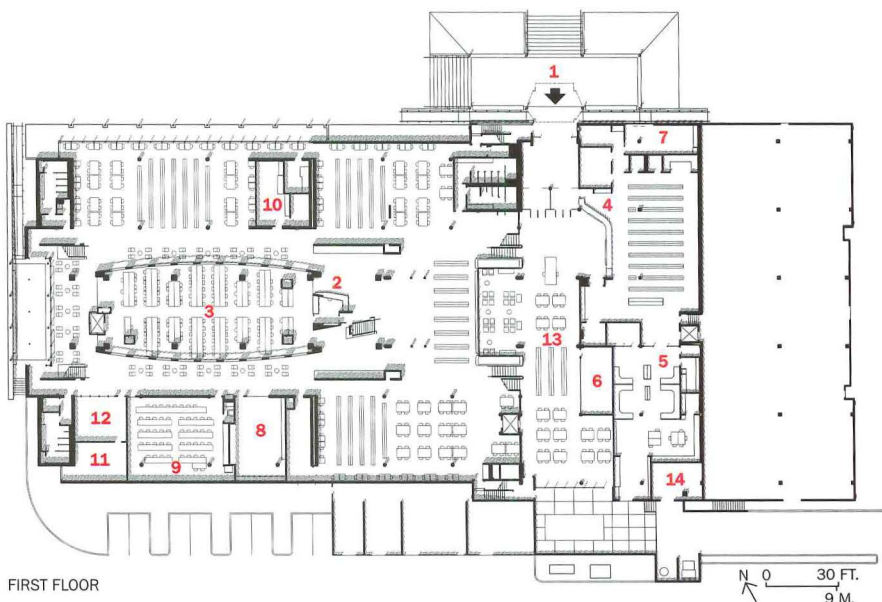


EXPLODED AXONOMETRIC

- 1. Entry
- 2. Reference librarians
- 3. Reference
- 4. Circulation desk
- 5. Technical services
- 6. Copy room
- 7. Staff lounge
- 8. Electronic services
- 9. Bibliographic instruction
- 10. Reference photography
- 11. Systems room
- 12. Curriculum development
- 13. Periodicals
- 14. Mechanical
- 15. Audiovisual workstations
- 16. Group study
- 17. Workrooms
- 18. Offices



SECOND FLOOR



FIRST FLOOR

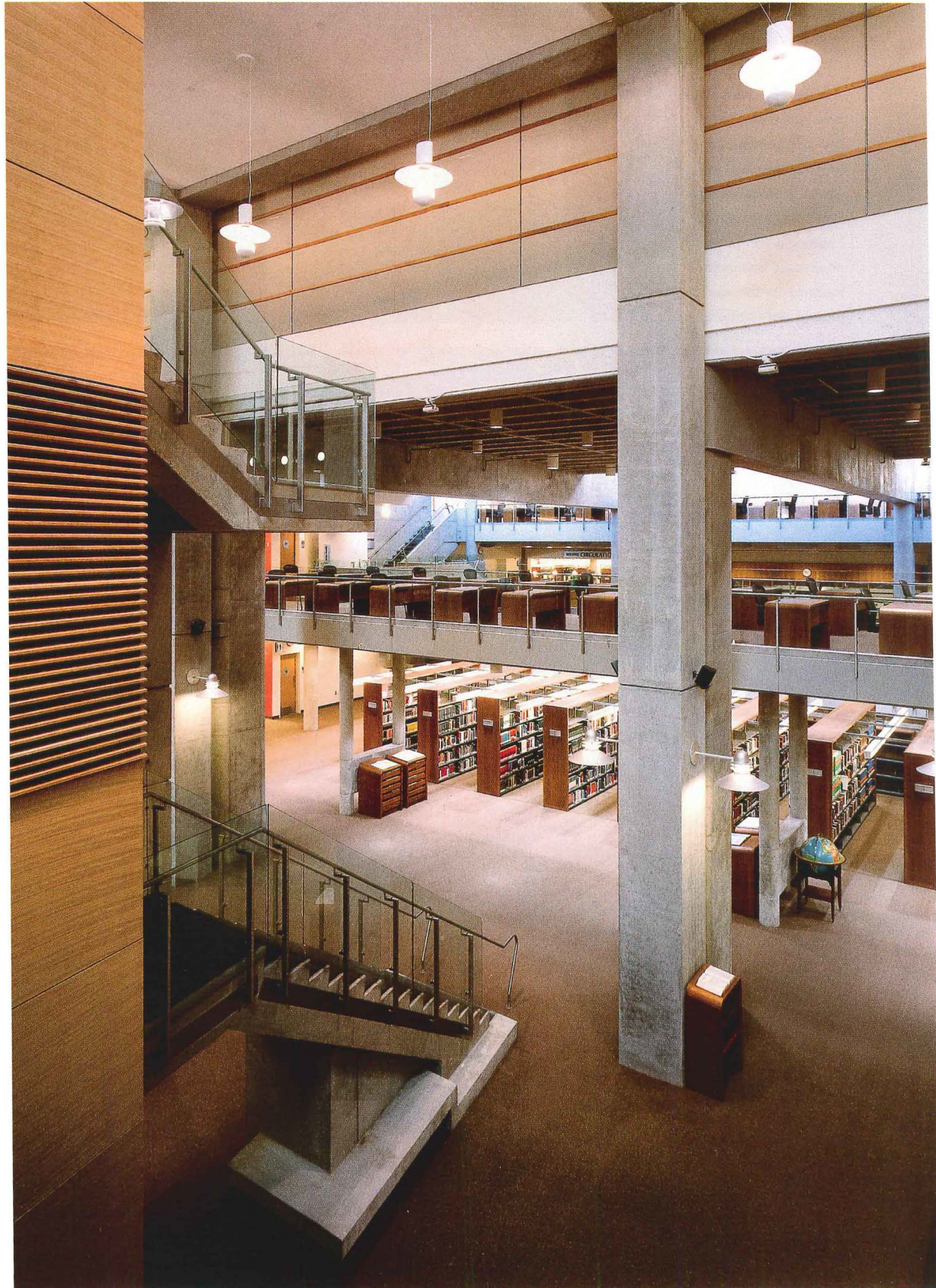


LEVEL 1 NORTH
LIBRARY
ARCHIVES
BOOKS & MEDIA
CLASSICAL CAMPUS
COMPUTER
REFERENCE
SERVICES



A three-story, skylit atrium brings daylight into the center of the library and the surrounding seating areas

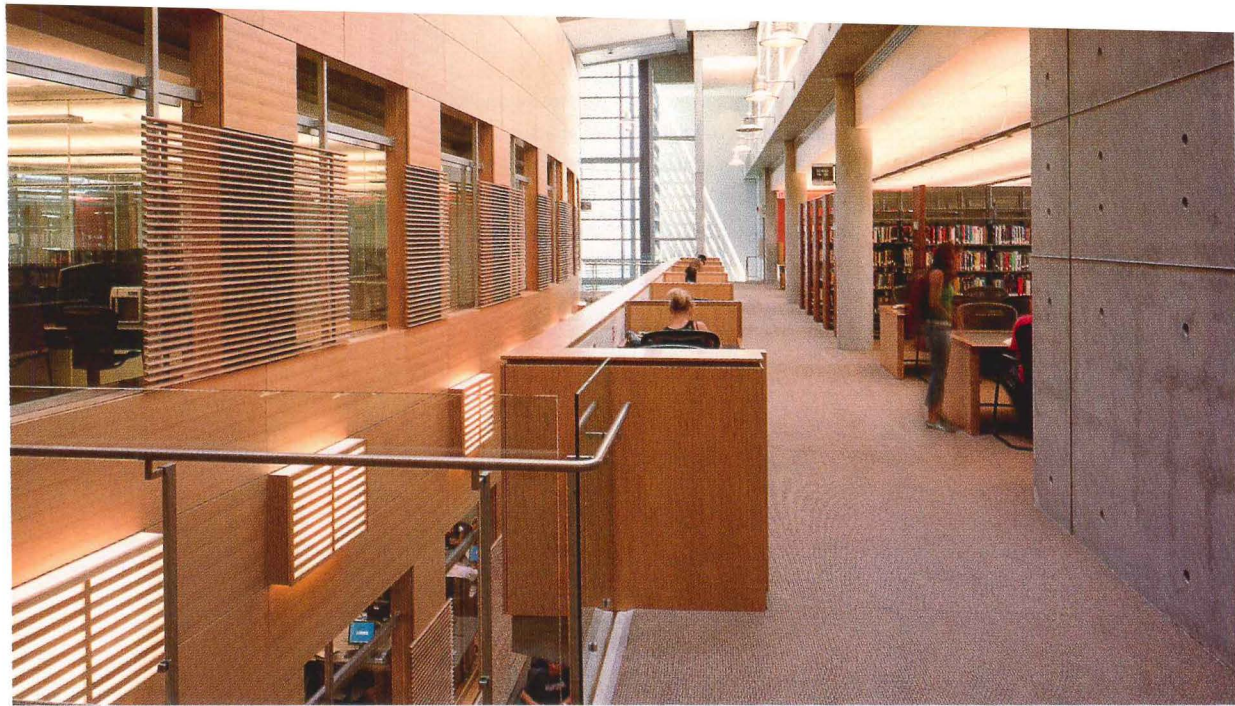
(opposite and left). The expanded and easy-to-access book stacks can store 145,000 volumes (below).



dropped ceiling in the existing wing to control noise. A raceway of communications wiring for laptop computers is hidden in a hanging light fixture that runs along the outer aisles of the building. Stacks and reading areas are located in two parallel wings that extend the structure's axial organization.

The computer commons, a three-level, freestanding unit within the new wing, contains a computer classroom, a reference facility, and plug-in study desks. Separating the computer floors, says Zajfen, provides a strong visual symbol for information technology within the library, while keeping the clicking of keyboards away from the rest of the interior. Housed in curving walls of oak and glass, the computer core has been nicknamed "the boat" by students. The boat indeed seems to float by itself, separated from surrounding floors by a 4-foot reveal that opens lower floors to daylighting while providing visitors with visual transparency from floor to floor. Structurally, the boat has its own seismically separate foundation and is supported by a concrete moment frame.

A wood-clad core structure was inserted in the original volume (right and below). It centralizes information technology systems, housing a computer commons, enclosed multimedia lab, and plug-in workstations.



Zajfen had proposed a row of rooftop brise-soleils for lighting throughout the new wing, but discussions with the client resulted in a series of individual skylights with punched openings. This compromise does not take away from the impressiveness of the ceiling section of the wing's south-facing hallway, where the wall reaches up 42 feet to the skylights and then immediately swoops down to provide intimate overhead lighting for study carrels.

Commentary

Students have embraced the enlarged library, with about 7,500 people, or roughly a quarter of the student body, using the building daily. The existing seating has doubled, while the library provides 19 new conference rooms for collaborative student work, plus a larger meeting room that is popular for faculty gatherings. Outside, new built-in seating near the entrance has cemented the role of the library as the social center of the college. A recent master plan proposes a new main road through the campus terminating at the library's south elevation. The success of the building seems confirmed by the ownership expressed by students, according to Martin, who reports that "every student seems to have identified his or her favorite place." ■

Architectural Technology

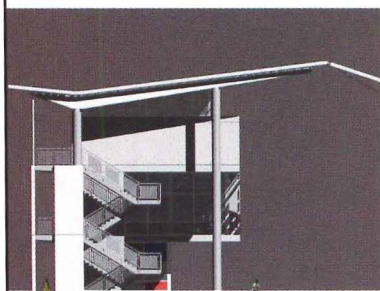
Keeping up with the latest materials has become a full-time job, and several groups are now doing it

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A pedestrian bridge in London makes waves by rolling out of the way (230).

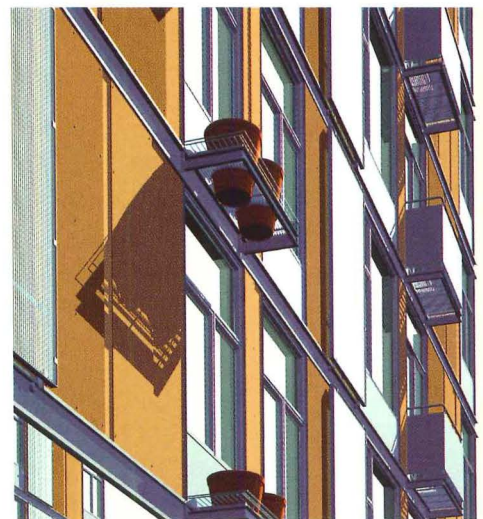


In Angola's capital, an eco-efficient campus takes shape (226).

Traditional building materials and finishes will always have their place, but it's not just a concrete, steel, and glass world anymore. Material science has rocketed forward in the past decade, and manufacturers are developing new products at such a rapid pace that keeping abreast of the latest information has become an uphill battle for many of our readers. This month's continuing-education feature helps alleviate the burden of research by identifying a handful of enterprising individuals and organizations who make it their business to collect, investigate, or publish information about new materials and products for buildings. Even the mighty engineering firm Arup has recently spun off its own materials-consulting practice, and it's not unlikely that experts like these will become integral members of project teams in the future.

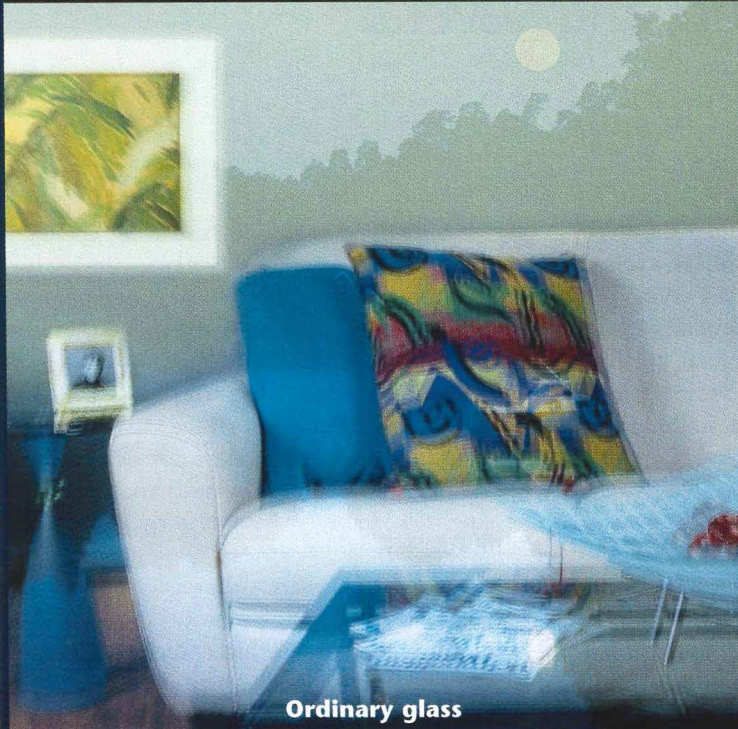
In talking to these entrepreneurs and researchers, we learned again how green building is driving innovation in design. Our second feature addresses sustainability for a different and often-overlooked material in buildings—wiring. A story on this topic in *Environmental Building News* by its executive editor Alex Wilson caught our attention earlier this year, and we're sharing much of this valuable information with you here. Wilson's story illuminates the complex processes of making, installing, and removing wiring from buildings, and highlights environmental and health issues surrounding its manufacture and use.

Finally, we examine the science behind the design of two recently completed projects that have a lot of kinetic energy: a lift for vintage cars that's a sleek machine in its own right, and a footbridge that curls up on itself to make way for nautical traffic. Aside from being good examples of the advantages of architect-engineer collaborations, they're just plain fun. Take a look. *Deborah Snoonian, P.E.*

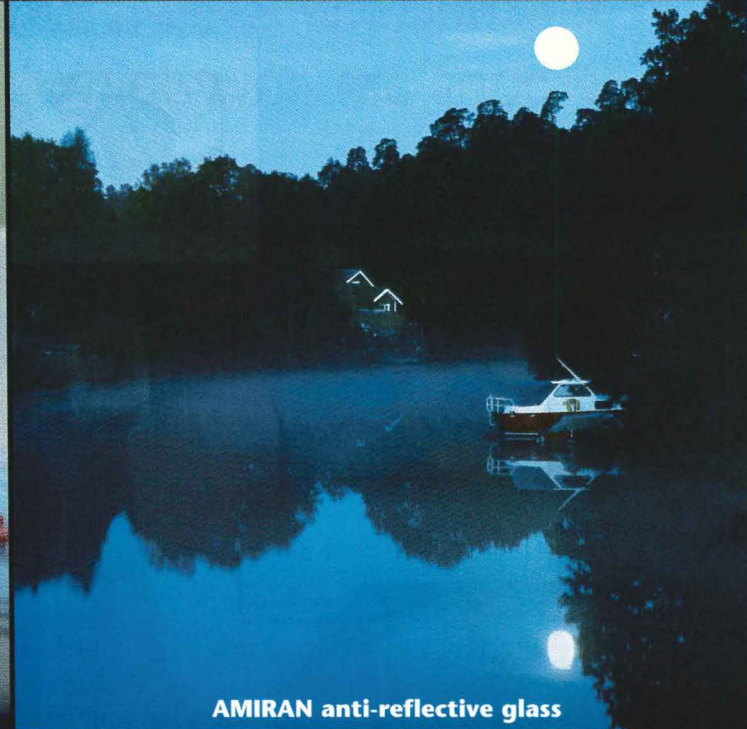


(215).

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glass made of ideas

Entrepreneurial Curators Seek Innovations

A COTTAGE INDUSTRY IS EMERGING TO COLLECT, EVALUATE, AND PROPEL INNOVATIVE BUILDING MATERIALS AND TECHNOLOGIES FROM DRAWING BOARDS TO CONSTRUCTION SITES

By Sara Hart

More products have been invented in the past 15 years than in the entire prior history of architecture. We're only beginning to tap the potential of those materials," says Stephen Kieran, FAIA, principal of Philadelphia-based KieranTimberlake Architects. There's very little data to confirm real numbers, but *Sweets* (sweets.construction.com) currently tracks 61,000 building products, and *Greenspec* (buildinggreen.com) lists over 1,800 sustainable materials. And yet there are apparently so many new and unusual materials flooding the marketplace that the phenomenon has spawned a cottage industry of boutique libraries and subscriber services to evaluate and promote them.



Seattle-based NBBJ did many facade iterations in order to design a buildable rain screen out of a new material.

ARCHITECTURAL TECHNOLOGY

The hunters and gatherers

Materials ConneXion, started by George Beylerian in 1997 in New York, is the gold standard for collecting, evaluating, and dispensing information about new materials and manufacturing processes for a variety of industries, from architecture to toy manufacturing. Its on-site library in New York displays many items from its collection of more than 1,400 new materials samples. Its online database gives members access to a reservoir of marketing services, strategic alliances, and research, and it has recently established on-site libraries in Milan and Cologne.

And yet there are newcomers to the innovative materials market, which seems to confirm that the expanding universe of products and innovations is big enough for multiple archivists. Zach Kaplan and Keith Schacht launched *Inventables* in 2002. The company publishes *DesignAid*, a smart subscription service that is packed with objects and information. Every three months, subscribers receive a three-part issue—20 samples displayed in three cases, a hard-copy design guide, and access to its online database.

The Chicago-based entrepreneurs started *Inventables* by interviewing design professionals and compiling information about how they find and use product samples. Kaplan says they discovered that many design professionals either don't have time for research, or they do it cyclically depending on specific project needs. "We found a lot of unfinished databases and materials in cardboard boxes in a lot of offices," he explains.

Kaplan has gleaned the typical ways in which designers work with information about materials. "They often use iteration. Traditionally, this is the methodology used when trying to optimize cost. It is the repetition of a design process by calculating [different material applications] again and again, each time improving the accuracy of the result by some amount," he says. "Or they use interaction. This is sometimes referred to as *play*. By interacting with a material, by touching it or playing with a prototype or a model, they can learn things that they may not have logically deduced otherwise."

Once armed with real data and keen observations, Kaplan and Schacht assembled a panel of volunteer professional designers and engineers that now meets four times a year to establish criteria for choosing materials, which they then use to evaluate and make selections. Kaplan and Schacht share the information they gather with clients and industry experts; they scour trade shows, trade journals, and press releases, and develop relationships with manufacturers, in an effort to keep news of

CONTINUING EDUCATION



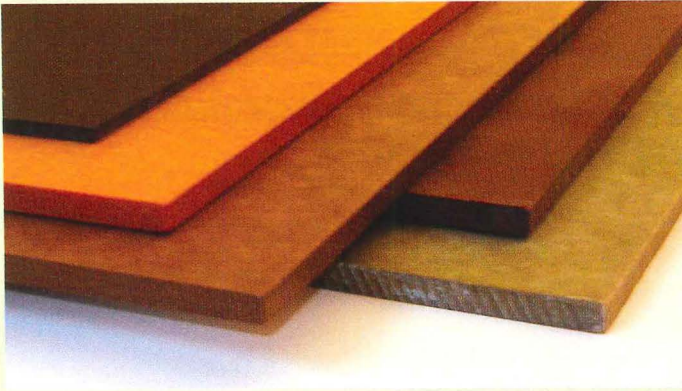
Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 326 and follow the instructions. Other opportunities to receive Continuing Education credits in this issue are found on page 241.

LEARNING OBJECTIVES

After reading this article, you should be able to:

1. Describe the new industry that has developed around building materials.
2. Explain how different companies collect information and evaluate materials.
3. Discuss new trends regarding building materials.

For this story and more continuing education, as well as links to sources, white papers, and products, go to www.architecturalrecord.com.



Materials tested for one application can work in another

NBBJ Architects sought an alternative cladding system for a 172-unit residential complex in Seattle. The hardboard panels making up the rain screen are made of

layers of paper and a low-VOC phenolic binder, manufactured by Rainier Richlite (left). The isometric (opposite, top) shows how the panels (brown colored) were

lapped rather than butt-jointed. The aluminum sunshades are off-the-shelf products. The details (opposite, bottom two) show an airspace for water vapor.



innovation flowing in multiple directions.

Kaplan describes their efforts as “focusing on things that make something possible that was not possible before. The intent is to find things that provide stimulus and jumping-off points for fresh ideas.” An important editorial policy is that *DesignAid* does not feature incremental improvements, nor does it publish materials in research and development. “We focus on materials and technologies that are available for

“THE INTENT IS TO FIND THINGS THAT PROVIDE STIMULUS AND JUMPING-OFF POINTS FOR FRESH IDEAS.”

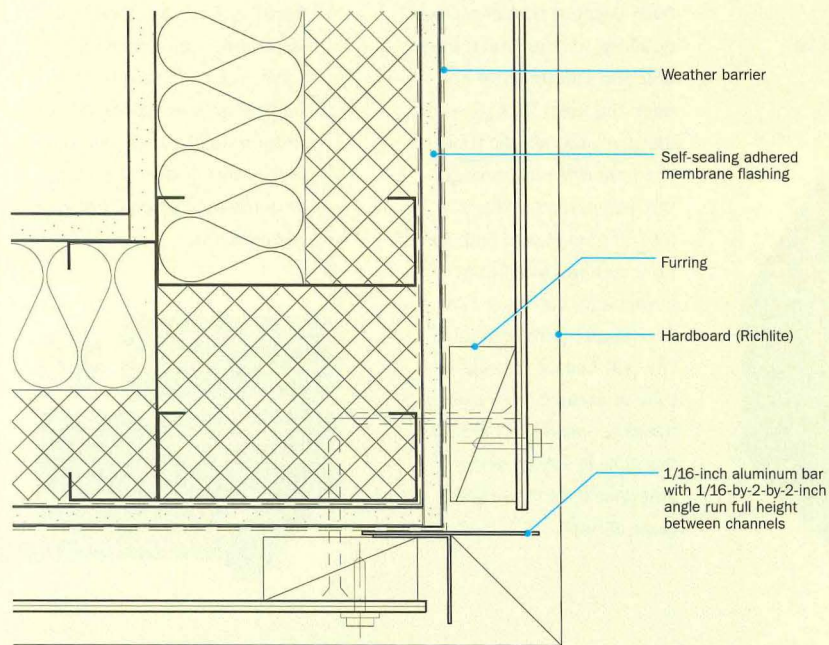
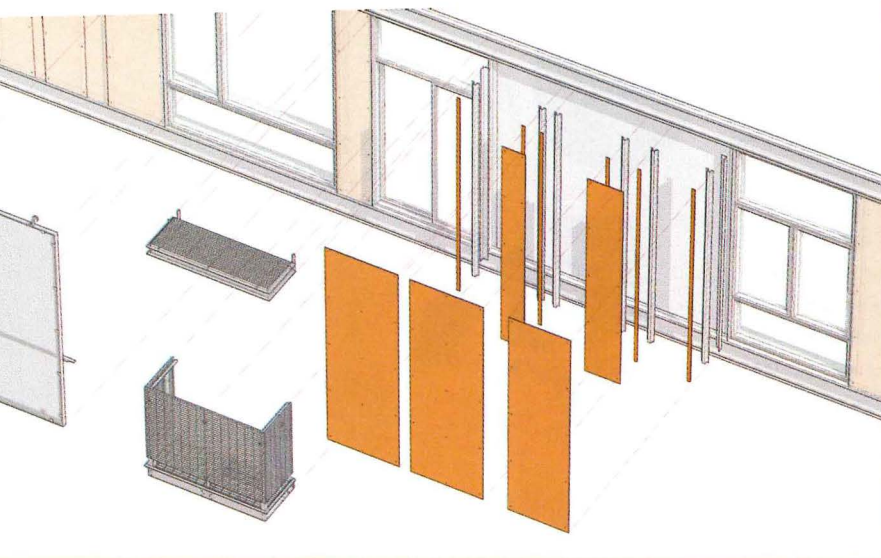
production. If we identify something in the research labs, we wait until it’s ready before featuring it.” Kaplan declines to divulge the exact number of subscribers, but he claims there are hundreds, which is promising, considering *Material ConneXion* has more than 400.

Whereas *DesignAid* is aimed primarily at industrial designers, New York-based Princeton Architectural Press, a publisher of architecture and design books, is developing a materials sampler, *Materials Monthly*,

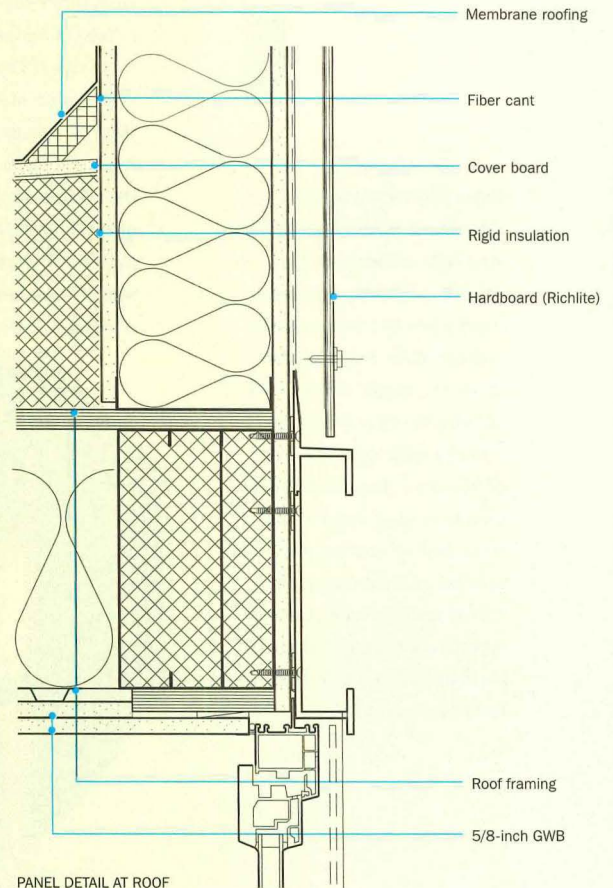
specifically for architects. The publisher has hired Jennifer Siegal, an architect and principal of MobileDesign in Los Angeles, to be the series editor. Her interest in innovation can be traced to her investigation into smart materials as a Loeb Fellow at Harvard and MIT, and now she teaches a seminar about smart materials at Woodbury University in Los Angeles.

Scheduled to launch in the spring 2005, *Materials Monthly* will be a subscriber-based magazine-in-a-box, and like *DesignAid*, it will include material samples, a written guide book, and access to an online database. Rather than assemble a permanent panel to choose materials like the *DesignAid* principals, Siegal will select a guest designer to edit each themed volume.

Then there’s Blaine Brownell, an architect and associate at Seattle-based NBBJ Architects, a one-man clearinghouse for the most cutting-edge materials on the market. Whereas *Material ConneXion*, *DesignAid*, and *Materials Monthly* charge subscription fees, Brownell’s undertaking—Transstudio—is a not-yet-for-profit enterprise. A self-published catalog of the latest materials, *Transmaterial*, currently weighs in at 196 pages in its hard-copy version. Because it’s an ever-expanding archive, Brownell invites architects to download the entire catalog as PDF files at



OUTSIDE CORNER DETAIL



PANEL DETAIL AT ROOF

no charge from his Web site. He also produces a free product-of-the-week newsletter, delivered by e-mail and added to his database. Recipients get a one-page description of a material in the same format as the catalog so that it can easily be added to the appropriate category.

Strategies and arrangements

Each enterprise adopts similar subscription models, although there are differences. *Material ConneXion* uses somewhat traditional genres—polymers, glass, ceramics, carbon-based materials, cement-based materials, metals, natural materials, and natural material derivatives. Still, the catalog receives 35 to 45 submissions of highly innovative products each month.

Kaplan and Schacht organized *DesignAid's* material into categories—materials, mechanics, processes, electronics, and last but not least, the sexy “wow” division that gets the creative juices flowing. “Our five categories were developed for easy sorting. These were the primary categories of items that designers we interviewed look into. Also, since we only publish 20 per month, because we are being so selective, we did not want to get too specific limiting what could be in a particular category.

For example, if we made a category ‘glass,’ it would be too narrow. We cover more than just materials.”

Like *DesignAid*, Princeton Architectural Press is developing *Materials Monthly* to be a tool kit with which architects can build their own libraries. At this point in development, Siegal is using the following general system—natural materials, color-changing materials, recycled materials, pattern materials, shape-memory materials, films, plastic composites, super soy, paints and coatings, and future fabrics.

Brownell, on the other hand, delivers no samples for fondling. However, he has employed a unique curatorial classification system in lieu of generic labels. *Transmaterial* is organized according to ultra-performing, multidimensional, repurposed, recombinant, intelligent, transformational, and interfacial materials. His goal with this system is to collect seemingly dissimilar materials into groups that will identify trends that may not be evident in more generalized groupings.

Trends and predictions

When asked what research and development is garnering the most attention, Siegal says that sustainability is the most important. “Green,

DESIGNAID

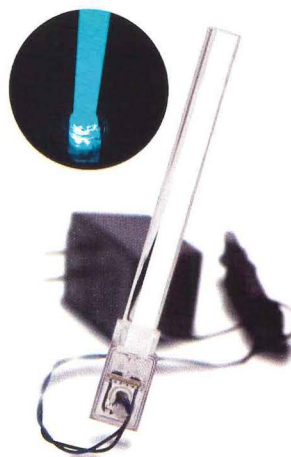


Mechanisms

Expando Pin from Los Angeles-based Monogram Aerospace Fasteners is a secure mechanism that is used when the back side is inaccessible. Rotating the lever the length of the shaft constricts the metal rings and expands the diameter of the shaft. Expando Pin is simple to use, requires no tools and no loose parts. It provides a tight radial fit resisting vibrations. And it is a blind operation, so it can be installed and removed from one side only.

Materials

CarbonX Fire-Resistant Fabric from Chapman Innovations in Salt Lake City is a carbon-fiber-based material that will not char, shrink, burn, ignite, or decompose when exposed to an open flame. It is different from other fire-resistant products because of its ability to resist flaming and the conduction of heat for more than 60 seconds per layer. CarbonX yarns are blended with different types of strengthening fibers to achieve the desired tensile strength and abrasion-resistant properties.



Electronics

The Reflective Light Pipe from Luxaura USA contains no glass and no gas. It uses LED and electricity to produce the color that glows along a solid acrylic tube. The light diffuses through the material from the LED mechanism at one end. The tube can be bent like a horseshoe, but there is a maximum bending radius. The LED source can light a tube of about 6 feet. Due to the lower power of the LED, the glow is softer, more ambient, than the bright glare of neon.

Processes

Processes generally require more than one step before they benefit an existing product. A **Carbon-Reinforcing Web** by IsoGrid is an additive that provides stiffness in areas where a product needs it most. Applications that have thin wall sections relative to their internal diameter benefit the most from the addition of IsoGrid. It can be applied to extremely small diameter parts, such as a fishing rod. IsoGrid provides a way to reduce weight and maintain or improve performance, particularly in sporting goods applications.



recycled, or materials that don't off-gas is very important to my clients and myself," she explains.

Brownell agrees with Siegal about the need for sustainable products and processes, especially when complying with the Green Building Council's LEED Rating System, a consensus-based national standard for developing high-performance, sustainable buildings. "LEED is taking off like wildfire, and affecting the entire construction industry. For example, just recently, the State of Washington ruled that all new state buildings be LEED Silver minimum; the University of Washington also mandates LEED Silver for all its new construction," explains Brownell. "We're even seeing shell and core developer interest in LEED, which is quite interesting. Many architects will be forced to become LEED accredited very quickly, given the market demand."

"I would say that another area concerns technology and process, which would correspond to my 'interfacial' category," he continues. "The computer is radically changing how we construct buildings, from sharing digital CAD files with subcontractors to translating data directly to building materials. For example, the Italian company Abet Laminati makes photocast tiles, using a digital imaging process for exterior laminate panels." Siegal

adds, "The 'smart' materials such as color changing, shape forming, composites, and so on, are truly the wave of the future. There is also a great deal of interest in the processes of forming shapes and building components. Three-dimensional printing is used primarily in my office to create models of buildings to achieve cost and time savings."

Brownell is particularly drawn to "recombinant" materials, such as Plasphalt [a proprietary combination of asphalt and plastic, developed by TEWA Technology]. "It derives its performance from the combination of dissimilar ingredients to create a whole that is stronger than the sum of the parts," explains Brownell. "It represents a trend that many manufacturers have been implementing, which is to create these hybrid or composite materials in order to use materials in a smarter way, to use fewer raw materials, and/or to divert resources from the waste stream."

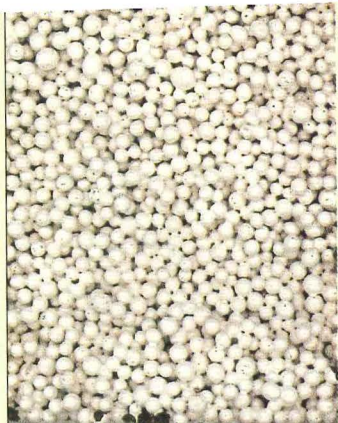
Proof is in the details

Materials make it to the market place with greater ease these days, but how do the new and unusual make it into projects? NBBJ is designing Alley 24, a 362,000-square-foot mixed-use project in the South Lake Union district

TRANSMATERIAL

Recombinant

Recombinant materials consist of two or more different materials that act in harmony to create a product whose performance is greater than the sum of its parts. **Glare** is a blast-proof fiber-metal developed by Delft University of Technology in the Netherlands. It consists of multiple aluminum layers interspersed with layers of fiberglass and adhesive bonding that are supple yet strong. It expands with a blast, absorbs the explosive energy, and redistributes the impact load.

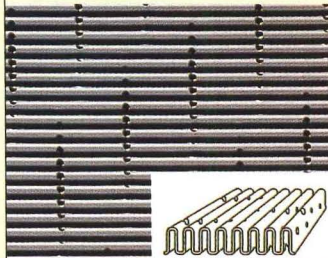


Intelligent

Materials that often take inspiration from biological systems are classified as intelligent. They can act actively or passively, and they can be high- or low-tech. **Porocom** is short for “porous construction material.” It is an environmentally friendly product that reduces noise pollution. It consists of granules of recycled materials (such as sintered coal, ashes, clay, glass shards, eco grid) heated before being brought into contact with thermosetting powder paint. The end product is made by sintering the granules in a mold, causing them to stick together and achieve maximum hardness.

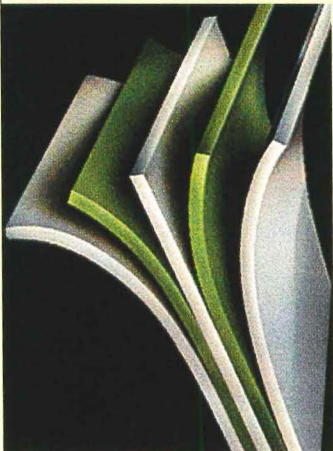
Multidimensional

A new trend highlights the z-axis in the manufacture of a variety of materials. One reason is that greater depth allows thin materials to become more structurally stable. Aero uses tightly corrugated, anodized aluminum sheets that are both flexible and formable. They are ideal for many interior applications for either geometric compositions or fluid curves. The lightweight material is sturdy enough to be used for wall and ceiling panels, yet is malleable enough to be rolled like a carpet.



Repurposed

Ultra-performing materials are those that are stronger, lighter, more durable, and more flexible than their conventional counterparts. SMI Steel makes a smartbeam, which is suited for long-span composite floor construction or long-span roof applications for architecturally exposed steel. Produced with castelated, hexagonal web openings or cellular, circular web openings, smartbeams operate most efficiently between 30- and 80-foot spans. The most common building types for smartbeams are office buildings, mezzanines, parking garages, or any application using a suspended composite floor.



of Seattle, scheduled for occupancy in early 2006. Part of the program calls for 172 market-rate residential units. The program also required that the architect incorporate sustainable features, including daylighting, operable windows and sunshades, and sustainable materials.

Brownell and colleague Andrew McCune led the facade-design team. Although the budget was tight, they wanted to get away from the typical Seattle cladding materials—Dryvit, vinyl siding, and corrugated

ARCHITECTS MUST DETAIL [MATERIALS] SO THAT THEY ARE BUILDABLE AND THEIR INHERENT ATTRIBUTES REMAIN INTACT.

metal, while addressing the sustainability issues. Because of Brownell's experience collecting and evaluating new products and processes, he proposed several new hardboards that could conceivably perform well as exterior cladding. At first, the client balked, not wanting to take a risk on an unfamiliar material with no precedent for the proposed application.

Brownell and McCune's subsequent research suggests an emerging trend in specification: begin at the end. Describe the aesthetic

and functional attributes required of the finished component and then work backwards to find the best materials or combination of materials. After evaluating several cementitious panels, the architects were convinced that one of *Transmaterial's* recombinant materials—Richlite—was a good alternative. A panel made of layers of paper impregnated with a phenolic binder, it's tough, long-wearing, and low-maintenance. The architects made it clear to the client that this hardboard is environmentally friendly by virtue of employing a low-VOC binder and paper from certified managed forests. They also explained that its durability and low-maintenance made it an excellent cladding material for Alley 24.

Specifying a material, however, is only a small part of the process. For new materials to make it from the catalog to the construction site, architects must figure out how to detail them so that they are buildable and their inherent attributes remain intact. In this case, the architects decided to detail the hardboard as a rain screen for several reasons, but one in particular—mold. Brownell says that mold is a problem in the damp Seattle area, because wall cavities are often too thin and trap moisture. They designed a generous airspace behind the rain screen, which will allow water vapor to exit the wall cavity, thus discouraging the

cultivation of a mold (see details on page 216).

NBBJ encourages the evaluation of the key materials on a project, but Brownell admits that it takes a great deal of time to study alternatives to time-tested materials. It requires factory visits, engineering calculations, mock-ups, multiple iterations of details, and even letters to the building department regarding code compliance. Although it is hard to assign the cost of this research, Brownell estimates that it could add 5 to 10 percent to the design-development and construction-document phases for those areas being studied. Sometimes, though, clients see the value and the long-term benefits of the additional costs, especially those who place a priority on environmentally responsible development. Still, paying extra for research is a long way from becoming the norm.

On the other hand, it's possible that clients will begin to hire additional consultants to provide their architects with material research for difficult projects with exigent circumstances. In July 2003, Arup launched an independent specialty—Arup Materials Consulting (arup.com). Materials specialist Graham Gedge said then that this was an opportunity for the international engineering firm to provide “best-practice advice on the use of materials from design to demolition, from steel and concrete to glass, stone, timber, and new materials technologies.” If these and other experts can guarantee minimization of risk, enhanced performance, and added value, then we may see more innovation in design and building sooner rather than later. ■

New services for innovative materials

Material ConneXion, New York

Contact: 212/842-2050

www.materialconnexion.com

DesignAid (Inventables), Chicago

Contact: Zach Kaplan and Keith Schacht, 773/697-0130

www.inventables.com

Materials Monthly (Princeton Architectural Press), New York and Los Angeles

Contact: Jennifer Siegal, 310/439-1129

www.materialsmmonthly.com

www.papress.com

www.designmobile.com

Transmaterial (Transstudio), Seattle

Contact: Blaine Brownell, 206/223-5135

www.transstudio.com

www.nbbj.com



AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

- ◆ Read the article “Entrepreneurial Curators Seek Innovations” using the learning objectives provided.
- ◆ Complete the questions below, then fill in your answers (page 326).
- ◆ Fill out and submit the AIA/CES education reporting form (page 326) or download the form at www.architecturalrecord.com to receive one AIA learning unit.

QUESTIONS

1. What are recombinant materials?
 - a. materials designed by a digital imaging process
 - b. materials with a combination of aesthetic and functional attributes
 - c. a combination of dissimilar ingredients to produce a smarter material
 - d. a combination of sustainable and traditional materials
2. Included in the “wave of the future” are all of the following except which materials?
 - a. color-changing materials
 - b. shape-forming materials
 - c. polymers
 - d. sustainable materials
3. Emerging trends in specifications include which?
 - a. multiple iterations of details
 - b. describing the aesthetic and functional requirements of the component
 - c. visiting factories during production
 - d. engineering calculations
4. The article says architects will soon be forced to become LEED accredited because of which?
 - a. market demand
 - b. State of Washington ruling that all new buildings be at least LEED Silver
 - c. University of Washington’s mandate that all new construction be LEED Silver
 - d. building developer’s interest in LEED
5. Of the four materials-based enterprises in this article, which one uses a panel

of volunteer professional designers and engineers to establish selection criteria?

- a. *Material ConneXion*
 - b. *DesignAid* (Inventables)
 - c. *Materials Monthly* (Princeton Architectural Press)
 - d. *Transmaterial* (Transstudio)
6. Of the four materials-based enterprises discussed in this article, which one is a tool kit for architects to build their own libraries?
 - a. *Material ConneXion*
 - b. *DesignAid* (Inventables)
 - c. *Materials Monthly* (Princeton Architectural Press)
 - d. *Transmaterial* (Transstudio)
 7. Of the four materials-based enterprises discussed in this article, which has a goal of identifying trends?
 - a. *Material ConneXion*
 - b. *DesignAid* (Inventables)
 - c. *Materials Monthly* (Princeton Architectural Press)
 - d. *Transmaterial* (Transstudio)
 8. Which of the four is considered the gold standard for collecting, evaluating, and dispensing information about new materials and manufacturing processes?
 - a. *Material ConneXion*
 - b. *DesignAid* (Inventables)
 - c. *Materials Monthly* (Princeton Architectural Press)
 - d. *Transmaterial* (Transstudio)
 9. Which best describes the iteration method used by designers?
 - a. gathering information from industry experts and trade shows
 - b. touching or playing with a prototype
 - c. the repetition of a design process
 - d. research for specific project needs
 10. Which of the following does not describe ultra-performing materials?
 - a. stronger and lighter
 - b. more flexible
 - c. more durable
 - d. inspired by biological systems

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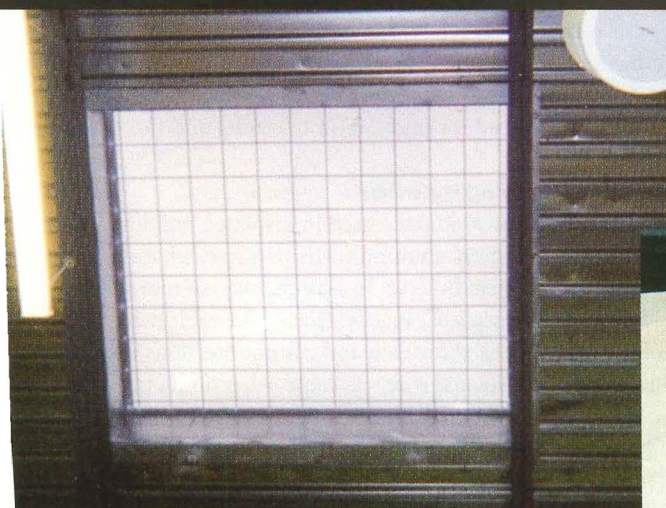


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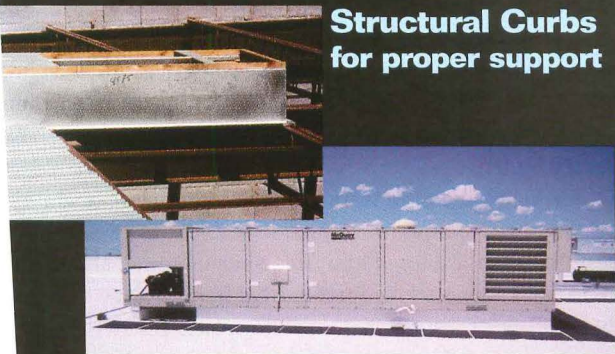


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Getting Down to the Wire

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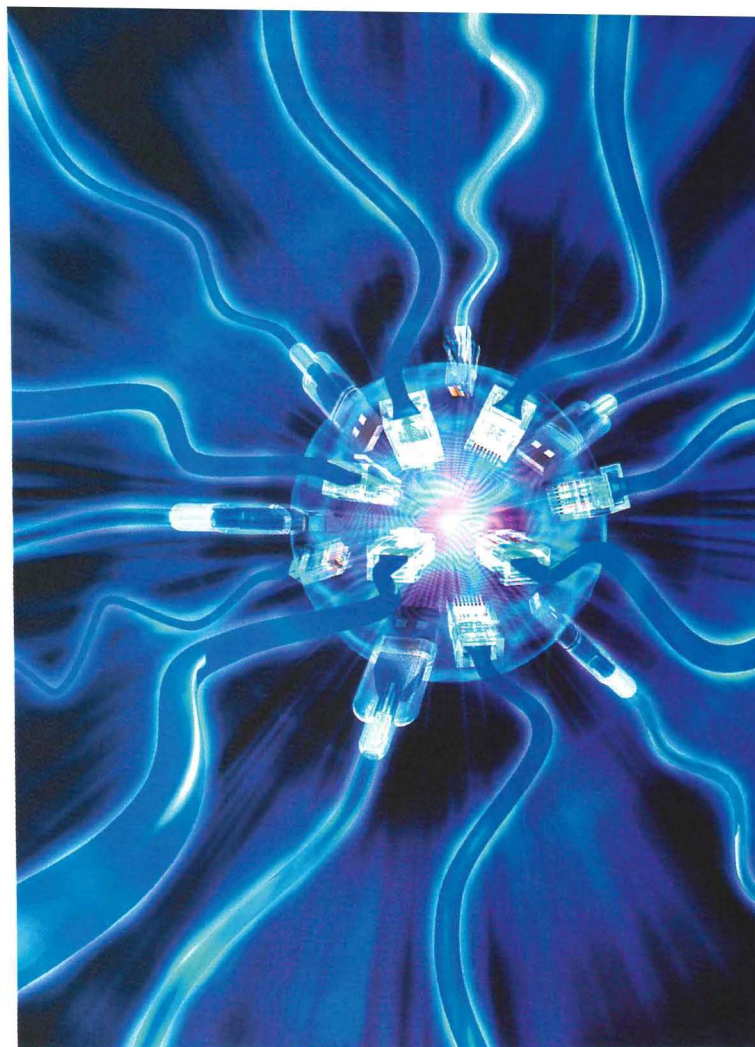
By Alex Wilson

Even the greenest of architects seldom give much consideration to wiring in buildings. How significant can wiring be? It's just a small fraction of what's installed compared to other building materials—and don't fire codes more or less dictate what can be used? But some sleuthing about how wiring is made and used in buildings sheds light on a highly complex issue and points up a need to pay closer attention to today's practices, from environmental, health, and safety standpoints.

All modern buildings, of course, require wires and cables for power distribution and to carry voice and data signals. The term *wire* refers to an individual strand of material that conducts electrical current, whereas *cable* refers to two or more wires twisted together. Virtually all wire and cable used in buildings is wrapped in plastic insulation, and most of these components are made by bundling multiple insulated wires together, sheathing them in an additional outer jacket. Insulated wire and cable come in a large variety of types, and there are many performance standards and ratings that govern how and where they can be used. In the U.S., insulated wire and cable represents an annual \$20.5 billion market that is projected to grow by more than 5 percent per year through 2006, according to a 2002 report from the Freedonia Group. There are an estimated 11 million miles of data cabling in U.S. buildings today.

In general terms, power cables in commercial buildings must be either sheathed in metal armor (BX cable) or protected within metal conduit. In residential buildings, power cables can be jacketed in plastic; this

Alex Wilson, the president of BuildingGreen and the executive editor of Environmental Building News, has written about energy-efficient and environmentally responsible design and construction for more than 20 years.



type of cable is commonly referred to by a trade name, Romex (made by the Southwire Company). Data or communications cables can be installed in most buildings without metal protection, but a specialized plenum rating is required for installation in ceiling and floor plenums.

Many materials coming together

Copper is the dominant conductor used in insulated building wire and cable. Though less common, aluminum wire is also used; it's lighter and less expensive than copper, but also less conductive, so more material is required for the same electrical capacity. Fiber-optic cable, which is made of glass, is increasingly used for data and communications applications commonly served by insulated wire and cable. Fiber optics transmit light signals instead of electricity to carry data—and they're lighter, less expensive, and more energy-efficient than copper for data transmission. Because they don't carry electric current, insulation requirements are not as great as for metal conductors.

Copper and aluminum wires and cables are typically insulated with a nonconductive material that allows wires to be in contact with one another without conducting electric current between them. The most common resins used for insulating wire are polyethylene (PE), polyvinyl chloride (PVC), and fluoropolymers. Nylon, various rubber compounds, silicone, and polyurethane are also used for insulation and jacketing, but less widely.

Polyethylene is the most common type of insulation and jacketing for high-voltage power-transmission cables, as well as for non-plenum-rated data cables, radio frequency wiring, and audio wiring. It has excellent dielectric properties (that is, it insulates well) but is inherently less flame resistant than other insulation materials. As

result, it's rarely used for power in buildings, and when used, other materials are often added to it to improve its flame resistance. It is widely used for data cable installations requiring no flame resistance, such as wire runs in conduit or behind fire-rated barriers.

Polyvinyl chloride (PVC) is the most common insulation and jacketing material for wiring in buildings, owing largely to its good flame resistance and low cost. In Romex-type wiring, for example, PVC is typically used both as the insulation on individual conductors and as the jacketing that surrounds the bundle of individual wires. PVC has significantly greater flame resistance than polyethylene, but other additives are required to make it flexible and stable.

In the past 10 years, PVC has come under attack by several groups because of a variety of health and environmental concerns. The biggest concern is that under certain conditions, highly toxic dioxins can be released—especially from accidental fires or incineration at the end of its life. According to the National Institute of Environmental Health Sciences (NIEHS), dioxins are known to be toxic to laboratory animals, causing cancer and altering reproductive, developmental, and immune functions. There are also concerns about the need to add stabilizers and plasticizers to PVC, some of which have health impacts, and PVC also releases hydrogen chloride, a toxic, corrosive gas, when exposed to extreme heat—both before and after it ignites.

Various fluorine-containing polymers, especially fluorinated ethylene propylene (FEP), are increasingly common in data wiring insulation because of their exceptional dielectric properties, superb flame resistance, heat resistance, chemical inertness, durability, and flexibility. For plenum-rated data cable, FEP-insulated wire is often the only option allowed by code, due to fire-safety concerns. Such wire is often wrapped in a PVC jacket, though newer, more stringent “limited combustible” ratings require FEP jacketing. In addition to these performance benefits of FEP, the polymer can be recycled easily, according to DuPont.

While superb performance has spurred rapid growth of FEP wire insulation, some significant environmental and health concerns have arisen about the whole class of fluoropolymer materials (see sidebar at right). FEP does not burn easily, but it can emit toxic gases when it gets very hot, even without actual combustion. The primary gas emitted is hydrogen fluoride, which is more dangerous than the hydrogen chloride given off by PVC. Other toxic chemicals can be given off by FEP during fires; these poorly understood thermal degradation products have been referred to collectively as “the supertoxin.”

In addition to toxicity concerns, the chemicals emitted by FEP (and to a lesser extent by PVC) during a fire are highly corrosive. An article by Stephen Saunders, “Cabling: What You Don't Know Can Kill You” (posted at www.wireville.com), suggests that it is the corrosivity of halogen-insulated wiring that may ultimately shift us away from halogen-based wire insulation and jacketing. Frank Bisbee, a data cable consultant and editor of www.wireville.com, suggests that how good or bad a particular type of cabling looks—relative to toxicity and potential for corrosive by-products to cause damage to electronic equipment—is highly dependent on how the tests are performed. If humidity during testing is very low, for example, there won't be enough water vapor to convert hydrogen fluoride into hydrofluoric acid, or hydrogen chloride into hydrochloric acid, and acid corrosion will be less of a problem.

The Fluorine Debate

Fluorine, chlorine, and bromine all belong to a family of elements known as halogens. Halogens form strong chemical bonds, which makes the resultant compounds durable and often inert—but their longevity also allows them to accumulate in biological systems. Many halogenated compounds have been demonstrated to be toxic in laboratory tests.

There is growing evidence that fluoropolymers, comprised almost entirely of carbon and fluorine, pose health and environmental dangers. According to some environmental and health advocates, they may be a worse threat than chlorinated polymers such as PVC.

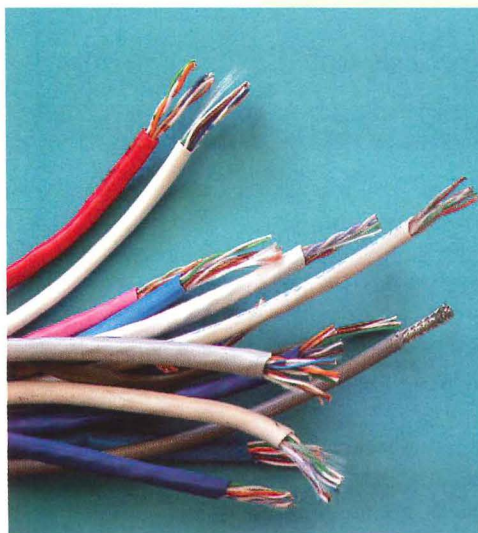
Fluoropolymers go by many different names, but the family of chemicals is often referred to as perfluorochemicals (PFCs). They are synthetic chemicals that don't occur naturally in the environment, and they exhibit properties that have made them useful for a wide range of applications, from nonstick surfaces to stain-shedding fabric treatments to wire insulation.

In April 2003, the U.S. Environmental Protection Agency (EPA) released a preliminary risk assessment for perfluorooctanoic acid (PFOA), one type of PFC, noting that “studies recently evaluated by the agency have raised a number of potential toxicity concerns.” The agency has solicited information about PFOA from the industry and the scientific community, and fluoropolymer manufacturers have voluntarily agreed to reduce emissions, to study their products to determine if they contribute to the widespread PFOA pollution, and to take steps to reduce worker exposure during manufacturing.

Several recent peer-reviewed papers in the journal *Environmental Health Perspectives* also detail the potential health impacts of PFCs. A September 2003 paper entitled “Neuroendocrine Effects of Perfluorooctane Sulfonate (PFOS) in Rats” presented evidence that PFOS can function as an endocrine inhibitor. In the December 2003 issue, another paper showed that out of 645 blood samples collected at random from six Red Cross blood banks around the country, all but one had measurable levels of PFOS.

Industry response to these concerns has been mixed. In the late 1990s, manufacturer 3M discovered that PFOA, used in producing its popular Scotchguard fabric

treatment, was showing up in humans and wildlife worldwide, and in May 2000, the company announced it was voluntarily pulling it off the market. DuPont, which had purchased PFOA from 3M, has continued to produce the chemical to fuel its \$1.5 billion fluoropolymer business. DuPont downplays health and environmental concerns about PFOA, but also points out that its Teflon products, such as FEP, use PFOA in manufacturing but don't contain the compound in the finished product. While DuPont claims that its fluoropolymer products are safe, the company also posts some consumer warnings on its Web site. A.W.



Depending on the amount of oxygen present during a fire, the resultant emissions will vary tremendously, he says.

Making wires workable

To make insulated cables easy to manufacture and safe for buildings, three additives—plasticizers, stabilizers, and flame retardants—are typically added to insulation and jacket materials.

Plasticizers are usually added to PVC to make it flexible enough to be used to insulate wires. The most common plasticizers used in PVC are phthalate compounds, which have come under scrutiny because their chemical composition mimics natural hormones in humans and other animals, causing reproductive problems and birth defects. Unlike PVC, polyolefins used for wire insulation do not require the use of plasticizers.

Stabilizers are added to some plastics to increase resistance to heat, sunlight, moisture, and other stressors. The most common stabilizers used in insulation and jacketing are lead compounds, which can constitute 2 to 5 percent of the total weight of the material. PVC is the only widely used resin for which lead stabilizers are needed. Other stabilizers beginning to appear on the market include salt-metal blends, such as barium-zinc and calcium-zinc; organotin compounds; and metal-free organic compounds. Cable manufacturer Mohawk/CDT is one of the companies shifting to lead-free PVC; according to Michael Rubera, Mohawk's director of technical support, the company primarily uses polyolefin insulation and lead-free PVC jacketing on its non-plenum-rated data cables.

Flame retardants are added to plastics to slow the spread of a fire, reduce the amount of heat and smoke emitted during a fire, and cause a fire to self-extinguish. They operate by different means. Some retardants reduce the fuel content of the material, for example; others raise the decomposition temperature of the polymer by more tightly bonding the molecules; still others emit water at high temperatures.

PVC and fluoropolymer resins are inherently flame resistant due to their halogen content, but the plasticizers added to PVC are not, so additional flame retardants have to be added to PVC for use in some wiring applications. FEP is more flame resistant than PVC, but the hydrofluoric acid released when it's exposed to heat is more toxic than the hydrochloric acid released by PVC.

Three classes of flame retardants are commonly used in wire and cable insulation: halogenated compounds (based on bromine, fluorine, or chlorine), inorganic compounds (such as antimony), and phosphorous compounds. Among halogenated flame retardants, bromine-based compounds are more effective than chlorine-based compounds, because bromine forms a weaker bond to carbon and thus interferes more effectively with combustion. A number of brominated flame retardants are commonly added to polyolefin wire and cable insulation—either alone or mixed with an antimony compound.

Chlorine is sometimes added to polyethylene insulation, but its presence can negatively affect the performance of the polymer, and as with PVC, it may release hydrogen chloride or dioxin in the event of a fire.

The most common inorganic flame retardants are metal hydrates, antimony compounds, and zinc borate. Metal hydrates work by introducing water to the fire; when used, they can be either compounded with the resin, or packed in around the wires as the cable is manufac-

tured. Aluminum hydroxide is widely used in plastics such as polyethylene. At temperatures above 480 degrees Fahrenheit, the compound degrades into water and alumina, slowing flame spread or extinguishing the fire. Magnesium hydroxide is similar but degrades at a higher temperature; it is more commonly used with polypropylene.

Antimony flame retardants are generally most effective when combined with halogens. Antimony trioxide is commonly added to PVC, for example. Halogen acid, released during a fire, reacts with the antimony compound and produces char, which acts as a physical barrier to flame spread. Antimony-halogen reactions in a fire also keep oxygen from easily combining with the fuel contributed by the polymer.

Zinc borate, alone or in combination with aluminum hydroxide, is used as a flame retardant in a variety of halogen-free polymers. Phosphorous-containing flame retardants are very versatile; many different compounds are used, although the most common are phosphate esters (used in flexible PVC) and chlorinated phosphates (used in polyurethanes).

Other components used to make insulation and jacketing, like fillers, pigments, dyes, and lubricants, are generally of lesser environmental priority and concern than the ones mentioned above.

Searching for greener solutions

To date, there's been little attention paid to health and environmental concerns related to wiring, but one group that has studied the issue in

Some manufacturers are developing wire insulators that are free of halogens, which have come under fire for negative environmental and health effects.

some depth is the Massachusetts Toxics Use Reduction Institute (TURI). According to TURI deputy director Liz Harriman, there are significant international efforts to reduce lead use in insulation and jacketing. The European Union's directive on Waste Electrical and Electronic Equipment (WEEE) and the Restriction of Hazardous Substances Directive (RoHS) will ban lead from electrical equipment and electronics by 2006, and some manufacturers are removing lead from their products before this deadline. "TURI is working with the wire and cable industry and their suppliers in Massachusetts to keep them competitive in the global marketplace," Harriman says.

In terms of fire safety, U.S. codes rely exclusively on test standards for flammability and flame spread, ignoring the risks of toxic and corrosive gases released before and after ignition. This approach differs from some European codes, which assume that incapacitation from irritating gases can affect occupants' ability to escape from a building fire.

There is clearly interest in some circles in specifying halogen-free wiring. Clear alternatives to halogenated wire and cable are polyolefin products; to use these for insulation and jacketing, compounds are typically added for flame resistance, as described earlier. Borealis Compounds, the U.S. division of the Danish company Borealis A/S, offers such products in the U.S., but sales are limited. They're used primarily in subway systems and other locations where acid emissions from halogenated compounds are unacceptable. The manufacturing costs of flame-resistant polyolefin wiring are significantly higher than

those of PVC, according to a Borealis engineer, and regulatory changes would probably be required to bring about a significant shift toward polyolefins from PVC.

Some manufacturers, including Mohawk/CDT, offer PVC-insulated wiring without lead or other heavy metals. Demanding lead-free or heavy-metal-free cable can hasten the transition away from these toxins.

Yet another approach is to specify polyolefin cable with lower flame resistance and place it in a fire-protected environment (e.g., metal conduit or cellular cores of concrete floor panels). Such a method will add to a project costs, however, and the trends are generally in the other direction: specifying plenum-rated, FEP-insulated cable that can be installed in plenums without additional protection.

For data and voice signals, fiber-optic cables and wireless technologies are increasingly viable options. One fiber-optic cable can replace many copper cables in high-capacity applications, and wireless data networks are quickly supplanting hardwired connections in settings such as classrooms and meeting rooms.

Leave no wire behind

A new requirement in the 2002 National Electrical Code (NEC), known as Article 800, specifies that abandoned cables must be removed from plenum spaces. The change was made because of a concern that leaving old cables in place when new ones are added leads to dangerous fuel loading in plenums. Though it's already being enforced in some jurisdictions, the requirement generally kicks in when a space is remodeled.

Removing old cable during renovations and retrofits raises the issue of lead exposure. Since 1984, most cable jackets have been made with lead-stabilized PVC. As the plasticizer leaches out over time, the jackets become brittle and the lead migrates to the surface, leaving behind dust with a high lead content. This dust, loose in ceiling or floor plenums, can easily reach building occupants or workers removing old cable.

Although there seems to be no concerted effort to study or address this potential health hazard, the new NEC requirement forces building owners and occupants to consider potential removal options when cables are first installed. Many owners are now requiring tenants to remove cables once they leave a space; this requirement should lead to more frugal use of cable, the installation of systems that facilitate eventual removal, and better labeling practices for cables in use.

Once old wire and cable is removed, what can be done with it? Copper is a valuable commodity, so old wiring is commonly recycled, but the various additives in wire insulation and jackets raise concerns about incineration, and most of these materials are difficult if not impossible to recycle. Of all the wire insulation and jacketing materials, FEP is the most recyclable, though recycling programs for this material are not known to exist and may not appear any time soon, since the labor involved in identifying and separating it out is substantial.

Wrapping up

Wiring remains a challenge for designers and builders involved in sustainable design. Acceptable alternatives are heavily controlled by codes that focus almost exclusively (in the U.S.) on flame spread and smoke development, with no regard for the toxicity of wire and cable products. Whether this will be considered in fire-safety testing of wire and cable remains uncertain, but it seems clear that the EPA and other agencies will continue researching the safety of halogen-containing insulators.

Perhaps the best news is that better solutions are on the way. "New, innovative materials that are halogen-free and flame retardant will hit the market," says TURI's Harriman. "There are significant drivers for their development, even if not from the building industry." ■

Greener Wiring: A Checklist for Action

General Guidelines

Design for easy access. Install wiring in readily accessible wiring chases to simplify future modifications.

Minimize wiring runs. Reduce material use by installing high-capacity runs to local hubs, rather than connecting each directly to a central hub. Local hubs can connect to workstations via wireless or short-wired connections.

Avoid wiring in exterior walls. Limit wiring runs and receptacle placement in exterior walls, particularly in residential buildings. Such installations interfere with insulation and can result in significant air leakage.

Avoid the need for plenum-rated and limited-combustion cable. Run data cable in metal conduit, sealed wiring chases, or cellular raceways in concrete decking to avoid the need for highly flame-resistant cable.

Don't overwire. Design for future wiring needs, but avoid installing wires unless there is an immediate need for them.

Design for future removal. Design installations so that wire can be easily removed when not in use.

Minimize EMF. Rely on "prudent avoidance" strategies to minimize exposure of building occupants to electromagnetic fields.

Go wireless. Use wireless data connections instead of hard-wired ones for maximum flexibility and minimum material use. Wireless connections may be usable in some local areas, even if they are not usable buildingwide.

Specifications

Plan for future needs. Install voice-data-video (VDV) cable that can serve upgraded networks so that cable will not become obsolete as quickly.

Eliminate use of lead stabilizers. Some PVC wire insulation and jacketing are composed of 5 to 10 percent lead by weight. Specify products that don't contain lead stabilizers.

Don't install lead-stabilized cable loose in plenums. To keep lead dust out of indoor air, cable that's stabilized with lead (which includes most plenum-rated cable) should be installed in metal conduit and not directly exposed to conditioned air circulating through ceiling or floor plenums.

Specify halogen-free products. Wherever possible, specify wire and cable insulation and jacketing that do not contain PVC, chlorinated polyethylene, FEP, or products containing brominated flame retardants.

Specify heavy-metal-free wire and cable. Cadmium, chromium, and other heavy metals are often used in pigments for wire insulation and jackets. Avoid using them whenever possible.

Use fiber-optic cable. Fiber optics, widely used to carry voice and data signals, require less insulation and jacketing than copper wiring. It may be possible to run fiber-optic trunk lines to smaller copper distribution lines, thus reducing total insulated cable use.

Removal

Remove old cable. As per 2002 revisions to the National Electrical Code, remove cable that is not being used or will not be usable in the future.

Follow safety precautions when removing old cable. Old cable contains high levels of lead dust. Ensure that workers wear proper respiratory protection, and seal removed cable in plastic bags.

Recycle old cable. Deliver old cable to facilities where it's properly recycled; never burn old cable to recover copper.

Zoom In

Universidade Agostinho Neto Luanda, Angola

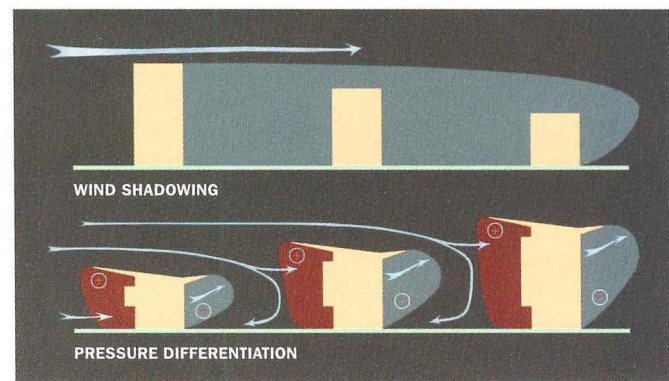
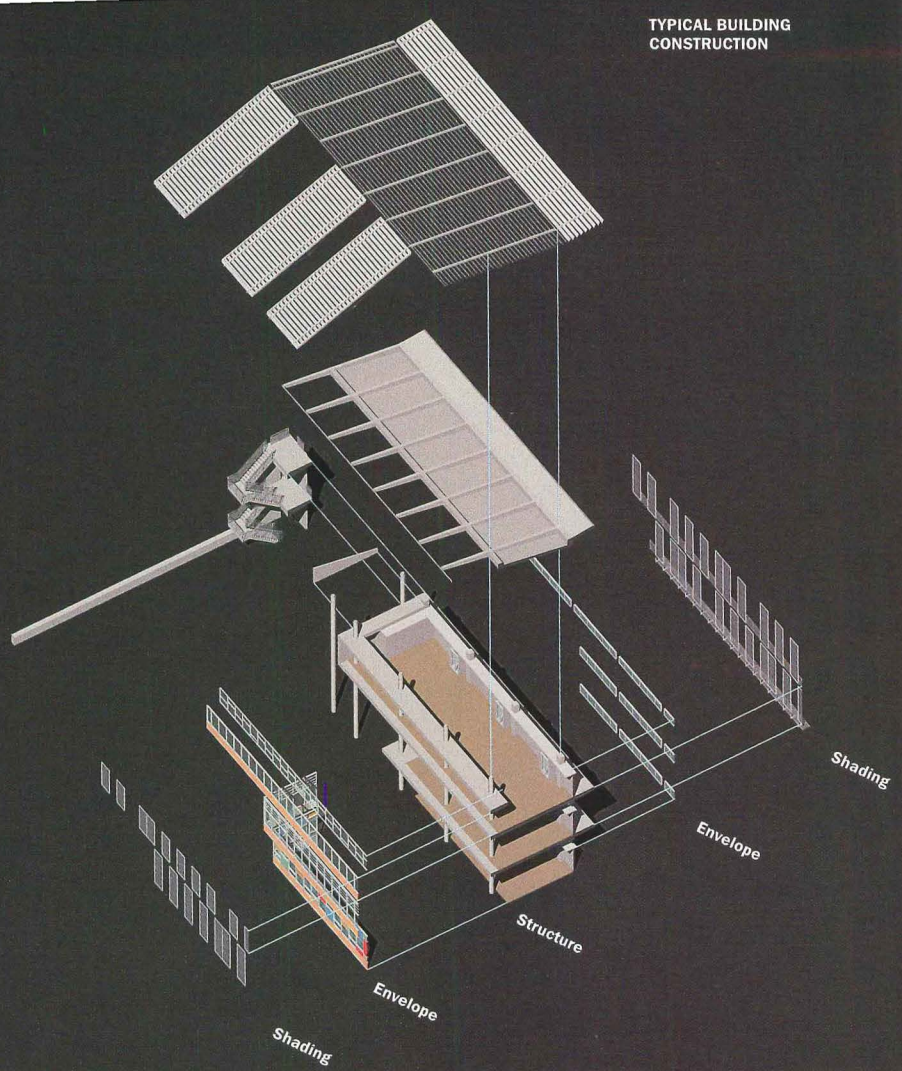
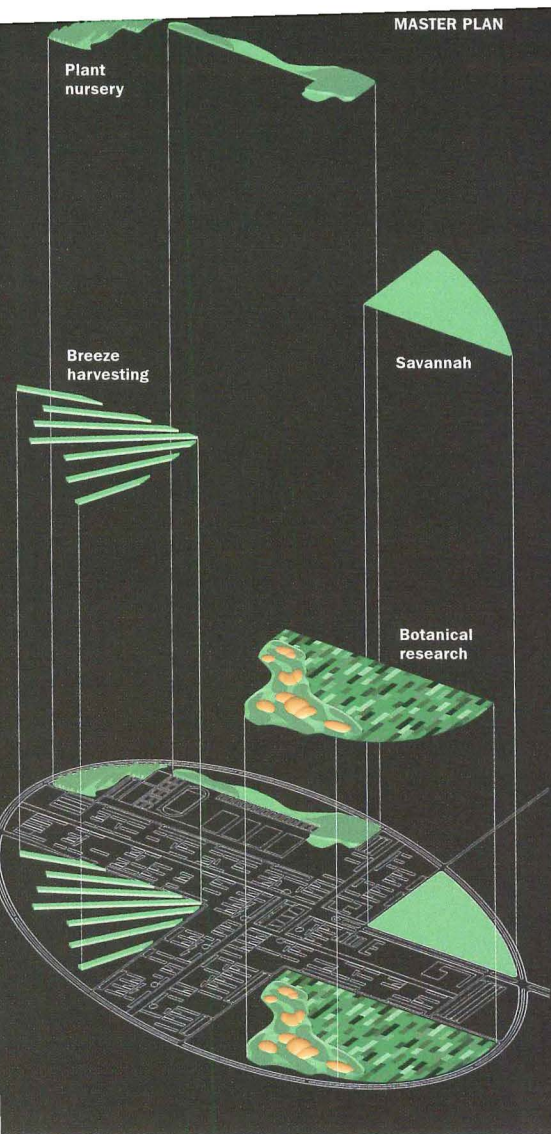


By Deborah Snoonian, P.E.

Green design has taken center stage in a country struggling to its feet after more than 25 years of civil war. Perkins + Will, with sustainability consultants Battle McCarthy, has developed a master plan for a new university for 17,000 students in Angola's capital city of Luanda. The eco-efficient campus of nearly 5,000 acres integrates landscape, building orientation, and massing to take advantage of wind and sun. The design team, led by Ralph Johnson, first imagined a circular plan with quadrangles that pinwheeled from a central point and academic buildings located equidistant from the campus center, to project an image of equality the school's leaders wanted. After studying the local topography and arid, savannah climate, the shape was altered to an ellipse that better conforms to the site's natural drainage patterns, which also reduced landscaping costs. The main axis of the campus is rotated off true north to optimize both passive cooling and daylighting. Now under construction, the master plan will be realized over the next 10 to 15 years. ■

IMAGES: COURTESY PERKINS + WILL

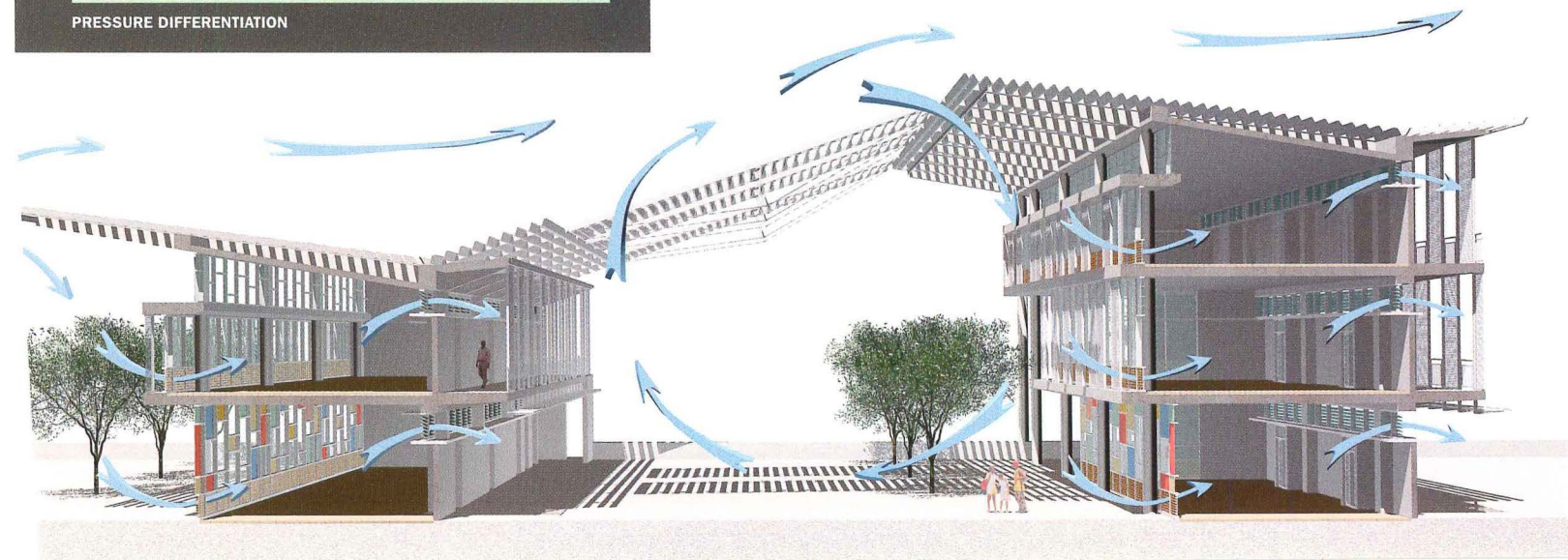




The master plan calls for low buildings to be sited upwind of taller ones (left) to create the pressure differentials needed for wind to penetrate deep into the campus. Many buildings will be connected

at their roofs by a louvered-shade system (below) that screens out strong rays and enables turbulent, cooling eddies to form outdoors. Structures will have screens and light shelves to bal-

ance lighting needs with minimizing heat gain (above right). Rows of trees will be planted in the southwest portion of the campus to channel the savannah breezes (above left).



More and more architects are specifying formaldehyde-free insulation. Must be something in the air.

Johns Manville Formaldehyde-free fiber glass insulation promotes better indoor air quality. Unlike other so-called "green products," JM fiber glass insulation passes Environmental Specification 1350 with non-detect for all pollutants. It's the nation's toughest indoor air quality test, and it's the standard California architects and public school officials rely on to protect 6.2 million children. That's why more architects see JM as not just the best insulation, but the right insulation.

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It's Comforting to Know We're There.

Tech Briefs

Projects: A sleek new lift system moves vintage vehicles in technofuturistic style • Infrastructure: In London, a pedestrian bridge rolls up and out of the way for nautical traffic • Codes and standards: Study finds few U.S. municipalities accept electronic permitting data

BYTES

Seeking a way to generate electricity from the motion of ocean waves, a company called Energetech recently anchored a 486-ton wave turbine off the coast of Australia, 150 miles south of Sydney. In 2006, they will install a similar turbine off the coast of Rhode Island.

The U.S. Green Building Council and the National Environmental Education & Training Foundation have teamed up to launch greenerbuildings.com, a free Web site that provides information and resources about key environmental issues related to buildings and facility management.

Researchers from Oak Ridge National Laboratory and the University of Tennessee have formulated a new, stronger type of steel with an atomic structure that's amorphous, like glass, rather than crystalline, like most metals. Practical applications are still a year or two away.

The General Services Administration has posted a free, searchable database of companies that recycle construction and demolition waste, at cwm.wbdg.org. The EPA estimates that 136 million tons of such waste are generated each year.

At MIT, architecture professor Larry Sass is working on a software program that would let architects quickly design temporary emergency shelters from off-the-shelf, standardized sizes of plywood sheets. The software would determine automatically the most efficient way to assemble the structures, based on input from the architect.

The AIA and the Associated General Contractors have posted a new primer on project delivery methods online. It's available free of charge to members at either www.aia.org or www.agc.org.

Need a lift? New York firm designs a high-tech car-transport system

It's an elevator! It's a material lift! No, it's the Vertical Reciprocating Conveyor (VRC), a transporter custom-built for a vintage-car collector who stores several vehicles in a two-story lot. Its designers, the New York firm ROART, coined the moniker. ("We still don't really know what it means," admits project architect Eran Shemesh.) Combining sleek materials, sensors and actuators, and innovative digital signaling technologies, one might call the VRC a 21st-century machine for moving.

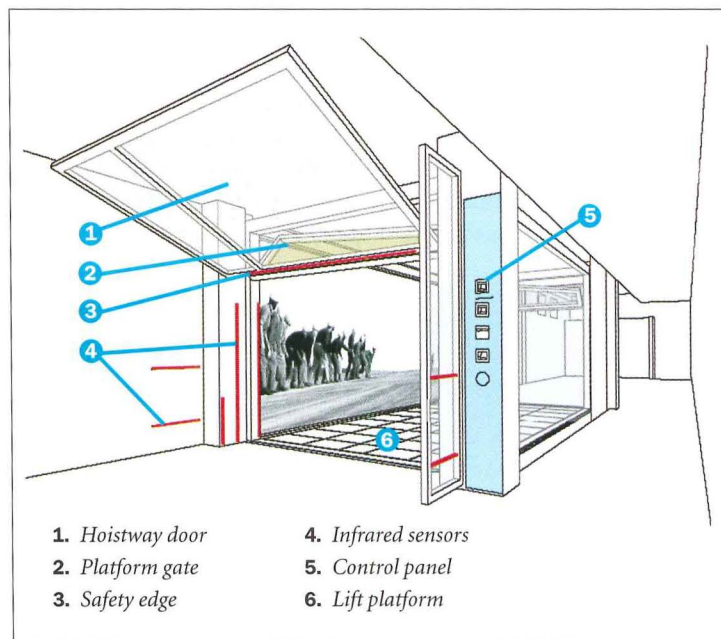
The firm began the project by researching the history of cars and driving, and principal Ran Oron ran across an old black-and-white photo of an early auto race. The client loved the idea of driving onto the lift and becoming part of the life-size image. From that point forward, working with the building's architect, Derek Larson, "we thought of the VRC less like a lift and more like a pleasure machine—a mechanical device that would possess the same technological ingenuity and design sophistication as the cars it transports," Oron says.

Poetry in motion

The site's constraints dictated many of the design decisions. The two-floor garage, only 15 feet wide and 100 feet deep, left no room for doors that slide open to the side or pivot outward; for aesthetic reasons, the architect eschewed garage-style rolling doors on tracks. Instead, the firm designed doors and gates custom-manufactured of stainless-steel mesh, powered by a system of sensors and actuators that elevate and tilt each barrier out of the way. The two gates are installed on the lift itself. When a gate is raised, it slides up on recessed, multifaceted raceways that force its upper and lower points to take separate paths as the



The car lift, or VRC, glows softly, as if welcoming the vehicles it transports.



gate tilts into the cab. The doors, installed on the building's hoistways, take the opposite motion, sliding first up and then tilting outward with the help of linear ball-screw actuators. The motions are synchronized to an elegant choreography, giving the visual effect of a giant pair of

scissors that moves in three dimensions. The speeds, trajectories, and timing can be changed at will.

Five full-scale mock-ups of the doors and gates, each with different geometries and movement trajectories, were tested before the architects found the effect they

Tech Briefs

were satisfied with. “We reviewed three options: a mechanical system with chains and cables, a hydraulic system, and an electrical system. In the end, we needed the actuators to make the motion smooth and reliably repetitive,” says Oron.

To prevent injuries (or—gasp!—dents and scratches), the architects also installed a series of infrared sensors around and inside the lift that detect obstacles within a prescribed safety zone, and halt or reverse the motion of the doors and gates. Programming the safety system so that the sensors would not interfere with one another, or with the normal trajectory of the doors and gates, was no small challenge.

The call buttons were given equal attention. (“This one took at least 15 mock-ups to get right,” says Shemesh.) Instead of conventional pressure-activated buttons, ROART designed a multilayered glass panel embedded with charge-transfer touch sensors, which are capable of detecting near-proximity or human touch. When the user touches a panel, the sensor sends a signal to a control room that then transmits the proper instructions to the lift system. The panel itself is composed of seven layers of glass,

interlayers, and stainless-steel mesh. Some layers are frosted, some clear, and the middle layer has a sandblasted mirror finish. Four images are etched onto the back side of the front layer of each panel; they indicate what floor the lift is on, and whether the door and gates are open or closed.

Picture-perfect touches

Incorporating the vintage car-racing photo at life-size also took some sleuthing. Originally, Oron intended to have it enlarged and silk-screened onto laminated glass for one wall of the lift, even going so far as to track down Andy Warhol’s former silk-screener for the task. But ultimately the process was deemed “a logistical nightmare” because the five 4-by-8-foot panels that constitute the image would have had to be printed at the same time, in a dust-free environment, with no room for error or damage to the glass. Then one of ROART’s collaborators, Depp Glass, told Oron they’d been working with DuPont on a new system that allowed digital printing on an interlayer film typically used to laminate glass, with an ink DuPont invented for the process. At the time,



Electro Kinetics built the doors and gates out of custom-made stainless-steel mesh. Behind the glass call panel (left in photo at right), theatrical multicolored LED fixtures were installed to indicate the VRC’s position and status.



DuPont’s digital printer was only a foot wide, but a year later the company developed a working 4-foot-wide printer, and Oron had his image panels. As the client requested, the photo retains the pixellated, grainy character of a silk-screened image—thanks to an algorithm ROART wrote to alter its appearance in Photoshop. Fiber-optic lighting illuminates the five-panel image, while LEDs light up the lift’s glass floor panels.

Call it a VRC, a pleasure machine, or a lift: This project is a sophisticated mini-laboratory of the architecture of motion. And working out the kinks in the kinetics was exactly the sort of detective work that the firm enjoys. Oron concludes, “We were fortunate to have the luxury of time to grapple with the challenges. As Einstein said, it’s not that we’re smarter—we were just able to stay with the problem longer.” *Deborah Snoonian, P.E.*



This London Bridge doesn’t fall down—it does a backbend

The latest cultural adornment to a 2.1-million-square-foot mixed-use development in the Paddington region of West London is a pedestrian bridge that’s as much mobile sculpture as engineered structure.

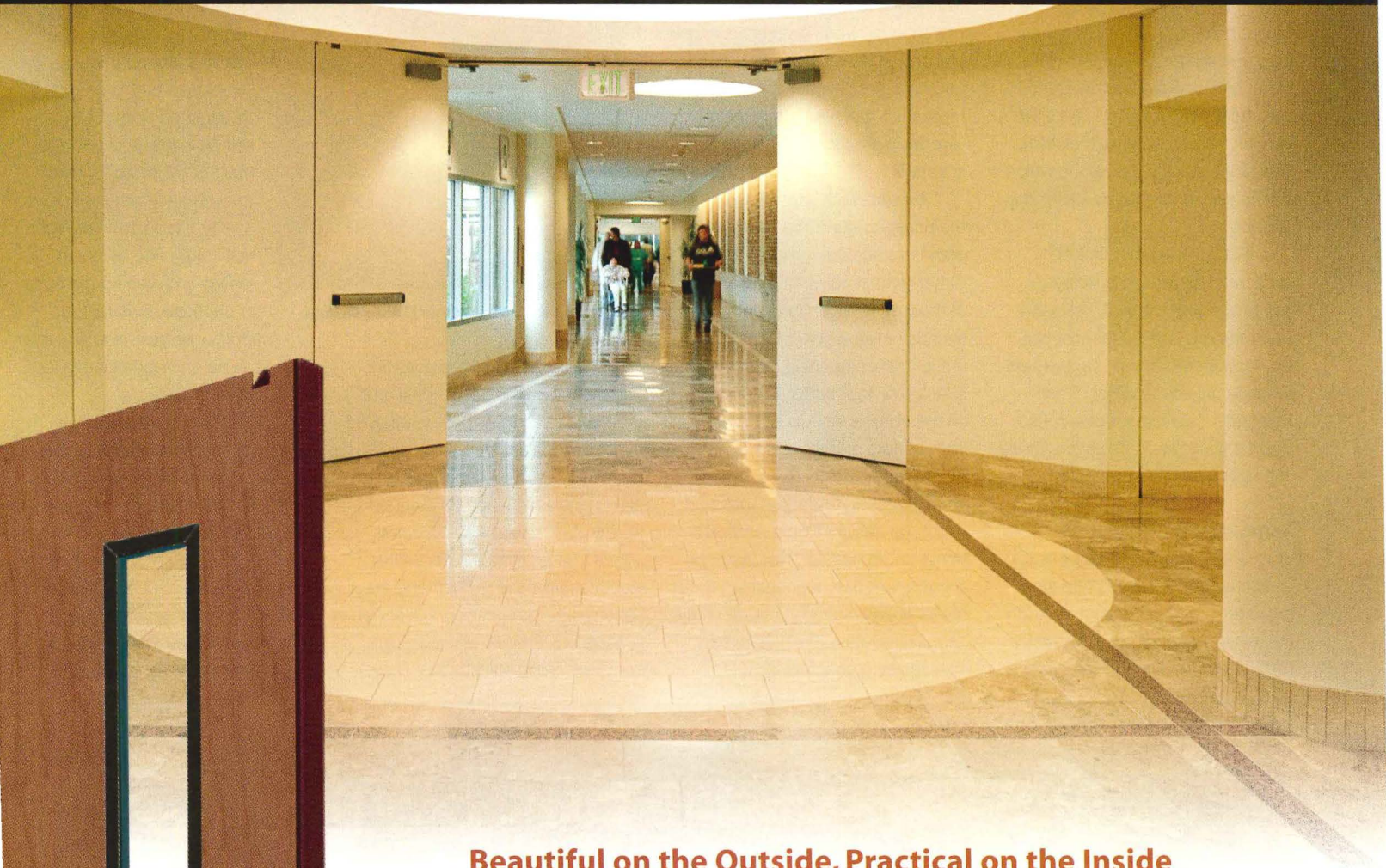
Spanning the mouth of a small dock off the Grand Union canal, the Rolling Bridge rests steady for foot traffic, but opens for boat navigation by curling upward and onto its one fixed support, like a scorpion’s tail.

The 39.4-foot-long bridge, which has a steel frame and timber deck, was designed by Thomas Heatherwick Studio of London.

The structural metamorphosis from footpath to wheel has become

The Rolling Bridge (photos above) goes through its motions to make way for nautical traffic. The hydraulic system is controlled remotely.

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Tech Briefs

a weekly spectacle for passersby since the bridge's inauguration in September. The feat occurs more often when needed for navigation. "We think it's fantastic," says Mike Rayner, an official with Chelsfield, Paddington's lead developer, which commissioned Heatherwick for the project.

Set among a number of Modern, understated buildings, the bridge was detailed "seriously and maturely" and is "almost boring" under normal use, says Stuart Wood, a project designer. "That heightens the element of surprise when it starts to do its action. There is a strong element of theater."

Structure or sculpture?

Since completing his studies in 3D design at Manchester Polytechnic and later the Royal College of Art in London, 34-year-old Heatherwick has adeptly blended art, architect-

ture, engineering, and product design in his work. Among his recent pieces is a seven-story sculpture of 150,000 glasslike beads, linked by more than half a million miles of wire, for a corporate headquarters in London.

Heatherwick says he wanted the bridge to open in a "sensuous manner, transforming itself entirely, rather than simply lifting up and out of the way." Conventional draw-bridges or retracting bridges "look broken" when opening, adds Wood. A structure that curled upon itself, on the other hand, would "look complete in both states."

Heatherwick collaborated with an engineering team that included structural designer SKM Anthony Hunts of Cirencester. Heatherwick and the firm had been looking for a site to build an all-glass bridge they had conceived in the 1990s, says Alan Jones, a principal of Hunts.



Thomas Heatherwick on his Rolling Bridge.

Paddington looked like a possible setting when Chelsfield called, but the scheme was ultimately replaced by the Rolling Bridge.

The 4.5-ton bridge is made of eight segments joined together by hinges. Its articulated balustrades act as trusses, with the deck-floor elements acting in tension and the handrails in compression. Seven vertical pistons above the deck hinges form part of the balustrades. They

also control the bridge's opening motion, which is powered by underground hydraulic equipment.

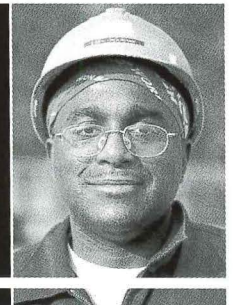
When the bridge needs to be opened, the pistons along the deck elongate. As this happens, articulated sections of the balustrade over each part of the footpath turn toward each other, causing the bridge to curl up. When fully open, the bridge forms a loop with the tip resting on the base. Closing the bridge involves reversing the process in an operation lasting less than three minutes.

Initially the bridge was designed to be retracted into three quarters of a full circle by pulling cables in the handrails. The structure would have opened again under its own weight, without the aid of machinery. But for better access and other reasons, the design team opted for a bridge that would bend into a complete circle,



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which eliminated the possibility of using gravity's forces for reopening it. At that stage, the bridge was to be curled section by section, with pistons activated in turn, expending minimum energy, says Jones. Then Heatherwick asked the engineers if the segments could be retracted at the same time and speed. "I think this is a work of art," Jones declares. "It ceased to be purely structural when its function was determined more by aesthetics than mechanics."

Considered a maverick among the U.K.'s design circles, Heatherwick has shown a flair for the dramatic at many scales. In 1997, he designed a window display for Harvey Nichols in London that broke the plane between private and public space, extending from the store onto the sidewalk. Upcoming work includes the U.K.'s tallest monument, which will be built at Manchester Stadium; a Buddhist temple in Japan; and a tote bag for clothing manufacturer Longchamp. *Peter Reina*

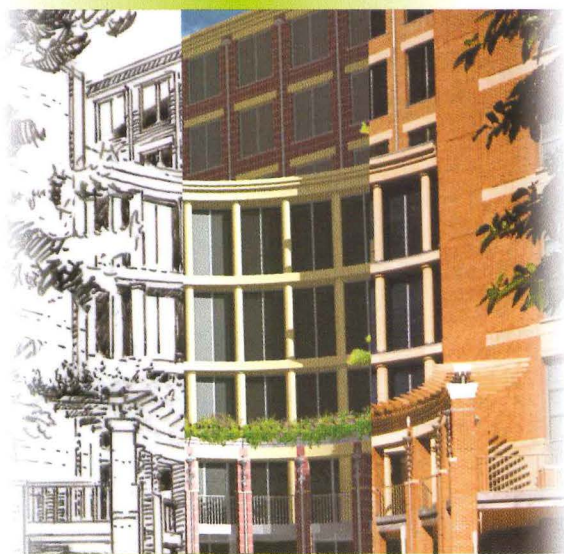
Few jurisdictions in U.S. use electronic documents for permitting

The Stone Age, the Barbarian invasions, the submittal process for building permits in the U.S.: Unfortunately, these three things share a similar level of sophistication, according to the results of a recent study conducted by the National Conference of States on Building Codes and Standards (NCSBCS) and the AIA, which are making strides to update the technologies and processes associated with the collection of permits. The AIA is part of the NCSBCS's National Alliance for Building Regulatory Reform in the Digital Age.

The survey, conducted last winter and released in June, studied state and local government techniques for building-document submittal, and revealed seriously outdated procedures. Out of 120 jurisdictions representing 16 states and 26 major cities, only 16 accept plans electronically over the Internet, the survey shows. Meanwhile, less than 10 percent of reporting jurisdictions share electronically submitted plans with other districts, and 47 of the responding areas don't accept electronic plans at all. Of those that do accept plans digitally, only about five or six, says NCSBCS's executive director Bob Wible, keep the process electronically based all the way through (most state governments still require documents to be wet-sealed on paper).

"It's 2004. I was astounded by how few jurisdictions had implemented any changes at all," says Paul Mendelsohn, senior director of state and local affairs at the AIA, who attributes the lack of progress mostly to squeezed budgets, bureaucratic inertia, out-of-date laws, and the lack of interoperability in available design software. The advantages of updating the technology, Mendelsohn adds, include improved approval speed, accuracy, job-site safety, and perhaps most important, economic benefits. "If a city doesn't have a good system and can't get plans passed quickly, companies will jump elsewhere," he points out.

The good news is that 33 of 54 responding jurisdictions said they expect to accept electronic plans within the next one to two years, and the NCSBCS's alliance partners are undertaking several initiatives to assist state and local governments making the transition. They've drafted model streamlining processes, procurement requirements, and systems for submitting and tracking online permits and plans, as well as field inspection and code enforcement. The AIA may retain a consulting firm to help lay out the case for improved digital plan sharing, and the NCSBCS is also helping jurisdictions to update their laws concerning electronic sign-off, and to create new standards for interoperability of building-permit data. *Sam Lubell*



Illustrations courtesy of Lord, Aeck & Sargent

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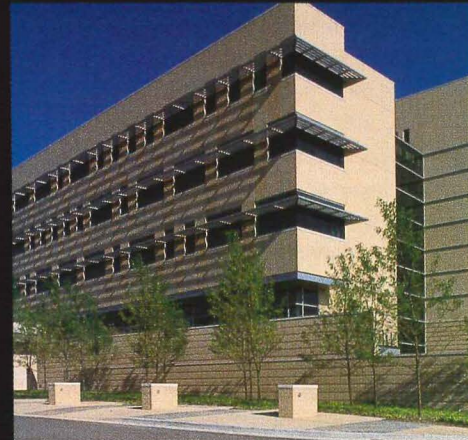
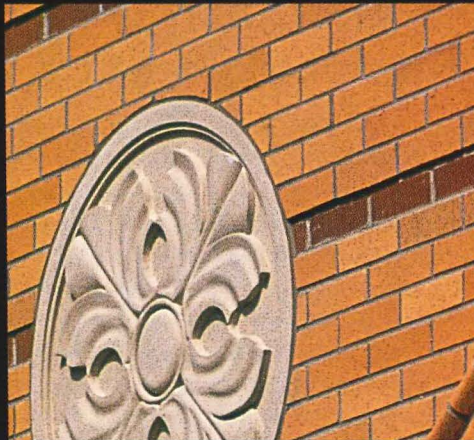
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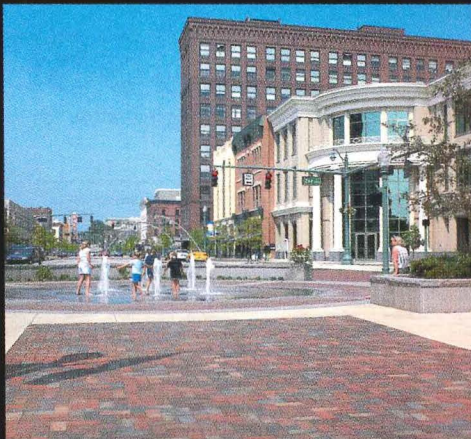
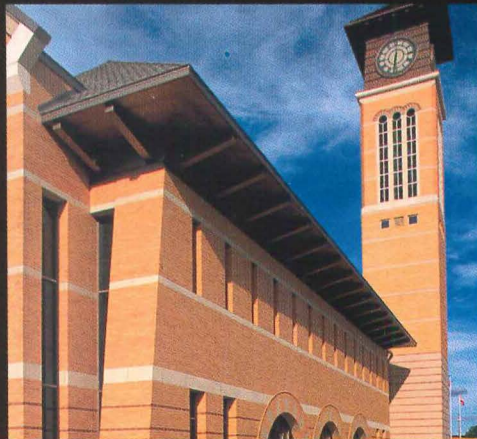
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Updates for 3D CAD, collaboration tools

By Deborah Snoonian, P.E.

Lamina 1.0

Lamina Design
www.laminadesign.com
Windows only

This new software package enables the fabrication of large-scale, free-form structures from planar materials like plywood, plastic, and metal. Useful for a wide range of architectural applications, including interior finishes, lighting and product design, and custom signage, Lamina works by taking a 3D model file and "breaking up" the structure into machinable 2D parts that are fabricated using laser cutting, waterjet cutting, or plasma cutting, depending on the material used and the size of the desired end product. The software automatically accounts for material properties like thickness and flexibility, and subsequently adjusts joining angles and joint types automatically during the cutting process. The preferred 3D file formats that Lamina can accept are OBJ and 3DS-formatted files, but it can also use STL files, which are common in digital fabrication.

Revit 7

Autodesk
www.autodesk.com
Windows only

Autodesk has followed an aggressive upgrade schedule for Revit (this release is the second major update in the past year). New features include the "building maker" design environment that lets users

For more information on technology for architects, including reviews, vendor lists, and links, go to Digital Architect at www.architecturalrecord.com.

map conceptual models to components such as doors and curtain walls; parametric components that are alterable, so that repeating elements within a design, such as an office, can be changed quickly throughout a model; and improved tools for drawing tasks, including change-tracking legends.

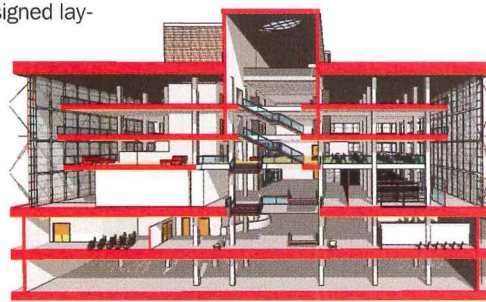
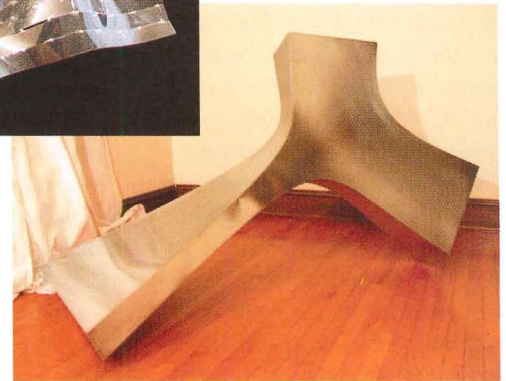
ArchiCAD 9

Graphisoft
www.graphisoft.com
Windows and Mac

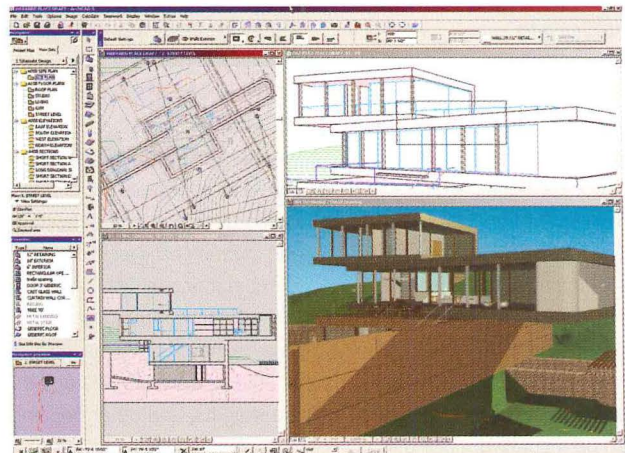
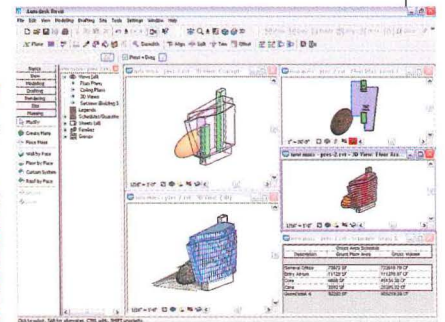
The biggest revision in the latest version of Graphisoft's flagship CAD software is a simplified interface that users can customize with tools of their choosing. A redesigned layout for palettes gives users up to 50 percent more room on-screen to see their designs (rather than software tools). AutoCAD DWG files can be dragged and dropped directly into ArchiCAD for changes and modifications. Re-engineering the product has also improved its speed; the company says that tasks like automatic section generation occurs up to 10 times faster than in previous versions. Productivity-boosting features include enhanced text formatting and the ability for multiple users to share the same customized work environment to make it easier for clients to adhere to companywide layering conventions and drafting standards. Graphisoft has also incorporated the LightWorks rendering engine into the product, which improves its presentation capabilities and its support of output using the popular PDF format.



Lamina aids the design and production of complex 3D forms made from planar materials like metal and wood.



Revit's latest upgrade offers enhancements to its parametric components.



Graphisoft's revised interface for ArchiCAD 9 lets users customize tools and see more of their designs on-screen.

Tech Products

Treo 650 Smartphone

palmOne

www.palmone.com

Palm OS/Windows and Mac

After the wild success of last year's Treo 600, palmOne has upgraded its popular mobile device with several new and improved features. Like the older version, it combines a Palm handheld organizer, a full-featured mobile phone with speakerphone and conferencing capabilities, a digital camera, an MP3 digital music player, and a Web browser. Carriers Sprint, T-Mobile, and Cingular provide mobile-phone service for the Treo. Customers can download their e-mail messages using palmOne's VersaMail technology, and for corporate customers, the 650 also enables synchronization with Microsoft Outlook data such as messages, task lists, and calendar items. Integrated Bluetooth technology communicates wirelessly with accessories such as headsets, car kits, and computing devices, and a full (if tiny) keyboard lets users type text messages, e-mails, or phone numbers on the fly. Expansion cards also let users add custom content and applications like games and electronic books. Even among smartphones, this device is an overachiever.

Texxus

Texxus

www.texxus.com

Windows and Mac

Texxus is a specialized service firm offering surface design, texture design, and rendering and manufacturing capabilities. Originally envisioned as a company to assist designers in creating custom-textured surfaces for injection-molded materials, the firm now used 3D CAD/CAM technology to model complex geometries and surfaces that can be mass-produced using digital manufacturing methods, in any machinable material—including

stone, concrete, wood, terrazzo, and rapid-prototyping materials. The company works on projects on various scales, from model development to full-scale manufacturing, and its services have been employed for both preservation work and new projects. When creating customized surfaces, the team combines its aesthetic approach with an intimate knowledge and understanding of material properties and behavior, so that the surfaces imagined can be produced cost-effectively. The firm uses several different software programs in its work, including CATIA and ProEngineer. Projects the company has supported include the Diana, Princess of Wales Memorial Fountain in London's Hyde Park.

LaunchPad

CadOperator

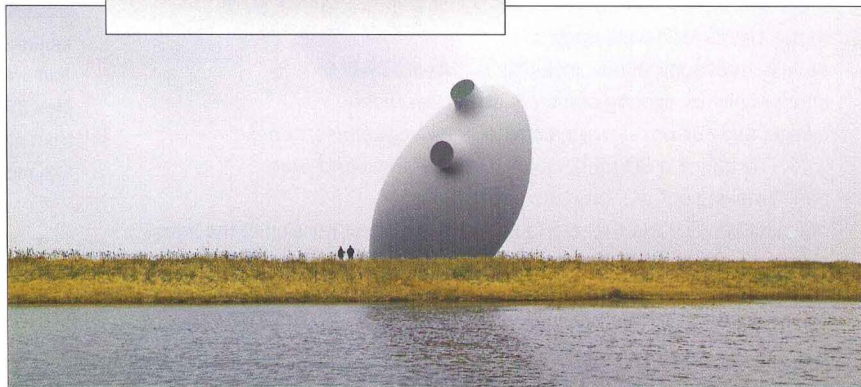
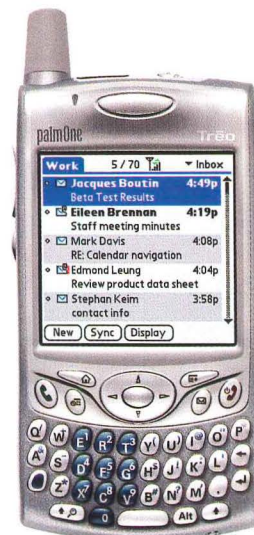
LaunchPadOffice

www.aclaunchpad.com

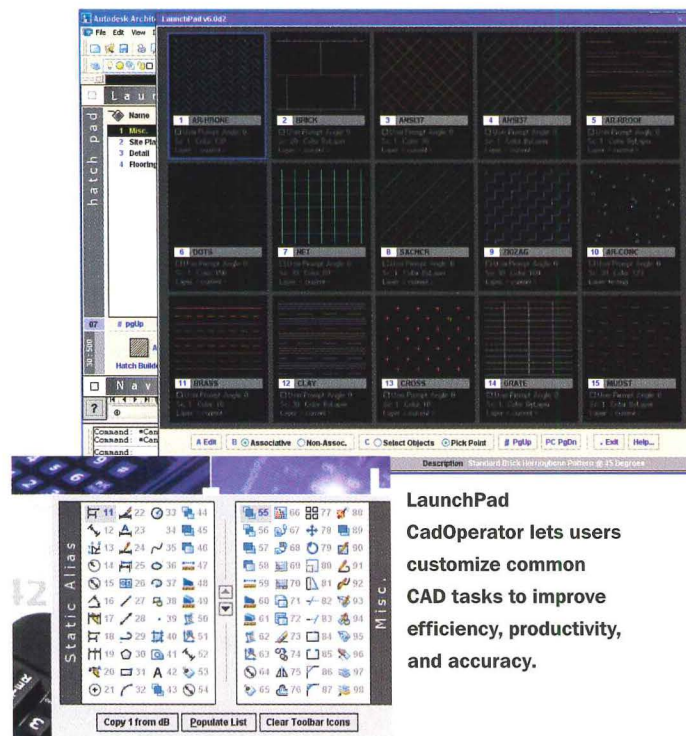
Windows only

As any budding architect knows, CAD drafting can be mind-numbingly rote and repetitive. This combined software/hardware package aims to slash drafting time by 50 percent or more (a video showing a mock race between two CAD operators using traditional entry methods versus this product even verifies the claim). A specialized keyboard and mouse device simplifies repetitive tasks and reduces the number of keystrokes needed for common operations. The software allows users to create shortcuts for, and libraries of, specialized "blocks" (combinations of CAD keystrokes or "objects" that repeat throughout a project), hatch patterns, color combinations, layering rules and styles, line weights, and other popular drafting tasks. Training videos and online tutorials are also available to bring users up to speed—literally.

The Treo 650 Smartphone is compatible with mobile-phone carriers Cingular, Sprint, and T-Mobile.

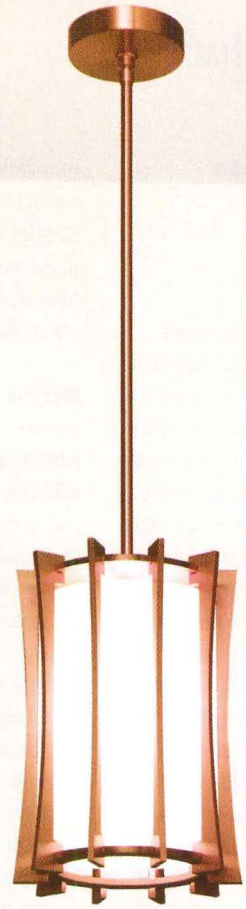


The Texxus team is helping design the Skipper Library in England (above), a pebble shaped structure that will house a private collection of Japanese manuscripts.



LaunchPad

CadOperator lets users customize common CAD tasks to improve efficiency, productivity, and accuracy.

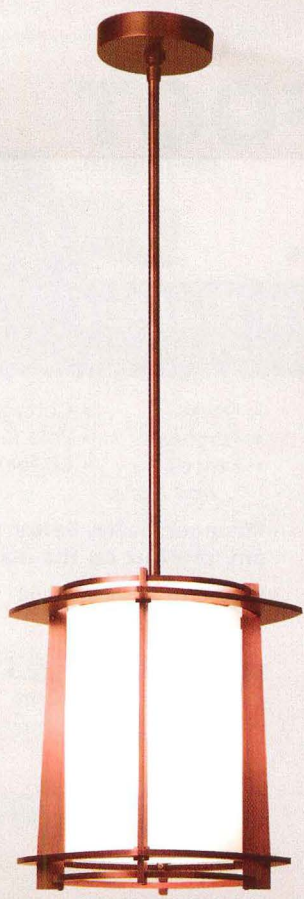


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ProjectWise V8 2004

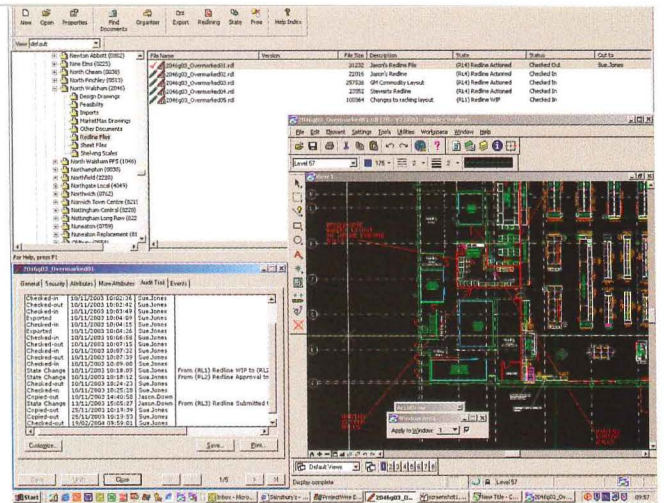
Bentley Systems
www.bentley.com
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Bentley's collaboration software provides a repository and common platform for project team members working in far-flung locations. With ProjectWise, users can exercise control over the flow of data throughout a project's lifetime, such as creating checkout and approval procedures for drawings and automatic notification to team members when critical documents have been revised. Features include the ability to search, query, and navigate all content stored, including metadata such as keywords and individual building components, for example doors or windows, that are modeled in larger project files. Facility managers can also use the system to track a building's operations, maintenance, and

renovation projects. Supported file types include those from all of Bentley's design and engineering software, as well as AutoCAD, Microsoft Office documents, and some Adobe applications.

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Backup storage for critical data is never farther away from your Web browser with Xdrive, an online storage solutions company that has several small and medium-size architecture firms as clients. Users can access their storage areas directly via a Web interface that works with all popular browsers, or through the company's desktop software. Pricing varies depending on the amount of storage space desired.



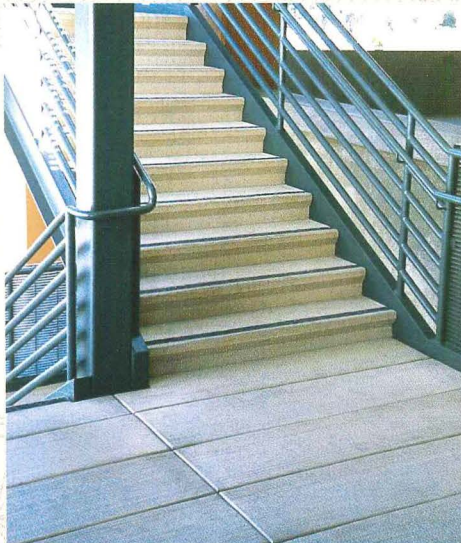
Bentley's ProjectWise software is being used by a 150-member project team designing stores in the U.K. for Sainsbury Supermarkets.



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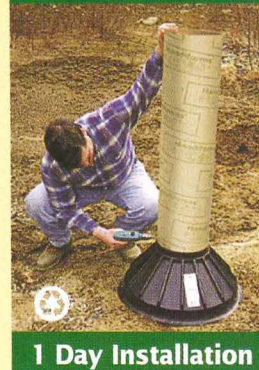
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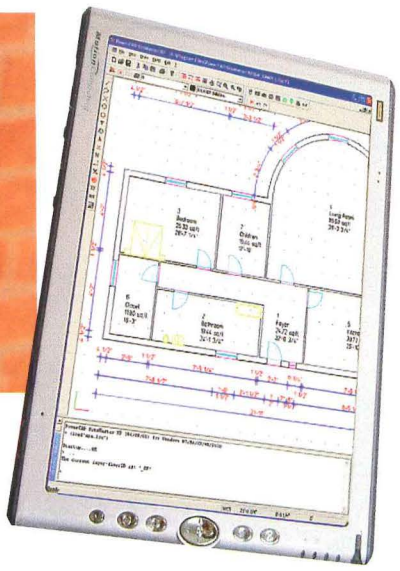
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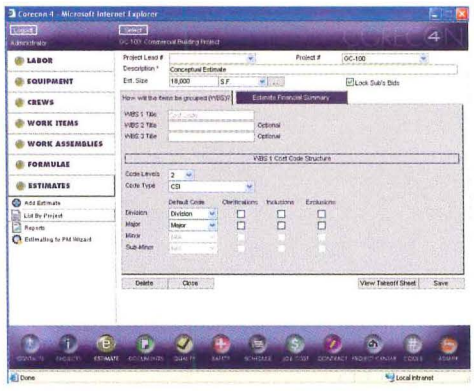
Two companies have teamed up to sell a combined software/hardware solution that automates the creation of as-built floor plans using wireless technology. Laser measurements are collected with the Leica DISTO device; the spatial information is communicated via a Bluetooth connection to a Pocket PC, tablet PC, or laptop computer, where the PowerCAD SiteMaster software transforms the information into AutoCAD-compatible drawings. The companies say the system can be operated by a single person and is capable of producing as-built floor plans from site measurements up to 10 times faster compared to con-

ventional methods involving those lowly low-tech tools: measuring tapes, paper, and pencil.

Corecon 4.0

Corecon Technologies
www.corecon.com
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Once geared to the contractor community, this Web-based estimating and project-management software now offers a customized package for architects and engineers, which is geared to small and midsize firms. It offers several productivity and management tools, such as online time-sheet entry; task scheduling; and tracking of proposals, leads, team members, and expenses and hours on projects under way. Users can set up the software's desktop to obtain at-a-glance project information, such as unfinished tasks or dollars expended. ■



Corecon has released an architect-specific version of its estimating and project-management software.

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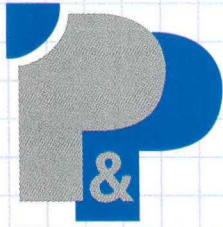
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Designing for security: Glass technology for blast protection

Eagleton Federal Building, St. Louis
Photography: Tim Parker

In recent years, the bomb has become the weapon of choice for terrorists. Since the early 1990s, several significant bomb attacks have occurred that directly affected the U.S., including the bombings of the U.S. embassies in East Africa, the Alfred P. Murrah Federal Building in Oklahoma City, and the World Trade Center. These and other attacks have heightened concerns about the security buildings provide to their occupants and neighbors. In most bomb attacks, structural damage and broken windows constitute major causes of

death and injury for occupants of the targeted and surrounding buildings.

Unlike naturally occurring destructive events like hurricanes, a bomb blast cannot be reacted to with significant warning, and there is virtually no time between recognition and reaction. In order to be prepared for a blast event, risk assessment and planning must be completed far in

advance and protection needs to be in place at all times.

Although no single product offers complete protection, laminated glass windows and doors made with a polyvinyl butyral (PVB) interlayer can be a critical first line of defense, because the glass tends to remain in its frame, thereby helping to protect the interior of the building from the blast wave effect of energy which causes the majority of damage to a building's interior and surrounding buildings. Protection from flying glass is equally imperative, because as studies of bomb explosions indicate, more than 75 percent of the injuries caused by bomb blasts are glass-related.

Laminated glass with a polyvinyl butyral PVB interlayer can be installed easily during the initial construction of a building and, in many cases, can be installed as a retrofit system for established facilities. Laminated glass with a PVB interlayer is virtually invisible to occupants and outsiders.



Structural damage and broken glass were major contributors to death and injury for both the targeted buildings and the surrounding area in the 1995 bombing of the Murrah Federal Building in Oklahoma City.

CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **Designing for security: Glass technology for blast protection**. To earn one AIA/CES Learning Unit, including one hour of health safety welfare credit, answer the questions on page 265, then follow the reporting instructions on page 328 or go to the Continuing Education section on archrecord.construction.com and follow the reporting instructions.

LEARNING OBJECTIVES

After reading this article, you should be able to:

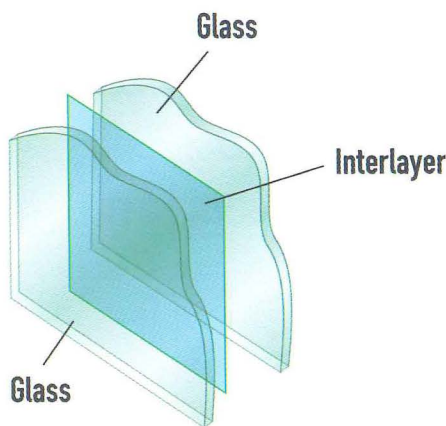
Understand how laminated glass with a polyvinyl butyral (PVB) interlayer can be used in the design of a building to protect that building, neighboring buildings and their occupants in the event of a bomb blast.

Recognize the situations in which a bomb blast risk assessment should be conducted prior to the design of a building or prior to the retrofitting on an existing building's windows. Understand the dynamics of a bomb detonation and the impact of bomb fallout on a building's structure

Terrorist attacks and glazing affects

Recent events such as the September 11 attacks and the Oklahoma City bombing have dramatically heightened the need for increased security at all high-risk buildings. According to a published study by the Glass Research and Testing Laboratory at Texas Tech University, the leading cause of injury in the Oklahoma City federal building bombing was flying glass. In fact, it was estimated that of the hundreds injured in the bomb blast, 80 percent suffered glass-related injuries. To compile their study, University researchers visited the Oklahoma City bombing site immediately following the disaster. During their inspection, the investigative team found glass strewn over an area encompassing six miles to the north of the Alfred P. Murrah Federal Building, one mile to the south, and one mile on either side in downtown Oklahoma City. Shards of glass were even found embedded in walls and inside the buildings surrounding the site.

The researchers' key findings, however, came while investigating how different types of glass products behaved during the explosion. While most glazing systems used in the downtown area of Oklahoma City in close proximity to the detonated bomb were completely destroyed, laminated glass windows and doors made with a polyvinyl butyral (PVB) interlayer performed better than any other glass type found. Having the glass stay in the frame helped protect the surroundings from additional amounts of falling and flying broken glass.



Laminated glass consists of a tough protective PVB interlayer which is bonded between two pieces of glass under heat and pressure.

During a bomb blast, **laminated glass with a PVB interlayer helps to diminish the effects of the explosion by allowing the interlayer to stretch and in essence absorb some of the energy generated by the blast.** If the glass breaks, the **PVB plastic interlayer in laminated glass tends to hold the broken fragments in place helping to prevent glass-related injuries and damage.** With the appropriate types of glass and installation in frames, laminated glass with a PVB interlayer helps protect the interior of the building from

the blast wave effect. By retaining the building envelope, the blast wave does not enter the building and cause additional damage by hurling furniture, fixtures and collectibles around the interior environment—causing the majority of damage to a building's interior after an explosion. Unfortunately, laminated glass with a PVB interlayer was used in less than three percent of doors and windows in the Oklahoma City area affected by the blast pressure.

In their analysis, Texas Tech researchers concluded that damage to people and property in the Oklahoma City bombing could have been significantly reduced had laminated glass with a PVB interlayer been used exclusively in the commercial buildings surrounding the Murrah Federal Building. They also concluded that more emphasis should be placed on the design of a building's non-structural elements, especially glazed windows and doors.

The Oklahoma City bombing and other terrorist acts have led laminated glass with a PVB interlayer to be used and specified for many high-security buildings—including the \$185-million Eagleton Federal Building located in St. Louis, Missouri, and the Las Vegas Federal Courthouse in Las Vegas, Nevada. In addition to using laminated glass in these federal buildings, the General Services Administration (GSA) announced that laminated architectural glass is among the products it recommends to provide bomb blast protection in all new construction and major renovations of federal buildings under their control. In fact, laminated glass was listed as a preferred system for use in federal facilities, as noted in a recent GSA release to the glazing industry, outlining information it had recently provided to regional offices “for planning purposes.”

Las Vegas Federal Courthouse: One of first courthouses built after GSA standard introduced



Glazing Contractor: Enclos Corporation, Minneapolis, MN
Laminator: Viracon, Owatonna, Minnesota
Interlayer Manufacturer: Solutia Inc., St. Louis, Missouri
Architect: Dworsky Associates, Los Angeles, California
Blast Consultant: Weidlinger Associates Inc., New York, NY
Project Completion Date: Spring 2000

Photography: Wes Thompson

The Las Vegas Federal Courthouse, one of the first federal courthouses to be completed since the Oklahoma City bombing, blends an open and inviting glass facade with state-of-the-art security measures. The building looks nothing like the fortress it is, and its designers say it could fare better through a bomb attack similar to the attack on the Alfred P. Murrah Building in Oklahoma City.

The 407,000-square-foot facility is located on Las Vegas Boulevard in the center of the downtown business district. The \$97-million project includes 10 courtrooms, judicial chambers and various state offices. It is the first building to incorporate the federal government's new anti-blast design standards, which were developed after the Oklahoma City bombing.

The additional security measures, which include blast-resistant glazing and floors designed not to collapse on each other, added about \$5-million, or 5 percent, to the overall construction cost for the building. The lead designer on the project used laminated glass with a polyvinyl butyral (PVB) interlayer in the curtain wall instead of the annealed glass used in Oklahoma City's Murrah Building.

In the Las Vegas Federal Courthouse, light flows through the two seemingly conventional double-glazed walls, which are actually unitized panels of aluminum frames and one-inch-thick insulated panes of laminated glass with a PVB interlayer. A glass dome tops the structure, which is also blast resistant. The General Services Administration (GSA) gave the designers a tall order — the new structure needed to protect the interior occupants from a terrorist's bomb — but left the execution of the assignment in the hands of the design team. Armed with the knowledge gained from Oklahoma City's massive glass damage, a blast-resistant curtain wall was designed, fabricated and installed to help heighten the level of protection for the building. The entire design team agreed that full-scale testing would be required, marking the first time a curtain wall was subjected to such rigorous blast testing. Two full-scale specimens were used for testing at the government's White Sands Missile Range in New Mexico. Two systems were tested using laminated glass with a PVB interlayer attached to an aluminum frame, and subjected to another test where the glass was attached to a steel truss framework.

The units are integrally connected to the building frame, rather than clipped on. Compared with the simple construction of the Murrah Building in Oklahoma City, the steel frame is more ductile and has greater energy dissipation capacity. Exterior design elements, such as landscaping and concrete barriers, are also designed to keep explosive laden vehicles from getting near the building.

Risk assessment

When considering protection for a building, the owners and architects can work with structural engineers and blast consultants to determine which threats they are trying to protect against. Terrorist threats range from large truck bombs to mid-size car bombs to small package or letter bombs, which can originate from inside or outside the building.

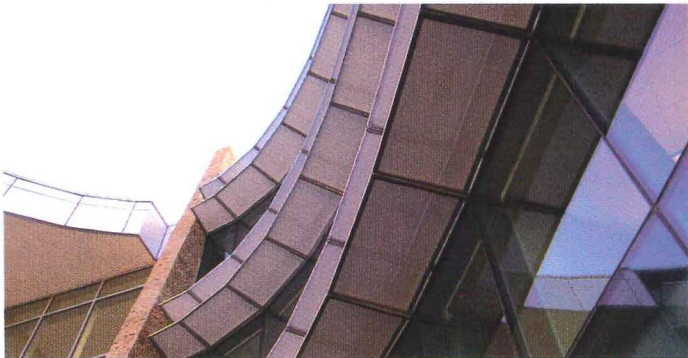
Not all laminated glass is the same, and the same glass configuration may not meet every facility's needs. For an installation where a blast hazard is suspected, a risk assessment of the facility should be completed prior to installation of any product. The risk assessment will encompass many areas that go beyond glazing, such as progressive collapse and site design.

To start, every project is unique. There is no industry standard, and the level of protection is determined by the building owner. After a risk assessment has been performed, the very difficult decision to balance the amount of acceptable risk with the amount of desired protection must be made. From a glazing standpoint, several key items need to be understood:

1. Amount of glass desired in structure
2. Structural capacity of the glass (wind and/or snow load)
3. Blast load determination
4. Acceptable hazard level
5. Stand off distance
6. Life cycle of glazing product
7. Solar control needs and aesthetic desire

The trend toward increased amounts of glass in buildings coupled with the desire for added protection is not mutually exclusive. The developed glazing and framing techniques, along with structural and blast performance and long life cycle of laminated glass with a PVB interlayer, have given designers and engineers the capability to use more glass in buildings. Their desired or targeted protection levels can be established without sacrificing the comforting environment while still portraying the desired image.

Oklahoma City's new federal campus showcases blast-resistant glazing technologies



Sunlight streams into the new Oklahoma Federal Campus that replaces the Alfred P. Murrah Building destroyed in the 1995 terrorist blast, creating an uplifting vision of a future filled with hope and renewal. Photography: Brad J. Goldberg

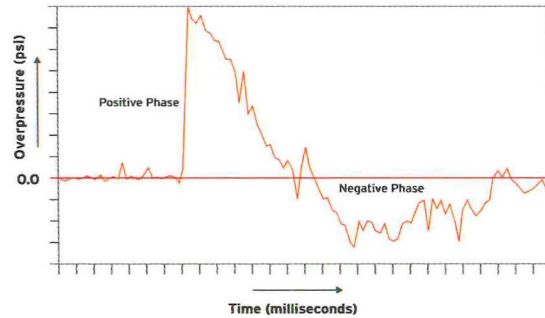
Glazing Contractor: Masonry Arts Inc., Bessemer, Alabama
Laminator: Viracon, Owatonna, Minnesota
Interlayer Manufacturer: Solutia Inc., St. Louis, Missouri
Design Architect/Architect of Record: Ross Barney + Jankowski Architects, Chicago, Illinois
Associate Architect/Engineers: The Benham Group, Oklahoma City, Oklahoma
Blast Consultant: Weidlinger Associates, New York, New York
Project Completion Date: December 2003

The design of the 181,000 square foot, three-story building in the new Oklahoma City Federal Campus, embodies a balance between solidity and openness. The architect defined the disparity between these two concepts by contrasting street elevations of exposed concrete and punched windows with large areas of curtain wall at the angled southeast and northwest faces, and in a sweeping elliptical courtyard. Adding further to the seemingly contradictory terms of security and openness, concrete colonnades complete the urban rectangular

Properties of glazing to resist bomb blast attack

The primary cause of glazing damage is the shock, or blast wave, that expands in all directions from the explosive charge. A secondary cause of damage is debris. The two main sources of debris are 1) the intentional missiles in the composition of the weapon such as nails, and 2) fragments from the surrounding environment such as rocks or pieces of the transport vehicle. To resist the damaging effects of a bomb attack, the glazing must be able to withstand both the primary blast event and the accompanying debris.

Typical Blast Wave Incident (Side-on) Overpressure



Basic principles of a bomb blast

An enormous amount of energy is released when a bomb is detonated. After the detonation, ambient pressure increases almost instantaneously, and promptly begins to decay, forming a nearly triangular overpressure pulse. The highest load is called the peak positive overpressure, which represents the pressure seen at a point in space when the shock wave is unimpeded in its motion. The duration of the positive overpressure is called the positive phase duration.

footprint, separating the building from the street and creating physical and emotional security for the building occupants. The liberal use of glass in both the interior and exterior creates a warm and inviting space.

To resist blast loads, the architect chose galvanized steel as the structural framing components for the windows and curtain wall system. As for any landmark project, exhaustive research, testing and verification of performance was carried out before the final decisions on material type, installation methods and overall dimensions of products were made. After reviewing the products available, the designers determined that laminated glass with a polyvinyl butyral (PVB) interlayer and special framing system was their best option.

With the façade glazing requirements of the building met, the architects began to explore the use of glass in other spaces. Because the lobby space was somewhat small, the architects needed to create a welcoming environment for a building with such a significant emotional legacy. The answer came from above. To let light flow into the lobby from the dramatic skylights overhead, the architects designed two glass bridges that span the lobby airspace on the second and third floors. Armed with the expertise of the blast consultants on the project, a multi layer glass configuration strong enough to meet not only structural requirements, but able to withstand an explosion in the lobby below, was created.

One of the most important design challenges was finding a way to use glass in a distinctive way, while admitting only as much light as necessary and distributing it evenly throughout the space without introducing glare or heat. Most of the glazing in the building extends from floor level to ceiling at 11 feet above finished floor. A clever combination consisting of a high performance low-e coating with tinted and clear glazing was used. Viracon, the glass fabricator, provided a proprietary high performance low-e coating with a blue-green tinted glass, which extends from floor to eight feet to reduce glare in the workspace. At the eight foot level, a horizontal lightsheaf of white vinyl-coated fiberglass awning material on the façade of the building was utilized. These light shelves shade the glass below from direct sunlight, and reflect this light through the clear glass in the band from 8 to 11 feet above the floor and onto the ceiling for a deeper and more uniform distribution. The lightweight material used in the awnings would disintegrate easily in the event of an explosion, helping to diffuse the problem of flying debris.

The peak overpressure and positive phase duration determine the specific impulse of the blast wave, and both factors influence the property damage and injury that the blast wave can cause. These two parameters must be addressed, as some materials can resist rapid high level blast, but will fail as the duration is extended.

Some of the necessary information for designing glazing for bomb-blast mitigation are the peak overpressure (psi), duration of the load (msec) or the impulse (psi*msec) if the blast properties are known. If only the threat is established, a load can be calculated from the size of the anticipated bomb (TNT equivalent lbs), the distance away from the target (stand off distance) and the site altitude.

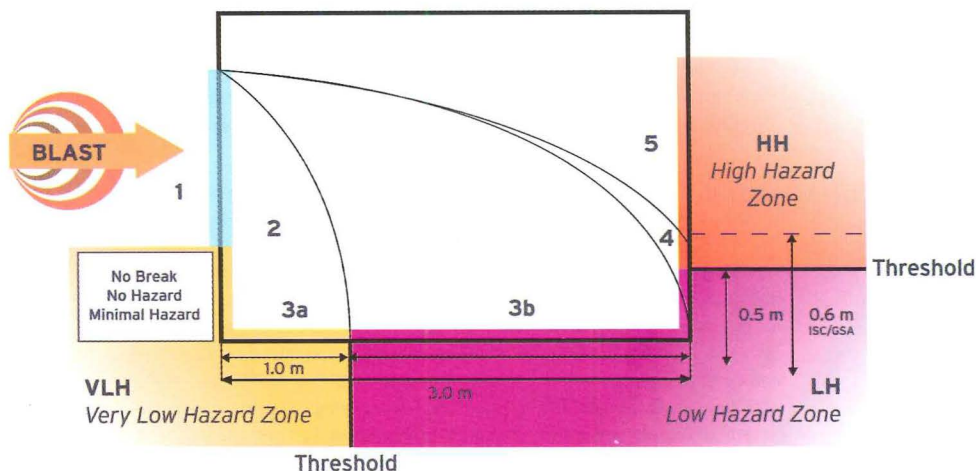
Bomb blast performance of glazing

The two primary aspects of glazing that characterize blast performance are 1) the level of blast load causing the glazing to initially crack or break, and 2) the retention of glass in the frame. Thus, both the performance of the frame and the glazing process are equally critical.

If glass leaves the frame, it has the potential to become a secondary hazard of the explosion. The hazard is dependent upon the size, shape and velocity of the fragments or shards, as well as the direction in which the glass is propelled. Classification guidelines for the performance of glazing during a blast event are used and defined in the diagram below and in Table 1.

Combined ASTM F 1642/ISC Hazard Criteria

Fragment Severity Rating under the ISC takes into account the final location of particles from the glazing after an explosion as seen by the arcs and numbers in the below figure. The hazard rating developed by ASTM F 1642 takes into account the fragment size, number of fragments and their final location and is depicted by the blocks of color. All dimensions are the same except for the height on the back wall which is 0.5 m (20 in) for ASTM and 0.6 m (24 in) for ISC.



Fragment Severity Rating under the ISC/GSA takes into account the final location of particles from the glazing after an explosion as seen by the arcs and numbers in the above figure. The hazard rating developed by ASTM F 1642 takes into account the fragment size, number of fragments and their final location and is depicted by the blocks of color. All dimensions are the same except for the height on the back wall which is 0.5 m (20 in) for ASTM and 0.6 m (24 in) for ISC/GSA

Table 1: Interagency Security Council (ISC) Glazing Protection Levels Based on Fragment Locations

PERFORMANCE CONDITION	PROTECTION LEVEL	HAZARD LEVEL	DESCRIPTION OF WINDOW GLAZING RESPONSE
1	Safe	None	Glazing does not break. No visible damage to glazing or frame.
2	Very High	None	Glazing cracks but is retained by the frame. Dusting or very small fragments near sill or on floor acceptable.
3a	High	Very Low	Glazing cracks. Fragments enter space and land on floor no further than 3.3 feet from the window.
3b	High	Low	Glazing cracks. Fragments enter space and land on floor no further than 10 feet from the window.
4	Medium	Medium	Glazing cracks. Fragments enter space and land on floor and impact a vertical witness panel at a distance of no more than 10 feet from the window at a height no greater than 2 feet above the floor.
5	Low	High	Glazing cracks and window system fails catastrophically. Fragments enter space impacting a vertical witness panel at a distance of no more than 10 feet from the window at a height greater than 2 feet above the floor.

System performance

Equally important to the design of the glass, is the design of the frames and attachments to the structure. To realize the greatest protection, the laminate must be retained within the framing members to enable the PVB interlayer to behave as a blast shield and prevent debris from entering the occupied space. This can be accomplished by enhancing the framing system design, such as: increasing the glazing bite, adding structural silicone adhesive, introducing enhanced anchorage and/or hardware or a combination of all enhanced glazing techniques. It is strongly recommended to solicit the involvement of a qualified blast consultant to verify the overall performance of the glass and framing system combination to resist the specified blast criteria.

Testing

There are basically two test methodologies utilized in blast testing; shock tube and arena. Each methodology can be used to evaluate glass lites or a complete glazed system. The frame in which the glass is glazed, as well as the anchoring of the frame to the building, both play significant roles in the ultimate success of a glazing system. Without proper glazing, the glass could come out of the frame. Without sufficient anchoring, the frame could come out of the wall.

The tests are different, however, in what you can do with them. Typically, the shock tube tests are done on a single fenestration system per blast and can be less expensive than an arena test. The shock tube sends a wave of pressure through a tube towards the fenestration. The pressure and speed of this wave can be manipulated to simulate many different blast levels. An arena test is performed with an actual blast using detonated TNT (or equivalent weight TNT) explosive material. Several systems can be placed around the perimeter of the blast, and they will experience a different blast load depending upon the distance away from the detonated bomb. An arena test serves a good practice for evaluating multiple variables with the same blast load.

The two main documents used as a guidance in testing are General Service Administration (GSA) TS-01 and American Society of Testing and Materials (ASTM) F 1642. Both test methods recognize shock tube and arena testing. The protocols are very similar, with slight differences in the manner in which glass spall from the glazing is measured at the end of the test. Both documents measure the overpressure, duration and the amount of time the load is applied to the glass – as a means of quantifying the test. The characteristics of the test that are recorded are:

- **Overpressure (psi)**
- **Duration (msec)**
- **Impulse (psi*msec – calculated from overpressure and duration)**
- **Glass condition**
- **Glazing retention in frame**
- **Glass fragment number, size and location**
- **Frame condition**

Neither document provides guidance on the blast size or duration. That information comes from the threat and risk assessment of the facility. Some common levels of blast that have been extracted from designs are: 4 psi at 28 psi*msec (basic level) and 10 psi at 89 psi*msec (enhanced level). There are some government agencies that require 40+ psi overpressure with several hundred msec durations; however those levels are typically used specifically for very high risk facilities. Using laminated glass with polyvinyl butyral (PVB) interlayers in properly designed frames can successfully meet all of the mentioned blast levels. For low level blast loads, standard commercial frames with properly designed glazing, anchoring and laminated glass have been shown to perform effectively. For higher level loads or complex structures, a blast consultant or structural engineer may need to be contacted for design review.

In addition to the test methodologies outlined above, software analysis programs have been established to assist in analyzing the response of windows during an explosion. These programs were all developed based on past testing that was conducted and they assist blast consultants and engineers in the design process.



Tests prove that when windows glazed with laminated glass with a PVB interlayer are subjected to a blast impulse, broken glass fragments tend to adhere to the PVB interlayer rather than spraying building occupants.

CLICK FOR ADDITIONAL REQUIRED READING

The article continues online at: archrecord.construction.com/resources/conteduc/archives/o412solutia-1.asp

To receive AIA/CES credit, you are required to read this additional text. For a faxed copy of the material, 877-674-1233 or email glazin@solutia.com.

The following quiz questions include information from this material.

**AIA/ARCHITECTURAL RECORD
CONTINUING EDUCATION Series**

LEARNING OBJECTIVES

- Understand how laminated glass with a polyvinyl butyral (PVB) interlayer can be used in the design of a building to protect that building, neighboring buildings and their occupants in the event of a bomb blast.
- Recognize the situations in which a bomb blast risk assessment should be conducted prior to the design of a building or prior to the retrofitting on an existing building's windows.
- Understand the dynamics of a bomb detonation and the impact of bomb fallout on a building's structure

INSTRUCTIONS

Refer to the learning objectives above. Complete the questions below. Go to the self-report form on page 328. Follow the reporting instructions, answer the test questions and submit the form. Or use the Continuing Education self-report form on Record's website, archrecord.construction.com, to receive one AIA/CES Learning Unit including one hour of health safety welfare credit.

QUESTIONS

1. According to research, approximately what percentage of bomb blast injuries are glass-related?
 - a. 35%
 - b. 45%
 - c. 65%
 - d. 75%
2. The strongest blast wave during a bomb detonation is known as the:
 - a. Blast load
 - b. Peak positive overpressure
 - c. Positive phase duration
3. Which of the following may not be addressed during a bomb blast mitigation study?
 - a. Overpressure
 - b. Load duration
 - c. Voltage
 - d. Site altitude
4. When testing glazing systems, the two characteristics by which blast performance is measured are blast load and glass retention within the frame.
 - a. True
 - b. False
5. After the Oklahoma City bombing, an investigative team discovered glass from the Murrah Federal Building as far as six miles away.
 - a. True
 - b. False
6. In addition to blast mitigation, windows made with a polyvinyl butyral interlayer offer additional benefits that include all of the following except:
 - a. Decreased visibility
 - b. Noise reduction
 - c. Solar protection
 - d. Intruder resistance
7. Bomb blast consultants may also weigh the risk of major weather events when making determinations about a building's laminated glass needs.
 - a. True
 - b. False
8. Which of the following is not a factor recorded during bomb blast mitigation testing for glass?
 - a. Glass opacity
 - b. Glazing retention in frame
 - c. Number, size and location of glass fragments
 - d. Frame condition
9. Of the following methods, which is not utilized to improve blast performance of laminated glass?
 - a. Add structural silicone adhesive
 - b. Enhance anchorage
 - c. Decrease the glazing bite
10. A risk assessment is not necessary for retrofitting an existing building for laminated glass.
 - a. True
 - b. False

About Solutia Inc. and Viracon

Solutia Inc. is a world leader in performance films, producing Saflex® and Vanceva™ brand polyvinyl butyral interlayers (PVB) for laminated glass in automotive, architectural and residential applications.



Solutia Inc.
Corporate Headquarters
575 Maryville Centre Drive
St. Louis, MO 63141
877-674-1233
glazin@solutia.com
www.solutia.com



Viracon
Corporate Headquarters
800 Park Drive
Owatonna, MN 55060
800-533-2080
www.viracon.com

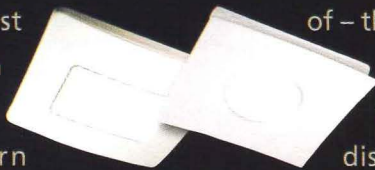
Viracon is an international company of Apogee Enterprises, Inc. Viracon produces high-performance glass products, including tempered, laminated, insulating, and silk-screened glass, and high-performance coatings. Apogee Enterprises, Inc., is a leading fabricator, distributor, and installer of value-added glass products and systems.

CIRCLE 88 ON READER SERVICE CARD OR GO TO [HTTP://ARCHRECORD.CONSTRUCTION.COM/READERSERVICE/READERSERVICE.ASPX](http://ARCHRECORD.CONSTRUCTION.COM/READERSERVICE/READERSERVICE.ASPX)



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OBTAINING THE CASE 962D DOCUMENT

Copies of the CASE 962D document, *A Guideline Addressing Coordination and Completeness of Structural Construction Drawings*, are available for \$30 each from CASE through the bookstore at www.acec.org or by calling 202-347-7474. The CASE 962D document is item #10417.

CLICK FOR ADDITIONAL REQUIRED READING

As part of this CES Learning Activity, you are required to read additional material consisting of sections 4 through 7 and 10 of the CASE 962D document. To access this material online, visit www.aisc.org/case962d or to obtain a faxed copy of the selected chapters call the AISC Steel Solutions Center at 1-866-ASK-AISC.



AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION Series

LEARNING OBJECTIVES

After reading this article, you should be able to:

- Recognize the value of the coordination of construction documents.
- Identify the process required to generate coordinated and complete construction documents
- Understand the role of the architect in the provision of coordinated and complete construction documents
- Be motivated to encourage the use of the CASE 962D Guideline in projects

INSTRUCTIONS

Refer to the learning objectives above. Complete the questions below. Go to the self-report form on page 329. Follow the reporting instructions, answer the test questions and submit the form. Or use the Continuing Education self-report form on *Record's* website—archrecord.construction.com—to receive one AIA/CES Learning Unit including one hour of health safety welfare credit.

QUESTIONS

1. When construction drawings are not coordinated or incomplete a contractor will have difficulty
 - a. accurately bidding the project
 - b. executing the architect's design intention
 - c. maintaining project budget and schedule
 - d. all of the above
2. The problem with the quality of drawings today rests with the
 - a. the owner
 - b. all members of the project design team
 - c. the architect
 - d. the structural engineer
3. A comprehensive scope of services
 - a. is essential for managing the budget
 - b. establishes the responsibilities of all design team members including their relationship to other design team members
 - c. is an essential step in achieving a successful project
 - d. all of the above
4. CASE 962D is
 - a. a standard of care for structural engineers preparing construction documents
 - b. a guideline that structural engineers can use in preparing project specific *quality management plans*
 - c. language for inclusion in contract documents to limit a structural engineer's liability for incomplete plans
 - d. specifies information to be provided to the structural engineer by the architect
5. In general, except for several western states, complete structural documents will not include
 - a. clear descriptions of structural elements and their material specifications
 - b. the relationship of structural components to pertinent non-structural elements
 - c. documentation of the governing codes and loads used in the design
 - d. connection details
6. The best first step to overcome poor quality documents is
 - a. for each design professional to place the blame on other design professionals
 - b. for the architect to encourage communication within the project design team
 - c. to request an increase in design fees
 - d. to ignore the problem
7. As the prime design professional on a project, the project architect should
 - a. take the lead in the discussion with project owners about the need for complete, coordinated documents
 - b. develop a document quality plan for the structural engineer
 - c. promise the owner complete, coordinated documents
 - d. require all communication between design team members take place with the architect present
8. Drawing review checklists in CASE 962D include
 - a. all of the items required to be provided to the structural engineer
 - b. all of the items required to be included in drawings by the structural engineer
 - c. typical items that should be included on structural construction drawings
 - d. only items relating to steel framed construction
9. When a proper *quality management plan* is in place
 - a. there is no need for meetings between members of the design team
 - b. contractors are never consulted during the design phase
 - c. the project architect still needs to coordinate communication between members of the design team
 - d. complete, coordinated construction drawings are guaranteed
10. The project specifications should
 - a. identify the material types and strengths to be used
 - b. include supporting cut sheets
 - c. duplicate the information noted in the General Notes
 - d. not be project specific



866-ASK-AISC
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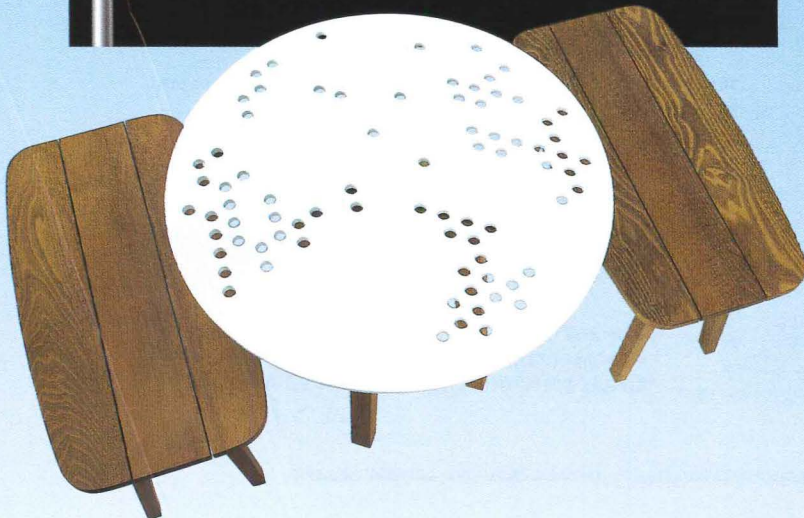
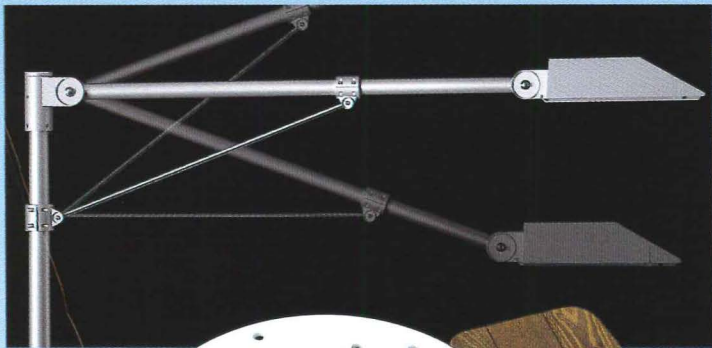
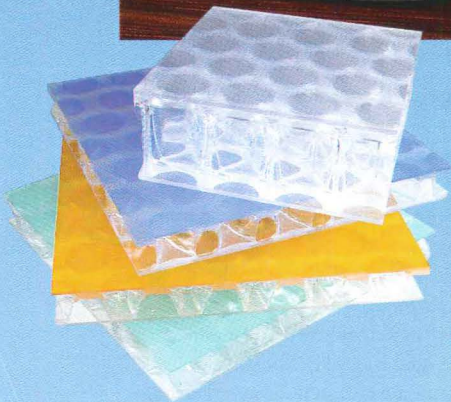
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Product Reports



How do you recognize a well-designed product? The seminal designer Charles Eames once said, “The real questions are: Does it solve a problem? Is it serviceable? How is it going to look in 10 years?” As I sift through the thousands of product submissions that cross my desk during the year, I keep this quote tacked to the wall as a reminder of the goals of good design. Our aim at *RECORD* is to feature products that are useful, timeless, and address a problem in a new way. This is a quest that is not only rewarding for us, but we hope rewarding for you, as well.

In fact, once a year we gather a passionate and knowledgeable jury representing our readers—architects, designers, and product experts—to choose the most outstanding products of the year. This tireless group donates a day from their busy schedules to pore over product submissions, images, and samples, to find products that answer a well-known or recently created demand in the market. This is no beauty contest—products are chosen not only for their aesthetics, but also for their sustainability, durability, ease of maintenance, and a range of other qualities that push them a step beyond the standard.

Our jury has a different relationship with the product manufacturers than our editors do, and while lead times, customer service, and price points are not part of the criteria for judging, the jury can’t help but let these issues factor into their choices. Often their personal experiences with a company that was stellar, or less so, will affect their final decisions.

After all was said and done, our jury selected 125 new products



2004

that they felt deserved recognition this year. While avoiding overdesigned products, they favored offerings that combined new technologies and customization options, including a rear-projection acrylic screen that comes in lengths of up to 340 feet, and a phosphorescent glass block material that can be crafted into an array of surfaces.

For the second year in a row, our Digital Products editor Deborah Snoonian, P.E., organized a "virtual" jury to evaluate the best digital products of 2004. Her jury included Patrick Mays, AIA, principal and C.I.O. of NBBJ, Seattle, and Paul Seletsky, Assoc. AIA, director of technology, Davis Brody Bond, New York City.

Our thanks go to the jurors, participating companies, and RECORD interns Audrey Beaton and James Murdock for their help with this year's Reports. We are eager to see what manufacturers have on the boards for 2005, and with Eames's criteria as a guide, to continue our search for the industry's most exciting new products. Rita F. Catinella

280 Editors' Picks	301 Doors & Windows
282 Top 10 Green Products	305 Finishes
285 Digital Products	311 Specialties & Equipment
289 Sitework	314 Furnishings
291 Concrete & Masonry	319 Special Construction & Conveyance
295 Metals, Woods & Plastics	321 Mechanical
299 Thermal & Moisture Protection	322 Electrical

Our 2004 Product Reports Jury

Howard Brandston, LC, FIES, Hon. FCIBSE, FIALD (back row, far left), is a partner with Brandston Partnership in New York City and an adjunct professor at Rensselaer Polytechnic Institute in Troy, N.Y. Brandston has more than 40 years experience in lighting design, engineering, and electronics, having designed illumination for more than 2,500 commercial, institutional, residential, and government projects.

Thomas C. Lekometros (back row, second from left) is a principal owner and the partner in charge of design for The Lawrence Group Architects, New York. The office is part of a multidisciplinary firm that has practiced broadcast, educational, corporate, and residential architecture. Lekometros was formerly an associate at Gwathmey Siegel & Associates, where he practiced for more than 12 years.

Blaine Brownell (back row, third from left) is a LEED-certified architect and an associate with NBBJ in Seattle. Brownell is the editor of a weekly electronic journal that highlights innovative products, as well as *Transmaterial*, a catalog of materials, products, and processes that are redefining our physical environment. Brownell has roughly eight years of experience working for firms in Houston, Tokyo, Nagoya, and Seattle.

Roger Klein, AIA (back row, far right), is principal and director of architectural design at Swanke Hayden Connell Architects (SHCA), where he is responsible for overseeing the design teams of all architectural projects in the New York office, including commercial, retail, educational, and public-sector projects. Prior to joining SHCA, Klein was an associate principal at Kohn Pedersen Fox in New York City.

Morley Bland (front row, left) has been with Beyer Blinder Belle in New York City since 1991. Following her position as first executive director of the James Marston Fitch Charitable Trust, founded by the firm in 1988, she became BBB's resource director in 1998. Bland is a member of the Resource Director's Association, an organization of product and materials specialists working at architecture and interior design firms.

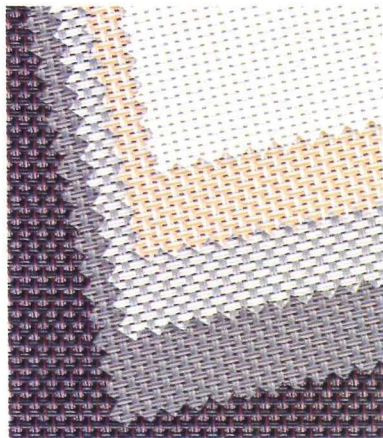
Lauren Crahan (front row, right) studied fine arts and architecture at the Rhode Island School of Design, in Providence. She has been a partner in the Brooklyn, N.Y., firm Freecell since 2000. She has worked as a project designer for Weiss/Manfredi Architects and as a project manager for Rafael Viñoly. She is an adjunct professor for the first year design studio at the New Jersey Institute of Technology, in Newark.





Editors' Picks

Our fifth annual roundup of the year's most impressive building products



EcoVeil solar-shade cloth, **MechoShade**. Top 10 Green Products, page 282.



Steelcase's Think chair is designed with a three-part "brain" and 98 percent recyclable content. [See RECORD, June 2004, page 364.]

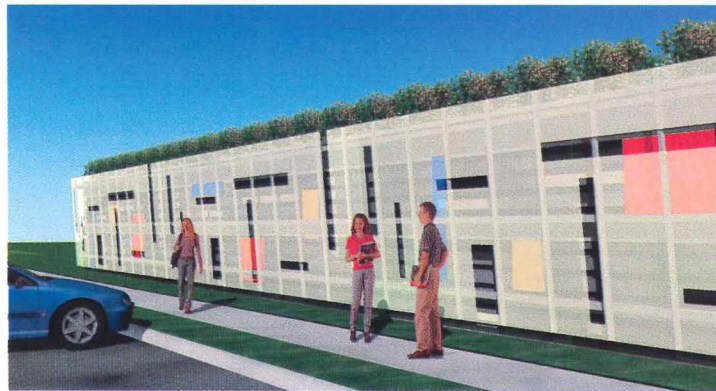


Ductal composite, **Lafarge N.A.** Concrete & Masonry, page 292.



The Blue Ocean acrylic projection screen, **U.S. Nippura.** Specialties & Equipment, page 311.

Metalith prefabricated steel wall perimeter security system can absorb the impact of explosives and/or speeding vehicles and be customized by an architect to enhance its aesthetic. **Corrugated Metals**, Chicago. www.corrugated-metals.com CIRCLE 200



Integrated-display screen, **ad notam USA.** Specialties & Equipment, page 312.



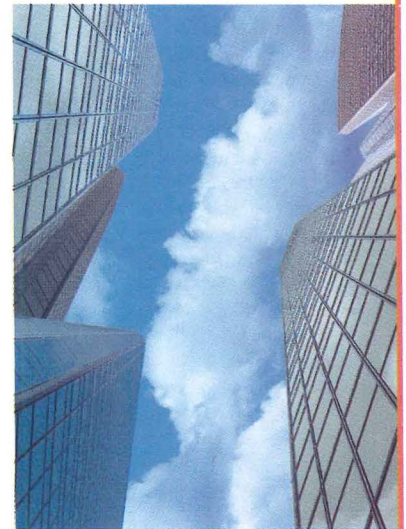
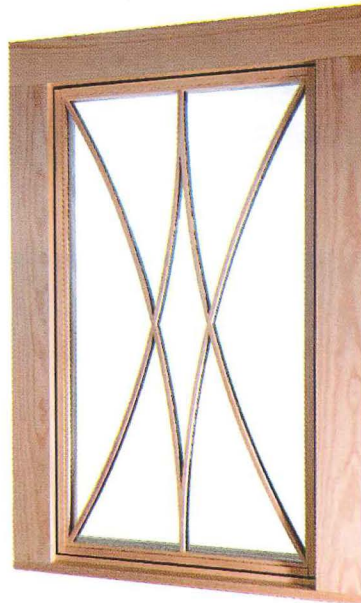
Solarban 60 Starphire glass (left) is ultra-clear with the solar content of low-e glass. **PPG**, Pittsburgh. www.ppgglazing.com CIRCLE 201

Several of the compelling products that caught our attention this year featured an exciting combination of materials, such as fiber optics and concrete or LEDs and glass. Others were notable for improvements in design or advancements in technology that yielded unexpected results, such as a customizable perimeter wall or a lightweight aluminum chair. As always, the true test of a product's merit will be its ability to satisfy the demands of your future projects. Rita F. Catinella

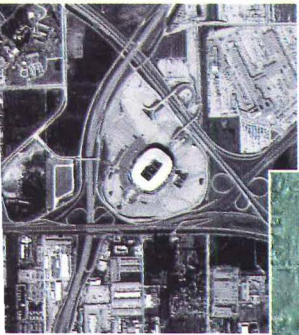


htPoints LED glass, **Schott N.A.** Doors & Windows, page 302.

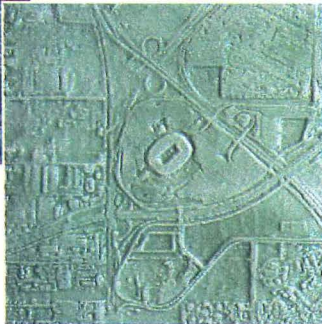
AuraLast water-based treatment from **Jeld-Wen** protects wood windows and patio doors against wood decay and infestation. [See RECORD, April 2004, page 206.]



Pilkington's Eclipse Advantage reflective low-e glass combines subtle reflectivity, high visible light transmittance, and thermal- and solar-control. [See RECORD, February 2004, page 171.]



Bas-relief tiles, **Photo-Form.** Finishes, page 306.



LiTraCon translucent concrete block, LiTraCon. Concrete & Masonry, page 291.



The Superlight aluminum chair designed by Frank Gehry, **Emeco.** Furnishings, page 316.

IMAGE: COURTESY LEGAT ARCHITECTS, CHICAGO (OPPOSITE, METALITH RENDERING)

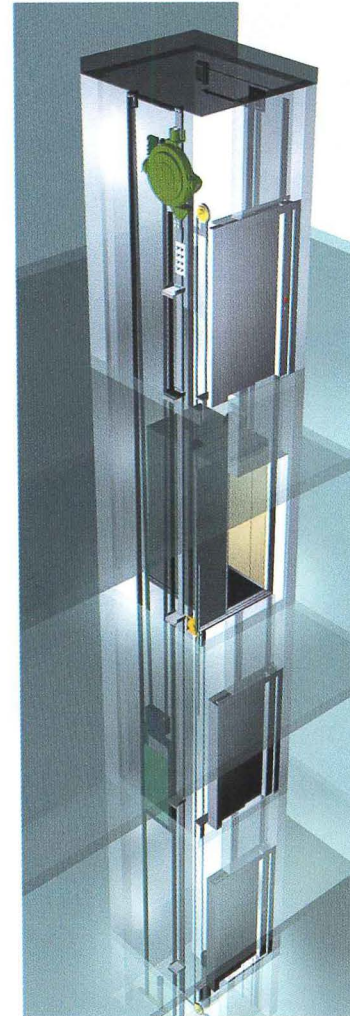
Top 10 Green Products

Third annual award highlights the year's most innovative sustainable products

MSK's semitransparent **building-integrated photovoltaic glazing element** allows visible light transmission while generating electricity. An edge-mounted electrical connection system conceals all wiring within the laminated-glass edge framing. MSK, Tokyo. www.msk.ne.jp **CIRCLE 202**



The **EcoSpace** traction elevator requires no lubricating oil and consumes 60 percent less energy than conventional hydraulic elevators. Kone, Moline, Ill. www.kone.com **CIRCLE 206**

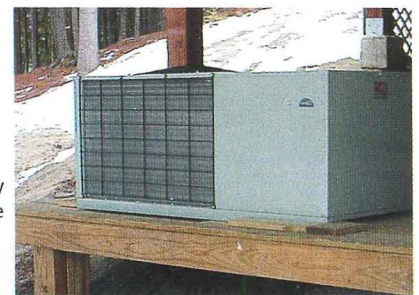


The **ECO I Paver** is a regionally available interlocking concrete grid paver designed for porous paving applications. Protrusions on the sides of the paver ensure proper rainwater infiltration. E.P. Henry, Woodbury, N.J. www.ephenry.com **CIRCLE 203**

EcoVeil, an interior shade-screen for commercial buildings made from a thermoplastic olefin yarn called EarthTex, can be returned to the company for recycling when no longer wanted. Mechoshade Systems, Long Island City, N.Y. www.mechoshade.com **CIRCLE 204**



The multiple-stage **Cold Climate Heat Pump** rivals many geothermal heat pumps in performance and can operate efficiently at much lower temperatures than conventional air-source heat pumps. Nyle Special Products, Bangor, Maine. www.nyletherm.com **CIRCLE 205**



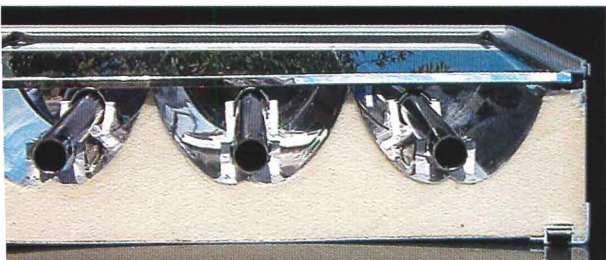
At last month's GreenBuild Conference in Portland, Oregon, BuildingGreen, publisher of the GreenSpec Directory and Environmental Building News, announced the year's top 10 green building products. "Reflected in our Top-10 list this year is a concern about energy," says GreenSpec coeditor Alex Wilson. Other issues reflected in the selections are water conservation, toxin reduction, and longer product life cycles. For more info on these products, check out www.BuildingGreen.com. R.F.C.



Potlatch is producing chain-of-custody Forest Stewardship Council-certified Hem-fir and Douglas fir-Larch framing lumber, inland red cedar decking and siding, and Douglas fir and white fir plywood from three mills in Idaho. Potlatch, Spokane, Wash. www.potlatchcorp.com CIRCLE 207



Ethos carpet-cushion backing from C&A Floorcoverings is made from nonchlorinated polyvinyl butyral safety-glass film collected when auto windows and other safety-glass panes are recycled. The backing is 96 percent postconsumer recycled, resulting in carpet products with a total recycled content of 40–62 percent. Tandus Group, Dalton, Ga. www.tandus.com CIRCLE 208



Winston Series CPC Collector is a residential and commercial solar water-heating system that is composed of 12 small compound parabolic collectors that focus sunlight onto absorber tubes through which heat-transfer fluid is piped. Solargenix Energy, Raleigh, N.C. www.solargenix.com CIRCLE 209



The FlushMate IV pressure-assist toilet flush mechanism features an inner airtight flushometer tank that is pressured after the flush as the tank refills. During the flush operation, this air pressure flushes the toilet with increased velocity, improving flush performance. Sloan Valve, Franklin Park, Ill. www.sloanvalve.com CIRCLE 210



TimberSIL is a sodium-silicate-based pressure-treatment system for wood that relies on a mineralization process rather than toxins to prevent infestations and decay. Timber Treatment Technologies, Grosse Pointe Farms, Mich. www.timbersil.com CIRCLE 211

PHOTOGRAPHY: COURTESY BUILDINGGREEN



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Digital Products

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Sharing their digital world

Gehry Partners has not only packaged its high-tech Digital Project software based on CATIA for the design and construction industry, it has also set up an extensive training and education program for users who want to harness its power to make their own projects beautiful, functional, and deliverable on time. Gehry Technologies, Culver City, Calif.

www.gehrytechnologies.com **CIRCLE 212**

Printing a new dimension

Imagine clicking "print" in your 3D CAD program and getting a 3D model of your design, forged from a plastic material tough enough to withstand field testing. Dimension's 3D printers offer just that for a price lower than earlier generations of the technology. The SST version submerges models in water to wash away support structures and allow "hands-free" printing. Stratasys, Minneapolis.

www.dimensionprinting.com **CIRCLE 213**

N-Gons playing at CINEMA 4D

The latest version of Maxon's CINEMA 4D modeling and animation software boasts a feature called N-Gons, which allows users to develop complex models based on polygons of any number of points. The program also boasts improved "polygon knitting" (important for realistic rendering) and a more efficient interface to full-screen editing. Maxon Computer, Newbury Park, Calif.

www.maxoncomputer.com **CIRCLE 214**

3D models for all

NavisWorks allows users to coordinate 3D models saved in any file format. The system is organized around a module called Roamer, which allows users to convert model files into universally readable documents. Additional modules, including the Publisher and Presenter, allow users to share files, while the Clash Detective finds interferences and helps design teams work out construction sequencing. NavisWorks, Phoenix.

www.navisworks.com **CIRCLE 215**

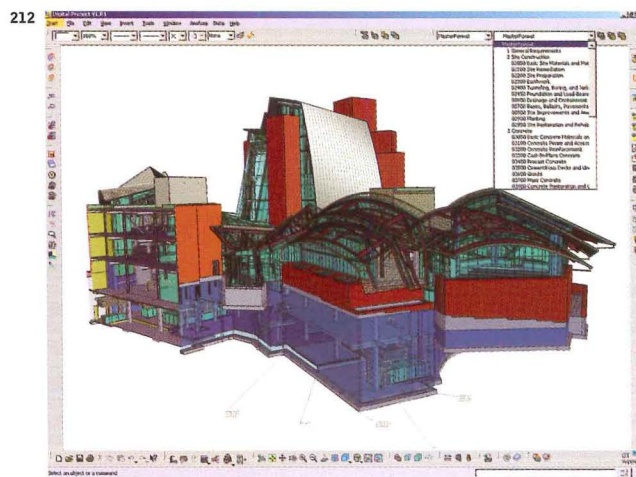
GoToMeeting is not only highly affordable, its user interface is by far one of the easiest to quickly learn and master. —PAUL SELETSKY



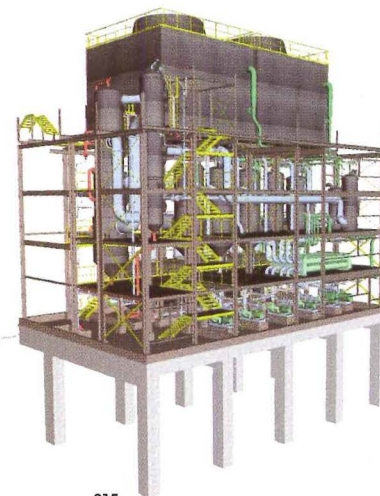
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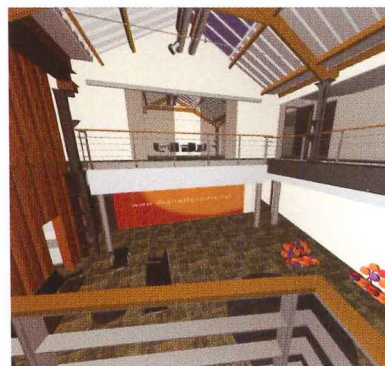
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212



215



Digital Products

3D CAD • Rendering & visualization software • Hardware • Productivity and collaboration tools • Analysis software • Integration of design and construction data

Pocketing paint matches

At the touch of a button, the Pocket Palette color reader allows users to match a paint sample to colors within the Benjamin Moore product line, storing up to 20 color matches. Benjamin Moore, Montvale, N.J. www.benjaminmoore.com **CIRCLE 216**

All you can meet

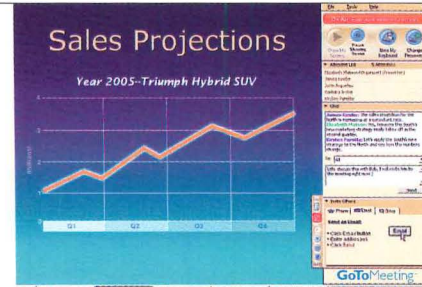
For a flat fee, Citrix offers clients unlimited online meeting time through its GoToMeeting software. The software allows users to broadcast a desktop to all attendees, as well as share keyboard and mouse controls. Citrix, Santa Barbara, Calif. www.gotomeeting.com **CIRCLE 217**

Integrating space and time

Graphisoft's Virtual Construction offers integrated modeling and estimating services. Components include a 5D planning module that lets users create presentations that integrate 3D models with time and cost estimates. Graphisoft, Burlington, Mass. www.graphisoft.com **CIRCLE 218**



216

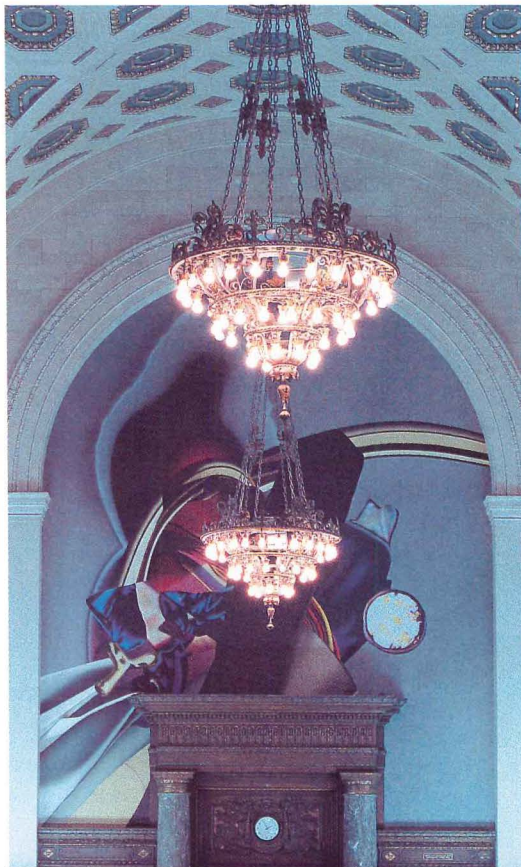


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218



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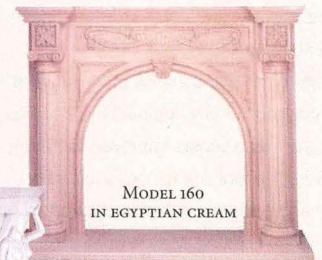
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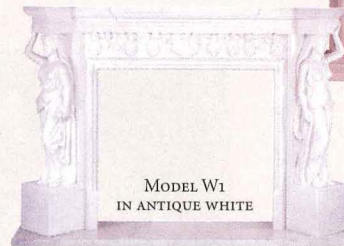
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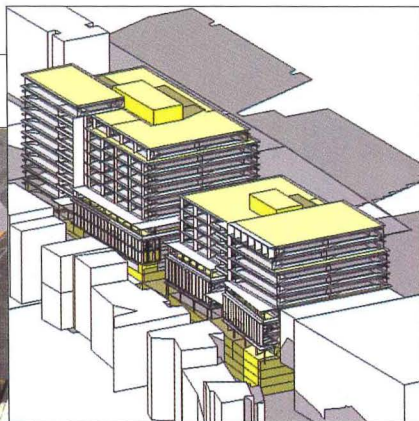
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219

“What-if” questions answered

IES's Virtual Environment program integrates all aspects of building systems, performance, and assessment, allowing designers to explore what-if scenarios that could reduce operating costs and improve energy efficiency. IES, Glasgow, U.K. www.iesve.com **CIRCLE 219**

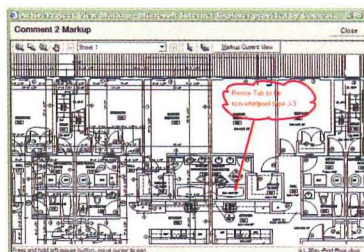
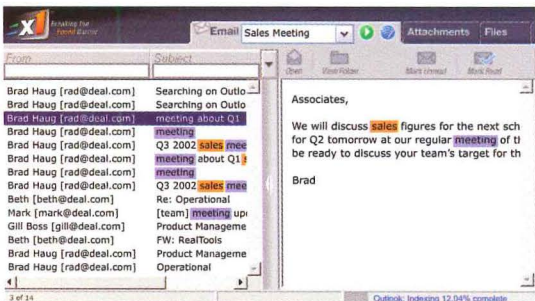
Speedy searching

Install X1 software on a computer, and the program will index the machine's entire hard drive, e-mail folders, and e-mail attachments, allowing users to locate files efficiently in little more than the time it takes to type a file name. X1 Technologies, Pasadena, Calif. www.x1.com **CIRCLE 220**

File sharing made easy

Project Website offers a secure online repository for all information and communications related to a project—everything from CAD files and schedules to task lists. Best of all, users can store as much data as they want. Project Website Services, Watertown, Mass. www.project-websites.com **CIRCLE 221**

220



221

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The slight slope makes the Dune Series containers a little more elegant and different. —MORLEY BLAND

A cutting edge doesn't cut

The Nox line, designed by Raul Barbieri, features cylindrical containers, planters, and vase trays. Made of brushed stainless steel, the products feature streamlined "no cut" rounded edges for safety. They also come with casters. Rexite, Milan. www.rexite.it **CIRCLE 222**

Containers dune right

With a graceful form inspired by the rhythmic undulations of desert sand dunes, these cast-concrete landscape containers are appropriately called the Dune Series. They range in size from a shallow wok to a 44"-high planter. Kornegay Design, Tempe, Ariz. www.kornegaydesign.com **CIRCLE 223**



Secure in its looks

Huntco's solution to fully covered bike storage also provides improved security. Made of high-density polyethylene, each shell-like pod is 32½" wide, 51½" high, and 74½" long. Huntco Supply, Portland, Ore. www.huntco.com **CIRCLE 224**



Lightweight and lighthearted

Made from molded polypropylene and stainless steel or aluminum, the Take 5 seating, table, and planter line offers lightweight solutions for a variety of commercial outdoor and indoor spaces. Landscape Forms, Kalamazoo, Mich. www.landscapeforms.com **CIRCLE 225**



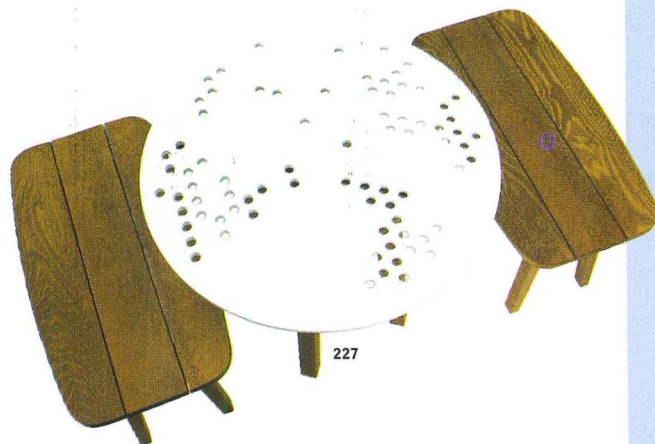
Take a load off

Offering the attractiveness and warmth of wood, yet boasting construction that's rugged enough for use in the most demanding public space, the Hudson Bench is 100 percent Ipé wood. Forms+Surfaces, Carpinteria, Calif. www.forms-surfaces.com **CIRCLE 226**



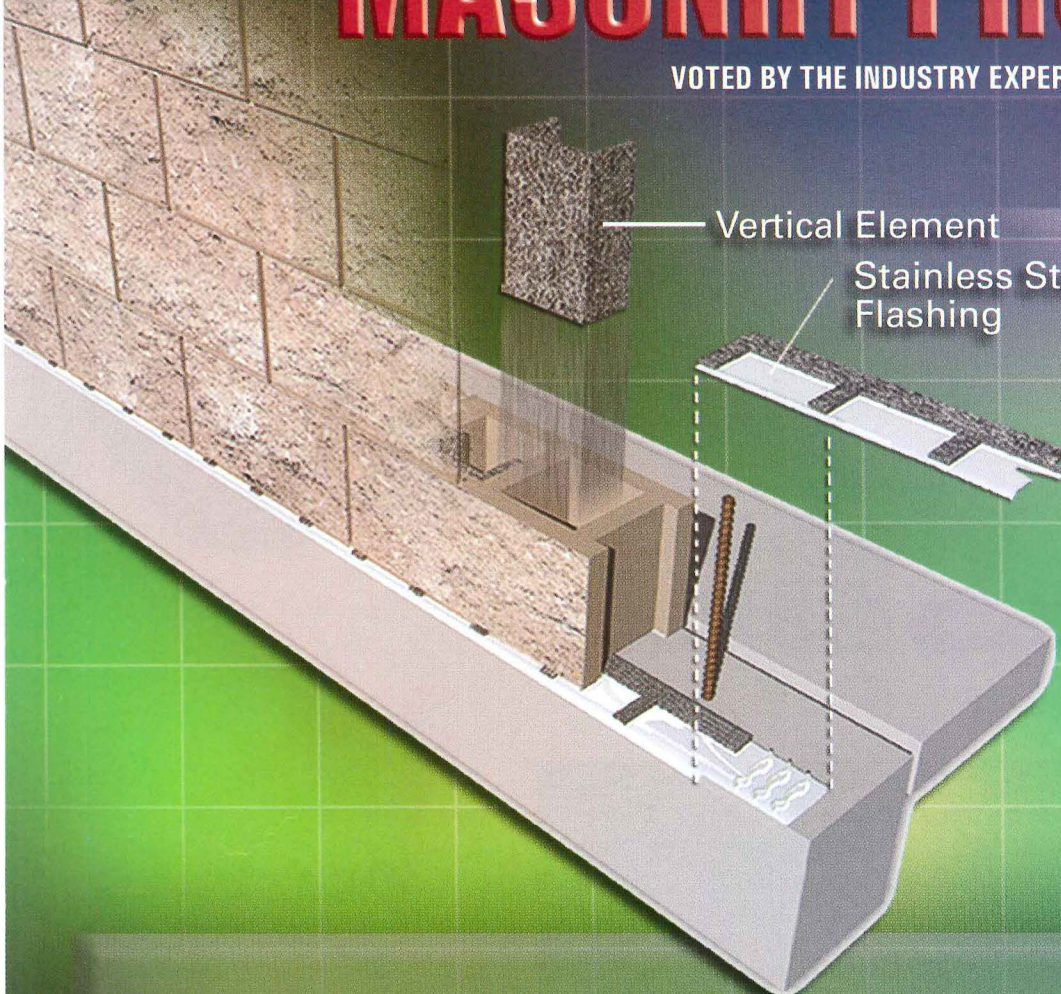
Holier than other tables

The Tolt table and bench combine the "classic" material of acacia wood with a "high-tech" Corian tabletop. Featuring a retro 1970s feel, the perforated tabletop allows for easy drainage and cleaning. Ideas for Living, Albuquerque, N.M. www.extremis.be **CIRCLE 227**



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Concrete & Masonry

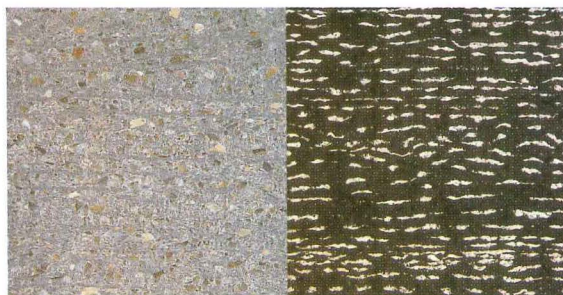
Concrete materials • Cast-in-place concrete • Precast concrete • Grout • Concrete restoration & cleaning • Unit masonry • Cast stone • Masonry assemblies



Finding visually satisfying masonry products for contemporary designs is difficult. —ROGER L. KLEIN

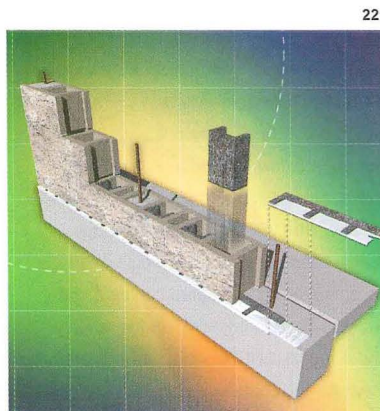
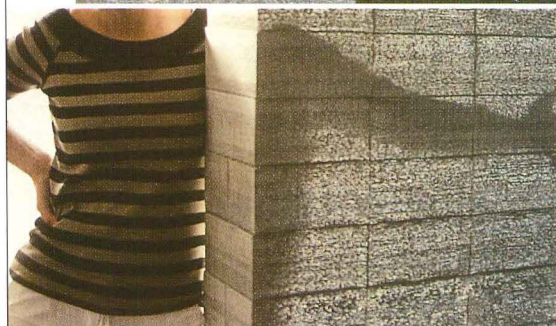
Light-transmitting concrete

LiTraCon is a translucent concrete building block that combines the material with thousands of optical fibers that run side by side between the two main surfaces of the block. The blocks are load bearing, provide the same effect with both natural and artificial light, and have the same strength and qualities as common concrete blocks. LiTraCon, Aachen, Germany. www.litracon.com **CIRCLE 228**



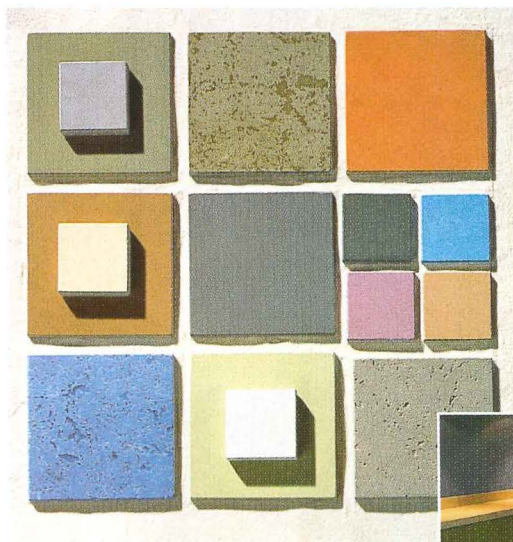
Concrete block wall protection

The BlockNet system by Mortar Net protects single-wythe concrete-block walls from the damage caused by water infiltration. It is composed of specially shaped, 3/8"-deep, stainless-steel drainage strips with an integrated drip edge, horizontal mesh element, and rear water dam, plus a separate vertical mesh element. Mortar Net USA, Gary, Ind. www.mortarnet.com/ar **CIRCLE 229**



Fiber-reinforced concrete

Extremeconcrete cast-concrete material is made from high-quality raw ingredients blended with a choice of fibers. The material can be used to create custom fixtures, surfaces, furnishings, and accessories for office, retail, hospitality, and entertainment environments. Twelve standard finishes are available, as well as custom colors. Meld USA, Raleigh, N.C. www.extremeconcrete.com **CIRCLE 230**



Greener drainage mat

Made from 100 percent recycled materials, CavClear Stone Mat provides a full-height continuous drainage area behind exterior stone that will allow water to reach the flashing and weep system. CavClear/Archcovations, Hudson, Wis. www.cavclear.com **CIRCLE 231**



Concrete & Masonry

Concrete materials • Cast-in-place concrete • Precast concrete • Grout • Concrete restoration • Unit masonry • Cast stone • Masonry assemblies

Improved grout and cement

Lafarge's Agilia Blockfill self-consolidating grout is for use in partially grouted and solid-grouted walls. The grout is capable of flowing both vertically and horizontally under its own weight, and has a lower water/cement ratio and significantly reduced shrinkage compared to conventional masonry grout. Ductal composite, also from Lafarge, is significantly stronger than normal concrete: It has a compressive strength of 20,000 psi (six to seven times stronger) and a flexural strength of 4,000 psi (three times stronger). Lafarge N.A., Herndon, Va.

www.lafargenorthamerica.com **CIRCLE 232**

Concrete color stain

Lithochrome Tintura Stain is a new waterborne, low-VOC, reactive product that penetrates and bonds with concrete for color that will not peel. Unlike acid stains, this material can be applied to horizontal or vertical cured concrete without time-consuming acid residue removal and disposal. L.M. Scofield, Los Angeles.

www.scofield.com **CIRCLE 233**

Exterior wall panels

Hanover's new line of exterior wall panels bridge the gap between concrete and natural stone. The stone units can be prepared with either slots or grooves that will accommodate many styles and anchoring systems. Hanover Architectural Panels, Hanover, Pa.

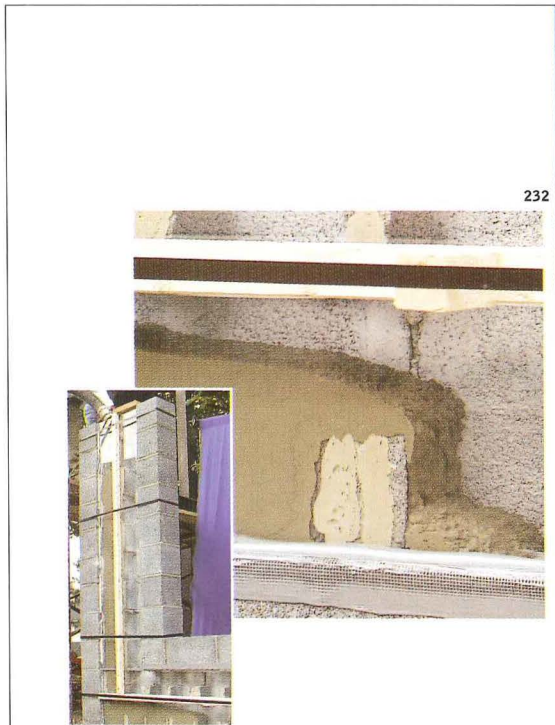
www.hanoverpavers.com **CIRCLE 234**

Concrete restoration

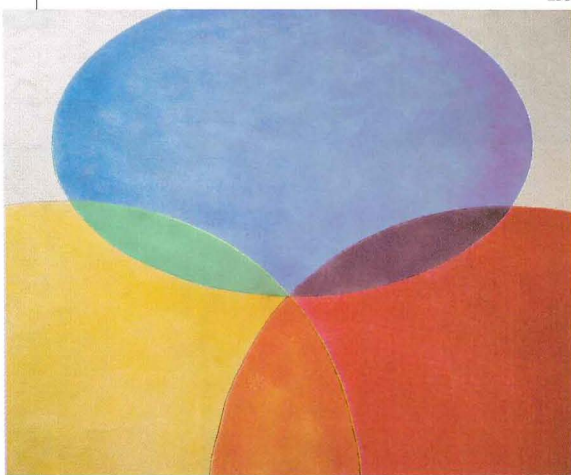
Xypex Megamix is a thick repair mortar for the patching and resurfacing of deteriorated concrete. It has been specifically formulated to produce superior bond, low shrinkage, chemical durability, and high strength. Xypex Chemical, Richmond, British Columbia. www.xypex.com **CIRCLE 235**

Insulated masonry form

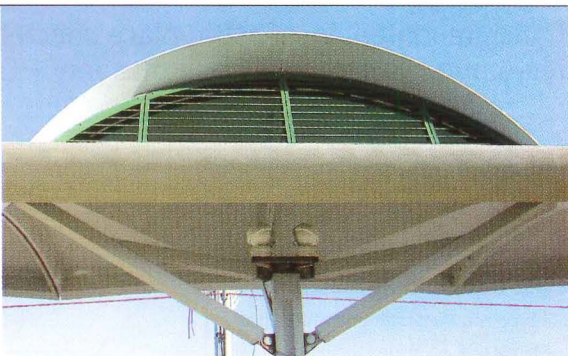
The IMF (insulated masonry form) wall system is cost competitive with ICF, precast, and tilt-up. IMF reduces the amount of concrete delivered to the job site, is nontoxic, and offers a thermal efficiency in excess of R-20, excellent noise suppression, fireproof construction, no formaldehyde/CFCs, and mold/mildew-resistance. CBIS/Korfil, West Brookfield, Mass. www.cbisinc.com **CIRCLE 236**



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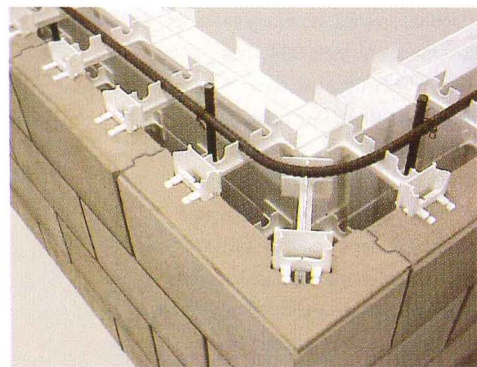
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Metals, Woods & Plastics

Architectural woodwork • Structural plastics • Railings & handrails • Wood veneer • Plastic fabrications • Solid polymer fabrications



Pep/Stage is an interesting improvement on the polycarbonate system for making walls, plus its ability to be used as flooring is great. —LAUREN CRAHAN

Attractive tropical toppings

The Tropical Veneers collection features handcrafted veneers containing slivers of organic materials from South America, such as coconut and totumo shell, plantain bark, and tagua seed. These exotic materials are embedded in an MDF base that comes in a variety of colors and three different thicknesses. Applications include walls, doors, ceilings, screens, and furniture. Architectural Systems, New York City. www.archsystems.com

CIRCLE 237

High-performance honeycombs

Pep and Stage are 3form's latest honeycomb panel products. Pep is suitable for vertical and horizontal surfacing, while Stage is specifically engineered for flooring. Both are ultra-lightweight, class A fire-rated, and highly structural. 3form, Salt Lake City. www.3-form.com

CIRCLE 238

Economical glazing

Suitable for wall and roof applications, Spectra lite 16 is an economical translucent glazing material made from high-impact-resistant polycarbonate. Internal chambers create an insulation value comparable to insulated glass. Available in a rainbow of colors as well as clear and milky white, Spectra lite 16 is ideal for nursery and kindergarten projects. Rodeca, Mulheim-Ruhr, Germany. www.rodeca.de CIRCLE 239

Prefabricated possibilities

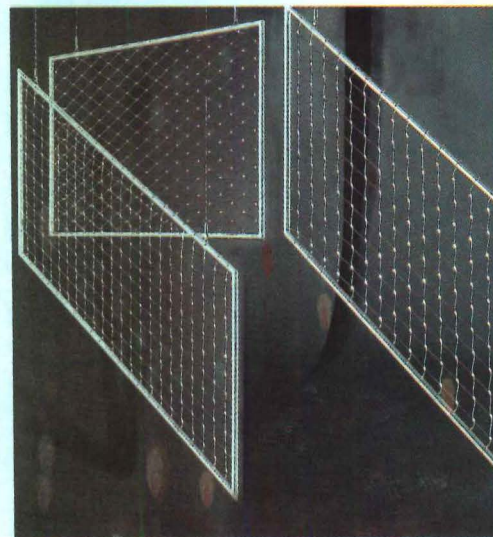
The X-Tend2 prefabricated handrail system features DecorCable's X-Tend SS mesh panels premounted on 316 SS frames. Panels are available in lengths up to 6 feet long and come in three heights and several mesh densities. For easy installation, the X-Tend2 system features "no-drill" mounting brackets. Carl Stahl DecorCable, Chicago. www.decorcable.com CIRCLE 240



237



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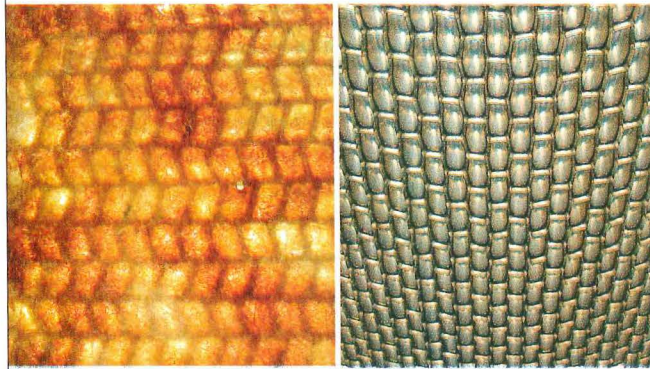
239

Metals, Woods & Plastics

Architectural woodwork • Structural plastics • Railings & handrails • Wood veneer • Plastic fabrications • Solid polymer fabrications

Self-supporting curves

Panelite's Cast Polymer Series of translucent honeycomb panels boasts self-supportive, light-transmitting, curved and straight panels. The straight panels feature a translucent colored resin cast onto a polymer woven grid core (left), while the curved panels feature clear or colored resin cast onto an aluminum overexpanded core (right). Panelite, Los Angeles. www.e-panelite.com **CIRCLE 241**



241

Pearly fluorescents

Made of hardy Eastman PETG resin, known for its fire- and impact-resistance, the Pearls hard surface collection offers six super-bright fluorescent colors and a vibrant iridescent surface finish. Designtex, New York City. www.dtex.com **CIRCLE 242**



242

Strength on both sides

Hybrid glulam beams feature laminated veneer lumber on the outermost top and bottom laminations. A balanced layup means the beam retains structural value even if installed upside down. APA-The Engineered Wood Association, Tacoma. www.glulambeams.org **CIRCLE 243**



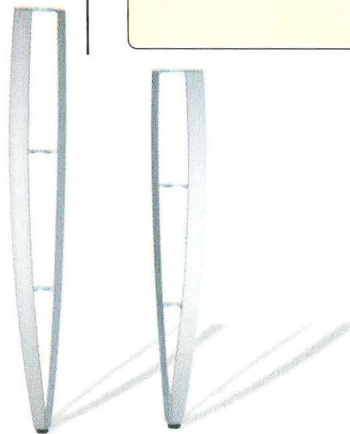
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CIRCLE 244

Terra-cotta facade system

Known as Terrart, NBK's suspended facade system is made from large-scale terra-cotta elements that are ventilated at the rear. By combining classic techniques along with the latest technologies, the system can work with closed surfaces, open glass constructions, and to create transparent optical effects. The Terrart-Flex system is a patented substructure consisting of 15 components that can integrate the facade into any classic or modern wall construction. NBK Keramik, Emmerich, Germany. www.nbk.de CIRCLE 245

Concealed fastener panels

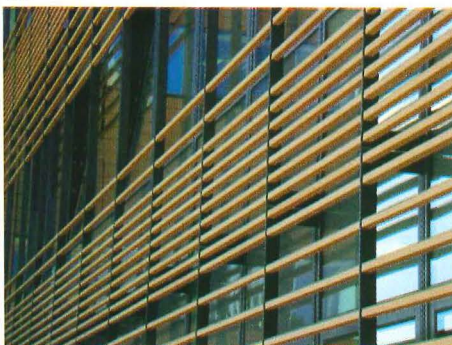
Concept Series concealed fastener panels feature a complementary asymmetrical geometry and identical side joinery permitting integration of multiple profiles within a single elevation for horizontal or vertical application. They are available in three 12" and three 16" widths. Centria, Moon Township, Pa. www.centria.com

CIRCLE 246

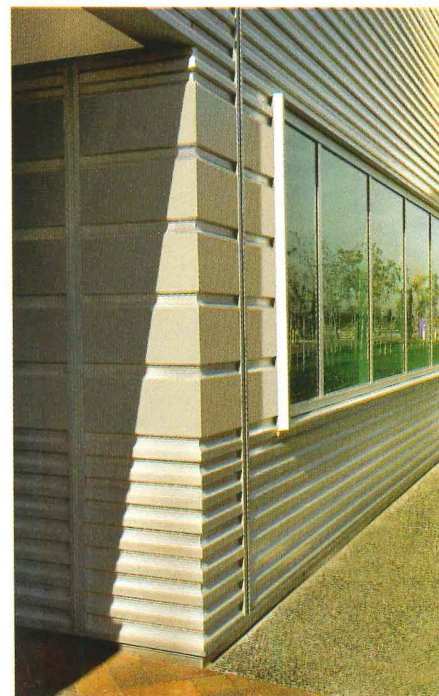
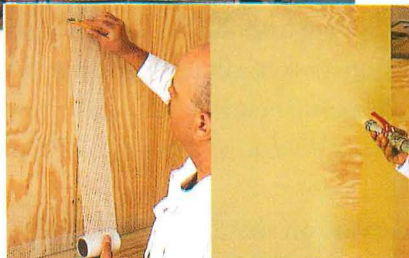
[Terrart] is an ingenious system for a solid or partly solid facade exterior. It's a good addition to the kit of parts for exterior design and construction. —THOMAS C. LEKOMETROS



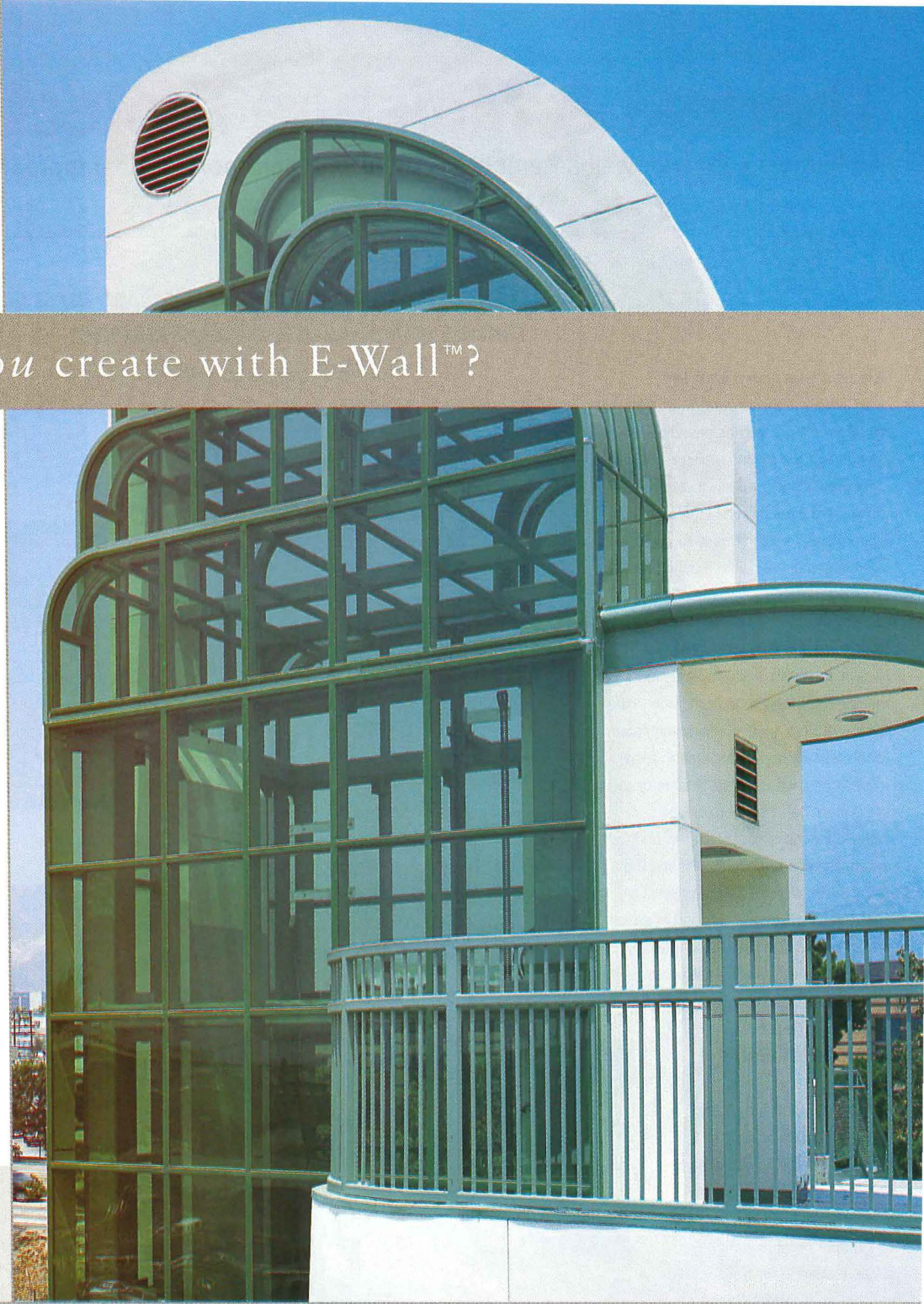
245



244



246



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Doors & Windows

Glass • Translucent wall & roof assemblies • Fire-rated glazed wall/door assemblies • Metal windows & doors • Storm sash & screens • Door hardware

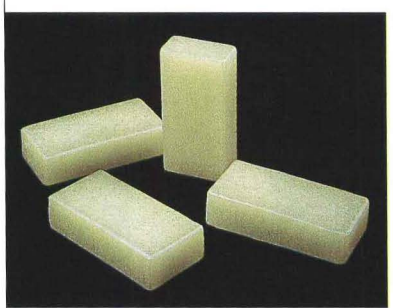
Gore-Tex meets windows? The boundary between inside and outside is becoming all the more transparent.

—BLAINE BROWNELL



Glow-in-the-dark glass

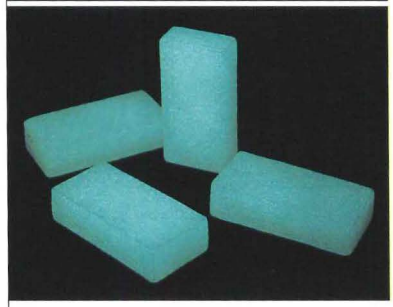
Luna cast glass contains a phosphorescent chemical that absorbs light during the day and glows for hours at night. Supplied in flat sheets and bricks, Luna is ideal for bar tops, feature walls, flooring, or any interior or exterior area. Architectural Systems, New York City. www.archsystems.com **CIRCLE 247**



247

Rated aluminum systems

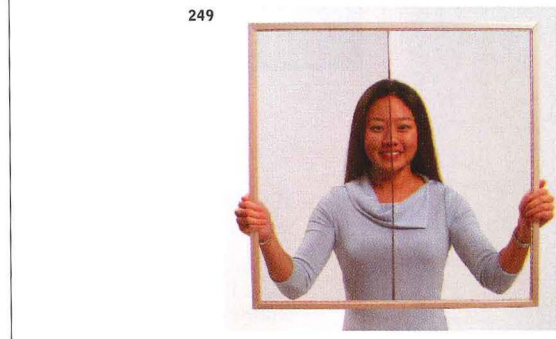
Originally developed in Europe, the Alufam aluminum door and window system has been completely fire-tested for the North American market. The system is comprised of custom-extruded and -filled aluminum framing combined with a clear, wire-free glass laminate. Alufam N.A., Huntington Beach, Calif. www.alufam-usa.com **CIRCLE 248**



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Get a better view

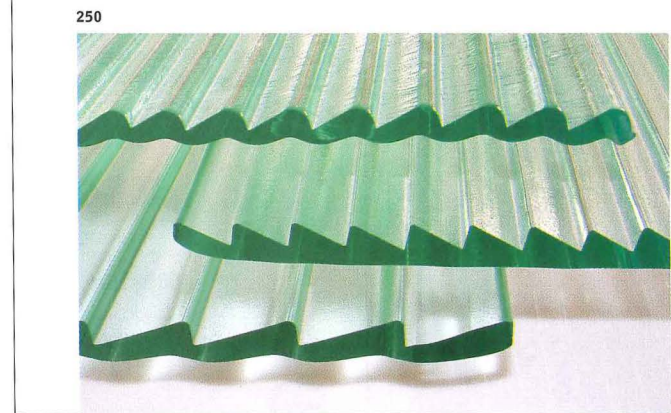
Pella Vivid View screens feature a patent-pending high-transparency screen fabric from W.L. Gore Associates, the manufacturer of Gore-Tex fabric. Vivid View screens allow 50 percent more natural light and up to three times the ventilation compared to standard fiberglass screens. Pella, Pella, Iowa. www.pella.com **CIRCLE 249**



249

Sawtooth cast glass

Profile 3D cast glass features a trio of cast-glass textures available in unlimited colors and transparent, frosted, opaque, and sfumato finishes. Based on a glass for the Sten Frenke house designed by Richard Neutra, Profile can be made using 100 percent recycled materials. Joel Berman Glass Studios, Vancouver, Canada. www.jbermanglass.com **CIRCLE 250**



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251

Luxurious leather pulls

Rockwood's line of leather door pulls feature English Bridle leather for interior and exterior applications, and Upholstery leather for interior applications. Both are available in straight and offset versions and can be wrapped onto an ergonomic oval-door-pull shape. Rockwood Manufacturing, Rockwood, Pa. www.rockwoodmfg.com **CIRCLE 251**

Doors & Windows

Glass • Translucent wall & roof assemblies • Fire-rated glazed wall/door assemblies • Metal windows & doors • Storm sash & screens • Door hardware

Glass of bubbly

WaterGlass is a highly translucent glass material that suspends air bubbles within the sheet through a proprietary casting process. Architectural Systems, New York City. www.archsystems.com **CIRCLE 252**

Fire-rated, minimal profile

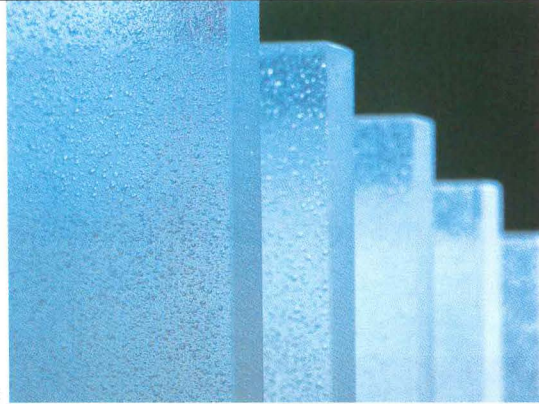
SGG Swissflam Structure is a fully tested 60-minute flush-joint system that provides a clear vision area and high-impact safety, and makes vertical joints virtually invisible. Vetrotech Saint-Gobain, Auburn, Wash. www.vetrotech.com **CIRCLE 253**

Translucent aerogel panels

Kalwall + Nanogel translucent aerogel panels provide a U-value of R-10, up to 20 percent light transmission, and improved sound attenuation. Kalwall, Manchester, N.H. www.kalwall.com **CIRCLE 254**

Floating points of light

The LightPoints LED system incorporates LEDs into transparent glass conductor plates protected by a top and bottom layer of laminated glass, eliminating the need for any visible wiring. Schott N.A., Elmsford, N.Y. www.us.schott.com **CIRCLE 255**



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Finishes

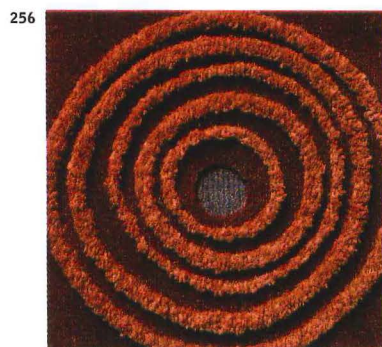
Tile • Wall coverings • Carpet tile • Resilient flooring • Indoor/outdoor carpet • Tile-setting materials & accessories • Special wall surfaces

I'm excited to see the reuse of the old technology of gypsum block as a finish material [for Bas-relief tiles from Photo-Form]. —LAUREN CRAHAN



Archival inspiration

Over the next three years, an exclusive licensing agreement between Designtex and the Guggenheim Museum will result in several collections of upholstery, drapery fabrics, wall covering, carpeting, and translucent acrylic paneling inspired by the museum's collections and archives. The first collection, entitled Singular Forms, was inspired by a recent exhibition at the museum. Designtex, New York City. www.dtex.com **CIRCLE 256**



Glue-free carpet back

TractionBack is a high-friction coating applied to carpet backings that eliminates the need for traditional wet glues or the newer "peel and stick" dry adhesives. Available on all Milliken modular carpets, the glue-free system reduces installation time and expenses while improving indoor air quality. Milliken Carpet, LaGrange, Ga. www.millikencarpetsamplestudio.com **CIRCLE 257**



257

Modern Astroturf

Plynyl Shag indoor/outdoor flooring, the first tufted product from Chilewich, is available in 3-foot widths and in five bold stripes, incorporating bright vinyl yarns that appear to have an anodized finish. Chilewich, New York City. www.plynyl.com **CIRCLE 258**



258

Three-dimensional rugs

Topissimo, designed by Nani Marquina, is made of 100 percent hand-tufted wool and is guaranteed to be child-labor-free. The rug is practically flat, while featuring voluminous polka dots that are available either multicolored or in two tones of the same color. The Terence Conran Shop, New York City. www.nanimarquina.com **CIRCLE 259**



259

Finishes

Tile • Wall coverings • Carpet tile • Resilient flooring • Indoor/outdoor carpet • Tile-setting materials & accessories • Special wall surfaces

Brooklyn in the house

DesignTex's new collection of products designed by the Brooklyn, New York, design studio twentytwo includes nine wall-covering patterns (several shown here); three upholstery patterns; and three drapery patterns for hospitality, corporate, or residential applications. DesignTex, New York City. www.dtex.com

CIRCLE 260

Snapshot tiles

Using a patent-pending Photo-Cast process, Photo-Form can create bas-relief tiles from any type of two-dimensional image. Ceramic tiles or gypsum-based polymer tiles with a metallic finish are available for wall-mounted applications. Photo-Form, Scottsdale, Ariz. www.photo-form.com

CIRCLE 261

Send a strong message

The Pause wall-covering pattern is composed of oversize commas and periods that refer to the digital stream of electronic transmissions, including e-mails, chat rooms, and instant messaging. The large-scale vinyl wall covering comes in orange, gray, and blue. KnollTextiles, New York City. www.knolltextiles.com

CIRCLE 262

Fabric-inspired glass tile

Quilt-glass tile, designed by Erin Adams, features a retro geometric look for residential or commercial interiors. Available in 36 color options, the handcrafted tile is created using fused glass in a design that resembles a quilted fabric. Ann Sacks, Portland, Ore. www.annsacks.com

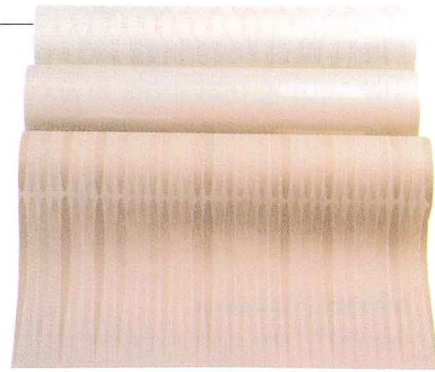
CIRCLE 263

Designing with fire

When thick terra-cotta pieces are fired, oxygen does not reach the center, leaving the natural gray of the original clay in that area. Vertically cut, the tile features a gray surface and terra-cotta-colored striping on its edges. Named Terra Serena, this listello is designed for finishing and decorative applications in outdoor or indoor areas. EX: Inc., New York City. www.exinc.org

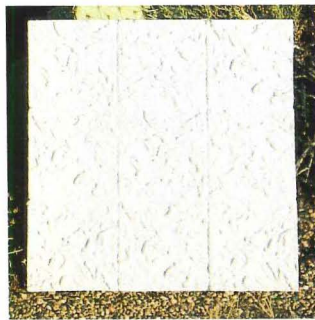
Stain-fighting grout

Laticrete SpectraLock Grout with Microban locks in color and inhibits the growth of stain-causing bacteria, mold, and mildew. Laticrete, Bethany, Conn. www.laticrete.com

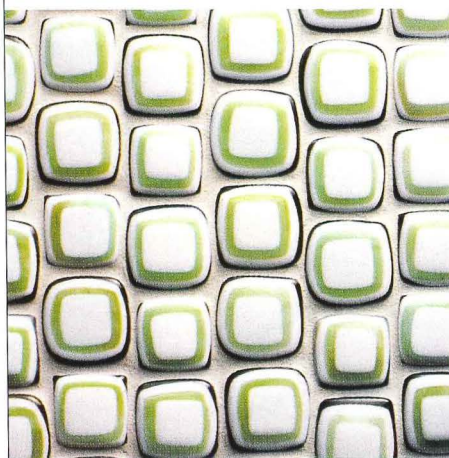
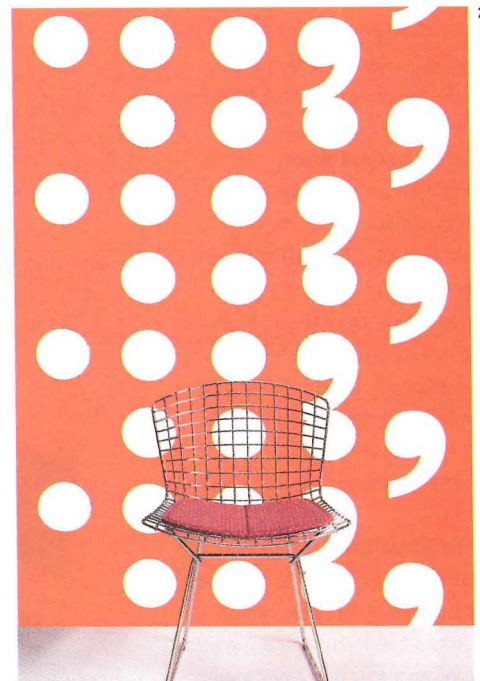


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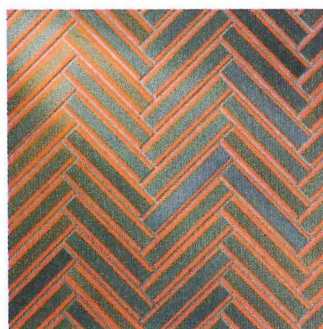


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265

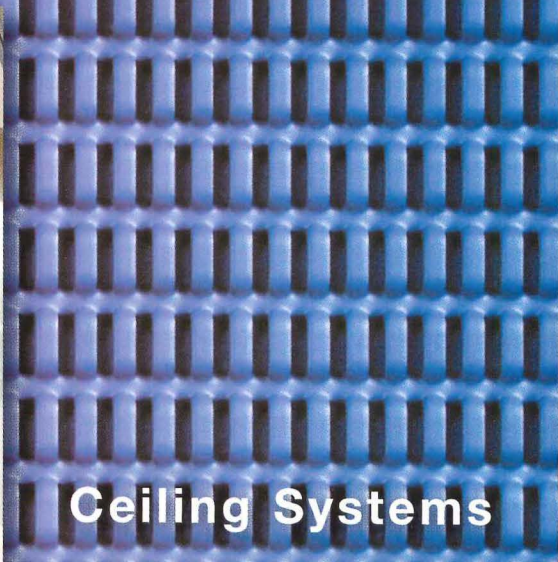


MILLENNIUM™

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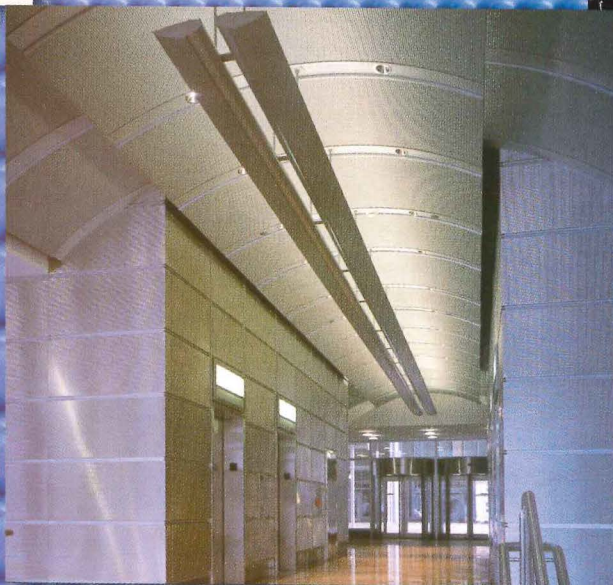
Wall Systems



Ceiling Systems



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Finishes

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Fresh take on wood wall panels

The Embossed Wood Collection of dimensional textured panels for vertical applications is available both single- and double-sided in 14 relief patterns. Architectural Systems, New York City. www.archsystems.com **CIRCLE 266**

Plug-and-play

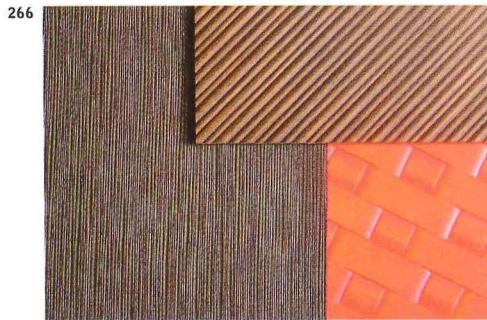
The Focus tile from Viva Ceramica features a dimpled white base tile that can be fitted with whimsically patterned inserts. Italian Trade Commission, New York City. www.italytile.com **CIRCLE 267**

Oxidized-steel-like tiles

Cor-Ten replicates the look of naturally oxidized steel and is available in a dark-blue-iron finish and a rusty bronze color. Tau Ceramic, Castellon, Spain. www.tauceramic.com **CIRCLE 268**

Tough and luminous vinyl

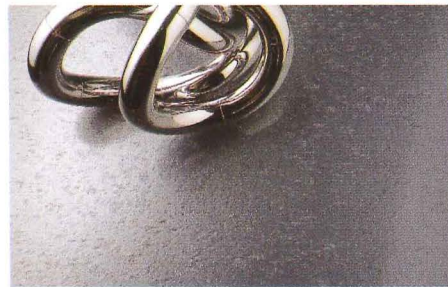
Lonseal Nova UV sheet vinyl combines a tough, UV-cured urethane finish with a light-shifting range of colors and 20 percent recycled material content. Lonseal, Carson, Calif. www.lonseal.com **CIRCLE 269**



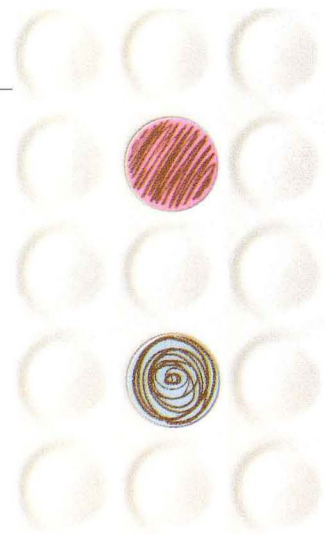
266



268



269



267

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Innovative ControlLite® Technology

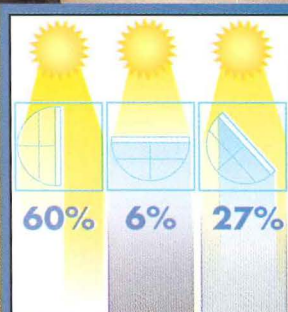
Provides Managed Daylighting for Versatile Performance in School Gymnasiums, multipurpose space, corridors and class rooms



ControlLite® panels consist of proprietary translucent half-cylinder **Rota-blades** built into translucent light transmitting polycarbonate panels.

The angle of the **Rota-blades** is completely adjustable for controlling and maintaining the desired light intensity and comfort level – any time of day, any time of year.

Models are available in a full range from simple manual operators to motorized operators to technically advanced, fully automated systems.



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Anything we can do to improve bumper systems is a good thing. —ROGER L. KLEIN

Super suction centralized

Afuera is a built-in central vacuum system offering permanent HEPA filtration. Powered by a 520-air-watt motor, it screens particles as small as dust mites, pollen, mold spores, and tobacco smoke, preventing their reentry into the home. Electrolux Home Care Products, Webster City, Iowa. www.electrolux.com **CIRCLE 270**



270

Futuristic flat filtration

Om is an almost vertical, completely flat glass hood. The glass is silk-screened on the back in plain colors but can be customized with patterns and decoration; it is less sensitive to finger marks and is easy to clean. Highly efficient, it is also quieter than conventional hoods. Elica, Ancona, Italy. www.elica.com **CIRCLE 271**



271

How deep is your Blue Ocean?

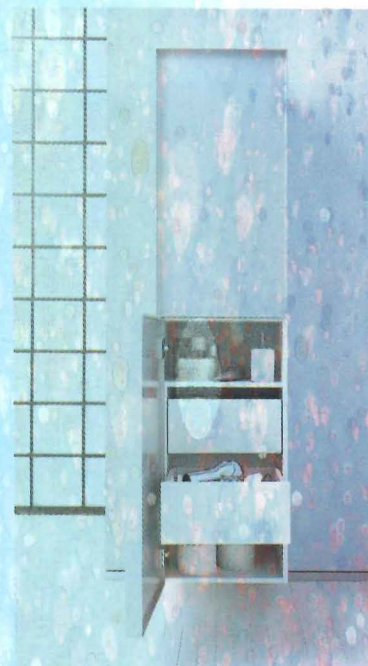
Providing a 3D portrayal of digital video and graphics, and asymmetrical projection for viewing from both sides at once, the Blue Ocean screen is finely cast in a high-grade acrylic between two ultra-clear, optical cell-cast-acrylic panels that are scratch-resistant. U.S. Nippura, Charlotte. www.usnippura.com **CIRCLE 272**



272

Tall, Starck, and handsome

The Starck 1.2.3. tall cabinet coordinates with every ceramic piece in Duravit's extensive Starck inventory. The cabinet is made of compressed three-ply chip-board with a melamine resin decor pressed on both sides and is finished in a matt varnish. Duravit, Duluth, Ga. www.duravit.com **CIRCLE 273**



273

Bumpered up to first class

Ideal for hospitality, food service, health-care, and other busy public spaces, the Latitude Bumper System consists of an aluminum mounting channel that accepts impact-absorbing Santoprene thermoplastic rubber extrusions, which can be fitted with decorative strips. The system is available in stock lengths for on-site cutting or as a pre-engineered kit. Forms+Surfaces, Carpinteria, Calif. www.forms-surfaces.com **CIRCLE 274**



274



Specialties & Equipment

Residential appliances • Kitchen hoods & ventilation • Wardrobe & closet specialties • Toilet compartments • Audiovisual equipment

Well-dressed closet

The Varia closet, designed by Paolo Piva, is defined by a series of vertical aluminum studs, with shelves and sleek-fitting containers for alternative storage options. Poliform USA, New York City. www.poliformusa.com **CIRCLE 275**



275

Floats like a cloud

The whisper quiet SIU401-22 sculptural island-style hood is a sleek combo of stainless steel and glass. Sirius Range Hoods USA, Buffalo, N.Y.

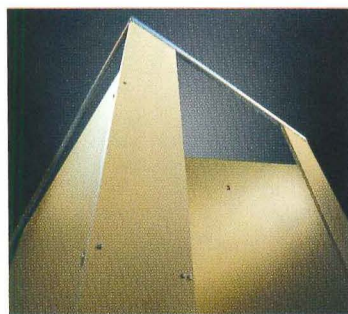
www.siriushoods.com **CIRCLE 276**

276



Graffiti ghostbuster

Perfect for heavy abuse, vandal-prone environments, the scratch- and impact-resistant Sierra Series is solidly colored throughout to avoid ghosting. Bobrick Washroom Equipment, North Hollywood, Calif. www.bobrick.com **CIRCLE 277**



277

Smoke and mirrors

An integrated-display screen that utilizes thin-film transistor technology appears in a mirror when on, and disappears completely when off. ad notam USA, New York City. www.ad-notam.com **CIRCLE 278**



278

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Furnishings

Office furniture • Dormitory furniture • Multiple seating • Room dividers • Draperies & curtains • Blinds, shades & shutters • Hotel & motel furniture • Manufactured casework

Colorful collaboration

Allsteel's partnership with Pantone means that any of the more than 1,900 colors in the Pantone for architecture and interiors group or the 1,100 colors in the Pantone Matching System can be applied on Allsteel's Terrace office system tiles. Allsteel, Muscatine, Iowa. www.allsteeloffice.com **CIRCLE 279**

Supportive mesh chair

The design of the Liberty chair transforms traditional mesh into an adaptable and supportive material that combines all the benefits of traditional mesh with the body-friendly support found in highly contoured structural foam cushions. Humanscale, New York City. www.humanscale.com **CIRCLE 280**

Bamboo cocoon

The curvilinear shape of the Nung chair cradles the user in layered, recursive rings of bamboo that build on and support each other. Its bamboo fibers are sealed together with an extremely durable, environmentally friendly epoxy that contains 60 percent less VOCs than other resins. Xeno Objects, Austin, Tex. www.xenoobjects.com **CIRCLE 281**

Always in style

The Timeless chair's seat and backrest are a single stretch of leather attached to a chromed-metal frame, accentuating its curvilinear silhouette. Flexform, New York City. www.flexformusa.com

CIRCLE 282

The Nung chair is sustainable and very inviting looking.

—MORLEY BLAND



279



280



281



282



283



284

Soft wall partition

Soft Wall is a flexible partition prefabricated from 600 thin layers of a soft, translucent, nonwoven textile. The wall measures a mere 1" in length when compressed and extends to a length of 20' or more when expanded. The material is being designed to be flame-, U.V.-, and chemical-resistant, as well as 100 percent recyclable and made with recycled content. molo design, Vancouver. www.molodesign.com **CIRCLE 283**

Letter perfect

The k chair has a tubular steel frame with a matte chrome finish and consists of three removable parts for easy shipping. Upholstered in Woodnotes fabrics, the removable cover is a combination of paper yarn and cotton and is available in five colors. Centro Modern Furnishings, St. Louis. www.centro-inc.com **CIRCLE 284**



285



Got it covered

The Flori chair and ottoman, designed by Werner Aisslinger, features a steel base and a back seat grip in varnished aluminum. It has both a nonremovable internal nylon cover and a removable external cover in fabric or leather. Modern Living, Los Angeles. www.modernliving.com **CIRCLE 285**

Streamlined workstation

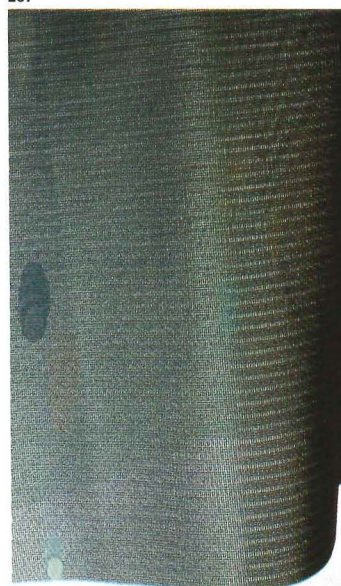
Vox Office workstation was designed to meet the needs of the shrinking executive office footprint. To fit into the new long, lean office design, Vox Office is designed as an elegant L-shaped office surface (wrapped in wood veneer) that can be personalized to the individual's needs. Nienkämper, Toronto. www.nienkamper.com **CIRCLE 286**

Sailworthy curtain fabric

Cadena, designed by Suzanne Tick, is made of high-tenacity polyester borrowed from the marine industry that can withstand even the harshest of salty, sunny, or wet locations. KnollTextiles, New York City. www.knolltextiles.com

CIRCLE 287

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Furnishings

Office furniture • Dormitory furniture • Multiple seating • Room dividers • Blinds, shades & shutters • Hotel & motel furniture • Manufactured casework

Greener protection

For a description of the EcoVeil solar shade cloth, see page 282. **CIRCLE 204**

Lightweight, strong effect

The Superlight aluminum chair, designed by Frank Gehry, weighs in at 6½ pounds and is available with an industrial felt pad or in brushed/anodized aluminum. It stacks by unclipping the skin from the structure. Emeco, Hanover, Pa.

www.emeco.net **CIRCLE 288**

Shore-inspired seating

The curved lines of the Strip chair, designed by Carlo Colombo, were inspired by the shape of a shell. The polyurethane structure is available in white or black, and with a revolving base or chromed stationary legs. Poliform USA, New York City.

www.poliformusa.com **CIRCLE 289**

Flexible office worker

Topo's "flex-fit" walls feature unlimited adjustment within an 18" range to increase or decrease worksetting size without additional components. Users may open or close their work space with sliding window screens between desks and roller screens between workstations to facilitate collaboration or concentration. Metro, Oakland, Calif.

www.metrofurniture.com **CIRCLE 290**

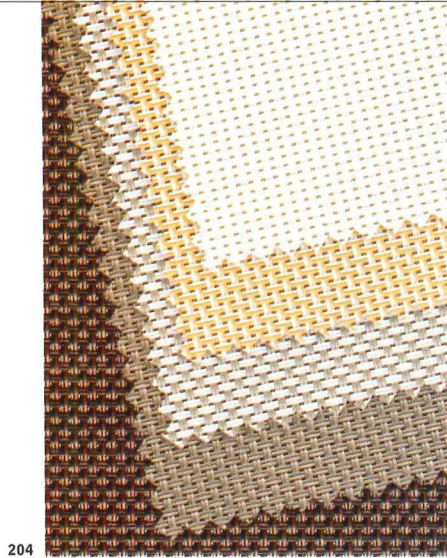
Turn over a new leaf

The Leaf seating collection, designed by the Swedish design partnership of Claesson Koivisto Rune, features a lightweight, painted steel frame that supports a fixed cushion folded over on itself to striking effect, particularly with two-tone upholstery (shown). Living Divani, Los Angeles. www.modernliving.com

CIRCLE 291

Sustaining student life

Sustain residence-hall furniture features an appearance, strength, and hardness similar to oak, but it is constructed of renewable, ecofriendly rubberwood. Intended to weather years of heavy use, the line features solid wood construction, integrated drawer pulls with replaceable drawer fronts, 100-pound steel-ball-bearing drawer slides, and joinery details such as dovetails, mortise, and tenon. Ki, Green Bay, Wis. www.ki.com **CIRCLE 292**



204



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290



291



292

Special Construction & Conveyance

Solar energy systems • Security access • Retractable enclosures • Elevators



Siedle ushers in the brave new world of fingerprint-based security control with a Minimalist design. —BLAINE BROWNELL

Space-saving elevator system

ThyssenKrupp claims the company's ISIS elevator saves, on average, 60 square feet of building space per elevator. The geared traction system will serve two to 50 stops, and features a lift system that includes a synthetic hoist rope made of Dupont Kevlar that is stronger and more flexible than traditional steel rope, and an advanced set of synthetic modular traction sheaves. The sheaves, one third the size of typical steel sheaves, allow for reduced machine and motor sizes and for ISIS to be contained completely within the elevator shaft. ThyssenKrupp Elevator, Frisco, Tex. www.thyssenkrupp.com **CIRCLE 293**



293

Powerful photovoltaics

RWI Schott Solar's semitransparent building-integrated photovoltaic panels for windows, facades, and skylights lower energy costs, provide glare protection, supply heat insulation, and help reduce greenhouse gases. Independent studies show that the thin-film panels provide 20 percent more energy per rated wattpeak unit than other solar-cell technologies. Schott North America, Elmsford, N.Y. www.us.schott.com



294

CIRCLE 294

Large-span retractable roofs

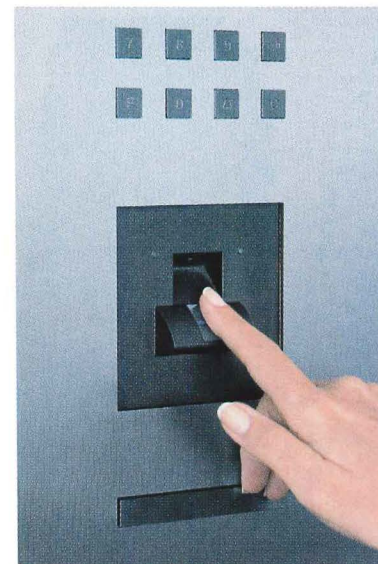
OpenAire has developed a proprietary aluminum building system that can span 150 degrees and extend to any length desired. These structures have thermally broken frames and incorporate a retractable roof capable of opening 50 percent of the rafter length. OpenAire, Mississauga, Ontario. www.openaire.com **CIRCLE 295**

295



Security at your fingertips

Siedle's fingerprint-based access control for residential and small commercial applications features a compact design and simple operation. Each finger read is compared with stored print information of entitled persons. Siedle Communications Systems, Broomall, Pa. www.siedleusa.com **CIRCLE 296**



296

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Superior Performance.

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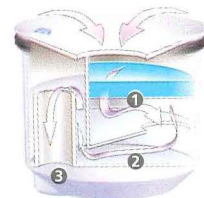
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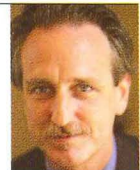
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Mechanical

Plumbing fixtures • Water filtration equipment • Fittings, trim & accessories



The WT.RX basin offers a striking shape and material presentation. —THOMAS C. LEKOMETROS

Luxe cylindrical basin

Alape's WT.RX basin is a single streamlined cylinder that stands approximately 3' tall. Made of scratchproof glassed steel, WT.RX is available as a full pedestal in either a round or rectangular pillar shape. Alape, Duluth, Ga. www.alape.com

CIRCLE 297

Laminar wall-mount faucets

Kohler has paired the clear water delivery of the laminar technology with the sleek, paired-down style of the Stillness and Purist wall-mount faucet designs. Kohler, Kohler, Wis. www.kohler.com

CIRCLE 298

Drinking water purifier

Capable of removing bacteria, viruses, and protozoa, the Purefecta Drinking Water Purifier is the first drinking-water system certified as a microbiological purifier for residential, health-care, and light commercial applications. Kinetico, Newbury, Ohio. www.kinetico.com

Egg-inspired bath fixtures

Inspired by the oval shape of an egg, Conran & Partners have designed Aveo, a collection of bathroom fixtures from Villeroy & Boch, including a lavatory, bidet, toilet, and tub. Villeroy & Boch, Monroe Township, N.J. www.villeroy-boch.com

CIRCLE 300

Tub for two

Norman Foster's first design for Hoesch includes single- or double-seated bathtubs in four sizes. The high neck area of the double-seated tub offers a modern twist on the look of the traditional galvanized tub. Hoesch, Ronkonkoma, N.Y. www.hoesch.de

CIRCLE 301

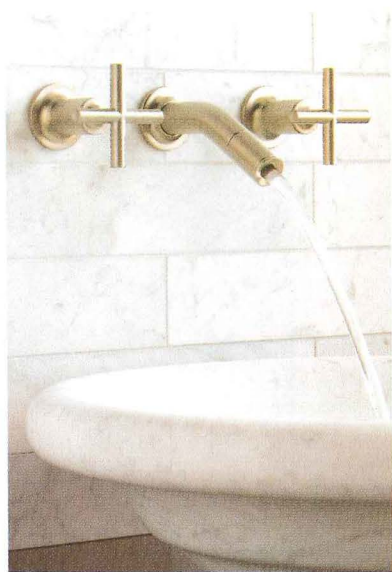
Updating the original

The Axor Steel collection of stainless-steel bath and kitchen faucets, shower products, and accessories has a new streamlined look that combines the curved and circular shapes of the earlier version with straight lines, flat surfaces, and square angles. Hansgrohe, Alpharetta, Ga. www.hansgrohe-usa.com

CIRCLE 302



297



298



299



300



301



302

Electrical

Interior & exterior luminaires • Lamps & ballasts • Sound reinforcement • Dimming control • Stair, walkway, roadway & parking area luminaires • Fiber-optic lighting

Minimalist pendant

Soli Zontio comes with or without an etched-glass diffuser suspended within the center of the rectangular extruded-aluminum form. The pendant features two T5 lamps and two 28-watt or 54-watt lamps that direct light up and onto the diffuser and ceiling plane while a slit of light emanates onto the work surface below. Lightolier, Fall River, Mass. www.lightolier.com **CIRCLE 303**

Adjustable area lighting

The pole top design for Bega's Adjustable Gantry System presents a clean, simplified design solution, addresses a variety of road and pathway applications, and adheres to I.E.S. Full Cutoff requirements. Bega/US, Carpinteria, Calif. www.bega-us.com **CIRCLE 304**

Energy-efficient options

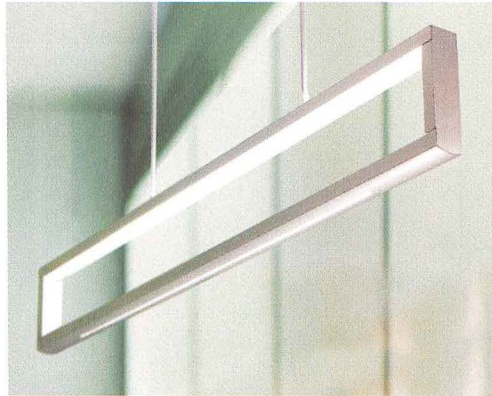
Sylvania Prominence is illuminated by solid-state LEDs enclosed in polycarbonate tubing and controlled by a patented low-voltage power supply. Prominence uses 75 percent less energy than neon and is virtually maintenance-free. Sylvania HaloBright halogen lamps can be used almost anywhere incandescent lamps are used, and fit in most standard fixtures. Watt for watt they deliver higher lumens than standard incandescent lamps and have a 3,000-hour average rated life, up to four times longer than incandescents. Osram Sylvania, Danvers, Mass. www.sylvania.com **CIRCLE 305**

Camouflaged speakers

Martin Architectural's new Flat panel speakers offer top audio reproduction in a slim speaker construction that integrates seamlessly into the interior design of a space. A collection of themed designs is available, or custom designs can be created to match any concept. For true camouflaging or flush mounting, specifiers can print or paint directly onto the Flat speaker itself. Martin Architectural, Sunrise, Fla. www.martinarchitectural.com **CIRCLE 306**

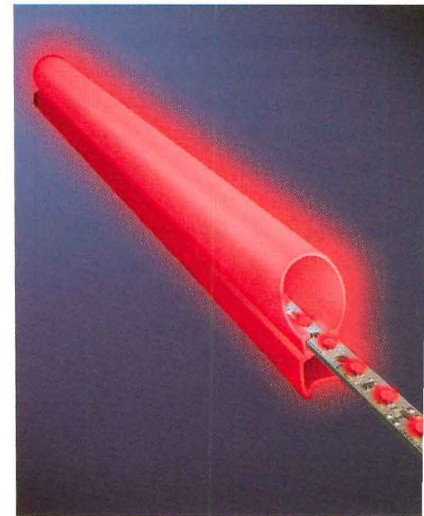
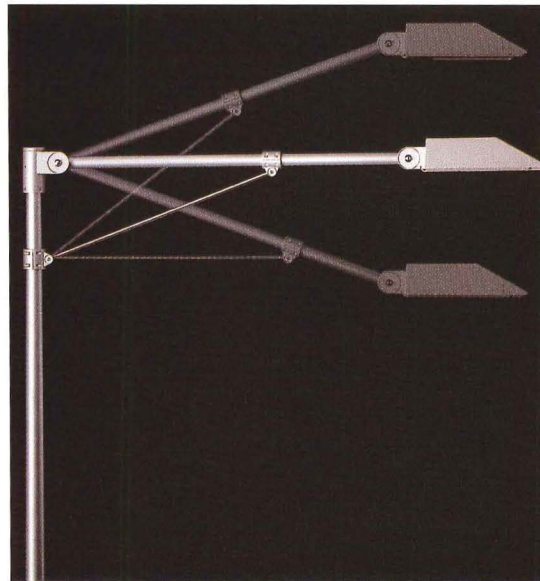
This collection of new lighting products will be of great value to lighting designers and their future projects.

—HOWARD M. BRANDSTON



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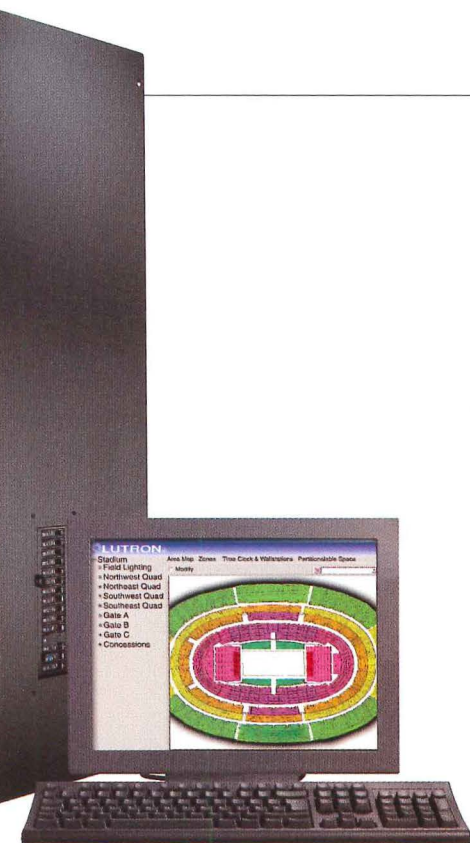
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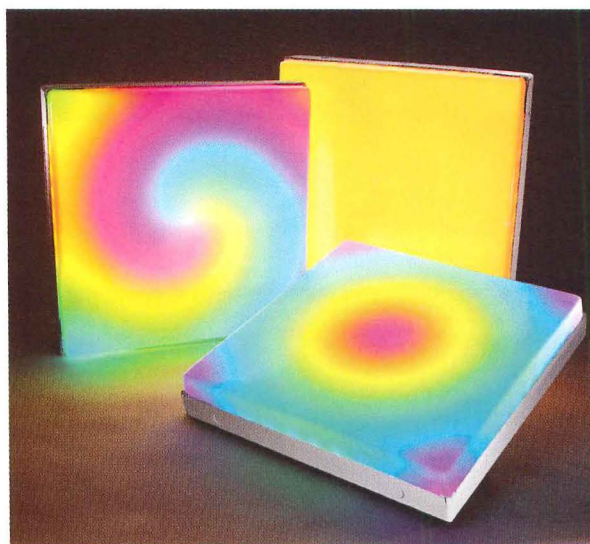
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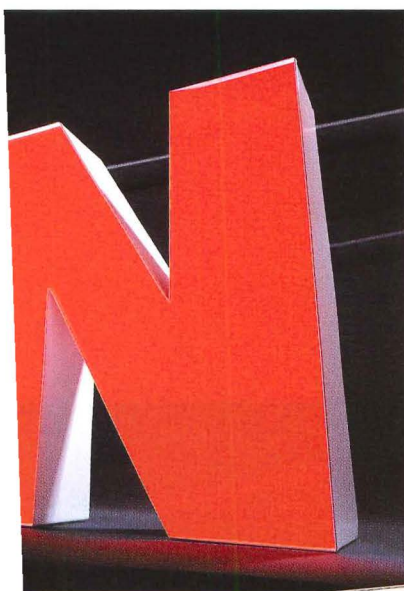
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310



311

Centralized lighting control

The Grafik 7000 centralized lighting control system offers advanced hardware capabilities and customizable user interfaces for flexible and seamless integration of dimming, switching, window-shading systems, and daylighting. Lutron Electronics, Coopersburg, Pa. www.lutron.com

CIRCLE 307

Wildly colorful LED option

iColor Tile FX works independently or as part of a large-scale, multitile installation. Each 2' x 2' panel incorporates 144 individually addressable tricolor nodes that are powered to create images with light. Color Kinetics, Boston. www.colorkinetics.com

CIRCLE 308

An illuminating wardrobe

Retail Rod is a fluorescent rod system for retail-store clothing displays and residential closets that evenly distributes light emitted from a choice of linear T2 and T5 fluorescent lamps. Ardee Lighting, Shelby, N.C. www.ardeelighting.com

LED signage and cove lighting

LightScript is an LED-based illumination solution for channel lettering in corporate identity signage applications. LED-based signage solutions deliver up to 80 percent energy savings; greatly reduced maintenance costs; and a wide variety of colors, font sizes, and design capabilities. Destiny CV is a cove luminaire that incorporates high-flux LEDs and advanced solid-state lighting technology to provide an even surface glow while projecting a farther throw. TIR Systems, Burnaby, British Columbia. www.tirsys.com

High color rendering

Uni-Form Natural White pulse-start metal-halide systems feature a color-rendering index greater than 90, an improvement over ceramic metal-halide lamps. When used with an electronic ballast, the systems can be dimmed to 35 percent of rated lamp power for energy savings. Venture Lighting, Solon, Ohio.

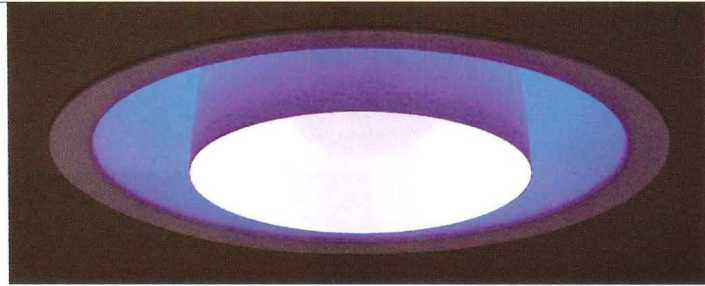
www.venturelighting.com **CIRCLE 311**

Electrical

Interior & exterior luminaires • Lamps & ballasts • Sound reinforcement • Dimming control • Roadway & parking area luminaires • Fiber-optic lighting

Colorful downlight

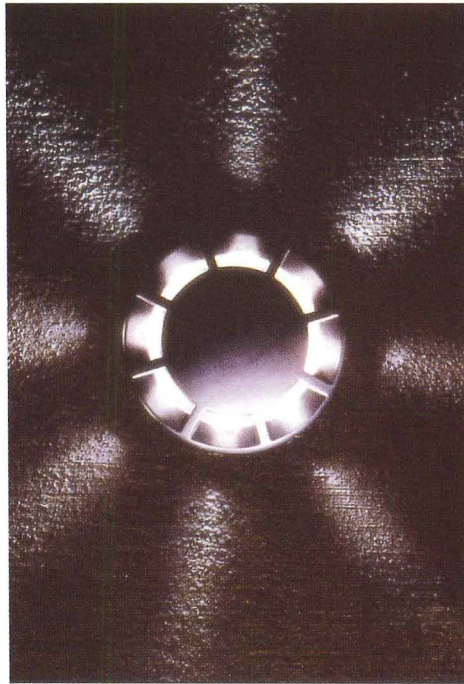
Candéo is a decorative, high-performance, recessed downlighting product available in white or saturated colors, including sky blue, sea green, and sand. Gotham Architectural Lighting, Conyers, Ga. www.gothamlighting.com **CIRCLE 312**



312

Multitasking landscape light

The SL-43 in-ground/above-ground landscape lighting luminaire is ideal for pedestrian areas to wall wash buildings, illuminate signs, light landscape grounds, and accent pathways. The fixture provides superior resistance to corrosion, the effects of UV radiation, and inclement weather. Allscape, Santa Ana, Calif. www.allighting.com **CIRCLE 313**



313

Rapid-start ballast

The T5HO high-range voltage AccuStart 5 ballast is intended for applications from 347 to 480 volts. It features programmed rapid-start technology to provide long lamp life in frequently switched applications, such as occupancy sensors. Universal Lighting Technologies, Nashville. www.universalballast.com **CIRCLE 314**

314



Troubleshooting device

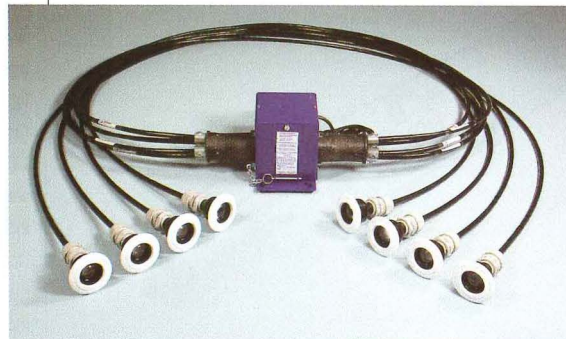
I.Q. On Board is a troubleshooting LED signal device for outdoor commercial lighting fixtures. When the lamp does not go on, a LED will light if the failure is due to the lamp; if the LED does not go on, that means the ballast has failed, allowing for the correct component to be repaired without delay. Beacon Products, Sarasota, Fla. www.beaconproducts.com **CIRCLE 315**



315

Fiber-optic downlights

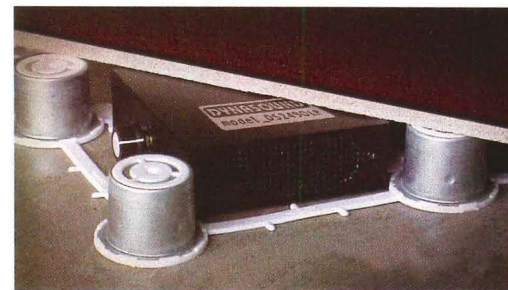
EFO is the only fiber-optic light source to provide highly energy efficient downlighting with the focused luminance and directional optics of MR series lamps, in a price-competitive system. Fiberstars, Fremont, Calif. www.fiberstars.com **CIRCLE 316**



316

Soundmasking floors

The DS2490LP (low profile) soundmasker is a dual-driver device for use in cavities as shallow as 1 3/4", combating the threat of eavesdropping through raised-access floors and from below the area of concern. It also provides protection in ceiling cavities as shallow as 5". Dynasound, Norcross, Ga. www.dynasound.com **CIRCLE 317**



317

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317	116		Sota Glazing Inc sotawall.com
238	73	☐	Stepstone Inc stepstoneinc.com
298	105	☐	Sto Corp stocorp.com
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327			Sweets sweets.construction.com
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313	115		Thermador thermador.com
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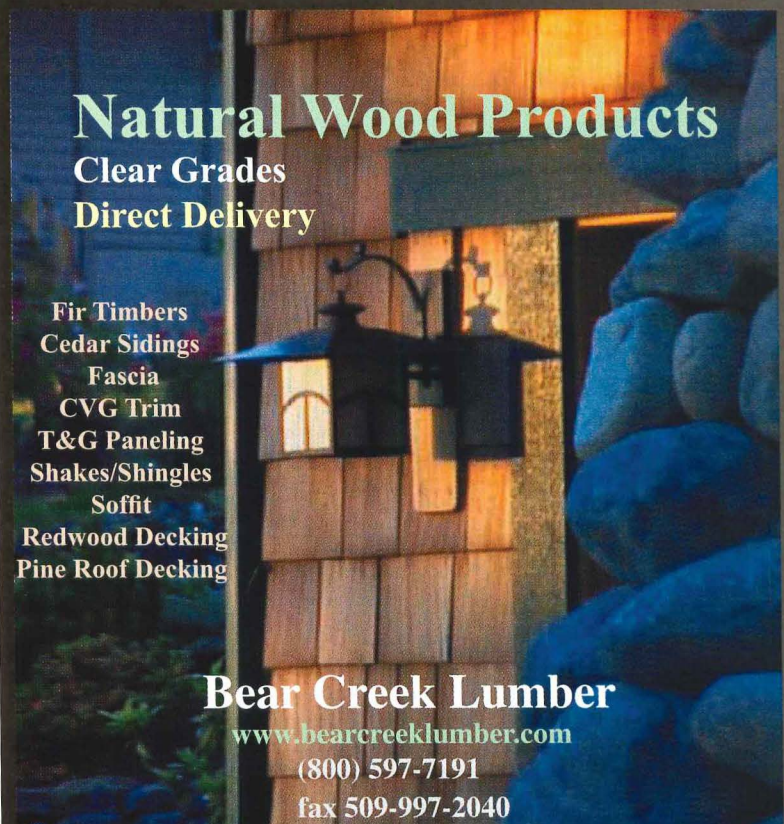
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Profile



Matteo Pericoli's drawings pay homage to the city he adopted

Interviewed by Deborah Snoonian, P.E.

It took a few Circle Line tours, hundreds of photographs and sketches, and two long rolls of trace paper to get there, but Matteo Pericoli's debut book, a foldout illustration of New York's West and East Side skyliness called Manhattan Unfurled, became an instant classic when it was released in October 2001. He followed up with Manhattan Within and See the City, a children's book based on Unfurled, which got an exposure boost when the rap group The Beastie Boys used its drawings as cover art for To the 5 Boroughs, their album dedicated to New York. Pericoli earned a degree in architecture from the Polytechnic Institute of Milan and moved to New York in 1995, working for a time for Richard Meier on the Jubilee Church in Rome.

Q: *Why did you turn Manhattan Unfurled into a children's book? When I began drawing the West Side—I didn't know yet that it was going to become a book—I thought to myself, if I can make a drawing out of this apparent or stereotyped chaos of New York that is clear and understandable even to children, then I will have achieved something. So I gave myself a simple rule to handle the complexity of the skyline: to draw everything I saw, not to leave anything behind, that every building is worth drawing because it's Manhattan. I wanted the drawing to appeal to children, too, that's why the waves in the rivers are drawn playfully, like monsters almost. The idea would be that, for children, the skyline is an image, an image that you can*



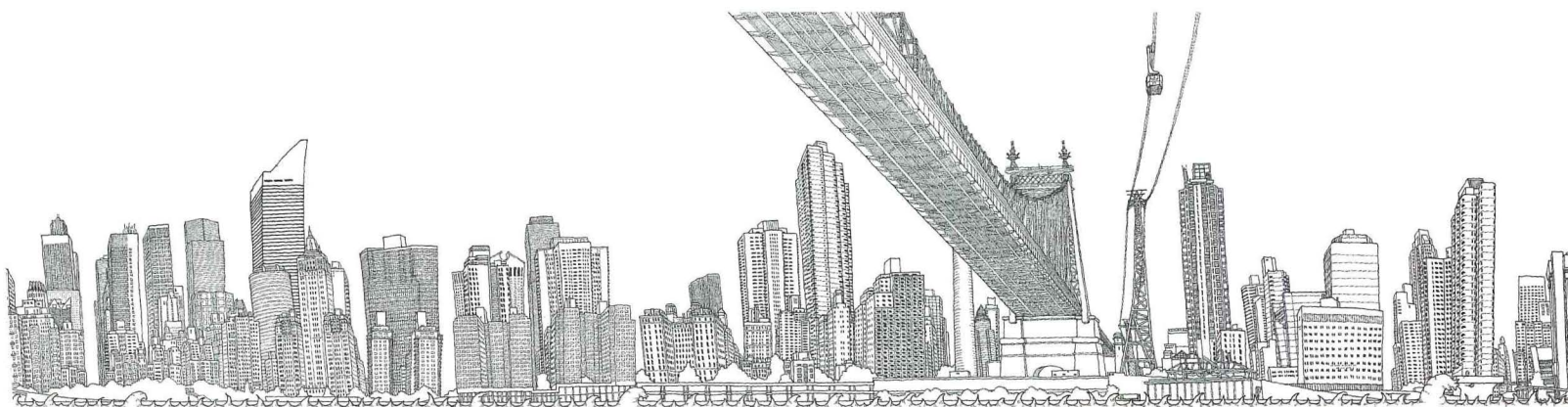


Manhattan Within (above) shows Pericoli's color renderings of the buildings that ring Central Park, and includes a journal he wrote while he worked on the book. Below, a portion of the east side from *Manhattan Unfurled*.

change, by adding buildings, or coloring it perhaps. *How have your drawings influenced your relationship with the city?* We as Europeans have a view of New York that's informed mostly by movies, commercials, magazines, things like that. When I moved here I was expecting to feel detachment, massive buildings pushing me away. But in reality this place is very different from what anyone can see from far away. I found it to be as difficult as I expected, but at the same time there are neighborhoods and sights not in the guidebooks that make it very livable and humane. And it's antiquated in a way I didn't expect. Going into the subway was like going into the ruins of an ancient city. So, I felt a sense of injustice

that much of what I'd been led to believe about New York, and by extension about America, was not true. And I felt a real warmth for the city because of that. That's why I began the first drawing—to understand New York, and to appreciate it.

Do you have a favorite building in Manhattan? I always liked how the U.N. is rotated off the grid. It's the only building that looks out toward the east in a very clear manner. I had nausea while I was working on it because I had to draw all the windows, and then out of curiosity, when I was done, I counted the lines and I found out I had drawn 3,000 lines for that building. Three thousand lines! I probably absorbed it better than I did any other building I



Profile

(Continued from previous page)

“THE SKYLINE IS NOT THE SUM OF BUILDINGS AGAINST THE SKY. IT IS SOMETHING THAT TRANSCENDS THE BUILDINGS AND HAS A LIFE OF ITS OWN.” *Matteo Pericoli, from Manhattan Within*



drew because of its orientation—it gave me the whole of itself.

What projects are you working on now? I'm writing and illustrating another children's book, and I'm also thinking about a new drawing project for New York. My wife and I moved recently from the Upper West Side to Jackson Heights, in Queens, and when everything was ready to go, I realized that the view from the window next to where I worked was stuck there, and I wouldn't be able to see it again. Imagine spending seven years working at the same table and glancing up every minute or so through the window; it must have been months of staring. I realized how much my view of the city affected my work and my well-being. So I drew first a sketch and then a larger, more realistic drawing of the view, as if I had been able to peel from the glass what I could see. I took it with me so that I could enjoy this view even from the new place. In New York, the view from the window is incredibly important. It

belongs to the interior, not the city. So I'm imagining a book of drawings that would be an encyclopedia of these window views, invisible to everyone else but the people who use and enjoy the view. The drawings would have to include the people, of course, and the window frames themselves, to be complete.

What do you enjoy most about drawing? Each line has an invisible weight of fear and pleasure. In *Manhattan Within*, those big lines that go from bottom to top—like the bridge crossings, zoom!—those were tough, choosing the angle, the orientation. But you have to start somewhere. The thing that can never be taken away from drawing by hand is the fear, the fear of doing something that's real and committed to paper. It's the fear that makes it worth doing.

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