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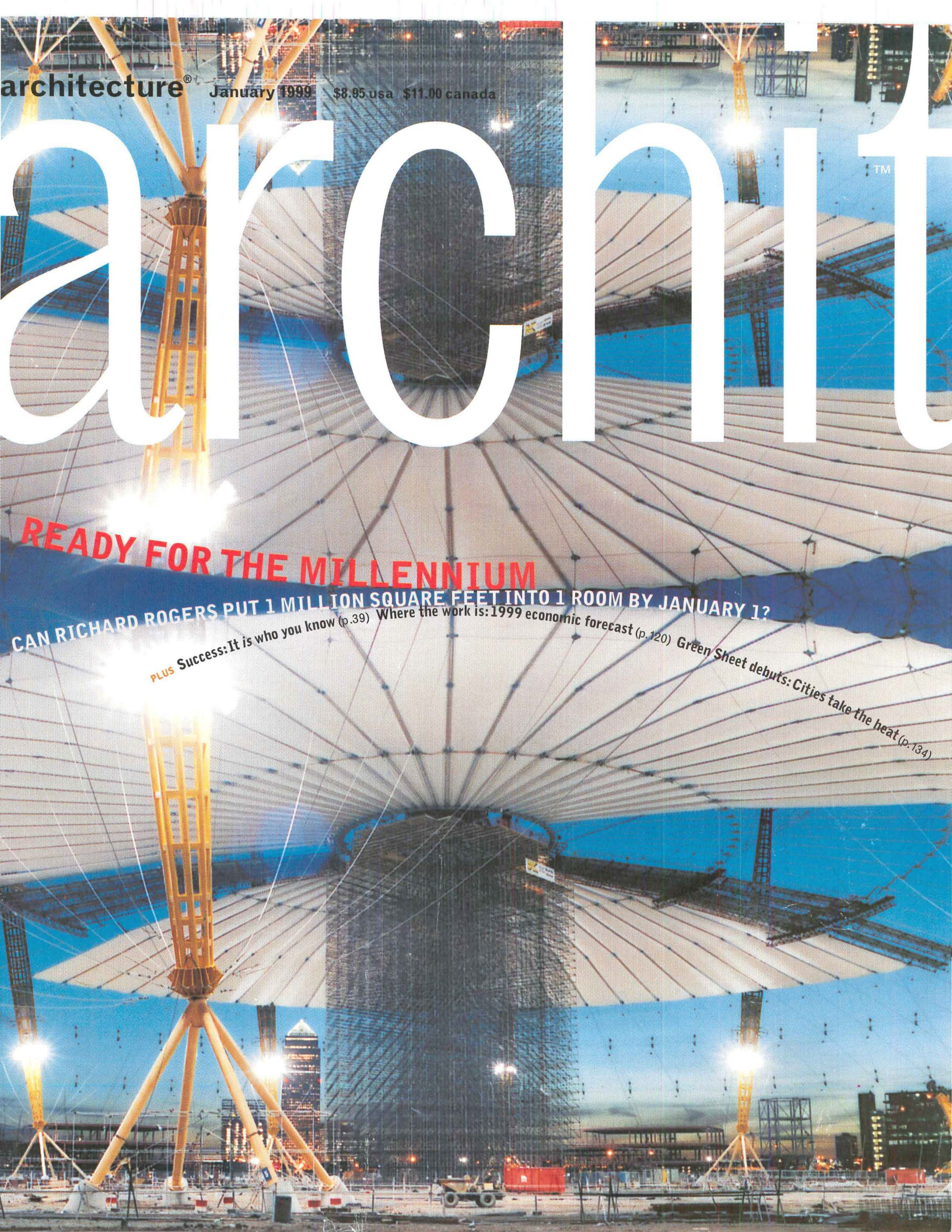

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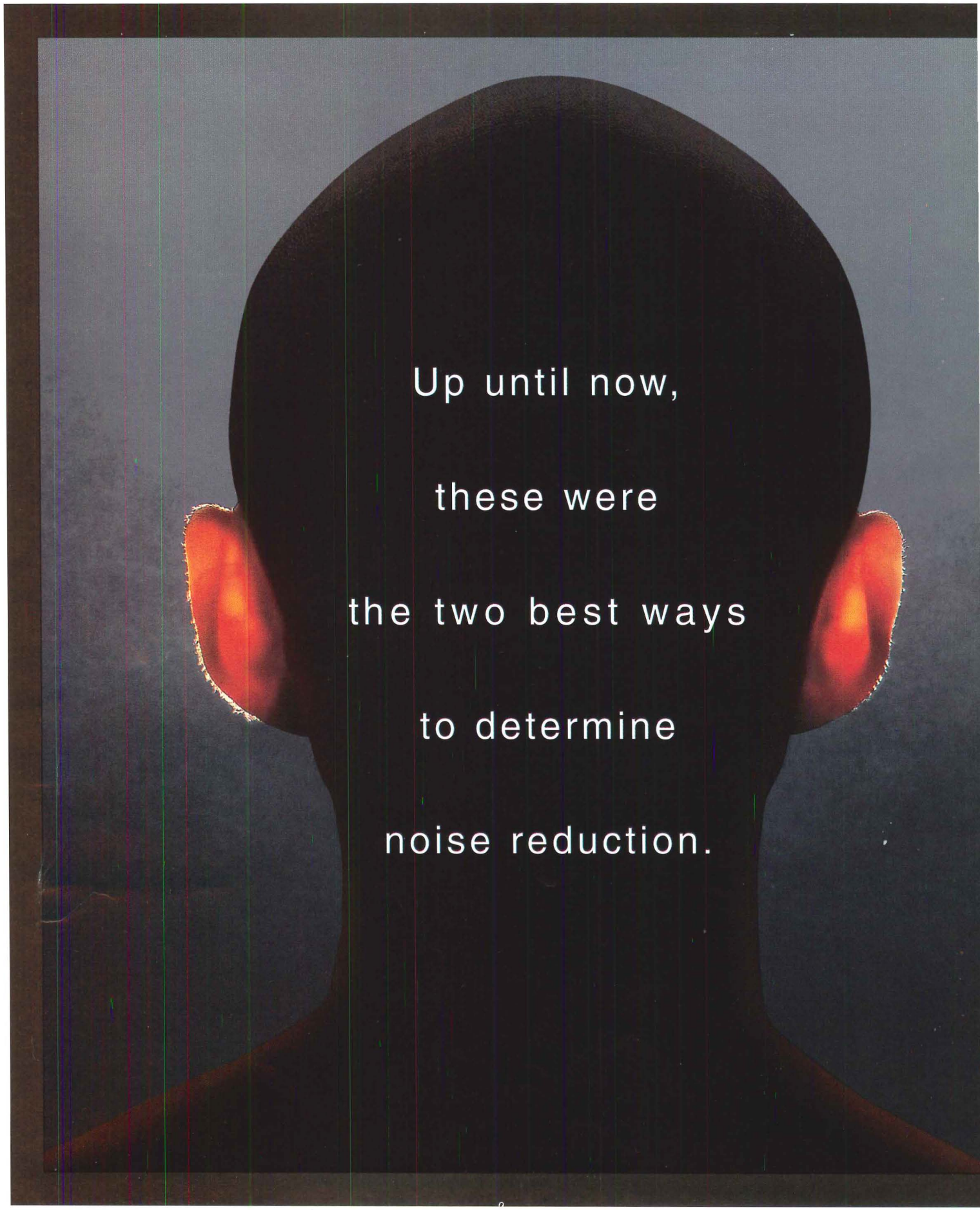
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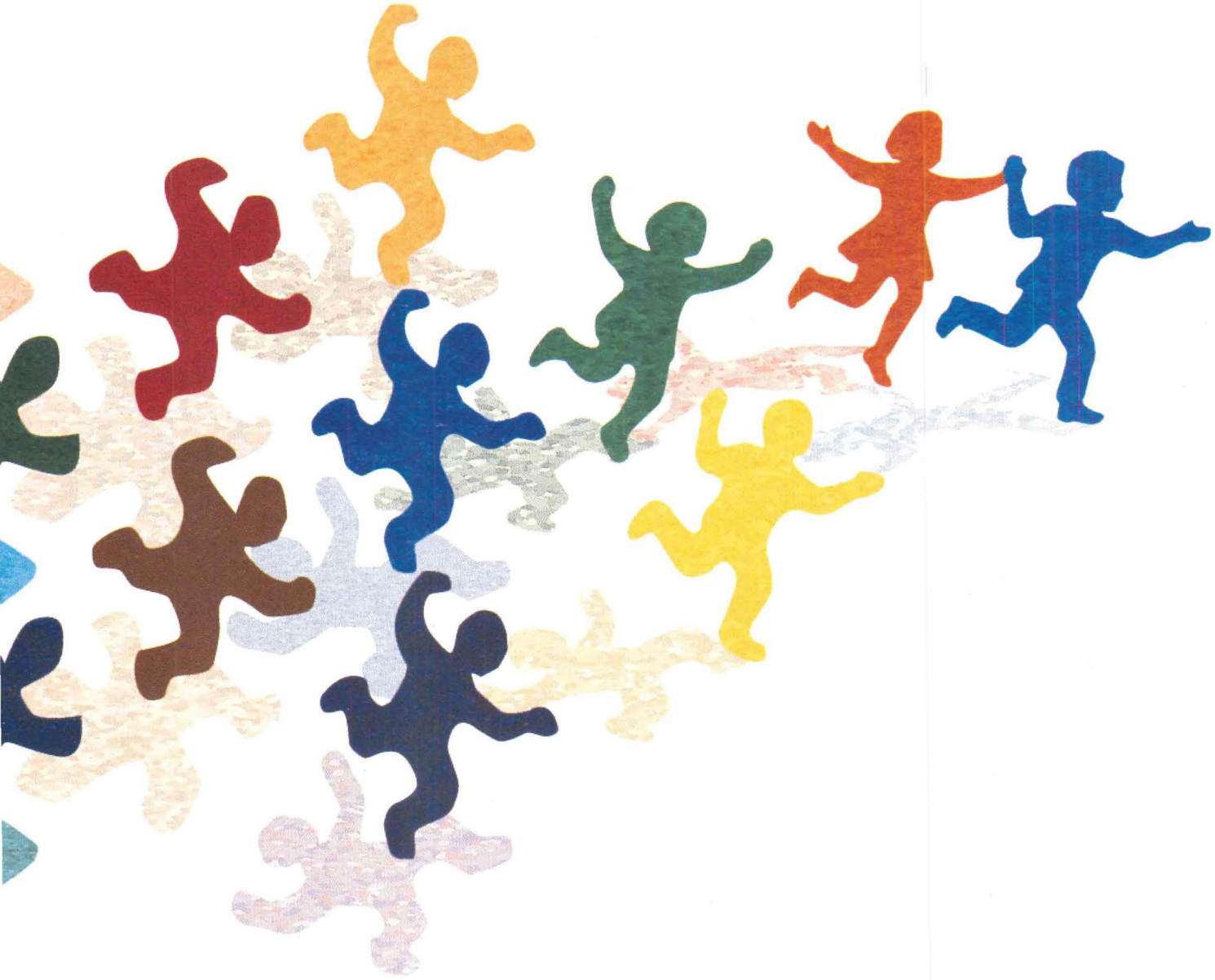

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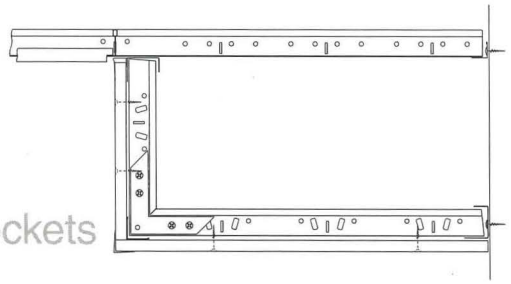

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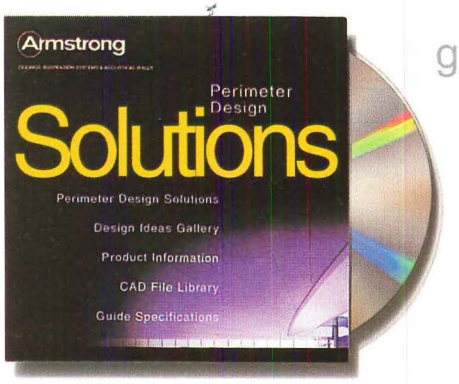

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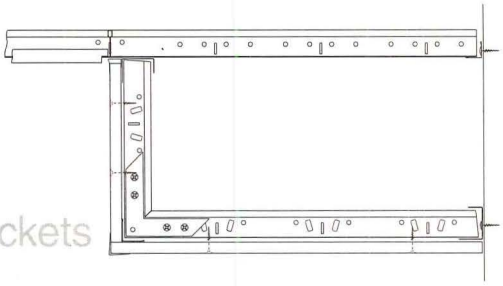

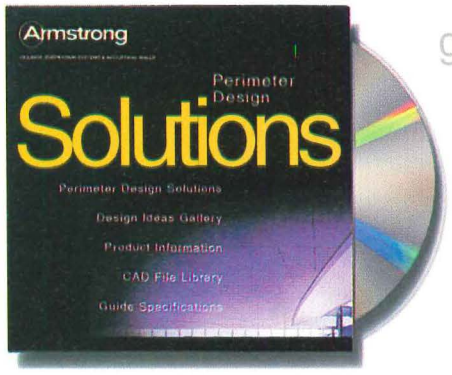

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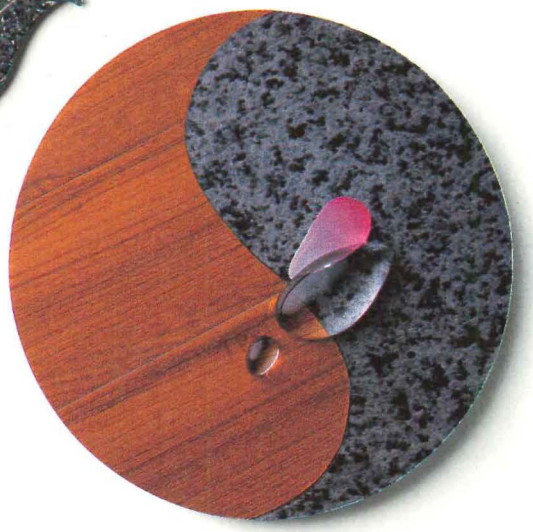

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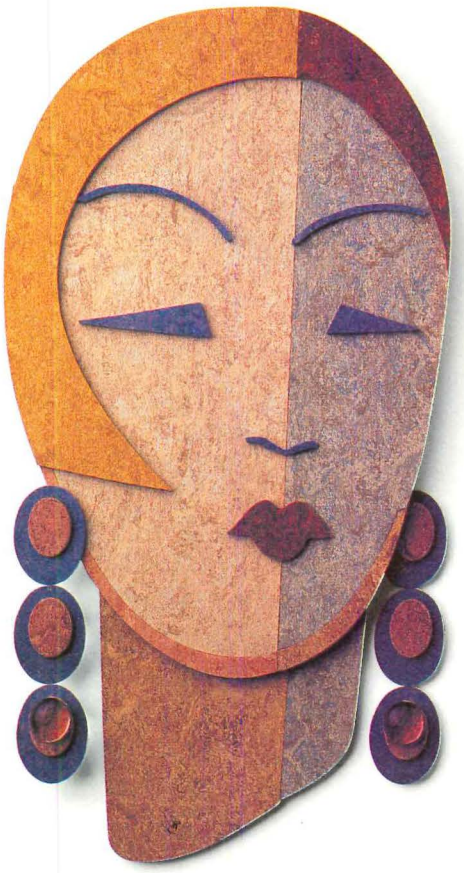

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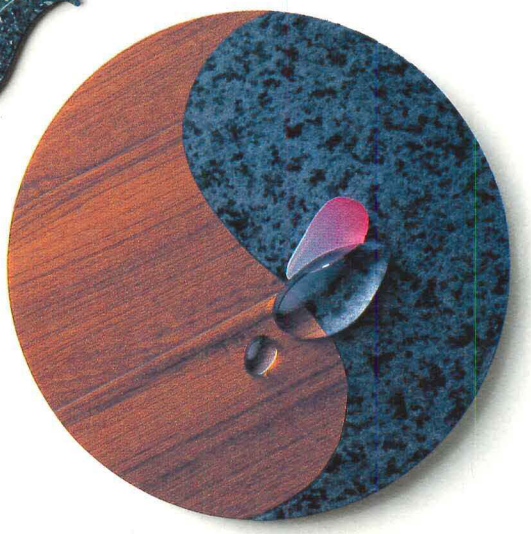

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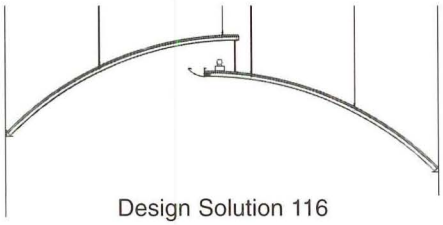

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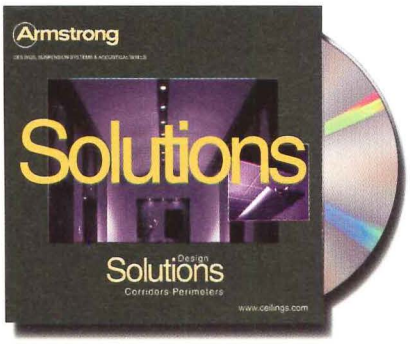

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Graph Paper Architecture, Saul Steinberg, 1954
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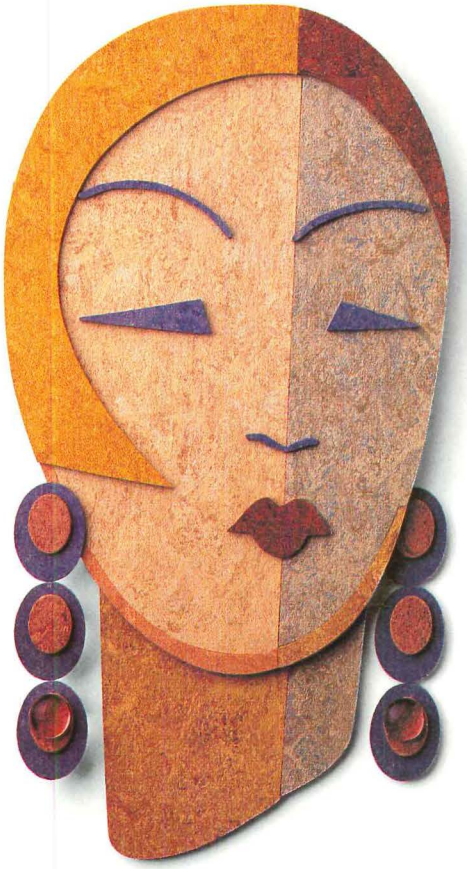

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DESIGN

October 1999

TECHNOLOGY + PRACTICE

NEXT ISSUE

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Uncovering architectural treasures at Max Protetch Gallery

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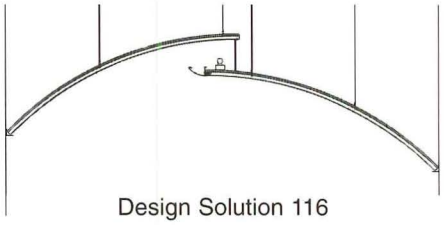

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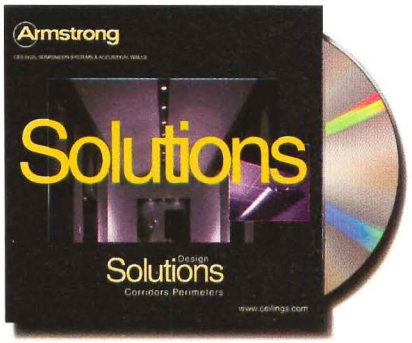

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America's built environment at the millennial moment

Architects open the Pandora's box of intellectual property rights

How Hollywood animators are stealing architecture's talented youth

Impresario Sam Green protects sacred sites

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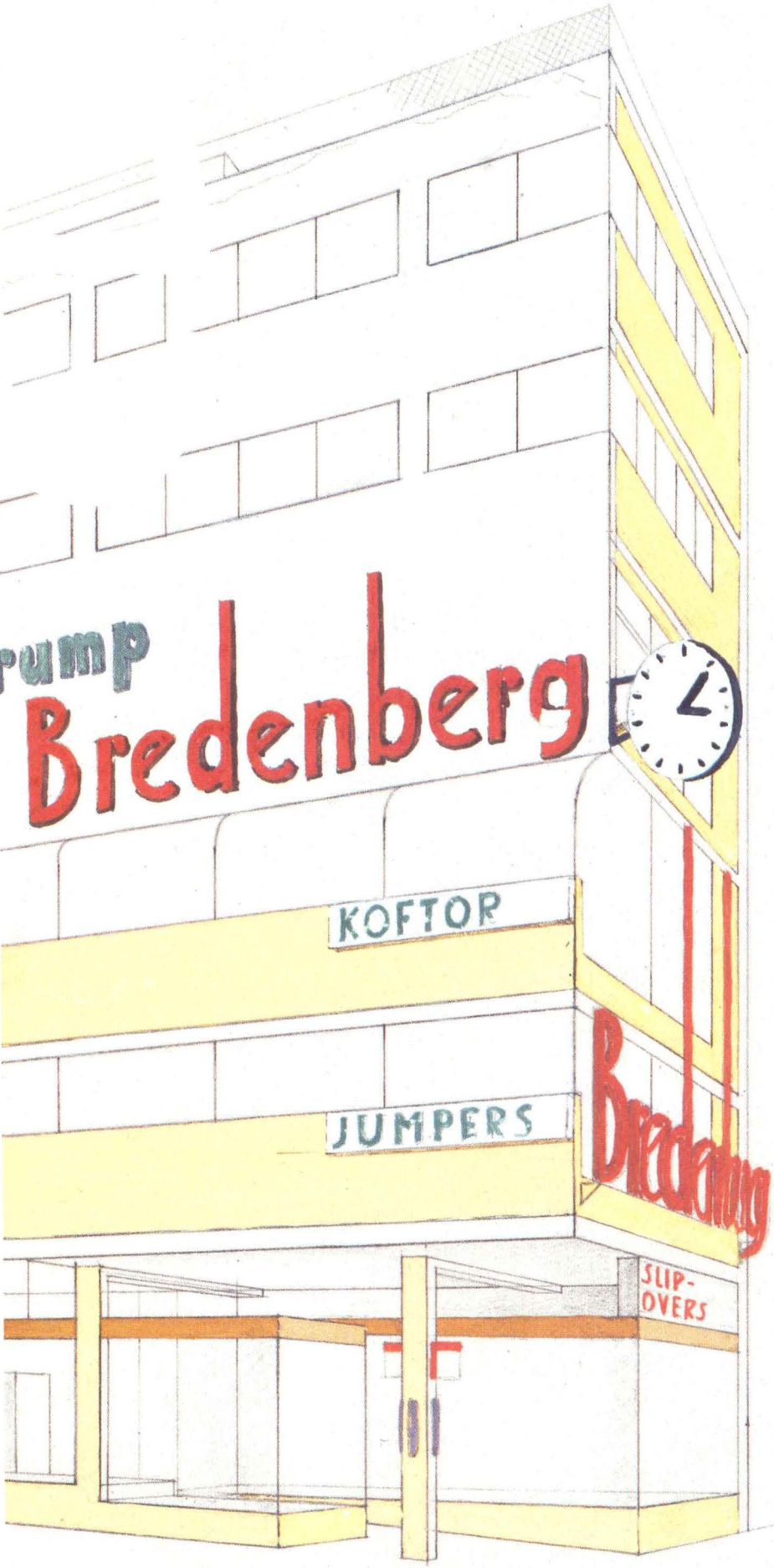
Erik Gunnar Asplund, *Bredenberg Department Store, Stockholm*, 1933, tempera and pencil on board, 11 11/16" x 16 1/2". Photographed by Dennis Cowley.

COVER

Photographed by Dennis Cowley.

November 1999



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Brains and Beauty: *Architecture*'s new writers, departments, and graphics.

By Reed Kroloff

Hello there.

It's interesting to note how the addition of a single photograph changes this page: Suddenly it's more intimate, more direct. Purists might object that the portrait suggests we are more interested in people than ideas, or that it engenders a cult of personality. (I should live so long.)

At first, I was concerned about the picture, too, but now it makes sense. It assigns an identity to the opinions expressed in this column. In essence, that's what we've been striving to do here since our 1997 redesign: Create a magazine with personality, an outspoken, independent voice for the profession.

The redesign was our first salvo, a full-blown makeover that would do Elizabeth Arden proud. It certainly turned heads in the magazine world, where we picked up an unprecedented six Ozzie awards from *Folio:* magazine's prestigious competition in 1997. We did it again this year, winning five encore Ozzies. We're proud of our looks, but we want to be known for our brains as well. My priority as editor-in-chief has been to ensure that the quality of our writing equals that of our graphics.

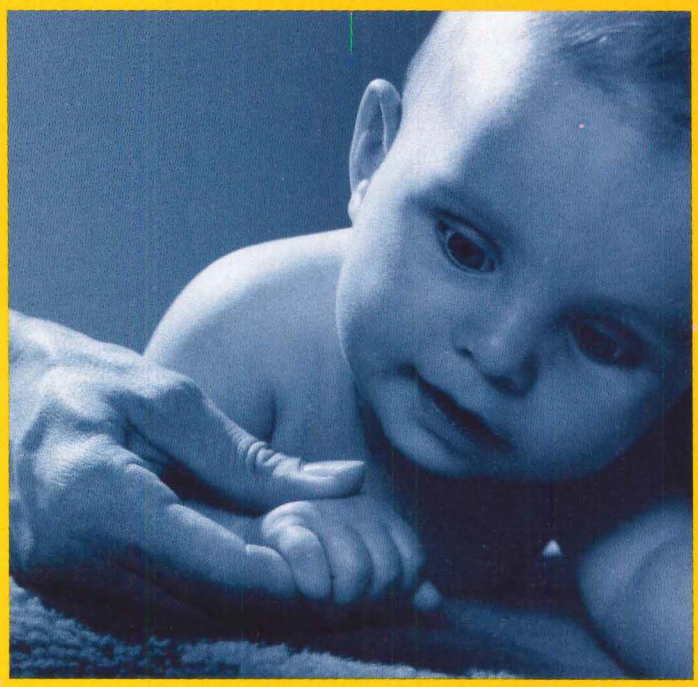
To that end, I am proud to announce several additions to our list of contributing editors. First is Lawrence Cheek, a Seattle-based journalist whose architectural criticism has been twice nominated for a Pulitzer Prize. Second is Andrei Codrescu, a professor of English literature at Louisiana State University, best known for his witty, sardonic commentary for National Public Radio's *All Things Considered*. Third is Catherine Slessor, the respected deputy editor of *Architectural Review* in London. They join contributors such as Aaron Betsky, Joseph Giovannini, and Richard Ingersoll; our award-winning in-house editors; and guest essayists that include Peter Blake, Kenneth Frampton, Paul Goldberger, K. Michael Hays, Jane Holtz Kay, Alex Krieger, Witold Rybczynski, and others to comprise the strongest group of writers in architectural publishing today. What is it that they say about the company you keep?

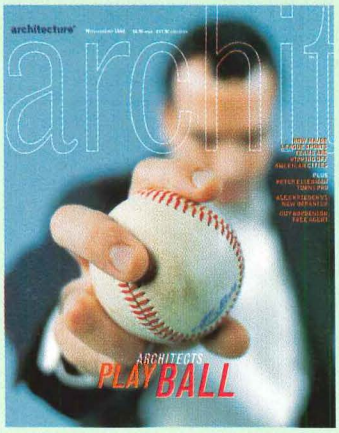
This month, we are also innaugurating several new sections in the magazine, all of them firsts for contemporary design publications. Green Sheet presents news and information about environmentally sensitive and sustainable design. Specifications cuts through the flood of manufacturer's data with cogent and timely analysis of new building systems. History features stories about the people, buildings, and places that have shaped architecture.

This issue also marks the next stage in our design evolution. We have completely redesigned the Technology + Practice section. Gone is the look of a structures textbook. In its place are striking page designs with larger, clearer pictures and drawings and bolder graphics. We've introduced a tab to identify each of the seven departments in the section (look for the little red box). To sum up, we've given Technology + Practice the visual sophistication that reflects its central role in the profession.

There are other, more subtle changes throughout the rest of the magazine as well, including refinements to our typeface and an end bullet—■—to conclude stories. Together, the changes make *Architecture* easier to read, and more visually cohesive.

As I discussed in my first editorial last April, magazines have personalities. They reflect the staffs who make the magazines, as well as the people who read them. For *Architecture*, both of those groups are demanding, witty, and intelligent. That's why we look and sound different. Get the picture? ■





Stadia mania

Bravo for common sense and balanced priorities in the face of overreaching greed and extreme shortsightedness (*Architecture*, November 1998, page 11).

Jon Luft
Phoenix, Arizona

As an architect who has had a deep and abiding belief in the value of architectural criticism, it was very disconcerting to read a number of articles in your November issue. Despite the high quality of the work of the design architects that include Peter Pran and Joseph Spear, because they are on the staff of larger firms such as HOK, Ellerbe Becket, and NBBJ, they are relegated to the status of no-name architects. In a much larger measure, it was quite disturbing to note that a journal I had prized highly for offering an alternative view about our profession on one hand heaped infernal scorn on the leaders of major league sports tems that are "holding cities hostage." On the other hand, it highlighted the work of star architects who take advantage of the situation to design even more extravagant design solutions for this building type. While I am not personally involved in the design of sports facilities, I believe that this issue does a disservice to the profession.

Alexander Bonutti
Senior Vice President
Hellmuth, Obata + Kassabaum
San Francisco

As a design principal of one of those no-name firms specializing in the design of sports facilities, I felt compelled to respond to a number of the issues raised in your November issue. While it is true that many professional owners have used the threat of a move to obtain public funding for a new stadium, your writers fail to note that sports operate in a free-market economy. For every large city who refuses to provide public funds to keep a professional franchise, there are a half dozen smaller market cities waiting in line. Although true that analysis of the economic impact of professional teams on a community rarely provides justification for contributing millions of tax dollars to build a stadium, it is hard for most cities to resist the exposure and intangible benefits.

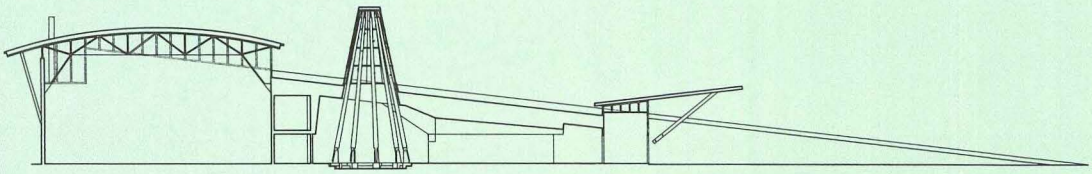
One disturbing assertion made by K. Michael Hays (*Architecture*, pages 116-117) is that "high design" can only be achieved by well-known "name" architects who are more likely to experiment with the building type and that retro-ballparks fail society because it references historical architecture. That is exactly the kind of pretentious statement that serves only to further separate our profession from our clients and the people these buildings are designed to entertain. What we as architects should be concerned with is insuring that these buildings respond to the needs and goals of our clients and that they become the awe-inspiring and lasting civic monuments that any public investment should be. Whether that is accomplished by a firm with a name or an acronym is completely irrelevant.

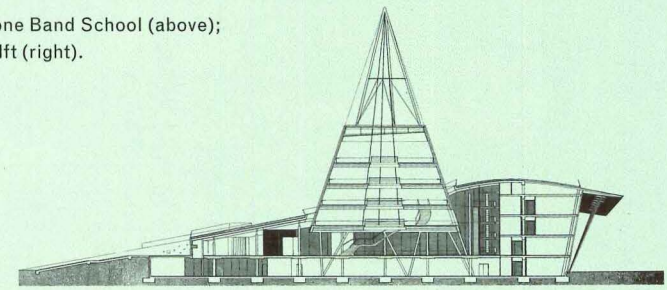
Dan Meis
Design Principal
NBBJ Sports and Entertainment
Los Angeles

Coincidence?

We are flattered that our P/A Award-winning design for an Indian band school (*Progressive Architecture*, January 1991, page 112) was influential in the design of the Delft library (*Architecture*, October 1998, page 124-133). However, the obvious question that Aaron Betsky's review does not address is how a form that evolved through an appreciation of the traditional underground structures of the Chilcotin Indians in a remote and rugged region of British Columbia is applicable to a university campus in Holland. Perhaps [Mecanoo Architects project architect] Francine Houben could explain.

Peter Cardew
Peter Cardew Architects
Vancouver, British Columbia





Coincidence? Peter Cardew Architects' Stone Band School (above); Mecanoo Architects' library, University of Delft (right).

CORRECTION

The source for "In Principal" (*Architecture*, October 1998, page 33) is Zweig, White & Associates' 1998 Principal's Survey.

Memphis Botanic Garden Visitor Center, Memphis, TN Architects: Williamson, Haizlip & Pounders, Inc., Memphis, TN
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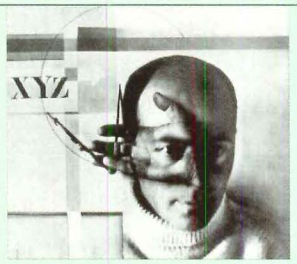
exhibitions

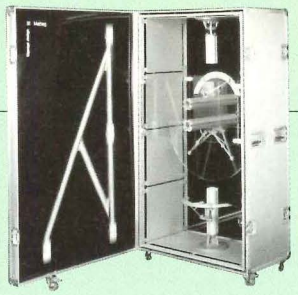
city	dates	exhibition	contact
Long Island City, New York	through January 22	**Cities on the Move 3—The Asian City in the '90s: Between Euphoria and Crisis** at the P.S. 1 Contemporary Art Center	(718) 784-2084
Los Angeles	through February 21	**"Monuments of the Future": Designs by El Lissitzky** at the Getty Research Institute	(310) 440-7300
Montreal	through April 25	**Photography and Transformations of the Contemporary City: Venezia-Marghera** at the Canadian Centre for Architecture	(514) 939-7026
New York City	through March 21	**Unlimited by Design** at the Cooper-Hewitt, National Design Museum	(212) 849-8300
Pittsburgh	through March 28	**Zig Zags and Speed Stripes: The Art Deco Style** at the Heinz Architectural Center	(412) 622-3131



This 1924 self-portrait is among more than 100 objects in Getty Research Institute's survey of El Lissitzky.

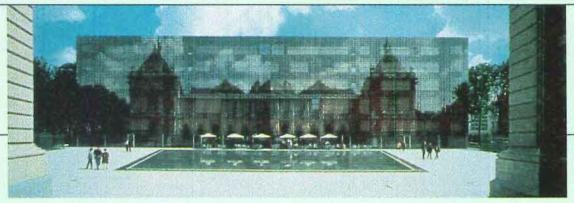
conferences

city	dates	conference	contact
Cincinnati	May 19-22	**Society for Environmental Graphic Design Conference and Expo** German signage manufacturer Mabeg chose Nicholas Grimshaw to design armature that won last year's SEGD "Best of Show."	(202) 638-5555
Dallas	May 6-9	**The 1999 AIA National Convention and Expo**	(617) 572-3553
Los Angeles	March 11-13	**L.A.DesignWeek 1999** incorporates WestWeek 99, NeoCon West, Senior Living Design Expo, Design Show Los Angeles, and CAD/FM Systems	(800) 677-6278
St. Augustine, Florida	March 8-12	**International Making Cities Livable Conference** is accepting proposals on the relationship between the physical and social aspects of cities (deadline: January 25)	(408) 626-9080
Singapore	April 19-21	**World Conference on Model Cities,** sponsored by the Urban Redevelopment Authority and the Institute of Policy Studies of Singapore	(65) 779-2633
Washington, D.C.	January 28-30	**Restoration & Renovation 1999**	(800) 982-6247, ext. 10

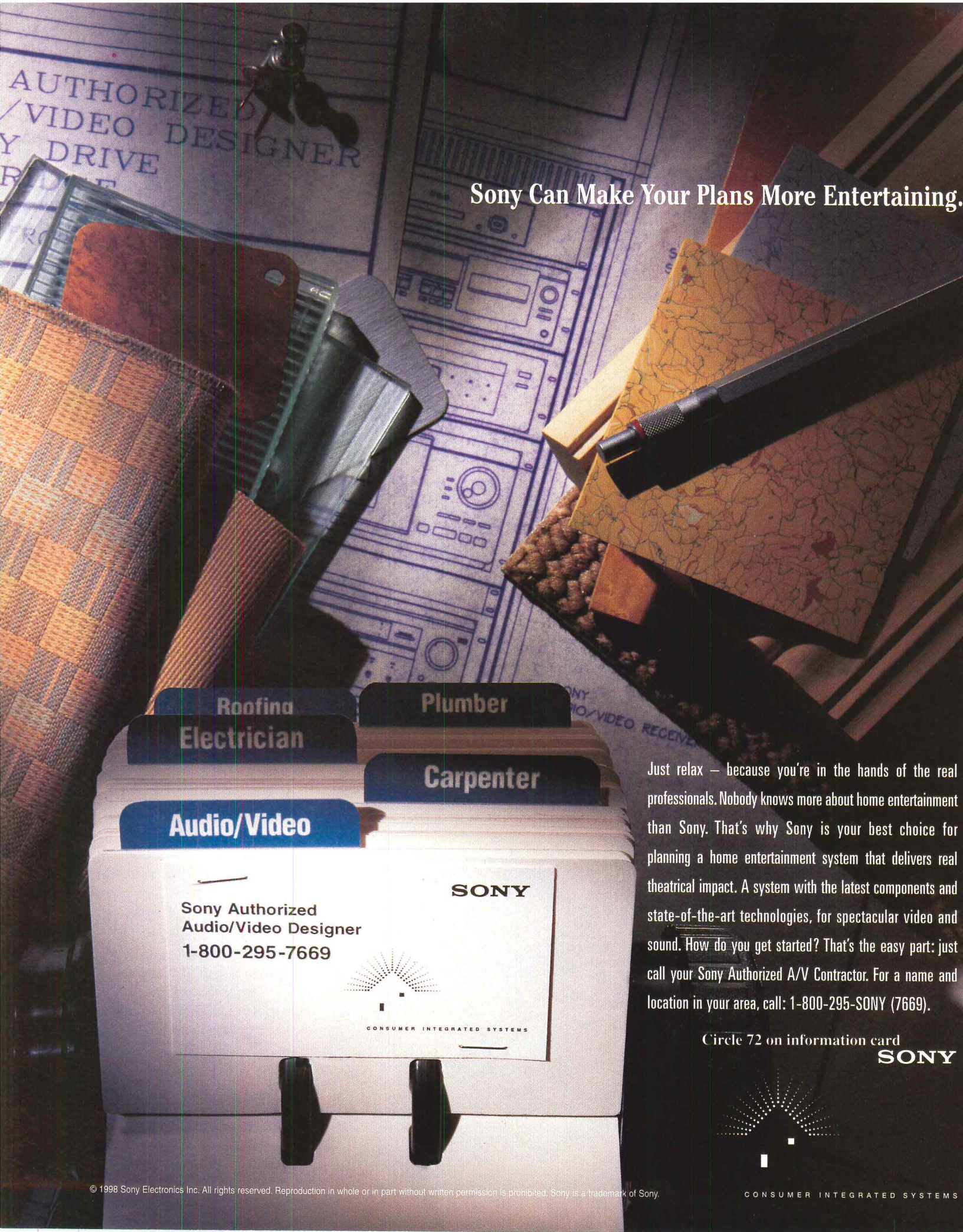


competitions

competition	deadline	contact
Kristin Visser Memorial Scholarship, a $1,500 grant to visit the works of Frank Lloyd Wright in Wisconsin	February 1	(608) 254-6051
The Architectural League of New York Young Architects Competition	February 1	(212) 753-1722
New Strategies for the Undercrowded Baltimore Neighborhood: Encouraging Neighborhoods of Choice and Diversity, sponsored by Neighborhood Design Center and the Historic East Baltimore Community Action Coalition	February 15	(410) 233-9686
DuPont Benedictus Awards for Innovation in Architectural Laminated Glass	March 8	(202) 393-5247
Presidential Design Awards 2000, sponsored by the U.S. General Services Administration, to recognize federal design projects	April 8	(202) 501-1888
What is Shelter? Resort Concept Competition for an environmentally sensitive portable tent village	May 15	(415) 276-5958



French architects Jean-Marc Ibos and Myrto Vitart won 1998 DuPont Benedictus Award for Palais des Beaux-Arts de Lille.



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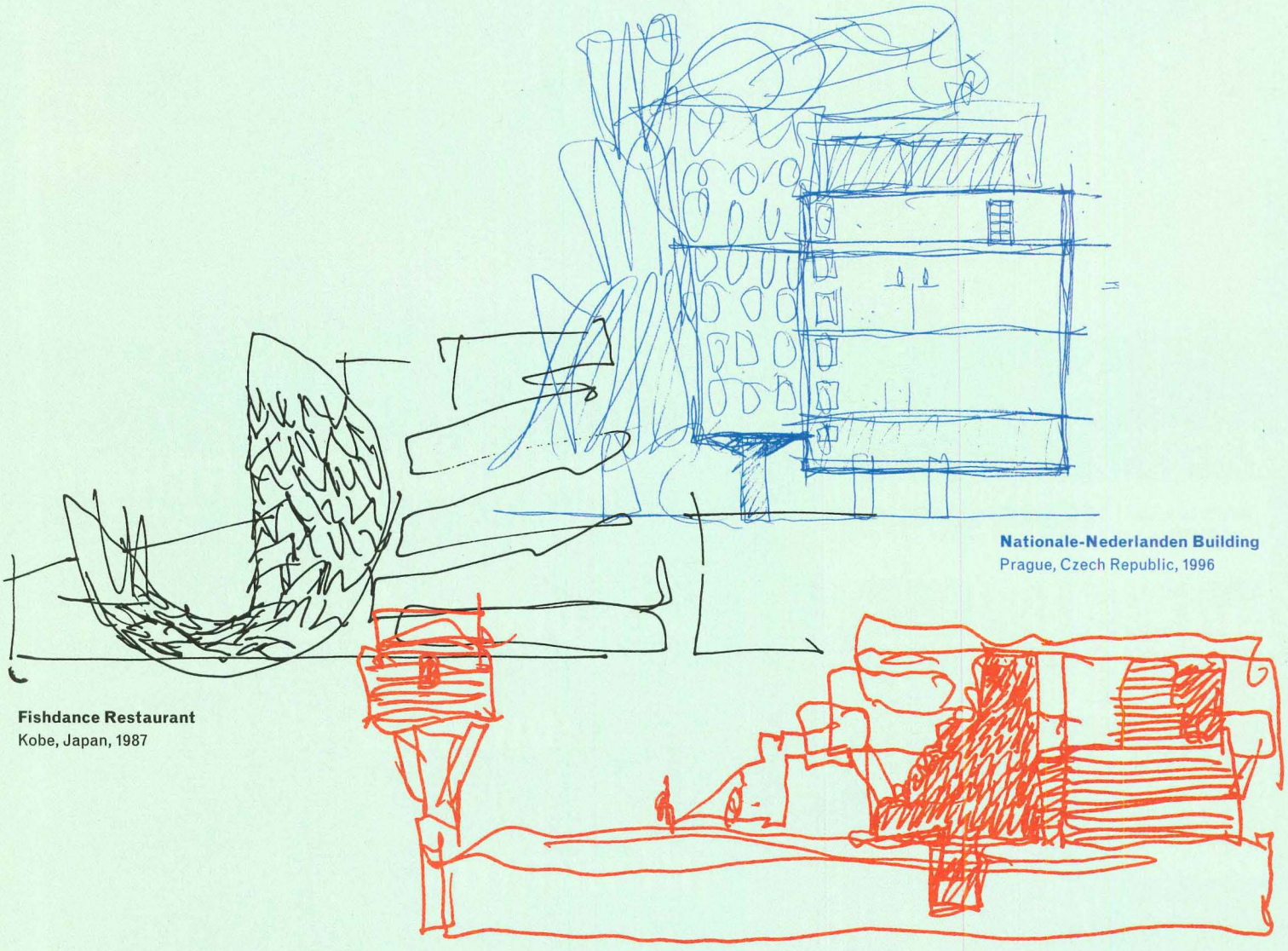


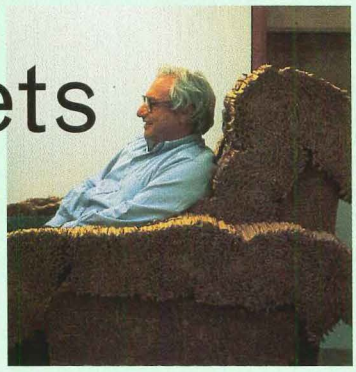
Nationale-Nederlanden Building
Prague, Czech Republic, 1996

Fishdance Restaurant
Kobe, Japan, 1987

Norton House
Venice, California, 1984

AWARDS

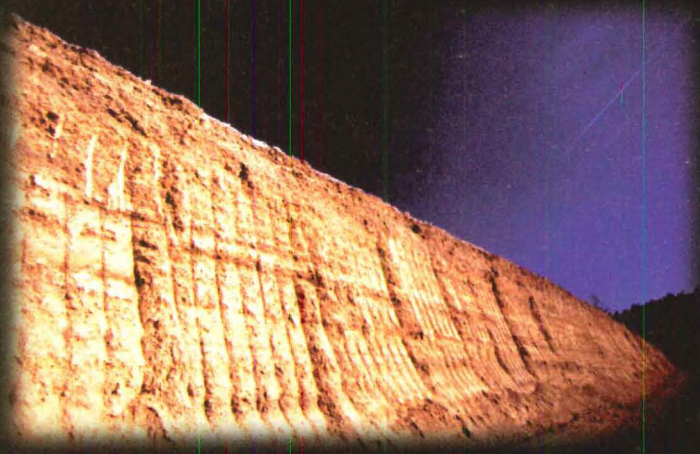
Gehry Gets the Gold

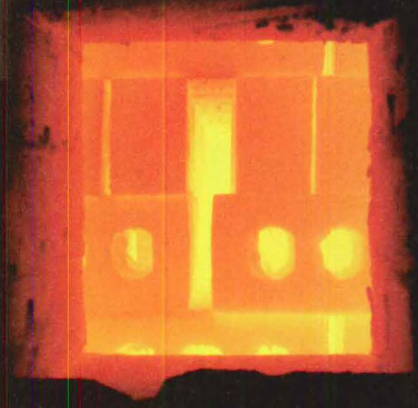


The board of directors of the American Institute of Architects (AIA) has given its 1999 Gold Medal to Frank Gehry. Gehry is the 57th medalist, joining a pantheon that includes Thomas Jefferson, Frank Lloyd Wright, and Le Corbusier.

Gehry's esthetics have followed a roller coaster-like evolution from strict early Modernism to subversive Deconstructivism to representative sculpture to his more recent expressionistic work. Along the way, he has produced a staggering array of work, including the Danziger Studio and Residence in Hollywood (1965); his own reconfigured Santa Monica, California, bungalow (*AIA Journal*, Mid-May 1980, pages 168-173); the Winton Guest House in Wayzata, Minnesota (*Architecture*, May 1988, pages 166-169); the University of Minnesota's Frederick R. Weisman Art and Teaching Museum in Minneapolis (*Architecture*, June 1994, pages 84-93); and the Guggenheim Museum Bilbao in Bilbao, Spain (*Architecture*, December 1997, pages 64-77).

Next month, The Monacelli Press will release a comprehensive chronology titled *Frank O. Gehry: The Complete Works*. The museum world (and *The New York Times*) is currently abuzz with rumors that the architect will design a new facility for the Solomon R. Guggenheim Museum on a Hudson River pier on Manhattan's West Side. (Both Gehry and the Guggenheim refused to comment.) Gehry has many other irons in the fire as well, including Seattle's Experience Music Project, a museum that will celebrate the music of Jimi Hendrix and his contemporaries (*Architecture*, December 1996, page 31) and the Walt Disney Concert Hall in Los Angeles (*Architecture*, August 1992, pages 108-109). The AIA will present the award to Gehry at the Accent on Architecture gala in Washington, D.C., next month. *Michael J. O'Connor*





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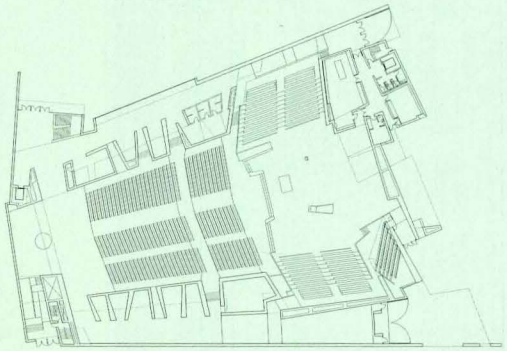
Moneo Sees the Light



Jose Rafael Moneo's design for Our Lady of the Angels Cathedral in Los Angeles masterfully recasts the forms and symbols of traditional Catholic church architecture. The truncated Latin-cross plan has flanking ambulatories with side chapels that turn their backs to the nave, creating a nearly continuous enclosure. An alabaster window with stylized cruciform mullions sits above the high altar at the church's eastern end. Stacked alabaster panels on the north and south facades reflect diffused light into the ambulatories and, with the help of sloping light scoops, over the chapels and into the nave. Seats for more than 2,000 democratically wrap the high altar on three sides. The cathedral will hold its first services in 2000. *M.J.O.*

AWARDS

AIA Names 1999 Firm of the Year, Topaz Medalist

Frank Gehry wasn't the only American Institute of Architects (AIA) honoree in December. Partners at Perkins & Will, the AIA's 1999 Firm of the Year, will share the podium with Gehry at the February 6 Accent on Architecture dinner in Washington, D.C. W. Cecil Steward, recipient of the 1999 Topaz Medallion for Excellence in Architectural Education, will take the stage at the annual AIA convention in Dallas. Steward is a board member of the Association of Collegiate Schools of Architecture, dean and professor of the College of Architecture at the University of Nebraska in Lincoln, and former president of the AIA and the National Architectural Accrediting Board. This month, the AIA will announce the rest of its annual awards, including the Honor, 25 Year, Whitney M. Young Jr., and Edward C. Kemper Awards. *Ned Cramer*

VITALS

Paying the Rent: The Cost of Expansion

Thinking about opening a field office? A new report by financial consultant Cushman & Wakefield reveals the 15 most expensive commercial rental markets.

LOCATION	COST ($U.S. per square foot)
London (West End)	$122
London (City)	$112
Tokyo	$84
Moscow	$79
Hong Kong	$65
Mumbai, India	$55
Warsaw, Poland	$54
Paris	$50
Frankfurt, Germany	$48
New Delhi, India	$46
Singapore	$46
Stockholm, Sweden	$43
New York City (Midtown)	$43
São Paulo, Brazil	$42
San Francisco	$40

Source: Cushman & Wakefield Research Services

ACQUISITIONS

NBBJ Picks New Starting Lineup

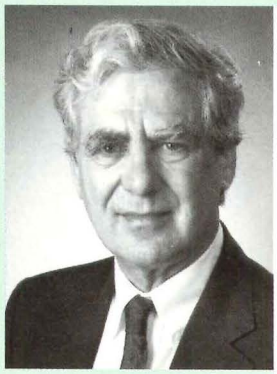
Last month, Seattle-based NBBJ announced three major staffing changes that promise to stoke the nation's fifth largest architecture firm's design cachet. **Timothy Johnson** (above left), formerly of Ellerbe Becket in Minneapolis and New York City, has become NBBJ New York's design principal. **Richard Clarke** (above center), who most recently ran Leo A Daly's Washington, D.C., office, has signed on as a design principal of NBBJ's San Francisco branch. Ending the guessing game that started when **Richard Keating** (above right) abruptly left DMJM in November (*Architecture*, December 1998, page 27), NBBJ has announced that he will join the firm as a design principal of their Los Angeles office. *M.J.O*

OVERHEARD

Out of ArchAfrica

ArchAfrica, a four-day conference held in Durban, South Africa, in October, included presentations by delegates of more than 15 countries and bestowed honorary membership into The African Union of Architects upon President Nelson Mandela. Gavin McLachlan, of the department of architecture of the University of Port Elizabeth, South Africa, discussed the challenge of preserving the architectural traditions of post-Colonial Africa. Following is an excerpt of McLachlan's address. *Michelle Patient*

"In the developing world, important cultural resources are threatened by the desperate satisfaction of the basic needs of rapidly expanding populations and are beset by a pervasive lack of funds. As the governments of southern Africa attempt to develop a strong private sector . . . they seem to have bought into market capitalism so completely that there can be little doubt that they would choose commercial developments over conserving Colonial European architecture. Old buildings are an important economic resource in their own right and not just an obstacle to development."



TRIBUTE

Topaz-Winning Educator Seligmann Dies

Werner Seligmann, former dean of Syracuse University's school of architecture from 1976 to 1990, succumbed to cancer on November 12. Last spring, Seligmann received the American Institute of Architects and the Association of Collegiate Schools of Architecture's prestigious Topaz Medallion for excellence in teaching and scholarship. Over his 40-plus-year career, he taught at numerous architecture schools including Harvard, Cornell, and Yale universities. His namesake firm, founded in 1961, completed several noted institutional projects, including the Beth David Synagogue in Binghamton, New York, for which he received a 1963 P/A Award. *M.J.O.*

PRESERVATION

Hello Dolley

The National Trust for Historic Preservation and the U.S. Mint have unveiled the Dolley Madison Commemorative Silver Dollar—the first American coin to depict a First Lady. Designed by Tiffany & Company, the coin's obverse features a portrait of Dolley Madison, wife of fourth President James Madison; its reverse depicts Montpelier (c. 1760), the Madisons' 2,700-acre Virginia Piedmont residence, a National Trust Historic Site. Proceeds from the coin, which will be sold for about $35 for two years, will fund preservation at Montpelier. *M.P.*

For more information, call (800) USA-MINT or visit the National Trust Web site at *www.dolleycoin.nationaltrust.org*.

THE MARKET

HLM Goes Public

In an effort to slash red ink, HLM Design (née Hansen Lind Meyer) became the first architecture firm to hold an initial public offering (IPO) in June. While several engineering or construction firms are listed on national exchanges, HLM claims it is the first that counts architecture as its primary business.

HLM entered the Nasdaq small capitalizaton index under the trading symbol of HLMD. Stockholder reports indicate that after the first quarter, HLM unloaded nearly $3 million in debt, allowing the firm to "position itself to resume growth with new projects." Charlotte, North Carolina-based HLM currently boasts offices in Atlanta; Chicago; Denver; Iowa City, Iowa; Orlando, Florida; Philadelphia; Portland, Oregon; Sacramento, California; and Washington, D.C.

Last month, at the close of the second quarter since the IPO, the firm announced the acquisition of Dallas's JPJ Architects, raising its annual design construction volume to more than $900 million. At press time, HLM stock, which opened at $6.25 per share in June, was holding steady at around $5 per share. *M.J.O.*

HLM Ds n 45/8 – 5/8

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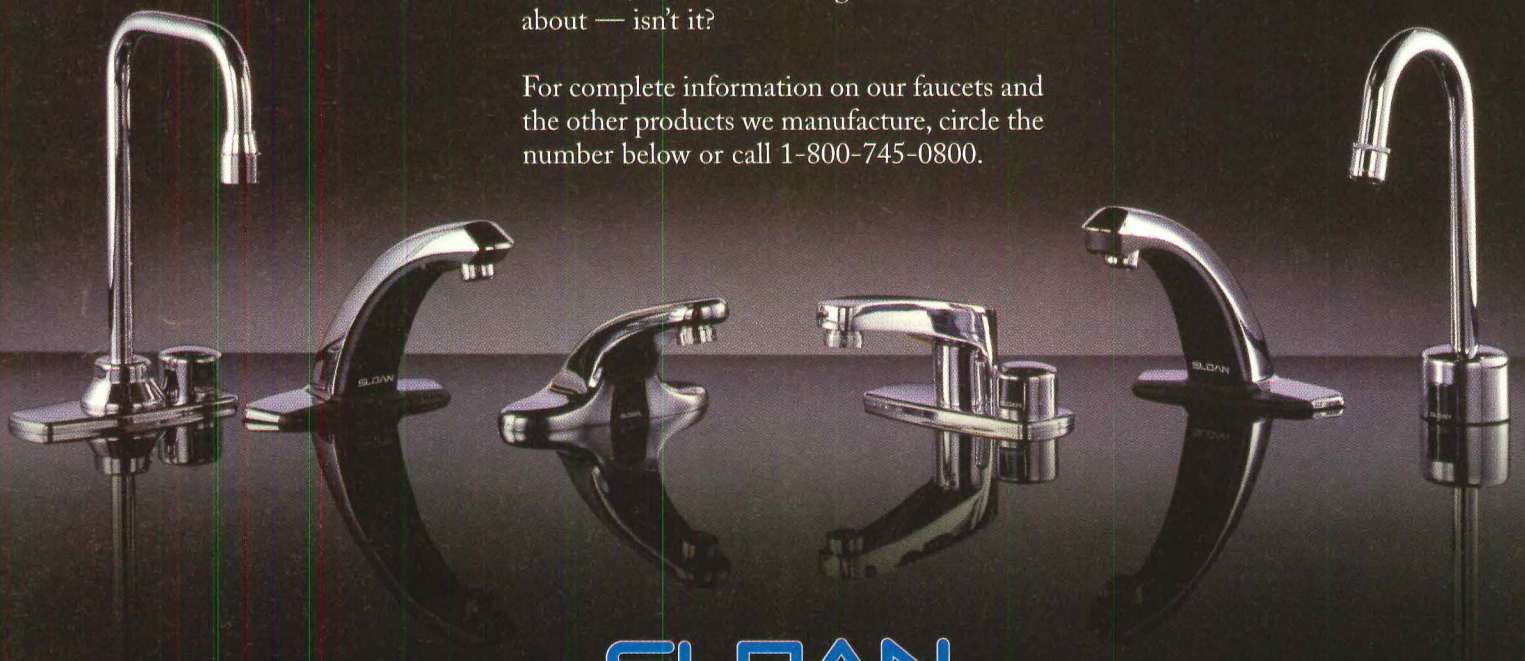

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Buzz

Pei Cobb Freed & Partners' Ronald Reagan Building and International Trade Center in Washington, D.C.; **Kohn Pedersen Fox Associates'** Mark O. Hatfield U.S. Courthouse in Portland, Oregon; **Tobey + Davis** and **Davis, Brody, Bond Architects'** U.S. Bureau of the Census National Data Processing Center in Bowie, Maryland; and **The Miller/Hull Partnership**'s Point Roberts Border Station in Point Roberts, Washington, all received prizes in the 1998 U.S. General Services Administration Design Awards.

Norman Foster has won the annual Stirling Prize for the best building in Britain for his American Air Museum at Duxford in Cambridgeshire, England. The museum bested 10 other finalists, including **Colin St. John Wilson**'s controversial British Library.

Last month, the **National Park Service** released a comprehensive design plan for the White House that calls for a $300 million, 20-year-long modernization and expansion. Read a 24-page summary of the plan at *www.nps.gov/planning*.

In December, a small group of architecture students from around the country completed a memorial to the 110 victims of the crash of ValuJet Flight 592 in Everglades National Park, which killed a University of Miami architecture student.

Herzog & de Meuron Architects will design a new 100,000-square-foot home for the Jack S. Blanton Museum of Art at the University of Texas at Austin. New York City's **Weiss/Manfredi Architects** will design the 15,000-square-foot Museum of the Earth in Ithaca, New York.

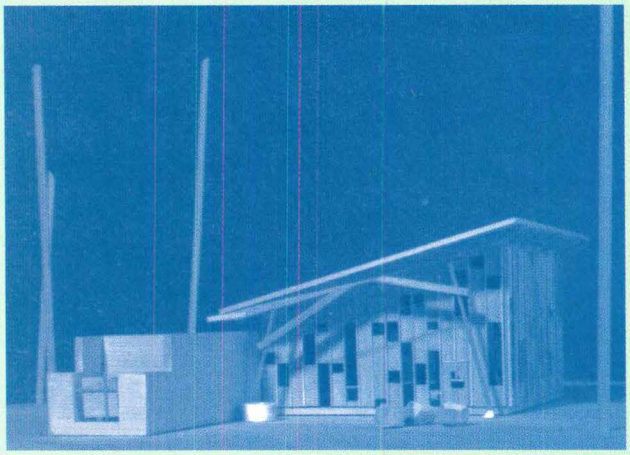
Simon Martin-Vegue Winklestein Moris will work with London's **Richard Rogers Partnership** to upgrade the Transbay Terminal in San Francisco.

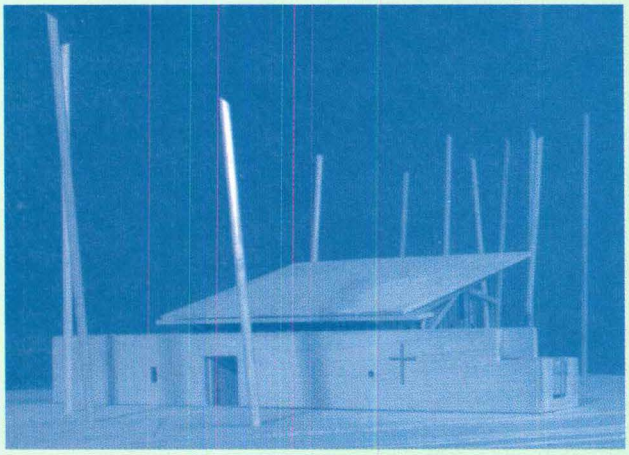
Robert A.M. Stern Architects has designed the $85 million Hobby Center for the Performing Arts in Houston. Stern has also completed a scheme for 1,300 new housing units on a 4,500-acre development in Tuxedo, New York.

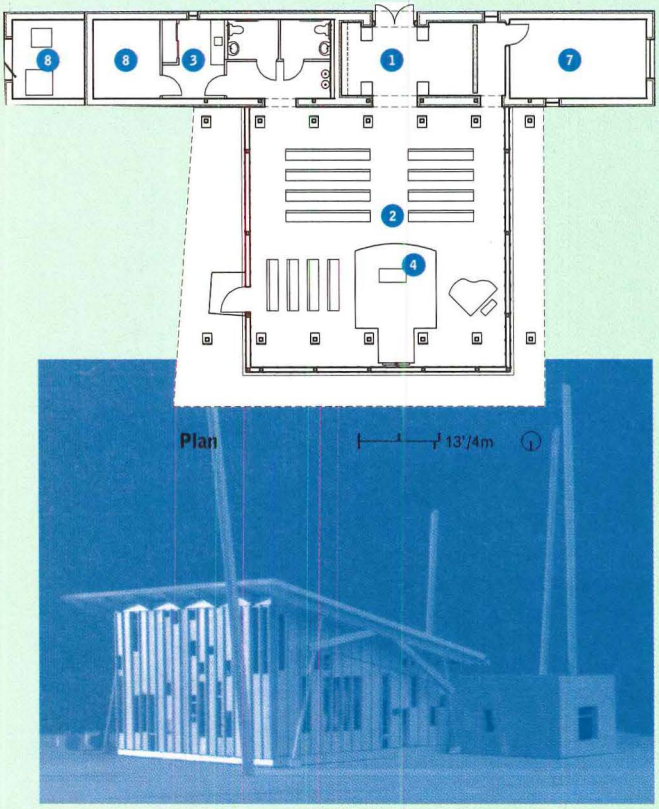
The National Trust for Historic Preservation has added New York City's **Lower East Side Tenement Museum** to its National Trust Historic Sites collection. The 19th-century tenement re-creates the Lower East Side immigrant experience.

Indianapolis-based **Ratio Architects** will design the 230,000-square-foot Indiana State Museum in their hometown. They also secured the commission to design a 1,000-seat church for the St. Bartholomew Roman Catholic Parish in Columbus, Indiana.

OBITUARY:
Modernist architect **Judith Davidson Chafee**, 66.







Shaping Modern Religion

Kerns Group Architects,
United Methodist Board of Child Care Chapel, Baltimore

DeBartolo Architects, First Assembly of God, White Plains, New York

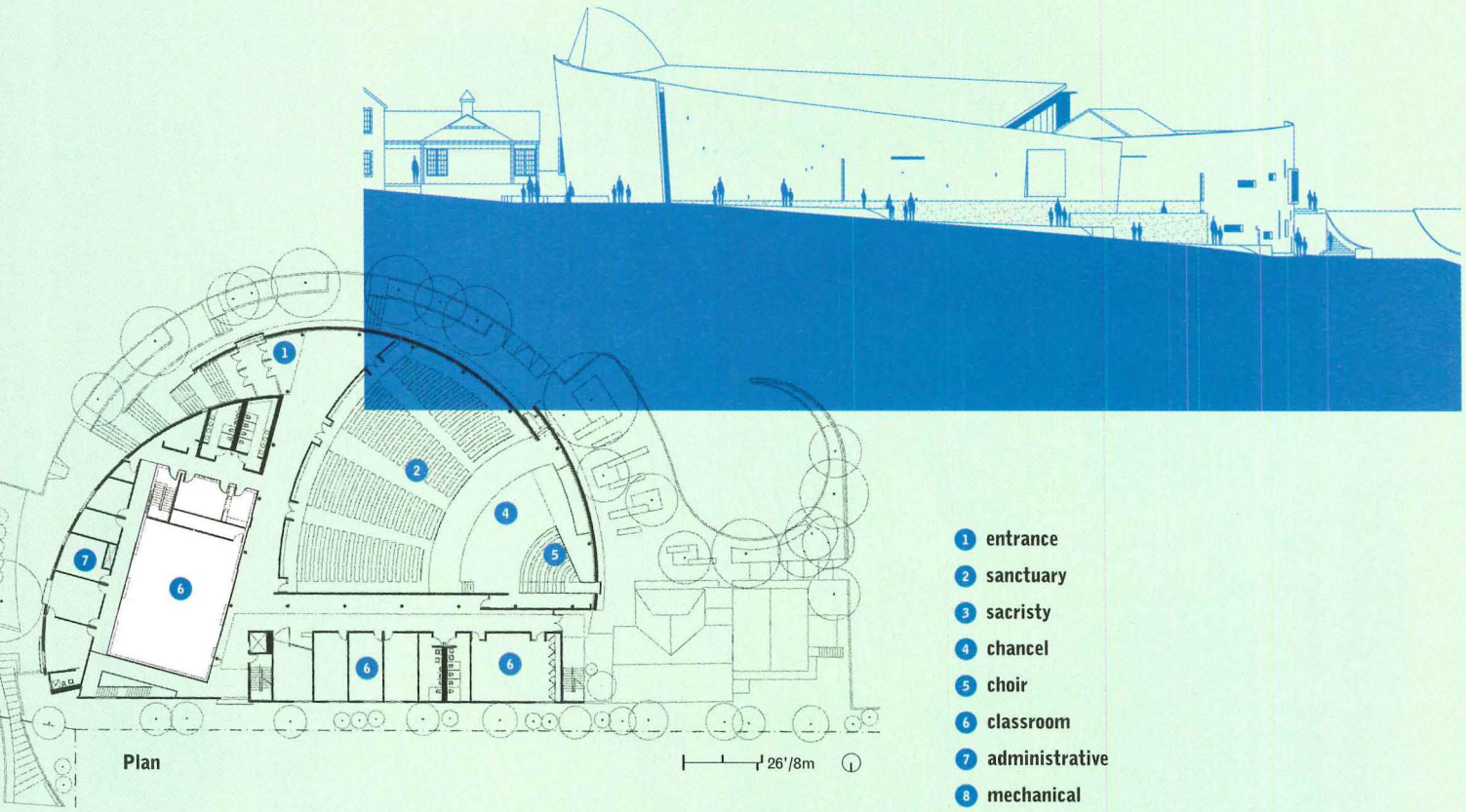
Designing a Modern landmark for the 'burbs can be a daunting task, but two new religious buildings confront that challenge with sensitive scale and thoughtful siting. Baltimore's United Methodist Board of Child Care charged Arlington, Virginia-based Kerns Group Architects with crafting a small chapel for the organization's outreach ministries on its wooded Baltimore campus. The architect crafted a simple, T-shaped structure—a square wooden sanctuary and an ashlar stone-clad bar building—that holds 75 worshippers within its 2,300 square feet.

A canted roof slopes toward the chapel's entrance on the south elevation, a minimalist, practically windowless composition. In contrast, fenestration placed randomly between the building's 2-foot-on-center framing studs on the other three elevations hold clear and textured glazing and translucent rice paper to create dappled lighting effects in the sanctuary. The Board of Child Care Chapel is currently under construction; the organization hopes to hold inaugural services this spring.

After years of overcrowding its 1950s 200-seat facility in New York's Westchester County, officials at White Plains' Assembly of God church commissioned Phoenix-based father-and-son team DeBartolo Architects to create a new church on a 2.5-acre site that would triple its capacity and raise its esthetic profile.

Starting with the base of a styrofoam coffee cup as a template and a $4 million budget, the elder DeBartolo engulfed the existing chapel in a swirling semicircular mass that maintains the suburban street edge. A glazed vestibule sits at the confluence of two offset arcs that frame an entrance stair. Inside, this entrance opens onto a wedge-shaped sanctuary of roughly half of the structure's 24,000 square feet (classrooms and rehearsal areas comprise the other half). Cast glass apertures in the rough plaster shell and a terne-clad cupola will animate the church with changing morning light. Pending final city approval, church officials hope to unveil the completed Assembly of God in mid-2000. *Michael J. O'Connor*

Lightness of perforated **east elevation** (top left) contrasts with monolithic **south entrance facade** (above left). Triangulated truss system and exterior wooden columns (left) support roof overhang. View of **north and west elevations** shows clear division of boxy sanctuary and stone-clad bar building that contains chapel's support functions.



Plan

26'/8m

1 entrance
2 sanctuary
3 sacristy
4 chancel
5 choir
6 classroom
7 administrative
8 mechanical

Pitched roof of **existing chapel** (top and highlighted in plan) peeks out from view of south elevation. Parishioners enter sanctuary by ascending stair that follows arc's curve. Perspective (below) from southeast illustrates variegated **cast glass openings**. Large projected square opening demarcates second-floor conference area. Abstracted trees indicate site's wooded quality.

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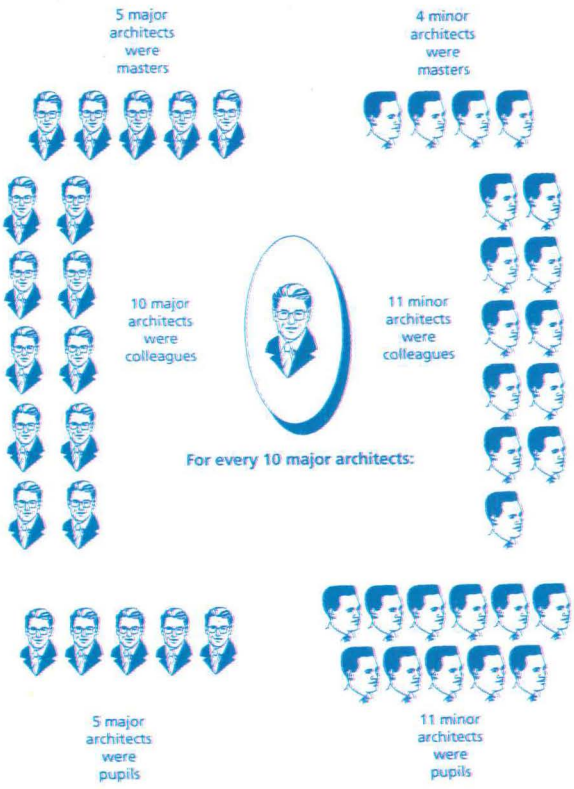

Figure 4.11 The relations between major architects and others. Numbers are for a group of ten major architects.

Background, not talent, accounts for professional success, says the author of *The Favored Circle.* Review by D.S. Friedman

Making It

The Favored Circle: The Social Foundations of Architectural Distinction
By Garry Stevens (The MIT Press)

According to Garry Stevens, author of *The Favored Circle*, genius and all its appurtenances—inspiration, poetic insight, taste, reflection, wonder, invention, artistic skill—mask a truer path to power and success in architecture. To get to the top, the right stuff matters less than the right school and the right breeding. For Stevens, the highest place in architecture is a small, "favored" circle of elite practitioners who usually inherit their positions within a select network of master-pupil affiliations. Members of the favored circle, Stevens argues, use discourse—theory, history, criticism, and philosophy—to monopolize the way the ruling economic class perceives and values architecture. In turn, the ruling economic class uses architecture to symbolize its power and wealth, a reciprocity that both justifies and funds the architectural elite. The rest of us misunderstand architectural discourse as having something to do with ideas.

Stevens, a research associate in the Department of Architectural and Design Science at the University of Sydney, Australia, pries open the question of class in architecture with intellectual equipment perfected by the French sociologist Pierre Bourdieu, and devotes the first third of *The Favored Circle* to Bourdieu's theory of learning, using it to analyze what Stevens calls the "entire social universe" in which architects operate.

At the heart of Stevens' research is an elaborate and sometimes entertaining statistical interpretation of the *Macmillan Encyclopedia of Architecture*. With this data, Stevens analyzes the historical ebb and flow of major and minor architects since 1400; examines ratios between architects and general populations; traces and quantifies the master-pupil genealogy over time, establishing for instance "a direct chain of personal interaction across 400 years" that links Stanley Tigerman to the 17th-century architect Jacques Lemercier; and describes modern patterns of intellectual struggle between architecture's institutions, priests, and prophets. Buildings, images, and ethics are beside the point: What interests Stevens are the social mechanisms that create and sustain the social status and reputation of the architect in Western culture.

Truisms are as populous as graphs in this book. Take Stevens' conclusion that "those with a habitus that predisposes them to play the game they have chosen to enter, and to love to play that game, will do better than those without." Beware also of runaway redundancy, such as Stevens on what Bourdieu's concept of "habitus" actually means—it is both "a structuring structure" and "a structured structure," he writes—or worse yet, when he unleashes phrases like "naturally natural naturality."

Notwithstanding its splenetic resentment of the architectural intelligentsia, *The Favored Circle* offers litigants an indispensable reference in the quarrel between art and science. Stevens' sociology adds often illuminating statistical evidence of structural inequities in professional education and culture. With good cause, he warns us at the beginning that in order to state his case at all he has to overstate it, and his overstatements often prove startling and insightful. He sheds new light on old problems in architecture. Alternative solutions for teaching and practice he leaves up to us. ■

Architect Daniel S. Friedman is director of the Center for the Study of Practice at the University of Cincinnati.

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SCARED?

Mike Davis thinks you should be.

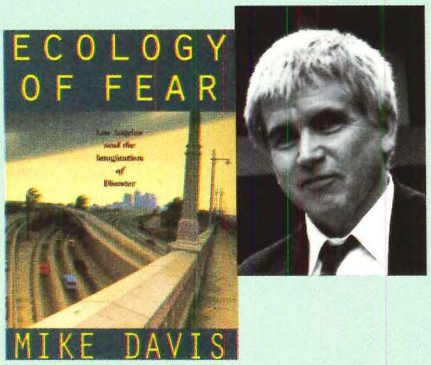
Interview by Cathy Lang Ho

With the publication of *City of Quartz* in 1990 (Verso), Mike Davis offered a new approach to urban history—an electric blend of street reporting with Marxist theory, and sober analyses with unabashed activism. Written in a deliciously literary, defiantly provocative style, the book generated a huge reaction by questioning the underlying social, cultural, and political forces that shaped Los Angeles, and posed questions about how all cities are built, grow, thrive, or disintegrate.

Los Angeles is again the focus of this native son, whose new book, *Ecology of Fear: Los Angeles and the Imagination of Disaster* (Metropolitan Press) draws on environmental science, social theory, intellectual history, and more, to interpret the meanings and costs associated with the city's frequent disasters. Today, the one-time meatcutter and truckdriver teaches urban theory at Southern California Institute of Architecture and writes regularly for *The Nation* and the *Los Angeles Times*. Earlier this year, he received a MacArthur "Genius" Fellowship.

CATHY HO: Why did you write *City of Quartz*?
MIKE DAVIS: There had been no truly comprehensive framework for understanding Los Angeles; L.A. histories tend to focus on different facets, like economics, politics, or architecture. *City of Quartz* was an

Films like *Volcano* (above) underscore the idea of a disaster-prone Los Angeles.



attempt at a more integrated and radical critique of the place. I studied how the image of the city, as a land of endless fair weather and opportunities, became a force in the selling and building of the city.

How do *City of Quartz* and *Ecology of Fear* relate?

City of Quartz and *Ecology of Fear* are actually the first two installments in a trilogy, the outcome of a conversation I imagine occurring between three figures who have been important to me: philosopher Walter Benjamin, who doesn't commit suicide at the Spanish border but arrives in Hollywood; as does Fernand Braudel, postwar environmental historian and author of *The Mediterranean and the Mediterranean World in the Age of Philip II*; and socialist Friedrich Engels who, more than Karl Marx, was a great pioneer in urban sociology.

I look to Benjamin for how he studied the relationship between culture and ideology, between the concrete reality of the city and the ideas it represents; to Braudel for relating history and nature; and to Engels for his perspectives on labor and the working class. The conversation might be interrupted from time to time by playwright Bertolt Brecht, who also lived in L.A., but like so many Weimar exiles, always felt alienated by the place, probably because he never bothered to explore it.

Tell us about the last part of your trilogy.

The third volume (Engels' imaginary contribution) is strictly under wraps, because I have no way of anticipating what terrible beauties or social eruptions the next period may bring to Los Angeles. Each of my books has changed course midway in writing to accommodate new realities. What I can say is that the final part of the trilogy will focus on Los Angeles as a Latino and Pacific Rim metropolis, with due attention to the role of labor and community protest.

Do you think that practicing planners and designers can make use of your brand of urban theory and history?

When people write activist books, they of course work from within the framework of political strategy, with the ambition of changing things. If you talk to real planners, you find they're desperate for concrete solutions. The point is to give groups and neighborhoods and families a wide variety of options to help them modify space in ways that reinforce feel-

ings of community, solidarity, identity. These are things that people should be demanding from cities and developers. But instead of helping people to realize their goals, planners and developers are only telling them the limits of what's possible.

What about the conflicts that arise when people's goals vary?
What's been so deadly to American cities is the failure to get citizens' input, so planning and design fail to represent many key groups. It's important to remember that each goal has more than one dimension. When I speak to environmental groups, I try to point out that all their issues must somehow be tied to jobs or projects for inner-city youth, for example, because these are two sides of the same coin. Edge-city development threatens not only agriculture and the environment but also the life of cities and older suburbs. In fact, cities and older suburbs are subsidizing their own downfall; public funds finance expansion of the infrastructure to the edge, which caters to a mostly affluent population. So I always emphasize that environmental goals must be equally motivated by socioeconomic equity; every environmental act must also have a social edge.

Do you equate resolving the crisis of the city with resolving the global environmental problem?
The way we read a built landscape to understand society should include the natural landscape as it existed before we changed it. In *Ecology of Fear*, I hoped to imply that scarcity can prompt bursts of creativity, just as the converse idea—artificial abundance—can limit ingenuity and encourage dumb practices. The tragedy of L.A. is that things like energy, land, and water have been so artificially cheap that we've ended up with a surplus of dumb buildings. The problem is, the benefit of cheap natural resources doesn't accrue equally across the population; the bottom third of the population suffers disproportionately because they have less access to the amenities that make an environment comfortable, whether it's air conditioning or natural shade.

More of our standard of living needs to be transformed into collective rather than private consumption. The great value and distinction of the city is the incidence of the crowd, diversity, promiscuity, public life. Now, with intense privatization, we have multiple cities within the city. With increasingly private residential life, there remains a need for crowds and public space, but we're getting the junk food solution, like the Citywalks and promenades, that destroy the diversity of the city base, because they are all based on chain shopping.

If people like the idea of the city, why do they still flock to places that proffer controlled doses of urbanity?
People feel defeated. It's like how you feel when you're confronted by the homeless. You want to help, but over time, you get stonier. It's disheartening when you hear that liberal cities like Berkeley or Santa Monica are taking the lead with hardline tactics to rid their streets of the home-

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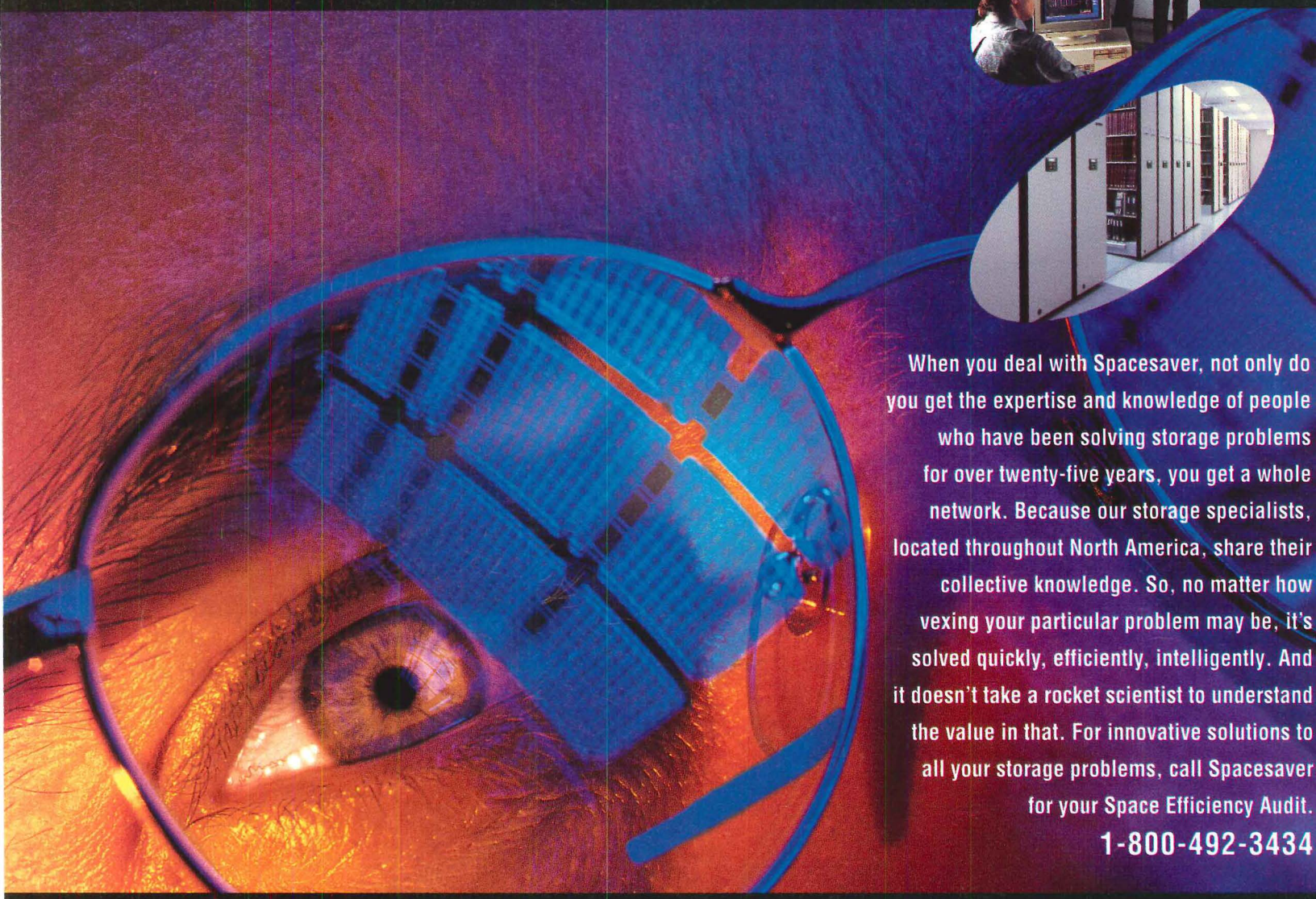

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less. But the solutions are shortsighted. What usually happens is one city pushes its problem onto a neighboring city, and none want to be the other's human landfill. People don't mind that there is a creeping totalitariansm at the level of the use of public space. Ironically, the most affluent districts, like Orange County—a bastion of rugged Republicanism, with an airport named after John Wayne—are the least democratic, with only one lawful way to landscape your lawn, and limits on how long you can leave your garage door open.

Control gives us a sense of safety. But *Ecology of Fear* shows us that we can't be safe, particularly if we choose to build and rebuild in disaster-prone areas. Given our controlling nature, why do you think we make ourselves vulnerable to uncontrollable forces?
We've so alienated ourselves from any clear understanding of nature that when it behaves according to its natural metabolism, we attach fictions to explain it, or we believe that technological fixes can rescue us. When fires break out, the fire departments and newscasts often fix on identifying the culprit, the careless hiker or arsonist deviant, and they debate methods of prevention and protection, even though it's a natural part of the ecology to burn as regularly as the chaparral regenerates itself. Ignoring the land-use issue—the uncontrolled proliferation of firebelt suburbs—they are locked instead in neutral discourse about public safety, contemplating such things as buying $17 million Super Scoopers, aircraft that can load thousands of gallons of water from the ocean. The book attempts to point out the immense and overarching costs of trying to make the environment safe. But we're also getting to the point where we can't afford another disaster like the Northridge earthquake, which cost $42 billion dollars. Neither the insurance companies nor the federal government will be willing to continue to fund this, and the burden will be spread out among the populace. And you have to think about how these costs are diverting funds from other projects, like low-income housing or fire protection in tenements. Because L.A. has the added weight of a large population living in poverty, you have to question how the social cost is being paid.

Is it too late for a city like Los Angeles to save itself?
No, we can still do things, like implement hazard zoning to keep development away from delicate and dangerous ecologies; for example, when a mansion burns down in Malibu, it is not rebuilt, thus gradually expanding the park system; revise zoning to encourage infill, to allow L.A. to achieve medium density; and preserve open space, which is key to responsible urbanism. These are important for not only economic but also social reasons, and would contribute to L.A. becoming both a safer and a far more egalitarian city. ■

Cathy Lang Ho is editor of Design Book Review.

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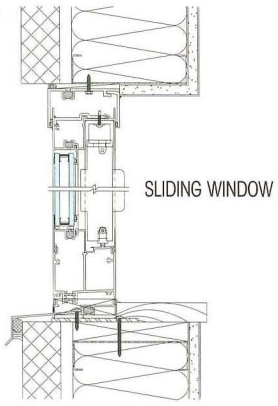

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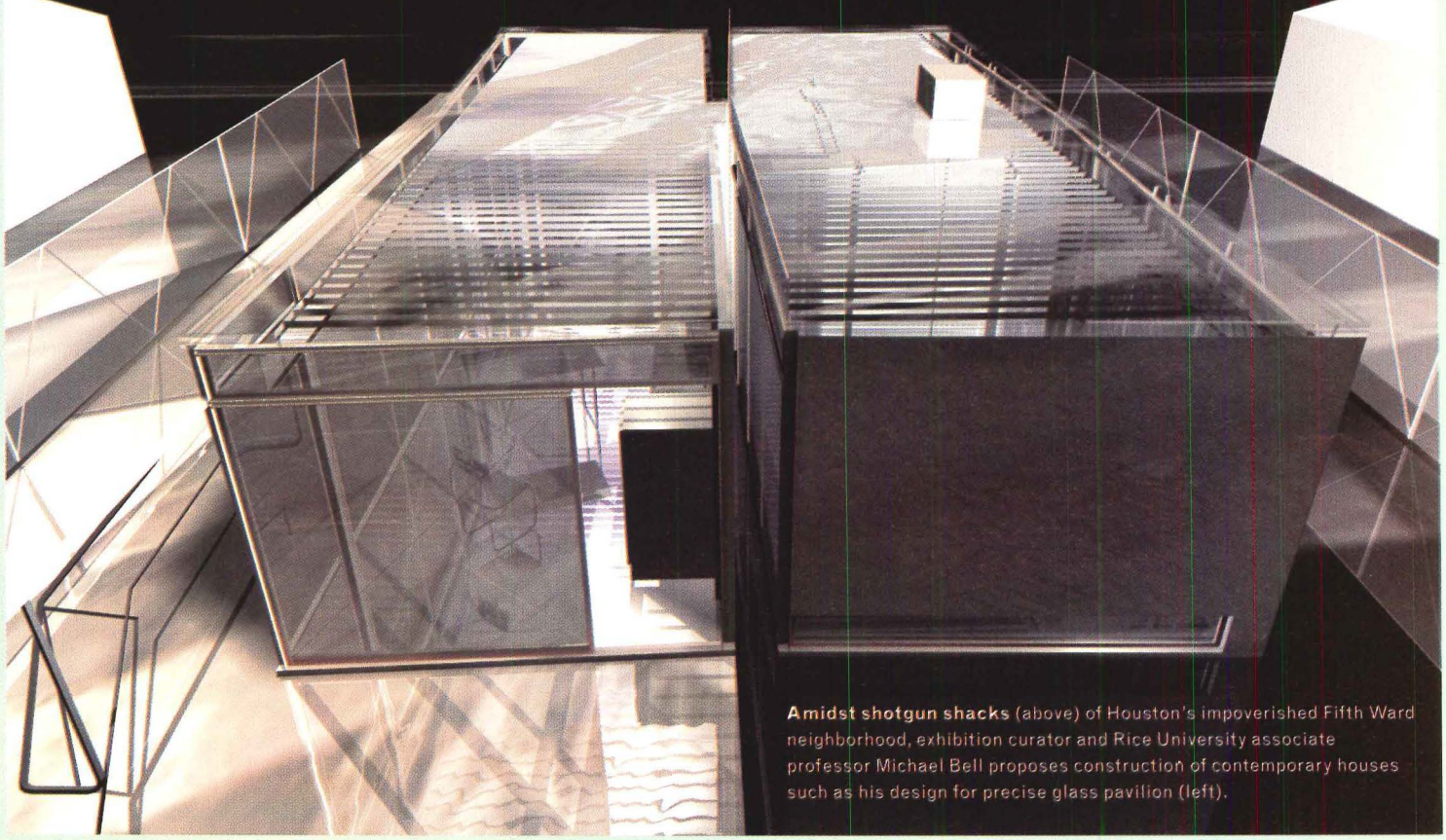

Amidst shotgun shacks (above) of Houston's impoverished Fifth Ward neighborhood, exhibition curator and Rice University associate professor Michael Bell proposes construction of contemporary houses such as his design for precise glass pavilion (left).

An exhibition of new houses offers hope to a struggling Houston community. By Shaila Dewan

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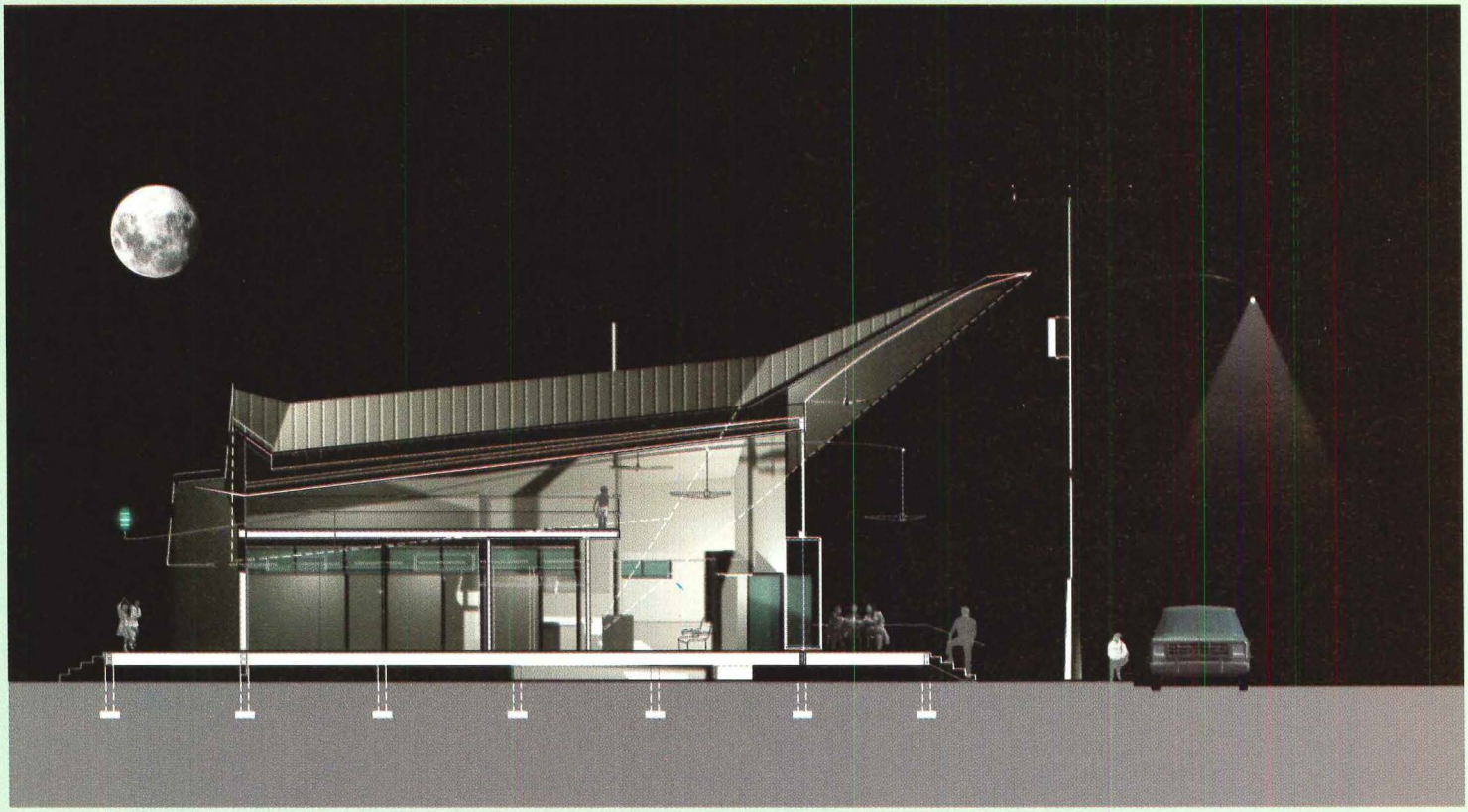


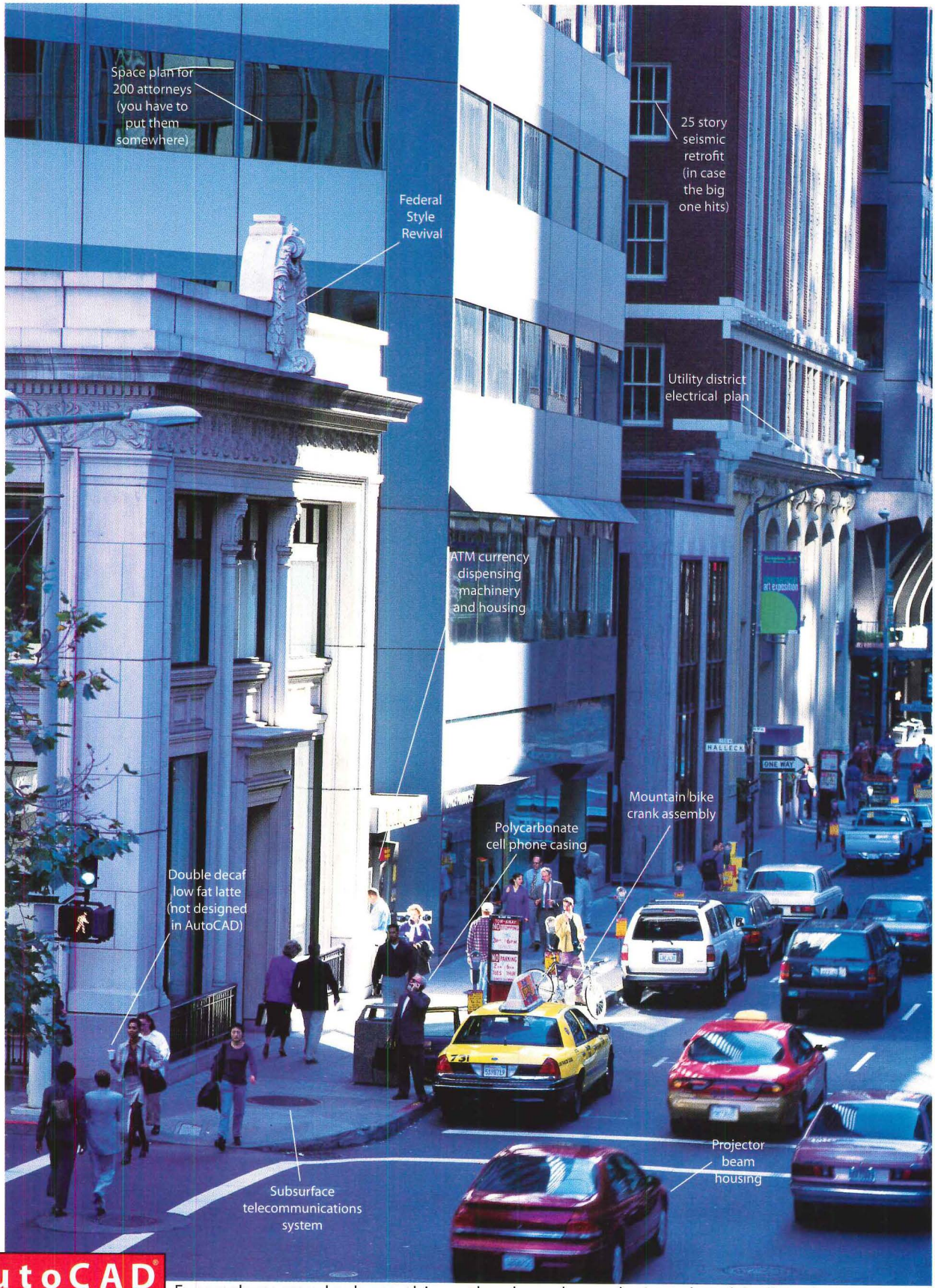
Ceiling fan on front porch (above, at right)is mounted on suspended scaffold that pierces Lindy Roy's house lengthwise, and ends, outside back door, with bug zapper (at left).

Houston, where land is cheap and density a non-issue, is a perfect place to promote single-family home ownership as housing policy. The city's Homes for Houston initiative issued 1,500 down-payment grants to people with below-median incomes in 1998. The grants reflect a shift in federal housing assistance away from large-scale rental projects, whose siting, density, and racial segregation were a source of antagonism for communities across the country. This new emphasis on single-family ownership is bringing housing policy in step with the goals of community-based urban revitalization, one of whose central tenets is the belief that ownership promotes pride of place. (It's important to note that vouchers do little for the poorest of the poor, who don't qualify because they lack steady incomes and good credit).

Set in the lee of Houston's downtown, the blighted Fifth Ward—once a thriving black community that produced late congresswoman Barbara Jordan, boxer George Foreman, and Smith College president Ruth Simmons—is a prime candidate for stabilization through ownership. Many of the families that fled "the Nickel" after desegregation still have strong ties to its churches and elderly residents, and are gravitating back to the neighborhood through the grassroots efforts of the nonprofit Fifth Ward Community Redevelopment Corporation (CRC).

Since 1991, the Fifth Ward CRC has built 100 houses, the designs of which meld modestly with the neighborhood's 1940s vernacular wood bungalows. Now, with the goal of offering clients a wider array of choices, the CRC has created a window of opportunity for innovative design. Teaming up with Rice University School of Architecture associate professor Michael Bell as curator, the CRC commissioned 16 architects, including San Francisco-based Stanley Saitowitz, Houston-based Carlos Jimenez, and New York City-based Lindy Roy, to design affordable ($75,000 with soft costs included) houses for the Fifth Ward.

What are you going to design next?



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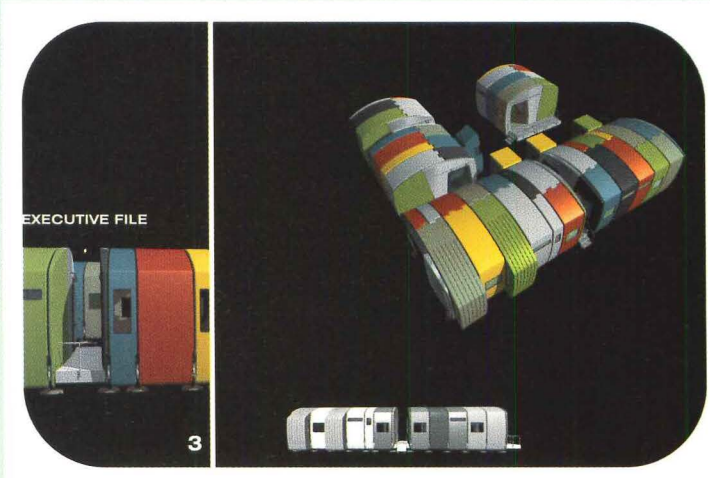
Houston's DiverseWorks Artspace exhibited the results in November, and the Graham Foundation will underwrite a forthcoming catalog. Most importantly, the CRC will build six of the houses in the Fifth Ward and sell them to clients, whom the CRC will help get loans, and, if they qualify, federal down-payment vouchers.

It will be interesting to see which houses the CRC chooses to build, not to mention which of the chosen meet their budgets, and which find buyers among the 300 families on the CRC's waiting list. Some of the strongest designs in the *16 Houses* focus on innovation to the exclusion of contextual sensitivity: There's no way materials such as metal, translucent plastic, and fiberglass screens can be discreetly introduced in a neighborhood that, bypassed by Houston's slap-happy mania for development, has retained a cohesive modesty of scale, materials, and esthetics. While firms like Taft Architects and Jimenez offer tuned-up, spacious versions of your basic four walls (with a cost-saving prefab kitchen in the former and a vibrant red, gently pitched roof capping the latter), others in the exhibit ask—demand, really—that home buyers venture onto a precipice sans the guardrails of nostalgia.

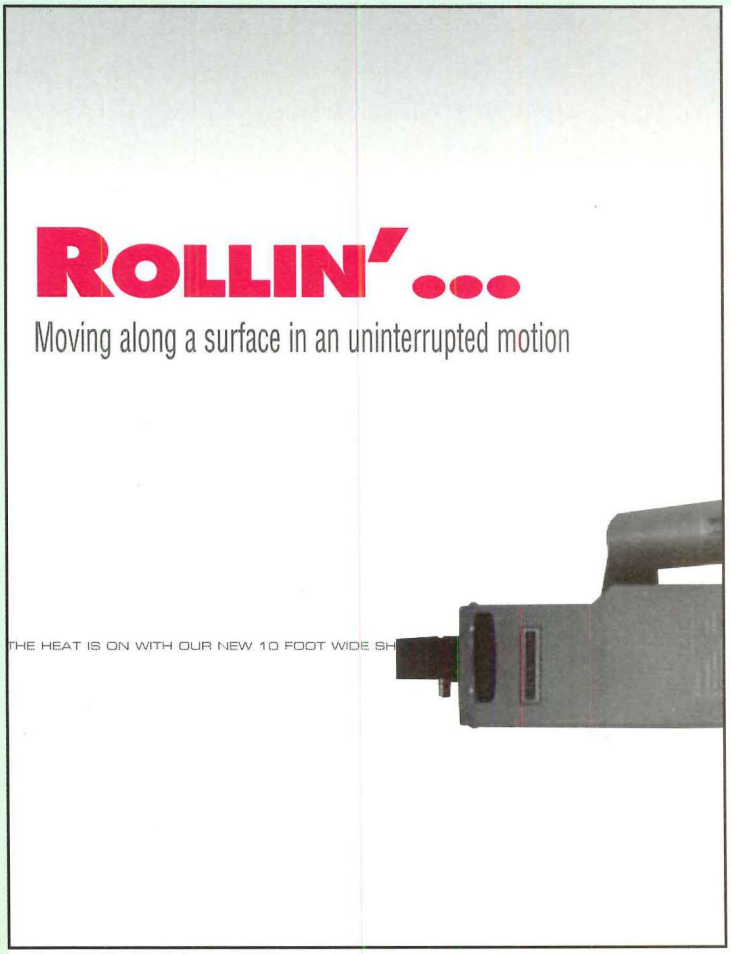
At its best, that demand is exhilarating, and the notion that the Fifth Ward could absorb a few gorgeous anomalies—Saitowitz's fluid, athletic version of the Modernist box, for example—is seductive. Of course, *16 Houses* at times reaches beyond the probable to the fantastic. On the theoretical end, Bell's Glass House No. 347 @ 2 Degrees remakes the Modernist house of pure spectacle by using its mass-produced, banal residue—sliding doors—as walls. Mark Wamble and Dawn Finley's BinderHouse looks forward rather than back by positing a remarkably flexible "Klip Binder" system, in which injection-molded building components are manufactured by brand-name companies (the "Cookerklip" by Coleman, the "Surroundklip" by Sony) and fastened together in sexy, tubular configurations of the client's choice. With trade-in and leasing options, BinderHouse owners can be as fickle and up-to-the-minute with their house as with their other consumer activities.

One stand-out project manages to be both challenging and unprepossessing. Robert Mangurian and Mary-Ann Ray's Cosmos of Houses offers dressed-down, diplomatic functionality that incorporates the outdoors into the design. Mangurian and Ray nestle programmatically ambiguous spaces within a freestanding outer shell. Movable partitions allow the owners to define the use of these spaces for themselves. The master bedroom, for example, can be converted into open seating. With a low-key formal vocabulary including a patina-green pitched roof, the house offers much but dictates little.

If Lindy Roy's galvanized metal house lacks fluency in the Fifth Ward's visual dialect, it makes up for it with an urbanistic, streetward gesture that's as eager as a puppy. The roof reaches up toward a string of telephone wire and streetlights, as if nominating itself for an official



Mark Wamble and Dawn Finley's **futuristic BinderHouse** (left), with its modular building components, more closely resembles trains that transverse the Fifth Ward than the neighborhood's simple wood-framed houses (below left).



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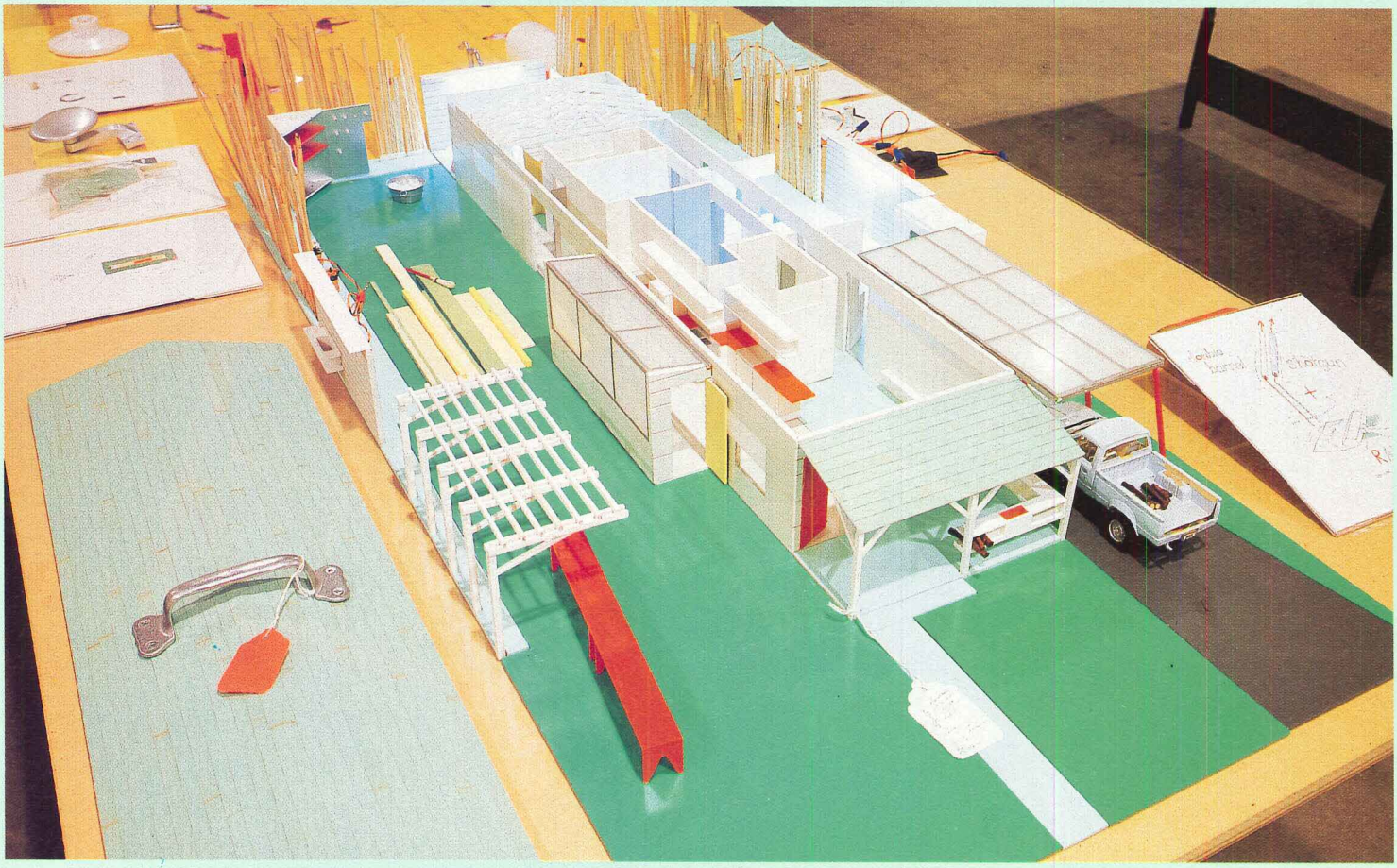
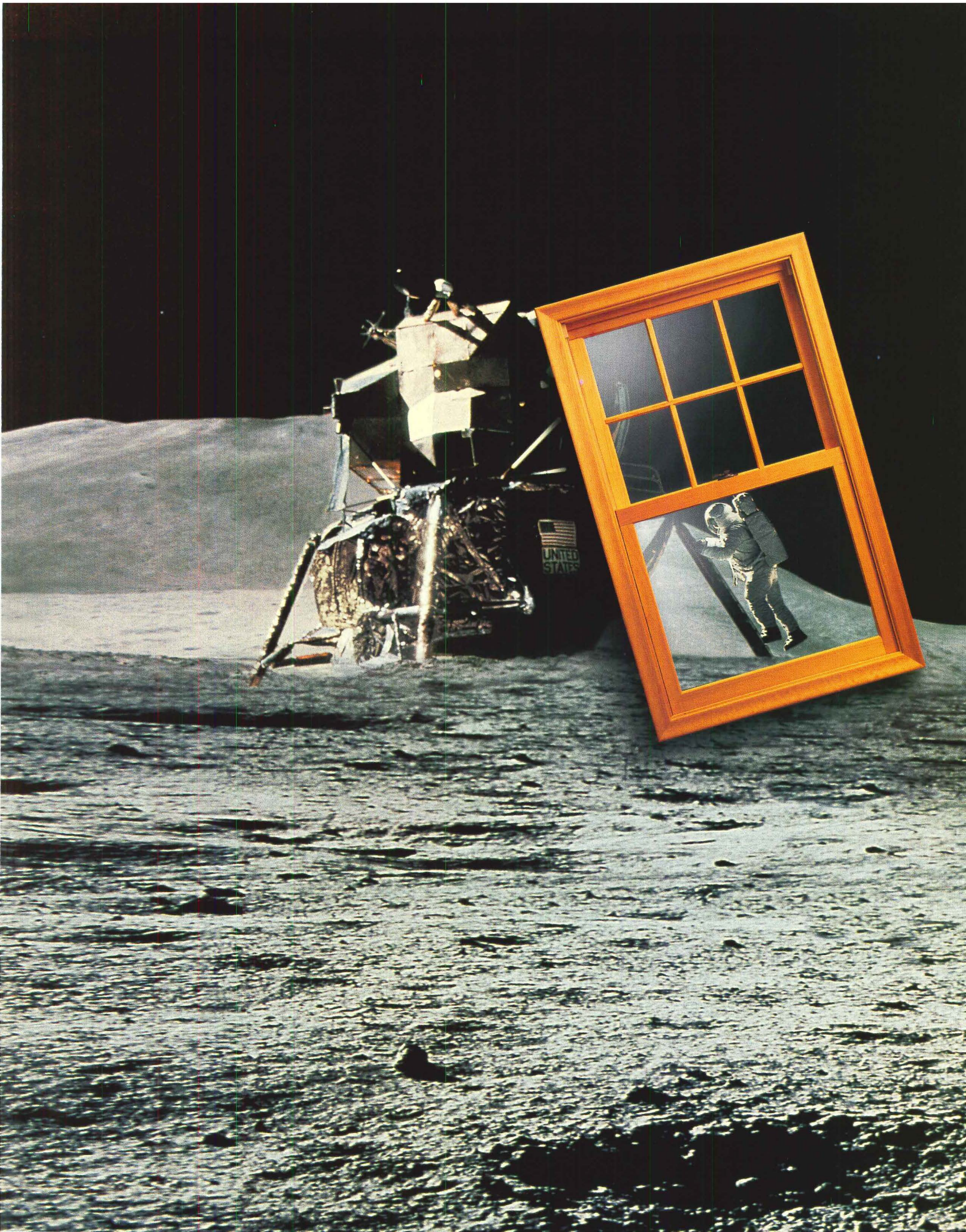


Robert Mangurian and Mary-Ann Ray's **installation** at DiverseWorks Artspace in Houston (above) includes model of house they designed, as well as hardware, construction details, and study drawings.

position in the city's infrastructure. With a touch of the environmental sensitivity that pervades the house, intended to be built of materials that are both recycled and recyclable, that twist of roof doubles as a ventilation-promoting wind catcher.

Domestic floorplans remain largely in default mode even as nuclear families have decayed into new isotopes. So almost any of the designs in *16 Houses*—Morris Gutierrez Architects' garden-centered house with an attached cabana, Chuihua Judy Chung and Sze Tsung Leong's modish, expandable Variable Houses, or Keith Krumwiede's slender and sun-drenched house on stilts—significantly improve the range of esthetic and programmatic options. And although the exhibit hinges on a buoyant optimism about the power of good design to change lives, for the most part participants avoid the grandiose promises of past attempts at housing reform. If there is a common thread in this exhibit, it's a thread of personal narrative. In fact, some of the design teams included artists whose stories and images helped flesh out abstract clients, replacing the bombast of Usonian utopianism with a subtle acknowledgment of individuality and choice. The point of *16 Houses*, ultimately, is not the supremacy of any one design for low-cost housing, but—whether you're plunking down a federal voucher or cash—the pleasure of choosing among many.

Shaila Dewan is a staff writer and art critic for The Houston Press.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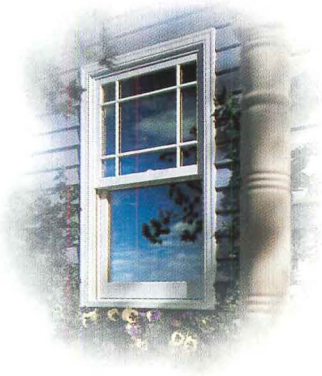

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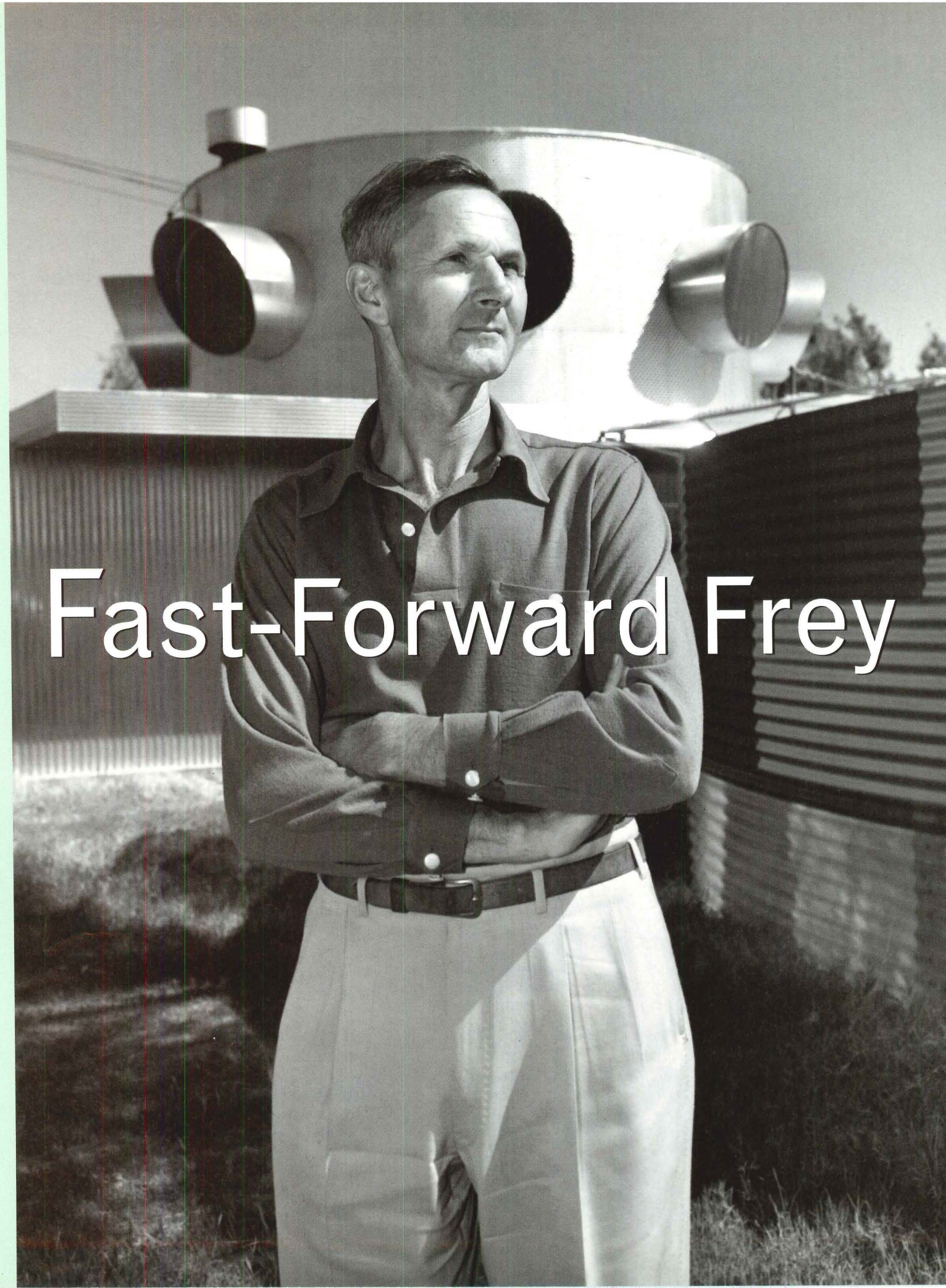

Fast-Forward Frey

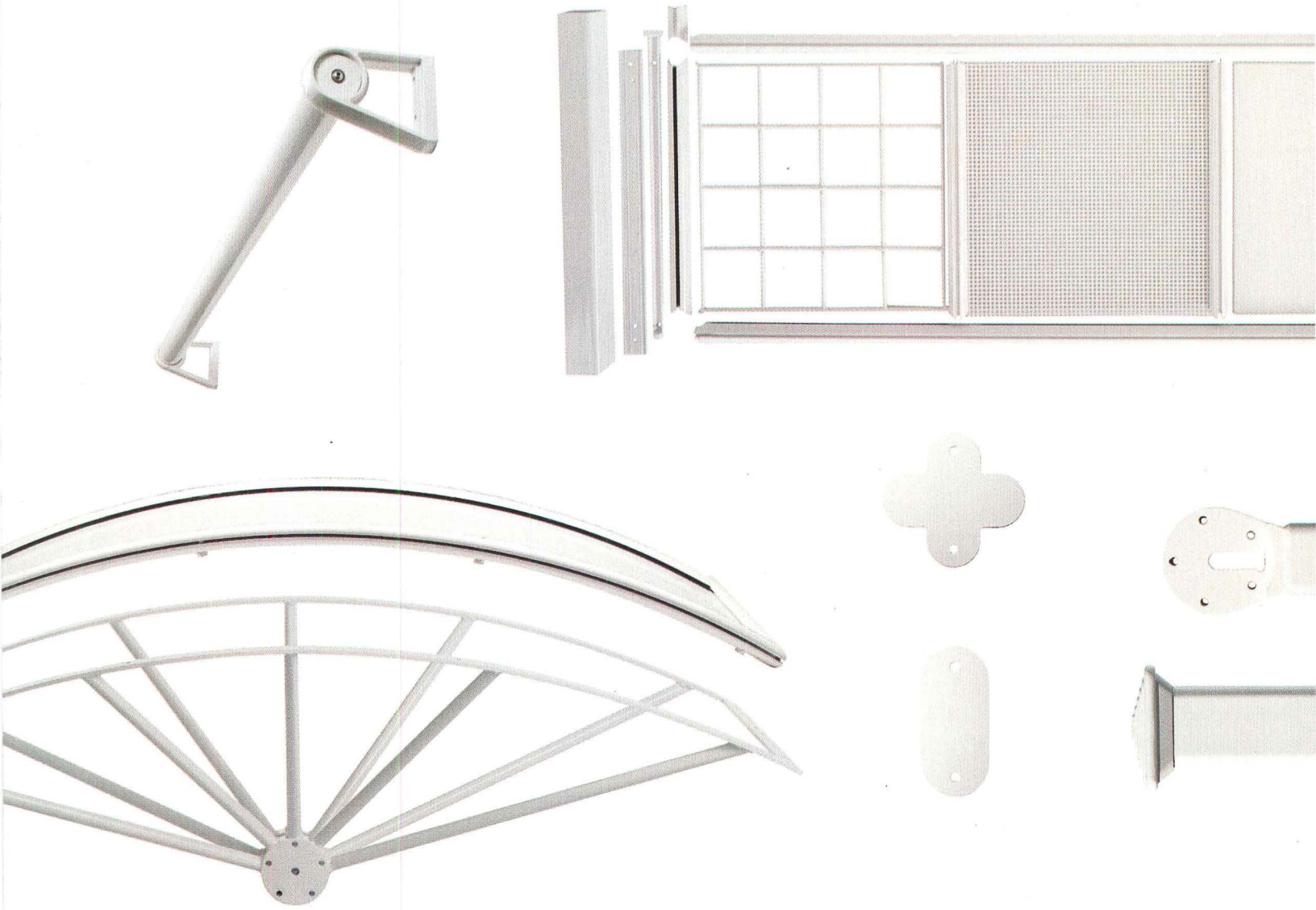
Albert Frey (facing page) stands before flying saucer-like 1953 addition to his 1941 Palm Springs house. Photographer Julius Shulman's **poolside scene** (right) exemplifies modern California lifestyle that lured Frey from New York City. In Frey's open-plan **second house** (below right), boulder separates sleeping area (foreground) from living and dining area (background).

Just as the profession woke up to Albert Frey's futuristic mid-century Modernism, the 95-year-old architect passed into history. By Susanna Sirefman

The forgotten Modernist Albert Frey, the first European disciple of Le Corbusier to build in America, was basking in a global resurgence of interest in his work when he died last November at the age of 95. The current Modernist renaissance, driven by cultural backlash against the excesses of Postmodernism, celebrates the esthetic simplicity and economy of means of Frey and his contemporaries: Richard Neutra, R.M. Schindler, Charles and Ray Eames, and John Lautner. One of the primary catalysts for renewed interest in Frey's work was Joseph Rosa, chief curator of the National Building Museum in Washington, D.C., who in 1987 helped save Frey's seminal Aluminaire House from demolition. Rosa's activism led to a 1990 book and 1991 traveling exhibition of Frey's work, bringing notoriety to the elderly architect after years of neglect. Frey's futuristic residences are now retro Pop icons for the fashion, entertainment, and design flock.

The Swiss-born Frey was swept up by the European craze for all things American following World War I, particularly by the nation's worship of technology. In 1928, while waiting for a visa to relocate to the United States, Frey showed up at Le Corbusier's Paris studio unannounced, and was hired on the spot. For 10 months, Frey worked alongside Charlotte Perriand and Jose Luis Sert in Corb's atelier, developing innovative details from standardized hardware he found in the Sweets catalogue for projects including the Villa Savoye (1931) and the unbuilt Centrosoyous building (1934) in Moscow.

After emigrating to the United States in 1930, Frey spent five years working in partnership with architect Lawrence Kocher in New York City. Expanding on Frey's earlier hardware experiments, the team built



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Frey skillfully integrated Palm Springs house for famed industrial designer Raymond Loewy (1947, left) with surrounding desert landscape.

the prefabricated Aluminaire House in 1931, the first all-steel-and-aluminum house to be built in America (now preserved as a landmark in Central Islip, Long Island, New York). Kocher and Frey designed a number of unbuilt projects in the same mechanistic spirit as the Aluminaire House, including the Experimental Five Room House (1932) and the House of Prefabricated Walls and Floors (1934). According to Jennifer Golub, author of *Albert Frey/Houses 1 and 2* (Princeton Architectural Press), "Albert loved structures that were strictly functional: basketball courts, radio towers—he had a passion for creative engineering."

In 1935, Frey's growing fervor for the American West led him to write to Corb, "The East Coast of the U.S. is still quite European, enlarged to grotesque proportions; it is in the new towns out West, established during the evolution of the automobile, where modern American life is to be found." Frey eventually gave into his obsession with the West and relocated to Palm Springs, California, in 1939. His work there focused on a newfound sensitivity to site. The first house Frey built for himself, completed in 1941, relates to nature with exquisite simplicity, as a Miesian composition of vertical planes protruding into the desert, held in place by an expansive flat roof. In 1953, Frey added a round, aluminum-clad, second-floor bedroom with circular telescopic windows that framed spectacular mountain views. Experimenting on his own homes, Frey incorporated Cor-ten steel, corrugated metals, and plastic-coated metal cables, and designed using these materials' off-the-shelf dimensions.

In the late 1950s and early 1960s, collaborating with architects John Porter Clark and Robson Chambers, Frey produced several significant local buildings: the concrete-block Palm Springs City Hall (1957); the Palm Springs Aerial Tramway (1963), which comprises an enclosed bridge spanning a shallow stream; and the Tramway Gas Station (1965), with a hyperbolic paraboloid roof that spans over 90 feet.

Frey lived his last 34 years in the second, extraordinary glass-and-metal house (1964) he designed in Palm Springs. There, he personified the same qualities found in his buildings: elegant, simple, streamlined, and clever. Even his wardrobe demonstrated a sensual notion of esthetic frugality: He wore shirts, trousers, and socks in a strictly limited palette of white, powder blue, salmon, pale yellow, and beige. For Frey, Modernism was not merely a stylistic issue, but a philosophical way of life.

Architect and author Susanna Sirefman's most recent book is New York: A Guide to Recent Architecture.

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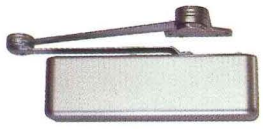

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Sour Note

Seattle's new symphony hall is easy on the ears, not on the eyes.

By Lawrence W. Cheek

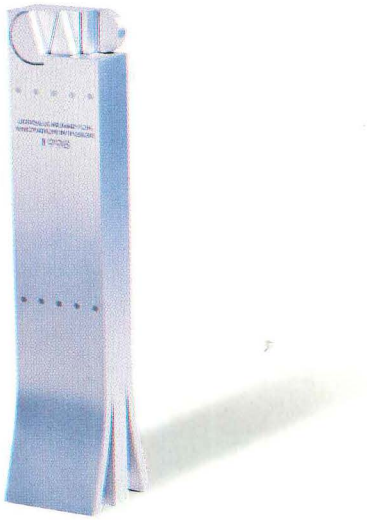
Deep in the opening movement of Gustav Mahler's Symphony No. 1 comes a very low F-natural growl from the contrabassoon, played pianissimo. It's so hushed that you may never hear it on a CD, nor in most concert halls. But in one of the first Seattle Symphony concerts this season in Benaroya Hall, the orchestra's new $132 million home, it was right there, a vivid dotted line etched under Mahler's dense musical fabric. Nearly everyone who has heard music in this hall agrees: Benaroya is a roaring success, one of the best orchestra halls in the world. Acoustically.

But press commentary on the architecture has been sotto voce, and for good reason: There isn't a lot to say. The building, by the Seattle firm of LMN Architects, vaguely resembles one of the region's plump, angular lighthouses toppled over on its side. Ask symphony subscribers to describe the building and they say, "Well...it's kind of yellow." Although it adeptly solves site and functional problems by encasing two concert halls and acoustically isolating them from a subterranean bus terminal, it's so bland in form and bereft of engaging eye-level detail that bus passengers who duck into its long east gallery may never realize they're in a world-class temple of music.

Maybe this is as it should be. Seattleites cherish their arts, but have zero tolerance for airs. This is a city wrapped up in Eddie Bauer, not Giorgio Armani. An imperial palace of a hall, the kind of place designed to make concertgoers feel like mice as they enter, would have been as foreign a presence in gloomy Seattle as a solar energy farm. The city seems satisfied that the excellence of its new hall is concentrated in its substance—the musical experience.

Downtown Seattle, however, even after its remarkable retail revival, desperately needed a centerpiece, a visual symbol. (The Space Needle, that wacky but beloved municipal lawn ornament, is almost 40 years old, and it marks Seattle's emergence as a big city, not its maturity.) There's no great downtown park, no celebration of the waterfront, and no civic building with the charisma of, say, Moshe Safdie's Vancouver Library (1995). As in so many cities, all architectural feasting at street level is at a buffet of pre-1930s buildings.

This is where LMN missed a delectable opportunity. Since the confined site prohibited a Sydney Opera House and Seattle's hip informality argued against a temple, Benaroya should have stirred up some party fun, some architectural commotion, on the street. As it is, the gestures are few and futile, like the thuddingly prosaic quote from composer Aaron Copland etched into the otherwise blank north wall. And inside, the four-story lobby, for all its space, is as devoid of spatial drama as a Boeing hangar. Only a slivered parklet dedicated to Washington state's veterans offers anything worthy of contemplation. Other than, of course, the music.



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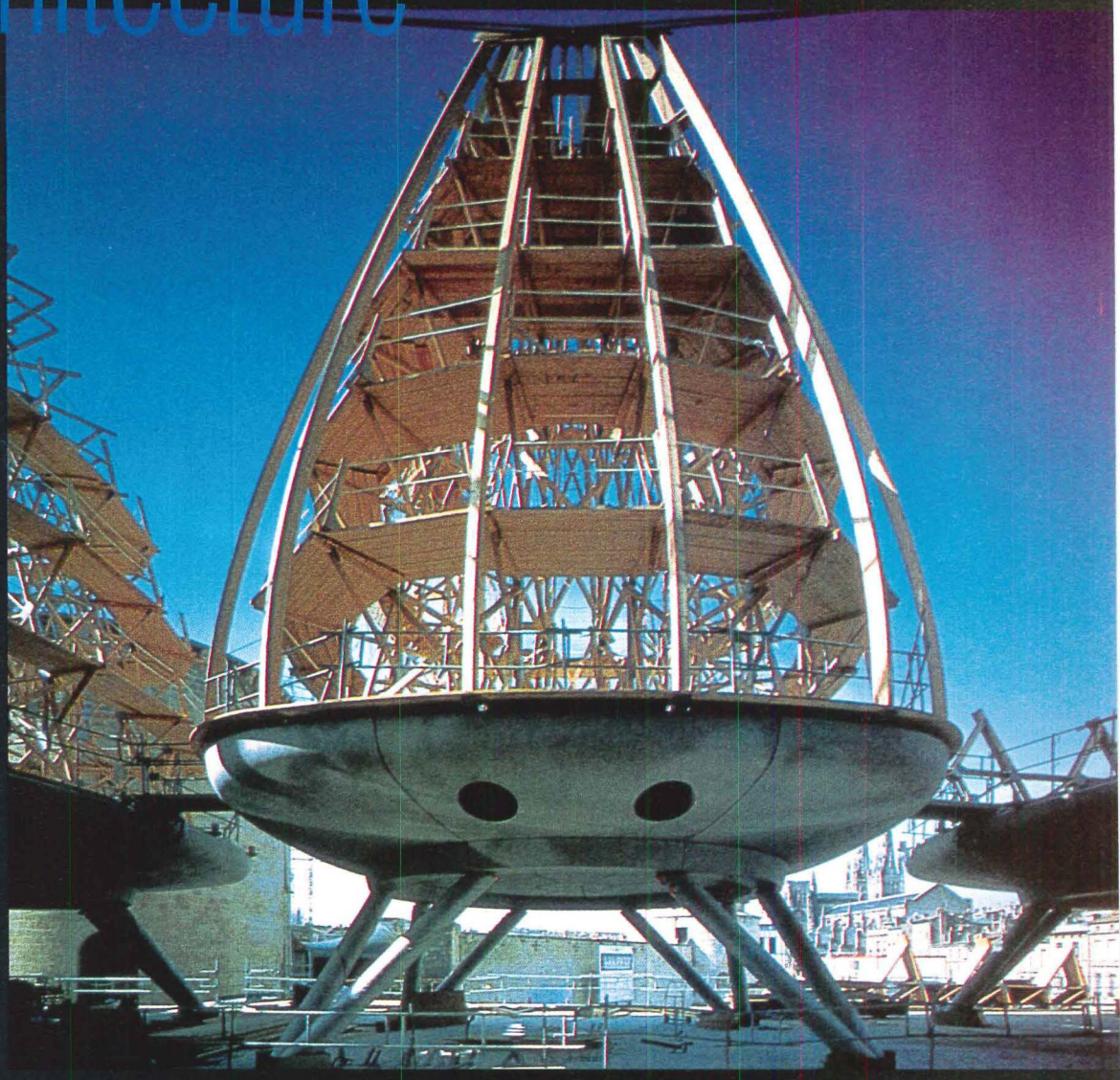
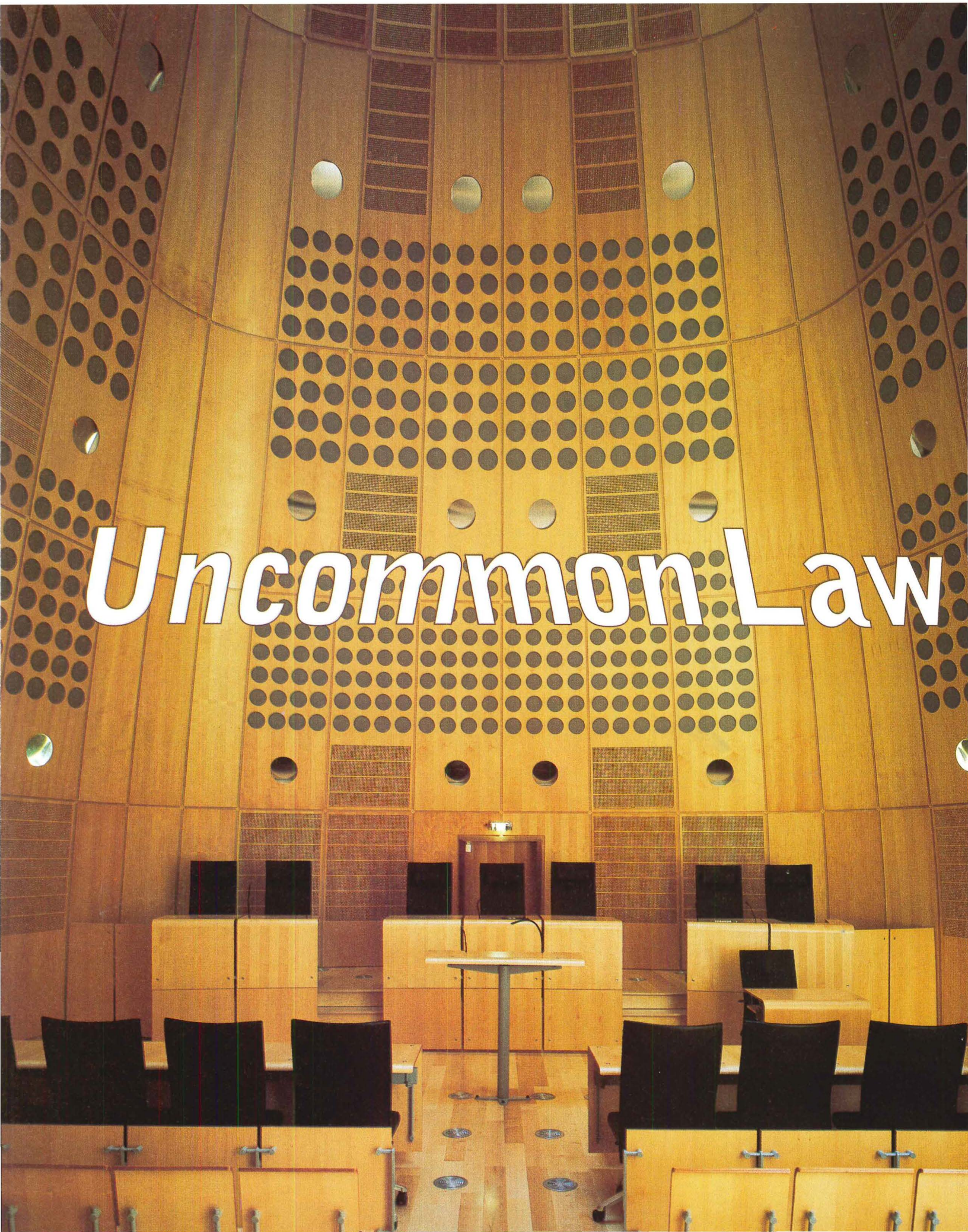
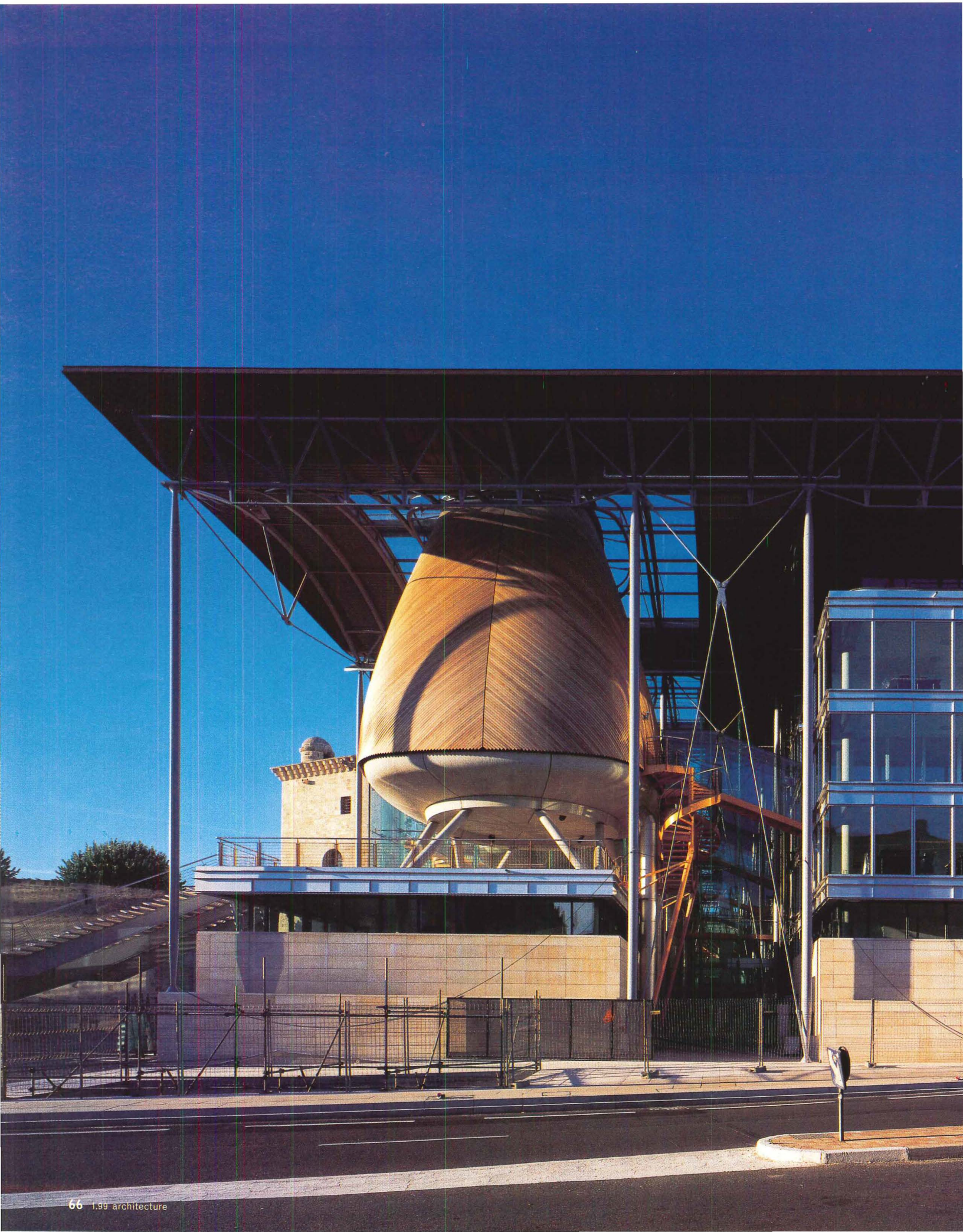


Perennial design problems often hold the greatest opportunities for experimentation. Architects that reshape staid institutions and formulaic building types like courthouses, aquariums, and urban housing don't need to reinvent paradigms: It is in dissecting the subtleties of how buildings function and how materials are put together that they discover new modes of architectural expression. Even with well-intentioned strategies, some problems remain vexing: How do we mark national borders? Can urban housing be well designed and affordable? Is it possible to continue reinventing the American roadside? For architects willing to try new ideas, it's all fertile ground.

Richard Rogers gives new podlike form to courthouse in Bordeaux, France, shown here under construction.


Uncommon Law

Richard Rogers Partnership overturns precedent with a startling addition to the historic Palais de Justice in Bordeaux. By Colin Davies

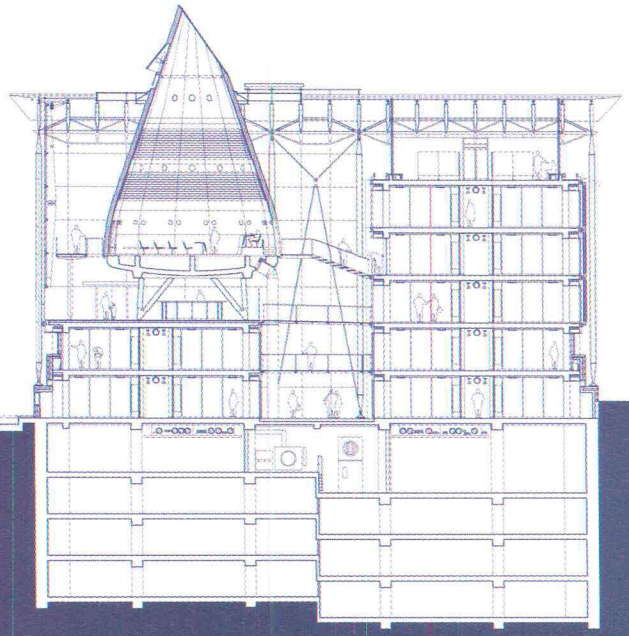


The evidence can be found in Bordeaux, France: Richard Rogers harbors Classicist sympathies. His striking extension to the Palais de Justice, a courthouse on the city's Place de la Republique, takes cues from the 19th-century Neoclassical structure it annexes: Both have straightforward, rectangular plans, stone-clad bases, and an open colonnade, one built of stone with Doric capitals, the other of steel with tapers like pencil points.

In every other respect, however, Rogers inverts Classical formulas. His addition's front facade is turned from the street to an informal landscaped court populated by a heterogeneous collection of buildings, including one of France's premier law schools and a 1,000-year-old fragment of the medieval city wall. While the old courthouse is formal and axial in plan, Rogers' $43 million, 150,000-square-foot building (with 200,000 square feet of underground parking) has a skylighted concourse, asymetrically loaded. Rogers observed, "We were very attentive to the grain, skyline, and materials of the urban fabric adjoining the building. The existing Palais de Justice sets a datum for our main public space within the new building. The presence of the medieval towers is echoed in the sculptural plasticity of the courts."

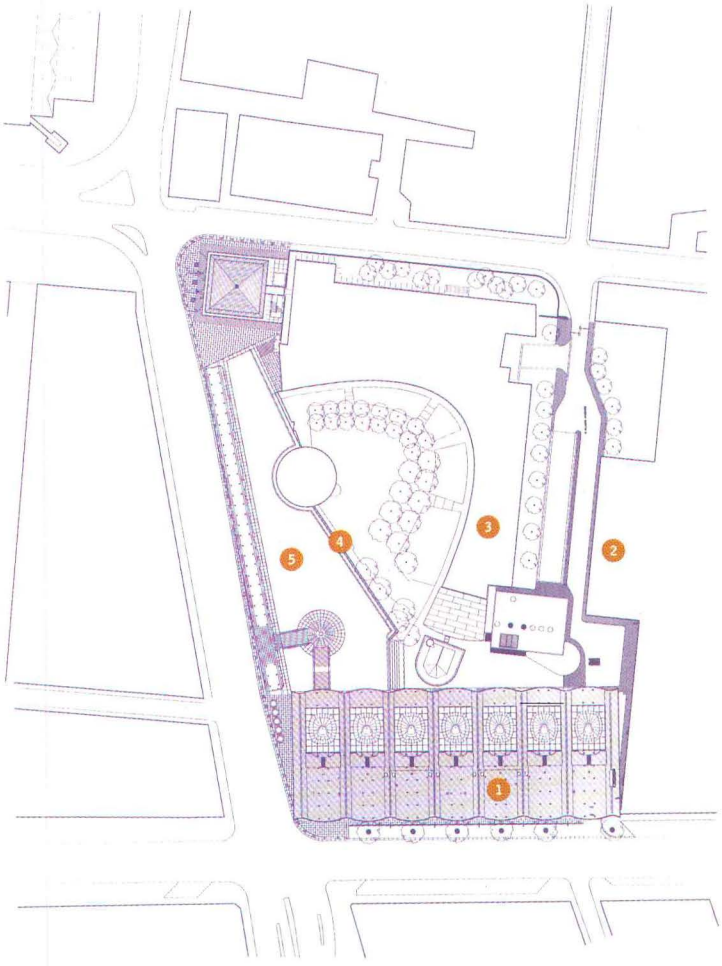
Where the heavy and forbidding old building symbolizes the weight and power of the law, the light and transparent new building symbolizes contemporary legal openness. In the old building the courtrooms are buried in a cellular array of rooms; in the new building there are seven distinct forms open to view from the landscaped court through a 65-by-250-foot wall of frameless glass, braced by glass fins and set

Each of seven courtrooms (previous page, left) in the Richard Rogers Partnership's law courts is wooden vessel, with reductive, yet ceremonial interior. Seen from outside at night, (previous page, right) courtroom becomes bulbous sculpture poised on struts above law courts' entrance. Street facade (left) features high-tech variant of classical masonry base, a-b-a column spacing, and roof with broad cornice. Stair (at left), which flanks street, leads to reception area beneath courtroom.



East-west section 16'/5m

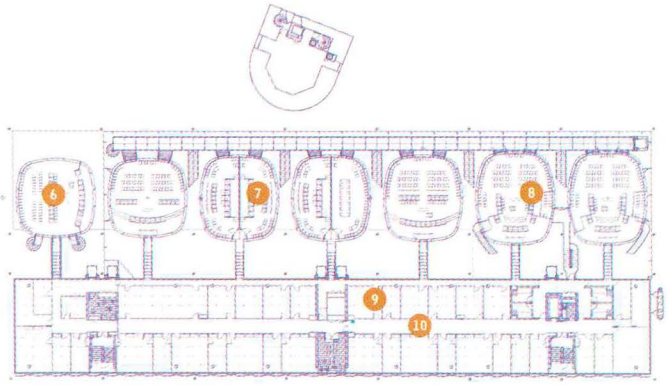
Aerial view of west facade (above) shows that copper roof bays and glazed peaks of new courtrooms blend handsomely with historic core of Bordeaux. Top-level frameless glass wall and three tiers of louvered windows enclose offices; ridge roof of Neoclassical Palais de Justice, linked to new structure, extends south and east.



Schematic site plan 80'/24m

1. law courts
2. Palais de Justice
3. law school
4. medieval wall
5. reflecting pool (future)

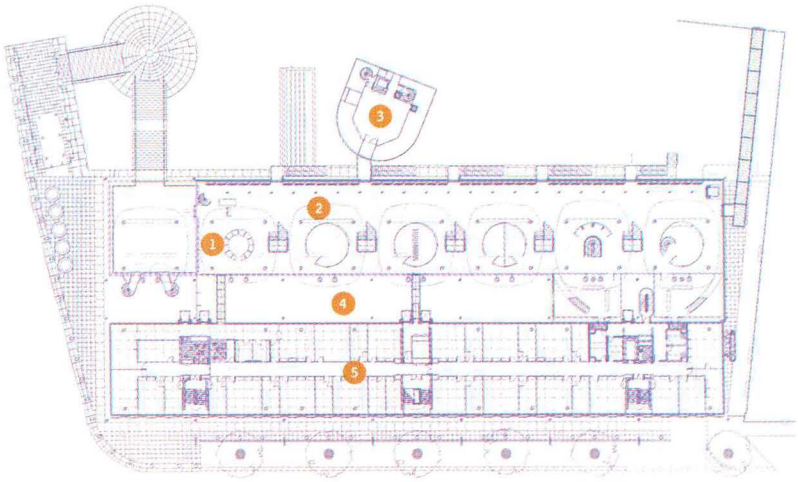
1. reception
2. foyer
3. medieval tower
4. concourse
5. judges' chambers, criminal court
6. juvenile court
7. civil court
8. corrections court
9. judges' chambers
10. judges' chambers, juvenile court



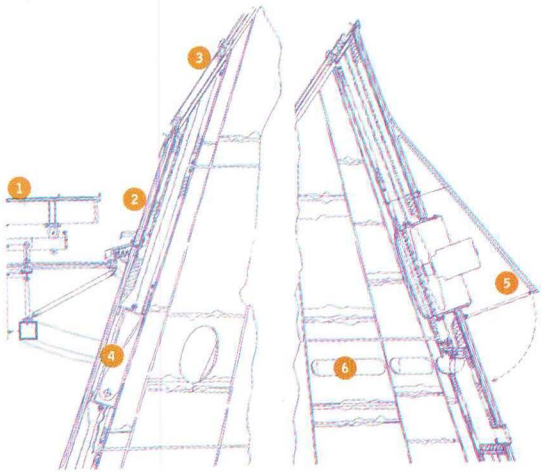
Fourth-floor plan

Schematic section through courtroom peak 5'/1.5m

1. rolling brise-soleil over glass
2. aluminum frame
3. glass skylight
4. concealed light fixture
5. smoke extractor
6. air vent



Third-floor plan 36'/11m



behind a steel colonnade. The courts stand behind this wall like bottles on a shelf: high, curved, tapering forms, raised from the stone podium on triangulated legs, their necks poking up through the roof like chimneys. The vessels are compelling forms, as memorable as anything built in the city over the past few hundred years.

Structurally, the building, which runs north-south on the edge of the landscaped court, comprises three stacked elements: parallel blocks of concrete-framed offices, six stories and two stories high, on either side of an atrium concourse; seven law courts, which rise 65 feet above the lower office block; and, at the top, a delicate, steel-framed umbrellalike roof supported by one of the minimalist superstructures for which Rogers is known. The umbrella, divided into arched bays, one per law court, is supported by tubular columns, braced by trussed tie rods on the exterior. *Y*-shaped trusses at the junction of each bay span the width of the building. Secondary tie rods stabilize the roof above the concourse; six-story-tall, three-dimensional bracing, as tall as the concourse, gives longitudinal stability. As almost always in a Rogers building, all the tension and compression members are exposed to view, internally and externally.

On the east side of the building, facing the court, the steel frame is infilled by the heroically scaled glass curtain wall, suspended from the copper roof, and braced by tapered glass fins. This is the shop window behind which the vessel-shaped courts are displayed. The curtain wall's minimal detailing has revealed the hazards of high tech: some of the glass fins have shattered; they are sheathed in netting to protect occupants while an arbitrator seeks a settlement between the architect and the contractor.

At the north end of the building, the glass wall cuts back, leaving the courtroom adjacent to the street free of any enclosure. The space around and under this court is the main entrance portico, reached via a two-floor flight of steps over a reflecting pool by the artist Anish Kapoor, to be installed later this year. The 45-foot-tall volume of space over the lower office wing—where the courtrooms stand—is perceived as a quasi-external podium; it is enclosed from the outdoors, and acts as a thermal buffer for the courtrooms and offices. The stacked offices opposite this concourse include secure investigation rooms, juvenile court jurisdiction rooms, and chambers for legal counsel.

The office blocks and the enclosing steel frame sustain the exposed structure and intricate mechanics typical of the Rogers Partnership, but the wooden bottles of the courts are completely unexpected. Their form and placement in the building are powerfully symbolic. Judges enter the courts from the taller office block via open bridges across the concourse. Members of the public enter from the other side, via a metal walkway raised above the podium. The public and the judges meet in the tall, top-lit, womblike interiors of the courtrooms—wooden crucibles in which justice is dispensed. The spatial contrast between the open podium and the theatrical interiors of the courtrooms, whose sole source of daylight is an oval skylight, is extreme, and its meaning is clear: Informality gives way to formality in one step.

Each of these strange, organic forms is a combination of a concrete base and a timber-framed superstructure. The bases, which resemble shallow dishes, are made from precast concrete petals that rest on ring beams lifted up off the podium on four, *V*-shaped, raking supports. The inclined superstructures are glulam wood columns, braced by horizontal wood members. Interiors are clad in cold-laid plywood; workers nailed the external veneer of narrow cedar strips individually on site.

To make the plywood lining panels, a Swiss subcontractor translated the form into solid wooden molds, carved on computer-controlled milling machines. The plywood was then laid into these molds, one lamination at a time, resulting in about 70 different types of double-curved panels. The panels have a variety of perforations that screen sound absorbers and angled reflectors to improve the acoustics.

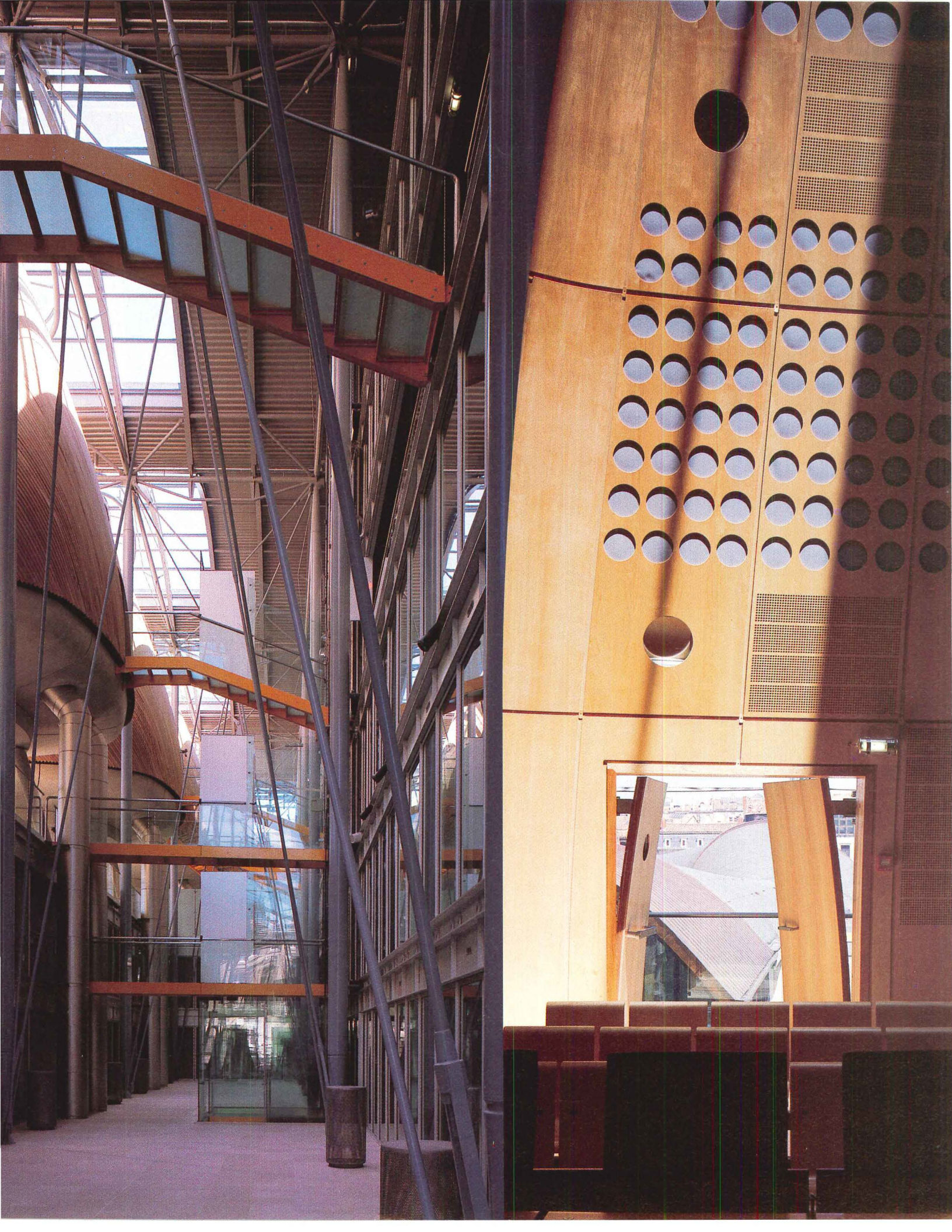
The windowless courtrooms impart a powerful sense of enclosure. Nonetheless, lightness, transparency, openness, flexibility, and informality—characteristics of Richard Rogers' architecture—prevail in Bordeaux, as well. His instinct is always to democratize, to break down the barriers between different functions, dissolving all social and symbolic hierarchies. His habit of displaying structure and services on the outside of the building—think of the Centre Pompidou in Paris or Lloyds in London—is not merely a showcase for the technology of modern building (though that is part of the message), but frees internal space, making it visible and, if possible, accessible to all.

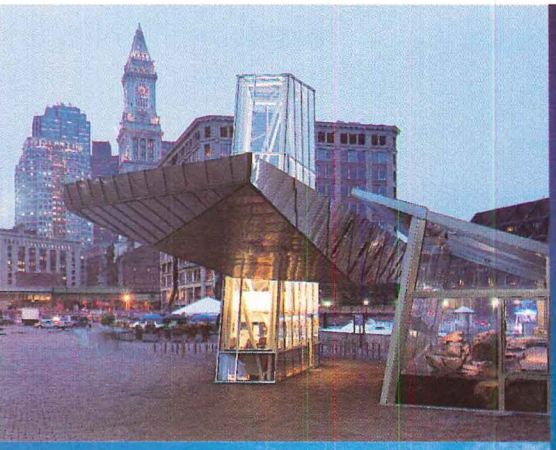
This may be an appropriate strategy for an art gallery or an office building, but here, in a law court, enclosure, permanence, and a sense of occasion take precedence over flexibility. The Rogers Partnership brilliantly demonstrates that formality and permanence need not call for monumentality and pomposity. Their design strategy is simple: to isolate the permanent enclosures, in this case the courtrooms, and place them as freestanding objects in a lightweight, transparent envelope. There is no compromise between formality and openness; both qualities are enhanced by their juxtaposition. The firm's technology is as inventive and articulate as ever but here the effect is vividly symbolic: The law, this building seems to say, belongs to us all and we engage in its processes freely. Authority belongs to the people, not to unseen powers behind closed doors.

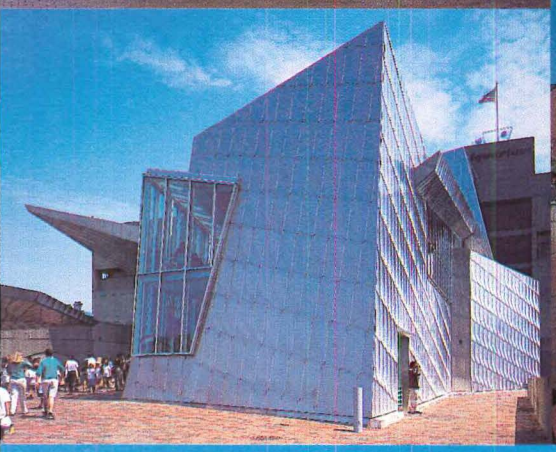
One thousand-year-old fragment of Bordeaux city walls (facing page) leads to 250-foot-long glazed front facade of Rogers Partnership's Law Courts. Medieval tower and barrel-roofed law school (1972, at left) border landscaped court behind wall; reflecting pool will be installed later this year, beneath entrance stair (at right).

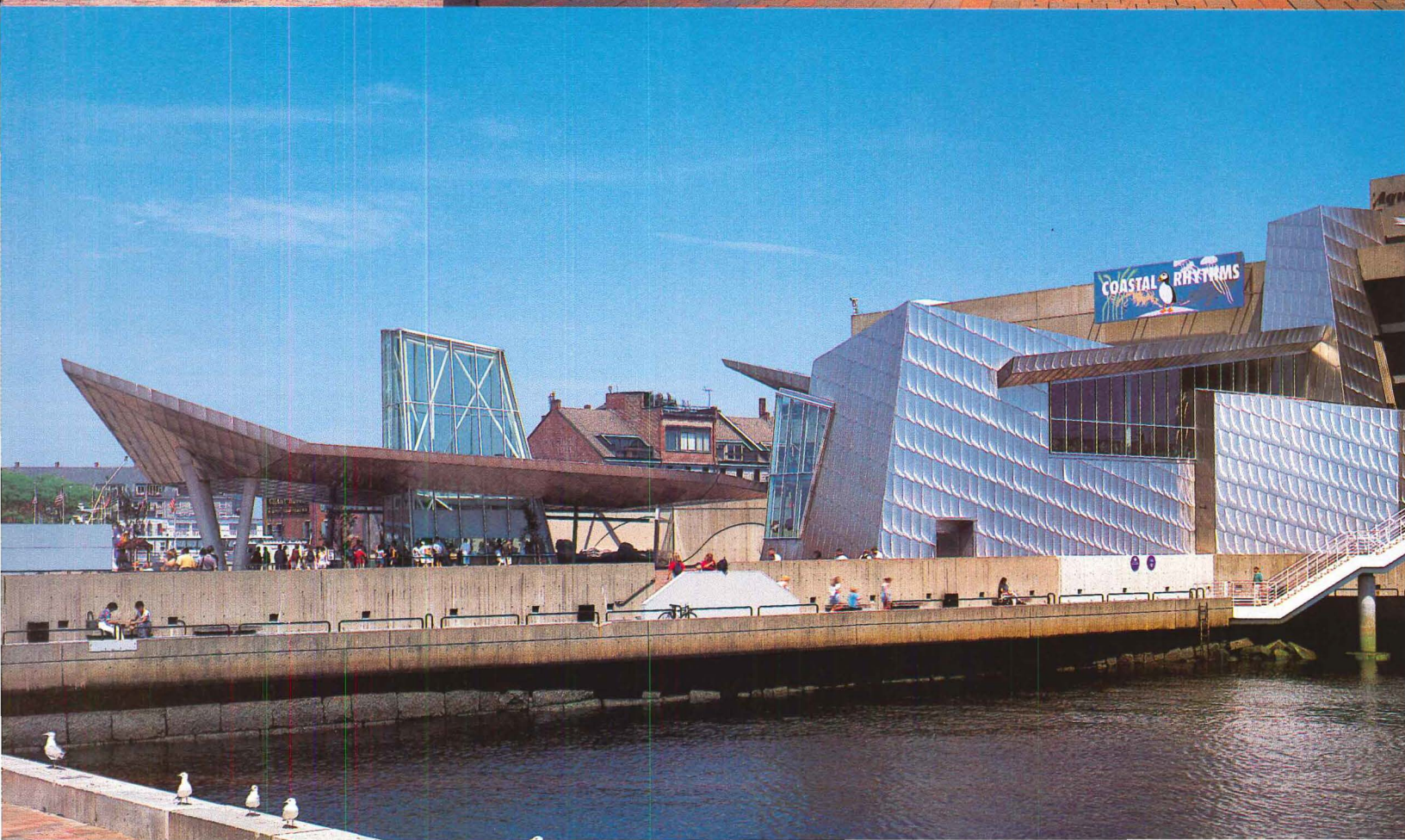
Plaintiffs and defendants enter courtrooms along elevated walkway (this page) three floors above street level. Six-floor concourse (right) reveals full height of building; offices and courtrooms are linked by bridges amid network of tie rods that brace tapered steel columns. View from judge's seat (far right) highlights grid of circular acoustic panels; roof of adjacent law school is visible through door to elevated walkway.

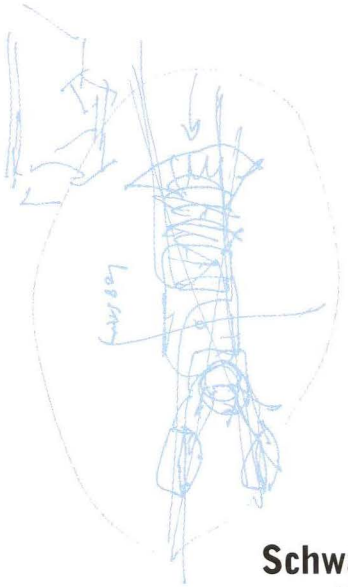
BORDEAUX LAW COURTS, BORDEAUX, FRANCE
CLIENT: Ministry of Justice
ARCHITECT: Richard Rogers Partnership, London—Richard Rogers (principal), Stephen Barrett, Elliot Boyd, Mike Davies, Pascale Gibon, Marco Goldschmied, Lennart Grut, Philip Gumuchdjian, Jackie Hands, Ivan Harbour, Avery Howe, Eric Jaffrés, Amarjit Kalsi, Stig Larsen, Carmel Lewin, Avtar Lotay, Annette Main, Sophie Nguyen, Louise Palomba, Kim Quasi, Simon Smithson, Dan Sibert, John Young (design team)
LANDSCAPE ARCHITECT: Edward Hutchison
ENGINEERS: Ove Arup & Partners; OTH Southwest (structural); OTH Southwest (mechanical)
CONSULTANTS: Sound Research Laboratories (acoustics); Lighting Design Partnership (lighting); Rice Francis Ritchie (facades); Hayes Davidson (imaging)
GENERAL CONTRACTOR: Spie Citra Midi Atlantique
COST: $43 million
PHOTOGRAPHER: Christian Richters








COASTAL RHYTHMS



Schwartz/Silver's addition to a Boston landmark signals a new age of aquarium architecture. By Raul A. Barreneche

Glass tower of aquarium's new ticket booth (facing page, top left), wrapped in folded, steel-clad canopy, creates beacon against skyline of Boston's Financial District. Ticket booth and canted wing (facing page, top right) that contains gift shop and cafeteria extends into paved waterfront plaza to frame new entrance to old aquarium. Massing of gift shop and cafeteria block (facing page, center left) recalls Frank Gehry's 1992 visual arts center at University of Toledo in Ohio. On sunny days, surface of radially sanded, lapped steel shingles (facing page, bottom) animates facades of addition with wavy highlights. Size of metal sheets mediates between bulk of original concrete structure and scale of promenade.

The modern aquarium revolution started with a box, not a bang. When it opened in 1969, Cambridge Seven Associates' New England Aquarium on Boston's Central Wharf heralded a new age of aquarium programming and design—although these days it's harder to sing the architectural praises of this kind of Brutalist concrete block. The aquarium quickly became the city's top tourist attraction and started a worldwide obsession with aquatic tourism. Almost 30 years later, Schwartz/Silver Architects, another Boston firm, is slicing open Cambridge Seven's box with a big, silvery slash. The first phase of a four-part, $100 million expansion of the aging facility opened last spring, and it's literally changed the face of a local landmark.

In the late 1980s, Director John Prescott decided he didn't want to hire "an aquarium architect" to design an addition to the aging facility. "He really wanted to break the mold," explains Principal Warren Schwartz of Schwartz/Silver Architects. Prescott got his wish: The firm's additions make a bold break from the concrete bunker with a formal edginess unseen in stodgy Boston.

There is no mistaking Schwartz/Silver's hand for their predecessor's. The new architect's scheme adds two chiseled, metallic wings skinned in large stainless steel shingles and canted glass curtain walls, which will more than double the size of the existing facility when completed in 2002. The east wing will add 75,000 square feet of exhibition space overlooking Boston Harbor. Also planned are an IMAX theater and a new entrance plaza facing downtown. The only completed component of Schwartz/Silver's ambitious expansion is a small entrance wing on the aquarium's west side, facing Boston's financial district. The architects grafted a lobby, gift shop, and café onto the front of the original structure; transformed an existing auditorium into changing exhibition galleries; and added a freestanding ticket booth crowned by an oversized metal canopy on tubular steel stilts.

There's no disguising the seams between old and new, especially on a sunny day, when the surface of the metal tiles and the canted windows glint, while the original aquarium stays mute. The entrance ensemble steals the show from the box and all but obscures it. On a gray New England afternoon, however, the flashy new materials become dull. Without the shimmer of sunlight on its skin, the addition appears alien.

It would be easy to dismiss the building's hard-cut angles and abrasive materials as Frank Gehry knockoffs, especially since Schwartz/Silver collaborated with Gehry on the 360 Newbury Street building (1992) nearby, and the unbuilt Boston Children's Museum (1992). The architect's esthetic inspiration may be consciously or subconsciously influenced by Gehry, but the additions nonetheless create their own identity. They set a cool, watery tone for the aquarium, recalling images of a scaly, shimmery fish or iceberg chunks.

These forms may seem radical in a traditionalist city such as Boston, but the addition actually makes a better neighbor than its precursor. Instead of creating a faceless object detached from the city in size and spirit, the architect brings the building's scale down to the pedestrian promenade alongside it.

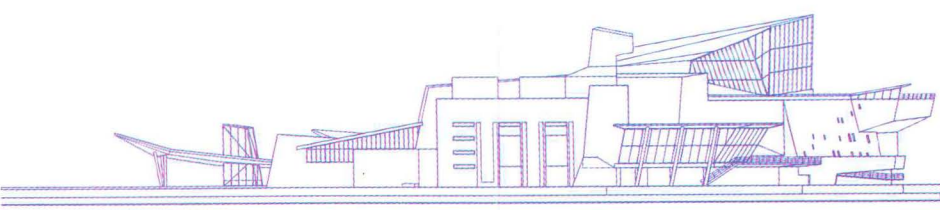
Schwartz/Silver's addition is accessible and inviting—everything Cambridge Seven's building isn't. As their expansion continues to grow over the old aquarium like a space-age barnacle, its forms will weave their way around the original to create a coherent composition less alien to the site. Schwartz/Silver are heralding a new age of aquaria with an explosion of sculptural chutzpah—and a healthy dose of civic-mindedness.

SCALING UP

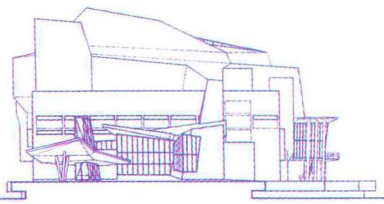
Addition's interiors (left) draw on aquatic imagery: Pearly lapis stone dots lobby's cool blue terrazzo floor and radially sanded steel plates wrap walls and ceiling. Canted stair separates double-height lobby from gift shop; glass entrance wall faces downtown Boston. Site plan (facing page, right) illustrates aquarium's prominent location on Boston Harbor wharf. Building plan and model (facing page, center and far right) show completed addition, proposed free-standing IMAX theater to west of original structure (organized around cylindrical tank at center), and future addition that will overlook water.

NEW ENGLAND AQUARIUM—WEST WING ADDITION, BOSTON

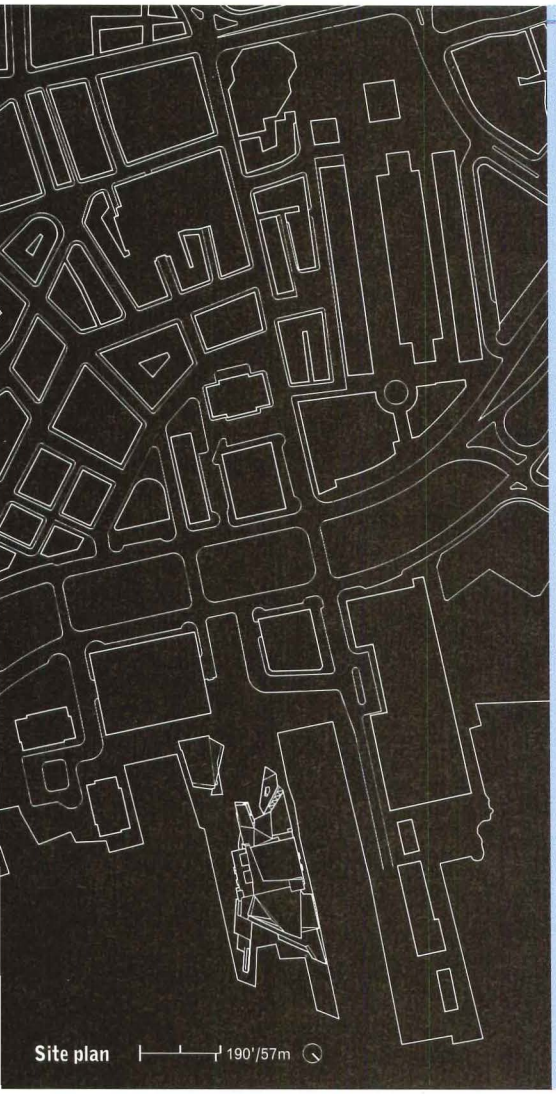
CLIENT: New England Aquarium **ARCHITECT:** Schwartz/Silver Architects, Boston—Warren Schwartz, Robert Silver (principals-in-charge), Christopher Ingersoll (project architect), Kathleen Lindstrom (job captain), Angela Ward Hyatt (project designer), Anne Filson, Steven Gerrard, Lisa Iwamoto, Peter Kleiner, Nelson Liu, Mark McVay, Randolph Meiklejohn, Bob Miklos, John Nakazawa, Scott Peltier, Sandra Saccone, Mark Schatz, John Sheetz, Patricia Anahory Silva, Jon Traficonte (design team) **ENGINEERS:** Weidlinger Associates (structural); Judith Nitsch Engineering (civil); Syska & Hennessy New England (mechanical, electrical, aquatic life support); Childs Engineering (marine); Haley & Aldrich (geotechnical) **CONSULTANTS:** Lyons/Zaremba (exhibit designer); H.M. Brandston & Partners (lighting); Oppenheim Lewis (cost estimating); Group One/Langer Consulting Group (food service); Solutions Engineering (codes) **GENERAL CONTRACTOR:** Beacon Skanska Construction Company **COST:** $13.9 million **PHOTOGRAPHER:** Matt Wargo

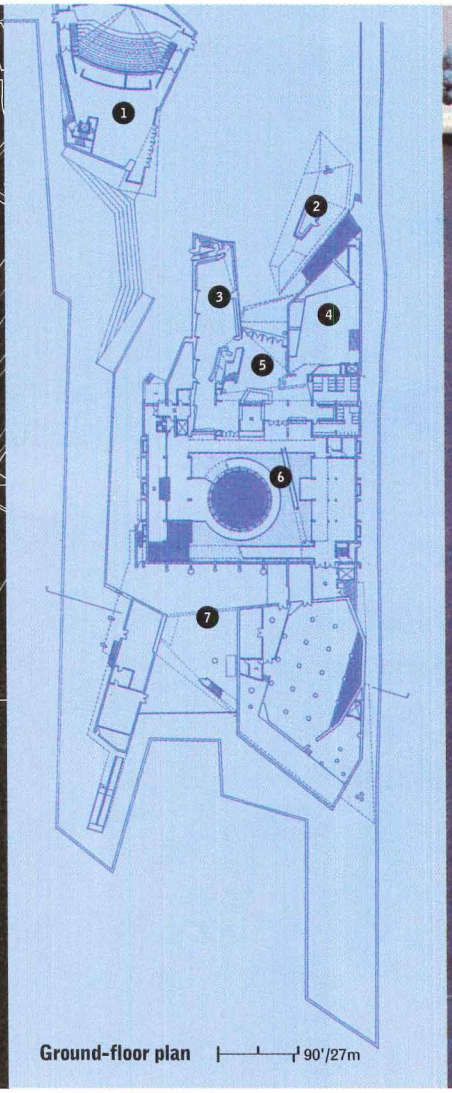


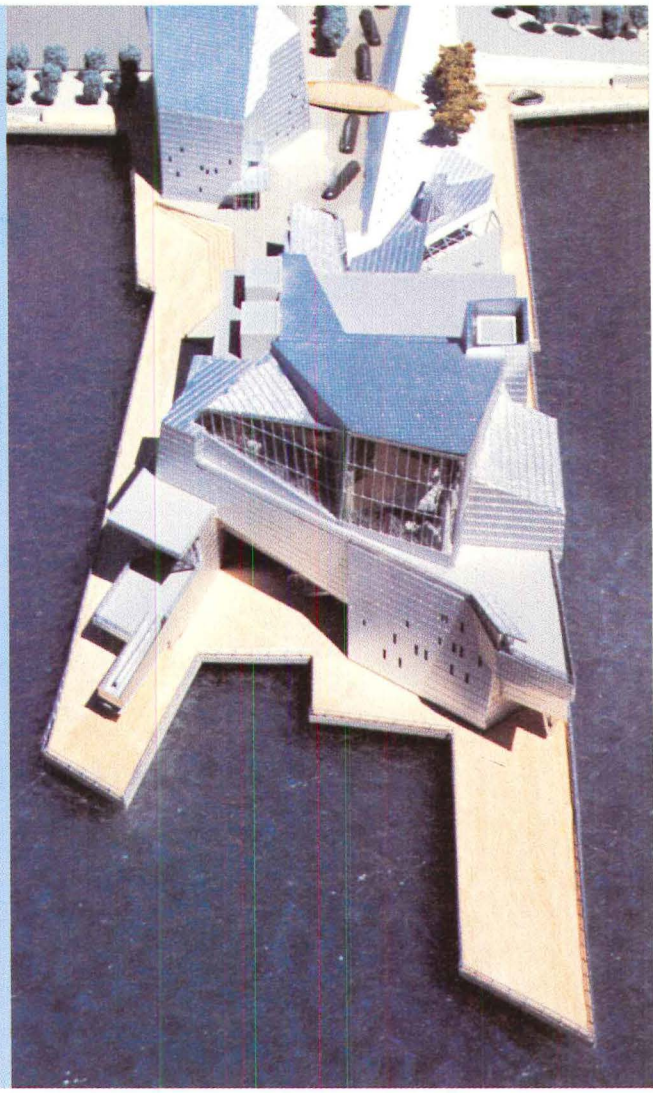
South elevation 50'/15m



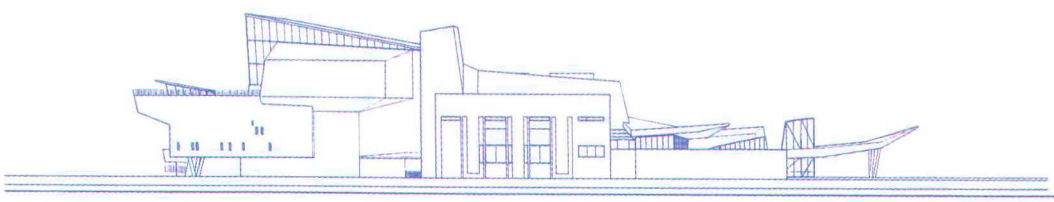
West elevation



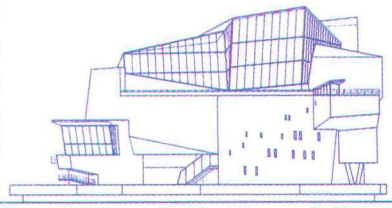




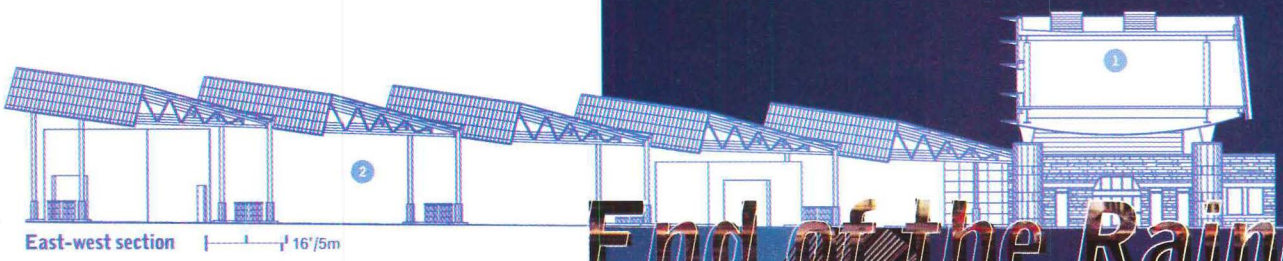
1. IMAX theater (future)
2. ticket booth
3. gift shop
4. temporary exhibition gallery
5. lobby
6. original aquarium
7. additional exhibition gallery (future)



North elevation

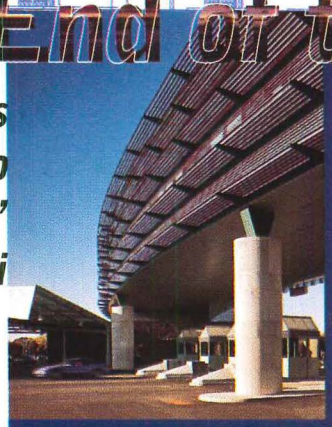


East elevation



End of the Rainbow

Hardy Holzman Pfeiffer Associates extends a minimalist welcome to the United States at Niagara Falls' Rainbow Bridge. By Philip Arcidi

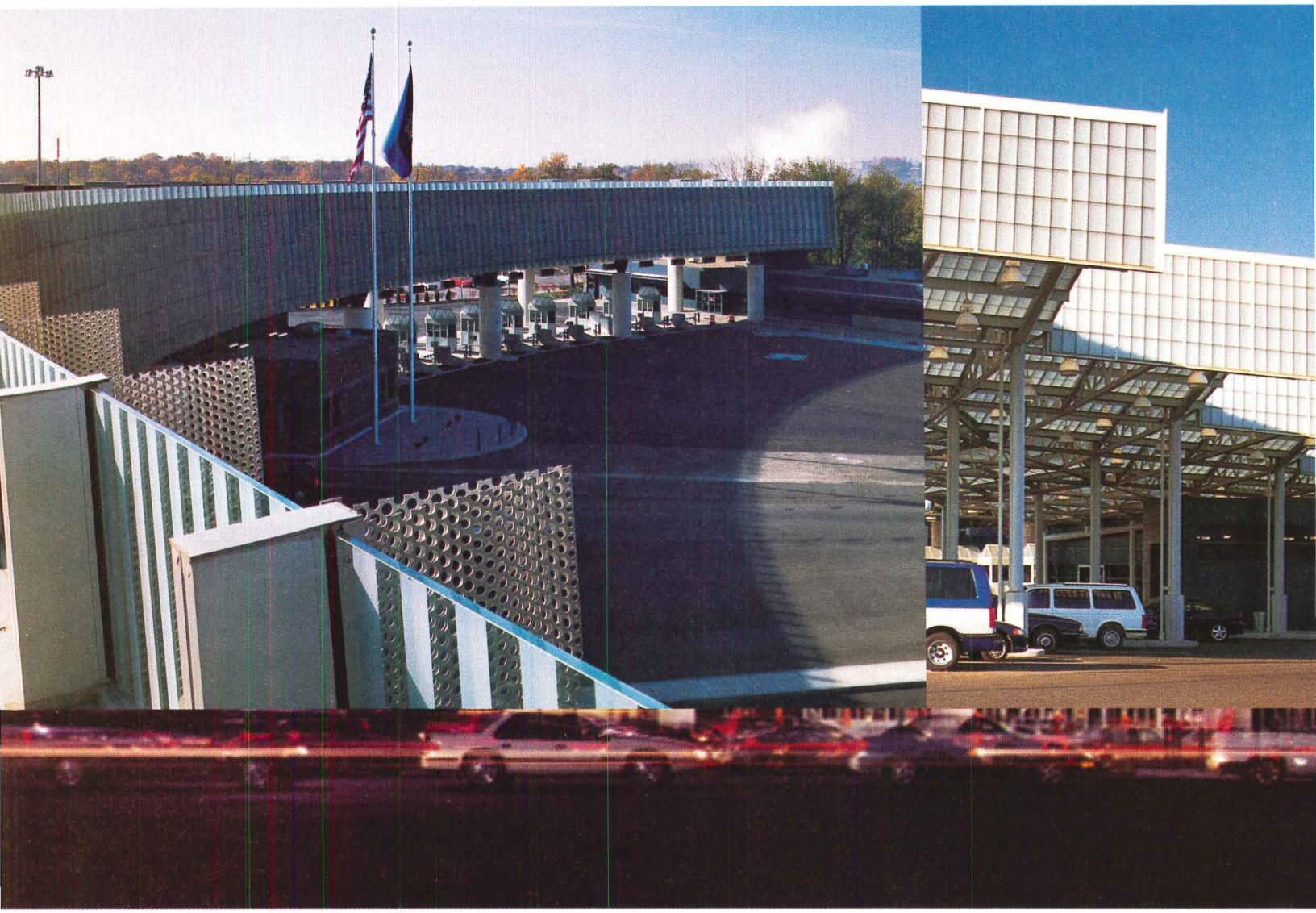


It seems a mere formality to cross the line from Canada to the United States at Niagara Falls, New York. The entrants, typically in a car, summarize their itinerary to a U.S. customs officer who usually waves them on without much ado. Nevertheless, it is a significant procedure: The customs officer is at the literal frontier of the federal government, the place where the United States makes its first impression.

Hardy Holzman Pfeiffer Associates (HHPA) crowned their new border station at the American terminus of the Rainbow Bridge (whose midpoint is the international border) with an elegant glass building, curved in plan and supported on stone-clad columns above a row of toll and inspection stations. This structure, which contains offices for U.S. Customs and Immigration, gives the nation's front door a reticent image, as neutral as the neomodern facade of a suburban office building. The design won a 1990 competition sponsored by the Niagara Falls Bridge Commission, a joint jurisdiction

Five hundred-foot-long glass wall (right) faces Canada and encloses U.S. customs and immigration offices, which span 25 toll and inspection booths. Convex side of glazed offices (inset) faces Niagara Falls, New York.


CLOSED
CLOSED
CLOSED
CLOSED
OPEN

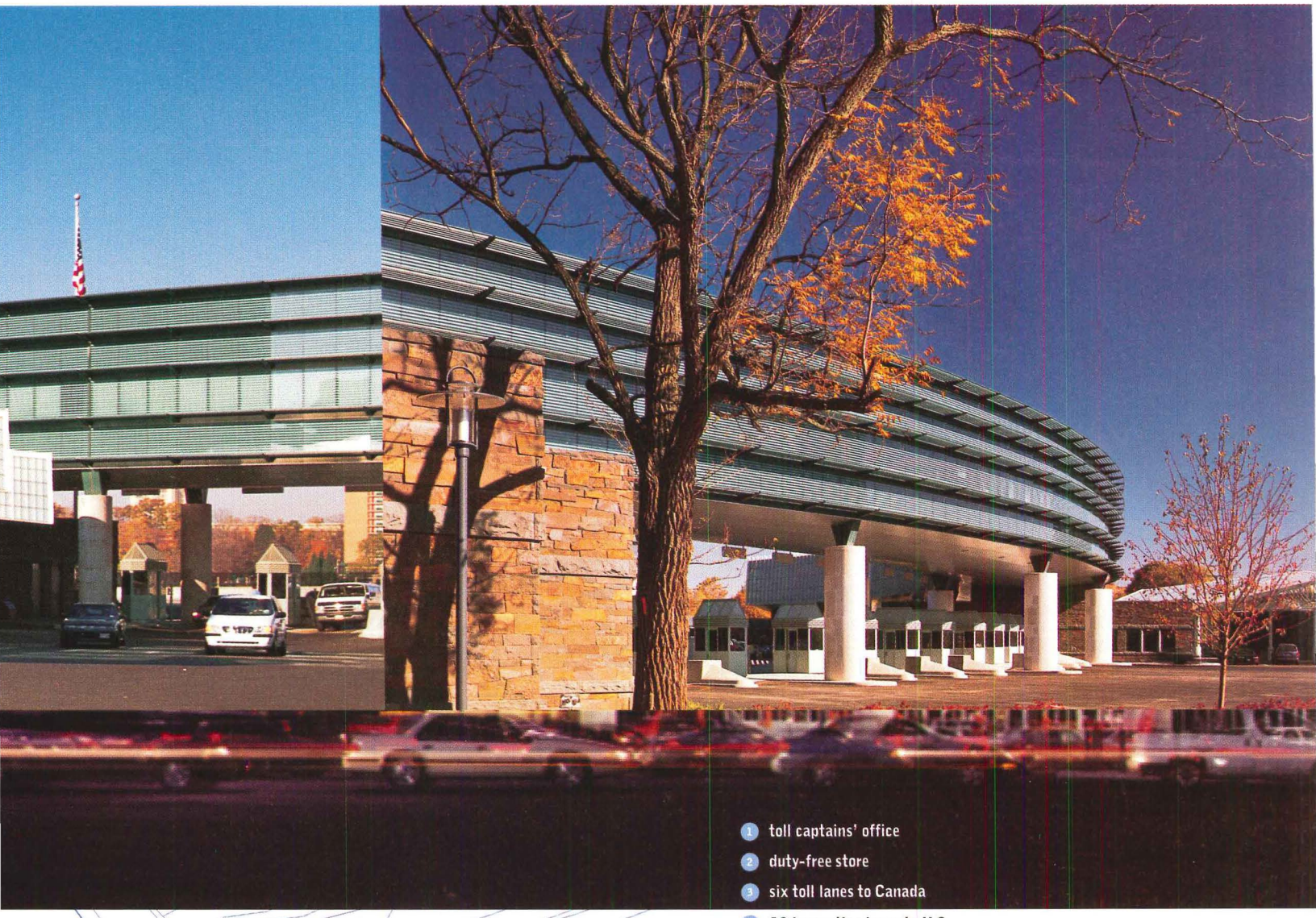


Perforated stainless steel fins (above) extend to form parapet above Canadian facade of glazed offices. Sawtooth roof, clad in translucent panels (these pages), covers parking stalls on American side of offices. Five-tiered brise-soleil on American facade (facing page) screens one floor of offices; curved soffit over toll booths is clad in aluminum panels.

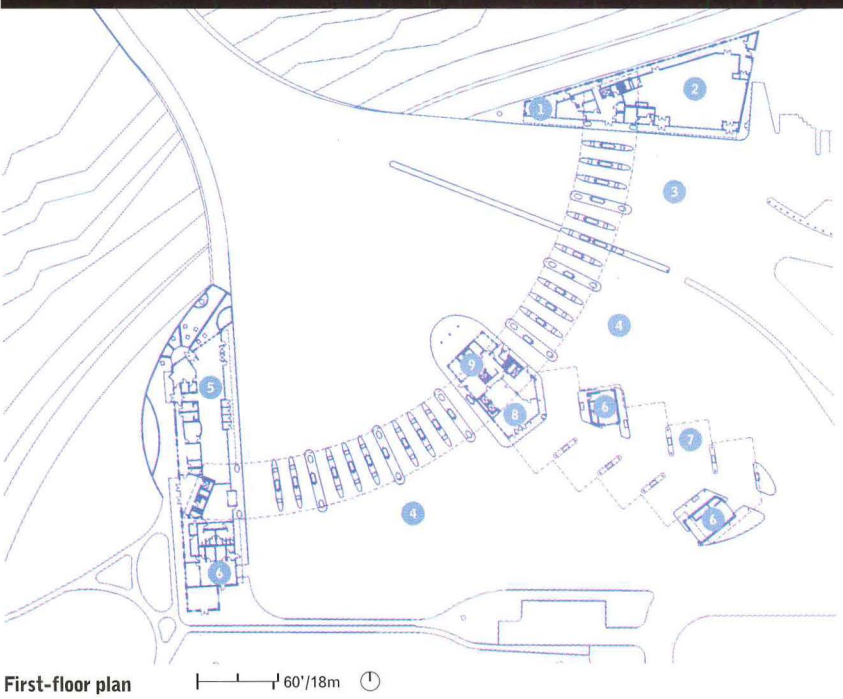
between Canada and the United States (see *Architecture*, January 1996, pages 96-101); it suggests that glass and steel minimalism has become as emblematic of the American nation as it is of corporate America, or perhaps that the American nation is corporate America. HHPA toned down their work to the architectural equivalent of easy listening on this commission: The strident juxtapositions expected of them have been tamed, perhaps to sustain the impression that customs and immigration officers are kind and gentle.

The building, which cost $27 million, admits as many as 20,000 across the border on a summer day through the 25 booths arrayed in a 500-foot-long curve, more than double the number that previously occupied the cramped site. Three one-floor, stone-clad buildings stand beneath the offices (the composite comprises 60,000 square feet): On the northern edge of the booths, a wedge-shaped building houses a duty-free store and an office for toll captains. On the booths' opposite end, a second, slightly larger building serves bus passengers, who disembark for customs inquiries and baggage inspection inside. Pedestrians from Canada gain access to the United States here as well. The formal entrance to the second-floor offices is in the third structure, which bisects the row of booths. It has two seating areas: one for people with issues that can be settled at the first-floor counter, and another for consultations upstairs when security is important.

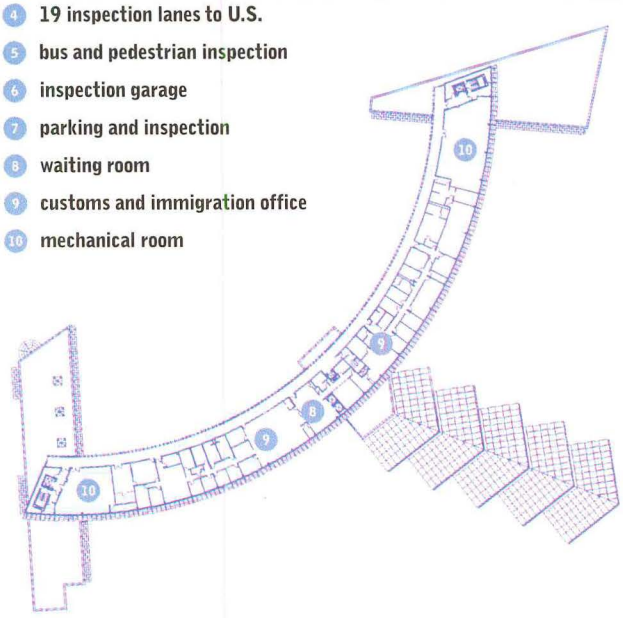
Covered parking, for automotive passengers with business inside, or passengers whose luggage is searched, extends from the first-floor seating area, on the eastern (American) side. Steel columns support covered trusses that span the parking area and two garages in which customs agents can



1. toll captains' office
2. duty-free store
3. six toll lanes to Canada
4. 19 inspection lanes to U.S.
5. bus and pedestrian inspection
6. inspection garage
7. parking and inspection
8. waiting room
9. customs and immigration office
10. mechanical room

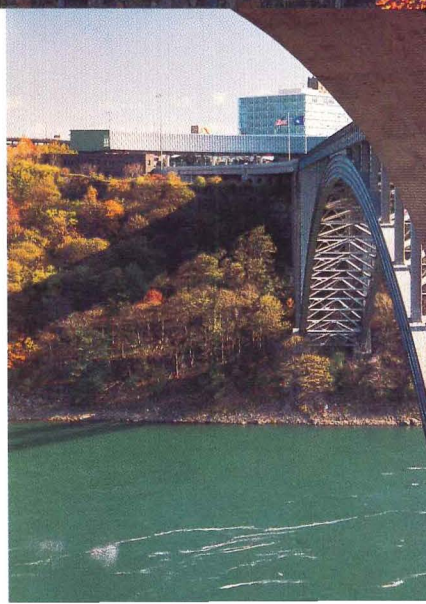


First-floor plan 60'/18m



Second-floor plan

search or dismantle suspicious cars. Hardy let the sawtooth profile and translucent roof of this parking shelter (which he likens to "the tail on a kite"—a disparate, yet integral attachment) stand in contrast to the plaza's enclosed structures. However, it is at odds with their subtleties and diminishes their coherence. In part, this seems deliberate. Only on the Canadian side can drivers see the glass band of offices in its entirety, for Hardy emphasizes arrival into the United States, not departure from it. Nevertheless, his corporate imagery in both directions—well-mannered and unimposing—implies that crossing the border is a low-friction passage, as smooth as a business transaction.



UNITED STATES CUSTOMS AND IMMIGRATION CENTER AT RAINBOW BRIDGE, NIAGARA FALLS, NEW YORK
CLIENT: Niagara Falls Bridge Commission **ARCHITECT:** Hardy Holzman Pfeiffer Associates, New York City—Hugh Hardy (partner-in charge), Jack Martin (project manager), Doug Freeman, Maya Schali (project architects), Robert Koert (construction engineer), Yasin Abdullah, Ching-Wen Lin, Ted Sheridan, James Brogan (design team) **LANDSCAPE ARCHITECT:** The Saratoga Associates **ENGINEERS:** Severud Associates (structural); Wilson, Klaes, Brucker & Worden (mechanical); Hardesty & Hanover (civil) **CONSULTANTS:** Israel Berger & Associates (curtainwall); Fisher Marantz Renfro Stone (lighting); Visual Security Network (security) General Contractors: Fontana Enterprises (construction manager); Ciminelli-Cowper Construction Management **COST:** $27 million **PHOTOGRAPHER:** Michael Moran

Veneer of alcove bluestone on duty-free store and toll captains' office (facing page, top, and above) provides masonry pedestal for sleek glass office structure. Seen from Canadian shore of Niagara River (facing page, left), border station appears as minimalist sculpture sited on forested gorge.

Out Of The Blue

A fast food prototype raises eyebrows and whets appetites on the Pacific Coast Highway.

By Raul A. Barreneche

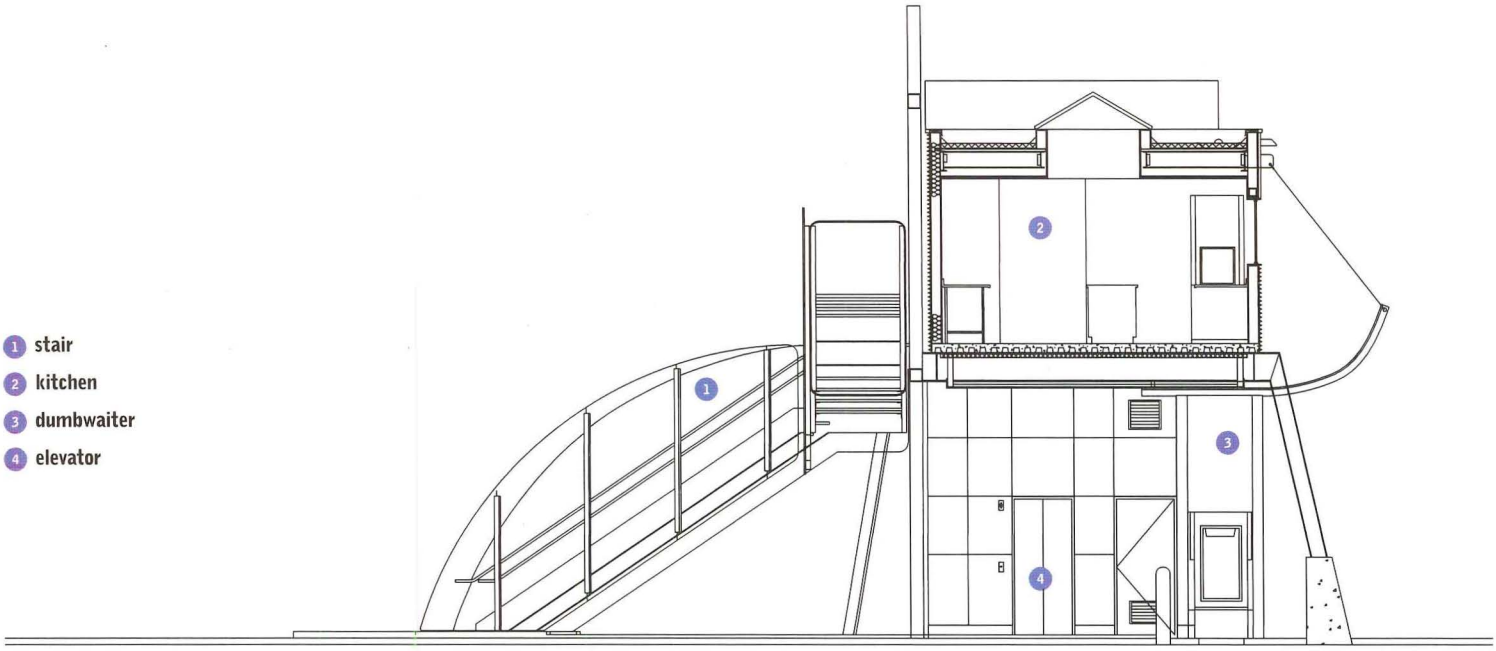
Motorists driving along the Pacific Coast Highway in Newport Beach, California, have no idea what's inside the big blue box on stilts by the side of the road. "Some people think it's a strange new BMW dealership; others think it's a car wash," laments local resident Ken Anchors. The latest and certainly brightest addition to Orange County's seaside sprawl is neither: It's Autobistro. This new high-end, drive-through-only fast food chain is ready to revolutionize the roadside dining experience with its rarefied menu and aggressive architecture.

Anchors is general manager of the first outpost of what Seattle-based entrepreneur Gordon Bowker and his partners hope will become a new fast food giant (*Architecture*, May 1998, page 63). Bowker's business savvy is certainly key to the success of Autobistro—he cofounded Starbucks Coffee and Seattle-bred megabrands, Redhook Brewing Company and Peet's Coffee & Tea—but he's banking just as much on a strong visual identity to build up brand recognition. Bowker hired Portland, Oregon-based BOORA Architects to design the $1.5 million prototype in Newport Beach (which was erected in just five months), and brought aboard Portland, Oregon-based Sandstrom Design to create the restaurant's punchy packaging and cheeky graphics that pair artichokes with auto parts. "From the beginning, the overall strategy was to align the architecture, product, and service, making sure all three elements were working toward the same goal," explains BOORA principal Stanley Boles.

Robert Venturi would surely appreciate Autobistro's "building-board" nature: It's a billboard and building rolled into one. There are no instantly recognizable architectural features such as golden arches or a mansard roof to advertise Autobistro's identity and function; there are only small signs with the company's name and logo, a stylized fork spreading a pair of Mercurial wings, attached to the 30-foot-tall structure. The enormous truss that supports the kitchen 13 feet above the ground and allows customers' cars to squeeze into a site less than half the size of the average burger joint bears more than a casual resemblance to highway billboard construction.

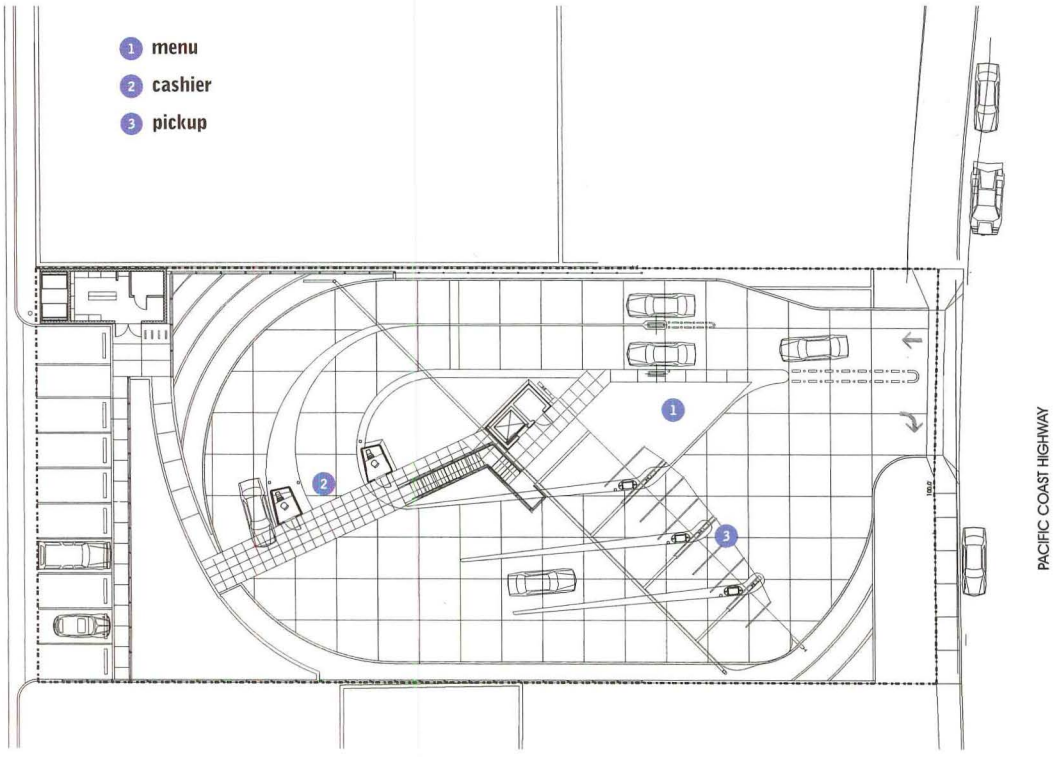
Autobistro's architecture has a significant role to play, since everything about the experience is revolutionary by the canonical standards of American fast food culture. There is no parking and no restaurant per se, only the 1,440-square-foot elevated kitchen. The six-person, 16-by-90-foot kitchen is a simple, trailerlike box wrapped in steel panels painted a bright, blueberry color and articulated only by the patterning of its skin and a white fabric canopy beneath strip windows along the structure's roadside facade. Drive-through diners order from a human host, not through a staticky microphone; pay a cashier in a glass box

Autobistro's bold colors and sharp, angular forms (above) recall optimistic spirit of early Modernism, according to architect Stanley Boles. Roadside facade sports company's name and winged fork logo. White fabric sail, a gesture to seaside surroundings, partially shades strip windows along kitchen. "Vittleveyors," dumbwaiters that descend through steel-clad tubes, deliver food to drivers parked beneath kitchen.



Section through kitchen 5'/2m

Everything about the Autobistro experience is revolutionary.



Site plan 20'/6m

AUTOBISTRO, NEWPORT BEACH, CALIFORNIA
CLIENT: Autobistro **ARCHITECT:** BOORA Architects, Portland, Oregon—Stanley Boles (principal-in-charge), Kevin Johnson (project manager), Mark VanderZanden (project designer), Brian Jackson (project architect), Jason Giles (design assistant), Cindy Gunderson (interior designer) **LANDSCAPE ARCHITECT:** Walker & Macy **ENGINEERS:** KPFF Consulting Engineers (structural, civil); Interface Engineering (mechanical, electrical) **CONSULTANTS:** Sandstrom Design (graphics); Candela (lighting); Kittelson and Associates (traffic); Architectural Cost Consultants (cost estimating) **GENERAL CONTRACTOR:** Contractor Management Group **COST:** $1.5 million **PHOTOGRAPHER:** Jeff Goldberg/Esto

By elevating kitchen and eliminating need for customer parking, BOORA allows Autobistro (site plan, facing page) to fit into sites half as small as 40,000-square-foot property of typical fast food restaurants: Newport Beach prototype (below) occupies 21,000-square-foot plot along crowded Pacific Coast Highway. Tapering from height of 33 feet above ground to 21 feet, giant truss spans diagonally across site, creating portal above drive-through dining sequence. Stair next to twin cashier booths provides staff access to kitchen.

resembling a toll booth; and finally drive under the kitchen to claim their food on bright red trays that descends through tubular, stainless steel dumbwaiters.

Autobistro's sophisticated menu and design feel like the kind of fast food experience Europeans might invent, yet it's purely American in its roadside sensibility and imagery. Consumers have been slow to warm up to the restaurant since its opening in July, but their reluctance may be due more to squeamishness over the burgerfree menu of cappuccinos, blueberry scones, sesame peanut noodles, and chicken-and-artichoke focaccia sandwiches than a lack of compelling design. But considering Bowker's success in building Starbucks into a national phenomenon—making double lattes as common as double cheeseburgers—Autobistro may yet become an American roadside icon.

ON THE FENCE

Good neighbors don't always build good fences, as Camilo José Vergara documents in his photographs of and writings on the U.S.-Mexican border.

For millions of poor Latinos, entry into the United States has little to do with airport waiting lounges or drive-through immigration centers (this issue, pages 78-83). Instead, in cities along the border between the United States and Mexico, the abstract line between the two countries takes the form of very real metal barriers as divisive as the Berlin Wall. In these bifurcated communities—Brownsville and Matamoros, El Paso and Ciudad Juárez, the two Nogaleses—going to work, or home to the family, can entail a physically and psychologically harrowing journey over barbed wire, past armed guards, and across busy highways.

Photographer Camilo José Vergara, known for his plain-spoken portrayal of American inner-city decline, now turns his socially critical eye to the landscapes developing on both sides of the border between California and Mexico—Tijuana, San Diego County, Tecate, Calexico, and Mexicali. The results of his two-year investigation appear in an exhibition, *El Nuevo Mundo: The Landscape of Latino Los Angeles*, through March 28 at the National Building Museum in Washington, D.C., as well as in Vergara's book *American Ruins*, which The Monacelli Press will release this fall. *Ned Cramer*

A yellow highway sign depicts a family of three running. The little girl, pulled by the hand as they race for safety, seems to be flying. The family resembles primeval humanity, young, stocky, and strong. Their heads are down, their fists clenched. Fabian, a Mexican mechanic living in Los Angeles, is not bothered by these signs. "They say: Be careful, there are Mexican women and children crossing the highway. They are there to alert us, not to humiliate us. They don't want drivers to run them over." And of the way the people are characterized on the sign, he simply remarks, "They draw us the way we are." For Jose Luis, a businessman who came to the United States 30 years ago, the signs tell drivers to be careful, lest "they get into trouble for killing some poor starving Mexicans." He says: "These are two nations that should be very close to each other, but instead more barriers are going up. This is madness. Barriers cannot stop people who don't have enough to eat."

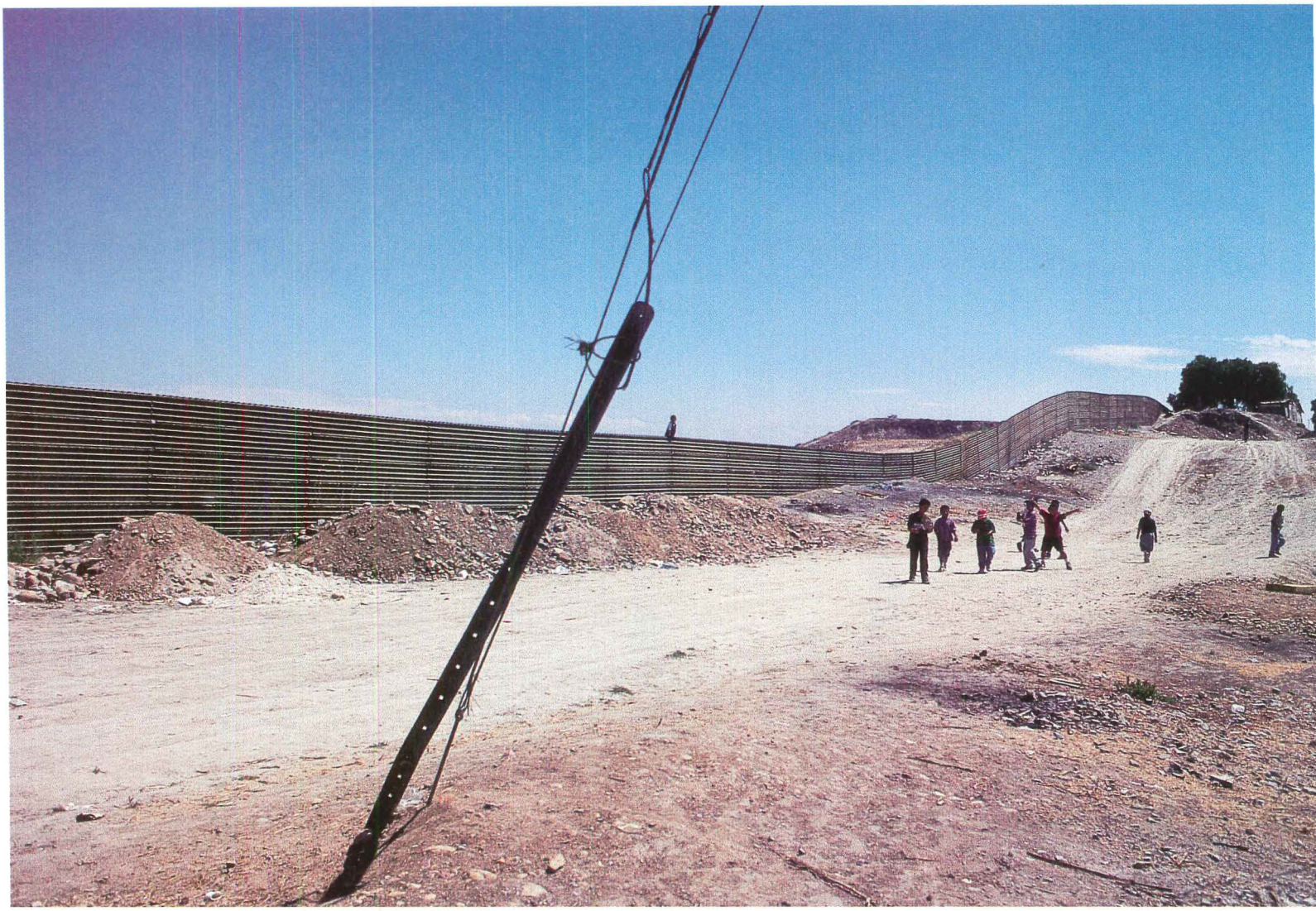
WARNING SIGN, ONE MILE NORTH OF THE GARITA DE OTAY BORDER CROSSING. SAN DIEGO COUNTY, 1997.

California Governor Peter Wilson focused on the influx of Latinos in his 1994 campaign slogan: "They keep coming! They keep coming!" As Spanish-speaking peoples form a *Nuevo Mundo* (New World) in Southern California, and are even predicted to become a majority in the state over the next four decades, fences are going up along the San Diego border to keep more poor Latinos from entering the United States. While California is traditionally depicted as a place of golden opportunity, signs are appearing on the Mexican side of the fence portraying the land to the north as arid, precipitous, and full of scorpions, rattlesnakes, and spiders. As I drove by the border, a Tijuana radio station warned, "Don't cross the desert. No dream is worth dying for."

VIEW NORTH FROM DOWNTOWN TIJUANA, 1990.

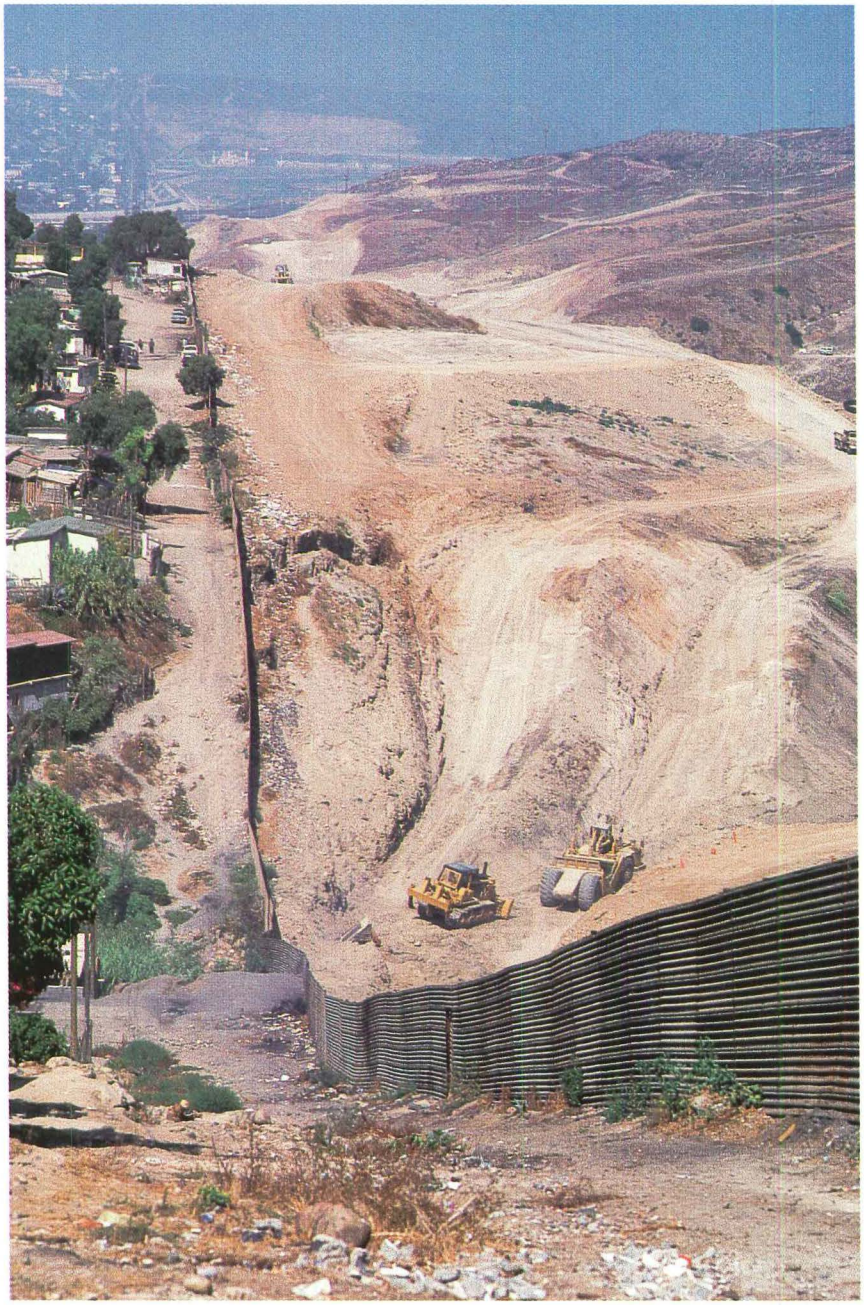
The U.S. Immigration and Naturalization Service (INS) name for gaining control of the border is Operation Gatekeeper. The INS has prolonged the fence 340 feet into the Pacific Ocean, and is erecting a second barrier made of 14-foot-tall concrete columns a few inches apart from each other. Behind the barrier the INS is adding bright lights, motion detectors, and posting guards with night-vision scopes.

VIEW NORTHWEST FROM PLAYAS DE TIJUANA, 1998.



"One no longer sees the crowds of immigrants in Tijuana, getting ready to make the jump; residents of San Diego no longer remember people trooping through their backyards; there aren't people running through the freeway anymore," says Ken Ellingwood, a reporter for the *Los Angeles Times*. He adds, "Immigration is shifting eastward into the desert. It's a very dry, arid zone. It's also much more dangerous."

CHILD RETRIEVING A BASEBALL FROM THE UNITED STATES SIDE OF THE BORDER. TECATE, MEXICO, 1998.



This vast, emerging, fragmented environment, created by the U.S. military, the INS, and the San Diego region's economic boom tells Americans as much about their country as do the Statue of Liberty or monumental Washington, D.C. I want to believe that this dystopia does not define us as Americans. I hope that the signs with the running family and the fence that runs into the Pacific will soon become museum pieces, or building materials for shacks in Tijuana.

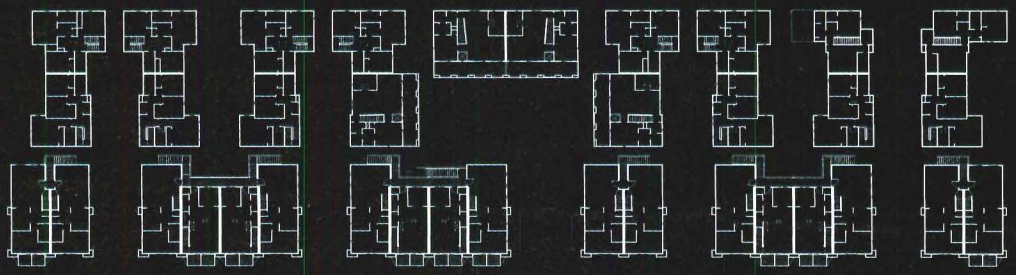
VIEW WEST FROM COLONIA LIBERTAD, TIJUANA, 1998.

A housing and retail complex by New Urbanist Dan Solomon revitalizes

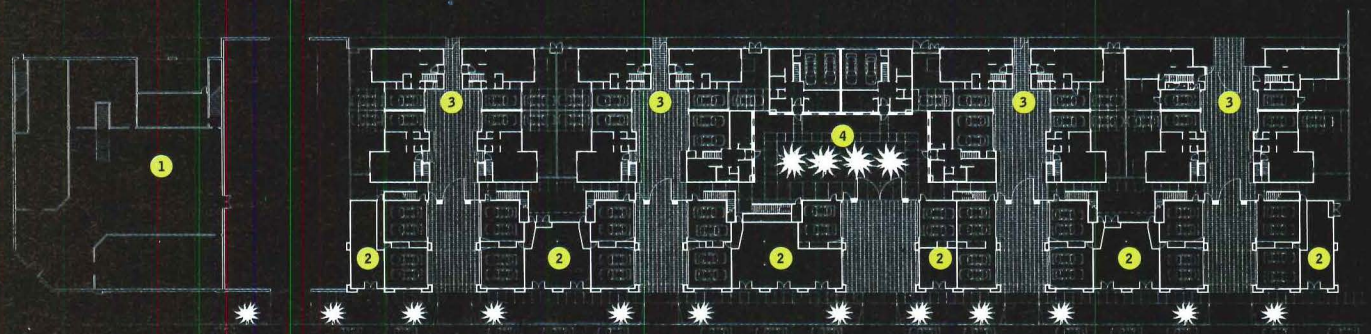
a strip of South Central Los Angeles. By Lisa R. Findley

Street Wise

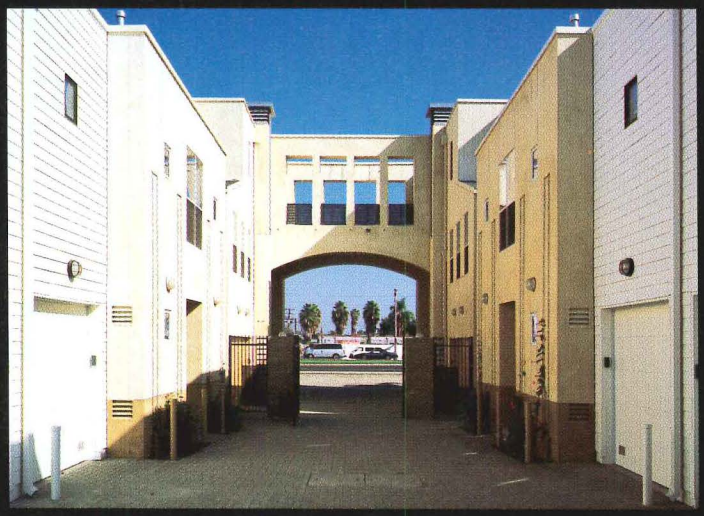
Rhythm of pilasters along Vermont Avenue (facing page) creates strong facade among landmarks of South Central Los Angeles. Three-story townhouses (above, background) give way to two-story living units behind central courtyard.



Second-floor plan



Site plan 30'/9m



Stuccoed arches that span driveways (above left) support private balconies on third level. Vertical bands of windows complement large-scaled pilasters along stucco facade. Driveway (above center) leads from Vermont Avenue to paved mews and two-car garages beneath each unit. Within complex, slatted wood partitions (above right) enclose small private yards.

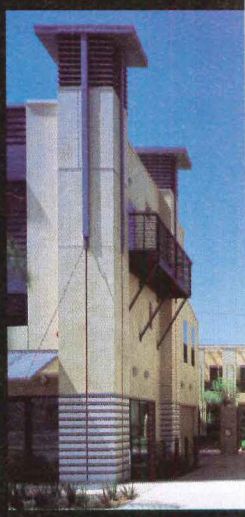
1. Hattem store
2. retail/commercial
3. driveway/mews
4. courtyard

As a signatory of the Charter of the New Urbanism, Dan Solomon has always taken exception with those who accuse the movement of being inherently elitist and accessible only to the middle class. Solomon hopes the handsome urbanity of his $4.2 million Vermont Village Plaza, 36 units of subsidized, owner-occupied townhouses in the riot-scarred heart of South Central Los Angeles, will prove New Urbanism's critics wrong. The project indeed provides skillful design and market-rate amenities to the battle-weary, mostly African-American community. However, without huge subsidies, the units would never have been affordable. Despite its virtues, Vermont Village Plaza is not a new template for inner-city development: It is the result of unique circumstances.

San Francisco-based Solomon, Inc., in partnership with local developer Rodney Shepard, won the commission for Vermont Village in a 1994 design competition sponsored by First Interstate Bank, which initiated the open competition to quell intense criticism of its lack of reinvestment in South Central in the wake of the 1992 riots. The competition originally called for the rehabilitation of the Art Deco Hattem Store building (1931) at the corner of 81st Street and Vermont Avenue into commercial space, with a maximum of 133 low-income rental units on a 1.3-acre site attached to the former store. However, residents of the adjoining Vermont Knolls neighborhood, an oasis of neatly maintained homes kept by middle-class African-Americans, protested the idea of such high-density housing in their backyard. They showed up in force at community meetings in an attempt to halt the process. "I have never seen such hostile, organized, and articulate opposition to a project," recalls Solomon. The community envisioned a revival of the shopping district that thrived along Vermont Avenue until the 1950s, but Shepard felt present-day Vermont Avenue could not support that kind of retail activity. Smaller commercial projects, built in tandem with housing, though, might succeed, given the demand for quality housing in the area.

Solomon and Shepard reevaluated the competition program and proposed 35 owner-occupied townhouses with small commercial spaces at street level. The bank, which consulted with a panel of residents, selected Solomon and Shepard's solution. The duo was just the team to tackle the project: Solomon has a thick portfolio of award-winning housing projects, many of them incorporating medium-density dwellings with high parking ratios on tight urban sites. Shepard was born and raised in South Central L.A., and has firsthand knowledge of the local housing market and prospective homeowners gleaned from his years as a local developer.

Solomon and Shepard's medium-density (27 units per acre) project, which incorporates city-mandated parking for two cars per unit, stretches 481 feet along Vermont Avenue with a three-story street facade. Along this east-facing front, Solomon created a rhythm of towering 5-foot-wide pilasters, spaced 13 feet apart, in a vaguely Deco style which harmonizes with the Hattem Store. These stucco pilasters give the building a larger presence along Vermont's eight lanes of traffic while bringing its scale down to the pedestrian realm. Private terraces two stories above gated driveways—a Solomon trademark—create a series of thresholds into the project and an opportunity for eyes on the street. Solomon says that these gestures have created a true gated community—a notion that seems paranoid in suburbia, but makes sense in this tough urban neighborhood.



Townhouses above a single level of parking makes up the three-story facade that holds the street edge. Behind and perpendicular to the street are bars of two-story townhouses alternating with a series of paved mews and a large landscaped courtyard. Through this arrangement, Solomon maintains a sense of spaciousness in a dense site. As in many of his projects, the mews act as both driveway and open space, with private parking garages tucked under the units. A clever exception exists in the back townhouses, where additional parking space is accessed through a wooden roll-up door at the rear of a single-car garage. Pedestrians amble through the site along an internal walk that strings together the mews and courtyard.

Individual units measure 1,200 to 1,500 square feet for two-bedroom residences, and 1,400 to 1,800 square feet in three-bedroom dwellings. All except those surrounding the courtyard have entrance-level kitchens and living spaces, with bedrooms

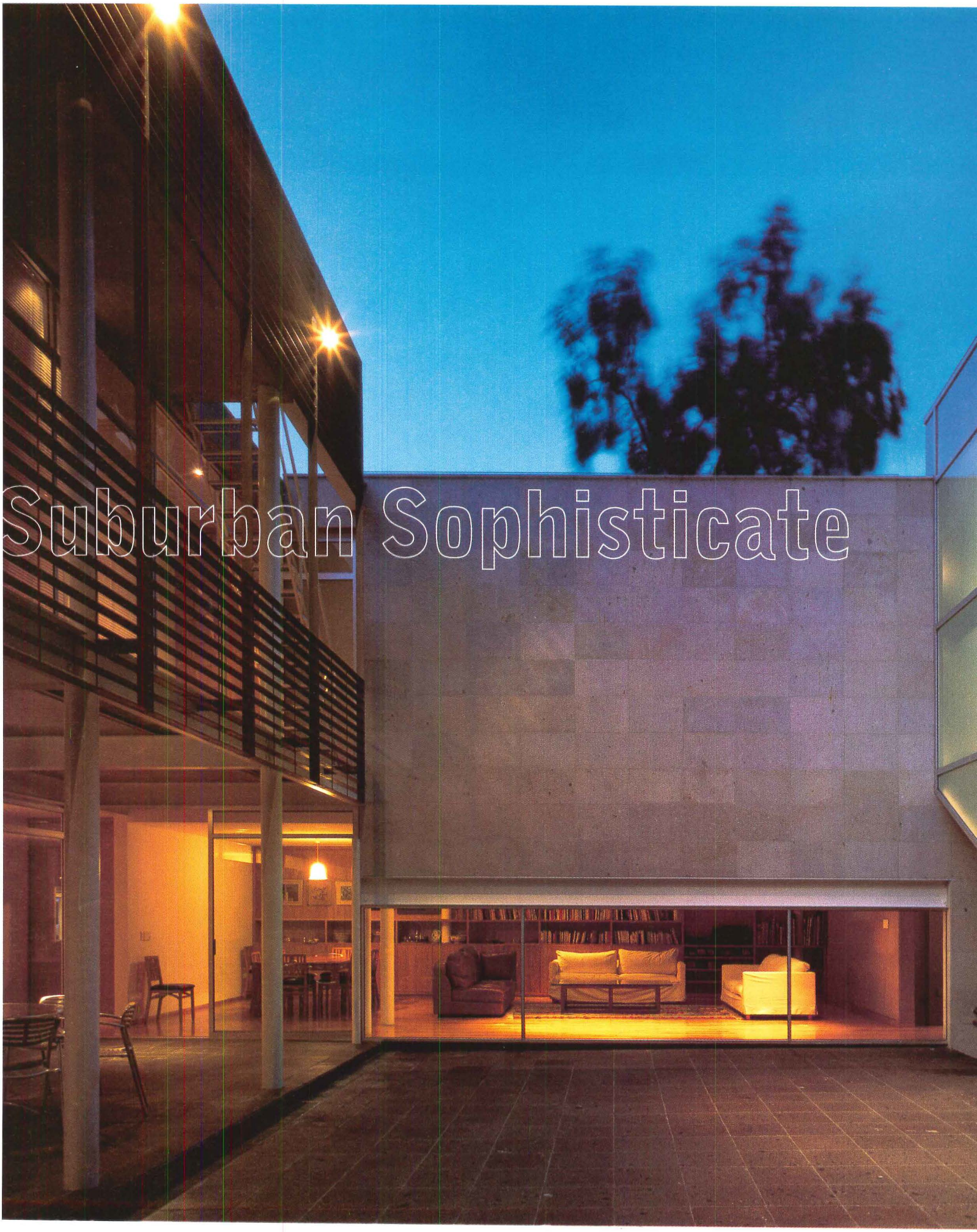
upstairs. Each has a private outdoor space directly attached to it—whether a small yard, long balcony, or open terrace. Inside, the nine-foot-high rooms have humanistic details that have become Solomon standards: Daylight washes the ceilings through windows pushed up against the tops of walls, making even the smallest bedrooms feel spacious; skylights bring natural light into upstairs hallways; kitchens are well-appointed; and residents can select their own palette of flooring—all within a construction budget of just $77 per square foot.

The townhouses, which were priced between $89,000 and $119,000, proved extremely popular: All 36 were sold within months of going on the market. However, the larger financial picture shows that while the developer made every effort to keep the townhouses within the budgets of South Central residents, they were not actually affordable. The selling prices reflect a whopping average subsidy of at least $70,000 per unit. Almost half the subsidy was necessary to offset First Interstate's purchase of the land at three times its appraised value. But even without the price increase caused by the inflated land cost, the price of the townhouses would still have been out of many residents' reach.

Vermont Village, while an exemplary project, does not disprove critics of its implicit ties to a higher economic class. However, the project did come about in the wake of the most serious civil disturbance of the decade, which motivated an unlikely dedication of resources to owner-occupied housing in South Central. When asked if the formula could be repeated, Rdney Shepard shakes his head, "I doubt it." It seems Solomon must continue the search for new ways of providing affordable urban living options to people of all economic stratas.

Flanked by future retail space along ground floor of three-story townhouses, paved plaza (previous page and above left) opens onto landscaped courtyard at heart of housing complex. Tile bands accent base of pilasters. Operable gate that protects courtyard (facing page) creates secure precinct for neighborly interaction. At rear of courtyard are smaller, two-story townhouses.

VERMONT VILLAGE PLAZA, LOS ANGELES
CLIENT: Vermont Village Plaza—Rodney Shepard (president) **ARCHITECT:** Solomon, Inc., San Francisco—Daniel Solomon (principal), Anne Torney (project architect), Marcos Ancinas, Owen Kennerly, Martha Martinez, Thai Nguyen, Gabriel Ruspini, Jose Villegas (design team) **ASSOCIATE ARCHITECT:** John Maloney, Architect, Culver City, California **LANDSCAPE ARCHITECT:** GLS Architecture/Landscape Architecture **ENGINEERS:** G.O. Dyer (structural); Khalifeh and Associates (mechanical, electrical); C. W. Cook (civil) **CONSULTANTS:** M. L. Kimbrough & Associates (construction management); Design Control (project management) **GENERAL CONTRACTOR:** Windjammer Construction **COST:** $4.2 million **PHOTOGRAPHER:** Grant Mudford



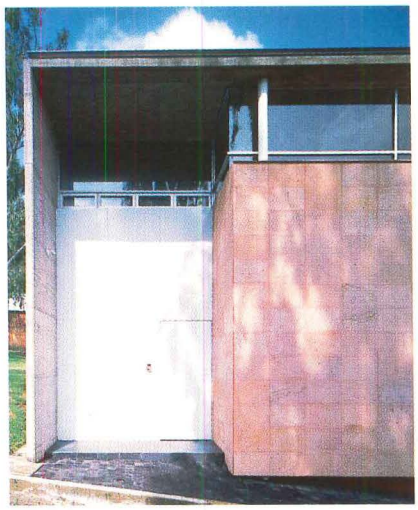
Suburban Sophisticate

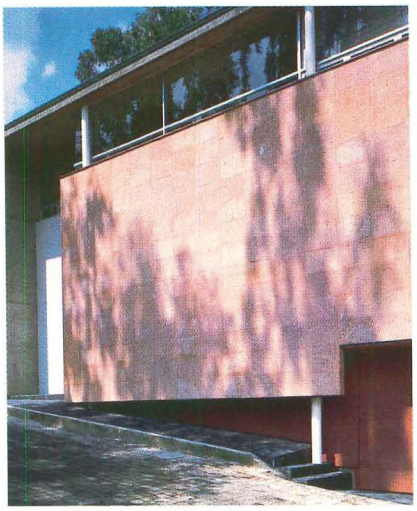
A new courtyard house by TEN Architects brings urbanity to the outskirts of Mexico City. By Raul A. Barreneche

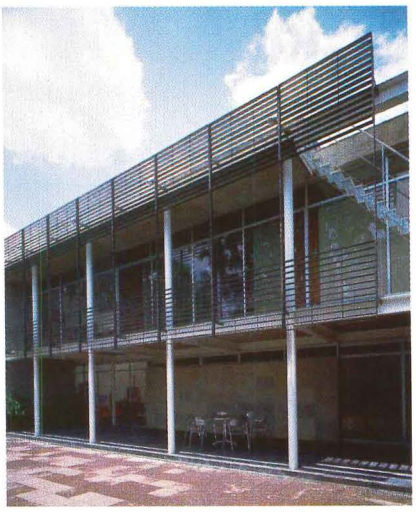
Mexican architecture has spent the better part of the 20th century trying to get out from under the long shadow cast by Luis Barragan and the heirs and imitators of his colorful oeuvre. Some Mexico City architects jokingly refer to this generation as "los Barragansitos," or "the little Barragans," but the pun is only somewhat good-natured: It has been difficult for hardline Modernists to make headway in Mexico, especially when it comes to designing private homes.

Over the past few years, the Mexico City firm of TEN Architects has emerged as the undisputed leader of a new generation of designers who reject bright colors and neo-Aztec references in favor of technological innovation and expression. TEN's newest project, a house in

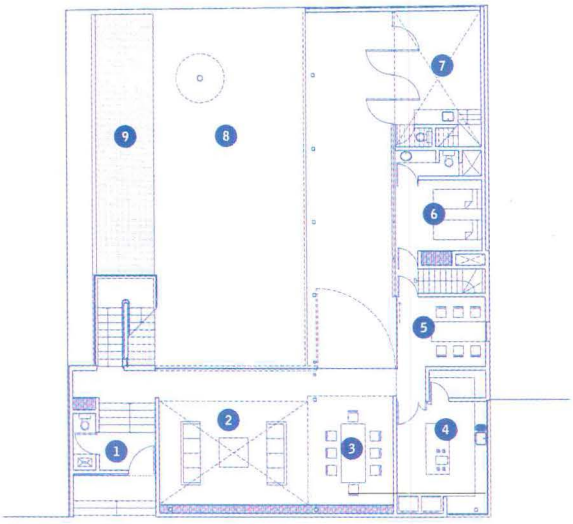
View from interior patio captures urbane disposition of Reyes-Retana House (these pages). Luminous stair tower wrapped in sandblasted glass (at right) connects entrance vestibule to upstairs den. Rectangular window (at center) hugs ground to block views from living room of second-floor bedrooms.



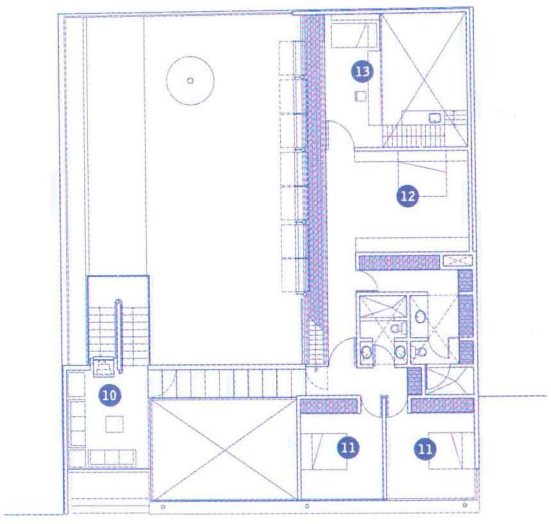




Architect set back porcelain-covered steel door (above left) at eastern corner of street facade to create shallow entrance porch. Rose-colored limestone wall (above center) was quarried in client's hometown of Xilotepec, at his request. Clerestory behind exposed steel pipe columns illuminates living room. Steel grilles (above right) wrap balcony that extends along bedroom wing; slate-tiled arcade below serves as outdoor dining terrace. Reflecting pool (facing page) beneath glazed stair tower adds to serenity of patio.



Ground-floor plan



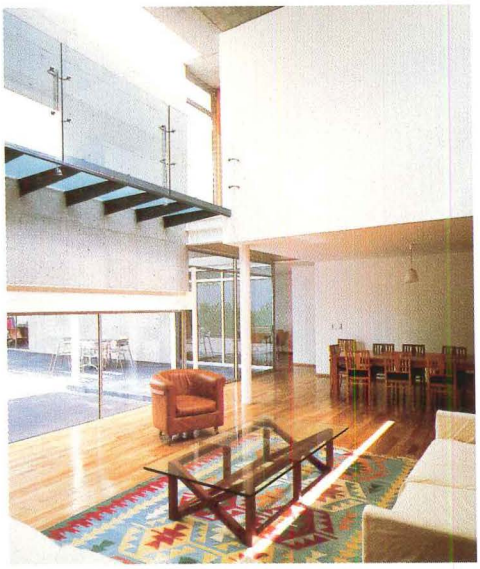
Second-floor plan

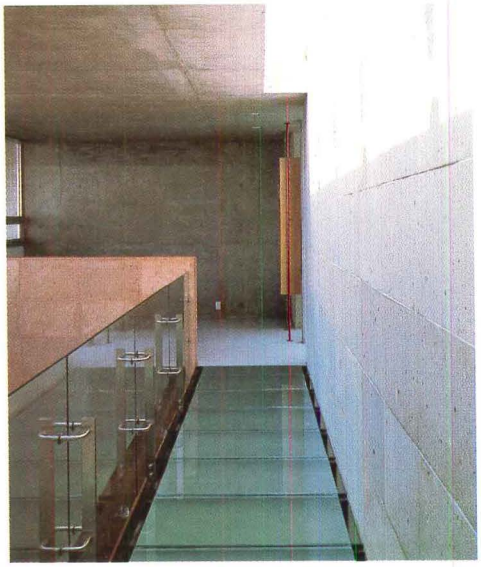
1 entrance
2 living room
3 dining room
4 kitchen
5 breakfast area
6 service quarters
7 painting studio
8 patio
9 reflecting pool
10 den
11 bedroom
12 main bedroom
13 sleeping loft

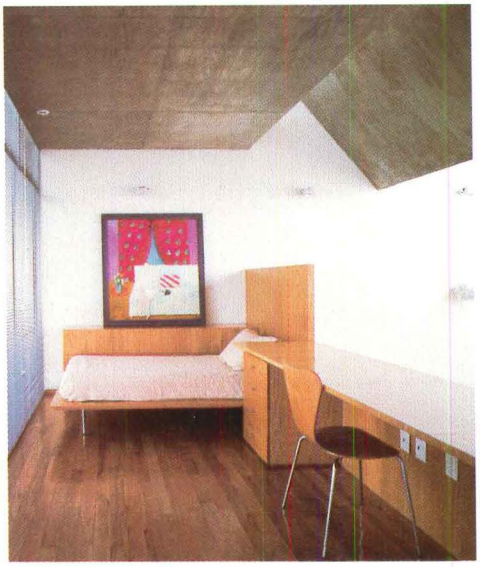
Mexico City, is every bit as sleek and sophisticated as their larger scale buildings, which include the National School of Theater (*Architecture*, September 1995, pages 78-83) and the Televisa Headquarters (*Architecture*, December 1995, pages 76-83), both in Mexico City. Perhaps more than any other of the architect's works, however, the house draws heavily on time-honored typology—in this case, the courtyard house plan handed down from colonial Latin America. Principal Enrique Norten manipulates the classic configuration into a spatially complex composition that reinforces the interior patio as the locus of family life.

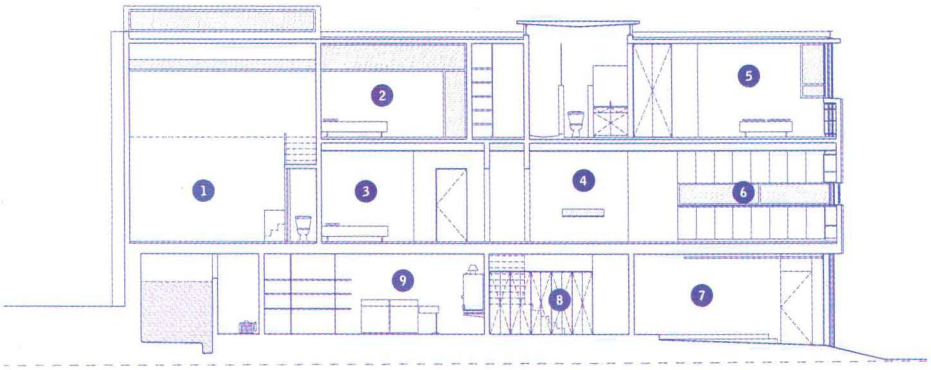
The Reyes-Retana family hired Norten to design a house on a site they had purchased in a gated hillside subdivision on Mexico City's southwestern fringe. The family had seen Norten's own home in the city's Colonia Condesa district (*Architecture*, December 1996, pages 64-69), and asked him to re-create it for them. Norten was certainly not about to replicate his own home, nor was he willing to defer too overtly to the faux-historical environs of the neighboring Colonial-style dwellings. His solution was to play up the urban character of a town-house in the suburbs that turns a fairly solid face to the street and creates a private sanctuary for the family at its heart. "Unlike suburban American houses, the Latin house is more introspective, more inwardly focused," offers Norten.

Instead of placing the courtyard at the center of the rectangular site, Norten created an *L*-shaped configuration with two wings of the house and a pair of vine-covered concrete party walls framing the open-air patio. The short side of the *L* contains a soaring double-height living room, an adjoining dining room, and an upstairs den; the long side of the *L* houses a kitchen, breakfast area, service quarters, and a painting studio on the ground floor, and bedrooms upstairs. Gone is the rigid, axial movement of the traditional Mediterranean house, where rooms connect only through formal enfilades and access to the inner sanctum of the patio is limited. In the Reyes-Retana House, rooms flow freely into each other along the inside edges of the *L*; all provide easy access

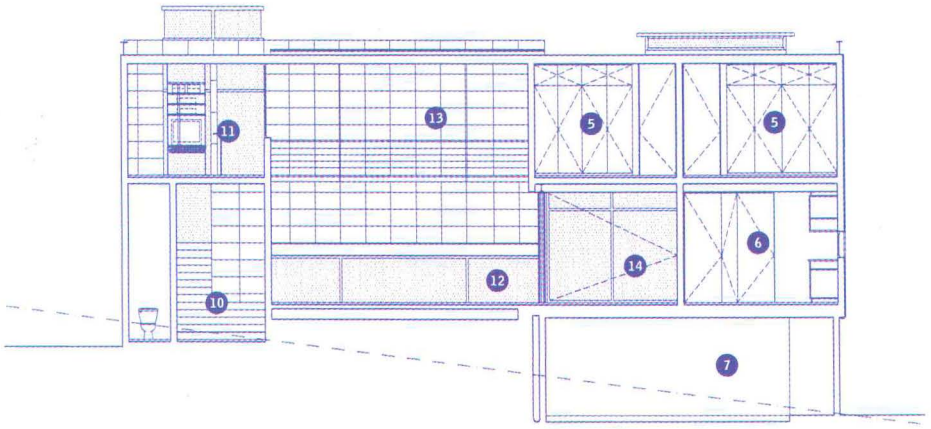








East-west section



North-south section 6'/2m

1 painting studio
2 main bedroom
3 service quarters
4 breakfast area
5 bedroom
6 kitchen
7 garage
8 storage
9 laundry
10 entrance
11 den
12 living room
13 bridge
14 dining room

HOUSE RR, MEXICO CITY
CLIENT: Reyes-Retana family
ARCHITECT: TEN Architects, Mexico City—Bernardo Gomez-Pimienta, Enrique Norten (principals); Aarón Hernández, Francisco Pardo (project team) **ENGINEER:** Vicente Robles (structural) **CONSULTANT:** Julio Amezcua (model) **COST:** Withheld at owner's request
PHOTOGRAPHER: Luis Gordoa

Narrow skylight washes stone-clad living room wall (top) with daylight. Cantilevered glass bridge above living room (top and above center) links second-floor den to bedroom wing. Adjoining master bedroom, sleeping loft (above) overlooks painting studio below. Sawtooth concrete roof directs daylight into studio.

At night, facade of bedroom wing (above) all but disappears. Screened by steel grilles, glazed facades reveal narrow interior rooms, including double-height painting studio and loft (at left); master bedroom above service quarters (at center); and bedrooms atop breakfast area (at right). Clerestories along rear wall of loft and master suite edit views out to surrounding valleys.

to the courtyard through sliding glass doors. A continuous balcony along the bedroom wing and a covered arcade beneath it create opportunities to engage the courtyard more intimately.

The building's single exterior elevation is by no means a static, impenetrable facade. A wall of rose-colored limestone blocks, skewered with steel columns exposed above and below it, dominates the elevation. The exposed edges of the concrete walls and roof create a thin frame that sets off the richly hued stone surface, which seems to float above the sidewalk as the ground beneath it slopes down toward the garage. The limestone's rosy tone and the salmon-colored porcelain panels of the garage doors are Norten's begrudging abstract nod to the red tile roofs of the surrounding stucco houses. This attitude of acknowledging yet rejecting the outside world sets up contradictions that permeate the entire building: "The house is blind to the street, yet it has a strong relationship to it." explains Norten. "There is a sense of both repulsion and attraction."

While the exterior elevation struggles with its public character, the core of the house, the patio, is completely disengaged from the neighborhood. Norten allows the space to become wholly urban and urbane, despite its suburban setting: The textures, volumes, and heights of the patio elevations, particularly the covered arcade and balcony along the bedroom wing and a luminous stair tower wrapped in glass, recall the rhythm of facades fronting an urban *zócalo*, or public plaza. The overall mood of the space is soothing, aided by the pale palette of steel, light wood, gray and black stone, and aquamarine glass, as well as a long, narrow reflecting pool along the courtyard's southern edge.

The Reyes-Retana House demonstrates Norten's growing maturity. The architect has traded his earlier structural exuberance for quietness and restraint. "I think modesty and simplicity come later. You suddenly find there's no need for complex forms and weird geometries," he says. The result is a dignified building that reshapes elements of Mexico's architectural past into an expression of its contemporary condition.

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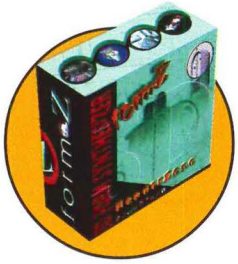

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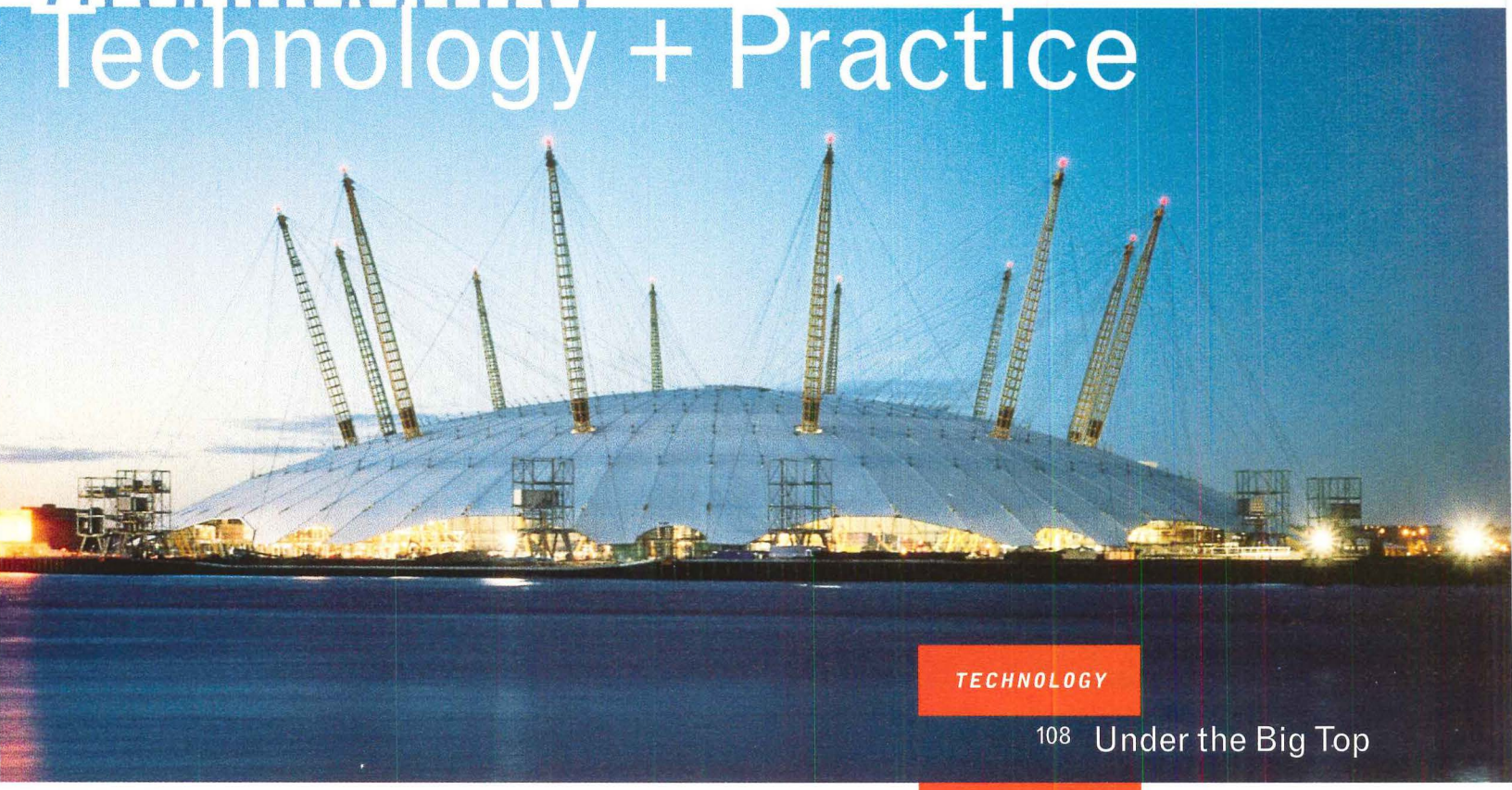
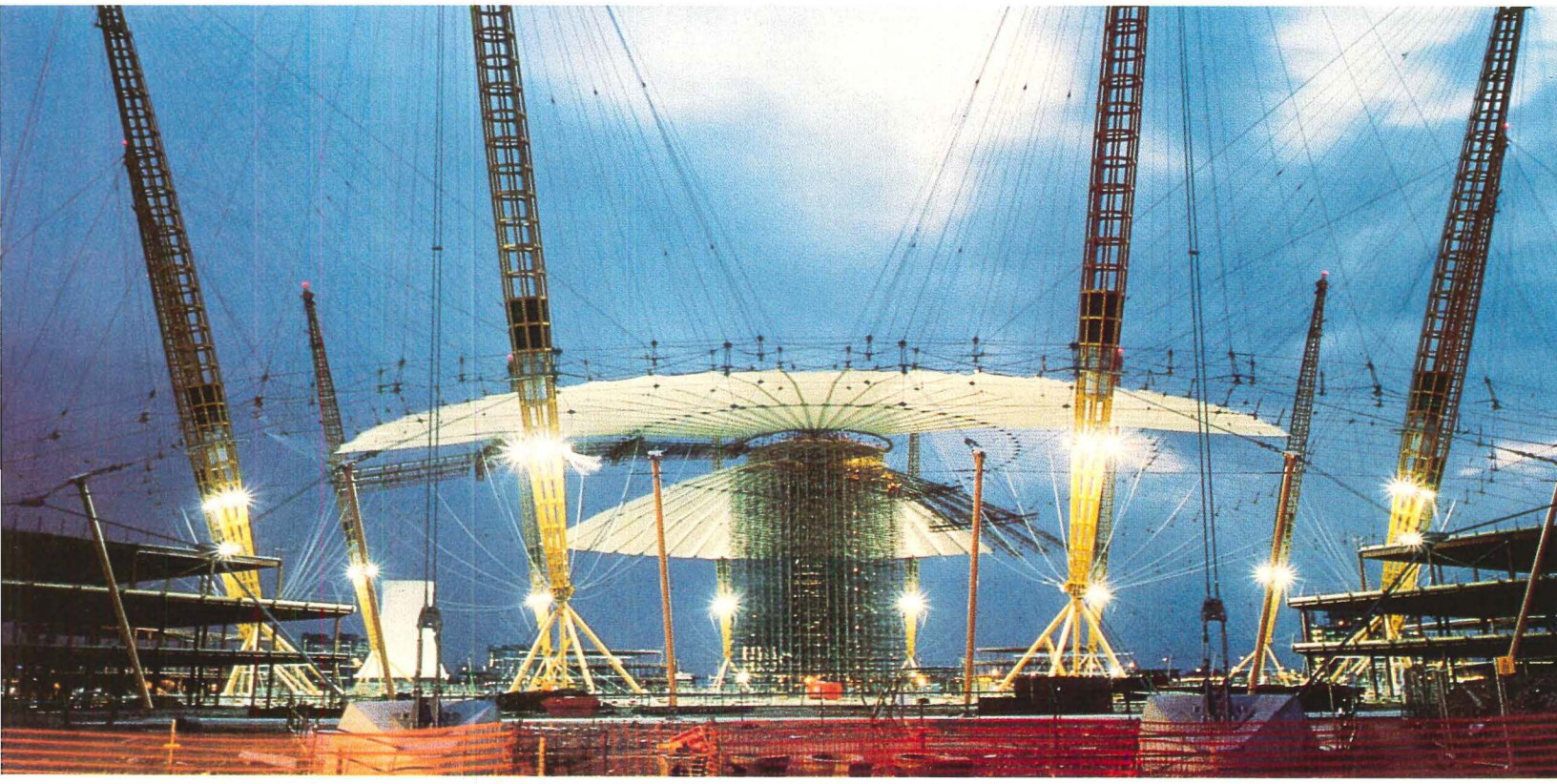
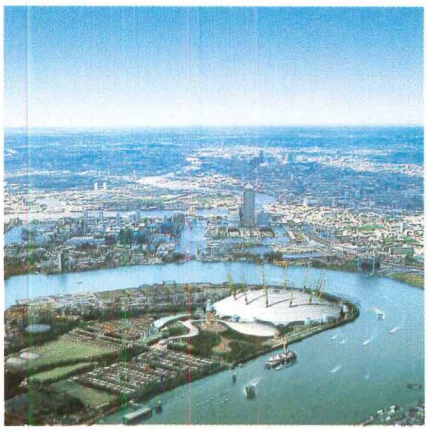


Enclosing 1 million square feet, Richard Rogers Partnership's Millennium Dome, more than twice the size of Georgia Dome, is now world's largest tensile-roofed structure.

Wishbone nodes connect circumferential cables to pairs of radial cables that form a netting (above), which will hold tensioned membrane panels. **Scaffolding** (below) made of 44 miles of steel tubing gives workers access to cable network. **Aerial view** (opposite page) looks over dome on 181-acre site next to River Thames.





TECHNOLOGY

Richard Rogers' tensile-roofed Millennium Dome brings London Under the Big Top

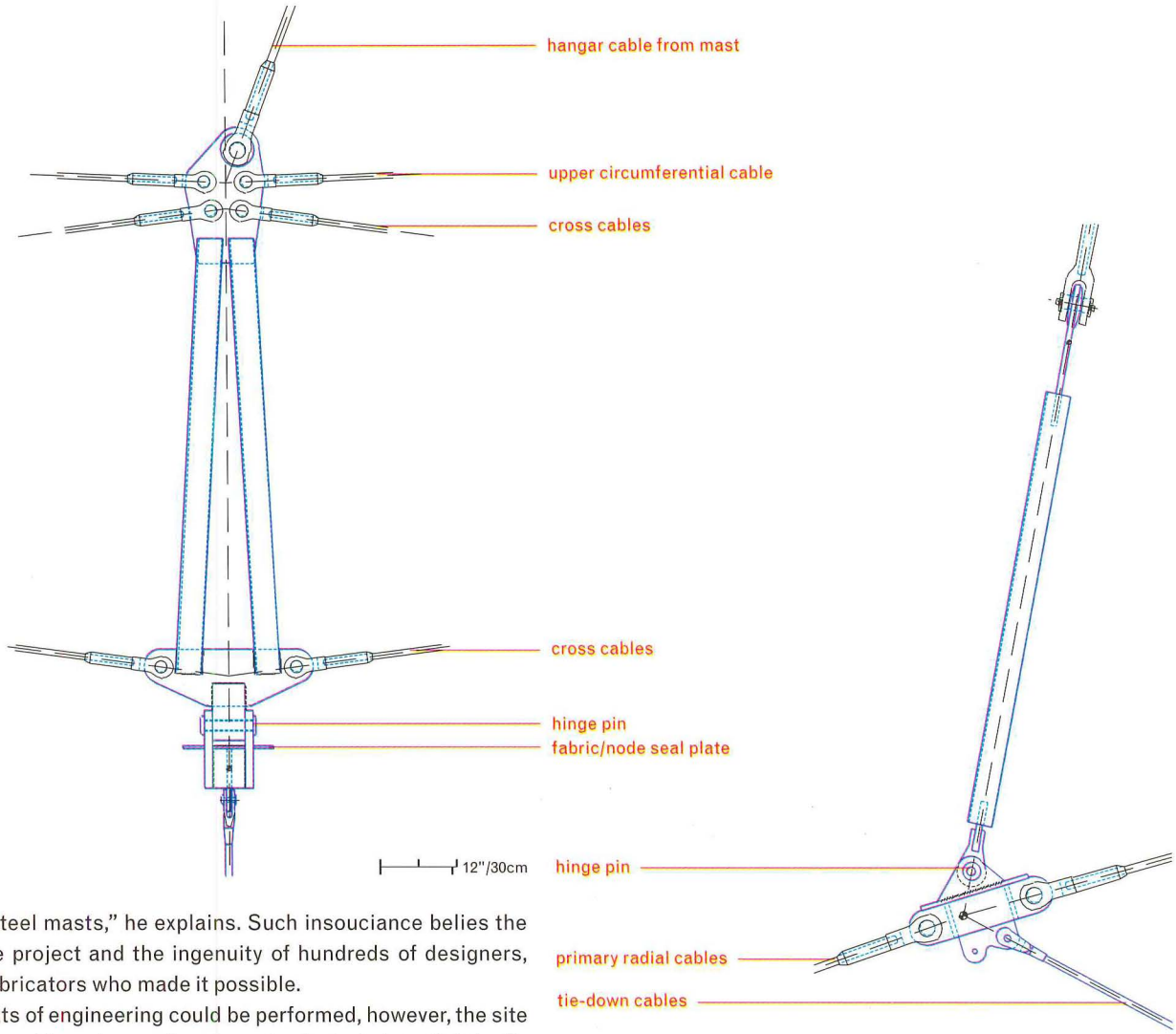
By Sara Hart

Christopher Wren's Royal Observatory (1675) crests an expansive, sloping park in the village of Greenwich, around a River Thames bend in southeast London. Down the street, Britain's last clipper ship, the Cutty Sark, rests in peaceful permanent dry-dock as a museum and symbol of Britain's seafaring, imperial past. The scene resembles more the 19th-century English village where Charles Dickens' David Copperfield went to school than the host town of the country's most ambitious national celebration since the 1951 Festival of Britain. The only clue that Greenwich is about to be catapulted into the global spotlight is a voluminous, white object looming on the horizon.

The Millennium Dome, as it's called, is the tensile-membrane umbrella designed to cover Britain's billion-dollar, government-sponsored celebration of the beginning of the next thousand years. Because the dome currently stands alone on a nearly barren peninsula about a mile from Greenwich (Nicholas Grimshaw's new London Underground station sits quietly off to the side, awaiting the arrival of the Jubilee Line extension), its true enormousness can only be described quantitatively: It's nearly a mile in circumference, enclosing 20 acres, or 1 million square feet. It can accommodate 35,000 people at one time, who will visit 14 themed pavilions and the performing arts arena within it. It's twice the size of Atlanta's Georgia Dome, previously the largest tensile-roofed structure in the world. Twelve 100-meter-tall masts hold the fabric and cable dome, which reaches 164 feet above ground at center. Over 1 million square feet of fabric cut into 144 panels, each weighing about 1 ton, are attached to 43 miles of steel cables. And for those dazzled by engineering virtuosity, the entire structure weighs less than the air contained within it.

Siting the project on the Greenwich peninsula has economic and symbolic significance. Since 1884, Greenwich has been associated with the Prime Meridian (0 degrees longitude), the imaginary line where time—or more accurately, telling time—begins. Architect Richard Rogers, long an advocate of responsible stewardship of the Thames riverbanks, was already working on a master plan for the site when the Millennium Commission chose him to develop a scheme for a millennium celebration there. Rogers' partner Michael Davies visited the site and realized that it was too exposed to the elements, especially in winter months, to expect visitors to circulate among freestanding buildings. The driving considerations for Davies were shelter, economy of means, site compatibility, architectural significance, and speed of construction. "I realized that a dome would achieve all those," he explains. "A dome is the universal symbol of assembly." Buro Happold Consulting Engineers took Davies' idea and rationalized it as a tensile-stressed structure.

"The structural concept for the dome is rather simple," says Buro Happold Partner Ian Liddell, who masterminded the engineering. "It's a tensioned, fabric-clad, spherical cap defined by radially arranged tensioned steel cables, held in place by hangar and tie-down cables, which



Wishbone nodes (above and above left) connect radial cables to circumferential cable rings, which are lifted above fabric to prevent ponding.
Fabric is sealed to plate in order to waterproof membrane where steelwork penetrates surface.

are attached to steel masts," he explains. Such insouciance belies the complexity of the project and the ingenuity of hundreds of designers, engineers, and fabricators who made it possible.

Before any feats of engineering could be performed, however, the site had to be resurrected from its moribund, contaminated state. Originally a marsh, the Greenwich peninsula was the site of Europe's largest gasworks from the turn of the century to the mid-1960s. The conversion of coal to gas was a nasty and toxic operation that dumped contaminated lime, along with tar and benzene, on the site. A $30 million cleanup of the land to a depth of 46 feet was successful enough to allow construction of the dome. Enough pollutants remained, however, to require a gas-tight, welded polyethylene membrane under the foundation, which will keep contaminated ground water and gases from rising into the dome.

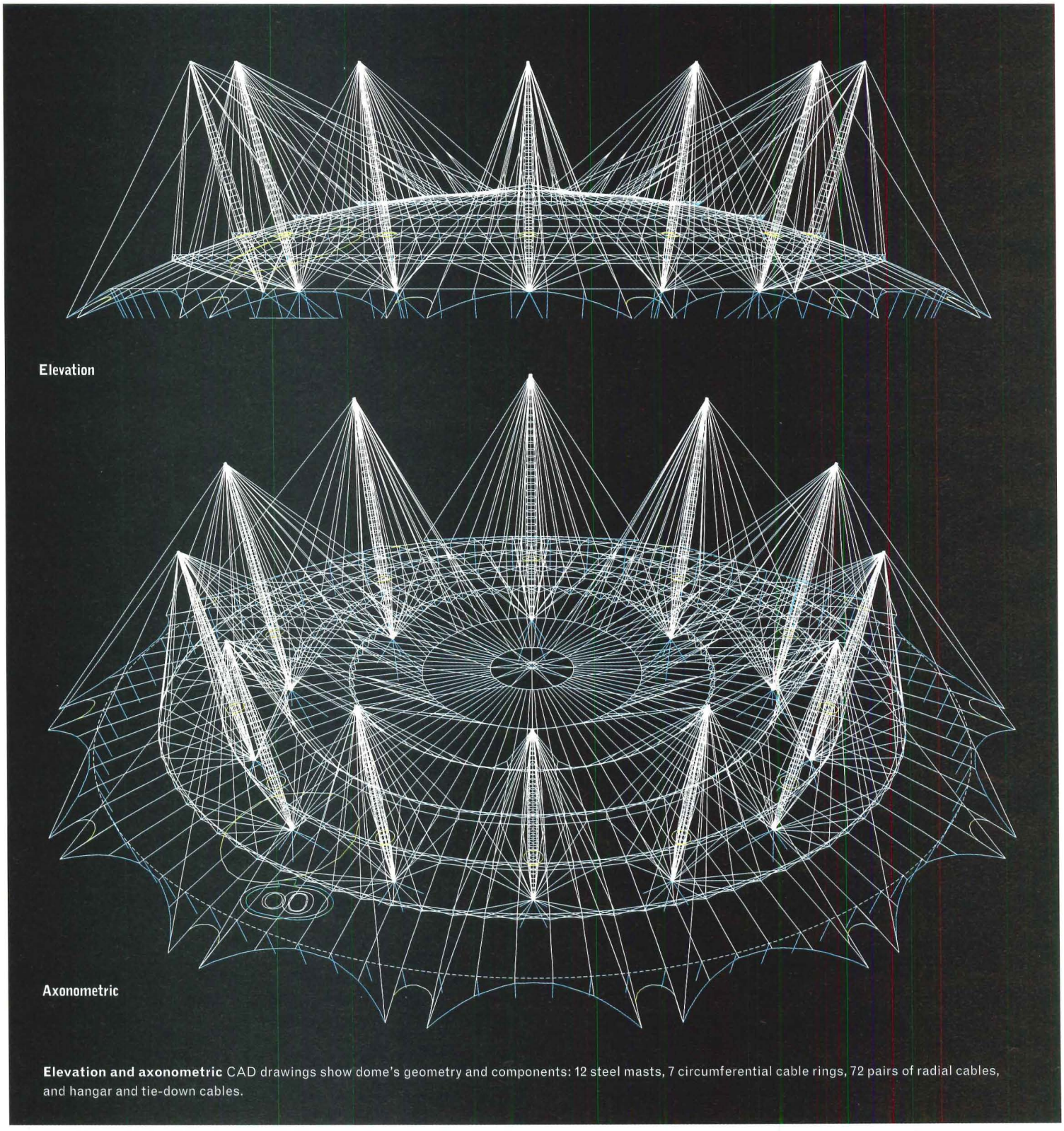
Because the top 8 to 10 meters of clay were too silty for a pad foundation, the engineers chose cast-in-place piles, which bear on the gravel below the silt. Beginning in June 1997, operators of 14 piling rigs drove 8,000 piles into the ground in just 13 weeks. The project needed deeper piles around the highway tunnel running under the building site. Here, the engineers used continuous flight auger (CFA) pilings to reach the subsoil stratum below the gravel. With CFA, an auger is bored, rather than driven, into the ground. As the auger is withdrawn, concrete is poured down its center to fill the void. Foundation work followed, including bases for the main masts and a 20-foot-wide reinforced-concrete compression ring beam around the circumference of the dome's base. The ring beam contains the horizontal forces generated at the anchors, which hold the hangar and tie-down cables to the 72 perimeter masts.

Twelve external service structures around the perimeter contain the physical plant, including chillers and chiller pumps, high-voltage switchrooms, standby generators, and sprinkler tanks. These feed into six internal service structures that will also contain the primary toilet and corporate hospitality facilities for the dome. Distribution of services from the cores to the exhibition pavilions required shallow trenches running radially and circumferentially. Small tertiary services (mainly cabling) will run within the finish floor above the slabs in the exhibition areas.

The fabric package went out to bid in February 1997, with requests for bids for two fabric types: Teflon-coated fiberglass and PVC-coated polyester. Because the dome was initially conceived to last only the 12-month duration of the millennium celebrations, the architects chose cheaper PVC-coated polyester. However, Tony Blair's New Labour government decided in 1997 that the dome should be permanent, so a more durable Teflon PTFE-coated (polytetrafluoroethylene) fiberglass replaced the PVC-coated polyester specification. Buffalo, New York-based Birdair, who developed dozens of tensioned membrane structures, including Denver International Airport, won the contract.

The Birdair panels are Sheerfill Architectural Membrane, a spun and woven electrical grade fiberglass substrate dipped in Teflon PTFE coating. The Teflon outer covering is chemically inert and remains unchanged throughout extreme temperature variations. However, in a structure this enormous, the possibility that internal weather patterns

Over 1 million square feet of fabric cut into 144 panels, each weighing about 1 ton, are attached to 43 miles of steel cables. And for those dazzled by engineering virtuosity, the entire structure weighs less than the air contained within it.



Elevation and axonometric CAD drawings show dome's geometry and components: 12 steel masts, 7 circumferential cable rings, 72 pairs of radial cables, and hangar and tie-down cables.

could form is a real one. "Condensation is a big issue," says Daniel Ptacek, general manager of Birdair UK, expressing concern that moisture build-up could turn to rain inside the dome. "We welded Fabrasorb II [an acoustical liner] to the interior side of the panels in the factory. It functions more as insulation than as an acoustical device by creating a dead-air space to prevent dripping," he explains.

Having solved one climatic problem, engineers had to figure out how to maintain comfortable temperatures inside, a monumental task considering the internal volume is over 74 million cubic feet. Using thermal analysis on a two-dimensional section and computational fluid dynamics (CFD) analysis on a three-dimensional model, Buro Happold engineers determined air flow and heat transfer conditions and solutions. There will be three types of spaces on the interior of the dome: circulation paths around the entrance corridors and around the central performance arena, the arena itself, and the 14 exhibition buildings. The arena and the exhibitions will be cooled with local air handling plants. To ensure that fresh air reaches the center of the dome, the six perimeter service buildings will pump air into the center through 12 large ducts. In addition, 24 extractor fans in the masts and the center of the roof will exhaust air out while drawing fresh air in through a continuous opening around the perimeter.

The steel contractor fabricated each of twelve 100-meter steel masts in six 15-meter sections and transported the sections to the site where they were welded together and painted bright yellow. A crawler crane hoisted one mast per day into position atop four-legged steel pyramid bases, and workers attached tensioned guy-wires to hold them in place.

The galvanized, prestressed steel cables were laid out on the ground in a grid of 72 paired cables, radiating from the center to the periphery, and seven circumferential cable rings. Once again, a roof of this size creates atypical conditions. With the condensation risk apparently solved, Buro Happold engineers were concerned about ponding at the circumferential rings, caused by deflection in both the cables and the cladding. Their solution called for the cable rings to be attached to the radial cables above the cladding with rigid wishbone connectors. Crane operators lifted the cable network to the top of the masts.

The job of clamping the tensioned membrane panels and welding the seams fell to a team of specialists called abseilers. (Abseiling is rappelling in British parlance.) These industrial aerialists accessed the cable network via a 164-foot tower made of 43 miles of scaffolding beneath the dome's center. From there, radially projecting access platforms allowed the abseilers to attach 20,000 aluminum clamps onto the network's radial cables to hold 144 Teflon-coated fiberglass cladding panels in place. The workmen welded the seams with Birdair's proprietary welding equipment at a temperature of 1,260 degrees Fahrenheit.

Of course, a project of this magnitude requires effective management and a vigilant eye on the calendar: After all, a commemoration of the new millennium can't be postponed. "The only way to keep on schedule was to have all the players under one roof," says Bernard Ainsworth, project director for the construction management company, McAlpine–Laing Joint Venture. A temporary, but technologically sophisticated, two-story building 100 yards or so from the construction site houses as many as 200 people that represent the client, architects, engineers, and fabricators. "We don't have time to write memos and send faxes. If there's a problem, we sit down together and solve it," he explains.

A local area network (LAN) supports the onsite project team and provides controlled access to all software and project information. Approximately 150 desktop computers run Microsoft Office and E-mail, and another 60 high-end PCs are used to produce CAD models. All stored documents can be viewed or edited at the desktop by staff with appropriate authorization. A Wide Area Network (WAN) links each onsite team to its respective home offices.

A crawler crane hoisted one mast per day into position atop four-legged steel pyramid bases, and workers attached tensioned guy-wires to hold them in place.

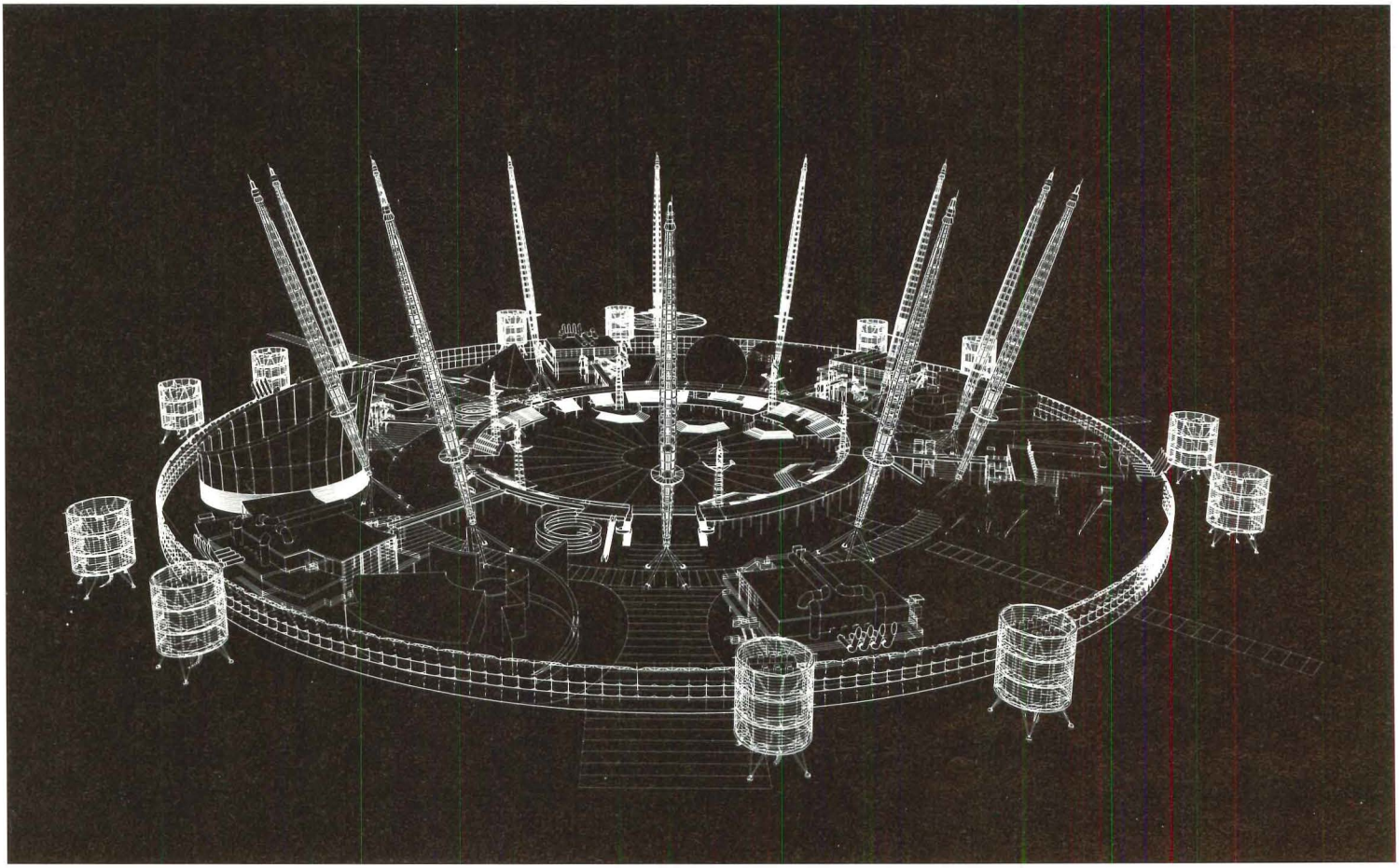
It's January 1999, and the race is in the final stretch. The pavilions are being constructed under the watchful eye of oversight committees that consist of Davies and others, whose job is to ensure control and a visual parity among the individual exhibitions. Construction is on schedule.

Although the Millennium Commission is optimistic, the project still has its critics. First, there's the billion-dollar price tag. Davies clarifies, "The dome itself constitutes only 7 percent of the whole budget. It cost the same [per square foot] as a typical industrial shed in the U.K." Other criticism is focused on the high-tech, glitzy exhibits, which many believe might lack substance. It's too soon to evaluate the experiences, but not too soon to speculate on dome life after the celebrations. At least eight proposals have been presented to the government suggesting uses for the dome after the pavilions are dismantled, which range from a sports complex to a university campus. Davies is unconcerned about its life expectancy: "We're not overly serious about it, and we're not on a crusade. It should last as long as it's useful and needed. It's not about keeping historical props; it's about the dynamism of now."

MILLENNIUM DOME, LONDON

CLIENT: The New Millennium Experience Company **ARCHITECT:** Richard Rogers Partnership **ENGINEER:** Buro Happold Consulting Engineers (structural, mechanical, electrical) **CONSULTANTS:** McAlpine/Laing Joint Venture (construction manager); Birdair (fabric); Chemlab of New Hampshire (Teflon); English Partnerships (site remediation); Keller Ground Engineering of Coventry (piles); John Doyle Construction (foundations); Watson Steel (mast fabrication); Bridon International (steel cables); The CAN Group (abseiling); Danny's Construction Company (roof installation); Kwikform (scaffolding tower) **COST:** $1 billion

Perspective from dome's interior floor (above) provides expansive view of completed Teflon-coated fabric panel installation. **Computer rendering** (below) shows 12 exterior service structures that feed six internal physical plants. **Abseilers** (left) on top of dome cable network unfurl tensioned membrane panels, each weighing just under 1 ton.



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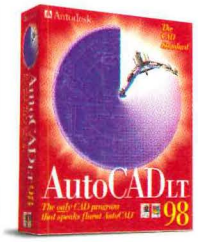

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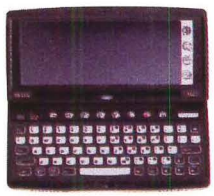
Small Wonders

COMPUTERS

Handheld computers help architects write, sketch, and schedule. What's next, PocketCAD? By Ann C. Sullivan

Handheld and palmsized computers offer wide array of features, including (clockwise from top right): Sharp Mobilon HC-4600's optional digital color camera; Compaq C-series 2015c's QuickNotes sketching software; Novatel Contact's wireless communication capability; Philips Nino 312's Windows CE compatibility; and 3Com Palm III's large selection of third-party software. (Lamp designed by Gaetano Pesce, courtesy of moss, New York City.)

Vital Stats



Name	HP 660LX	Philips Nino 312	Novatel Wireless Contact	Compaq C-Series 2015c
Type	handheld	palmsized	handheld	handheld
Price	$999	$459	$999	$599
Weight	20.6 ounces	7.8 ounces	22.4 ounces	15.2 ounces
Size (HWD)	1.4" x 7.8" x 4.1"	5.25" x 3.41" x 0.75"	1.2" x 7.6" x 4.7"	1.61" x 7.32" x 3.93"
Operating System	Windows CE 2.0	Windows CE 2.0 for palmsized PCs	Windows CE 2.0	Windows CE 2.0
ROM/RAM included	16MB / 32MB	8MB / 8MB	16MB / 8MB	16MB / 20MB
Battery	rechargeable lithium	2 AA or rechargeable NiMH	rechargeable lithium	rechargeable NiMH
Display	6.5" diagonal color touch screen	3.75" diagonal grayscale	7" diagonal grayscale	6.5" diagonal color touch screen
Modem	56.6 kbps	optional 19.2 kbps	14.4 kbps internal, 19.2 kbps wireless	33.6 kbps
Features	Quicken financial software; voice recording	voice command recognition	two modems (wireless and wireline)	docking cradle; preinstalled sketch software

Architect Louis Goetz, principal of Washington, D.C.-based Greenwell Goetz Architects, once dropped his PalmPilot Professional onto the ground, cracking the little handheld computer's plastic housing. Luckily, there was no permanent damage—his contacts, schedule information, and notes remained intact on the PalmPilot and safely backed up on his desktop PC. It did, however, take 3Com a few days to repair the unit. To Goetz, the wait was nearly as bad as losing the data might have been. "I felt lost without it," the architect recalls.

Goetz isn't the only architect attached to his pocket-sized computer. Los Angeles-based RoTo Architects principals Michael Rotondi and Clark Stevens feel the same way. "They're addictive little things," muses Stevens, who has toted around a PalmPilot since 1997. Slightly larger than a deck of cards, the PalmPilot slips easily into your hand or shirt pocket. It stores contact information and appointments and can keep track of billable hours and reimbursable expenses. It can also be used to take notes, make sketches, and send E-mail.

Like other palmsized computers on the market—such as Casio's Cassiopeia and Philips' Nino—the PalmPilot's biggest draw is its simplicity. There are only five buttons on the 6-ounce unit along with a plastic, penlike stylus that lets you run applications, execute commands, and jot down notes. There is no traditional keyboard, but a digital on-screen keyboard instead, activated by the stylus; synchronizing data with your desktop PC is accomplished easily.

This simplicity initially attracted consumers and eventually won over corporate buyers as well. At client meetings, when those present want to schedule the next date or deadline, Stevens sees increasing numbers of people whipping out tiny computers rather than pen and paper organizers. "It's become symbolic of being organized," he observes.

Architects need organization as much as anybody else, so palmsized computers and their slightly larger and more versatile brethren, handheld computers, are beginning to be as commonplace in architectural offices as they are in client offices—a dozen architects at Goetz's 35-person office now carry their own PalmPilots. But while 3Com's PalmPilot clearly dominates the market with more than 60 percent of handheld sales, other manufacturers are beginning to catch up as they offer more options, gadgets, power, and speed.

Buoyed by increased processing power and decreased hardware prices, these computers are becoming more sophisticated. Manufacturers are targeting users who want more than just a digital calendar, address book, and to-do list. Web browsing and E-mail retrieval capabilities as well as infrared ports, global positioning systems, and pagers distinguish the latest handheld gadgets. For architects, these capabilities mean there are more ways handheld computers can come in, well, handy: Architects can sketch while stuck in






EC MobilePro 750C	3Com Palm III	Sharp Mobilon HC-4600	Casio Cassiopeia E-11	Psion Series 5	Philips Velo 500
handheld	palmsized	handheld	palmsized	handheld	handheld
799	$369	$799	$399	$499	$599
8 pounds	6 ounces	1.1 pounds	6.5 ounces	12.5 ounces	15.3 ounces
2" x 9.6" x 5.4"	4.7" x 3.2" x 0.7"	1.1" x 7.3" x 3.6"	4.8" x 3.75" x 0.75"	0.9" x 6.7" x 3.5"	1" x 6.75" x 3.75"
Windows CE 2.0	Palm OS 3.0	Windows CE 2.0	Windows CE 2.0 for palmsized PCs	Psion EPOC32	Windows CE 2.0
6MB / 16MB	2MB / 2MB	16MB / 16MB	8MB / 4MB	6MB / 8MB	16MB / 16MB
echargeable lithium	2 AAA	rechargeable NiMH	2 AAA	2 AA or rechargeable lithium	2 AA or rechargeable NiMH
" diagonal olor touch screen	4" diagonal grayscale	6.5" diagonal color touch screen	4" diagonal grayscale	6" diagonal grayscale	6" diagonal grayscale
3.6 kbps internal	optional 14.4 kbps	33.6 kbps	optional 19.2 kbps cradle modem not included	requires external modem	28.8 kbps data/fax
oice recording; omfortable keyboard	infrared data transfer	infrared data transfer; optional digital camera	built-in voice recorder; docking cradle included	comprehensive software suite	infrared data transfer

traffic, digitally photograph sites or construction progress and E-mail the photos to clients and colleagues, study project spreadsheets in restaurants, and track to-do lists while on the move. With new handheld-specific software coming out all the time, the list is growing.

One hand or two?

What's on the shelves today falls into two categories: those units that are truly palmsized and compete with the PalmPilot, and those that are slightly larger and include a full keyboard. Essentially, palmsized devices, which average $400, can be held in one hand, while handheld devices, which range from $400 to $1,000 or more, require two.

For the palmsized units, typical standard features include handwriting recognition software, a voice recorder, and synchronization software for a standard PC. They either use their own operating systems, such as the PalmPilot does, or Microsoft Windows CE, a specialized version of the ubiquitous PC operating system. Palmsized units are suited for quick takes—jotting down or recording notes, for example. You can store address information and calendar items and digitize to-do lists. While the handwriting recognition software is generally excellent at deciphering your scrawls, getting used to it can take some time. "It definitely takes more time than just scribbling something down on paper," Goetz remarks. "But when you're done, you're done. You don't have to go back and retype everything."

The larger handheld units, which measure between one-third and one-half the size of a laptop computer and weigh 1 to 2 pounds, offer more applications. Some like Psion's Series 5, have proprietary operating systems, but most run another version of Windows CE that includes more versatile software. The computers include word processing, spreadsheet, and presentation programs. Like a shrunken notebook PC, these larger handheld units have a real, albeit small, keyboard and hinged display screen. Two-handers are typist-friendly; they allow users to create and edit content more naturally than palmsized models. They are expandable and upgradeable and offer internal or PC card modem options. The more robust two-hander models often have color screens, while palmsized devices are generally gray-scale. Palmsized units are powered by standard alkaline batteries, whereas handheld computers are typically powered by proprietary lithium-ion battery packs that can be recharged.

The new class

Many of 3Com's competitors are banking on Microsoft to help lure buyers to their products. The first crop of Windows CE 1.0 devices competed against PalmPilot without much success. But when Windows CE 2.0 shipped in October 1997, complete with an improved Web browser, support for color screens, and Ethernet connectivity, consumers took notice.

This new generation of Windows CE devices comprise both palmsized units—which compete directly with the Pilot line—and the handheld PCs. The $400 palmsized Casio Cassiopeia E-11, for example, comes equipped with a healthy 4MB of memory, built-in voice recorder, and a docking cradle and serial port connection kit for synchronization. For color screens, consider such handheld units as Hewlett Packard's $999 HP 660LX and the $799 NEC MobilePro 750C. These weigh over a pound typically—the HP and NEC products are 20.6 and 28.8 ounces, respectively—and cost more, but they are equipped with more advanced standard features. The HP 660LX packs 32MB memory and an integral 56.6 kbps internal modem. The MobilePro 750C includes 16MB memory and 33.6 kbps internal modem.

Pulling the trigger

When it comes time to make a decision, there are several factors to consider. The first is the availability of software. The Microsoft Windows-based fleet of handheld and palmsized computers offers a broad range of third-party software add-ons as well as built-in features, including a suite of applications called Pocket Office, which includes Pocket Word, Pocket Excel and Pocket PowerPoint—each of which is compatible with its full-sized Office counterpart. You can't create presentations with Pocket PowerPoint, but you can download a completed one in a condensed format to the handheld PC and present it on full-sized monitors while on the road.

Microsoft also offers Pocket Outlook for scheduling and contact management and Pocket Internet Explorer for email access and moderate Web browsing. (The Internet wasn't designed for computers with tiny screens and slower processors, so online surfing remains slow.) Non-Microsoft-created options for these computers include sketching software, such as QuickNotes, which is included with the Compaq C-Series computers, and a video camera option for the Sharp Mobilon. This camera, at about $300, plugs into the side of the computer and enables users to take photographs and store them in files or E-mail them.

The tiny PalmPilot's greatest strength is third-party vendor support. If users find anything the PalmPilot can't do, there's probably a vendor already working to fill the void. To soup up your PalmPilot, consider any of more than 1,000 third-party titles written for the PalmPilot line, from financial management software to Internet browsing solutions. One of these add-ons is even designed specifically for architects: PunchList, from StrataSystems, tracks punch-list items from the field. Once you synchronize the PalmPilot with a host PC, changes made in the field are updated in the office, and updates can be automatically sent to project team members by fax. Another PalmPilot add-on that should get a warm welcome from architects is sketching software. "I use the freehand shareware I have installed on it to do small, simple sketches when I see something that strikes me as interesting," says Jason Kuperman, project planner at New York City-based Hardy Holzman Pfeiffer Associates, of the Handwrite software he acquired for his machine.

Web browsing software such as AvantGo's WebClient is improving in speed and usability, as well. Offline Web browsing lets you download Web content onto your host PC. Then, when you synchronize with the host, you copy the stored content onto your palmsized computer for viewing later.

Weighing less than your average paper-filled day planner, handheld computers combine technology and convenience; architects are finding that these small wonders are gradually bringing job sites only a modem away from their desktops.

Technology and convenience

Weighing less than your average paper-filled day planner, handheld computers combine technology and convenience. But they can't, of course, do everything: Goetz, Rotondi, and Kuperman, who are accustomed to being in constant contact with the office, all carry laptop computers and phones with them in addition to their PalmPilots. Still, architects are finding that these small wonders are gradually bringing job sites only a modem away from their desktops. ■

Ann C. Sullivan is reviews editor at Framingham, Massachusetts-based Network World.

Shrunken PCs stay in synch

Handheld computers rely on a variety of techniques to transfer data from a host PC to a handheld and vice-versa. Most units have serial communications ports for direct cable connections to PCs. Docking cradles with serial cables are also available to link the computers to their host PCs for automatic updates. If you change an item on your to-do list from your office or while traveling, for example, the changes are automatically copied to the handheld when it's in its docking cradle. Likewise, revisions made on the road are automatically transferred to the host PC as soon as you return the handheld to the cradle. "It helps me to plan. No matter where I am, I know I have the most up-to-date version of my schedule with me," says HHPA's Jason Kuperman.

Some of the newest palmsized units, including 3Com's Palm III, have an infrared transceiver for wireless updates. The infrared port sits at the top of the unit. Simply select a file to be transferred, point the Palm III at another Palm III up to a meter away, and click. If you want to give a colleague someone's contact information, for example, point, click, and the data will automatically be stored in the recipient's address book.

Another advantage of synchronization is built-in redundancy. RoTo's Clark Stevens isn't concerned about the possibility of losing his PalmPilot after more than a year of carrying it from place to place. "If I ever lost one or had it stolen, I've just lost the unit, not the information," he says.

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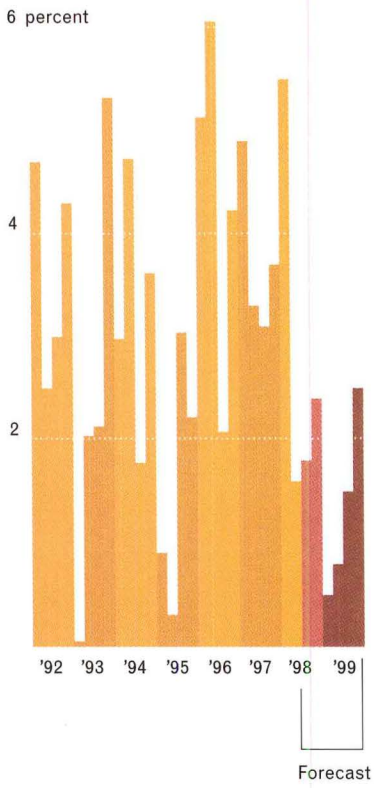
1999 Economic Outlook

The world construction market is in a funk—and a slowdown at home may not be far behind.

Economic Growth

Plotted quarterly



After six years of brisk expansion, **U.S. economy will likely grow** by a tame 2.1 percent in 1999, economists predict.
Source: National Association of Realtors

By Bradford McKee

Because most mainstream architecture is built, ultimately, with a credit card, the 1999 outlook for architects is not stupendous. It is, of course, pure guff to try to predict exactly what will happen this year either in the U.S. or abroad, what with the stock markets skittish, the bond markets shaky, and the liquidity, which makes credit possible, simply ebbing and flowing at the whim of the world economy. All one can do is gauge the mood of people who build things. And with big-name investment banking firms like Goldman Sachs withdrawing a $25 billion initial public stock offering at the last minute because IPOs aren't quite what they were a year ago, and Merrill Lynch laying off 3,400 of its 65,000 employees, you can bet nobody really knows what's next. Corporate America, and everyone who depends on it, is a bit spooked.

Today's troubles in property markets aren't like the domestic ills that drove architects into an abysmal recession in the early '90s. But the visible signs of alarm are much the same: A lot of U.S. bankers in 1998's fourth quarter found themselves choking on the high-risk loans they made in hyperinflated emerging markets that are now a shambles. It started out as a pan-Asian problem, but Asia soon took Russia and, notably, Brazil with it—all of which rank among the chief places that American architects have been visible over the past five years. American corporations are feeling the effects of world turmoil: The typical corporate client is likely to wrap up, say, the fourth phase of their suburban research park, but put the fifth phase on hold for now.

"There's a chill in the air," says Paul Nakazawa, a consultant based in Wellesley Hills, Massachusetts. "However, most of my clients are busy and have a year's backlog. If they have a problem, it'll be because people suddenly cancel the backlog."

The U.S. economy remains essentially stronger than it's been in a generation despite global malaise: Gross domestic product in the U.S. grew by a healthy 3.3 percent in the third quarter of 1998, having ballooned to over 5 percent during the first quarter and then dropped to below 2 percent during the second. Fifty blue-chip economists expect the economy to grow at a modest 2.1 percent in 1999.

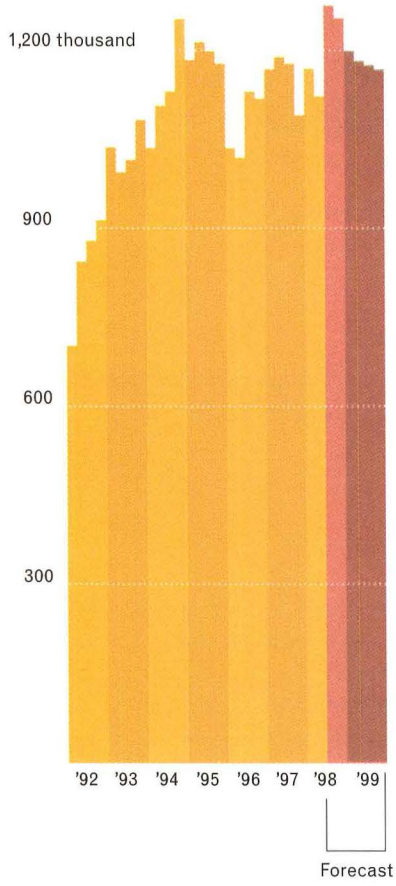
Markets send mixed signals

The larger vital signs offer optimism on the whole, but business investment in new plants and equipment, a good broad-brush indicator of construction activity, fell by 1 percent in mid-1998 after increasing by a tremendous 26 percent during the first half of the year. American businesses, it seems, are not using the space they currently have to its full potential, which suggests that new design and construction contracts will slow considerably. Corporate clients,

Housing starts will probably remain strong, but surge in both single-family and multifamily housing is expected to cool off (right and far right). Table (below) shows how real estate investment trusts (shown by type) gained tremendous value in 1997, only to fall in 1998. Sources: National Association of Realtors (right and far right), NAREIT (below)

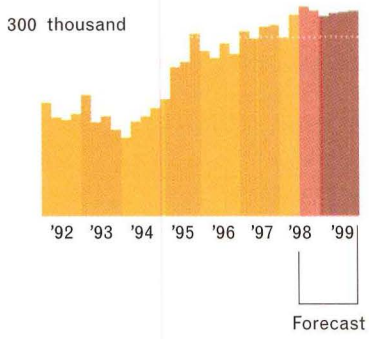
Single-Family Housing Starts

Plotted quarterly



Multifamily Housing Starts

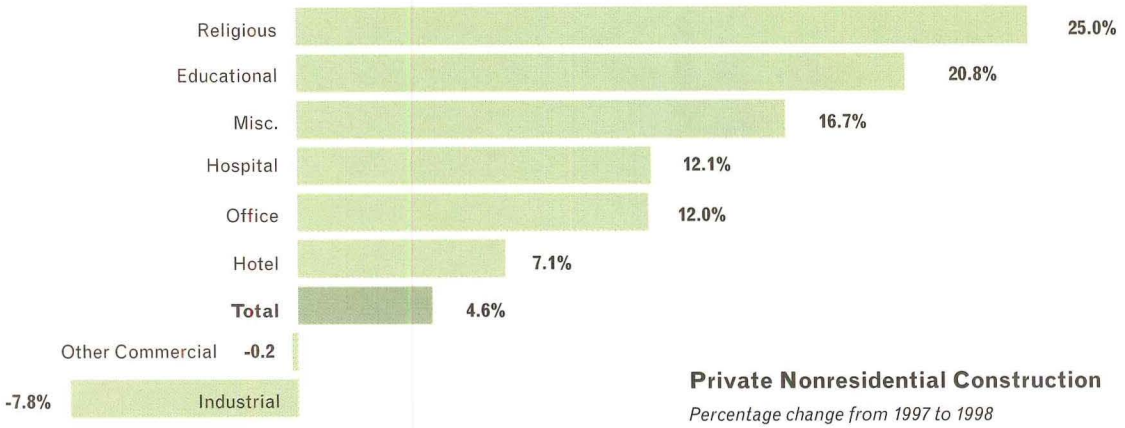
Plotted quarterly



NAREIT Performance Indices

Data as of 3rd quarter of 1998

	Total Return on Investment 1997		Total Return on Investment 1998 *As of 3rd Quarter*		Dividend Yield	Number of REITs	Market Capitalization *In billions*
ALL COMPANIES	18.86%		-15.50%		7.15%	211	$144.4
Diversified	24.48%		-22.57%		**6.05%**	27	$12.9
Health Care	13.32%		-19.27%		**10.18%**	14	$11.4
Self Storage	3.41%		-9.05%		**4.31%**	6	$6.0
Industrial/Office	27.48%		-13.98%		**6.43%**	39	$37.6
Industrial	19.02%		-6.17%		6.18%	13	$9.9
Office	29.00%		-19.12%		6.58%	20	$20.6
Mixed	27.91%		-8.07%		6.32%	6	$7.1
Residential	16.3 3%		-7.01%		**6.80%**	31	$25.2
Apartments	16.04%		-7.23%		6.87%	27	$23.1
Manufactured Homes	18.12%		-4.61%		6.09%	4	$2.1
Retail	16.99%		-3.81%		**7.32%**	49	$28.7
Strip Centers	21.44%		-7.31%		7.48%	28	$12.5
Regional Malls	13.69%		-0.56%		7.11%	11	$11.7
Free Standing	N/A		-0.41%		6.59%	7	$3.4
Outlet Centers	0.88%		-14.74%		9.92%	3	$1.1
Lodging/Resorts	30.05%		-40.13%		**8.25%**	14	$13.2
Specialty	27.31%		-30.18%		**7.39%**	7	$1.6
Mortgage Backed Securities	-3.05%		-13.93%		**8.36%**	24	$7.8



Private Nonresidential Construction

Percentage change from 1997 to 1998

Religious buildings accounted for highest degree of growth in **private-sector construction volume** between 1997 and 1998, while activity in industrial buildings dropped. Source: Torto Wheaton Research

however, are still enjoying good cash flow even though the profits of many have suffered in recent months. This slowdown in domestic property markets differs from the early '90s crash in that it reflects not a hangover on the part of developers, but a chastening: In the U.S., fears of overbuilding have preempted a glut, meaning that speculative projects in hotel, office, and multifamily residential construction have recessed, but those driven by plausible demand are going ahead.

The fact that developers fear a crash before one occurs shows how ever more direct the relationship between architecture and Wall Street has recently become. Corporations have been riding an eight-year surge in stock prices and have gone shopping, accordingly, for new buildings. That represents direct investment in real estate, which is the simple part: When stock prices start falling, so does the money available for new construction as companies have a harder time shopping for credit.

The more complicated matter as 1998 drew to a close was the rise—and subsequent fall—of indirect gambling on property through real-estate investment trusts (REITs). REITs own properties and fund their expansion by selling stock through investment banks to pension funds, mutual funds, and insurance firms. These investors bet on the REITs' expected rental income and management fees.

From 1992 to 1997, the popularity of REIT investing grew exponentially. In June 1997, according to the National Association of Real Estate Investment Trusts (NAREIT), the value of REIT stocks had shot up by 29 percent over the previous year—4 percentage points more than Standard & Poor's 500 index in the same period. By the end of 1997, the value of REITs had grown by more than it had from 1994 to 1996 combined. A real estate boom was under way; the supply of construction money seemed infinite.

But the threat of an ailing world economy and a fear of overbuilding caused investor faith in REITs to dissolve in 1998; REIT stocks as a whole lost 15.5 percent of their value as of the end of the third quarter over the previous year, according to NAREIT. With REITs in trouble, commercial borrowers encountered a credit squeeze. At the same time, after a long, moderate expansion, construction volume in 1998 reached an all-time high of more than $500 billion (in 1992 dollars), as William D. Toal, chief economist of the Portland Cement Association, pointed out at a North American construction forecast conference held in October by CMD Group of Norcross, Georgia. Most construction sectors, Toal reports, are currently in supply-demand balance.

If the market seems to be schizoid, it is. "Everybody is trying to figure out what will happen," observes Steven Scruggs, president of the corporate services group at the Grubb & Ellis Company in Northbrook, Illinois. "REITs went down, so there's very little money to build with right now. We're starting to read some of the early signs that the explosive-growth phase may be on hold—if not over."

Because even the current global nightmare is, in the end, part of a wrenching cycle, architects in the U.S. need to be asking themselves whether they're playing the international scene for the short or long term.

U.S. vacancy rates remain stable

The construction boom from early last year may be over, but that doesn't necessarily mean a bust will follow. Metropolitan office vacancy rates, for example, have stabilized at an unalarming 9.3 percent nationwide, according to Raymond G. Torto of Torto Wheaton Research, a commercial real estate analysis firm in Boston. Cities like San Francisco, Seattle, and San Jose, California, remain very tight, with less than 5 percent vacancy. However, Houston, Dallas, and Los Angeles are attempting to fill vacancies of 12 to 15 percent.

Suburban office vacancies in general have begun to level off, and both demand and new construction are expected to decline over the next two years—especially

as borrowing gets tougher. "Suburban build-to-suits will continue," Scruggs says, "and spec development out of the ground will continue, but no new [spec development] will start." Still, the suburbs will see more activity than central business districts (CBDs), which record higher vacancy rates overall. Scruggs adds: "There are no big CBD developments. The problem is, it's the wrong kind of space for flexible organizations," which prefer suburbia's larger floor plates.

Hotel and motel construction screeched to a halt in the fourth quarter of 1998, as hospitality-driven REITs lost 40 percent of their value in the first three quarters. Nationwide, hotel occupancy is expected to drop slightly from 63.9 percent in 1998 to 62.5 percent in 2000 (construction slows as occupancy drops below 70 percent), according to a report by the gaming and lodging group of PricewaterhouseCoopers. Hotel and motel owners have remained profitable since 1992, and their break-even points have dropped steadily, owing to buyouts and better organizational efficiency. But investors fear that the market is overbuilt, and some projects, particularly in the northeastern U.S., have been put on hold.

Investor confidence is not the first concern in the retail industry—which accounted for 29 percent of all private nonresidential spending in 1997, according to Toal—consumer confidence is. The jitters in the stock market in late 1998 showed signs of rippling over into depressed consumer spending habits, which could intensify competition, and snuff out both marginal retail concerns and any plans stronger retailers have for expansion. The strongest retail markets, according to Hugh F. Kelly, executive managing director of real estate consultants Landauer Associates, are in Portland, Oregon; Chicago; Palm Beach, Florida; Nashville, Tennessee; and Pittsburgh; the weakest are Honolulu; northern New Jersey; Boston; Los Angeles; and Long Island, New York.

While big-bucks commercial deals are expected to diminish in number, domestic demographic trends reinforce that architects will likely find plenty of work in residential construction, as housing starts and sales remain strong—despite an unexpected dip this past autumn—with mortgage-interest rates at their lowest in a generation and inflation practically nonexistent. Public construction too will likely continue apace, particularly in erecting new schools and correctional facilities, because local and state governments are still running surpluses and demand is high.

The world slumps

Once architects cross the U.S. border, things look much more difficult. Late in 1998, the International Monetary Fund (IMF) revised its forecast for world economic growth for the year to 2 percent, down from an anticipated 3 percent.

After Asia collapsed, Russia and Brazil both experienced the failure of their currencies; the Russian ruble fell to its lowest point in four years. With less cash, Russia's government defaulted on its bonds, which panicked global investors and prompted another round of aid from the IMF; in Brazil, central bank interest rates soared 50 percent, driving the country into a slump. The IMF pledged $41.5 billion in loans to stabilize the nation's economy.

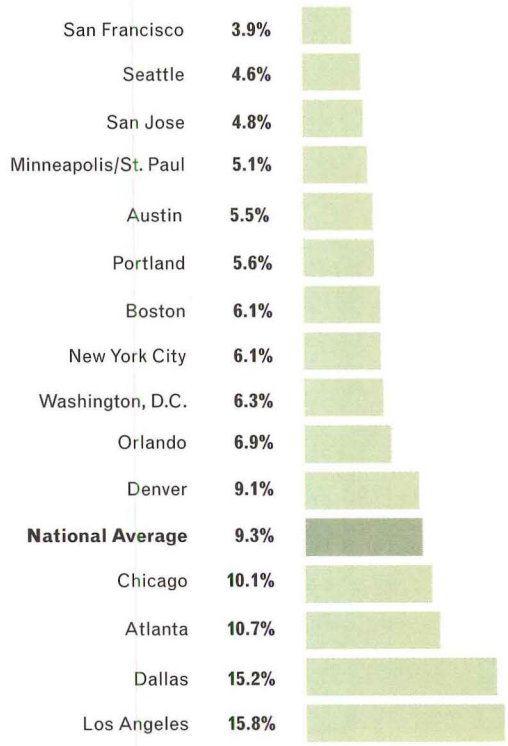
American architects had been viewing both countries as rich potential markets, but the turmoil in Russia and Brazil is less salient for the presumed loss of work than for the problems these countries quickly caused in other emerging markets. To discourage investors from fleeing those economies, the Federal Reserve Board thrice lowered its short-term interest rates to help restore domestic liquidity. With two huge national economies newly in turmoil, the next big precipice to watch is China, which has beckoned legions of American architects with its gross domestic product growth of 9 percent per year since 1978.

It appears now that China's economy is slowing to about 3 to 4 percent annual GDP growth, as global currency watchers hold their breath while Chinese officials debate whether or not to devalue the yuan—which, if they did, could be disastrous to the fragile world monetary equation. China's exports have dropped in the wake of the Asian crisis, and imports—many undocumented—are flooding in. The Chinese government is also very bad about policing foul loans, which by some estimates may add up to 30 percent of its current GDP.

Property market indexes remained stable in China as of the end of 1998's third quarter, going up slightly in Tianjin, Xi'an, and Chongqing, but falling somewhat in go-go Beijing, Shanghai, and Shenzhen. Vacancy rates in some established office areas of Shanghai currently stand between 25 and 40 percent, with new buildings as much as 60 percent vacant, according to recent statistics published by Cushman & Wakefield, whose analysts expect vacancy rates to peak in 1999. Beijing is quite active, with General Electric, Hewlett-Packard, Compaq/Digital, and Microsoft recently completing deals there, but the city's office vacancy rate was poised to rise sharply at the end of 1998, as more

National Office Markets

Metropolitan Areas
With the Current Lowest
Vacancy Rates



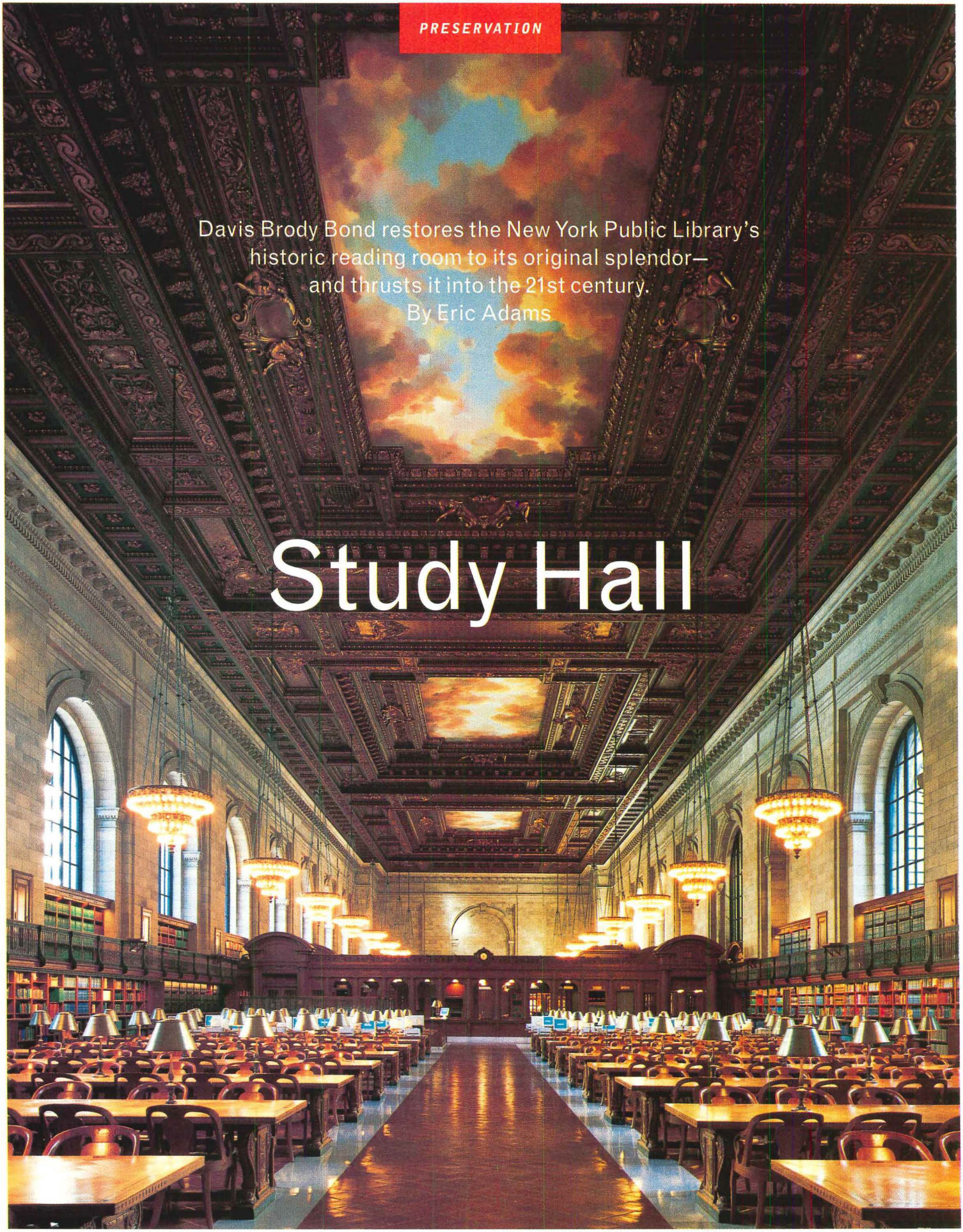
U.S. metropolitan **office vacancy rates** have settled at solid 9.3 percent, with San Francisco and Seattle holding tightest markets. Source: Torto Wheaton Research

than 1 million square meters of new office space became available in that year alone.

The rest of Asia has a seemingly unshakable case of the blues. Depressed real estate values mean that for the first time in recent memory, American investors are buying up more property in Asia than Asian investors are buying in the U.S. Japan won't be building much before its finance ministers reckon with fundamental flaws in that country's banking system. (The Nikkei stock exchange is slumping at a 12-year low.) The IMF predicted that Japan's economy would contract by 2.5 percent, and a recent Bank of Japan survey shows that Japanese firms intended to cut their capital spending by 8 percent in 1998.

Hong Kong development will peak this year as the city adds about 13 million square feet of office space to the world's second costliest office market (after London); the capital value of Hong Kong office space has fallen 44 percent since 1997, and on the residential side, a record number of buyers are defaulting on their mortgage loans there as well as in Kuala Lumpur, Malaysia, and Singapore. Development remains mostly at a standstill in Indonesia and Thailand, as those countries struggle to rebuild their ravaged economies, whose collapse in mid-1997 anticipated the mess in which the world currently finds itself.

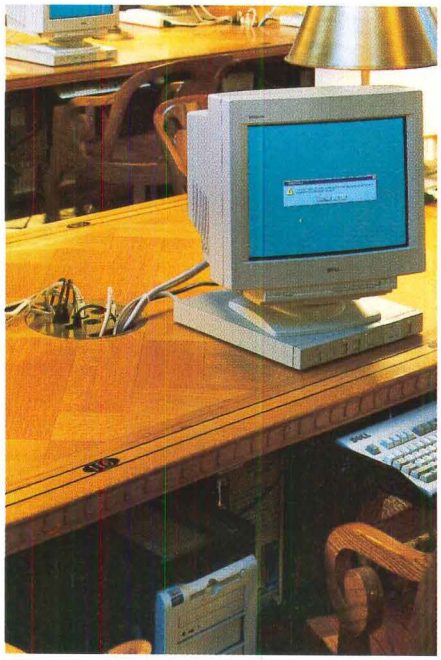
Because even the current global nightmare is, in the end, part of a wrenching cycle, architects in the U.S.—who may see the domestic market freeze up as well sometime in the next three years—need to be asking themselves whether they're playing the international scene for the short or long term. It's like the stock market: The longer the view, the less likely you are to be disappointed. But activity in international markets—usually most attractive to architects because of energy and challenge—entails a high cost of doing business, an impossibly compressed fee structure, and little chance of profit. "Unfortunately, a lot of small and midsized firms don't have the confidence that things are going to be economically strong enough to hang onto these international ventures," remarks Hugh Hochberg, a consultant to architects with the Coxe Group in Seattle. "The larger firms have more staying power, but they, too, are getting nervous."

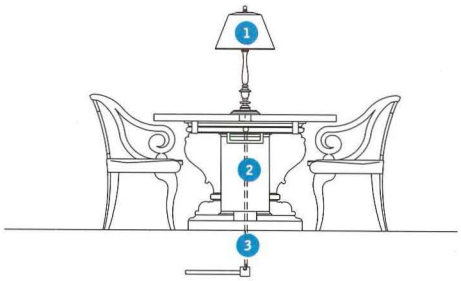


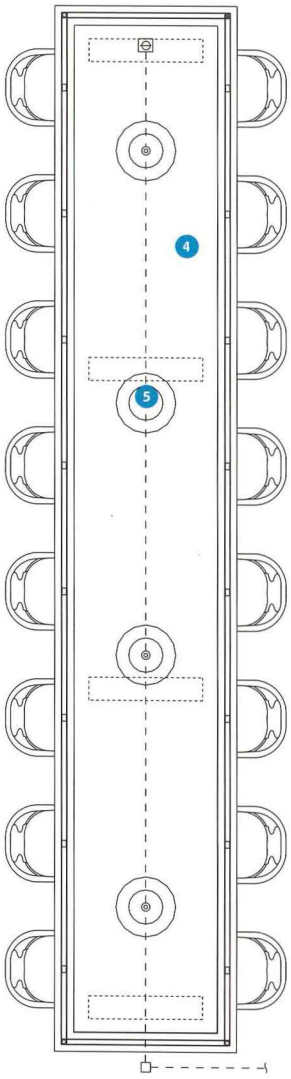
Davis Brody Bond restores the New York Public Library's historic reading room to its original splendor—and thrusts it into the 21st century.

By Eric Adams

Study Hall







1 bronze lamp
2 oak pedestal
3 data/power wiring
4 oak table
5 bronze power/ data grommet

Information technology 2'/.6m

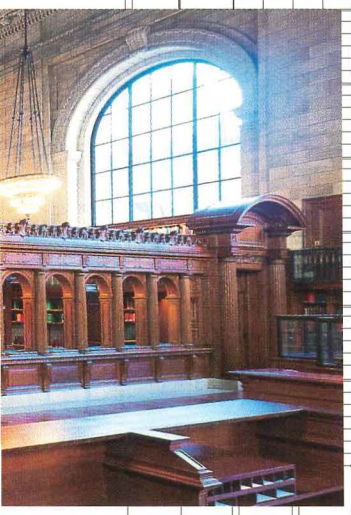
During World War II, the 17-foot-tall arched windows of the New York Public Library's massive and ornate main reading room were painted black—a common defense against the nighttime German air raids that many feared were imminent. Fortunately, the war ended without such an attack, but most of the paint remained on the glass, lending a gloomy pall to one of New York City's most important public spaces and beloved architectural landmarks.

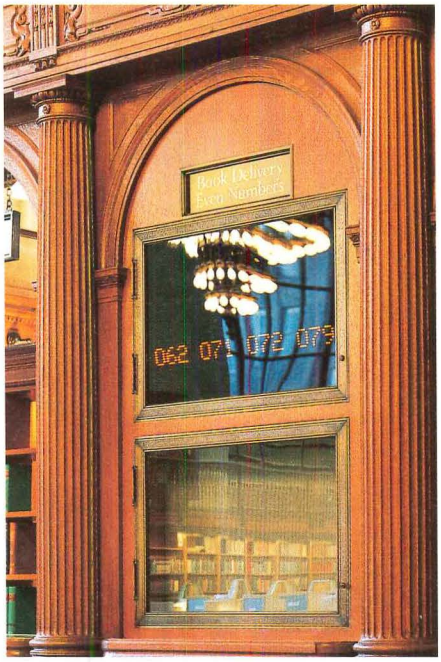
That bit of apparent indifference to general upkeep set a precedent for a 50-year period of neglect and misuse that saw the room deteriorate in function and appearance as the library gradually outgrew its landmark midtown location. While the reading room remained a city favorite, it was only partly open to readers: Half of the 23,000-square-foot space became overflow offices and the library's photocopy and microforms service center.

The deterioration and organizational chaos within the room also symbolized the New York Public Library's diminishing role as a public resource for information and knowledge, especially in the wake of more recent worldwide information technology (IT) advancements. "We realized that we had lost our leadership position in terms of innovation," explains library president Paul LeClerc, who began aggressively pushing the library's already accelerating self-improvement efforts when he took office in 1993. "And the reading room was in simply dreadful condition."

But LeClerc and his colleagues have just been given a shot in the arm. After a year of planning by the library and New York City architect Davis Brody Bond (DBB), and an 18-month closure that ended with the room's reopening in November, the 297-by-78-by-51-foot, north-to-south-oriented reading room has been completely revived. The overflow offices are gone and the room can now accommodate up to 636 readers, instead of the previous 490; its period fixtures and surfaces are completely refinished; the complex book-delivery mechanicals have been upgraded; and, with a sensitive insertion of advanced IT conduits, the room is positioned for a new era of library

New bronze grommets atop refinished oak tables (above left) house computer data and power outlets; custom-designed trays beneath table surface conceal keyboards and CPUs. **Central service island** (these pages) bisects reading room and houses mechanized book delivery system, backup dumbwaiters, and new passenger elevator for reference staff. **New digital readouts** (facing page) on both sides of service desk inform waiting users when books are ready to be picked up.





1 attic catwalk
2 balcony bookcase
3 perimeter bookcase
4 passenger elevator
5 steel book stacks
6 dumbwaiter
7 book delivery system
8 cellar

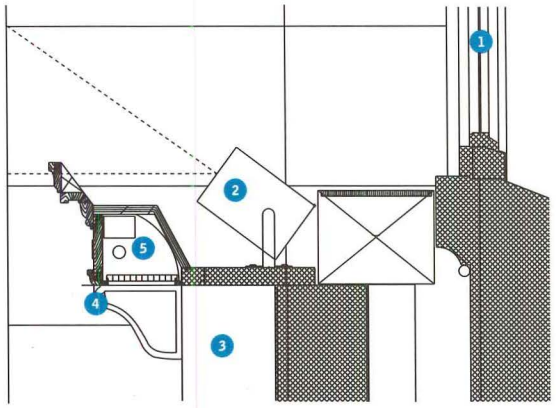
North-south section at central service island

8'/2m

function. "We really wanted to bring this room up to the 21st century," explains DBB Partner Lewis Davis of the $15 million effort, which is the centerpiece of the library's overall restoration and renovation program now in progress. "So now every seat in the room now has a power outlet for notebook computers and a data port for Internet and library database access."

Restoring surfaces

The IT advancements made in the room, which houses the library's Center for the Humanities General Research Division, are eclipsed only by the restoration work that brings the 1911 John Merven Carrère and Thomas Hastings-designed space back to its original glory. Carrère and Hastings designed not only the building and its cavernous, uncolumned reading room, but also the chairs, tables, chandeliers, table lamps, and wastebaskets. DBB restored each of these elements. Craftsmen stripped and refinished the wood central service enclosure—which contains the library's book delivery systems—as well as the wooden tables, chairs, doorways, and bookcases, two levels of which skirt the perimeter of the room. (Those pieces that were too badly damaged were replicated.) Elsewhere, workers cleaned bronze railings, lamps, fixtures, and handles throughout the room with a mild solvent, while marble and tile were cleaned and coated with a protective sealer. The walls, which look like limestone, are in fact a form of plaster called caen stone and were in good enough condition that they required only minor cleaning and patching.



1. window
2. quartz halogen par lamp
3. balcony bookcase
4. new cornice
5. fluorescent downlighting

Ceiling lighting section detail 9"/22cm

The IT advancements made in the library are eclipsed only by the restoration work that brings the 1911 John Merven Carrére and Thomas Hastings-designed space back to its original glory.

Five stories above all the floor-level activity, however, the gilded plaster ceiling required extensive repairs, including patching, cleaning, polishing, and regilding. Craftsmen fixed damaged areas by inserting replacement pieces made from plaster casts of matching sections elsewhere on the ceiling. Three sky murals were so badly damaged that they had to be replaced with newly painted duplicates by artist Yohannes Aynalem of New York City-based EverGreene Painting Studios. "The new murals give a marvelous illusion of looking through the ceiling directly at the sky," Davis says.

Rounding out the restoration work executed in the reading room is a new lighting scheme that more evenly distributes light in the room and highlights the ceiling. The architect's first priority was removing the blackened glass to enhance daylighting. They replaced the panes in the arched bronze windows, which line the east and west walls, with clear, low-E glass that diminishes ultraviolet light. Craftsmen cleaned the room's 18 bronze chandeliers and rewired and refurbished the table lamps.

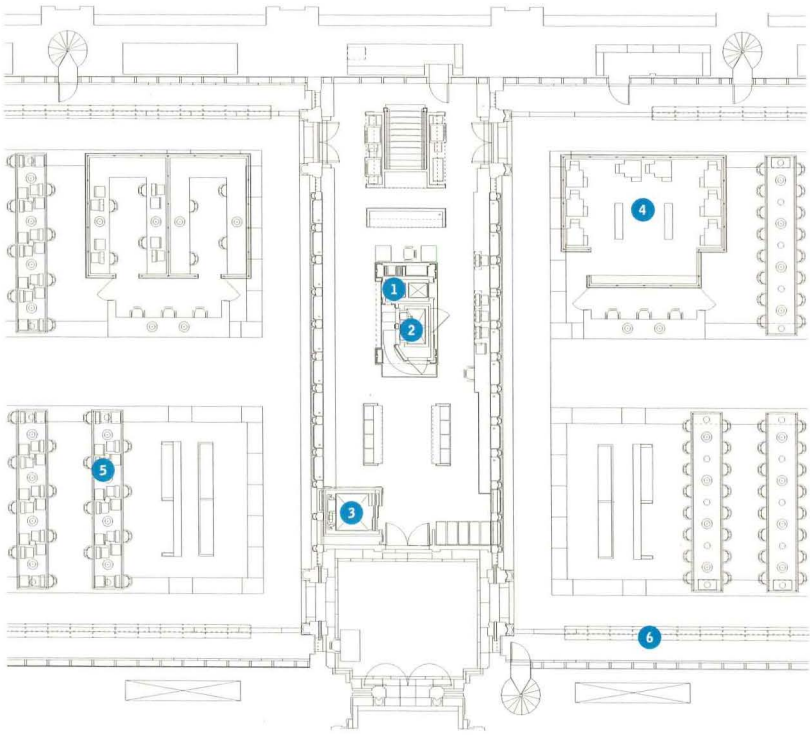
To illuminate the ceiling and the window frames, the architect installed more than 100 quartz halogen par lamps atop the second level of bookcases on the room's perimeter. "We concealed them by building a new cornice atop the existing bookcases," DBB Associate Partner Nathan Hoyt explains. "The bookcases had a small existing cornice molding that we removed so we could expand the cornice to make enough room for the lights. That also enabled us to install fluorescent downlighting to illuminate the books."

Discreet IT

One of the architect's greatest challenges was inserting the cutting-edge IT systems that the library hopes will help it regain its status as an intellectual crossroads. "What's characteristic of this administration is its very aggressive and confident embrace of information technology," LeClerc says. "We are learning from and sharing information about IT with our sister libraries around the world, and we want to train the public to use it. To do that, we have created what we're told is the most advanced IT system of any library in the country."

The library's Web site, which is in continuous development, is available to users who dial in, but making that resource accessible to people without personal Internet

1. dumbwaiter
2. book delivery system
3. passenger elevator
4. reference desk
5. computer tables
6. bookcase



Plan at central service island 10'/3m

connections was key when the library was planning renovation work in the reading room. Wiring 30 of the room's forty-two 23-by-4-foot oak tables (12 were left unwired and are intended exclusively for reading) without changing the room's esthetics became an exercise in discretion and simplicity. "We wanted to keep the IT presence almost invisible," Hoyt explains. "And in terms of future alterations, the key was not to create a rigid structure for technology, but to keep it open so improvements and upgrades can be easily executed."

To that end, the team of architects, electricians, and computer technicians connected more than 100,000 feet of wire from the basement through the floor and into the tables' pedestals in a manner that is both simple and easily accessible: The top level of book stacks, located directly beneath the reading room, contains a ceiling-mounted tray of neatly bundled cables that branch up through the 2 1/2-foot-thick floor above and into the table pedestals. On the table surfaces, custom-designed bronze plates house the power and data outlets. Most of these outlets are for user-provided notebook computers, but the library also installed 48 computers of its own, half of which contain an assortment of programs, databases, and resources, and the rest offer Internet access. These computers sit in three rows of tables near the room's central book delivery center. This concentrates them in areas of higher traffic, leaving the edges of the room quieter, and gives computer users easier access to two new librarian-staffed reference desks.

Book delivery

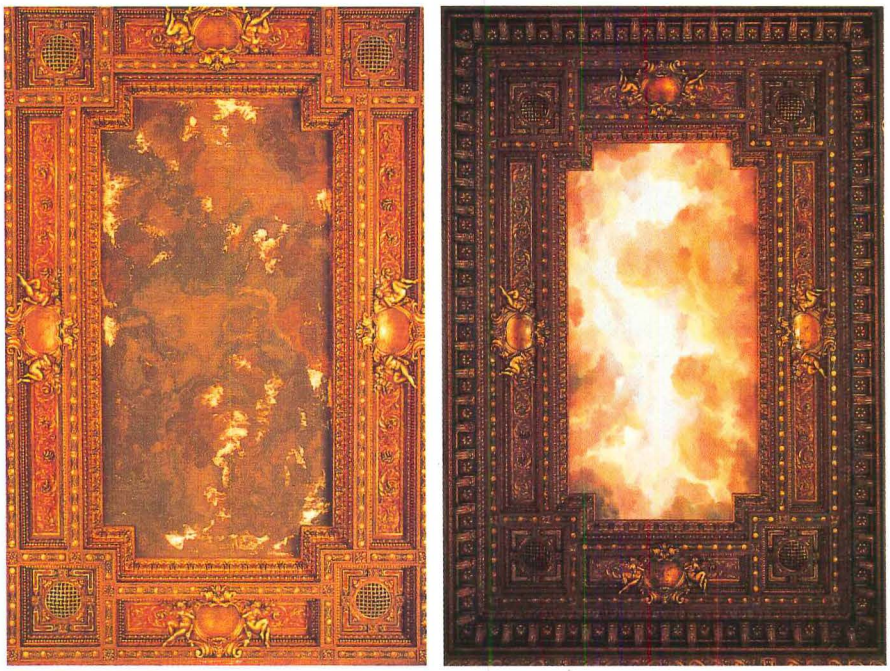
While the library is making a considerable IT investment, most of its activity still centers on providing public access to its 7 million printed volumes, which need to be speedily moved from the building's miles of bookstacks. These stacks are located on seven floors beneath the reading room, as well as two levels buried beneath Bryant Park, which sits behind the library.

In the centrally located book delivery center, a new, mechanized Ferris wheel-style conveyor system replaces the library's previous system that was installed in the 1920s and which suffered repeated mechanical difficulties. A new dumbwaiter system serves as a backup to this system, replacing dumbwaiters that were installed in the 1960s. As before the restoration, pneumatic tubes deliver book requests to the library personnel in the book stacks below, and a new hydraulic passenger elevator allows staff to move easily between stack levels.

First stage

The restoration and renovation of the newly renamed Rose Main Reading Room (named in honor of the children of restoration donors Sandra Priest Rose, a library trustee, and her husband, Frederick Phineas Rose) is the centerpiece of several major DBB-designed renovations concluding over the next four years at the library's landmark building. Among them will be a new five-story office, public IT training, and conference structure inserted into the library's 80-by-80-foot interior courtyard, to be completed in 2001. DBB, which has been working with the library since 1982 on masterplanning and renovation projects, is also renovating two of the library's rooms into a new writers and scholars center and a rare book vault, both of which will open late this year.

LeClerc believes the reading room restoration and renovation is a successful first step into the next century for the library, as well as a treatment that honors both the building and its users. "The public is worthy of this space," LeClerc says. "And we were pleased to see that we could make the advancements we needed without giving up what this room offers."



Prior to renovation, gilded plaster ceiling in reading room (left) was damaged and deeply soiled. **Craftsmen** cleaned surface (right) with industrial vacuum, cleaning solution, and leaf blower, which workers discovered to be best tool for removing decades of grime. Cotton rags, soft sea sponges, and water removed excess dirt and debris and all gilded surfaces were cleaned, hand-polished, and buffed. **Three cloud murals**, too damaged to repair, were replaced with new paintings.

THE DEBORAH, JONATHAN F.P., SAMUEL PRIEST, AND ADAM RAPHAEL ROSE MAIN READING ROOM, THE NEW YORK PUBLIC LIBRARY'S HUMANITIES AND SOCIAL SCIENCES LIBRARY, NEW YORK CITY

CLIENT: New York Public Library **ARCHITECT:** Davis Brody Bond, New York City—Lewis Davis (partner-in-charge), Julia Doern (project manager), Nathan Hoyt (associate partner), John Torborg (restoration architect), Brian Sweny (architect), Bennie Johnson (job captain), Fred Chomowicz (specifications), Don Nicoulin (models), Daniel Brody (photo/video) **ENGINEERS:** Weidlinger Associates (structural); Atkinson Koven Feinberg (mechanical) **CONSULTANTS:** Fisher, Marantz, Renfro, Stone (lighting); Jenkins & Huntington (vertical conveyer); Spagnola Associates (signage); Shen Milson Wilke (acoustics, audio/visual, telecommunications) **GENERAL CONTRACTOR:** A. J. Contracting **COST:** $15 million **PHOTOGRAPHER:** Peter Aaron/Esto

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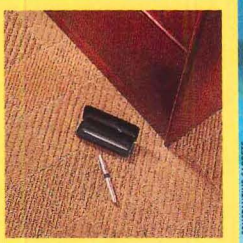
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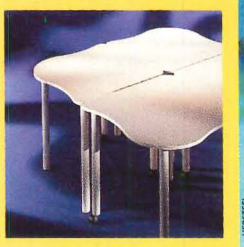
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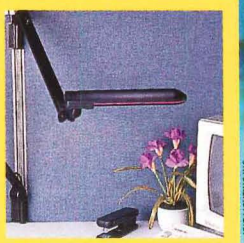
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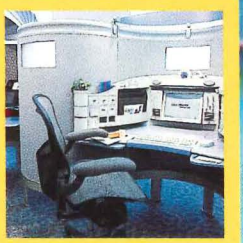
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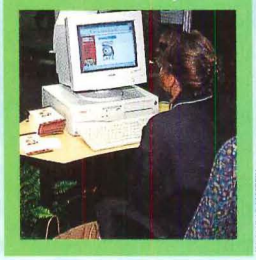
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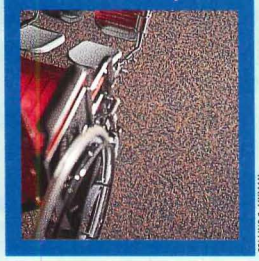
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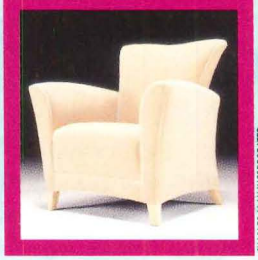
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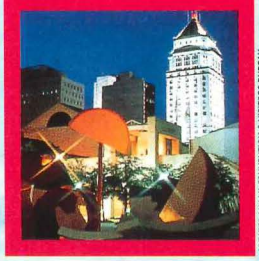
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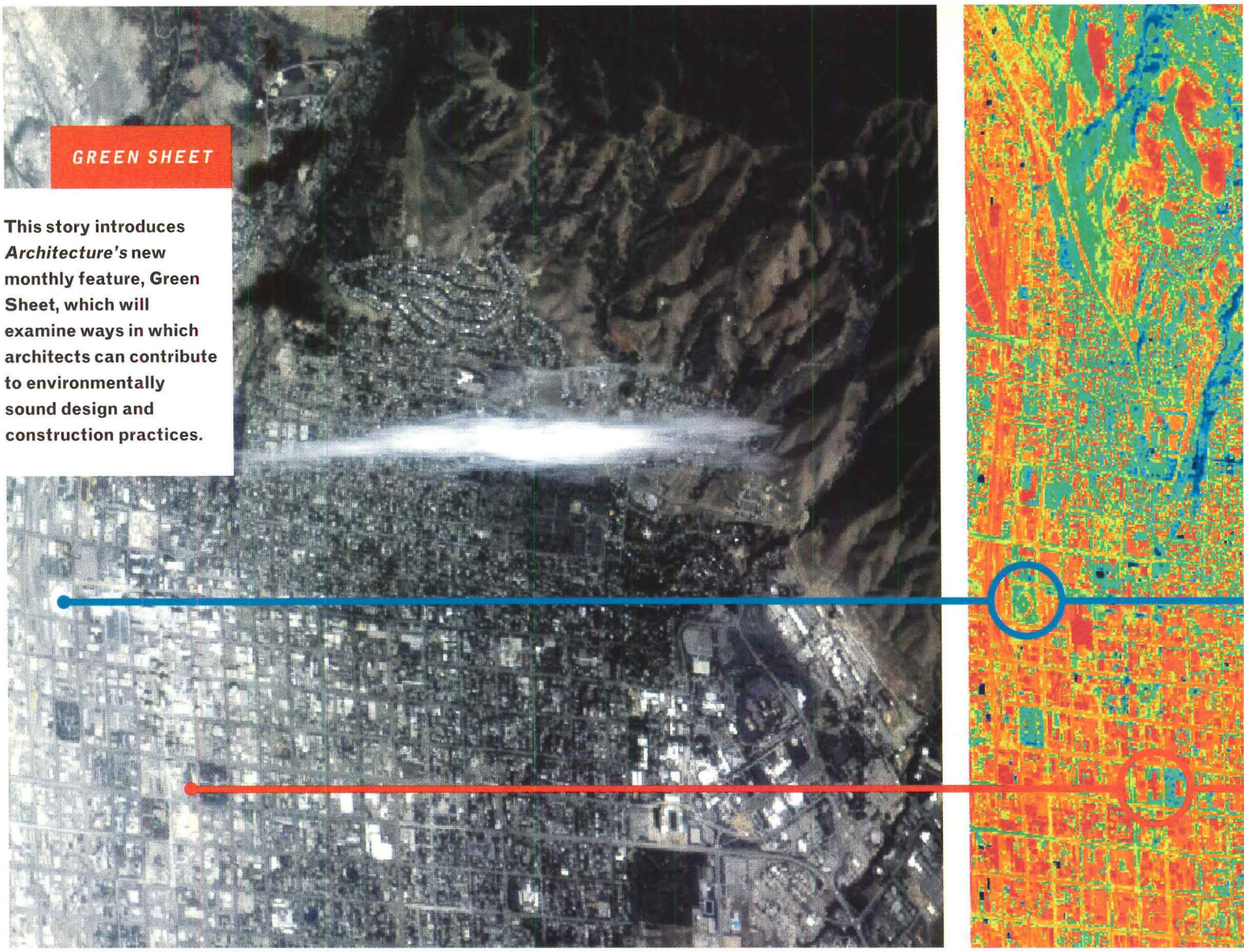


GREEN SHEET

This story introduces *Architecture's* new monthly feature, Green Sheet, which will examine ways in which architects can contribute to environmentally sound design and construction practices.

NASA images of Salt Lake City, Utah, reveal thermal variations. **Matheson Courthouse's** black roof makes it one of the city's hottest, while

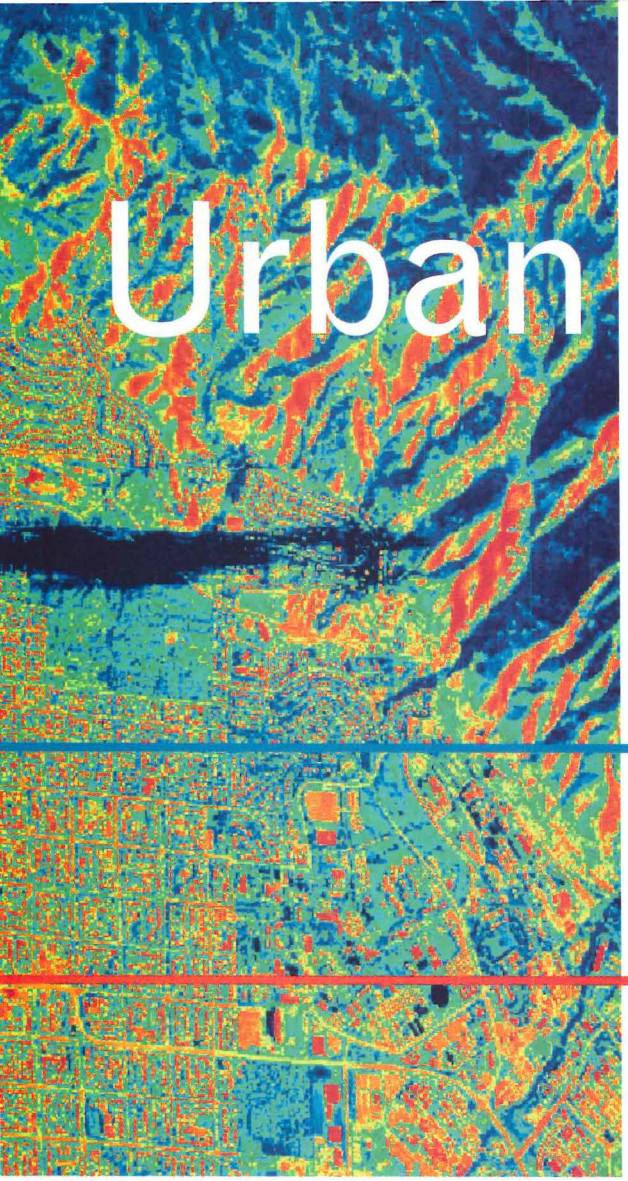
Last July, National Aeronautics and Space Administration scientists flew an airplane equipped with sophisticated remote-sensing scanners over Salt Lake City, Utah, to document ground-level temperature changes. The cameras generated comprehensible images that prove what anyone who ever ran barefoot across an unshaded asphalt road in the summer or nearly suffocated on an urban rooftop already suspected: Cities are hot, more so than their nearby suburbs, and far hotter than rural areas.

NASA's colorful images—red and yellow identify hot areas while blue and green mark cooler spots—indicate exactly which parts of town contribute the most to the city's dome of hot, stale air, known as an urban heat island, and in particular what types of surfaces absorb the most heat. Dark rooftops, the scientists confirmed, retain substantially more heat than their lightly colored, more light-reflective neighbors, and black asphalt roads can fry eggs much faster than those made of concrete. When abundant foliage shades any of these materials, their temperatures plummet.

"There's a big difference between how man-made and natural materials absorb heat," explains Jeff Luvall, a researcher at NASA's Global Hydrology and Climate Center (*http:www.ghcc.msfc.nasa.gov/*) in Huntsville, Alabama, whose team conducted similar high-altitude flyovers in Baton Rouge, Louisiana; Atlanta; and Sacramento, California. "We're studying how the land interacts with the atmosphere and how to mitigate the way these materials contribute to low air quality."

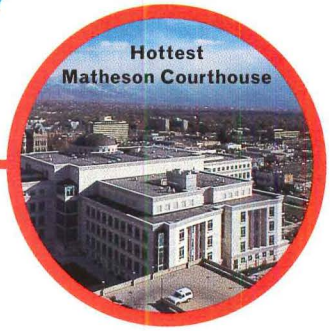
That contribution is significant. The more heat that is absorbed at ground level, the higher the city temperatures become. The heat islands that result from the absorption raise urban temperatures by up to 5 degrees and serve as incubators for smog, which results from chemical reactions that accelerate as temperatures rise. Hashem Akbari, a scientist with the Lawrence Berkeley National Laboratory (*http://eetd.lbl.gov/heatisland/*) in Berkeley, California, estimates that every 1 degree increase in temperature in Los Angeles increases smog risks three percent and results in a 2 percent increase in the demand for cooling power. "If we can cool a city down by only 3 degrees, which our computer modeling suggests can be done through both tree planting and light-colored building materials, the result in terms of air quality is comparable to making all of a city's cars electric," Akbari says, adding that in financial terms, lower temperatures can save Los Angeles alone $500 million in annual cooling costs and the whole nation $10 billion per year. Though there are currently no governmental incentive programs to encourage these measures, this reduction of operating costs should be a powerful enough draw for individual building owners.

NASA and Lawrence Berkeley Labs are collaborating with the Department of Energy (DOE), which leads the President Clinton-initi-



Heat

No, it's not a new cop show; it's a real problem in cities worldwide. But recent research reveals how simple design changes can improve air quality and cool cities down. By Eric Adams



Delta Center's white roof keeps building temperatures very low.

ated Cool Communities Partnership. This effort focuses on research and private sector collaboration to increase the use of shade-providing foliage—which also cools the air through water evaporation—and the use of reflective building materials. The partnership, aided by NASA's indisputable imagery, is raising awareness among architects, who may not usually consider roof temperatures when specifying materials and colors. In each city, the photos show exactly which buildings fare best and worst. In Salt Lake City, the big winner was the FFKR Architecture-designed Delta Center basketball arena, where the Utah Jazz play. The eight-year-old structure's 140,000-square-foot roof is covered with white Firestone Ultra-Ply 78, which is a hybrid of EPDM and PVC. It absorbs so little heat that its emissions barely registered on NASA's scanners.

The brand-new HOK/MHTN Architects-designed Scott M. Matheson Courthouse, on the other hand, glows red-hot in the NASA images. Its black, 80,000-square-foot EPDM roof absorbs so much light that its summertime rooftop temperatures soar up to 170 degrees Fahrenheit, whereas the Delta Center's roof never rises above 100 degrees Fahrenheit.

Both conditions, however, can be attributed to chance, because neither of the architects considered roof temperatures during design. At Delta Center, FFKR selected the white roof for cost reasons. Architect Jim Lohse explains that it was cheaper than the built-up roof they had originally wanted—a system of black asphalt and felt that probably would have fried NASA's lenses. At the Matheson Courthouse, MHTN's Peter Moyes says they chose the EPDM roof primarily because it is was the state's preferred material: It has a 20-year warranty.

Mark Decot, who heads the DOE's Cool Communities program, explains that cooperation between architects, state building supervisors, and roofing manufacturers will be key in the battle against high energy costs and low air quality. Collective efforts have already produced the Cool Roof Rating Council, a private nonprofit agency geared toward increasing the manufacture and standardization of light-colored roofs; increased involvement from the Department of Transportation, which influences paving materials selection; and focused efforts by the U.S. Forest Service, which is encouraging public and private sector-led tree planting efforts. "Architects needs to be right in there, talking about how their buildings will fit in with city infrastructures," Decot says.

Architects agree. Although FFKR's Lohse innocently reverted to a black EPDM roof for their Rice-Eccels Stadium now under construction at the University of Utah ("You're making me feel bad," he groans), both he and MHTN's Moyes say they would eagerly consider reflectivity issues in future designs. They probably figure that the next time NASA flies one of its planes over Salt Lake City, they'd just as soon not get noticed.

SPECIFICATIONS

***Architecture*'s new monthly feature, Specifications, will give spec writers what they need to cut through the mountains of product information they receive from manufacturers. Product types will rotate three general categories: lighting, surfaces, and building systems.**

Raising the Bar

For specifiers, modernizing elevators means staying on top of cutting-edge technology—and deciding where it's needed. By Jack Klein

Leaps in technology, an aging building inventory, new construction that's forcing existing buildings to compete harder for tenants—all of these are pushing elevator modernization faster than ever before. The rapid rate of change means that specifications architects wrote only a few years ago are probably hopelessly outdated.

The first step for any elevator specifier is to thoroughly analyze existing equipment and the needs of the building. As part of this process, New York City-based renovation consultant Kenneth Levien also assesses building traffic, tenant mix, and freight requirements—in addition to the general condition of the elevator equipment—to specify the proper elevator dimensions and capacities for each type of building. "It's obviously important to zero in on your needs prior to specifying any component of a modernization program," he says.

Control mechanisms are often the focus of elevator upgrades. As they wear with age, the old mechanical relays slow service, create jolts during elevator starts and stops, and cause problems with elevators leveling at floors. These relays are now being converted to digital microprocessors, which exchange information instantly, require much less maintenance, and consume less energy. "It's like going from a phonograph to a CD player," explains George van Klan, president of elevator modernization specialist Edgett Williams Consulting Group in Mill Valley, California.

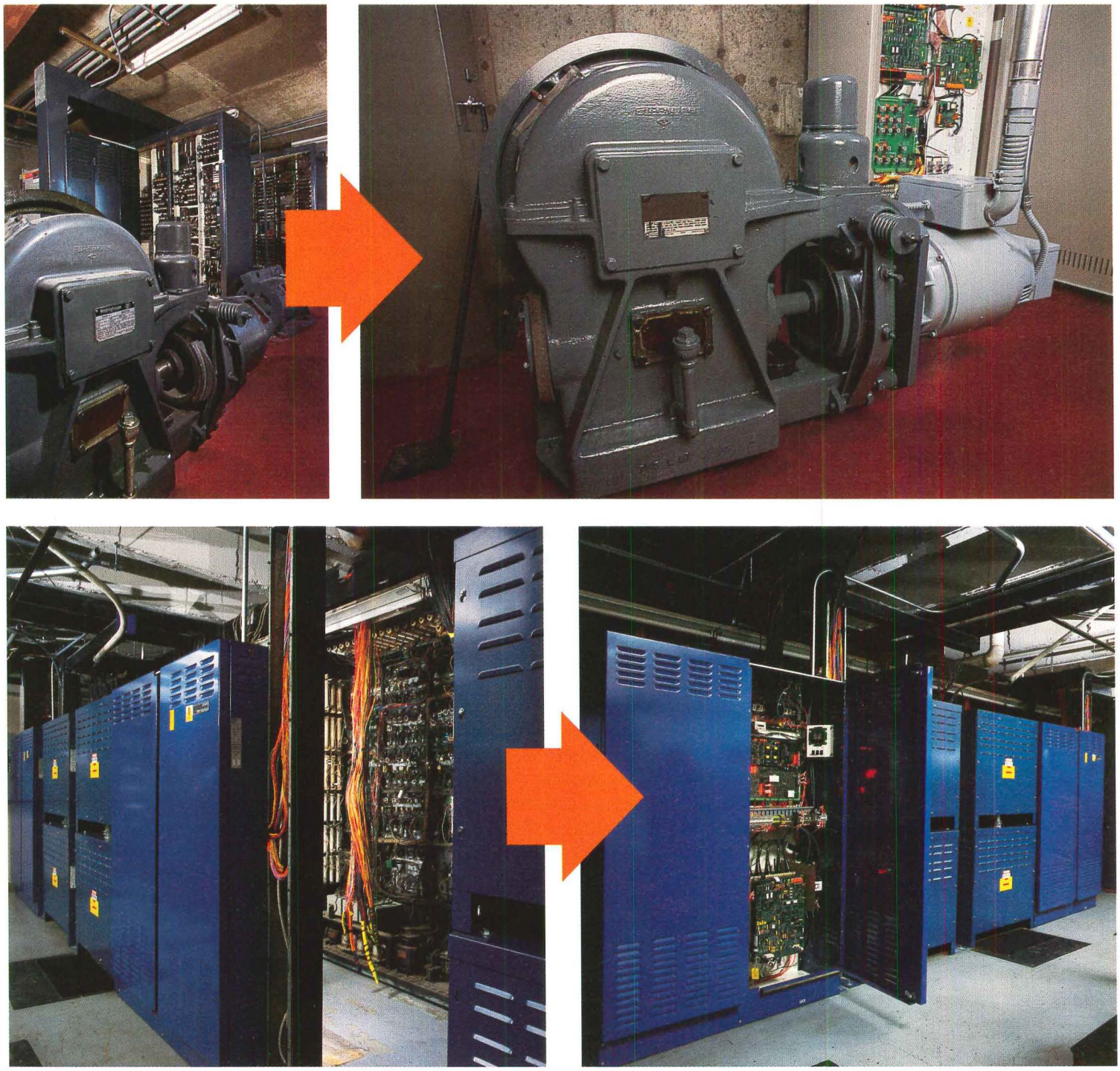
Indeed, some systems now available put CD players to shame. In New York City's 1929, 67-story building at 40 Wall Street, for example, architect Richard Winokur and Millar Elevator Company installed Millar's artificial intelligence system, Millar CVT\net, which is designed for large, multifloor tenant applications with a lot of interfloor traffic. "The CVT\net system recognizes and stores traffic patterns," Millar's Mitch Hellman explains. "If on Mondays at two o'clock everyone goes to a meeting on the 18th floor, the system, which updates itself daily, will recognize this as a pattern of behavior for the building population, adjust the zoning, and automatically dispatch elevators based on this prior history of traffic patterns."

Hoist machinery is another key component specifiers need to assess. Many older, DC-powered motors are being switched out because the older equipment, with its worn-out motors, requires as much maintenance as the mechanical relays in the old control systems. Newer AC motors, which are the exclusive choice in new construction these days, not only require less maintenance, but also consume less energy and permit the use of computer controls. "When you specify AC drives, you can use a computerized direct-drive system with digital controls that regulate the motor directly," van Klan says, explaining that DC-powered systems work only with analog controls. "This offers instantaneous and extremely accurate current output."

Elevator consultant John Van Deusen, of Van Deusen & Associates in Livingston, New Jersey, says that along with controls and motors, his company has seen a great deal of customer interest in elevator door components. (Manufacturer Dover Elevators offers statistics to back this up.) According to Dover, worn-out door operators cause 75 percent of elevator shutdowns. In addition, the rollers and tracks wear out, causing slow or erratic door operation. "A great deal of wear on elevator door components comes from the old mechanical safety devices in door edges that require contact before the door will reopen," says Van Deusen. Most elevator companies offer specifiers nonmechanical door safety systems with photoelectric eyes; infrared optical transceivers; and, most recently, low-powered Doppler effect radar devices, which can sense if someone is coming toward the elevator door, or merely passing by.

While most spec writers concentrate on performance criteria, they should also understand the importance of esthetic changes. Bill DeCelle, product manager for modernization at Otis Elevator Corporation, says his company often gets customers who modernize to stay competitive, but elevator users need to be able to appreciate the changes. "When the tenants get into the same old elevator car after the modernization is complete, they wonder what the fuss was about," DeCelle says. "By making architectural changes to the car itself, you have an esthetic as well as performance improvement. Building owners also see that as important." ■

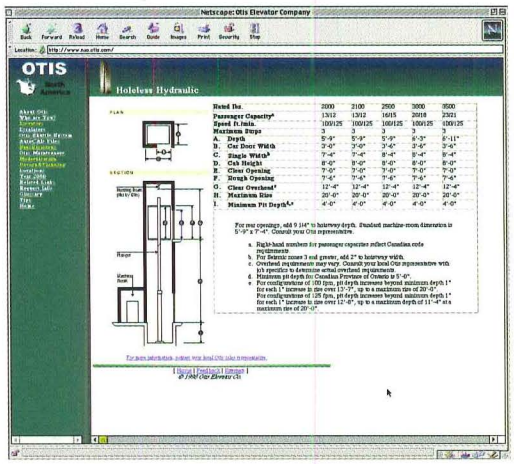
Jack Klein is a Tampa, Florida-based freelance writer.

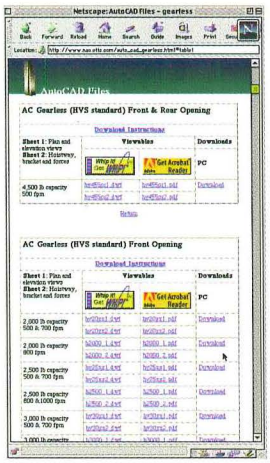


New elevator systems designed specifically for modernization projects feature compact designs that ease installation into existing mechanical space. **Schindler Elevator**'s computer-controlled ACVF Express (top right), available in speeds of 200 to 450 feet per minute and in capacities of 2,500 to 5,000 pounds, replaces bulk of old mechanical relay system (top left). **Otis Elevator**'s Elevonic 411M (above right) condenses control panels similarly (above left) and also features Otis's RSR Plus Dispatching, which evaluates and adjusts for traffic demand at any given moment.

Elevator Specs Go Online

Manufacturer Web pages help elevator specifiers stay on track. By Jack Klein





Otis Elevator's Web site includes detailed specification information on its range of products as well as downloadable CAD drawings for each.

Elevator design and specification has never been a streamlined process. While there is no shortage of information—sales representatives deliver piles of specifications, technical details, and catalogs to firms—the drawings manufacturers provide are usually too general, with variables and dimensions that have to be cross-referenced on accompanying charts to determine which drawings go with which models. Then, draftspeople spend considerable time researching and redrawing manufacturer designs to fit specific projects.

Elevator manufacturers' Web sites are rapidly changing this cumbersome process. Merely by perusing such sites, specifiers can find complete elevator specifications in standard Construction Specifications Institute (CSI) format; dimensional data and downloadable CAD drawings; design and planning guides; product literature for elevators and components; and the latest new technology information. "I've used a number of elevator manufacturer Web sites," says Daniel Montana, senior project manager for Martin J. Brockstedt Architect in New York City. "They facilitate adapting standard models directly into my architectural designs because the information has already been engineered in terms of such things as size and clearance."

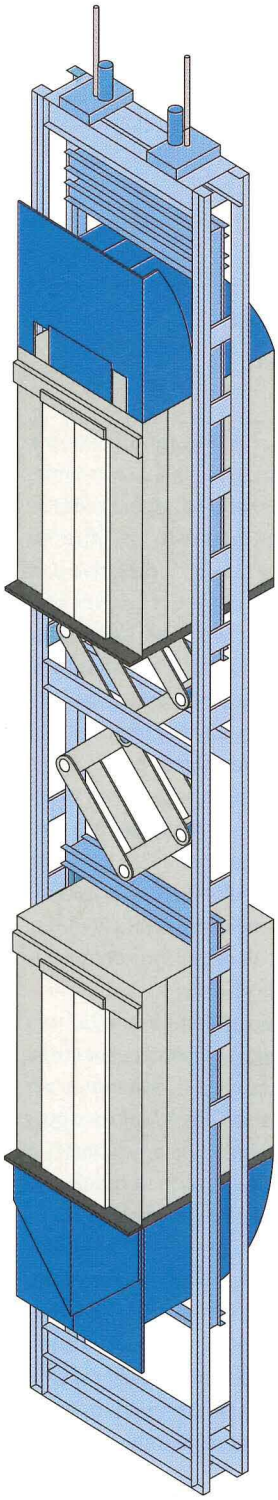
Montana prefers this system of electronic files over manufacturer catalogs and printed specs because the electronic files are already to scale—they are drawn exactly the way the manufacturer expects the shaft or enclosure to be when it's time to install the machinery. "For example, we were modernizing two elevators in a hotel project, installing new microprocessor controls and modifying the interior of the cabs," Montana relates. "We were able to pull the specs off a manufacturer's Web site relating to general performance criteria, finishes, and other items for the cab interior. Since the manufacturer already has these formatted in his specifications, all we had to do was modify them to our own format."

By using the Web to access the manufacturer information, architects can also quickly determine whether they have the appropriate clearances within existing shafts and mechanical rooms. Further, they can quickly generate drawings—using downloadable CAD files—that incorporate mechanical and electrical requirements.

Of course, some architects and specifiers aren't yet comfortable working on the Web, but Malcolm Daniels, manager of Internet services for Horn Lake, Mississippi-based Dover Elevators, is confident the method will catch on. "We're talking about a three-part process, at most," says Daniels. First, he explains, users go to Dover's Web site and select the products section, where the company lists its individual models and their capacities, platform sizes, and other basic information. Specifiers then select one, and a list of drawings of each product in several different door configurations appears. From there, users select the drawing they want and download it to their hard drive in one of three different CAD formats.

Schindler Elevator Corporation takes a different approach with its Web site specification aids. It offers an option in which the specifier need only plug in a few variables, and the proper elevator is matched to their needs. "The designer is asked about the number of elevators needed, capacity, the number of floors, and the number of people in the building," says Schindler's Kathy Rucki, who manages the company's Web site. "It then matches the correct elevator to those parameters. We want to save a lot of time in the comparison of different models' specs."

Such time savings, as Montana points out, can lead to major cost savings. "On just about any project of any size, elevators are one of the major investments an owner makes," says Montana. "They are very expensive, and even a minor miscalculation in design can mean big cost overruns. It's helpful to receive precise information and details that can be manipulated, put directly into your drawings and then designed around, and still be confident that everything is going to work the way it's supposed to."



Rising Demand

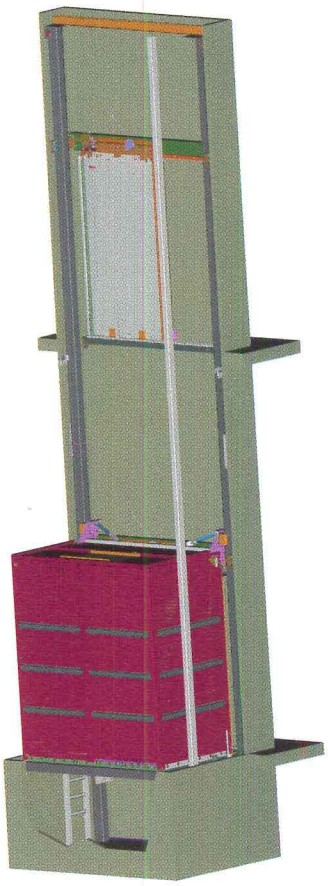
New elevator products for high-volume loads, low-volume spaces, and no-volume foundations. By Eric Adams

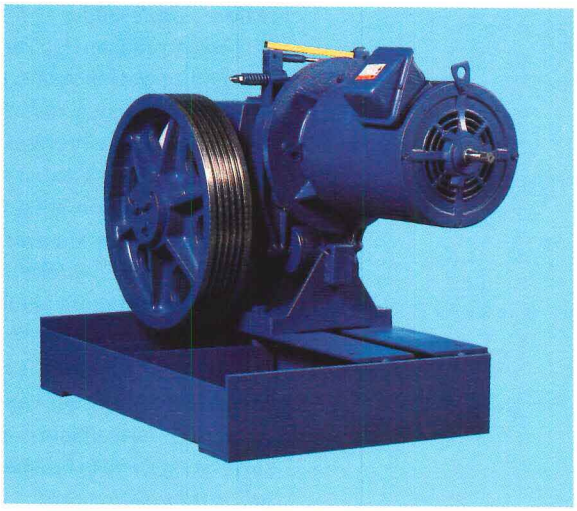
Double-deck design

For designers who think single elevator cabs waste precious space in elevator shafts comes Otis Elevator's new Skyway family of high-speed, high-load, double-deck elevators (left). The systems feature aerodynamically designed cabs that reduce noise and vibration; speeds of up to 50 feet per second; and a 9,900-pound capacity equal to 68 passengers. The flexible structure features a pantograph joint between cabs that, with a maximum 6 1/2-foot separation, frees architects from the restriction of designing uniform floor heights to accommodate double-deck elevators. *Circle 294 on reader service card.*

Ecofriendly elevator

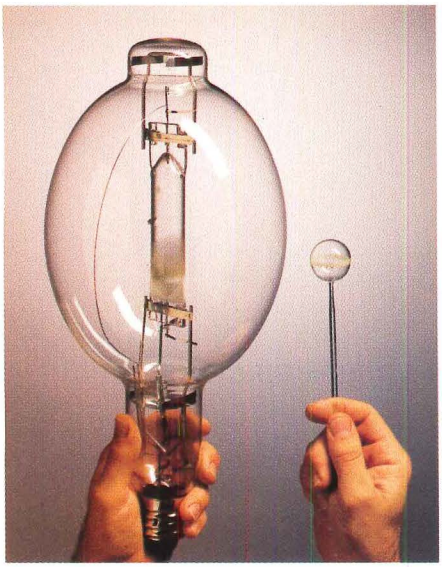
Operating efficiency and minimal environmental impact are hallmarks of the new, lightweight 321A Hydraulic Elevator System from Schindler (right), which incorporates a holeless design that eliminates the need for and expense of jack-hole drilling. The self-contained, aboveground hydraulics, which require little maintenance and eliminate the risk of in-ground oil leaks, use telescoping pistons that provide up to 41 feet of travel. *Circle 295 on reader service card.*

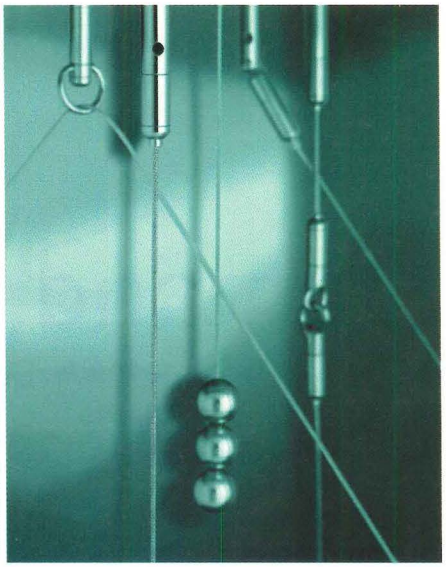


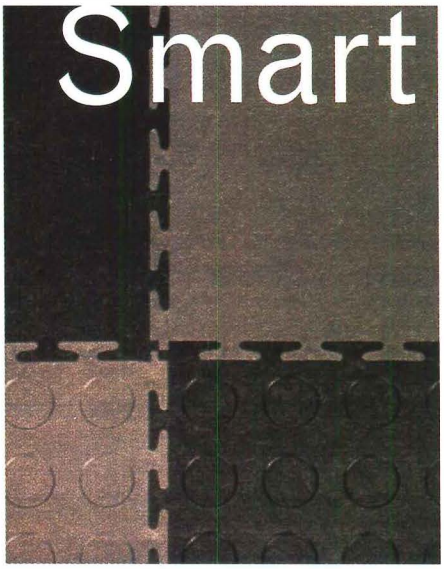


Modernization-ready

For architects trying to squeeze new technology into old spaces, the compact dimensions of Thyssen's new TW 151 geared traction elevator machine (left) might be the solution. Available with or without motors, the machine measures 53 inches at its base and 37.5 inches in height, so it is well-suited for elevator modernization projects. Equipped with precision gears that require no field adjustments, the low-maintenance TW 151 works in overhead, basement, and side-mount applications. *Circle 296 on reader service card.*





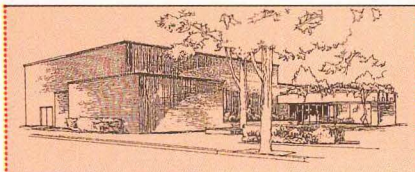


PRODUCTS

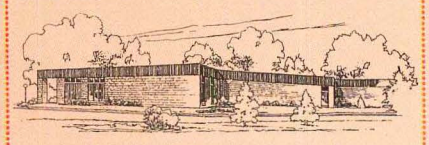
Smart Parts

CLOCKWISE FROM TOP LEFT: **Sulfur Lamp** Fusion Lighting's new, highly energy-efficient LightDrive 1000 sulfur lamp, shown next to a larger, 1,000-watt metal halide bulb, delivers sunlight-quality, full-spectrum light with low infrared and low ultraviolet output. Each 1,425-watt LightDrive unit generates 135,000 lumens, has a 60,000-hour service life, and can be dimmed to 20 percent with minimal color change. The system, which can be used with reflectors, light pipes, and fiber optics, is especially suited for rail stations, airports, and high- and low-bay commercial and industrial facilities. *Circle 297 on information card.* **Locked Suspension** Décor Cable introduces Posilock, a new component cable system that provides quick and secure tension for unlimited design applications. A 1 to 2mm stainless steel cable, combined with either a nickel-plated brass tensioner or holder, locks the cable in place. Ideal for displays and applications requiring reconfiguration. *Circle 298 on information card.* **Scaled Floor** DuPont introduces RepTile, a new utility floor made from recycled carpet materials. Used vinyl-backed carpet tiles are shredded and mixed with other vinyl waste materials to produce these interlocking floor tiles. Ideal for sport facilities, RepTiles do not need to be glued down and can be placed over damaged floors. Available in black and gray, other colors are available at a lower recycled content. *Circle 299 on information card.* **Backseat** Canadian-based Allseating introduces OS^{S}, a line of stackable, ergonomically designed furniture. When stacked nine-high the chairs mimic the human spine. The curved shell supports the entire back and is molded to relieve pressure points. OS^{S} is available in a variety of colors, with or without armrests, and in brushed or polished aluminum. *Circle 300 on information card.*

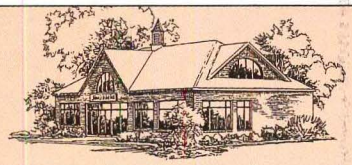
CONSTRUCTION COST COMPARISONS PER SQUARE FOOT • JANUARY 1999



AUDITORIUM
1 story building with 24' story height and 24,000 square feet of floor area



FACTORY
1 story building with 20' story height and 30,000 square feet of floor area



RESTAURANT
1 story building with 12' story height and 5,000 square feet of floor area

	AUDITORIUM		FACTORY		RESTAURANT	
	1st Q 1999	1st Q 1998	1st Q 1999	1st Q 1998	1st Q 1999	1st Q 1998
Atlanta	$ 90.04	88.12	52.82	52.78	97.37	96.51
Boston	118.86	118.43	69.73	69.44	128.55	126.97
Chicago	112.95	111.67	66.26	65.81	122.16	120.33
Dallas	88.30	87.33	51.80	51.47	95.50	94.11
Kansas City	99.20	96.36	58.20	56.76	107.29	103.80
Los Angeles	112.65	112.27	66.08	65.96	121.83	120.99
New York City	136.38	135.36	80.01	79.85	147.49	146.01
Phoenix	91.87	90.91	53.89	53.31	99.36	97.48
St. Louis	104.60	103.32	61.36	60.87	113.12	111.30
San Francisco	126.50	125.68	74.21	74.02	136.81	135.35
Seattle	106.54	106.31	62.50	62.37	115.22	114.78
Washington, D.C.	97.78	96.57	57.36	56.82	105.74	103.90

Each month Architecture takes a snapshot of U.S. construction – looking at average costs and upcoming projects for different building types. News on projects is provided by Construction Market Data and cost information by R.S. Means – both CMD Group companies.

NOTE: Cost comparisons shown here are for the basic building without sitework, development, land, specialty finishes or equipment. Actual square foot costs vary significantly from project to project based on quality, complexity and local economy.

UPCOMING PROJECTS

Hispanic Cultural Center Phase 2
Location: Avenida Ceasar Chavez & Bridge Street, Albuquerque, Santa Fe County, NM
Project Value: $14.6 million
Size: 100,000 sq ft, 7 floors above grade, 3 structures
Contract Type: Open Bidding
Current Project Stage: Planning; Architect Selection Underway
Status: Architect Selection Underway
Owner: New Mexico Office of Cultural Affairs; Michael Bodelson; 228 E. Palace Avenue; Santa Fe, NM 87503
Phone: 505.827.6364
Owner's Representative: Hispanic Culture Division; Ron Vigil; PO Box 2087; Santa Fe, NM 87503
Phone: 505.827.8440; **Fax:** 505.827.7308

Lassen High School Classroom Building
Location: 1110 Main Street, Susanville, Lassen County, CA
Project Value: $8 million
Size: 53,000 sq ft, 3 floors above grade, 1 structure
Contract Type: Open Bidding
Current Project Stage: Planning; Schematics
Status: Schematics Complete; Bid Schedule Not Set
Project Scope: 16 Classrooms, Library & Performing Arts Space; Steel Frame Structure & Masonry, Type II-Sprinklered
Owner: Lassen County Union High School District; Diane Grose; 1324 Cornell Street; Susanville, CA 96130
Phone: 530.257.5134; **Fax:** 530.257.0796
Architect: Dwayne E. Evans Architects; Dwayne Evans; 15393 Highway 299 W, PO Box 2760; Shasta, CA 96087
Phone: 530.241.6600 **Fax:** 530.241.3036

Ameristeel Incorporated Melt Shop
Location: Knoxville, Knox County, TN
Project Value: $35 – $40 million
Size: 10,000 sq ft, 1 floor above grade, 1 structure
Contract Type: Invited Bidders
Current Project Stage: Planning; Working Drawings
Status: Working Drawings Complete; Owner Negotiating with Select GC
Project Scope: Melt Shop Using Electric Arc Furnace & Steel Continuous Caster
Owner: Ameristeel Inc.; Don Baker; 1919 Tennessee Avenue; Knoxville, TN 37921
Phone: 423.546.5472; **Fax:** 423.637.8293
Architect: RE Warner Associates; Bill Sage; 24600 Center Ridge Road, Suite 300; Westlake, OH 44145
Phone: 440.835.9400; **Fax:** 440.835.9474

Seminis Seed Production Complex BP3
Location: Rice Avenue & Camino del Sol, Oxnard, Ventura County, CA
Project Value: $25 million
Size: 32 acres, 370,000 sq ft, 2 floors above grade, 1 structure
Contract Type: Negotiated
Current Project Stage: Planning; Working Drawings
Status: Working Drawings in Progress; GC To Take Subbids Approx. 12/98
Project Scope: New Seed Production Complex, Warehouse, Offices, Distribution Facilities
Owner: Seminis Vegetable Seed Inc.; Jim Silveria; 1905 Lirio Avenue; Oxnard, CA 93004
Phone: 805.647.1188; **Fax:** 805.872.1939
Architect: Jim January; 10293 Cohasset Road; Chico, CA 95973
Phone: 530.342.1386

West Side Restaurants
Location: Southfield, Okland County, MI
Project Value: $2.5 million
Size: 2 structures
Contract Type: Invited Bidders
Current Project Stage: Planning; Working Drawings
Status: Working Drawings in Progress; OTB 11/98
Project Scope: Two Restaurants, One Italian & One American Brew Pub
Owner: Ark Restaurants Corporation; Michael Weinstein; 85 Fifth Avenue, 14th Floor; New York, NY 10003
Phone: 212.206.8800; **Fax:** 212.206.8845
Architect: CSC Architecture; Charles S. Cordero; 5550 Wilshire Boulevard, Suite 300; Los Angeles, CA 90036

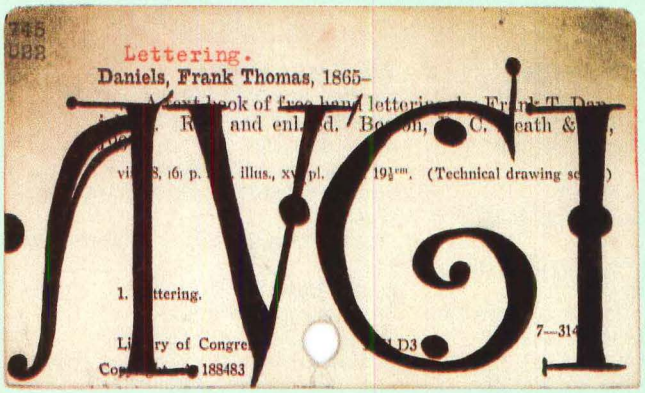
Hops Grill & Bar
Location: Fort Myers, Lee County, FL
Project Value: $2 million
Size: 1 floor above grade, 1 structure
Contract Type: Negotiated
Current Project Stage: Planning; Working Drawings
Status: Working Drawings in Progress; Subbid Schedule Not Set
Owner: Hops Grill & Bar; 3030 N Rocky Point Drive W, Suite 65; Tampa, FL 33607
Phone: 813.282.9350
Architect: Alfonso Architects Inc.; Scott Cooley; 1705 N 16th Street; Tampa, FL 33605
Phone: 813.247.3333; **Fax:** 813.247.3395

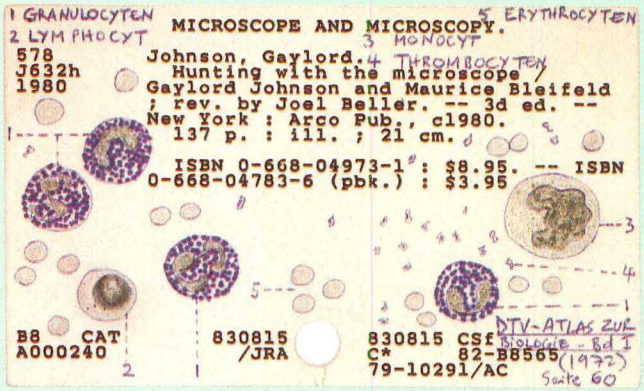
The advance of digital culture is blindly eradicating the simpler, more tactile pleasures of the old-fashioned library.
By Andrei Codrescu

The Might of Bytes

The Astra Library in Sibiu, Romania, was the safe haven of my childhood. Inside the marble-floored main reading room of the Italianate villa hidden in a small park, I could dream and hide from the drabness and meanness of the world outside. No fantasy of escape is complete without a library: Even *20,000 Leagues'* Captain Nemo had a splendid *bibliothèque* in his submarine. The Astra library seemed to me infinite, like Argentine author Jorge Luis Borges' cosmic library in "The Library of Babel." There, the entire universe was mirrored through writing, making books the building blocks of an alternate creation.

The library was, for a century, the eminent metaphor for opposing barbarity, synonymous with civilization. The great book repositories of the world were the secular equivalent of the great cathedrals. In the domed Round Reading Room of the British Museum, where Karl Marx wrote *Das Kapital*, I got chills just absorbing the essence of its genius loci. The Main Reading Room of the Library of Congress, which grew from the seed of Thomas Jefferson's private library, is ineffably American, though modeled after the British Museum library. But grandeur is not required: American democracy is at ease in the hundreds of public libraries in small towns where Americans, since the 19th century, have been learning about the world.





Access to the public library may have inhibited the construction of private libraries in the U.S. In other countries, such libraries are indispensable. The Mexican writer Ludvik Zeller, who lives in Oaxaca, told me recently that his library had to hold every reference book he needed for his research because none were available outside of Mexico City. Interlibrary loan is unheard of in Mexico. In Romania, I found books forbidden by the Communist regime in the secret libraries of a dissident professor.

Nostalgia notwithstanding, the time of fine libraries, public and private, may be coming to an end. In Los Angeles, a realtor showing a fine 1920s house to a couple pointed out the splendid library with some embarrassment. "Tear down the shelves and you've got yourself a fine rec room," she said. On a different scale, the new San Francisco Main Public Library (*Architecture*, July 1996, pages 80-91), financed in part by computer money from Silicon Valley—contrary to the original reason for building it—has less shelf space for books than the old library. There are plenty of computers, though.

The mystique of the computer is dangerous. A blinking screen will never replace a book, no matter how much data the infinite storage room of the machine holds. A book is a physical object greater than the data it contains. Likewise, the library is greater than its seeming function of storing and circulating books. The physical book involves the erotic thrill of holding knowledge and fantasy in your hands, while the library allows for the overlapping of public and private space with the expansion of inner and outer life.

When computerization of San Francisco's new library rendered card catalog obsolete, artists Ann Hamilton and Ann Chamberlain recycled 20,000 cards as wallpaper. Volunteers recorded their personal impressions over each card.

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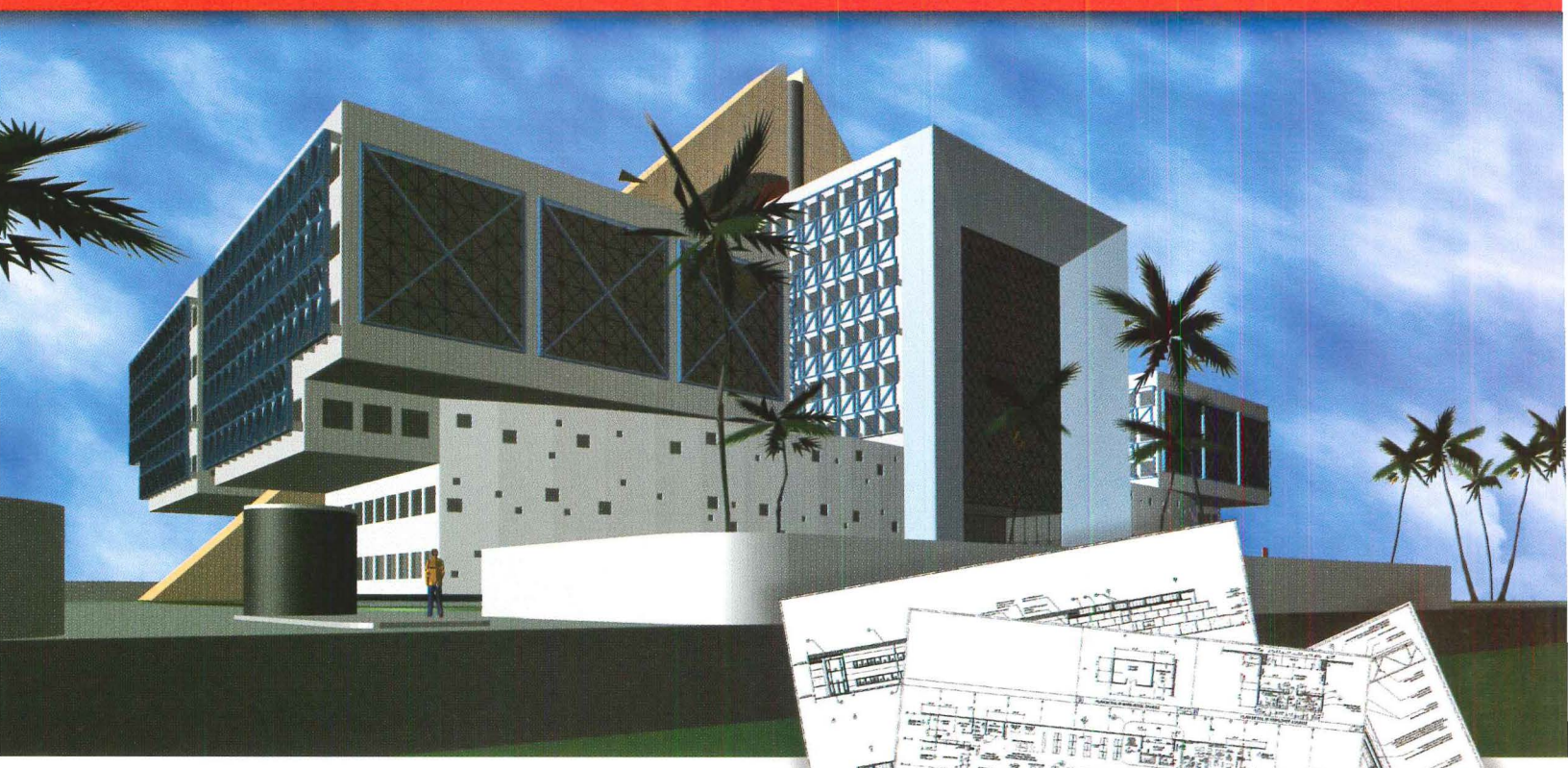

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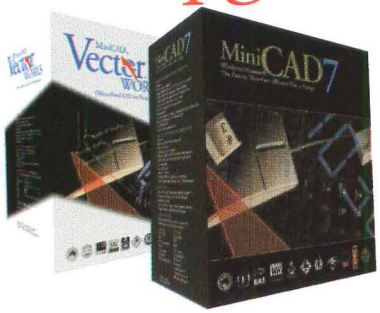

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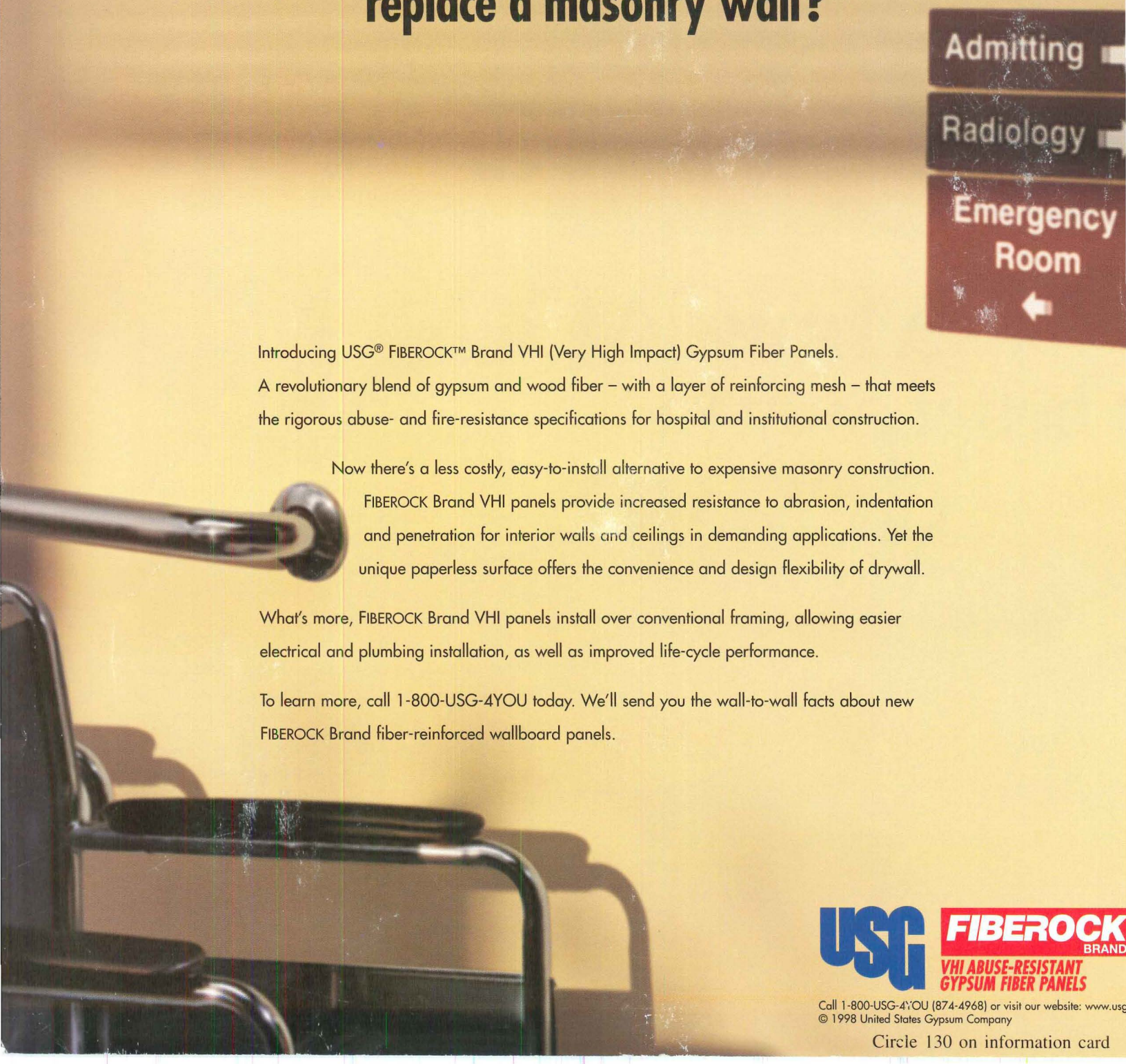

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