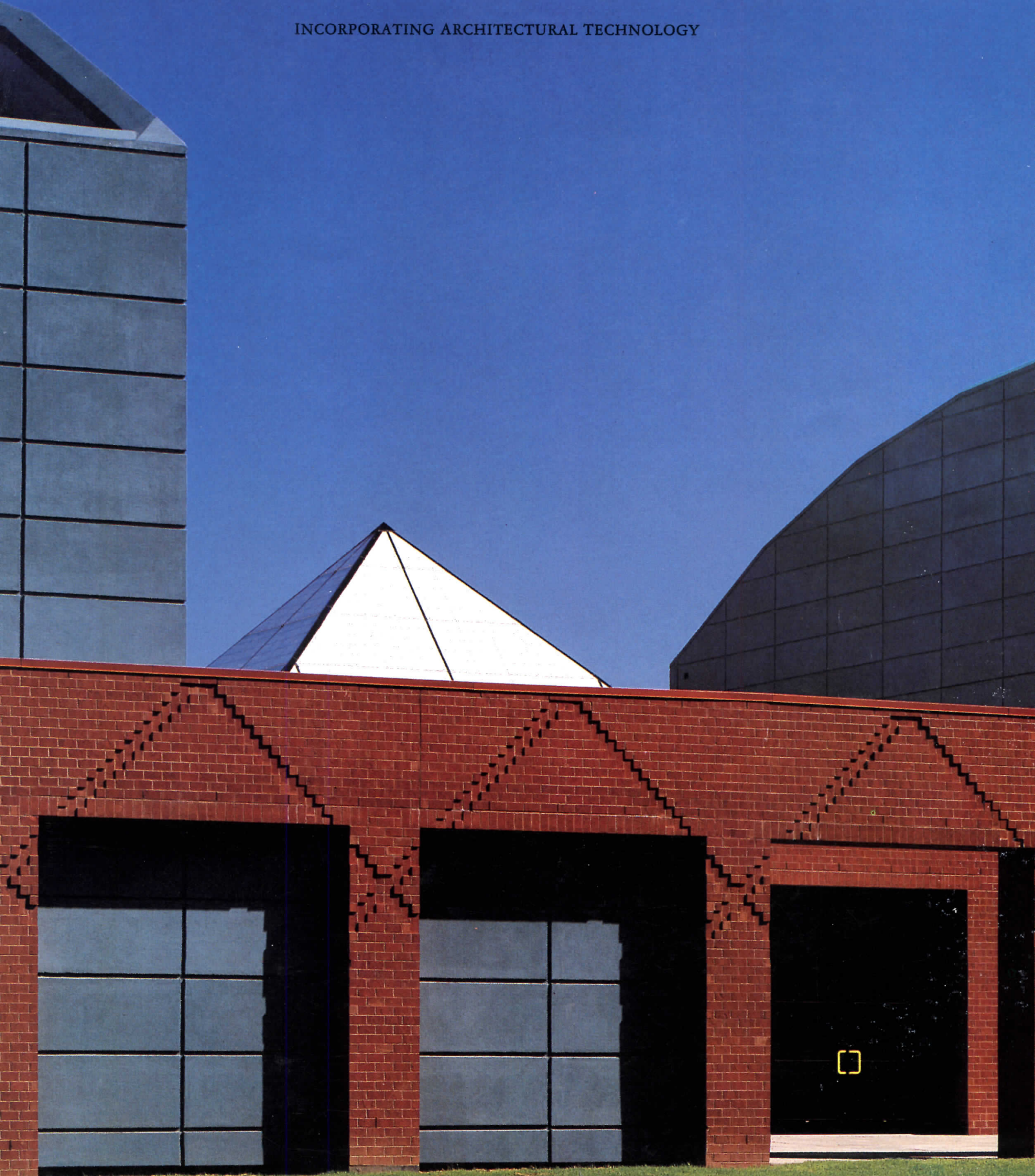


AUGUST 1990 ■ SIX DOLLARS

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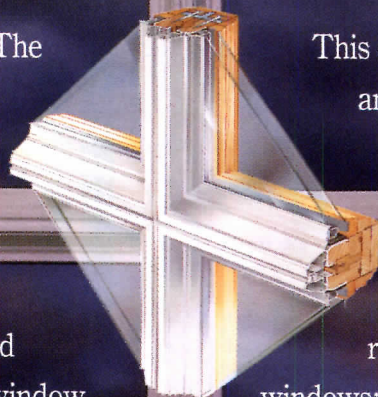


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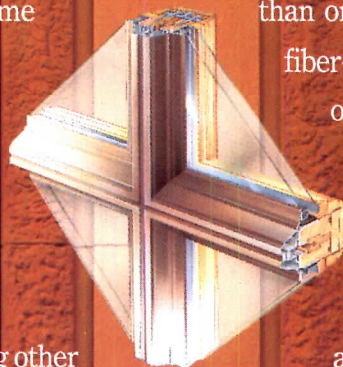
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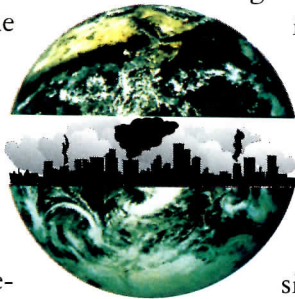
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EDITOR'S PAGE

Green Architecture

EARTH DAY 1990 HAS COME AND GONE, BUT environmental conservation continues to remain at the forefront of public concern. Increasingly, clients are demanding that architects become more sensitive to "green" issues in buildings. As a step in that direction, the AIA Board of Directors endorsed and funded a new committee on the environment in May to study how architects can more effectively create safe and healthy buildings. This November, the institute will host a major symposium on the environment in Washington, D.C., during which the first installment of the AIA's Environmental Resource Guide will be discussed. Now under development, the guide will contain scientific research on the impact of commonly specified building materials, organized according to the 16 Construction Specification Institute categories.

"Green" architecture, however, requires more than a checklist of safe products. As the failure of airtight, energy-efficient, and ultimately "sick" buildings of the 1970s demonstrated, environmentally conscientious architecture demands consideration of a building as a whole system in order to prevent indoor pollution, depletion of energy, and decimation of natural resources. To that end, architects and developers in the United Kingdom have conceived a way of determining an office building's environmental soundness during the design stage. Announced last month by Britain's Minister for the Environment, David Trippier, the Building Research Establishment Environmental Assessment Method (BREEAM)



was developed by ECD Partnership, a firm which specializes in energy-conscious design, and Building Research Establishment, a government-sponsored organization. More importantly, the assessment method was sponsored by three major real estate developers, Stanhope Properties, Greycourt, and Olympia & York, as well as the Sainsbury's supermarket chain. Its aim is to identify potential building-related pollutants on the global and neighborhood scale, such as acid rain and carbon dioxide, and indoor contaminants such as formaldehyde, lead-based paints, and asbestos. Once these dangers are evaluated, credits are assigned by

independent analysts to aspects that reduce pollution. At the completion of the voluntary assessment, a certificate listing the environmental criteria that the building has satisfied is issued. Improvements can then be incorporated into a design before construction begins.

While BREEAM clearly serves as a marketing ploy for its developer/sponsors, the scheme is an important step toward achieving environmentally responsible architecture. It not only evaluates buildings as interdependent systems, but involves clients as well as architects in the process. Professionals in this country could learn from the British model, which strikes a balance between practical and ideal methods of promoting environmental safety and health. As the BREEAM outline indicates, often the greenest architecture takes advantage of the simplest design elements: site orientation, natural ventilation, and sunlight. ■

—DEBORAH K. DIETSCH

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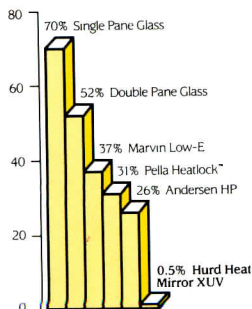
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*Total unit R value of 5.5 is for commercial size units; 4.6 for residential size units.

Windows since double-pane glass.

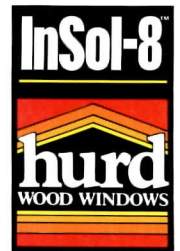
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LETTERS & EVENTS

Other geometries

Your article about proportion and geometry (May, 1990) is charmingly naive and rife with errors. Of course, any two numbers in a series do not make for a Fibonacci series. The rules governing musical proportion are built from whole number ratios, not irrational numbers like 1.62 et cetera, and curved space is a mathematical notion as is chaos theory and cannot be described with Euclidean geometry. The artist's assertions are no different, if more strident, than assertions made by folks who had little science but who noted certain forms in nature seemed to occur in various species that might or might not be explained by Darwinian theory.

*William T. Firschein, AIA
Venice, California*

Wholeness and matriarchy

Kudos to Frank Carson for taking his quest for wholeness in hand and sharing his thoughts and drawings with us. Also to Beverly Russell for attempting to explain a very difficult ubiquitous phenomenon: the dominance of society by the patriarchal attitude.

There are, however, a few inaccuracies in the article that need attention. The most basic expression of wholeness is the "squared circle." The circle divided through the center at 90 degrees each way, quartering the circle, is a universal symbol from most ancient times. Mathematically, squaring the circle is only an approximation, as the circle cannot be precisely proscribed because of the value of pi. The circle is the universal symbol of Deity, therefore inscrutable, irrational. The square, on the other hand, is calculable and rational, representing Earth and humankind. A squared circle's conjunction of the rational/irrational is a grand union of opposites, conjoining God/man or Heaven/Earth, psychologically symbolizing wholeness.

*Charles Wright
Lake Worth, Florida*

Asbestos dangers

Upon reading the article on asbestos abatement "Ripped Off" (News, May, 1990), we were severely disappointed with the one-sided, inaccurate information provided.

The findings from Harvard University's Energy and Environmental Policies Center were actually from a symposium there, put

on by the asbestos manufacturers and Safe Building Alliance. Harvard's medical school has since vigorously denied both the information and use of the Harvard name associated with that symposium. The truth is that asbestos is a known potent carcinogen—there are federal laws regarding asbestos exposure and eventual removal of asbestos from all structures before demolition.

Professionals reading your article may disregard the threats of asbestos and find themselves in a court case. They will be on the losing side.

*Fred B. Blood, President
Mike W. Holman, AIA, General Manager
Asbestos Control Consultants, Inc.
Austin, Texas*

Pitfalls of detailing

In the article "Against the Wall" (May, 1990), the authors brought out several requirements in exterior wall design that need to be expanded upon.

Not only do owners often permit substitutions of unsatisfactory systems, but many architects and engineers do not investigate substitutions to ensure compliance with contract documents and the required performance criteria. The other error in detailing is to ignore critical factors, solving one criterion but creating other problems with the solution. The window sill curtain wall construction illustrated on page 130 is a good example. The improvements solved only the need for redundancy to prevent water infiltration. The problem created was not addressed. Similarly, the details on page 131 show the "through wall flashing" which again induces thermal bridging. Resulting condensation may be concealed for years before the results of corrosion or other damage become apparent.

*Robert J. Berg, AIA, CSI
Rockville, Maryland*

Corrections

In "Survival Tactics" (April, 1990, page 103), Klages Carter Vail and Partners should have been credited as associate architect for the Irvine City Hall.

Walter Smalling photographed the Walker & Dunlop office for Greenwell-Goetz Architects (June, 1990, page 130).

Through November 10: "Eliel Saarinen, Finnish-American Architect, 1873-1950" at the Indianapolis Museum of Art, Columbus Gallery. Contact: (812) 372-4622.

September 13: INNOVA's Innovations '90 open house and market event, Houston, Texas. Contact: Lynn Billings (713) 963-9955 or (800) 231-0617.

September 14: Deadline for the Prince Frederick Town Design Competition. Sponsored by the Chesapeake Bay Chapter, AIA. Contact: Craig Purcell (301) 263-7494.

September 15: Deadline for entries for the American Wood Council Design Award Program. Contact: AWC, 1250 Connecticut Ave., NW, Washington, DC, 20036. (202) 833-1595.

September 17: International Facilities Management Association's career day in New York City. Contact: Arthur Harris, IFMA, Greater New York Chapter, PO Box 2220, New York, New York 10185. (201) 455-8525.

October 1: Deadline for submissions to the Schoolyards Design Competition, a project of the New York City Children's Play Coalition and the New York City Board of Education. Contact: Children's Environments Research Group, City University Graduate Center, 33 West 42nd Street, New York, New York 10036.

October 3-4: Applied Technology Council's seminar on seismic design in Irvine, California. Contact: Christopher Rojahn (415) 595-1542.

October 11-13: "Crosscurrents" at the International Design Center, during Designer's Saturday in New York City. Contact: Alexia Lalli, IDCNY (718) 937-7474, or Linda Foa, Designer's Saturday (212) 826-3155.

Oct. 15-16: Northeast Solar Energy Association conference in Springfield, Massachusetts. Contact: NESBA, 23 Ames Street, Greenfield, Massachusetts 01301 (413) 774-6051.

October 25-27: "Home: A Place in the World," a conference in New York City, cosponsored by the New School for Social Research. Contact Malcolm Carter, The New School (212) 741-5677.

NEWS

BICOASTAL CONSTRUCTIVISM ■ ASPEN DESIGN CONFERENCE ■ VIETNAM MEMORIALS

Justice Department Files Antitrust Suit Against AIA

ON JULY 5, THE JUSTICE DEPARTMENT filed a civil antitrust suit against the American Institute of Architects for alleged price-fixing. On the same day, lawyers for the AIA and the department filed a proposed consent decree that, if accepted by a federal district judge in September, will settle the government's claim against the institute.

Culminating a four-year investigation, the Justice Department's action was filed under the powerful Sherman Antitrust Act, which was conceived in 1890 to protect competition by shattering the immense monopolies of wealthy industrialists. The most famous antitrust case was the breakup of Standard Oil in 1911, but in recent years the department has successfully invoked antitrust legislation against companies such as AT&T, as well as against several professional organizations, including the American Society of Civil Engineers in 1972.

The lawsuit alleges that a 1984 policy statement on compensation and fees, issued by the Chicago chapter of the AIA, "prohibited AIA members from engaging in competitive bidding, discounting fees or providing free services." That policy statement read, in part: "An architect shall not participate in any client request for a proposal where fee is the sole basis for selection" and "architects shall not provide professional services without compensation."

In the suit, the Justice Department also contends that the AIA violated a 1972 consent decree prohibiting it from adopting any policy that restricted competitive bidding. (Prior to 1972, the AIA, the American Society of Civil Engineers, and two other professional associations determined their own ethical rules discouraging price competition.) AIA officers, however, insist that competition exists today in the profession. AIA President Sylvester Damianos maintains, "The practice of architecture is highly competitive, and likely to become even more so." While the goal of the antitrust suit is to reinstate fair competition in order to reduce fees, AIA officers doubt that the agreement will actually lower the cost of architectural services. According to Theodore F. Mariani, AIA, principal with Mariani & Associates in Washington, D.C., "You even compete when you work for the government. If the feds don't like the price, then they go to the next guy." Mariani chaired the institute's legal oversight committee that was formed to monitor the settlement process. He adds, "[The Justice Department] wanted to find if there was any collusion. After months of investigating, there was no criminal indictment. We're not in the business of restraining competition....there's no grand conspiracy among architects to limit free trade." However, Justice Department spokesman Joseph Krovisky notes that when a possible antitrust violation is under investigation, and the party concerned "files a consent decree saying 'we won't do it anymore'—then you can draw your own conclusions."

Under the new consent decree, which is subject to a 60-day period of comment and review, the AIA agrees that neither its local chapters nor its national organization may indulge in any practices that restrain price competition in the sale of architectural services. The Institute also agrees to pay \$50,000 toward the cost of the Justice Department's investigation, to refrain from limiting free service, and to educate its 54,000 members on federal antitrust policy. David K. Perdue, associate general counsel for the AIA, says the institute welcomes the settlement despite its constraints and the \$50,000 payment.

—HEIDI LANDECKER

AIA BRIEFS

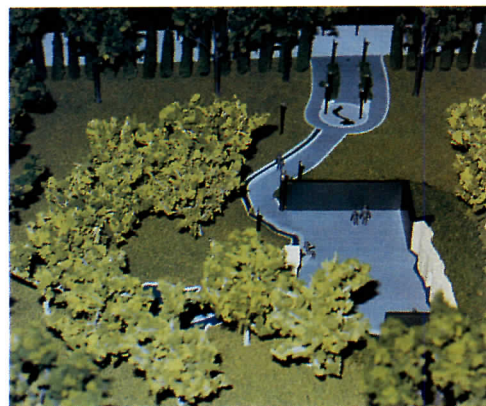
Three new open committees in the areas of the environment, international relations, and young architects have been recently created by the AIA in response to a growing interest in these fields. The Committee on the Environment confirms the AIA's renewed commitment to environmental sensitivity. An appointed steering group is planning a meeting and conference in November in Washington, D.C. The existing International Relations Committee will reopen its doors to new membership as a result of renewed interest, beginning with a meeting scheduled for November in Washington, D.C. The Young Architects Committee, geared toward architects who have been registered less than 10 years, will hold its first open meeting in March in San Diego. For information on membership to these committees, contact the AIA.

AIA's Design Committee held a conference in June in New Harmony, Indiana, exploring the history and development of utopian communities in the United States and abroad. Highlights included the opening remarks given in the Athenaeum, a visitor's center designed by Richard Meier, FAIA, and a slide presentation on Philip Johnson's Roofless Church.

Behnisch & Partners, Architects, of Stuttgart, West Germany, are the recipients of the AIA co-sponsored 1990 Reynolds Award for the partially submerged German Postal Museum in Frankfurt (below).



NEW VIETNAM MEMORIAL



"Lakefront D.M.Z." (above), designed by a team of artists and architects, is the winner of Minnesota's Vietnam memorial competition.

PAGE 30

DETAILS

The new architecture and interior design firm **Keating Mann Jernigan Rottet** was formed this May in Los Angeles. Partners **Richard Keating, FAIA, Michael Mann, AIA, Robert Jernigan, AIA, and Lauren Rottet, AIA,** were formerly a design team with **Skidmore Owings & Merrill** in Houston, and most recently with **SOM's Los Angeles office.** Principals **Paul Danna, Jose Palacios, Richard Riveire, and Steve Zimmerman** also joined the new firm from **SOM.**

James Oleg Kruhly + Associates is the recipient of the **1990 Gold Medal** from the **AIA Philadelphia Chapter.** The award was presented for the firm's **New Hackensack Reformed Church** in **Wappinger Falls, New York.**

Architectural patron and Domino's Pizza founder Thomas S. Monaghan announced the selection of **30 firms** for the second annual **1990 Domino's 30 Award.** A jury of nationally prominent architects selected the recipients, who will receive architectural commissions in lieu of cash prizes.

The **Albert S. Bard Awards,** considered the most prestigious architecture awards within **New York City,** were presented in June by the **City Club.** Four buildings were honored, as well as four public officials including former Mayor **John Lindsey.** The projects are: the **Central Park Zoo, Kevin Roche John Dinkeloo & Associates; Brooklyn Borough Hall, Conklin Rossant Architects; St. Thomas Choir School, Buttrick White & Burtis; and Columbus Townhouses, Hoberman & Wasserman Architects.**

Robert Greenstreet, chair of the architecture department at the **University of Wisconsin Milwaukee** was promoted to dean of **UWM's school of architecture and planning** in July.

Renowned furniture designer **George Nakashima** died in June. **Nakashima** was known for his untrimmed slabs of wood that preserved the character of trees. His work earned him a gold medal for craftsmanship from the **AIA** in 1956.

Jerome J. Sincoff, AIA, was appointed president of **Hellmuth, Obata & Kassabaum** in July, in an effort to consolidate the **St. Louis firm's operations.**

Russian Constructivism Visits Seattle...

WHEN VLADIMIR TATLIN'S MODEL FOR his 1,200-foot "Monument to the Third International" was paraded through Moscow in 1927, it was mounted on a trailer pulled by horses. That event may have been emblematic of the central problem facing Soviet architects during the flowering of Constructivism. They imagined soaring monuments of steel, glass and concrete, yet the technology to bring their dreams to fruition was all but non-existent.

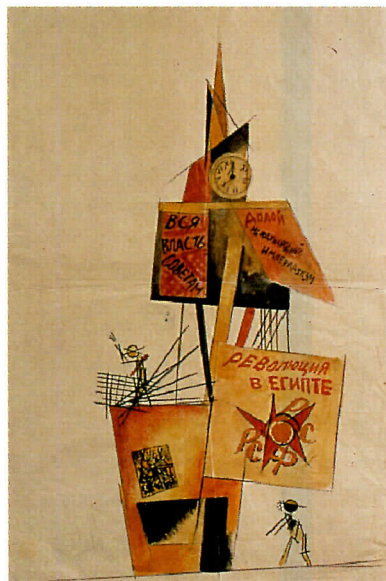
Now a major art exhibition brings hundreds of samples of Soviet art and architecture of the 1920s to the United States. "Art into Life: Russian Constructivism 1914-1932" is the first large-scale exhibition devoted to an art which sought to wrest the new Soviet Union out of its peasant and Czarist past and into the 20th century. A model of Tatlin's "Monument," photomontages of El Lissitzky's "Horizontal Skyscraper," and a reconstruction of Aleksandr Rodchenko's "Worker's Club" are among the 300 plus

pieces in the exhibition, along with examples of Constructivist graphics and theater design.

The exhibition is arranged in a sequence of galleries that trace the history of the movement from early attempts by Soviet painters to mimic the new Cubist style to its final idealistic, visionary phase. Particularly interesting are drawings that reveal how artists and architects grappled with the theoretical underpinnings of their movement. The increasingly three-dimensional art of Tatlin and others, created in the early 1920's, clearly foretells the startling architectural visions that were to come.

The exhibition runs through September 2 at the Henry Art Gallery at the University of Washington in Seattle, then moves to the Walker Art Center in Minneapolis until December 30, and concludes its tour in Moscow in the spring of 1991. —DOUGLAS GANTENBEIN

Douglas Gantenbein is a Seattle-based writer.



Aleksandr Rodchenko's "Design for a Newspaper Kiosk" (above).

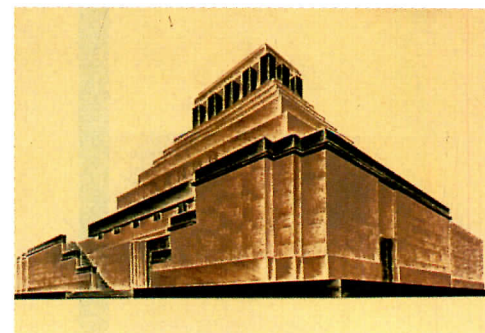
...and New York City's Museum of Modern Art

DESPITE ITS RECENT REFORMS, AND IN part because of them, the Soviet Union is still exporting its revolution. On June 27, a garrison of Bolshevik architects established a firm beachhead in Manhattan, as "Architectural Drawings of the Russian Avant-Garde" opened at the Museum of Modern Art. The show brings together more than 150 drawings from the A.V. Shchusev State Research Museum of Architecture in Moscow, documenting an extraordinary moment in the history of architecture.

As the 1917 revolution sought to create a new society, the advent of Modernism promised a truly new architecture. And because very few projects were ever built during this time, architects were unchained from practical constraints. This is doubtless a paper architecture. One telling example: Ivan Leonidov's "Commisariat of Heavy Industry," which is presented in both drawing and model form, seems markedly more convincing in pen-and-ink.

"Architectural Drawings of the Russian Avant-Garde" will be exhibited at MoMA through September 4, at which point the drawings will return to an ever-rebuilding Soviet Union. —STEVE BODOW

Steve Bodow is an architectural historian working in New York City.



Perspective of "Lenin Mausoleum," Moscow, 1929-30 (above) by Alexei Shchusev from the MoMA exhibit.

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Deck manufacturing locations. Developer: Duke Associates; Architect: CSO Architects, Inc.; Design Architect: 3DI International; Construction Manager: Duke Construction Management, Inc.; Structural Engineer: Walter P. Moore & Associates; Steel Fabricator: Ferguson Steel Company.

Vietnam Memorial Winners in Two States

AS THE NATIONAL VIETNAM VETERANS Memorial in Washington, D.C. unblocked our nation's collective memory, individual states are bringing the memories home. Two states, Mississippi and Minnesota, recently held design competitions for Vietnam Veterans memorials, each conceived to commemorate the fallen and missing veterans to the place that sustained them.

In Mississippi, a memorial committee headed by lawyer Henry J. Cook, spearheaded an effort to raise funds for a \$1.5-

million memorial to be located at Point Cadet, a reach of land in Biloxi Bay on Mississippi's Gulf Coast. The competition required the inclusion of a photograph of each Mississippi casualty—637 dead and 18 missing in action. The Mississippi chapters of the AIA and ASLA and the Mississippi Vietnam Veterans Memorial Committee sponsored the design competition.

An enormous granite cenotaph angled to touch the sea marks Mississippi's evocative winner, designed by the architectural team

of Mark Vaughn and Bud Hollomon of Jackson, Mississippi. The project has two fronts: a rough side, softened by earth berms, open to green space; and an approachable smooth side that holds glass shelves to display personal remembrances beneath each soldier's photograph, etched by laser into the stone block. To broaden the memorial's impact beyond names and faces, the entire block is draped, Christo-fashion, with a billowing white shroud on special occasions.

Minnesota's memorial, like Mississippi's, should be completed by the fall of 1991. Called "Lakefront D.M.Z." by its team of designers, the Minnesota memorial will consist of a granite-faced, Minnesota-shaped plaza bounded by trees, water, and native stone. Sharing the \$10,000 first prize will be Nina Ackerberg, an art graduate of Macalester College in St. Paul; Jake Castillo, a St. Paul artist; Rich Laffin, a Minneapolis architect; and Stanton Sears, a Macalester College art professor.

The \$1.2-million memorial will lie at the end of a walkway, past a stone representation of Vietnam, in an open-air, Minnesota-shaped room on the grounds of its capitol in St. Paul. The 1,030 Minnesotans killed and 42 missing will be listed on a nine-foot, gray-green granite wall; at the wall's base, 1,072 markers on the Minnesota map will pinpoint the home towns of all the dead and missing. Nearby will be pools of water representing Minnesota's rivers and lakes.

—ROBERT A. IVY

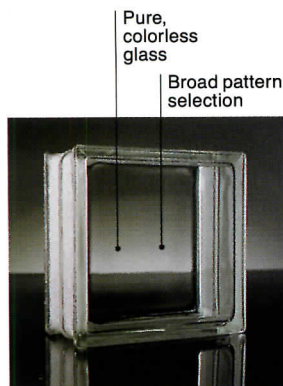
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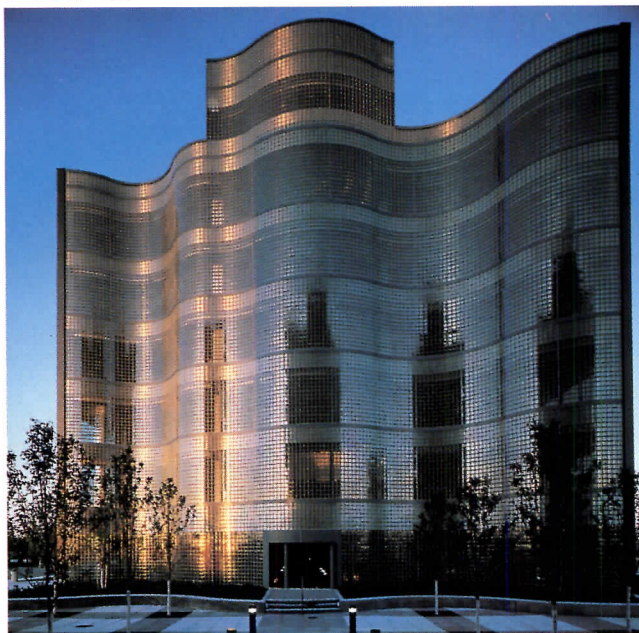
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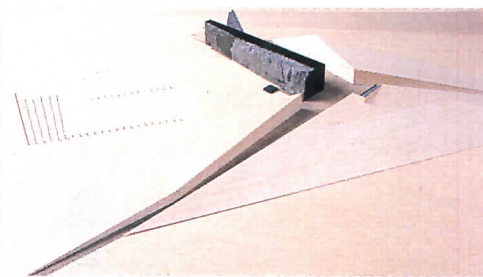
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*Independent study results available upon request.
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Mark Vaughn and Bud Hollomon's winning design for the Mississippi memorial (above) features a vault with individual containers (right) that allow family and friends to store photographs and other memorabilia.





Architects: Richard Jessup & Associates

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Aspen Design Conference: Child's Play

THE 40TH ANNUAL INTERNATIONAL DESIGN Conference in Aspen, held in June, was noisier than usual. Was it the addition of children to this year's five-day session, entitled "Growing By Design" and devoted to children's learning and environmental needs? Or was it that, in the children's presence, the adults were freer to leave their business personas behind, play with brightly colored three-foot balls scattered about the campus, and sidewalk hopscotch on their way to lectures?

It was a colorful conference as well, with brilliant banners, a pyramid of six-foot crayons, and a tent rimmed with tempera-paint drawings by students of the New York public school system. Sixteen of these "portraits" were distributed in welcome packets to the 1,500 participants, along with a sack of LEGO building bricks that were to be added to a random sculpture on the lawn. At one count, 14 adults vied with the two children in a LEGO imagination contest.

Perhaps it was not coincidental that for its 40th anniversary, the IDCA chose to look at children; most of us by the age of 40 begin to look more introspectively at our lives, what we have accomplished, created, and will pass on to the next generation. In this vein, there was much discussion about our society's progress in day care, health care, education, and the arts for children. Marian Wright Edelman, founder and president of the Children's Defense Fund, statistically illustrated the social ills our nation is enduring, and called for a "massive consciousness raising" about the plight of kids today. Philosopher Mortimer Adler, in examining the problems of our educational system, decried our society's shortfall of moral virtue, understanding, and wisdom. "Children are not idiots," said Mario Salvadori, professor

emeritus of architecture at Columbia University. "They see through the obvious contradictions in what is taught and how people really behave."

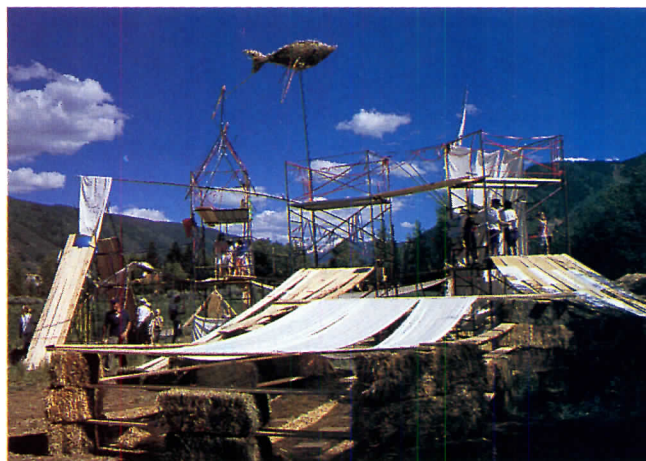
The conference included much-needed analyses of architecture and design requirements for children in such panel discussions as "Integrating Design," "School Design: Landscape for Learning," and "Design for Communities" by architect and urban planner Peter Calthorpe. "The Living World at the St. Louis Zoo" addressed children's museums in urban centers, and a panel on "Communities Where Children Matter" focused on the need for safe and unstructured places for children to create their own play.

At week's end, Aspen architect Harry Teague, who designed Aspen's innovative Community School largely with the input of children and their elders, echoed the general consensus of the attendees. "These discussions are the core of design. The substance of our efforts will create a better future, and kids are the future." —SHERRY GUEST

Sherry Guest is a freelance writer based in Aspen, Colorado.



MARTIE STERLING PHOTOS



A construction made entirely of LEGO blocks (above) appeared in the fields beside the IDCA's conference tent. Aspen architect Harry Teague orchestrated stacks of lumber and hay into a fantasy "Micropolis City" (left), a living and playing space designed by children for children, complete with a fish-shaped weather vane and architectural elements like flying buttresses and turrets.



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NEWS

Neocon 22: A Different Animal

NEOCON 22 ATTRACTED 40,000 ARCHITECTS, interior designers, facility managers, contract furnishing dealers, and other professionals during the second week of June at Chicago's Merchandise Mart, but attendance was down by 7 percent from last year. Despite this year's introduction of animal acts in certain showrooms (bulldog puppies plugged Knoll's new chair line of the same pugilist form and name, fish swam in the walls at Architectural



Michael Graves' Dorsey Collection for Dunbar.



Panels Inc., and a monkey entertained at American Leather), the carnival atmosphere gave a false impression of festivity in the industry.

Nearly all showroom representatives noted that visitors were more careful in their selections than in previous years. It was also a cautious year for manufacturers. Fewer product introductions gave credence to the theory that the furniture industry is down to 1 to 2 percent growth, "coattailing" the overall slowdown in building construction. The industry remains sluggish, although

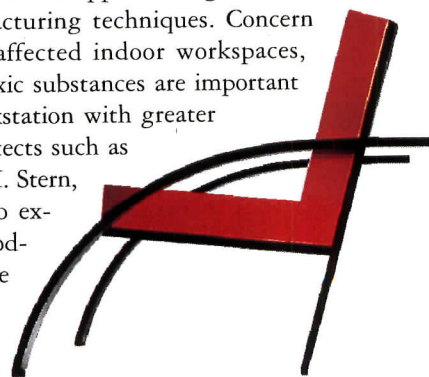


Knoll International's Bulldog.

stable, with total shipments of \$8.4 billion forecast for 1990, according to figures provided by the Business and Institutional Furniture Manufacturer's Association (BIFMA).

Surely the hottest topic for both manufacturers and attendees was an increased awareness of environmental issues. Toward this end, many furniture companies are now offering alternatives to wood from exotic trees that are

listed as endangered species, and several companies employ finishes closely resembling exotics that are applied using "environmentally sensitive" manufacturing techniques. Concern for the environment also affected indoor workspaces, where clean air and non-toxic substances are important topics, as is creating a workstation with greater comfort for the user. Architects such as Michael Graves, Robert A.M. Stern, and Aldo Rossi continue to expand into furniture and product designs, which range from traditional to futuristic, and include whimsical throwbacks to the 1930s. —A.G.L.



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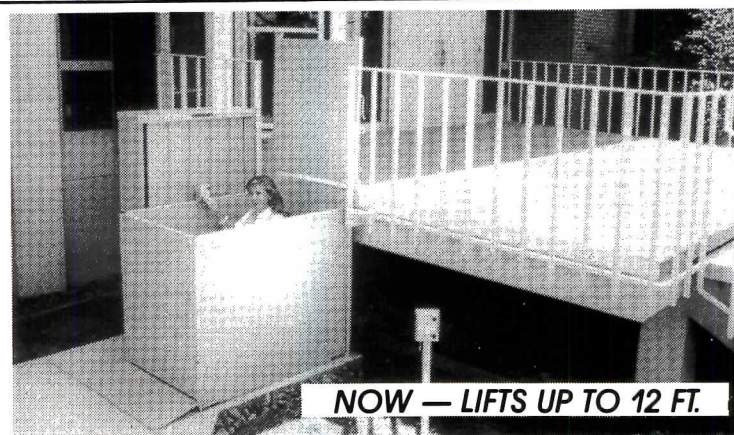
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A/E/C Systems: CADD Integration

BREAKING DOWN THE BARRIERS THAT DIVIDE THE BUILDING industry was the focus of the Integrated Construction Association (ICA) conference at the A/E/C Systems show in June. ICA was formed in 1988 to combine modern management practices with advances in computer technology.

The keynote speaker was Paul M. Teicholz, director of the Center for Integrated Facility Engineering, a broad-based research and teaching program at Stanford University. Teicholz began his presentation with an object-oriented 3D computer model, created by an architect or engineer. Instead of adopting a linear concept, he proposed that a project should evolve as if in concentric circles from a core to encourage participation by architects, builders, and clients. Although 85 percent of the profession uses computer-aided design simply to create renderings, he argued that the future lies in the creation of a pool of data—created by many, useful to many, used by many. Applying this concept will require more integration within both CADD and construction.

John D. Macomber, a Boston contractor, attacked what he called "islands of automation," contending that "a lot of people get paid just for counting. They're not adding value, just passing information." He urged ICA members to use their computers to build relationships, to focus on services that add real value, and to integrate their efforts. Dianne B. Davis, president of ForeSite Design in Baltimore described a need to define standardization, noting that no in-

dustry-wide level of communication exists. Small firms entering into database technology shouldn't have to reinvent the wheel.

Systems integration was also a hot topic. New products that implement this trend were much in evidence. Isicad, for example, introduced a new version of Cadvance that provides the benefits of work-group computing on the Novell network. Autodesk also announced that its next version, Release 11, would contain features intended for networks. A new program from Japan, Super CAD, premiered at the show—an OS/2 version suitable for networking is scheduled for release next year for about \$25,000. Virtus showed a new program, not yet ready for sale, that enables a designer to create a 3D model of a space and move through it in real time. The program runs on a Macintosh and is expected to cost less than \$1,000. Sigma Design showed its CADD program, Arris, running on Macintosh, DEC, DOS-based, and Iris computers under the X-Window system, a standard graphic interface that supports diverse environments. Eclat demonstrated its new Product Researcher software, an electronic retrieval system that makes it easier to combine product literature, specifications, and CADD. The program will be introduced early next year.

Management of existing drawings is increasingly receiving attention by vendors such as Intergraph and Houston Instrument, companies whose scanning technology brings existing paper drawings into the electronic environment.

—OLIVER R. WITTE

Facilities Architect

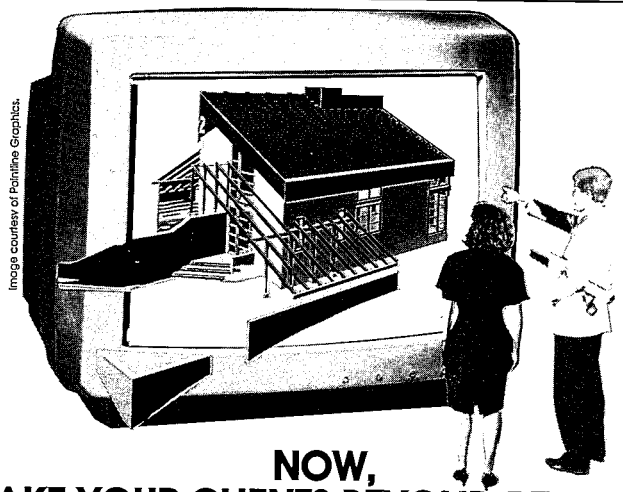
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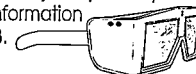
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NEWS

San Francisco Visions

"VISIONARY SAN FRANCISCO" IS THE inaugural exhibition of the recently formed Department of Architecture at the San Francisco Museum of Modern Art. Under the curatorial direction of Paolo Polledri, the exhibition consists of "Past Visions," with drawings and models of San Francisco from the 19th century up to the present, and "Future Visions," work by four writers and four architects that examines the changing city.

"Past Visions" includes spectacular drawings by Daniel Burnham for a remaking of the city just prior to the 1906 earthquake, as well as plans for the 1939 Golden Gate Exposition and designs for both the Bay and Golden Gate Bridges. As evidenced by the exhibition, San Francisco's post-World War II ideas have for the most part been failures, although the city has been saved from some fiascos, such as the Panhandle Freeway that would have blasted its way through

Golden Gate Park. "Future Visions" includes Barbara Stauffacher Solomon's exquisite green rectangles and grids on the Port of St. Francis, and Lars Lerup's design for an earthquake-resistant rowhouse. Diana Agrest and Mario Gandelsonas reveal an interpretation of San Francisco's rich grid system, and Craig Hodgetts interprets a future shock vision of Golden Gate Park after the city has sold itself to Japanese development interests.

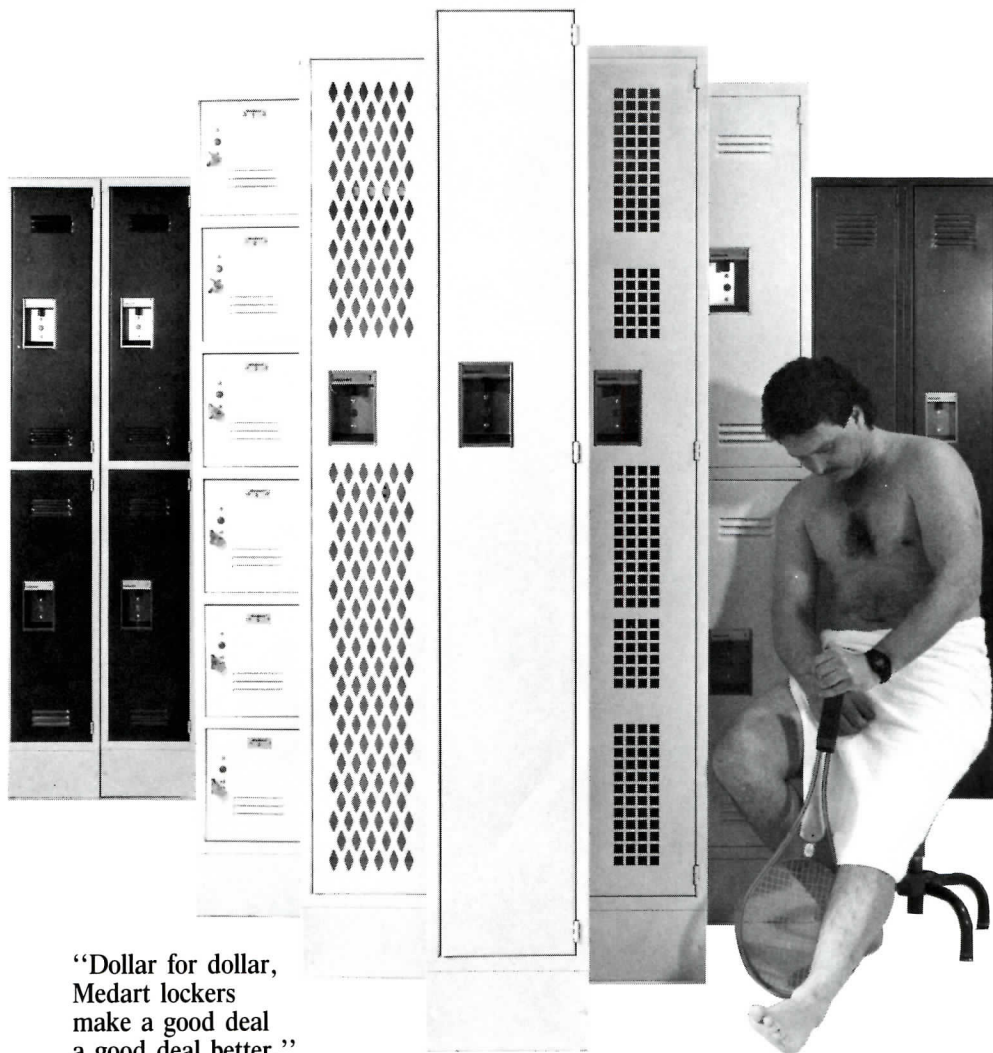


Chesley Bonestell's "Tower of the Sun" for the 1939 Golden Gate Exposition.

Compared to Leon Krier's thought-provoking 1987 proposal for Washington D.C., or the 1979 "Roma Interrotta" reinterpretation of Nolli's map of Rome by James Stirling, Colin Rowe, and others, the San Francisco schemes on display seem tame and like private dreams. They are especially disappointing when contrasted with the Beaux-Arts-era plans for San Francisco, which so thoroughly addressed every aspect of urban design. —JOHN ELLIS

John Ellis is a senior associate of the San Francisco firm of Kaplan/McLaughlin/Diaz.

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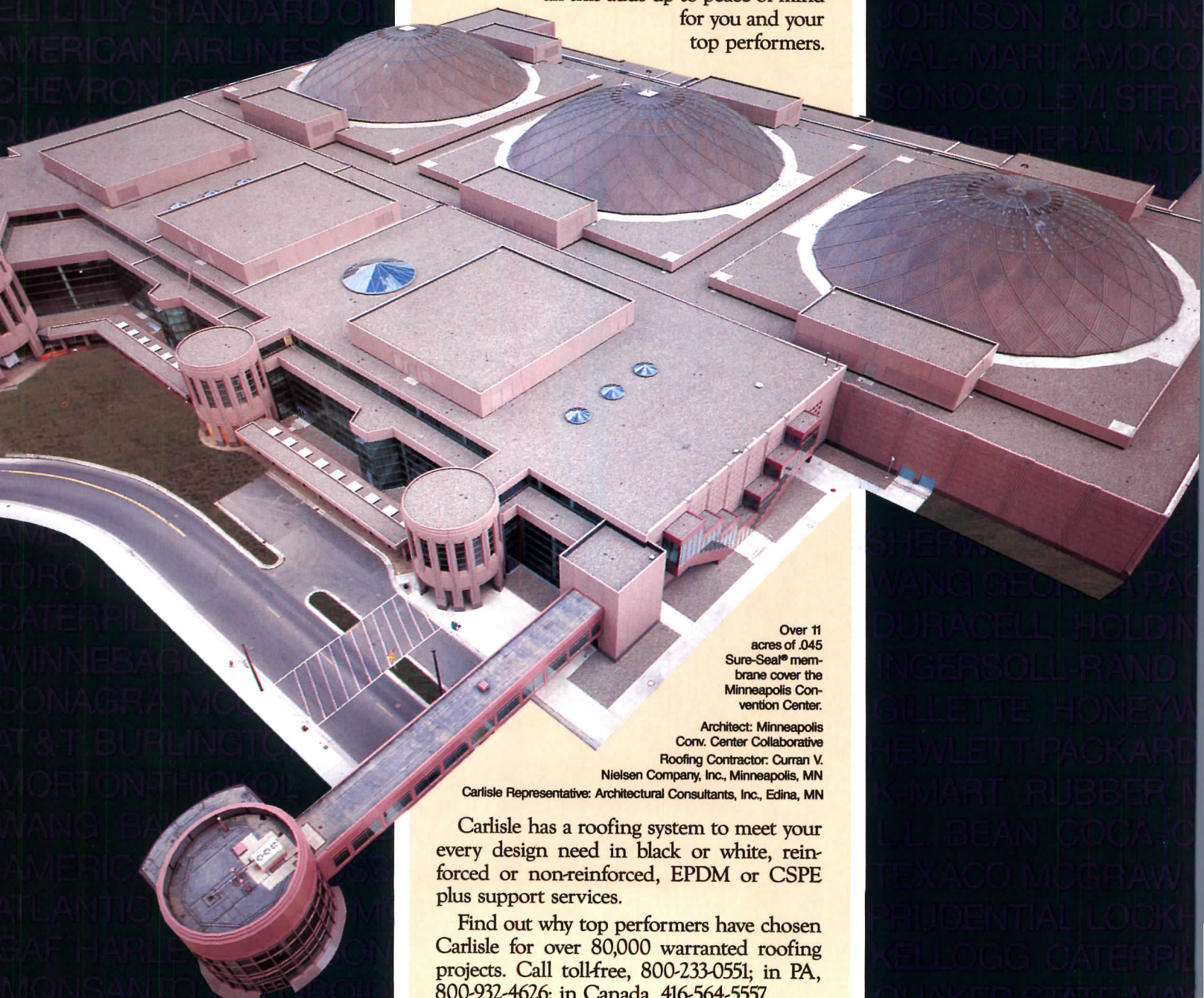
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NEWS

Housing Bill Approved

IN LATE JUNE, THE UNITED STATES Senate approved a major overhaul of federal housing policy, marking the end of a decade in which government sponsorship of subsidized housing languished. During the Reagan administration, federal support of housing assistance was cut by more than 80 percent, and the supply of low-income rental units dropped drastically. The \$17.8-billion Senate bill was approved 96 to 1 after a compromise was reached between Bush officials and key senators of both parties.

The House of Representatives is still waiting to decide on a significantly different bill that would provide \$28 billion for housing. While the Senate version seeks to rehabilitate affordable housing stock, the House measure provides funds for construction of new rental housing. However, both bills at-



WASHINGTON WATCH

tempt to expand the country's supply of low-income and affordable housing, and both incorporate parts of President Bush's initiative aimed at encouraging home ownership. Although the House version provides more generous programs, many housing advocacy groups support the Senate compromise because of its more realistic chance of winning approval.

A major Democratic component of the Senate bill is a program that consolidates several small existing programs under a \$2-billion block grant system and encourages state, local, and private investment in rehabilitation of substandard housing. Municipalities and states would have to establish a five-year plan for expansion of affordable housing stock in their regions to be eligible for the federal monies.

In one concession to the Bush administration, the Senate approved increased funding for the HUD program Home Ownership for People Everywhere (HOPE), providing nearly \$2 billion over the next three years to help residents in federal housing programs buy units they now rent.

After passage in the Senate, HUD Secretary Jack Kemp called the housing legislation "the most significant step...to combat conditions of homelessness, hopelessness, poverty, and despair" since the War on Poverty 25 years ago.


—LYNN NESMITH

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AIA Urban Design Charettes in Baltimore

IN CONJUNCTION WITH BALTIMORE'S PLANNING EFFORT launched by Mayor Kurt L. Schmoke, the AIA Baltimore chapter recently organized two urban design charettes that turned up a wealth of ideas for further development of the city's downtown. The city's plan is meant to build on the success of two previous large-scale renewal projects: Charles Center, a 33-acre redevelopment in the heart of downtown, and the Inner Harbor, which transformed 250 acres around Baltimore's waterfront. New projects include a 27-mile light rail system that will traverse the city, and, for the Baltimore Orioles, a deliberately old-fashioned ballpark designed by Hellmuth Obata Kassarbaum and others, due to open in 1992.

From the first charette, held this past spring, came the suggestion to replace a mile-long stretch of raised expressway on the east side of downtown with an at-grade boulevard, converting the land on either side into the city's next major revitalization area. Architects also suggested sites for new streets, monuments, and public buildings such as a 3,000-seat performing arts center. They called for reforestation of the city and reintroduction of two-way traffic on Charles Street, the main north-south thor-

oughfare. The second charette was held in June to coincide with an international conference on "The Future of the Industrial City," sponsored by Johns Hopkins University's Institute for Policy Studies, and local AIA members joined European team leaders. The site was the Central Avenue corridor, a largely undeveloped but strategically-located tract east of downtown. Several teams recommended that a creek that had been filled in the 1940s be reopened and redeveloped as a canal. Designers also recommended that nearby high-rise public housing be demolished or converted to housing for the elderly, and that new residences be interspersed with light industrial uses—a mix the city's current zoning doesn't allow.

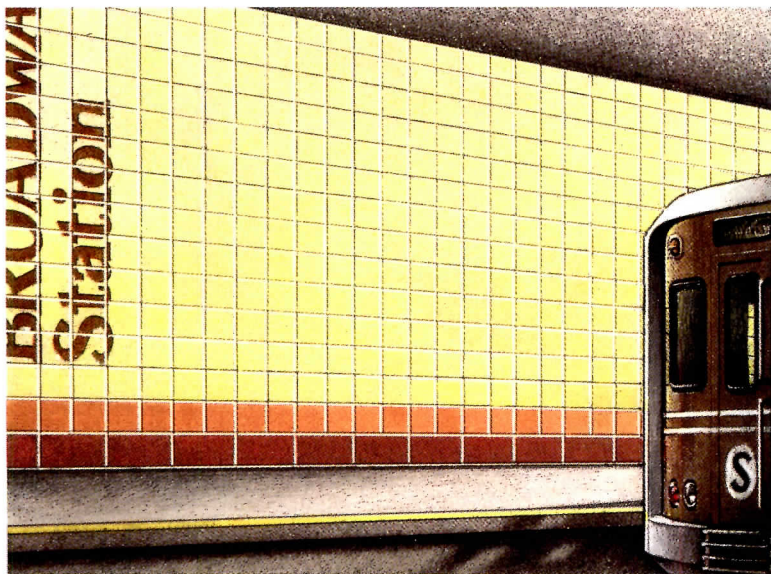
Reports on the AIA charettes have been forwarded for further study to the city's management team, a combination of public officials, and members of the non-profit Greater Baltimore Committee. Final recommendations will be presented to Baltimore's mayor by next spring. ■

—EDWARD GUNTS

Edward Gunts is the architecture critic for The Baltimore Sun.



HOK's proposed Camden Yards Stadium (above) was addressed by the AIA Baltimore chapter charettes.



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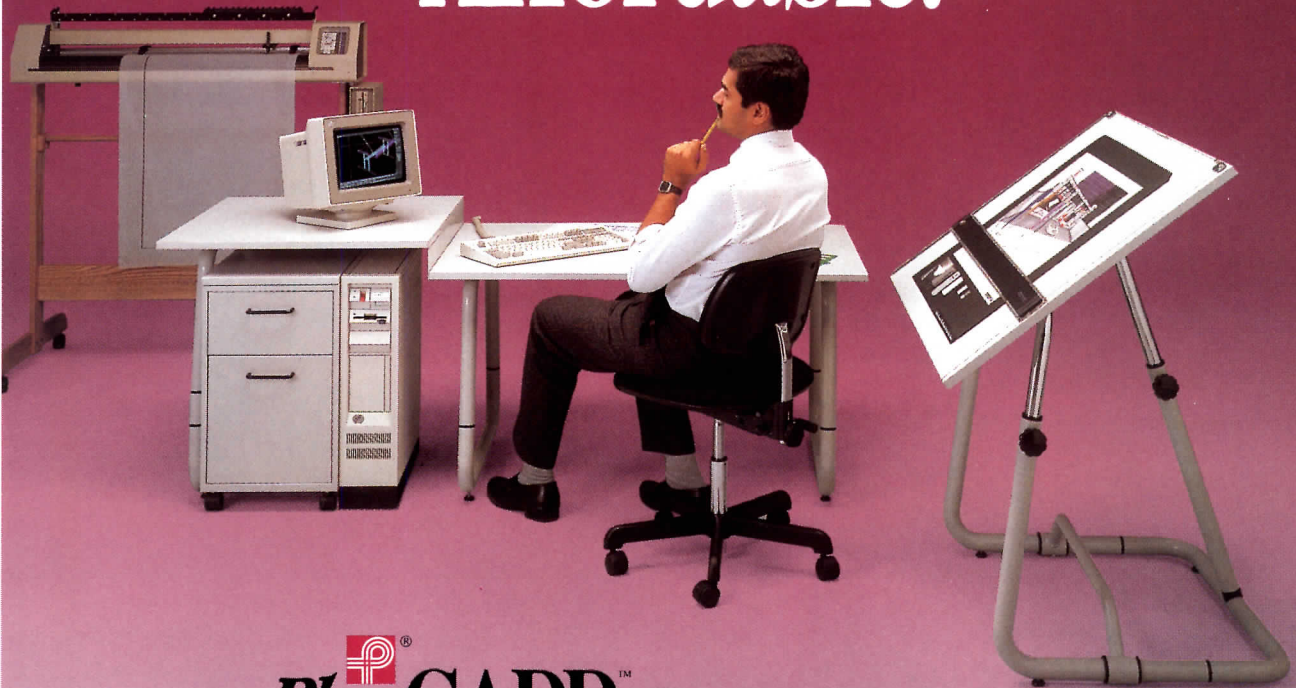
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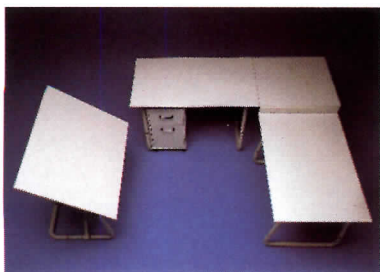
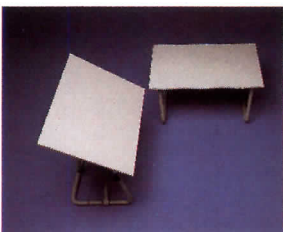
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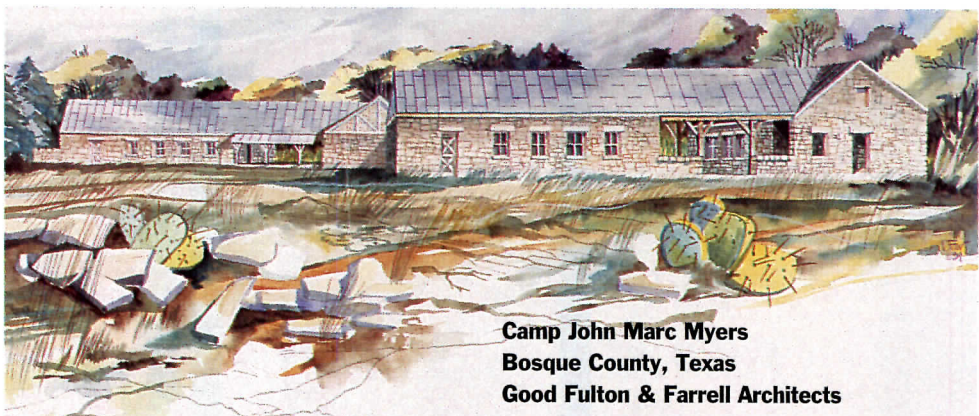
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Red Lands Council Girl Scouts Building
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RAND ELLIOTT, AIA, AND CO-DESIGNER David Foltz, AIA, recognized the importance of talking to the client of this project, so programming sessions were held with three troops of Girl Scouts, their leaders, and staff members. The result is a building that expresses the vitality, spirit, and personality of the Scouts' organization. Rather than concentrating the construction budget on renovation, the architects housed garages and storage space in an existing 3,740-square-foot structure, and turned their attention to designing an 8,454-square-foot addition containing administrative offices, training areas, various workrooms, nursery, and support facilities. The heart of the building is an 800-square-foot outdoor courtyard intended to be used for the scouts' "friendship circle," an open-air garden with a small pool and bridge where "flying-up" ceremonies will be held. Although sited in an industrial and transitional area, the building reflects the idea of an encampment through interior paths of flagstone leading to training room "outbuildings." Regional references to Oklahoma will be represented through patinated copper roofs, deep overhangs, and red stone walls (above). The estimated cost of the building has risen from \$500,000 to \$1.5 million, as plans for the building grew due to increased scout memberships and personal involvement from interested participants. Construction is scheduled to begin in the spring of 1991.



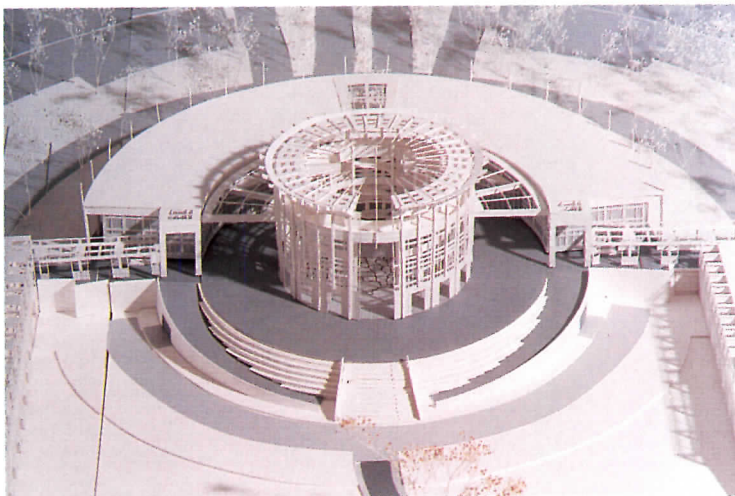
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Bosque County, Texas
Good Fulton & Farrell Architects



A THERAPEUTIC CAMP FOR CHRONICALLY ill children is under construction and expected to be completed next summer. Camp John Marc Myers is set on 137 acres of rural land donated by a Dallas couple as a memorial to their son. The Texas non-profit organization Special Camps for Special Kids has raised more than \$3.6 million for the project so far. Good Fulton & Farrell Architects involved the health groups interested in the camp in extensive programming, resulting in a complex of five buildings connected by a verandah. The site, between a wooded plateau and a grassy meadow, slopes down to a lake. The camp will house administration offices, a dining room, a medical facility, arts and crafts areas, and a basketball pavilion. Clusters of thirteen cabins are located nearby (left). Designed in the vernacular of the region, walls and foundations will be constructed of limestone and cedar posts, with galvanized metal roofs (above). The 77,400-square-foot facility will accommodate 250 children and staff members.

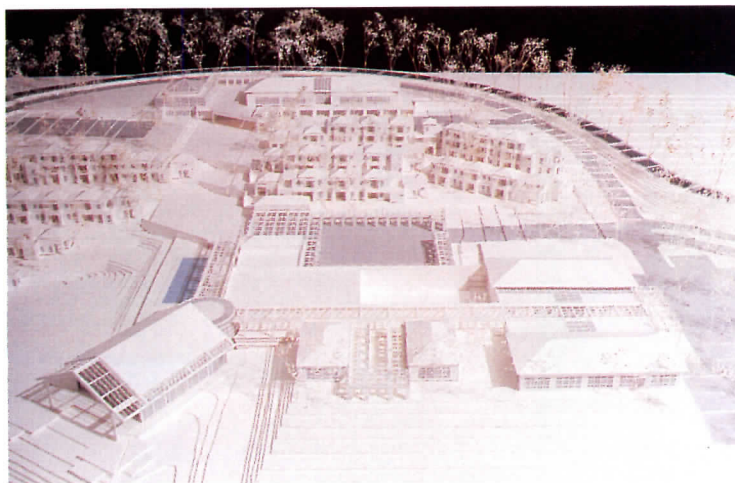
Leu Gardens Botanical Center
Orlando, Florida
Morris Architects

SITED ON A FORMER ORANGE GROVE, this 25,000-square-foot, two-story, multi-purpose building (right) is designed by Morris Architects to be sympathetic to the vernacular styles of South Florida. Administrative offices, support areas, and an herbarium will be housed in the north wing; a banquet hall in the south wing. A south-facing tower over the reception area serves as a point of reference for outdoor tours, and rises above dormered roofs of the main building to culminate in a columned "temple" of glass. Full-height windows and a second-story balcony distinguish the east elevation. The center's west side comprises a long, glazed wall reminiscent of 19th-century European conservatories. The building exterior will be sheathed in wood siding, glass, and brick. Construction is scheduled to begin in the fall of 1991.



Warm Weather Training Facility
United States Olympic Committee
San Diego, California
Skidmore, Owings & Merrill

A 150-ACRE TRAINING FACILITY FOR United States athletes and the largest center in the world for warm-weather Olympic sports just broke ground in June. The project will accommodate housing for 300 athletes and indoor and outdoor facilities for 27 Olympic sports. SOM's Washington, D.C., office designed the complex with assistance by the owner, the San Diego National Sports Training Foundation. The entire facility will cost \$4.5 million and comprise 315,396 square feet. The design evolved from the site on the western edge of Otay Reservoir with views to mountains in the east. A visitor center to the north (top left) will mark the main entrance and command views of the entire complex. Here, an observation tower and ceremonial area is planned. Support facilities will be located in the middle of the site (bottom left), with support complexes and sports medicine and science facilities nearby. Linking all the training venues, visitors center, and support buildings is the Olympic Path, a 1.5 mile, tree-lined walkway forming the central spine of the complex. The path follows the natural north-south ridge that bisects the site. ■





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AWARDS

1990 New York Chapter AIA Distinguished Architecture and Project Awards

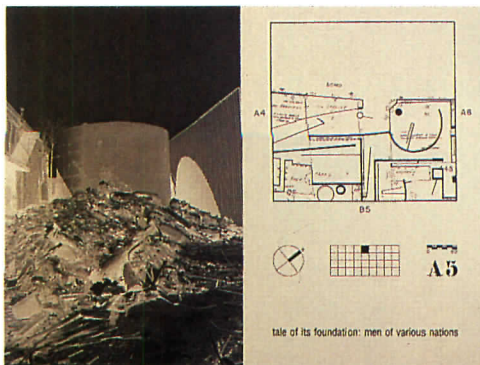
THE DESIGN AWARDS FROM the largest AIA chapter in the country are currently the subject of an exhibition at the National Academy of Design in New York City. Drawings and models for "New York Architecture: 1990 NYC/AIA Design Awards" are on view until September 2. The NYC/AIA Design Awards Committee received more than 90 projects from all over the world by practicing, registered New York architects. Honors were awarded in three categories: Distinguished Architecture, Architecture Projects, and Interior Awards. The Distinguished Architecture Awards are the highest professional recognition by NYC/AIA, and the Project Awards acknowledge the creative aspects of unbuilt architecture. Jurors for the Distinguished Architecture Awards were Hugh Newell Jacobsen, FAIA, Jean Nouvel, and Peter Prangnell. The Architecture Project Awards were juried by Julie Eizenberg, Stanley Saitowitz, and Peter Wilson. Simplicity, elegance, and intelligent use of real materials were cited by the six jurors, who expressed a distaste for "Post-modern sickness," as well as a concern for the "surprising lack of technological innovation among American architects."



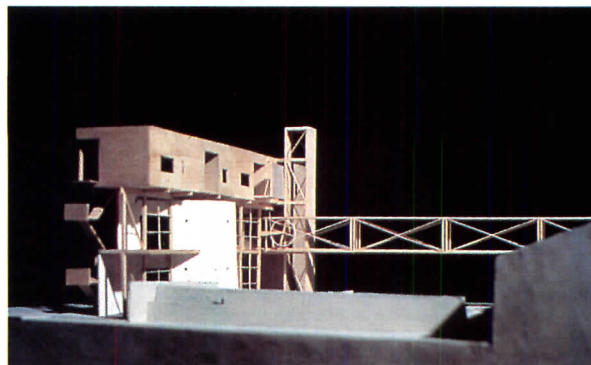
Grotta Residence
Richard Meier & Partners



North Carolina National Bank
Harry Wolf, FAIA



Angst: Cartography
Baratloo-Balch Architects



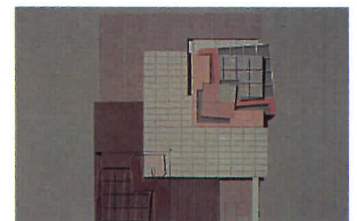
Crafts Exhibition and Production Center
Thomas Hanrahan with Victoria Meyers



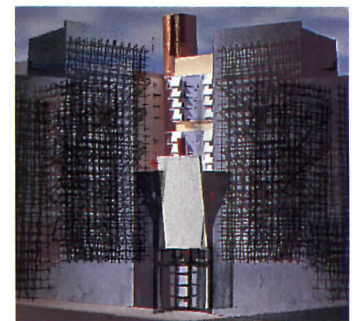
CN/Royal Trust Development
Ellerbe Becket



Melnick Residence
Voorsanger & Mills Associates



Kolzumi Sangyo Building
Eisenman Architects



Soho Townhouse
Frank Lupo/Daniel Rowen



Museum of Ethnology
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AWARDS

1990 New York Chapter AIA Interior Awards

JURORS KATHERINE MCCOY, CO-CHAIRMAN OF THE CRANBROOK Academy of Art and partner of McCoy & McCoy Associates, and Boston architect Warren Schwartz were especially pleased by the entrants' unconventional use of materials, such as mesh-clad walls. McCoy said she was also surprised by the use of shadow as a tangible and inexpensive design material. "A lot of successful interiors use light dramatically, but very few use shadows," she commented. The jurors were intrigued by what they considered the projects' "incredibly sensual, psychologically induced spaces, forms, details, and materials." ■

—A.G.L.



Royalton Hotel
Gruzen Sampton Steinglass with Philippe Starck



Kenneth Cole New York
Voorsanger & Mills Associates

PETER AARON / ESTO



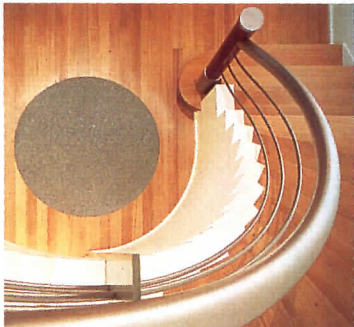
Shamana
Baratloo-Balch Architects

PAUL WARCHOL



JON JENSEN

Berini Residence
Michael McDonough



PAUL WARCHOL

Duplex Apartment
Agrest & Gandelonas



MICHAEL MORAN

Lipschutz/Jones Apartment
Frank Lupo/Daniel Rowen



Executive Floor, Deloitte & Touche
Ellerbe Becket

BOOKS

GARDENS OF LEISURE

The Art and Architecture of English Gardens

Jane Brown (Rizzoli, \$85.)

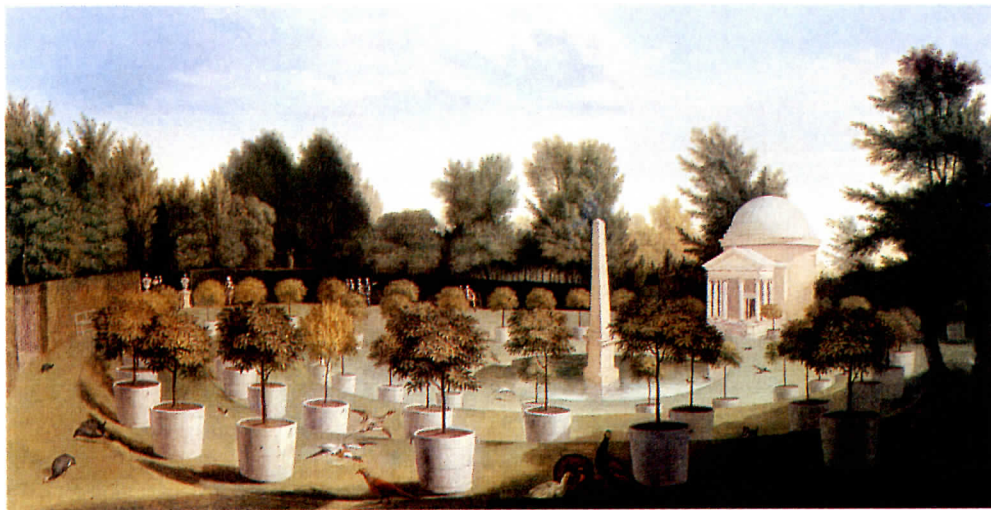
JANE BROWN IS A BRITISH WRITER WHO has produced several distinguished garden books; her present volume is one of the most scholarly and readable garden books to come out of England. Brown is equipped with the skill and understanding to tell us about English garden history, and she has the talent to tell it memorably and well.

Most of us do not have the time or the inclination to study the drawings collection of the Royal Institute of British Architects, where the material for this volume is preserved. The collection began in 1834, drawings first coming from architects and antiquarians. These drawings provided a basis for architectural history, and as the collection became world famous it grew; it now comprises some 350,000 drawings ranging from the Renaissance to the present. Most of the drawings are architectural in nature, but many portray the architect as garden designer. Brown explores the architect's contribution to garden design, stressing the relationships between house and garden. She begins with the London garden in the reign of King James I and concludes with the current work of architect and landscape designer Sir Geoffrey Jellicoe.

The book, with more than 300 watercolors, drawings, working sections, and elevations, is beautifully produced, printed, and bound in Italy. The wealth of illustrations makes this volume a wonderful design source for architects, landscape architects, and garden makers, and a delight for those who simply enjoy gardens.

Some of the drawings are fragile and travel-stained, yet exquisite. Brown has carefully examined them with a magnifying glass to transpose difficult handwritten notations into print. In many cases, the garden drawings are more wonderful than the gardens could possibly have been.

Among the earliest plans discussed in this volume are those of Robert Smythson. His survey of Wimbledon and other London gardens dates from 1609, thus illustrating gar-



"The Orange Tree Garden, Chiswick House, Middlesex," painted by Pieter Andreas Rysbrack (above). Lord Burlington's garden inspired the English love of potted orange trees, which were placed in the yard during the summer and stored in the orangery in the winter.

dens from the time of Queen Elizabeth I. The design theme of these gardens is the circle within a square, a solution that flourished in England for 300 years until the rose garden at Folly Farm by Sir Edwin Lutyens.

With the revolution of 1688, the Dutch king William III came to England with a passion for his army and his gardens. His English queen, Mary, was a botanist and together they were responsible in large part for the Dutch garden influence in England.

As the 18th century began, Brown reminds us, nature was to be feared and conquered, not to be admired and courted—the word "landscape" was not yet in use. For the powerful lords who owned most of the land, rural England was a hunting preserve. The owners travelled from Whitehall to their country places with the carriage blinds drawn. In the *Spectator* of June 25, 1712, Joseph Addison wrote: "Our English gardens are not so entertaining to the Fancy as those in France and Italy, where we see a large extent of Ground covered over with an agreeable mixture of Garden and Forest... why may not a whole Estate be thrown into a kind of Garden.... A man might make a pretty Landskip of his own Possessions." A change in attitude was in the wind—the English landscape movement was beginning.

The collection contains the drawings made by men such as Lancelot "Capability" Brown and Humphry Repton, who were to change the landscape of England. Brown began as a gardener in his native Northumberland. With more than 200 commissions completed before he died in 1783, he covered thousands of acres in England and Wales with gentle mounds, clumps of trees, and wandering lakes.

Repton's great gift to the English garden making was his understanding of the larger landscape. His clever artistry in painting for his clients before-and-after scenes, showing his proposed improvements, and his *Observations on the Theory and Practice of Landscape Gardening* made him the first professional landscape architect.

After Repton's death in 1818 there was a revolt against the 18th-century landscape park. The Victorian garden reigned supreme as a work of art. Distant landscape was underplayed. Direct symmetry, stately stairs, balustrades topped with urns, flowers in parterres, colored gravels, and fountains rising from architectural basins were the formula. This extravaganza was questionable design, but it delighted the Victorians.

This climate was just right for the Arts

Continued on page 126

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UNTIL NOW, DOORS WERE ATTRACTIVE O

ABOUT THIS ISSUE

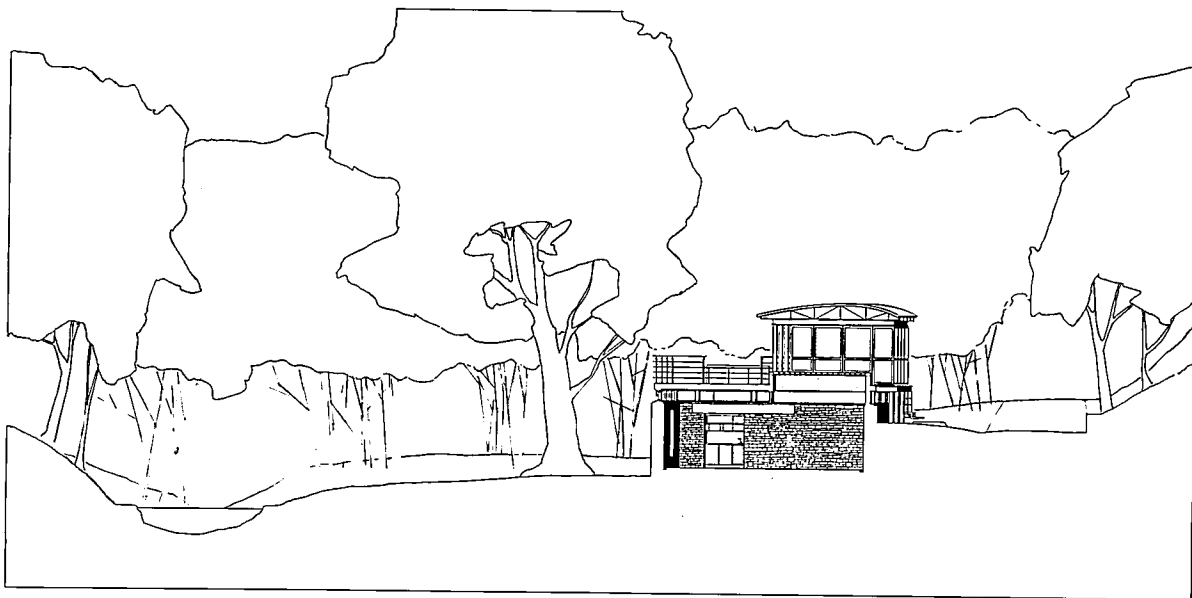
Places of Leisure and Pleasure

JOHN RUSKIN LONG AGO PROCLAIMED nature the source of architectural beauty, but modern society has created an environment where nature is often superseded by history, local custom, and vernacular artifacts. Together, these elements create a cultural context for a building that is equally as important as its natural surroundings. Integrating architecture into the contemporary American landscape therefore requires more than a simple understanding of a site's morphology. Architects must create buildings that draw upon our culture at the same time that they augment it. The task is not merely to integrate, but to enliven ordinary environments.

This month's issue deals with places of leisure, pleasure, and celebration. In featuring a diversity of building types, we've chosen architects who have handled the complicated matter of context with particular imagination. Keenen/Riley's casino in New Jersey (below) reflects its history without imitating the past by retaining the original foundation of a mill house as an element of the firm's abstract composition. Northeastern University's new boat-house in Boston, designed by Graham Gund,

pays more direct homage to its late-19th-century predecessors through a Shingle Style-inspired vocabulary. Nature takes precedence in southeastern Utah, where FFKR Architects designed a theater clad in brick that reflects the region's rugged stone terrain in materials and profile; inside, wooden railings are reminiscent of local rustic lodges. A lobby wall in a Seattle convention center recalls the basalt cliffs of northern Washington, and in downtown Nashville, a sports complex uses color and form to reduce its apparent mass in a tight location. Even the Aventine, Michael Graves's new destination resort at the edge of a San Diego freeway, takes its context into account, if only by inspiring an otherwise bland Southern California suburb.

A portfolio of projects dealing with glass—its use in a new cladding system, its detailing, and the energy efficiency of new glazing systems—forms the basis of our Technology & Practice section this month. We also address two practical matters that most architects loathe but must inevitably confront—computerized financial management and professional liability insurance. ■



Mill House Casino, Keenen/Riley, Lambertville, New Jersey.

Amicable Separation

Two young architects elegantly distinguish old from new in a weekend retreat.

LIKE MANY YOUNG NEW YORK ARCHITECTS, JOHN KEENEN and Terence Riley have built their six-year-old practice on residential interiors and additions. In late 1988, however, the partners were commissioned by a New Jersey businessman to design a freestanding casino for playing pool. Although the project turned out to comprise only 600 square feet, Keenen/Riley's small pavilion reveals the architects' accomplished skill in material detailing and formal composition.

In choosing a site for the casino, the architects convinced the client to transform a ruinous, late-18th-century mill house on his weekend property, adjacent to a swimming pool and creek. But instead of glorifying the historic artifact, Keenen/Riley treated the old building's fieldstone walls as an integral part of a thoroughly contemporary assemblage. "We had no nostalgia toward the original building," says Riley. "It was treated as part of our larger design."

In describing their collage of old and new, the architects cite the work of Carlo Scarpa as a source of inspiration. Scarpa's influence on their work, Keenen explains, stems from a trip the pair took to Italy two years ago to accept the Andrea Palladio prize for a proposed boathouse, which was never built. Impressed by Scarpa's unsentimentality toward antiquity, the architects decided to adopt the same sensibility and use the existing mill house as a one-room base from which to extend a roof deck, screened pavilion, kitchen, and bathroom.

To introduce more daylight into the one-room interior without further puncturing its fragile masonry walls, the architects capped the enclosure with a concrete deck over a steel frame, into which they inserted an 18-inch-high clerestory. In visually separating the stone walls from the roof terrace, this slot of glass clearly distinguishes the new structure from its 18th-century container. Similarly, cast concrete

pavers inside the building are pulled away from the perimeter, forming a gutter that separates new flooring from old walls.

On the western side of the building, Keenen/Riley extended a stucco-covered volume containing a tiny kitchen, bathroom, and secondary entrance, and erected a mahogany-framed, screened room on top of the roof terrace. Both additions are capped with curved forms—a lead-coated copper wall enclosing the kitchen and a vaulted roof over the screened pavilion—that project into the landscape and enliven the building's spare outlines. Sectional variation is also achieved through the introduction of a skylight over the east entrance, which breaks the planar uniformity of the clerestory and roof terrace. The asymmetrical placement of these additive elements and kinetically charged forms further activates the building profile, subordinating the mill house to the abstraction of the contemporary design.

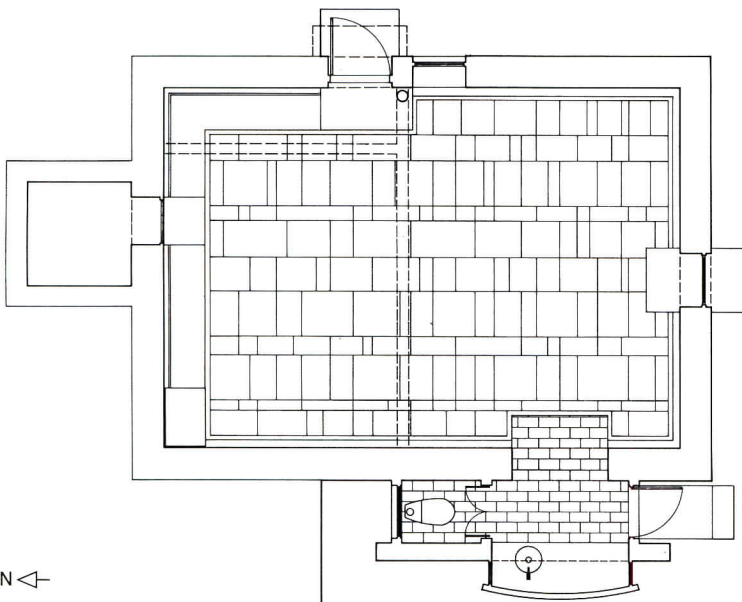
Keenen/Riley's experience in designing cabinetry and finishes has obviously paid off in the casino's precise detailing, including a concrete scupper that the duo cast themselves. In juxtaposing crisply outlined steel, wood, and glass components against roughly textured stone walls, the architects manage to forge these disparate elements into a strong unity. "Some visitors think that we actually designed the stone wall," notes Riley. "We take that as a compliment." ■

—DEBORAH K. DIETSCH

Set into a hillside, the casino includes a screened enclosure on the roof deck (top and bottom right) and a kitchen/bathroom addition with a curved, lead-coated copper wall (facing page).

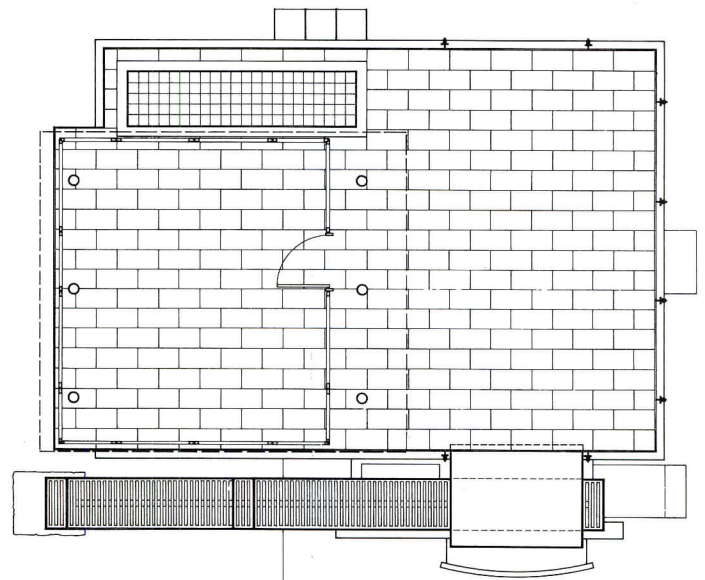






N ←

FIRST FLOOR



TERRACE

Inside the mill house, the architects exposed the stone walls (above), built in ash cabinetry, and extended a kitchen (facing page, bottom right) and bathroom (bottom of plan above) to the west. Concrete pavers (above) are separated from the perimeter by a 3-inch gutter. Daylight is admitted through clerestory windows

inserted between steel stanchions (facing page, top right) and a glass block skylight (facing page, bottom left) over the entrance at the east elevation. An existing cellar (left in plan) houses mechanical equipment. Handrails, window frames, and stair treads are detailed in mahogany (facing page, top left).

MILL HOUSE CASINO
LAMBERTVILLE, NEW JERSEY

ARCHITECT: Keenen/Riley, New York, New York—John Keenen, Terence Riley (principals-in-charge); Jim Yohe, Seung Jae Lee, Patrick Walker (project team)
STRUCTURAL ENGINEER: Peter J. Galdi Structural Engineer—Dennis Letson (project engineer)
GENERAL CONTRACTOR: T&L General Contracting, Inc.
METAL FABRICATION: Aileron Design, Inc.
PHOTOGRAPHER: Eduard Hueber



Urban Camouflage

Angela Danadjieva and Thomas Koenig create landscapes and buildings that hide a city's flaws.

IN THE 1960S AND '70S, LANDSCAPE ARCHITECT LAWRENCE Halprin built projects that combined environmentalism, urbanism, and theater. Among Halprin's most talented and determined disciples was architect Angela Danadjieva, who, after working in San Francisco for Lawrence Halprin & Associates for nine years, founded her own firm on July 4, 1976, with her husband, fellow Halprin acolyte Thomas Koenig. Since then, Danadjieva & Koenig Associates has been building on Halprin's remarkable, multidisciplinary legacy.

Halprin's experimental designs include buildings as extensions of their sites, subservient to the web of parks, paths, and plazas that link and define the urban fabric. He seeks dynamism and the greatest possible variety in his designs, and his city parks, distinguished by thundering waterfalls and progressions of diverse spaces, evoke a variety of moods and invite a range of activities from water play to solitary meditation. His most original contribution is the reclamation of vacant plazas and portions of downtowns slashed by freeways as usable open spaces. Explaining his concept for capping a portion of Seattle's artery, Interstate-5, with a lush green carpet, Halprin says: "The trick is to perceive the old freeway as a part of the cityscape and tame it, rather than complain about it." Angela Danadjieva has similarly focused her attention on healing and camouflaging wounds inflicted on the environment by unsightly new buildings and construction.

There are other similarities between the formidably energetic Halprin and the equally prolific Danadjieva. Halprin was strongly influenced by his experience working on a kibbutz in Israel as a youth in the 1930s, and later by his wife Anna's work with dance and choreography. Danadjieva's environmental approach was largely shaped by her childhood in Sofia, Bulgaria, ("a world where the city was our living room and everybody was outdoors as much as possible"); by her architectural training at the State University of Sofia, which embraced city planning, urban design, landscape, and interiors as inseparable disciplines; and by a seven-year stint designing movie sets for the Bulgarian film industry. In set design, she points out, "you have to relate to a dramatic tradition and follow the view angles of the camera, with its constant motion and changes of mood and light."

Danadjieva embarked on a new life in 1962 after her design for a Cuban memorial to the Bay of Pigs invasion won second place in an international competition, allowing her to travel to Paris. She studied at the Ecole des Beaux-Arts for two-and-a-half years, then worked for a Parisian architect. In 1965, she won a second competition for San Francisco's Civic Center Plaza Civic Square, which

brought her to the United States and to the office of Lawrence Halprin & Associates.

During her years with Halprin, Danadjieva was the lead designer for Portland's Forecourt Fountain, a block-sized fountain-as-plaza, and Seattle's Freeway Park (facing page), which opened in 1976. By the time Halprin temporarily disbanded his office in 1975, Danadjieva was in possession of the characteristics that today define her hybrid art.

Like Halprin, she tries to infuse her projects with a sense of place and tradition by echoing the natural forms of a particular region. Danadjieva's urban parks comprise a progression of diverse spaces intended for a variety of activities that change with the seasons, weather, and time of day. She often makes it difficult to tell where nature ends and architecture begins.

Within her firm, which has offices in Tiburon, California, and Bellevue, Washington, Danadjieva focuses on conceptual design and client relations, while her partner, Koenig, concentrates on design development and business. In 1984, Danadjieva and Koenig completed an extension of Seattle's Freeway Park and added the Pigott Memorial Corridor, a stair and ramp designed for the handicapped. Danadjieva & Koenig was also associate architect for the Washington State Convention & Trade Center complex, a multi-use air-rights development that spans I-5 and includes an intricate web of layered spaces. A 1,000-car garage slides over the freeway and under the park extension, which is adjacent to the largely transparent convention center.

The center's public spaces form a glass and

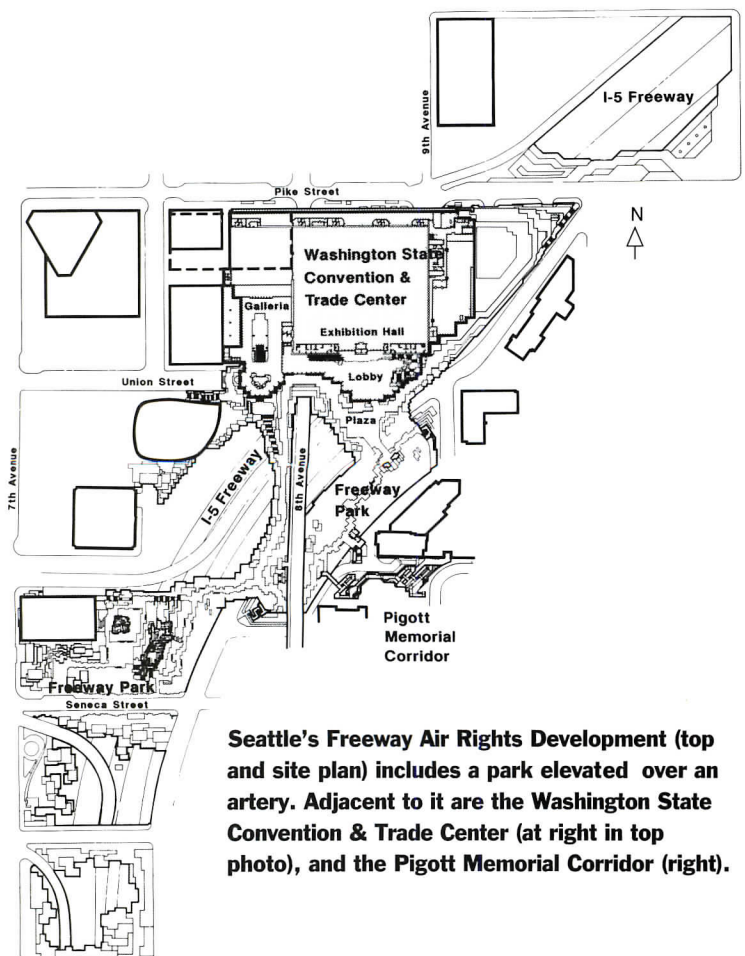
concrete greenhouse that continues the forms and spirit of the park outside, connecting street-level retail areas to neighboring office towers.

Having recently completed White River Park Promenade in Indianapolis (pages 64-65) and the open space plan for the new San Francisco neighborhood of Mission Bay, Danadjieva and Koenig are currently at work on two environmental architecture projects. A new town square for Anchorage, Alaska, (above) has been designed as an ice-skating rink framed by a "frozen curtain," which is showered at night with moving, colored lights to recall the patterns of the aurora borealis. The second project, in Westpoint, Washington, expands and camouflages a sewage treatment plant by molding its contours to follow the landscape and orienting footpaths and views away from the plant and toward an adjacent bay. Danadjieva calls such environmental design strategies "mitigation" architecture. "My specialty," she explains, "is working with difficult sites."

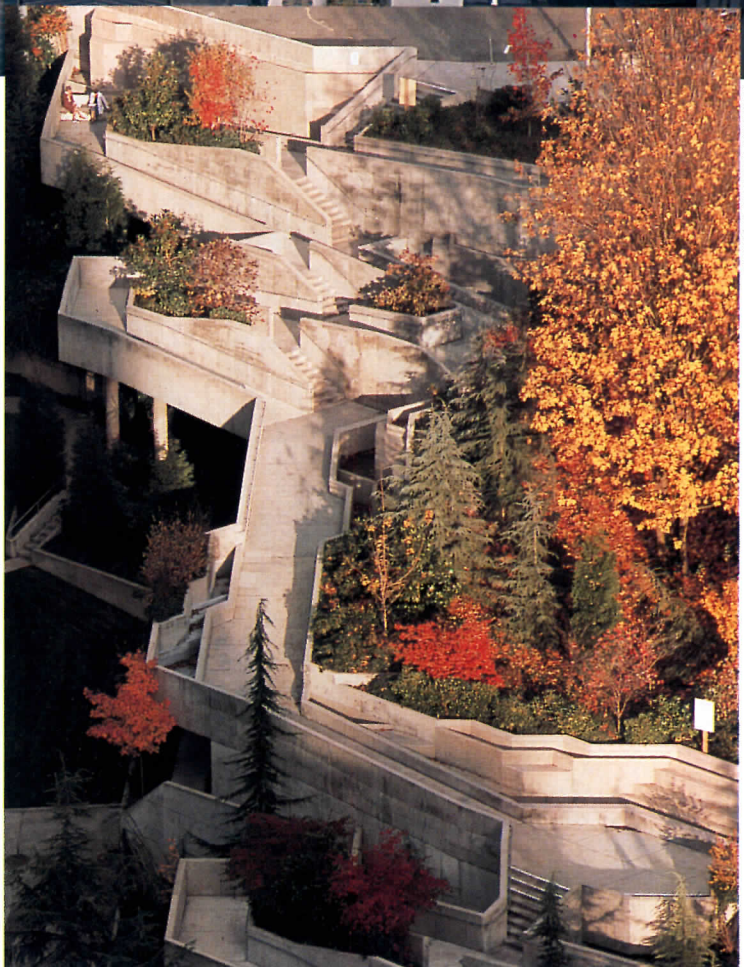
—ANDREA OPPENHEIMER DEAN



The glacierlike forms of Danadjieva & Koenig Associates' new town square (above) for downtown Anchorage, Alaska, are intended as relief from the city's oppressive grid.



Seattle's Freeway Air Rights Development (top and site plan) includes a park elevated over an artery. Adjacent to it are the Washington State Convention & Trade Center (at right in top photo), and the Pigott Memorial Corridor (right).



JAMES F. HOUSEL PHOTOS



Freeway Air Rights Development Seattle, Washington

Located on the edge of downtown, Seattle's Freeway Air Rights Development includes 10 acres of parks, civic buildings, walkways, and parking built on artificially constructed land above the I-5 artery.

Before Freeway Park was built, the interstate sundered Seattle's downtown, severing it from First Hill, an area comprised of residences, hospitals, retirement homes, and churches. The park, which floats above the freeway, reconnects these areas while its edge, configured to form a multiplane sound barrier, muffles the din. Thundering waterfalls drown out traffic noise altogether, greenery soaks up automobile exhaust fumes, and boxy concrete overhangs and lush terraces echo the shapes and textures of the surrounding city.

Danadjieva's involvement with the project began when she was an associate at Lawrence Halprin & Associates, which teamed with Edward MacLeod & Associates and design consultant NBBJ to design the park in 1976. Her design contribution is the park's 1984 expansion to the east and the Pigott Memorial Corridor (left), which bridges part of the extension and links the park with a large residential neighborhood. TRA and HNTB were the architects, and Danadjieva & Koenig Associates the associate designer, for the Washington State Convention & Trade Center, completed two years ago, which extends the park northward.

Danadjieva & Koenig Associates' design for the Pigott Memorial Corridor, a meandering elevated ramp and stairway, creates an innovative form of barrier-free circulation. The rampway follows the forms of the site, is shaped to accommodate planned construction, and negotiates a 50-foot change in grade between Freeway Park and 9th Avenue. The grade change had previously discouraged many people—particularly the handicapped—from using the park.

The stepped Washington State Convention & Trade Center complex, with its faceted green glazing, resembles a hill rising from the park. Danadjieva & Koenig's landscape design for its multilevel lobby (facing page, bottom left) adorns the space with fountains, mature Ficus, cedar, Douglas fir, flowering magnolia, crab-apple trees, and rhododendron, while hanging plants form 20-foot green curtains to the floor below. The lobby's centerpiece is Danadjieva's dramatically sculptured and cantilevered north wall (facing page, top).

Danadjieva sees Freeway Park and its extension as merely a beginning. She would like it expanded southward to continue the task of "converting an environmental liability into an urban amenity."





Danadjieva's spectacular lobby wall (top) for the Washington State Convention & Trade Center was inspired by the basalt cliffs (above) near Wenatchee, Washington. The wall's massive, angular shapes with stalactitelike forms appear cavelike, and also resemble an extremely heavy theater curtain. On occasion, the sculptural form is used as a backdrop for performances that convert a portion of the lobby

into a stage. The wall's concrete bush-hammered and board-formed shapes echo natural forms in the park outdoors, while the lobby's overgrown, stepped and boxed terraces (left)—some with cascading waterfalls—are virtual copies of those outside. The wall is cantilevered from the southern members of the exhibit hall's structural box truss and was created with a two-stage shotcrete method.



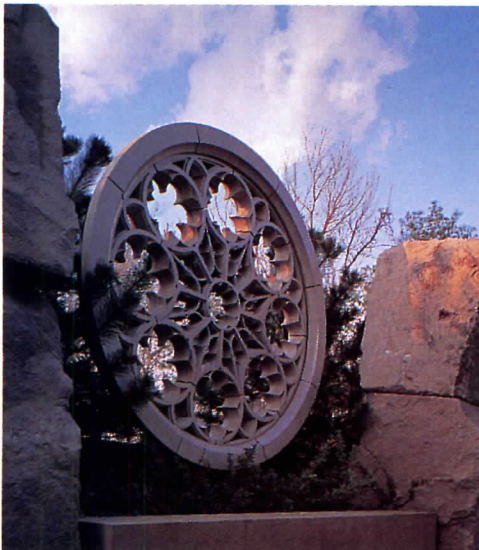
**Riverfront Promenade
White River Park
Indianapolis, Indiana**

Danadjieva & Koenig Associates helped to create the master plan for the transformation of 250 derelict acres into a park along the banks of Indianapolis' White River; Riverfront Promenade is its first completed element. The park will showcase the Hoosier State's strengths and accomplishments and promises to employ 1,000 new permanent workers, provide another 1,200 seasonal jobs, and bring in \$25 million in tourist income annually.

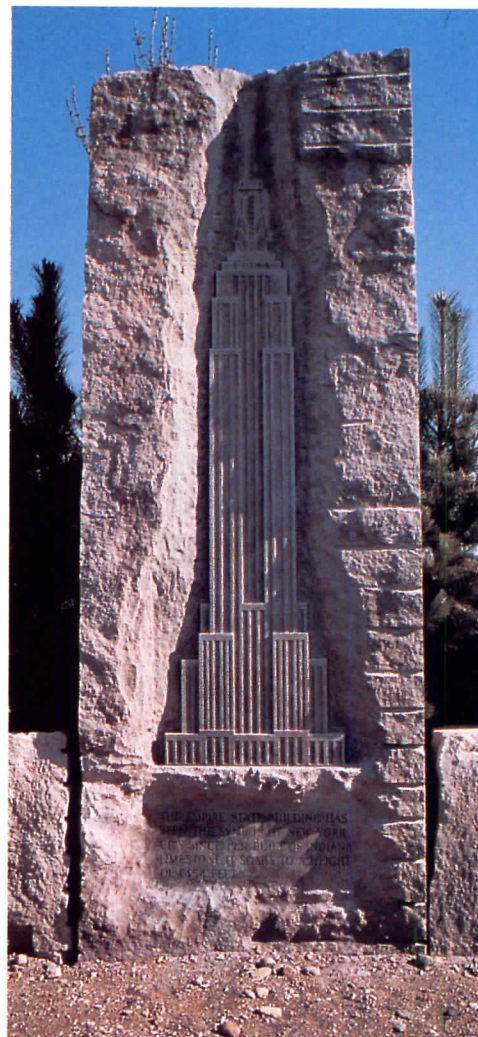
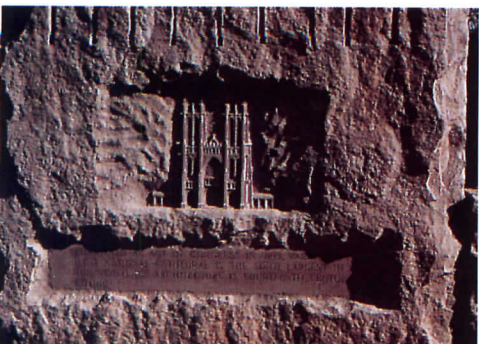
Among the park's features will be a three-level pedestrian bridge spanning the river in the exact location of the original covered bridge that led pioneers west over the Old National Road—the gateway to the western frontier. A 70-acre zoo will offer safari adventure train rides to exhibits of animals in their natural environments. A family entertainment center resembling Copenhagen's Tivoli Gardens will contain fanciful towers, an elevated tram, and a special-effects movie theater. The park will also feature a performing arts/museum complex; a leaning tower whose arcaded rampways will take visitors up 1,000 feet for views over a 40-mile area; and a winter garden designed by Danadjieva & Koenig. The ambitious redevelopment is financed by partnerships between the state of Indiana and private entrepreneurs, and private business partners will lease and develop the land as set forth in contracts with the state.

The master plan team established six open-space "galleries," one for each of the park's major features, with an overall frame of native plant material and limestone providing continuity. Danadjieva & Koenig's half-mile-long Riverfront Promenade, whose walls contain 1,200 boulders, some of which weigh as much as 16 tons, is "an outdoor walk-through corridor/museum that celebrates the state's principle industry—Indiana limestone," according to Thomas Koenig. The walk is divided into "galleries" that illustrate the history of limestone and why it is so frequently used in the building industry. As a demonstration of Danadjieva's conviction that open space, like buildings, should have multiple uses, one of the promenade's walls provides a barrier for the zoo while the other shields an ugly retaining wall.

Still in the planning stages for the park is a winter garden. Its four glass pyramids will become less dominant upon approach until they appear almost invisible. Each pyramid will enclose a garden and aviary from a different climate: Southwest desert, Southeast swamp, Pacific Northwest forest, and Midwest woodland. Topping the winter garden will be a restaurant with spectacular views over the entire White River Park.

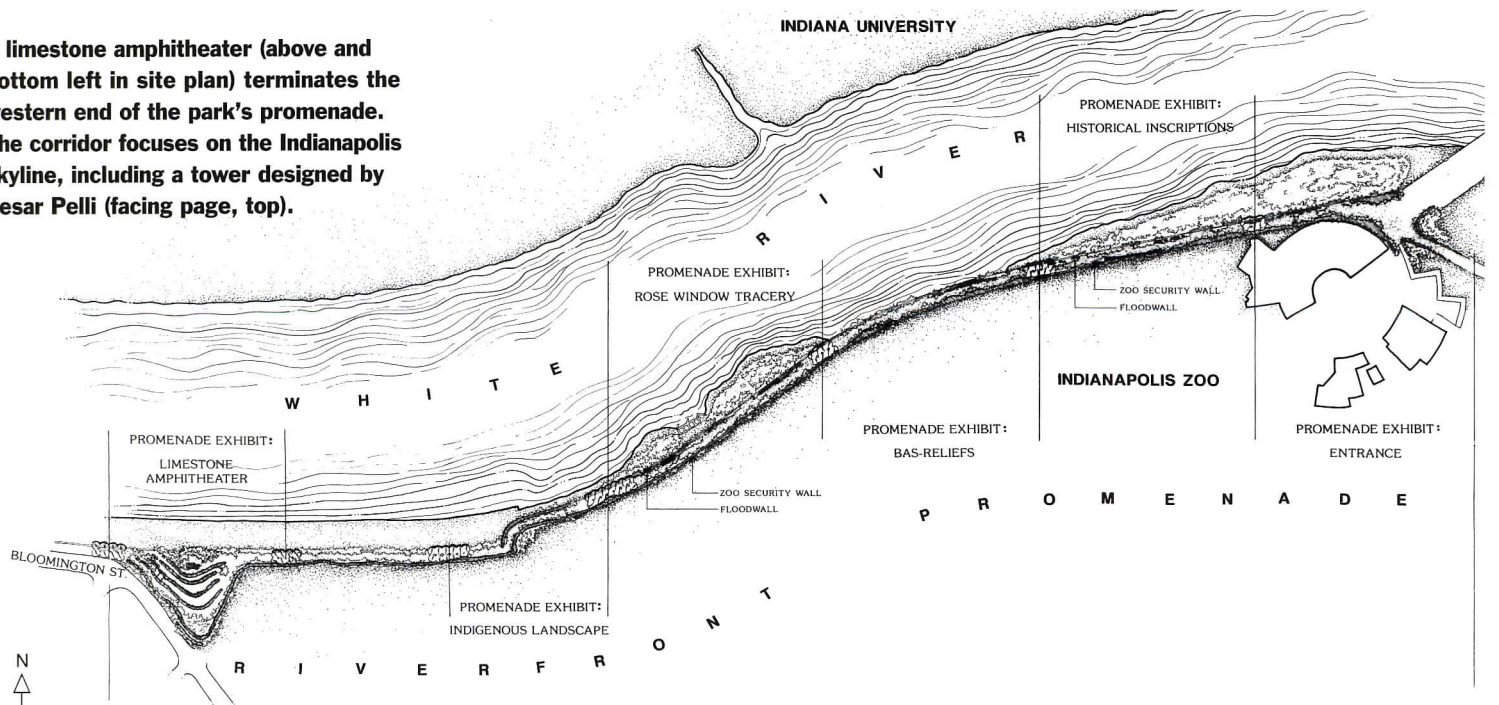


Among the images carved into the limestone blocks (above) are a bas-relief of the Indiana State Capitol (lower left); the National Cathedral in Washington, D.C., (bottom left); and the Empire State Building (below). A rose window (left) along the walkway is made of 17 pieces of carved stone attached to a frame.





A limestone amphitheater (above and bottom left in site plan) terminates the western end of the park's promenade. The corridor focuses on the Indianapolis skyline, including a tower designed by Cesar Pelli (facing page, top).



The Aventine
La Jolla, California
Michael Graves, Architect

Grand Illusion

A mixed-use complex infuses an ordinary suburb with luxury.

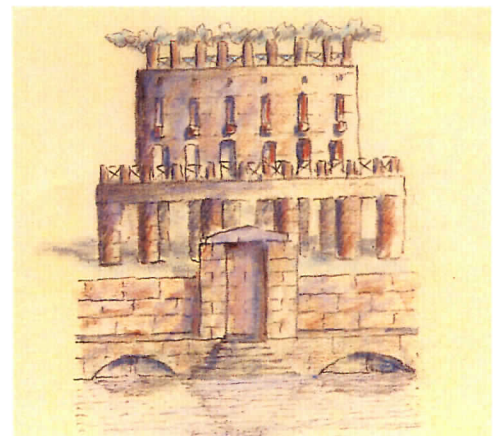


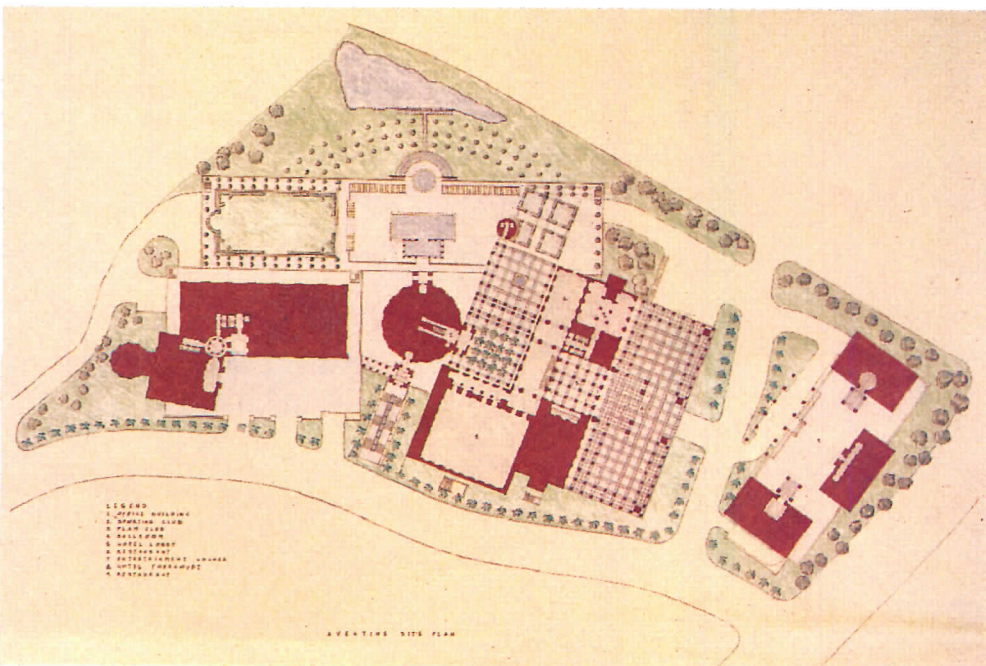


THE MIXED-USE COMPLEX DESIGNED BY Michael Graves on 11.7 acres in La Jolla, California, is a noble presence in a mundane context. Occupying the prow of a hill overlooking the San Diego Freeway, the \$150-million development presents a powerful Italianate composition of squares, circles, and oblongs linked by pergolas, fountains, pools, and courtyards. Named for one of the seven hills of Rome, the Aventine includes a 16-story, 400-room Hyatt Regency hotel, an 11-story, 22,000-square-foot office building, a health club, and four "theme" restaurants—set against a background of visually depressing tract townhouses, slab-sided condo towers, and standard suburban office parks. Plinths of red Baruli sandstone from India link the complex at base level, while various shades of stucco differentiate the upper floors of each building.

Graves won the Aventine commission in a limited competition with I.M. Pei & Partners in 1987. Originally asked to design the Aventine's interiors, Graves convinced Jack Naiman, the complex's chief developer, that his Italianate Postmodernism would create attractive architecture on the edge of an area between the I-5 and I-805 freeways known as the Golden Triangle. "I also inherited an already-approved site plan," Graves explains. "My only major maneuver was to turn the hotel's axis through 30 degrees, allowing more sunshine to fall upon the pool and its terraces. I also broke the office building into three distinct geometric blocks to reduce the impact of its bulk." The steep northern slope of the site allows direct access into the service areas and two levels of subgrade parking that provide a base for the main buildings.

The Aventine's buildings include an office building (left), a rotunda-shaped health club (center and preliminary study below), and a hotel (facing page).





Between the hotel and the row of restaurants to the east is a wide, paved plaza through which vehicles circulate to drop off patrons and guests.

The Hyatt Regency, designed down to the last detail by Graves, is the kingpin of the complex. While the exterior is striking in its light-and-dark alteration of stucco surfaces and large window panels, the interior—from the low-ceiling lobby to the grandiose, marbled Barcino restaurant below the lobby—is less impressive.

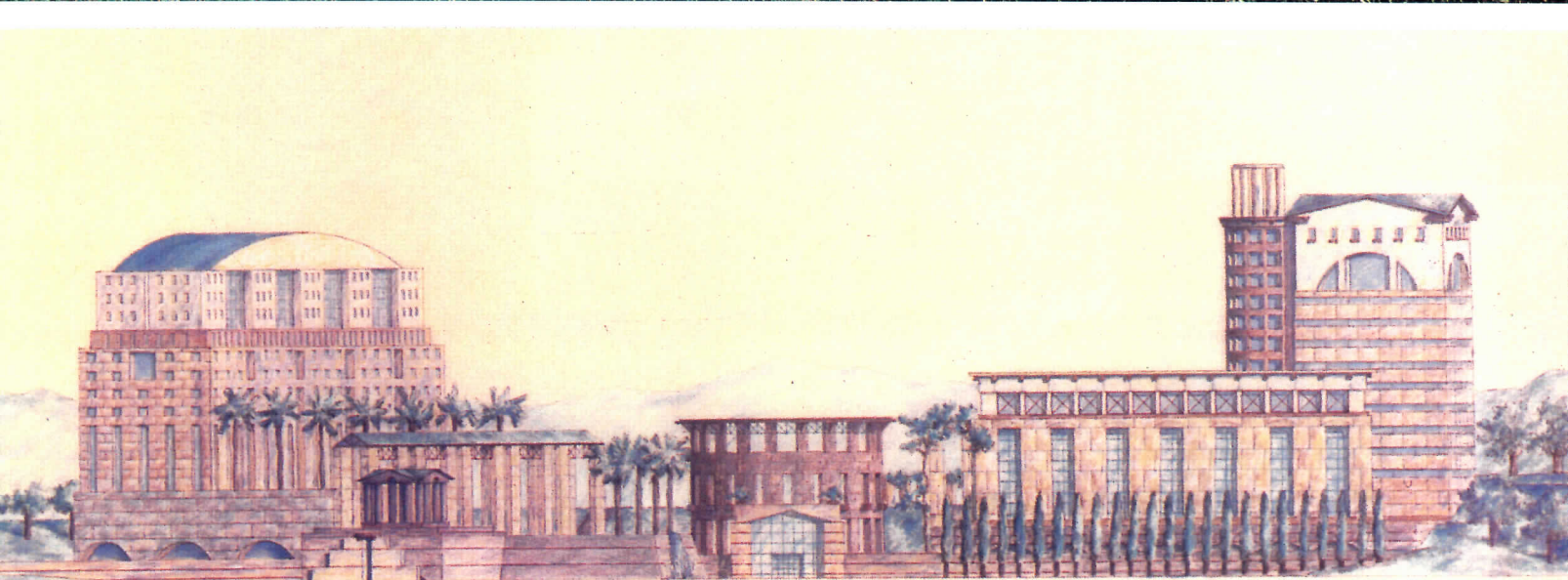
Throughout the Aventine, the design is most successful at the extreme ends of the spectrum, and least accomplished in the middle range. At the megascale of the major composition, the complex is elegant, bold, and clear—exhibiting a skilled touch that's also apparent at the miniscule of detailing, down to the delightful little "temple" clocks found in some suites. This surety falters in the design of areas such as the hotel restaurant, where a tight budget makes the use of rose- and cream-colored marbles seem cheap in contrast with the grand ambition embodied in the Egyptoid colonnade.

The lobby's lack of grandeur, Graves explains, is due to the need to save money by extending the close-columned structural grid of the hotel rooms down to the ground level, sparing the cost of massive transfer beams. He feels this spatial compression prepares the visitor for the expansive volume of the Barcino restaurant on the level below, reached by a marble stairway.

Graves' ironic comment that "you can see the budget at work" is also manifest in the decor of other public spaces in the hotel. The 11,000-square-foot ballroom is stark, striped of all the finery that usually elaborates such facilities. Michael's Jazz Club, a nightclub off the lobby, is finished in a fake "Venetian" ochre stucco that looks like cut-price wallpaper against the colorful furnishings and Graves-designed Finestra chairs.

The health club rotunda is the visual fulcrum of the complex, turning the axis between the office building and the hotel. Meant to be seen from above as well as from ground level, the rotunda's roof parapet is penetrated by a series of slots that lighten its bulk. Surrounding the rotunda is a sequence of pools, pergolas, and courtyards that knit the Aventine. Walkways between buildings

The eastern edge of the Aventine's 11.7-acre site (bottom left) is defined by four restaurant pavilions (top left). Landscaped open spaces link the various parts of the composition, including a swimming pool located next to the health club and office block (center left). As revealed in Graves' rendering (facing page, bottom), the volumes rest on a sandstone-covered podium, elevated above the sloping site (facing page, top).



Designed by G. B. L. S. S.



THE AVENTINE
LA JOLLA, CALIFORNIA

ARCHITECT: Michael Graves, Architect—Michael Graves (project architect); Ross Woolley (associate-in-charge); Alexey Grigorieff, Robert Martino (job captains); Patrick Burke, Jesse Casteneda, David Coleman, Michael Crackel, John Diebboll, June Goldberg, Nick Gonser, Mark Naden, Tom Rowe, Roger Smith (design team); Wendy Bradford, Susan Butcher, Carole Nicholson, Deborah O'Brien, Michelle Stivelman (interiors)
ASSOCIATE ARCHITECTS: Langdon Wilson Architects—Langdon Wilson (executive architect); Randolph Jefferson (partner-in-charge); Richard D. Sholl (project architect); Thomas Manok, Scott Taylor, Alfonso Gutierrez, Albert Klein
ENGINEERS: CBM Structural Engineers (structural); Robert M. Young & Associates (plumbing); Southland Heating and Air Conditioning (HVAC); Dunn, Lee, Smith, Klein & Associates (electrical); VTN Civil Engineers (civil)
GENERAL CONTRACTOR: Nielsen Construction
COST: \$153 million
PHOTOGRAPHER: David Hewitt/Anne Garrison

are covered by gaily striped metal awnings supported on steel posts. The changing room for bathers is designed as a permanent tent between the swimming pool and the fountains restaurant court. Small formal gardens sprout palms, pines, and cypresses in a mixture of Southern Californian and Mediterranean flora.

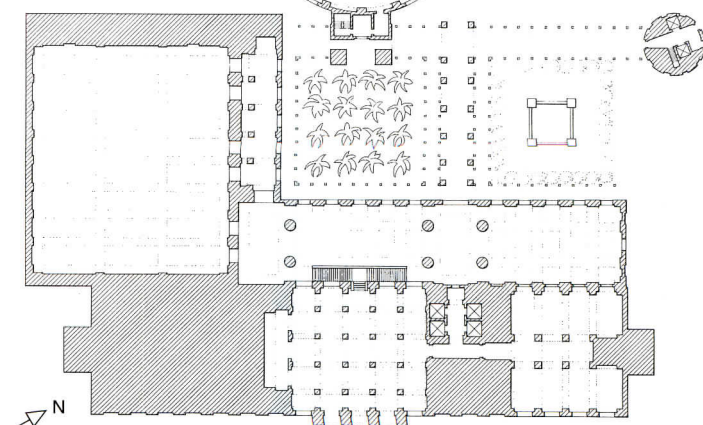
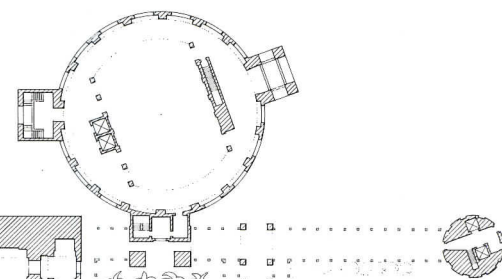
On the east side of the hotel, "theme" restaurants form a series of minipavilions finished in a variety of patterned stuccos that create the air of an Italian village street filtered through the heated lens of Hollywood. Graves has been playful here, allowing his crayons to make diagonal stripes, conjuring up mock serious tree forms and other amusing jeux d'esprit.

While many of the neighbors complain that the complex is an "architectural sore thumb," utterly out of tune with its surroundings, the Aventine's noble manner and voluptuous style represent a splendid aspiration for the undistinguished outreaches of suburban San Diego.

—LEON WHITESON

Leon Whiteson is the architecture critic of the Los Angeles Times.

The Hyatt's formal portico (top left) is flanked by bellboy sentry boxes. The lobby (left) was configured with a low ceiling and dense columns to spare the expense of massive transfer beams. Graves designed many of the Aventine's interiors, including (facing page, clockwise from top left): the hotel's Michael's Jazz Club; lounges overlooking the hotel lobby; health club; typical hotel room; and Barcino restaurant. Several rooms also feature Graves-designed furniture, rugs, and accessories.



HOTEL GROUND FLOOR PLAN



Northeastern University Boathouse
Boston, Massachusetts
Graham Gund Architects



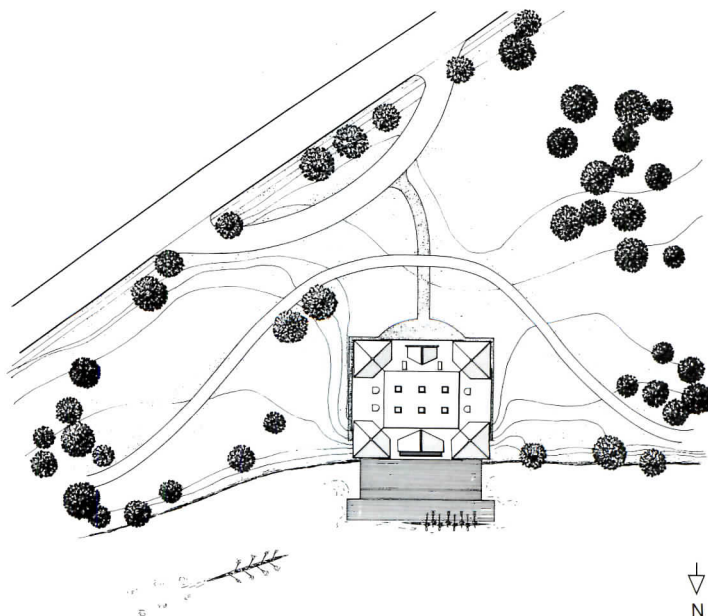
Team Spirit

A new boathouse joins forces with its neighbors.

BETWEEN BOSTON AND CAMBRIDGE, THE BANKS OF THE Charles River are lined with boathouses for the university crew teams of Harvard, MIT, and Boston University. It has been years since the construction of a new university boathouse—the last was MIT's flat-topped, shoeboxlike building in 1967. Last December, however, Northeastern University completed a new boathouse, designed by Graham Gund Architects, that recalls its traditional 19th-century predecessors along the Charles with a distinctive roof line, symmetrical plan, and multi-paned windows.

Northeastern University is tucked behind Boston's Museum of Fine Arts, and lacked a presence on the Charles River. Its rowing team shared spaces in another university's boathouse, which was not only inconvenient but robbed the team of its own identity. Located on a bend of the river at the city's western edge, Northeastern's new Henderson Boathouse rectifies both deficiencies. An existing bike path, which had stopped just east of the boathouse site, now winds its way around the new structure and completes a circuit. Gund cites the new bike path, which meanders around the bank of the Charles, as evidence of the boathouse's beneficial impact on the neighborhood, made up mostly of one-story office buildings.

The program for the 18,000-square-foot structure—"a garage for boats," as Gund describes it—was essentially identical to that of its 19th-century brethren. What separates Northeastern's new struc-



Gund's boathouse for Northeastern University faces Soldiers Field Road (above) and the Charles River (facing page and site plan). Squat towers and horizontal lines anchor the boathouse to the landscape (above right) and echo late-19th-century precedents.



NORTHEASTERN UNIVERSITY
HENDERSON BOATHOUSE

MS 4768AP



ture from all the other boathouses, however, are facilities divided equally for men's and women's crew teams. The first floor, which opens onto a dock that ends at the river's edge, is completely devoted to housing boats and repairing them. Facing Soldiers Field Road, the building's broad roof rests on four Tuscan columns that frame the main entrance and extend into the lobby, distinguished by a gently curving, wood-slatted ceiling. To either side of the entrance are sliding doors that anchor the facade, located at the base of the hip-roofed towers—one leading directly to the boat bay, the other to the repair shop.

Rowing is a no-nonsense, Spartan sport that frowns on grandstand play, and Gund (who has rowed) connects the elegant, spare, and utilitarian structure of the sculls to the building's bare-bones simplicity. The boat bays are surrounded with an exposed structure of Douglas fir columns and beams, with heavy, bolted connections. The interior's horizontal pine siding reinforces the sleek geometry of the boats and how they are stored. Four bay doors slide open to the dock, a steeply sloped deck with ribbed strips for traction, down which the inverted

boats are carried. On the river side, the building seems more relaxed, punctuated with more windows, doors, and gentle nautical references, such as the wavy shingles on the dormers and "oar" balusters along the balconies.

The second floor is symmetrically arranged along its north-south axis, evenly divided into men's and women's spaces. The lounge, which overlooks the street-side entrance, is glazed by built-in trophy cases. At the top of the southern towers are locker rooms, flooded with daylight from a frieze of windows that runs just above the lockers, and crowned with the exposed structure of the hip roof. The northern towers are devoted to coaches' offices, with excellent views of the dock area and up and down the Charles.

At the very center of the plan—and the teams' sporting life—is an exercise room, offering views out to the river and to the trophy lounge. This space receives natural light from above and is inhabited by muscular Pratt trusses with gently arched bottom chords, which allude to the structure of the racing sculls and the nature of the sport. ■

—MICHAEL J. CROSBIE

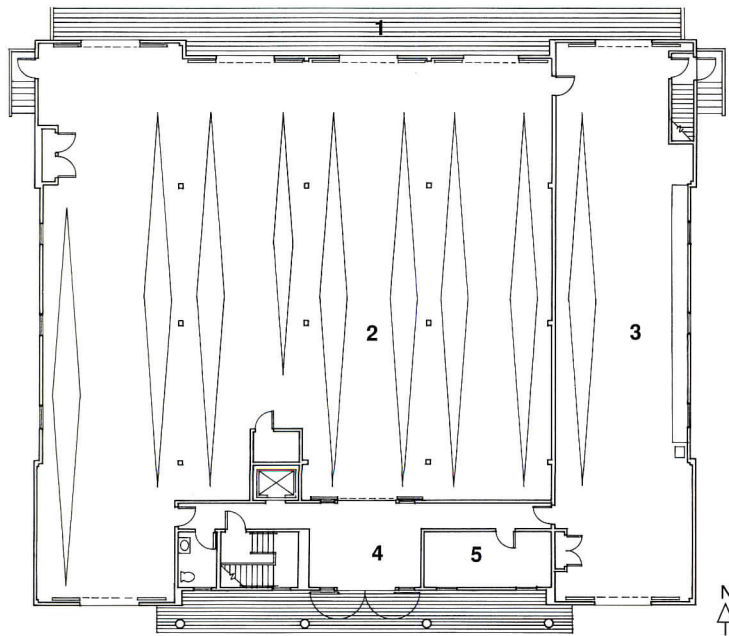
Boat bays (above and left plan, facing page) open onto dock and river, and feature exposed, bolted wood structural members and horizontal pine siding that matches the sculls. Doors slide back along metal tracks. Exercise room (facing page and right plan) refers to older boathouses with arched openings and multi-paned windows. Interior windows offer views to trophy lounge. Weight rooms flank exercise room, with entry to locker rooms in corners.

NORTHEASTERN UNIVERSITY BOATHOUSE
BOSTON, MASSACHUSETTS

ARCHITECT: Graham Gund Architects, Cambridge, Massachusetts—Graham Gund, FAIA (principal); David Perry, AIA (principal); Vincent Codispoti, Jr. (project architect); Robert Arthur (job captain); Laura Cabo, AIA, Dongik Lee, Derek Barcinski (project team); Sarah Stanton (architectural administrator); Elena Saporta (landscape architect)

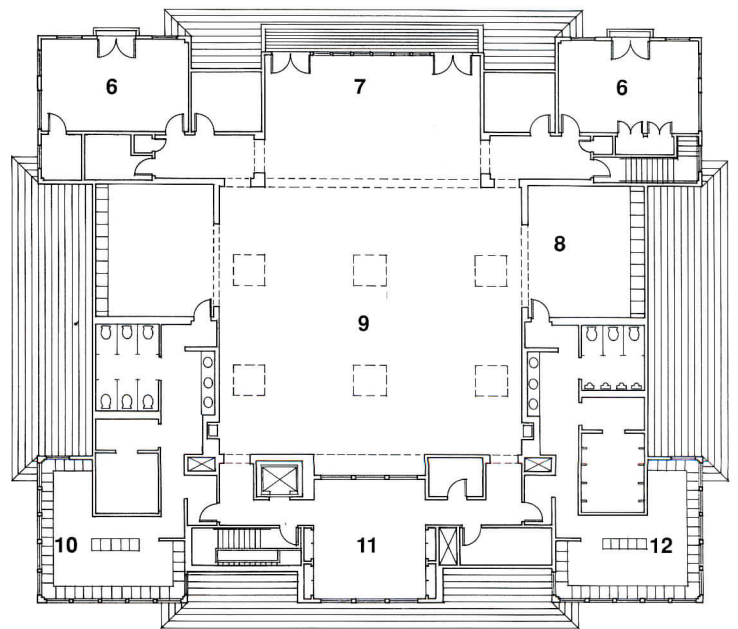
MARINE ARCHITECT: Waterfront Design
ENGINEERS: Chaloff/Barnes Inc. (structural); Zade Company, Inc. (mechanical and electrical); Bryant Associates (civil); HMM Associates (environmental)

CONTRACTOR: Macomber Construction Co.
PHOTOGRAPHER: Steve Rosenthal



FIRST FLOOR

- 1 DOCK
- 2 BOAT BAYS
- 3 REPAIR SHOP
- 4 LOBBY
- 5 MECHANICAL



SECOND FLOOR

- 6 OFFICE
- 7 ROWING EXERCISE
- 8 WEIGHT ROOM
- 9 MAIN EXERCISE
- 10 WOMEN'S LOCKERS
- 11 LOUNGE
- 12 MEN'S LOCKERS

Centennial Sportsplex
Nashville, Tennessee
Thomas, Miller & Partners, Architects

Water and Ice

Swimming and skating are combined under the roof of a new sports complex.



ON A RECENT HOT AFTERNOON IN NASHVILLE, A GROUP OF HUNGARIAN athletes playfully ice-skated in their swimsuits. If the curious event seems incongruous to outsiders, it makes perfect sense to Nashvillians, proprietors of a new municipal recreation center where pool and ice rink are virtually under one roof. Indeed, three primary sports—ice skating, swimming, and tennis—are housed in one ambitious complex designed to provide state-of-the-art facilities for both daily recreation and international competition.

The Hungarian athletes were not alone; Nashville's Centennial Sportsplex surprises most visitors. Why should such a huge structure be located on a leafy midtown street? Who designed these dramatic and colorful buildings? Why are three major sports facilities joined in one complex?

One answer lies in an unusual land swap that resulted in consolidating the Sportsplex. Aiming at becoming a future Olympic site, the city of Nashville wanted to enter the big leagues of national and international skating, aquatic sports, and tennis competitions; Nashville's Hospital Corporation of America needed land for a burgeoning land-locked medical center. In a shrewd arrangement, the city government supplied municipal park acreage to the private hospital corporation, which in turn funded the \$12-million sports complex. The city thus expanded its tax base, acquired improved private medical facilities for the community, and got its sports complex free of charge.

The resulting bonanza is located on 17 acres of sloping land west of downtown Nashville, adjacent to the city's Centennial Park—a 132-acre tract of mature trees, ponds, and lawns surrounded by commercial buildings. The centerpiece of the larger park is a local architectural icon, a replica of the Parthenon. The trick was to fit the 112,000-square-foot contemporary aquatic center/ice arena onto the property, respect the nearby Parthenon, and not overwhelm the neighborhood, according to project architect Robert Oglesby, AIA, of Nashville's Thomas, Miller & Partners. The project succeeds through color, form, and siting.

To minimize the facility's impact on its urban site, swimming and ice skating were combined into one 589-foot, three-part building, turned inward toward the property and skewed slightly, parallel to the Parthenon. A large, open courtyard at the center of the structure yields to the larger park across the street, inviting public inspection and activity. The Sportsplex's entrance and true front face north, toward the drive

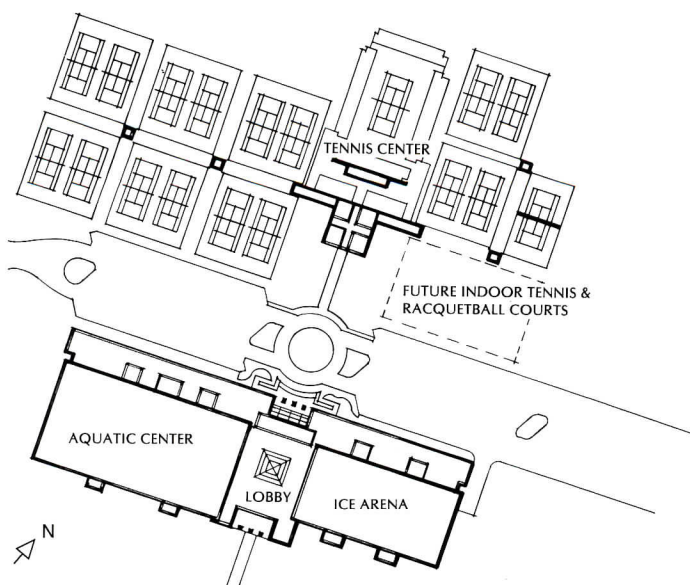
and drop-off loop that bisect the acreage, rather than toward the more obvious street frontage on Brandau Place, diminishing the impact of the massive building on its surroundings.

While the twin wings of the aquatic center/ice arena could have dominated the neighborhood like two aircraft hangars or factories, the architects modified the perception of the building's size with scale-reducing elements. The main building is covered by scored panels that subdivide its 38-foot-high walls. Oversize louvered boxes hang from the facades, breaking up the massiveness of the elevation with shaded volumes that contain the numerous mechanical units. Within the building, barrel vaults scoop upward from the roof, their 60-foot height hidden by exterior walls. Custom-sized "centennial red" bricks are patterned in diamond

shaped courses that reduce the scale at the pedestrian level.

Across from the main building, on axis with the entrance drive, lies the tennis center, a grouping of 17 courts anchored by a small, 3,000-square-foot clubhouse with a rooftop observation area and a smaller tournament-scheduling pavilion directly behind. Center court contains public seating for 2,200 persons, and expansion is possible. Fabric-covered walkways link the clubhouse and the pavilion, echoing the bright colors of the main building. Color is also used to reduce the complex's apparent mass. The gray-green roofs and exterior insulation systems harmonize with surrounding vegetation, while black grilles and louvers down-play mechanical elements. Brilliant turquoise handrails, scarlet metal accents, and lemon-yellow canopies snap the incidental pieces into play, announcing that the Sportsplex is fresh, new, and fun.

According to Oglesby, the primary charge to the architects by the city was not appear-



The Centennial Sportsplex lies in Nashville's busy West End, near businesses, medical center, and universities (above). In plan (left), the center consists of an aquatic center and ice arena joined in one long building facing a tennis complex. Future expansion will include indoor tennis and racquetball. Bright color and form reduce the apparent bulk of the south (facing page, top) and north (facing page, bottom) elevations of the main building.

ance but function, to make the individual components perform properly—to provide fast pools for racing, distraction-free spaces for skating. Oglesby's major personal challenge was to go beyond these requirements in considering the optimum environment for the participating athlete, and, secondarily, for the visiting public. To address the special opportunities present in designing for an international competition, critical consultants included the Los Angeles-based Jerde Partnership, a firm involved in planning for the 1984 Olympics.

To achieve spaces free of distraction, the architect provided high, open volumes crowned by long bow trusses. No skylights or clerestory windows disrupt the calm atmosphere; these are controlled environments for serious competition.

To further shield the athletes from distractions, public and participants are separated. Spectators sit on simple, elevated bleachers on the south side of both swimming and ice arenas, and seating is reached through a main lobby that is shielded from the active athletes. Locker rooms, weight training areas, and support spaces off the

pool and rink are blocked from the athletes' view by a continuous low wall punctuated by structural columns. As a result of this inward focus on pool and rink, athletes have already pulled and kicked their way to faster times, setting two world swimming records since the complex opened in February.

A busy lobby filled with people, light, and activity divides pool and skating rink. A broader corridor runs through the central axis like a gently rising street, dividing ice from water and opening a pathway for the public. Natural light draws the eye through the main entrance, beyond a central ticket sales and information counter to tables and chairs under a wide central atrium, its roof pierced with a large glass pyramid.

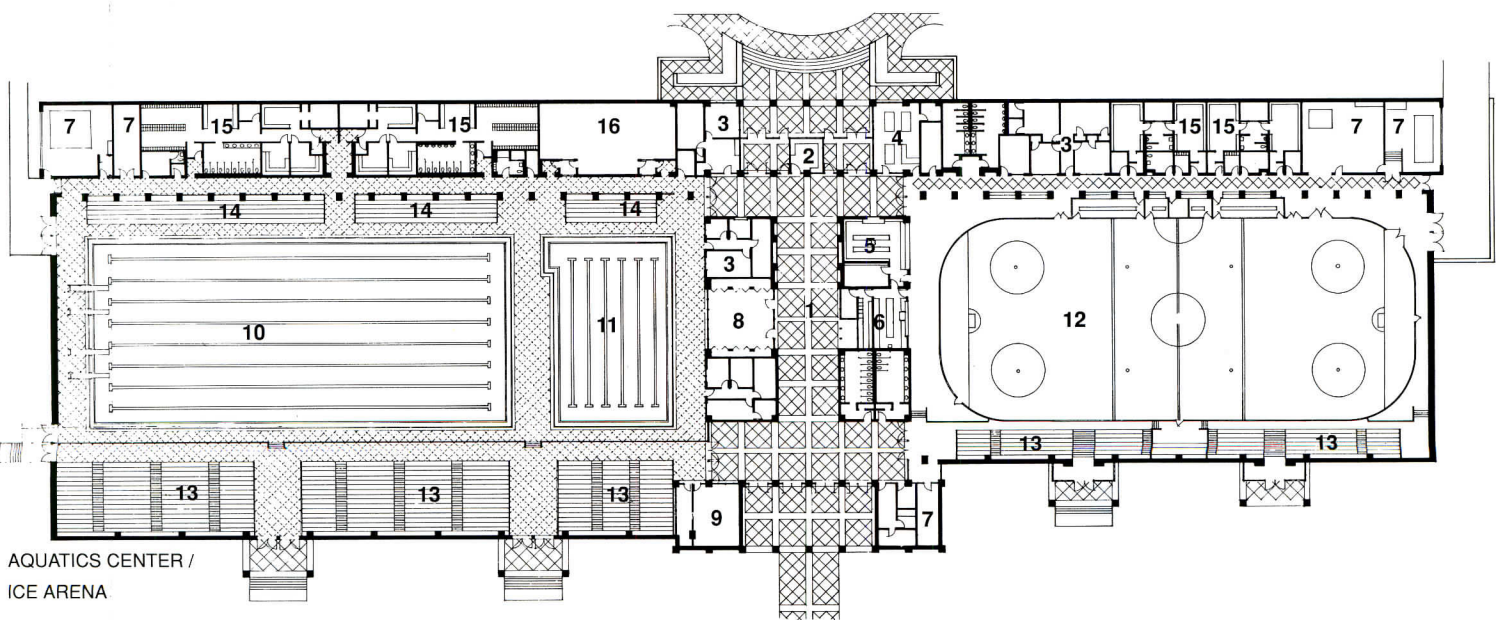
Crowds are increasing as the Sportsplex becomes known; future plans demand more construction for an indoor tennis and racquetball facility to extend eastward from the tennis courts. While the media will focus on competitive events, the real test of the facility will be Nashvillians, whose daily participation—skating and splashing their way to health—will validate its purpose. ■

—ROBERT A. IVY

A skylight (below center) caps the main interior circulation space within the swimming/skating building. A 50-meter pool (below left) is for competitive swimming, while a smaller pool is reserved for recreational swimming (plan). The tennis center (facing page, plan) encompasses two small buildings—a tournament-scheduling pavilion (facing page, top) and clubhouse. Colorful awnings cap the over-look and walkways (facing page, bottom).

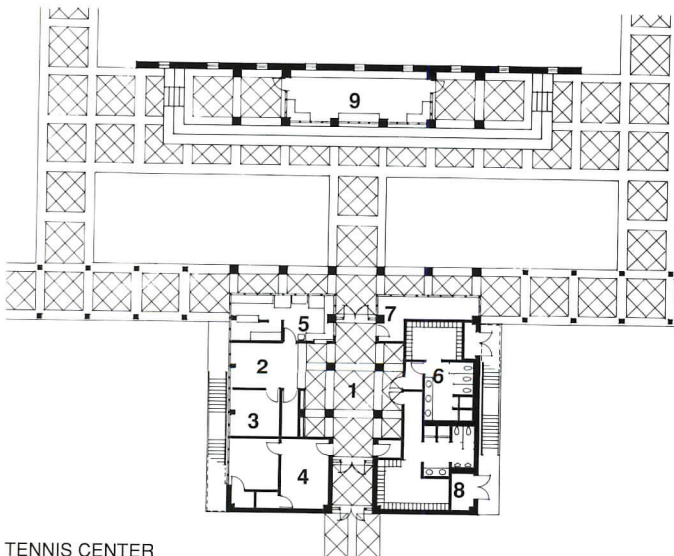
CENTENNIAL SPORTSPLEX
NASHVILLE, TENNESSEE

ARCHITECTS: Thomas, Miller & Partners, Nashville, Tennessee—Albert L. Thomas (partner-in-charge); Robert E. Oglesby, AIA (partner-designer/project architect); Lawrence R. Hart, (construction administration)
ASSOCIATE ARCHITECT: The Jerde Partnership—Eddie S.Y. Wang, AIA (executive vice president); Tim Magill (project designer)
ENGINEER: Stanley D. Lindsey & Associates, Ltd. (building structural); John Carpenter & Associates (pool structural); I.C. Thomasson Associates (mechanical and electrical); Hickerson/Harrison/Hayes; Thomas, Miller & Partners (civil)
CONTRACTOR: Centrex-Rodgers Construction Co.
PHOTOGRAPHER: Jeff Goldberg/Esto



AQUATICS CENTER /
ICE ARENA

- | | | | |
|-----------|---------------------|---------------------|------------------------|
| 1 LOBBY | 5 SKATE RENTAL | 9 CLASSROOM | 13 SPECTATOR SEATING |
| 2 TICKETS | 6 CONCESSIONS | 10 COMPETITION POOL | 14 PARTICIPANT SEATING |
| 3 OFFICES | 7 EQUIPMENT/STORAGE | 11 RECREATION POOL | 15 LOCKER ROOMS |
| 4 SHOP | 8 MULTIPURPOSE | 12 ICE ARENA | 16 FITNESS CENTER |



TENNIS CENTER

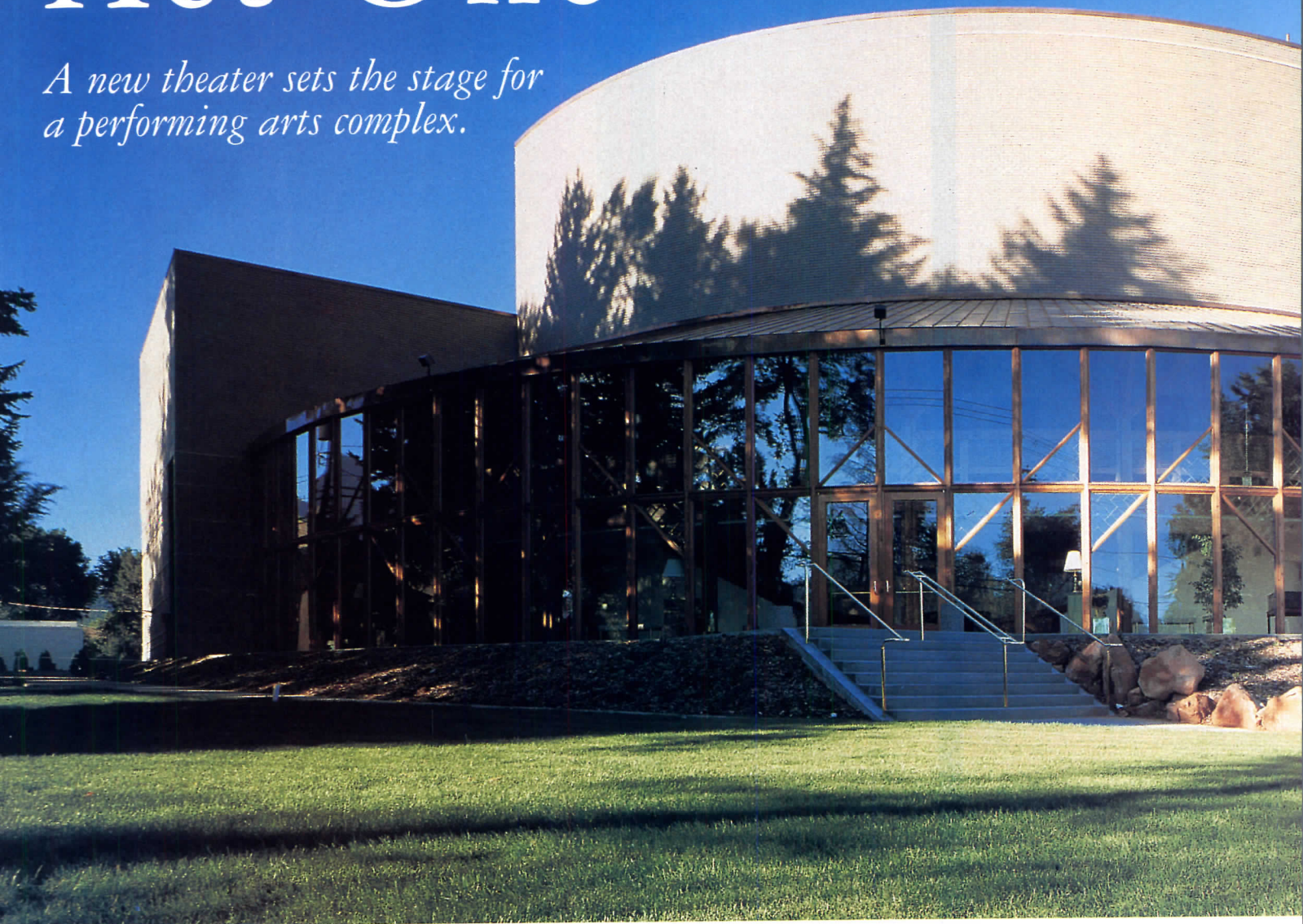
- 1 LOBBY
- 2 PRO-SHOP
- 3 MANAGER'S OFFICE
- 4 OFFICES
- 5 CONCESSIONS
- 6 LOCKERS/SHOWERS
- 7 STORAGE
- 8 EQUIPMENT
- 9 TOURNAMENT SCHEDULING



Randall L. Jones Memorial Theater
Cedar City, Utah
FFKR Architects

Act One

A new theater sets the stage for a performing arts complex.



THE DRAMATIC LANDSCAPE OF SOUTHERN UTAH DRAWS THOUSANDS OF tourists from all over the world, not only to its national parks, but to an annual Shakespeare festival. For the last 30 summers Shakespeare has been performed in

an authentic Tudor playhouse in Cedar City, Utah, a small town 250 miles south of Salt Lake City. To attract audiences who love theater but are not particularly interested in Shakespeare, the Randall L. Jones Memorial Theater by FFKR Architects of Salt Lake City provides a contemporary facility for modern dramatic classics.

The 39,000-square-foot performing arts center is the first building of FFKR's master plan for Shakespearean Square on the campus of Southern Utah State College. Covering an entire city block, the proposed compound is intended to recall an English

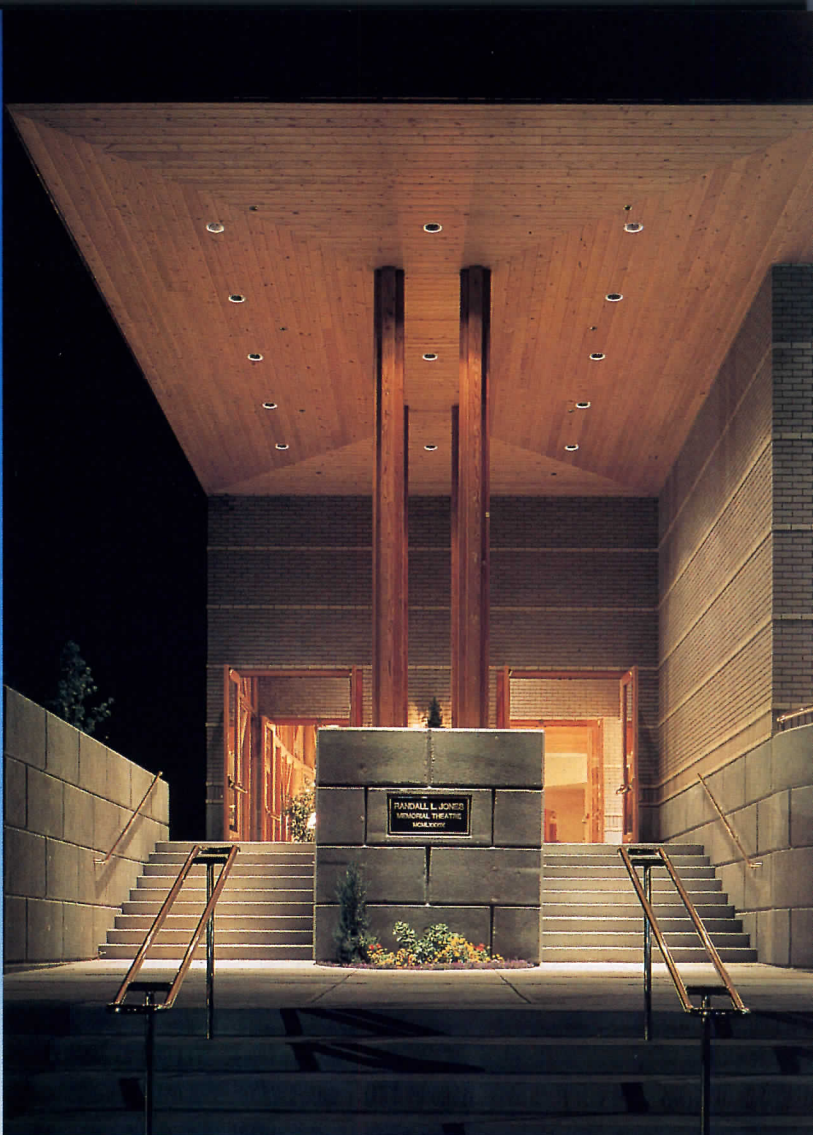
village. The Adams Theater, a 1977 replica of Shakespeare's Globe Theater, will be moved to the square from a block away.

"For the Randall Jones Theater, our goal was to create a building true to the character of its time and place. Its materials reflect Elizabethan architecture without looking like Disneyland," says principal M. Louis Ulrich. A rusticated concrete base and light-colored, banded brick tie the building to Utah's rocky landscape, while heavy timber detailing recalls the vernacular architecture of the lodges throughout the parks. Yet with its 160-foot sweeping window wall, the

Jones Theater is closer to mainstream Modernism than to picturesque styles or the cutting edge of architectural fashion.

The architect oriented the theater to the campus by defining the entrance with an overscaled portico leading into a curving, two-story foyer. In deliberate contrast to the light and airy lobby, the 767-seat theater is finished in dark oak paneling and 23-carat-gold leaf. The architects arranged rows of seats in parabolic curves around the modified thrust stage, and shallow balcony and box seating accentuate intimacy between audience and performer.

Cedar City's Shakespeare Festival features a repertory schedule alternating three plays every other day, with matinee and evening performances. The Randall Jones Theater



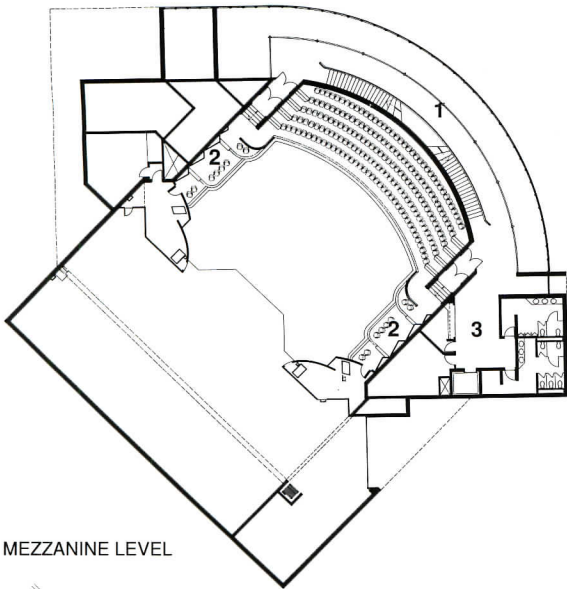
was designed so that three plays could be mounted simultaneously. The huge projecting form behind the stage provides space for two entire sets while a third is on stage. "We can change from one play to another in 45 minutes," says the festival's founding director Fred Adams.

Visitors may assume that Utah's strong Mormon influence might not provide the most supportive environment for a theatrical festival. On the contrary, the Mormons have fostered theater as a means "to represent in character evil and its consequences, good and its happy results and rewards," in the words of their founder, Brigham Young. The Randall Jones Theater is a befitting place to express just such human drama. ■

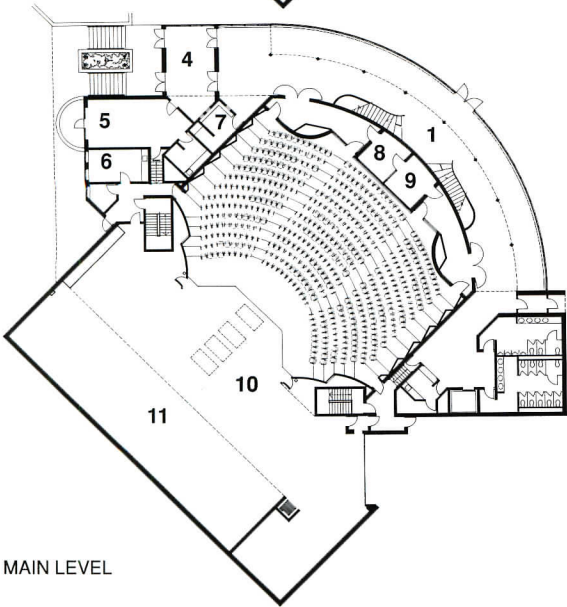
—LYNN NESMITH



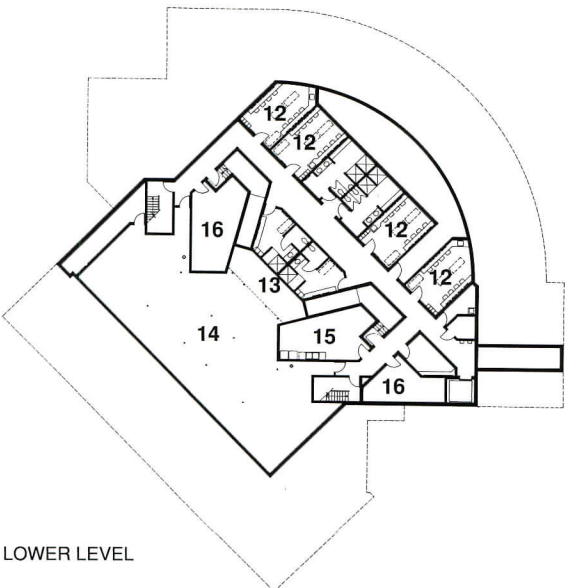
The theater's sweeping wall (facing page) faces the landscaped courtyard of the proposed square (right). The main entrance (above right and top) is situated at the southwestern corner of the site.



MEZZANINE LEVEL

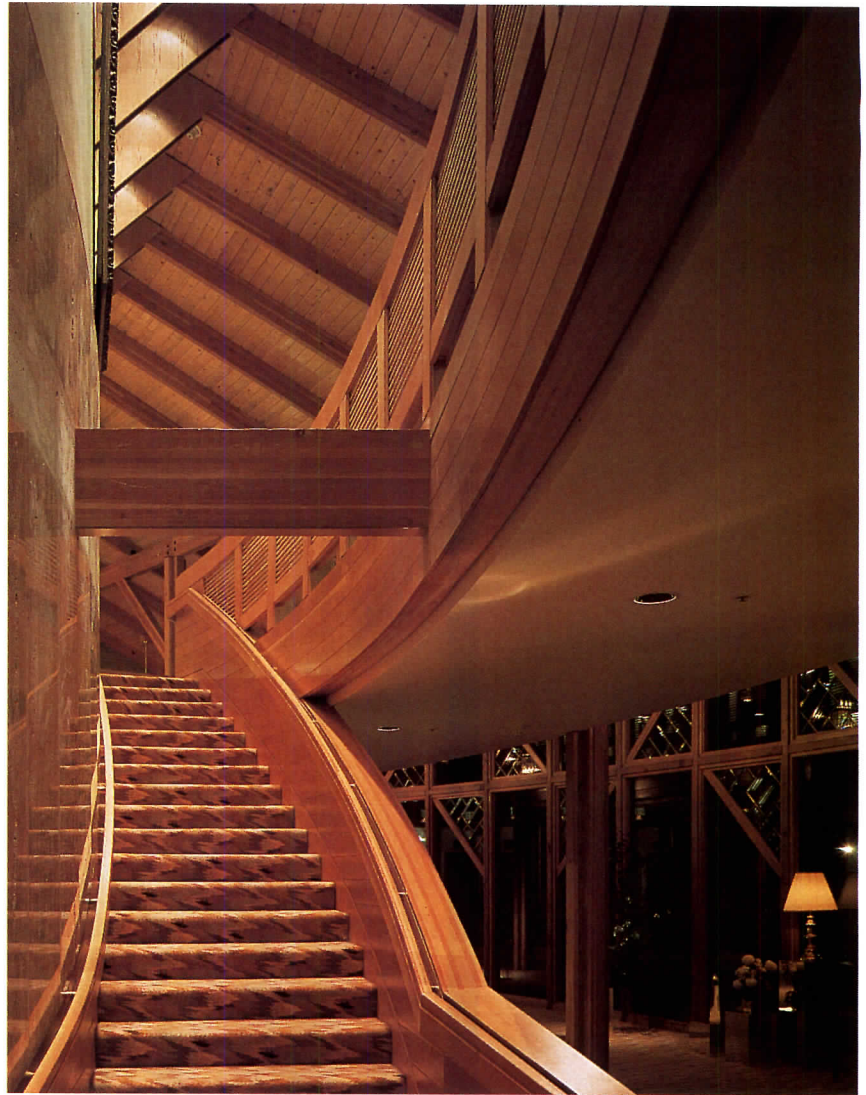


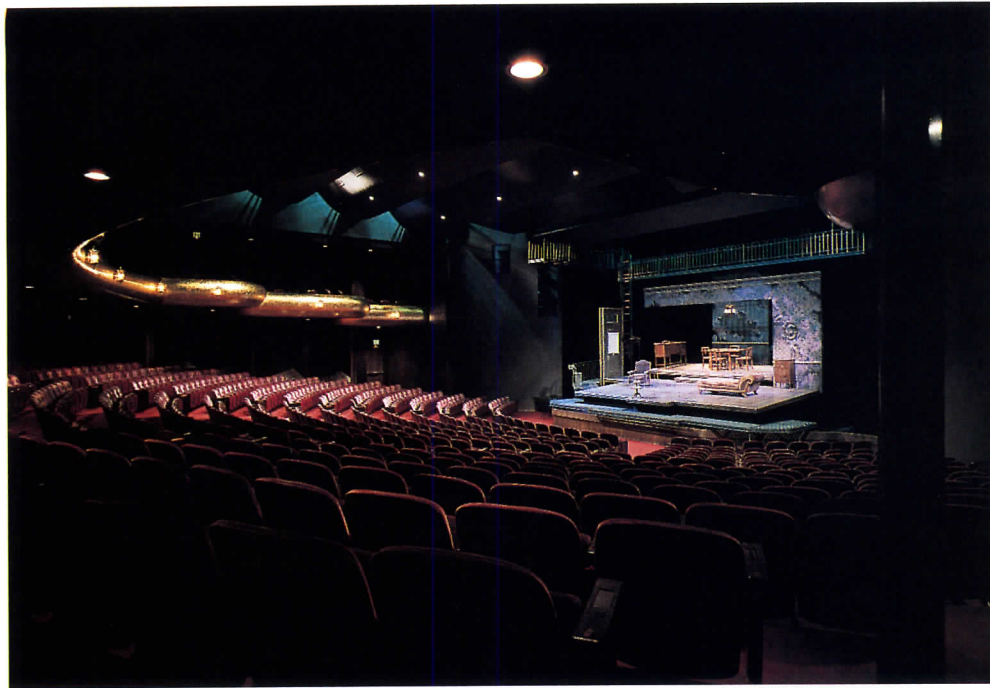
MAIN LEVEL



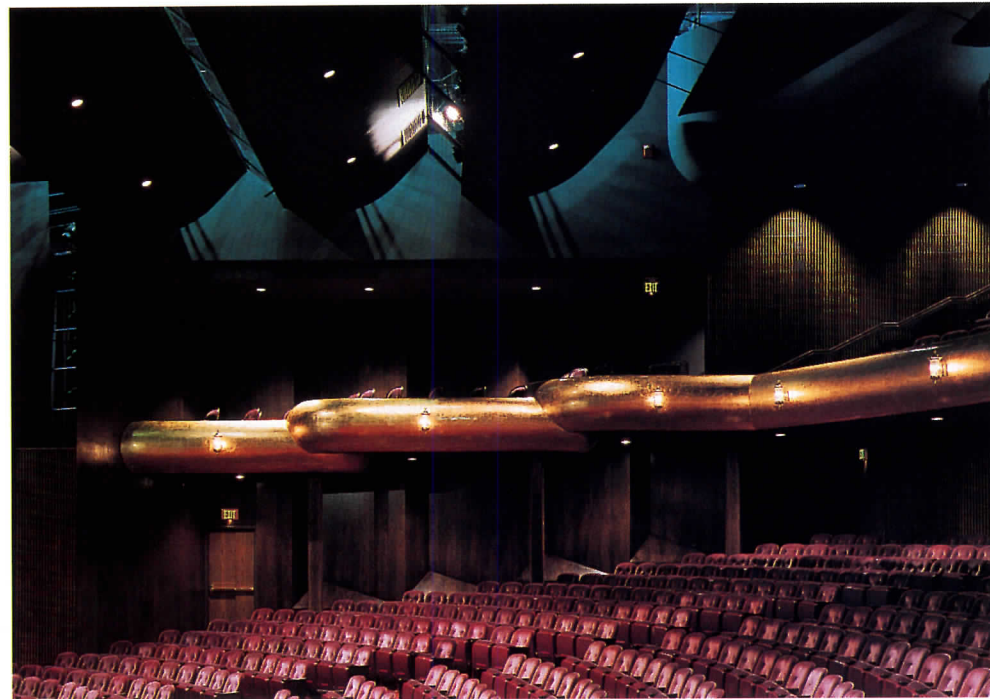
LOWER LEVEL

- | | |
|-----------------|-------------------------|
| 1 LOBBY | 9 SOUND CONTROL |
| 2 BOX SEATING | 10 STAGE PLATFORM |
| 3 CONCESSIONS | 11 REPERTORY STORAGE |
| 4 VESTIBULE | 12 DRESSING ROOMS |
| 5 FOUNDERS ROOM | 13 ORCHESTRA PIT |
| 6 GREEN ROOM | 14 TRAP ROOM |
| 7 TICKETS | 15 COSTUMES |
| 8 LIGHT CONTROL | 16 ELECTRICAL EQUIPMENT |



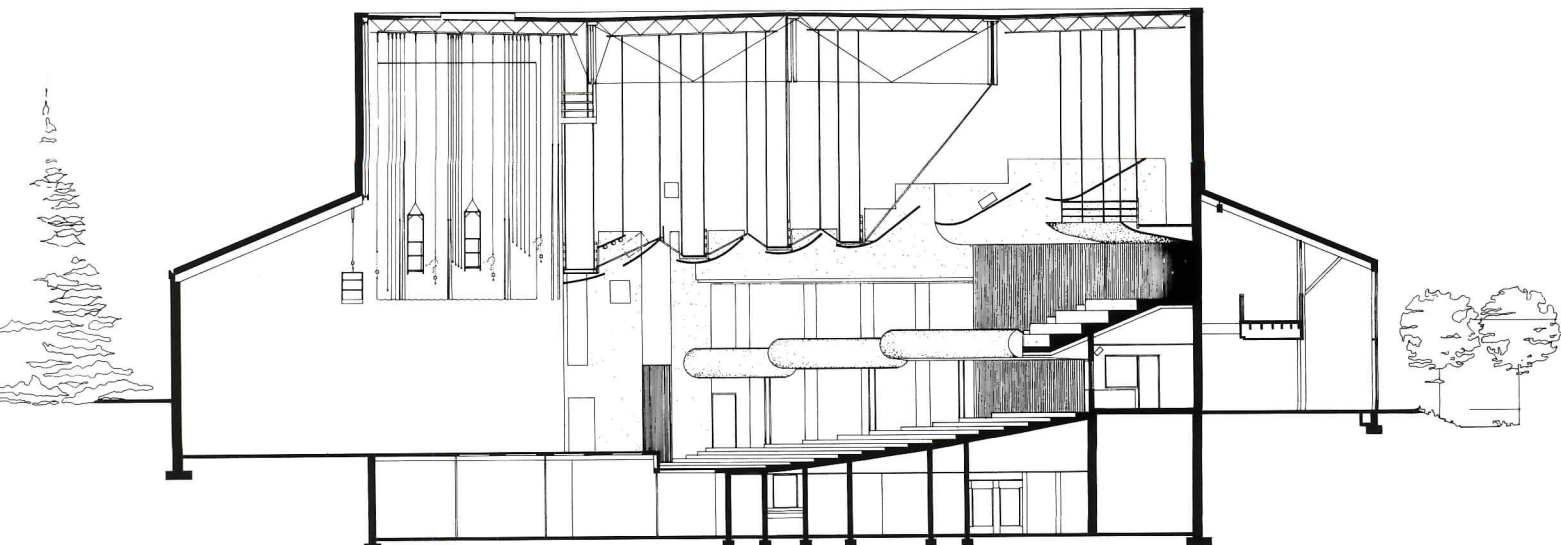


Twin curving stairways in the two-story foyer (facing page, top) lead to a mezzanine level that offers views out to a terrace and the Utah mountains beyond. The architect contrasted the wooden timber trusses with more polished finishes for the railings, which feature concealed lighting on the upper level (facing page, bottom). The stage (left, above) enjoys the flexibility of combined thrust and proscenium features, fusing a stagehouse with flies and a thrust apron without the requirement of a fire curtain. Special stage entrances are available when dictated by production demands. The trap room under the stage supports a small orchestra for musical performances and features a fan-shaped orchestra arrangement. Suspended sculptural forms cover upper catwalks and lighting platforms (left, center). Building section (left, below) illustrates the facility's boxy volume, revealing that the stage is the same height as the house.

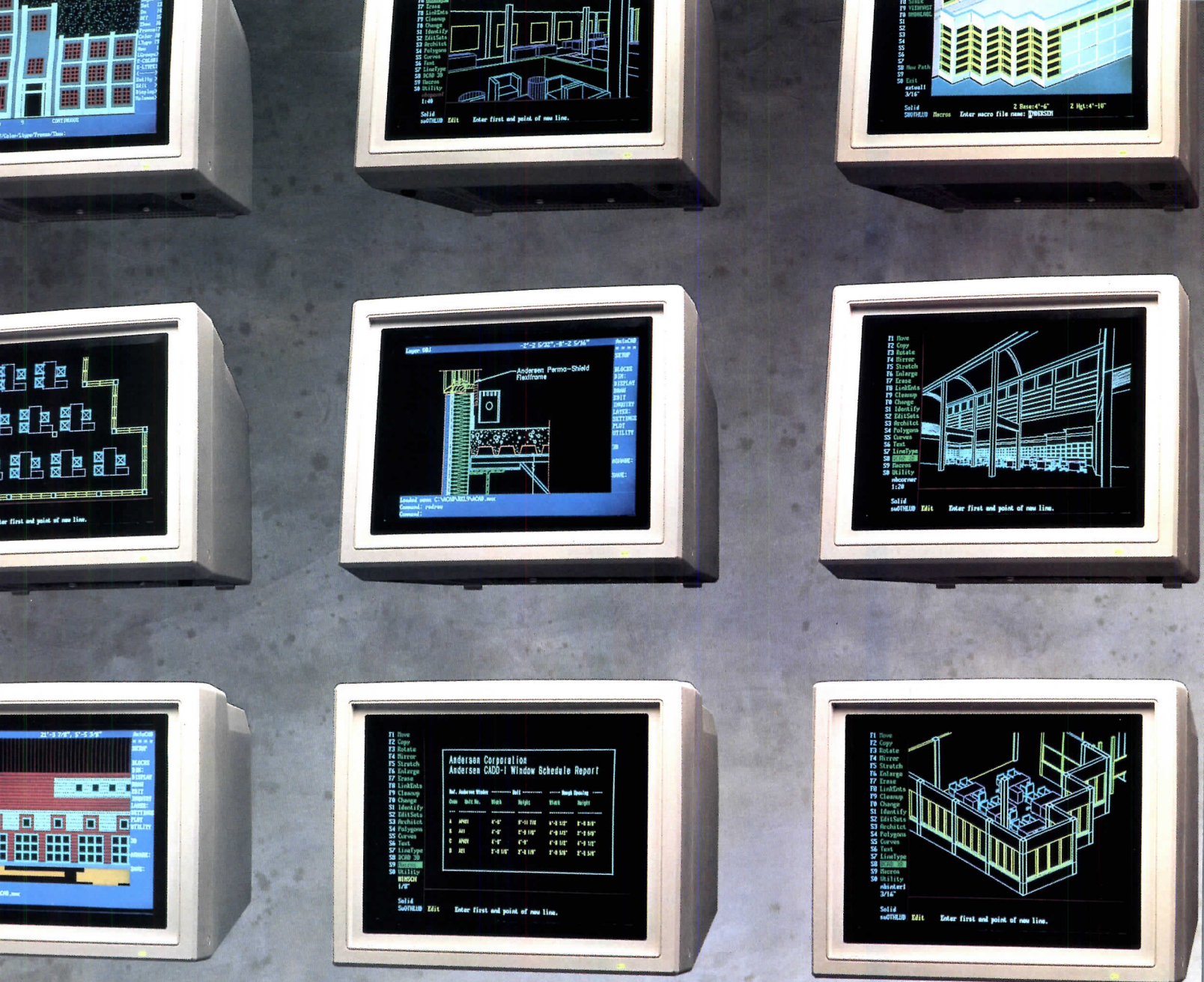


RANDALL L. JONES MEMORIAL THEATER
CEDAR CITY, UTAH

ARCHITECT: FFKR, Salt Lake City, Utah—
M. Louis Ulrich, AIA, (principal-in-charge);
David Proctor, Thomas A. Buese, AIA, James B.
Lohse (project team)
ENGINEERS: E.W. Allen Associates (structural);
Colvin Engineering (mechanical); Becherer
Nielsen Associates (electrical)
CONSULTANTS: Landry & Bogan with Cameron
Harvey (design and lighting); Boner Associates
with Morris-Jones Associates (acoustics); Frank
Adams (art glass); Charles Parker (gold leaf)
CONTRACTOR: Gower Construction Company
COST: \$3.1 million—\$83/square foot
PHOTOGRAPHER: Douglas Kahn



BUILDING SECTION



HOW WE'RE HELPING ARCHITECTS

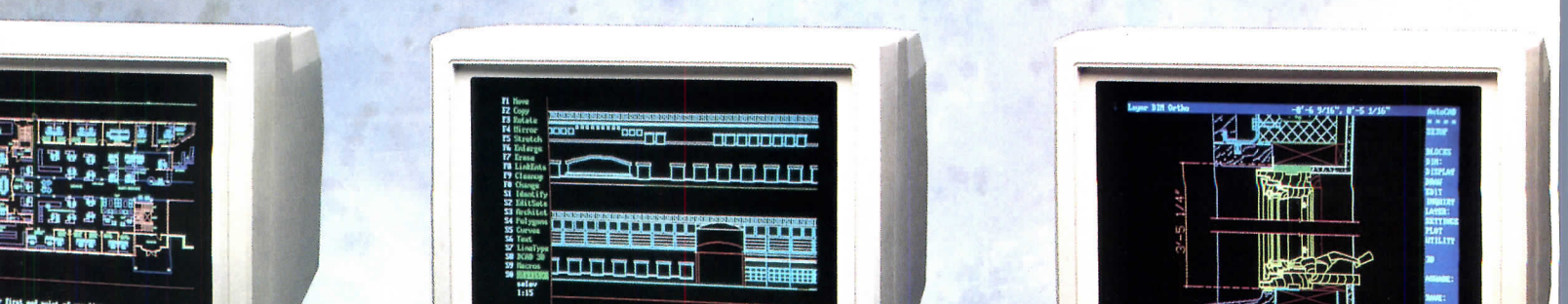
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parametric programs are available for use with AutoCAD®* and DataCAD®† software. And the DXF symbol library allows Andersen CADD-I™ to run with most other CAD packages.

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Accurate Reflections

GLASS: DETAILING COMPONENTS

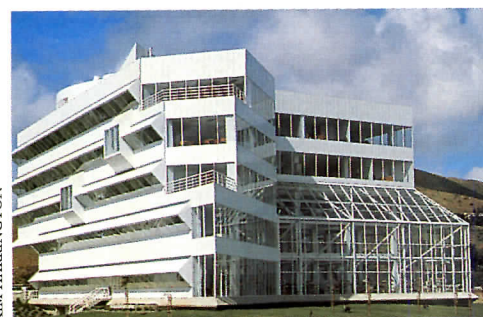
Three projects provide a close-up view of glazed elements and their crucial role in the design process.



"The Link," Kansas City, Missouri
Zimmer Gunsul Frasca Partnership Page 88



3M Austin Center, West Austin, Texas
CRSS, Inc., Architects Page 90



Dakin Building, San Francisco, California
Theodore Brown & Partners Page 92

MULTIPLE FACTORS MAY INFLUENCE the specification and design of contemporary glazing systems. Climate can create particular demands, especially if it is not addressed in the configuration of a building's plan and massing. Architects must determine whether the primary criterion for a building's form and orientation is a response to natural light, or whether other constraints dictate a glazing system that will correct deficiencies in daylighting control and thermal transmission.

Glazing is an effective way to convey an image of lightness and transparency, but large areas of glass, depending on the region, can generate excessive heat loss. A deep plan also presents problems in providing adequate daylighting from the sides to the core of the building. This disadvantage can be corrected in a one-story building by glazing roof areas, but if the structure has multiple floors, a central atrium may become necessary.

Available views affect decisions concerning the size, location, and total glass percentage of the exterior walls. To address safety concerns, location of the glass will also influence composition of the glazing. Laminated, heat strengthened, or tempered glass may need to be specified to guard against areas vulnerable to impact. Wired glass affects the appearance of windows that require fire-rated glazing.

All of these considerations should strike a balance with the choice of structural framework. Punched openings in a load-bearing wall are limited by allowable spans for lintels over window openings, and the ability to transfer loads from above. Skeleton frames clad with a curtain wall have no such constraints, enabling nearly unlimited glazing with floor-to-ceiling glass, if so desired. Both punched openings and curtain walls, however, must contend with the constraints of heat transfer and glare.

As the design progresses, several options are available to control infrared solar radiation and achieve the optimum shading coefficient, reducing heat transmission. Insulated glazings consisting of multiple layers of glass (in combination with a range of tint levels and colors, or mirrored films) can be specified, but glazing coatings also reduce visible light transmission. An alternative may be re-

flected or bounced light, which, if manipulated correctly, can bring pleasing natural light to areas unable to receive direct sunlight through the strategic placement of light wells, scoops, and reflective lenses.

To reduce glare, shading can be created by several means, from fixed elements such as wall projections and roof overhangs to interior blinds and shades. Interior treatments may reduce glare effectively but are ineffective against heat gain, since solar radiation must be deflected before it is absorbed by the glass and reradiated into the building.

To compensate for different expansion properties of materials that are not homogeneous, thermal movement near glass panels, glazing surrounds, and the building's structural frame must be accounted for at junctures between these systems. Sliding joints at mullions and structural frame attachments can be designed to allow for adjustment corrections. Flexible sealants and neoprene gaskets are effective edge treatments that have the added benefits of preventing moisture penetration and reducing air infiltration into a building.

Any joints created by openings and junctures between wall or roof systems are susceptible to moisture infiltration. Minimizing the glazing's exposure to water is the first precautionary measure, but joint closures must be designed to limit vulnerability effectively. Some moisture will inevitably penetrate to the interior, however, creating the need for a weep system for drainage.

The ultimate combination of elements that form a properly functioning, esthetically pleasing glazing system may create a complex and often problematic equation whose variables are solved through an evolving design process. That formula will have ramifications for a building's structure, facade articulation, artificial lighting, and mechanical systems. The end result should be a well-thought-out balance between these elements.

On the following pages are three projects in which the consideration and implementation of glazing systems were an essential part of the design. They highlight how innovative uses of glazing can affect the final expression of an architect's intentions. ■

—MARC S. HARRIMAN

The Link Kansas City, Missouri Zimmer Gunsul Frasca Partnership

GLASS: DETAILING COMPONENTS

A new walkway between office buildings features exposed supports and skyline views.

A STEEL FRAMEWORK SHEATHED IN glass that snakes its way through downtown Kansas City, Missouri, the Link provides a connection to five separate buildings that are part of the Crown Center office complex. Primary goals in the design of the Link included limiting the impact of an elevated walkway in an urban site, while still creating a visually clear and identifiable means of pedestrian access between buildings. Several elements that were considered particularly important were views of the city and the walkway's sense of transparency, dictating that the Zimmer Gunsul Frasca Partnership clad the Link almost entirely in glass. Its support structure was made of an exposed tensile steel-tube truss that was configured in a triangular form due to the inherent rigidity provided by diagonal bracing (left). This structural organization also minimized the size of the individual truss members, and contributed to the walkway's transparency.

To account for the different expansion properties of the steel framework and aluminum mullion system, slip joints with a set screw were designed at the corners of the framework. These joints allow for any adjustments needed to correct

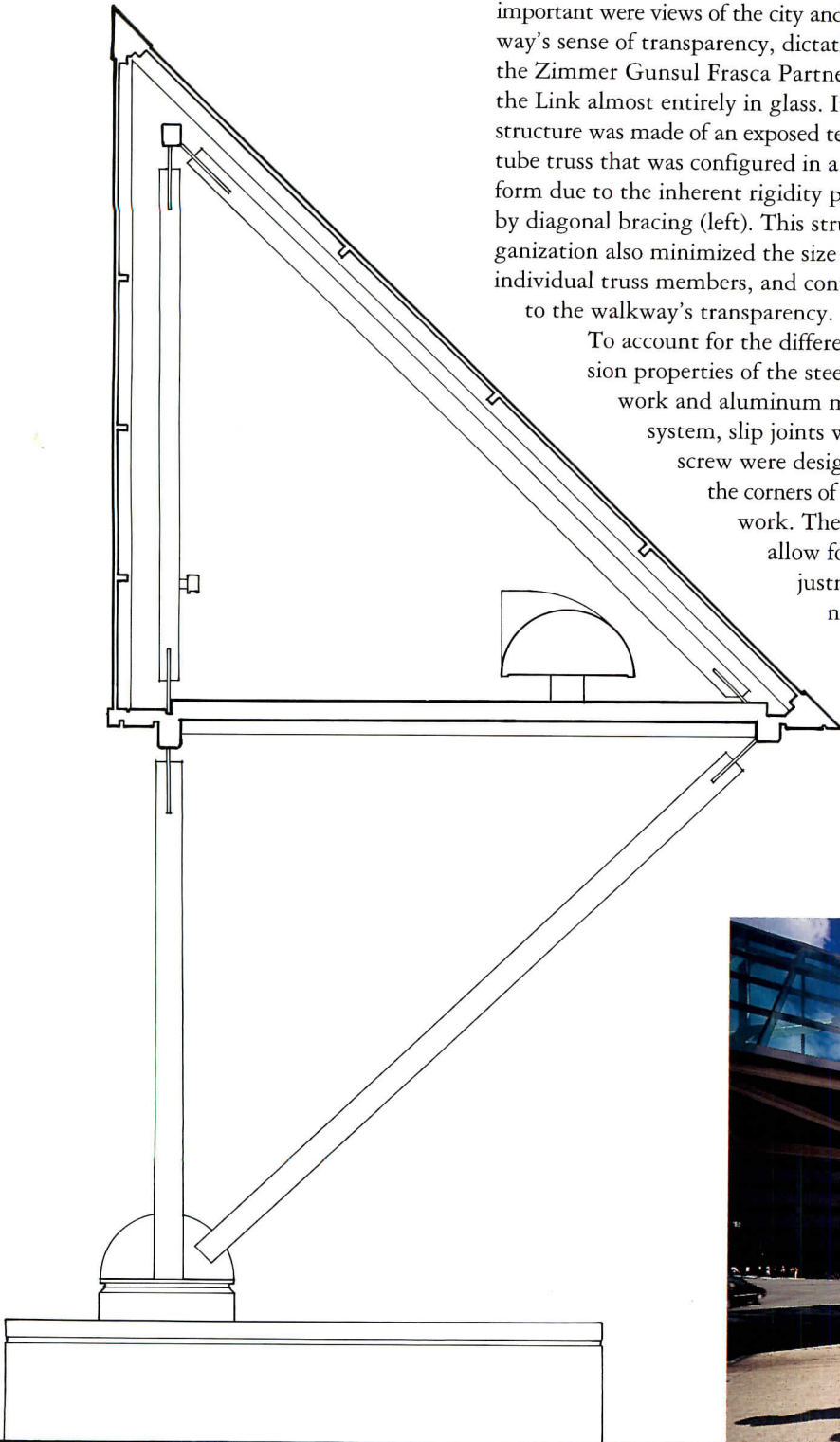
alignment deviations created by thermal movement. To accommodate the slip joints, the glass panels were fabricated with inset channels.

Moisture from condensation is controlled by an internal weep system of aluminum channels located at the inside face of the horizontal crossbars between the vertical mullions. Continuous stainless steel gutters capture and redistribute moisture at the base of sloped rafters.

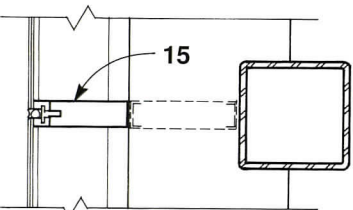
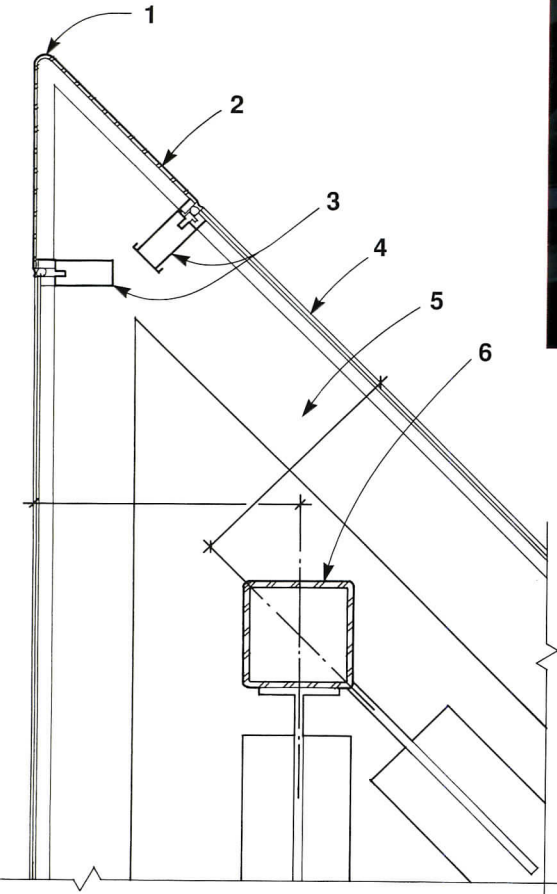
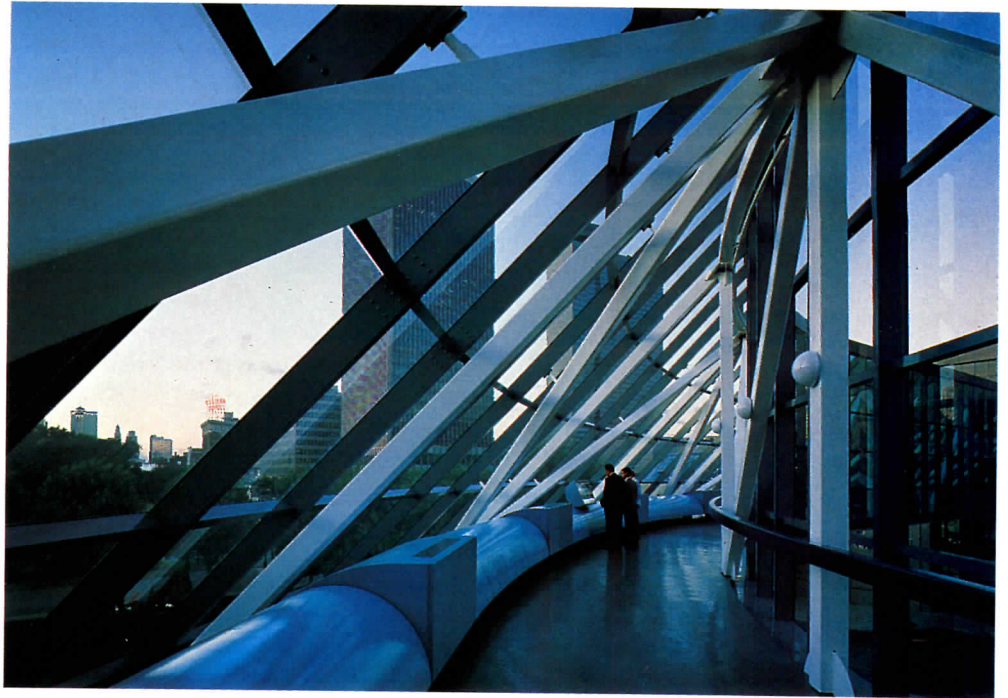
An enclosed pedestrian walkway protects its users from the elements and allows control of the interior climate. However, weather still affects the choice of glazing—a solar glass was therefore chosen to minimize heat gain. Although the glass is single glazed, it consists of two laminated layers: a clear inner sheet, and a green-tinted outer layer to limit solar radiation penetration. A single layer of glazing was chosen to prevent ice formation on the sloped face, which could pose a danger to pedestrian and vehicular traffic below. Since insulated glass was not specified, the surface temperature of the exterior glass face is maintained in the winter by warm interior air, which is carried in an exposed conduit housing heating and ventilating systems.

Because glass surrounds the entire walkway from floor to ceiling, the impact resistance of the glazing is crucial for safety. The strength of laminated glazing and the ability to control fragmentation is increased by an interlayer of polyvinyl butyral (PVB), which is used to bond the layers together. Laminated glazing is also superior to monolithic glass in the reduction of sound transmission at frequencies associated with traffic noise—an added benefit for this downtown location.

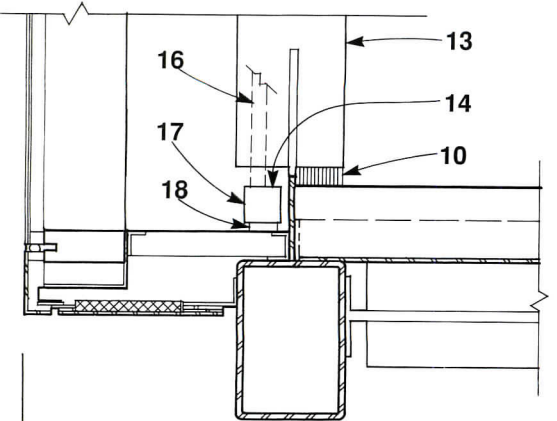
—M.S.H.



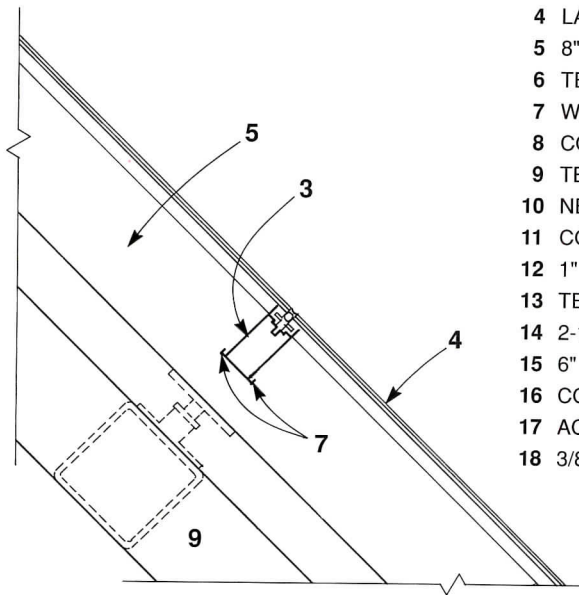
A glazed exterior was essential to allow pedestrians within the Link to view the city. The exposed structure is visible to users of the walkway (right). It also creates a sense of transparency, reducing the apparent size of the structure to viewers on the street below (facing page, bottom). Two vertical sections (below and facing page) show how the skeletal steel-tube truss-and-mullion framework was detailed and assembled.



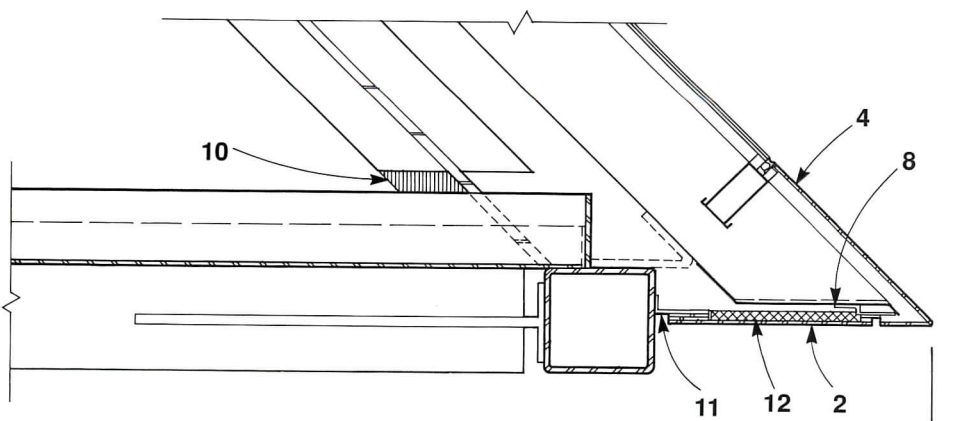
TYPICAL MULLION PLAN



WINDOW WALL SECTION



- 1 3/4" RADIUS
- 2 1/8" STAINLESS STEEL PANEL
- 3 4-1/2" X 2" CROSSBAR
- 4 LAMINATED GLAZING
- 5 8" X 2-1/2" RAFTER
- 6 TENSILE STEEL RIDGE STRUCTURE
- 7 WEEP CHANNEL
- 8 CONTINUOUS ST. STEEL GUTTERING
- 9 TENSILE STEEL STRUCTURE
- 10 NEOPRENE FILLER
- 11 CONTINUOUS ST. STEEL SUPPORT
- 12 1" RIGID INSULATION
- 13 TENSILE STEEL COLUMN
- 14 2-1/2" X 2-1/2" WIREWAY
- 15 6" X 2-1/2" MULLION
- 16 CONCEALED CONDUIT
- 17 ACCESS PANEL
- 18 3/8" SPACER



18' - 0"

**3M Austin Center
West Austin, Texas
CRSS, Inc., Architects**

**GLASS:
DETAILING COMPONENTS**

*An adaptation of the Fresnel lens
diffuses southern light to create a partly
cloudy day on an atrium floor.*



GREG HURSLEY PHOTOS

3M AUSTIN CENTER COULD HAVE BEEN the quintessential Class B suburban-office-building cliché, with identical five-story office blocks regularly arranged around a 65-foot-tall atrium. In the hands of CRSS Inc., however, this 1.2-million-square-foot first-phase research center and its daylighted amenity have been massaged to symbolize 3M's collaborative spirit.

Led by the late Paul Kennon, the CRSS design team worked in partnership with researchers and architects at 3M Company to bring daylight into the vast complex. By clustering laboratory and support spaces for 1,500 workers in eight tightly-knit buildings and adjacent structures, the design team encouraged daily interaction of staff members. The "paseo," as 3M's atrium and main circulation path is called, is topped by groups of linear light monitors oriented to the north, but able to admit diffused southern light.

Each light monitor consists of an exterior reflector shaped and positioned to catch direct sunlight and reflect it through clear glazing onto a larger reflecting panel, which bounces the light downward into the paseo. The surface of each reflector is a wafer-thin, extruded-solar-lens reflecting film developed for the project by 3M scientists. They fol-

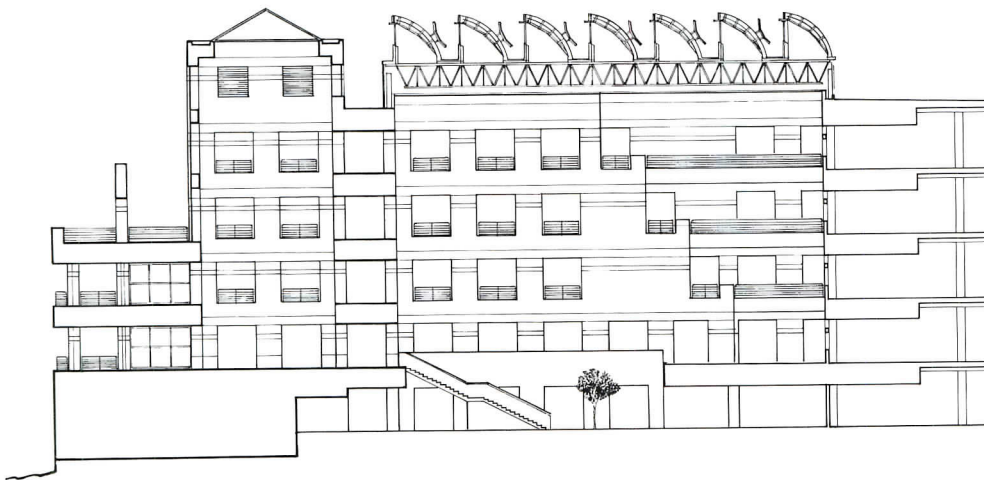
lowed the light-transmission principles of the Fresnel lens, used to direct and intensify light in lighthouses and on stage. The film itself resembles corduroy, with parallel ribs that scatter light 10 degrees. In each reflector, one ribbed surface runs horizontally, the other vertically, to ensure maximum combined diffusion. The film is bonded to an acrylic backing that is mounted on a metal frame to allow for thermal movement. The monitors are framed in steel and clad in standing-seam copper roofing.

Modeling was the key to the lighting system's evolution, says CRSS project director Jim Gatton. A group of students at Texas A&M built a model on the College of Architecture's roof which revealed crucial subtleties. For instance, a space lit wholly by diffusion resembles a "London fog" and lacks a comfortable sense of delineation and contrast. Architects penetrated the fog by placing skylights at four separate elevator banks to introduce shafts of pure sunlight. Test readings in the model showed that light was strongest (as high as 360 footcandles) at the lowest levels of the paseo, a condition borne out in the actual project. Light at the upper levels originates from one or two monitors. Further down, daylight is concentrated from the light of many monitors.

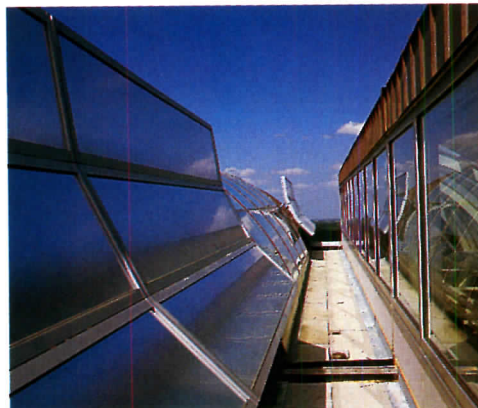
Although the paseo's lighting successfully imitates a partly cloudy day, it is being revised in the center's second phase, says Jim McGregor, CRSS design director of the first phase and now project director of the second. The second phase will include a lab block that mirrors the first phase, an enlarged primary reflector suspended beneath an insulated skylight, and a secondary reflector whose arc reaches from one skylight to the next, creating an uninterrupted alternation of tempered direct and diffused daylight.

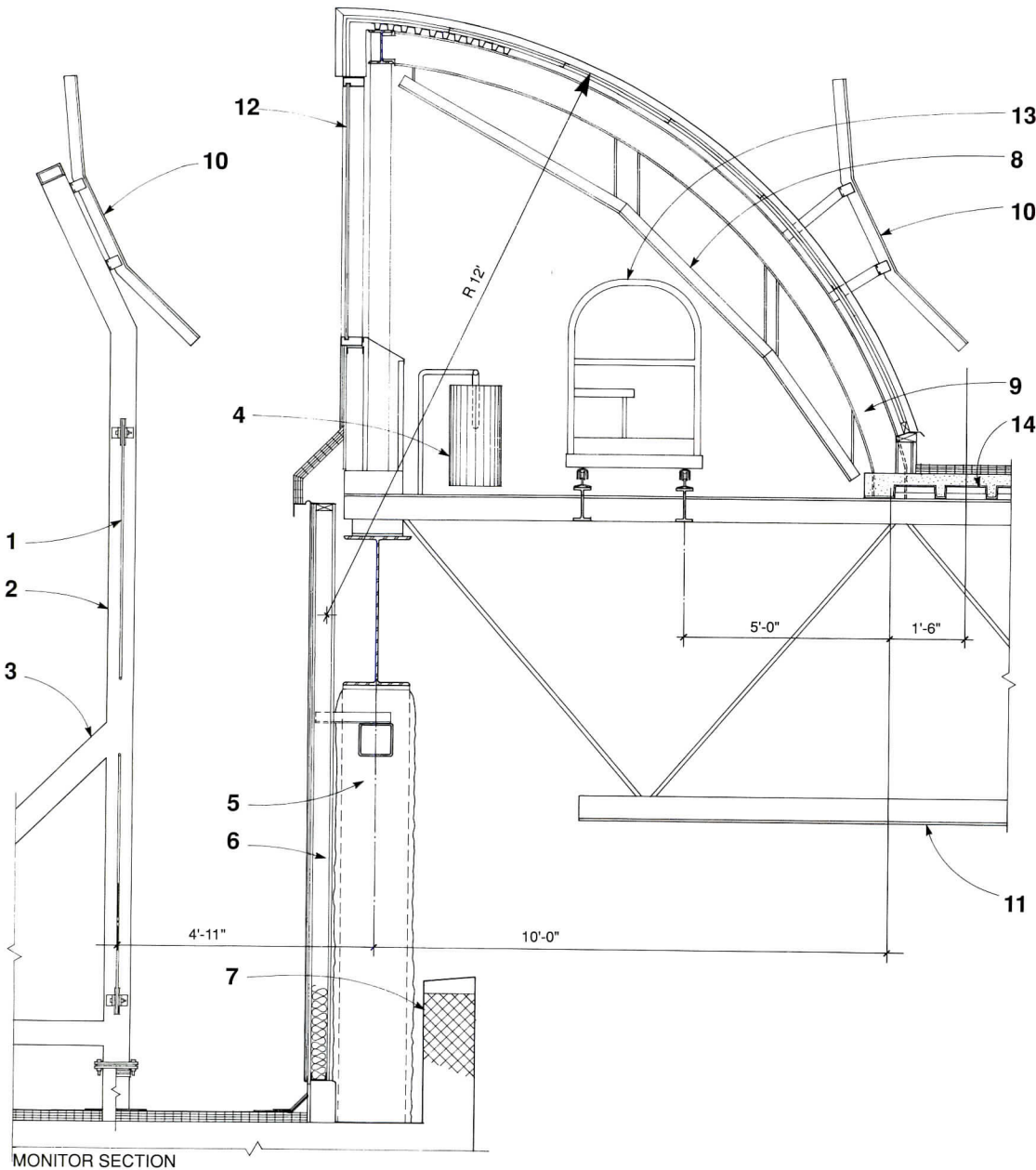
—RAY DON TILLEY

Ray Don Tilley is the associate editor and art director of Texas Architect.



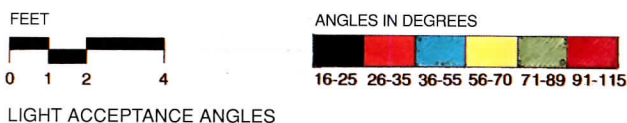
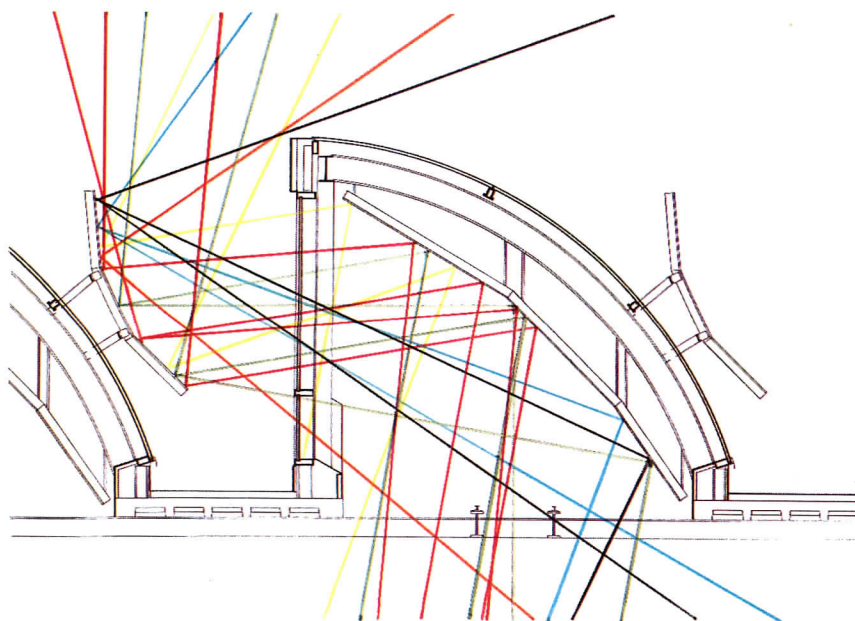
The light monitors of 3M Company's new research center in West Austin (top) reach back to Fresnel lens precedents and forward to the company's aggressive product development to create a simple but precise recreation of daylight inside. The monitors are grouped above a full-height linear atrium (above) that zigzags next to four of the eight lab buildings on the 162-acre site. Direct sunlight strikes an exterior reflector (right), and passes inside to a secondary diffuser (far right). On the paseo floor, the diffused light is concentrated from all the monitors.





- 1 CROSS-BRACING
- 2 FREE-STANDING LENS SUPPORT
- 3 FREE-STANDING LENS SUPPORT BRACING MEMBER
- 4 LIGHT FIXTURE
- 5 STEEL COLUMN BEYOND
- 6 STEEL STUD WALL CONSTRUCTION
- 7 CMU CONSTRUCTION
- 8 SECONDARY REFLECTOR
- 9 STEEL BEAM
- 10 PRIMARY REFLECTOR
- 11 STEEL TRUSS
- 12 INSULATED GLASS
- 13 WINDOW WASHING EQUIPMENT
- 14 ROOF DECK

Section through the foremost monitor (left) reveals the day-lighting system in detail. 3M reflecting film is adhered to an acrylic backing, which is attached to curved steel beams. Infrequently-used light fixtures project from the plane of the simple, clear glazing. Diagram (below, left) shows the range of light-acceptance angles—from 16 degrees to 115 degrees above the horizon—for each primary reflection. The broad range ensures that sufficient light is gathered throughout the day. At elevator banks (below), the monitor system is interrupted by a skylight, which admits sunlight to impart contrast to what might otherwise be a statically consistent environment.



Dakin Building San Francisco, California Theodore Brown & Partners

GLASS: DETAILING COMPONENTS

Architects angle for a view from a San Francisco office tower, designed to capture sunlight.

RESPONDING TO THE CLIENT'S REQUEST, the Dakin building is situated to take advantage of views of San Francisco Bay, but the building's configuration is a direct response to natural light. Theodore Brown, principal architect for the project, says he is frequently approached by other architects who are curious about the glazing system he designed. He reveals that the successful incorporation of daylight in the project is largely based on a manipulation of the building's geometry, using calculated angles to capture and control sunlight.

Since the primary views are to the north, and light from this direction produces little glare, the building's central atrium opens in that direction. The two north-facing atrium walls are faced entirely in glass, rising three floors to a sloping, completely glazed roof. Due to the expanse of glass, the projecting atrium gives the impression of a greenhouse, creating the effect of extending the interior to an adjacent park and to the bay beyond.

The rear of the atrium, at the core of the building, benefits from a 40-foot-wide skylight constructed of laminated glass. Chosen for its higher resistance to fracturing over monolithic glass, the laminated glass skylight offers a greater degree of safety for the occupants. Reducing heat gain inside the building was a concern in the choice of glass layering, so insulated glazing was avoided for this extensively glazed northern facade, composed of a single glass thickness.

In order to reduce heat gain, diffuse the intensity of direct sunlight, and eliminate glare from windows on the southeastern and southwestern exposures, the window heads were extended outward, rotated slightly more than 45 degrees from the building face. This calculation was based on the angle of solar-incidence relative to the glass face. The angled wall projections provide continuous and permanent sunscreens, eliminating the need for interior blinds and shades. This configuration also reduced the amount of heat absorbed, since most of the sunlight entering the building is indirect reflected light with reduced levels of infrared radiation.

The sloped glazing face produced several additional benefits. Vertical glazing usually produces reflections of the building interior, which were eliminated with tilted windows. Also, rainwater travelling down the building face is deflected by the angled steel panel wall over the windows, creating a drip edge that limits the exposure of the window frame and glazing joints to moisture, while shielding the glass from dirt and streaking. The support for these angled windows is masked by the alignment of steel tubes behind the vertical and horizontal aluminum mullions, and separated by neoprene gaskets to allow for differential movement between the two independent systems.

Rather than allowing the materials to dominate the design decisions, the architects considered the sun and its properties carefully and employed glazing techniques to support design and programmatic considerations.

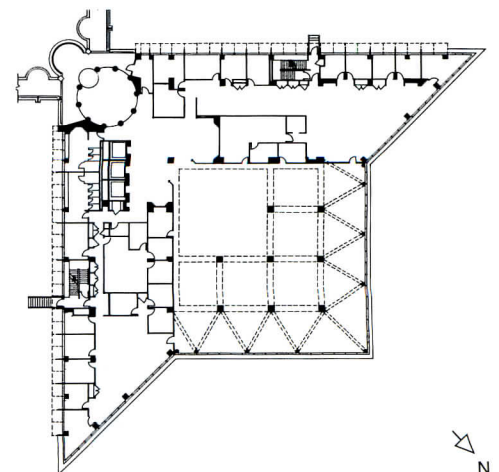
Based on its inventive design, the Dakin Building was recently named a semi-finalist for the 1990 Quaternario Award, a biannual international competition for buildings that demonstrate innovative architectural technology, employed with esthetic and environmental sensitivity. ■

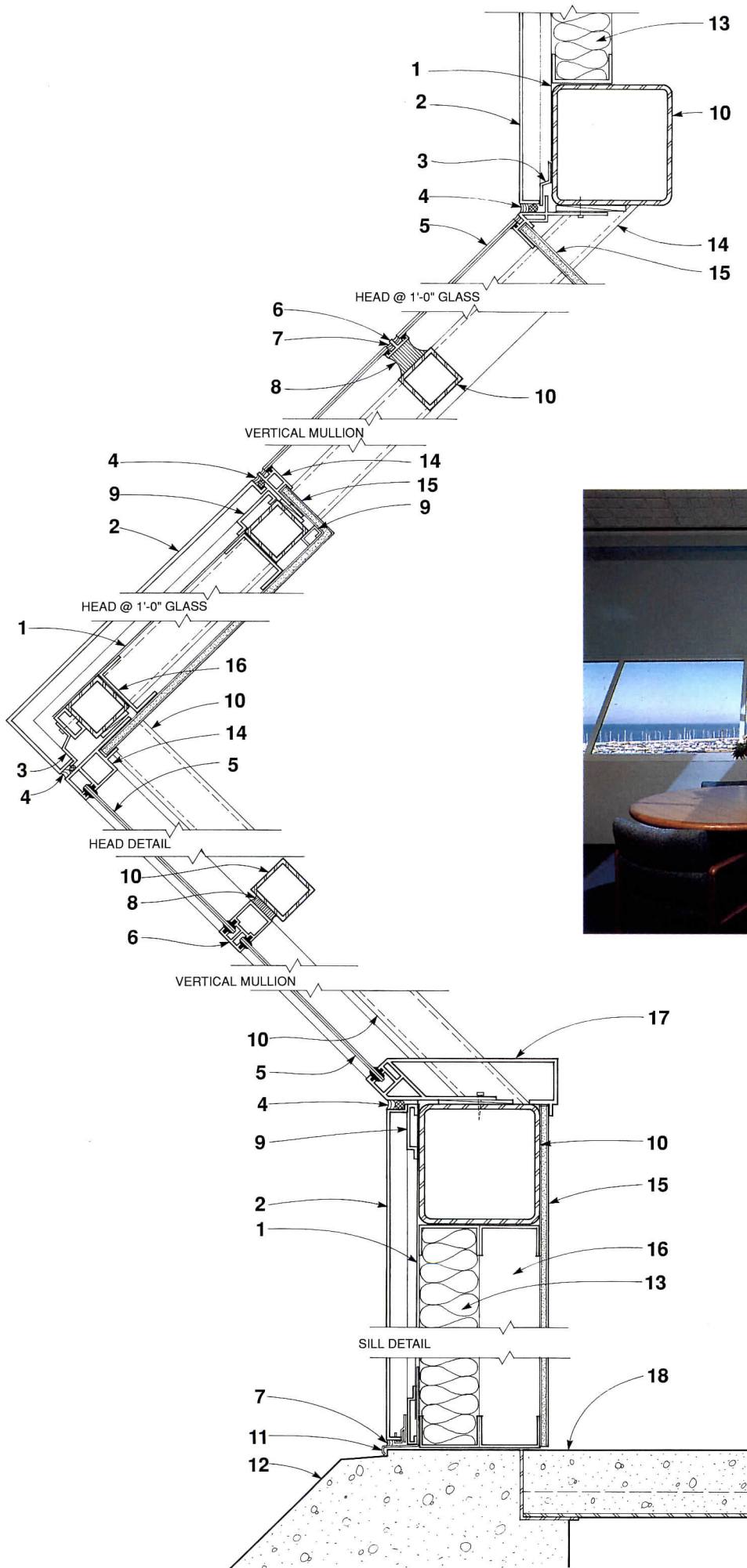
—M.S.H.

Plan (bottom right) shows how the Dakin building opens up to the north. A view from the northeast (below) reveals how the orientation of the building influenced the choice of glass. The southeast- and southwest-facing windows (section, facing page) are tilted, shaded from the sun by metal-panel wall projections located above. This arrangement allows for glare-free views from interior offices overlooking the bay (facing page, inset).



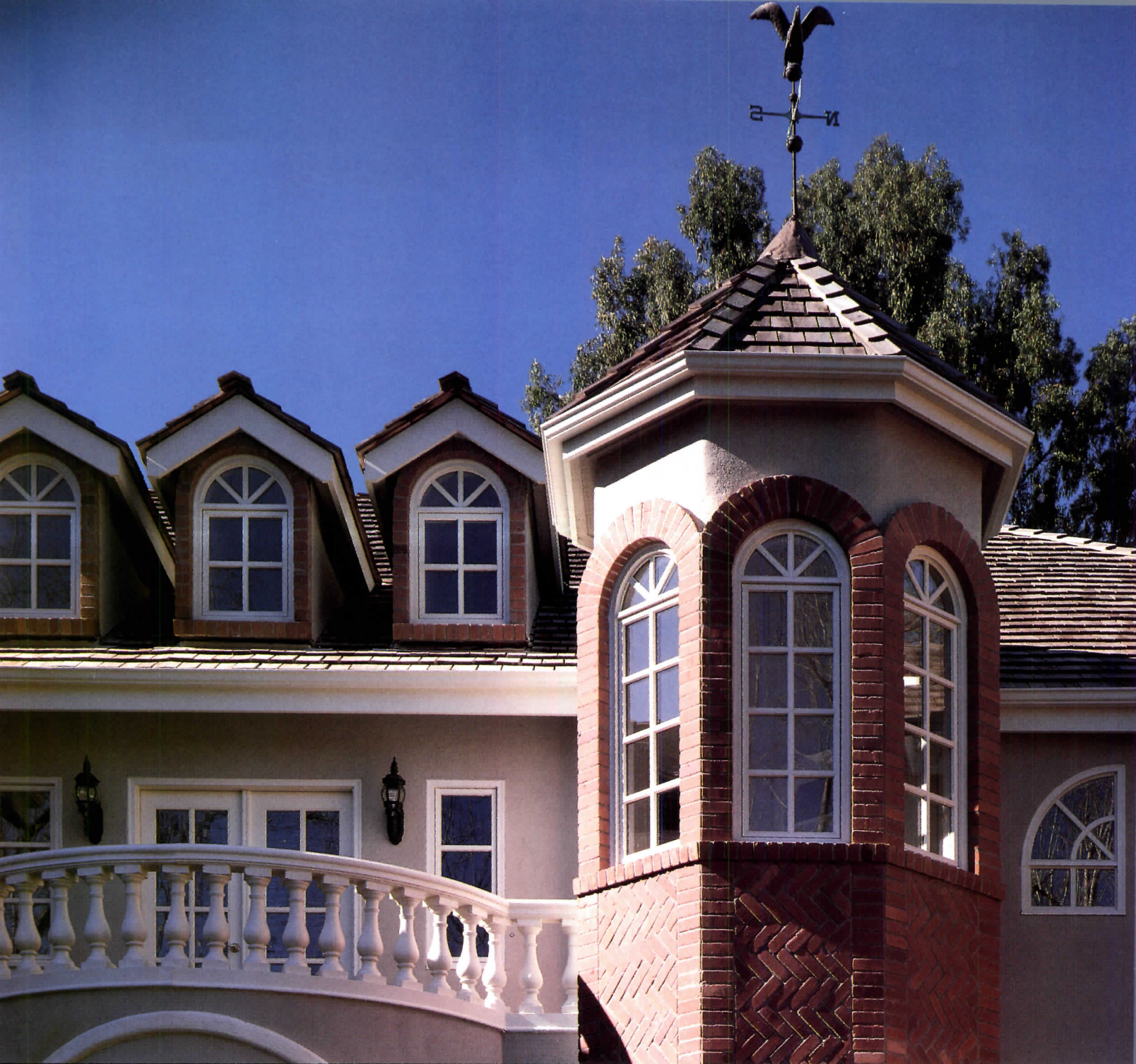
KIM HARRINGTON PHOTOS





- 1 BUILDING PAPER
- 2 METAL PANEL
- 3 METAL CLIP
- 4 SEALANT WITH BACKER ROD
- 5 GLASS
- 6 ALUMINUM MULLION
- 7 SEALANT
- 8 NEOPRENE GASKET
- 9 METAL FURRING CHANNEL
- 10 STRUCTURAL STEEL TUBE
- 11 METAL FLASHING
- 12 CONCRETE PERIMETER BASE
- 13 BATT INSULATION
- 14 ALUMINUM FRAME
- 15 5/8" GYPSUM BOARD
- 16 METAL STUD FRAMING
- 17 ALUMINUM SILL
- 18 CONCRETE OVER METAL DECK

SECTION THROUGH ANGLED WINDOW



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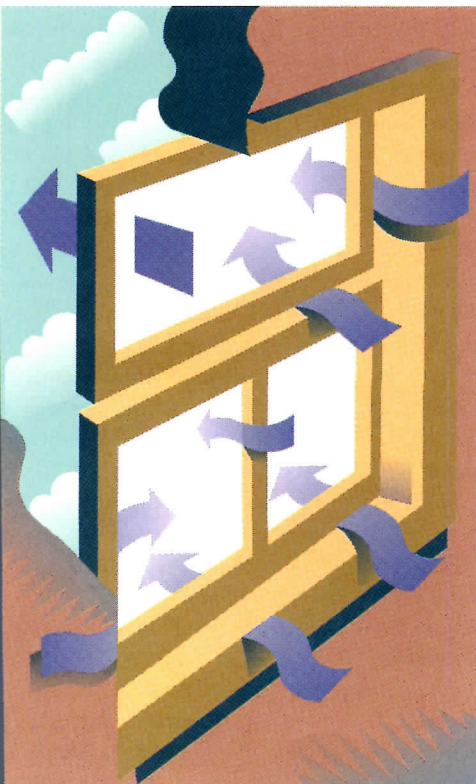
Circle 77 on information card

An Improved Outlook

GLASS:
WINDOW DEVELOPMENTS

Recent advances in sun-blocking, U-V blocking, and sound control are dramatically improving architects' options.

Within the thermal envelope, the weak spot is generally the window (below). Arrows indicate sources and degree of loss. Chart (bottom right) shows comparative leakage rates of common windows, listed by type.



WINDOW TECHNOLOGY IS CHANGING so quickly that it's almost impossible to keep up with the latest developments. Just five years ago, for example, it was difficult to specify a window with a center-of-glazing R-value greater than 3; today, center-of-glazing R-values above 8 are on the market. These "super windows" can actually gain more energy than they lose averaged over a heating season, opening up tremendous opportunities for passive solar design.

Other new developments in the industry include windows that block out most solar gain yet appear perfectly transparent. New edge seals and glazing spacers are being built into windows to balance the improvements in glazing performance. High-performance laminated safety glass is just entering the market, offering more design possibilities for residential and light commercial buildings. And at the far end of the spectrum, glazing that provides total privacy at the touch of a switch by turning glass from clear to opaque is now available.

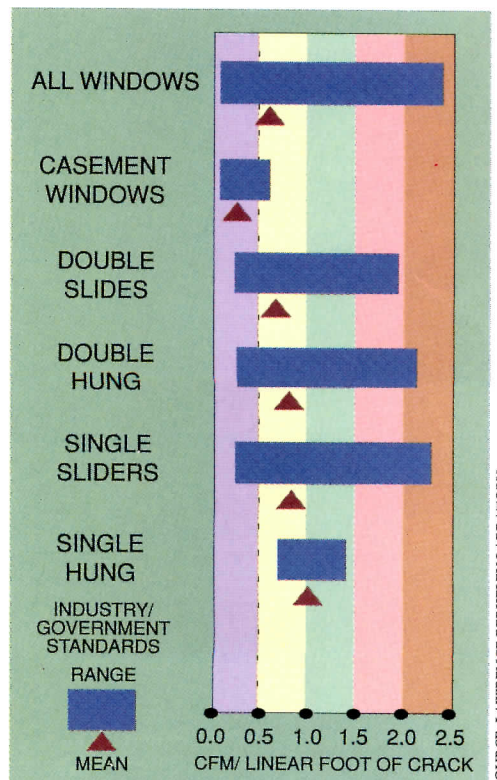
All these new types of windows dramatically increase the architect's design options, but they also increase the complexity of specifying windows. For residential and light commercial applications, specification is no longer simply a question of determining window and trim styles; architects now need to decide on specific glazing types—and it increasingly makes sense to specify different glazings for different locations within a single building.

Low-E coatings

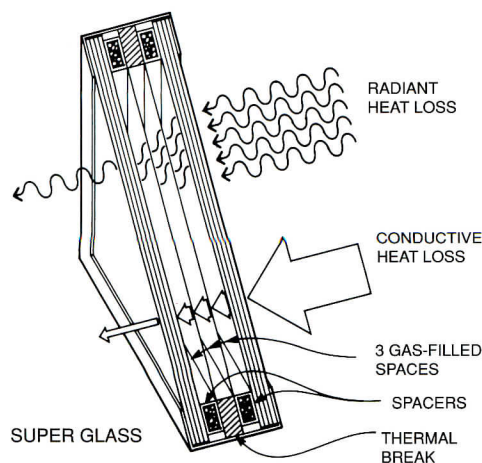
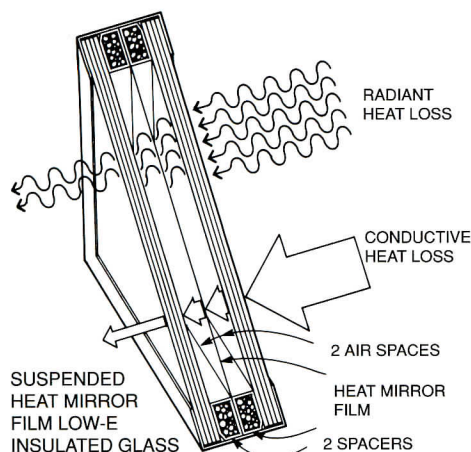
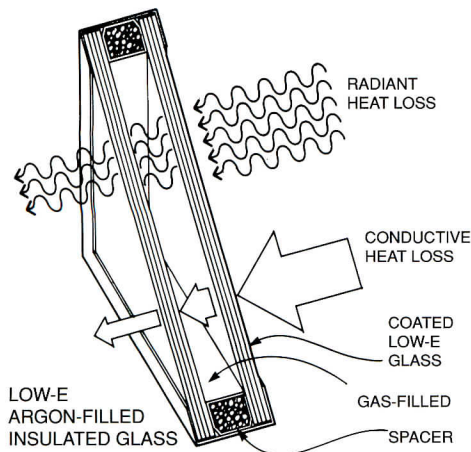
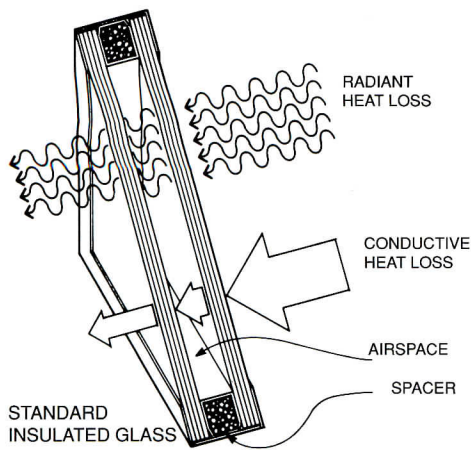
ARGUABLY THE MOST SIGNIFICANT advancement in window technology over the past several decades has been the development of low-emissivity, or low-E, coatings. Very thin metal coatings, either placed directly on the glass or suspended on plastic film, dramatically boost energy efficiency by reflecting, rather than absorbing, long-wavelength light. These glazings are selective in their transmission properties; that is, they allow one wavelength to pass through more easily than another. A low-E coating can boost the R-value of insulating glass by more than 50 percent, from about R-2 to R-3 center-of-glass values.

The most common low-E coatings are deposited directly on the glass in one of two ways: either by sputtering a thin layer of silver and metal oxide on the cured glass (soft-coat), or by depositing a reflective layer on the glass during manufacturing (hard-coat). Soft-coat glazings reduce emissivity to about 15 percent in commonly available products, but the coating is relatively fragile and must be protected in sealed insulated glass units. Hard-coat, or pyrolytic, low-E coatings, on the other hand, are very durable and do not need to be protected within sealed glass units. Until recently, however, their energy performance was significantly lower than soft-coat products (emissivity of 40 percent). Furthermore, windows treated with this coating displayed a bluish tint, which some architects and homeowners have tried to avoid.

Suspended-film low-E windows feature a separate layer of plastic film suspended between the layers of glass and deposited with a soft-coat low-E coating. As a result, two insulating air spaces are provided, further boosting R-value.



SOURCE: LAWRENCE BERKELEY LABORATORY



High performance glazing systems (above) reduce radiant and conductive heat losses.

Low-E windows now account for about half of all residential windows sold, according to industry experts, and the largest window manufacturer, Andersen Corporation, now offers low-E standard on all insulated windows. Second-generation products have just been introduced to the market in both soft-coat and hard-coat products. Cardinal, supplier of glass to Andersen and other manufacturers, has just introduced a new soft-coat product called low-E-squared (low-E²) with emissivity reduced to a remarkable 3 or 4 percent, boosting R-values even further. Visible light transmittance has only dropped 10 percent from that of the standard soft-coat low-E, but total solar transmittance is 33 percent lower and the shading coefficient is 31 percent lower, owing to low-E²'s selective wavelength properties. As a result, this product is suitable for warm climates and spaces with large west-facing window areas that could overheat.

The developments in hard-coatings are just as significant. LOF and Pilkington Glass have just introduced Energy Advantage, a second generation product with emissivity reduced to that of the standard soft-coat low-E glazings (about 20 percent) and the bluish tint eliminated. The properties of this glass make it a superb choice for passive solar applications: good heat retention, yet a very high shading coefficient, so that very little solar energy is blocked out.

Low-conductivity gas fill

AIR IS A GOOD INSULATOR. FIBERGLASS insulation, for example, works by trapping small pockets of air, which insulate against conductive heat loss. Certain other gases, however, insulate better than air. Higher-density gases such as argon are increasingly used in windows to boost R-values. Argon is inexpensive, and a number of window manufacturers offer it as a no-cost option or as a standard feature in insulated glass windows.

Some companies are experimenting with denser, more effective gases such as krypton and sulfur hexafluoride, as window fill.

Edge losses

AS THE GLAZING ITSELF BECOMES increasingly better at blocking heat loss, the edges of windows become proportionally more significant. A window with a rating of R-4 at its center will only provide about R-2 at the edges. As a result, large windows are more energy-efficient than, for example, small windows. That is why window product catalogs often show commercial windows to be more efficient than residential models. The industry-standard commercial window is 4-by-6 feet, while the industry-standard residential window is 3-by-4 feet.

Edge losses are also the reason window manufacturers are adopting new conventions

for estimating and listing window R- and U-values. Starting this year, most major window manufacturers will be listing both center-of-glass insulating values and unit insulating values, which factor in edge losses from standard-sized windows. The new calculations are performed using a computer program developed by the Lawrence Berkeley Laboratory called Window 3.1, which uses newly adopted ASHRAE methods for determining heat loss through windows. These unit R- and U-values are still approximations, but they are far more accurate approximations than the older center-of-glass values. For example, an Andersen Perma-Shield casement window that was rated with an R-value of 4.2 in 1989 now boasts a unit R-value of 3.1. Most manufacturers now list both values.

Because of the significance of edge losses in energy-efficient windows, considerable effort by manufacturers is being focused on reducing those losses. One of the primary culprits is the aluminum glazing spacer used in most windows to hold the layers of glass apart. Metal is a very good conductor of heat, so manufacturers are working with a number of possible alternatives: fiberglass, butyl, wood, and welded glass (no spacer). One manufacturer has introduced a window with a thermal break between two sealed insulated units. In addition to heat-loss considerations, glazing edges must also be airtight to prevent fogging and, with low-conductivity gas fill, to contain the gas. Welded-glass seals are the tightest, but still uncommon. Most manufacturers have turned to using both a primary and secondary seal. Some add foil tape around the glazing edge to reduce permeability, and several insert desiccant beads in the spacer to absorb moisture that may get into the insulated glass unit.

Super windows

IN 1989, TWO MANUFACTURERS—HURD Millwork and Weather Shield—introduced super-efficient windows. Hurd's InSol-8 window, currently available only in casement models, achieves center-of-glass R-values of slightly more than 8, nearly doubling the previous best. This dramatic energy performance is achieved with two suspended low-E Heat Mirror films made by SouthWall Technologies of Palo Alto, California, and low-conductivity gas fill in the inter-glazing spaces. Hurd uses a proprietary mixture of gases that includes krypton, which offers better performance than argon but is also considerably more expensive. Hurd has also dramatically reduced edge losses by designing a thermal break between the two metal glazing spacers. Even so, the center-of-glass R-8 drops considerably when edge losses are factored in. The unit R-value for a residential-sized window (3-by-4 feet) is

4.6, which is well above the unit values for standard high-performance windows.

Weather Shield claims a remarkable R-9.09 for center-of-glass energy performance on its new triple-glass 1 1/2-inch thick window, and R-6.67 for its 1-inch thick window. The windows incorporate three layers of glass sandwiched with two soft-coat low-E coatings, with argon gas fill in both spaces. However, Weather Shield has done nothing to reduce edge losses, and a company representative indicated that there is no data available on whole-window performance. When they are published, unit R-values will be considerably lower than the claimed R-9.09 center-of-glass value—probably below 4.0—and condensation could still be a problem at the glass edges.

Sun blocking

SUN-CONTROL GLAZINGS HAVE BEEN around for years and are used extensively in commercial buildings, where cooling loads generally exceed heating loads. But they have never been popular in residential and light commercial buildings, primarily because they block a lot of the visible light or significantly change the appearance of the glass. Recent low-E product introductions are changing that situation, however. As mentioned above, Cardinal's new low-E² glass provides very good visible-light transmittance (69 percent), with a very low shading coefficient (.49). Compare that to their standard

low-E sun-control insulating glass with a shading coefficient of .40 and visible light transmittance of only 43 percent. The good news is that architects can now achieve sun blocking and maintain good visual properties.

UV blocking

ULTRAVIOLET LIGHT COMPRISES JUST 2 percent of the total solar spectrum at ground level, but accounts for an estimated 60 percent of fading damage to upholstery, draperies, paintings, for example, due to sunlight. Standard insulated glass blocks about half of the UV light, while hard and soft-coat low-E insulated glass windows block from 60 to 85 percent. To block more than that, a UV-blocking plastic film, either suspended, as in Heat Mirror films, or laminated between two layers of glass, is needed. Either treatment will block UV light dramatically. When comparing UV transmission values from different manufacturers, be aware of indirect comparisons. Some manufacturers use 400 nanometers (nm) as the UV cut-off, while others use 380 nm. The 380 nm cut-off may provide unrealistically low UV transmission values. If UV blocking is important, check these numbers carefully.

Sound control

SOUND CONTROL HAS LONG BEEN A factor in commercial window design; now it's becoming an issue with residential and light commercial design in blocking out traffic noise. Some reduction in sound transmission can be obtained with multiple layers of glass and/or suspended film, but the most effective strategy is to use laminated glass. Monsanto Corporation, with its Saflex glass and a newly introduced Solarflex glass (which blocks more sun), is a leader in the sound-control glazing field. To compare sound transmission, look for Sound Transmission Class or STC ratings. Standard insulated glass has STC ratings in the 28-32 range, primarily depending on the spacing between layers of glass. Hurd's new InSol-8 window with two suspended films has an STC value of 35. Laminated glass achieves higher STC values, but is more expensive. Insulating laminated glass windows with two 1/4-inch laminated glass panes separated by a 1/2-inch air space (1 inch thick overall), for example, achieves an STC rating of 42.

Security glazing is another specialty type of window that is only beginning to make its way from commercial applications into the residential arena. As with sound control, laminated glass is generally the system of choice for high-strength and security applications. Several of the major window manufacturers (including Pella, Andersen, Marvin) offer laminated glass as options in certain types of windows.

A guide to specifying windows

Advances in window glazing are technologically exciting, but what really counts is how they improve the built environment, including occupant comfort, energy use, and design opportunities for large glazed areas. Properly benefitting from new glazing options requires a lot more work on the architect's part than it used to. Tips for specifying new window technologies in residential and light commercial design follow:

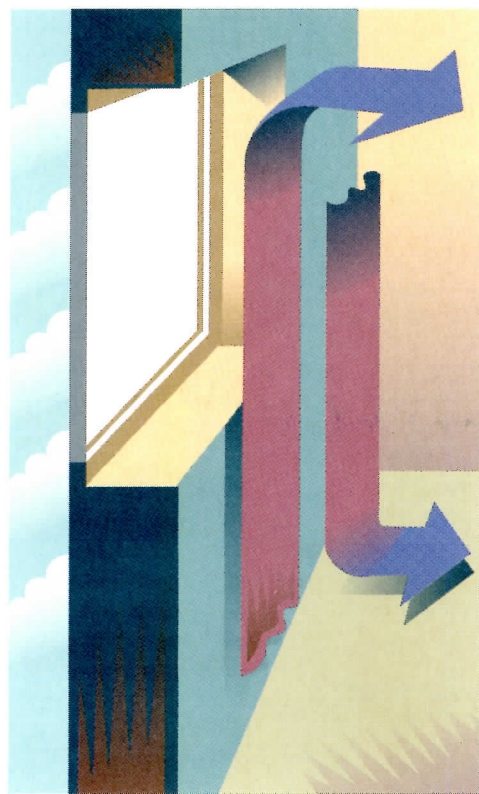
■ **For south-facing windows in cold climates, and especially in buildings using passive solar heat, look for high shading coefficient and good energy performance.**

■ **For large expanses of west-facing windows, where summertime overheating is most likely to occur, choose a low shading coefficient while maintaining good energy performance.**

■ **On the north side of buildings, solar gain is not an issue; heat loss is the main concern. Look for the highest R-value windows available. Consider one of the new super windows for large expanses of glazing. For small window areas (with proportionally larger edge losses), investing in very high center-of-glass R-values may not be cost-effective.**

■ **For south- or west-facing skylights, look for the lowest shading coefficient available, such as a sun-control low-E glazing. If daylighting from those skylights is important, low-E² will allow more visible light through the glass.**

Talk to your manufacturer's representatives about these different possibilities, but be patient. Many of the advances in window technologies are so new that even the company reps are not familiar with them.



Recessed windows are more prone to condensation (above) because indoor air currents are less likely to reach the window and defrost the glass.

Design features

ALONG WITH THE MORE UTILITARIAN advances continually being introduced in the window industry, important aesthetic advances have been made, some of which have an impact on energy. Marvin Windows recently introduced a wraparound insulated glass corner window, and last year Pella unveiled its Architect Series that solves many problems both with true divided-lite insulated-glass windows and with applied-grill insulated glass windows. The Pella models feature full-size sheets of glass with glazing spacers to match the grill pattern between

the layers of glass and grills that are glued directly to the glass. The muntins are thinner than needed for true divided-light insulated glass windows, and thus they more accurately reproduce the look of older windows. Because the glass is continuous, they are more energy efficient and durable.

Perhaps the most remarkable development in windows during the past few years is a glazing that can be switched from clear to opaque at the flick of a switch. Taliq Corporation, of Sunnyvale, California, takes advantage of liquid-crystal technology—the same technology used in digital watch dis-

plays—in its Varilite vision panels. The first product to enter the market is designed only for interior applications, such as separating off conference rooms in office buildings, but an insulated-glass model suitable for exterior wall applications will soon be offered. Other related switchable glazings, some operating passively in response to elevated temperature, are under development and should be introduced in the next year or two. ■

—ALEX WILSON

Alex Wilson is a technical writer and energy expert based in Brattleboro, Vermont.

Glazing Properties

Glazing Type	Thermal Performance				Light Transmittance			Cooling Performance SHADING COEFF	Sound Transmittance (STC)
	CENTER-OF-GLASS		UNIT VALUE (1990)		VISIBLE LIGHT	TOTAL SOLAR	ULTRA-VIOLET*		
	U	R	U	R					
Single Glass									
STANDARD CLEAR 1/8" ¹	1.11	.90	.90	1.11	90%	84%	80%	1.0	30
HARD-COAT LOW-E (E = .40 or .20) ¹					82%	74%	66%		
Insulated Glass (2 layers)									
STANDARD 1/8" GLASS (1/4" AIR SPACE)	.57 ¹	1.75 ¹	.54 ²	1.85 ²	81% ¹	70% ¹	52% ¹	.89 ¹	≈ 28
STANDARD 1/8" GLASS (1/2" AIR SPACE)	.49 ¹	2.04 ¹	.49 ²	2.04 ²	81%	70%	52%	.89	≈ 32
SOFT-COAT LOW-E (E=.15) ³									
1/2" space with air	.31	3.23	.39	2.56	77%	52%	27%	.71	
1/2" space with argon	.25	4.00	.36	2.78	77%	52%	27%	.71	
SOFT-COAT LOW-E ² CARDINAL (E=.04) ³									
1/2" space with air	.29	3.45	.35	2.86	69%	35%	13%	.49	
1/2" space with argon	.23	4.35	.30	3.33	69%	35%	13%	.49	
HARD-COAT LOW-E (E=.40) ¹									
1/2" space with air	.40	2.50	.40	2.50	76%	64%	36%	.87	
1/2" space with argon	.35	2.86	.37	2.70	76%	64%	36%	.87	
HARD-COAT LOW-E - LOF (E=.20) ¹									
1/2" space with air	.35	2.86	.36	2.78	76%	64%	36%	.87	
1/2" space with argon	.30	3.33	.34	2.94	76%	64%	36%	.87	
SUN-BLOCKING LOW-E GLASS CARDINAL ³									
1/2" space with air	.31	3.23	.37	2.70	43%	26%	16%	.40	
1/2" space with argon	.26	3.85	.32	3.13	43%	26%	16%	.40	
INSULATED GLASS WITH SUSPENDED LOW-E FILM⁵									
HURD WITH HEAT MIRROR 88	.25	4.05	.34	2.9	71%	48%	<.5%	.66	33
HURD WITH HEAT MIRROR 66	.24	4.20	.33	3.0	56%	31%	<.5%	.45	33
HURD INSOL-8 (2 LOW-E SUSP. FILMS)	.12	8.1	.22	4.6	62%	34%	<.5%	.52	35
Insulated Glass (3 layers)									
STANDARD 1/8" GLASS									
1/2" space with air	.32 ²	3.13 ²	.38 ²	2.63 ²	74% ⁴	59% ⁴	N.A.	.80 ⁴	
WEATHER SHIELD - 2 LOW-E COATINGS ⁶									
1" overall thickness with argon	.15	6.67	N.A.	N.A.	N.A.	N.A.	N.A.		
1-1/2" overall with argon	.11	9.09	N.A.	N.A.	N.A.	N.A.	N.A.		
Laminated Glass⁷									
SINGLE LAYER 1/4" LAM. GLASS	1.0	1.0			89%	77%	<.1%	.92	35
SINGLE LAYER SOLARFLEX 1/4" LAM.	1.0	1.0			73%	40%	<.1%	.56	35
INSUL. (INNER LAYER LAM. SAFLEX)	.55	1.8			79%	62%	<.1%	.78	39

Sources:

- Libby-Owens-Ford Glass
- ASHRAE 1989 Fundamentals
- Cardinal Glass
- Energy Design Update
- Hurd Millwork, Southwall Technologies
- Weather Shield
- Monsanto

* UV transmission values are not consistently reported by manufacturers. Published Cardinal and Hurd values assume a 380 nm cut-off; published LOF values assume a 400 nm cut-off. For this comparison, unpublished LOF values at 400 nm were used in the LOF data.

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Architect: HMBH Architects, Planners and Interior Designers, Dallas, Texas; Photography: Peter Leach, Philadelphia, PA

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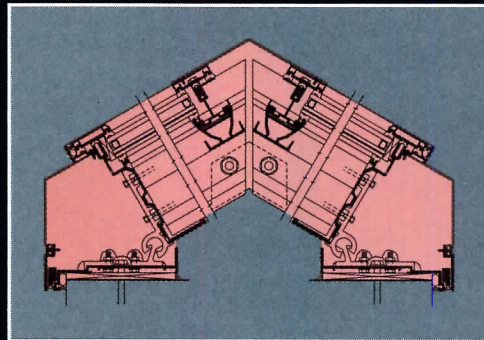


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A new exterior sheathing made of crystallized glass offers structural and esthetic characteristics comparable to stone or marble without the weight.



Japanese architect Arata Isozaki specified Neopariés to clad the undulate fascia near the entrance to the Museum of Contemporary Art in Los Angeles (above). Neopariés, compared with marble and granite (below), offers differences and similarities in properties.

NEOPARIÉS, A CLADDING MATERIAL recently introduced to the United States, is capturing the imagination of architects across the country. Named for the Latin words *neo* (new) and *pare* (wall), and pronounced like the French bottled water (*neo-Perrier*), Neopariés is a glass-ceramic product with the rich look of stone.

While relatively unknown in the U.S., Neopariés is quite common in Asia. Architects in not only Japan, but in Singapore, Malaysia, Hong Kong, Taiwan, Korea, and Thailand have been taking advantage of its properties for some time. According to Nippon Electric Glass Company, Ltd., (NEG) of Japan, manufacturer of the material, Neopariés has captured about 20 percent of the stone market in Asia, where “one out of every four or five buildings in Tokyo is clad with Neopariés,” says Steve Edwards, technical sales manager for NEG America, Inc., the Illinois-based subsidiary of NEG.

Why is it so popular in the Far East? Edwards explains: “First, it is a good-quality, good-looking material—a must in Japan’s expensive real estate market. Second, it is one of the few materials that has, because of its consistency, received blanket approval by the Japanese government for seismic requirements. Natural materials like granite, for instance, must be tested for each project because the material varies so greatly.”

Arata Isozaki, for one, has frequently

specified Neopariés. Edwards notes that NEG considers Isozaki its “corporate architect” since he has designed a number of projects for the company with Neopariés. In the U.S., there are approximately 50 finished projects sporting Neopariés as an exterior cladding and/or an interior application. The Museum of Contemporary Art in Los Angeles by Arata Isozaki Atelier and Gruen & Associates, for example, uses this crystallized glass panel as an accent material (left), while others, like the Spector Group’s Corporate Financial Headquarters for Long Island Savings Bank (page 104) are fully clad with it.

“It’s bright, clean, pure,” describes David Wagner, AIA, a principal of Clark Tribble Harris & Li in Charlotte, North Carolina. Impressed with its “clarity, uniformity and appearance,” Wagner plans to use the material when the right project comes along.

But appearance is not the only asset Neopariés has to offer. This material, the only glass-ceramic building product in the world today, exhibits an array of physical properties that make it a tempting alternative to stone. With a density similar to that of marble and granite but three times the bending strength, Neopariés panels are noticeably thinner than exterior stone veneer, thereby reducing the dead load imposed on a building’s structure. Since it is not porous, Neopariés does not stain or exhibit the problems of efflorescence that can plague natural stone, nor is it subject to damage by the freeze-thaw cycle. Significantly less susceptible to damage by acids or alkalines than granites and marbles, it is also a natural substitute for stone where severe pollution or acid rain is present.

For example, the Corporate Financial Headquarters for the Long Island Savings Bank is adjacent to a major highway and subjected to a steady stream of pollutants. “It would not have been easy to maintain, for instance, a concrete building in the same location,” says Frank Messano, the architect of the project. “But Neopariés is simple to clean: you just squeegee it along with the glass,” he maintains.

Neopariés panels are extremely hard, and therefore quite difficult to scratch or abrade. But if they do crack, a fiber-mat lining pre-

MATERIAL PROPERTIES		NEOPARIÉS	MARBLE	GRANITE
STRENGTH	Specific gravity (g/cm ³)	2.7	2.7	2.6
	Bending strength (kg/cm ²)	510	170	150
	Compressive strength (ton/cm ²)	1.2-5.6	0.9-2.3	0.6-3.0
	Charpy shock strength † (kg-cm/cm ²)	2.5	2.1	2.0
	Young’s modulus x 10 ³ (kg/cm ²)	5.2	2.8-8.4	4.3-6.1
HARDNESS	Moh’s Coefficient	6.5	3-5	5.5
HEAT CHARACTERISTICS	Specific heat (50°) cal/°C	0.19	0.19	0.19
	Coefficient of thermal expansion (x 10 ⁻⁶ /°C, 30 ≈ 380°C)	6.2	8.0-26.0	5.0-15.0
	Thermal conductivity (kcal/mhr°C)	1.4	1.9-2.0	1.8-2.1
	Water absorption rate (%)	0.00	0.30	0.35
CHEMICAL RESISTANCE	Acid resistance † 1% H ₂ SO ₄	0.08	10.3	1.0
	Alkali resistance † 1% NaOH	0.05	0.30	0.10
	Freeze resistance *	0.028	0.23	0.25

† Energy needed for rupture by instantaneous load.

† Weight loss of test piece of 15 x 15 x 10mm after 650-hour immersion of 25°C.

* Weight loss of test piece of 15 x 15 x 10mm after 25 cycles: immersion of test piece in water of 25°C for 2 days = exposure for 4 hours in a temperature of -20°C. (JISA5209)

vents the pieces from tumbling down. It is also dimensionally stable with an extremely small coefficient of thermal expansion. Joints between panels can be less than 1/8-inch thick. However, care must be taken to provide enough space between Neopariés and other, more variable, materials. It is not predisposed to the "oil-canning," or buckling, for example, that metal panels often exhibit.

Developed in the early 1970s by NEG, Neopariés is a crystallized glass material. A specially-formulated mixture that includes silica, feldspar, calcium carbonate, zinc oxide, and barium carbonate is heated to 1,500 degrees Centigrade, melted, and submerged into water to create granular particles of glass. These particles are then set into forms and heated. At 850 degrees Centigrade, the glass granules fuse. By 950 degrees Centigrade, needle-shaped crystals appear at the surface of each particle and extend toward its center. After an hour, at a temperature of 1,100 degrees Centigrade, the crystallization is complete. The surface of the Neopariés panel is then ground smooth, exposing a delicate granular pattern beneath an icy, sleek surface that NEG compares with the marble of Classical architecture.

Neopariés Light, a thinner version with essentially all of Neopariés' characteristics at about half the price, is formulated by a similar process, except that sheets of glass material, rather than granular particles, are used. As a result, Neopariés Light does not have quite the same textured appearance.

But only 40 percent of the finished product is crystallized; the rest is glass. This glass matrix allows a flat panel of Neopariés to be heat-softened and reformed into curved panels. The standard flat panels are 3-by-3-by-4 (or 6) feet long; curved panels are made with a range of radii, and right angles and round-corner pieces are also standard. A variety of chamfered edges are available for corner detailing, and logos can be sandblasted onto the surface, though the material's hardness makes this difficult.

The thickness of the panels is generally 5/8-inch, though thicker slabs are possible. In addition, panels can be cut to different sizes and shapes, including curved cuts. And, because there are limitations to the size and location of cut-outs for electrical receptacles, they are best done at the factory.

NEG produces the material in eight standard colors consistent throughout the panels: white, black, beige, dark beige, and four shades of gray. These are stocked as three-by-6-foot slabs and are cut to size to fill any size job order. Custom colors, however, are not so easy to obtain. As Steve Edwards explains, "Developing new colors requires a rigorous and expensive research and development process, because each color is of a unique chemical composition." A minimum-

size order, however, is required for the 20-odd so-called "custom colors," which are not kept in large inventory. NEG is willing to develop new colors, "but only if the client is willing to invest six to eight months of time, and something on the order of \$100,000," warns Edwards. Even so, there are certain colors that simply cannot be fabricated: intense reds, blues, and greens.

The various types of installation techniques offer insight into the versatility of the material. NEG's standard exterior-wall installation for Neopariés is based on anchored-veneer technology—comparable to hanging marble or granite mechanically by clips and anchors, panel by panel. Each

With a density similar to marble or granite but with three times the bending strength, panels of Neopariés reduce the dead load on the building structure while satisfying code requirements for seismic stability.

Neopariés panel rests on a metal plate with vertical pins or dowels. The dowels are inserted with an epoxy adhesive into pre-drilled holes at the upper and lower edges of the panel. The plate is attached to an angle clip, which in turn is bolted to a concrete or steel structural frame. A backer rod and caulk seal the narrow joints between panels. By providing adequate spacing between the panels and the structure, this installation method virtually eliminates problems of expansion, shrinkage, and vibrations between structure and cladding, and is appropriate for both exterior and interior applications.

Another method, suitable only for interior installations, uses mortar along with steel bars and wire to attach the panel to the structure. A third technique that has proved cost-effective in Japan is the precast-concrete method. Ten or 20 panels are placed face down in a form, with clips, anchors, matting, and bond breaker attached. Concrete is then poured on top, creating a precast panel that can be quickly installed on site. In most cases, NEG will coordinate their efforts with the architect, contractor, and client to develop appropriate methods for specific buildings, taking into account location, accessibility, schedule, cost, and design. As Edwards has stressed, "No one method is perfect for all applications."

Neopariés has also found a place in the residential market. Though more expensive than popular types of plastic laminates, Edwards argues that the glass ceramic makes for a better countertop. "You can chop onions on it without odors being absorbed, spill wine without staining it, carve meat without cutting it, and place piping-hot casseroles without damaging it," he maintains. The standard countertop slab is 5/8-inch thick with a 2-inch mitered front apron.

While a number of architects have used Neopariés or expressed interest in it, not every client is ready to venture into a new product. David Wagner, for instance, was hoping to use it on a bank in North Carolina. He wanted a white building and found white granite too gray, white marble too grainy, metal cladding too expensive, and stucco incompatible with the design grid. "We think Neopariés is perfect for what we want to do, but the owner is hesitant because it isn't a natural material. Also, it's so bright he's afraid a passerby would have to wear sunglasses." In an all-out effort to convince his client, Wagner flew the owner to the Midwest to see a completed installation. Contrary to being too bright, that building had not been cleaned for some time. The client rejected the material.

One of the few warnings offered by architects who have used Neopariés is that the frequently-specified silicone weather sealant tends to collect dust, which eventually streaks the panels. Edwards admits that the building must be washed with some regularity: every six months in most areas; every three months where severe pollution or unusual weather patterns exist. NEG, however, is studying other sealants to determine which can match the performance and durability of silicone, be compatible with structural silicone adhesive, and not streak.

"Because Neopariés is a foreign product," cautions Carlos J. Jahan, associate architect of the Delta Air Lines Terminal renovation (facing page), "the architect must be aware of lead times. We worked closely with the general contractor to sequence the project, and were prompt about reviewing shop drawings so that everything could be ordered and manufactured in time."

In addition, the price of Neopariés fluctuates with the yen, but it is generally cost-competitive with stone. Currently, 3.5 million square feet of Neopariés are being manufactured worldwide per year, but it will still be a least three or four years before NEG will consider opening a manufacturing plant in the United States.

—NANCY B. SOLOMON

Nancy Solomon is an architect and writer living in Takoma Park, Maryland.

Delta Air Lines Terminal
Los Angeles
Gensler and Associates/Architects

Gensler and Associates/Architects had two primary objectives in their design for the expansion and remodeling of Terminal 5 at Los Angeles International Airport (above left): transform the old structure into a symbolic gateway to the City of Los Angeles and, in effect, establish a signature building for the tenant, Western Air Lines. The project, which began in 1986 as the Western Air Lines Terminal, was completed in 1989 as the Delta Air Lines Terminal.

Essential to the scheme is a thoroughfare—lined with palm trees, seating, shops, and dining—echoing life in LA. This indoor street is part of a pedestrian route that clearly connects the terminal's entrance and ticketing to its waiting area and gates. Circulation in the old terminal was much less direct. At 372,000 square feet, the expanded terminal is more than triple its original size.

While the old building's structure was retained, its glass-and-metal skin was removed. Neopariés was applied to the exterior of the front entrance and to selected interior areas. The beige panels are typically 30-by-36-by-5/8 inches. Curved panels clad the round planters. According to associate architect Carlos J. Jahen, AIA, "The client chose to spend money where passengers had hand contact." Stucco, therefore, was used at less prominent rear elevations.

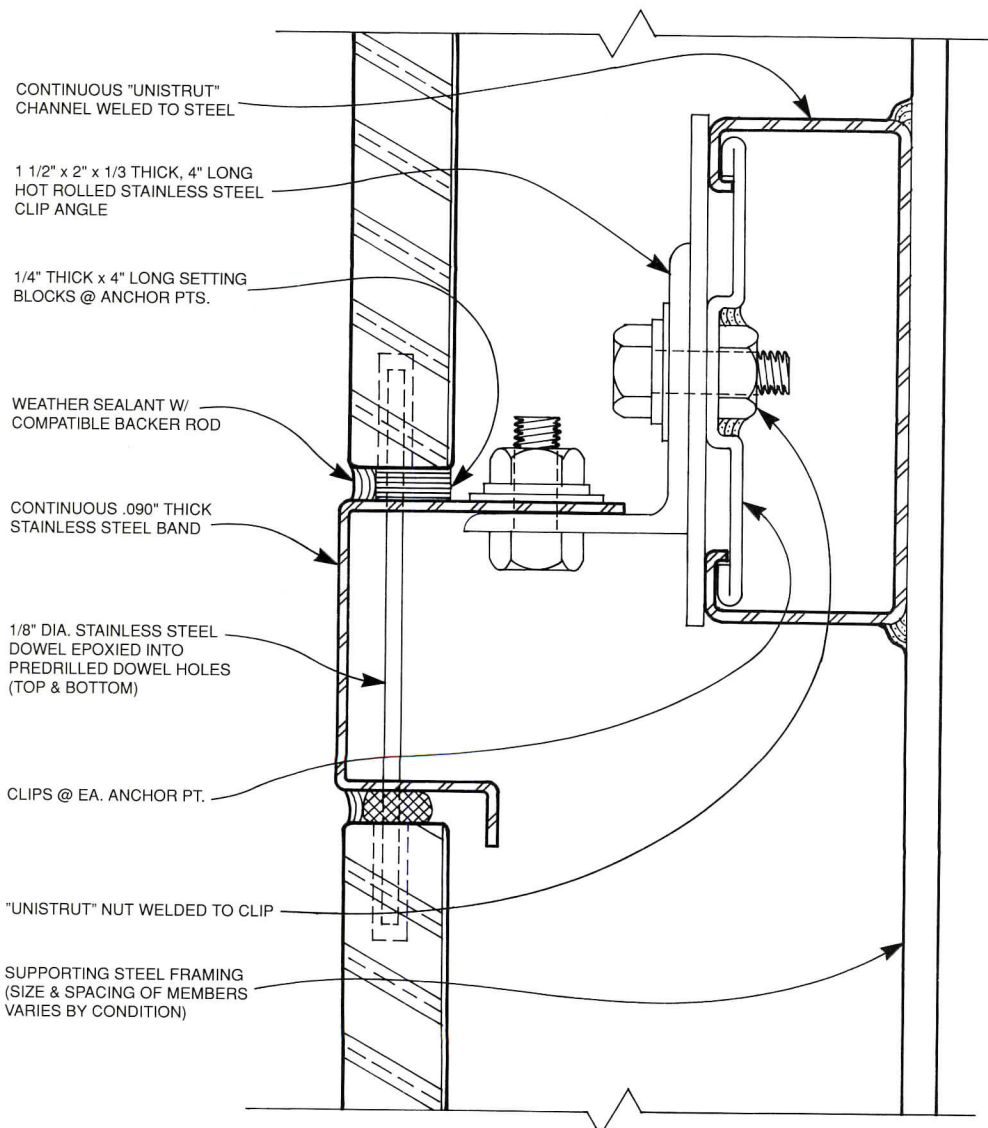
Neopariés was selected, Jahen recalls, "because it met all of the guideline requirements. It looks great. It lasts a long time. It's very consistent, easily cleaned, and stain-resistant." Jahen adds, "Our firm likes to try new materials on the market."

This last advantage, however, was accompanied by an added responsibility. As Jahen explains, "whenever a new product is specified, the architect must demonstrate that it complies with the building code. He takes it upon himself to educate the public." This is particularly true in earthquake-prone California, where the architects successfully convinced the Los Angeles building department that the material and installation would satisfy all of its requirements.

The installation at Delta Air Lines uses an interesting variation of the standard clip-and-anchor attachment (bottom left). Instead of resting on a concealed flat plate, the panels are supported by a fully-exposed, polished, stainless steel band. A long dowel pins the upper and lower panels in place. To ensure that the joint above the stainless steel band matches the joint below, the panels sit on a non-compressible setting block. Due to seismic code considerations, the clip angles are first bolted to a channel that is, in turn, welded to the steel structure.



Neopariés panels inside the Delta Air Lines terminal (above) are supported by exposed, stainless steel bands and pinned by stainless steel dowels (detail below). Clip angles behind the panels are bolted to channels welded to the building's steel framing to meet seismic codes.





Long Island Savings Bank
Corporate Financial Headquarters
Melville, New York
Spector Group

White Neopariés was the material of choice for both the exterior and interior of the Long Island Savings Bank's (LISB) Corporate Financial Headquarters (above left) in Melville, New York. Designed by the Spector Group of North Hills, New York, the building was completed in 1986. This three-story, 210,000-square-foot complex uses 77,000 square feet of Neopariés in concert with vision glass.

"Choosing Neopariés was a design decision," acknowledges project architect Frank Messano, AIA. "The client wanted a white building of substance. Granite was too peppery in color, marble was too soft, aluminum and porcelain were too lightweight."

Partner Peter Toh, AIA, traveled to Tokyo to tour Neopariés installations. He returned, convinced. "It's as white as can be; there is no veining. And the granular crystals reflect the light very beautifully."

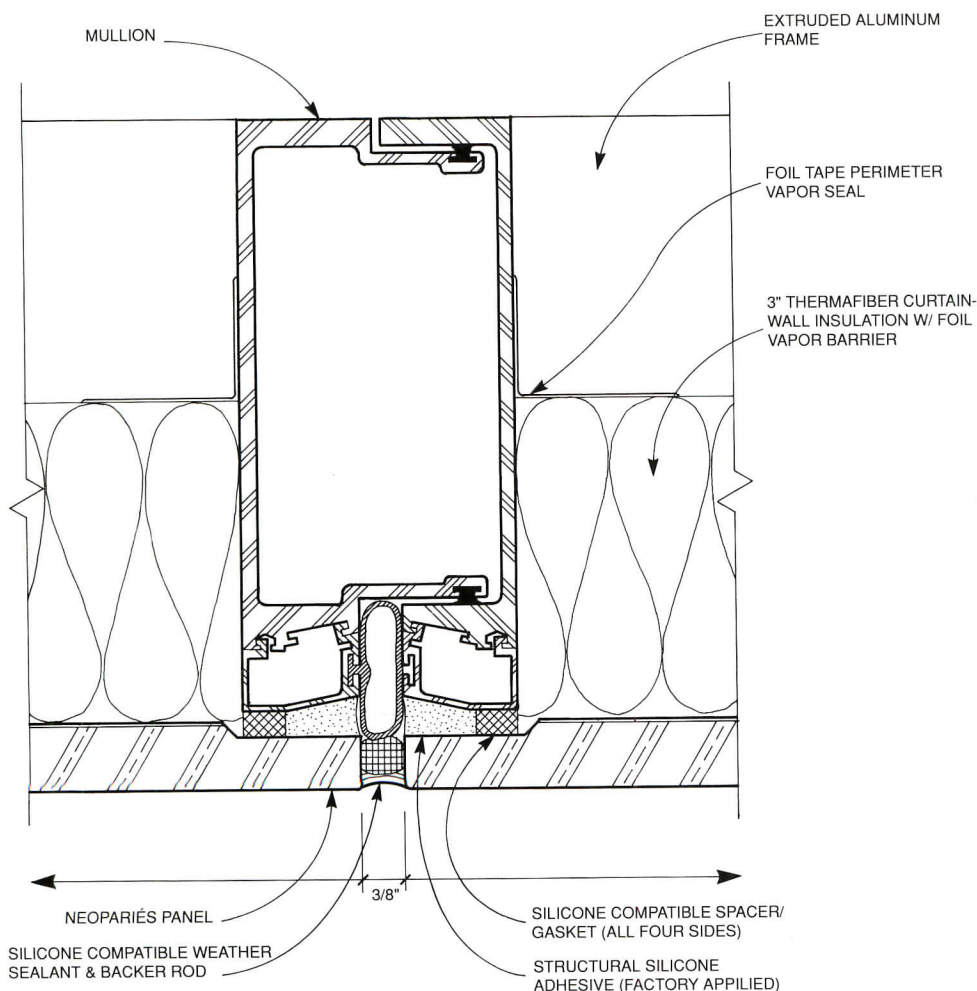
The application of Neopariés at the bank headquarters was inventive. Instead of being hung individually with clips and anchors, the panels were incorporated into a unitized curtain wall system (below left). Spector Group developed the details in consultation with NEG. Thermalum Industries of Florida tested the assembly and then fabricated the 5-by-13-foot units. Each unit consisted of a 5-by-5-foot pane of vision glass with Neopariés spandrels above and below. Both materials were mounted onto an extruded aluminum frame with structural silicone adhesive. The units came to the site fully glazed and insulated. Once the assembly was fixed in place, its joints were caulked with a silicone weather sealant. The contractor was able to enclose the building quite quickly, hanging about 30 units a day.

The architects did have some concerns over the course of the project. Unimpressed with an earlier U.S. installation, Toh insisted on a perfect alignment of the panels at LISB. "Accuracy depends not so much on the material as on the installation method and the skill of the contractor." Streaking due to the silicone sealant has not gone unnoticed, but Messano is optimistic that it will stop once the caulking has fully cured.

Vandals broke a vision panel and cracked one section of Neopariés. "Like many materials," Messano observes, "it can be damaged if smashed with a hammer. Even though the vision glass shattered, the Neopariés' fiber backing held the glass ceramic in place."

Toh expects to see more of Neopariés in the years to come. "I've been getting calls from offices like Arquitectonica and Richard Meier & Partners, wanting to know more about it."

Constructing a sleek curtain wall out of Neopariés (above), the Spector Group designed an assembly consisting of 5-foot panes of vision glass sandwiched between Neopariés panels and mounted onto an extruded aluminum frame with silicone adhesives (detail below).



Calculated Risk

**PRACTICE:
LIABILITY INSURANCE**

Selecting an insurance policy for architectural practice warrants a close examination of the carrier, premiums, and deductibles.

ANY BUSINESS ENTAILS RISK, AND THE unusual nature of architecture makes our business particularly speculative. As architects, we are but one in a large group of decision makers that includes owners, contractors, subcontractors, and consultants. Each decision maker will affect the end product. Professional liability insurance has therefore been tailored so that a portion of the financial risk incurred by architects can be transferred to a third party.

Selecting a carrier

PROFESSIONAL LIABILITY INSURANCE IS expensive, and the decision to purchase coverage must be based on a careful evaluation of each practice. The broker is the first point of contact between firm and insurance company, and a broker experienced in dealing with architects should be selected. The broker should be able to evaluate the firm's needs, recommend a specific program, and advise on insurance implications of changes in organization or practice. Some brokers will review proposed contractual provisions for insurability, help develop risk-management programs, and monitor claims administration. In exchange for these services, the broker receives a commission, the amount of which is negotiable and not set by law or insurance regulation.

There are relatively few companies offering liability coverage for architects, so an insurer's experience and tenure in the business is an indication of capability and commitment. Claims and reliable loss-experience data take time to develop. Even with statutes of limitation, claims may be brought years after a project is completed, and it may take five years or longer before that claim is resolved. It is this long "tail" on liability claims against architects that makes it so difficult for actuaries to project future rates based on present-day levels of design and construction. Actuaries must estimate the amount the company will pay on claims for which the premium has already been paid, perhaps years in advance. The premium for an earlier year may not be adequate to cover current losses for projects completed in that year, losses which may be much higher than anticipated. Thus, the adequacy of a policy's premium

may not be known for years. Yet, if an insurer is to remain profitable, the amount to be paid in lost claims must be estimated with a reasonable degree of accuracy.

Actuarial projections become more reliable with experience. Few carriers have been willing to stay the course long enough to develop reliable data. Several have recognized the rate-making problem and have stopped insuring architects, particularly after offering unrealistically low premiums in order to be competitive. Experience and longevity are important for another reason. In the case of a "claims-made" policy, all coverage for future claims stops if the insurer decides to stop writing architects' liability insurance. (A claims-made policy is one in which the policy was in force when the claim was made, and was also in force when the service that spawned the claim was rendered.)

Of course, any policy provision makes no difference if the carrier ceases to do all business because of financial insolvency. It is therefore important that a carrier have adequate financial strength to stay in the professional liability business. Losses in the architectural profession can be catastrophic in their character and financial amount. If an insurer has limited assets, a few large claims can severely affect its financial condition. Even with reinsurers (investors who insure the insurance companies, and therefore take a major part of the risk) the primary carrier must have sufficient financial strength to cover its exposure.

A carrier's financial strength can be evaluated by checking the "Best" rating. This rating is provided by A.M. Best Company of New Jersey, and even though it does not specifically address insurance for architects, it is one indication of a carrier's financial posture.

State insurance commissions have information on companies operating on an "admitted basis." This means that they must comply with certain reporting rules and often must contribute to a fund that may be made available for claims should the carrier go out of business. In some states, this also means that a state commission reviews and actually approves rates and policy terms. Not all insurance carriers operate on an ad-



Claims experience can only be developed over time. Since the policy premium is based on claims experience, the adequacy of the premium may not be known for years.

mitted basis; those who do not are called "excess and surplus" carriers. They are not subject to the same regulations as admitted carriers, nor do they have to provide guarantee funds. They can move in and out of the market and change rates and policy terms when they wish.

Claims handling

ALSO CRITICAL IN THE EVALUATION OF the carrier is its response to a claim. Claims-handling procedures may be meaningless if the carrier does not respond promptly, efficiently, and economically. Several factors should be considered when judging claims-handling capabilities:

- How are claims reported and processed?
- Do those who will handle the claim have the background, experience, and qualifications to work with architects?
- Does the carrier have local claims offices?
- How promptly does the carrier respond when a claim is reported?
- How are defense lawyers selected and what are their qualifications?
- Is there a program for educating claims personnel and defense lawyers about architects and the construction industry?
- If there is a problem in handling the claim, does the insured have access to the insurance underwriting manager for assistance?

Selecting coverage

MANY CLIENTS THINK THAT AN ARCHITECT'S coverage should be for the full value of the project. This is neither wise nor realistic, and is always extremely expensive. Coverage is for the architect's protection, not the client's, and should therefore be purchased in accordance with the architect's business needs.

The vast majority of AIA firms are small and have coverage of no more than \$250,000,



A carrier should be selected that has adequate claims experience, longevity, and the financial resources to offer professional liability coverage for a long time.

although it is not unreasonable to find some that carry only \$100,000 in the first five years of practice if the firm is relatively small and gross billings are low. Coverage should not be less than gross annual billings, although insurance professionals advise "buy as much as you can afford."

Clients will often try to dictate the amount of coverage architects should carry, but they are usually seeking an unreasonable amount. In these cases, the resultant premium is out of proportion to the fee charged on such a project. Architects may choose to negotiate an arrangement whereby the client pays for the additional premium required to raise the policy limits. But even then, that is only a one-year solution.

Project insurance

ONE ALTERNATIVE MAY BE PROJECT INSURANCE. A project insurance policy essentially transfers the cost of insurance, and thus the risk, to the project itself. The owner of the project purchases a policy that covers the design team from the start of design through completion of construction. Additional discovery coverage is available for the first few years after the date of completion—the period in which most claims occur. The premium is set at the policy's inception, and is guaranteed for the policy period as long as the project scope remains unchanged. Limits are set for that particular project and are unaffected by claims on any other projects. The billings for project insurance do not affect a firm's practice policy, nor do claims brought against that project.

Many clients believe that a firm's insurance coverage provides protection for their project. The claims made and annual aggregate nature of liability policies for architects mean that there may or may not be financial resources, or even coverage, should the limit be exhausted by other claims or the policy not renewed for whatever reason. Project insurance avoids this potential coverage vacuum. But the most difficult aspect of this kind of coverage is convincing new clients that it is in his or her best interest to purchase this policy.

Premium costs

WHEN PURCHASING INSURANCE, A PREMIUM is charged which is an indication of how the insurer evaluates the risk. The premium is determined by two basic factors—the insurer's experience and the nature of the practice of architecture. Underwriters have to consider what the potential losses will be for a given policy period and judge how much to charge to cover these losses, meet expenses, and make a profit.

To set the policy, underwriters will consider a "loss ratio" (anticipated losses divided by available monies taken in as premiums). There are two kinds of loss ratios: a paid loss ratio is the ratio of paid losses (claims for which the company pays) to premiums collected; an incurred loss ratio is the ratio of paid losses plus "claims reserves" to premiums paid by the insureds. "Claims reserves" are monies placed by the insurance company in an escrow-type account when a claim is first reported. This amount is an estimate of the anticipated loss, and reflects the total amount it may pay in indemnity and/or expenses to resolve a claim.

Other factors affecting premiums, however, are directly related to the practice of architecture:

- Project billings. The higher a firm's billings in the preceding year, the higher the premium.

Where to find help

The Architects Liability Committee of the American Institute of Architects is charged with monitoring the insurance industry and offering information about issues related to professional liability insurance to the membership.

The committee works closely with the CNA insurance program underwritten by the Victor O. Schinnerer Company, the program that has been "commended" by the AIA since 1957. The commendation program was developed to ensure that insurance coverage would be available to all qualified firms in every state.

The committee meets regularly with Schinnerer to study the status of the marketplace, review the program, and to discuss areas of concern to the membership. In the last few years it has produced such services as: project insurance; claims coding; profit sharing; loss prevention credits; modifications of asbestos and pollution exclusions; design/build coverage; expanded equity interest coverage; and claims closeout studies.

The committee also meets annually with other insurers of architects and publishes a survey describing their programs and the markets they wish to serve. For more information on risk management, consult chapter 1.15 in the *Architect's Handbook of Professional Practice*, or call Christopher R. Clark, AIA, at The American Institute of Architects in Washington, D.C. 202-626-7537.

■ **Project type.** Firms that undertake studies, master planning, reports, opinions, or interior design, for example, will have lower premiums than would traditional practices. These areas are considered to have less exposure to liability.

■ **Geographic location.** In states with poor loss experience, premiums will be higher than in states with good loss experience.

■ **Individual claim experience.** An insured individual's loss experience is reviewed, including paid and pending claims. Underwriters consider both the amounts involved and the frequency or number of claims. Simply reporting claims does not affect the premium, unless the number of claims reported become excessive.

■ **Other factors.** Some carriers will apply rating credits for the use of insured consultants, continuing education, and other considerations. These factors vary from program to program.

Policy exclusions and endorsements

CONSIDERATION MUST BE GIVEN TO certain activities, called "exclusions," that are not covered by basic policy. The insurer chooses not to include coverage for them because of adverse experience. For instance, between 1987 and 1990, no coverage could be purchased for any work related to asbestos. Some architects engage in activity that requires coverage but is excluded by the policy, and these can sometimes be covered under the policy by purchasing an endorsement.

As with most other types of insurance, the professional liability premium is further adjusted by a given "limit of liability" (the amount that the insurance company will pay out on your behalf in a given year), and by the deductible accepted by the insured. A higher deductible will decrease the premium, and a higher liability limit will increase the premium.

Different companies have different premium rates, based on history in the marketplace, return on investment, long-term goals, and services provided. In addition, the company's relationship and reputation with its reinsurers affects premiums. Your insurer is essentially selling part of the risk of your practice to reinsurers, many of whom are located in Europe. The reinsurers are looking for stability and return on investment, so their evaluation of performance and risk directly affects your premiums.

Determining a deductible

THE DEDUCTIBLE AMOUNT DEPENDS ON two opposing business instincts. First is the desire to have the largest amount of risk transferred to the insurer—a low deductible. Second is the recognition that when the insurer carries more risk, the insured must pay more. Some insurance programs allow de-

When a claim is filed

As soon as a claim is filed, consider calling your lawyer before taking any action. Then:

■ **Notify the insurance carrier through the underwriter, in writing. If the circumstances indicate that immediate counsel is needed, call your underwriter.**

■ **Cooperate fully with your insurer. Refusal to do so may result in the cancellation of your policy.**

■ **If the claim involves a traumatic situation, such as a collapse or bodily injury, take photographs, if possible. Your photos, taken promptly after the incident, are more valuable than professional photographs taken later.**

■ **Once the claim has been made, do not attend or agree to attend any conferences set up specifically for the purpose of discussing the claim without first consulting your claims representative.**

■ **Do not sign or accept any releases from any parties without approval from the claims representative.**

■ **Commit to writing, when directed by counsel or the insurance company, the circumstances of the claim that are known to all involved. Do this as soon as possible after the incident.**

■ **Assemble, in chronological order, all pertinent agreements for services, all correspondence, memoranda, et cetera, without comments or argument.**

■ **Do not admit (or even imply) liability, and do not attempt to place blame.**



Low deductibles threaten a firm's loss record. Too many minor claims burden the carrier, result in a less favorable experience record, and translate into higher premiums.

ductibles as low as \$2,000, but most firms carry a much higher amount. The deductible applies to all types of claims—both bodily injury and property damage—and applies to legal fees as well.

Coverage for legal fees can be obtained as a "first dollar defense" endorsement. It eliminates the deductible with regard to defense costs on property-damage claims when no indemnity payment is made by the insurer or insured. There is an additional premium charge for this option. The problem is, if you settle a claim that has a small indemnity payment, you have to pay the defense costs anyway.

Recent history has proven that the cost for some of these options fluctuates from

company to company, and even within the same company as a performance record develops over the course of coverage. Architects should be aware of all the deductible options offered and their implications, as well as up-front cash requirements should a claim be settled against the architect.

Professional liability insurance is offered for protection against major claims that could drain the firm's resources or put it out of business. A firm's deductible should therefore be directly related to its volume of work and its finances—especially cash flow. A deductible that is too low threatens a firm's loss record. It burdens the insurance company with the cost of minor claims and adjustments, and results in a less favorable experience record, in turn reflected by the firm's premium.

Yet a deductible that is too high may strain a firm's finances in the event of multiple claims, since the deductible applies to each claim made during the policy period. This is a crucial aspect of professional liability insurance: policy limits are aggregate. Each indemnity payment, as well as defense costs, apply to the annual limit and reduce it accordingly.

Most policies require the insured's consent before settling a claim. However the policy terms must be carefully studied with regard to claims reporting, handling, and settling, since certain policies may permit the carrier to settle a claim without consent from the insured. In cases such as this, the architect has handed over his or her financial future—much more than simply risk—to a third party.

—BURTON W. THOMAS, AIA

Burton Thomas is a principal with Thomas Associates in Concord, New Hampshire.

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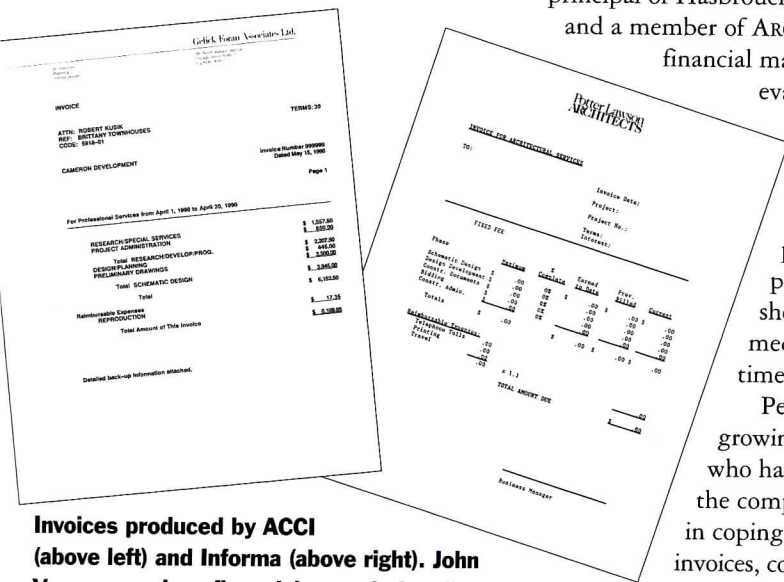
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Balancing the Budget

COMPUTERS: FINANCIAL MANAGEMENT

Architects review computer software for accounting and project control.



ACCI

ACCI'S SPECIAL FEATURES, WHICH DISTINGUISHED the system three years ago, are now available in several other financial management programs in this evaluation, but ACCI's "man-hour scheduling" module is unique. Its purpose is to show numerically or graphically the total number of hours required to complete known work, anticipated work, or even speculative work, according to as many as six employee classes. In addition to standard accounting, ACCI provides an "intelligent query" module, intended to help customize reports or pull out information into a non-standard format.

ACCI is not the easiest program to learn. Its comprehensive nature and sophistication do not facilitate quick, intuitive understanding. The program should be installed by ACCI or a consultant to gain the most benefit. Many decisions need to be made to initialize the system correctly. On start-up, each project can be specialized to tasks related to the work.

ACCI has a wide-ranging ability to provide management information. At the heart of this capability are the office earnings, cost summary, project progress, and summary reports, which can be viewed on the monitor. Other reports must be printed to be viewed.

Design firms have been unable to use conventional, accountant-produced financial statements as management aids because these documents were not produced with that goal in mind. With ACCI's ability to customize, the financial statement at last becomes useful as a clear picture of the firm's operation in the firm's own language, without losing the financial statement's primary function. The exact components of a firm's overhead ratio are clearly noted on the statement—a reversal of the previous, buried-in-the-numbers approach used by accountants who did not understand our business.

Compared to other programs in this evaluation, ACCI is good but expensive—ranging from \$3,095 to \$9,190 per firm, depending on the number of employees.

Some evaluators thought ACCI's graphic presentation was not as well organized or as well designed as others. That point is well taken. ACCI obviously has put a lot of effort into the software's ability to do what design firms need it to do, but its graphic presentation is not on par with the front-runners.

ACCI is best suited for the medium-size or large firm. Its average-size user employs 45 persons. Small firms with fewer than 10 staff members cannot afford and probably don't need the sophistication of ACCI, although a two- or three-module version of ACCI would solve a lot of future problems in firms that plan to grow.

No program in this evaluation is clearly

ahead in being comprehensive and versatile. ACCI has been a high-quality front runner for eight years. With a little more focus on its graphic image, the system's high performance level should keep it desirable to design firms that need thorough, professional, and versatile management software.

—WALTER J. FORAN, AIA
AND WILLIAM D. MURPHY

DATA-BASICS

SOME FINANCIAL MANAGEMENT PROBLEMS require an architecture firm to change its operation to please the computer. This role reversal is not the case with Data-Basics, which we consider one of the best programs in this evaluation.

Data-Basics maintains all information for as long as the user wishes. In case of a mistake, corrections can be entered and reports for that earlier period can be reprinted with the updated information. Even payroll information can be entered after the end of the year, before the previous year is closed out and end-of-year payroll reports generated.

The newest version is based on a windows-style screen using three levels of menus. One window allows the user to select one of three defined printers or any pre-defined printer format codes. Another window can be used to look up, create, or edit any of the program record files (employee, job, account number) while still active in the current screen. Thus, a Data-Basics user can create a new job while in the middle of entering time sheets.

All entries are posted immediately, so the program is always current. To avoid time-sheet problems, paychecks and tax reports are not processed until hours have been reviewed. This allows job-hours to be corrected without affecting payroll reports while maintaining the real-time reporting of job costs. And, since each employee has a billing rate and a multiplier as default values that can then be overridden for specific jobs, an employee could be billed as a draftsman on one line and a CADD operator on the next line.

Some information can be limited to those who need it, while still allowing a wide

range of employees to access the reports. The program contains a spreadsheet generator to allow the user to customize a report. Jobs can be set as overhead, thus allowing hours to be billed to these items, yet distributed as overhead. Job invoicing also allows the user to create a series of invoice forms that can be recalled for any job.

The program's main shortcomings are simple application issues that appear to be readily corrected. Since offering one of the first financial management programs for architects, Data-Basics has made many decisions as to how to interact with users. Unfortunately, we disagree with many of those decisions. Unlike most financial management software commands that can be executed with a keystroke, Data-Basics requires users to move through the options with arrow keys. Although this is intuitive and easy to learn, it becomes a time-consuming nuisance to experienced users.

One strength of Data-Basics is that it operates on several platforms, from DOS-based PCs to minicomputers (but not on the Macintosh). If a firm is already computerized, this software will probably run on the firm's existing computers. If the firm outgrows its microcomputers, it can transfer easily to a more powerful platform.

In the meantime, Data-Basics' programmers appear to have picked up a lot of non-DOS habits, like using the F1 key, which usually summons help, to abort an operation or back up one step. Also, in the DOS environment, the "enter" key is used to accept an entry, but Data-Basics uses the F10 key. One can adjust to this different format, but the program would be much more intuitive if established conventions were applied.

Printer commands are entered as Hex codes rather than ASCII codes, which are required by most DOS-based software. ASCII codes would save both time and frustration in configuring printers. We also recommend that Data-Basics include the codes for most popular printers in their documentation.

No program in this evaluation has an effective method of tracking a principal's time. Many principals and administrators work on several projects per day, often billing on an hourly basis for phone calls and meetings. Time-sheet programs need to be made easier, using pop-up menus and defaults from previous entries.

Data-Basics' most serious quirk has been modified but remains burdensome. Because the company feels it is important for users to keep their systems up to date, it requests payment of an annual maintenance fee. If the fee is not paid, the system will not advance the date beyond the end of the year. All reports will be dated December 31. Although the system still works, it is not very useful.



WAYNE CABLE STUDIOS PHOTOS

Charles R. Newman, AIA (above).

But we are confident that these issues will be addressed. Data-Basics has fixed all the complaints we had in our previous evaluation. The only program that may be a better value is Semaphore. It appears to have most of the features of Data-Basics and is faster in executing commands and printing reports.

—CHARLES R. NEWMAN, AIA,
AND WILLIAM J. WALDORF

HARPER AND SHUMAN

ALTHOUGH SOME PROGRAMS INCLUDED in this evaluation appeared faster and flashier, none could persuade us to abandon our microcomputer-based financial management system from Harper and Shuman. It is unsurpassed for ease of implementation, checking for internal consistency, clear audit trails, and solid technical support.

Error prevention is a special strength. The program will not allow entry of nonexistent accounts or project numbers, nor inconsistent information such as attributing overhead account numbers to regular project expenses. Most forms post automatically to the appropriate accounts, minimizing the number of entries required and the potential for errors.

Posting of data is accomplished through a separate posting step that prints a copy of all posting transactions. This system saves enough accountant costs in one year to more than pay for the software.

Because the program is project-based, with all information entered by project number to either regular, promotional, or overhead accounts, the project-control system must be installed first. For each project, the system tracks actual vs. budgeted labor hours and costs, overhead, direct, and reimbursable costs.

The billing module accommodates almost any conceivable method of calculating compensation. It is possible to modify the invoice amount and post it back into the system. This feature reduces the time to prepare and review invoices. The invoice can be seen on the screen as it is generated by the system, so changes can be made immediately.

While the billing module does not offer total flexibility with invoice formats, invoices can be customized. Services can be described in detail and amounts changed. A limited number of custom formats can be saved for each project.

Some modules are easier to install than others. The billing module is relatively easy because the manual provides sample invoices to use as models in making decisions. The project control and accounting system was more challenging. Better samples would have been helpful.

The major weakness of the program involves the lack of flexibility in customizing



James C. Jankowski, AIA, (above left) and Paul A. Harding, AIA (above right).

reports and printing formats. While the preformatted reports are essential, some data cannot be produced on the same page. Our firms work around this limitation by using the spreadsheet interface to produce custom reports.

Unlike some programs, Harper and Shuman does not keep all details entered into the system forever. Once an accounting period is closed, the detailed transactions are no longer available on line. Another limitation is that only two accounting periods are available: prior month and current month. Thus we keep print-outs of detail in our accounting files.

Of particular value is the annual survey of statistics from Harper and Shuman clients. This provides a yardstick with which we compare our firms to others. The survey provides a meaningful look at effective multiplier, chargeable time ratios, overhead, profit, capital investment per employee, and office costs per category.

Harper and Shuman's greatest strengths are the company's experience and background in sound accounting procedures and in the practice of architecture. These may seem like mundane considerations, but they are more important than speed and flash in saving the time of our accountants, helping us to find the error we made six months ago, or preventing it.

—JAMES C. JANKOWSKI, AIA,
AND PAUL A. HARDING, AIA

INFORMA

INFORMA'S NUMBERING SYSTEM WORKS well in tracking project information with a seven-digit job number. The last two digits indicate additional services; another one-digit number tracks the phase; and a two-digit number tracks the task.

All programs included in this evaluation provide more reports than are needed to manage a project. The major report for project management is "job cost labor." It lists the project; employees by pay period, phase, and task; hours; and cost. Project managers also use the "labor summary by phase." For each phase of a project, it gives budgeted

dollars, actual dollars, balance remaining, average hourly cost used on that phase, actual hours, and hours remaining, based on the remaining dollars divided by the average hourly cost.

Strengths of the Informa program are its payroll and accounts payable systems. The payroll screen is helpful because it shows the last five projects entered for each employee. After payroll checks are printed, it takes about 45 minutes for the program to process the job-cost information.

The program comes with either a cash or accrual accounting system. The only difference between the two methods is the posting of receipts. The cash system uses a cash-disbursement journal that posts to the general ledger instead of accounts receivable. The job-costing portion of the program operates from an accrual system for project reports.

The billing portion of the program, however, is not flexible enough for our needs. Some projects last more than a year, and overhead and wage rates might change, depending on the contract. The billing module must be able to make those changes without affecting job costs for prior years. If an employee's wage changes in the middle of an hourly project, the program will change all prior job-cost reports. The program also has trouble dealing with projects that change from hourly to fixed fee.

Although Informa generated information that helped us manage our projects, it does not provide an entirely satisfactory answer to the basic question: Am I making a profit on this job? Simply listing profit or loss to date doesn't tell the whole story. There should be an opportunity for the project manager to estimate how far along the project is. Informa uses only the calculation of total cost divided by total budget to report complete percentage of a job.

Some needed changes in Informa's software include better graphics, both on screen and in reports. Also, the ability to modify or delete information temporarily on a report would be helpful—this is essential to "what if...?" investigations. Finally, the program should have the ability to keep open a month or a year while entering information in a new period. Informa requires the current period to be closed before a new period is opened.

Installing the Informa program is quite simple. It took all of five minutes, including the automatic password. Setting up the system also went smoothly. The chart of accounts has been defined with an architectural firm in mind and the tax tables come pre-defined for our location, although we could edit them if necessary.

—DAVID J. ENGELKE, AIA,
AND ROBERT J. BOHLMANN, AIA

MICRO MODE

ALTHOUGH MICRO MODE SHARES A common heritage with ACCI, the two firms and their programs have distanced themselves since breaking up in 1987. Micro Mode completely reworked three of its five modules in its latest version, System VI, released last year. The others are being rewritten for release this fall. An optional module, Intelligent Query, allows the user to develop custom reports and graphics without the need to export data to a spreadsheet file.

The new modules depart from the older, text-style prompts by providing graphically organized displays with highlighted user entry fields. New users will find that each screen in the updated modules offers superb on-line help, available in pop-up windows at any level. Checklists can be called up to verify data-entry sequences. The user also can retrieve data lists for cross-referencing prior entries. For example, the project database directory, containing default information pertaining to that screen, can be brought in when entering time sheets, thus eliminating the need for a hard-copy reference. Most importantly, the program displays warnings whenever the operator inadvertently enters an area where modifying data will alter the operation of the system.

Reports and printouts remain Micro Mode's strength. The program now supports Hewlett-Packard and compatible laser printers, speeding up printer-intensive tasks. Payroll checks and invoices are a snap to print. Invoices can be customized with various header, body, and footer information for fixed-fee percentage-complete projects or time-and-material hourly projects.

Project management reports show variances with budgeted versus actual costs, allowing project managers to obtain a project's status quickly. Financial statements are provided to principals, with ratios customized to the needs of the firm.

The most troublesome aspect of the program is the format of its two unrevised modules. Although there appear to be no compatibility problems, the older modules are cumbersome due to the lack of on-line help menus and a format that requires all data to be entered before revising mistakes made earlier in the entry process.

We also wish that all reports were available on screen. Several reports must be printed to be reviewed. Another annoyance is the time the program takes to process information after about 250 projects.

We strongly recommend buying on-site training, installation, and phone support. The cost is small compared with the saving in time to learn the system.

—ANDREW R. WANG, AIA,
AND DAVID V. KASPRAK

SEMAPHORE

THE LEAST EXPENSIVE BASE PROGRAM, Semaphore runs faster, more smoothly, and more flexibly than the most expensive software. This advantage would be minimal if the program were difficult to put in place, but we found that it is also relatively easy to get up and running. It is not only the best value, it is the best financial management package.

Semaphore is the only vendor that will send you a full working copy of the program and not ask for payment within 30 days. If you don't like the program, just return it and get your \$100 deposit back. If you do like it, send as little as \$625, depending on your firm's size and how many modules you want. Then begins a one-year warranty period, during which you are allowed unlimited free support calls and free updates.

A very nice feature, not available with the other programs, is Semaphore's ability to connect to six dumb terminals (consisting of monitor, keyboard and cable) at a cost of only \$325 each, creating a kind of faux local area network. This arrangement permits more than one operator to be inputting data at the same time, or the bookkeeper to be entering data while the principal is viewing reports. The program supports record locking without file locking, which means a record can be viewed at two or more workstations simultaneously, however only one operator can change the record. When a change is made, it appears immediately on all workstations the next time their screens are refreshed.

Semaphore's modem support permits a technician to take over a computer and demonstrate on screen how to perform a task.

In the spectrum of freedom and authority, Semaphore jumps as close to the freedom end as accounting can go. It offers password control at all levels, unrestricted and easy invoicing permutations, and an unlimited number of simultaneously open consecutive accounting periods. Cash and accrual-based books are always current. Simply select which basis you wish to use when viewing—for instance, a balance-sheet report. Job detail is maintained indefinitely.

Standard job costing and project control linkages and reports are built in. Semaphore's approach to recording data and its slick report generator make this information useful and exciting.

Built-in invoices include AIA-type formats that can be edited easily to resemble in-house format types. The system's customized invoice generator is so flexible that it's easy to create unique invoices ranging from a terse "pay me \$X" to multipage documents that include more information than any

architect could possibly want.

Editing tools are uniquely powerful and extensive. Data can be entered almost anywhere and edited in another section. Editing can be done before or after posting. Posted invoices can be unposted, edited, and reposted.

Jobs can be coded for sorting by building type. This permits analysis of churches, breweries, or whatever building designed by employees, as well as profits, cost per square foot, et cetera. The process, however, is limited to data Semaphore knows; derived data can't be written back into Semaphore's fields.

Semaphore's drawback is its lack of consistency. Prompts are often confusing due to a lack of punctuation and highlighting. Sometimes they appear near the top of the screen, other times near the bottom. On-line help, summoned by pressing F4 instead of the conventional F1, is sometimes available, but most often not.

Semaphore offers more features than most of its competitors in an easier format. Its advantages are no longer limited to price.

—JAMES M. PETERSON, AIA,
AND JOHN C. VOOSSEN

WIND-2

WIND-2 ALLOWS ALL REPORTS TO BE viewed on the screen. A scroll feature permits full, 132-character review. The first column locks into place and the rest of the report can be scrolled beneath.

Time-entry control totals are determined and set by each employee's time sheet. Errors are easy to locate. Time and expense entry allow for a 50-character comment field, which can be shown on reports and invoices at the user's option. Wind-2 maintains all project detail until selective archiving. Entering time into one year without closing the previous year is no problem. The choice is always available to budget by hours, cost, or billings, or any combination of the three. The "summary earnings" report provides profit-loss projections to date based on actual company overhead.

Wind-2 performs a "soft" close all year on the general ledger. All detail remains in the program and financial statements can be reprinted with changes. More than one month can be open at one time.

Users may begin payroll for the new year before printing W-2 forms. Wind-2 uses the same check format for both accounts payable and payroll. The new payroll module will allow for deductions up to a maximum (for example, \$10 a week up to \$500). The accounts-payable module allows for unlimited partial payments.

We especially like the alphanumeric fea-



William A. McBride, AIA, (left), John F. Kelley, AIA, (center), and David Mangurten (right).

ture for project identification numbers. If the project is a proposal or preliminary, we prefix a job number with a "P." When a project is under contract, we remove the prefix. Wind-2's utilities allow us to recoup all the proposal time on a project.

Unlike ACCI, Data-Basic, Micro Mode and Semaphore, Wind-2 does not accommodate both cash and accrual accounting—it provides for accrual only.

Manuals are available with forms for easy setup. The upper right-hand corner of each screen references the corresponding section of the manual.

We wish Wind-2 could be as easily and inexpensively networked as Semaphore, but its expansion capabilities are attractive, and it provides plenty of room for growth.

—DAVID I. MANGURTEN AND
WILLIAM A. MCBRIDE, AIA

CLERK OF THE WORKS

FOR TURN-OF-THE-CENTURY ARCHITECTS, a project accountant was known as a "clerk of the works." This program is aptly named, but it does much more. Samsara's "Clerk" as we refer to it, is one of the only complete financial management programs that follows AIA accounting guidelines and runs on the Macintosh. It also is the only Mac- or DOS-based program in this evaluation that offers graphic aids such as lines and scanned art.

Other advantages of the program include indefinite retention of all data, on-screen look-ups, the ability to view all reports on the screen, and a strong architectural orientation. Principals of architectural firms and bookkeepers will feel at home immediately with the terminology and organization of the software program.

The complete, unrestricted program is also among the least expensive at \$2,495. Those who feel this cost is high may purchase the input software and manual for \$25 and pay only \$75 for each report, plus a \$50 setup charge. Free upgrades are included until further notice.

A fully functional demonstration disk is available with a \$90 deposit, but it works only briefly. The user must pay for a program to get a continuation code.

The Clerk of the Works program was released in November and our firm has had it for only a month, but it is very easy to use. The tutorial is helpful. It is unnecessary to use a consultant to assist in setting up, but telephone support and familiarity with basic accounting principles will speed the process for architects.

Multiple billing rates and multipliers can be used, but if multipliers are used, principals of firms can't be automatically invoiced at flat rates. However, with a relatively small number of invoices, this is easily edited on the system's automatically-generated invoice.

Simplified data entry in the proper places by non-accountants produces a database that forms the basis of all accounting functions. This should save considerable time, since the same data can be employed for other purposes.

The program would be more useful if it permitted a principal to get at the "bottom line" more quickly and easily. There is simply no time to piece together summary and comparative data for financial, schedule, or quality results. The software does not offer related programs for budgeting, scheduling, and more sophisticated project management. These related programs, however, are needed. Clerk of the Works also needs an internal word processor. This would permit a wider selection of fonts, currently limited to only one.

Other problems with Clerk of the Works include:

- Vendor invoices default to 30 days from invoice, and due dates for consultant invoices cannot be edited.

- We haven't figured out how to handle consultant fees disbursed to a separate account for future payment.

- No cash-disbursements journal is provided. Checks covering more than one expense type cannot be distributed to separate general-ledger accounts.

- Partners take draws, not salaries. Clerk of the Works doesn't address this financial problem.

- Insufficient space is provided for entry of titles, account numbers, fax numbers, and a billing address different from the retail outlet.

- Financial reports for receivables and payables are sometimes needed weekly, but Clerk of the Works reports monthly.

We don't, however, anticipate any serious problems or drawbacks with Clerk of the Works, and are generally pleased with the software program.

—MARSHALL J. MORETTA, AIA,
AND RICHARD J. ABRHAM

OTHER DOS PROGRAMS

FIVE PRODUCTS, INTEGRATED INTO accounting programs, extend the range of financial software options. The programs are Quicken Version 3 from Intuit; Timeslips III Version 3.4 from North Edge Software; Prosys Version 7 from Harrison C. Phillips; Pro Cash Flo from Pro Systems; and RFP Version 4.3b from A/E Management Services. None of them are competitive with the programs reviewed previously.

Quicken is an electronic check register that categorizes deposits and payments. The program is best suited as a stepping stone from a manual system to office automation. Many features found in previously accounting programs simply do not exist in Quicken. Moving data from one account to another is cumbersome. Time-sheet data entry is not available, and automated invoicing is not possible. If the user is familiar with accounting, some limited project reports may be produced. At a retail price of \$59.95, Quicken is a bargain. But a complete management system for architects, it is not practical. The program is written for DOS-based computers, but a Macintosh version is available at the same price.

Timeslips III appears to be an excellent personal time manager. It runs in the background and pops up at the touch of a key. Highly interactive and designed for the novice, the program hides accounting details well. Still, the project setup is very sophisticated and allows for flat fees, hourly, and hourly not-to-exceed billing. The report feature is strong, providing invoice aging, project analysis, and personnel analysis. But as a data-entry program for time cards, the program has many deficiencies. The "slips" are used on a per-project basis, not by a client. This can be a problem when billing multiple projects to the same client. The program does not track checking accounts, write checks, or perform any payroll functions. Built-in invoicing is not easily customized. Priced at \$299.95, the program is available in DOS, Macintosh, and network versions.

The new Prosys accounting program was the most promising software, but it crashed on setup. A corrected version also had a programming error. The manual supplied with the program needs a lot of work before it is ready for a novice. When the bugs are worked out, the \$650 program has the potential to be a powerful analytical tool.

Pro Cash Flo, priced at \$995, offers complete project costing. Standard reports include time sequence, job cost, cost activity, invoice log, statements, aged receivables, check log, labels, cash flow estimation, project cost estimation, and summaries. Customized invoices are included in the price, if

Continued on page 128

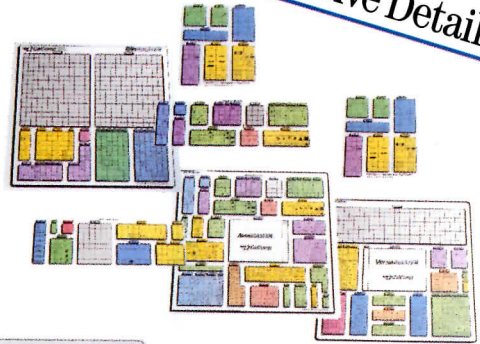
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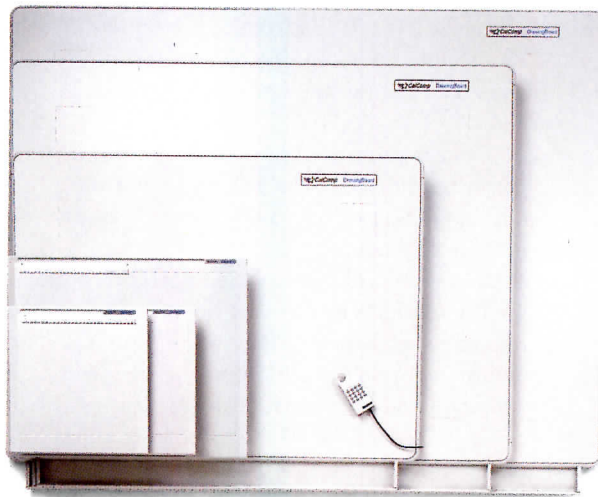


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Circle 125 on information card

PRODUCTS



1



2

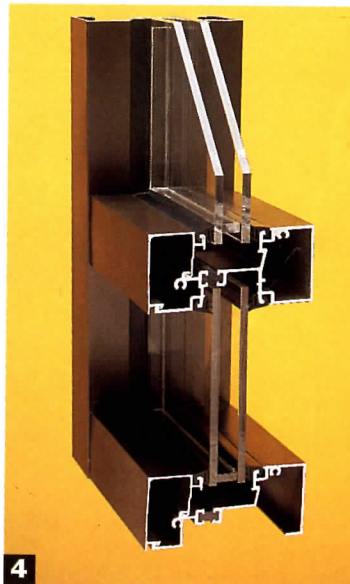
1. The stepped, gabled facade of Florida's De Land Public Library by Gee & Jensen Architects showcases Libbey-Owens-Ford Eclipse reflective glass supported by the Kawneer 1600 glazing system. The 1600 curtain wall system offers a choice between slight mullion reveals and structural silicone glazing. Circle 416 and 417 on information card.

2. Pickwick Place in Birmingham, Alabama, designed by Kidd/Plosser/Sprague/Architects, is constructed with Kawneer's Trifab 450 framing system. Trifab II 450, a new version identical in appearance, consists of few parts for simplicity of installation. Circle 417 on information card.

3. A design goal for K.B.J. Architects' Orlando International Airport terminal was to eliminate visual barriers between indoors and outdoors. The GlasWal system by W&W Glass Products was chosen. Circle 418 on information card.



3

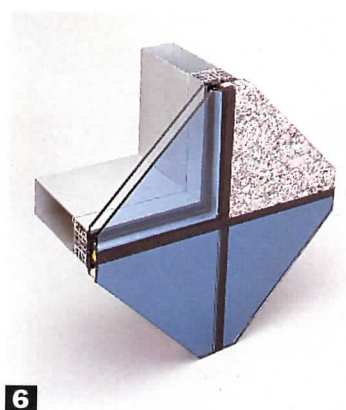


4

4. Amarlite's IGS 450 EZ Thermal Framing System is geared toward applications requiring the greatest thermal protection and is designed with few parts for ease of installation. Mullions are available in a range of finishes. Circle 419 on information card. 5 & 6. Alumitech's curtain wall system can create a mullionless surface in existing walls or new construction. This system can accommodate glass, aluminum panels, and lightweight composites. An example of Alumitech's system is Mojo-Stumer Architects' sleek office building in Plainview, Long Island. Circle 420 on information card.



5



6

TECHNOLOGICAL VISION

Marrying design versatility with thermal integrity.

EXTERIOR GLASS WALLS HAVE THE POTENTIAL TO CREATE A strong visual relationship between interior and exterior. With advances in design versatility and in thermal- and cost-efficiency of structural framing for glazing systems, esthetic and functional possibilities for glass walls have blossomed. While technical advances such as low-emissivity glass and structural silicone serve to free the hand of the architect in specifying glass, glazing systems are not simply at the service of design. Structural integrity and safety against a range of physical stresses are perhaps the most obvious attributes. New unitized products, consisting of a small number of standard, interchangeable parts, are easier and less expensive to construct and repair. Systems that were formerly fitted only with glass can now accept aluminum, granite and marble composites, and other materials. The most far-reaching innovation is the ability to create and economically preserve an interior climate in buildings clad with large glazed areas, made possible by more energy-efficient glazing and tighter seals between panels. —RANDALL MASON

FORM FOLLOWS COMPUTER

New equipment for the electronic office.

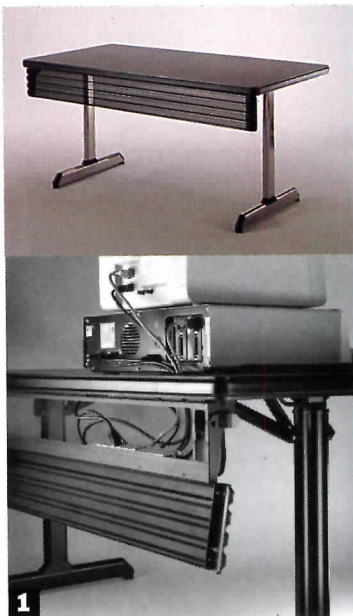
THE OFFICE SYSTEMS AND ACCESSORIES INTRODUCED AT NEO-con 22 in Chicago this past June (see page 34) refine earlier modular furniture and components to meet the challenges of the continually evolving white collar environment.

Research by manufacturers of office furniture confirms that professionals need easy access to a computer, yet also desire uncluttered work space for other activities.

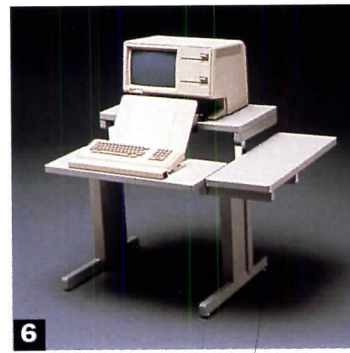
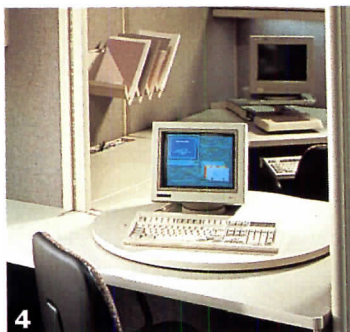
The newest office systems angle electronic hardware into the corners of the work space or build them into the furniture. Computer monitors may also be lifted completely off the table by arms that can be swung out of the way when not needed. More work space with less clutter from wiring is achieved by raceways placed within tables or partitions. Wire management also enables furniture components to be moved easily and reconfigured as necessary. The steady influx of accessories such as interchangeable and add-on work surfaces, adjustable keyboard extensions, and storage units, meets practical workstation requirements while accommodating the changes within a growing company.

—A.G.L.

1. The training table designed by Niels Diffrient features a mod-esty panel that contains the power center and is hinged downward for easy access. Also attached is an electrical raceway. Grommets allow cable entry into the cable trough, which runs the length of the table and accommodates a multi-outlet power center. Howe Furniture Corporation. Circle 401 on information card.



2. The Quest modular office system was designed by James Hayward to be easily adapted, moved, and reconfigured, with add-on work surfaces, storage units, acoustic screens, and connectors. Kinetics. Circle 402 on information card.



3. Places' fabric-covered ported panels provide duplex power receptacles and communication-cable access configurations at work-surface height, panel-top raceways, and an adjustable keyboard pad. Haworth. Circle 403 on information card.

4. Turntable with movable platform rotates 360 degrees with a self-breaking mechanism, and has a center hole for cord and cabling. Westinghouse Furniture Systems. Circle 404 on information card.

5. The Ergo Arm places the computer monitor anywhere within the cube of the office space. Three-dimensional adjustability allows exact positioning, and a spring counterbalances the monitor to hold it in place. Ergo Systems. Circle 405 on information card.

6. The dual-surface CRT table allows for both CRT and keyboard adjustment, while offering a printer table with bottom and backfeed capability. The table also includes a paper stack shelf. Shaw-Walker. Circle 406 on information card.

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1. Harditexture exterior sheathing looks like stucco and can be used in molding and trims. James Hardie Building Products. Circle 411 on information card.
2. Multi-use, non-asbestos, fiber cement interior and exterior building panels are available from FibreCem Corporation. Circle 412 on information card.
3. Dens-Glass Gold sheathing combines a fiberglass mat surface with a silicone-treated gypsum core and an alkali-resistant surface coating to resist weathering. Georgia-Pacific. Circle 413 on information card.



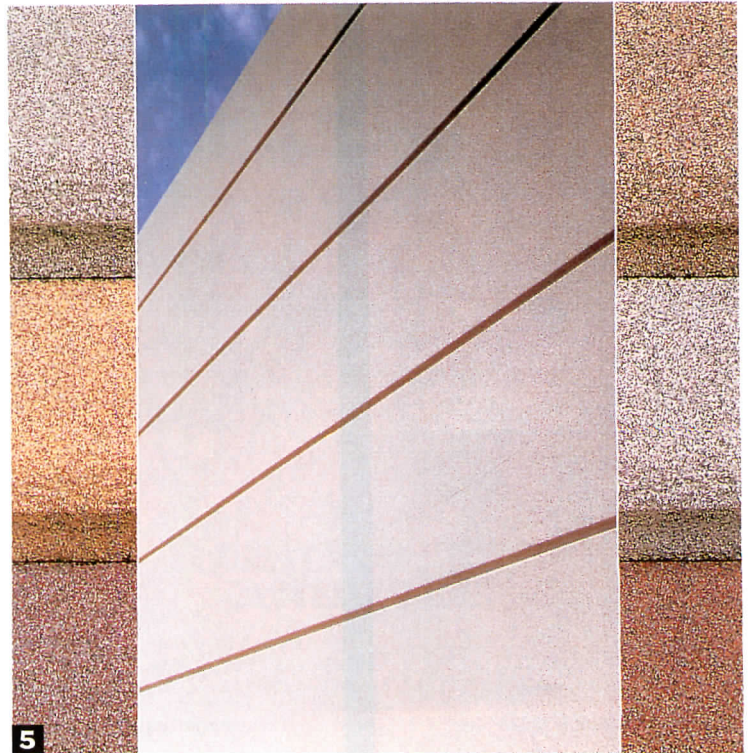
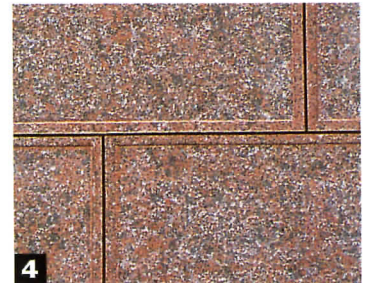
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—A.G.L.

4. Lumishield and Granstone Finish are two new exterior coatings formulated for durability. Granstone Finish, shown below, simulates the appearance of granite or stone. The Lumishield fluoropolymer coating is a site-applied finish formulated to protect surfaces such as aluminum, steel, glazed brick, concrete, and glass-fibered reinforced concrete. Thoro System Products. Circle 414 on information card.
5. A new multicolored quartz aggregate finish simulates the appearance of natural stone and is designed to pick up and reflect natural sunlight. Both Stone Mist and Stone Mist/Luster are spray-applied EIFS, suitable for both interior and exterior applications, and are offered in 10 colors. Dryvit Systems Inc. Circle 415 on information card.



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The use of these peripherals enables the user to engage in greater resource-sharing in a networked environment. ■

—A.G.L.



1



2

1. The DrawingBoard 2300 series of digitizer tables now includes three larger format models. Large-format tablets in the 2300A series are specially configured to support the Apple Macintosh II and SE computers. CalComp. Circle 407 on information card.

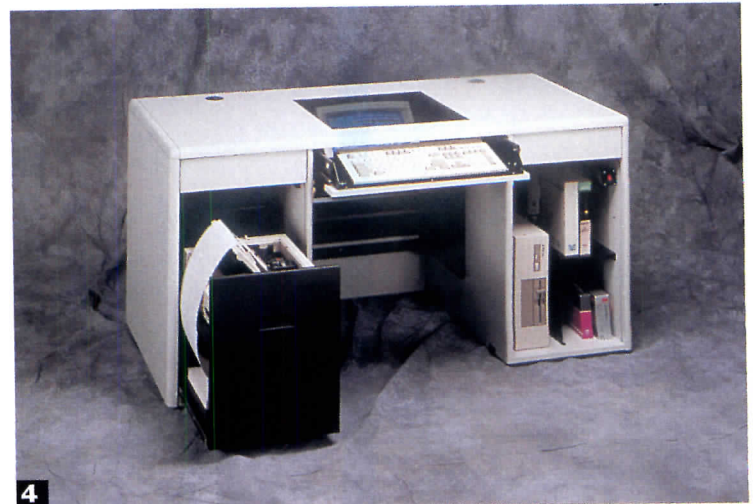
2. The updated Series 6000 workstations feature processing and graphics capabilities as well as an InterAct ergostand with a digitizing surface or menu tablet. InterServes features in-cabinet disk and memory expansion. Intergraph. Circle 408 on information card.



3

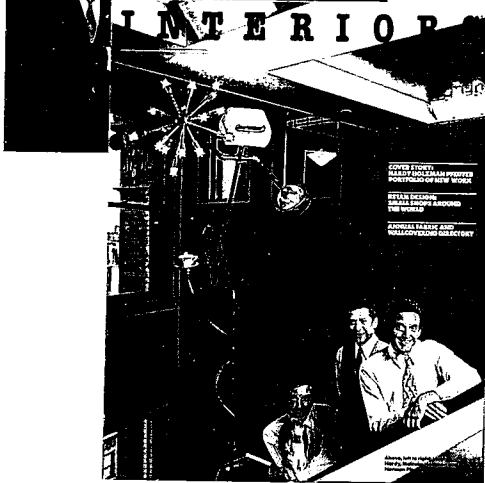
3. Photolink's infrared light pulses bounce off the ceiling to transmit data from one PC to another or to peripherals. This wireless alternative replaces cabling. Infrared transmissions are not subject to interference, unlike radio transmissions. Hi-Tech. Circle 409 on information card.

4. NetWork desk conquers repetitive stress injuries by placing CRT, keyboard, and reference data within the peripheral vision of the operator, enabling the entire work surface to be used. The computer screen is recessed into the desktop. Nova Inc. Circle 410 on information card.



4

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Books from page 51

and Crafts garden movement, which ran from 1890-1914. The Arts and Crafts garden was congenial: ordered and enclosed space, the garden surrounding the house, straight walks of stone or brick bordered with flowers. At the 19th century's close, young architects sought out the old gardens of England and Scotland for inspiration. They shelved styles and pattern books and went on sketching trips. They knew from Ruskin and Morris that they must be in touch not only with the past, but also with nature.

The gardens of this movement needed a star, and that became Gertrude Jekyll, born in 1843. She, like many of the architects, studied at Henry Cole's South Kensington School of Art, travelled and painted and worked with iron, silver, and ivory. She knew Ruskin and Morris, was a gregarious woman with charm and enormous vitality. At age 45 she met the 19-year-old architect Edwin Lutyens. Both loved old buildings and the crafts—soon they were in partnership, producing some of England's most beautiful gardens and houses. Jekyll's artistic theories of planting, her knowledge of plants, and her energy welded the houses and gardens together.

Cleverly, Jane Brown concludes her remarkable book with a chapter called "Toward the 21st Century." She lets the plans and sketches for Sir Geoffrey Jellicoe's Moody Gardens in Galveston, Texas, do the summing up. Jellicoe was born in London in 1900. After his formal education at Cheltenham College and the Architectural Association School, his Rome scholarship allowed him, with J.C. Shepherd, to measure and draw Italian villa gardens.

By 1570 the Italian gardens, as Brown writes, had reached their zenith; their designers were harmonizing formality with informality, giving their gardens warmth, color, and proper scale in the Italian landscape. These gardens, these humanist cre-

ations, are Jellicoe's reference points.

On the preliminary layout of Moody Gardens, Jellicoe makes this note: "A Plan to Illustrate the history of Gardens from the Beginning to the Nineteenth Century, presented in fourteen sheets as a unified concept of time and space." The project is a water park on the Gulf of Mexico. Visitors will tour the garden by boat, viewing garden interpretations of Eden, Egypt, Rome, England, France, China, and Japan—Jellicoe's drawings are precise and charming. Sir Geoffrey must know Texas, because only there could such a project be undertaken. Its completion date is scheduled for well into the 21st century.

Sir Geoffrey will be 90 this year. Let us hope Jane Brown lives even longer, helping us to understand and use our garden history.

—LESTER COLLINS, FASLA

A practicing landscape architect, Lester Collins directs Innisfree Foundation in Millbrook, New York.

Nine Commentaries on Frank Lloyd Wright

Edgar Kaufmann, Jr. (The Architectural History Foundation and MIT Press, \$30.)

WITHIN THE LAST SEVERAL YEARS, there has been an outpouring of books on Wright, and a new book by the prominent architectural historian, the late Edgar Kaufmann, Jr., represents yet another. Kaufmann, an apprentice to Wright from 1933 to 1934, was the man responsible for bringing the work of Wright to the attention of his father, Edgar Kaufmann, Sr., who commissioned Fallingwater. Following his apprenticeship, Kaufmann was with the Department of Architecture and Design at the Museum of Modern Art and then, in 1954, became an editorial adviser to the *Encyclopedia Britannica*. From 1963 until his retirement in 1980, he was a professor of art history and architecture at Columbia Uni-

versity. Documented in an appendix to this book is a compilation of Kaufmann's 229 articles on architectural history, spanning more than 50 years. Many of the publications which appear in this compilation are on Wright—an impressive list as well as legacy of thought.

With the exception of several primary source documents included in *Nine Commentaries*, the reader is afforded Kaufmann's keen insights into Wright through a careful presentation of more than 50 years of architectural study. Not only was Kaufmann a scholar, but also a former student, client, and friend of Wright.

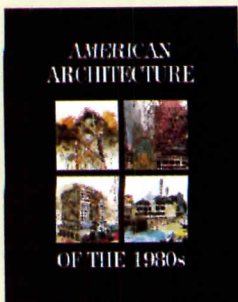
The first two commentaries are reprints of articles that appeared in 1981 and 1982 issues of the *Journal of the Society of Architectural Historians*, which relate, almost exclusively, to the influences of Friedrich Froebel's "Kindergarten Gifts" on Wright's architectural education. In both commentaries, excerpts from primary sources on the Froebel teaching system are presented, giving the reader excellent insights into Wright's earliest architectural experiences.

The third commentary, "Frank Lloyd Wright's 'Lieber Meister,'" represents heretofore unpublished material. The highlight of this particular commentary is the 1925 court testimony of engineer Paul F.P. Mueller. Mueller had worked with Wright during the architect's days at the office of Adler and Sullivan, on the design of the Auditorium Building in Chicago (1887-1890). In this primary source document, Mueller presents an exceptional account of the construction of that building, bringing it to life through an eyewitness account.

The fourth commentary is on Wright's use of the title "The Sovereignty of the Individual" for a short essay he had written. Wright had used this title for an essay that initially appeared as the introduction for the famous Wasmuth portfolio of his work in 1910. Kaufmann explores the origins of the title and why Wright may have used it.

American Architecture of the 1980s

Foreword by Donald Canty; introduction by Andrea Oppenheimer Dean. (The American Institute of Architects Press, \$60.)



American Architecture of the 1980s shows an extraordinary range of buildings and projects, drawn from the pages of ARCHITECTURE magazine. The 80s represent "a fertile decade that has embraced and refined a range of expression from literal historicism to minimalist abstraction, from regionalism to corporate internationalism, from organic architecture to cool high-tech," writes Andrea Oppenheimer Dean in

the book's introduction. The period began with the election of Reagan and the "Presence of the Past" entry in the Venice Biennale. "By the close of the decade, the stylistic battles, tire-some arguments, and factional in-fighting of the early 80s seemed as out of date as the Cold War," she concludes.

The 352-page book presents 45 buildings including Richard Meier's Atheneum, Frank Gehry's own house, Fay Jones's Thorn-crown Chapel, Philip Johnson's PPG Place, Kohn Pedersen Fox's Procter & Gamble headquarters, Michael Graves's Portland Public Services Building and Capistrano Library, and Kallmann McKinnell & Wood's Hynes Convention Center. The book also includes essays on the decade by Joseph Esherick, Peter Forbes, Robert Frasca, David Gebhard, Robert Geddes, Frances Halsband, Robert A. Ivy, Jr., Doug Kelbaugh, Donn Logan, Glenn Robert Lym, Margaret McCurry, Samuel Mockbee, Mark Simon, and Richard Guy Wilson.

"Precedent and Progress in the Work of Frank Lloyd Wright" is the fifth commentary. Through this essay, Kaufmann indicates potential precedents that may have influenced Wright's designs for inglenooks in several of his residential buildings. In his analysis, Kaufmann presents not only several of Wright's inglenook designs but also those of mid-19th-century English architects W. Eden Nesfield and R. Norman Shaw, as well as Adolf Loos and J.M. Olbrich.

The sixth commentary, "The New Order of This Machine Age" presents new analysis relative to Wright's Larkin building in Buffalo, and the design of that building's reception desk, which "guided the flow of people in the lobby." The evolution of the design is well documented through numerous illustrations, including nine of Wright's preliminary design development sketches and drawings of the desk. "Crisis and Creativity: Frank Lloyd Wright, 1904-1914," the seventh commentary, highlights a vivid account by Wright's son, architect Lloyd Wright, of the preparation of the famous Wasmuth portfolio.

Excluding the compilation of Kaufmann's writings, these first seven commentaries represent more than 75 percent of the book and concentrate exclusively on Wright's early years—before 1914.

The eighth and ninth commentaries are

titled "Frank Lloyd Wright's Years of Modernism, 1925-1935" and "Frank Lloyd Wright: Plasticity, Continuity, and Ornament" and present what Kaufmann describes as "microanalyses of elements of Wrightiana." Not much new ground, however, is covered in these essays.

There is also a "tenth" commentary in the book titled "Frank Lloyd Wright and Gottfried Semper," published for the first time. This is a supplement to Kaufmann's "Lieber Meister" commentary in which he discusses the influence of Semper on the architectural community of Chicago when Wright first worked there as a young draftsman.

While the book is quite useful in analyzing the work of Wright, particularly during his early years, there is little new information presented. The various commentaries perhaps should have introduced additional thoughts from Kaufmann, who, with his intimate knowledge of Wright, could have better integrated them to relate not only to one another, but to the book as a whole. While disappointing for the ardent Wright scholar, *Nine Commentaries* offers most readers a better understanding of the master.

—PATRICK J. MEEHAN, AIA, AICP

Patrick J. Meehan is the author of several books on Frank Lloyd Wright.

John Webb: Architectural Theory and Practice in the Seventeenth Century

John Bold (Oxford University Press, \$98.)

A STUDENT OF INIGO JONES (AND MARRIED to his cousin), John Webb was a transitional figure in 17th-century British architecture, between Jones and Christopher Wren. Born in 1611, 38 years after Jones and 21 years before Wren, Webb is considered England's first professional architect, beginning his training under Jones at age 17. He assisted the elder architect on designs for theater sets, Somerset House, Whitehall Palace, and Jones's restorative work on old St. Paul's Cathedral, destroyed by the great fire of 1666 and built anew by Wren.

An appointment to the court of King Charles I followed after years of apprenticeship under Jones, and Webb went on to build what is considered his greatest extant work—the King Charles building at Greenwich, completed shortly before his death in 1672, now part of the Royal Naval College.

Webb executed a number of interior designs, grand country houses, and the Physicians College in London. Webb also wrote on architectural theory, and published a book on his study of Stonehenge.

—MICHAEL J. CROSBIE

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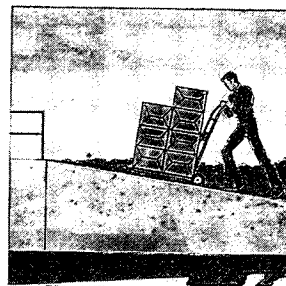
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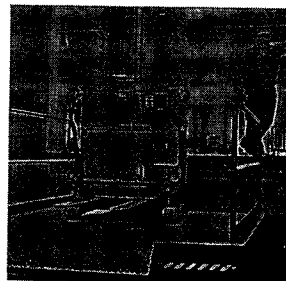
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Software from page 117

the user's needs are not too complex. An optional payroll module rounds out the system. Many of the pre-programmed report forms have the look and feel of manufacturing-based cost analysis, which is the speciality of its developer, engineer Dan Johnson. The program would be valuable if it incorporated an architectural version with project-construction estimates or budgets and phased breakdown of fees for standard contracts.

RFP was developed to streamline the production of architectural and engineering proposals. It generates SF254 and SF255 forms flawlessly on laser printers. This feature alone is a great selling point. Because of its database roots, the program utilizes information about the firm and its projects to prepare custom proposals for private work, project management, firm management, and other reports. The resume section is unique. It creates multiple fields permitting paragraphs to be rearranged and tailored to specific client or project needs. Data can be exported to WordPerfect 5.1 for editing and graphic enhancement with scanned images and clip art. The impact of high-end, professional-quality proposals is overwhelming. The possibilities it opens are sensational. The system should become a standard in every

office. The price is \$500 to \$6,000, depending on size of the firm and components acquired. The reviewed version cost \$2,795.

—STEVEN L. GLENN, AIA

OTHER MACINTOSH PROGRAMS

FEE SIMPLE FROM CREIGHTON NOLTE & Associates, Time Is Money by Collier Software, and Arch Account by the Gardner Partnership provide useful additions to the library of Macintosh-based financial software, even though they are not integrated accounting programs like Clerk of the Works.

Fee Simple is a collection of templates for use with Excel, a spreadsheet program. It helps determine and analyze project fees, overhead rates, multipliers, and related data for small- to medium-sized firms. One set bases the fee on phases and overhead rates. Fee Simple provides the type of analysis and decision support tools the spreadsheet was designed for, yet it eliminates the setup time, which can be one of the most frustrating aspects of computing. These templates, at \$225, offer the opportunity to review project fees quickly from different points of view, and are worthwhile for any firm trying to be more competitive, profitable, and smart about financial management.

Time Is Money is a series of pre-formatted data-entry forms and report templates for use with Reflex Plus, a database program. It is used to manage staff time-sheet data, client account and billing information, and to track fees and expenses throughout the course of a project. Several levels of complexity are offered. You can choose to enter and report information within the available templates, or you can learn the inner working of Reflex Plus and custom tailor the input and output. Time is Money is priced at \$265 for the basic version, or \$399 for the professional version.

Arch Account is a stand-alone program designed to help the small firm manage project billing. It is simple, intuitive and inexpensive at \$295. Installation is as easy as it gets and documentation is simple to understand. Project billing can be structured hourly or by percentage of fixed fee by phase. Reports for each project summarize fees and billing. Few options are provided for customizing the entry and reporting of project data. Given the number of firms with fewer than five members, Arch Account could find a significant niche within the profession if it adds a few options and features. ■

—DAVID J. JOHNSON, AIA
Continued on page 129

	ACCI	Data-Basics	H&S	Informa	Micro Mode	Clerk	Semaphore	Wind-2
Version	7.0	1.2	9.0	3.1	6.0	1.1	5	4.1
Price, single user *	\$3,095-\$9,190	\$987-\$6,986	\$825-\$7,050	\$1,995-\$4,500	\$2,780-\$4,380	\$2,495 ♦	\$625-\$4,995	\$1,790-\$5,590
Operating system	DOS	⊕	DOS, VAX	DOS	DOS	Macintosh	DOS	DOS
Trial period	60 days	90 days ❖	30 days	30 days	60 days	90 days	30 days ❖	30 days
Free support	To next cal. yr.	No	One year	12 months	No	30 days	13 months	30 days
Support, full year, per year	\$295	\$678 ♦	\$395-495 ♦	\$350	\$360 ♦	\$1 per minute	\$210	\$495 ♦
Toll-free support	No	No	No	No	Free return call	Yes	Yes	No
Tutorial	No	Yes	Yes	No	Yes	Yes	Yes	No
Updates (single user)	\$750-\$1,250	\$300	\$195-\$495	\$350 ★	\$695	Free	\$250 ★	\$249-\$350
Demo disk	Free	Yes	Free	\$20	Free	\$90	Free	Free
Use protection	●	Yes	None	(c)	None	Yes	(c)	(c)
First sale	1982	1976	1973	1981	1982	1989	1984	1983
Installations	450	800	2,800 ▲	150	356	33	800	2,200
Percentage to architects	62%	50%	50%	80%	56%	97%	80%	55%
Maintains data	Indefinitely	Indefinitely	Till close-out	*	*	Indefinitely	Indefinitely	*
Dealers	10	15	3 offices	2	12	10	No	50
Newsletter	Quarterly	No	Bimonthly	No	Quarterly	No	No	Quarterly
Avg. size of customer	45	35	22	15	30	7	15	23
Cash and accrual	Both	Both	Accrual	Either	Both	Either	Both	Accrual
Reports in any date range	Any	Any	Some	Any	Some	Yes	Any	Some
Processes real-time/batch	Batch	Real-time	Batch	Batch	Batch	Batch	Real-time	Real-time
Edit entry w/o reversing	No	No	No	Yes	No	No	Yes	No
Circle number on information card	421	422	423	424	425	426	427	428

Notes: * Smaller firms pay the lesser amounts. Custom report generator for Micro Mode and Wind-2 is extra. ♦ Options available. ▲ 2,500 on PC, 300 on VAX. ⊕ DOS, OS/2, AIX, Xenix. ★ Free with support plan from Informa; \$300 with support plan from Semaphore. ● Firm name inscribed on disk. * Project detail data maintained indefinitely, but not general ledger. ❖ With refundable deposit.

Software from page 128

Walter J. Foran, AIA, is chief executive officer of Gelick Foran Associates, Chicago, a 35-member firm designing residential and commercial buildings.

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Charles R. Newman, AIA, heads a 10-member firm located in Naperville, Illinois.

William J. Waldorf is a senior architect at Larson & Darby, Rockford, Illinois.

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Paul A. Harding, AIA, is president of a seven-member Chicago firm that specializes in institutional and religious design.

David J. Engelke, AIA, is vice president of Potter Lawson Architects, a 38-member firm in Madison, Wisconsin.

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Andrew R. Wang, AIA, is a project manager at Hague-Richards Associates, a 40-member firm in Chicago.

David V. Kasprak is a senior project architect at Aumiller Youngquist, a 14-member firm in Mount Prospect, Illinois.

James M. Peterson, AIA, is a principal at Hasbrouck Peterson, a 13-member Chicago firm.

John C. Voosen heads his own four-member firm in Chicago.

David I. Mangurten is a partner at Kaplan Mangurten Architects, an eight-member general design firm in Deerfield, Illinois.

William A. McBride, AIA, and John F. Kelley, AIA, are partners at McBride & Kelley, a 16-member general design firm in Chicago.

Steven L. Glenn, AIA, heads ECD Associates, a six-member architectural/engineering firm responsible for commercial, institutional, and residential architecture based in Oak Park, Illinois.

Marshall J. Moretta, AIA, and Thomas W. Sheehy, AIA, are partners at Moretta & Sheehy Architects, a seven-member firm in Evanston, Illinois.

Richard J. Abrham is principal architect of RJA/Architects, a four-member general design firm in Chicago.

David J. Johnson, AIA, is a principal of Eastlake Studio, a 10-member corporate architecture and interior design firm in Chicago.

	ACCI	DATA-BASICS	H&S	INFORMA	MICRO MODE	SEMAPHORE	WIND-2
Foran	1	3	2	3	1	2	1
Murphy	1	3	3	3	3	2	3
Waldorf	1	1	2	3	1	1	1
Newman	4	1	6	7	3	2	5
Jankowski	1	3	1	4	2	1	1
Harding	N/R	3	3	3	1	2	2
Engelke	3	2	3	2	3	1	1
Bohlmann	3	3	2	3	2	1	3
Wang	3	3	2	3	2	1	2
Kasprak	3	2	2	3	1	1	1
Peterson	3	3	3	3	2	1	2
Voosen	6	3	4	7	5	2	1
Mangurten	6	5	2	7	3	4	1
McBride	6	3	4	7	5	2	1
Glenn	3	4	2	4	2	1	3

N/R=Not ranked
 Note: This chart is intended to summarize the perceptions of each evaluator regarding the relative merit of the programs, on a scale of 1-7 with 1 considered the best. Adding up the rankings to obtain a "winner" is not recommended. Only DOS-based financial management programs were ranked. Clerk of the Works is not included since Macintosh evaluators met separately.

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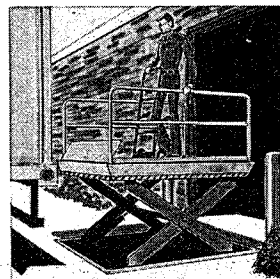
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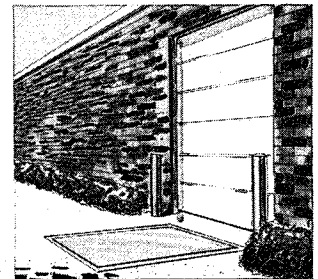
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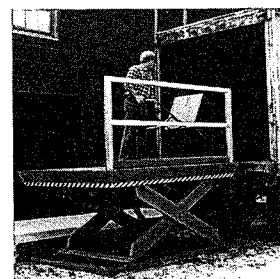
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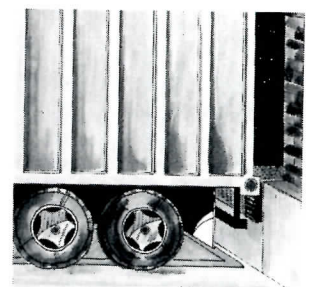
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