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Urban Agenda

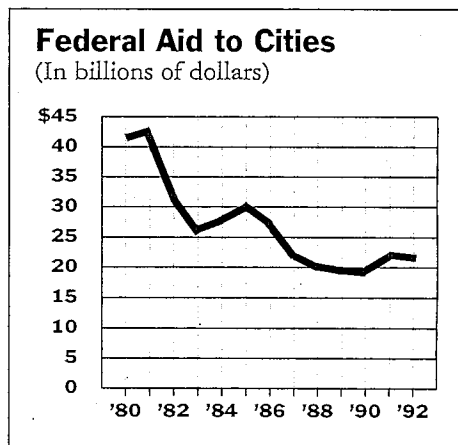
IN THE AFTERMATH OF THE LOS ANGELES RIOTS, POLITICIANS, GOVERNMENT officials, and urban experts agree that revitalizing our inner cities must become a national priority. They also agree that the task has never been harder. Over the past three decades, radical social and economic changes have occurred in cities across the country, setting the stage for rage and violence. The middle class has continued its exodus to the suburbs, and now not only lives, but also works, in outlying areas, seldom venturing downtown to shop, dine, or attend a cultural event. With increased immigration, the racial and ethnic profile of urban America has shifted, exacerbating tensions between minorities competing for housing and jobs. Under the Reagan and Bush administrations, government spending on cities dropped dramatically; in an age of increased urban crime and decay, federal aid is approximately half of what it was in 1980 (see chart, below).

Architects, too, ignored the needs of cities during the 1980s, concentrating their efforts on speculative and private development. But a growing group of practitioners is determined to set an urban agenda at the AIA convention in Boston this month. In March, Philadelphia AIA Chapter President Alan Greenberger led a coalition of the nation's largest AIA chapters to urge the Institute to commit its resources and lobbying to saving our cities. As Greenberger points out, architects must lead the fight. The health and vitality of cities is directly related to the health and vitality of the architectural profession.

As the Los Angeles riots made clear, the need to stem the tide of urban decline has never been more urgent. As advocates for cities, architects must seize the opportunity to devise alternatives to rebuilding the status quo, safeguarding the urban core against the large-scale, anonymous redevelopment of the 1960s and 1970s. A mix of uses—housing, schools, parks, and stores—must be developed to stabilize older neighborhoods and form new ones. Businesses and retail must be encouraged to relocate downtown to create employment opportunities and a strong economy. Cultural institutions must be encouraged to stay. Architects must design buildings and neighborhoods that bolster real lives, rather than environments that idealize or patronize their inhabitants. They must work with local community groups and other professionals, such as planners and economists. Joining forces with allied organizations such as the National Organization of Minority Architects, AIA members must build bridges into inner-city neighborhoods.

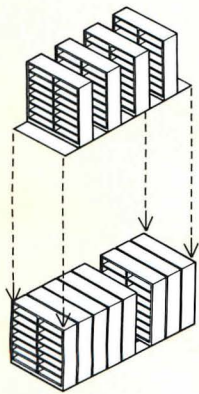
Implementing this urban agenda will be no easy task. Cities like Newark, Washington, and Detroit that were torn apart by riots in the 1960s have never fully recovered, and the scars of poverty and neglect are obvious still. We must begin the healing process. Who better to help cure our ailing cities than those who shape them? ■

—DEBORAH K. DIETSCH



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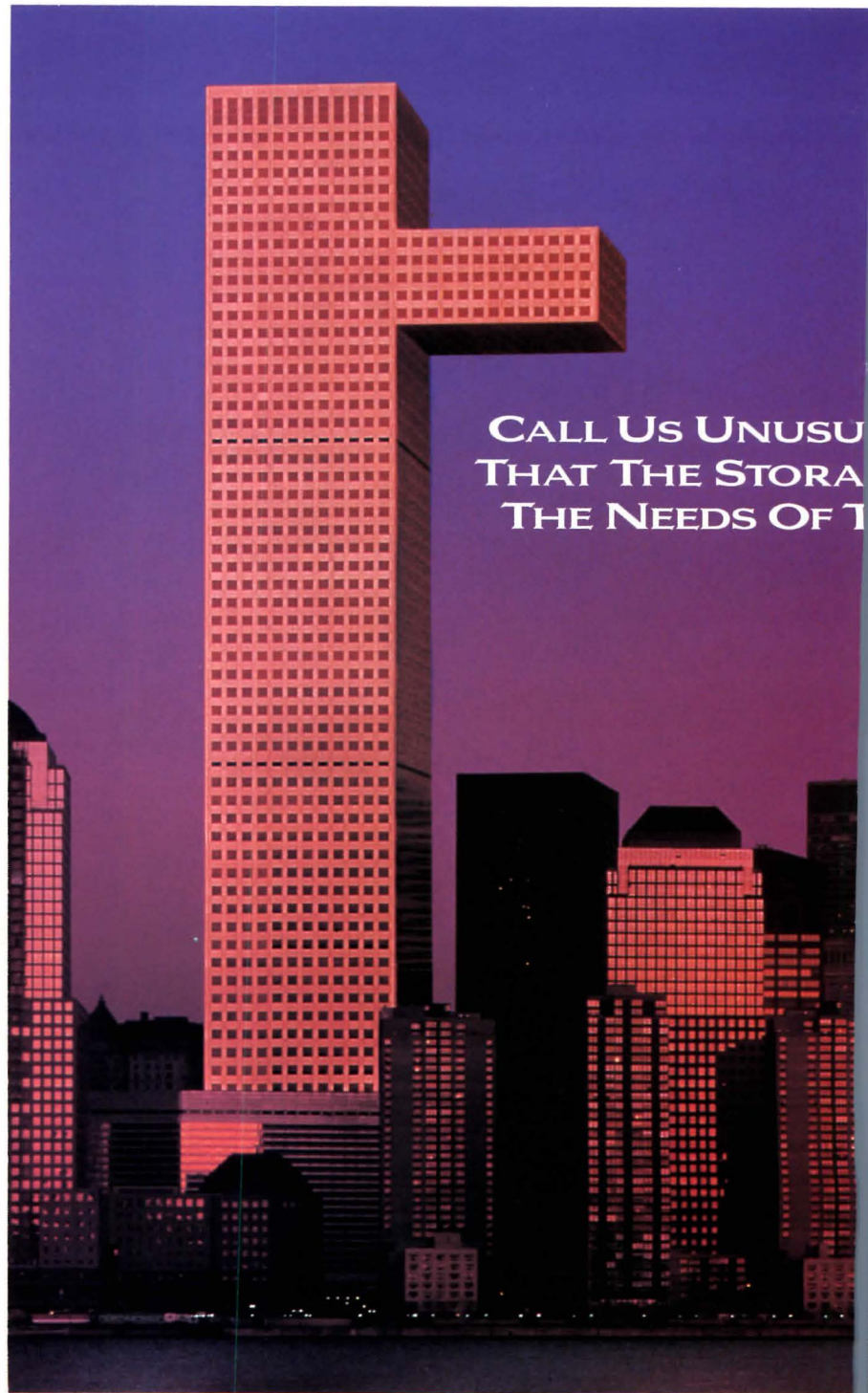


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LETTERS & EVENTS

Preserving Ellis Island

Congratulations on the thoughtful and compassionate editorial, "Island of Hope, Island of Tears" (March 1992, page 15). Although an immigrant myself, I arrived in New York Harbor 45 years ago in the comparative luxury of an ocean liner. For years, Ellis Island was for me a symbol of hope mixed with foreboding and fear, and I strongly believe that it must be preserved so that future generations can better understand their roots.

The National Park Service has a dismal record of allowing many national treasures to crumble by turning them into versions of Coney Island. It's time someone reminded these bureaucrats that "we, the people" pay their salaries.

*Jules G. Horton, FIALD
Horton-Lees Lighting Design
New York City*

A thousand heartfelt thanks for your support of Ellis Island preservation and of the unsanitized presentation of the full immigrant experience. The appropriately rough and gritty

quality of Ellis Island has already been somewhat compromised as a result of the necessary accommodation of tourism. The further and unnecessary dismemberment of the landmark island would constitute a tragic and permanent loss.

*Graham S. Wyatt
Robert A.M. Stern Architects
New York City*

Hometown Flavor

It was great to see that a local fella who made good hasn't forgotten his hometown. The buildings in Akron by James Stewart Polshek and Partners (March 1992, pages 78-79) are two of five construction projects going up downtown. As a graduate student of urban planning, I see Polshek as an architect who really has a feeling for the flavor of a city. He's done a wonderful job with Akron's challenging topography by designing buildings that get along nicely with their older neighbors and don't scare pedestrians on the street.

*Jeff Walker
Akron, Ohio*

Inappropriate Iconography

The representation of the kneelers and votive candles in the "Halftime" exhibition in Chicago (March 1992, page 25) appears to be a reference to prayer in a Catholic church. I am unsure what inspired the exhibit organizers to use this type of display, but the imagery disturbs me. Perhaps the organizers were prompted by a comment made by Professor David Watkin at a Graham Foundation conference on architecture and ethics that architecture is important because of the collapse of religion. Whatever the inspiration, I believe that the choice of display material is offensive, mocking, and inappropriate.

*Daniel L. Faoro, AIA
Daniel L. Faoro, Architect
Westland, Michigan*

Modern Myth

Your choice of the Lazarus House as a feature article (April 1992, pages 52-57) was very disappointing. Here is a house dropped onto barren farmland that obviously does not belong to this landscape or to the local building




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tradition. Modern architecture, I was taught, was done by master builders with big egos. But many of the buildings of the self-conscious and dogmatic Modern movement were inhuman, conceived with disdain for local context and tradition. By publishing the Lazarus House, the magazine is perpetuating the myth that architects are still eccentrics who care more for their personal statements and less about serving the public.

*Jeffrey Bellows, AIA
Bellows Architects
Bantam, Connecticut*

Correction

Timothy Walzak did not intend to advise specifying "decks that have been galvanized or coated with an aluminum zinc alloy," as quoted in "California Convention Addresses Roofing Issues" (April 1992, page 81). While galvanized steel, or epoxy paint coatings on bare or galvanized steel, can provide excellent protection against corrosion, Walzak does not have enough data to recommend one coating system over another.

May 26-28: "Accessibility and Historic Preservation" workshops for public officials sponsored by the National Park Service in Springfield, Massachusetts. Contact: Judy L. Hayward, (802) 674-6752.

June 1: Deadline for submissions to the Boston Society of Architects competition for "Unbuilt Architecture." Contact: Robert Brown, (617) 262-4354.

June 13-July 25: Six-week intensive program in the theory and practice of classical architecture at the New York Academy of Art. Contact: Donald Rattner, (212) 941-8088.

June 14-19: "New Realities of the '90s" at the International Design Conference in Aspen. Contact: Lori Schwab, (212) 725-2233.

June 15: 1992 Du Pont/ASID Student Design Award competition entry deadline. Contact: Michael Cryan, (212) 614-5072.

June 18-19: National Symposium on Healthcare Design, Newport Beach, California. Contact: Sara Marberry, (908) 290-1260.

June 19-22: "Exploration 92: Engaging Society in Vital Ways," AIA national convention in Boston. Contact: AIA, (202) 626-7300.

June 26-28: The Construction Specifications Institute in Atlanta. Contact: Sarah Phaneuf, (703) 684-0300.

June 29: Entry deadline for the AIA healthcare facility design exhibit and catalog. Contact: Todd Phillips, (202) 626-7361.

June 30: Entry deadline for Propane Gas Home Design Competition. Contact: Evelyn Caprel, (708) 352-4004.

July 1: Deadline for the Waterfront Center's awards program for waterfront planning projects and studies. Contact: (202) 337-0356.

July 9-11: International Design Exposition at the Anaheim Convention Center. Contact: Bill Schoenfisch, (914) 658-8393.

Aug 31: Deadline for submitting to the Chicago Athenaeum International Exhibit on Black Architects. Contact: Carolyn Davis, (312) 266-0269.

Sept 23-24: Capital Design Week at the Washington Design Center in Washington, D.C. Contact: (202) 554-5053.

Sept. 26-Nov. 14: National Institute for Architectural Education career days in architecture. Contact: (212) 924-7000.

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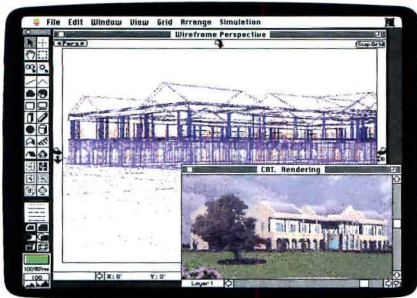
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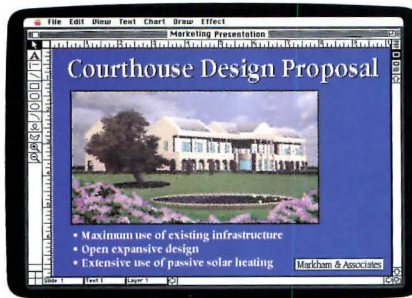
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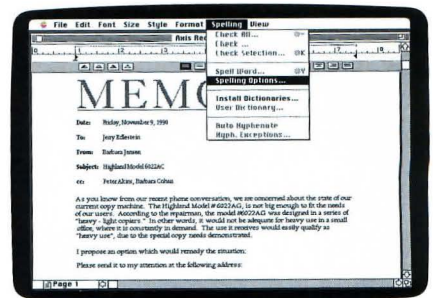
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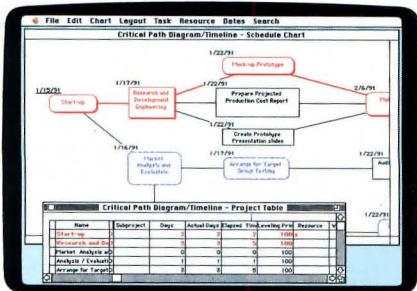
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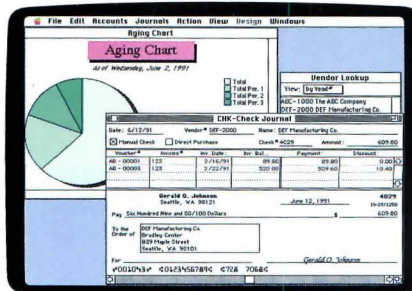
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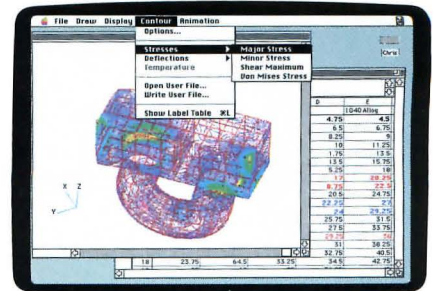
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NEWS

International Committee in Miami • Pittsburgh Housing Competition • Young Architects Citation

Alvaro Siza Wins Pritzker Prize



"NOT SINCE THE LATE LUIS Barragan of Mexico was elected laureate in the second year of the prize have we honored someone whose work has so eluded the international spotlight," maintained Jay A. Pritzker, president of the Hyatt Foundation, in awarding Portuguese architect Alvaro Siza this year's Pritzker architecture prize in Chicago.

Although not well-known in the U.S., 60-year-old Siza has long been recognized in Europe for his site-sensitive public architecture, social housing, and commercial buildings that recall the rationality of the early Modernists while drawing upon elements from the present and the past. "His shapes, molded by light, have a deceptive simplicity about them; they are honest," noted the jury, which consisted of J. Carter Brown, director of the National Gallery of Art in Washington, D.C.; Giovanni Agnelli, chairman of Fiat; Mexican architect Ricardo Legorreta; architecture critic Ada Louise Huxtable; *A+U* Editor Toshio Nakamura; and Lord Rothchild, chairman of the Board of Trustees of the National Gallery of Art in London.

Though he has been compared to Alvar Aalto and Le Corbusier, Siza denies a particular fascination with any of the great architects: "I learn from all of them," he states. Critics single out the Borges & Irmao Bank in Vila do Conde (top right) as a comprehensive illustration of the architect's rational vocabulary, but Siza

views all of his buildings as part of a continuous search for meaning and beauty. He agrees that several factors—including a strong financial base—contributed to the success of the bank project: "It was built slowly, so I could transform the interiors during construction," he notes. "Also, it is placed in a stimulating area—in the historical center of a small town in transformation."

Siza believes that the quality of the urban fabric is fundamental to the quality of a single building. As in the case of the Borges & Irmao Bank, and his largest project—a 1977 low-income housing development in Quinta da Malagueira that incorporates an existing Renaissance aqueduct—Siza mediates between historical structures and a contemporary vocabulary. "Architects invent nothing..." he claims, "they redefine the value of a form by virtue of its relation to other elements in a composition." The architect avoids creating isolated, overly expressive buildings, preferring to establish a dialogue between a structure and its surroundings.

Siza, who runs a 20-person firm in Porto, about 150 miles north of Lisbon, anticipates the groundbreaking of a 14,000-square-meter furniture factory in Weil am Rein, Germany (second from bottom), later this year. The architect currently teaches at his alma mater, the University of Porto School of Architecture, where he has taught intermittently since 1966.

Last month, the Pritzker prize, accompanied by a \$100,000 grant, was presented to Siza at Chicago's recently completed Harold Washington Library Center. A traveling exhibition featuring of the work of the Pritzker laureates will be on display at the Washington Library Center through the end of this month. —K.S.

Pritzker Prize winner Alvaro Siza (left) recently completed the six-story Meteorological Center for the Olympic Village in Barcelona (right).



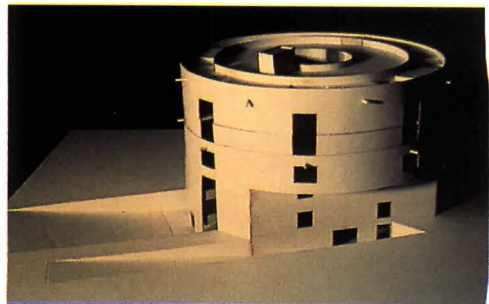
BORGES & IRMAO BANK, 1978
VILA DO CONDE, PORTUGAL



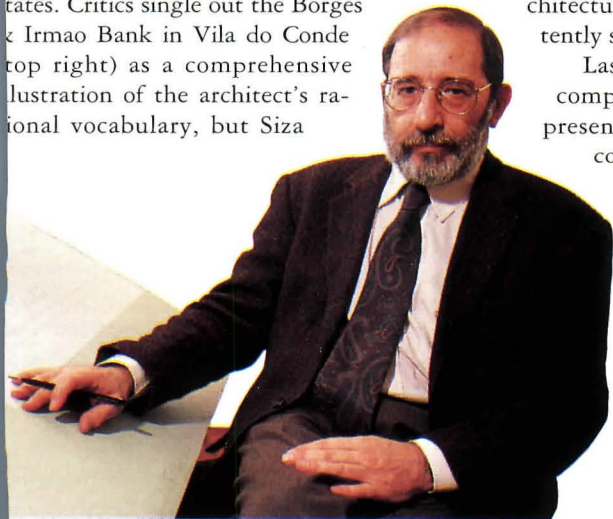
VAN DER VENNE PARK HOUSES/SHOPS, 1984
THE HAGUE, NETHERLANDS



VITRA FURNITURE FACTORY AND OFFICES, 1991
WEIL AM REIN, GERMANY

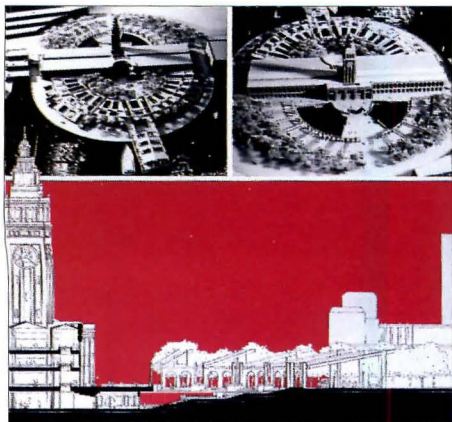


METEOROLOGICAL CENTER, 1992
BARCELONA, SPAIN



DETAILS

Fred Koetter of Koetter, Kim & Associates has been named dean of the Yale School of Architecture. **Franklin D. Israel Design Associates** of Los Angeles has unveiled a scheme for a mixed-use complex encompassing a city block in north Tokyo. New York-based **John Burgee Architects** recently filed for Chapter 11 protection, following the loss of a \$16.7 million claim filed by Raj Ahuja, a former partner who claims he was forced out of the firm in 1988. **Anshen + Allen Architects** of Los Angeles has been selected to design the Peter F. Drucker Management Center at the Claremont Graduate School in Southern California. The University of Chicago will break ground this month on a \$44 million Graduate School of Business, designed by Chicago-based **Lohan Associates**. New York architects Arthur May, Graeme A. Whitelaw, and Stanley Pinska have formed **May Whitelaw Pinska**, an architecture and planning firm. Gay and lesbian architects, interior designers, landscape architects, and contractors in the Delaware Valley have formed **Building Perspectives**, intended to support homosexuals in the building professions. The Oregon Community Foundation recently awarded \$30,000 to Reed College of Portland for purchasing the personal library of turn-of-the-century Portland architect **A.E. Doyle**. Oklahoma State University architecture student **Dallas Branch** earned first place in "Defining the Edge," a student competition sponsored by AIAS, for a waterfront plaza adjoining San Francisco's historic Ferry Building (below).



"DEFINING THE EDGE" WINNING ENTRY

International Committee Addresses Latin America

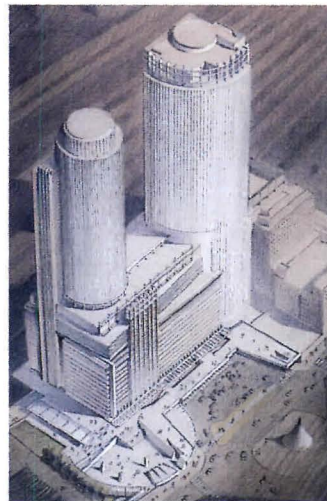
AIA UPDATE

FOCUSING ON SOUTH AMERICA and the Caribbean, the AIA's International Committee held its fourth conference May 1-2 in Miami, the gateway to the region. Since 1991, the International Committee has worked with the National Council of Architectural Registration Boards and the U.S. State Department to negotiate opportunities for cross-border practice for U.S. architects and their foreign counterparts. The committee is currently advocating such provisions in the future North American Free Trade Agreement (NAFTA), which is intended to economically unite the United States, Canada, and Mexico.

Chairman Donald Hackl of Loeb Schlossman and Hackl in Chicago, opened the conference by contrasting the 1970s, when American architects first looked for work overseas, with today's global economy. This year, the European Economic Community (EEC) eliminated customs and passport controls between some European nations. While the Americas may be far from instituting such free passage, the future interdependence of global markets will require increased sensitivity and long-term commitment to local clients and cultures.

Michael Stein, principal of Arthur Andersen & Company, a Miami firm that specializes in international real estate, recommended the Pacific Rim, Eastern Europe, and Latin America as future growth areas. Stein maintained that the recently attained political and economic stability of countries in South America and Asia, is creating a demand for land in previously depressed markets such as Chile, Colombia, Indonesia, and Thailand.

The issue of whether South America would be aligned with NAFTA or the EEC was discussed by Hilario Candela of Spillis Candela and Partners. Candela noted with some irony that while many North American architects seem bent on concentrating their marketing efforts in Europe, European architects are following EEC developers and

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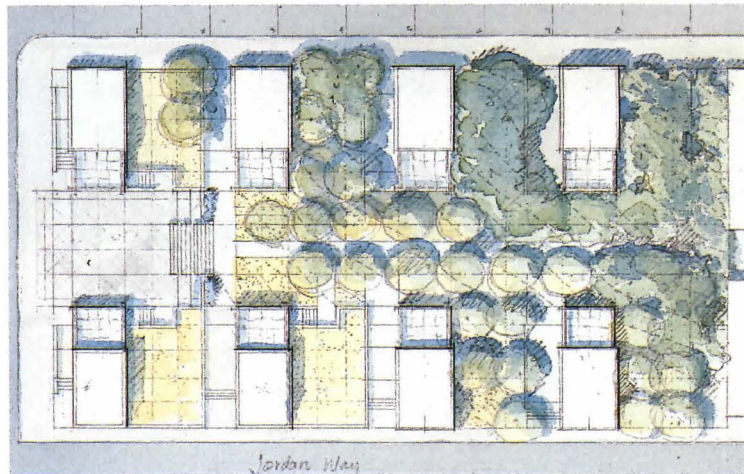
tourists to South America. As a result, U.S. architects are losing the advantage they had when developers were creating resorts aimed at North American tourists.

Other speakers presented impressive examples of their international work: Eugene Kohn of Kohn Pedersen Fox, Bernardo Fort-Brescia of Arquitectonica, and Thomas Marvel of Marvel Flores Cobian, Puerto Rico. Marvel criticized the notion of "parachute" architecture—unsuitable buildings dropped into the local context, and blamed U.S. architects as its most common perpetrators.

The conference left the impression that the enormity of many multinational AIA firms, the increasing sophistication of international clients, and the creation of global economic blocks has regionalized spheres of influence for the wealthiest nations. America no longer dominates the free world, as it once did, and American architecture may have lost some of its prestige abroad as well. Yet, the increasing size of the global pie suggests that opportunities remain for architects who are very good, very big, or both. Competing in the world market still means walking in the land of giants.

—RICHARD ARANGO

Richard Arango is partner of Seckinger Arango Architects of Coral Gables, Florida.



FIRST PLACE, STUDIO WANDA

Baltimore Firm Wins Pittsburgh Housing Competition

ELEGANCE AND SIMPLICITY DISTINGUISH THE winner of an international competition for affordable housing in Pittsburgh. The scheme was designed by Peter Fillat and Randy Sovich of Studio Wanda, Baltimore, Maryland, who received the commission from Pittsburgh's Community Design Center as well as \$4,000. Their design was selected from a field of 350 entries by a jury comprising architect James Wines of SITE, New York City; Laurie Maurer of Maurer & Maurer Architects, Brooklyn, New York; Leonard Plotnikov, an archaeologist and sociologist who teaches at the University of Pittsburgh; Richard Swartz, development director of Pittsburgh's Bloomfield-Garfield Corporation, which will build the project, and ARCHITECTURE Senior Editor Michael Crosbie.

The project's quarter-acre site is located in Garfield, a working-class Pittsburgh neighborhood dominated by narrow, single-family, wood-frame houses built at the turn of the century. Over the past 20 years, the community has lost approximately 1,200 of these houses through abandonment and demolition, resulting in street frontage with a gap-toothed appearance. The site typifies this neglect, as well as the neighborhood's hilly topography: from corner to corner, the rectangular site drops 35 feet over a distance of 100 feet. The competition called for effectively negotiating this sloping site, providing between seven and nine units of housing at a construction cost of \$50 per square foot, and accommodating a diversity of living arrangements—from single, unrelated adults to extended families.

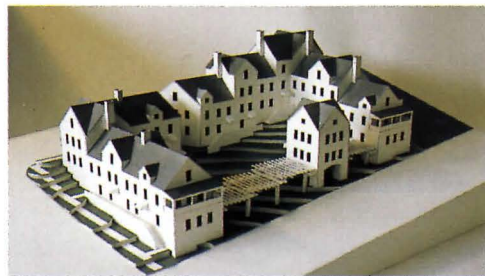
After reviewing the entries, the jury discovered that most submissions had unworkable floor plans and exteriors, and many designs bore little resemblance to the existing neighborhood. Dignity was an aspect sorely missing from most of the entries, which translated "affordable" housing into cramped rooms with poor circulation and few amenities such as gardens or open spaces.

Fillat and Sovich, however, proposed eight rectangular houses of 1,200 square feet each, with masonry bases and wood-frame construction, entered through terraces and surrounded by a thick grove of trees. Each unit is topped by an open-air roof terrace—a private outdoor space in the city. The jury deliberated at length over the fact that the scheme located parking on the street, instead of within the site, as had been requested in the program. In the final analysis, jurors agreed that on-street parking reinforced the scheme's "urban" character, preserving more open space for the residents' enjoyment. The jury ultimately agreed that this competition, titled "New Urban Housing," should produce a winner that was urban in character.

Studio Wanda's design possesses an integrity in its minimal forms, which do not ape the surrounding neighborhood but provide a distinctive identity. Well-suited to the Garfield site, the scheme transcends the stigma of affordable housing. It is now up to the Bloomfield-Garfield Corporation and Pittsburgh's Urban Redevelopment Authority, which will work to construct Studio Wanda's project, to preserve these qualities in realizing the design.



SECOND PLACE, JUDITH SHEINE



THIRD PLACE, STEPHEN ZAGORSKI

Architect Judith Sheine, with planners Jacqueline Leavitt and Carol Goldstein of Los Angeles, California, won \$2,000 and second place; Stephen Zagorski of Austin, Texas, was awarded third place and \$1,000. Four awards of merit at \$500 each were given to James Mullahy of Philadelphia; Sheward Henderson Architects of Philadelphia; Wesley Wei and Daniel Magno of Philadelphia; and Craig Slater and Julia Graham Slater of Moorestown, New Jersey. First place for the student design category was awarded to Gregory Bradshaw and Kent Suhrbier of Carnegie Mellon University in Pittsburgh; a scheme by Jason A. Montgomery and A. James Tinson of the University of Notre Dame received honorable mention. —M.J.C.

Interiors Committee Debates Value of Design

AIA UPDATE FOR TWO DAYS LAST MAY, 70 architects, interior designers, educators, social scientists, and journalists assembled at AIA headquarters to attempt to define interior design excellence. Sponsored by the AIA's 15-year-old Interiors Committee, founded to support a growing number of architecture firms that undertake interiors, the first of this year's two conferences steered clear of marketing strategies and licensing disputes in order to unravel some of the mystique and ambiguity surrounding excellence in design.

Committee Chair Loren Hosack of Minneapolis-based Planning and Design began the event by posing the contradiction between award-winning designs and client needs. Hosack presented slides of an office that won a local interior design award and was vacated the same week by the client in pursuit of more suitable facilities. User satisfaction must be high on the list of qualities contributing to excellence, according to a panel of social scientists, who offered ways of raising user consciousness about the potential of design to enhance environments. Yet "clients often don't have enough information to know what they want," stated environmental psychologist Karen Frank, who teaches architecture at the New Jersey Institute of Technology. She cited the work of Clare Cooper-Marcus, who uses Gestalt therapy techniques to help clients discover their values with respect to the space around them.

Cecil Williams, corporate psychologist for Herman Miller, offered more practical advice. His *Guide to the Negotiable Environment* is an interactive computer program that synthesizes information about an employee's personality and helps designers tailor workstation configurations accordingly. Robert Sommer, professor of environmental design at the University of California, Davis, maintained that designers have a responsibility to teach occupants how to use their space and to design for changing requirements.

Throughout the conference, participants sought ways of "detrivializing" interior design. Three design professors—Arnold Friedmann of the University of Massachusetts, Peter Brandt, of the New York College of Interior Design, and Michael Kroelinger of Arizona State University—advocated a liberal, multidisciplinary education to foster



HBF SHOWROOM, LOS ANGELES, VANDERBYL DESIGN

critical thinking and promote a broader knowledge base for the profession. Stanley Abercrombie, editor of *Interior Design*, justified the discipline as a valuable necessity in the face of decaying cities: "Where else can we turn from a brutalizing environment, than to go indoors?"

Some speakers asserted that urban decline and the current recession create opportunities for design professionals to exact change. Ziva Freiman, senior editor of *Progressive Architecture*, urged those present to move beyond the failures of Modernism and adopt a social agenda that "places our expertise in the service of worthy causes." *Contract Design* Editor Roger Yee outlined a holistic approach to design in the 1990s, encouraging interior designers to learn how to use research, broaden technical skills, and sharply define services to forge stronger ties with the architectural profession and clients.

A discussion on esthetics that followed design presentations proved to be the most engaging segment of the conference. Michael Vanderbyl, a San Francisco graphic designer, discussed how he transformed the images of three manufacturers—clothier

Esprit, Hickory Business Furniture (left), and Bernhardt Furniture Company—through cost-effective product and showroom design. Vanderbyl, who overcomes low budgets through creative applications of inexpensive materials, joined New York architect Kenneth Walker in debunking perceptions that design belongs to a privileged class, and that the best design originates in Europe. Walker, who cited turn-of-the-century Vienna and post-World War II Italy as esthetic high points, also held up design elements of the American experience—billboards, fast-food establishments, and Rubbermaid products—as rich components of our cultural landscape. "While we are too pluralistic a society to have one great period of dictatorial design, there are pockets of it," Walker claimed. "We will excel, if we can reflect the culture we live in and not latch on to the latest style," Vanderbyl corroborated. Participants concluded that design success combines client satisfaction with "passion" that in some way draws from the human experience. The committee is scheduled to meet again in New Orleans this October.

—K.S.

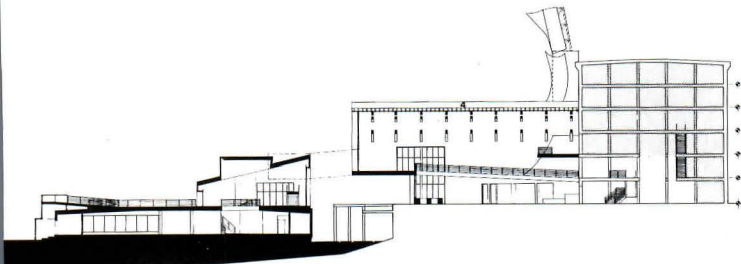
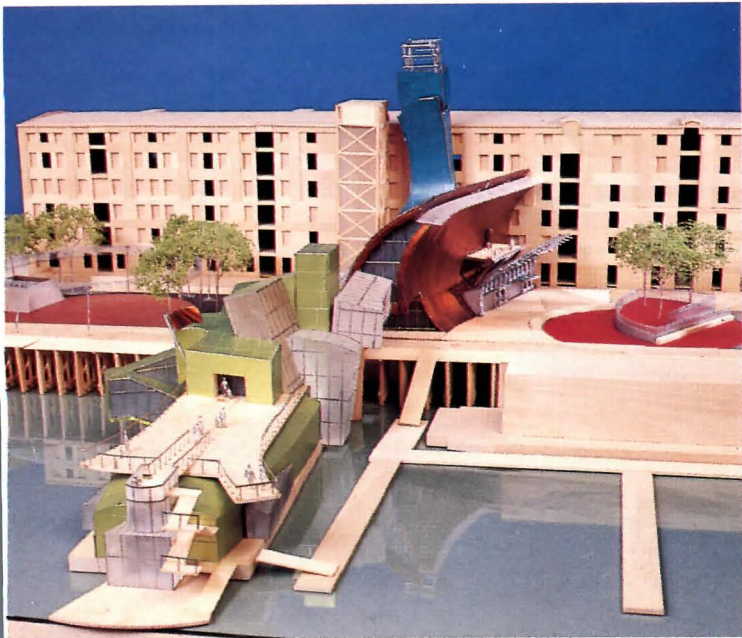
New Award for Young Talent

Since its beginnings in 1989, the AIA's Young Architects Forum has grown from two chapters to participation by 28. To further its goal of encouraging the professional development of architects in the early stages of their careers, the AIA recently announced a new national award. The Young Architects Citation will recognize skilled practitioners licensed within the last ten years, rather than by age, who have demonstrated exceptional leadership potential in design, planning, education, and service to the profession. The first citation will be presented at the 1993 AIA convention in Chicago.

Over the past year, the Young Architects Forum has held conferences in San Diego, Chicago, and Philadelphia, and most recently in San Antonio (ARCHITECTURE, May 1992, page 79), addressing issues such as finding a mentor, starting a new firm, and defining a career path. The Forum is now planning upcoming meetings in Miami, San Francisco, and a fall lecture series in Washington, D.C., to inspire active participation of interns and recently licensed architects in the AIA; according to the Institute, more than 4,500 of its current members are young architects.

The Forum's conference reports and a quarterly newsletter are available to those seeking more information on the group's activities from AIA staff liaison Monica Williams, (202) 626-7311. For further information on the citation, contact the AIA honors and awards department.

ON THE BOARDS

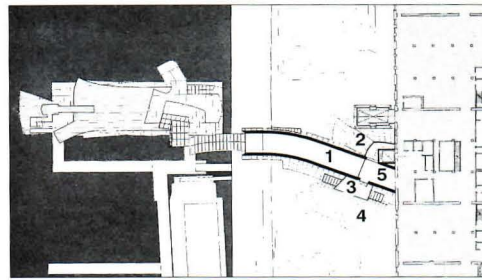


NORTH-SOUTH

The Children's Museum
Boston, Massachusetts
Frank O. Gehry & Associates
Schwartz/Silver Architects

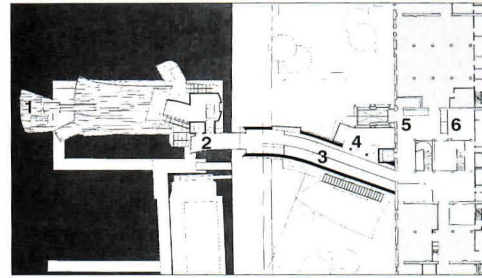
BOSTON'S CHILDREN'S MUSEUM, IN PARTNERSHIP WITH THE COMPUTER MUSEUM, RECENTLY UNVEILED FRANK GEHRY'S \$10 MILLION PROPOSAL (TOP) TO ADD 13,000 SQUARE FEET OF EXHIBITION SPACE AND EDUCATIONAL FACILITIES TO THE MUSEUMS' EXISTING BUILDING AT MUSEUM WHARF ON FORT POINT CHANNEL. THE CLUSTERED, VARIEGATED VOLUMES OF GEHRY'S FLOATING EDUCATION CENTER WILL EXTEND INTO THE CHANNEL, SUPPORTED BY A PILE-ANCHORED BARGE THAT RISES AND FALLS WITH THE TIDES. THE NEW CENTER WILL CONTAIN EXHIBITION AREAS, AN AQUATIC LABORATORY, A CLOUD OBSERVATION AREA, AND CLASSROOMS. AT THE ENTRANCE, AN ELEVATOR THAT ADJUSTS TO CHANGES IN WATER LEVELS WILL ACCOMMODATE THE PHYSICALLY IMPAIRED. A 15-FOOT-HIGH "WAVE," CONSTRUCTED OF PAINTED METAL AND GLASS, WILL BECOME THE MAIN ENTRANCE TO BOTH MUSEUMS AND CONTAIN PUBLIC AMENITIES SUCH AS A CAFE AND A SHOP (PLANS). PUBLIC PARKS ON BOTH SIDES OF THE NEW COMPLEX ARE BEING DESIGNED BY CAMBRIDGE LANDSCAPE ARCHITECT MICHAEL VAN VALKENBURGH. THE CHILDREN'S MUSEUM HOPES TO OBTAIN CITY AND STATE APPROVAL FOR THE PROJECT LATE THIS YEAR AND PLANS TO BEGIN CONSTRUCTION NEXT FALL.

—K.S.



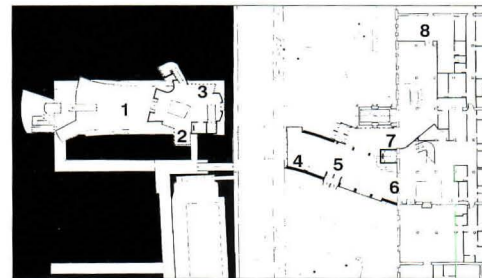
THIRD FLOOR PLAN

- 1 OPEN TO BELOW
- 2 HIGH READER CANOPY
- 3 PRE-SCHOOL TERRACE
- 4 CANOPY
- 5 PRE-SCHOOL WATER EXHIBITION AREA



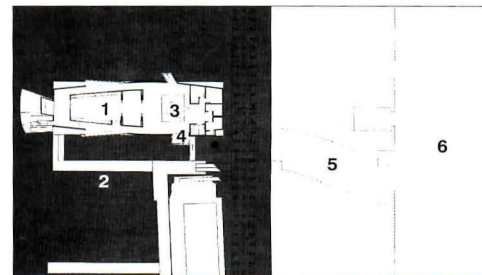
BARGE CONNECTION/SECOND FLOOR PLAN

- 1 BIRD BALCONY
- 2 BRIDGE
- 3 BRIDGE GALLERY
- 4 OPEN TO BELOW
- 5 RECYCLING EXHIBITION
- 6 ORIENTATION ROOM



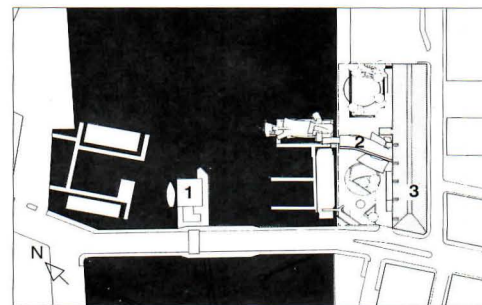
UPPER BARGE FLOOR PLAN/ENTRY FLOOR PLAN

- 1 UPPER DECK
- 2 RAINBOW ROOM
- 3 CLOUD ROOM
- 4 CAFE
- 5 COMMON LOBBY
- 6 CHILDREN'S MUSEUM ENTRY
- 7 COMPUTER MUSEUM ENTRY
- 8 RETAIL



LOWER BARGE FLOOR PLAN

- 1 LAB/CLASSROOM
- 2 WATER TAXI DOCK
- 3 WATER EXHIBITION AREA
- 4 WAVE CAVE
- 5 WAVE
- 6 CHILDREN'S MUSEUM



SITE PLAN

- 1 BARGE
- 2 WAVE
- 3 MUSEUM WHARF

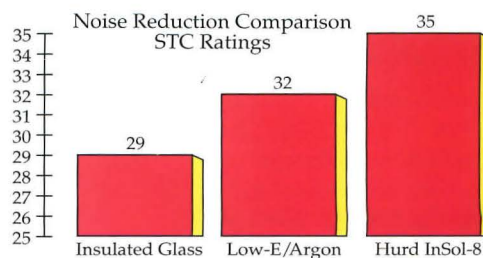
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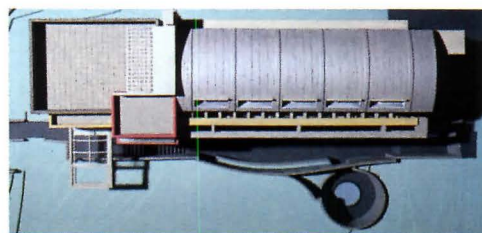
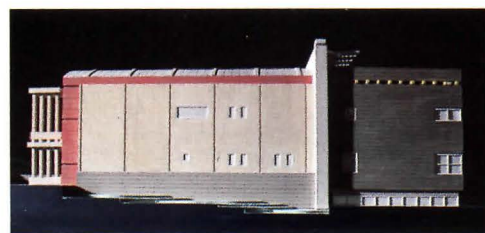
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ON THE BOARDS

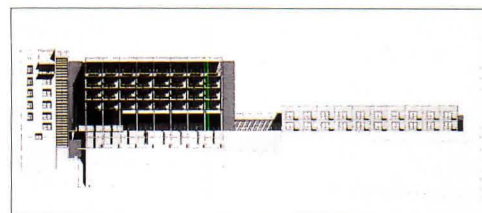
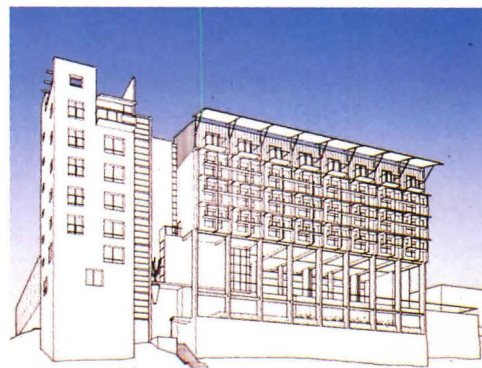
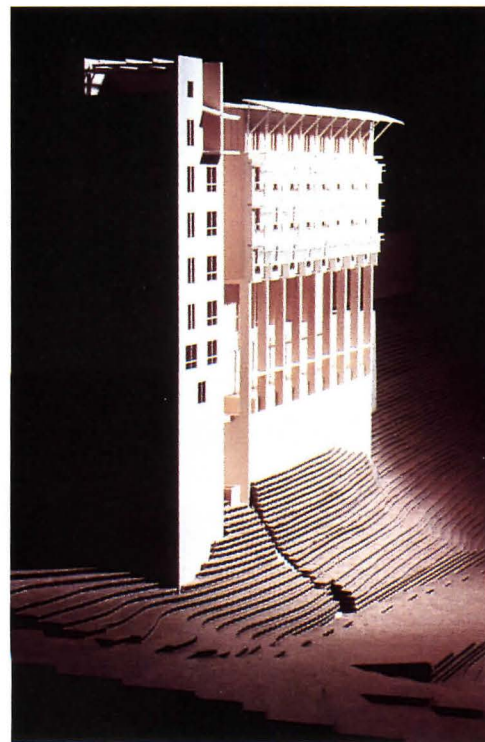
Murad Residence **Los Angeles, California** **Edmund M. Einy, Architect**

FOR A 3,400-SQUARE-FOOT HOUSE ON A SLOPING site in the Hollywood Hills, local architect Edmund Einy organized the building along a central spine. To meet height limitations and create privacy from the street, Einy submerged the four-story building into the hillside, which also allowed the structure to rest directly on bedrock without expensive caisson foundations. A ground-floor courtyard allows light to enter the house's lowest level, which contains formal living room, guest bedroom, and private study. A lead-coated copper vault crowns the main body of the house, with light monitors located between each of the structural bays (below right). Along the south elevation (top right), the architect set a floor-to-ceiling glass wall behind an exterior screen wall and arranged discrete volumes to define internal functions and reinforce a sense of privacy. A projecting stair tower finished in dark red plaster provides the main vertical circulation. The north elevation (below left) abutting the property line is rendered as a nearly opaque wall. Construction is scheduled to begin in September.



Cliff Inn Tower **El Paso, Texas** **Longoria/Peters, Architects**

LOCATED AT THE SOUTHERN TIP OF THE Franklin Mountains, the existing, two-story *Cliff Inn Hotel* sits atop a prominent ledge overlooking El Paso and the Sierra Madre. Houston architects Longoria/Peters proposed a 36,000-square-foot tower that steps down the steep terrain directly west of the original hotel (bottom right). The addition will be constructed as an exposed cast-in-place concrete frame with plastered masonry walls. Standing-seam metal roofs will crown the structure, and perforated aluminum sunscreens and thin limestone slabs will be attached to the building for shading. The scheme calls for suites in the corner tower topped with a two-story penthouse (model, right). Guest rooms will be located along a single-loaded corridor in the main, west-facing wing, which is elevated above an arcade and terrace (above right). Construction is scheduled to begin later this year. —L.N.



EAST-WEST SECTION



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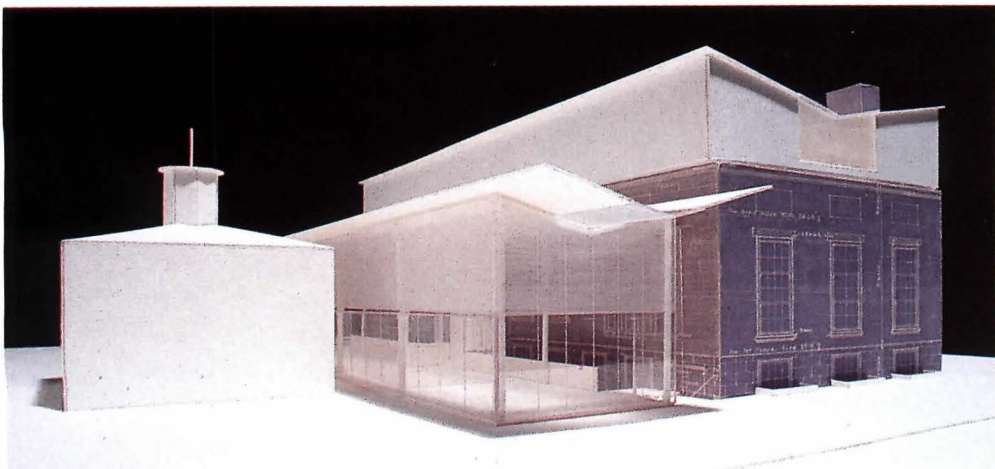


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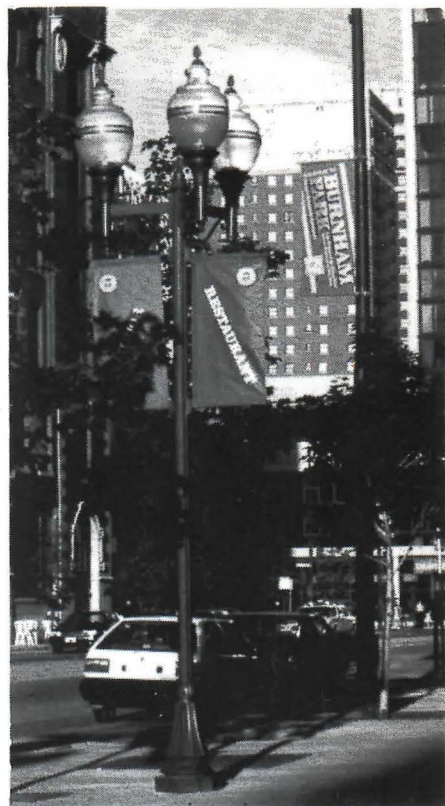
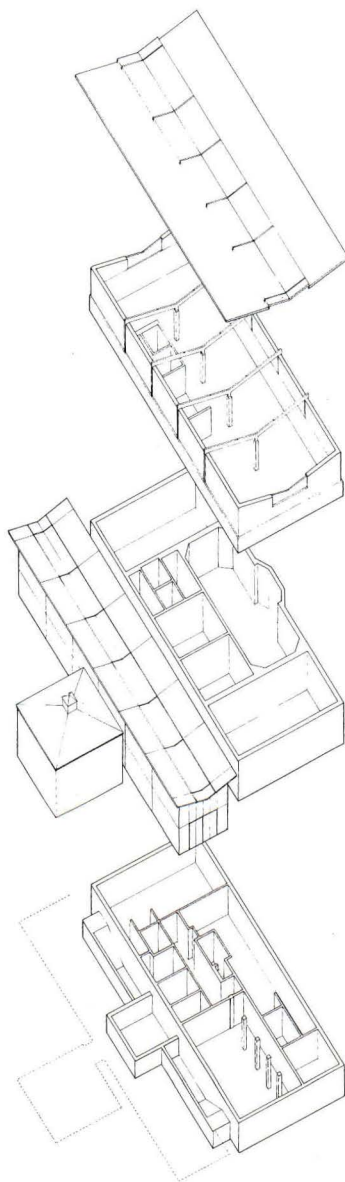
ON THE BOARDS



**William A. Farnsworth Library and Museum
Rockland, Maine
Toshiko Mori Architect**

AS PART OF A LONG-RANGE MASTER PLAN for the Farnsworth museum complex, New York architect Toshiko Mori is renovating the existing museum buildings and adding infill to strengthen the city's historic fabric. Mori's scheme calls for a new linear wing linking the museum's 1948 fine art wing (right in top model) and the late 19th-century Homestead building (left in top model). The 4,000-square-foot addition is designed to provide needed reception space and centralize the museum's informational and security functions. The new glass-and-steel structure is crowned by a butterfly metal roof with a linear skylight (drawings, right). The existing museum's upper level will be expanded to house an open loft gallery with a movable partition system for changing exhibitions (above). Mori's new museum roof echoes the form of her atrium addition. The first phase of construction is scheduled to begin next spring. A second phase calls for a new administration and classroom building. ■

—L.N.



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AWARDS

Texas Architects Laud New Orleans Projects

THE AIA/NEW ORLEANS CHAPTER'S 1992 Design awards honored a new building and an adaptive reuse project that creatively respond to their contexts and programmatic requirements, according to jury chair David Lake, who was joined by fellow San Antonio architects Davis Sprinkle and Matt Morris. Salvato & Company Architects won honors for Audubon Zoological Garden's Learning Center, recognized for synthesizing the materials and scale of the zoo's existing WPA-era buildings. The jury also cited Concordia Architects for the adaptation of a turn-of-the-century building in New Orleans's historic warehouse district into a contemporary arts center. Creating an assemblage of art and architecture, the firm exposed the building's original structural grid, and collaborated with six sculptors on designing building elements. —L.N.



**Learning Center, Audubon Zoological Garden
New Orleans, Louisiana
Salvato & Company Architects**



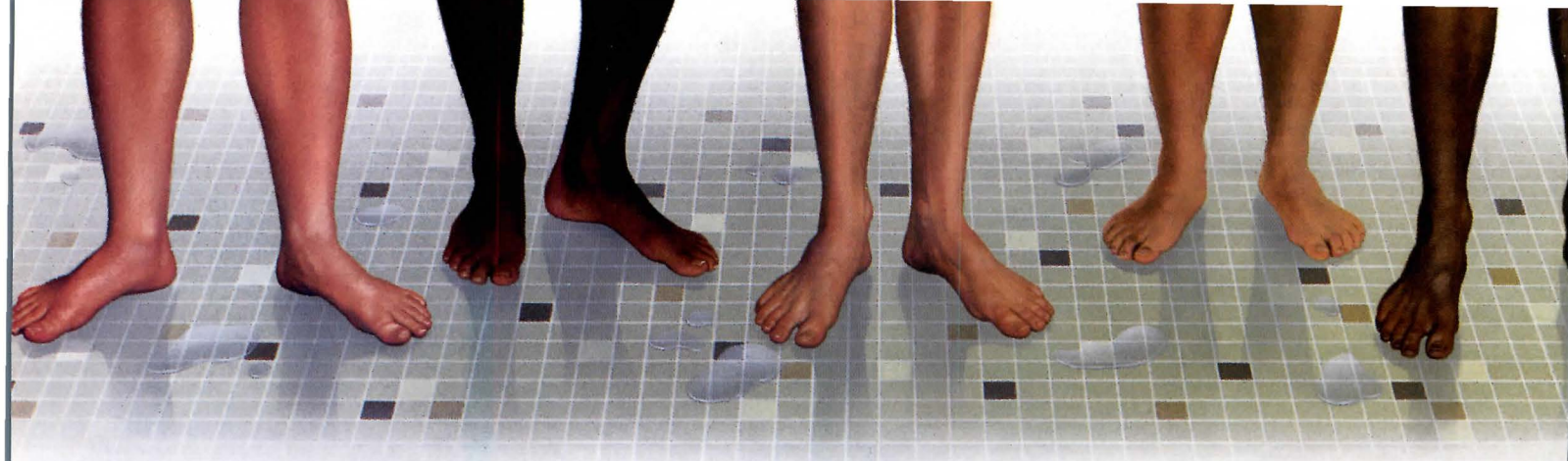
ALAN KARCHMER PHOTOS



**Contemporary Arts Center
New Orleans, Louisiana
Concordia Architects**



TIMOTHY HURSLEY PHOTOS



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Sun Valley Elementary School
Birmingham, Alabama
Davis, Speake & Associates, Architects

Birmingham Firms Win AIA Design Awards

AUBURN UNIVERSITY ARCHITECTS HONORED three Birmingham firms in the annual design awards program of the Birmingham Chapter of the AIA. Samuel Mockbee, guest critic at the architecture school, chaired the awards jury, which included Professors Behzad Nakhjavani and John Pratt, and student George Thompson. Davis, Speake & Associates won an honor award for Sun Valley Elementary School, which was cited by the jury for its "straightforward building plan and thoughtful, well-considered detailing." Within the masonry building, the architects clustered common facilities at the junction of two main corridors topped by metal-covered clerestories. An honor award was presented to the KPS Group for renovating the 1889 Spencer Furniture Company building into law offices. The jury commended the "businesslike interiors, expression of structural detailing of the columns, and choice of lighting in the central pine." A design citation went to Gresham, Smith, and Partners in association with Philadelphia's Geddes, Brecher, Qualls, Cunningham Architects for Alabama Power's new tripartite and 18-story office building that rise adjacent to the company's 1925 flagship tower. Noting the powerful image of the project, the jury commended the "first-rate detailing of the building's exterior and its relationship to the original structure."

—L.N.



JOHN O'HAGEN

Spencer Building
Birmingham, Alabama
KPS Group, Architects



Alabama Power Corporate Headquarters
Birmingham, Alabama
Gresham, Smith, and Partners with
Geddes, Brecher, Qualls, Cunningham,
Architects



H. DURSTON SAYLOR PHOTOS

The \$40 million 312 Walnut Building overlooks the Ohio River in downtown Cincinnati.

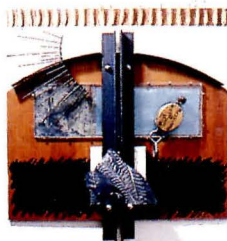


ARCHITECTURE

Emerging Talent

OUR COMPETITION TO DISCOVER NEW TALENT drew nearly 350 entries from all over the United States and Canada. This issue reflects not only the geographic diversity of those submissions, but a variety of building types, esthetic choices, and firm styles and sizes. We discovered that emerging talent comes in many forms and a variety of ages: young architects Paul and Peter Bentel and Rick Rowe are heirs to their parents' established practices, while new firms such as Ziger, Hoopes & Snead and Wheeler Kearns are practices formed by corporate-firm refugees who emphasize a collective process and individualized projects. Emerging talent in this issue also includes seasoned designers like Denver-based Anthony Pellechia and San Diego's Richard Friedson, who have just begun to attract a national following.

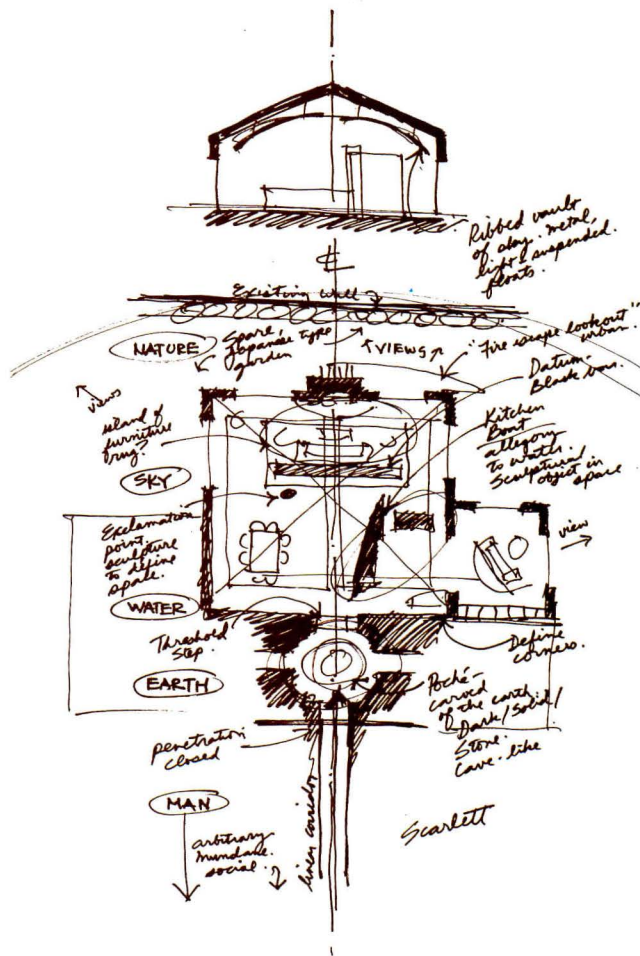
As a group, the projects we selected indicate a clear move away from Postmodernism's formalistic fireworks toward a more basic, stripped-down approach to architecture, rooted in a sense of local culture and place. Originality is not as paramount to their architects as responding to the specifics of context, culture, use, topography, and climate. For example, Rowe Rados Hammer Russell animates a state office building in Fort Myers with the overhanging roofs and verandas of Florida



"cracker" architecture, and Richard Friedson domesticates a senior citizens' complex near San Diego with elements indigenous to California houses. For a Chicago couple with a penchant for Modernism, Wheeler Kearns Architects borrowed from a spare, Miesian esthetic, yet designed a retreat that responds to its woodland site, with a redwood-clad living area oriented to panoramic views.

Urbanity is another important consideration for the architects in this issue. It is evident in the strong, planar facade of Pope Sherman's row-house complex in a residential Houston neighborhood, and in Mulder-Katkov's metaphorical projections for a renovated plumbing-supply warehouse in Venice, California.

Common to the firms featured this month is a willingness to view each commission afresh without resorting to stylistic formulas, to infuse even the most mundane project with a sense of higher purpose. Ziger, Hoopes & Snead's design for a Baltimore aerie, for example, led principal Steven Ziger to investigate the relationship between the penthouse and the harbor and parkland below, and to distill his ideas into a collage of wood, metal, slate, wheat, and other materials (top). As Ziger points out, even projects with a limited budget or a restricted site offer poetic possibilities. ■



SKETCH AND COLLAGE BY STEVEN ZIGER
INNER HARBOR PENTHOUSE, BALTIMORE, MARYLAND
ZIGER, HOOPES & SNEAD ARCHITECTS



emerging talent

Ziger, Hoopes & Snead, Architects
Baltimore, Maryland

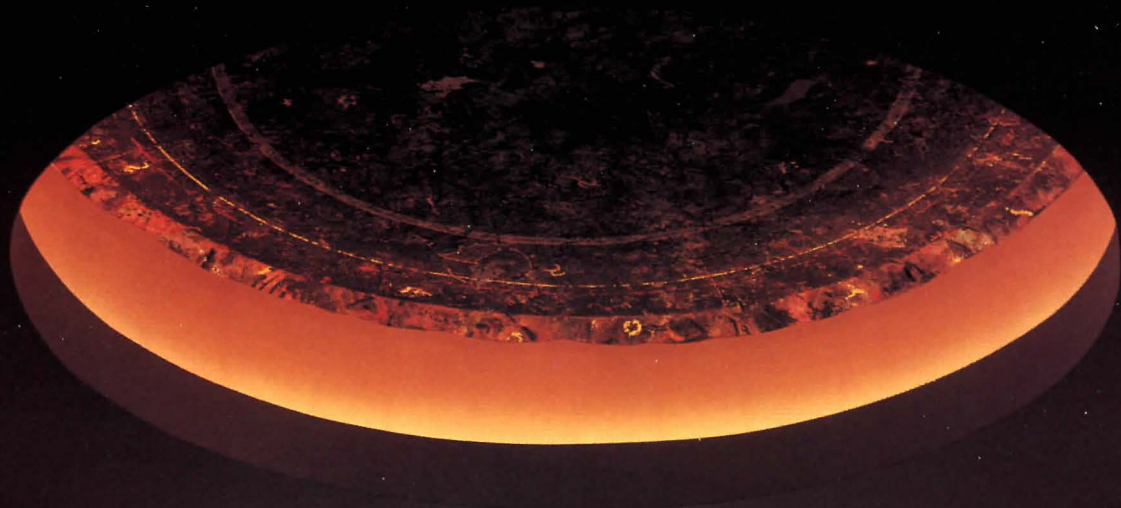
Poetic Potential

WHEN ZIGER, HOOPES & SNEAD PERSONALIZED A PENTHOUSE CONDOMINIUM overlooking downtown Baltimore for two art collectors, they didn't stop with new interiors. After construction was completed, principal-in-charge Steven Ziger created a collage of glass, steel, slate, and wood (previous page) to sum up the design, an allegory of Baltimore's Inner Harbor. "The painter Grace Hartigan once said, 'I work at a painting until it stops haunting me.' I feel the same way about architecture," Ziger explains. "It consumes me, and I had to create the collage as a way of finishing the project."

That total immersion in a design characterizes the hands-on involvement of the Baltimore firm, launched in 1984 by Ziger, 35, and partners Craig



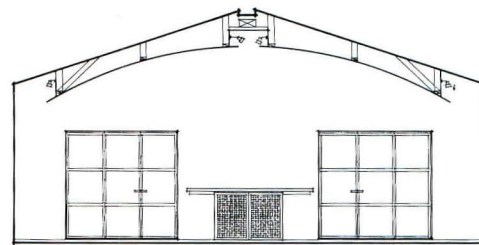
Corrugated aluminum vault (right) evokes sky in double-height living/dining area, which also serves as gallery. Octagonal foyer (facing page) is finished in slate floor and wall panels.



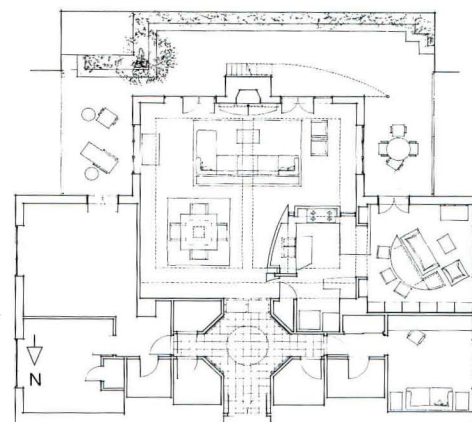
Hoopes and Jamie Snead, both 41. Since then, Ziger, Hoopes & Snead has gained recognition for work on numerous arts-related commissions, including an award-winning theater and artists' housing for Baltimore's Center Stage and two auditoriums for the Johns Hopkins University. The firm has a practical side too, as revealed by a project list that ranges from production housing and medical offices to reviewing the designs of the Rouse Company's retail centers. Increasingly active in church design, Ziger, Hoopes & Snead was recently named restoration architect for Benjamin Latrobe's Basilica of the Assumption in Baltimore, the first Roman Catholic Cathedral in the United States.

The Inner Harbor condominium exemplifies the eight-member firm's effort to infuse each project with sculptural qualities that lift it above the norm. A dark, slate-covered foyer represents the hard-edged city left behind; a vaulted living/dining area serves as a metaphor for the harbor below; and a raised outdoor terrace symbolizes the cultivated parkland across the water. The underlying narrative, in turn, provided a springboard for the architects to explore the sensuality of materials and the craft of building. "There are design opportunities inherent in every project, even those with a limited budget or a restricted site," Ziger contends. "It's up to us to investigate the poetic possibilities." ■

—EDWARD GUNTS



EAST-WEST SECTION



PLAN



Bleached oak floor in living/dining area (right) represents water; partition evoking ship's hull (facing page, top) separates kitchen from dining area (facing page, bottom).

**INNER HARBOR
PENTHOUSE
BALTIMORE, MARYLAND**

ARCHITECT: Ziger, Hoopes & Snead, Baltimore, Maryland—Steve Ziger (principal), Ann Geddes (designer)
LANDSCAPE ARCHITECT: Shiloh Nurseries (patio)
GENERAL CONTRACTOR: Victor Boehm Building
COST: Withheld at owner's request
PHOTOGRAPHER: Jeff Goldberg/Esto





emerging talent

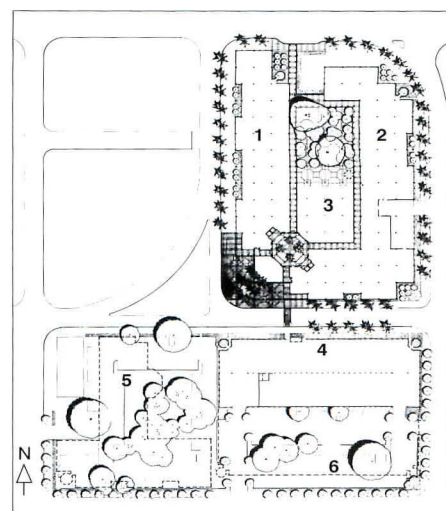
Rowe Rados Hammer Russell Architects
Tampa, Florida

Florida Roots

DUBBED THE CITY OF LIGHT, FORT MYERS, FLORIDA, once the winter home of Thomas Edison, now lives up to its reputation with a luminous state office building that brightens its downtown horizon. With a rotunda inspired by Florida's open steel lighthouses, covered walkways embracing a central courtyard, and overhanging roofs, the new 232,000-square-foot structure borrows from the best of local "cracker" architecture. Although it houses 800 workers for Florida's Department of General Services (DGS), the three-story complex fits comfortably into its low-rise residential neighborhood.

The DGS structure also represents the coming of age of a new generation of architects at one of Florida's oldest design firms. The eight-person Tampa firm Rowe Rados Hammer Russell, an offshoot of a firm founded in 1964 by Dean Rowe, 58, has undergone several management permutations, including a merger in the mid-

Northern entrance to new DGS building (facing page) leads through covered walkway into cloistered courtyard (site plan). Open steel stair towers at building's northern edge (below), in the courtyard, and at corners of adjacent parking garage supplement elevator access.



SITE PLAN

- 1 WEST WING
- 2 EAST WING
- 3 COURTYARD
- 4 PARKING GARAGE
- 5 PROPOSED BUILDING EXPANSION
- 6 PROPOSED PARKING GARAGE ADDITION





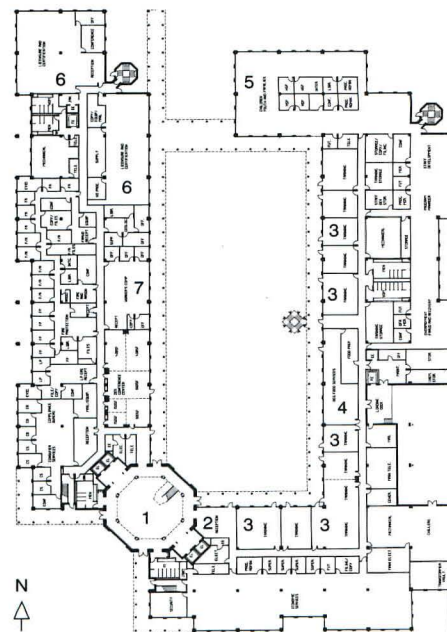
1980s into a 150-person entity called Design Arts Group. When the conglomerate proved unworkable in 1987, Rowe, former partner Dwight Holmes, and partner Tom Hammer resurrected the smaller practice, including Michael Russell, now 42, as a partner. Russell has won state and chapter AIA awards for his own 1987 house in suburban Tampa. Rick Rados, 53, joined the firm as a partner in 1991 and has also received a Florida AIA award for his Tampa residence.

But the firm's newest partner is Rick Rowe, son of the founder, who returned to Florida in 1986 with a master's degree in architecture from Yale and experience working for Kevin Roche John Dinkeloo and Associates, where he learned the "nuts and bolts" of architecture. In fact, the younger Rowe has been learning architecture since age 13, when he began working for his father every summer until enrolling at the University of Florida's architecture school in Gainesville. After he graduated, Rowe spent two years working for Paul Kennon at CRS in Houston before attending Yale, where Frank Gehry was his professor. He cites Kennon and Gehry as the greatest influences on his design process—after his father, whom he credits with teaching him to treat every project as unique.

Rick Rowe has been schooled in the design philosophy of the Sarasota School—Paul Rudolph, Victor Lundy, and others—which drew his father to Florida from the University of Nebraska in 1958. The Sarasota esthetic coupled the repetitive elements of the International Style with a free-form expression that its proponents deemed appropriate to sunny Florida's tropical abandon. The firm has adapted those ideas to include an awareness of Florida's strong sun to create light and shadow, employing structural modules to break down a building's scale, and relating materials to place and site.

Embodying those ideas, the DGS building is organized into two

Primary entrance and elevators are located at southwest corner, through a rotunda of Florida keystone (below). Courtyard (facing page) includes grassy area where keystone bollards support lighting. Stair towers (bottom) recall open steel lighthouses such as one marking Carysfort Reef in the Florida Keys (right).



GROUND FLOOR PLAN

- 1 ENTRANCE
- 2 RECEPTION
- 3 TRAINING
- 4 CAFETERIA
- 5 CHILDREN, YOUTH & FAMILY SERVICES
- 6 LICENSURE/CERTIFICATION
- 7 WORKERS' COMPENSATION



wings of 30-foot structural modules, expressed as bays to reduce the apparent mass. The base of the building is clad in Florida keystone, a coral-rock limestone, whose surface may be riddled by the wavy channels of brain coral or fan-shaped coral fragments. An interior courtyard preserves specimen trees, and a skylit rotunda scatters rainbows of sunlight along its balconies. "Architects have a responsibility to understand the reaction of people to their buildings," asserts Mike Russell, project manager of the Fort Myers complex. "People seem to like this building. It's not foreign to them, and it doesn't play gimmicks. It has a straightforward honesty of expression."

Although the recession has trimmed the practice to what Rick Rowe deems "all chiefs and subchiefs," its members clearly enjoy the creation of architecture, sharing the design process. Organized in an open room with no private offices, the partners stress teamwork. Friday afternoons are reserved for an all-staff design critique, and on Wednesday evenings, the entire firm turns out to play softball in Tampa's architectural league, where Rowe Rados Hammer Russell is currently ranked number one.

The architectural softball league is one sign of Florida's slumbering economy: last year, it included 12 architecture firms; this year, there are six. But Rowe Rados Hammer Russell continues to find work: an elementary school, headquarters for a sportswear manufacturer, and a library for the University of South Florida's St. Petersburg campus are on the boards. And, since the DGS building was completed ahead of schedule and under budget, prospects appear bright for future state projects. That Rowe Rados Hammer Russell will survive the recession is a reflection of the versatility of its new leadership, coupled with its sound design principles. ■

—HEIDI LANDECKER

Oregon architectural artist Ed Carpenter worked closely with the architects to create an abstract cone of tempered, sandblasted glass, dichroic glass, and prisms (below right). The sculpture filters images of sunlight along balconies within the octagonal rotunda (below left and facing page).

**STATE REGIONAL SERVICES CENTER
FORT MYERS, FLORIDA**

CLIENT: State of Florida, Department of General Services

ARCHITECT: Rowe Rados Hammer Russell Architects, Tampa, Florida—H. Dean Rowe (principal-in-charge); Michael Russell (project manager); Rick Rowe (project architect); Lisa Wannemacher (assistant project architect); Michael L. Stinson (CADD manager); Thomas A. Hammer (specifications, quality control); D.E. Holmes (partner and team critic); Dawn Jacobson Gunter, Wendy Landry, Robert Bryant (project team)

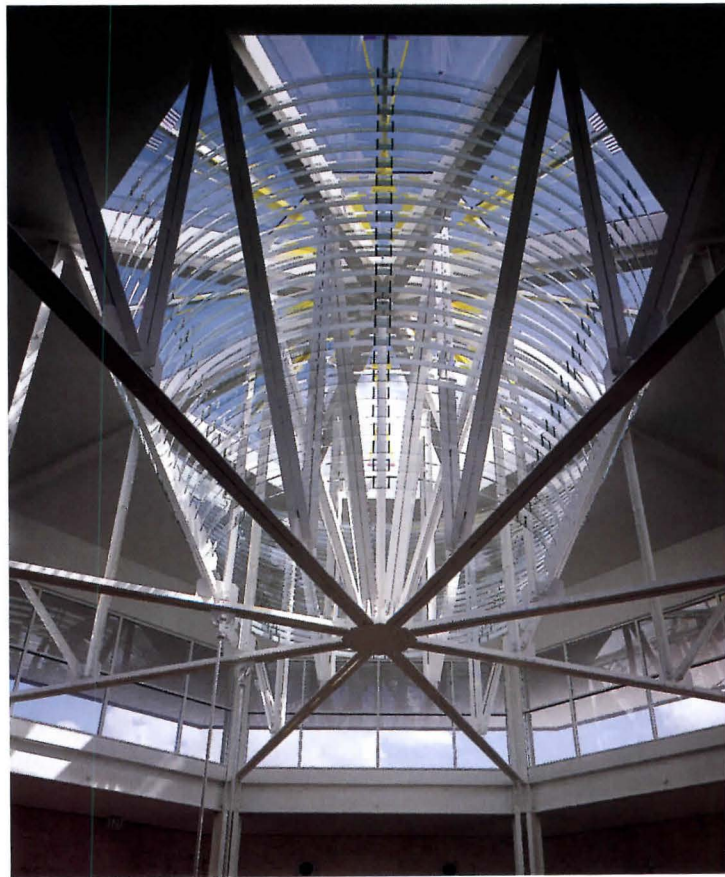
ASSOCIATE ARCHITECT: Parker/Mudgett/Smith Architects, Fort Myers, Florida—Wiley Parker, Sr., Wiley Parker, Jr. (project team)

LANDSCAPE ARCHITECT: Rigall & Parker

ENGINEERS: Rast Associates (structural); Energetics Engineering (mechanical/electrical/plumbing); Butler Engineering (civil)

CONSULTANT: Ed Carpenter (public art)

GENERAL CONTRACTOR: Centex Rooney Construction
COST: \$22.3 million—\$80/square foot





EXIT

ENVIRONMENTAL
MEDIA CENTER

EXIT

WEST 256-266

WEST 155-165

EXIT

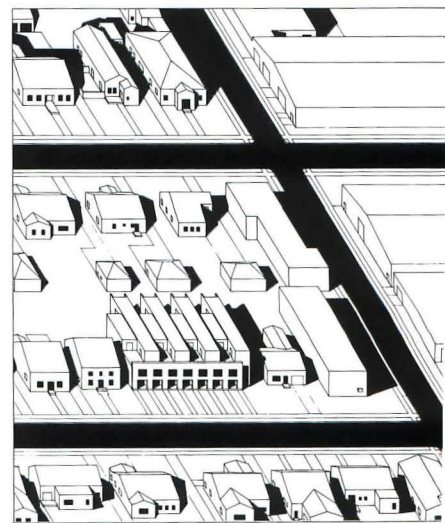


emerging talent

**Pope Sherman Architects
Houston, Texas**

TEACHERS AT RICE UNIVERSITY SINCE 1987, ALBERT POPE AND WILLIAM Sherman formed Pope Sherman Architects five years ago to design buildings that embody Houston's "brilliant and vulgar contrasts." Their spare esthetic, although tightly composed, often appears unresolved and sometimes contradictory, reflecting the city's disparities of form and scale. Thirty-seven-year-old Pope and 36-year-old Sherman reached their complementary attractions to such architectural opposition through similar training as students at Ivy League schools and as designers for influential architects. Sherman attended Princeton and Yale and worked for Peter Waldman, Fox &

Row houses stand shoulder to shoulder with commercial and industrial buildings (axonometric, below). Stucco cores (bottom left) rise behind brick screen facing street (below left and facing page), linked by metal-clad bedrooms (drawing, bottom).



Urban Resolution



Fowle, and Cesar Pelli. Pope studied at the Southern California Institute of Architecture and Princeton, and worked for Frank Gehry and Morphosis. Early projects from their partnership have included precisely detailed storage space and donor walls for Houston's Mies van der Rohe-designed Museum of Fine Arts, and an office building in Beaumont, Texas, the first phase of which was completed last year. The architects' first fully realized major building, the Wroxton Road Row Houses, reflects their argument that urban sprawl and the loss of community must be countered with denser suburban housing.

The site fronts a tree-lined street that courses through a suburban Houston neighborhood, lined with modest, single-family houses and sliced episodically by growing commercial and industrial corridors. Into this uncertain context, Pope and Sherman injected a richly layered building that stakes an urbanistic presence without pushing a utopian agenda. With straight-faced Wrightian aplomb, the architects looked beyond the clashing quaintness and grit of the immediate context to imagine a structure that would outlast 50 years of subsequent development.

The four-unit building's tautly combined industrial and residential conventions begin at street level. Garage doors open onto a parking area with auto-repair-shop frankness, rather than hiding behind a neatly trimmed yard and driveway. But the experience shifts quickly inside. An intimate passageway leads from the somber red-brick screen that fronts and unifies the row to a ground-level office/bedroom and up a flight of stairs to a soaring, light-filled, two-story main living space. The stair continues around a three-story light well to a roof terrace and metal-clad master bedroom, which juts to the side of the stuccoed

living volume, sheltering a garden at the rear. The long, narrow, south-facing garden is further shaded by the towering living room walls that define its perimeter.

Each 2,100-square-foot unit reflects Pope Sherman Architects's assessment of city living as a struggle between public life and the desire for a private enclave. The architects created a collection of living spaces roughly the size of others in the neighborhood, but they squeezed them into less than half the usual land area. The resulting proximity of the units is amplified by roof terraces and outdoor gardens that are only partially separated, fostering interaction among neighbors.

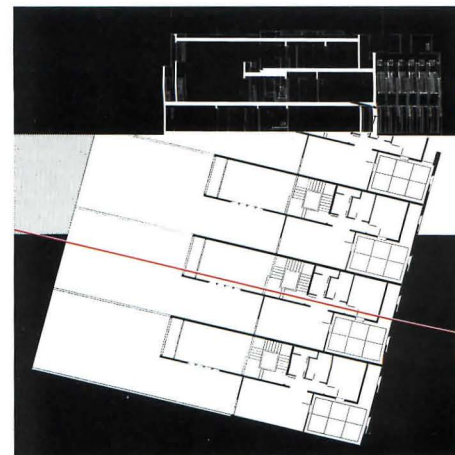
Rather than confine their commentary on the city to academia or paper projects, Pope and Sherman insist on building their ideas. With these row houses, they altered the formula for livable housing by manipulating space and light, capturing more than 1,500 square feet of garden and yard per unit, and presenting a rigorous public facade that stands its ground against the lube shop a block away. As if their design were not commitment enough to their urban stance, Pope and Sherman have each moved into the row houses, experiencing first-hand how well their vision will succeed. ■

—RAY DON TILLEY

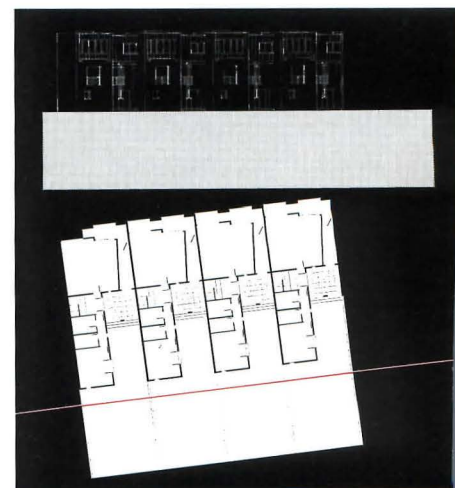
**WROXTON ROAD ROW HOUSES
HOUSTON, TEXAS**

CLIENT: John Neese, Weswin, Inc.
ARCHITECTS: Pope Sherman Architects, Houston, Texas—Albert Pope, William Sherman (principals); Steven Klimas, Karl Jensen, Richard Gowe (project team)
ENGINEER: Wilson Wan (structural)
GENERAL CONTRACTOR: Myles Sherman Builders
COST: \$618,000—\$72/square foot
PHOTOGRAPHER: Paul Hester

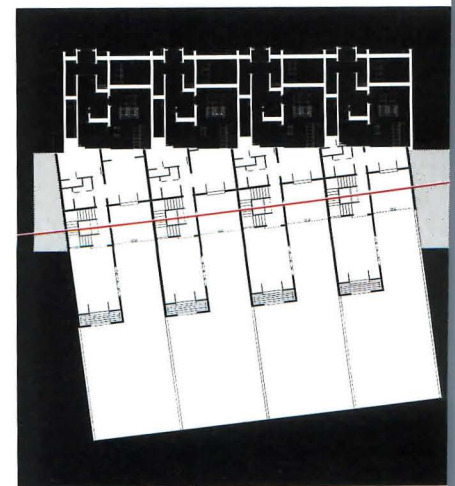
Ground floor (bottom plan) contains garage and office/bedroom; second floor includes living/dining area (facing page, center plan, and bottom right) and balcony (bottom left). Third floor (plan below) contains master suite.



THIRD FLOOR PLAN/LONGITUDINAL SECTION



SECOND FLOOR PLAN/SECTION THROUGH ENTRY



GROUND FLOOR PLAN/REAR ELEVATION







emerging talent

Richard Friedson/The Visions Studio
Solana Beach, California



Richness and Restraint

THE CITY OF CHULA VISTA IS A PERFECT PROTOTYPE OF SMALL-TOWN SOUTHERN CALIFORNIA in the 1990s. It's a place where an older generation of Middle American Baptists, who settled the flat plain on the Mexican border south of San Diego in the 1930s, mingles with a growing community of Latino immigrants arrived in recent decades. The original downtown, a cozy Main Street populated with small stores, has been upstaged by a typical suburban shopping sprawl of fast-food palaces and glitzy supermarkets.

The new Norman Park Senior Citizens Center, one block north of the old downtown, derives its esthetic from the older Chula Vista. Set in a park surrounded by Protestant churches, the center's style is 1940s Southern California, with a twist. It is airy, informal, slightly playful, and thoroughly amiable—a sophisticated rendering of populist architecture.

On a basic stucco box, Visions principal Richard Friedson has grafted a few design gestures that garnish the 16,000-square-foot building with just the right amount of urbane gloss, with



Entrance to the center (above) evokes a 1940s Southern California domesticity with its chimney and picture window. To the west of the building, pergola continues roof curve (facing page). On the east elevation (left) windows follow rhythm of overhang, with smaller windows interspersed at random.



out overloading its essential simplicity. The curved roof over the center's main hall also shelters the building's principal south entrance, and is punctuated by a chimney clad in sandstone, adding a touch of domestic familiarity. This curve is echoed in variations throughout the center; a rounded pergola enclosing a small garden defines the street edge, and curved timber struts support the overhangs that shade the second-floor administration offices.

The main interior gathering area exudes the aura of a small-town street. Inside the main hall, a circular volume housing a conference room articulates the junction between the functions of the complex, which comprise information services for the elderly and areas for recreation. A subtlety of understatement informs the seeming simplicity of the space—its proportions are just right, and the details are trim and restrained. The designer, as a presence and a personality, is not so much absent as discreet.

This quality of refined restraint marks Friedson's best work. Even in the more colorful post office he designed in the San Diego suburb of Rancho Penasquitos, Friedson still resists any tendency to over-design. When the 40-year-old architect claims, "I consider the context of a building to be paramount," it is truly evident in his work.

Friedson's tiny practice in Solana Beach, an oceanside community near San Diego, varies in size from one to four, depending on commissions. Formed in 1986, the firm mostly keeps busy with projects such as civic centers, fire stations, post offices, and senior citizens' facilities. "Rather than designing lavish private homes that occupy many small offices in Southern California," Friedson notes, "we find a greater satisfaction in creating public architecture."

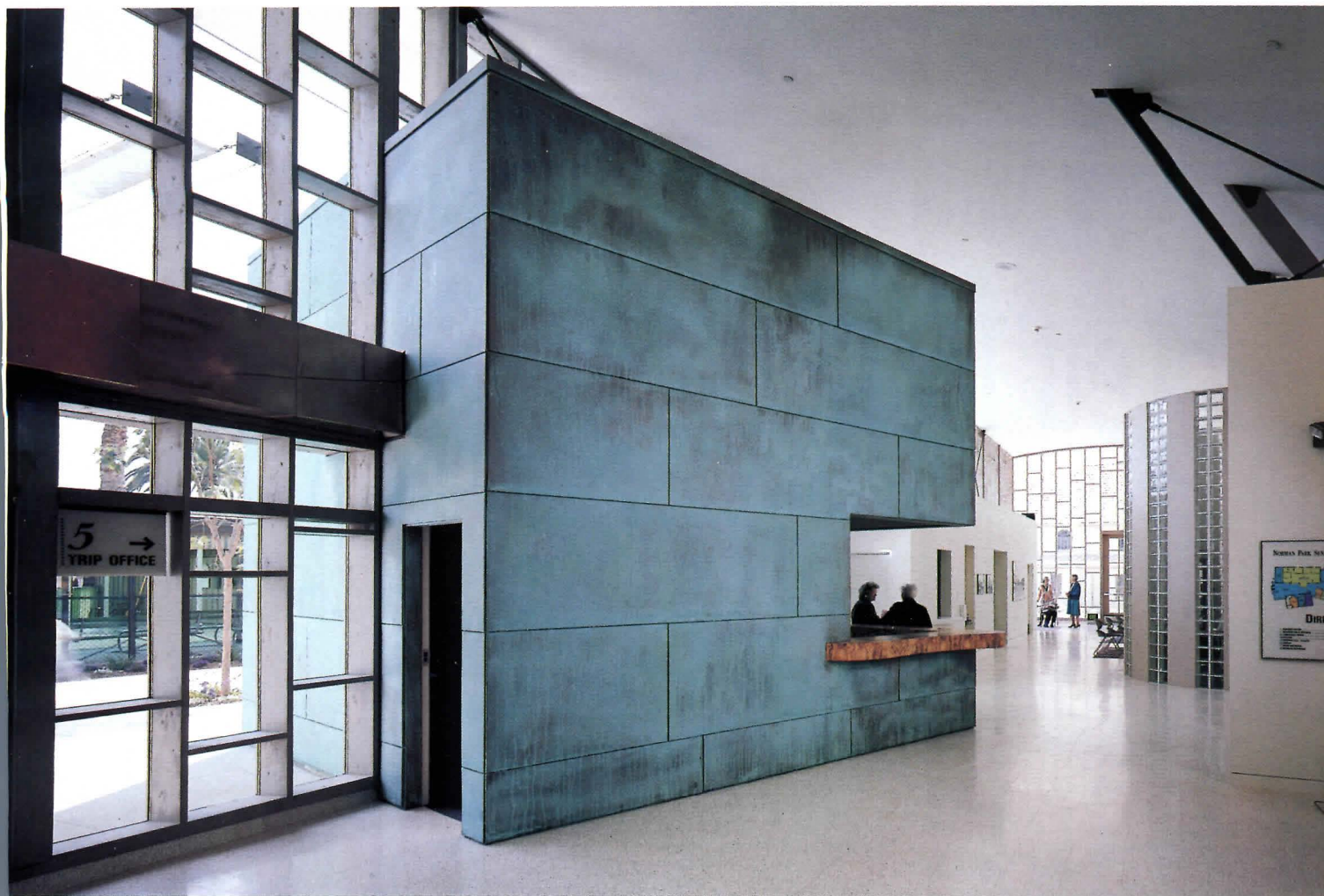
Friedson's background contributes to the maturity of his work. After graduation from the University of Southern California, he spent several years working for Louis de Sois-

sons Architects in London. On his return, he served his time in Maxwell Starkman & Associates and Charles Kober Associates in Los Angeles, before striking out on his own. For a few years, he worked as a designer-contractor-developer in the Mammoth Lakes ski resort in the eastern Sierra Nevadas, learning about architecture "from the other side."

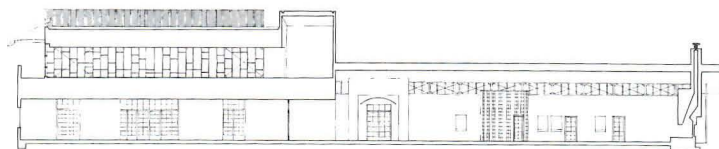
Friedson acknowledges a variety of influences and mentors. "I studied Frank Gehry's style for clues to a valid Southern California idiom," he says, "and I look to Le Corbusier for a certain purity of style." Out of these elements, the San Diego architect is forging a distinctive architectural character of his own—one that is not so much obsessed with originality as with an enlightened sincerity that is rare in these overwrought times. It is, as Friedson says, "the kind of work I can live with."

—LEON WHITESON

Leon Whiteson writes about architecture for the Los Angeles Times.



Illuminated by a clerestory, the gathering space in the main hall includes a copper-clad information booth (above). Services are dispersed along its length, articulated by chimney (facing page, left) and conference room clad in glass block (facing page, right).



EAST-WEST SECTION

NORMAN PARK SENIOR CITIZENS CENTER
CHULA VISTA, CALIFORNIA

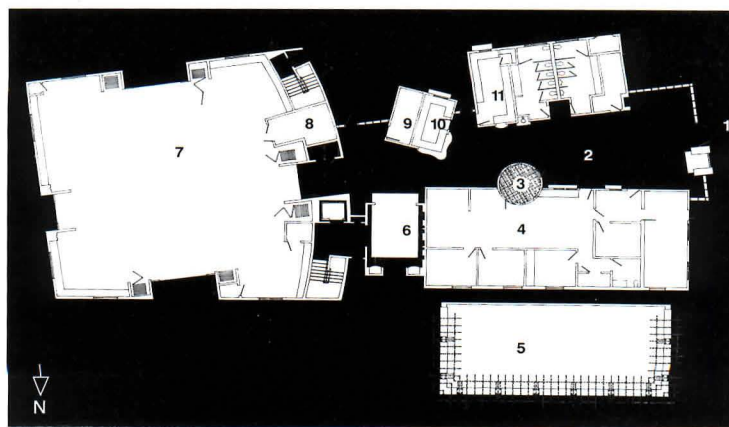
CLIENT: City of Chula Vista
ARCHITECT: Richard Friedson/The Visions Studio, Solana Beach, California—Richard Friedson (principal-in-charge); Jennifer Luce (interior design); James Sable, Mark Viguri, Larry Pokras (project team)

LANDSCAPE ARCHITECT: POD, Inc.—Frank Brower; Martin Schmidt

ENGINEERS: Flores and Ng (structural); Mattson Beaudin Engineering (mechanical); J-Rad Engineering (electrical); Rinehart Engineering (civil)

GENERAL CONTRACTOR: Davidson Construction
COST: \$2.3 million—\$143/square foot

PHOTOGRAPHER: Sandra Williams Photography



GROUND FLOOR PLAN

- 1 ENTRY PLAZA
- 2 MAIN HALL
- 3 CONFERENCE ROOM
- 4 ADMINISTRATION
- 5 PATIO
- 6 LOUNGE
- 7 AUDITORIUM
- 8 STORAGE
- 9 NURSE'S STATION
- 10 RECEPTION
- 11 KITCHEN



emerging talent

Bentel & Bentel Architects/Planners
Locust Valley, New York

Sacred Traditions

ARCHITECTURE IS A FAMILY AFFAIR FOR BENTEL & BENTEL ARCHITECTS/Planners of Locust Valley, New York. Brothers Peter, 31, and Paul, 35, head the firm that was started by their parents, Frederick and Maria Bentel, in 1957. Carol Rusche, 35, Paul's wife, is also a partner. All three young architects combine practice with their own theoretical investigations, and each is currently a doctoral candidate in architecture at the Massachusetts Institute of Technology. Church architecture is a staple of the family practice—the firm has completed more than a dozen churches over the past 25 years—along with schools, libraries, and other public buildings.

"Communicating the special relationship of the institution to the community is an important issue in our work," says Paul Bentel, principal-in-charge of the design of St. Stephen's Church in Warwick, New York, a small town near the New Jersey border. "Another is architecture's materiality. We're eager to present the building's materials, such as the brick and steel in St. Stephen's." These qualities were not lost on the parish's building committee, which unanimously chose Bentel & Bentel from a field of 15 firms. "We liked the way the architects used brick in their other churches," observes Monsignor Bernard Corrigan, the church's pastor, "and the way their buildings were placed."

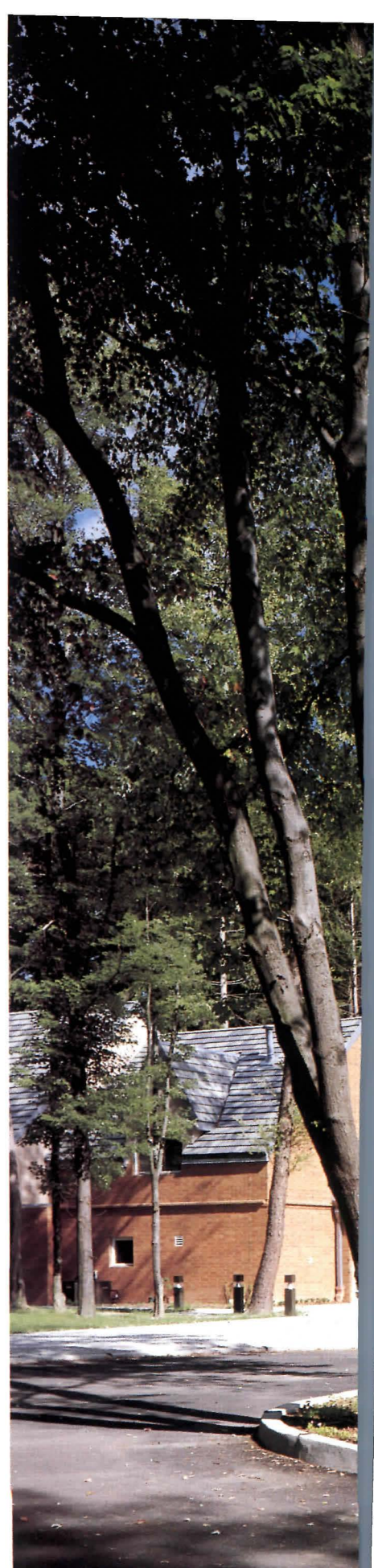
Siting the church was the most critical aspect of its design. St. Stephen's had occupied a stone church in downtown Warwick since 1903, and the congregation resisted the move to nearby farmland. The church had to establish an identifiable presence in its new location, as well as provide an amenity to compensate for the move out of town. As Monsignor Corrigan adds, "The building had to be a thing of beauty for the entire community, not just for the congregation."

From the south, the church appears as a large, single, barnlike volume. But from the north, the building comprises a collection of gable-roofed forms, an ecclesiastical village in which each element of the plan—entrance, community space, sacristy, bell tower, and sanctuary—is distinguished.

Since a stand of red pines occupies the southern edge of the site and restricts access from the street, the architects placed the building's entrance on its north side, giving the church a certain duality. The streetside elevation, rendered in a glass curtain wall, reveals the building's interior but no entrance; to the rear, the entrance elevation is opaque, clad in brick with little fenestration.

The exterior brick is detailed to give the entrance, bell tower, and the building's corners visual weight and depth as the bricks corbel back at the edges. The architects admit that the roofs, which are covered with concrete tile, were meant to suggest the forms of farm structures nearby, but Corrigan also sees in them the steep, corbelled roofs of 7th century monasteries in Ireland.

The architects worked with an Albany-based liturgical consultant who helped create

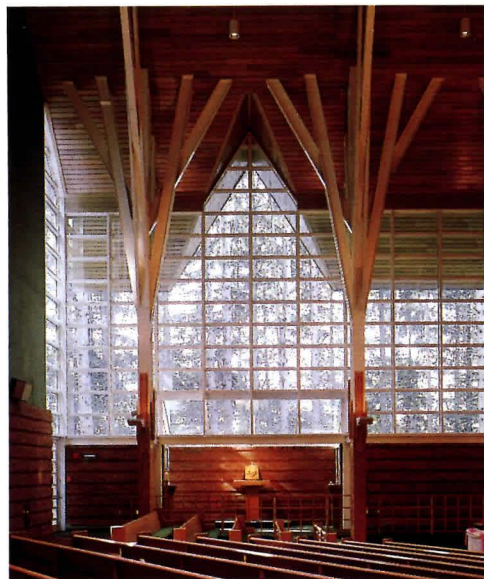




From the northwest, church appears as a village of steeply roofed forms (these pages). Church entrance (above left) is distinguished by single-story pediment. West elevation of worship space (above) is marked by steel supports that mimic trees.







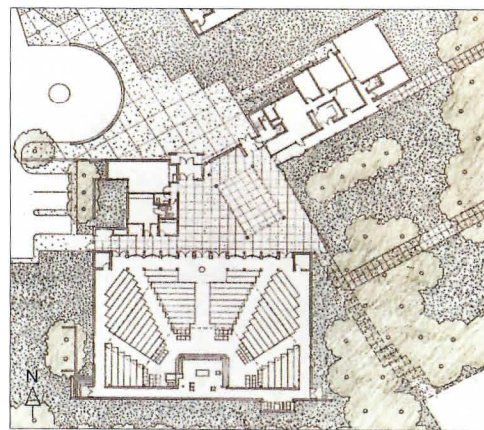
suitably symbolic and juxtaposed spaces. For example, the community space at the center of the building, where parishioners gather after mass, is rectangular in form, crowned by a steep gable roof and round windows to visually convey the heart of the complex.

Yet far more dramatic and inspiring is the church sanctuary—one large, light-filled space contained under a sharply sloped gable that rises nearly 60 feet above the floor, clad with cedar clapboards. One hundred feet long by 70 feet wide, the sanctuary's configuration breaks with tradition. Instead of placing the altar at the end of a long aisle parallel to the roof ridge, the altar is located perpendicular to the ridge, against the long, glazed, south wall. Angled seating brings the congregation members into close proximity with one another and the altar, and underscores the sense of community. Forests of white steel columns along the north and south walls allude to the trees that surround this glassy volume, but also suggest other images: the outstretched arms of Christ on the cross, or the ribs of stone vaulting in Gothic cathedrals. The brick wall behind the altar is high enough to screen churchgoers from the road, but low enough to permit views through the curtain wall up into the cathedral of pines.

Bentel & Bentel seeks to revive a Ruskinian tradition in church-building—the joy of creation on the part of the builders. Paul Bentel explains that revealing the brick and steel at St. Stephen's caused bricklayers and steel workers to exhibit pride and exactitude. "With its emphasis on materials," notes Bentel, "our design work is calculated to reinforce the tradesman's craft."

—MICHAEL J. CROSBIE

Steel columns appear as trees growing through the roof of worship space (facing page). From entrances, ambulatory (above) continues around worship space (plan below) leading to tabernacle (above left) at building's southeast corner.



GROUND FLOOR PLAN

**ST. STEPHEN'S ROMAN CATHOLIC CHURCH
WARWICK, NEW YORK**

ARCHITECT: Bentel & Bentel Architects/Planners, Locust Valley, New York—Paul Bentel (principal-in-charge); Carol Rusche, Peter Bentel (design team/project architects); Michael J. Kranyak (project architect); Edward Casper, Theresa McCarty (project team)

LANDSCAPE ARCHITECT: Bentel & Bentel Architects/Planners

ENGINEERS: Baskam & Associates (structural); Emtec Consultants (electrical/plumbing); John Lehman (civil)

CONSULTANT: Father Richard Vosko (liturgical)

GENERAL CONTRACTOR: Barrett Construction & Management

COST: \$2.2 million—\$125/square foot

PHOTOGRAPHER: Eduard Hueber/Arch Photo



emerging talent

Mulder-Katkov Architects
Santa Monica, California

Developing Metaphor

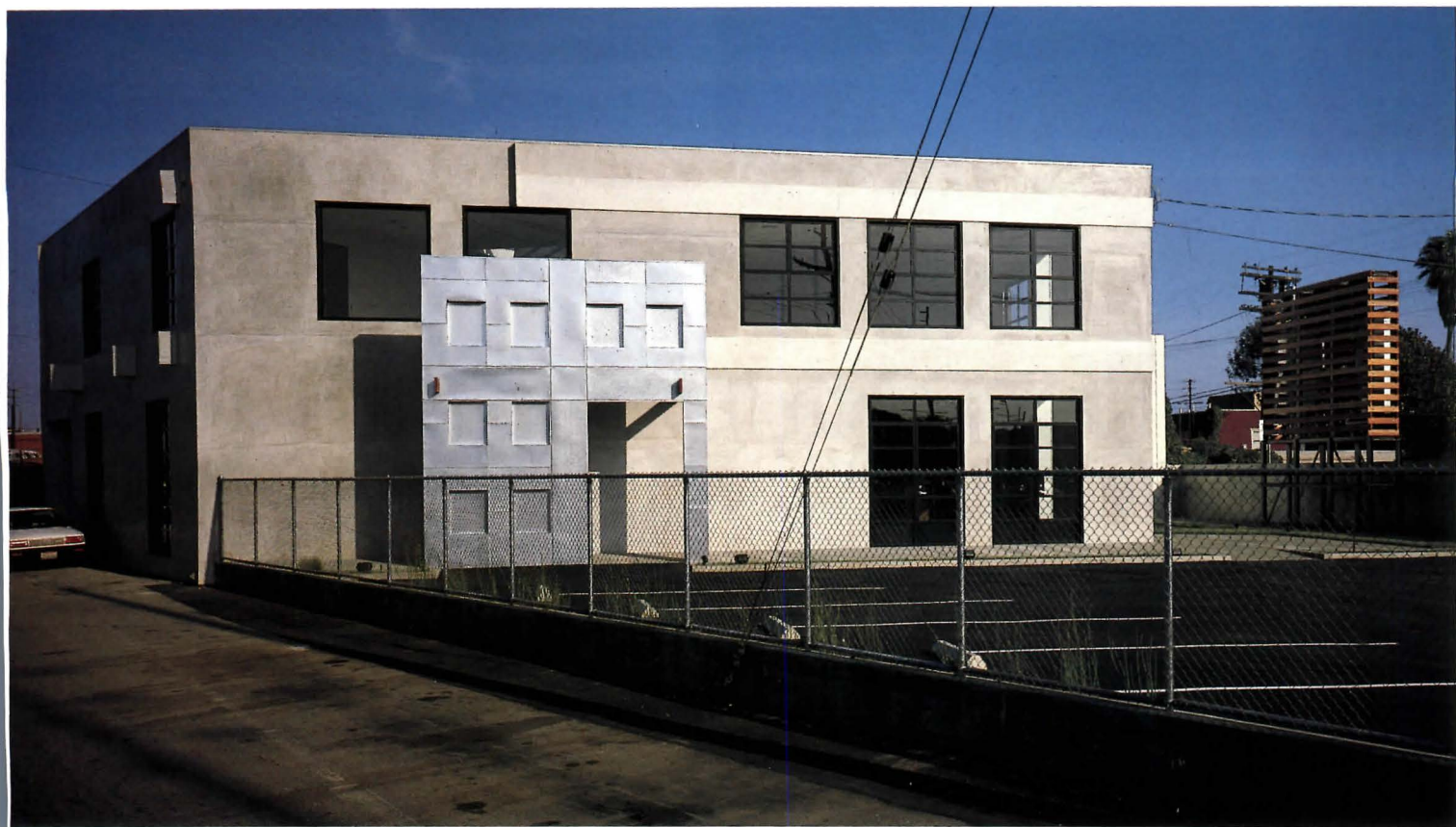
IN THE EARLY 1980s, LOS ANGELES WAS AN EXCITING PLACE TO STUDY architecture. The work of Frank Gehry was just beginning to receive international attention, and several innovative young architects—Eric Owen Moss, Frederick Fisher, and Morphosis’s Thom Mayne and Michael Rotondi—were surfing the wave created by Gehry’s newfound fame. By the middle of the decade, the local economy was booming, the city was expanding, and clients were willing to experiment with new forms. Students at the Southern California Institute of Architecture (Sci-Arc) were at the vortex of all this creative energy, dreaming of building their own cutting-edge designs.

The realities of the 1990s are less conducive to this vision: the economy has taken a nosedive, Sci-Arc is becoming an old boys’ club, and what was once cutting-edge is beginning to look like the same old stuff. But some small Los Angeles firms are surviving with their ideals largely intact. Mulder-Katkov is such a practice.

The partners, both Sci-Arc graduates, founded their own firm in 1986. Miriam Mulder had been happily working for Fred Fisher, but, after the birth of her first child, began practicing on her own, first in her house, and then in her converted garage. A year later, Mulder’s husband, Richard Katkov, left Steven Ehrlich’s office to join her. It is a measure of the respect the young architects earned from their employers that much of their early work, including a new house in Venice and a condominium on the Marina del Rey peninsula, came through recommendations from Fisher and Ehrlich. The condominium led to a 6,000-square-foot remodeling of a Venice plumbing-supply warehouse into an office building, and a new, 23,000-square-foot commercial building, now under construction nearby. The refer-



Sculpture (right and facing page, bottom left) at building’s western boundary contains symbols of Venice. Image of sculpture is “transmitted” through glass slot on western elevation (facing page, bottom left). Metal-clad screen shielding entrance (facing page, top and bottom-right) represents flattened image of sculpture.



rals may have started their practice, but it is clearly talent and hard work that keep Mulder-Katkov going. The architects now work out of a small office in Santa Monica, where they employ one part-time assistant.

The work of the wife-husband team is a real collaboration, with Mulder, 37, taking the lead in the conceptual stages and Katkov, 38, taking a stronger role in later design and construction. Both designers were inspired to study architecture at an early age: Mulder describes seeing R.M. Schindler's 1926 Lovell beach house as a child, and Katkov speaks of trips to Frank Lloyd Wright-designed homes in Oak Park, Illinois. Today, although Fred Fisher helped them get started, it is the influence of Eric Owen Moss—particularly his focus on mythology and narrative—that is evident in their work.

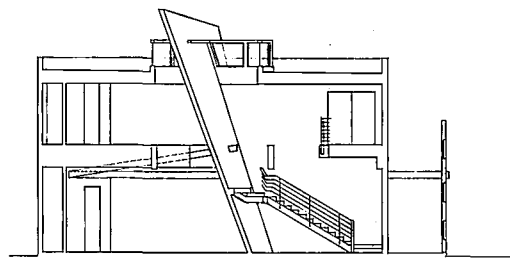
In the Venice warehouse renovation, for example, the existing building's irregular plan inspired the idea of a camera obscura, a chamber with a lens that transmits light from external objects to form an image on an opposite surface. At the western edge of the site, the architects erected a slatted cage, filled with objects that represent aspects of Venice: a house, a fence, a homeless person. A two-story glass slot in the building's western facade is aligned with this object and acts as the "lens." The image is then "processed" within the interior, in a dynamic space formed by a stucco-covered angled wall. On the northern edge of the building, the slatted sculpture reemerges as a flattened projection, a gridded screen wall covered in galvanized metal, defining the building's entrance.

While focused on such architectural metaphors, Mulder and Katkov also pay attention to the experiential level of their buildings: how light enters a space, and how craft and detail can enrich it. This concern is evident in their careful placement of glazing and in elegantly detailed staircases. In the Venice building, for example, the angled wall of the "camera obscura" pierces through the roof to create skylights on its north and south sides, illuminating an angled steel staircase and second-level conference room.

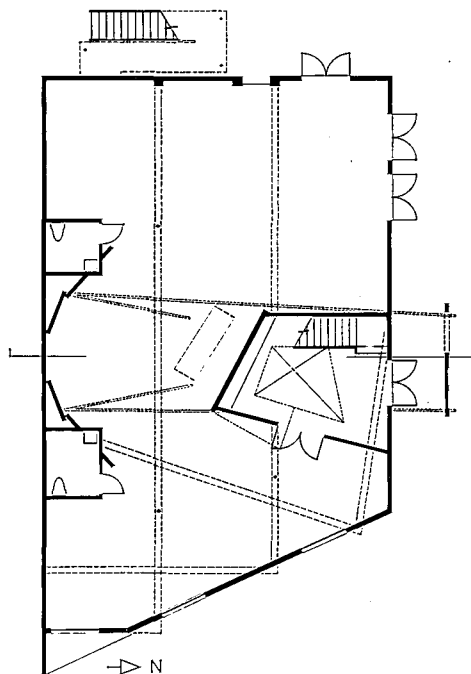
Mulder and Katkov may not always directly communicate their metaphorical ideas to their clients. But by adapting their abstractions to the demands of construction and program, even in the most prosaic of buildings, they manage to keep both their ideals and practice growing. ■

—JUDITH SHEINE

Judith Sheine is a Los Angeles-based architect.



NORTH-SOUTH SECTION

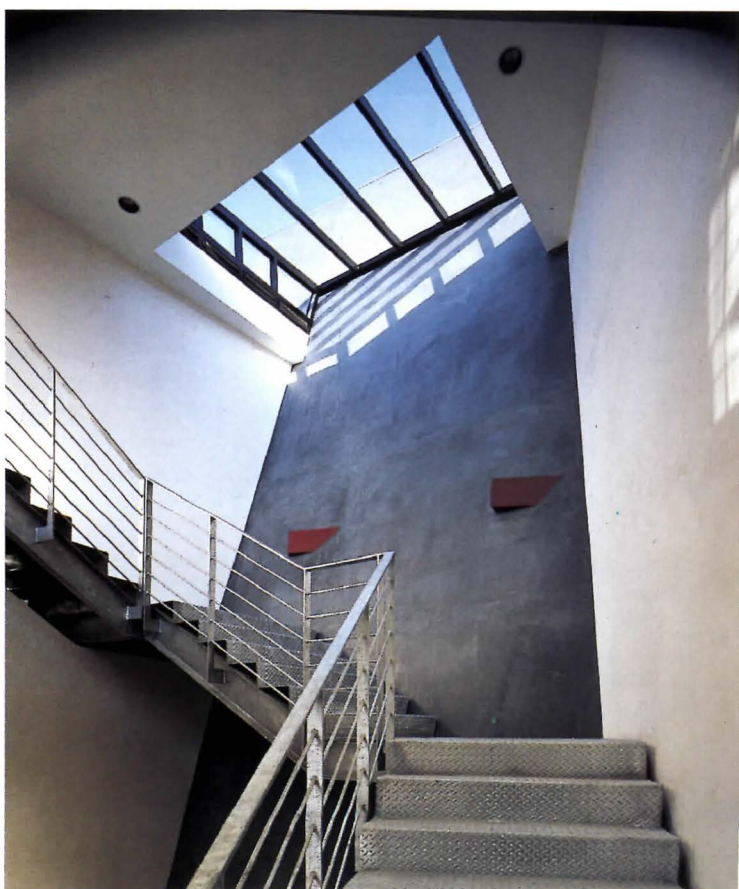


GROUND FLOOR PLAN

1611 ELECTRIC AVENUE
VENICE, CALIFORNIA

CLIENT: David Hendler
ARCHITECTS: Mulder-Katkov, Venice, California—
Miriam Mulder (principal-in-charge); Richard
Katkov (principal-in-charge/project manager);
Robert Cull, Gregory Makowski (project team)
ENGINEER: Martin Gantman Studio
CONSULTANT: Sparks Electric
GENERAL CONTRACTOR: Davis Development
COST: Withheld at owner's request
PHOTOGRAPHER: Dominique Vorillon

Mulder and Katkov translated image of site sculpture through the building with a two-story-high angled wall, revealed in plan and section (above right). Interiors defined by slanted enclosure include skylit staircase (facing page, bottom right) and upper-level conference room (facing page, top and bottom left).





emerging talent

Wheeler Kearns Architects
Chicago, Illinois

Elevated Simplicity

MANY YOUNG ARCHITECTS GET THEIR BIG BREAK BY WINNING A design competition, and Daniel H. Wheeler is no exception. In 1987, Wheeler triumphed over three prominent Chicago firms—Tigerman McCurry Architects, Hammond Beeby and Babka, and Holabird & Root—to win the commission for Camp Madron, a resort community on the site of an abandoned Boy Scout camp in rural Michigan. Created in his spare time, the winning design gave Wheeler, a Skidmore, Owings & Merrill studio head, the opportunity to leave his employer of six years. Half a year later, Lawrence Kearns, another SOM/Chicago veteran, joined Wheeler's nascent practice, which became Wheeler Kearns Architects in 1990.

The Chicago firm, which now employs five architects, has since developed the master plan for Camp Madron and completed a lodge, custom residences, and three prototype houses rendered in a traditional vocabulary inspired by Shaker craftsmanship, all in accordance with the developer's architectural guidelines. Two years ago, a Chicago couple with three young children commissioned Wheeler Kearns to design a weekend house on one of the highest parcels in the wooded 260-acre resort, which surrounds a 60-acre lake. "The impetus for the design was taking advantage of distinct views in each direction and responding to the client's request for a Modernist statement," explains Kearns.

With a mandate to explore a minimalist vocabulary within the constraints of the community's strict design guidelines, Wheeler Kearns developed a simple, boxlike structure that adheres to a strict geometry, yet is rendered in rustic materials. The exterior is clad in vertical redwood siding punctuated by a slender steel canopy over the entrance. In response to a tight budget, the architects uti-

lized standard sliding glass doors to assemble the building's prominent horizontal glazing.

The 3,120-square-foot structure is divided into four symmetrical bedrooms on the ground floor, which forms a plinth broken only by a double front door and pairs of sliding glass doors along the east and west sides of the building. This arrangement allowed the second floor to be devoted to a single, main living space—an elevated, all-glass room that seems to float in the trees. The only interruption in this open plan is a bright blue partition shielding the kitchen.

Wheeler Kearns's Modernist composition appears more akin to Philip Johnson's Glass House and Mies van der Rohe's Farnsworth House than to its immediate neighbors. Yet in massing and siting this modest residence, the architects responded to the traditional elements of the larger enclave they created. This example of enlightened contextualism proves that design guidelines don't necessarily dictate a single stylistic response. It also reveals Wheeler Kearns's self-confidence and willingness to explore diverse solutions for each new commission. ■

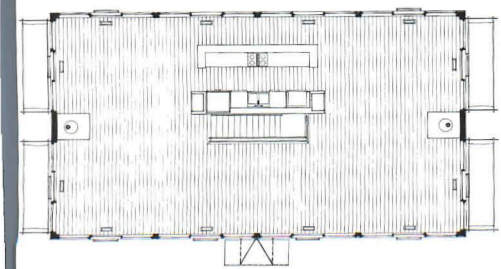
—LYNN NESMITH



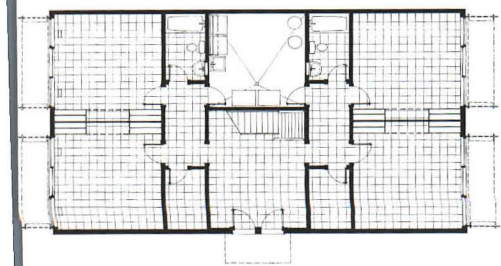
Wheeler Kearns interrupted the house's taut exterior with a ribbon of glass articulated with crafted metal trim (above). Ground-floor bedrooms serve as a base for the main living space on second floor (facing page, plans), which features a panorama broken only by a pair of slender wood-burning stoves (facing page, bottom).

CAMP MADRON HOUSE
BUCHANAN TOWNSHIP, MICHIGAN

ARCHITECT: Wheeler Kearns Architects, Chicago, Illinois—Mark Weber (project architect); Daniel Wheeler, Lawrence Kearns, Suzanne Aeder, Liza Bachrach, Lorenzo Felder, Susan Melsop-Bonn (design team)
ENGINEER: Stearn Joglekar (structural)
GENERAL CONTRACTOR: Elder/Jones Construction
COST: Withheld at owner's request
PHOTOGRAPHER: William Kildow Photography



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FIRST FLOOR PLAN





emerging talent

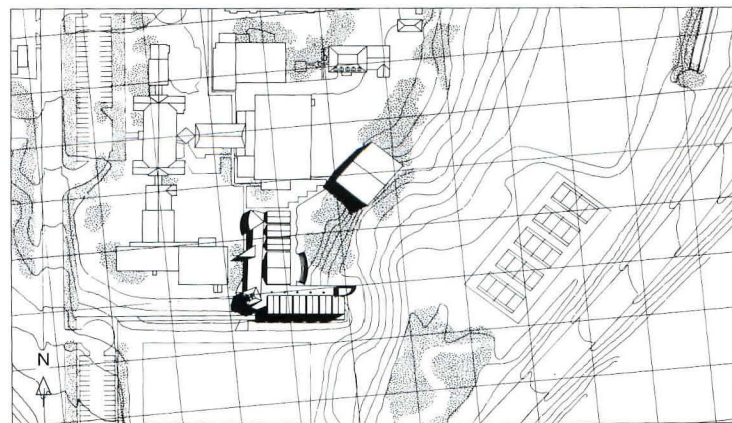
**Pellecchia Olson Architects
Denver, Colorado**

IF EXPERIENCE IS THE BEST TEACHER, ANTHONY PELLECCIA has certainly earned a broad education. After attending the University of Illinois, Pellecchia worked for five years for Louis Kahn followed by a year with Venturi and Rauch in Philadelphia. In 1973, he formed Pellecchia & Meyers and was selected to complete working drawings for the Yale Center for British Art after Kahn's death. "My years with Kahn were an incredible experience," recalls Pellecchia, "But I knew I would never get big developer commissions." With that goal in mind, Pellecchia joined Kohn Pedersen Fox Associates in 1980.

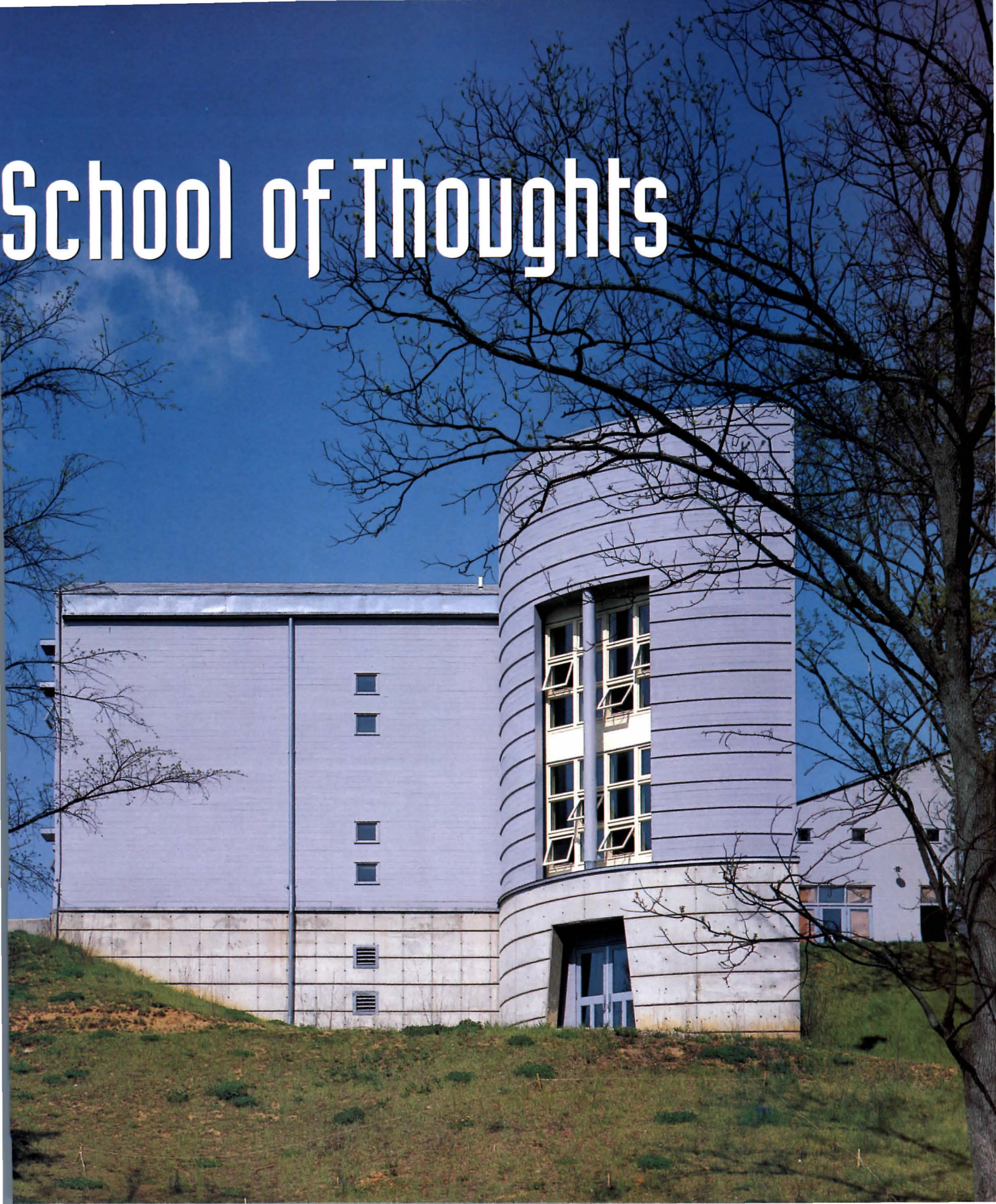
KPF's Tabor Center, a major mixed-used project, took him to Denver in 1982, where he has stayed. Two years later, Pellecchia teamed up with Jeffrey Olson, a principal at the local firm UDG, who had previously worked for Skidmore, Owings & Merrill/Chicago. Of the partners, Pellecchia is the acknowledged designer and Olson the administrator, but the eight-person practice eschews compartmentalization or a strict hierarchy. "We are definitely small-firm minded," explains Olson, "Anthony and I sit in the same office and spend a lot of time talking about all aspects of every project."

The pair's first major institutional commission is a 26,500-square-foot academic building for Seven Hills, a private school in Cincinnati, Ohio. Pellecchia Olson won the job through an ambitious selection process. A major donor to the school's construction fund stipulated that the building must "elevate the level of architecture," according to Seven Hills Headmaster Henry Peter Briggs, Jr. An invited competition followed, which resulted in a short list that included Susana Torre, Tigerman McCurry, local architect David Niland, and Pellecchia Olson. Each firm participated in a weekend charette that concluded with a public presentation at Cincinnati's Museum of Contemporary Art. By his own admission, Pellecchia's selection was based on the fact that his firm's modest scheme was the most sympathetic to the existing buildings.

The L-shaped academic building and adjacent gymnasium (center right) define the school's southern and eastern boundaries (top right and site plan). Three-story stair tower (facing page) anchors the eastern terminus of the classroom block.



School of Thoughts



Seven Hills's 32-acre campus is entered off a residential street, while the rear of the site fronts a busy highway. "Our concept was to expand the school's existing villagelike configuration, while creating a strong visual presence for passing motorists," explains Pellecchia. The new L-shaped middle school is carefully tucked on a sloping, wooded site and defines a new edge to the campus.

Acknowledging Kahn's unbuilt convent in Media, Pennsylvania, as a source of inspiration, Pellecchia arranged a series of discrete rooms off a linear, west-facing wing: a pie-shaped wedge housing a music room, an obtuse triangle marking the main entrance, and a skewed library at the juncture of the two wings. However, the south elevation, with its six identical gables enlivened by projecting "eyebrows," immediately recalls more recent architectural precedents, especially the Neo-Rationalist compositions of Aldo Rossi. It is this elevation that imparts a bold new identity for the school.

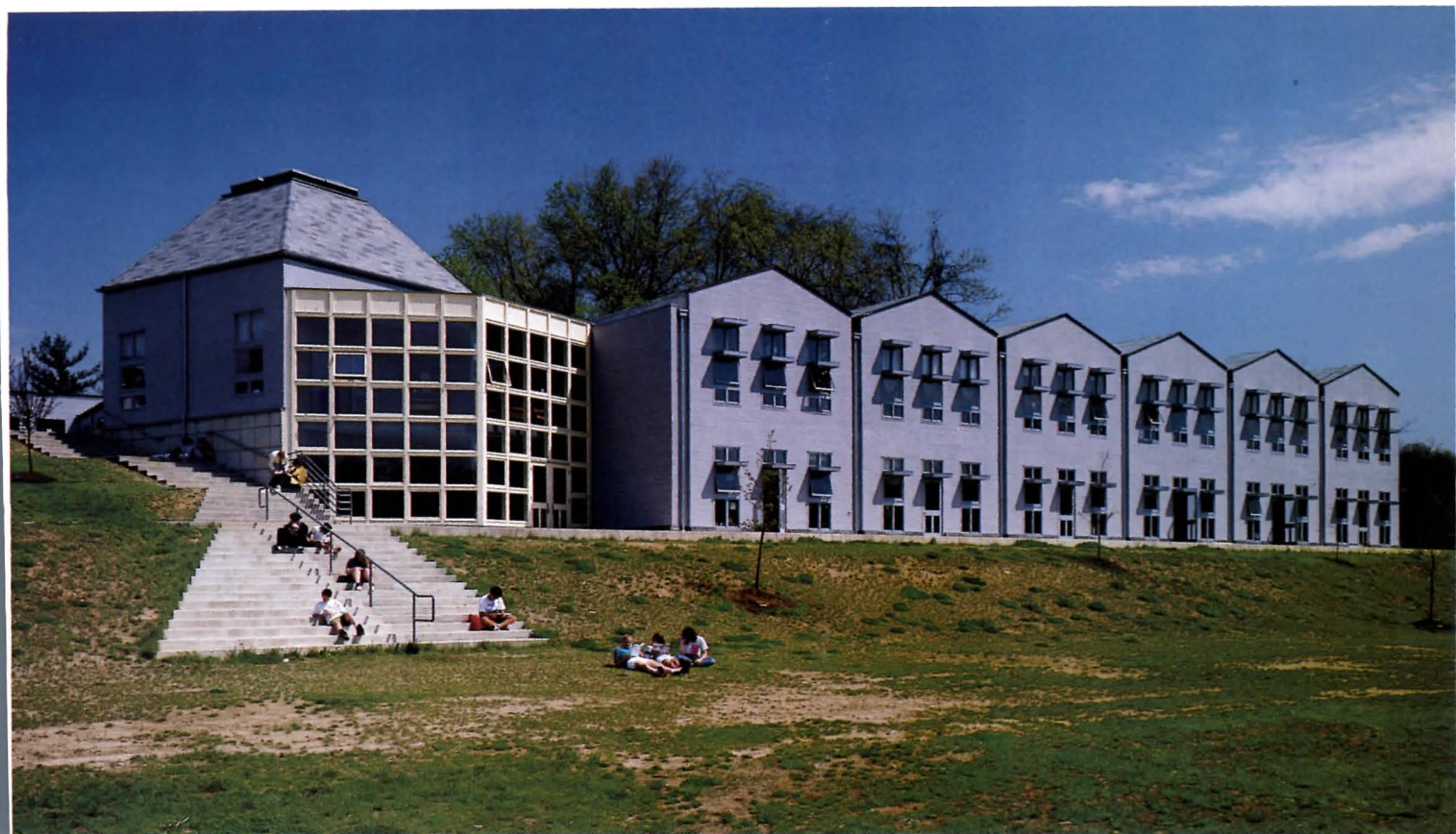
Despite a tight budget, the architect was able to steal space to carve out informal, non-specific areas. He treated the corridors not merely as circulation routes, but as gathering places where the life of the school is conducted. The most sophisticated of these dual-purpose spaces, and Pellecchia's homage to Le Corbusier, is the school's main vertical circulation path, a gradual ramp fronting a wall articulated with bands of horizontal windows. Confirmation of the school's satisfaction with the project came midway through design, when Pellecchia Olson was commissioned to design a new athletic facility to the north of the academic building.

Over the past eight years, the 51-year-old Pellecchia and 44-year-old Olson have completed diverse houses, a Venturi-inspired expansion of Spruce Hall at Colorado State University, and a 360,000-square-foot hotel that responds to the vernacular context of its mountainous site in Telluride. Pellecchia Olson's commitment to site-specific solutions over preconceived design notions is creating a growing body of work that defies easy classification. Acknowledging his own ambivalence about the firm's esthetic diversity, Pellecchia explains, "When I was younger, I didn't think Eero Saarinen was as good an architect as someone like Paul Rudolph, who had an immediately recognizable style." Today Pellecchia finds it ironic that his firm has no trademark image. "And not surprisingly," he adds, "I find I have a growing respect for Saarinen." ■

—LYNN NESMITH

Gymnasium (below) is northeast of classrooms; west wing's volumes define a courtyard (below center and bottom). Library (facing page, left in top photo) and stair tower (facing page, bottom) anchor classroom wing.

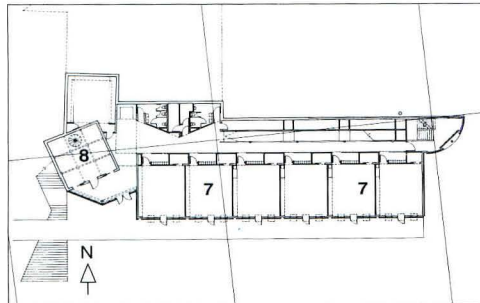




Lighting and windows enliven ramp (below and bottom). Music room, art room, and labs (facing page, bottom) are clustered in west wing; commons room (facing page, top) features exposed structure.



UPPER LEVEL



LOWER LEVEL

- | | |
|----------------|------------------|
| 1 ENTRANCE | 5 COMMONS ROOM |
| 2 MUSIC ROOM | 6 ADMINISTRATION |
| 3 ART ROOM | 7 CLASSROOMS |
| 4 LABORATORIES | 8 LIBRARY |

**SEVEN HILLS MIDDLE SCHOOL
CINCINNATI, OHIO**

ARCHITECT: Pellecchia Olson Architects, Denver, Colorado—Anthony Pellecchia (principal-in-charge of design); Jeffrey Olson (principal-in-charge of administration); Andrew Nielsen (project coordinator); Geoffrey Harris (design team)

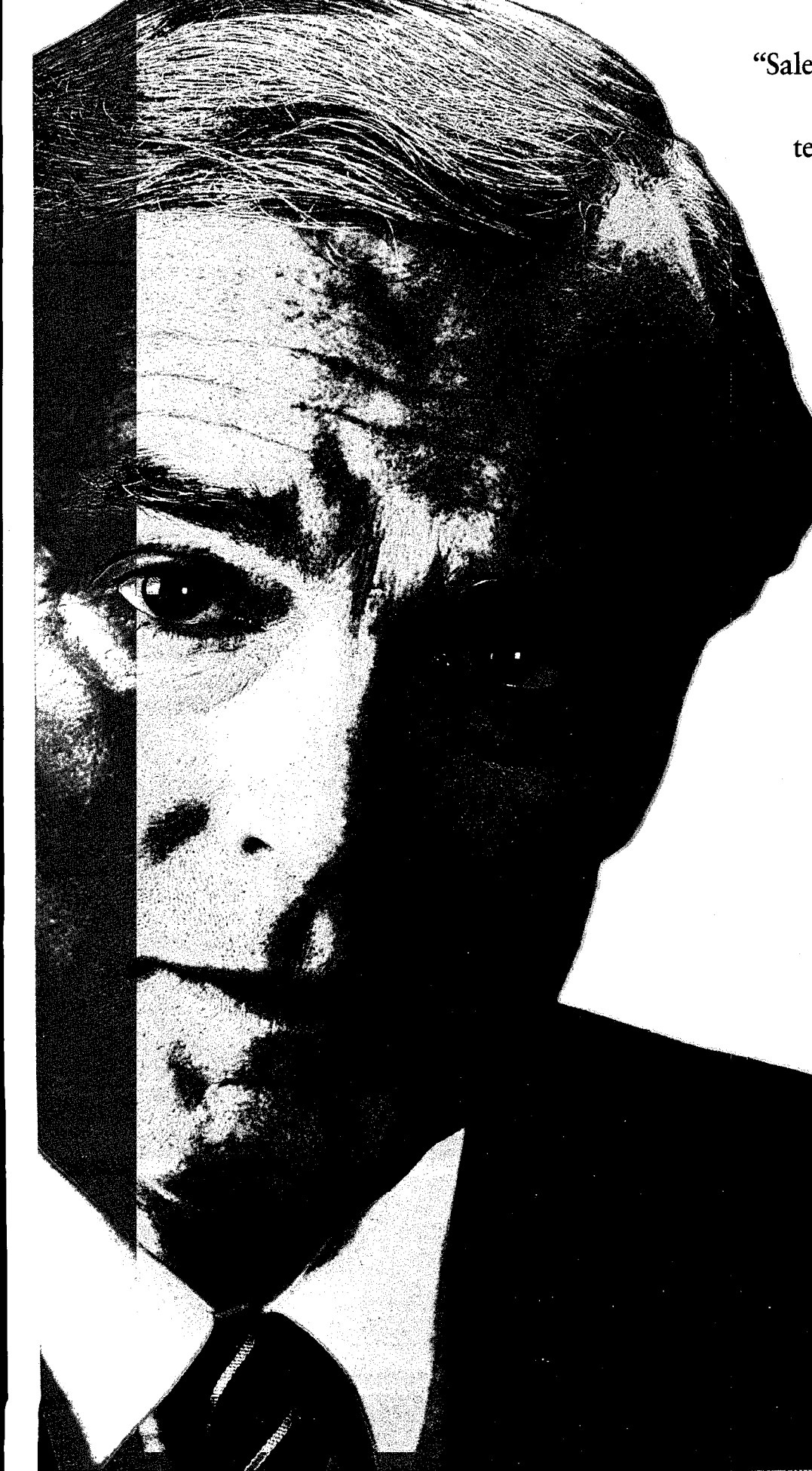
ENGINEERS: J.R. Harris & Company (structural); ABS Consultants (mechanical/electrical)

GENERAL CONTRACTOR: Matrix Building Company
COST: \$3.2 million—\$65/square foot (school); \$53/square foot (gymnasium)

PHOTOGRAPHER: Ron Forth (except as noted)







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Your salespeople can be effective when they get to see a customer or prospect. But, on a day-to-day basis, the buying influences you need to reach turn to specialized industry publications for more of the important information that helps them make buying decisions. A recent study, conducted by the Forsyth Group, proves it.

In the study, 9,823 business and professional buying influences were asked what sources they find most useful in providing information about the products and services they purchase for their companies. The results were somewhat surprising. Overall, specialized business publications emerged as the source business people turn to first. In other words, trade magazines are where business goes shopping.

Many other sources of information, including sales representatives, direct mail and trade shows, have their place in the total marketing mix. But if you want to reach the highest number of qualified buyers at the lowest cost, specialized business publications are clearly the best choice.

For a free copy of the study, please write to American Business Press, 675 Third Avenue, Suite 400, New York, NY 10017.

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Technology & Practice info

Information on building construction, professional development, and events



Architect William P. Bruder's Cholla Branch Library in Phoenix, Arizona (above).

Metal Architecture Awards Announced

IN MARCH, THE METAL CONSTRUCTION ASSOCIATION (MCA) announced five 1991 honor awards for recently completed buildings that serve as outstanding examples of metal applications. Two of the winners were singled out for additional monetary scholarship prizes: William P. Bruder Architects, for the Cholla Branch Library in Phoenix, Arizona, (ARCHITECTURE, August 1991, pages 74-77), and the Kansas Department of Planning and Research for the Overland Park Farmer's Market Canopy in Overland Park, Kansas. Other awards went to the Grand Central office building in St Louis, Missouri, by Mackey Mitchell Associates; Macro Plastics in Fairfield, California, by Boe & Company Architects; and Emery Street Studios in Emeryville, California, by ASC Pacific.

The winners will be exhibited at Metalcon 92 in Chicago from October 28-30. For further information regarding the conference and exhibition, contact: (617) 965-0055. The entry deadline for next year's MCA competition is July 7. For more information on submission requirements for the annual awards program, contact: (202) 371-1243.

Model House Demonstrates Green Construction



WHAT APPEARS TO BE AN ORDINARY, single-family house in suburban Washington, D.C., (below right) is proving to be a unique testing ground for resource-conserving materials and construction methods. The wood-sided, steel-framed house, a project by the National Association of Homebuilders (NAHB), is being assembled from commercially available products donated by manufacturers and chosen for their minimal consumption of natural resources.

Donated products include studs, joists, and rafters composed of recycled scrap steel, and hardboard siding fabricated from previously wasted lumber byproducts. The roof will be finished with durable, recycled plastic shingles, and the house will include insulated, low-E windows and a heat pump. Additional energy conserving features include solar-powered hot water, lighting, and electrical systems. To provide for additional utility savings, recycled copper pipes will be fitted with water-conserving fixtures plumbed to allow for gray-water recycling. The interior of the house will feature wall and attic insulation that contains recycled newsprint. Kitchen cabinetry will be designed to provide convenient ways to separate household items such as paper, plastic, aluminum, and glass waste products for recycling.

Based on a 1991 study sponsored by the Washington, D.C.-based Society of the Plastics Industry, the house's garage will be constructed on top of a shallow slab-on-grade foundation insulated with recycled polystyrene foam to eliminate the need for deeper footings below the frost line. The study revealed that rigid insulation board correctly placed on the interior, exterior, and beneath a foundation absorbs heat, which can effectively elevate the surrounding soil temperature and raise the ground's frost line enough to adequately protect buildings from the uneven settlement that occurs during annual freeze-thaw cycles. "Frost-protected" shallow foundations have been widely adopted in Scandinavia and have been accepted for residential structures by code officials in several regions in the United States.

The "green" house marks the fourth prototype to be built at NAHB's Research Park in Upper Marlboro, Maryland. The others—a "smart" house (ARCHITECTURE, June 1991, page 111), an accessible residence (ARCHITECTURE, July 1991, pages 88-89), and a recently completed structure demonstrating masonry systems—are designed to encourage the acceptance of improved materials, methods, and designs. The resource conservation house is scheduled for completion this summer. For further information, contact: (301) 249-4000. ■

—M.S.H.

AIA Forms Wetlands Agenda

To offer architects guidance in balancing wetlands preservation and development goals, members of the AIA's Committee On The Environment have created a new wetlands task force. In addition to developing an official policy position on wetland's ecosystems, the task force's efforts are directed toward providing a seminar on the topic at the annual AIA Convention in Boston this month. For more information on upcoming activities, contact task force member Mark Broyles, (301) 588-7524.



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Starting Your Own Firm

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TODAY, AS THE ECONOMY FORCES MORE firms to shrink in size, more and more architects are transforming an unwanted layoff into an opportunity to start their own practices. According to AIA's 1991 *Firm Survey Report*, 5 percent of today's member-owned firms began in 1989, 3 percent in 1990, and 4 percent in 1991. But being out of work is not the only motivating force behind independence—a desire for greater artistic control, a keen interest in a particular building type or service, or a small commission that does not interest the parent company are just a few of the many catalysts to starting a firm. No matter what the reason for launching a practice, architects must clearly establish a new identity for their firms, and carefully consider matters of finance, organizational structure, staffing, and market strategies.

Why employees leave

MOST ARCHITECTS RESIGN FROM A FIRM when they realize that their current positions no longer satisfy their long-term, professional goals. James Garrison, for instance, left James Stewart Polshek and Partners in 1991 after working for the firm for 14 years—including three years as partner—because he wanted more control and better recognition for his own design work. Architect Kenneth Wiseman and interior designer Debra Lehman-Smith left SOM's Washington office in 1991 after working for the corporate practice for more than a dozen years each. The associate partners, who had both watched SOM offices in other cities fold, were uncomfortable with the corporate firm's organizational transformation in response to changing economic conditions. When one client offered Wiseman a position as in-house architect, he proposed instead to set up an independent design firm with Lehman-Smith and undertake the project.

Establish an identity

AN ARCHITECT SHOULD START A FIRM WITH a clear sense of goals. Management consultant Ellen Flynn-Heapes, president of Flynn-Heapes Consulting in Alexandria, Virginia,

explains: "Think about who you are and what you want to be, and the steps you need to get there. Who are your clients now and whom do you want them to be? Position your new firm in that playing field."

Some firms focus on a unique esthetic as the impetus for starting afresh. In 1985, for example, Joseph Valerio left Chrysalis Architects, his successful, 15-year-old Milwaukee-based firm, in search of greater stylistic consistency. After working at a larger firm for two years, he tried again, forming Valerio Associates in Chicago. He wrote out his firm philosophy at the very beginning and now hires only new employees who are committed to his innovative and dynamic designs.

Other new-firm owners distinguish their offices through their practice methods. "We focus on process and service in addition to design," says Daniel H. Wheeler, who left SOM in 1987 after winning a competition (pages 74-75). "We do not have stylistic hang-ups, but try to fit each project to its context and client's sensibility." His new, Chicago-based firm, Wheeler Kearns Architects, models its practice on the legal profession, where firms often have dozens of partners, each in charge of his or her own cases. Wheeler and Kearns make a point of giving primary credit to the staff member in charge, even if that architect is not one of the firm's owners.

But many management consultants recommend that new-firm owners concentrate

on a single building type or narrow range of services through which they can excel. "The Achilles heel of architects is that they are trained to produce a wide range of buildings," notes Flynn-Heapes. "But today's clients want experts. Research shows that specialized, or niche, firms are significantly more profitable than generalists."

Plan ahead

BOLSTERED BY A SENSE OF PURPOSE, AN ARCHITECT should next develop a business plan for the new firm. "Think things through like a chess game on paper before spending your money," continues Flynn-Heapes. The plan should clarify firm goals, profile desired clients and projects, determine staff needs, and estimate income and expenses. These initial strategies should be reviewed periodically and revised to accommodate new information and experience.

The resources for developing a plan and subsequently structuring the new firm are diverse: "how-to" books from local business libraries; seasoned principals who can share their first-hand experiences; potential clients who have expressed interest in working with the new firm; management consultants who know the industry; accountants who can explain tax obligations and develop an appropriate accounting system; and lawyers who can advise architects on the best way to leave a firm and legally organize a new one.

How Architects Get Work

Staff size	1	2-4	5-9	10-19	20+	All Firms
Repeat work	39%	39%	43%	45%	47%	44%
Personal or professional contacts	19%	16%	13%	13%	9%	12%
Referrals	22%	19%	13%	10%	7%	11%
Reputation	10%	12%	14%	12%	13%	13%
Requests for qualifications, interviews, or proposals	4%	8%	11%	16%	16%	13%
Selection based on fee	3%	4%	3%	2%	4%	3%
Competitive design-build selection	<1%	1%	1%	1%	1%	1%
Design competition	<2%	0%	0%	<2%	2%	2%
Architect as own client	2%	1%	2%	<1%	1%	1%

SOURCE: 1991 AIA FIRM SURVEY REPORT

Management consultants recommend anywhere from six months to a year of savings for those practitioners who open shop without any projects in hand.

Severing old ties

MANAGEMENT CONSULTANTS AND ARCHITECTS who have taken the plunge recommend honesty and straightforwardness when submitting a resignation. Jill Weber, a marketing management consultant affiliated with the Boston Society of Architects, notes, "The more open and clearer the divorce papers are, the better off everyone will be. You don't want to burn any bridges." An architect should respect the current obligations to the firm and clarify what credit he or she may be able to claim in future marketing brochures for projects completed while working at the old office. Left amicably, a previous employer can be a valuable reference, sending prospective clients to the new firm or providing technical assistance on projects.

Peter Piven, a Philadelphia-based management consultant with the Coxe Group, has found that most established principals are not offended by a young architect's departure. "That's the way the profession has grown," he points out. Problems may arise, however, when existing clients or other staff members are at stake. Employees who sign a noncompete clause as part of their terms of employment with a firm may be barred from approaching its current client base for a specified period of time. Though there is some legal ambiguity in this area—courts have ruled that a person's right to earn a living cannot be inhibited by another firm—Piven recommends the ethical high ground of not wooing clients away from a previous employer. Clients, of course, may switch allegiances to the new firm on their own accord.

Wiseman and Lehman-Smith, for example, took every precaution to make a clean, amicable break from SOM. They timed their resignation so that they could finish current projects, believing that this continuity was best for their clients. Though they had never signed a noncompete clause, the two professionals assumed their projects would remain with SOM. After consulting an attorney, they submitted a joint letter of resignation, stating that they were going to start a business together and would solicit some of SOM's staff to join them. Ironically, some of the SOM clients wanted to continue working with the pair, and, with the parent company's understanding, they left with several projects for the U.S. Olympic Committee. Seven staff members soon followed.

Working alone or with others

DECIDING TO GO SOLO OR WITH ONE OR more partners is a function of personality, work volume, and circumstance. "You have to be able to share both responsibility and wealth," cautions Piven. "People unwilling to practice that way should not take on partners." Working with a colleague provides an in-house sounding board for innovative ideas and allows for expanded services or multidisciplinary expertise. It also offers pragmatic advantages, such as allowing one principal to take a vacation or travel to job sites without leaving the office unattended.

Partners should complement one another, either by function—such as business, design, and technology—or discipline—such as architecture and interior design. Now that more clients are women, observes Flynn-Heapes, a male/female partnership is particularly effective in securing commissions. Whatever combination is selected, partners must respect one another's strengths. Architects setting up shop with other professionals should consult a lawyer to help structure the organization and develop a buy-sell agreement just in case the firm ever breaks up.

With or without a partner, staffing is critical, particularly at the start, notes Flynn-Heapes, "because most new principals, not knowing how to run a business, need as much expertise as they can get." To prevent what she calls "mis-hires" Flynn-Heapes recommends, whenever possible, enlisting the services of former colleagues or employees. Some principals hire on a temporary basis to adequately assess the potential employee's skills, or on a part-time basis to respond to market fluctuations. A well-rounded design staff that has been exposed to the making of drawings, the writing of specifications, and the realities of construction is invaluable. When hiring mistakes do occur, it is best to correct them promptly and directly, rather than avoid the problem.

Finances

FIRMS THAT FAIL DO SO PRIMARILY BECAUSE they lack sufficient capital. Without an adequate amount of money, owners cannot afford good business advisors, a quality staff, or appropriate marketing tools. Some experts believe a firm should begin with no fewer than three projects so that the enterprise can be financed with cash flow. Management consul-

tants recommend anywhere from six months to a year of savings for those practitioners who open shop without any projects in hand. But, in reality, most people start with only enough savings to last about two months. The money usually comes from personal savings and family investments. Bank financing, available in the roaring 1980s, has all but evaporated. "The silent partner tends to be Dad," quips Flynn-Heapes, "who is also the first client." Alternative sources of income, such as teaching, can be helpful to get through slow times.

Marketing

ONCE SET UP WITH A TELEPHONE NUMBER and business cards, many new firm owners rely on the quality of their projects to advertise their practice. But Weber recommends active marketing. "Let people know you are starting a firm, send out letters to potential clients, establish your identity," she notes.

A list of potential clients can be developed by skimming business directories and company annual reports at a local library and discussing with appropriate personnel the current and future needs of targeted government agencies. Weber encourages architects to become an authority on or advocate of a particular issue, offer services as a resource to community groups, suggest story ideas to the press, or even offer walking tours of architectural sites to the local community. "The sooner you can get your name recognized, the better," she stresses. Flynn-Heapes recommends a personalized marketing plan for start-up firms, so that each person in the new practice has a clear idea of how many calls he or she will make each month and to whom; what articles are to be written and for what publication; and what speeches are going to be made, and to which organizations.

Weber is skeptical about investing in bound brochures. "The shelf life of a firm brochure is two years—brand new firms don't have that kind of time," she explains. Instead, an architect should gather the basic ingredients that would constitute a brochure—including resumes, project descriptions, and visual documentation—and reproduce them neatly and cheaply. Weber suggests that architects hire a graphic designer, writer, or public relations specialist on an hourly basis and take a seminar to brush up on presentation skills.

There is no magical number governing how long an architect must remain at a firm to prepare for heading up his or her own. Planning is critical; timing is not.

Office setup

"CHOOSING WHERE YOU WORK HAS A LOT to do with how you intend to position yourself in the market," Wheeler insists. He and his partner wanted to be downtown to establish a civic presence. Wiseman and Lehman-Smith, who were vying for national as well as local projects, elected to locate in a highly visible office building in Washington, D.C.

Garrison, who set up shop in a Brooklyn brownstone, disagrees. "I don't believe you have to be downtown to get national work. A downtown address may provide convenience and boost image, but if the trade-off is a crushing overhead, it's not worth it."

Start-up firms are usually cautious about investing in equipment. Wheeler and Kearns opened with a typewriter in the cheapest space they could find in downtown Chicago. The two partners took over an older architecture firm, bought its files, and built desks. As the firm grew at the rate of an employee per year, the need for more equipment grew apace. Their first investment was a photocopier; a computer and fax followed soon after. Incrementally, they added a scanner for specifications and built space for photography, modelmaking, and material samples.

Valerio, who headed his own firm once

before, set up with a fax, computer, and other critical equipment right away. "We didn't want to hurt ourselves by not having the necessary technology," he explains. Garrison suggests a pragmatic compromise: "You can always lease computers and other machines until you know what you really need."

Liability insurance

AS CONSTRUCTION HAS BECOME MORE COMPLEX and society more litigious, liability insurance has become a significant component to the practice of architecture. But taking out a policy for tens of thousands of dollars before a firm has any real exposure may not be the best use of precious financial resources. A principal in a start-up firm must become familiar with insurance options and weigh potential risks. According to Piven, "Liability insurance may not be critical for a small, conventional starting practice."

But for Wheeler, his firm's \$13,000-a-year policy not only gives him peace of mind, but credibility in the eyes of certain clients. Liability insurance is essential when vying for school, government, and some high-end residential projects where clients often require such policies outright. Instead of purchasing general coverage for the individual firm, a

new firm owner should investigate the possibility of obtaining an insurance policy that covers a specific project. Some clients may be willing to absorb such a cost.

When to take the leap?

UNLIKE THE LENGTH OF TIME AN INTERN must work for a licensed practitioner before taking the registration exam, there is no magical number governing how long an architect must remain at a firm to prepare for heading up his or her own. "People who work for 20 years before going it alone believe that their years of experience have helped," observes Piven, "while those who have a high degree of self-confidence matched by a high degree of frustration think that staying so long would stifle them."

Whether they have three years of experience or 20, architects who go out on their own agree that while planning is critical to starting a successful firm, timing is not. "You just have to feel strongly about doing it," argues Garrison. "People stay in firms for many many years, waiting for the perfect project to come their way—but that opportunity may never come. You don't swim hard against the tide unless you have to." ■

—NANCY B. SOLOMON

Six Essentials for Starting a New Firm

1 Decide what kind of firm you want to create.

Imagine the types of clients, projects, and services that have been successful for you in the past. Then describe what your new firm needs in terms of staff, resources, and expertise to live up to that image. Hold onto and revisit that image periodically. The world loves a winner; start out knowing you are one.

2 Solicit clients who can help you get there from here.

Go for the right targets of opportunity. Everybody who socializes, works, plays, or joins in cultural and civic activities with your ideal clients are useful gatekeepers to your next project. Be the architect whose name comes to their minds because you're so sincerely interested in their welfare and success.

3 Listen hard to your clients.

But don't just listen. Play back to them what they just said to you until they give you a signal that they understand that you understand. Wait to make judgments or give solutions. Projects are successful when clients discover the best solutions for themselves because you asked the right

questions. Marketing is successful when you treat everyone as though they were potential clients. Active listening is also the key to successful negotiation and risk management.

4 Use quality risk-management information to your advantage.

Instead of limiting your practice in fear of liability, empower yourself out of a sense of capability. Weigh your capabilities against potential liability exposure and decide how best to manage the risk. Be streetwise; ask yourself what could go wrong, who would be damaged if it did, and who can best keep it from happening. Then, through a contract, agree on an equitable allocation of responsibilities and power to make things go right.

5 Learn when to say "yes" and when to say "no."

Many architects say "no" in a way that stops the discussion or misses alternative opportunities. They say "no" from a position of weakness or at the wrong time. Evaluate the situation before responding so that opportunities expand. And be prepared to negotiate at every level. If you have to give something up,

get something in return. If you decide to accept risk, get paid adequately to manage it.

6 The rest depends on money. The primary reason young firms fail is undercapitalization. Ask for a fee high enough to make a profit. Working for cost leaves nothing for when things go wrong—and sometimes they will.

■ Weigh the odds before accepting a low-paying project for promises of future prestige or money. Such quid-pro-quo arrangements place a heavy burden on small firms and should only be undertaken if the rewards are specific, fair, and assured by a certain date.

■ Ask for retainers. Many clients expect to pay them, but only if asked.

■ Bill early and often. For the client, writing small checks routinely is a lot easier than issuing a large amount of money in one lump sum.

—AVA J. ABRAMOWITZ
AND JAMES R. FRANKLIN

Ava J. Abramowitz is vice-president of Victor O. Schinnerer & Company. James R. Franklin, FAIA, is a resident fellow at the AIA.

“Carolyn’s been w

Carolyn and Gordon met in 1977. “I was new and he was new,” she says, “and we sort of grew together.” Perhaps all clients don’t take advantage of Carolyn’s brand of thorough service, but Gordon does. “He’s cautious,” she says. “He tends to call us before he starts a project or gets into certain areas. He might say, ‘We’re thinking about a joint venture with another firm. How will that impact our insurance?’ Then our contract analyst and I work together to give him some advice on short and long-term consequences.”

On the account management side, Carolyn doesn’t just wait for the renewal quote to come in. She’s on the phone with DPIC — dealing with the underwriters, pointing out her clients’ strengths, negotiating for the terms she needs. And she’s persuasive.

“I expect a high quality of service for him — I want to be as professional as Gordon is. He

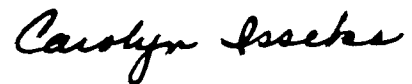
emphasizes high standards in serving his clients. And we feel the same way.” Carolyn also works hard to keep Gordon H. Chong + Associates informed about the many premium reduction opportunities available from the DPIC program.

Carolyn has a master’s degree in education and began her working life as a teacher. The teacher in her still comes out when she’s conducting a workshop panel on liability issues for one of the Bay Area AIA chapters or a brownbag seminar for one of her clients. “I love to see the light bulb go on in someone’s head,” she says. “The ‘oh, now I know what you’re talking about.’ I think that’s what I like about this job: I’m always teaching and getting close to people who, I think, appreciate what I have to tell them. They all have the same interests — they want to better their practice in a professional way.”

Gordon Chong is the owner of Gordon H. Chong + Associates, a 45-person architectural practice located in San Francisco, California. He is president of the San Francisco Chapter of the AIA for 1991, and has been a director of the California Council of the AIA and president of Asian American Architects and Engineers.



Carolyn Isseks is vice president of Dealey, Renton & Associates, an independent insurance agency based in Oakland, California. She has represented DPIC’s unique insurance program of education and loss prevention services for over thirteen years. She is also a member of the Professional Liability Agents Network (PLAN), a nationwide group that specializes in serving the risk management needs of design professionals.



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Moving Designs

Careful planning enhances spatial efficiency of building transport systems.

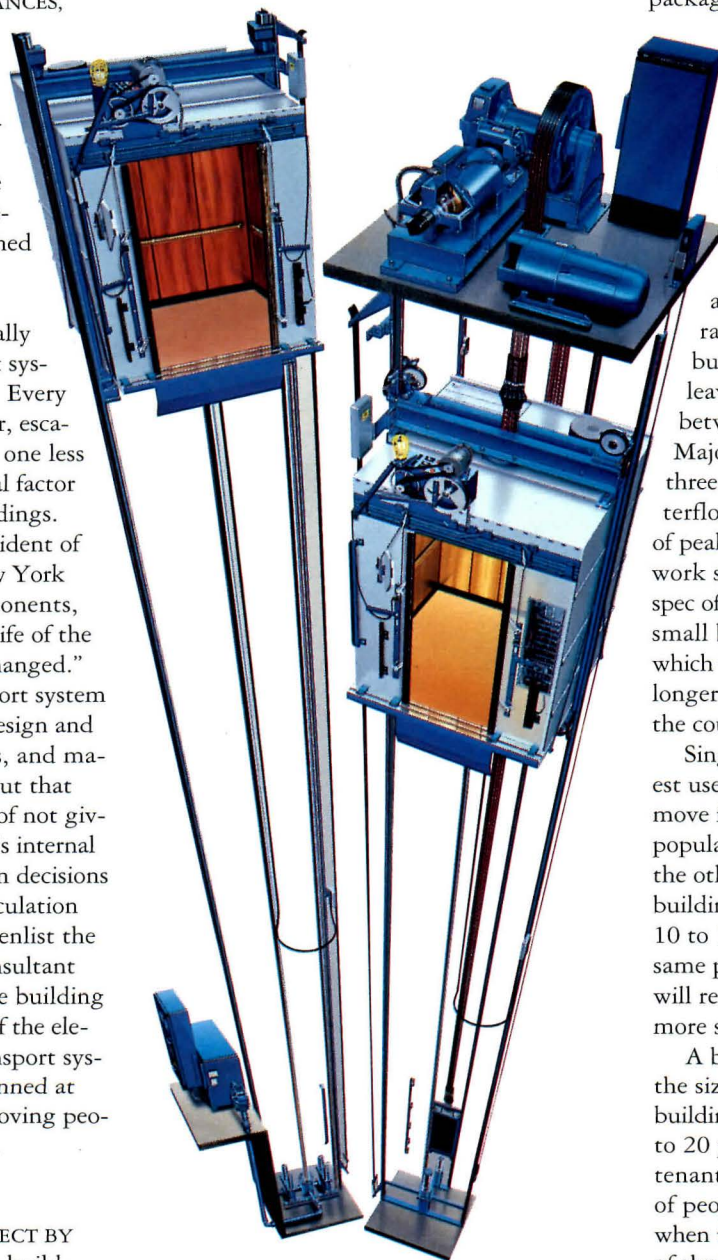
THANKS TO TECHNOLOGICAL ADVANCES, elevators and material transport systems now operate with greater speed and efficiency. “Talking” elevators with computerized voices announce floor stops and direction of travel, infrared sensors calculate the number of people waiting for an elevator, and elevator cabs are dispatched quietly and quickly, at speeds approaching 2,000 feet per minute.

Yet, no matter how technologically sophisticated, a building’s transport system still demands spatial efficiency. Every square foot consumed by an elevator, escalator, or other circulation system is one less available for occupant use—a critical factor in designing commercial office buildings. Notes Robert S. Caporale, vice president of Syska & Hennessy Engineers in New York City, “Unlike other building components, transport systems are fixed for the life of the building and cannot be added or changed.”

As head of the company’s transport system group, Caporale specializes in the design and engineering of elevators, escalators, and material-delivery systems. He points out that many architects make the mistake of not giving enough thought to the building’s internal transportation early in design, when decisions about space use, allocation, and circulation are made. He advises architects to enlist the expertise of a transport systems consultant early in schematic design, when the building footprint and the location and size of the elevator core begin to emerge. “A transport system that has not been carefully planned at the outset will be inadequate for moving people and materials,” warns Caporale.

Transport system analysis

SYSKA & HENNESSY BEGINS A PROJECT BY using computer software to study a building’s transportation demands. This analysis allows comparisons of various transportation schemes—elevator sizes and number, stacking arrangements, material transport systems, and system costs. Once a scheme is selected, it can be tested with another software



Dover Elevators manufactures oilraulic (left) and traction-lifting (right) systems. Oilraulic pump, located at bottom of shaft, raises cab to a maximum height of six stories at 200 feet per minute. Traction elevators serve high rises at speeds of 1,500 feet per minute.

package that replicates “real world” scenarios of peak use—analyzing the number of elevator calls per minute, elevator use during heavily trafficked events such as conferences, and the number of calls from various locations in the building—to determine how well the scheme responds.

Transport system type and capacity are dictated by a building’s size and tenant profile. For example, a corporate headquarters is a single-tenant building, where employees arrive and leave at the same time and traffic occurs between floors as departments interact. Major tenant buildings may house two or three tenants, decreasing the amount of interfloor traffic and producing fewer periods of peak travel because tenants are likely to work staggered hours. Multiple-tenant or spec office buildings are composed of many small businesses, perhaps a dozen or more, which experience little interfloor traffic and longer periods of peak transport activity over the course of a day.

Single-tenant buildings demand the greatest use of elevators, which are required to move from 13 to 20 percent of the building’s population within a five-minute period. On the other end of the scale, multiple-tenant buildings need to accommodate only about 10 to 12 percent of the population in the same period. Thus, single-tenant buildings will require more elevators, which require more space, than multiple-tenant buildings.

A building’s tenant profile also affects the size of its elevator lobbies. Single-tenant buildings require lobbies approximately 10 to 20 percent larger than those of multiple-tenant buildings, because larger numbers of people exit the building simultaneously when the workday ends. The configuration of the lobby space, moreover, directly affects the speed with which elevators handle traffic. The amount of time an elevator waits at a floor after opening its doors is governed by the time required for a physically impaired person to travel from the call button to the farthest elevator. Long waits increase the

time required for the elevators to empty the building. Thus, a long, narrow lobby with elevators arranged along a single wall produces longer waiting periods than a wider lobby where elevators are aligned on opposite walls.

Planning strategies

ONE SPACE-PLANNING STRATEGY TO LIGHTEN elevator use in single-tenant buildings is to place those departments that frequently interact in close proximity with one another, either on the same floor or on adjacent floors. If local fire regulations permit, adjacent floors can also be connected by internal stairs. However, connecting more than two floors internally will increase the likelihood of elevator use, as people are generally less willing to climb more than two flights of stairs. Escalators between floors are an extravagant use of space because they move traffic in only one direction and must be placed on a 30-degree angle. However, escalators are preferable for negotiating large floor-to-floor distances, particularly in public spaces such as lobbies, and for moving large numbers of people quickly, as is often required at public arenas and theaters.

In office buildings, conventional stairs, which handle traffic in two directions, are designed at steeper angles than escalators and consume less space. Circular stairs are the most space-efficient, but may also be restricted by local building codes.

Another space-planning strategy is to place high-traffic areas—cafeterias, auditoriums, conference centers, banks, and retail centers—on the ground level to avoid the need for elevator access. A mezzanine level accessible by stairs is also a good location for high-traffic facilities, notes Caporale. “If a cafeteria or auditorium must be placed on an upper floor,” he adds, “a dedicated elevator to service them should be considered.”

Elevator control software

ADVANCES IN CONTROL SYSTEMS HAVE MADE elevators more efficient for handling large volumes of traffic in shorter periods of time, thus saving space by reducing the number of elevators needed. According to Michael Dugan, director of electrical systems at Dover Elevator in Memphis, Tennessee, “Ride times between floors are shorter as elevators become faster, with better acceleration and stopping capabilities.” Computer-driven elevator control systems that take advantage of what the industry calls “artificial intelligence” software now recognize new traffic patterns over a 24-hour period and position elevator



Central reception building for the Coca-Cola Company's world headquarters in Atlanta, Georgia (top), designed by Heery International of Atlanta, serves as a circulation artery between the company's two office towers. The three-story reception building contains executive lounges, dining, and conference areas accessible from dedicated elevators (above and center), thus reducing traffic in tower elevators. The building's circulation incorporates marble stairs (above) in lobbies to lighten elevator traffic between floors. Engineers at Syska & Hennessy analyzed traffic for 22 elevators, two escalators, and a material transport system to carry personnel and supplies throughout the complex.

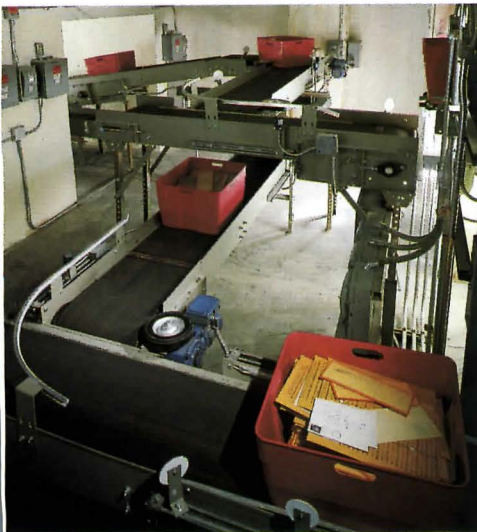
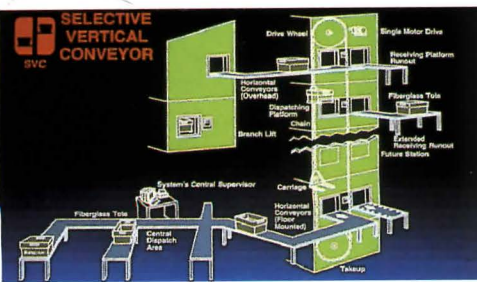
cabs in anticipation of increased use.

Before the computer heyday of the 1970s, “relay-logic” control systems dispatched elevators to various floors in response to where call buttons were pushed. Cabs were programmed to wait at the lobby level when not in use, or they could be reprogrammed manually to wait elsewhere in the building when idle. Controls using an artificial intelligence program, however, automatically respond to changes in traffic without human intervention. Over the course of a day, the computer software “remembers” calls, popular routes, peak periods, and locations of traffic, and can adjust the elevator to meet such a demand the following day. For example, a weeklong sales conference on the 15th floor of a building would generate more traffic to that floor at certain times of the day. Artificial intelligence controls recognize this new pattern and send elevators to floor 15 when traffic is about to increase. After the sales conference ends, the elevators return to their normal programming. Because of this capability, a building might require fewer elevators. The alternative to efficiently meeting the increased demand is a separate elevator dedicated to service the sales conference.

As elevator controls became computerized, they required less space in elevator mechanical rooms, usually located in a penthouse at the top of the elevator shaft. However, computer-driven controls are temperature-sensitive and require more mechanical equipment to air-condition the rooms. Even with the air-conditioning requirement, smaller mechanical rooms have resulted in a 10 percent space saving in the decade since computerized systems have become widespread.

Dugan points out that, as control equipment at the top of the elevator hoistway has become smaller, it is now possible to locate all equipment in a single cabinet accessible from one side. This configuration eliminates the 2-foot to 3-foot work clearances previously required around double-sided control cabinets, thus saving space.

The trend in elevator passenger cabs, however, is to make them larger in response to Americans with Disabilities Act requirements for handicapped access. According to the act, elevator cabs with center-opening doors must be at least 80 inches wide and include a minimum clearance of 54 inches from the cab's rear to the inside of the door. Cabs with side-opening doors must be at least 68 inches wide, with the same door-to-rear-wall clearance. All doors must be at least 36 inches wide.



Vertical conveyors, such as the Translogic Corporation model (top), move mail and office supplies through shafts smaller than those required for service elevators. Up to 60 pounds of supplies are placed in bins that move along a ground-level conveyor belt (center) to a continuously moving vertical chain loop. The bin's destination is entered into a computer keypad, and materials are automatically off-loaded at the designated floor. A motor requiring approximately 50 square feet of mechanical space powers the system and is housed at the top of the loop. As bins enter the mailroom, they are routed through an 8-foot-diameter spiral accumulator (above), which can store up to 30 bins.

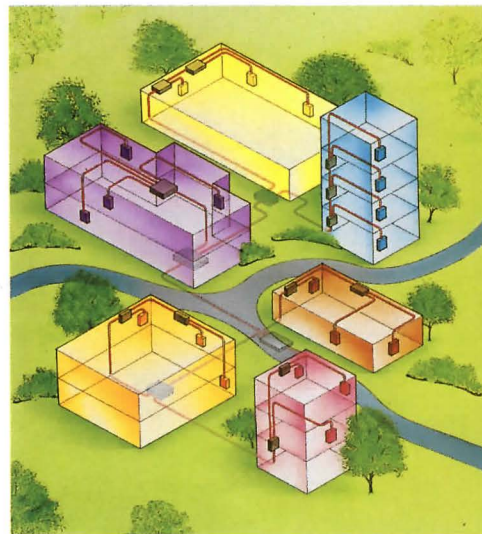
Material transport

IN A LARGE COMMERCIAL OFFICE BUILDING, service elevators are inefficient for delivery of small parcels such as mail because they occupy more space, require personnel to load and unload one mail cart at a time, and are often otherwise engaged moving office equipment, furniture, or other bulky items. Adding a material transport system for moving mail and office supplies may reduce the number of elevators needed. Vertical conveyor systems can serve either single or multiple-tenant buildings and occupy only a 3-by-4-foot chase, a fraction of that required for a full-size service elevator.

A vertical conveyor system is most efficient in buildings of more than four stories, and can serve high rises up to 60 stories. The system consists of a continuously moving vertical chain loop located within the elevator core, with mechanical equipment positioned at the top of the loop (see page 93). At each floor, the chain loop is accessed through two square wall ports—one for the upward-moving part of the loop, the other for the downward-moving portion. As a tote box is loaded onto the chain, routing information is punched into a keypad located between the ports, and the tote travels to its destination, where it is off-loaded. Tote boxes can hold up to 60 pounds and travel at a speed of approximately 70 feet per minute.

Pneumatic material delivery systems offer another alternative. These systems consist of a 4- or 6-inch-diameter steel tube through which clear plastic cannisters move 25 feet per second on a jet of air. Pneumatic systems, which carry loads up to 15 pounds, are most efficient in moving materials horizontally through a building, although they can also transport lighter loads vertically for short distances. Cannisters are placed into the system through wall ports, which may be recessed so that access is flush with a wall. Most pneumatic systems can accommodate hundreds of such ports. The cannister's destination is entered into the computerized system via keypad, and the materials are sent through the tubing, which is often routed above suspended ceilings. Pneumatic systems are most efficient for transporting documents between departments throughout the building, and can save space because they require no dedicated chases. Mechanical equipment for such systems is usually small—a blower that occupies about 8 cubic feet can be located in a mechanical room with other building equipment and serve an entire system. ■

—MICHAEL J. CROSSBIE



Pneumatic tubes transport loads of up to 15 pounds both vertically and horizontally throughout a building. One point of dispatch for a pneumatic system by Translogic Corporation is a station recessed into a wall (top), while Hale Systems's station (above) is located in corridor alcove. Pneumatic systems transport cannisters up to 6 inches in diameter through steel tubing that fits in ceiling plenums. A system with numerous stations (center) can be served by a single blower mechanism the size of a 2-foot cube. The mechanism can be located in a room with other mechanical equipment but should be isolated from areas such as conference rooms because of blower noise.

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Alternative Dispute Resolution

New hope emerges for controlling litigation in the construction industry.

IT HAS BECOME ALMOST SECOND NATURE IN recent years for architects to lament the proliferation of lawsuits that accompany building projects. Commonly, the reaction is to blame lawyers while invoking the specter of a "litigation industry" bent on perpetuating itself at everyone else's expense. Over the last year, however, influential figures within the construction industry have begun to look beyond such finger-pointing to stem the tide from within. The effort, broadly known as Alternative Dispute Resolution (ADR), focuses on ways to head off conflicts before they arise, and ways to resolve them without resorting to the courtroom. ADR methods include such time-honored alternatives to civil litigation as mediation and arbitration, and such new initiatives as partnering and risk allocation.

One way of understanding the differences between dispute resolution procedures is by examining the finality of their outcomes. Generally, the more binding the resolution, the costlier the procedure and the longer it will take (see diagram, page 100). A civil lawsuit, potentially leading to a jury trial, provides an outcome to which all parties are legally bound. So does arbitration, a private process by which a mutually agreed-upon third party renders a decision that cannot be appealed. ADR advocates, however, stress that binding procedures, which often lead to unnecessarily adversarial positions, do not always yield outcomes that are fairer or less expensive than nonbinding ones. A mediation hearing, for example, involves no commitment to a binding outcome—only a willingness to see an issue from all sides and settle it in the common interest. Of course, the best solution is to avoid the conflict in the first place.

In the past year, ADR awareness has spread through a number of channels, including a landmark November 1991 construction industry conference held in Washington, D.C., and sponsored by the Building Futures

Council. Chapters of several professional societies, including DC/AIA, have recently sponsored seminars on ADR. And a major report, "Preventing and Resolving Construction Disputes," was issued in 1991 by the Center for Public Resources, a New York City legal think tank. In addition, the Washington, D.C.-based Construction Industry Dispute Avoid-

are reflected in AIA's current general conditions document A-201, according to Dale Ellickson, director of the AIA documents program. AIA's standard documents first included provisions for third-party binding arbitration in 1888. More recently, they were modified in 1987 to include a provision for mediation as a nonbinding alternative.

But construction has become an increasingly complex enterprise, involving many parties with often conflicting interests. Any "gentlemanly" agreements that once prevailed have long since evaporated. ADR advocates place a great deal of emphasis on education because they believe the construction industry has unwittingly promoted disputes by not being diligent in understanding and responding to the ways in which disagreements commonly arise.

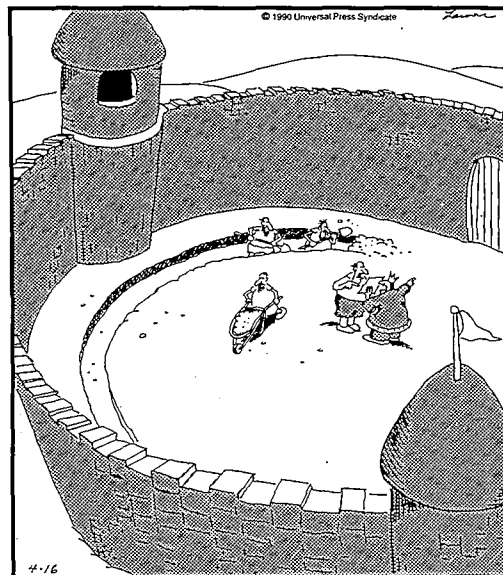
Seeds of dispute

GROTON HAS WATCHED "IN HORROR and fascination" as many sound building projects have gone sour. "There are a thousand ways in which the seeds of dispute may be sown," Groton contends. Common problems include low bids, unrealistic owner expectations, stereotypes of architects as dreamers and contractors as liars, and the assumption that specs and construction drawings are imperfect. A key ingredient is the inexperience of owners, especially small public agencies such as school boards, whose members may feel bound by public opinion to operate with less flexibility than they might as private citizens, asserts Peter Hawes, a DART board member and president of Design Professionals Insurance Company (DPIC), a major liability insurer.

Many in the construction industry view the increased influence of lawyers as another contributor to the spread of disputes. Trained as advocates in a partisan process, lawyers adhere to formalized channels that often conflict with the complex, multiparty nature of design and construction. In a building proj-

THE FAR SIDE

By GARY LARSON



Suddenly, a heated exchange took place between the king and the moat contractor.

ance and Resolution Task Force (DART) was founded last year to advocate ADR methods. Its board, chaired by James P. Groton, a construction attorney with the Atlanta firm Sutherland, Asbill & Brennan, includes building owners, contractors, and design professionals.

Despite this recent activity, the concepts behind ADR have offered alternatives to civil litigation for years, in arenas that range from construction-industry conflicts to settling family disputes. Architects' quasi-official position as renderers of impartial, "on-site" rulings in disputes between owners and contractors has been recognized since the 1800s, and

ect, a certain rough justice, arrived at by consensus with a minimum of procedural delays, may often be the best way to save time, money, and working relationships. These concerns may be jeopardized if a dispute is allowed to fester as it awaits formal resolution through a court of law.

Avoiding disputes

IN ORDER TO UNDERSTAND THE HIERARCHY of dispute resolution methods, DART has created a diagram outlining a series of ADR "steps." Each step on the ladder represents an increased level of hostility and cost.

Not surprisingly, the first rung up the ADR ladder is avoiding disputes in the first place. One procedure is "partnering," a concept popularized by the Army Corps of Engineers. Under partnering, the owner, often with the help of a management consultant, forms a construction team comprised of architects, general contractor, and major subcontractors before a project begins. Team members establish ground rules, alert one another to potential problems, and establish lines of communication.

According to Larry Dennis of Turbo Management Systems, a Portland, Oregon-based management consulting firm that conducts such partnering events, "Architects have a lot to learn about how to listen and how to ask questions." Like everyone else involved in a construction project, architects must realize that many disputes arise from communication problems—what seems obvious to one party may be unclear to others. "In partnering, you reach an agreement and go on, instead of posturing and trying to cover your tracks," Dennis maintains.

ADR advocates also stress the importance of paying attention at the outset to allocating the financial risks of a project. Owners have increasingly tried to ward off blame with broad indemnification clauses that shift risk unrealistically to other parties, especially contractors. But contractors forced to accept such contracts may take steps to ensure a profit, often gathering material for a lawsuit from the beginning. A similar problem arises over low bids. If a bid comes in 25 percent below all others, an owner may think he or she has a bargain. "But if that bid is accepted," advises Groton, "it will be the most expensive bargain ever made."

DPIC's Hawes explains that sophisticated,

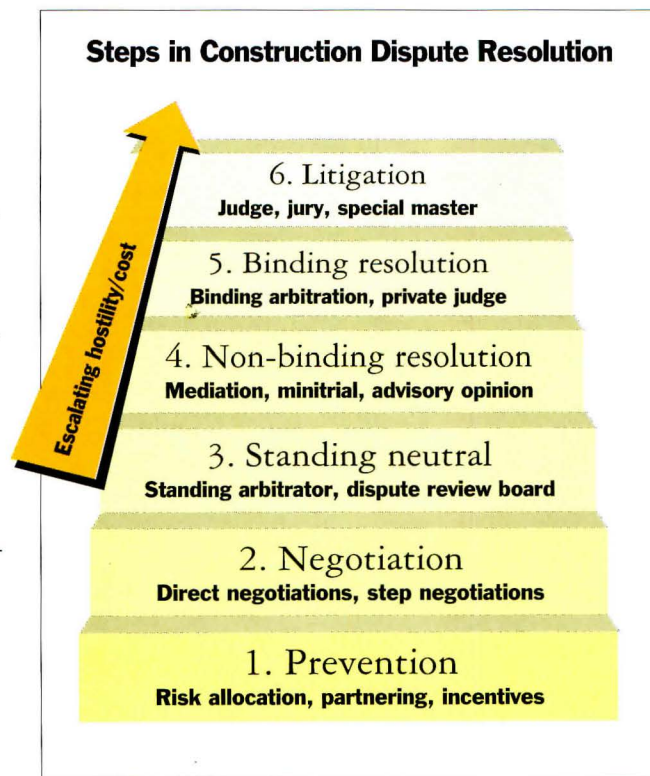
major purchasers of building services know that the most financially successful projects emerge from a quality-based selection process, not one stressing the cheapest design and the lowest bid. In this regard, part of DART's mission is simply to serve as a resource for architects to convince owners that contracts need not set up adversarial win-lose situations. Architect, contractor, and owner can all win if their concerns are adequately met, and if they don't feel they are being burdened with somebody else's problem.

On-site resolution

ONCE A CONFLICT ARISES, ADR ADVOCATES believe every effort should be made to settle it at the job site. On-site negotiations should take place before letters are written and law-

often requires a more impartial third party—often another architect or other respected authorities from the construction industry.

One variant of the standing neutral concept is the empaneling of an independent dispute review board or the appointment of an independent arbitrator before the project begins. The effectiveness of this practice has been shown in large civil projects such as the construction of Interstate-80 in Seattle, where the dispute review board ruled on a number of costly claims and settled them all without litigation. Many in the construction industry who have had experience with such boards claim their mere presence results in better attitudes, encouraging parties to delay lawsuits, submit more realistic bids, and recognize legitimately changed conditions.



Mediation

ONCE IT BECOMES CLEAR THAT A problem cannot be resolved without recourse to more formalized third-party assistance, the next step up the ADR ladder stresses cooperative resolution in a voluntary, nonbinding setting. At this level, mediation is the form of resolution most familiar to architects. It involves a private hearing facilitated by a third party who, by force of skill or authority, may coax parties to see one another's positions and deal reasonably with their differences. Mediation's rules and outcome are "designed" by the parties themselves and, because the process is nonbinding, mediation can be terminated at any point if someone believes a legitimate interest is not being heard.

San Francisco Bay Area architect William Reiner, who has served as a mediator, believes mediation is an essential step, especially in minor disputes. In one typical "errors and

omissions" case, a session conducted by Reiner exposed how an owner had tried to cut costs by using preliminary drawings as the basis for detailed construction. When the building failed to meet the owner's expectations, a dispute resulted. "No one should have been sued in the first place," Reiner contends, although it took a hearing in front of a knowledgeable authority to convince the owner of that. Often, mediation is a good way for architects to resolve fee disputes, and in some cases, mediation can even be accomplished over the phone.

One reason mediation has received much

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One reason mediation has received much

attention recently is that it has been pushed by both Victor O. Schinnerer & Company and DPIC, the two major providers of liability insurance to design professionals. DPIC, for example, offers a program called "Mediation Works!" through which firms receive a 50 percent reduction in their deductible obligation if they resolve claims through mediation. Between June 1985 and January 1990, parties agreed to mediation in 80 percent of cases for which DPIC suggested it. Of these, 76 percent were settled without further litigation, on average 10 months earlier, at a cost of, on average, \$40,000 less per claim.

Ava Abramowitz, a lawyer and vice-president for Victor O. Schinnerer, notes that in 70 percent of cases, an architect will pay little or nothing as a result of a mediated settlement. Linda Singer, a Washington, D.C.-based mediator gives a typical example: A school board accepted a low bid on the roof for a new school, and, when it leaked, the board sued under its agreement with the general contractor. The action eventually widened to include three other lawsuits that named everybody from the architect to building-parts manufacturers. After mediation was agreed upon, it required only two months to reach a final settlement, in which the architect paid a nominal \$1,000 fee.

At this midpoint along the ADR ladder, those entangled in a dispute may participate in a "minitrial," at which attorneys present evidence to partners of the firms involved, people not directly involved in the dispute but with the authority to decide whether to proceed with litigation. A minitrial can also settle a particular issue that may be holding up more general agreement. Another alternative is to call in a third party for advice on how a case might fare at trial.

According to construction attorney Lee Novich of the San Francisco law firm Pandell, Novich, Borsuk, such a step may avoid civil litigation before a court-appointed "special master," an individual familiar with the construction industry who has been appointed by a judge to try the case.

Arbitration

BINDING ARBITRATION HAS LONG EXISTED as the ADR process of last resort in the construction industry. But by the time the need for an arbitration hearing is reached, parties have normally passed a watershed where

nothing short of a binding, third-party decision will suffice. The advantage of arbitration over civil litigation in front of a judge and jury is that arbitrators will be familiar with design and construction issues, offering savings in time and money when presenting evidence on technical issues such as the standard or quality of work. One other alternative that has been employed outside the construction sector is to hire the services of a retired judge for a full-scale private "trial." Such a strategy offers many of the same procedural safeguards as civil litigation in the gathering and presentation of evidence. However, the process is normally much faster.

The problem with arbitration, according to the CPR report, is that it has become so formalized that its original advantages have

even after depositions and document discovery, all the unbillable hours, attorney's fees, and the creation of a climate of uncertainty and distrust, the parties may still not be afforded their "day in court," because the cost of presenting evidence makes out-of-court settlement by arbitration preferable. Also, adds Abramowitz, "If you have ever been sued, those will be the six most painful years of your life."

ADR advocacy

MANY ADR TECHNIQUES HAVE BEEN DEVELOPED to handle large-scale civil projects, where the stakes are much higher. But, according to Los Angeles architect Bill Love, a former DART board member, an ADR awareness is appropriate to jobs as small as custom houses.

Architects should first learn ways of avoiding and settling disputes, he contends. Next, they should arrange with owners to restrict bids to those who have a similar understanding. Then they should write specific provisions for mediation into their contracts. "Even at \$150 an hour, a mediator is still cheaper than most lawyers," Love says.

ADR advocates emphasize that architects must play a pivotal role in the grass-roots spread of new dispute resolution methods. Some 60 percent of construction-related disputes are initiated by owners, many of whom lack the most basic knowledge of a project's risks and uncertainties. Architects have access to owners at the crucial point: when contracts with major contractors are being written. However, "the level of creativity architects bring to the design of a building is rarely matched by creativity in ensuring it gets built on time and on budget," points out University of Kentucky law professor Tom Stipanowich, who has written extensively on construction disputes.

Architects in favor of ADR believe one of its great benefits may be to restore some lost prestige to the profession. "If an architect suggests mediation, he or she can come out looking like a hero," maintains Ellickson. That may not sound like the good old prelitigious days, but ADR methods at least offer the hope that litigation in the construction industry may be finally controlled. ■

—DAVID MOFFAT

David Moffat is associate editor of *Traditional Dwellings and Settlement Review*.

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all but evaporated. Attorneys, often unfamiliar with the special nature of the construction industry, may consider arbitration almost synonymous with a civil trial. In addition, a tendency has developed to lump all claims for arbitration on a project together into a single megasettlement, dragging all parties into the morass. Even if a claim against one party may be unjustified, he or she has no guarantee that an arbitrator will not simply rule to "split the difference."

But arbitration is arguably a better option than litigation, where a civil suit may languish in the courts for more than six years. And,

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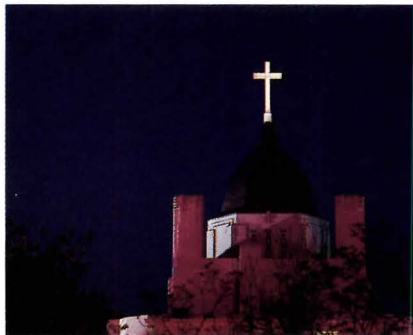
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Architect-Designed Lighting

Custom fixtures incorporate new technology and reinforce spatial intentions.

PAGE 104

Controlling Direct Sunlight

Light shelves redirect natural illumination to brighten offices and reduce glare.

PAGE 110

Lighting Design Software

New computer programs solve complex calculations to simplify lighting strategies.

PAGE 114

Architect-Designed Lighting

Custom fixtures enhance the spatial character of interiors.

FAILURE TO PROPERLY ILLUMINATE AN INTERIOR can be a glaring omission in any building. As Kohn Pedersen Fox's built-in wall and ceiling fixtures in Goldman Sachs's London headquarters attest (pages 108-109), well-designed lighting reinforces the distinctive character of a building, enhancing the architect's design intent.

Although myriad fixtures are now available on the market, stock products often do not match a room's nuances and scale. As a result, more architects are trying their hand at designing custom lighting fixtures to integrate ornamentation and illumination in high-profile public spaces.

Many manufacturers are willing to provide support services to architects seeking to develop custom fixtures, especially when they could become the source of a new product line for the company. For example, Astoria, New York-based Baldinger Architectural Lighting's collaborations with prominent architects such as Michael Graves, Richard Meier, and Robert A.M. Stern have led to signature fixture lines; Arquitectonica's fixtures will be added to Baldinger's list this fall.

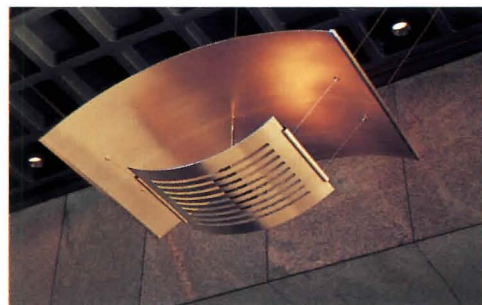
Such fixtures need not always be designed from scratch. Many custom designs are the result of minor modifications to manufacturer's stock fixtures. By adjusting the size, material, finish, and form of lamp housings, architects can produce a visually distinctive and unique fixture while still complying with the Underwriters' Laboratories (UL)-approved electrical components required by code. This procedure also simplifies the design process by eliminating the need for costly and time-consuming testing of luminaires required for UL approval.

But architects should be prepared to indicate whether lamps and connections should be concealed or exposed when detailing a custom fixture. Constructing a mock-up, or even temporarily installing a prototype, is also vital to ensure that the luminaire conforms to prescribed expectations. Developing a family of fixtures by modifying the prototype to accommodate different mounting conditions and illumination levels can prove eco-

nomical and provide for an integrated and consistent lighting scheme.

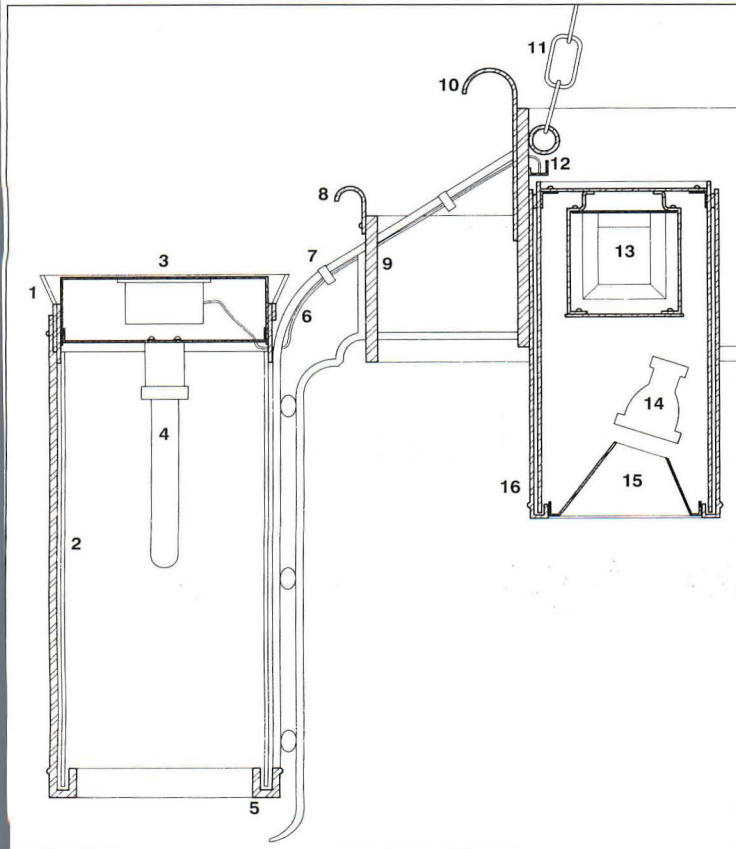
Since local energy codes are increasingly limiting the permissible watts per square foot for building illumination, even the most decorative fixtures can rarely afford to be merely glowing art objects. At a minimum, they must perform as accent lighting to supplement other primary sources of illumination. For commercial interiors, energy codes have virtually eliminated less efficient incandescent bulbs. Thus, even traditional fixtures must often be modified to accept more modern, energy-efficient sources of illumination. Such was the case for Robert A.M. Stern Architects in designing St. Paul School's new Ohrstrom Library in Concord, New Hampshire (facing page). Winner of a 1992 award from the International Association of Lighting Designers (IALD), the lighting combines traditionally detailed ornamental metal housings with contemporary, energy-efficient, compact fluorescent lamps and ballasts.

The recent proliferation of new lamp technologies, including low-voltage halogen and compact fluorescent lamps and ballasts, outpaces even the most contemporary stock fixture designs, according to Francesca Bettridge of New York-based Cline Bettridge Bernstein Lighting Design, the lighting consultant firm for Stern's Ohrstrom Library. Although manufacturers are quick to retrofit old housings with new lamps, they often lag in providing improved fixtures that fully exploit the advantages and design flexibility offered by new and more advanced light-source options. As a result, architects may prefer to team up with lighting consultants to create fixtures. Such consultants are familiar with the spectrum of available components, their performance properties, and suitable applications, and are helpful in assisting in discussions with fabricators. For example, Hammel Green and Abrahamson's "light pipes" for 3M's Divisional Headquarters (pages 106-107) illustrate how architects have increasingly become a driving force behind the technical advancement of fixtures and innovative lighting design. —MARC S. HARRIMAN



Time & Life Building
Chicago, Illinois
Perkins & Will, Architects

SEVEN CUSTOM-DESIGNED PENDANT FIXTURES supplement existing downlights and introduce a secondary tier of indirect lighting within the narrow, 27-foot-tall, remodeled lobby of Time & Life's former corporate headquarters (top), now a multitenant office building. The bronze fixtures are suspended at mid-height within the three-story space, and are visible from balconies at each of the stacked elevator vestibules. Paired curves of sheet metal are therefore designed to shield the bulbs from direct view from above or below the fixtures. Slotted bronze panels (above) filter light reflected from the larger, 6-foot-wide bronze canopy.



CHANDELIER SECTION

- 1 BRASS CROWN
- 2 COLOR-CORRECTED TRANSLUCENT GLASS CYLINDER
- 3 STEEL BALLAST SUPPORT
- 4 COMPACT FLUORESCENT LAMP
- 5 BRASS BOTTOM RING
- 6 VERTICAL BRASS MOUNTING BRACKET
- 7 BRASS STRAP
- 8 CONTINUOUS BLACKENED STEEL MOLDING
- 9 BLACKENED STEEL SUPPORT RING
- 10 DECORATIVE STEEL CRENELLATION
- 11 STEEL CHAIN
- 12 BLACKENED STEEL WIRING RACEWAY
- 13 TRANSFORMER
- 14 MR-16 LAMP
- 15 POLISHED BRASS REFLECTOR
- 16 BLACKENED STEEL CYLINDER

**Ohrstrom Library, St. Paul School
Concord, New Hampshire
Robert A.M. Stern Architects**

TASK AND AMBIENT LIGHTING FOR A PRIVATE high school's new library are provided by decorative fixtures (top left) designed to evoke the atmosphere of a traditional university setting. Working with New York-based lighting consultants Cline Bettridge Bernstein, the architects developed energy-efficient fluorescent fixtures that simulate the warmth of incandescent illumination.

By experimenting with gels used by photographers to alter the color of fluorescent-lit interiors, the architects matched the color of incandescent lamps. The 8-inch-diameter glass cylinders, which house compact fluorescent lamps, were then coated with enamel whose amber color derived from the gel experiments. Grouped singularly, in pairs, and in circles of six (above), eight, 12, and 16 (top), the fixtures create a family of pendants and wall sconces.

For the larger chandeliers, a ring of less conspicuous downlamps is concealed within an outer ring of ornamental cylinders (section at left). These lamps provide the variable task lighting required for study carrels, book stacks, desks, and seating areas.

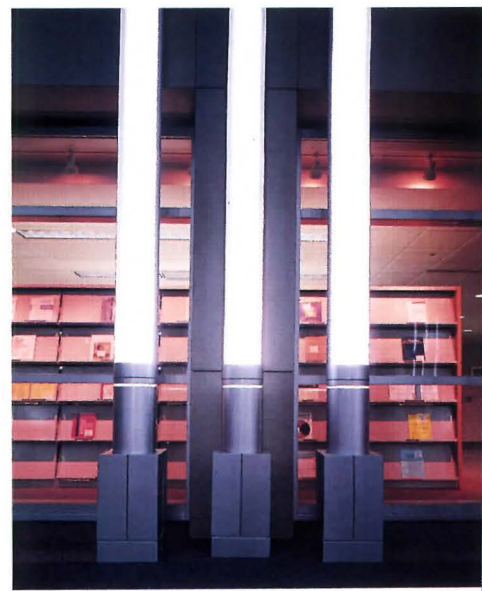
3M Divisional Headquarters
St. Paul, Minnesota
Hammel Green and Abrahamson, Architects

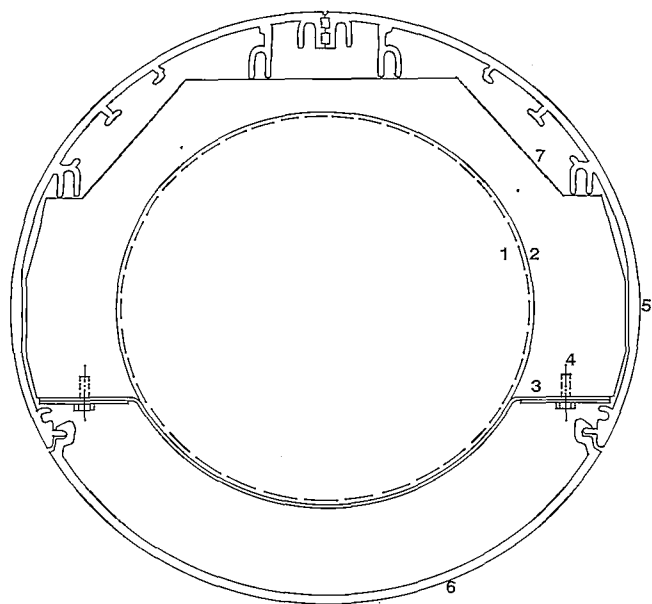
THE MOST PRACTICAL METHOD OF ILLUMINATING a new atrium linking two buildings within 3M's divisional headquarters turned out to be the application of an innovative material developed by the client. Initially designed for industrial applications, acrylic pipes contain a 3M-patented optical light film lining to create a continuous "lens" that disperses light in a manner similar to neon or fluorescent sources; yet they require only a single metal halide lamp to illuminate their 15-foot lengths. These "light pipes" are arranged as a series of 20 paired linear fixtures designed to reinforce the lines of the post-and-beam structure while evenly lighting the six-story space. Each of the 90-foot-tall fixtures is constructed of six vertically stacked pipe sections enclosed in a cylindrical aluminum housing.

The weight of the system prohibited each section of vertical piping from actually supporting the one above it. To maintain the light columns' clean lines and minimize the number of required structural supports, the segments are suspended and connected by T-brackets to cantilevered horizontal pipes at each story. Overhead lighting along the walkways is provided by a total of 100, 10-foot-long horizontal light pipes that branch from the vertical pylons at each floor. Horizontal pipes are hung from the ceiling of the perimeter walkways by slender metal rods.

Although light appears to rocket continuously upward from a ground-level source, most of the 250-watt metal halide lamps that light the pipes are actually located within each horizontal section, positioned close to the wall and pointed toward the center of the atrium. The 120-degree angle of light emanating from each pipe is directed downward on pedestrians at each level. The vertical pipe housings are oriented to direct light to the open center of the atrium. Within the T-bracket, a reflective mylar film positioned at a 45-degree angle acts as a mirror to redirect light downward, illuminating the vertical shaft attached beneath it.

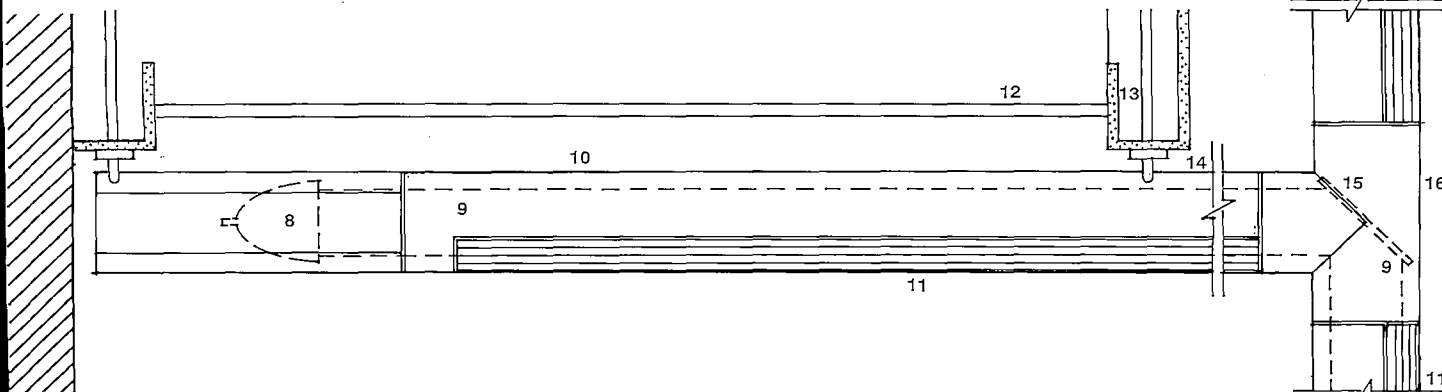
For ease of maintenance, the lamps are accessible from any of the elevated pedestrian bridges that encircle the atrium. A lamp at the base of each light column projects upward and illuminates the ground level. The 90-foot light pipes flank similarly constructed, two-story light pipes to supplement the atrium's illumination.





TYPICAL LIGHT PIPE PLAN

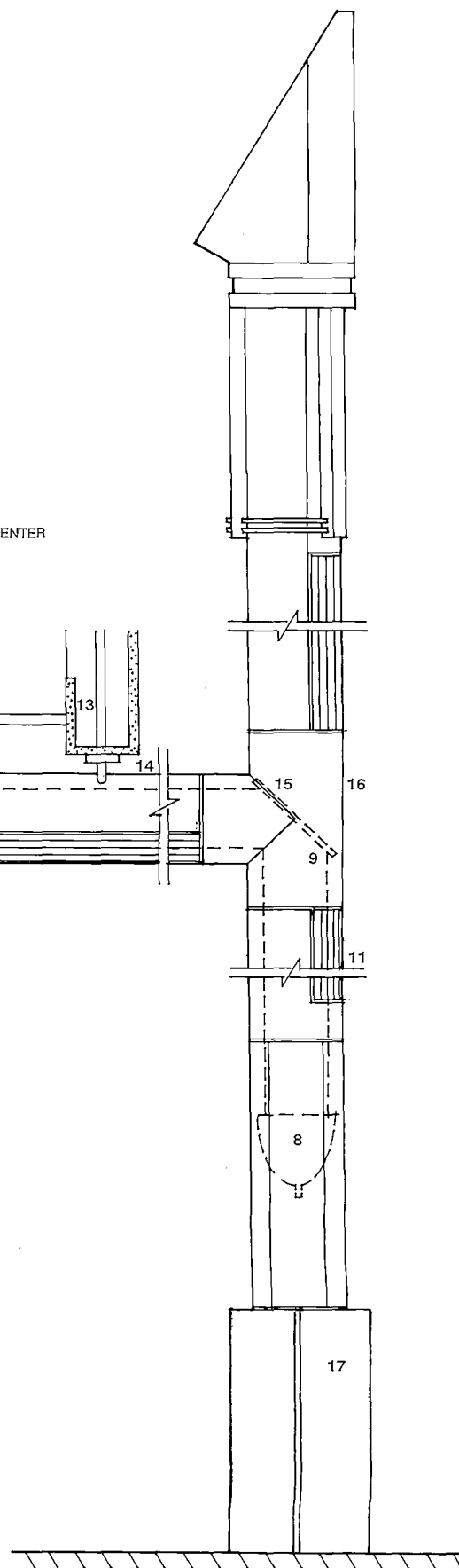
- 1 OPTICAL LIGHT FILM
- 2 6-INCH-DIAMETER ACRYLIC TUBE
- 3 1-INCH-WIDE CLEAR ACRYLIC STRAP
- 4 BOLT
- 5 9-INCH-DIAMETER ALUMINUM LIGHT PIPE
- 6 120-DEGREE ACRYLIC "LENS"
- 7 ALUMINUM BRACKET EVERY 4 FEET ON CENTER



TYPICAL LIGHT PIPE SECTION

Ninety-foot tall columns of light supplement daylight in 3M's atrium (facing page, top). Light pipes consist of acrylic tubes with an optical light film lining that distributes illumination up to 20 feet from a single lamp. Pipes are set within an aluminum cylinder and act as a lens to disperse light 120 degrees (top section). Vertical enclosures complement atrium's sleek metal finishes and visually reinforce the highly articulated structure (facing page, bottom left and right). Each light pipe is directly attached to the building at only two points: at its juncture with the vaulted ceiling (facing page, bottom left) and at the floor (facing page, bottom right). Lamps in each horizontal pipe illuminate successive lengths of 15-foot vertical pipe through cylindrical T-brackets connecting the sections. Brackets conceal a mirror that redirects light downward (section at right).

- 8 METAL HALIDE LAMP
- 9 OPTICAL LIGHT FILM
- 10 ALUMINUM SHROUD
- 11 ACRYLIC "LENS"
- 12 DROPPED CEILING
- 13 PENDANT ROD
- 14 ALUMINUM PLATE
- 15 45-DEGREE REFLECTOR
- 16 T-BRACKET
- 17 ALUMINUM CLAD BASE



Goldman Sachs Headquarters
London, England
Kohn Pedersen Fox Associates, Architects

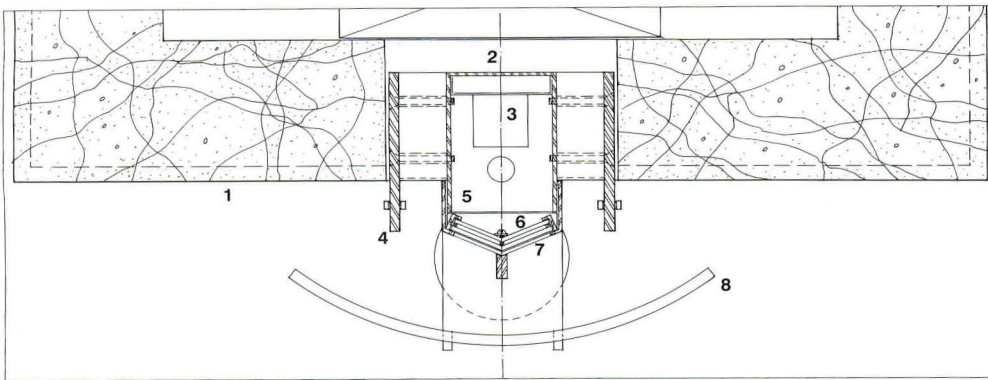
ECHOING THE METAL DETAILING THROUGHOUT Goldman Sachs's London Headquarters, custom fixtures designed by Kohn Pedersen Fox provide much of the ornament for the building's public rooms. On the ground floor, the fixtures reinforce the circulation path to the elevator lobby via a gallery and reception area. Downlighting from recessed stock ceiling fixtures reflects off the floor to provide the principal illumination for pedestrian circulation. But as visitors pass through the rooms in a sequenced progression, a secondary layer of accent lighting emanates from custom-designed architectonic fixtures to reflect the proportions and the highly articulated finishes in each area.

Vertically oriented fluorescent lamps and ballasts are recessed within the gallery walls, housed in slender, stainless steel enclosures that continue the striated pattern of the room's granite and wood cladding. According to project architect Craig Nealy, a supplemental downlamp is mounted within the base of each wall sconce along the double-height gallery's regularly defined bays. These downlamps, concealed by a curved wood panel, cast pools of light to the floor, emphasizing the regular rhythm of the piers within the space. An L-shaped soffit fixture, segmented by radially oriented stainless steel fins (bottom right, top of photo), conforms to the curved juncture of the walls and ceiling in the semicircular reception lobby.

Concerned that visible "hot spots" might be created by the concealed fluorescent lamps in the gallery and reception area, the architects experimented with samples of illuminated acrylic panels. They determined that a tandem of two closely spaced layers of acrylic for each fixture provided the best combination of diffused light and textured finish. A milk-white panel closest to the lamp proved optimal for light distribution. A second panel with a frosted surface echoes the texture of the sandblasted glass panels installed along gallery and reception room walls.

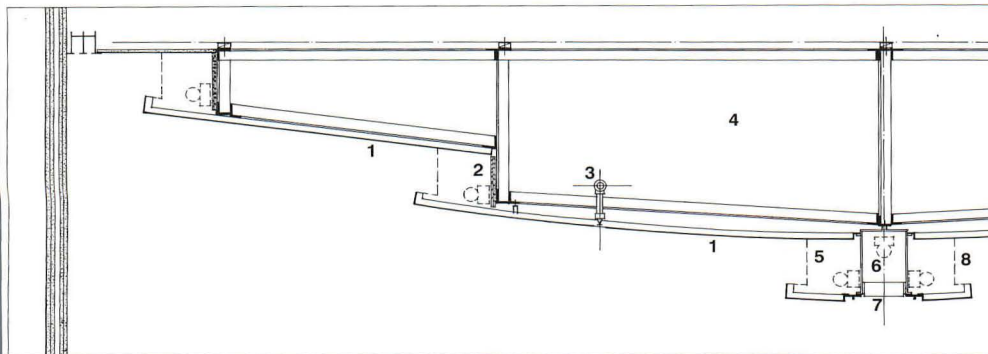
At the entrance to the elevator lobby, fluorescent lamps screened by a louvered grille in the center of the ceiling provide the principal downlighting that leads pedestrians through the hallway to the elevators. The two-tiered bowed ceiling forms light covers for fluorescent lamps that cast reflected light across the arched, luminous metal panel surfaces overhead.





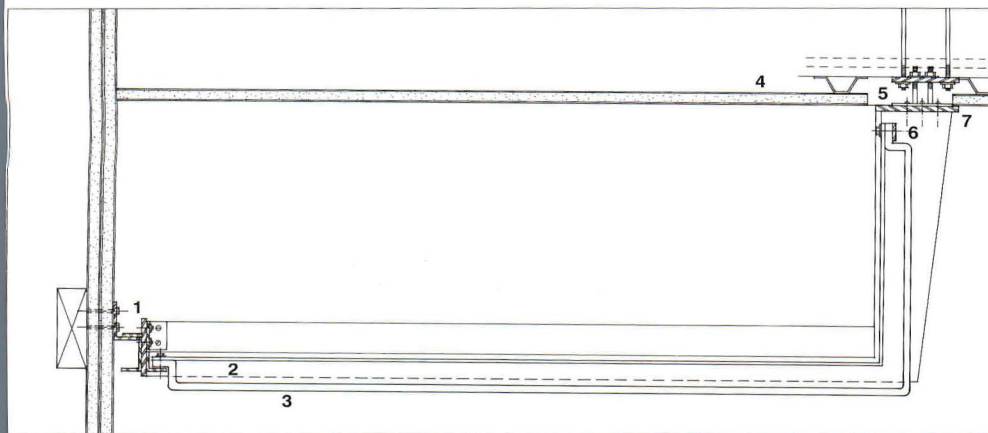
SECTION OF GALLERY SCONCE

- | | |
|----------------------------------|---|
| 1 GRANITE PANEL | 5 STAINLESS STEEL HOUSING |
| 2 LIGHT FIXTURE SUPPORT STRAP | 6 WHITE ACRYLIC DIFFUSER |
| 3 FLUORESCENT LAMP AND BALLAST | 7 CLEAR ACRYLIC DIFFUSER WITH FROSTED SURFACE |
| 4 POLISHED STAINLESS STEEL STUDS | 8 DOWNLIGHT BRACKET |



SECTION OF BOWED CEILING

- | | |
|-------------------------------------|--------------------|
| 1 PERFORATED STAINLESS STEEL PANEL | 5 LIGHT COVE |
| 2 WHITE PAINTED PLYWOOD | 6 FLUORESCENT LAMP |
| 3 SPRINKLER LINE WITH RECESSED HEAD | 7 BAFFLE |
| 4 PLENUM | 8 LINE OF FASCIA |



SECTION OF LOBBY CEILING FIXTURE

- | | |
|---------------------------------|---------------------------------------|
| 1 CURVED ANGLE SUPPORT BRACKETS | 5 CONTINUOUS MOUNTING PLATE |
| 2 WHITE ACRYLIC DIFFUSER | 6 L-SHAPED STAINLESS STEEL FIN |
| 3 FROSTED ACRYLIC DIFFUSER | 7 CONTINUOUS STAINLESS STEEL TOP BAND |
| 4 GYPSUM WALLBOARD CEILING | |

Built-in lighting fixtures in Goldman Sachs's Headquarters reinforce a procession of public spaces originating from a gallery (facing page top). Although dissimilar in proportion and scale, sconces set within gallery walls (top section, and top right) and radial fixtures along the ceiling of the reception area (facing page, bottom, and section, bottom left) are constructed of the same materials. Both fixtures consist of two acrylic layers, a white panel for diffusing light and a frosted panel for the desired finish texture, mounted in stainless steel housings. Fluorescent lamps within the tiered light coves above the elevator lobby cast streaks of reflected light across metal-clad walls and ceiling (above). Downlighting shines through the louvered spine of the ceiling, illuminating the path from the escalators along the lobby floor (center section).

Controlling Direct Sunlight

Light shelves and clerestories brighten offices and reduce glare.

WITH COMPUTERS NOW COMMON IN VIRTUALLY every workplace, display screen glare due to poor lighting conditions has caused a significant increase in headaches, blind spots, and stress among computer operators. While many architects may be familiar with indirect electric lighting strategies to reduce such complaints (ARCHITECTURE, June 1991, pages 99-102), most are unaware of successful daylighting techniques. To create naturally illuminated yet glare-free environments for computer users, architects must understand light and climatic conditions, test their designs with realistic models, and closely collaborate with owners, lighting designers, and engineers early in the design process.

Problems can arise when such precautions are not taken. In a recent study of daylit buildings, Joel Loveland of Seattle-based Loveland Millet Lighting Consultants found that the installation of tinted glazing undermined the effectiveness of one project's state-of-the-art dimming controls. Loveland contends that poor coordination among professionals

led to the problem: "It was a well-engineered system," he observes, "but the building didn't let any light in." Another common problem is presented by tenants who disable dimming controls—even when daylight is plentiful—because they have become accustomed to electric lights. "Educating the occupants and the building owners is very important," Loveland asserts.

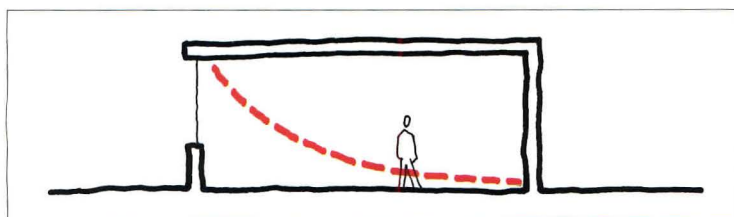
To eliminate bright spots on computer screens, the contrast ratio of surface brightnesses within a space must be no greater than 10 to one. This can be achieved when reflected and diffused light produce a uniform glow throughout the space. Such low contrast can be created by a light shelf, a horizontal element inside and/or outside the glazing, that shades the window while bouncing daylight to a light-colored ceiling, which illuminates work surfaces below.

According to University of Oregon architecture professor Virginia Cartwright, the orientation of computer screens is also important. "As long as your field of vision is not too

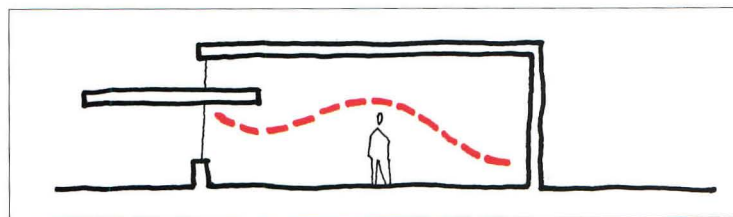
bright," Cartwright explains, "the best screen orientation is parallel to and away from the window." Positioning screens perpendicular to the window is the second choice, Cartwright adds, and recommends miniblinds for the glazing below the light shelf to control direct sunlight. To conserve energy, the electric lighting system should automatically turn off or dim when daylight is sufficient.

Because they are expensive to build, daylit offices are rare except when supported by incentives from conservation-minded utilities or by owners willing to pay for glare-free environments. However, as electricity rates escalate and more clients learn about light-related health issues, daylighting may become as common as computers. —B.J. NOVITSKI

Sketches and models by University of Oregon architecture professor Virginia Cartwright indicate that illumination drops off rapidly in rooms lit by direct sunlight (below left); light shelves (below right) shade the window and direct light toward the interior.

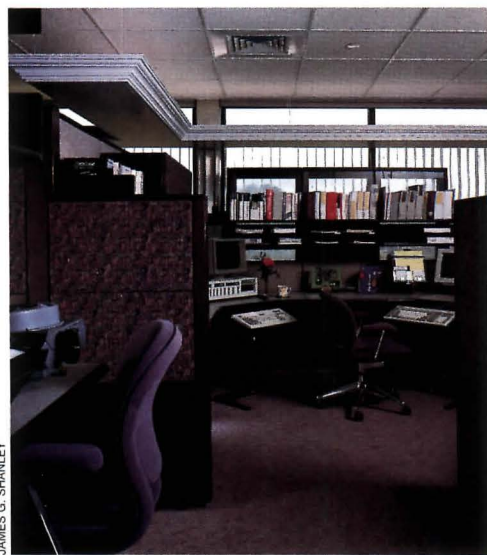


DAYLIGHT DISTRIBUTION WITHOUT LIGHT SHELF

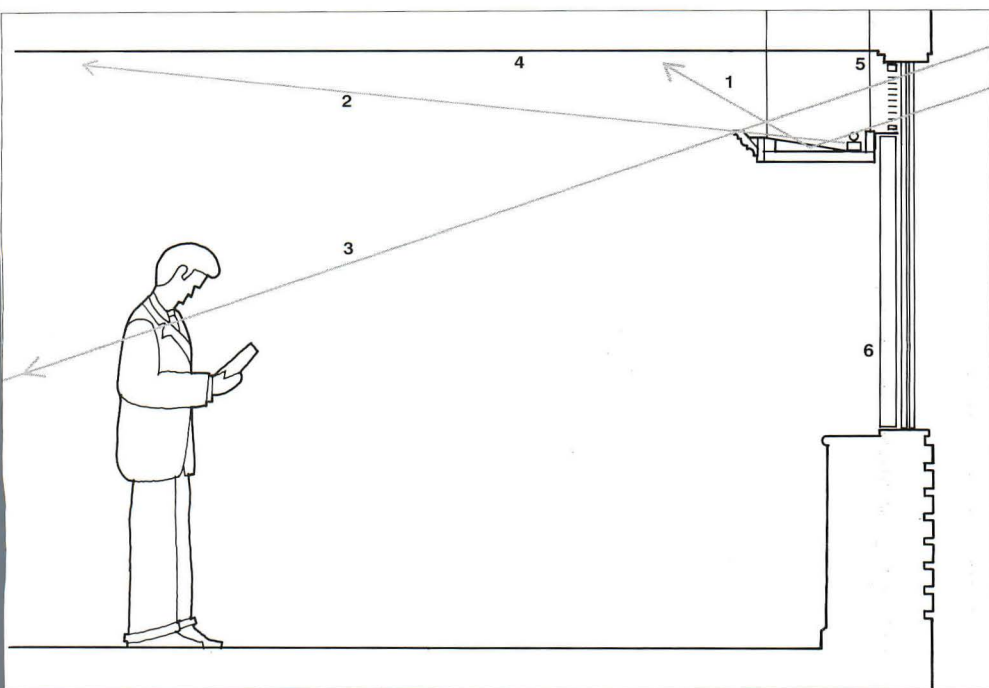


DAYLIGHT DISTRIBUTION WITH LIGHT SHELF

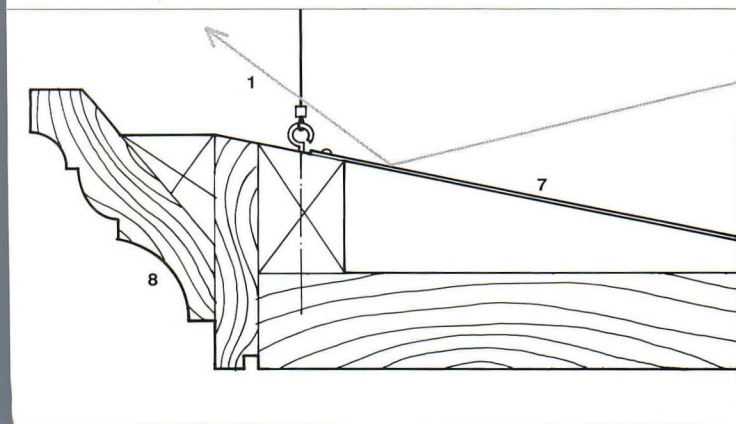




JAMES G. SHANLEY



SECTION THROUGH OFFICE



LIGHTSHELF DETAIL

- 1 REFLECTED SUNLIGHT
- 2 CUT-OFF FOR DIRECT LIGHT FROM FLUORESCENT LAMP
- 3 LOWEST ANGLE OF DIRECT SUN IN EARLY MORNING
- 4 80 PERCENT-REFLECTANCE ACOUSTICAL TILE
- 5 HORIZONTAL BLACKOUT PLEATED SHADE
- 6 VERTICAL DIFFUSING, FIBERGLASS MESH BLINDS
- 7 22-GAUGE BAKED-METAL REFLECTOR COATED WITH BAKED ENAMEL
- 8 PAINTED WOOD MOLDING



**Telco Office Building Renovation
Norwood, Massachusetts
CSY Design
Lam Partners, Lighting Consultants**

WHEN THE CEO OF A HIGH TECHNOLOGY firm expressed a penchant for warm colors and 18th-century furnishings in an existing building (above), designers of the renovation faced a conflict between this traditional image and the need for bright, uniform ambient light. The solution, proposed by Campbell Yaw of CSY Design in Millis, Massachusetts, and Paul Zaferiou of Lam Partners in Cambridge, Massachusetts, brought together new and old in modern light shelves with customized Chippendale moldings. The angled top surface of the interior light shelf reflects incoming light to the ceiling (detail, bottom left), from where it is distributed throughout the room. Vertical blinds below the shelf control sunlight. "On a clear day," Zaferiou contends, "the shelves provide natural light plus the necessary glare control." The shelves form a unifying design element and conceal simple biaxial fluorescent strips that uplight the ceiling to supplement daylight. Yaw applauds the CEO's decision to extend the principles of indirect lighting beyond the perimeter offices (top left and right), improving conditions in interior work areas as well.

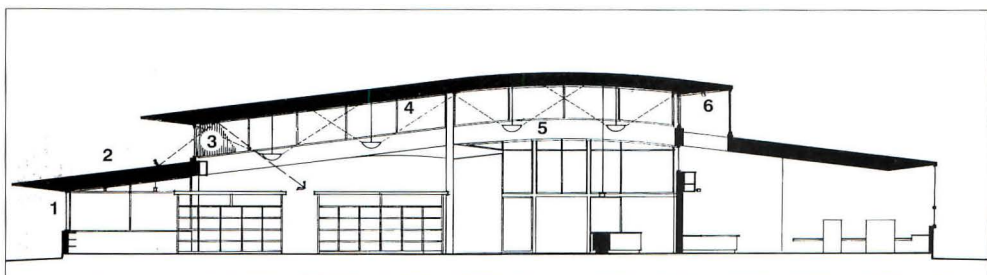


Ray D. Prueter Library
Port Hueneme, California
Scott Ellinwood & Associates, Architects

THE CURVED ROOFS OF A NEW LIBRARY (above) in the port town of Port Hueneme, California, not only evoke images of ocean waves, but contribute to a daylit, energy-conserving interior. The roofs sport deep overhangs at each orientation except north, and those below the clerestories have a reflective surface (top right). Thus, while the interior is shaded from direct sun, light bounces from the lower roof through clerestories (section), reflects off the curved ceiling, and is uniformly distributed to readers below (bottom left). Vertical blinds shade low-angled sunlight, and suspended fixtures (bottom right) uplight the ceiling when daylight is insufficient.

Because of the project's promise of reduced lighting and cooling loads, an initial daylighting feasibility study was funded by Southern California Edison's conservation incentive program. The study enabled architect Scott Ellinwood to build and test a daylighting model and run computer analyses of energy savings, projected at 27 percent. The experiments also determined which clerestories needed vertical blinds and confirmed that the curved ceiling would distribute the light evenly and effectively.

Ellinwood believes daylight design requires greater interaction with the owner. "It's critical that the building's operators and occupants understand how the systems work," he asserts, "and agree early in design to operate the building properly. Otherwise, the building may overheat under the double load of natural and electric light." For example, due to budget constraints, a stepped, rather than gradual, dimming system was installed. "It's obvious when the electric lights turn off," Ellinwood explains, "and people are worried, even if they have enough daylight to read by." The staff is willing to pay the price of explaining the lighting system to patrons because of the return they've enjoyed with a smaller mechanical system, ongoing energy savings, and the dramatic, daylit spaces.



NORTH-SOUTH SECTION

- 1 HIGH-PERFORMANCE GLAZING ABSORBS HEAT AND TRANSMITS LIGHT
- 2 REFLECTIVE ALUMINUM-COATED ROOF
- 3 FIXED PERFORATED-VINYL BLINDS
- 4 HIGH-REFLECTANCE ACOUSTICAL CEILING TILE
- 5 PHOTO-CONTROLLED, INDIRECT, HIGH-INTENSITY-DISCHARGE PENDANT LIGHT FIXTURES
- 6 PHOTOCELL FOR LIGHTING CONTROL AT EXTERIOR PORTION OF OVERHANG



DONALD L. MAURITZ

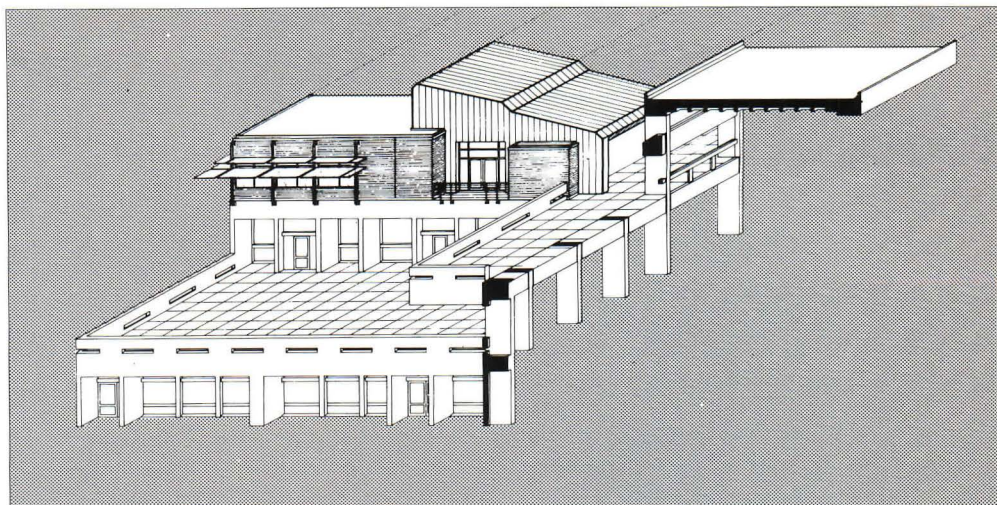


**The Evergreen State College
Olympia, Washington
Olson/Sundberg Architects
Loveland Millet Lighting Consultants**

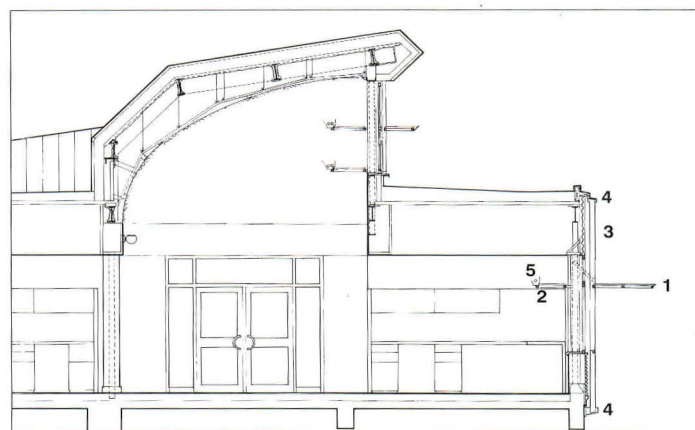
OFFICE COMPUTERS IN A NEW STUDENT activities building are daylit yet glare-free, thanks to light shelves that screen direct sunlight and reflect it to a light-colored ceiling. Walter Schacht, an associate of Olson/Sundberg Architects, attributes the integration of daylight with building form to the involvement of lighting consultants from the beginning of design. The architects had planned to understate the metal-clad office addition (top), until lighting designers suggested articulating the way light enters the building. As Schacht explains, "We discovered the rich, expressive potential of the diffusing sunscreens. They became expressions of the addition's light-gauge steel frame in the same way the tracery in a Gothic window repeats the shape of a vaulted structure."

"Light shelves are normally opaque to reflect light, but perforated metal was already part of the architects' palette," explains Marietta Millet, a principal of Loveland Millet Lighting Consultants, which collaborated with the Seattle-based architecture firm. With a quarter-size mockup, Millet and her associates experimented with different perforations. On clear days, sunlight appears to pour through the windows, but only 25 percent actually penetrates the screens. The warming patches of sunlight are welcome in the often cloudy Northwest and, on sunny days, eliminate shadows near windows (bottom right). Enough light is blocked, however, to reduce vision-impairing glare.

A photo-controlled system dims electric lights when daylight is sufficient, so the building consumes about 60 percent less energy than a conventional building during the day. Puget Sound Power and Light funded part of the design development and construction related to daylighting. Other funding came from the students, who requested low maintenance costs, "friendly" sources of energy, and comfortable work spaces. ■



AXONOMETRIC OF OFFICE ADDITION



SECTION THROUGH VAULTED LOBBY

- 1 EXTERIOR SUNSCREEN
- 2 INTERIOR LIGHT SHELF
- 3 TUBE STEEL FRAME
- 4 MOUNTING BRACKETS
- 5 FLUORESCENT UPLIGHT



Lighting Design Software

Computers tackle the complexity of light while revealing its beauty.

THE PHYSICS OF ILLUMINATION HAS BEEN known for more than a century, but only recently have computers made lighting calculations widely accessible. Software is currently available to help architects and lighting designers select and locate lamps and luminaires to maximize visual acuity, highlight architectural features, and minimize energy consumption. Ten years ago, computers were scarcely more helpful than slide rules and generated strictly numerical results. Now, the design applications of lighting software are improving dramatically as more powerful machines integrate lighting calculations with drawings and databases.

Calculation options

THE PRIMARY CALCULATION PROCEDURES executed by lighting programs are the zonal-cavity and the point-by-point methods. The simpler zonal-cavity approach calculates the average illumination in an interior created by a given configuration of fixtures; the more complex point-by-point method calculates illumination variations throughout a room.

Lumen-Micro, from Lighting Technologies, generates realistic renderings by calculating the precise illumination levels at every point in a scene (below left and right). The program considers the color of light sources and the color of surfaces that reflect light, as well as the effects of complex spatial geometries and a variety of daylight apertures.

Zonal-cavity calculations are fast, and the resulting illumination data is often displayed instantaneously. Point-by-point displays may require minutes or hours to generate, depending on the number of luminaires, the complexity of the space, and the power of the computer.

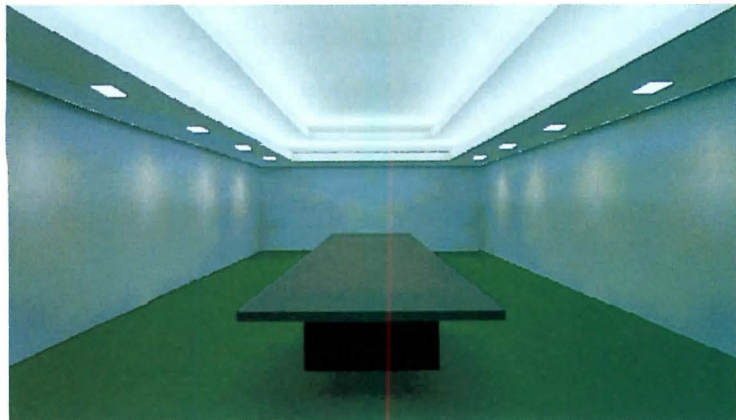
Charles Troxell, a Richmond, Virginia-based lighting designer, categorizes software as either "doers" or "checkers." Through zonal-cavity calculations, doers determine the number of fixtures required to obtain a desired illumination and automatically devise a workable, if unimaginative, layout. Unlike many point-by-point methods, zonal-cavity calculations consider reflection off interior surfaces and incorporate light from area sources such as fluorescent troffers. An example of a zonal-cavity program is Spec-L, from Lithonia Lighting, which calculates levels of illumination, number and spacing of fixtures, and resulting energy consumption in watts per square foot. When a user adjusts any one of these variables, the software automatically recalculates the other two.

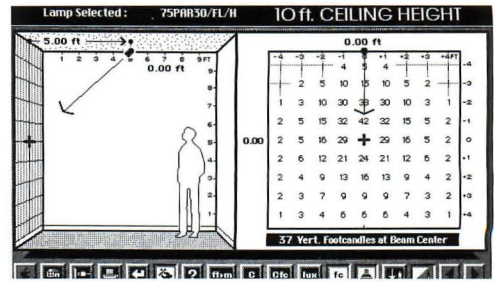
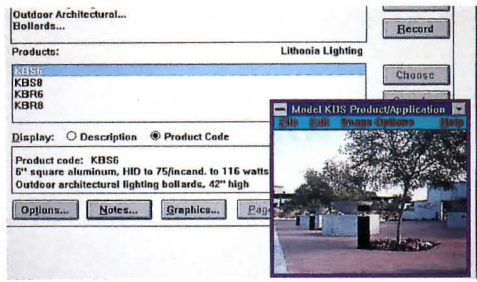
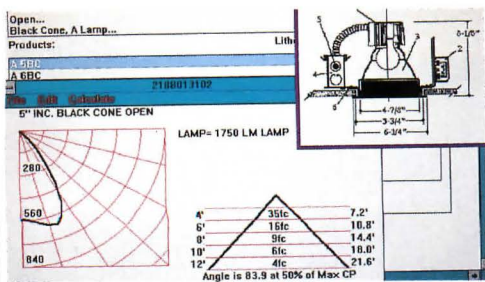
"Checkers" illustrate how much light is generated by a design through point-by-point calculations. Their output can be displayed as numbers in a matrix representing a surface, or as isoilluminance contours, which resemble the grades on topographic maps. These lines are usually shown superimposed on two-dimensional drawings of floors or walls. Some programs even render a perspective based

on these calculated light levels.

Data-Light 3, from Illumination Data Systems, is one example of an interior point-by-point program. It is also one of the few lighting programs available for both the Macintosh and Windows; most run only on DOS systems. Architects can graphically adjust the location, height, and focus point of a single fixture, and the program calculates the illumination for a grid of points on either a horizontal or a vertical surface. A number of point-by-point programs also calculate outdoor lighting, with special attention to pole heights, aiming angles, and typical configurations of roadways, parking lots, or sports fields.

Another point-by-point system, CALA, from Holophane, calculates the effects of multiple light sources and interior reflections with photometric data from any luminaire manufacturer. Within CALA, the designer can draw and aim luminaires, analyze illumination on vertical and tilted surfaces, and view the resulting isoilluminance contours in perspective. Summaries of the selected fixtures and their photometrics are also generated. Electrical engineer Russell Givens, president of R.E. Wall & Associates in Tustin, California, tested the program's accuracy when he uplit the 75-foot-high vaulted ceilings in the John Wayne Airport in Orange County, California. "With CALA," Givens claims, "we calculated the illumination reflected onto the floor and came within 1 footcandle of the final measured result."





Manufacturers' roles

LIGHTING-PRODUCT MANUFACTURERS HAVE been key players in software development over the past decade, partly because design and analysis programs require lamp- and luminaire-specific photometric data describing light's distribution and other characteristics. In the past, each manufacturer had its own electronic format for this data, but the Illuminating Engineering Society (IES) of North America recently developed an electronic format that has become an industry standard. Many lighting-product manufacturers provide their photometric data on disk in the IES format, so it can be read and processed by most lighting programs.

Eclat is a CD-ROM-based specification system that contains a variety of product data, including photographs, photometric distributions, zonal-cavity calculations, and ordering information from about a dozen lamp and luminaire manufacturers. Through Eclat's graphic Windows interface, designers can search the database by manufacturer or by several product criteria. Unlike manufacturer-

Auto-Site-Lite, from Lighting Sciences, calculates outdoor lighting (below) from an AutoCad-generated site plan that includes luminaire positions. The results appear as color-coded illuminance values. Advanced Graphics Interface, from Lighting Analysts, plots such data as contours on all surfaces of a pavilion and a parking lot (below right).

specific catalogs, the software enables a designer to locate a product by performance criteria without specifying a supplier.

Energy and economic benefits

ALONG WITH SPECIFYING PRODUCTS AND accurately predicting illumination, lighting software offers architects opportunities for conserving energy. Givens explains, "As environmental regulations restrict the watts per square foot allowed for lighting, it becomes more important to ensure that each fixture provides the amount of light you need, where you want it." Software that overlays illumination patterns on a floor plan—showing the alignment of light intensity with horizontal work surfaces—identifies noncritical locations where lower illumination levels may be acceptable to the client.

In addition to performing a variety of lighting design, analysis, and drafting chores, LightCAD, from the nonprofit Electric Power Research Institute, calculates utility rebates for energy-efficient lighting designs. It offers a comparative analysis of alternative fixtures and the electricity they consume, thus encouraging energy-efficient lighting design. LightCAD also provides an input file for the Lighting Code Check program developed jointly by the IES and the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE). With this program, users can check lighting designs for compliance with the ASHRAE/IES code, which is the

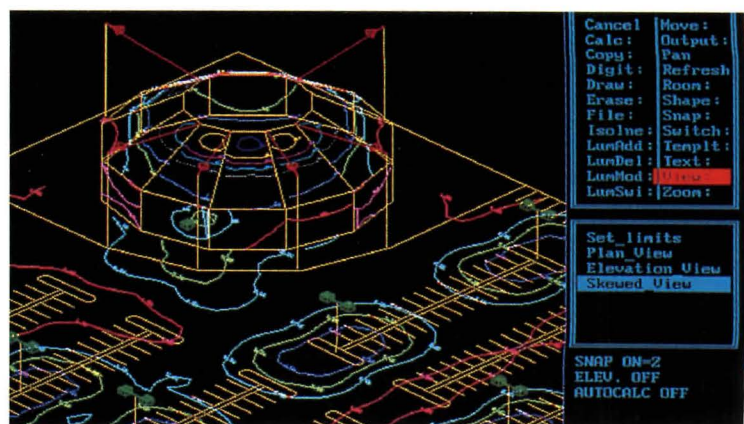
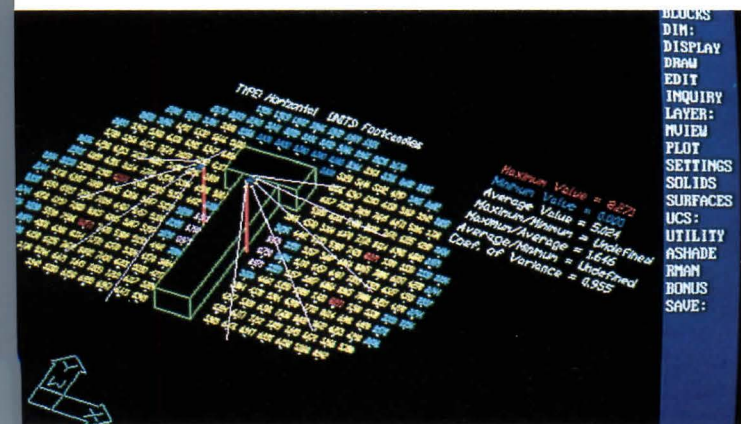
Eclat's CD-ROM disk contains product information (above left and center) from a dozen lamp and luminaire manufacturers. It includes photometric data, sketches, and color photographs. Data-Light 3 (above), from Illumination Data Systems, one of few lighting programs for the Macintosh, calculates the illumination on a grid of points for a single source. The user graphically moves the fixture location, height, and aiming point.

standard in many jurisdictions.

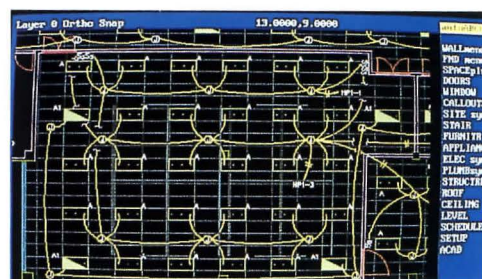
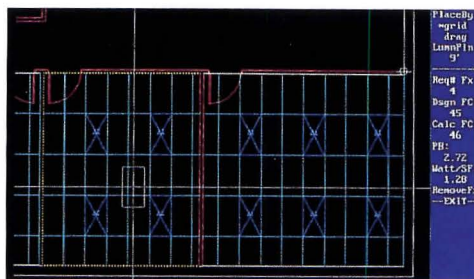
Energy optimization is a major focus of the analysis modules of Sylvia/PC from Sylvia Lighting. Besides calculating relamping schedules and lighting system costs over the life of the project, Sylvia/PC computes the savings and environmental emissions reductions achieved by converting to energy-efficient lamps. Soft/Light, from Thomas Industries, also performs an economic analysis by calculating investment payback.

CADD compatibility

SOME LIGHTING PROGRAMS ARE ESPECIALLY compatible with design processes because their graphic output, such as isoilluminance contours on floor plans, can be generated in DXF, the standard drawing exchange format, which can be read by many CADD systems. Thus, architects can introduce lighting information into a CADD drawing for further design. As an example, Genesys, from Genlyte, offers an electronic fixture catalog integrated



DATABASE MENU		Project Name: OFFICE		Drawing Name: BETA		
Defaults RoomSch Rdbata FixtSch ContrSch Summary DaySch DRWING						
FIXTURE	SCHEDULE	Luminaire	Size	Loop	Ballast	
Name	Code	Type		Intg No	Code	
FTSASE	A1	Troffer	2x4	Rec	2 F32TB	Elec Rapid St
FTAP1E	A2	Troffer	2x4	Rec	3 F32TB	Elec Rapid St
FTAP2E	A3	Troffer	2x4	Rec	4 F32TB	Elec Rapid St
FCDA	C1	Can	0"	Rec	CF11B/CF24q-2	Mag Energy Ef
FCDB	C2	Can	4"	Rec	CF11B/CF24q-1	Mag Energy Ef
FTAP3E	S1	Troffer	1x4	Rec	2 F32TB	Elec Rapid St
FTAP4E	S2	Troffer	1x4	Rec	1 F32TB	Elec Rapid St



LightCAD, from the Electric Power Research Institute, operates within AutoCad and performs lighting design analysis (above left), and drafting (above center), among other tasks. LightCAD's output includes reflected ceiling plans and fixture schedules. Electric, from Softdesk, calculates fixture requirements using the zonal-cavity method, produces fixture schedules that include power requirements (above right), and supplies a library of electrical symbols and drafting utilities.

with a graphic environment. Genesys imports drawings as DXF files, runs both zonal-cavity and point-by-point calculations, creates fixture layouts that an architect can accept or refine, and exports reflected ceiling plans, also in DXF format. A designer can switch between plans, elevations, and wire-frame perspectives, and request a full-color rendering of a room and its lighting. CALA and Spec-L also support DXF file formats.

Another program that can export DXF files is Lighting Technologies' Lumen-Micro, which features a drawing environment for constructing room geometries and lighting layouts. A catalog details standard IES photometric data and video images of luminaires in various architectural settings. Architects can navigate this database by answering design-oriented questions about the designer's intent or the luminaire's role. Taking into account indirect lighting, shadows, and glare, the program displays point illumination levels, contours, or renderings that accurately represent light quantity. Lumen-Micro is one of the few programs that also consider daylighting, factoring in the effects of windows, skylights, light shelves, glazing types, and sky conditions.

Advanced Graphics Interface (AGI), from Lighting Analysts, also features a drawing environment and DXF file exchange. AGI performs point-by-point calculations for both interior and exterior applications on multiple planes of any shape, angle, or orientation. The designer can import a floor plan, locate luminaires and obstructions, request isoillumination contours, and export the result to a

CADD system for plotting or further development. An AGI utility enables users to create IES photometric files by typing in data.

CADD integration

A FEW LIGHTING PROGRAMS BYPASS THE need for file exchange by working inside a CADD package. For example, Electric, from Softdesk, is an AutoCad application that stands alone or works with Softdesk's Auto-Architect. The software calculates luminaire requirements with the zonal-cavity method, produces fixture schedules including power requirements, supplies a library of electrical symbols, and provides drafting utilities for wiring diagrams and drawing notations. Similarly, Intergraph's Project Engineer (PE) Electrical applies dimensional information from Project Architect, determines the required number of lamps, and facilitates the layout of fixtures, receptacles, switches, panels, and other electrical equipment. Data such as voltage, phase, and load are recorded as the devices are placed. From this database, PE Electrical defines circuits, sizes wires, generates panel schedules, and routes cables and conduits. Besides electrical drawings and schedules, the program can generate 3D views for visualizing cable and conduit routes.

Several other programs work within AutoCad. Auto-Site-Lite, from Lighting Sciences, is an outdoor-lighting design and analysis system that works from a site plan. The designer can place and aim luminaires and view the effects of fixture type, pole height, and obstructions. The analysis provides color-coded illumination values on a grid of points or as contour lines on horizontal, vertical, and sloped surfaces.

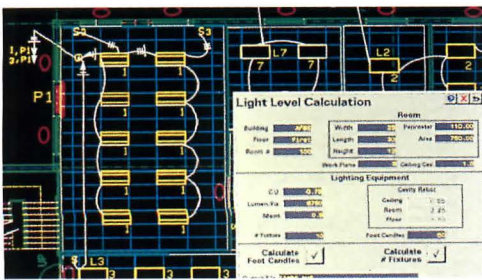
Rendering light

MOST LIGHTING PROGRAMS, WHETHER THEY perform zonal-cavity or point-by-point calculations, provide output in relatively abstract formats. That is, the results are displayed either numerically or as two-dimensional drawings or wire-frame perspectives. By contrast, a few advanced programs apply lighting principles to more complex rendered perspectives.

Image-rendering software is progressing on several fronts. Programs such as Intergraph's ModelView portray lighting photorealistically with ray-tracing, which tracks the reflection paths of light within a space. Multiple light sources can be simulated, showing differences in color, directionality, and intensity. The resulting images convincingly portray the effects of reflection, refraction, shadows, transparency, and other material attributes. However, most popular rendering programs do not calculate actual light levels, so the images they produce are more impressionistic than accurate.

Rendering progress is also under way in some lighting analysis software that calculates the illumination level of every point in the image. These programs are similar in accuracy to point-by-point calculations, but they display the result as a rendered perspective instead of in relatively abstract contours. Lumen-Micro is one such program; another, Radiance, from Lawrence Berkeley Laboratory, combines the detail of ray-tracing with the accuracy of illumination calculations. Radiance accurately portrays light because the calculation for every point in a scene considers every light source, including the room's reflective surfaces. Unlike impressionistic rendering software, Radiance can predict areas of glare or under-illumination. The program runs under Unix and, though it accepts geometric input from a few CADD programs, requires additional detailed information about surface properties and light sources. Although a high-resolution rendering may take hours to calculate, an interactive user interface provides faster, low-resolution results.

As appealing as rendered images may be, Stephen Lees, principal of the New York office of Horton-Lees Lighting Design, warns of the danger of designers reading too much into a rendering, even an accurate one. He explains, "Television works because people willingly suspend their disbelief. But it's dangerous to shut off your critical abilities when you're trying to evaluate design on a computer screen." A Lumen-Micro devotee, Lees says renderings work best in comparative



Intergraph's Project Engineer Electrical calculates lighting levels from fixtures on a reflected ceiling plan (above). Drafting utilities facilitate the layout of fixtures, switches, and other electrical equipment, while related information is recorded in a database. In another Intergraph application, ModelView, designs can be rendered with photorealistic lighting effects as in China's Nanning Design Institute of the Ministry of Light Industry (above right).

studies. "When choosing between down-lights and luminous sconces," he offers as an example, "architects don't focus on one picture as an absolute. Comparing two images helps them understand the choices."

Implications for architects

EVEN THE BEST SOFTWARE IS NO SUBSTITUTE for expertise. For example, a novice who tries to minimize energy consumption may specify an inappropriate lamp with an unpleasant color rendering. For now, the professionals who make the most of lighting software are electrical engineers, lighting designers, or architects who specialize in lighting.

According to Lees, Lumen-Micro was designed with an engineering bent even though its rendered output acknowledges lighting as a visual experience. "The program is computationally rigorous and offers good modeling capabilities," he asserts, "but you have to understand photometry, fixture options, and spatial dimensions that affect lighting, as well as ballast and maintenance factors, and other technical concepts in order to use the software correctly." The programs that require less lighting expertise contain simplifying assumptions. "Every time a program makes an underlying mathematical or modeling assumption that you're not aware of," Lees warns, "the chances of getting a wrong answer increase tremendously."

Nevertheless, architects can still take advantage of this software to better integrate lighting with their designs. According to Givens, an architect who has selected a fixture can use zonal-cavity software to determine fix-



ture numbers and spacings. These "ballpark" determinations are useful during preliminary design when, for example, bay sizes and configurations are being established. Later, during design development, a lighting designer or engineer can perform a more detailed analysis. "Software won't make the engineer's judgment unnecessary," Givens claims, "but will help architects work more knowledgeably before they go to their consultants." And the quality and quantity of this knowledge will only improve in the future.

Future advances

LIGHTING DESIGNER CHARLES TROXELL has observed trends in lighting software as it evolved from the old-fashioned number crunchers to its current integration with design software. "Within three to five years," he predicts, "we'll be doing ray-tracing to accurate light levels within CADD programs."

David Lord, who teaches architectural lighting at the California Polytechnic State University in San Luis Obispo, adds that advances in knowledge-based systems will continue. Systems now under development by Professor Jens Pohl and others at Cal Poly provide feedback during design about lighting and other factors guiding the architect toward an integrated lighting solution (ARCHITECTURE, January, 1992, pages 103-105). "This approach to simulation is in its infancy," explains Lord, "and it can only deliver limited results because not all the variables are brought into play. Although expert systems may not entirely replace human expertise, the power of computers is to remember things humans might forget."

While waiting for these advanced systems to develop, architects can enjoy multiple benefits from available software. By speeding up design and analysis, the software enables designers to consider many more options. Experimenting with these options builds expertise faster. And by incorporating lighting into CADD drawings and renderings, both architect and client can become more sensitive to how light can bring architecture to life. ■

—B.J. NOVITSKI

Software Resources

Advanced Graphics Interface (AGI)

Lighting Analysts, Inc.
(303) 972-8852

Auto-Site-Lite

Lighting Sciences, Inc.
(602) 991-9260

Electric

Softdesk, Inc.
(603) 428-3199

CALA

PreCALA

Holophane Company, Inc.
(614) 345-9631

Data-Light 3

Illumination Data Systems
(405) 340-3892

Eclat

Eclat, Inc.
(415) 484-8400

Genesys

Genlyte
(201) 864-3000

LightCAD

Electric Power Research Institute
(214) 655-8883

Lumen-Micro

Lighting Technologies
(303) 449-5791

Project Engineer Electrical ModelView

Intergraph Corporation
(800) 826-3515

Radiance

Lawrence Berkeley Laboratory
(510) 486-4096

Soft/Light

Thomas Industries
(615) 738-2241

Spec-L

Lithonia Lighting
(404) 922-9000

Sylvia/PC

Sylvania Lighting
(508) 777-1900

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2. American Glass Light Company offers the Fullerton Up-light. Circle 402 on information card.

3. Staff Lighting's Multitec/Multitron system dissipates heat. Circle 403 on information card.

4. The Crosshair Power-Trac Lampholder by Cooper Lighting serves as a spotlight or floodlight. Circle 404 on information card.

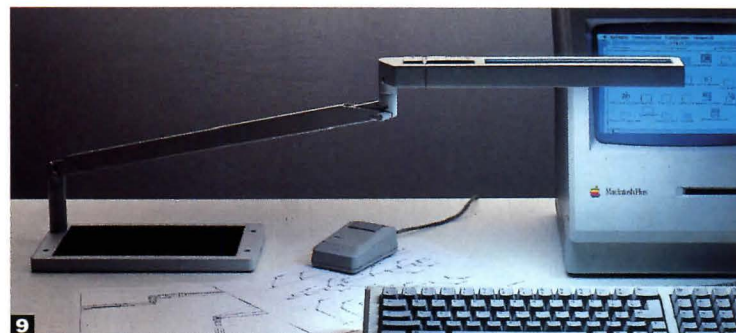
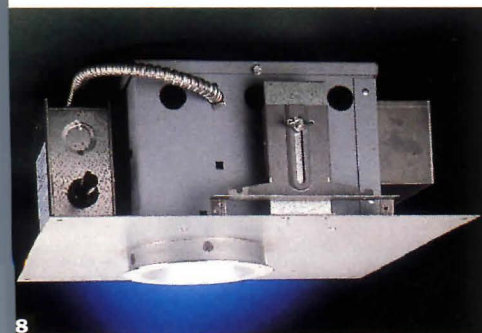
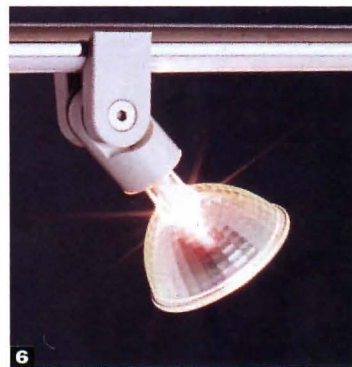
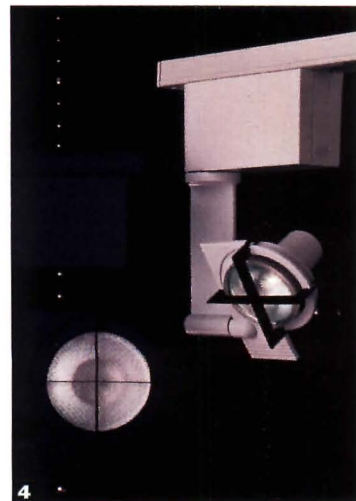
5. Flos adds Archetto to its Expanded Line Network system. Circle 405 on information card.

6. Translite Systems designed the Galaxis system. Circle 406 on information card.

7. Lithonia Lighting markets the lightweight ArenaVision fixture. Circle 407 on information card.

8. Edison Price offers the Anglux low-voltage accent light. Circle 408 on information card.

9. Artemide distributes the BAP task light by Luce Plan. Circle 409 on information card.



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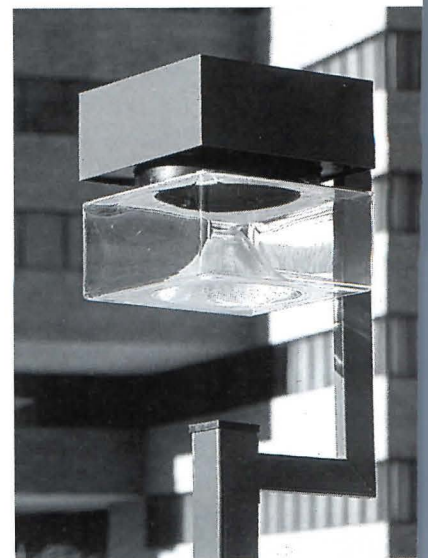
THE EUROLUXE LUMINAIRE BY HUBBELL Lighting operates with three possible light sources: high-pressure sodium, fluorescent, and incandescent. Manufactured with round and oval housings, the Euroluxe line includes a selection of hoods and guards for interior and exterior applications. The ribbed, borosilicate glass lens provides heat resistance and uniform light projection, while withstanding weather and insects. The aluminum fixture is finished in Hubbell's Lektrocote polyester powder paint, offered in seven colors. Hubbell Lighting. *Circle 410 on information card.*

Lighting software

GENLYTE HAS RELEASED VERSION 2.00 OF ITS Lighting Workstation, a software system for indoor and outdoor lighting design. The system can generate automatic fixture schedules, economic analyses, and specifications. *Circle 411 on information card.*

Exterior luminance

HOLOPHANE MANUFACTURES the ParkLane area-lighting fixture, characterized by a seamless acrylic light projection unit and extruded aluminum casing. ParkLane is available in five different mounting configurations and 170 polyester powder finishes, as well as black or bronze anodized coatings. The fixture can accommodate high-pressure sodium, metal halide, or mercury-vapor lamps from 200 to 400 watts. *Circle 412 on information card.*



Adjustable fixture

DESIGNED BY MICHAEL MCBURNETT FOR Orgatech America, the McB wall-mounted fixture produces indirect light for commercial interiors. The light operates with HID and incandescent sources and can be controlled manually or by remote. The 400-watt model, which cantilevers from the wall on arms from 14 to 40 inches in length, provides glare-free illumination with a broad output that allows fixtures to be spaced 19 feet apart. Orgatech America. *Circle 413 on information card.*

Night light

ARCHITECTURAL AREA LIGHTING INTRODUCES a 16-inch concrete bollard with pyramid or flat top. The bollard is constructed of reinforced precast concrete with a cast aluminum grill and an inner high-impact acrylic diffuser enclosing high-intensity distribution fixtures. The bollard is available in a selection of colors and with a variety of graphic features, including ceramic tile inlays and a handicap symbol. Architectural Area Lighting. *Circle 414 on information card.*



Indirect lighting

ARCHITECTURAL LIGHTING SYSTEMS OFFERS the High Performance QuadSystem (HPQ), a nonlinear, indirect fluorescent lighting system appropriate for office settings. HPQ provides low-angle light distribution for minimal glare. The energy efficient fixtures are available in different sizes with either extruded aluminum or seamless steel housings. Measuring 3 1/4 inches deep, HPQ can be mounted within one foot of the ceiling, and can be installed using aircraft cables or stems in either a grid or canopy system.

Circle 415 on information card.

Efficient lamp

OSRAM PRODUCES THE AR 58 LOW-VOLTAGE halogen reflector lamp for lighting displays without glare. The lamp, which is suitable for retail, commercial, and residential installations, has a rated average life of 2,000 hours. It can provide a spot, flood, and wide-beam spread. Osram also manufactures the LU 600 super high-intensity discharge lamp for parking lot, roadway, and industrial applications. Osram Corp. *Circle 416 on information card.*



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Compact fixtures

REGGIANI USA INTRODUCES THE SPACE Light series of lightweight wall and ceiling mounted fixtures designed with a Powertronic Ballast-#PT DE. Constructed of aluminum, the Space Light is available as an upright or as an upright with 25 percent downlight, and is manufactured in white, black, brass, and chrome. Sun Light is a cylindrical fixture with concealed adjustment mechanisms that creates ambient or accent lighting effects in exterior applications. Constructed of aluminum, it is available in three powder-coated polyester paint finishes.

Circle 417 on information card.

Task lighting

BIO-LITE IS A TASK LIGHTING SYSTEM BY Biovation Products designed to simulate the effects of natural morning sunlight in order to reduce eye fatigue in the workplace. The light converts alternating current into direct current, eliminating the eye-straining "flicker" found in incandescent and fluorescent lights. Bio-Lite utilizes a 60-watt bulb. Biovation Products.

Circle 418 on information card.

Luminous columns

GARDCO LIGHTING, A DIVISION OF THOMAS Industries, produces Lightcolumns, a line of extruded aluminum fixtures for outdoor commercial and retail installations including entranceways, plazas, and landscaped settings. Sealed with silicone, the fixtures are designed to resist moisture, insects, and pollutants. Finishes include high-gloss or semi-gloss polyurethane, metallic, or textured matte enamel. The light columns use HID and MR-16 lamps for energy efficiency and are manufactured in heights up to 12 feet. Thomas Industries, Inc.

Circle 419 on information card.

Emergency lighting

PATHWAY LIGHTING PRODUCTS INTRODUCES Series T, a recessed emergency lighting system intended for commercial facilities. The system features a hinged access door that supports two adjustable light fixtures and an optional exit sign. The access door can be provided with a locking device and tamper-proof screws to prevent unauthorized access. The device, which measures 4¹/₄ by 24 inches, can be installed in T-grid and nonac-

cessible ceilings and is manufactured in white. Pathway Lighting Products.

Circle 420 on information card.

Vintage lampposts

STERNBERG MANUFACTURES VINTAGE LIGHTING fixtures and ornamental poles and bollards for public spaces. Fabricated from aluminum, the Sternberg posts are pre-painted with a finish that will last from 5 to 10 years. Sternberg Lanterns.

Circle 421 on information card.

Dimmable fluorescents

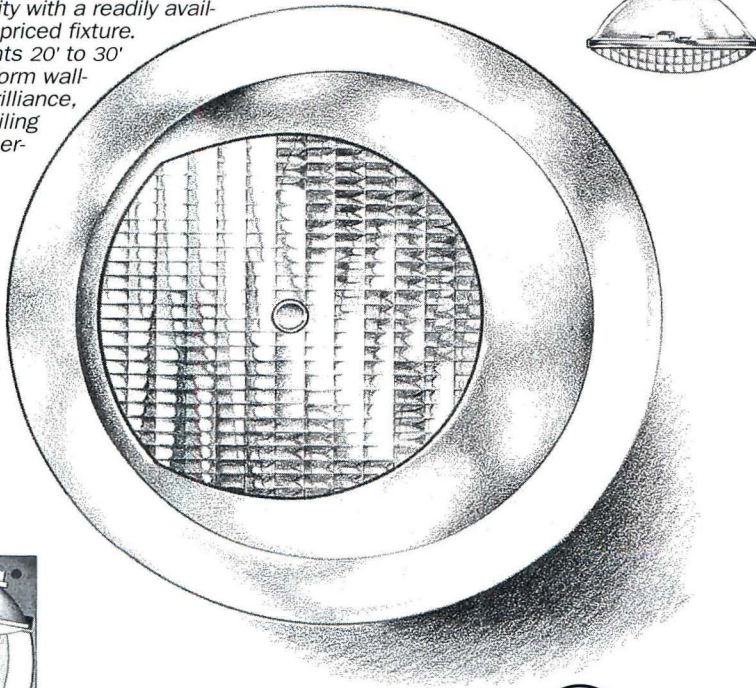
TEK-TRON ENTERPRISES MANUFACTURES THE 23A Dimmable Electronic Fluorescent Ballast, a lighting control system that offers energy efficiency and a range of dimming capabilities including manual, automatic, and remote. The company also manufactures a selection of lighting components and fixtures, including incandescent systems, fluorescent adapters, high-efficiency reflectors, power supplies, and electronic test equipment. Tek-Tron Enterprises.

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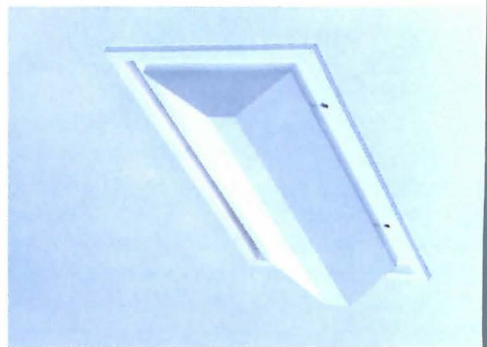
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Asymmetrical lighting

ELLIPTIPAR OFFERS THE SEMI-RECESSED WALL washer, which incorporates an aluminum asymmetric reflector to project light in a broad, uniform pattern. The fixture uses 70 or 150-watt metal halide lamps and offers an electronic ballast option for energy conservation. The fixture requires less than four inches of above-ceiling mounting space and projects 2¹/₂ inches below the ceiling surface. Elliptipar produces a complete line of asymmetric fixtures for exterior use. Elliptipar Inc.

Circle 423 on information card.

HID fixture

PART OF THE LIGHTING LEGENDS LUMINAIR series, Edison III by General Electric is a top-mounted fixture for posts from 8 to 16 feet high. The fixture is illuminated by high-intensity-discharge (HID) lamps from 35 to 175

watts, and provides symmetrical or asymmetrical light distribution. The impact-resistant globe is constructed of white or clear polycarbonate and is designed to minimize glare. The fixture is available with two different accessories that focus light upward or to the sides. General Electric Company.

Circle 424 on information card.

Flexible fixtures

PAF MANUFACTURES A RANGE OF LIGHTING fixtures, including the nine-piece Studio collection for residential or office applications. The Studio line includes one-arm and two-arm fixtures, a table lamp, clamp-on lamps, a table-mounted lamp, and a wall lamp. The fixtures are constructed of anodized aluminum with a heat-resistant black handle and base. The jointed, spring-tensioned arms allow for flexible positioning. Finishes include aluminum, black, and metal. PAF also offers the Joker series of wall or ceiling fixtures that operate with 150-watt halogen light sources. The casing is fabricated from aluminum and the shade from white glazed glass. Designed for residential or commercial use, the Joker collection is available in five finishes. PAF USA.

Circle 425 on information card.

Projection luminaire

PHOENIX PRODUCTS COMPANY MANUFACTURES the Projection Luminaire, which creates light patterns, logos, or messages on building exteriors and other surfaces. Available with a long or short lens, zoom and shutter adjustments, optional color filters, and custom templates, the Projection Luminaire operates with quartz or metal halide lamps. The fixture can be mounted on pedestals, poles, or walls. The company also produces lights for mining, marine, industrial, and hazardous-area installations. Phoenix Products Company.

Circle 426 on information card.

Smart lighting

THOMAS INDUSTRIES' HI/LO ENERGY SAVING System, manufactured by the Day-Brite Lighting division, provides full lighting when areas are occupied, and reduced lighting when work areas are not in use. Appropriate for warehouses, airports, parking lots, sports facilities, prisons, and shipping docks, the system uses Thomas Industries' metal halide or high pressure sodium lamps which are triggered by motion detectors. The Day-Brite/Benjamin division produces the VDT Ultra series of large cell, aluminum louvered fixtures for use with video display terminals.

Circle 427 on information card.

Cutoff Fixtures

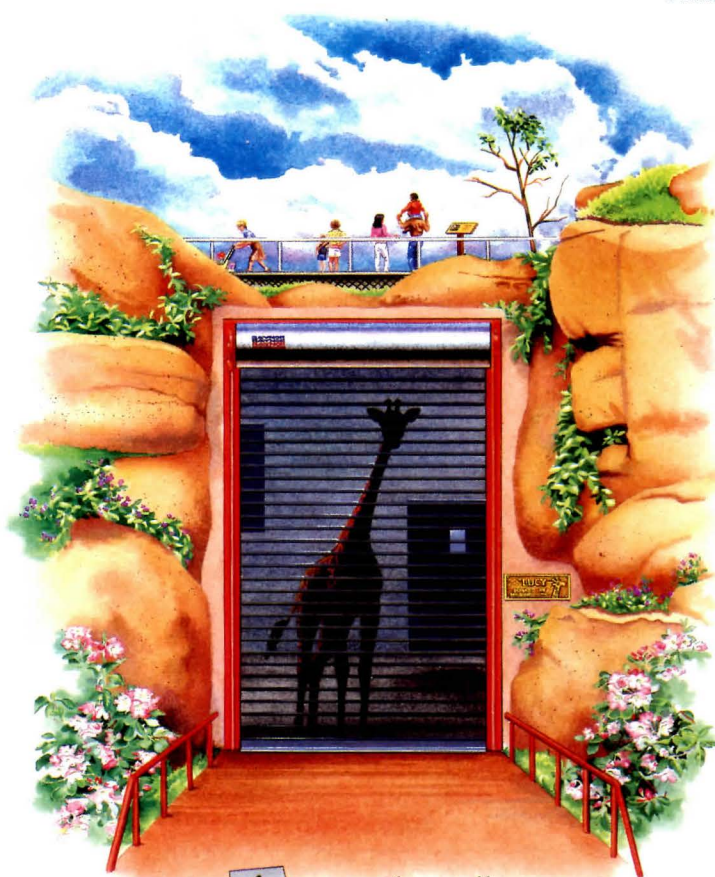
DEVINE DESIGN HAS DEVELOPED FIVE MULTIFACETED reflectors for their Cutoff luminaire series designed to shield the eye from light sources above 75 degrees vertical. Restricting light to this angle subjects the viewer to fewer distractions from additional light sources. The fixtures are constructed of hand-polished aluminum, in a variety of colors and finishes, and are offered with horizontal or vertical lamp positions. The fixtures can accommodate metal halide and high-pressure sodium lamps from 70 to 1000 watts. The company also manufactures lighting poles, mounting options, and hardware. Devine Design.

Circle 428 on information card.

Flexible downlights

ZUMTOBEL INTRODUCES OPTOS, A SERIES OF modular downlights including interchangeable rings, reflectors, and glass accessories. The Faceted reflector offers low luminance while the Louver reflector controls glare. The specular surface is sealed with silicate glass for a scratchproof finish. The series is appropriate for conference rooms, museums, restaurants, shops, and offices. The company has also added a wall-mounted luminaire to its Spheros series, and produces software for lighting design and planning. Cophography offers a three-dimensional representation of the effects of interior lighting systems. ■

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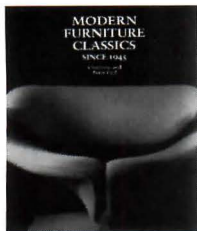
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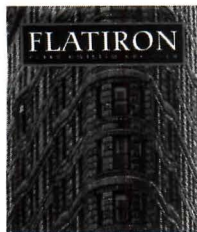
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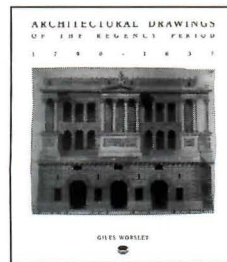


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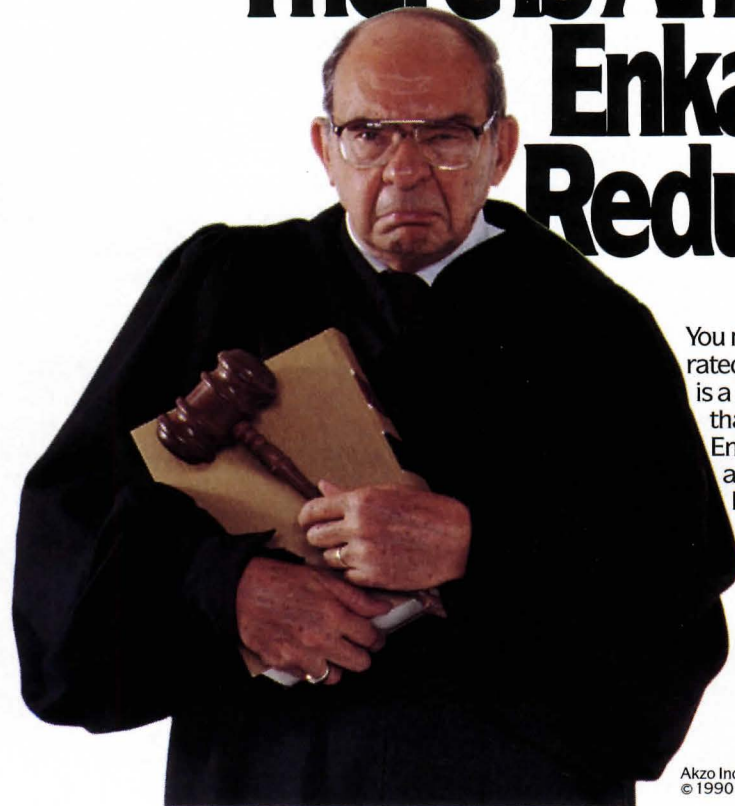
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Neat file

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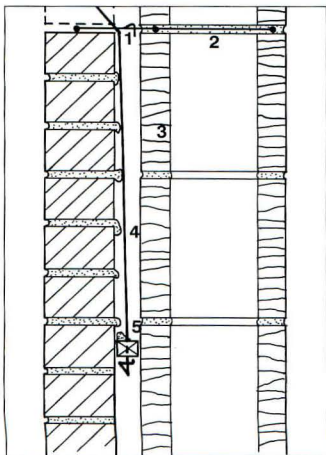
Custom brick shapes allow articulation of wall surfaces through projections, patterns, or recesses that create shadowed lines and texture. However, architects should keep in mind that specially designed bricks are more expensive than standard bricks, since customized units are often hand-cut rather than machine-made. The cutting technique affects the material's surface: wire-cut bricks may have a "torn" surface, whereas custom bricks are smooth. Machine-made bricks feature hollow cores, so their color may differ from shaped bricks, which are solid when fired. Because custom bricks have more exposed surfaces than standard bricks, they must be fired to color these surfaces evenly. Architects should consult with manufacturers to resolve questions of texture, color, cost, and detailing.

*Paul Bentel, AIA
Bentel & Bentel Architects
Locust Valley, New York*

Cavity Cleaning

A perennial problem in brick cavity wall construction is keeping the cavity clean of mortar that drops from the back side of the brick as the wall rises. This mortar can clog weep holes, causing water to migrate into the building. One way to catch dropped mortar and to clean the back of the brick is to suspend a board—milled to cavity size and long enough to prevent rotation—into the cavity (left), continually raising the board on wires as the brick wall rises. If metal ties are extended from a brick wall to a concrete block wall, the board can rest on the highest row of ties. A conscientious mason will carry out this procedure as a matter of course, but a good architect should stipulate in the specifications that this method must be applied to prevent mortar from dropping into the cavity.

*Michael Russell, AIA
Rowe Rados Hammer Russell Architects
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*Arthur Lubetz
Arthur Lubetz Associates
Pittsburgh, Pennsylvania*

Pneumatic Tube Locations

As architects involved in the design of laboratories, we have dealt extensively with pneumatic transport systems, which are used to quickly route materials such as lab samples, serum, and specimens around a building. When designing such pneumatic systems, architects should avoid sharp turns in the layout, since turns decrease the speed of the system and increase the likelihood of capsule blockage. Close coordination with HVAC, electrical, and plumbing systems is essential. Positioning the tubes in masonry shafts or above plaster ceilings or cable trays should be avoided. In the event of blockage, the entire length of the system should be easily accessible; the plenum above hung ceilings is a good location. Because some of the systems operate at velocities as high as 4,000 feet per minute, they are noisy and best located above ceilings in corridors and other circulation areas, rather than above offices and conference rooms.

*Alan Kaplan and Hank Kowalski
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