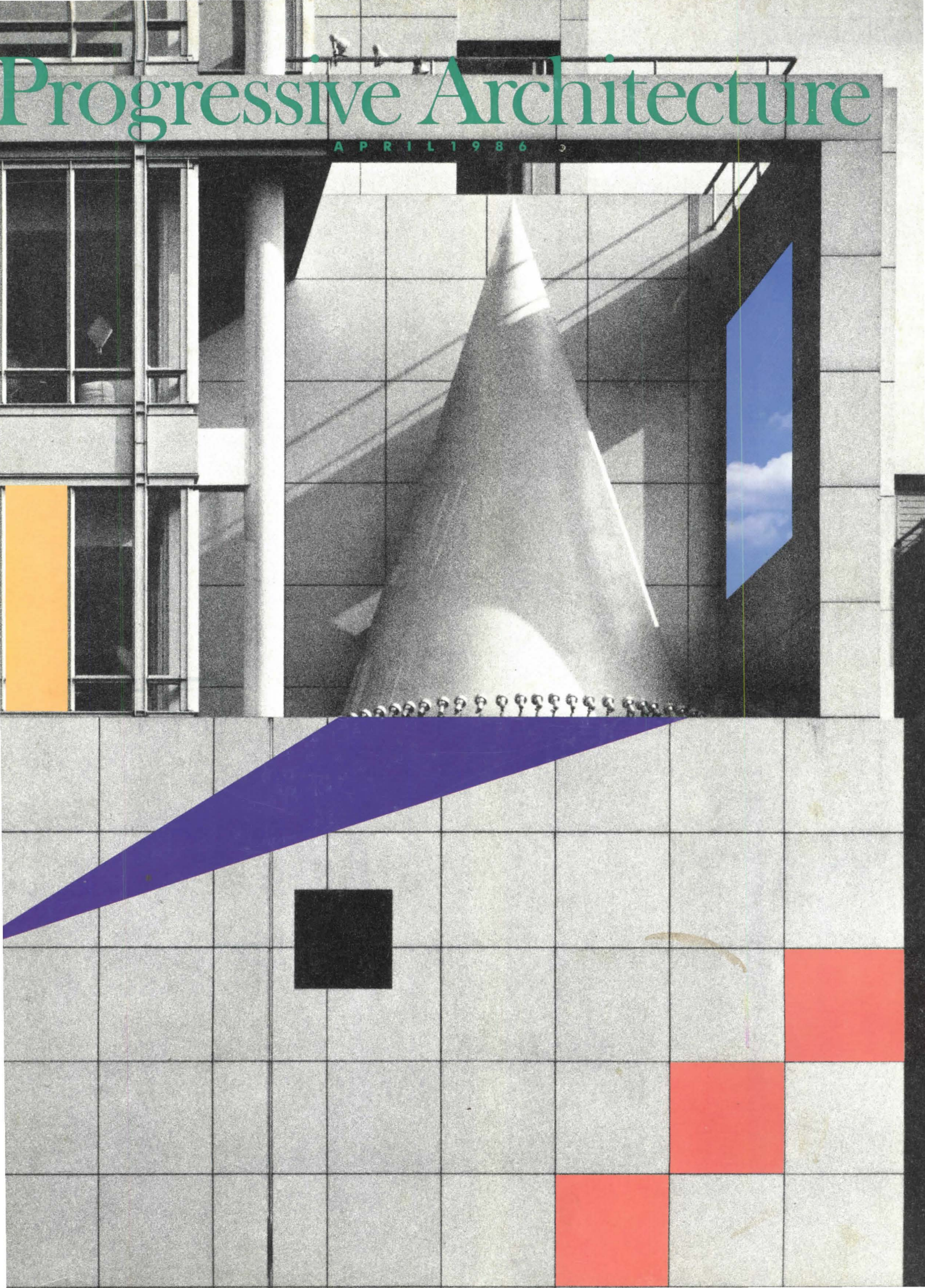
Progressive Architecture

APRIL 1986




Armstrong
introduces
a ceiling
we don't design.

APRIL 1986

Progressive Architecture

Penton Publishing
Progressive Architecture (ISSN 0033-0752) is published monthly by Reinhold Publishing, A Division of Penton Publishing, P.O. Box 95759, Cleveland, OH 44101: Philip H. Hubbard, Jr., President; Harry I. Martin, Robert J. Osborn, Vice-Presidents; Penton/IPC: Thomas L. Dempsey, Chairman; Sal F. Marino, President; James K. Gillam, N.N. Goodman, Jr., Paul Rolnick, Executive Vice-Presidents. Executive and editorial offices, 600 Summer St., P.O. Box 1361, Stamford, CT 06904 (203-348-7531).

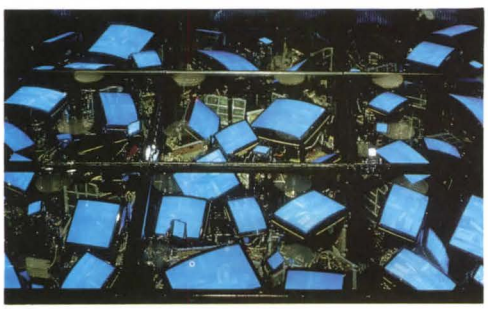
ABP ABC MPA

ARCHITECTURAL DESIGN

Editor in charge: Pilar Viladas

TECHNICS

SPECIAL SECTION



108

96

DEPARTMENTS

Cover
The Spiral, Tokyo, by Maki & Associates. Photo by Toshiharu Kitajima. Designed by Richelle J. Huff.

Subscription information: Send all subscription orders, payments and changes of address to Progressive Architecture, P.O. Box 95759, Cleveland, OH 44101 (216-696-7000). When filing change of address, give former as well as new address and zip codes, and include recent address label if possible. Allow two months for change. Publisher reserves right to refuse unqualified subscriptions. Professionals include architectural and architectural-engineering firm personnel and architects, designers, engineers, and draftsmen employed in allied fields. Subscription rates for U.S. professionals are $28 for 1 year ($33 in Canada, $60 for foreign); $45 for 2 years ($53 in Canada, $115 for foreign); $70 for 3 years ($85 in Canada). U.S. student subscription for 1 year is $28. Subscription rate for U.S. nonprofessionals is $45 for 1 year ($60 in Canada, $85 for foreign). Single copies are $7 in the U.S., $8 in Canada, and $12 for foreign. Permission to photocopy is granted for users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1 per copy of the article plus $0.50 per page is paid directly to CCC, 21 Congress St., Salem, MA 01970. Code number is ISSN 033-0752/81. Indexed in Art Index, Architectural Index, Engineering Index. Second class postage rates paid at Cleveland, Ohio, and additional mailing offices. Volume LXVII, No. 4. Printed in U.S.A.

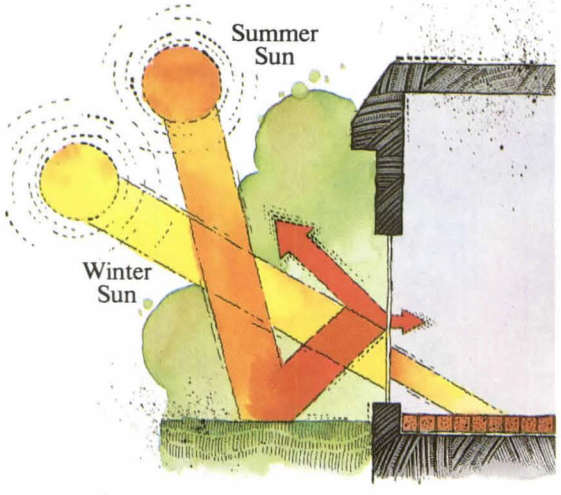
ANDERSEN'S REMARKABL
HOT SUN INTO

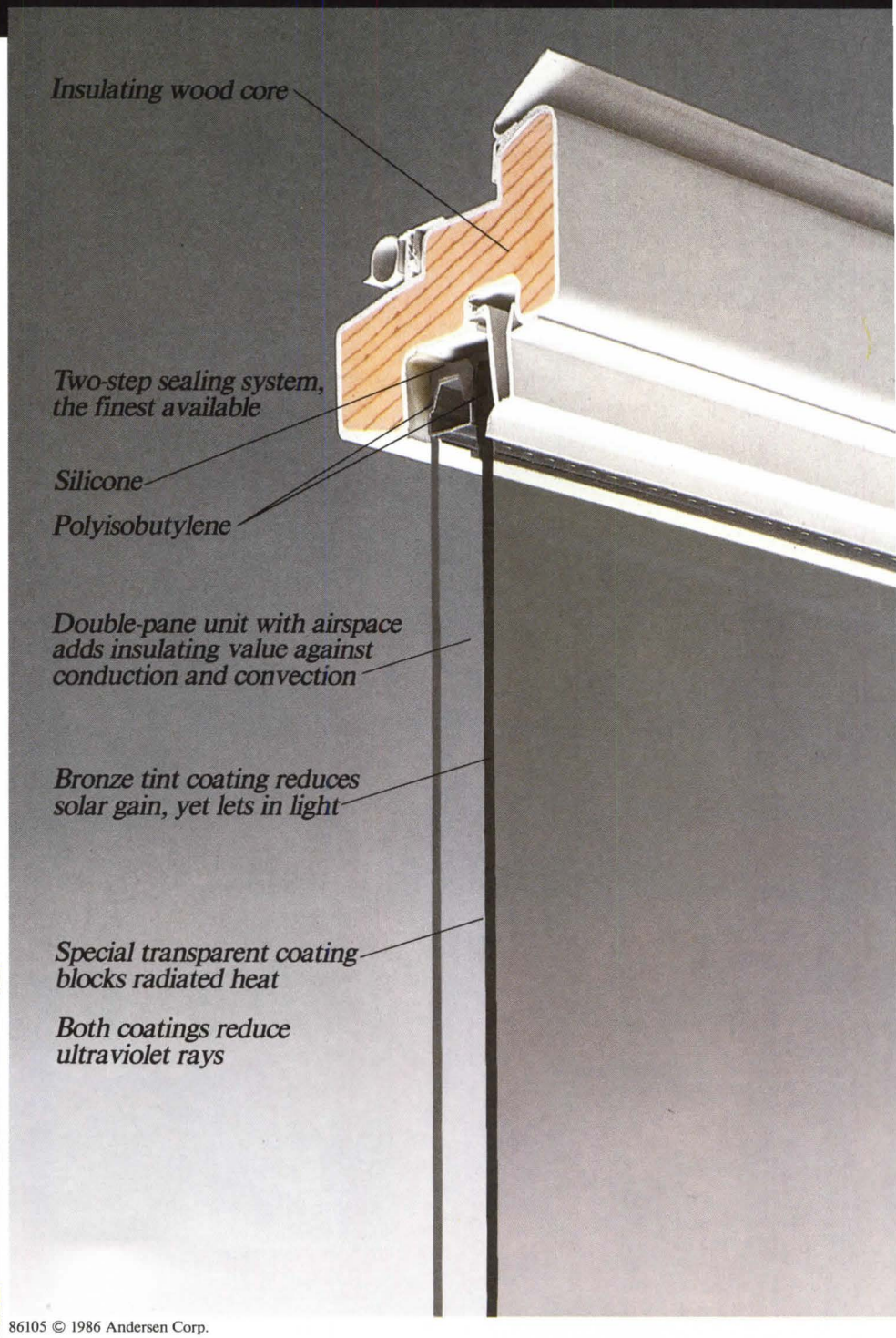
Until now, about the only way you could reduce the heat of the sun was with windows that also reduced the *light* of the sun. That made for buildings that looked like mirrors on the outside, and a bit like caves from the inside.

Now, Andersen has developed a window that reduces the sun's heat 2½ times better than ordinary single-pane glass, yet it lets in twice as much light as mirror-like reflective glass.

ANOTHER DESIGN OPTION, WITH WINDOWS THAT WORK.

Andersen® High-Performance Sun windows don't have the impenetrable and inscrutable look of most reflective glass. Yet for all their effectiveness against heat gain, they are able to provide more natural light, too. And, unlike most windows you find in commercial buildings, ours open and close.





86105 © 1986 Andersen Corp.

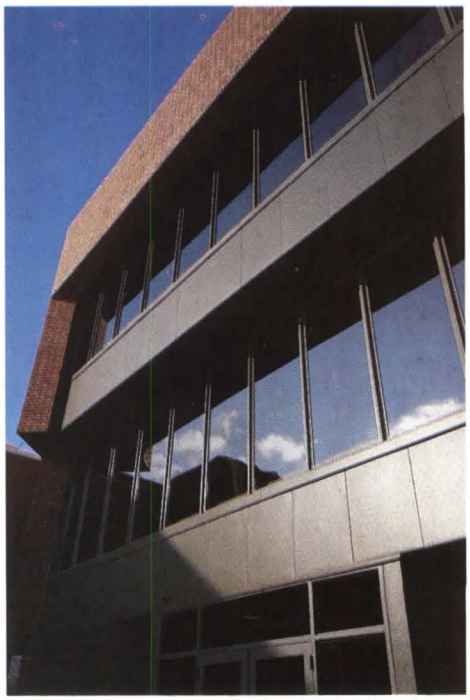
BETTER LOOKING FROM OUTSIDE. BETTER LOOKING FROM INSIDE.

These Andersen windows have a soft bronze tint that looks handsome from the outside, yet it doesn't distort colors for the people looking out. In fact, it makes these colors look much richer. The greens are greener and the blues are bluer.

NEW WINDOWS TURN COOL DAYLIGHT.

WHERE AND HOW. (IT'S NOT DONE WITH MIRRORS.)

It takes a truly remarkable window to control the awesome power of the sun. We call it the Andersen High-Performance Sun window. You can find out more about *what's* available and *how* it works by calling your Andersen distributor. And by consulting Sweet's File 8.16/An. Or write Andersen Corp., Box 12, Bayport, MN 55003.



PLANTS FLOURISH, COLORS FADE LESS.

One more wonder. This window filters out 88% of the ultraviolet rays that fade fabrics, yet there's still plenty of visible light for people and plants to flourish. Add to all that two more pertinent points: these windows are eminently affordable and readily available off the shelf.

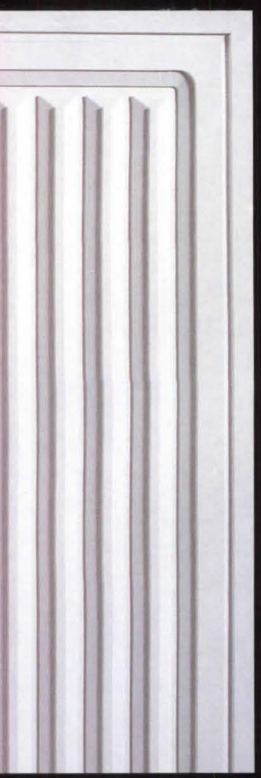
Come home to quality.

Andersen

Andersen AW Windows · Patio Doors ™

MAX™

Max. . .a completely new vocabulary of carved wood panels providing the subtle surface enrichment so desirable in today's more humanistic spaces. Precisely machined from hardwoods and softwoods, motifs are at once contemporary and enduringly elegant. Dimensions are easily adjusted to meet individual requirements. Available in a selection of natural woods, stain finishes, and color. Explore the unlimited possibilities for walls. . .doors. . . ceilings. . .cabinetry.



F+S

Forms + Surfaces Wood Surfaces Division Box 5215 Santa Barbara, CA 93150 (805) 969-7721

Circle No. 420

Expertise and Expediency

NASA's space shuttle disaster is a reminder that professional judgment is useless if it is overruled.

EVERYBODY'S first reaction to the space shuttle explosion in January was that there had been a terrible accident. But many of us almost immediately saw the event as no mere accident; to us, it was a technical blunder, a discouraging failure of that legendary American know-how. Only as the investigation proceeded did it become clear that this was not so much a technical failure as a management lapse.

Of all the prelaunch incidents revealed to date, the most ominous, to me, was when a professional expert was asked to "take off his engineering hat and put on his management hat." The author of this request has testified that he meant that without enough hard data on which to base a decision, there would have to be a judgment call. But to me, as apparently to the investigating panel, the question seemed intended to dismiss technical doubts that stood in the way of management objectives. Whatever the meaning of those words, the outcome of the exchange was that safety was sacrificed for the sake of schedule, income, and—ironically—public image. A further delay was seen as embarrassing to NASA and threatening to its budget.

On management's behalf, it must be said that they were unprepared for this professional warning. Told at the eleventh hour that the low temperatures threatened the success of the launch, the officials responded that they were "appalled." And properly so: The range of safe launching conditions should have been long known to all concerned.

What has this got to do with architecture? Some of the parallels are perhaps obvious. Time pressures and profit concerns can cause drawings and calculations to be reviewed carelessly or by unqualified personnel, raising the possibility of tragic failure. Errors in hastily churned out documents can lead to dubious trade-offs with a contractor who wants to cover his mistakes. Deals made to seduce the client initially may not yield enough income for thorough professional performance.

Carelessness is only one possible result of mismatches between management objectives and professional obligations. At the other extreme, the danger is exaggerated caution: The kind of firm known as "commercial" will avoid failures, meet schedules, and maximize profits by doing only what is safe and familiar. In so doing, it will fail in its professional responsibility to address the client's needs creatively—and it may bring about its eventual business failure when familiar formulas can no longer be fitted to changing demands.

Either carelessness or caution can be manifestations of expediency, which could be defined as meeting stated objectives with limited effort. Where expediency doesn't sink to outright crime, as in bribery, it involves cutting corners—skimping on the process, repeating formulas, yielding indiscriminately to pressures from clients or other sources.

Ideally, professional efforts should be managed so that expertise is fully deployed and there is never a resort to expedients. For architects, approaching that ideal would mean that management would never agree to impossible fees and schedules, that professional staff would never fritter away chargeable time on early day-dreaming, thus curtailing hours for the painstaking final stages, that contracts would allow for any possible contingencies, that various participants would be honest throughout about the limitations in their knowledge or output.

Obviously, as in the case of the space shuttle engineers, one individual may carry both professional and management responsibilities; in architecture, the key people almost always will. But these roles should never be viewed as "hats" that can be removed when they are in the way. Setting aside one's professional judgment, even under duress, is a betrayal of trust and an invitation to disaster. ■

John Morris Dixon

DINERS CLUB. BECAUSE NO OTHER CARD OFFERS YOU ALL THESE ADVANTAGES.

Welcome to the only card that offers this exclusive set of services to you the business person.

1. CLUB REWARDS:[SM] No other card can match the **FREE** rewards you receive with Diners Club from Citicorp. Best of all, the more you use the Card, the more you're rewarded with free gifts like a microcassette recorder, a night on the town, a personal computer, and free flights overseas.[1]

2. CLUB CHAUFFEUR:[SM] You can relax and ride in the comfort of a town car for just a few dollars more than a taxi between major airports and downtown business centers.

3. CLUB SUITES:[SM] Just imagine, for the standard price of a single room, you can indulge in an elegant hotel suite.[2]

4. CLUB WORKOUT CENTERS:[SM] While on the road, you can keep fit while enjoying guest privileges at some of the finest health clubs across the country.[3]

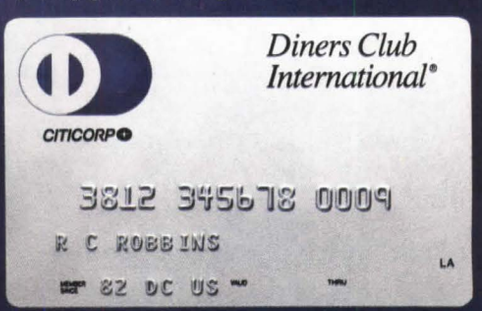
5. CLUB BUSINESS OFFICES:[SM] As a Club member, you can gain exclusive access to convenient business offices with full secretarial services and conference rooms.[4]

6. CLUB GIFTS:[SM] With one phone call, a personal gift consultant will help you select and send unique and impressive gifts to the important people in your life. From anywhere. To anyone.[5]

One 24-hour, toll-free number puts you in touch with all these services.

And of course, you'll be provided with all the other services the business person would expect. Like $650,000 Automatic Air Travel Accident Insurance,[6] check cashing privileges and Card acceptance at just about any place in the world your business takes you.

For more information about these Club benefits, simply call toll free 1-800-CLUB-INFO.[7] Just remember, there isn't a card in your wallet that can offer you all this. But then again, no other card is the Club.



WELCOME TO THE CLUB[SM]

TO APPLY CALL 1-800-CLUB-INFO

(1-800-258-2463)

1. Club Rewards is a service available only to Personal and Company accounts located within the 50 United States. Enrollment required. Certain terms and conditions apply. 2. Available Sunday through Thursday, at selected premium hotels in major U.S. cities. 3. Access to private membership athletic clubs in selected U.S. cities provided at a guest rate. Guest privileges apply only at those clubs which are located at least 50 miles from your home. 4. Provided through an arrangement with participating HQ.* Headquarters Companies licensees. 5. Additional fees apply. 6. This policy is underwritten by Commercial Insurance of Newark, N.J. The cost of the insurance, $.51 per trip, is included as part of the annual Cardmembership fee. The coverage is not available to Corporate Cardmembers. 7. Specific benefits and rewards are subject to availability and may be changed or discontinued without notice. Call 1-800-CLUB-INFO to ask for complete reservation and cancellation policies for Club Chauffeur, Club Suites, and Club Business Offices.

STOP SETTLING FOR
AND BEAUTY OF ALU

What windows should you specify for a commercial project?

For years the standard answer to that standard question was standard aluminum. Aluminum windows offered the best combination of performance characteristics. Never mind that they left something to be desired in terms of insulation and beauty.

Now you have a beautiful and efficient alternative. Marvin Magnums. Wood windows that shatter commercial standards.

ENGINEERED TO OPEN THE MIND.

Where could you use a commercial wood window? Practically anywhere you might use an aluminum window. High rise, low rise, hospitals, schools, renovation projects or new construction. The only limitation is your imagination.

Because these commercial wood windows perform. Beautifully. Tests on a 48" x 64" Marvin Magnum Tilt-Turn yielded these numbers:

Air infiltration: .01 cfm @ 25 mph. .02 cfm @ 50 mph.

Wind loads: 200 mph positive pressure. 256 mph negative pressure.

Water infiltration: 0 @ 66 mph.

R values: as high as 4.55.

U values: as low as .22.

MARVIN MAGNUMS PERFORM BECAUSE MARVIN PEOPLE PERFORM.

Those test results didn't happen by accident. They came about because Marvin people put all their pride and skill into every Marvin Magnum we make.

We don't warehouse an inventory of standard sizes. We make every window to order. Only the most precise hardware will do. And we specialize

THE WARMTH MINUM.

in extras such as weather-stripping that's welded at all four corners for the tightest possible seal.

Marvin people are with you every step of the way. From our design service up front to our field representatives, each of us is dedicated to making these windows the best choice you could possibly make.

EVERYTHING IS OPTIONAL. QUALITY IS STANDARD.

Marvin Magnums come in a variety of styles.

Our Tilt-Turns swing into the room for cleaning or tilt in for ventilation. Choose the simple, elegant lines of our basic Tilt-Turn or consider a Round Top or simulated double hung. For maintenance, there's a stationary unit with a system

of keyed locks. You can also specify the tilt-only hopper or an authentic double hung with sash that tilts into the room for washing.

Glazing options include 7/8" insulating, 1" insulating, solar bronze, solar gray, solar cool, Low-E or Low-E with Argon. For easy maintenance, most Magnums are available in medium bronze aluminum cladding or Polycron finishes.

Even if you should want to investigate your options, we'll gladly work with you.

YOUR TELEPHONE CALL WILL BE WARMLY RECEIVED.

We want to tell you much more about the Marvin Magnum series. Please call toll-free at **1-800-328-0268** (in Minnesota 1-612-854-1464). Or write Marvin Magnum Windows, 8043 24th Avenue South, Minneapolis, Minnesota 55420.

We'll show you how the future looks better through a warm, beautiful Marvin Magnum.

MARVIN MAGNUMS

ENGINEERED TO OPEN THE MIND.

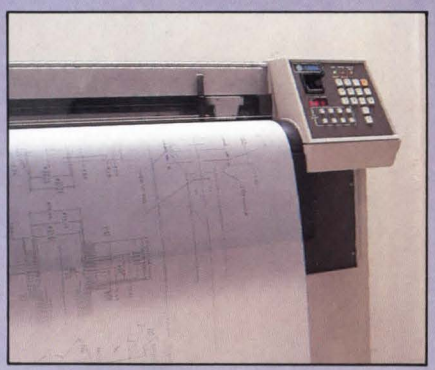
James River a superior line

With every James River CAD product, you get 30 years of experience and the resources of the largest technical team in the industry.

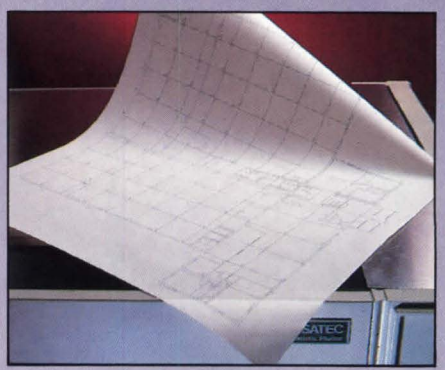
There's an excellent chance that the paper you have been using in your electrostatic plotter for the past 16 years was made by James River Graphics. We've been the leading manufacturer of media for the biggest names in the CAD industry since 1968. And now, you can buy **James River branded** CAD products direct through our nationwide network of over 300 dealers and distribution centers. James River papers and films for pen and electrostatic plotters are backed by our own

is building you of CAD materials.

James River CAD materials are produced to meet strict quality assurance standards. They are designed to exacting specifications required to provide optimum performance from your CAD systems.



James River pen plotting media includes versatile new JR300 Drafting Film and a complete line of opaque bond and 100% cotton rag vellum papers for liquid ink and pressure ball plotters.



James River electrographic media for electrostatic plotters includes report grade, translucent and vellum papers, new color plotter paper, and specially formulated toners for all VERSATEC and Benson printer/plotters.

in-depth research and engineering resources, as well as those of James River Corporation, the world's leading manufacturer of specialty papers and films. These extensive resources permit us to respond quickly to market demands, and to keep pace with rapidly advancing CAD technologies.

For the best hard copy output, look to James River for a complete line of superior CAD products designed to provide optimum performance from your CAD system.

For more information with FREE SAMPLES of new JR CAD products, call Toll Free

1-800-343-0835

In Massachusetts call: 1-800-332-4087 or complete and return this coupon to James River Graphics, Design Products Division, South Hadley, MA 01075

Name: Title:

Address:

Company:

City: State: Zip:

Tel.:

JAMES RIVER CORPORATION
JAMES RIVER GRAPHICS GROUP

PA

Plot data courtesy of VIA Systems, Inc., Intergraph Corporation, and Oliveri Corporation.

Versatec is a registered trademark of Versatec Corporation, a Xerox Company.

Circle **No. 364** on Reader Service Card

JG

Dallas Museum of Art
Dallas, Texas

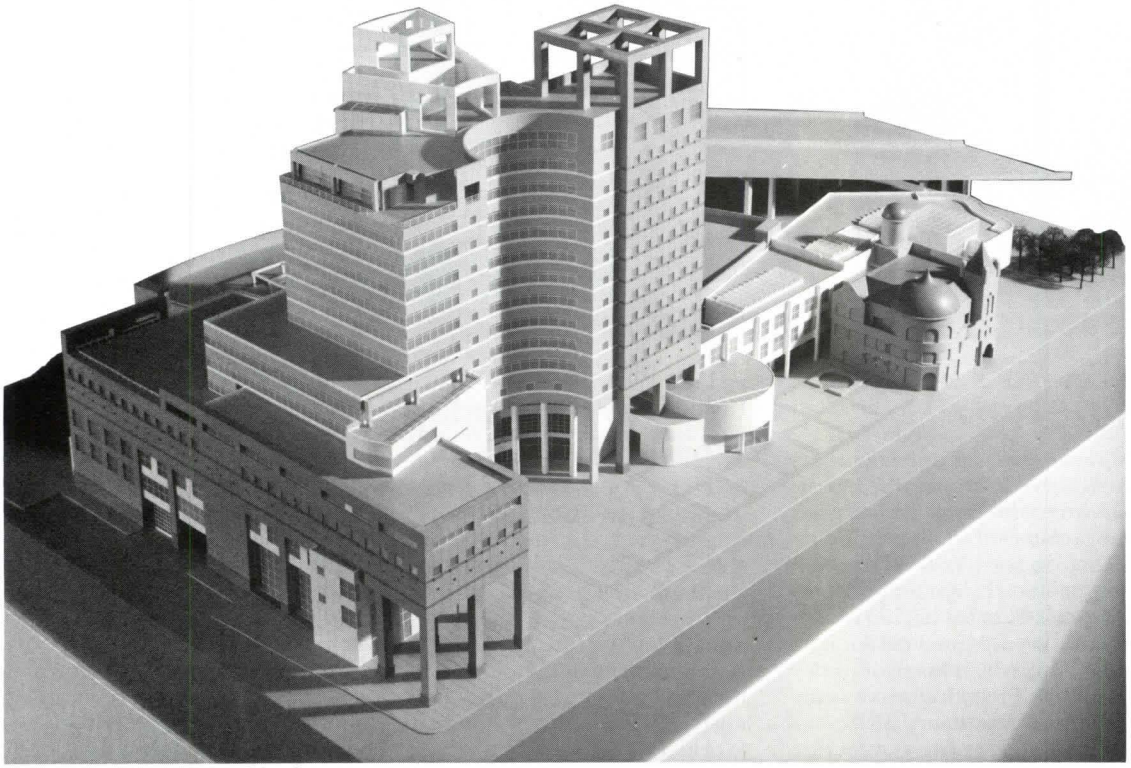
JG/62-63 auditorium chair
Architect: Edward Larrabee Barnes
Photography: Wes Thompson

Brochure, Planning Manual, and complimentary layout service available on request.

JG Furniture Systems, Inc.
Quakertown, Pennsylvania 18951
215.536.7343

Circle No. 361

P/A News Report



David Zinovenko

Bridgeport banking hall and headquarters.

Richard Meier's First Highrise: People's Bank in Bridgeport

Ground will be broken this summer for Richard Meier's first highrise, in downtown Bridgeport, Conn. The 15-story, 440,000-square-foot headquarters for People's Bank fills a difficult site adjacent to the elevated Connecticut Turnpike. Although its floor plates are continuous, the office building is articulated as a series of separate structures, buffered from the highway by an arc-shaped parking garage.

The main banking hall at the base of the tower's concave curve faces a public plaza; a second major entrance on the turnpike side will serve both the garage and pedestrians arriving from nearby bus, train, and ferry terminals. The complex will incorporate the existing onion-domed Barnum Museum (right in photo) which will be renovated and will gain increased space in the Center's adjoining low wing, which will also house a cafeteria and art gallery. ■

Pischall/Taylor

N.Y. residential tower over auction house.

Graves Designs Sotheby's Tower

Architect Michael Graves now has his first residential project in New York. His 34-story mixed-use development designed for Sotheby's, the international art auction house, takes advantage of air rights attached to the present four-story structure converted from a former garage on York Avenue and 72nd Street. This base is to be redesigned and a fifth floor added with expanded exhibition areas and additional viewing rooms. The sixth floor, where structural transfer occurs, will include an outdoor garden for sculpture exhibition, tennis and squash

(continued on page 26)

AIA Debate: Licensing

A nationwide campaign for the title registration of interior designers is forcing the American Institute of Architects to take a good hard look at licensing. A policy statement on the licensing of other professionals issued by the AIA last March and reaffirmed by its Board in July has been bumped back to the Design Commission, a top-level, in-house body, for review.

The Commission is now soliciting information from a dozen

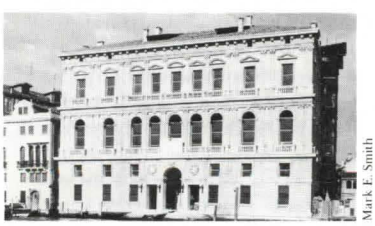
(continued on page 27)

AIA Debate: Energy/Research

With oil selling in early 1986 at $20 a barrel and falling, the AIA Board may have been prescient when it disbanded the Institute's national energy committee in late 1985. An AIA staff member refers to the move as "a transfer of concerns," suggesting that energy issues will find a home in the Institute's recently reformed Practice committee. To others, however, the move seems not only abrupt and somewhat unceremonious, but worrisome for what it signals about attitudes toward energy.

"It's not like there's peace in

(continued on page 36)



Mark E. Smith

Palazzo Grazzi in Venice.

Venice Futurism

On May 3, a new art center will open in Venice's Palazzo Grassi. Its inaugural exhibition, "Futurismo e Futurismi," is being organized by the center's artistic director, Pontus Hulten, and with 250 works culled from many countries, it is to be the largest Futurism show ever.

(continued on page 27)

Elements of Style.

There's more to SwirlFlo™ than meets the eye. Not only is Elkay's latest work of art beautiful, it has all of the innovative details you demand. SwirlFlo's recessed design creates a clean profile. And, unlike other fountains, it minimizes exposed surfaces that collect dust. At the same time a unique system, developed by Elkay, prevents water back-up and leakage. SwirlFlo's contoured basin minimizes splashing, is wheelchair accessible and meets all ANSI and UNFAS codes. And it comes with Elkay's exclusive FlexiGuard™ safety bubbler, to prevent accidental mouth injuries. SwirlFlo rounds out a full line of Elkay *water coolers* with six different models in bronzetone or stainless steel. See how one fits into your perspective.

ELKAY®

Model No. ERP2-8BC

For more information, write Elkay Manufacturing Company, 2222 Camden Court, Oak Brook, Illinois 60521.

Circle No. 335 on Reader Service Card

Licensing *(continued from page 27)*
who've used the title for one year previous to enactment of legislation), but it remains silent on the rights of architects in the field. (Only in Connecticut have architects been exempted from the provisions of the act and thereby permitted to use the label "interior designer.")

Title registration, however, isn't the real bugaboo for the AIA. "A title act has absolutely no meaning," says Design Commission Chairman Benjamin Brewer. It's nonexclusionary, meaning that anyone can still practice, without the title, and it's virtually unenforceable. But, asks Brewer, will the interior design profession stop at title registration? Or will they, and their peers in other specialized design professions, press eventually for practice acts, which are both exclusionary and enforceable? Schirn claims ASID has no intention of pursuing practice legislation. Donald Hackl, president-elect of the AIA, responds that the history of title registration in other fields—architecture included—suggests otherwise. More to the point, several states have provision *only* for practice acts, omitting title registration altogether. (Conversely, some states, most notably Texas, still have only title acts for architects. The State of Washington only last year passed a practice act for architecture, which includes an exemption for interior designers.)

Hackl personally is "not very high on title registration." Yet he recognizes the issue as one in which what's best for the profession may not necessarily correspond to what's best for the public at large. Architects have traditionally assumed that architecture encompasses all aspects of design, from doorknobs to urban districts. The public at large—or at least its legal watchdogs—might prefer a more concrete clarification of responsibility, and liability. "There's got to be a shake-down process," says Hackl, "establishing areas of overlap." The best course for the AIA now may be to clarify just what architects do, and what they do differently from other professionals in the design field. A consistent policy too seems key. Many local AIA chapters supported the landscape architects' ongoing drive for registration, successful in 39 states. A blanket policy that opposes the licensing of allied professionals thus may only damage relations, without affecting the outcome.

Daralice D. Boles ■

Rob Super

Fisher Winery, Santa Rosa, Calif.

Wood Awards

Three nonresidential buildings and seven houses have been honored in the third biennial American Wood Council's Wood Design Awards Program. Six projects, selected from 250 national entries, received Honor Awards, including the Wharton House, Nottingham, N.H. (Amsler, Hagenah, MacLean, Boston, Mass., architects); Shelly Ridge Girl Scout Center, Miquon, Penn. (Bohlin Powell Larkin Cywinski, Wilkes-Barre, Penn. See p. 119 and P/A, Jan. 1982, p. 81); House, Stony Creek, Conn. (Steven Izenour/Venturi, Rauch & Scott Brown, Philadelphia); The AWARE Shelter, Juneau, Alaska (The Miller/Hull Partnership, Seattle, Wash. See pp. 104–107); and the Fisher Winery, Santa Rosa, Calif. (William Turnbull Associates, San Francisco). Four projects received Citations, including: the Iooss residence, Montauk, N.Y. (Michael A. Geyer, New York); Fitzpatrick Residence, Pasadena, Calif. (Gilbert L. Hershberger, South Pasadena, Calif.); House, Westchester County, N.Y. (R.M. Kliment & Frances Halsband, New York); and Rosewalk Cottage Court, Seaside, Fla. (Orr & Taylor, New Haven, Conn. See P/A, July 1985, pp. 111–118). ■

Chunnel Passage

Not for the first time in the stormy history of Anglo-French relations, the governments of Britain and France have agreed on a project to link England with the continent. Unlike predecessor proposals dating back as early as 1751, this one looks as if it will be built: beginning in 1993, Great Britain will be accessible from France, and vice versa, by 31-mile-long, paired rail tunnels to be laid in the ground under the Channel, or Manche (sleeve) as it is called by the French. Stretching between Calais and Folkestone, the rails will carry high-speed passenger trains and railcars designed to carry automobiles and heavy freight. The $37 billion winning tunnel

(continued on page 30)

Chunnel *(continued from page 29)*
project is proposed by France-Manche and the Channel Tunnel Group, Ltd., an English-French construction consortium.

Travelers are promised that the new crossing, whether by passenger train or with automobiles parked on the "rolling road for cars," will take no more than 30 minutes, at a cost no greater than that of the present ferry service. Ferry workers on both sides of the water, apparently opposed to all schemes, called the decision "the end of cross-Channel shipping." But to anyone who has made the trip in the dead of winter, when rough waters prevent Hovercraft from running and ferries can take a sickening eight hours, this result may not seem so bad.

Thomas Vonier ■

Building and Book at the Buell Center

On February 28 and March 1, Columbia University's Temple Hoyne Buell Center for the Study of American Architecture held its first symposium *The Building and the Book: Architectural Publishing in America.*

The first session, *American Architecture through American Eyes: Book Trends and Economics, 1776–1986,* will likely be more valuable in transcript form than it was as a live experience. Most speakers mentioned the miniscule number of titles and small editions of architectural books throughout history, when compared with the total number of printed books in America. Only Victoria Newhouse of the Architectural History Foundation, who chaired the day's events, enunciated the reason, at least for the contemporary scene: how little money there is to be made in architectural books by authors, and how great the risk even for publishers.

While all of the participants provided some useful information, it was left to the final speaker, Spiro Kostof of the University of California at Berkeley, to breathe life into the proceedings, through both his delivery and his content.

Kostof's most valuable contribution, his wish list, "Needs I see," included histories of building construction; an economic model for American architecture; more work on neglected regions; a reappraisal of the period 1780 to 1850; and a history of urban forms (such as sidewalks).

Two areas were either ignored in the session or barely touched *(continued on page 32)*

Making more elevators makes Dover No. 1.

Major projects like this one—the Energy Centre in New Orleans—have helped make Dover the best-selling elevator in America.

In this busy 39-floor building, 18 Dover elevators are equipped with computerized Traflomatic® controls that minimize response time. The 7-floor parking garage and freight service needs are met with four additional Dover elevators.

Dover's vast and varied experience is yours to call on. For help on any project or more information, call your local Dover office.

Or write Dover Elevator Systems, Inc., P.O. Box 2177, Memphis, Tennessee 38101.

Energy Centre
Owner:
Lincoln Property Company
Architect:
Harwood K. Smith & Partners
Contractor:
Gervais F. Favrot Co., Inc.
Elevators sold and installed by Dover Elevator Co., New Orleans

DOVER®
ELEVATORS

Book *(continued from page 30)*
upon. While architectural photographer and bibliographer Richard Creek spoke about pre-1940 promotional literature, no one pursued the relationship between promotional and architectural values. And there was a total lack of discussion about the influence of the two-dimensional printed image upon three-dimensional built work.

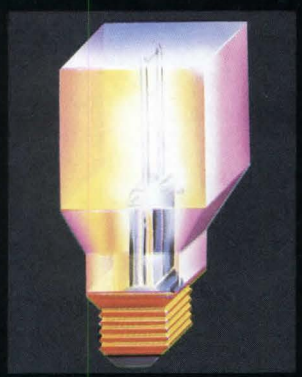
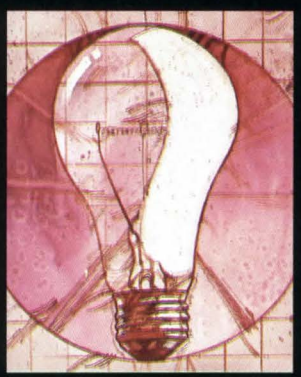
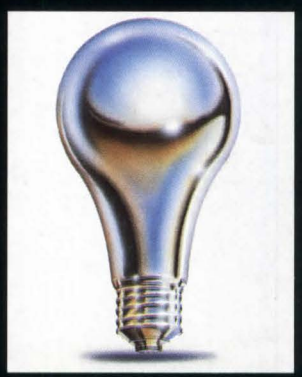
During the day-long Saturday session chaired by Suzanne Stephens, 11 papers were presented that chronologically traced the history of architectural publishing in the magazines and journals from the 1850s. All of the papers proved exhaustive scholarship, but some seemed content to outline trends and facts without framing analyses or drawing conclusions. Those presentations proved Thomas Bender's assertion that the present architectural publishing establishment no longer connects architecture to larger political, social, and cultural concerns, as did the writings of Lewis Mumford and Ada Louise Huxtable. The seeds for this attitude were nourished, he said, by the publication of such books as Hitchcock and Johnson's *The International Style* of 1932, which could look at Modern architecture mainly as a style, and Giedion's *Space, Time and Architecture* of 1941, which "tightened the discourse of architecture, making it self-referential."

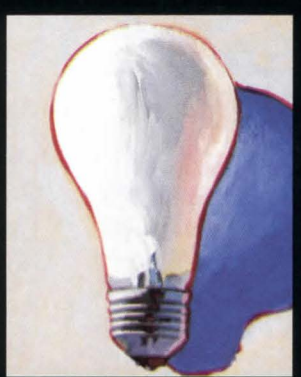
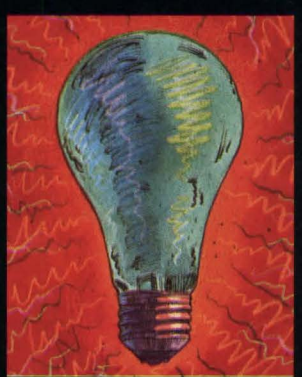
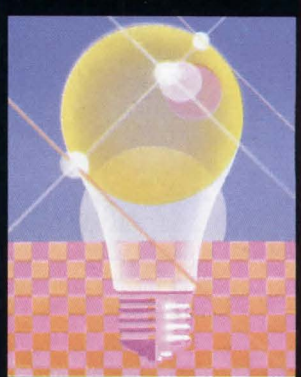
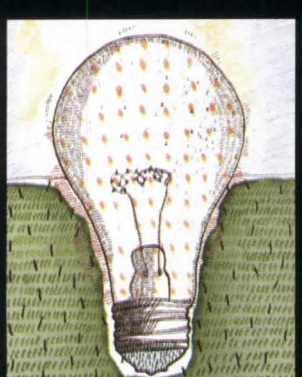
After Suzanne Stephens delivered a lively and very informative exegesis of the recent years of the professional press, analyzing the similarities and differences between the three major publications, Thomas Hines took on Tom Wolfe's *From Bauhaus to Our House*, concentrating on the reviews that understood the book primarily as an exposé of "The Compound." The author confirmed that had the original title *Inside the Compound* been used, subsequent confusion could have been avoided.

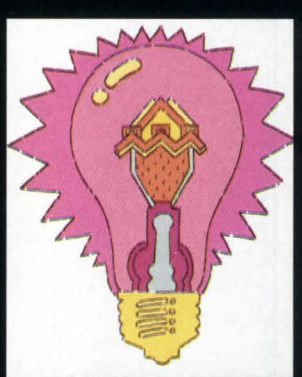
This was an ambitious first program for the Buell Center, and the fact that it dealt with publishing can only mean that this center devoted to the study of American architecture finds that of prime importance. Although, as Stephens pointed out, the major professional publications are becoming increasingly more homogeneous, this conference warned that, unlike in other fields, the strengths in architectural publishing traditionally have been in diversity.

David Morton, Susan Doubilet ■

C A L L F O R E N T R I E S




No matter how bright the idea, no two people will interpret it in exactly the same way. Consider, for example, the idea of using polyvinyl chloride (PVC) as an architectural material. More familiarly known as vinyl, PVC's light weight, durability and flexibility make it adaptable for a variety of applications. But how it can be used is what makes it exciting.

That's why we're sponsoring a design competition for new uses of PVC in architectural applications. Interior or exterior, structural or decorative, original or retrofit.

Our national competition is open to all architects, designers and architectural students interested in creating designs for PVC products. Team submissions will be accepted. The creator of the winning design will be awarded a $1,500 honorarium. Two honorable mention winners will each be awarded with a $500 honorarium.

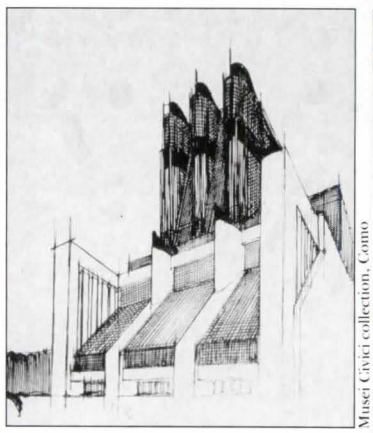
Turn your interpretations of PVC as a building material into bright ideas.

For more information and competition guidelines, circle the reader service card number or write to:

Wolverine Technologies Inc.
Design Competition
P.O. Box 1864
Ann Arbor, MI 48106

Wolverine Technologies Inc.

Circle No. 416 on Reader Service Card



Musei Civici collection, Como

Study for a power station, 1913.

Sant'Elia: How the Future Was

The work of Italian architect Antonio Sant'Elia (1886–1916) is the subject of a traveling show, now at the Farish Gallery, Rice University, Houston, through April 19. Originating at the Cooper Union in New York in February, the show will eventually move to New Haven (Yale University Art Gallery) and Miami (Lowe Art Museum) in the fall. Other stops are as yet undetermined. Curated by art historians Dore Ashton and Guido Ballo, *Antonio Sant'Elia* brings together over 80 important drawings for the first time in the United States.

Sant'Elia's stature as an important figure of the early 20th-Century avant-garde has always been subject to lively debate among Italian art historians; the slender body of work and small number of sketches that survive have led them to question his importance. Even the polemical aspects of the work have come under attack; some charge that F.T. Marinetti, the chief Futurist agitator and theorist, was the actual author of the Manifesto of Futurist Architecture, and that Sant'Elia was a mere figurehead.

The main English language studies of Sant'Elia's work up to now are chapters in general histories by Reyner Banham and Kenneth Frampton, which mainly synthesized Italian sources. The catalog essays by Ashton and Ballo do much to bring those interested up to date on current scholarship, and subject Sant'Elia's reputation to an extensive reevaluation.

The show's significance is therefore its academic accompaniment—the scholarly catalog. This is not to imply that the drawings themselves are not well worth seeing; they have an astonishing visionary quality that the hindsight of 20th-Century urban experience cannot dilute.

Joanna Wissinger ■

STEP UP TO E SIZE

Houston Instrument's new E size DMP-56 delivers the precision, throughput, and reliability you require from a drafting-intensive plotter. The DMP-56 also gives you the flexibility to handle 18 different drawing format sizes ranging from 8½ × 11 inches to 36 × 48 inches.

The DMP-56 was designed for any application calling for crisp, clean graphics—whether it's architectural floorplans, mechanical designs, electrical schematics, or overhead transparencies. Because of its media-size adjustment mechanism and automatic media-size sensing feature, the DMP-56 quickly and efficiently responds to your changing format requirements. This high-performance plotter can produce standard (A through E), metric (A4 through A0), oversize (A4 through A0), and Architectural C, D, and E drawings.

The DMP-56 is a professional drafting plotter that draws on the established track record of Houston Instrument's very successful DMP-51/52 and DMP-51/52 MP plotters—plotters that redefined the standard for price, performance, and quality.

Immediately compatible with hundreds of computer-aided design and graphics software packages through our powerful DM/PL™ command language, the DMP-56 also gives you a precise resolution of .001 inch and a maximum plotting speed of 17 inches per second. And, because it uses a standard RS-232-C compatible interface, the DMP-56 can operate with virtually any computer on the market.

The DMP-56 also delivers features you'd expect only from more expensive* plotters—such as quiet servo drive, and an easy-to-use front-panel control. Combine these standard features with the well-known Houston Instrument reliability and support and you have a superior plotter at a reasonable price.

In terms of throughput, performance, price, and quality the DMP-56 is the professional graphics tool you need. For more information, call 1-800-531-5205 (512-835-0900 if in Texas), or write Houston Instrument, 8500 Cameron Road, Austin, Texas 78753. In Europe, contact Houston Instrument, Belgium NV., Rochesterlaan 6, 8240 Gistel, Belgium. Tel.: 32-(0)59-277445. Tlx.: 846-81399.

*U.S. suggested retail price is $5,995. Pricing subject to change.
DM/PL is a trademark of Houston Instrument.

houston instrument
A Division of AMETEK

Circle **No. 359** on Reader Service Card

Energy *(continued from page 25)*
the Middle East, that the U.S. is totally energy independent, or every building is now energy efficient," said one former energy committee member, stressing his view that the AIA needs to maintain a strong emphasis on conservation and renewable energy resources.

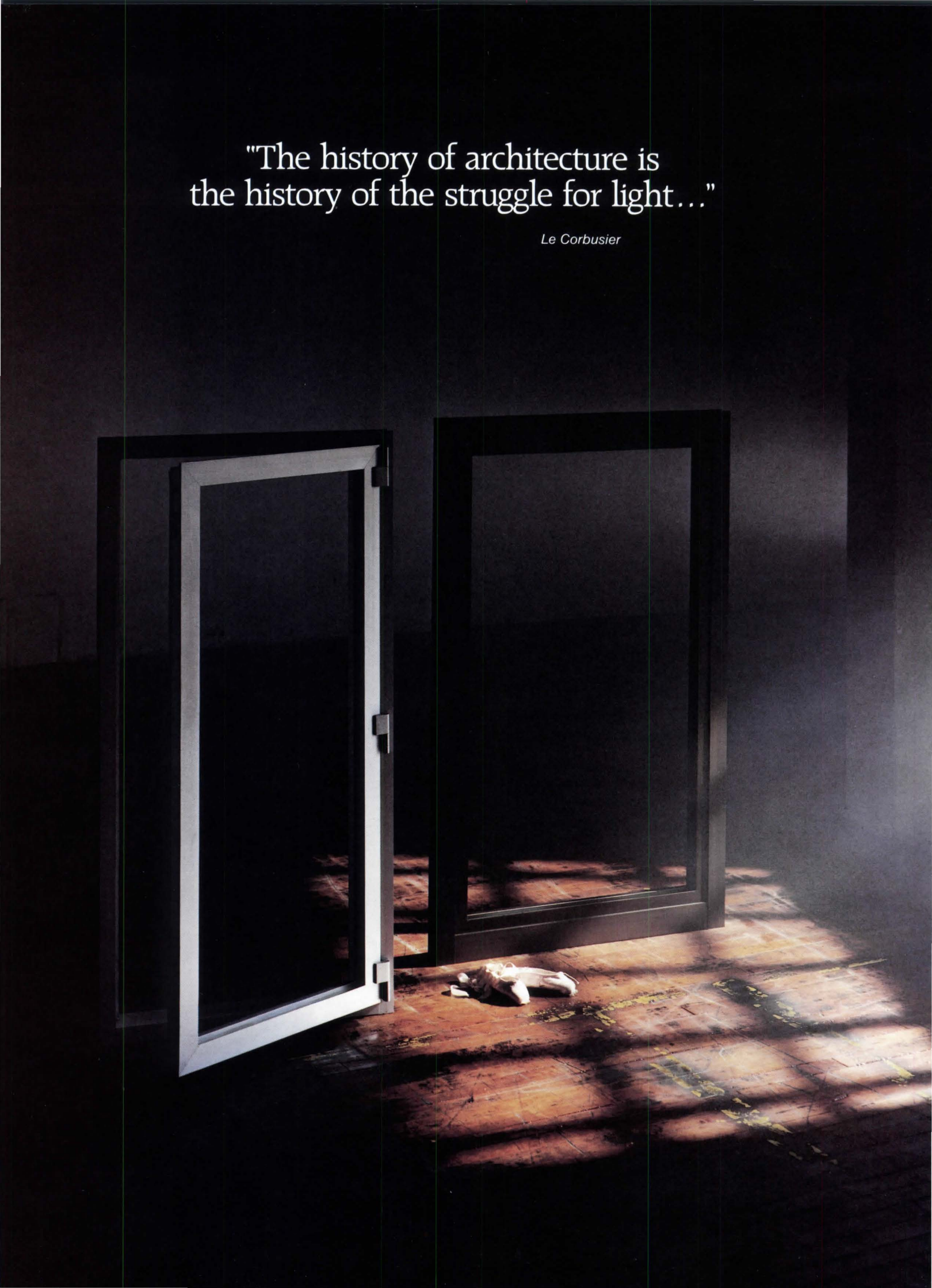
Federal Department of Energy staff members are alarmed by loss of the committee. DOE has battled for conservation and solar research funding each year since 1981. The department again faces massive budget cuts. Some DOE staffers wonder privately whether the AIA, which has been a strong proponent of DOE conservation and solar programs on Capitol Hill, will continue to voice its crucial support in Congressional hearings.

Rallying this support without the committee will clearly be much harder. The AIA plans to fund one person to serve as "energy liaison" to a "practice technology" task group, one of five subgroups within the restructured Practice Committee. However, there will no longer be an AIA staff person identified as having responsibility for energy programs. The AIA member asked to serve in the liaison capacity, who had not yet accepted as of this writing, calls the role a caretaking assignment.

The demise of the energy committee comes at a time when the AIA's overall involvement in research is also in transition. New leadership and staff changes at The AIA Foundation, which had grown into a major research enterprise, have resulted in a shift of emphasis toward public membership and outreach programs. The AIA board is considering a proposal to form an architectural research council with the Association of Collegiate Schools of Architecture. Independently, but with some of the same rationale, the American Consulting Engineering Council has recently proposed joining forces with the AIA to form a design professionals research corporation.

It is not known how or when the AIA board will act on these matters, but architects, educators, researchers, and research funding agencies are watching developments closely. They are anxious to avert retreat and keen to see that changes build on progress made by the AIA over the past decade in architectural research.

Thomas Vonier ■


"The history of architecture is
the history of the struggle for light..."
Le Corbusier

Lighting the way to tomorrow.

Today, windows are a bigger part of architectural design than ever before. That's because design is a bigger part of windows.

Kawneer's window line includes both Thermal and Non-Thermal models. Vertically and horizontally pivoted. Inswinging and outswinging casements. Projected, top-hinged, fixed and high performance windows. Kawneer has them all. To open design opportunities. To open minds.

And Kawneer windows are not only constructed to meet AAMA performance standards, but standards much higher. Our own.

Kawneer windows. They let you look at your design in a whole different light.

Kawneer

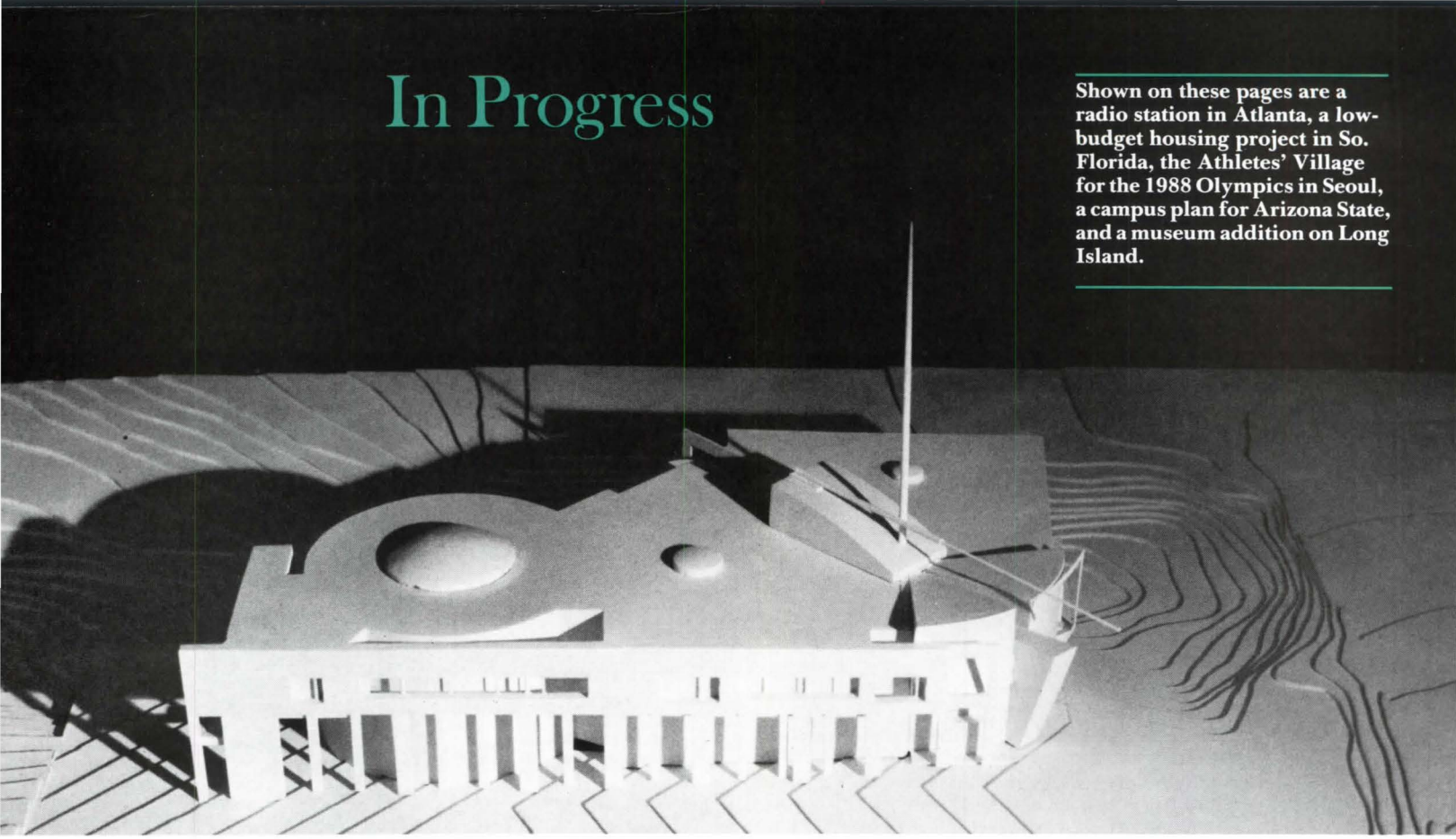
The Designer's Element

For full technical description, tracing details and specifications, contact your Kawneer representative or write to: Kawneer Company, Inc., Department C, Technology Park-Atlanta, 555 Guthridge Court, Norcross, GA 30092.

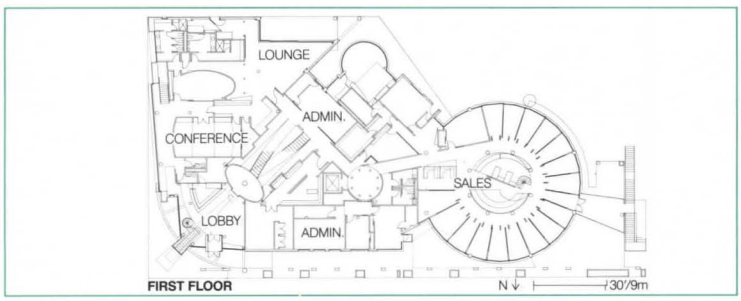
Circle No. 426 on Reader Service Card

In Progress

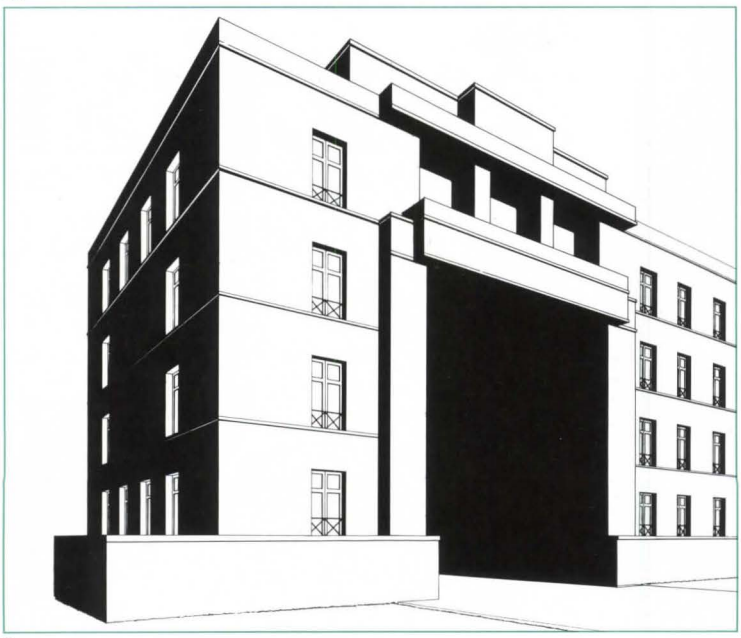
Shown on these pages are a radio station in Atlanta, a low-budget housing project in So. Florida, the Athletes' Village for the 1988 Olympics in Seoul, a campus plan for Arizona State, and a museum addition on Long Island.



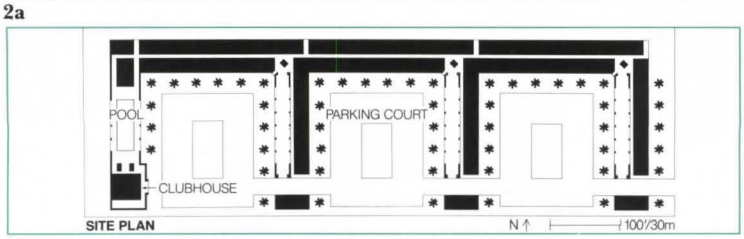
1a



1b



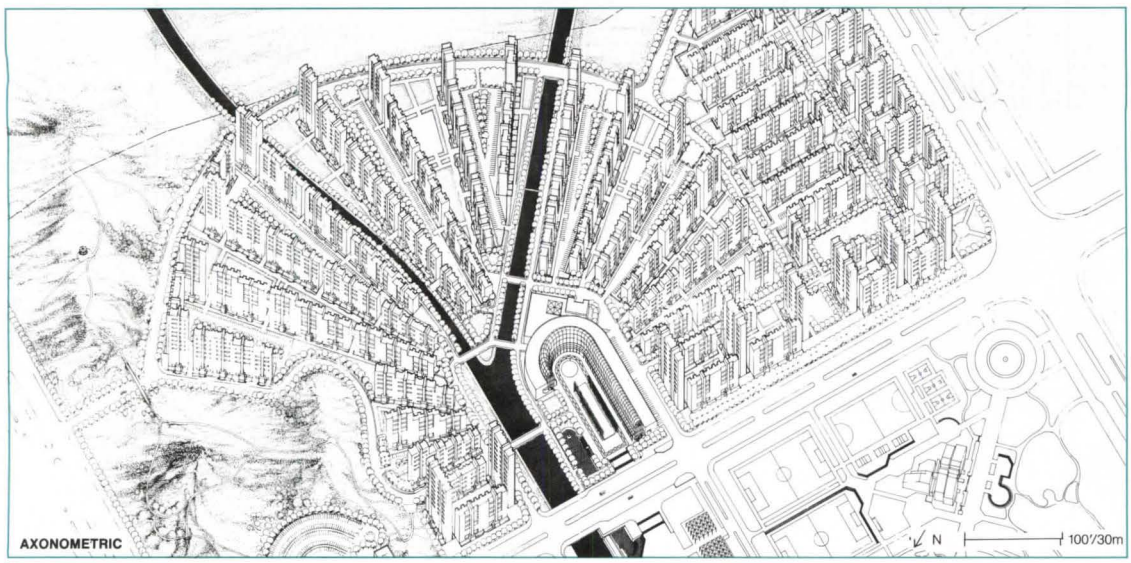
2a



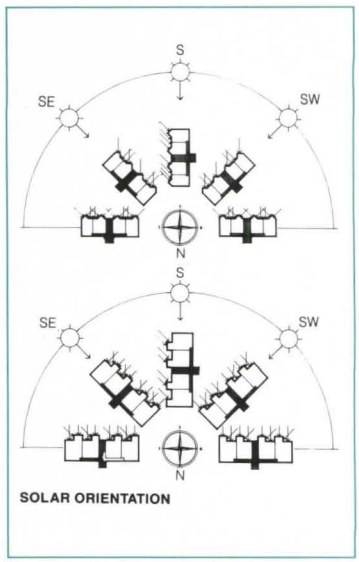
2b

1a, b WQXI Radio Station, Atlanta, Ga. *Architect: Parker & Scogin, Atlanta, Ga.* The number-one radio station in Atlanta is, say the architects "of dual personality . . . on the one hand, an all-energy, on-the-air emporium; on the other, a stable and highly lucrative business." Their building attempts to be both, with the flat, street façades punctuated by broadcast studios set over a corner entrance. The three-story, 34,000-square-foot headquarters also deliberately enforces the kind of spontaneous interaction that occurred in the former, cramped one-story station through the use of intersecting corridors, diagonal central stairs, and stacked, interpenetrating spaces. The structural steel frame is clad in brick veneer; construction is to be completed in spring, 1987.

2a, b The Williams, Hialeah, Fla. *Architects: Andres Duany & Elizabeth Plater-Zyberk, Architects, Miami.* These 270 rental apartments are organized in three L-shaped buildings, each providing a portal to parking courts within. The long entrance axis terminates in a clubhouse and pool. Economy of construction (stuccoed concrete block bearing walls) and simple repetition permit a low construction cost of $26 per square foot, despite certain grand features: 10-foot ceilings and mahogany exterior doors throughout, and exterior arcaded lobbies 140 feet long. The first building will open in September.

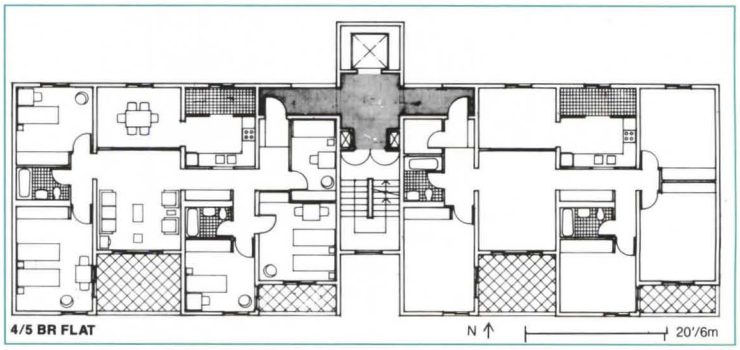


3a



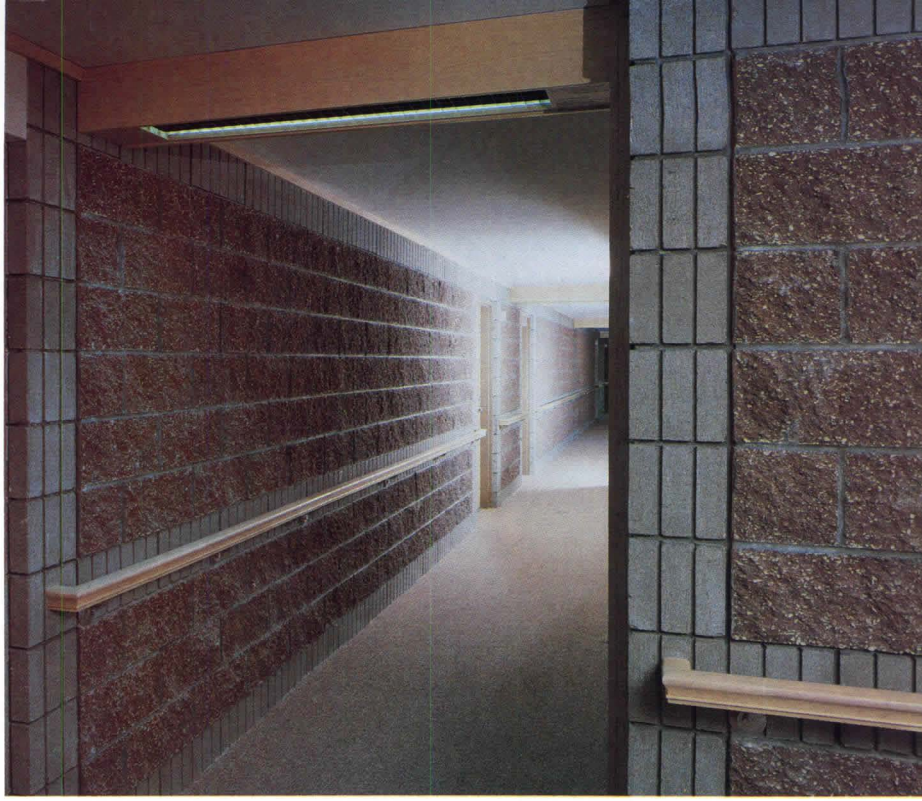
3b

3a-c 1988 Olympic Athletes' and Reporters' Village, Seoul, Korea. *Architect: Woo & Williams, Cambridge, Mass.* Selected through an international competition, the Olympic Village houses 13,000 athletes, 7000 reporters, and 2000 service workers in 5700 units. The fan-shaped athletes' village, which terminates the main north-south axis of the adjacent Olympic Park, focuses on a central dining and recreation building to be converted to a shopping arcade after the games. The reporters' village follows the orthogonal grid of adjacent streets. The units themselves are organized as three-, four-, and five-bedroom duplexes or flats with deep, two-story balconies that take the place of courtyards in traditional housing. Sites have been set aside for future schools, churches, and other public structures when the village is converted to a community.



3c

Overall view of the structure showing the adaptability of concrete masonry to "period" architecture. Featured in the facade are split face concrete masonry integrally colored burgundy, gray scored units and accents of "waffle" block and glazed face units in blue and green.



The building layout responds to seismic design requirements. The concrete masonry interior corridor bearing walls act as a shear wall in the longitudinal direction. The same burgundy colored split face concrete masonry and gray scored units used for the exterior provide design continuity.

Discover the Concrete Masonry Advantage

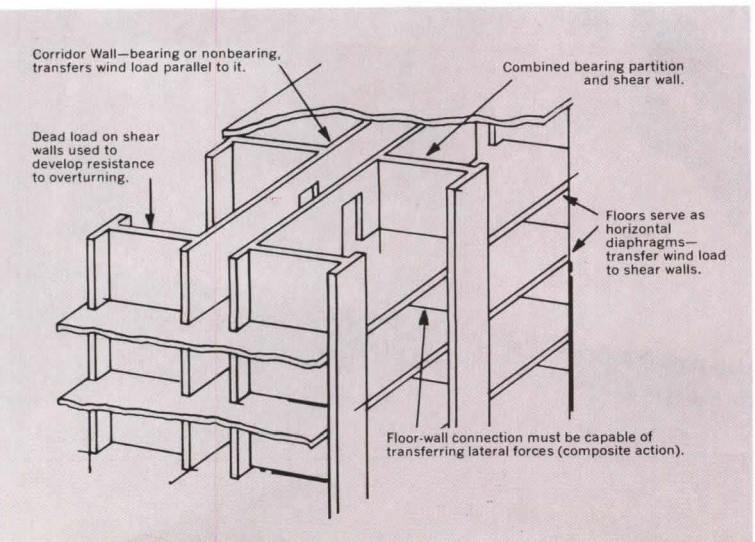
for loadbearing multi-story construction.

Eads Square Apartments, St. Louis, Missouri, features loadbearing concrete masonry construction, fire safety, sound control, aesthetics, energy saving, low construction and insurance costs.

Project facts: Owner, St. Louis Volunteers of America Elderly Housing, Inc.; Architect, Henderson Gantz Architects; Engineering Consultants, William C. Carr, Inc., Structural; Financing, U.S. Department of Housing & Urban Development; Site area, 1.1 acres; Masonry cost $8.57 psf (based on 44,000 sq. ft.—30,000 sq. ft. for exterior walls, 14,000 sq. ft., interior walls. Cost includes materials, labor, cleaning & sealing).

This uniquely designed home for the elderly in an historic neighborhood was created with 19 different concrete masonry units. The 76,000 sq. ft. facility is loadbearing concrete masonry construction. The architects comment, "The use of concrete masonry was cost effective. The use of the loadbearing concrete masonry building system reduced the number of trades involved with major structural work. The decorative block allowed its use as a structural and finish material at the same time. The choice of concrete masonry gave us a tremendous flexibility in the design of the facade."

Check our insert in Sweet's Catalog.



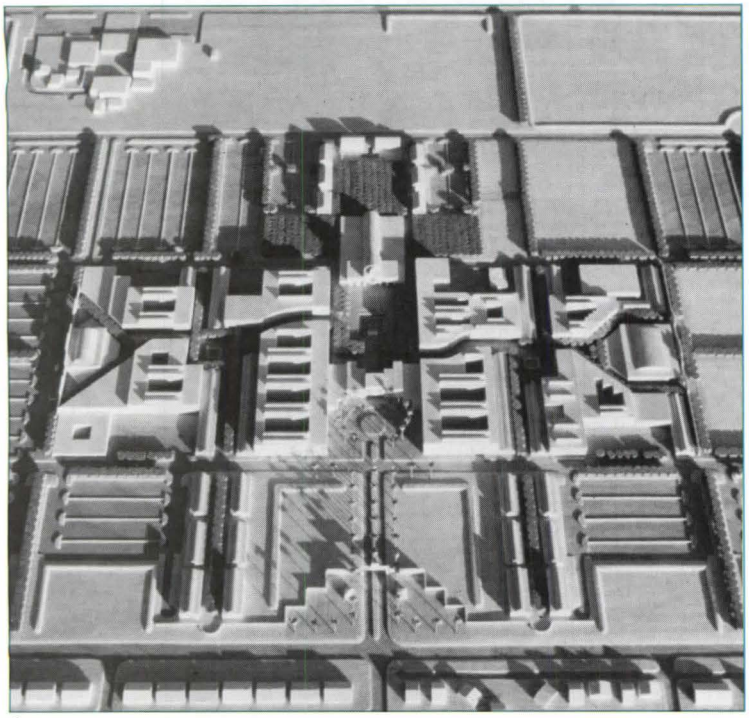
NATIONAL CONCRETE MASONRY ASSOCIATION

Marketing Department
National Concrete Masonry Association
P. O. Box 781
Herndon, Virginia 22070

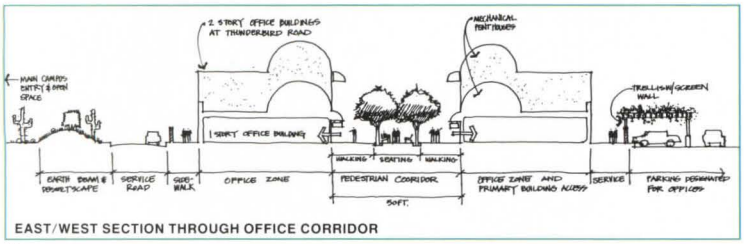
Send me further information on firesafe, loadbearing concrete masonry construction.

Name _____
Firm Name _____
Address _____
City _____ State _____ Zip _____
Phone _____

Circle **No. 382**

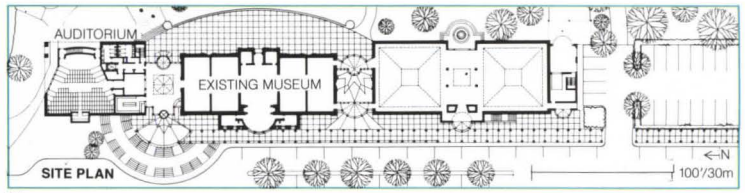


4a



4b

5a



5b

4a, b Arizona State University West campus plan, Phoenix, Ariz. *Architect: The NBBJ Group, Seattle, Wash.* This mixed-use satellite commuter campus in northwest Phoenix is to be built in phases, growing by the 1990s to accommodate 10,000 students. Developer-built office, retail, and market housing totaling 300,000 square feet will complement 1,000,000 square feet of academic buildings. The central square is formed by the library to the south (Anderson, DeBartolo, Pan, Tucson, architects), the main administration building to the north, and four-story, arcaded academic buildings east and west. An east-west main street curves out from the square to secondary plazas where it intersects north-south shopping streets lined with one-story retail. Infrastructure work is now under way.

5a, b Heckscher Museum of Art Additions, Huntington, New York. *Architects: Centerbrook Architects, Essex, Conn.* Two additions to either side of the existing Neo-Classical Heckscher Museum will more than double its available exhibition space. Included in the program are 7300 square feet of exhibition galleries, a museum shop, administrative offices, sculpture court, and 154-seat auditorium for community use, totaling 18,000 square feet.

At Fuddruckers Restaurants, the beef is tender and the floors are tough.

DURA-PAVERS 25 YR Guarantee

Running a successful restaurant means keeping food quality high and overhead low. And that's exactly what the management of Fuddruckers Restaurants had in mind when they began looking for a floor covering for their main dining rooms. They wanted an attractive surface that was tough enough to save them from dishing out $1,000 a month to a janitorial service for stripping, waxing, and buffing.

What they got was a floor that will pay for itself in one year in maintenance alone. Dura-Pavers by IAC. The world's first ceramic tile that can deliver the durability commonly associated with quarry tile, along with the beauty, stain resistance, and easy care of glazed tile. And the only tile that carries a 25-year guarantee against wear.

12 x 12 Dura-Pavers in Coffee and Aspen create a distinctive checkerboard.

THE PROOF IS IN THE PROCESS.

Dura-Pavers represent the state-of-the-art in glazing technology. A process we call Dura-Blending℠ gives these tiles an unequaled wear-resistant surface. They have the highest hardness rating of any American-made glazed tile — 9.0 on the Mohs scale (a diamond, the hardest substance known to man, rates 10.0). What's more, IAC Dura-Pavers never need sealing, stripping, waxing, or buffing. And their skid-resistant finish makes them ideal for areas where slippage is a concern.

CALL FOR YOUR FREE SAMPLE KIT TODAY.

When your projects demand floor tile that goes beyond durability, make the only choice. IAC Dura-Pavers. Made in America and available through more than 160 distributors nationwide. For a free Dura-Pavers sample kit and the name of your nearest IAC distributor, write to us at P.O. Box 6600, Tulsa, OK 74156, or call toll-free 1-800-331-3651.

iac LAUFEN

IAC Ceramic Tile. Made in America. And Made to Last.

Circle No. 360

Harbo Lites

With Sunglas® HP Reflective gl over 30 solar management glas

The Hotel Inter-Continental is a glass-clad high-rise tower, designe nautical silhouette to give every gu view of the San Diego Harbor and obstruction of the harbor's view from downtow San Diego.

The glass of choice is Sunglas HP Reflective — used here with a durable silver coating applied to clear glass for 8% nominal light transmittance. This version (S1-08) provides a subtle reflectance of the harbor's ever-changing color as well as a reduction in the hotel's air conditioning installation and operating costs.

Sunglas HP Reflective is part of Ford's Sunglas family — a family of over 30 different solar management glasses with colors and shading coefficients for virtually any application. All Sunglas HP Reflective products are also backed by Ford's ten-year coating warranty.

The next time you specify reflective glass, specify the total performance and versatility of Sunglas HP Reflective by Ford and see the lite. For Quality, variety, and availability in solar management glass — Nobody outglasses Ford.

For more information call: 1-800-521-6346
(In Michigan call collect: 1-313-446-5915)
(In Canada call: 1-416-363-7561)

Owner: Torrey Enterprises, Inc.
Architect: Hope Consulting Group

Ford GLASS DIVISION

Circle **No. 338** on Reader Service Card

Bold, blue hues of twilight. Timeless beauty. Dignified, mysterious, delightful. The essence captured by Spectrum Glass Products in new Vari-Tran® 300-Series coated glass. Vari-Tran Sapphire Blue on Clear. High-performance solar control glass to reflect the sun's rays, minimize solar heat gain, reduce air-conditioning equipment and operating costs. New Vari-Tran 300-Series Sapphire Blue. Art and function blended. Awaiting imaginative architectural expression. Capture it yourself. Spectrum Glass Products. Clinton, NC 28328, (919) 592-7101.

SPECTRUM
GLASS PRODUCTS
DIVISION OF H.H. ROBERTSON COMPANY

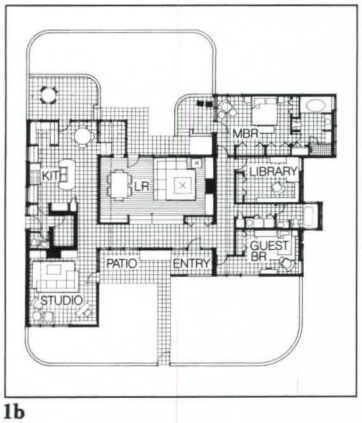
Circle **No. 400** on Reader Service Card

Energy Portfolio

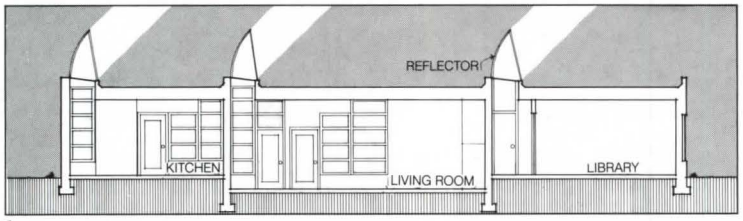
Energy conserving buildings can take many forms. These three houses show a range of formal possibilities, from that of the International Style to that of vernacular building.

Photos: Robert Reck

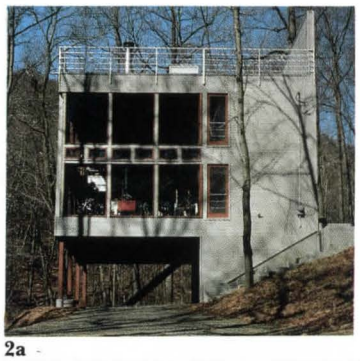
1a



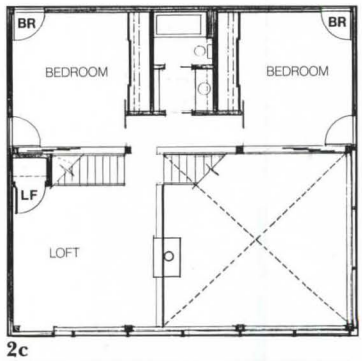
1b



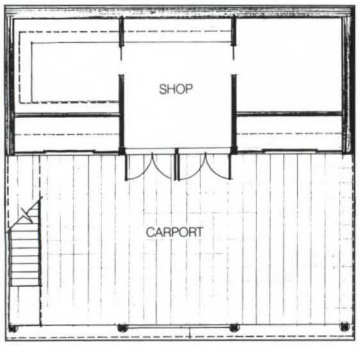
1c



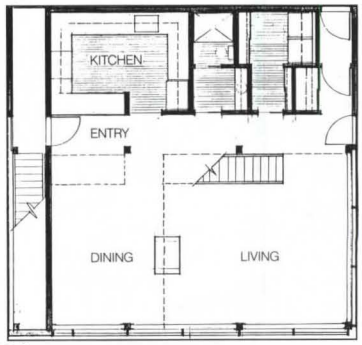
2a



2c



2b



2d

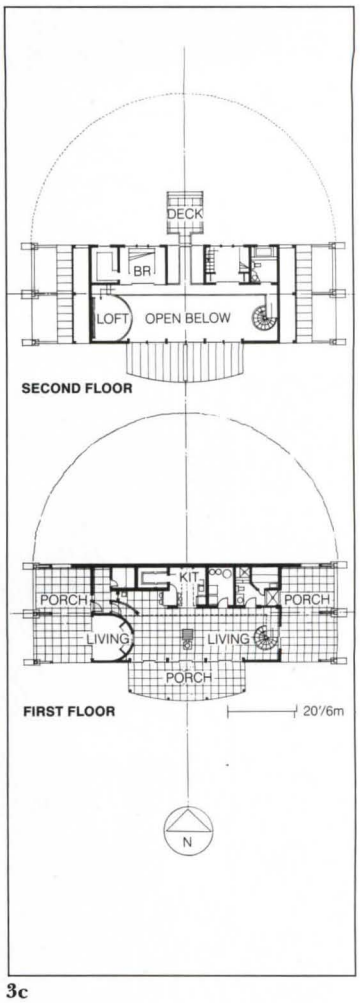
1a-c Sawyer Residence, Albuquerque, N.M. *Architect: Don Felts and Associates, Albuquerque.* The intense sun and daily temperature swings in the desert demand that glass be shaded and that construction be massive. In this Albuquerque, N.M., house, Don Felts and Associates have met both demands with considerable skill. Mass walls run east-west through the H-shaped structure. On the south-facing elevation, a trombe wall stores daytime heat for release at night. Parallel skylights, with curved movable reflectors, run the length of three other mass walls within the house. In the summer, the reflectors shade the skylights and, throughout the year, bathe the interior with daylight. Stepped windows on the east and west elevations visually anchor the ends of the skylights and lighten the building's blocky, stuccoed mass. The result is a building that is both indigenous and inventive.

2a-d Van Teeckelenburgh Residence, Northern New Jersey. *Architect: M. Stephen Zdepski, Newark.* Modernists such as Le Corbusier and Gropius paid close attention, particularly in their early work, to solar orientation and wind direction. Architect M. Stephen Zdepski recalls that tradition in this New Jersey residence, using elements of the International Style—pilotis, freestanding walls, an open plan and roof garden—to enhance the building's thermal performance. The pilotis raise the living areas above the sloping site to take advantage of the prevailing summer breezes. Largely solid north-facing walls screen the house from the winter winds. Inside, the free plan allows cross ventilation, while window insulation, combined with a high mass floor in the south-facing living room, controls daylighting and thermal storage. The roof garden, with an R-value of 54, further insulates the house. Zdepski shows that Modernism is alive and well and as environmentally responsive as ever.

3a-c Anderson Residence, Bristol, Vt. *Architect: John Anderson, Bristol.* Like the modern cow barns often seen in upper New England, architect John Anderson's own house has a roof of laminated wood arches. Spanning 50 feet in an east-west direction, those arches allow the south elevation to be largely glazed as determined by the amount of heat needed to charge the living room's plastered block walls and slate-topped concrete slabs in winter. (A removable awning shades the glazing in summer.) The long span structure also allows an open interior which, along with operable windows and sliding doors, facilitates cross ventilation. An earth berm insulates the house's north face and gives access to its second-floor entry. (Inside the entry, a bridgelike walkway gives access to the bedrooms and, via a circular stair, to living and service spaces.) And a wood stove heats the interior of the house as well as a water pipe used to back up the rooftop solar panels during cloudy weather. If the inspiration for the house came from the local barn vernacular, its image is that of some streamlined vehicle, not inappropriate for a house so efficient.

3a

3b



3c

IT'S NOT JUST WHAT YOU SAY, IT'S THE IMPRESSION YOU LEAVE BEHIND.

The way your work looks can make or break your presentation. Give your reports, plans, and proposals the perfect "final touch" by dressing them in GBC Professional Binders.

Book-quality GBC Binders provide the professional distinction and importance your work deserves. Your reports will look as if you sent them to a bindery. But your affordable GBC system works right in your office, in a space small enough for a typewriter!

Believe it or not, GBC Professional Cover Sets actually cost about the same as inexpensive "office supply" folders. Select hard or soft, customized or plain, textured or smooth, and choose from an array of colors. We'll help you find the look that's right for you.

As a first step, simply mail the coupon or call 1-800-DIAL-GBC. You'll discover how GBC Professional Binders will help you make a powerful and lasting impression.

GBC®

FREE BOOKLET

Please send "How to Dress Up Your Reports & Presentations," including details on how GBC binding systems can help me make the best impression possible.

Name (please print)

Company

Staple business card here and mail.

Address

City State Zip

( )
Phone

Call toll-free 1-800-DIAL-GBC
Or clip and mail to Jenny Van Treese,
One GBC Plaza, Northbrook, IL 60062

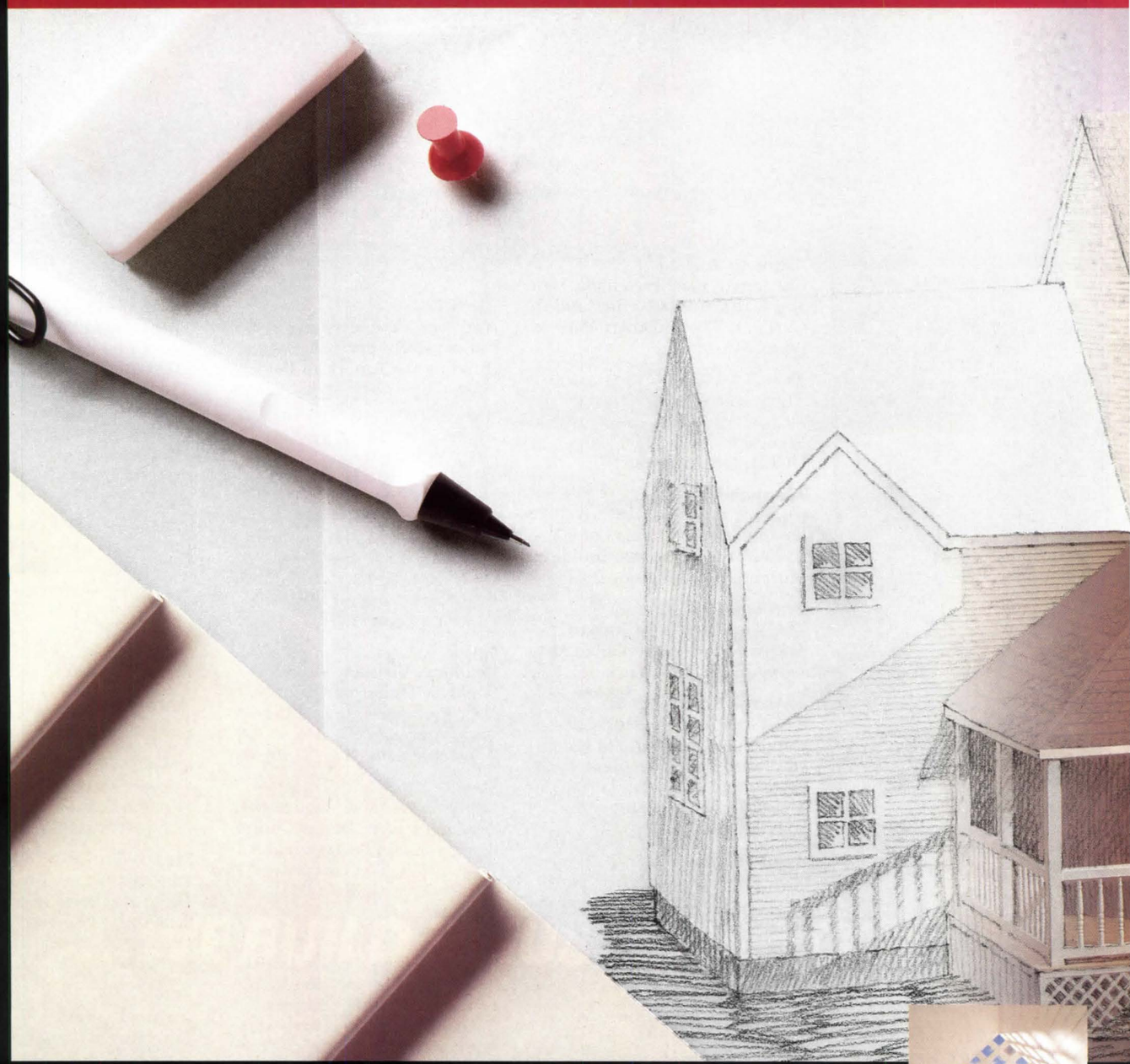
PA-PA-04P

Circle **No. 344**

PITTSBURGH pc CORNING

Circle No. 386

Introducing Restoration® Vinyl.



Everything You Thought Vinyl Could Never Be.

The Restoration Collection includes beaded panel and lattice.

Used to be, vinyl siding looked like, well, vinyl siding. Most architects probably thought that this would always be the case. Not so.

Now there's Restoration solid vinyl siding. Restoration looks like real painted wood. You have to see it to believe it.

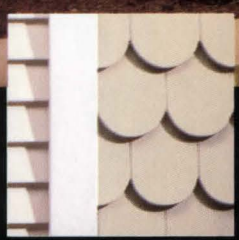
Budget and aesthetics often pull at a design from opposite directions. When a client not only wants the appearance of painted wood, but also the economy and durability of vinyl, Restoration solid vinyl siding provides the balance. It has all of the advantages of vinyl – lower cost, durability, low maintenance; plus all the aesthetic

This Old House

As seen on "This Old House."

advantages of real wood.

Through sophisticated technology we've achieved a smooth low gloss finish on a panel that's guaranteed to last a lifetime.* To provide flexibility, we've created the Restoration Collection, a full line of architecturally accurate vinyl accessories.



Finishing touches like Restoration Collection fish scale.

Faithfully detailed window moldings, trim and this extra wide corner post.

For more information on the entire Restoration Collection call **1-800-521-9020 (in Michigan, call 313-386-0800).**

After all, seeing is believing.

RESTORATION COLLECTION™

Enduring Appearance, Uncommon Economy.

*A copy of the warranty is available by writing Wolverine Technologies Inc., 1650 Howard Street, Lincoln Park, Michigan 48146.

Circle No. 415

MARVIN WINDOWS SELL ANY HOUSE. NO MATTER WHAT SHAPE IT'S IN.

SOLD

If this is the sign of success in your business, then consider that more and more signs are pointing to Marvin Windows as the window of choice in distinctive home designs.

Not just because we have higher standards than other window companies. Which we do.

Or more standards, which we do. (In fact, we have over 5,000 standard sizes or we'll custom build to your specifications.)

But because we *set* many of the standards now found throughout the industry.

THE WINDOW THAT LASTS HAS A HISTORY OF FIRSTS.

You should know that Marvin was the first national manufacturer to offer Round Top windows.

We were the first major manufacturer to offer Trapezoids and Triangles as complete units.

The first manufacturer to ship factory-installed extension jambs and completely assembled set-up windows.

First to bring wood bead glazing to the market on a

national scale.

First with its own nationwide trucking fleet, cutting delivery time from weeks to days.

We were the first to offer Low-E glass on its entire line.

And the list goes on.

WHY NEW IDEAS TAKE SHAPE FIRST AT MARVIN.

When you make a window to order, and word gets around, you start getting some pretty wild requests. Like factory applied jamb extensions that are 20" wide. Or Round Tops that are eight feet across.

All of which get our research guys thinking on an even bigger and grander scale.

But as our list of innovations shows, they're not just thinking shapes and sizes.

Up here in Warroad, temperatures can plunge to 40° or 50° below. So we've been building triple-glazed, double weatherstripped windows for a long time. And living with them comfortably through freezing winters and blistering summers. Because every window is made to order, we're able to offer state-of-the-art manufacturing and options, like deep-treated vacuum penetration processes for protection against rot and decay, and different metal and Polycron® finishes for maintenance-free exteriors.

FIRST IN AVAILABILITY AND SERVICE, TOO.

Of course you can't sell any shape house if your windows haven't arrived on time. So we had another innovative idea: no matter what size, no matter what options, we can usually ship in 3 weeks or less from the time we get your order. (Round Tops and special glazing take longer.)

Your Marvin dealer has all the information and advice you need to help your greatest designs take shape. He's specially trained in back-up support and timely service.

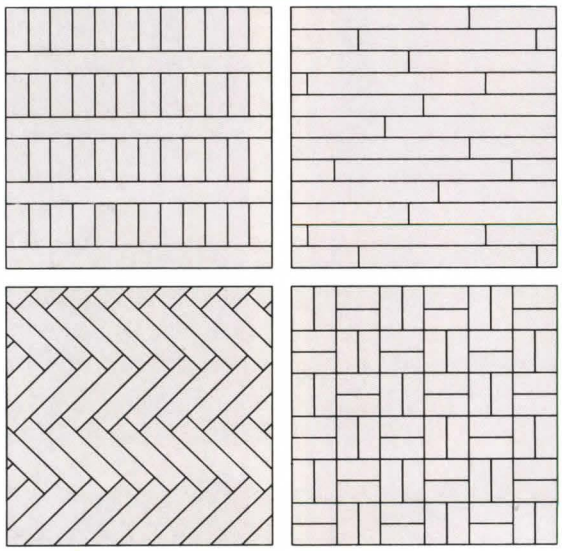
For more information on the shape of things to come, call **1-800-346-5128** (in Minnesota, 1-800-552-1167), or write, Marvin Windows, Warroad, MN 56763.

MARVIN WINDOWS ARE MADE TO ORDER.

Circle **No. 379** on Reader Service Card

Hartco Pattern-Plus®.

One tough oak floor. Thousands of designs.



Pattern-Plus has four lengths, one width, three colors. Mix or match to create thousands of designs.

Hartco designed Pattern-Plus for designers. And engineered it for the future.

The Pattern-Plus system of modular hardwood flooring units offer you unparalleled freedom. To create almost any design your mind can conceive. Four lengths, one width, three colors—to mix, match, combine in a dazzling variety of patterns.

And Pattern-Plus is made tough enough to take it—even in high-traffic commercial installations. Acrylic and stain are forced under pressure all the way through the oak to make it harder than hardwood. It resists stains, spills, scarring. Color won't wear away.

Tongues and grooves are engineered and precisely machined to lock together, give you a smooth, even floor every time.

Pattern-Plus. Designed for designers. Engineered for the future.

For more information on Pattern-Plus, call your Hartco distributor or write Hartco, Inc., P.O. Box 1001, Oneida, TN 37841-1001.

Hartco® The Quality Wood Flooring

Circle **No. 354**

Floor Tile: Boulevard
Wall Tile: Colorflex Series

DESIGNS THAT FLOOR THE COMPETITION.

Villeroy & Boch believes that beautiful buildings deserve beautiful floors. Exquisite designs and European craftsmanship make our ceramic tiles the perfect choice. When it comes to specifying your next job, think Villeroy & Boch. A source of supply for over 200 years.

Villeroy&Boch©
A Tradition of Untraditional Design.

For information on our ceramic tiles and plumbing fixtures, write Villeroy & Boch, I-80 at New Maple Ave., Pine Brook, NJ 07058.

Circle No. 414 on Reader Service Card

P/A Practice

Standards: Harvey Bryan discusses the new energy standard being proposed by ASHRAE.
Law: Norman Coplan suggests that the proper review of shop drawings depends upon the role architects play in the building team.

Standards: ASHRAE 90

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90 has made the design community most aware of energy's relation to design practice. Published in collaboration with the Illuminating Engineering Society (IES) in 1975 (then known as ASHRAE/IES Standard 90-75), it has been adopted in some form by all 50 states and served as a model standard for several other countries. This first attempt at a national energy standard served the years immediately following the oil embargo extremely well, when many people thought that buildings should be thermally tight, with as little surface area and as few penetrations as possible. However, as designers began to accumulate energy-conscious design experience, a number of problems with the 1975 standard began to emerge. In particular, it had become apparent that the "prescriptive component" approach, on which Standard 90 is based, fails to take into consideration the dynamics that exist between the many components of a building. For example, Standard 90 forces the designer to use insulation values and glazing areas that are extremely questionable in commercial buildings, where internal loads are large.

Cognizant of these problems, ASHRAE, along with the IES and the American National Standards Institute (ANSI), undertook to revise Standard 90 in the late 1970s. Two new sections were proposed to provide a more flexible design approach through the inclusion of renewable energy strategies and the use of whole building energy performance. Unfortunately, those new sections failed to gain the "consensus" (which is understood to mean much more than a majority but not necessarily unanimity) of those most affected by the standard. With the exclusion of the new sections, the 1980 revision of Standard 90 (known as ANSI/ASHRAE/IES Standard 90A-1980) seemed to many to be little more than a slight facelift of the 1975 document.

During this same period, the U.S. Department of Energy (DOE) was developing its own national energy standard, called Building Energy Performance Standards (BEPS), which many critics of Standard 90 thought would soon become law, replacing Standard 90. Although most experts agreed that the performance-based approach that BEPS took was far superior to that of Standard 90, it could not overcome the deregulatory philosophy of the incoming Reagan administration. By mid-1982, realizing that BEPS was dead, DOE began to refocus its standards research, establishing with ASHRAE a technically sound basis for revising Standard 90. This DOE research was managed by Pacific Northwest Laboratory in cooperation with ASHRAE and came to be known as ASHRAE Special Project 41 (SP41). A major component of SP41 involved extensive energy analysis of ten test buildings located in eight different climates around the country according to existing and proposed changes to Standard 90. The results of this project demonstrated that significant cost-effective improvements could be made to the existing standard. These findings were submitted in late 1983 as input to ASHRAE's Standing Standard Project Committee-90 Revision. The committee had been organized to develop two standards—one for commercial and the other for residential buildings—to replace Standard 90A-1980 for the 1985 scheduled revision.

Building on the recommendations of SP41, extensive public input, and nearly two years of committee deliberation, the commercial buildings draft standard (known as Draft Standard 90.1P) has been completed and is currently undergoing review. Draft Standard 90.1P takes a totally new approach compared to ear-

(continued on page 64)

Law: Reviewing Shop Drawings

The lack of a decisive, unambiguous, and accepted delineation of the function and responsibility of architects in dealing with shop drawings is a source of continuing problems and concern. The courts, in construing this function and responsibility, do not have clear guidelines, and the profession itself is divided on the proper approach to this facet of the architect's services. One school of thought is that architects should, to the highest degree possible, limit their involvement and responsibility to minimize liability. The other approach is that only by assuming greater responsibility for the adequacy of shop drawings can architects sufficiently protect themselves.

This subject is of concern to many architects because of charges asserted against the structural engineers for the Kansas City Hyatt Regency Hotel, stemming from the structural failure that occurred there in 1981. The Missouri Attorney General alleged that these engineers were negligent because of their approval of shop drawings prepared by the steel fabricator. The drawings allegedly did not provide for the integrity of certain beam connections, which ultimately failed. The engineers involved took the traditional position that it was not their function or responsibility to determine the load capacity of each connection, but rather that they had approved shop drawings only for conformance with the design concept. Apparently the contractual language that delineated the engineer's duties and obligations was inadequate, allowing the Attorney General to make his charges, or was misinterpreted or disregarded. In any event, the dispute illustrates the fact that the duties of architects or engineers in reviewing shop drawings is ill-defined or misunderstood.

The attack on architects arising from their review of shop

(continued on page 64)

Law *(continued from page 63)*
drawings is two-pronged. In addition to a defect in construction becoming the responsibility of architects who have approved an inadequate or erroneous shop drawing, it is quite common for contractors to assert claims for delay based upon the elapse of time between the submission and approval of shop drawings. The AIA form documents, in referring to architects' review and approval of shop drawings, state that "such action shall be taken with reasonable promptness so as to cause no delay." This language is almost an invitation for contractors to assert claims for delay damages on the purported failure of architects to approve the shop drawings promptly. First, the standard of "reasonable promptness" is subjective in nature. Second, there is no recognition in this language that if, after review, architects cannot approve the shop drawings and require revision and resubmission, this may very well cause a delay for which the architects, or course, should have no responsibility. One approach to this dilemma is to provide in the contract documents a specific minimum period of time to be alloted to architects to review each submission of shop drawings, and to make clear that any delay caused by requesting the contractor to correct and resubmit the shop drawings shall not be chargeable to either the owner or the architect.

Of more significance, however, is the language contained in the AIA form documents describing the services of architects in reviewing shop drawings. The form provides that "the architect shall review and approve or take other appropriate action upon the contractor's submittals such as shop drawings, product data, and samples, but only for conformance with the design concept of the work and with the information given in the contract documents." The generalized nature of this language reflects the uncertainty among architects as to what their proper role should be in reviewing shop drawings, but the ambiguity of this language leaves the door open for courts to find architects liable for failing to review properly areas that they may well believe are solely the responsibility of the contractor. To review and approve shop drawings for their conformance with the information contained in the construction contract documents, for example, may be interpreted as an agreement to review and approve the contractor's details, dimensions, and calculations. Unless the owner-architect agreement specifically defines the scope of the review and explicitly excludes the subject matter that is not included in the architects' review, they may be at the mercy of a judicial interpretation inconsistent with the true intent of the owner-contractor agreement.

Many architects have sought to limit their potential liability by stamping shop drawings with language of disclaimer. Some stamps do not use the word "approved" and specifically enumerate what the review of the shop drawing does not include. In too many instances, however, the wording of the owner-architect contract is not changed or correlated with the wording of the stamp, and thus the contract terms and the disclaimer of the stamp will appear to be in conflict. Under such circumstances, the contract will govern, and the disclaimer of the stamp will be ineffective. Architects in such a situation, having been lulled into a false sense of security by the wording of their stamps, may well find themselves liable for failing to pick up a defect in the shop drawing that the stamp expressly states is not within their province.

If architects' review and/or approval of shop drawings is not to include a review of dimensions, quantities, calculations, weights, fabrication processes, construction means or methods, the coordination of trades, or safety factors relating to the construction, the owner-architect contract should specifically set forth such exclusions and make it explicit that the contractor has the sole responsibility in connection therewith. It may be difficult for architects to obtain from clients acceptance of a contract that limits their responsibility for review or approval of shop drawings, particularly if the client is not knowledgeable of the construction field. It would, of course, be quite helpful if the AIA modified its forms to incorporate such disclaimer language, since a form contract is more readily acceptable. It is probable, however, that such modification will not occur unless and until there is a consensus in the profession about what the responsibilities and function of architects should be in reviewing and approving shop drawings.

Norman Coplan, Hon. AIA ■

The author is a member of the law firm Bernstein, Weiss, Coplan, Weinstein & Lake, New York.

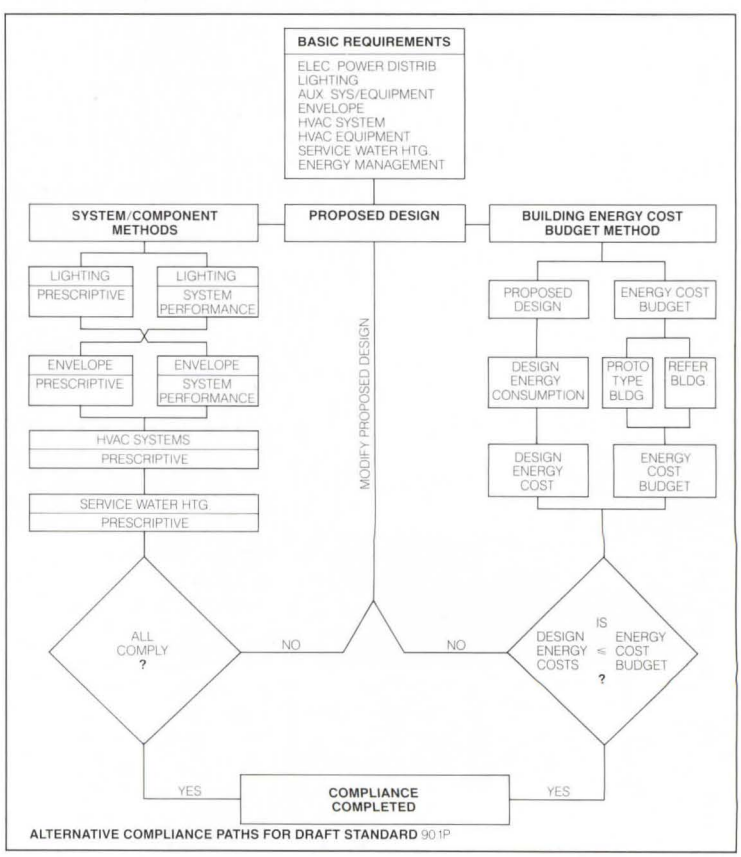
Standards *(continued from page 63)*
lier versions of Standard 90, by providing flexibility in the form of two parallel and alternative compliance paths: systems/component and building energy cost budget. However, no matter which path is used, several basic requirements must be met.

Basic Requirements
Basic requirements consist of either good energy-saving practices or prescribed levels of performance in the design of various building subsystems. Such practices as locating lighting switches and thermostats to be readily accessible to the occupants and achieving minimum HVAC system and equipment performance are typical items covered under these sections.

System/Component Method
This method is one of two major paths used in determining lighting, envelope, HVAC, and service water heating compliance. For lighting and envelope compliance, a designer has the option of using either a prescriptive component or a system performance approach, both of which can be used interchangeably.

Prescriptive Component Approach
This approach provides a series of prescriptive procedures. Lighting compliance requires the use of minimum luminaire and lamp/ballast efficiencies as well as a Unit Lighting Power Allowance (ULPA), which is an extremely simplified version of the Unit Power Density procedure first used in Standard 90A-1980 and IES Standard LEM-1. The ULPA procedure is best used when the building type is known, but the interior layout of rooms has not yet been defined. ULPA values are given in Watts/ft^2 for seven building types and five increments of gross lighted area. When a building does not fall within one of the building types or area designations, the other system performance approach should be used.

Envelope compliance under the prescriptive approach provides incentives for the use of several important energy strategies such as shading, daylighting, exterior mass, and high performance glazing. The use of any one or a combination of these strategies allows the designer to make trade-offs between the thermal transmittance (U-value) of opaque walls and the percent of allowable glazing. Compliance is easily determined through the use of a series of precalculated tables known as Alternate Component Packages. To use the tables, the designer must know the desired envelope strategy, the site's climatic condition (in degree-days), and the building's internal load (in Watts/ft^2). Compliance for other envelope elements, such as roofs and floors, is determined in a manner similar to those in Stand-
(continued on page 66)



ALTERNATIVE COMPLIANCE PATHS FOR DRAFT STANDARD 90.1P


Scalamandré
Unfolds BARBICAN.
A 100% wool cloth.
Atlanta
Boston
Chicago
Dallas
Honolulu
Houston
Los Angeles
Miami
New York
Philadelphia
Providence
San Francisco
Seattle
Washington
London
Sydney
Toronto
Circle No. 399

Standards *(continued from page 64)*
ard 90A-1980.

HVAC systems and service water heating compliance make slightly more stringent several provisions of the basic requirements.

System Performance Approach
When greater design freedom is desired, a designer may choose the system performance approach. This approach provides procedures for determining only lighting and envelope compliance. Lighting compliance is essentially the same method as the Unit Power Density procedure used in Standard 90A-1980 and IES Standard LEM-1. Although the approach is the same, the calculation process has been greatly simplified and the base values have been made more stringent to reflect improvements that have been made in lighting system efficiencies. Another change to this procedure is that specific room dimensions are no longer needed. Instead, an Area Factor, which accounts for room configuration and other conditions influencing the effectiveness of the lighting system, corrects the product of the room area and base Unit Power Density. This change makes it possible to determine the building's power density before all the interior spaces have been designed. Such information is essential early in the compliance process, since lighting power density (a major component of the internal load) is a critical factor in the determination of envelope compliance.

Envelope compliance under the system performance approach takes into consideration a number of factors important to successful envelope design, such as building orientation, shading, daylighting, exterior mass, fenestration, and internal load. Compliance is achieved if the calculated annual heating and cooling performance of various envelope elements is less than the values that have been determined through the use of compliance calculations. While the procedures required for the prescriptive component approach could be easily done by hand, most designers would need a microcomputer to use this system performance approach effectively. (The Standard 90.1P Committee has developed a computer program for determining envelope compliance under this section and is in the process of developing ways in which this program can be placed in the public domain.)

Building Cost Budget Method
The building cost budget method is the most flexible of the compliance methods, but requires the most complex analyses. This method provides an opportunity for the use of innovative energy design strategies such as daylighting, passive solar heating and cooling, heat recovery, and thermal storage as well as concepts that use "off-peak" electrical energy and that cannot be adequately evaluated under either the prescriptive or performance approaches. The building cost budget method will require the use of an energy simulation program, such as DOE-2.1, which can perform extremely sophisticated energy analyses. A typical compliance process begins with the proposed building design being simulated by computer, and the resulting value, referred to as Design Energy Consumption, further adjusted by the type of energy used. That gives a Design Energy Cost, which is then compared to the Energy Cost Budget, calculated for either a prototype or reference building. Compliance under this method is achieved when the designer is able to show that the total calculated annual energy cost for a proposed building is less than the calculated annual energy cost of a prototype or reference building. This compliance path is intended only for design comparisons and should not be used to predict either annual energy consumption or annual energy costs.

Present Status of Draft Standard 90.1P
The first public review of Draft Standard 90.1P was held last summer and resulted in over 8000 comments (about two thirds of which were reiterations) from over 300 individuals and organizations. In the months following the closing of the public review, the Standard 90.1P Committee has been addressing the comments and, when warranted, making appropriate changes to the draft. The result is a second public review draft, *(continued on page 72)*

Standards *(continued from page 66)* due to be released this summer. The committee feels confident that it has addressed the bulk of concerns and hopes that the review process is near completion.

Critics of Standard 90.1P believe that in the committee's effort to create a flexible standard, it has made the compliance process overly complex. Supporters of the new standard are concerned that, if the second public review process produces another deluge of comments, Draft Standard 90.1P will never gain consensus. These individuals argue that, if Draft Standard 90.1P fails to get a consensus, state governments will become impatient and begin developing their own energy standards, which would undermine the considerable influence ASHRAE has had in this area. Such concerns have generated a number of contingencies in case consensus fails. The most obvious would be for ASHRAE to incorporate the sections on basic requirements and prescriptive components into Standard 90A-1980 through the addenda process. The remaining portions of the draft could be modified for another attempt at consensus or for publishing as an ASHRAE Guideline rather than a Standard.

No matter how ASHRAE resolves this issue, DOE is in the process of publishing a Notice of Proposed Rulemaking (NOPR) which is, except for minor format changes, identical to the Draft Standard 90.1P published for ASHRAE's first public review last summer. If, after a 90-day review period, the NOPR is accepted, it will be put forth as an interim standard, which will allow a period of testing and possible revisions to take place. If, after this period, the proposed standard continues to be acceptable, it will be published in its final form and become mandatory for the design of federal buildings and serve as a model energy standard for state governments and the private sector.

Conclusion

Although some of the formulas, tables, and compliance charts in Draft Standard 90.1P may seem a little overwhelming at first, they become clear with use. By allowing interactions and tradeoffs among various building components, this draft makes a major break from the closed, inflexible approaches of the past. Previous standards have focused on controlling mediocre practices at the low end of the design market and, in so doing, have overloaded the standards with too many rules that frustrate innovative design. The multiple compliance approach of Draft Standard 90.1P creates an equitable distribution of design responsibilities; neither low-end buildings nor advanced projects will feel unduly restrained by this standard. If Draft Standard 90.1P achieves consensus without major changes, it may well provide the design community with a model standard that will go beyond energy—a model of flexible compliance that can be replicated by other standards. ■

Harvey Bryan

The author, an architect and researcher, is a member of ASHRAE's SSPC 90R committee and a professor at MIT.

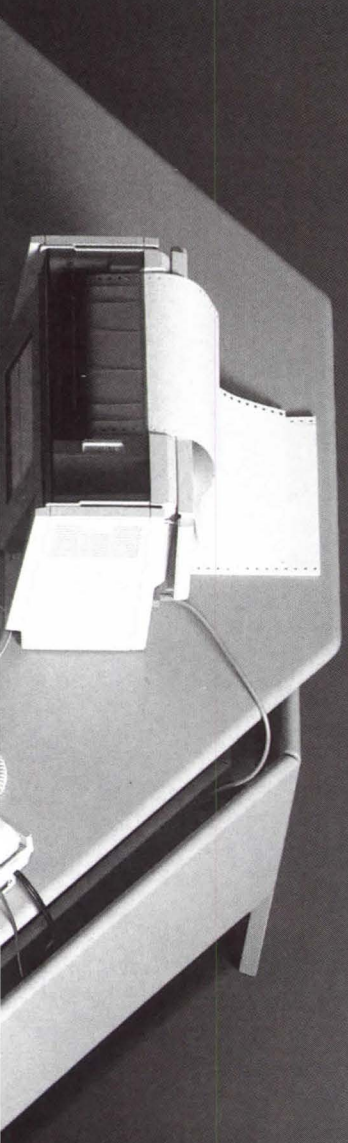
Through your Interior Designer

Boussac of France, Inc., Decorating and Design Building, 979 Third Avenue
New York, N.Y. 10022 (212) 421-0534

This exquisite Oregon (5968-2) is perfectly correlating with its matching wallpaper:
1. Omaha Wallpaper (4969-2) 2. Weston (9985-2) 3. Artigny (7032-561)
4. Odessa (9987-2) 5. Sirocco (3530-59)

Atlanta, Curran Assoc. Inc. **Boston,** Ostrer House. **Chicago,** Holly Hunt, Ltd. **Cincinnati,** De Cioccio and Assoc. **Dallas,** Decorators Walk. **Denver,** Decorators Walk. **High Point** Curran Textile Showroom. **Houston,** Decorators Walk. **Los Angeles,** Janus et Cie. **Miami,** Todd Wiggins & Assoc. **New Orleans,** Delk & Morrison, Inc. **Philadelphia** Taggart/Zwiebel Assoc., Inc. **Phoenix,** S.C. Smith, Ltd. **San Francisco,** Chalfonte St. Giles, Inc. **Seattle,** Jane Piper Reid & Co. **Washington, D.C.** Decorators Walk

At last. Computer furniture that looks and works like the real thing.



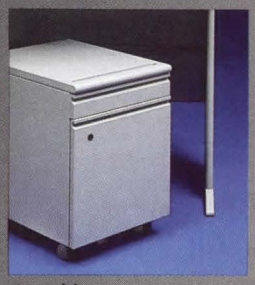
Series 8800 computer furniture *is* the real thing. Real furniture. Not a compromise; not a hastily assembled response to a poorly understood problem.

Ergonomically designed, it is shaped and sized to fit people and the way they work. And it's engineered to last. It will withstand frequent moves, it's simple to assemble, and has a good-looking, non-reflective, tough-as-nails finish.

Series 8800 also accommodates the maze of wires and cables that keep today's office humming. From the floor to the computer or from one workstation to the next. Neatly, safely, efficiently.

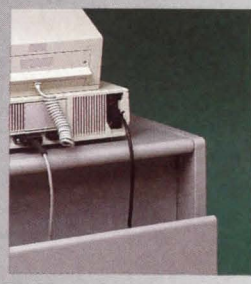
You can use Series 8800 as stand-alone units, or create a network of workstations. Either way, you get the best of both worlds: Computer furniture that looks and works like the real thing – and it's made by Steelcase.

For more information, contact your Steelcase Dealer or Steelcase Regional Office. Or dial toll-free 1-800-447-4700. Steelcase Inc. Grand Rapids, MI 49501



Portable storage at your fingertips

Worksurfaces are height-adjustable



Wires and cables are neatly handled

Steelcase

The Office Environment Company

Circle **No. 396** on Reader Service Card

SINCE IT WAS ANDERSEN WHO WINDOW, IT SEEMS ONLY RIGHT

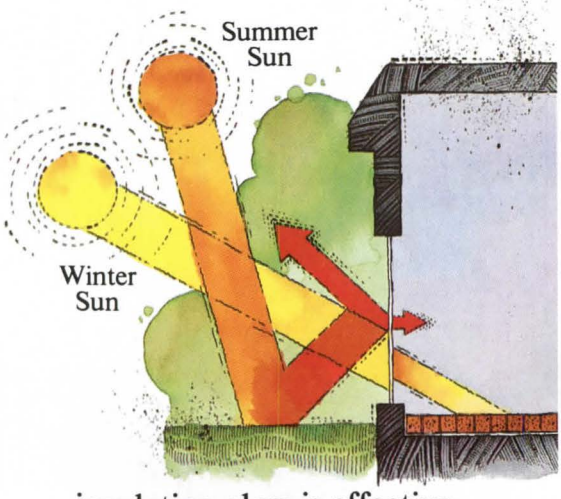
America's best window has been made better. And that's good news for an architect.

Now we have a special glazing called Andersen® High-Performance insulating glass. It proves itself 24 hours a day, 365 days a year. In all seasons. In all climates. On all sides of a building.

WE TOOK A COLD, HARD LOOK AT HEAT LOSS AND HEAT GAIN.

In the past, our double-pane window dealt superbly with two causes of a building's losing heat in winter and gaining heat in summer—convection (by preventing leaks with a snug-fitting design) and conduction (by using superior insulating materials).

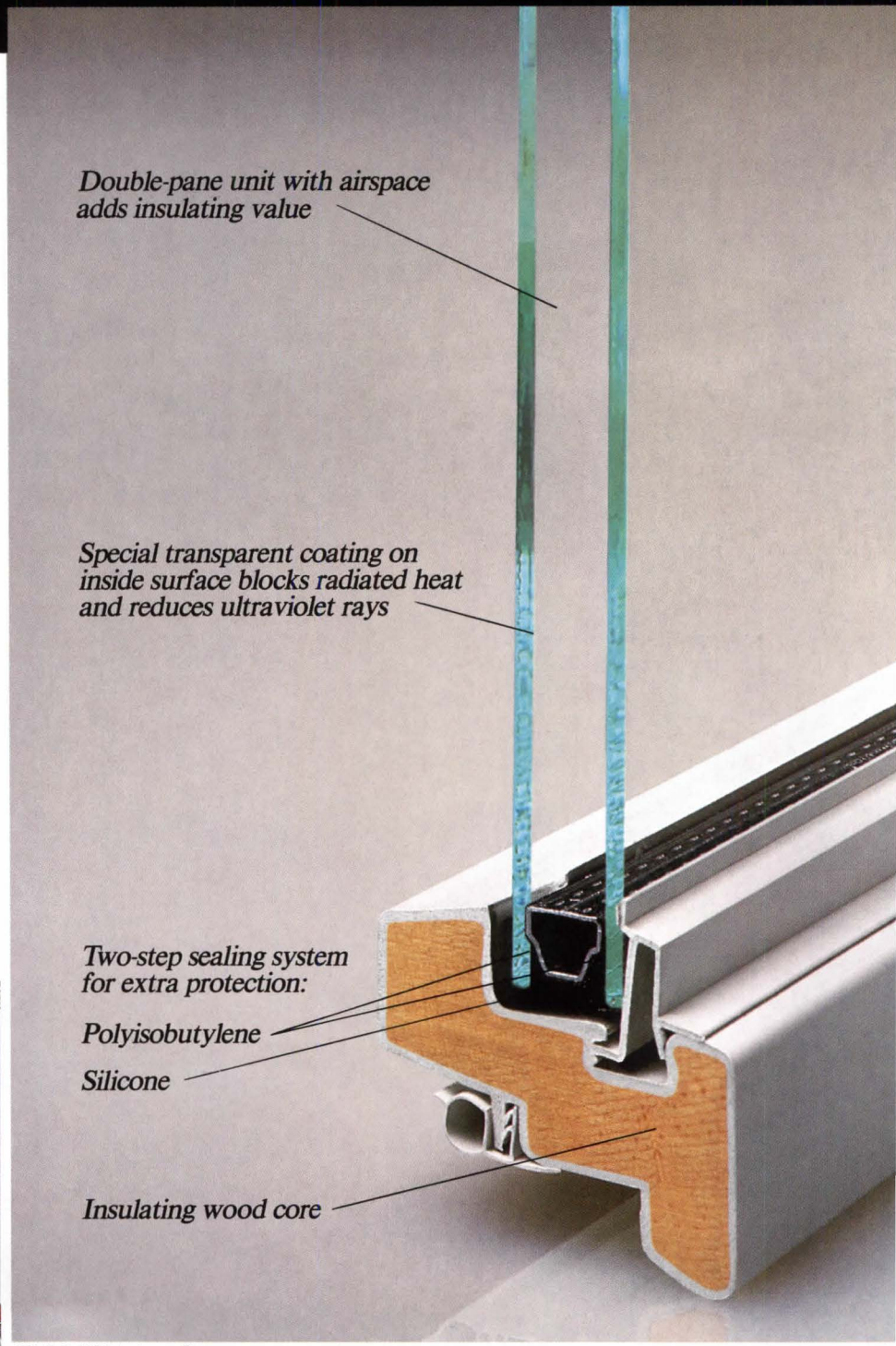
But our High-Performance insulating glass is effective against a third cause, thermal radiation, which is heat radiating in waves. If you've ever noticed the air shimmering above blacktop on a hot day, that's radiant heat.



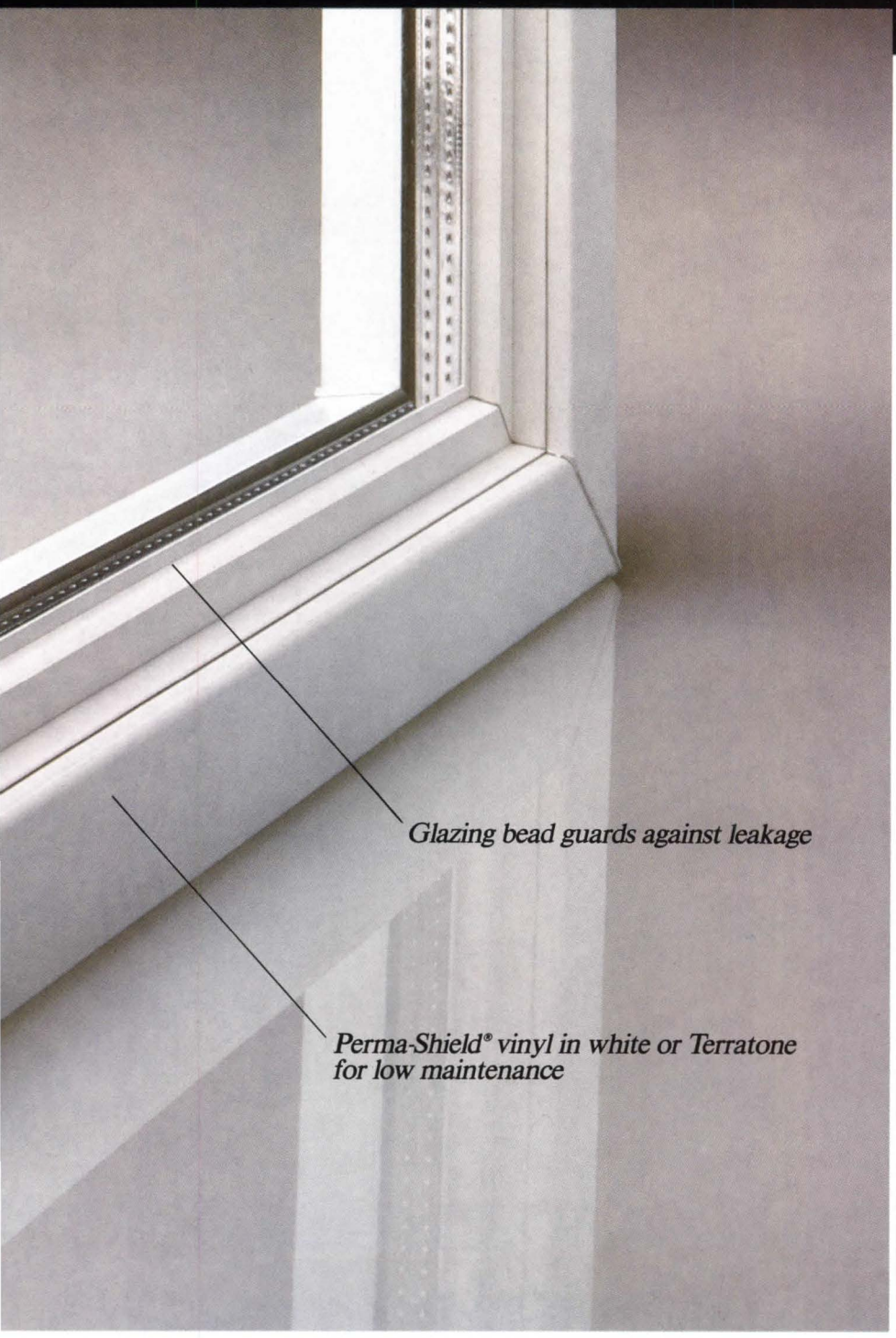
A special transparent coating on our High-Performance window glass greatly restricts this radiant heat from passing through it into the building.

Yet in winter, when the sun is low in the sky, our coating allows direct sunlight to shine into the building. After it strikes floors, walls and furniture in the rooms, it will be converted into radiant heat to help warm the building.

And since our special coating restricts radiant heat flow, this warmth will have trouble escaping.



PERFECTED THE DOUBLE-PANE WE BE THE ONES TO IMPROVE IT.



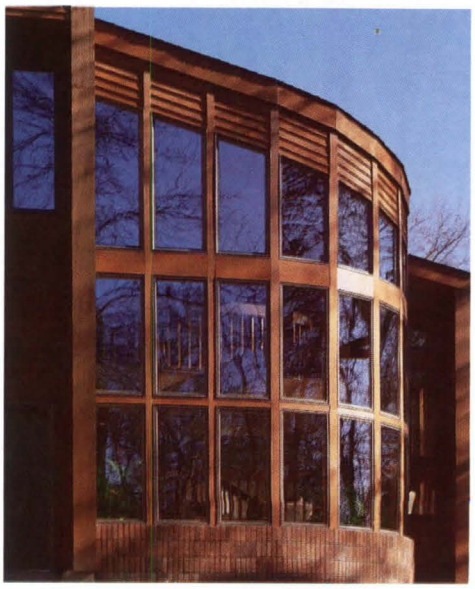
sun and 24% better in shade.

What's more, it's worth noting that High-Performance glass filters out 71% of the sun's ultraviolet rays that cause fading.

THE STORY IS CONTINUED ON THESE REMARKABLE WINDOWS.

Call your Andersen distributor, who can tell you more about Andersen High-Performance windows and our new High-Performance Sun windows, for climates where heat gain is a greater concern than heat loss. Also consult Sweet's File 8.16/An.

Or write Andersen Corp., Box 12, Bayport, MN 55003.



SO, WHAT'S IN OUR WINDOW THAT INTERESTS CLIENTS?

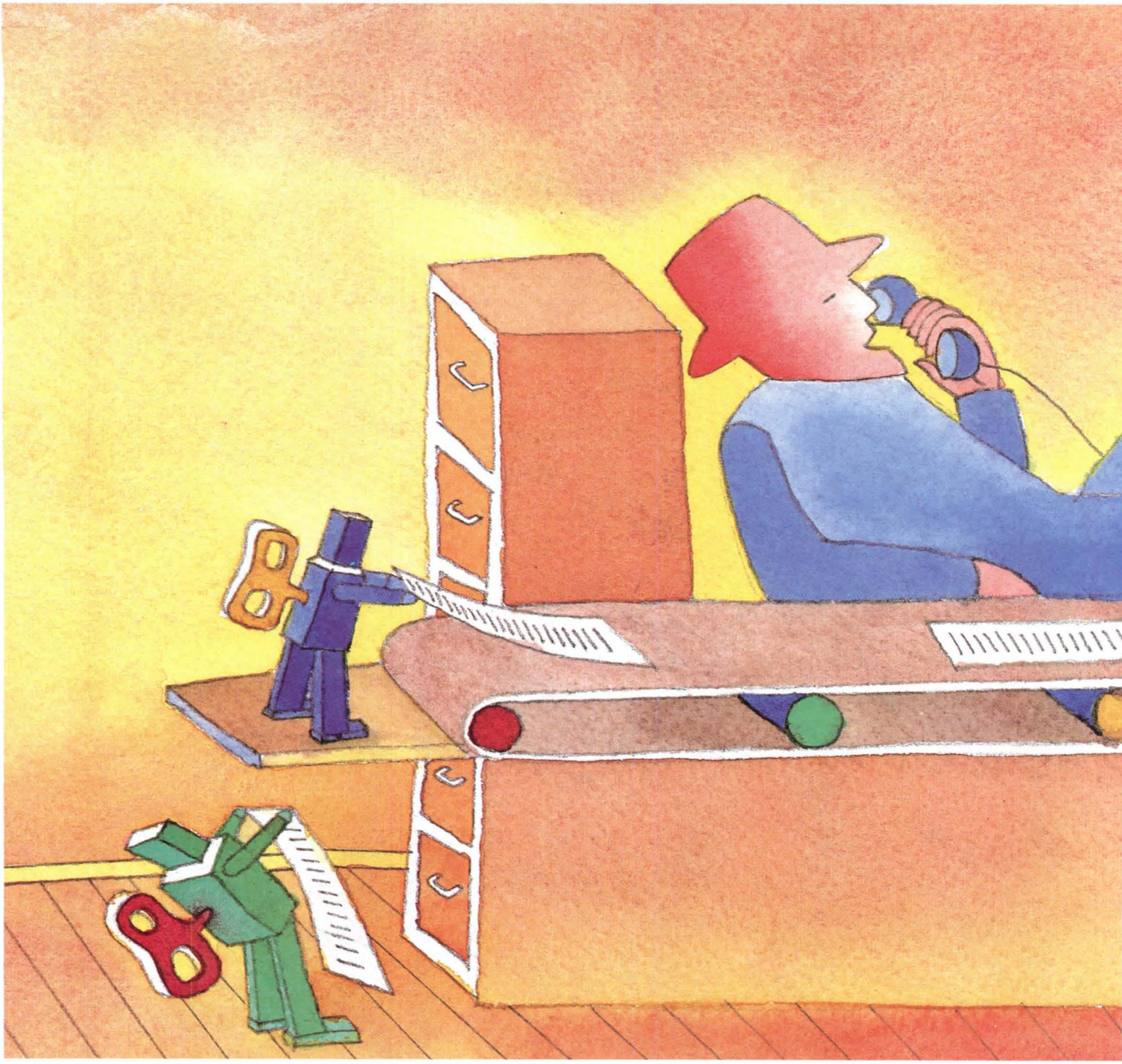
Tell them that, although it works year-round for energy efficiency, this revolutionary window is at its best in winter.

We've found that an Andersen window with High-Performance insulating glass is 42% more energy efficient than our uncoated double-pane window during the heating months. And in the cooling months, it's 19% better in

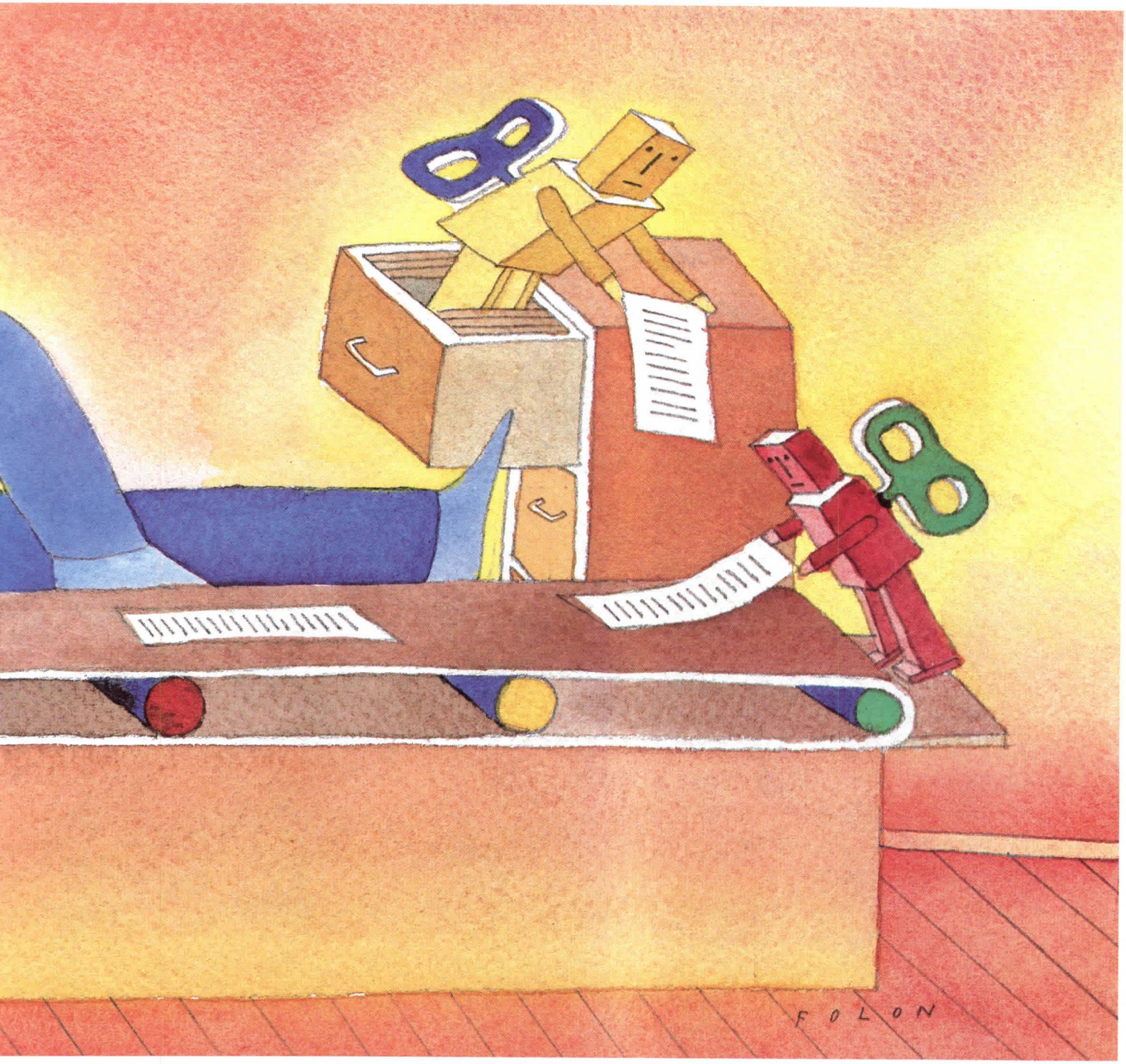
Come home to quality.

Andersen AW Windows · Patio Doors ™

Andersen



Your small company's expenses virtually manage themselves with the American Express® Corporate Card.



Keeping detailed, up-to-date
rds of your small company's
l, entertainment, and other
geable expenses was once an
man task.
ut with the American Express
orate Card, that job is easy.
use the Corporate Card does
of your record-keeping for you.
nstead of a jumbled mess of receipts, you'll have all your company's chargeable expenses detailed on one comprehensive monthly statement, separate from your personal expenses. That kind of exacting, easy-to-read documentation is especially useful come tax time.

You'll also get Quarterly Management Reports, which give you a complete picture of who's spending what where.

Furthermore, you and your employees will be carrying the Card that's as respected as your own company.

With the American Express Corporate Card, you'll find that managing your company's expenses becomes an almost effortless job. Which means you'll be free for the more human side of doing business.

To have the Corporate Card manage your expenses, call 1-800-528-AMEX* or fill out this coupon.

Mail to: A.M. Busquet, V.P., T.M.S.
P.O. Box 53821, Phoenix, Arizona 85072

Name _____ Title _____

Company _____

Address _____

City _____ State _____ ZIP _____

( ) _____

Phone _____ # Travelers _____

AMERICAN EXPRESS Travel Management Services

*In Arizona, call 1-602-222-3096

248-00-0071-0

TOP LEVEL INTELLIGENCE.

Build R/26 structural roof systems in one step with TUPS™: the smarter, faster way to build.

Smart architects have discovered an intelligent way to stay on top of current demands for higher energy ratings *and* lower costs.

They go to the very *top* and choose a structural, insulating roof system panel that can save energy, reduce cost, eliminate labor-intensive steps and cut time.

They choose TUPS.

Only TUPS features a load bearing, stress skin panel integrating structural Homasote 440 Boards with an insulating core of rigid polyisocyanurate foam.

Choose TUPS™ and install —in one step— a structural deck, insulation and nailbase. That's intelligence at the top level!

In just one step, you can install an interior ceiling ready for paint or other finish. And an energy efficient layer of insulation. Plus a structural nailbase ready for shingles, slate, tile, BUR or single-ply membrane roofing system.

All with one-step TUPS roofing panels. That's intelligence at the top level.

For full details, call (609) 883-3300. Or write The Homasote Company directly.

Panels sizes, nominal 4' x 8', 10' and 12' with T & G Long Edges	Nominal Thickness 4"	5"
R-FACTOR AGED	19.2	25.48
R-FACTOR SYSTEM*	20.43	26.71
Lbs. per sq. ft.	4.2	4.4
Foam Thickness (nominal)	2½"	3½"

*Includes air film and asphalt shingles.

homasote
COMPANY
P.O. Box 7240, West Trenton, New Jersey 08628-0240

SMART ARCHITECTS CHOOSE HOMASOTE.

5666

Circle **No. 358** on Reader Service Card

Crystal Plaza, Arlington, Va.

Flat or Bent Laminated Glass.

11th Street Station, Philadelphia, Pa.

Your Choice Overhead.

Choose Slopelite™ flat laminated glass for its safety features, scratch-resistance, solar control, and easy maintenance. Or choose Bentlite® bent laminated architectural glass to enhance your building's glazing design. Both are available in single or monolithic units made with a clear, bronze or gray polyvinyl butyral (PVB) interlayer. And both are code approved for use in overhead locations. For safety and versatility in overhead glazing, choose flat or bent laminated glass.

LGC LAMINATED GLASS CORPORATION
375 E. Church Avenue • Telford, Pa. 18969 • (215) 721-0400

Circle **No. 369** on Reader Service Card

A HEAT PUMP THAT'S SEVERAL DEGREES BETTER THAN THE OTHERS.

IT'S PURE GENIUS. FROM GE.

If you're designing or refurbishing a building, or a motel or hotel, you have two choices when it comes to heat pumps.

You could choose a conventional model, with mechanical controls.

But, if you're smart, you'll pick a General Electric Zoneline® IV heat pump, with electronic controls.

Why?

Because it's several degrees better than the others. In two ways.

For one thing, it offers you independent temperature limiting.

This means you can set the heating and cooling temperature limits independently of each other, at any temperature you choose.

Mechanical models, on the other hand, by design have a built-in band or range (usually 5°), that separates the heating and cooling limit settings.

As a result, if you set the maximum heating temperature at 70°, the minimum cooling temperature can't be set higher than 65°. (Allowing rooms to be cooled to this temperature can be very costly.)

The only way to take care of this problem is to manually reset the band to the desired limit every spring and fall.

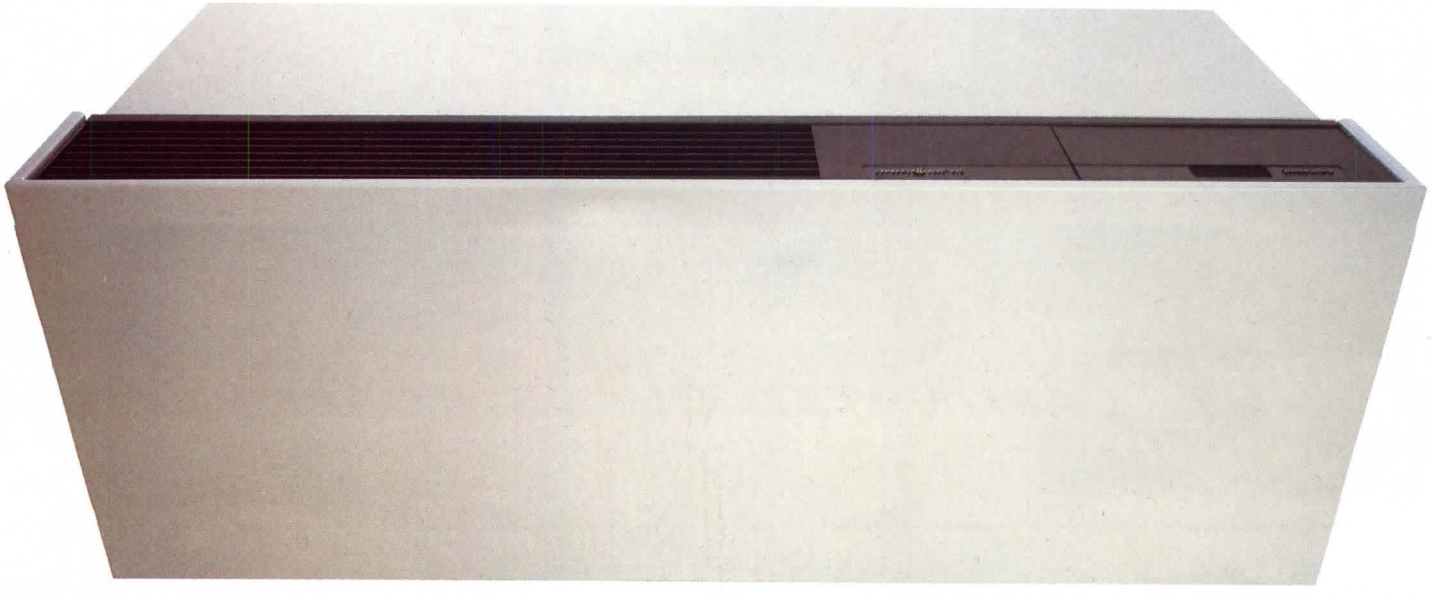
But that's not the only way a Zoneline IV heat pump is better than the others. It can also operate at lower outdoor temperatures than competitive units, only switching to electric resistance heat when absolutely necessary. And it has an Energy Management interface so you can control it from a central location.

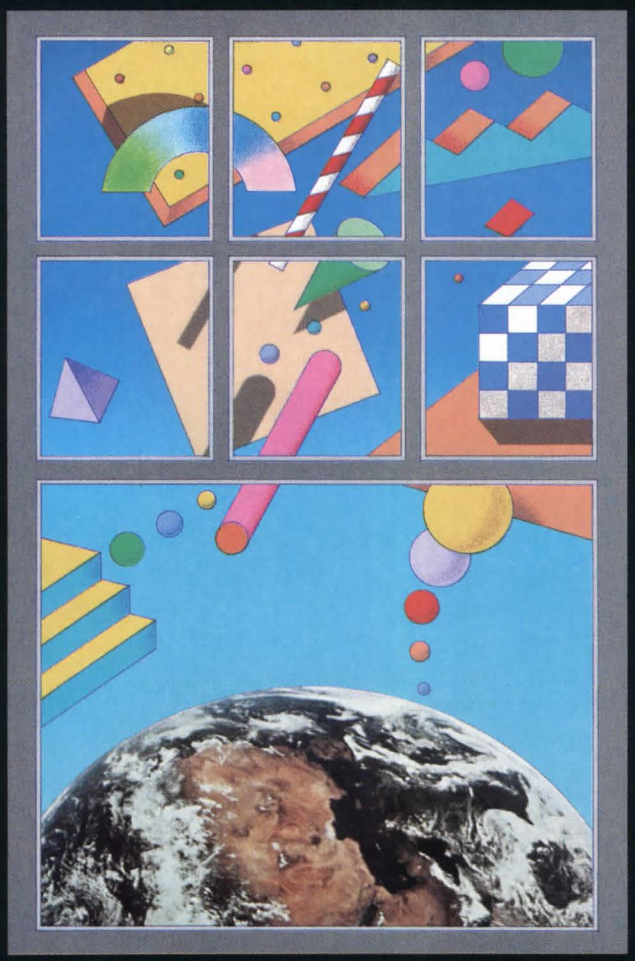
If you'd like to know more about our remarkable heat pump, contact your GE Sales Representative.

Or write J. Michelsen, Manager Marketing Planning, General Electric, AP4-292, Louisville, KY 40225.

Circle **No. 346** on Reader Service Card

We bring good things to life.





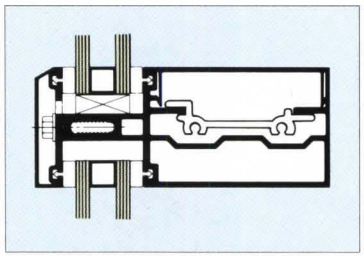
NEOCON 18

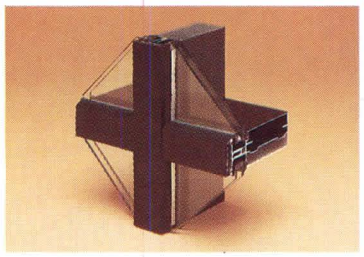
THE WORLD CONGRESS
ON ENVIRONMENTAL
PLANNING AND DESIGN

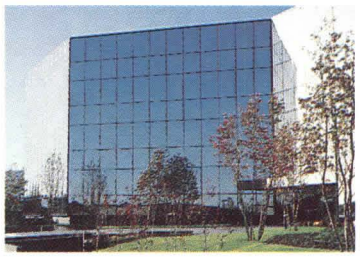
JUNE 10-13, 1986
THE MERCHANDISE MART
CHICAGO

Circle No. 380 on Reader Service Card

Introducing the Series 3200 Curtain Wall System from United States Aluminum Corporation







United States Aluminum Corporation is now offering the Series 3200 Curtain Wall system, specially engineered for low and high rise outside glazing applications, to receive ¼″ or 1″ glazing.

Design Features

Thermally Broken — Interior aluminum framing is thermally isolated from the exterior by continuous thermal spacers, interlocked with the horizontal and vertical pressure plates.

Labor Savings — Pressure plates are factory fabricated with thermal spacers installed and pressure bolts holes prepunched.

Gaskets — Interior close-cell neoprene and exterior E.P.D.M. gaskets provide a completely dry glazed system.

Horizontals — Face covers have a beveled water shed edge. Injection molded nylon end dams are furnished for water control.

Super Mullions — In addition to 3½″ and 5″ deep mullions, 8″ deep "Super Mullions" are stock items for high span conditions.

Performance — Certified test reports that meet or exceed AAMA TM-1-76 standard test procedure, E-283 air infiltration, E-330 structural performance & E-331 water penetration, are available.

S.T.C. sound test available for 1″ glass.

United States Aluminum gives you over 25 years of proven quality.

For complete information, call 1 (800) 527-6440 or write:

United States Aluminum Corporation

Manufacturing Facilities

3663 Bandini Blvd.
Vernon, California 90023
Telephone (213) 268-4230

200 Singleton Drive
Waxahachie, Texas 75165
Telephone (214) 937-9651
or (214) 299-5397 metro

6969 West 73rd Street
Chicago, Illinois 60638
Telephone (312) 458-9070

720 Cel-River Road
Rock Hill, South Carolina 29730
Telephone (803) 366-8326

FANCY FOOTWORK.

Ruggedly handsome Flex-Tuft™ Floor Covering performs in any high-traffic area. Its nylon-reinforced backing is vulcanized into the rubber substructure. Allowing a superior bond for maximum durability and flexibility. Enabling Flex-Tuft to withstand the punishment of being under foot, as well as extremes in temperature and weather. And the soft, skid-proof surface is a tremendous safety feature indoors or out.

Call your local Flexco distributor or 1-800-633-3151. Or write P.O. Box 553, Tuscumbia, AL 35674. And do a number on the competition. With Flex-Tuft. Only from Flexco.

FLEXCO®

Progressive Architecture

Urban Helix

The Spiral in Tokyo by Maki & Associates is most unusual in its sponsorship, function, and design. Built as a public arts and entertainment center by a leading manufacturer, it shows a unique response to its highly complex setting as well as to its equally complicated program of uses.

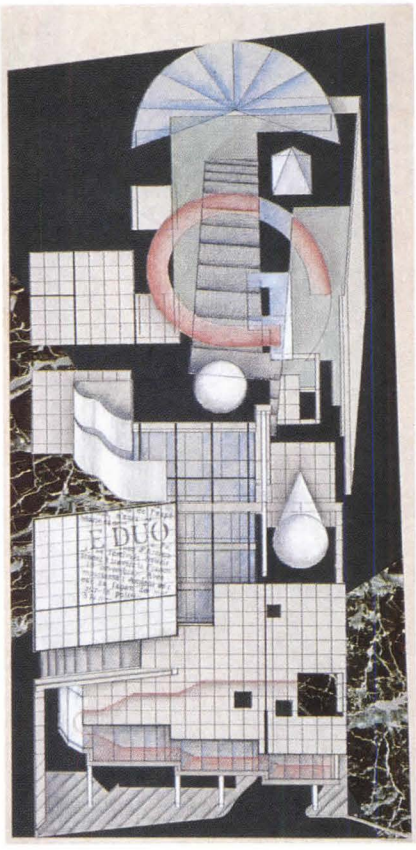
Satoru Mishima

Spiral building (center) in its neighborhood.

TODAY's observers of cities generally acknowledge the vitality of Tokyo's kaleidoscopic urban environment. Having adjusted to the stupefying effects of streetscapes of gaudy signs and jumbled buildings, we may agree with Roland Barthes in his *Empire of Signs* that "Tokyo reminds us that the rational is merely one system among others." More so than Las Vegas, Tokyo seems a place where anything goes and no one worries much about where and how it fits in. Yet, Japanese architects are increasingly concerned with issues of context. No one among them has grappled longer or more persistently with the urban design implications of his buildings than Fumihiko Maki.

Here, Maki has adopted from the context the themes of street façade and fragmented building volumes, drawing them into a composition that involves spirals: a spiral of building volumes up to a central penthouse; a flattened spiral of stairways zigzagging up the façade; and a deeper spiral that loops up through the interior.

The client, lingerie manufacturer Wacoal, wished to strengthen the ties between the worlds of fashion and the arts by incorporating a mixture of corporate-sponsored commercial and cultural activities into a new arts center building. Accordingly, the first five floors of the Spiral have art galleries, a 300-seat theater, video and recording studios, designers' shops, cafés, bars, a restaurant, a roof garden, and a multistory atrium for exhibitions, fashion shows, and performances. The sixth and seventh floors, including the room beneath the prominent conical form, house a display of costumes from the company collection. The club on the eighth and ninth floors accommodates a variety of activities: receptions, conferences, private fashion shows, etc. This complex program is neatly nested in a structure nine stories high in front and four in back. The lower back section and stepped-back top are responses to sunlight access codes.



Hasshoki

Maki's rendered projection reveals key geometric forms such as cones and helix. Front (facing page) is gridded aluminum plane with cutouts and overlays. On glazed stairways, mullion spacing varies with direction of ascent. One opening houses metal sculpture by Aiko Miyawaki.

The building faces Aoyama Avenue, Tokyo's most fashionable shopping street. A cursory view of the façade suggests that its composition is simply a response to the fragmentary nature of the streetscape. Closer study reveals that several strategies or games are going on here. First, there are the moves by which the building is embedded in its context. Second, there is orchestration of movement across the façade. Third, there is a complex iconography involving symbolic forms and elements abstracted from early Modernism.

Some planes of the façade are aligned with the broad avenue, but the form as a whole responds to the geometry of narrow side streets, which meet the avenue at an angle. The play of slight angles is also apparent in surrounding buildings. The avenue line is acknowledged mainly in the large canted section of façade treated as an urban-scaled "shoji" screen, thrust into a prominent position like a blank, inscrutable sign—a sign of no sign. The different angles also allow for a shallow plaza at the main entrance, while the automobile entrance is close to the street. As a whole, the façade takes its place deferentially in the Aoyama streetscape: It is unframed, and the shifts and angles suggest a diffusion of the front into its context.

Movement in a zigzag pattern across the façade dominates the composition. Columns—pilotis—mark the main plane of the façade and support a promenade, just inside the glass, which ascends diagonally in stages across it. In each glazed section, mullions spaced at intervals of graduated width indicate the direction of movement. Maki wished to serve the cause of urbanity by setting up a reciprocating spectacle between the people moving up and down this promenade and those out on the sidewalk and the street below. Although such reciprocity between inside and outside public spaces is increasingly the norm in America, in Japan the contents of buildings are, by tradition, generally well hidden.

But the movement does not stop with the promenade. Glazed sections, voids in the wall, mark a continuing ascent toward a cube-shaped opening at the top of the first stage of the building. Within it is a monumental cone lighted artificially from below and naturally through a large square opening in the outside wall. Next to the inside wall stands a white column, which rises through the roof. It both marks the location of the tension member indicated by the stainless steel crevice running up the wall below and redirects the pattern of movement on the façade.

Though the five-part glazed section between the void with the cone and the shoji is slightly off the building center, its mullions are spaced symmetrically as though to indicate a center. The glazed penthouse wall above has a regular a-b-a rhythm and extends one bay closer to the other side. This bay is partly screened by and tied into an undulating wall that moves back on a diagonal to meet two stacked cubes. The lightning rod marks the axis of the spiral expressed two-dimensionally in the façade and, in depth, in the plan of the building.

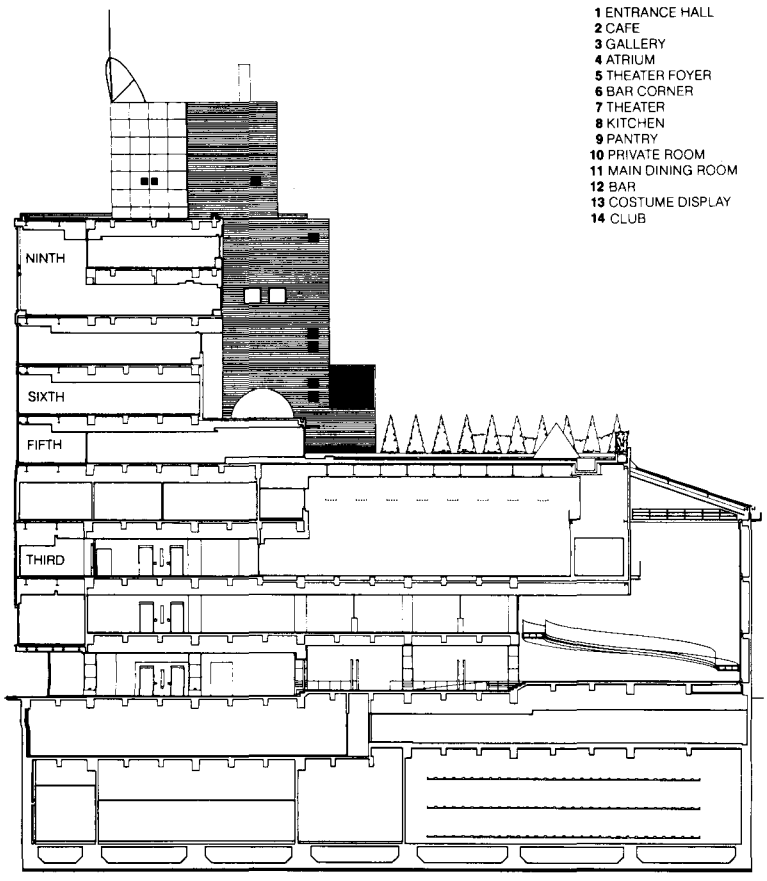
Complementing this meticulously detailed diagonal movement in a relatively shallow spatial layer behind the façade is another, interior sequence of spaces that spirals upward. This movement is discontinuous and more analogous to the Japanese art of packaging, in which the idea is not so much to encase the contents but to postpone their discovery through spatial layering.

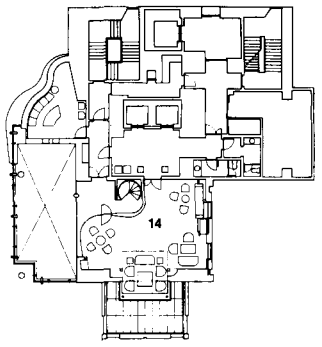
From the ground-floor entrance lobby—also an art gallery—where the spiral of façade promenade begins, the curving ramp in the atrium at the back of the building is visible from three vantage points: at the end of a sloped passageway on the left side of the lobby, through the café in the center, and from the first landing of the promenade at the end of the art gallery.

The atrium is the "oku," or heart space, of the building. Oku is a concept that continues to intrigue Maki, who wrote the essay "The City and Inner Space" about it in 1979. The word has long been used to connote a characteristically Japanese concept of place as inner, hidden, profound, and unfathomable. Yet, in spite of its marked spiritual dimension, Maki points out that "The innermost space as the ultimate destination often lacks a climactic quality. Instead, it is in the process of reaching the goal that drama and ritual are sought. . . ." Although the circular area described by the ramp is a dynamic space with great potential for drama and display, it is still just one of many events in an unfolding scenario rather than the final destination. Continuing action is indicated by the upward sweep of the ramp leading to a mezzanine. The atrium walls rise to a glazed, fan-framed skylight that peaks at the fifth level, where it is visible from the edge of the roof garden.

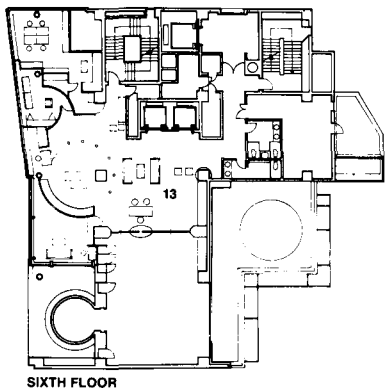
A 300-seat theater, well equipped technically for a range of performances of music, dance, and drama, occupies the central rear part of the third and fourth levels. The foyer is on the third level; video and recording studios occupy the corresponding area on the fourth level. The fifth level is devoted to social activities, with a restaurant that opens to a roof garden. A domed bar adjoining it occupies a central, transitional place. This square room has the quality of another "oku," the inner space of the ascending layers of spatial wrapping. The dome is exquisitely fashioned of painted steel triangles affixed to a perforated steel shell so that it appears to be stitched together. The bar's cavelike quality is enhanced by the view out to the roof garden.

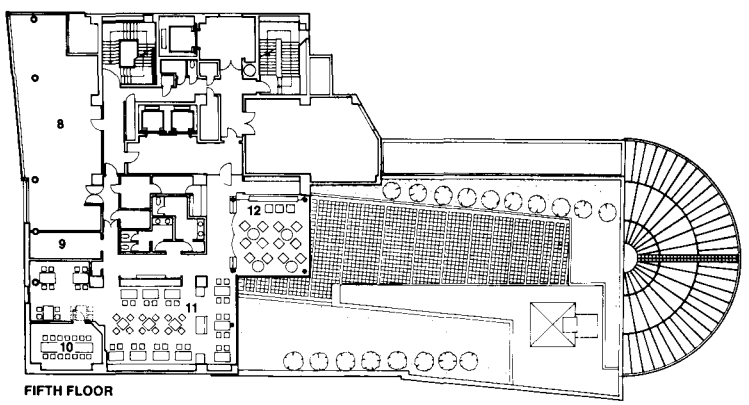
Removed from the din of the street, the roof garden has a surreal

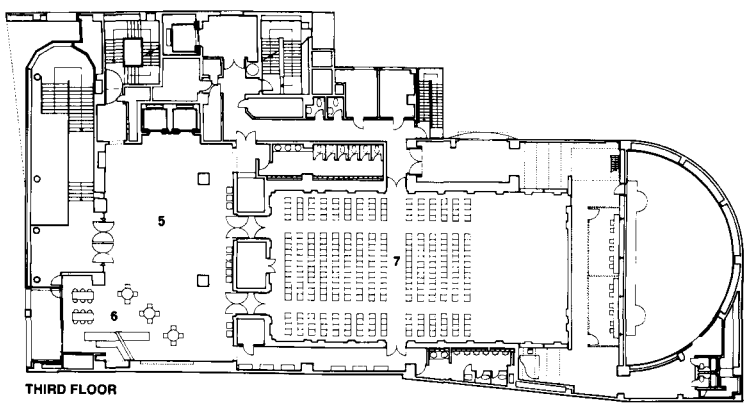


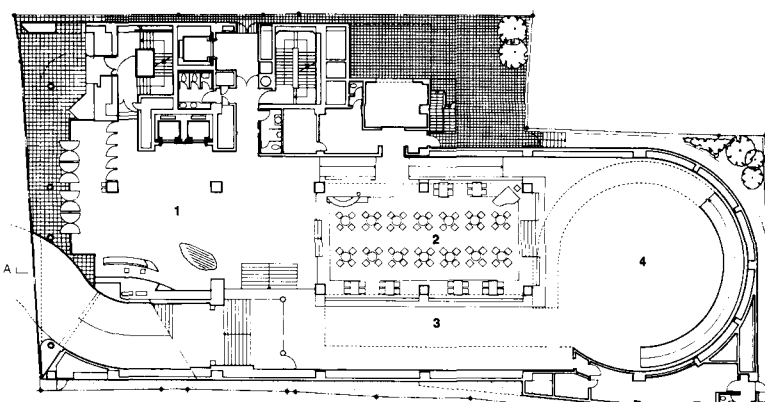


Seen along the avenue (facing page), the façade of The Spiral reflects the prevailing fragmentation, but has a unifying silvery color. The canted "shoji" projection of fiberglass panels helps to mark and to shelter the main entrance. The spiraling cubic forms of the building seem to revolve around an axis marked by the lightning rod on the top.









quality. Maki has capitalized on this by setting up two overlapping perspectives in the plan. The central vista is bounded by a paved area lined with trees on one side and by a reflecting pool on the other. These edges converge, creating the illusion of a greater depth. The reflecting pool is cut into by another landscaped area lined with trees at its outer edge. Just off the central vista, a white granite pyramid with water flowing from a slot near its apex appears to float on the pool's surface.

And so the ritual ascension ends. But there is yet another game to play. While the interior spaces must satisfy programmatic needs, Maki has yielded to the impulse to recognize history through references abstracted from Modernism rather than the Classicism that has so dominated Post-Modern design in the U.S. Since the use of the principles of Modernism transformed Japanese architecture more than a generation ago—given the acceleration of change—the Movement has now passed into the realm of history and is ripe for reuse as reference material.

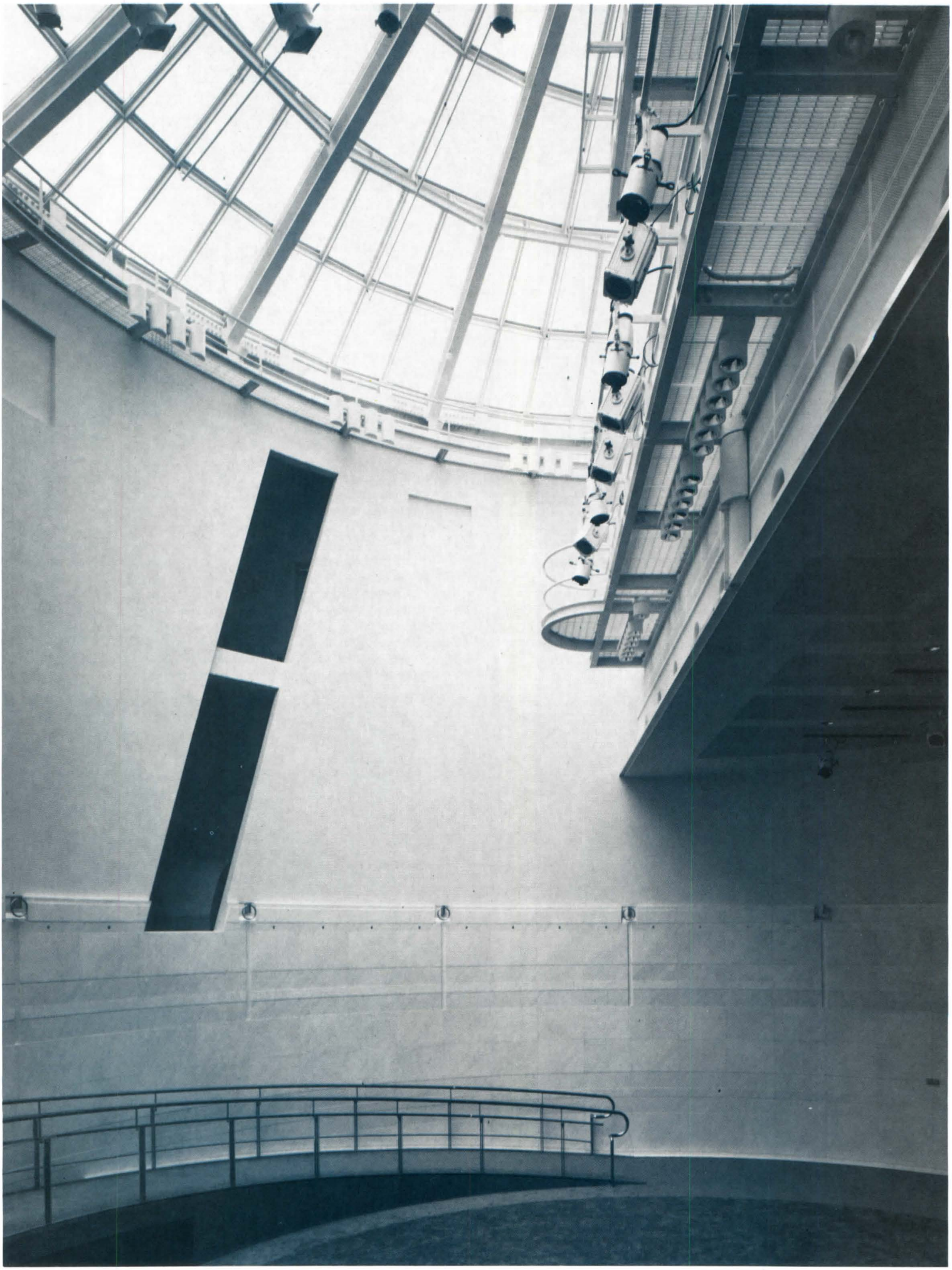
Maki has sought to nourish our intellect through quotations from early Modernism. Although he alludes to various aspects of the movement and the work of masters such as Mies, Aalto, and Loos, the most quoted source is Le Corbusier. The use of geometric solids—the cone, the cube, and the pyramid—salutes Purism. The squares of varying sizes, the lines of mullions or columns used as controlling elements on the façade, the pilotis that lift the façade off the ground, the "free" façade and flowing plan, the roof garden—all remind us of the man whose work and writing changed the course of architecture in Japan (not to mention other parts of the world).

Maki is often credited with designing in an internationally intelligible aesthetic. His skill in adapting traditional Japanese forms to contemporary uses, as expressed in the Fujisawa Municipal Sports Complex (P/A, June 1985, pp. 71–80), is polished further in the Spiral's archaeology of Modernism. Le Corbusier's motto sums up the process: "Creation is a patient search." ***Sally Woodbridge*** ■

The author is an architectural historian, lecturer, coauthor of several books on West Coast architecture, and a P/A correspondent. Her Historical American Buildings Survey Catalogue for California will be published this year.


Warrnal
三和銀行
港信用金庫
千成ビル
Victor

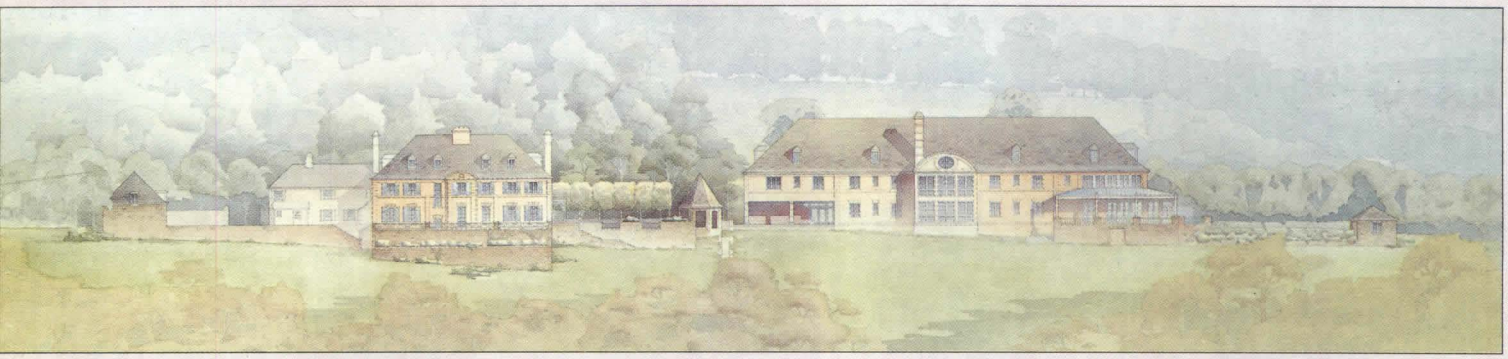
From the main lobby, a sequence of stairs (above left) rises just behind façade toward theater and upper floors. Dalmatian marble walls and spare stainless steel railings and light sconces are characteristic details; plaster soffits swoop in gentle curves above stairs. Moving from entrance toward rear of complex (below), one passes through low café area toward skylighted atrium (facing page). The finely proportioned ramp here (also in background, below) can be used for fashion shows or other events; the skylight or the array of theater lighting can enhance the dramatic qualities of the space. Walls here are of a custom-woven fabric above the marble dado; steel rings can hold fabric. Galleries flanking the café (above) can be used with the atrium for art exhibitions.



Tomio Ohashi

In the theater foyer (above), lighting in ceiling recesses expresses the traditional concept of columns as generators of space. The slashes and curves of light are complemented by details of Art Deco character. Roof garden (below) takes advantage of view over low buildings. Converging lines of trees and pool exaggerate distance. Pavilion-like bar (left foreground, below, and facing page) has dome with interior of stainless steel panels.

Project: *The Spiral, Tokyo, Japan.*
Architect: *Maki & Associates, Tokyo (Fumihiko Maki, Morikazu Shibuya, Tomoyoshi Fukunaga, Keisuke Yamamoto, Eiji Watanabe, Kiyohide Sawaoka, Naruya Kamihara).*
Client: *Wacoal Corporation.*
Site: *a 100' x 200' lot on shopping boulevard, center city.*
Program: *multiuse arts, theater, dining, retail, social functions; 9 floors, 113,645 sq ft.*
Structural system: *steel frame, reinforced concrete.*
Major materials: *aluminum panels, porcelain tiles, exposed concrete; marble and plaster walls, granite, carpet, and hardwood floors.*
Mechanical system: *central gas-fired water heater/chiller; individual air handling each floor.*
Consultants: *Takami Design House, Harutoshi Kada, Hidetoshi Ohno + APL, Null Haus, Yamamoto-Nishihara Architects & Associates, interiors; Kimura Structural Engineers, structural; Sogo Consultants, mechanical; Sumio Yoshii, theater; Minoru Nagata Acoustic Engineer & Associates, acoustics; Masayoshi Nakajo, signs; Kazuko Fujie, furniture; Kei Miyazaki, carpet.*
General contractor: *Takenaka Komuten Co., Ltd.*
Costs: *Not available.*
Photos: *Toshiharu Kitajima, except as noted.*



Creative Health Care

The nation's first independent residential rehabilitation center for the treatment of eating disorders, a 1985 P/A Citation winner designed by Atkin, Voith & Associates of Philadelphia, opened last June.

A watercolor rendering of Renfrew Center, part of the presentation that won Atkin, Voith & Associates a 1985 P/A Citation (above), shows the 1929 McGoodwin-designed manor house, reused for administrative and therapy rooms, to the left, and the new 40-bed rehabilitation facility to the right, with the garden gazebo acting as a "hinge" between new and old. The new building has no conventional entrance, but a sort of "residents only" approach (left) through a casual corner porch.

RENFREW Center is quite literally the first of its kind. This independent center, dedicated solely to the treatment of the eating disorders anorexia nervosa and bulimia, departs from the institutional norm, both programmatically and architecturally, to establish a prototype for residential health-care facilities. Like all experiments, Renfrew has its wrinkles, some the product of changes in program after construction was completed, others relating to the absence of a clear-cut code. The basic solution, however, seems proven sound with practice.

Eating disorders have only recently emerged as a major health-care problem. Anorexia nervosa, a pattern of self-starvation taken to life-threatening extremes, is considered the more immediately dangerous disease; however, bulimics, caught in a binge/purge cycle, can suffer serious physical side effects ranging from rapid tooth deterioration to severe chemical imbalance. The American Anorexia/Bulimia Association estimates that 1 to 4 percent of all high school and college women are anorexic, 6.5 to 18.6 percent bulimic. The typical anorexic or bulimic is a woman, white, middle- to upper-middle-class, between the ages of 13 and 30.

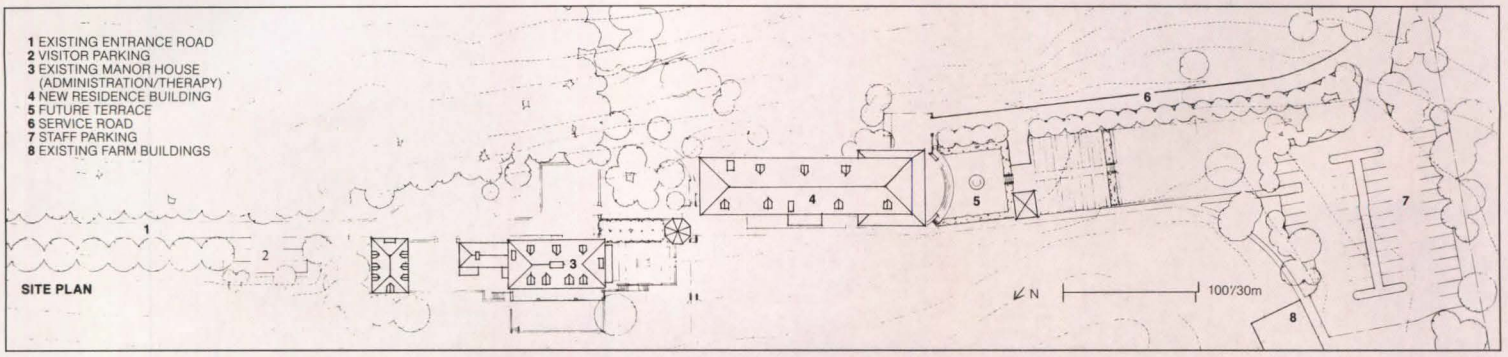
The "cure" must treat both physical or behavioral problems and their psychological roots. Yet few existing facilities are equipped to handle both aspects equally well. Medical hospitals tend to concentrate on the physical symptoms—stabilizing body weight or restoring chemical imbalances—without treating the psycho-social symptoms. Anorexics or bulimics do no better in psychiatric settings: They don't identify with other patients suffering from more serious psychological disorders and may well resist hospitalization altogether. Outpatient treatment has a mixed record.

In building a freestanding clinic dedicated solely to the treatment of eating disorders, Allen R. Davis and Samuel E. Menaged, Renfrew's founders, sought to fill this gap between medical and psychiatric care. At the same time, they saw the opportunity to reduce the cost of care. Medical and psychiatric hospitals, they reasoned, must provide staff and equipment for all types of diseases; Renfrew could streamline, supplying only those services required for treatment of eating disorders. This "unbundling of health care," Davis claims, leads to cheaper service and shorter stays; Renfrew's rates at $295 a day are, he says, roughly half the comparable costs of a hospital-based facility.

The Renfrew Farm was a lucky find, and at $620,000, a great buy. The 27-acre Houston family estate in Upper Roxborough, Pa., is isolated, yet not remote. Architects Tony Atkin and Daniela Voith of Atkin, Voith & Associates, Philadelphia, prescribed only minor alterations to the original 1929 manor house designed by Robert Rodes McGoodwin, bringing it up to code but otherwise retaining the main rooms intact for administrative or therapy use.

McGoodwin's site plan left little room for maneuvering. The manor house is informally situated, set not at the crown but into the side of a steep hill. The entrance drive slips by the front façade, and the carriage house, court, manor house, and terrace are strung out in one long line along the road. Atkin's entrance to the new "wing," hidden behind the drive's original end wall, is if anything still more informal and less prepossessing: a private way in for residents only. The new building, set back further into the hillside, defers to the main house, echoing its roof silhouette and details. In matching the manor house, the architects not only complement the original villa but disguise their own structure, complying with the clients' request that Renfrew appear "residential." It is this aspect of Renfrew's design that the P/A jury debated, praising the functional solution and siting, while arguing over the imagery appropriate to a new building type that is neither hospital nor home but something in between.

For all its reassuringly domestic detail, Renfrew is a licensed rehabilitation center, as the interior, more than the exterior, makes evident. In the absence of a specific role model, the architects relied on state standards developed for substance-abuse (drug and alcohol treatment) centers. They also followed quite closely the treatment schedule devised for Renfrew by Dr. Steven W. Emmett of Boston. Emmett's program, based upon individual therapeutic "contracts" through which patients set their own goals for treatment with staff guidance, stressed group interaction, physical and art therapy, communal meals, and family counseling—all group activities—in addition to individual psychotherapy sessions carried out over a 45–60-day stay. Thus the Renfrew "dorm" has at its heart

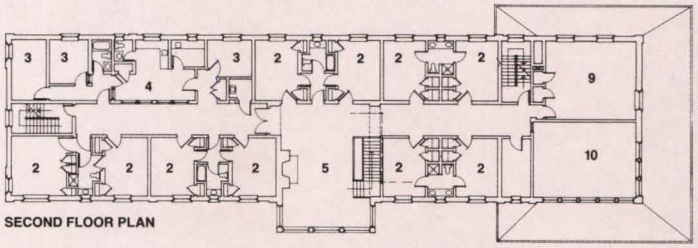


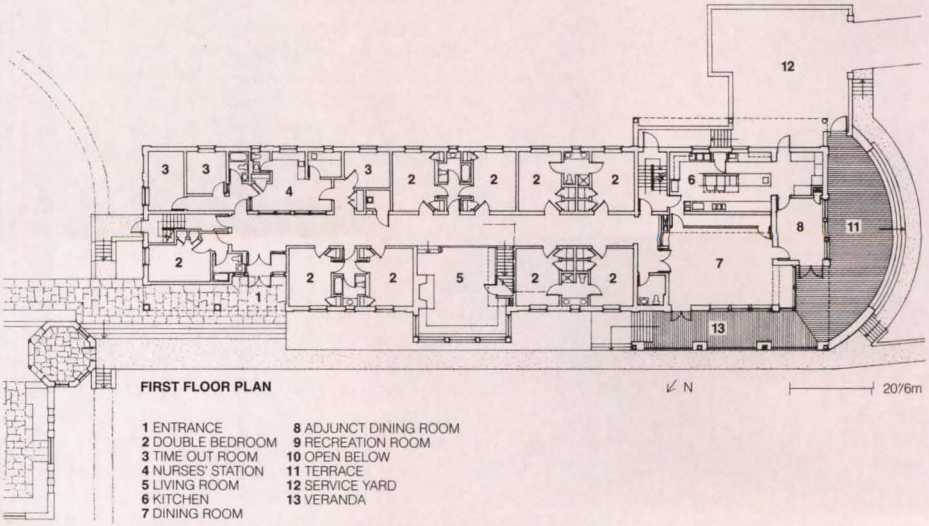
a pair of large living rooms that are the loci for social interaction and group therapy sessions. The main stair, a natural means of social contact, opens directly into these rooms. The units themselves, all doubles with shared baths, are deliberately furnished and finished in a noninstitutional fashion, the only hospital item a call button. (Renfrew does not accept acute care cases, defined as patients more than 20 percent below ideal body weight, or those with evidence of "severe thought disorder" better treated in a psychiatric hospital.) Bedrooms open onto a corridor whose overwide proportions, set in compliance with the wheelchair regulations of the substance-abuse code, afford additional opportunities for casual contact. These corridors in turn open directly into the living rooms, a critical connection for the program and one that required a code variance. Similarly, the usual requirement that juveniles be separated from adults was waived so that the small group of patients (40 maximum) could function as a single unit split up only for therapeutic purposes.

The program as actually practiced by the Renfrew staff takes Emmett's contract system a step further, and in so doing renders some of the more specifically institutional aspects of the facility unnecessary or underutilized. The lock-out bathrooms, designed with special vestibules for staff-controlled access, have never been used that way, although they could be, should a patient request external control as part of her contract. The "time-out" rooms, designed for monitored isolation, function instead as special units for patients who require the privacy of a single room. Renfrew's clinical director, Dr. Leonard S. Levitz, finds the glass-enclosed nurses' stations, another carry-over from the substance-abuse code, too hospitallike. Neither station is used as designed, serving instead as impromptu art room or coffee corner, fully accessible to patients. Levitz would also add more recreational space, both indoors and out (the center has only one all-purpose rec room on the second floor), and hopes to convert the existing carriage house to that purpose. Overall, however, the director praises the prototype, saying, "The building works amazingly well for not having a model to follow."

Davis and Menaged are equally pleased. While it is too early to assess the success of Renfrew's program, the current patient population of 18 (60 *total since the* opening) is ahead of their schedule. Last November the pair bought 19 additional acres adjacent to the farm, and they are now exploring a number of possible programs, including a conference center for the study of eating disorders or a stress management clinic. While Renfrew has as yet no imitators, the center has generated considerable national and international interest and inquiries from as far away as Australia, Italy, and Israel, suggesting that this type of small-scale, specialized health care, offered potentially on a regional basis, may well be the wave of the future.

Daralice D. Boles ■

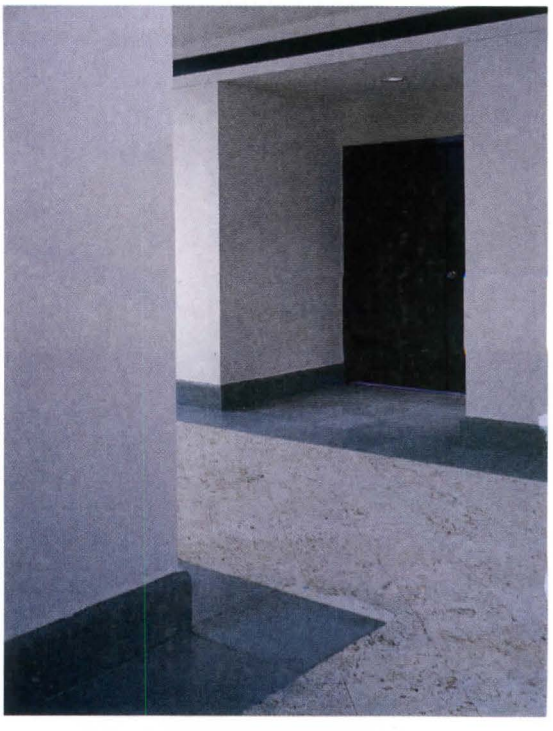


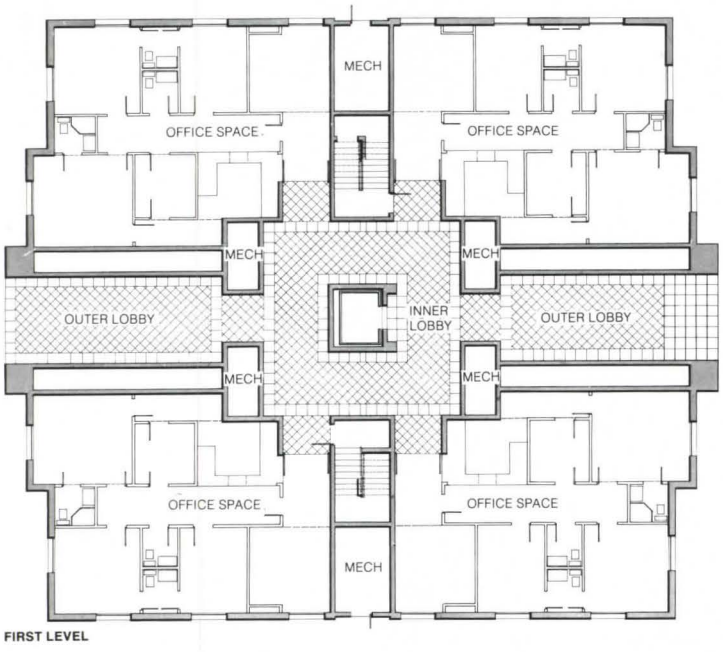


By setting the new building back from the old, the architects have preserved views of the valley and farm buildings from the manor house and its formal terrace (see site plan and photo, facing page). Although far greater in size than the main house, the new facility draws its domestic details from the older McGoodwin design, echoing its roof silhouette and dormers (these were to light attic recreation rooms belatedly cut from the program), its cast-stone banding and stuccoed walls, projected center bay, and casement windows.

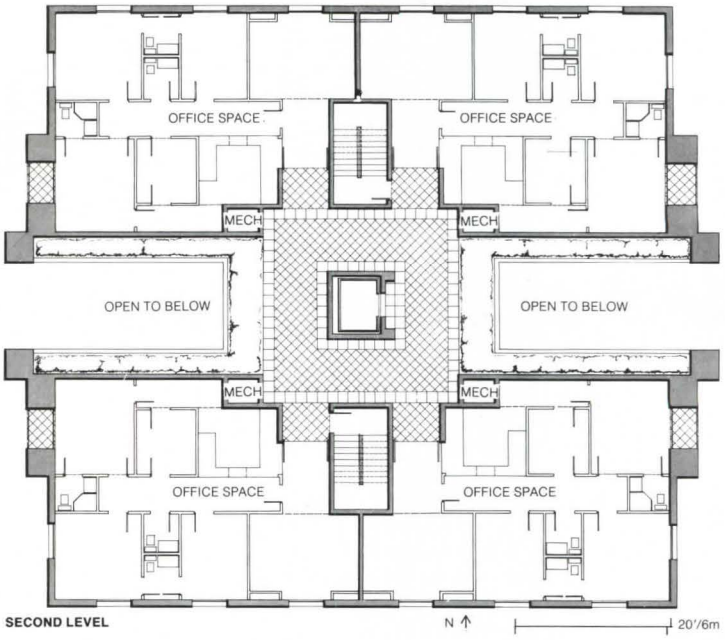
A second terrace and vegetable garden to be built this spring at the northwest end of the new building will complete the complex. The main public spaces—entrance porch, stacked living rooms, dining room, and veranda—look out over the valley (above). Renfrew's rear façade, set into the hillside and seldom seen (below), is a far more austere and functional composition of bedroom windows with only the simplest cast-stone banding for relief.

Carlos Domenech





FIRST LEVEL



SECOND LEVEL

Thickness is an important aspect of the building, as can be seen both on the exterior (facing page and above left) and the interior lobbies (above right). The building is constructed of concrete block, thickest at the base; the doctors' offices have balconies recessed deeply into the building; and the individual office suites are entered through deep niches off the lobbies. The base of the building is roughly textured to encourage climbing plants, and the windows at this level are round to respond to the fuzzy effect of the greenery.

Project: *The Galen Medical Building, Boca Raton, Fla.*
Architect: *Andres Duany & Elizabeth Plater-Zyberk, Architects, Miami (Carlos Figueroa, project manager; Caridad Hidalgo-Gato, Thomas Calvin Christ, Manuel Fernandez).*
Site: *typical inland Florida site: flat, no significant vegetation, neighboring buildings of varied size and type, 300' x 250'.*
Program: *18 medical offices averaging 1500 sq ft; 108 parking spaces; entrance to rear (facing associated hospital) and front.*
Structural system: *reinforced concrete foundations, load-bearing concrete block walls, prestressed concrete floors.*
Major materials: *stucco finish, exterior and lobby walls. Coral stone trimmed with concrete tile on lobby floors (see Building Materials, p. 216).*
Mechanical system: *HVAC split systems in each office.*
Consultants: *Santiago & Associates, Engineers Inc., structural; Martin & Vilato, mechanical.*
General contractor: *Santiago Development Company.*
Costs: *$1,100,000 (1984). Building: $30.10 per sq ft. Site: $2.60 per sq ft.*
Photos: *Steven Brooke, except as noted.*

AWARE Shelter
Juneau, Alaska

Marilyn Holmes

A Surrogate Home

Helping to restore some sense of order to lives disrupted by abuse, Juneau's AWARE Shelter by the Miller/Hull Partnership with Frank Maier reflects the residential yet communal nature of its purpose.

IN the best of all worlds, certain building types would be unnecessary. But it is our misfortune not to live in such a world. A center for victims of domestic violence is a relatively new building type, part of an effort to ameliorate an age-old tragedy. Long thought of as a private shame, the only domestic battles acknowledged were those that required police intervention.

Some studies indicate a direct correlation between various frustrations and aggressive behavior in the home. Among the numerous stultifying factors can be such things as an oppressive climate, which sometimes contributes to a sense of isolation and to alcoholism. While Juneau, Alaska, is a far cry from Prudhoe Bay—it is even south of the Yukon—the nights there can still get pretty long, the weather inhospitable. The AWARE Shelter—by the Miller/Hull Partnership of Seattle and Frank Maier Architect, the associated Juneau firm—provides shelter for abuse and rape victims.

AWARE (Aiding Women from Abuse and Rape Emergencies) has named the shelter "Dove Cottage," after Alaska resident Dove Kull, an advocate on behalf of women and the elderly. As many as 48 women and children can be housed in the shelter for up to six weeks at a time, and they can return if necessary. As a temporary "home," the facility is a cross between a lodge and a residence. It stresses a communal atmosphere, which allows for group interaction and children's play areas, yet provides private facilities for counseling, contemplation, and sleeping. In addition, AWARE's directors wanted the building to set an architectural example, raising Juneau's design standards. They wanted a modern building, but one recalling residential architecture common to Southeast Alaska.

Even though the climate is harsh, with heavy rain and strong winds, the area shares the compensations common to coastal areas south to Oregon—beautiful forests and, when clear, breathtaking mountain and water scenery. Dove Cottage perches on a wooded hillside, the site dropping some 40 feet from the entry road to the west. It is at the base of Mt. Juneau, and provides western views of the Gastineau Channel. The topography is skillfully used to accomplish several connected objectives. Because domestic strife is the reason the facility exists, visitor access is controlled.

Entry from the parking area is limited to two points, reached by what are, effectively, bridges over a lower areaway. Much of the building's base is impenetrable, and by virtue of the grade drop, the entry-level perimeter is protected from all but welcome guests. Decks on the south and west can be used on the nice days without fear of intrusion. Sharing the western view on this level are the children's area, dining, advocate and office areas, and a small library raised a few steps above the lobby. The largest meeting area occupies the rounded north end. The upper, more private level comprises bedrooms and lounge on the south end, and offices and another meeting room on the north.

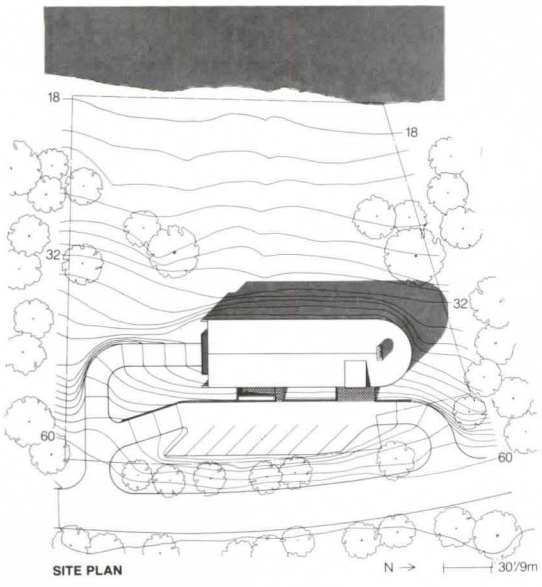
Chosen by the U.S. Attorney General's office as a national model for such shelters, the AWARE center is staffed by an extremely dedicated group under executive director Caren Robinson. Resisting the conventional wisdom that these facilities should be secret hideouts, Robinson has seemingly accomplished more in the way of community and governmental support by making AWARE visible. This very visibility seems to make it clearly off limits to intruders, and therefore somewhat self-policing.

Dove Cottage would have to be characterized as a humanist venture. While AWARE strives to build self-esteem in the women it serves, Robinson does not consider herself or the center primarily feminist in nature. The building offers the full range of spaces needed for recharging the troubled psyche. On the outside it takes it cues from building forms and elements seen all over Juneau. Inside, its residential scale and cheerful spaces help it avoid being cool or institutional. Its reason for being is grim; its aura is anything but. ***Jim Murphy*** ■

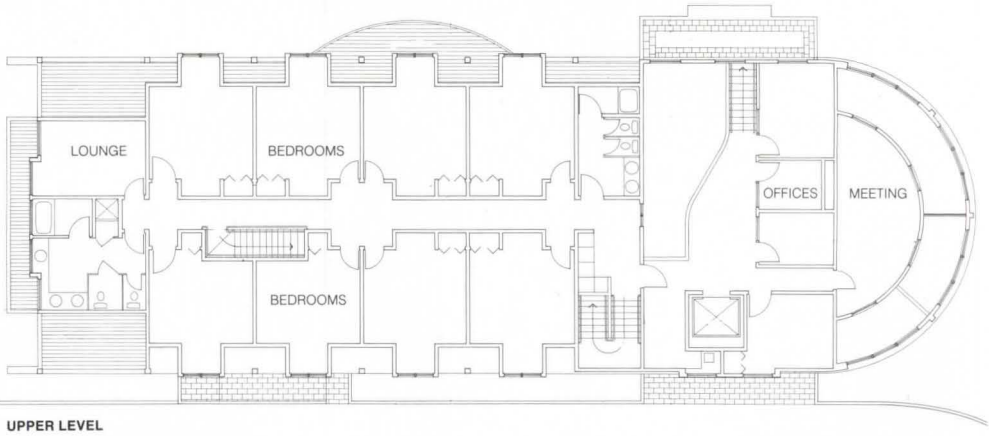
Above the garage (above, left), a south-facing deck adjoining the children's play room allows outdoor activities on much-appreciated sunny days. A continuation of the deck on the west side overlooks the Gastineau Channel and Douglas Island; however, these are separated from the site by marsh-lined Egan Expressway, "the road" that connects the spread-out parts of Juneau.

Meeting rooms on both levels share the sweep of the rounded north end (facing page); the base beneath houses mechanical equipment. The upper meeting room, held back from the outer wall by about six feet, is walled and glazed separately so that upper and lower rooms can be used simultaneously.

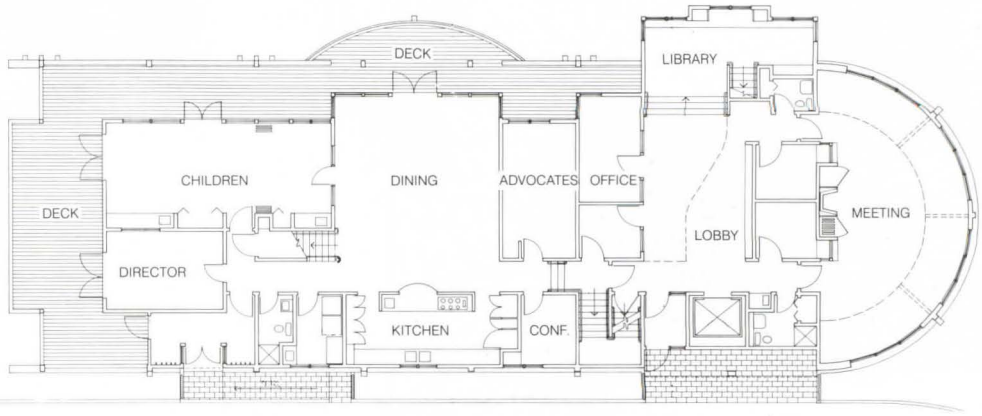
AWARE Center
Juneau, Alaska



SITE PLAN



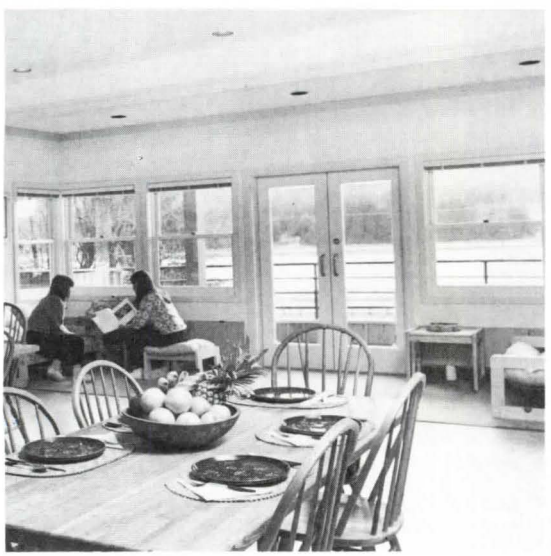
UPPER LEVEL



MAIN LEVEL

From the marshy area and the highway on the west (facing page), the regular pattern of the bedroom protrusions common to both long elevations overlays the sweep of the deck and the projecting library to the left. The scale of the entry side (above) is apparently reduced by the slope of the site. References to local residential forms are more pronounced here, in appropriate deference to the neighborhood.

In the lower level meeting room (center, right), a pointed opening marks the area for an intended fireplace the clients decided they would be too busy to use. Offices flanking this area borrow light from the meeting room glazing. From the dining room (bottom, right) broad views of the channel are afforded by maximum glazing and doors to the deck.



Marilyn Holmes

Project: *AWARE Shelter, Juneau, Alaska.*
Architects: *The Miller/Hull Partnership, Seattle, Wash.; Frank Maier Architect, Juneau, Alaska, associated architect.*
Client: *AWARE.*
Site: *6600-sq-ft hillside at the base of Mt. Juneau.*
Program: *temporary home for victims of domestic violence or rape. Gross area, not including garage, 9680 sq ft.*
Structural system: *concrete slab and foundations, truss joist floor structure for main and upper levels, wood truss roof structure, wood framing.*
Major materials: *wood framing, sash, exterior doors, and siding. Glass fiber and asphalt shingle roof, elastomeric waterproof decks. Gypsum board, carpet, and painted wood trim, interior (see Building Materials, p. 216).*
Mechanical system: *hot water boiler, fin tube radiators.*
Consultants: *Ballinger/Smith, structural; D.W. Thomson Consulting Engineers, mechanical; Sparling & Associates, electrical.*
General contractor: *August Corp.*
Costs: *not available.*
Photos: *Russell Abraham, except as noted.*

Tokyo: Form and Spirit

Japan's innovative contemporary artists, architects, and designers are well aware of their cultural past. An exhibition examining the link between continuity and invention will open this month at the Walker Art Center in Minneapolis.

THE well-known Japanese talent for innovation is matched by an equally strong sense of cultural, spiritual, and artistic tradition. This gift for integrating new information with the lessons of the past has produced some of the world's most inventive contemporary architecture, graphic, and product design. An exhibition that attempts to put these twin currents of innovation and tradition into artistic perspective will open April 20th at the Walker Art Center in Minneapolis. *Tokyo: Form and Sprit,* organized in association with Japan House Gallery, New York, and curated by the Walker's director, Martin Friedman, and its design curator, Mildred S. Friedman, will exhibit both important artworks from the Edo period (1603–1868) and commissioned installations by Japan's leading contemporary architects and designers.

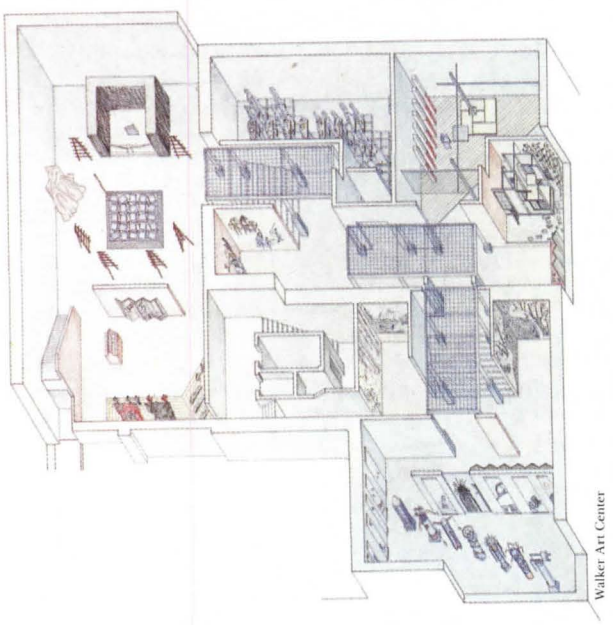
Martin Friedman, in his introductory essay for the show's impressive catalog, calls the exhibition "an effort to illuminate the relationship of Japanese artistic activity to various aspects of urban existence and to stress the durability of Japanese artistic attitudes from historical times to the present." Tokyo was chosen as the context for this relationship because it is the center of contemporary activity in Japanese arts and architecture, and because it epitomizes the contradictions of modern urban life, where McDonald's stands and Shinto shrines crowd the same streets. Nonetheless, according to Friedman, "An identifiable Japanese sensibility continues to survive the impact of outside influences by incorporating and 'Japanizing' them."

While this sensibility traces its roots back to ancient times, its modern genesis is in the Edo period, so named for the palace that became Japan's new capital when shogun Tokugawa Iyeasu moved it there from Kyoto in 1590. For nearly three centuries, while Japan was virtually closed to outsiders, the rise of the merchant class triggered the growth of private patronage, and the resulting boom in artistic production saw the rise of the individual artist and a flourishing of craftsmanship and arts such as lacquer, ceramics, printmaking, theater, and literature. The forced opening of Japan to the West and the Meiji Restoration of 1868—when Edo was renamed Tokyo—brought Japan into the modern world, and completed the evolution of the arts from an elitist pursuit to a part of popular culture.

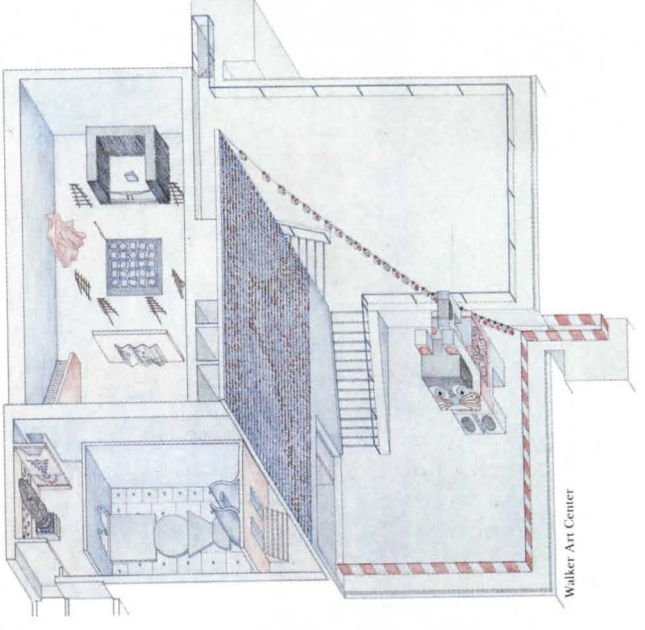
Because the arts in Japan are so integral to everyday life, the exhibition pairs "artistic phenomena with urban existence," in Friedman's words. Six aspects of daily life, each introduced by a group of Edo-period objects and artworks, are each represented by a contemporary thematic space: *Walking,* by the street; *Living,* by the house; *Working,* by the shop and factory; *Performing,* by the theater; *Reflecting,* by the temple; and *Playing,* by the playground. The contemporary spaces, which address urban themes in a "Philosophical, conceptual manner," were designed by architects Tadao Ando, Hiroshi Hara, Arata Isozaki, Toyo Ito, and Fumihiko Maki, and designers Kiyoshi Awazu, Shigeo Fukuda, Eiko Ishioka, Shiro Kuramata, Kohei Sugiura, and Tadanori Yokoo. After its initial run ends on July 20th, *Tokyo: Form and Spirit* will travel to Los Angeles, New York, and San Francisco. The following pages offer an advance look at the exhibition; a review will follow in the June issue of P/A. ***Pilar Viladas*** ■

An introductory gallery (see exhibition layout, facing page) outlines Japanese history and artistic styles from the Edo period (1603–1868) to the present. Maps, photos, everyday objects, and wood-block prints such as the *View of First Street, Nihonbashi* (above) from Ando Hiroshige's renowned *One Hundred Views of Edo* of 1858 (collection Art Museum of Elvehjem), will illustrate Tokyo's history, as will two pairs of screens, one from the 18th Century, the other by contemporary painter Masami Teraoka.

For the theme of *Walking,* The Street is introduced by a number of Edo *kanban,* highly descriptive tradesmen's signs, such as the one for a pharmacy advertising a stomach remedy (left, collection Peabody Museum of Salem). In the thematic space for this section (below), Arata Isozaki designed seven frameworks that contain Tadanori Yokoo's silkscreen paintings on ceramic tiles. The paintings combine historical and contemporary images of buildings and figures, and street imagery from Japan's passage through history, from Edo times through the "Near Future."



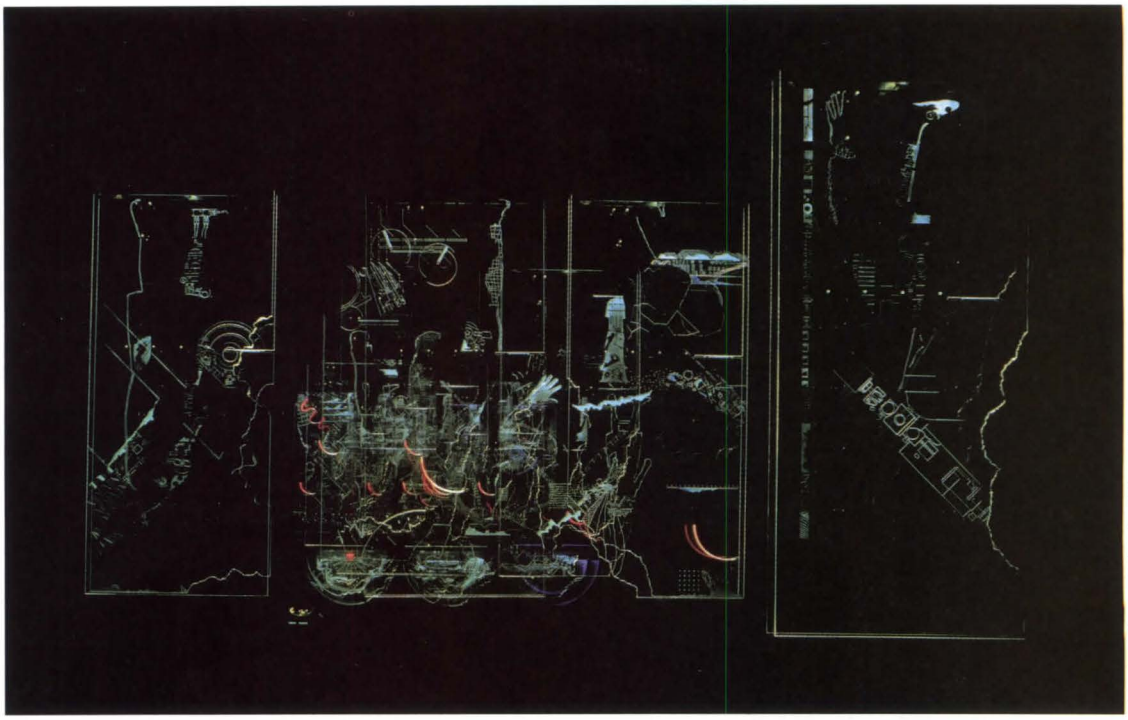
Walker Art Center



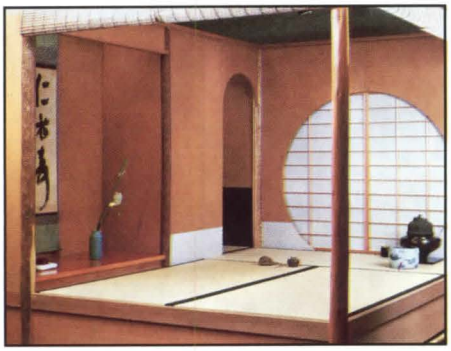
Walker Art Center

The *Tokyo Spirit* space, introduced by Keirin's *Bird's-Eye View of Great Edo,* a wood-block print from 1860 (left, collection Tokyo Metropolitan Central Library), houses a procession of six descriptive columns, designed by Fumihiko Maki and Kiyoshi Awazu, that recall Japanese architectural traditions, from the ancient (the Festival column, above, far left, with references to shrines and rituals) to the modern (second from right, with Tokyo's streets, buildings, and freeways wrapped around the column).

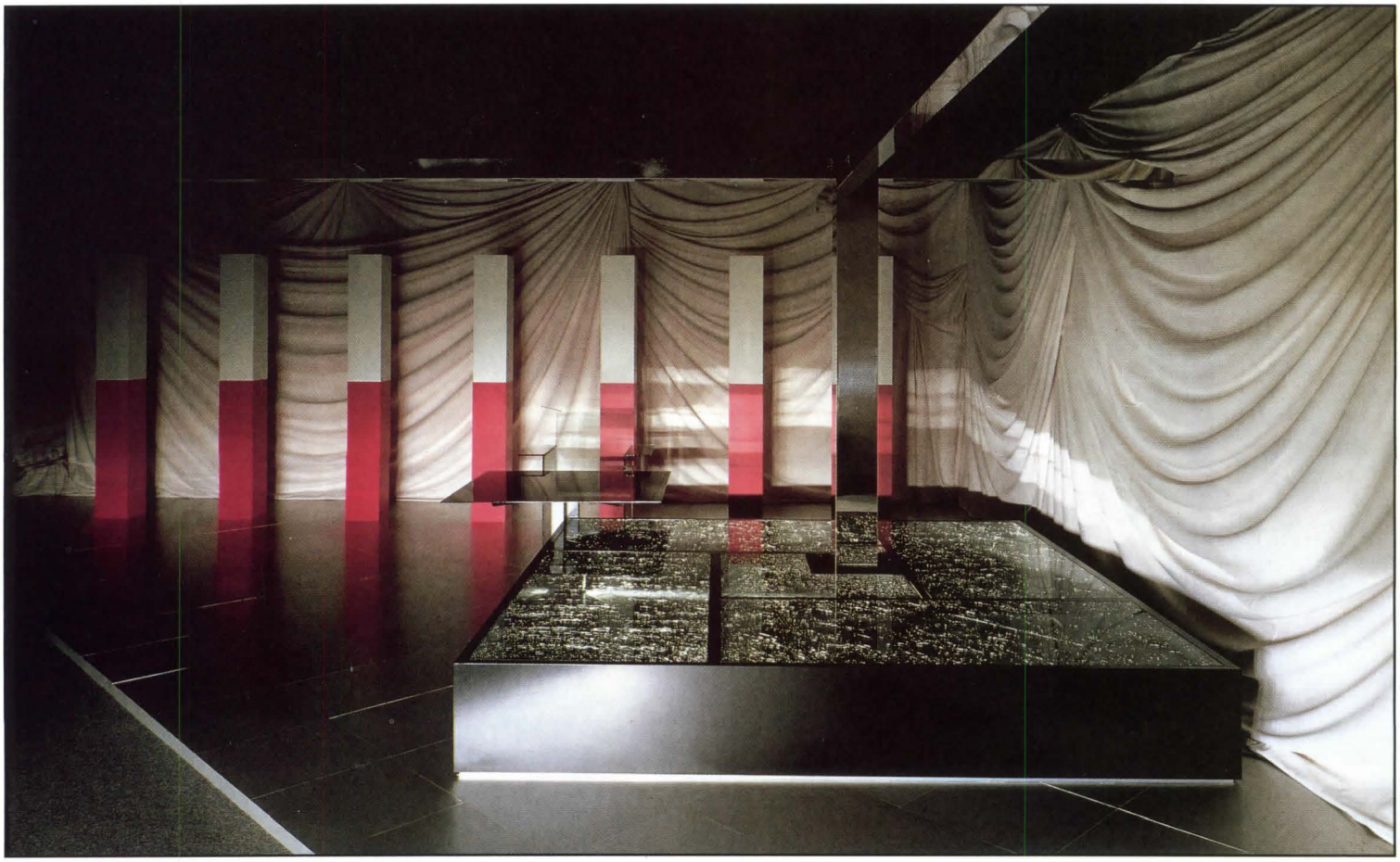
Among the Edo objects in the *Living* section are a portable teahouse (facing page, middle left, collection Urasenke Tea Society). Tadao Ando and Shiro Kuramata's thematic space (facing page, bottom) evokes the ambiguities of the Japanese house in its public/private and formal/informal roles, with red-and-white columns, walls draped "softly" with polymer-stiffened cloth, a glass chair and illuminated glass table, a hologram of an Ikebana floral arrangement, and *tatami*-like rectangles of cracked glass hovering over a metallic floor.



© Retoria/Y. Futagawa & Associated Photographers



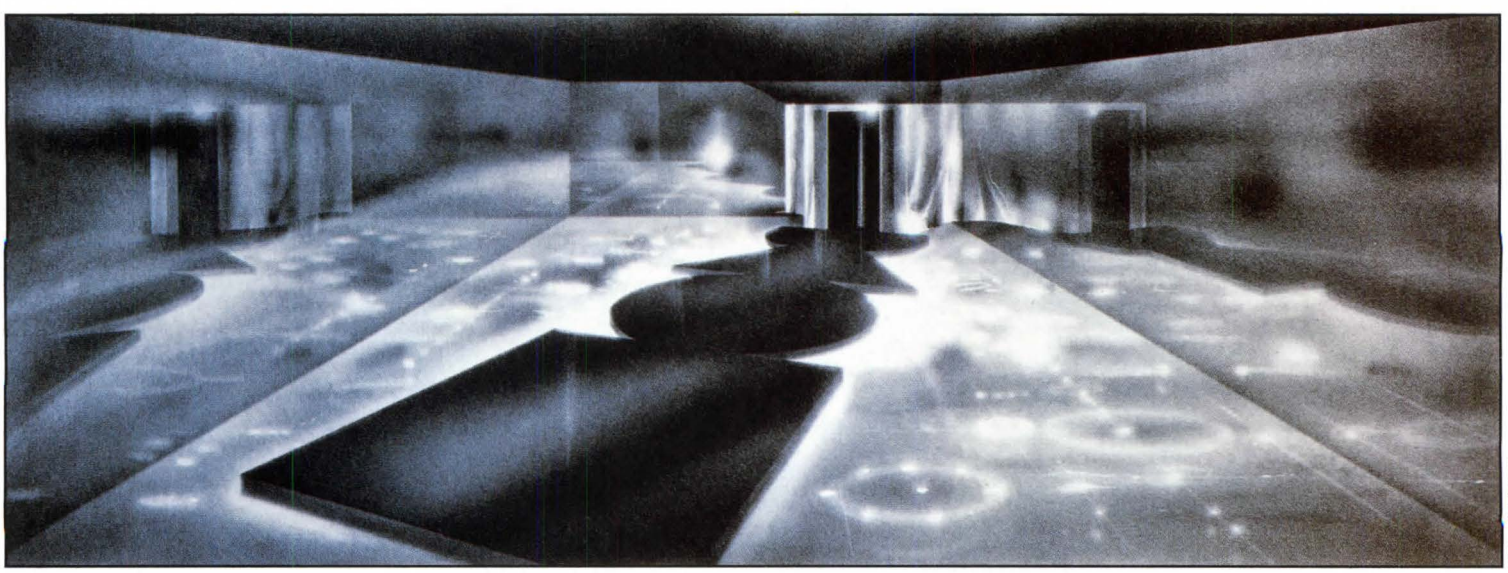
A pair of screens depicting craftsmen at work, by Edo artist Shokunin Zukushi-e (top left and facing page, collection Wadsworth Atheneum), are among the objects that introduce the *Working* section. Its thematic space (above), designed by Hiroshi Hara, contains rows of robotlike figures incised on plastic; wire filaments and diodes embedded in their surfaces project moving patterns of light on both gallery walls and visitors. Hara believes that "Earlier machines were an imitation of the human body; today's machines have come to resemble the human mind. Architecture that now conforms to the body will, in future, become an architecture of the mind."



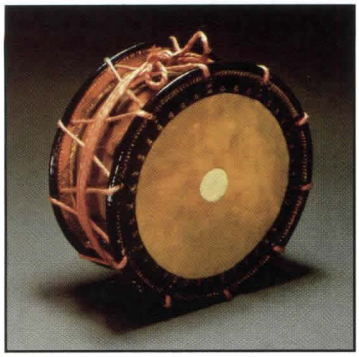
© Retoria/Y. Futagawa & Associated Photographers

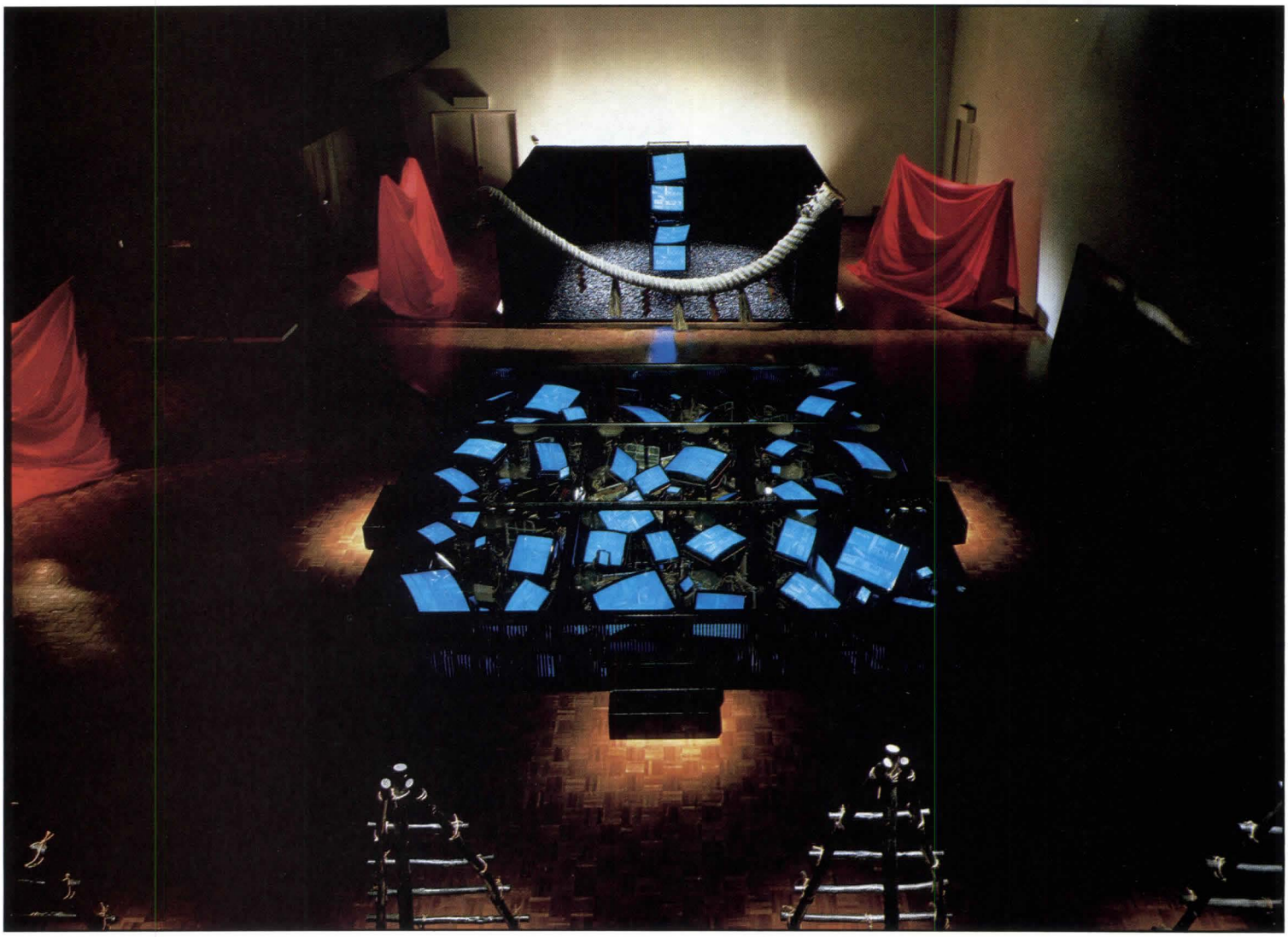
© Retoria/Y. Futagawa & Associated Photographers

Toys and games from the Edo period, including kites, dolls, playing cards, board games, and an *inu hariko*, a nine-inch-high papier-mâché dog (above, a 1920s version, collection Brooklyn Museum), introduce *Playing*. Shigeo Fukuda chose this engaging creature, traditionally offered at Shinto shrines by parents on behalf of their children, as the central image for his thematic space. Since that space is the Walker's outdoor terrace, Fukuda translated the paper original into a steel-structured animal, fifteen feet high (left). While painted in a traditional manner, its rather cubistic forms are contemporary. Visitors will be able to look through peepholes in the giant *inu hariko*, to see illusionistic games invented by Fukuda.

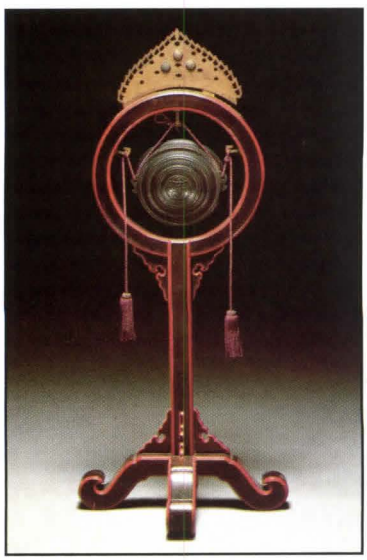


Walker Art Center





© Retoria/Y. Futagawa & Associated Photographers



Mark Sexton

Edo religious objects such as a bronze Buddha, Shinto shrine, and a gong (left, collection Peabody Museum of Salem) introduce the *Reflecting* section. Toyo Ito and Kohei Sugiura's thematic space (drawing, facing page, bottom) represents the Buddhist "universe." Walking through an entryway shaped like a seated Buddha, visitors proceed across a series of panels (illuminated from below by 1500 electric candles) representing the four natural elements: a square of earth; a circle of water; a triangle of wind; and a semicircle of ether.

A 19th-Century festival drum (top, collection Peabody Museum of Salem), Bunraku puppets, and Kabuki theater costumes set the historical backdrop for the *Performing* section. Arata Isozaki and Eiko Ishioka's performance space (above) consists of a *himorogi* (sacred space) made of black-painted rice straw, and a glass-topped stage organized like a *bento* (partitioned lunchbox) and housing fifty television monitors. These two designs represent the universal traditions of performance—the first the sacred dances at Shinto shrines, the second the plays of ancient Greece—while the televisions refer to contemporary entertainment. The monitors in both the *himorogi* and the stage broadcast Ishioka's video program of recent Japanese television commercials. Triangular ladders, placed around the space and draped with brilliantly colored cloth, offer visitors vantage points from which to view both the video programs and the live performances that will be staged there. The sounds and sights generated by the combination of live instrumental and vocal performances, and the images of the television commercials, according to the designers, "symbolically express the source of Tokyo's intricate energy—a mixture of tradition and modernity."

Energy Past and Future

For seven years each April, P/A has devoted all or part of its feature section to the subject of energy conservation. This year, with our coverage of the subject, we begin what will be an ongoing series of post-occupancy evaluations of buildings, many of which have been published in P/A.

HINDSIGHT, said Henry Ward Beecher, is always better than foresight. What he didn't say is that both are essential to progress in any area.

The following four articles offer both hindsight and foresight in the area of energy conservation. The first two evaluate the operation of and user response to several passive solar buildings. One article, written by Jean Wineman and Craig Zimring of Georgia Tech, looks at the use, operation, and maintenance of the Florida A&M School of Architecture (P/A, April 1985, pp. 74–79) now one year old. The other article, by Min Kantrowitz of Min Kantrowitz and Associates, examines seven passive solar buildings in terms of their performance and acceptance by users. Both articles take "a lessons learned approach," as Zimring and Wineman put it, "where the post-occupancy evaluation is used as a way of improving subsequent decisions rather than of assigning blame."

The second pair of articles discuss energy-related changes occurring in the fields of mechanical and electrical engineering. One article, by Robert Logan of Syska & Hennessy, emphasizes the impact electronics will have on the design and more efficient operation of buildings in the future. The other article, by Norman Kurtz of Flack & Kurtz, looks at the effect energy conservation has had and will continue to have on a building's configuration, envelope, and mechanical equipment. Related to both articles is a review in the P/A Practice section (p. 63), by Harvey Bryan of MIT, of the proposed revisions to ASHRAE's Standard 90.1P governing energy conservation in nonresidential and high-rise residential buildings.

With these articles, P/A marks its seventh year of energy-related coverage—and the beginning of the series on post-occupancy evaluations (POEs). It's appropriate that the beginning of one coincide with the continuation of the other, for in many respects, they depend upon each other. "To understand more about how buildings use energy," says Min Kantrowitz, "we must understand more about how people use buildings, since no one ever designed and built a building just to save energy."

Energy conservation and post-occupancy evaluation also relate to each other through the issue of building performance. "People and buildings," says Kantrowitz, "have a strongly interdependent, even symbiotic relationship. The performance of a building directly influences its inhabitants; in turn, user behavior directly influences building performance."

The desire on the part of many clients to improve building performance (and thus operating costs and employee productivity) has increased the interest in POEs. At the same time, the POEs have become more interesting. "Post-occupancy evaluation," says Craig Zimring, "started in the 1960s and 1970s as academic studies of people using buildings. Recently, it has been adopted as a routine business practice by a wide range of client organizations and architecture firms. Gray, dust-gathering reports are giving way to punchier presentations . . . and care is being taken in matching methods and presentation format to the needs of the users."

This POE series also comes at a time when the architectural profession, faced with a growth in litigation, must increasingly justify past decisions. "Architects," says Kantrowitz, "traditionally learn from experience and from analyzing the exemplary work of peers. Post-occupancy evaluation is a systematic way to do just that. The goal of POE research is to analyze systematically the reality of buildings in use." As the courts hold architects to an ever stricter liability, the conducting of POEs may become as common as consumer research is to product manufacturers.

While "the approach to POEs varies widely," says Zimring, with some amounting to "intensive engineering studies" and others focusing "on the experience of building users," the goals of most POEs remain fairly constant. Those goals, says Kantrowitz, include "debugging," which "systematically analyzes the process of settling into the building"; "fine-tuning," which sets up a process of "continual feedback and adjustment to a set of constantly changing occupancy conditions"; "generalization," which applies "lessons learned to other similar buildings that already exist"; and "design education," which integrates the POE's results into "the design of new buildings."

Other professions have established ways that members can learn from each other's experience. The architectural profession must do the same. The POE series, along with the articles on building failures in the Practice section, are efforts in that direction. They reflect a conviction that, just as the discussion of energy conservation shouldn't stop with the temporary downturn in oil prices, the discussion of buildings shouldn't stop with their completion.

Thomas Fisher ■

Photos: Steven Brooke

The Florida A&M School of Architecture, by Clements/Rumpell/Associates, has a front block (above) related in scale and material to the facing houses. The studio wings (far left) contain south-facing thermal chimneys, ridge ventilators, and operable windows. The open walkways (left) overlook the courtyards and outdoor amphitheater, promoting interaction among students and faculty.

Jean Wineman and Craig Zimring of Georgia Tech discuss the results of an evaluation of the Florida A&M School of Architecture, conducted by a multidisciplinary team of researchers. The article shows how much we can learn from thorough POEs.

THE Florida A & M School of Architecture building was featured in *Progressive Architecture* (April 1985, pp. 74–77) a few months after occupancy. Now, a year later, a nearly completed post-occupancy evaluation (POE) is shedding new light on the building. The POE reflects measurements and analysis of the building, and active and enthusiastic participation by students, faculty, staff, and an Advisory Task Force of key decision-makers from the university and state government. The Task Force includes people responsible for implementing recommendations from the POE and for using POE in future projects. In a meeting in late Spring 1986, the Task Force will work with the POE team to turn the descriptive information summarized in this article into recommendations for updating the Board of Regents space standards and building delivery process, fine-tuning the building to fit the architecture school's needs, rethinking maintenance scheduling, providing an ongoing evaluation system, and providing design recommendations for academic buildings.

Major goals of the original design competition and program were to produce a building that "pushed the limits of current definitions of architecture" and that provided a symbol of the "leading edge" quality of the school. Many of those aspirations have been realized. The building has become a standard feature of the school's publication and recruiting materials and is a first stop on Tallahassee tours by students and faculty. The building's exposed steel and mechanical systems are used as teaching tools in studios and lecture classes. Moreover, some of the client's innovations in space planning have proven successful, such as using smaller than standard faculty offices to release extra space for conference rooms and common areas.

There are many lessons to be learned from the building. Experience with the experimental energy-conserving design has raised questions about its suitablity for the Tallahassee climate and for the 24-hour schedule of an architecture building. The diversity of materials and details provides interest but also creates maintenance problems. An overall concern, in the Dean's words, is that the building is not "forgiving enough" of a state university's low maintenance budget and high need for flexibility, and of the extreme wear and tear caused by the activities of an architecture school.

How the POE Was Performed

The Florida Legislature was not only interested in producing a high quality, energy-conserving building, they also permitted a number of procedural innovations for Florida such as selecting the architect by competition, shortcutting some steps in the normal state building delivery process, and allowing some normal codes and standards to be relaxed. The POE was initiated to study systematically the building and building delivery process to help the state understand how to deliver higher quality buildings more quickly.

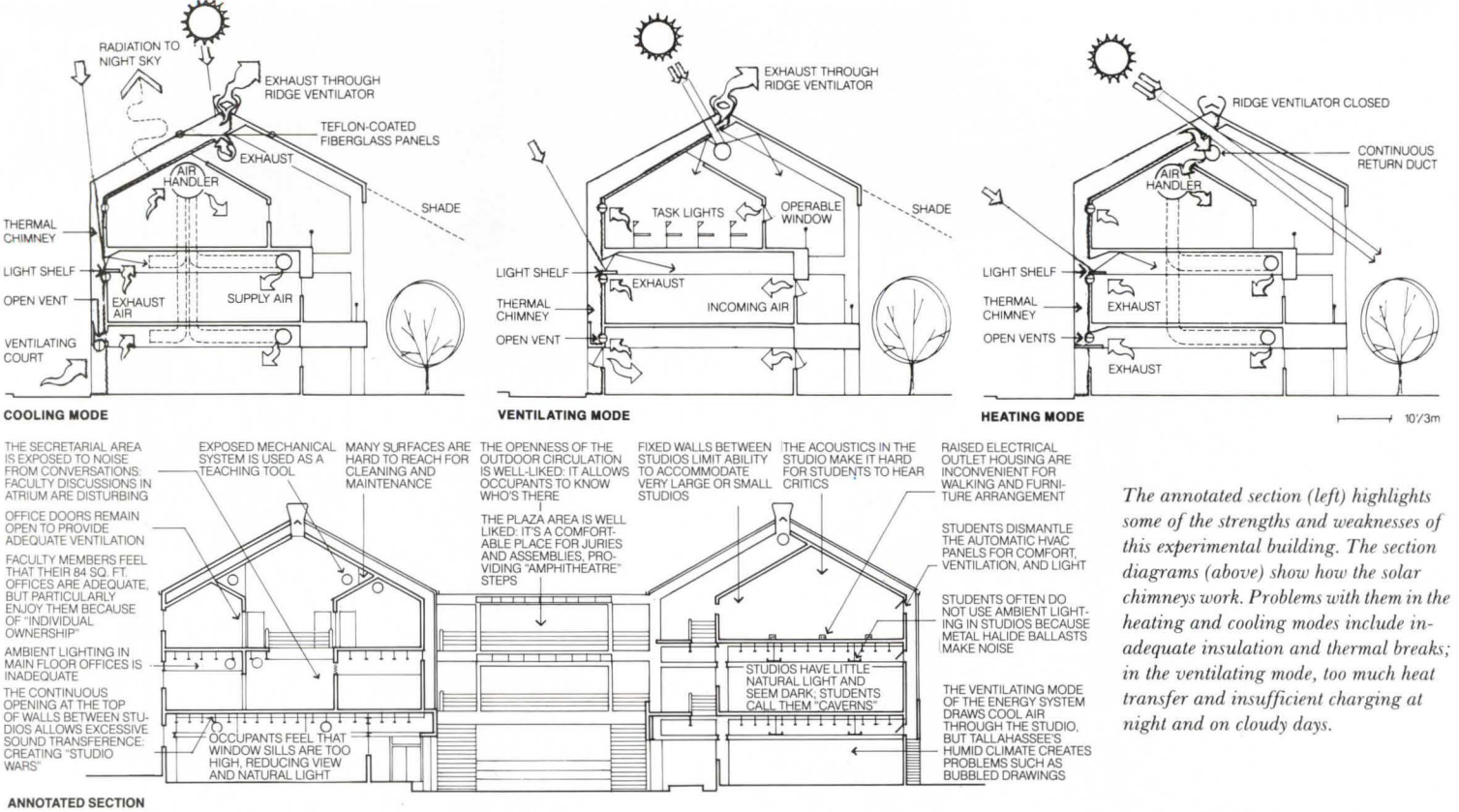
The POE team, a multidisciplinary group from Georgia Tech and Min Kantrowitz & Associates, studied six goals of the original program, which were to: create an image that would be advanced, yet humanly scaled and inviting; create a comfortable, state-of-the-art HVAC system that demonstrates energy conservation; increase building use; provide effective workspace; promote social interaction among students and faculty; and provide security in a building open 24 hours. The Advisory Task Force, which met early in the project to help establish goals, added a number of issues, such as: how well the innovative building-delivery system functioned; how easily the building could be maintained; and how easily it could accommodate changing needs of the architecture school or future occupants.

The POE team studied the school's former makeshift quarters, monitored the construction process, conducted a check visit ten weeks after occupancy to monitor the settling-in process, and collected extensive data one year after occupancy, using multiple data gathering methods. On each occasion, the team walked groups of students, faculty, and staff through the parts of the building they knew, then debriefed them about their uses of and experiences with the building.

The team surveyed students, faculty, and other key people several times over the two years, documented change orders, observed usage patterns, and analyzed noise, temperature, and light levels in the old and new buildings. Using many sources provided a check on the information received from participants who might be telling the POE team what they think they want to hear rather than their true opinions.

The Building's Image, Materials, and Construction

Students and faculty are proud of their new building and bring visitors often. The school is a campus landmark. As one student



The annotated section (left) highlights some of the strengths and weaknesses of this experimental building. The section diagrams (above) show how the solar chimneys work. Problems with them in the heating and cooling modes include inadequate insulation and thermal breaks; in the ventilating mode, too much heat transfer and insufficient charging at night and on cloudy days.

reports, "If I say I'm from the architecture school, everyone knows the building." Many students and faculty commented that the building is particularly dramatic at night when it is fully lighted. At night, especially from the west, it has a wonderful playful quality described by a student as a "Disneyland version of a factory."

Part of the building's visual interest is in the variety of materials. That, however, has created difficulties in construction and maintenance. The joining of materials is of particular concern to several administrators involved in the project. Unusual and complex construction details caused difficulty for construction trades inexperienced with them. Depending on sealant for weatherproofing joints may become a maintenance problem, since leaks attributed to joint conditions have been common during the first year of use. There is also a question about the long-term durability of some materials such as fiberglass, not previously used in Board of Regents' buildings.

The exposed steel trusses and HVAC ductwork are "dust collectors" and not within the routine care of the custodial staff. Their inaccessibility, as well as that of lights and HVAC controls, requires special equipment for maintenance or repair. A truss spanning the atrium in the administrative wing had a plaintive "dust me" written on it for weeks before it was attended to.

Lessons Learned from the Energy and HVAC Systems

The elements of the passive energy system provide students an instructive model. In terms of performance, however, the passive energy system may be overly experimental; and the computerized control system, too difficult to program and fine-tune.

The design concept for the passive system—south-facing solar chimneys—was based on its use in a residential project in the Northeast where, according to the passive design consultant, it seemed to work well. Although he acknowledges the system might provide only marginal thermal performance, the educational value of the system was of primary concern.

The system operates somewhat differently from that originally conceived because of budget constraints and changed procedures. The passive heating mode was originally intended for the entire building. Because of cost cutting, it is functional in only one of the four wings. The ventilating mode operates in three wings. There was also an expectation by the architect that mechanical cooling and ventilation would not occur in the same seasons; the central chiller was to be shut down during moderate seasons. Paddle fans specified for the studios and a desiccant bed included in the original concept ultimately had to be eliminated because of cost.

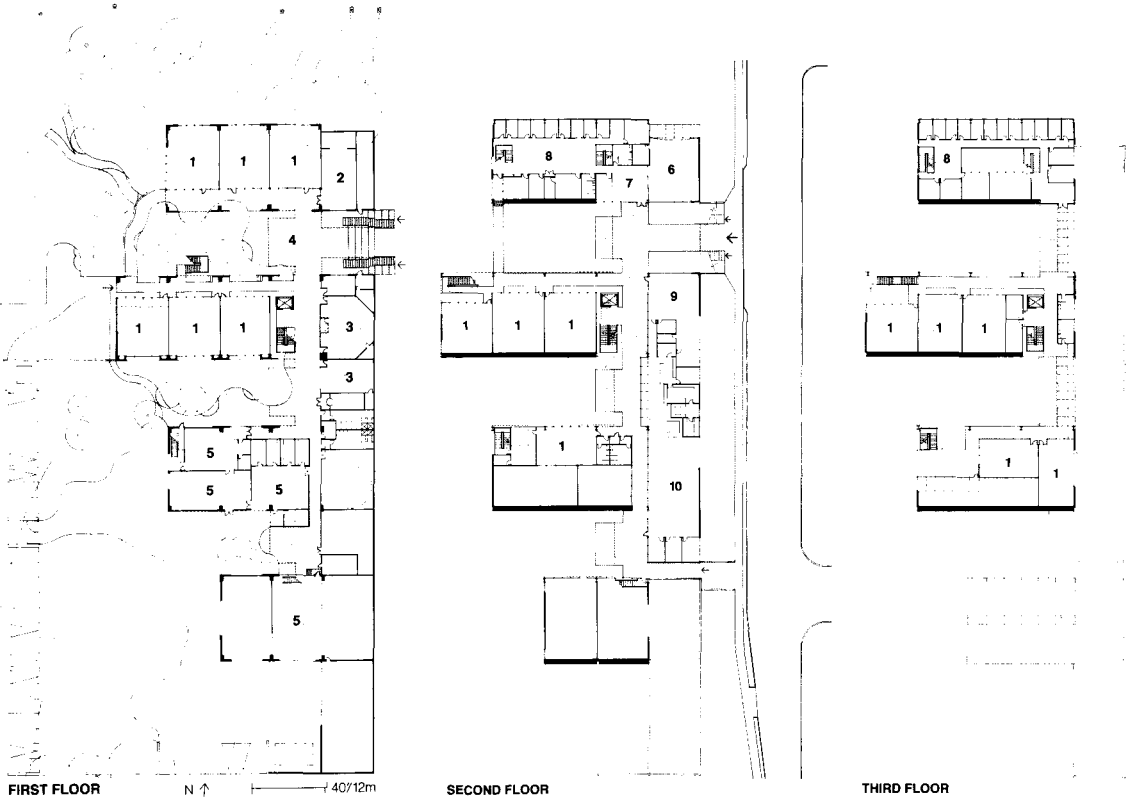
A major complaint of students, faculty, and staff is thermal comfort. They are often too warm or too cold with little ability to control conditions either mechanically or through adjustments such as opening windows. Some students have taken the situation into their own hands by dismantling the computer-operated ventilation panels and opening them manually.

There have been a number of "settling-in" problems that may contribute to users' responses, including difficulties in "tuning" the system and a major power outage during which the manual override for the system was unworkable. However, it may be difficult to provide thermal comfort using the system as built for several reasons. Heat is conducted into mechanically cooled space in the summer and out of heated space in the winter through steel trusses penetrating the building's skin, and through steel columns in both interior and exterior walls. Steel studs and trusses also transfer heat from the thermal chimney to interior spaces without a thermal break. On a sunny day, as one walks across the studio space, a clear temperature differential can be felt, with the wall adjoining the thermal chimney radiating heat to the interior. With a number of visible cracks in gypsum board and at joints, there is concern about the long-term effects of thermal stress on the building.

Humidity is a major drawback to the success of the passive cooling system. Students complain that if drawings are left out for any length of time, they bubble and curl because of humidity. When the exterior temperature drops below 75 degrees, the system switches into the ventilating mode (mode switches are based on temperature alone). However, if the thermal chimney is not charged by the sun, such as at night or on a cloudy day, sufficient cooling does not occur. (It had been hoped that adequate nighttime cooling would be provided by the wind-assisted ridge ventilation.) Humidity absorbed by interior materials while the system is in the ventilating mode puts additional load on the system during mechanical cooling, potentially offsetting energy savings.

There is a question whether the complex computer-run system is appropriate for a state-owned educational building. The system requires a fully trained building engineer to run it and no such person is available at the university. Fortuitously, the school of architecture has faculty who understand the system and have taken on the responsibility of operation. The original program for the system had many "bugs" and has had to be reprogrammed to meet occupant needs and to provide for greater overall energy efficiency.

The lack of adequate ventilation may be appropriate for a building used only from 9 to 5, such as a professional office building, but has resulted in cries of outrage from architecture students who often inhabit the building around the clock. It was proposed by the architect as a "hands-on laboratory," yet little can be done to alter uncomfortable conditions.



The floor plans of the school (left) indicate the building's clear organization, with a front block of rooms buried into the hillside, and perpendicular wings that contain studios, offices, and labs. The studios have proven difficult to subdivide, while the small faculty offices, with ample conference room space, have proven to be quite successful.

Making a Workable Building

In addition to presenting an appropriate image and energy-conserving HVAC system, the client and architect were concerned with making a building that would be flexible and efficient for a school of architecture. The finger plan and overall building organization are clear and contribute to the easy inside/outside movement. A gallery space off the main entry to the administrative wing is heavily used and provides a constantly changing view of student work and traveling shows. Segregating faculty into an administrative wing with access controlled by a receptionist remains controversial, with some faculty liking the refuge and faculty interaction and others feeling isolated by the separation; students were uniformly negative about it.

The open walkways and high nighttime light levels have contributed to increased security. The clustering of functions used during the evening and night, including the student lounge and heavily used graduate studio, has contributed to students being present to look out for each other. Surveillance is reduced, however, by the height of the studio windowsills, which reduces direct visual contact with the outside. Nonetheless, the outdoor circulation system allows students 24-hour access by providing them with keys to a single studio.

One of the primary goals of the school was to create spaces that would encourage faculty as well as students to work in the building. The faculty offices appear to be successful in this respect: Faculty appreciated having private offices, even of 84 square feet. They found it quite workable to move to a small conference room for larger meetings. Studios, in contrast, fall short of expectations. Even on bright sunny days, the studios are dim: Students refer to them as "caverns." Windows on the north wall have sills too high to see out from a seated position and provide little light because they are shaded by overhanging roofs or walkways. When the automatic ventilation panels on the south wall are closed, natural illumination is further reduced. Students and faculty unanimously agree that the library is the nicest space in the building, particularly the lounge area adjacent to the entry, where floor-to-ceiling windows provide natural light and capture the exceptional views to the west.

Students and faculty are enthusiastic about the openness of the plan. They enjoy the easy relationship between interior and exterior spaces, often taking advantage of good weather to hold classes and meetings outside. Students play frisbee, socialize, relax, and eat lunch in the plaza area on the ground level. The stairs to the street form a natural amphitheater. Yet while most students and faculty feel social interaction is enhanced by the ability to see one another on the open walkways, some report greater isolation of faculty from students because of the "wing" organization of the building. Graduate students, for example, must go out of their ground-floor studio and up three levels to converse with most of their professors.

Flexibility, a major programmatic objective, has been limited by providing studios for less than 20 workstations. Although allowing students to feel some identity with their studio group, it is problematic for administrators to schedule unusually large or small classes. Students also felt a bit isolated from each other and wished they could more easily see the work of other classes. Although the exposed HVAC system makes it difficult to subdivide space or move partitions, the 50-foot structural spans allow studio walls to be removed without major changes in structure or mechanical systems.

Summary

The POE team, with the Task Force, is developing a plan to implement recommendations. The benefits of the POE project go beyond space standards, building delivery, fine-tuning, maintenance scheduling, or design recommendations. It has helped students and faculty to think about and take control of their building and has helped decision-makers to reconsider the process they use to produce and manage buildings.

In sum, the building is exciting but shows some disturbing lapses in the design of the energy system, flexibility, and attention to maintainability and to user comfort. The bottom line was best expressed by a faculty member who said: "The students learn a lot from the fine qualities of this building—form, scale, structure, zoning, materials, lighting. They also learn from its flaws. What more can we ask?" ***Jean Wineman, Craig Zimring*** ■

Jean Wineman, Associate Professor of Architecture at Georgia Institute of Technology, received her Arch.D. from the University of Michigan. She recently edited the book Behavioral Issues in Office Design *(Van Nostrand Reinhold, 1986). Craig Zimring, Associate Professor of Architecture and Psychology at Georgia Tech, received his Ph.D. from the University of Massachusetts. He has done POEs for public and private clients.*

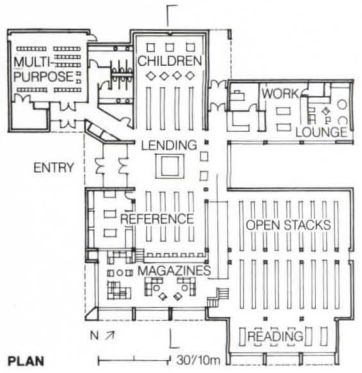
Project Team

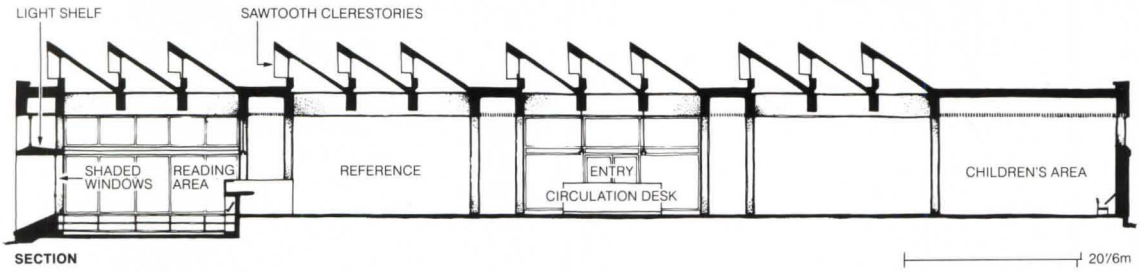
Georgia Tech: *John Archea, project advisor; Bettye Rose Connell, Jon Sanford, and Jean D. Wineman, project associates; Craig M. Zimring, principal investigator; Deborah Hayes Hyde and William Von Ingle, research assistants.*

Min Kantrowitz & Associates, Inc.: *Richard D. Barnes, Randolph-Macon Woman's College, project associate; Jay Farbstein, Jay Farbstein & Associates, analysis of construction process; Min Kantrowitz, Min Kantrowitz & Associates, project manager, energy issues; Robert Shibley, Caucus Partnership, advisory task force organization and coordination; Lynda Schneekloth, Caucus Partnership, landscape, contextual issues.*

Florida A&M School of Architecture: *Edward T. White, project officer.*

Photos: Gordon H. Schenck Jr.





The Mt. Airy (N.C.) Public Library, designed by J.N. Pease Associates and Mazria/Schiff & Associates, is a 13,500-square-foot building. It has south-facing windows containing light shelves to bounce daylight into the space and south-facing sawtooth clerestories with interior baffles to diffuse the daylight entering the central portion of the library.

Min Kantrowitz, who heads her own research firm in Albuquerque, N.M., summarizes the findings of her post-occupancy evaluations of sixteen passive solar buildings, seven of which are discussed here. She found that passive solar features are well liked but easily foiled.

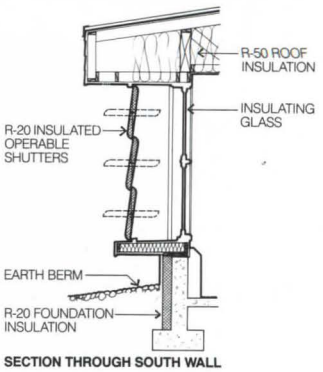
THE only reason that buildings use energy is that people use buildings. In order to understand how buildings use energy, we must understand how people use buildings, since no one ever designed and built a building *just* to save energy. Buildings serve a wide variety of purposes, some symbolic, some functional, some aesthetic. The challenge of energy-conserving design is to design, construct, and occupy a building that provides the best environment to support and enhance it, while saving auxiliary energy.

People and buildings have a strongly interdependent, even symbiotic relationship. The performance of a building directly influences its inhabitants; in turn, user behavior directly influences building performance. This interaction is even stronger in passive solar buildings, which are dynamic systems, continually responding to changes in the internal and external environment. In more traditional buildings, a "steady state" is assumed, one in which there is often little acceptable variation in the thermal and lighting environment. Morning and evening are the same, winter feels the same as summer and, except for the potential for view, the thermal environment of the periphery of the building is identical to that of the core. Passive solar commercial buildings are more sensitive, variable places on which users can exert an important influence.

Early passive solar designs were primarily residential, and concentrated on solving a wide variety of technical challenges. Passive solar design was deemed appropriate only for houses, and even then only for those highly motivated pioneers who would tolerate large temperature swings and peculiar looking buildings, in return for direct financial savings and the satisfaction of publicly demonstrating their commitment to a resource-conservative philosophy and life style. Over time, passive solar designs began looking less peculiar, but designers were still reluctant to attempt passive solar design of commercial buildings. There were two main reasons for this reluctance. First, concern about technical building performance under the demanding and relatively inflexible programmatic requirements of the work environment (e.g., stringent requirements for a narrow comfort band—workers can't move to another room if they are uncomfortable—rigid working hours, security concerns). The second reason related to uncertainty about how building users would respond to an energy-conserving building in which they had no direct "stake" (e.g., no direct financial payoff, no philosophical commitment, no "pioneer" spirit). Can people who don't stand to benefit directly from financial or philosophical rewards be satisfied in passive solar buildings? Can these users successfully learn to operate these dynamic, flexible, buildings to optimize energy savings?

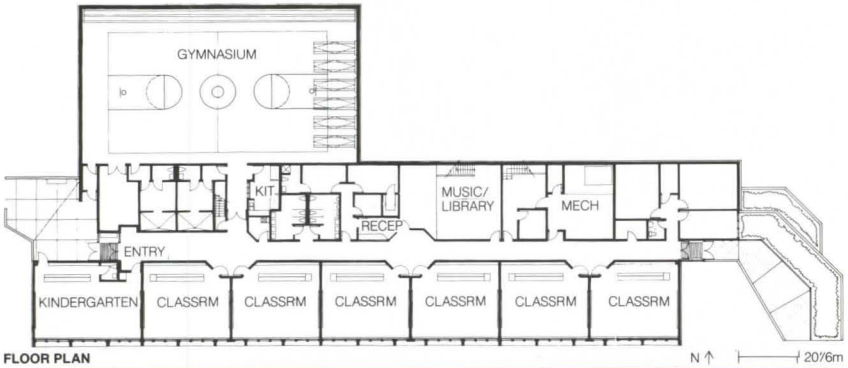
Even with the increasing use of passive solar techniques in commercial buildings, most building evaluations and published descriptions have concentrated almost exclusively on the design and performance of the *technical* aspects of buildings' energy systems, with some discussion of architectural design issues and concepts. The questions of how well commercial passive solar buildings support the activities that they house, how comfort is actually experienced by building users, how the unique characteristics of these energy systems influence building users, and how users influence building energy use patterns have rarely been examined. This article reports on the most extensive of these efforts, the Post Occupancy Evaluation of passive solar buildings in the Department of Energy Passive Solar Non-residential Buildings Program. This is the largest known attempt to evaluate simultaneously construction and operational costs, actual energy use and occupancy effects and reactions in passive solar non-residential buildings.

In 1979, the Department of Energy initiated the Passive Solar Nonresidential Experimental Buildings Program to assist in the design, construction, and evaluation of a diverse set of passive solar commercial buildings. Twenty-two buildings throughout the United States completed the design phase of the program; they use advanced conservation techniques as well as passive solar heating, cooling, and daylighting. Designers provided information including expectations about building occupancy patterns, operational assumptions, and estimates of anticipated energy performance. During the one-year evaluation phase, a team of design and research consultants measured each building's energy use and, through site visits and extensive reporting, examined building use patterns and occupant responses. Each month, actual energy use was compared to predicted energy use and occupancy assumptions, and then analyzed in light of weather data, building use patterns, and user comfort. Of the 16 buildings that completed the evaluation phase of the program, this article concentrates on 7 of them that illustrate a wide range of design approaches and occupancy issues.



Brian Allen

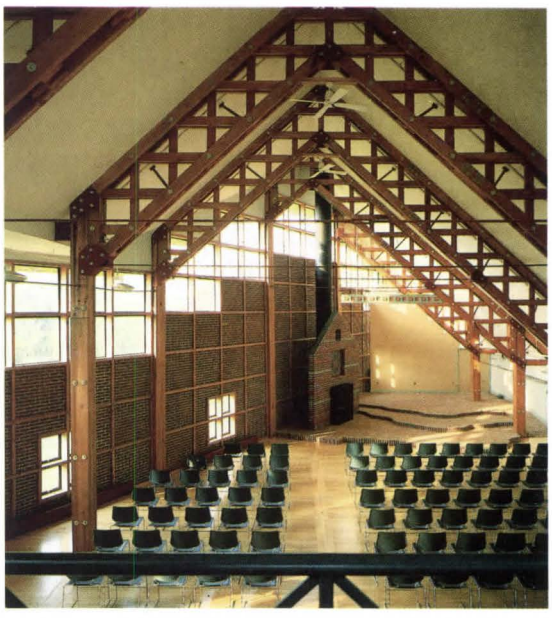
SECTION THROUGH SOUTH WALL



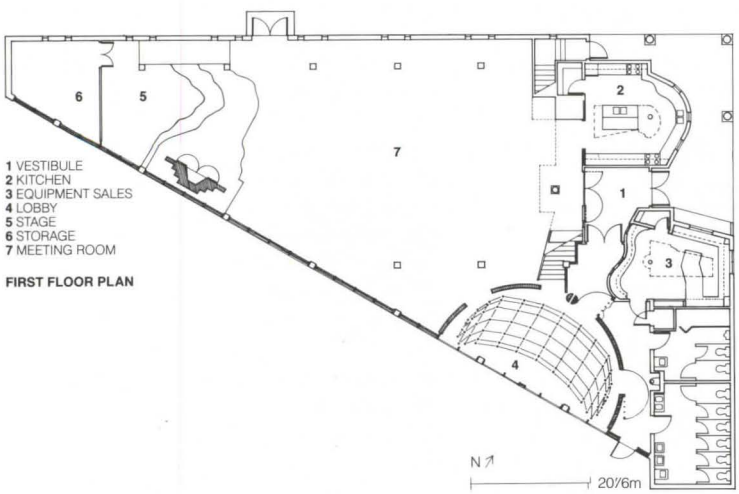
FLOOR PLAN

A 15,750-square-foot elementary school located outside Fairbanks, Alaska, the Two Rivers School was designed by Charles Bettisworth and Company. Intended as a prototype passive solar school responsive to Alaska's harsh climate and high energy and construction costs, the building features an earth berm and a thermal shuttering system over the south-facing triple glazing.

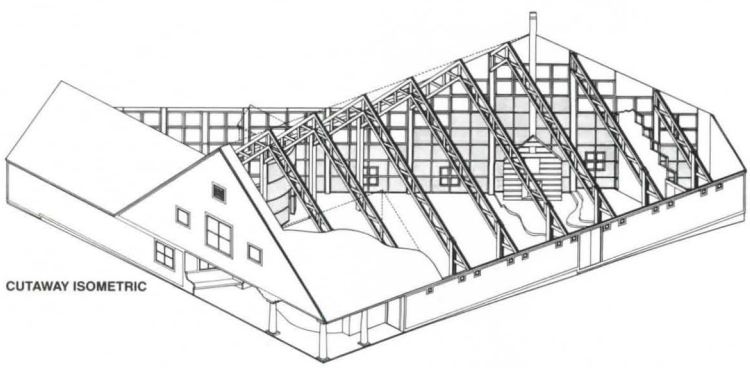
Photos: Otto Baitz



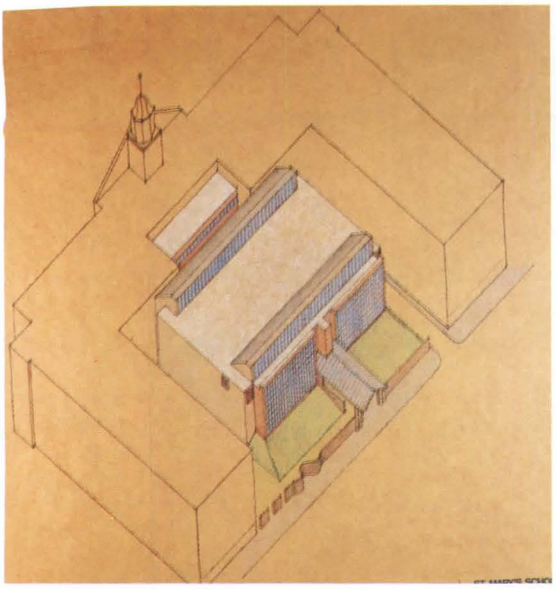
This community education facility, a 5700-square-foot building designed by Bohlin Powell Larkin Cywinski, is at the Shelly Ridge Girl Scout Center near Philadelphia. It uses direct solar gain and a trombe wall to spread heat delivery throughout the day.

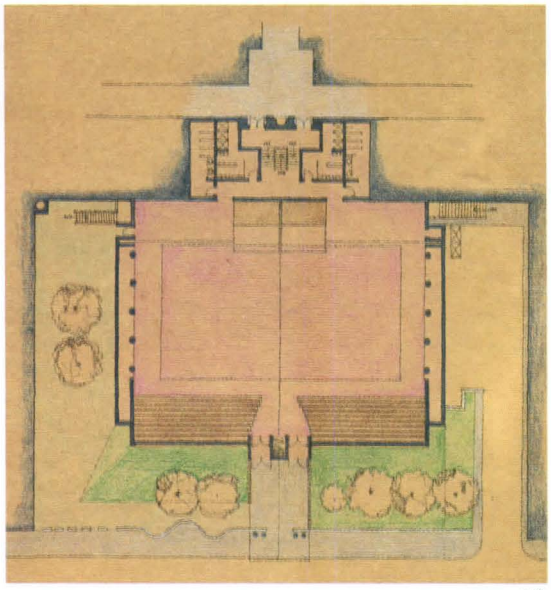


FIRST FLOOR PLAN



CUTAWAY ISOMETRIC





N↑

Min Kantrowitz

St. Mary's School Gymnasium is a 9000-square-foot addition to a school in Alexandria, Va. Designed by Archetype, the building features a full-height, south-facing trombe wall with three different thicknesses to vary the delivery of radiant heat to the interior. Skylights let daylight into the gym.

Findings

Overall, people are very satisfied with these buildings. Although satisfaction did vary some among individual buildings, the annual pattern indicates a high degree of satisfaction with all buildings in all climates in all seasons. A large majority of people said they liked the appearance of the buildings more than other buildings serving similar functions. Most also felt that the fact that the building was solar had a positive effect on their feelings about its attractiveness.

The popularity of these buildings led to many operational changes, including longer hours of operations and significantly increased occupancy levels. In all seven of these buildings, the number of users increased dramatically over predicted levels after the buildings were opened. For example, more than twice as many people use the new Mt. Airy library each day than was originally anticipated. The popularity led management to expand operating hours from 53 to 66 hours per week. In Wells, Minn., Security State Bank management was pleased when many new customers came into their new bank building to look, and then opened accounts.

Some of these operational changes strongly influenced building energy use. For example, in the Two Rivers School located in a rural area outside of Fairbanks, Alaska, some use by community groups was predicted. However, the school was so popular for evening events that the custodian had to switch to working the 11 P.M. to 7 A.M. shift, explaining the unexpected heating demand during these hours.

Buildings were frequently so popular that spaces originally designed to be unoccupied (transition spaces, storage areas, etc.) were pressed into use. The south-facing sunspace at the RPI Visitor Center, with its mass floor and walls and movable insulating curtain, was designed to contribute to the center's space heating needs and to act as a thermal buffer area. When this area was temporarily filled with blackboards and used as a classroom, the students were uncomfortably warm. To reduce overheating and glare, the insulating shades were closed, reducing the solar gain that the sunspace was designed to provide. In addition, the adjoining offices, which depended on borrowed light from the sunspace, found that the blackboards blocked their light source, which had already been reduced by the use of the insulating curtains. Auxiliary energy had to be used to establish comfortable thermal and lighting conditions.

People were basically satisfied with thermal comfort, but some complaints about cool mornings and warm afternoons leads to questions about the design of thermal mass. Comfort was generally high throughout the year, with more complaints during the winter and summer seasons than during the swing seasons. There are, however, some consistent patterns of "too cool in the morning" and "too warm in the afternoon" complaints. "Cool mornings" may be due to:

- Thermostat setback strategies in high mass buildings that were initially too deep and/or long. At Mt. Airy, for example, user feedback led to trying alternative setback approaches (e.g., shallower set back, stepped and/or earlier start up) until a satisfactory balance between user comfort and energy use was achieved. This is a good example of how the fine-tuning function of POE allowed feedback from building users to influence directly patterns of building operation.
- Changed timing of building use. In several buildings, users occupied the building earlier in the day than predicted, thus making planned timing of the heat release inappropriate. For example, a community college building in Colorado was supposed to operate only during afternoon and evening hours. The passive system was carefully designed to provide comfort conditions during those times. However, the building was so popular that people started demanding that it open at 8 A.M., necessitating the use of auxiliary heating systems.

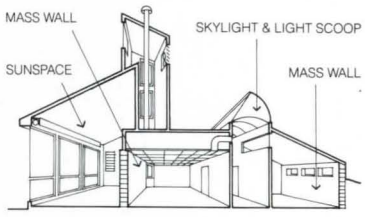
"Warm afternoons" may be related to:

- Increased building use.
- Ventilation problems. Shading to decrease solar gain, to reduce glare or darken a room sometimes interfered with ventilation. At Essex Dorsey Senior Center and at Two Rivers School, for example, when users felt too warm in the afternoon, they lowered the insulating shades to reduce solar gain. This effectively eliminated the use of windows for natural ventilation.

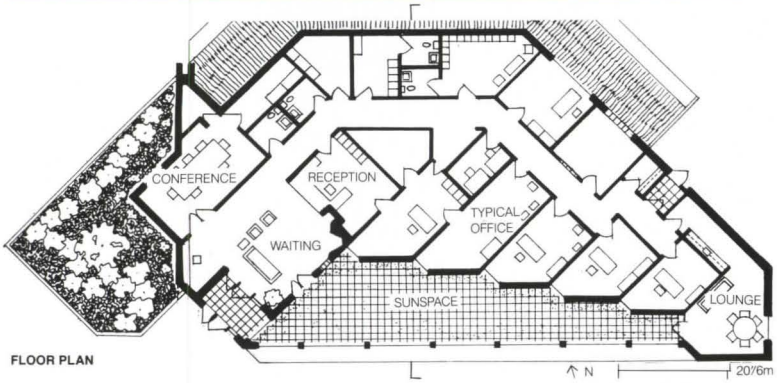
Designers tried various passive ventilation approaches; some worked well, others had a number of design and user related problems. All the buildings used natural passive and hybrid ventilation systems as an integral part of the cooling strategy. The POE revealed that:

- Assumptions about using air movement within buildings for cooling were sometimes incorrect. A number of designers based their cooling design strategies on assumed paths of interior ventilative currents. While most of these worked well, drawings of other assumed paths showed "magic arrows" indicating air currents turning corners or traveling along indirect pathways to deliver cooler air to occupants. Users, however, often reported feeling too warm in some of those areas.
- Reliance on purely passive "chimney effect/stack effect" cooling was frequently unsuccessful from the point of view of user comfort. Further examination revealed that this was either because the balance between inlet and outlet aperture size was not optimal, or, more frequently, because one or the other would be closed. For example, at Mt. Airy Public Library, the high windows located along the north walls were to be opened to increase ventilation. However, the librar-

Photos: Tom Griffin



BUILDING SECTION



FLOOR PLAN

The Rensselaer Polytechnic Institute's Visitor Center is a 5200-square-foot office and campus police headquarters in Troy, N.Y. It has a south-facing sunspace with mass walls. Skylights with reflectors provide daylight and direct solar gain, and earth berms and thermal shutters provide insulation. Walter Kroner of RPI was the architect.

ians chose not to use the awkward poles and just left the windows closed.

Similarly, at the Essex Dorsey Senior Center, the high outlet windows were awkward to operate and were used inconsistently. The deep porch overhang and plantings in the courtyard also interfered with the free flow of air that designers had predicted would enter through the courtyard. Hybrid systems using exhaust fans to draw out the warm air, such as the one cleverly designed into the east façade of the Shelly Ridge Girl Scout Center, were more effective.

- Night flushing strategies sometimes fell victim to security concerns. Both Comal County Mental Health Center and Essex Dorsey Senior Center are community facilities in suburban areas with little crime. Yet their management personnel would not cooperate with a night flushing strategy requiring open windows because of security concerns. At Shelly Ridge Girl Scout Center, however, the inlet apertures in the north wall were too small for an intruder to enter and were used as intended.
- Complex window assemblies caused difficult compromises. Multipurpose window assemblies were tried in a number of these buildings. By combining windows with a variety of insulating and shading devices, a multipurpose assembly (for view, light, heat, ventilation, insulation, darkening, solar gain reduction, and glare control) might occupy a very small area of the wall. But, to be effective for ventilation, the opening must remain unobstructed. Conflict sometimes occurred when shading devices were used for darkening, solar gain reduction, or glare control, and impeded the inflow of air. At Essex Dorsey Senior Center and at Two Rivers School the users were left with the choice of being too warm while the room was dark enough to show slides, or allowing ventilation, but not showing slides. At RPI, the thermal curtain was initially lowered automatically when the temperature in the sunspace exceeded 85 F, lowering the light levels dramatically. In one building, users taped a black plastic garbage bag over a carefully designed skylight to darken the room for a performance, but never went back to remove it.

Users were delighted with the daylighting. Daylighting was used as a passive design strategy in all of the buildings and was usually very well received. Users mentioned it spontaneously more frequently than they brought up anything else about any of the buildings. Some people specifically commented that they enjoyed knowing when clouds were passing, even if they were not sitting by a window, just by the change in daylighting. Fewer than 5 percent of all occupants complained about "too dim" or "too bright" conditions, across all buildings and types of daylighting design. In some buildings, people who initially worried about the natural lighting approach "got used to it" and said they enjoyed its variable, dynamic quality.

Even distribution is the most important aspect of successful daylighting. When the light was well distributed, the buildings were visually comfortable, and largely glare-free. Those buildings where beam sunlight was allowed to enter the space directly were less successful. As the late Si Daryanani, a prominent engineer said: "Trying to light a space with beam daylighting is like trying to take a sip of water from a fire hose." The most successful daylighting solutions were those in which glare and contrast were controlled by:

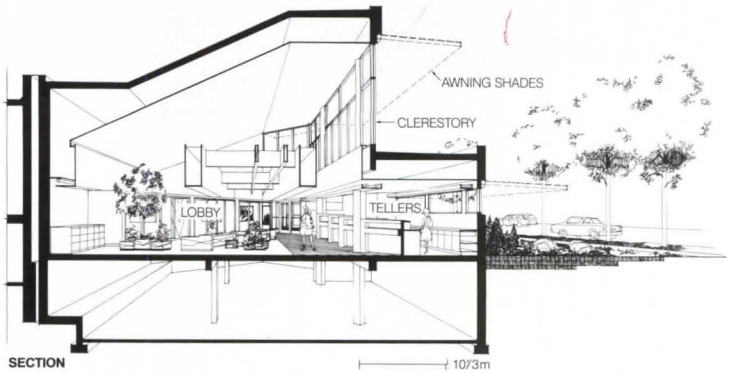
- not allowing beam daylighting to enter an occupied space directly. Baffles, diffusing reflecting surface, and/or diffusing glazing were used to control and break up strong sunbeams. The daylighting at Security State Bank and Mt. Airy was very effective; both used carefully designed baffles for diffusion.
- using apertures in the roof or high on the wall plane (clerestories, skylights, roof monitors) rather than daylighting sources on the building perimeter (windows, with or without light shelves).
- providing a number of smaller roof apertures rather than a few large openings.

Daylighting was often sufficient for task lighting as well as ambient illumination. In many buildings, the designer depends on daylight only for background lighting. In five of these buildings, however, Mt. Airy Library, Security State Bank, Essex Dorsey, Shelly Ridge, and St. Mary's School Gymnasium, daylight provided the majority of the task lighting, although artificial lighting systems were available.

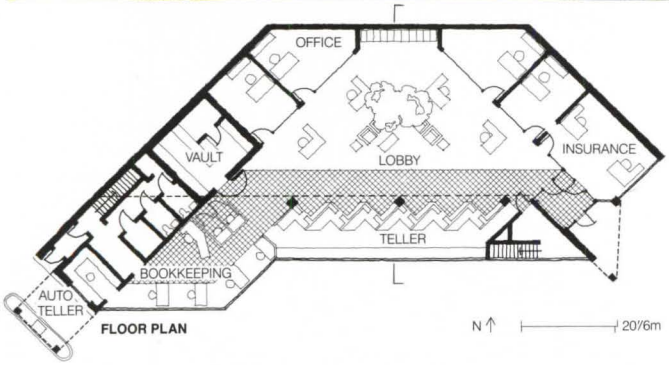
Sometimes manual lighting controls can save more energy than automated systems. Correct manual lighting control can result in both energy savings and acceptable lighting levels. Special studies carried out by Lawrence Berkeley Laboratory (Andersson et al, 1984), concluded that in the Mt. Airy Library, and one other building studied in depth (Community United Methodist Church educational addition), users operated manual lighting controls in a more energy-efficient manner than simple automated control systems would have under the same occupancy and daylight conditions. One reason is that, given the opportunity to control lighting levels, people were often satisfied at lower illumination levels than recommended by current industry standards.

Despite the fact that building users can operate manual lighting controls to save energy while achieving comfort, many still turn on the lights almost automatically at the beginning of the work day, irrespective of their actual illumination requirements. This may be a symbolic way of saying, "I am open for business and ready to work." Once lights have been turned on, people tend not to turn them off.

Several designers used light shelves to bounce light deeper into interior spaces. When they were located within reach, users put plants on them. While this was wonderful for the plants, the result for



Min Kantrowitz



John Weidt Associates' design for the Security State Bank in Wells, Minn., makes direct use of solar gain through south-facing glazing rather than indirect use of the sun's heat through thermal mass. A baffle system over the south-facing clerestory diffuses the light entering the 11,000-square-foot bank.

distribution of light was less successful.

There were some complaints about acoustics in the majority of buildings, and four types of problems were examined: people being disturbed by overhearing things, having difficulty on the telephone or with conversations, and having difficulty concentrating. Concentration and conversation problems were most frequent. In addition to the increased use of the buildings adding noise, there were some design problems relating to sound isolation and sound absorption.

- Effective sound isolation is difficult in open-plan passive solar buildings, since the designs enhance convective flow for heating and ventilation. For example, in the Security State Bank, the manager's office had four walls, but no ceiling, so that the office would exchange air with the rest of the building. In addition, the office was designed to receive daylight reflected from above. However, since sound was also exchanged and reflected, the office had little acoustic privacy.
- Large expanses of wall and floor surfaces designed for thermal storage mass also reflect sound since they are constructed of non-sound-absorbtive materials. Users at St. Mary's Gymnasium and Shelly Ridge Girl Scout Center both reported this concern.

In some buildings, management added acoustical treatment as the fine tuning of the building progressed.

Air quality was generally satisfactory in all buildings. During the settling-in period, a few people reported feeling drafts, usually related to construction problems that were then remedied. Later reports of stuffy, smoky, or drafty conditions occurred in areas not originally designed to be occupied.

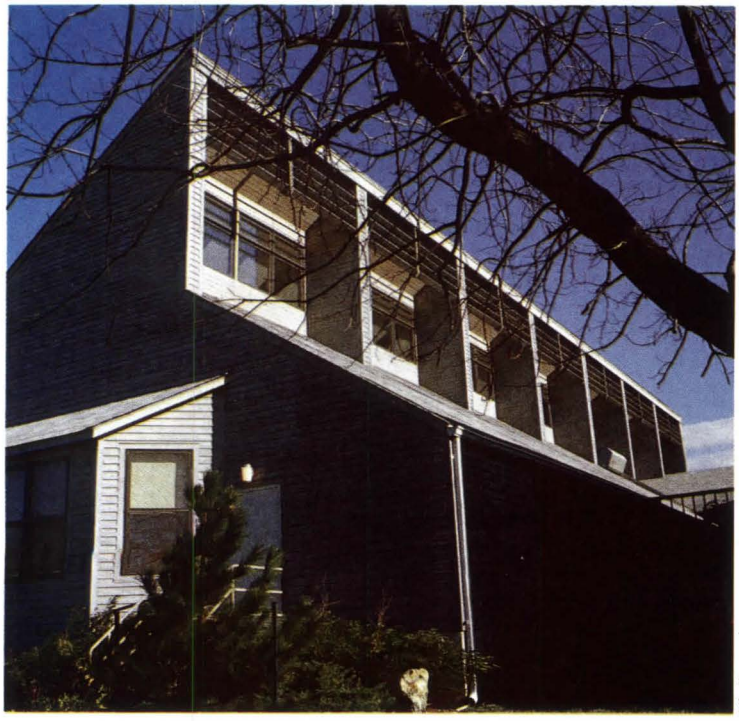
In some situations, contrast effects magnified discomfort. Contrast situations seemed to magnify people's awareness of differences in thermal, acoustic, and lighting conditions. For example, in the hot, humid summers in Baltimore, senior citizens using the Essex Dorsey senior center entered the front door into an air-conditioned space, then passed into a lounge area cooled by passive ventilation. By contrast, the lounge area felt too warm. At the Johnson Controls Branch office building, a dark colored carpet contrasted strongly with the light work surface and caused initial discomfort. At Two Rivers School, users turned on the fluorescent lights to decrease the contrast between the very bright windows and the darker spaces toward the interior. Automatic lighting controls, which turned lights completely on or off, bothered some people; there was greater acceptance of those that allowed for gradual step-up and step-down. The intermittent noise of telephones and conversations contrasted so strongly with the quiet background sound at Colorado Mountain College that one user solved the problem by putting a "white noise machine" at his desk.

Learning time is necessary to figure out how to operate buildings optimally. No building ever takes care of itself; people take care of buildings and learn to operate them to achieve comfort and functional satisfaction. This is especially true for passive solar buildings, which often require advance planning for building conditions several hours in the future. For example, at both the Shelly Ridge Girl Scout Center and the Mt. Airy Library, personnel initially had difficulty anticipating the time necessary to warm up the thermal mass of the building, and so would start their day in buildings that were uncomfortably cool. A variety of night set-back strategies were investigated before optimal balance between user comfort and energy savings could be reached. Similarly, if a significant drop in temperature during the day was forecast, they found it hard at first to decide when to increase the thermostat settings. After an initial adjustment period, however, users found they could manipulate the building well.

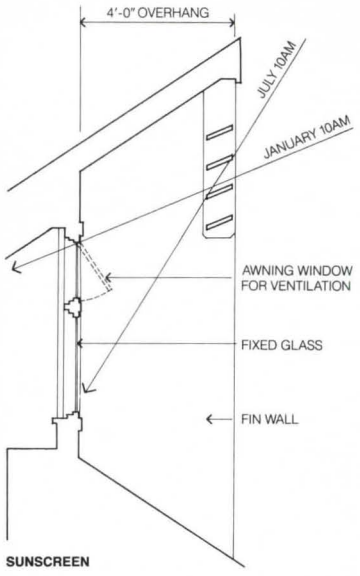
People want the opportunity to control comfort conditions in their buildings. Architect/engineers' conversations are full of anecdotes about how users "interfere" with automatic thermal and lighting controls. Among these seven buildings, users broke into locked panel boxes to gain access to the central controls in two of the buildings, routinely overrode the automatic thermal shutter systems in two of the buildings, broke the locked protective boxes covering programmable thermostats in one building, and demanded an increase in the number of building systems under manual control in another building. This is consistent with other findings that people are most satisfied with their environments if they have opportunities to interact with them in meaningful ways.

People controlled comfort conditions best when the operations were simple and clearly understandable, and when controls were familiar, located close to users, and had some noticeable effect when used. Manual controls were managed most effectively when a few full-time building users were in charge. For example, Shelly Ridge Girl Scout Center and Mt. Airy had full-time users who learned how to operate the buildings' manual controls well. When instructions were communicated appropriately for the group's level of education and sophistication, part-time users could understand and help operate the buildings; Shelly Ridge added simple plexiglass explanation panels near each building element that contributed to the passive solar system. St. Mary's Gymnasium designers wrote a short illustrated manual describing how (and why) to operate the building's passive solar components.

Users had the most trouble operating manual controls that were complex, ineffective, counter-intuitive (i.e., closed glass fireplace doors to keep the building warmer), or demanded a hierarchy of actions. At RPI, building occupants seemed overwhelmed by the



Min Kantrowitz



The Essex-Dorsey Senior Center, a 13,000-square-foot building in Baltimore, was designed by the Paul Partnership. The project entailed connecting and rehabilitating two Victorian schoolhouses, and adding a lounge and multipurpose space. A south-facing clerestory in the new wing provides daylight and aids in the building's natural ventilation.

many different systems. Despite frequent orientations, users often followed the most expedient route when several options were available, which did not always result in the best energy conservation practices.

Post-Occupancy Evaluation provided early feedback that building managers used to improve building function. A number of building owners and managers commented about how useful they found the monitoring and post-occupancy evaluation. They, together with the evaluation team, were able to use feedback about the buildings in discussions with users in fine-tuning the buildings' operation.

Conclusions

The buildings in the Department of Energy Passive Solar Nonresidential Experimental Buildings Program saved energy while providing comfortable, functional environments for their users. The Post-Occupancy Evaluation identified how light distribution, thermal mass, and acoustics influence user comfort. It isolated important building/user interactions, finding that user behavior in these buildings strongly affected energy use, sometimes positively and sometimes negatively. And it helped accomplish the fine-tuning necessary to obtain optimal building energy performance.

The POE also found that programmatic assumptions about building use patterns were often too specific, as if the concern for buildings' energy performance obscured the architects' concern for building flexibility. In two buildings, for example, the comfort of full-time users was well addressed, but that of the large number of transient users was not. Frequently, assumptions about user interactions with the building were not at all explicit, resulting in some operational problems. A specific energy component in a building's program would address these issues. Written building operation manuals, as well as regular feedback on building function through post-occupancy evaluation, could result in even better building performance.

Further research on energy-efficient design must systematically address both user comfort and user interaction issues, if total building function is to be understood and improved. These issues include thermal mass effects and perceived thermal comfort (timing of heat delivery to space, relationship between mean radiant temperature and ambient temperature, proximity to thermal storage mass, effect of air movement), acoustical concerns (effective sound isolation and absorption in passive solar buildings), psychological effects of daylighting, and the relationship between environmental control and perceived comfort.

The Post-Occupancy Evaluation not only accomplished the debugging and fine-tuning of individual buildings, but its results were generalized to other buildings in the program. Designers, evaluators and building owners directly involved in the program are already using its results in the next generation of design. Rather than evaluation being seen as a dreaded judgment by uninvolved outsiders, this POE demonstrated the importance and usefulness of systematic learning from experience in buildings. ***Min Kantrowitz*** ■

The author, who holds graduate degrees in both architecture and psychology, heads her own research firm in Albuquerque, N.M.

References

Andersson, Brandt et al, "Energy Effects of Electric Lighting Control Alternatives in Response to Daylighting," Lawrence Berkeley Laboratory, 1984.

Acknowledgments

Special thanks to the building owners, designers and users whose help and cooperation was essential to learning about and from these experimental buildings.

This work was supported by the Assistant Secretary for Conservation and Renewable Energy, Office of Solar Heat Technologies, Passive and Hybrid Solar Energy Division, of the U.S. Department of Energy. Portions of this work were completed under contractual agreements with the U.S. Department of Energy, Chicago Operations Office, and Lawrence Berkeley Laboratory.

Major participants in the multidisciplinary team include: Burt Hill Kosar Rittelmann Associates, prime contractor for technical assistance, review, and administration services; Lawrence Berkeley Laboratory, program support and systems studies on daylighting, thermal mass, and occupancy impact on energy performance; Booz, Allen and Hamilton, program support and case studies; Sizemore/ Floyd, technical monitoring; Hart, McMurphy and Parks, economic analysis and performance overview; Architectural Energy Corporation, energy data monitoring services; W.I. Whiddon & Associates, case studies and design overview.

An appreciative thank you to John Taschek and Lynn Perkins, previously of Min Kantrowitz & Associates, Inc., for their diligent and thoughtful analysis.

(The complete design and performance overviews of the project, including a number of in-depth building case studies, is due to be published in an edited volume by Van Nostrand Reinhold in the Fall of 1986).

P/A Technics Energy's Future

Norman Kurtz of Flack & Kurtz and Robert Logan of Syska & Hennessy discuss, in separate articles, changes in the fields of mechanical and electrical engineering and how those changes will affect the form and performance of future buildings.

Energy-Conserving Engineering

WHEN oil prices skyrocketed in the early 1970s, Americans realized painfully that energy costs had a sharp effect on everyday life. The sudden concern for conservation prompted exploration of new techniques and rapid development of new products, which dramatically changed the way buildings are designed. Electrical and mechanical engineers now employ tools once considered interesting but discretionary options that have become standard in design of all types of buildings.

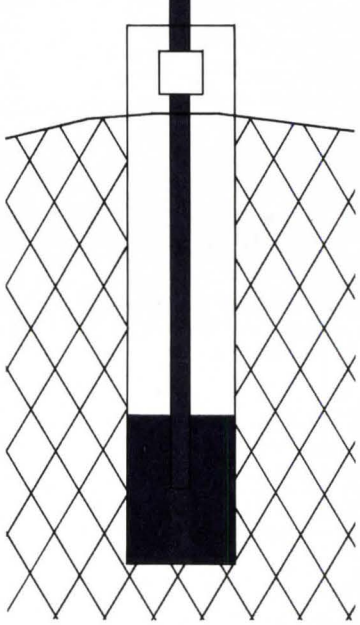
Energy conservation, still important, is likely to cause evolutionary rather than revolutionary changes in building engineering systems. We can at the same time expect changes driven by new forces, including a concern for health and safety and increasingly sophisticated demands for information processing.

Where We Are

Economic incentives created by the energy crisis have stimulated activity in four arenas: changes in building management, exploration of new techniques, development of new products, and government incentives for research and application of technology. These efforts have required close interaction of all team members in the design process: architect, engineer, developer/owner, contractor, and vendor. Architects in particular have become sensitive to what could be accomplished with the right technology.

Today's energy-related building systems reflect ten years of experience, fine-tuning successful solutions and weeding out those that proved less cost-effective. The following is a summary of the tools that are today considered not only accepted but expected in building design.

- **Building Configuration and Design.** Architects have explored a number of ways of locating buildings on a site and of shaping their bulk either to make use of or to protect the interior from natural elements such as the sun. These measures go hand-in-hand with the design of fenestration. In hot climates, thicker walls, smaller and/or recessed windows, and northern orientation reduce heat gain. Light shelves turn unwanted direct sunlight into diffuse light in light wells and perimeter offices. Atriums serve as buffer zones for heating and cooling and as a means of bringing



Engineering in the Information Age

IN the first half of the 1980s, the mechanical and electrical engineering profession has undergone a variety of significant changes. Technical advances, particularly in the area of commercial building design, have centered on adapting basic systems to meet the requirements of information age technology, and on the use of digital controls to enhance systems' operating characteristics. Yet these developments have occurred in the context of two broader changes stimulated by clients' changing needs.

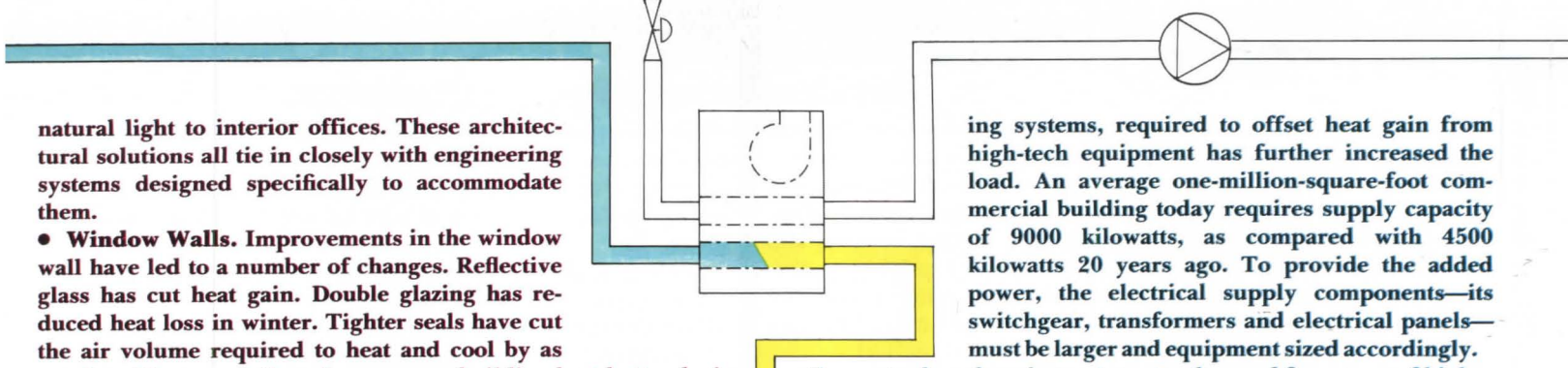
The needs of building occupants have become far more complex and varied than in the past. Today's buildings need more than "the basics," and developers' and owners' emphasis on providing systems at the lowest possible initial cost has given way to heightened concern with buildings' operating characteristics. Owners want to enhance building marketability, foster occupants' productivity, and ensure low life cycle costs—in short, to provide features that will make a facility optimal for its long-term use.

In response, engineers have had to develop, along with greater technical design expertise, a more sophisticated ability to analyze clients' objectives and communicate the value of engineering options. And the engineer's role has been altered: it now entails more consulting, and involvement in the earliest design decisions for a building.

Adapting Basic Systems for Information Age Occupants

Many clients' new requirements are the result of a dramatic change in the workplace: Today's building occupants require an environment in which people and information processing equipment can function together effectively. As a result, electrical and HVAC systems must be engineered to new standards.

- **Electrical Systems.** The electronic equipment in today's buildings requires greater power supply capacity, higher quality power, and more flexible and extensive power distribution. Power demand has increased by 100 percent or more. Lighting has decreased as a component of electrical load in the 1970s, but the reduction has been more than made up for by the increase in demand from office machinery. Larger capacity air-conditioning systems, and in some instances humidify-



natural light to interior offices. These architectural solutions all tie in closely with engineering systems designed specifically to accommodate them.

- **Window Walls.** Improvements in the window wall have led to a number of changes. Reflective glass has cut heat gain. Double glazing has reduced heat loss in winter. Tighter seals have cut the air volume required to heat and cool by as much as 10 percent; they also preserve building heat better during weekends, requiring shorter warm-up periods. As a result of these changes, the location of the heat supply source no longer has to be under the window, which allows greater freedom in design.
- **Building Automation Systems.** One of the biggest revolutions has been the development and use of building automation systems. They have enabled many other changes that require automatic, sensitive, quick, precise, and reliable controls. Direct digital systems now incorporate many different pieces of information (weather conditions, time of day, weekends/holidays, occupancy, prevailing rate structures, equipment performance, etc.) and automatically issue precisely calibrated commands to banks of controls and machinery.
- **Lighting.** Changes in lighting have been extensive. Most evident is the growing use of task lighting, which means fewer fixtures, lower levels of ambient light, and more focused light on work surfaces. New, sophisticated control systems react to the time of day, occupancy, and availability of natural light to tailor output without relying on human effort. Improvements in lighting have reduced total power requirements by cutting electricity needed for lighting and by lowering cooling requirements. Improvements also have taken place in fixtures, lamps, and ballasts; today designers have a wide variety of choices, although care is still needed to select the truly efficient fixtures from those that simply look efficient. Examples of new developments include parabolic luminaires, energy-saving and electronic ballasts, Octron lamps, and lighting provided within furniture and partition systems.
- **HVAC Equipment.** HVAC equipment has become more efficient, reliable, compact, and varied. Variable air volume systems have almost completely replaced constant air volume systems, relying on concurrent improvements in controls and monitoring systems.

Axial flow, pitch-in-motion fans are a good example of existing technology not readily used until incentives overcame inertia. Today they are fully accepted and in frequent use in a variety of buildings.

Manufacturers have developed high-efficiency chillers and boilers, both electric and gas-fired, whose performance and reliability outstrip those in use ten years ago. Their slightly higher initial cost is easily justified by short payback periods and long-term reduction in maintenance and operation cost.

- **Natural Resources.** Passive solar heating has frequently proved useful, with little need for additional capital, while, after ten years of experience, active solar heating is not yet cost-effective in most applications.

The use of ground water with heat pump systems has proved very effective, in some cases doing away with the need for a boiler. The system used at Codex Corporation in Canton, Mass., burns no fuel, requires small booster chillers only 5–10 days a year, takes up less floor space than conventional HVAC systems, and is less expensive to operate.

Methods for using river water are similar to those for using ground water. The World Financial Center at Battery Park City in New York (P/A, July 1985, pp. 79–86) draws water from the Hudson River, cleans and purifies it, runs it through a heat exchanger to cool building condenser water, and returns it to the river.

- **Thermal Storage.** Thermal storage systems, which chill water at off-peak rates and store it for use during peak rate periods, have proved useful when space for storage tanks is available. The World Financial Center uses a thermal storage system in conjunction with ing systems, required to offset heat gain from high-tech equipment has further increased the load. An average one-million-square-foot commercial building today requires supply capacity of 9000 kilowatts, as compared with 4500 kilowatts 20 years ago. To provide the added power, the electrical supply components—its switchgear, transformers and electrical panels—must be larger and equipment sized accordingly.

Computer-based equipment creates the need for power of higher quality as well. Higher quality power supply is characterized by reliability—the ability to guard against power failure from public utility outages—and uniformity—the ability to prevent inconsistencies in voltage and frequency.

To provide these characteristics, engineers are transplanting techniques and equipment developed for use in computer facilities to electrical systems for general work space. To ensure uniformity, surge suppressors, isolation transformers, voltage regulators, and line conditioners are included in more and more power supply systems, and distribution systems are being carefully grounded. To ensure reliability, engineers are beginning electrical design with studies of the local utility's history, and equipping buildings with uninterruptible power supply (UPS) systems and backup generators. UPS equipment provides instantaneous backup power during the time required for orderly computer shutdown or emergency generator activation. Emergency generators are being designed to higher power standards. By-pass and isolation capabilities are being built into supply systems, and multiple services from the utility are being provided for entire buildings or selected internal areas. In combination, these subsystems can provide practically failureproof electrical supply.

Today's power distribution systems must also be more carefully engineered than ever before. Power must be brought to more points, and because of the frequency of moves and changes in the office, the system must be extremely flexible. Proliferating cabling must be effectively managed.

One solution is to use access flooring, combined with various types of flexible, modular cable and outlet components. But unless these are matched with effective management of both power and communications cabling, access flooring will conceal, rather than solve, the problem of wire proliferation brought on by computers.

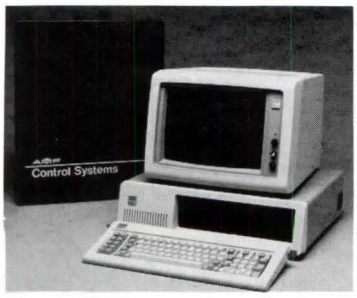
An alternate or complementary solution employs uniform wiring plans—fixed cabling networks that distribute both power and communications wiring to numerous outlets on a grid, so that most equipment can be moved without cable changes. By reducing the need for space under the floor, a uniform wiring plan also offers the possibility of reducing floor-to-floor height requirements. Wide-scale adoption of such networks is becoming more likely as computer manufacturers gravitate towards common standards for communication cabling, and as communications networks begin to be integrated with power distribution systems.

Engineers are focusing more attention than before on lighting as a part of electrical design, and are adapting designs to the increased use of video display terminals and to the growing awareness of lighting's effect on occupants. Low-glare systems employing parabolic louver shading or indirect lighting, paired with more extensive task lighting, are becoming the norms to improve occupants' performance and morale.

- **HVAC Systems.** Along with increased demands on the electrical system, computers and automated workstations in today's buildings have created an increased demand for cooling capacity, cool air distribution, and HVAC system flexibility. Since electronic equipment will not tolerate sharp temperature changes, maintaining proper temperatures throughout the office space is more critical than ever before.

Despite reductions in heat gain from light fixtures and external sources, and despite anticipated changes in computer technology

Technics-Related Products



SNAP energy management system controls air conditioners, exhaust fans, refrigeration, heating, and lighting, reducing energy costs by matching operation to actual needs. SNAP/NET software provides a means for supervising multiple SNAP installations from a single location. It is compatible with IBM's PC Jr., PC, and PC XT. SNAP controls a small facility or multiple, widely scattered facilities via a telephone network. AMF Control Systems.
Circle 249 on reader service card

JC/85 Building Automation System performs complex HVAC functions, energy, maintenance, and fire management, and security and lighting control. One or more computer components and associated controls can be combined to create a customized system for specific installations. Components vary from mini and personal computers to microprocessor-based direct digital controls. The system is UL listed for fire, security, and process management systems and conforms to National Fire Protection Association codes. Johnson Controls, Systems & Services Div.
Circle 250 on reader service card

The Facilitec master controller is a menu-driven energy management system and a programmable controller for building automation. It has universal output capability and allows both analog and digital inputs. The master unit can connect with up to 15 slave units as far as a mile away. Both master and slave units contain 16 outputs and 32 inputs. Triangle MicroSystems.
Circle 251 on reader service card

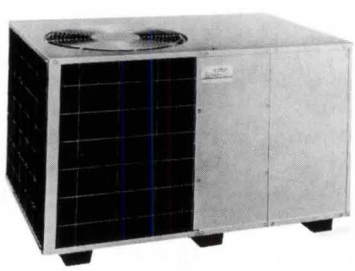
Ultra Edition load design is a new software program for the Customer Direct Service Network that links building system designers, consulting engineers, and contractors to the Trane mainframe computer. It can analyze a dozen different HVAC systems located in different parts of a proposed building, allowing system designers to analyze existing building systems or modifications to existing systems. Also new is an acoustics program that automates calculations necessary in acoustical studies of proposed and existing HVAC systems. The Trane Company.
Circle 252 on reader service card

Network 2100 integrated building management system comprises energy management, life safety and security, facilities management, and direct digital control. It automates HVAC, lighting, refrigeration, and other plant equipment. Functions include proportional + integrated + derivative control, positionable motor control, optimum start/stop, comfort-compensated duty cycling, and demand limiting. Network 2100 is also a facilities management system that monitors status and run times of many types of building equipment. Barber-Colman Company, Environmental Controls Div.
Circle 253 on reader service card

Cascade evaporative air-conditioning units for applications in the 20,000–50,000 CFM size range include an indirect cooling section and a direct cooling section, with primary and secondary fans, outside air louvers, dampers, filters, and controls. In larger buildings, multiple units can be combined for higher air flow requirements. Standard layouts are available for 100 percent outside air constant volume cooling, economizer cycle operation, and variable air volume control. A six-page brochure describes the system, illustrates its features, and includes a psychrometric chart. Norsaire Systems.
Circle 254 on reader service card

Building Energy System Analysis (BESA) microcomputer programs for building retrofit analysis in three software packages address specific user groups: architects, engineers, and A/E. The user can evaluate retrofit strategies, exercise any of more than 50 energy conservation measures contained in the program, or use the built-in parametric analysis option. BESA programs provide a cost effective means for retrofit analysis simulation. An average application requires less than three minutes of microcomputer run time. Candaplan Resources.
Circle 255 on reader service card

Time Control Units 4000 or 16000 enable commercial, industrial, and institutional facility managers to control lighting, security systems, industrial machinery, heating, and air conditioning with the press of a button. The system automatically adjusts for leap years and daylight-saving time, and can accommodate up to 20 holidays. The system's capabilities can grow as needs change. Touch-Plate International, Inc.
Circle 256 on reader service card



The Evolution™ Packaged Air Conditioner houses compressor, condenser coil, evaporator coil, and blower in one unit. An optional prewired electric heat package is offered with a choice of four heating capacities. The service panel provides easy access to the electric wiring and other components. A molecular sieve removes moisture and contaminants from the system's refrigerant to help prolong the life of the unit. The Coleman Company, Inc.
Circle 257 on reader service card

Encon 400 and 800 microprocessor-based electronic controllers provide energy management, environmental control, and facility monitoring. They are designed to control HVAC, refrigeration, lighting, boilers, and other energy-consuming equipment efficiently and effectively. A two-page data sheet lists the features, control strategies, and alarm capabilities, and includes specifications. Encon Systems.
Circle 258 on reader service card

Zone-All™ computerized system controls different zones in two ways. Used with any heating and cooling device, it controls the volume and air flow to different zones. As a reheat/recool system, used with incremental water-source heat pump, it controls the temperature of air flow to different zones without disturbing total air flow to the zones. Zone-All controls are described in a four-page brochure that includes specifications. American Air Filter.
Circle 259 on reader service card

The VAV Office Building Challenge brochure traces the expansion of rooftop applications from single-story and shopping-center applications to multistory office building applications. Major topics include: motor heat and blow-through coils; blow-through sound attenuation; high office building sensible load; importance of sensible capacity; blow-through vs draw-through CFM selection. McQuay Air Conditioning.
Circle 260 on reader service card

York® CodePak™ centrifugal liquid chillers, described in a 14-page, full-color brochure, have capacities of 150 through 1000 tons. The brochure explains functions and use of the York MicroComputer Control Center, the standard control panel for all CodePak chillers, and the optional Turbo-Modulator variable speed chiller control. Borg-Warner Air Conditioning, Inc.
Circle 261 on reader service card
(continued on page 130)

11.4 TO BE EXACT. The Enercon II Console Water-Source Heat Pump also offers coefficients of performance (COP's) up to 3.7 to go along with the high energy efficiency ratios, which explains why this unit provides remarkably low energy consumption and operating costs.

Other performance features include sleek, stylish cabinetry; field reversibility of cabinet and chassis; and a wide range of control options including a boilerless option so units can heat electrically. This can eliminate the need for a supplemental heater in some cases. The unit is also available with a Climate Director that heats and cools two rooms with one unit.

For more information and a copy of our new Enercon II product bulletin, contact your local AAF representative. Or write American Air Filter Co., Environmental Control Division, P. O. Box 35690, Louisville, KY 40232-5690.

Better Air is Our Business®

AAF American Air Filter
AN ALLIS-CHALMERS COMPANY

Circle No. 313 on Reader Service Card

The Roomtop air conditioner is a low, above-ceiling unit—16¾ inches high in 2- and 3-ton models; 23⅝ inches high in 4- and 5-ton models—that is 66 inches long, 49 inches wide. With features similar to rooftop units, it has rubber vibration isolators on compressor and fan motors and heavily insulated cabinet panels for quiet operation. Roomtop can be installed as one package, or split, separating condenser and evaporator sections. A four-page brochure explains the features, keyed to a diagram, and provides a table of data about four models. Carrier Corp.
Circle 262 on reader service card

Energy/PC energy analysis program for buildings is designed for use in predicting building and system energy use, as a comparative tool in making design decisions or to meet energy standards. It allows the user to develop the building load profiles on a zone by zone basis, and to simulate virtually any type of heating, cooling, or ventilation system. Energy/PC is designed to run on an IBM/PC with a two-diskette drive system and 256K memory. Engineering Applications Specialists.
Circle 263 on reader service card

System 600 Stand-alone Energy Management System monitors and controls HVAC equipment in one or many buildings. Using networking to collect building-wide control data, it provides energy management advantages without requiring a central computer. Designed for control of buildings from 50,000 to 100,000 square feet, it can be upgraded to full capability System 600 Building Management System by the addition of a central computer. MCC Powers.
Circle 264 on reader service card

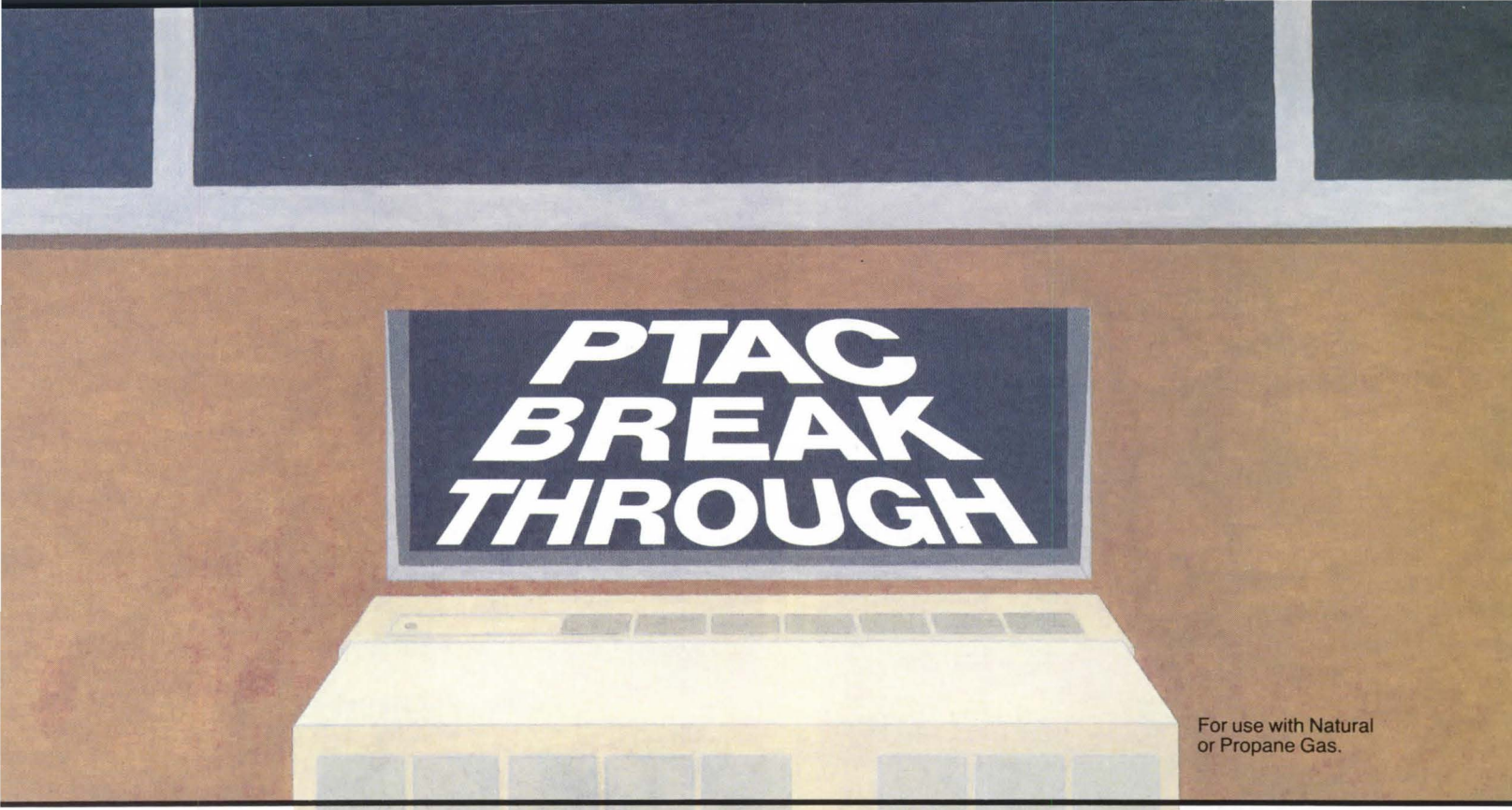
The SA 203 microprocessor-based programmable timer can vary the control points of up to 20 remote thermostats by supplying an electrical signal to a KA200 control module installed in each controlled thermostat. It controls heating systems with multiple line voltage thermostats, electric baseboard, ceiling cable, and radiant panel heaters; hot water, steam, and warm-air heating systems with zone thermostats. It can be used to program the operation of water heaters, ventilating equipment, lights, security systems, sound equipment, and irrigation systems. Sunne Controls.
Circle 265 on reader service card

AET 448 equipment and DDC controller for medium-sized buildings features four digital inputs, four digital outputs, eight analog inputs, and a fail-safe output. User-programmable control strategies include DDC (direct digital control), PID (proportional + integral + derivative control), and PWM (pulse width modulation) algebra, duty cycling, setback, load-shedding, enthalpy, and other building automation functions. The dedicated fail-safe internal relay can shut down equipment or signal in the event of power or equipment failure. Atlantic Energy Technologies.
Circle 266 on reader service card

The AC8 Plus, a microprocessor-based stand-alone HVAC control system, meets the requirements of smaller buildings, providing DDC control capabilities normally found only in larger buildings. It has 16 universal inputs to sense voltage, temperature, switch settings, or pulsed inputs. Eight outputs can operate as Form C relays or Universal outputs of 0–20 milliamps or 0–20 volts, and it is easily expanded. Andover Controls Corporation.
Circle 267 on reader service card

Distributed Control Station DCS-95 provides energy management and facility control for many commercial structures, such as shopping centers, offices, light industrial plants, and schools. DCS-95 is equipped with 56 interface ports for monitoring and controlling HVAC, lighting, and other electrical loads; fire, security, and other tasks within a building. A WS-100 workstation allows the building manager to supervise, schedule, and modify or override the automated operations. DCS, Inc.
Circle 268 on reader service card

Energy Commander control systems for paralleling multiple power sources permit the use of multiple smaller engine generator sets instead of one large set. A new six-page brochure describes the systems available for emergency power, prime power, and peak shaving applications. Energy Commander is a modular system with an optional programmable controller for reliability and ease of maintenance. It can accommodate additional generators as the system is expanded. Zenith Controls, Inc.
Circle 269 on reader service card



For use with Natural or Propane Gas.

DYNALINE™

The first PTAC with economical gas heat.

The Suburban Dynaline represents the first major advance in PTACs (Packaged Terminal Air Conditioners) in 20 years.

Combining the conventional features of compact zone control systems with an industry exclusive—economical gas heat—Dynaline offers many advantages over every electric system. For starters, here are just four.

First, savings. As much as 67% in operating costs over electric resistance heat and 45% over heat pumps, as documented for a typical Mid-Western installation.

Second, comfort. Gas heat is far more comfortable than either electric resistance heating or heat pumps.

Third, silence. Dynaline's gas heat is blissfully quiet. Heat pumps are anything but.

Fourth, ease of installation. Standard 42″ x 16″ wall cases make Dynaline the right choice for both new construction and replacement.

Maximum savings. Greater comfort. Quieter operation. Easy installation. Is there *any* reason to choose anything but the Suburban Dynaline?

SUBURBAN

Suburban Manufacturing Company
P.O. Box 399, Dayton, TN 37321
(615) 775-2131

Gas. America's best energy value.

When you compare the costs of all energies, gas now gives you even more for your money.

Beauty. Brawn. And now, Brains.

Don't settle for a plain CAD system when you can go with the best: the new VersaCAD ADVANCED. Combining its famous depth of design power with an intelligence that leads the pack, VersaCAD has what it takes to help you draw smart.

Just look at VersaCAD's lineup of productivity features: You can collect drawing parts in any combination for quick editing . . . cut and paste sections of your drawing for "on the fly" changes . . . draw curves freehand or connect-the-dots, then let the computer smooth them out for you . . . automatically convert plan views into true isometrics . . . build your own libraries of commonly-used drawing parts in minutes . . . all up to 10 times faster than before.

Despite its brawn, VersaCAD hasn't left out the brains. Sophisticated "macros" and programmable menus let you personalize the system to exactly fit your way of working — without needing a computer degree, either. And the powerful "record and playback" feature means you only have to perform an operation once, no matter how complex.

The optional VersaDATA module puts VersaCAD at the top of its class, giving you the only intelligent database that is integrated into a personal computer CAD system. You can include information about every part in your drawing, print reports, automatically change the drawing from the database, and much more.

Add its reputation for affordability, failsafe operation and a top support team, and it's easy to see why VersaCAD is the system of choice for thousands of design professionals.

For more information and the name of your nearest dealer, call toll-free 1-800-228-2028, Ext. 85. Don't settle for second best.

VERSACAD

A · D · V · A · N · C · E · D

THE EDUCATED EDGE

T&W Systems • 7372 Prince Drive • Huntington Beach, CA 92647 • (714) 847-9960

Circle **No. 405** on Reader Service Card

The International Advanced Illumination Exposition & Conference

Lighting World 4

Sponsored by:
The International Association of Lighting Designers

The Illuminating Engineering Society of North America

The Southern California Section of the Illuminating Engineering Society

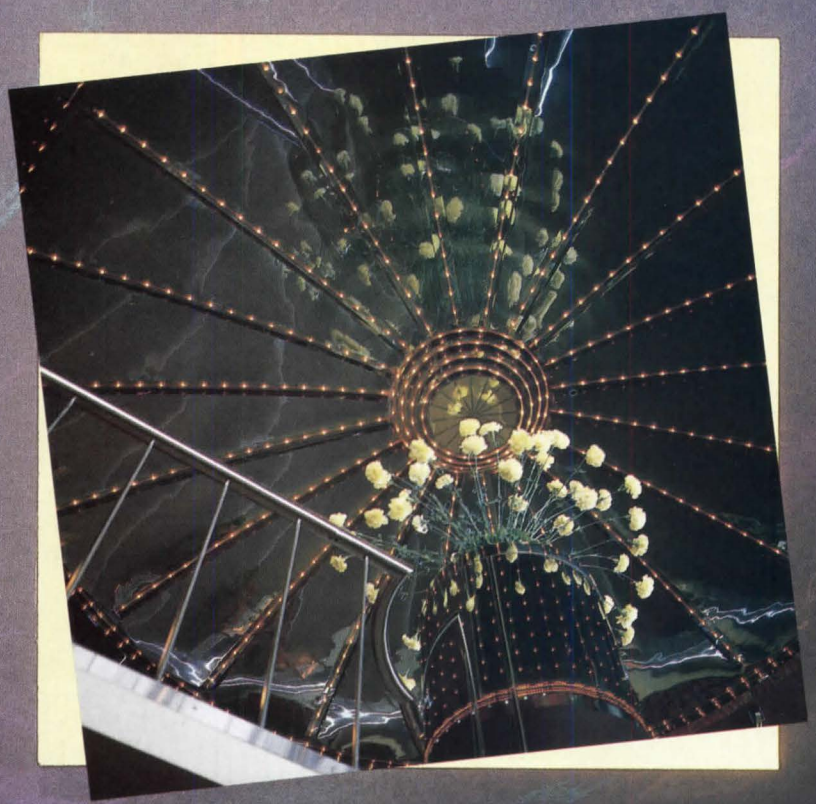
Produced and Managed by:
National Expositions Co., Inc.

Published by:
Progressive Architecture

May 11, 12, 13, 1986
Los Angeles Convention Center
Los Angeles, California

V I S T A

limited only by the imagination



The best architects and designers know there is one source of quality lighting that meets all their needs: Vista, the industry leader in creative interior lighting.

Let Vista give form to the flights of your imagination. Create a constellation, enhance a solarium or simply illuminate the aisles of a theatre, mall or store. Wrap a spiral staircase, drop a light curtain, suspend a chandelier, add splash to a fountain... Vista offers a creative solution for all your design challenges.

We have lights you can tie in a knot, bend around corners, run underwater. Lights dramatic enough to dazzle, subtle enough to know when to stay out of sight.

For more information and a brochure on our products, call or write today.

The Right Light People!®

V I S T A
MANUFACTURING, INC.

52864 Lillian Avenue, Elkhart, Indiana 46514, (219) 264-0711
South Masch Branch Road, Rt. 1, Box 409-2, Denton, Texas 76205, (817) 566-4704

Circle No. 413 on Reader Service Card

General Information

Registration Information—Exhibits, Seminars, Workshops and Special Events

LIGHTING WORLD 4 is the largest trade show in the United States dealing solely and specifically with the many aspects of architectural lighting. It is an international event designed to facilitate the exchange of information and the transaction of business within the industry.

LIGHTING WORLD 4 is open to all professionals active in the industry including: architects, lighting designers, engineers, interior designers, consultants, specifiers, distributors, contractors, facility managers, manufacturers, representatives, educators, and the working press. Children under twelve years of age will not be admitted to the exhibition.

All seminars and workshops will take place on the second floor of the Los Angeles Convention Center. Registration fees for seminars and workshops vary. Please consult registration form for fee schedule.

LIGHTING WORLD wishes to express its gratitude to:
Panel Optics for providing the illuminated directional signs which can be seen at various points in the exhibition.
Progressive Architecture magazine for producing the LIGHTING WORLD 4 Official Show Directory.
Visual Impact for supplying the electronic message boards in the registration area and exhibition as well as the message center located at the entrance to the exhibition.

Exhibit hours

Sunday	10:00 A.M.–5:30 P.M.
Monday	10:00 A.M.–8:00 P.M.
Tuesday	10:00 A.M.–5:00 P.M.

Registration

Registration will take place in the main lobby of the Los Angeles Convention Center, 1201 South Figueroa Street, Los Angeles.

Registration hours

Saturday	10:00 A.M.–5:00 P.M.
Sunday	8:00 A.M.–5:30 P.M.
Monday	8:00 A.M.–8:00 P.M.
Tuesday	8:00 A.M.–5:00 P.M.

A badge allowing entrance to the exhibition for all three show days is $5.00.

Badges

Where the information has been furnished, attendees will be provided with a color-coded badge indicating their occupation. The coding is as follows:

Architect	Blue
Lighting Designer	Brown
Engineer	Black
Interior Designer	Green
Contractor	Purple
Representative	Orange
Exhibitor	Red
Other	Yellow

Offices

Show Management office will be located on the second floor of the Los Angeles Convention Center in Room S-2. Information regarding LIGHTING WORLD 5 will be available throughout the show.

Press Room

Working press are invited to make full use of the Press Room located on the second floor of the Los Angeles Convention Center in Room 207. Personnel will be on hand to assist qualified members of the press in their coverage of LIGHTING WORLD 4. The Press Room will be open during all show hours.

Services

Lost and Found—located at the Security Desk in the main lobby of the Convention Center.
First Aid Room—located in the north corridor off the main lobby of the Convention Center. The first aid room will be staffed with a registered nurse.
Message Center—Messages may be left for an attendee or an exhibitor at the message center located at the entrance to the exhibition.
Bus Service—Shuttle buses will run continuously during show hours between the Convention Center and the Los Angeles Hilton, the Hyatt Regency Los Angeles, and the Westin Bonaventure. Consult signs in the lobbies of the hotels and the LIGHTING WORLD 4 registration area for schedule.
Parking—Ample parking is available at the Convention Center at the rate of $3.00 per day per car.
Restaurant Reservations—A restaurant information counter, staffed by the Los Angeles Visitors and Convention Bureau, will be located in the main lobby of the Convention Center during show hours for your convenience.
Dining Facilities—The L.A. Pub and Restaurant is located off the main lobby of the Convention Center. In addition, a concession stand with seating is located in the rear of the exhibition for your convenience.

LIGHTING WORLD 4 is sponsored by:

The International Association of Lighting Designers
18 East 16 Street, Room 208
New York, N.Y. 10003
212/206-1281

The Illuminating Engineering Society of North America
345 East 47 Street
New York, N.Y. 10017
212/705-7913

The Southern California Section of the Illuminating Engineering Society
P.O. Box 800, G.O. 1, Room 390
Rosemead, CA 91770
805/257-0286

LIGHTING WORLD 4 is produced and managed by:

National Expositions Co., Inc.
49 West 38 Street, Suite 12A
New York, N.Y. 10018
212/391-9111
Telex: 135401 dimcomm
Fax: 212/819-0755

Unauthorized Solicitation

Solicitations of business on the premises of the exhibition by anyone other than official exhibitors are strictly prohibited. Please report any such occurrence to Show Management immediately.

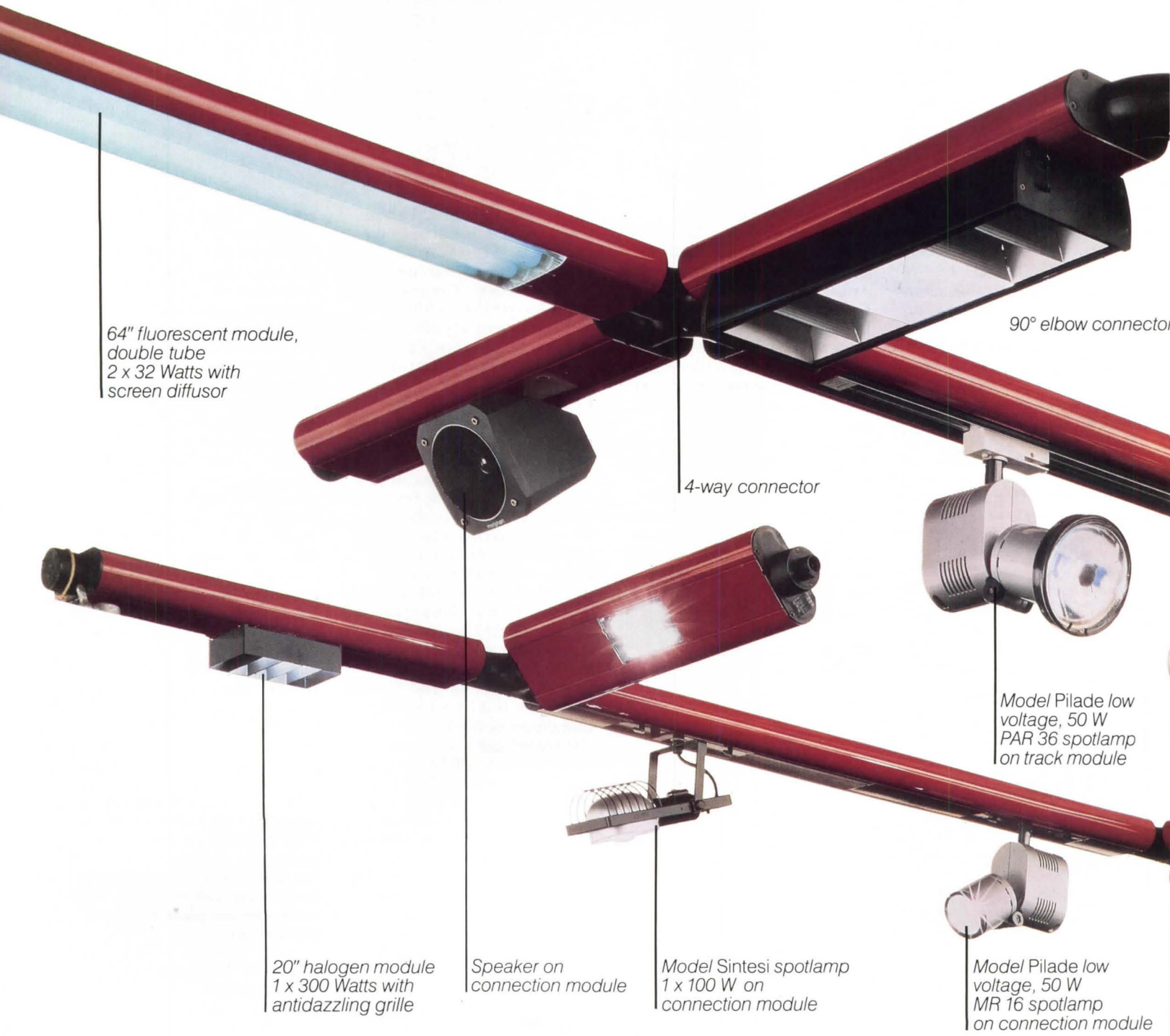
Artemide

Light years ahead™

Sales Headquarters & Showroom
Artemide Inc.
150 E. 58 Street, New York, NY 10155
Telephone: 212/980-0710

Regional Offices:
Chicago
Telephone: 312/644-0510
Dallas
Telephone: 214/747-6060
Houston
Telephone: 713/623-2284
Los Angeles
Telephone: 213/659-1708
Miami
Telephone: 305/925-3311

The Aton Modular Lighting System
Design: Ernesto Gismondi
Do functions, use, and personnel change frequently in your space? Has the lighting been poorly planned or forgotten entirely? your space temporary; are you planning a move or expansion?



Flexibility Above All

ɔes your space need more than just reg-
ar fluorescent lighting? Do you need light-
g for CRT terminals, indirect lighting,
otlighting, track lighting, halogen lighting,
candescent lighting, signage, electrical
tlets, or loudspeakers?

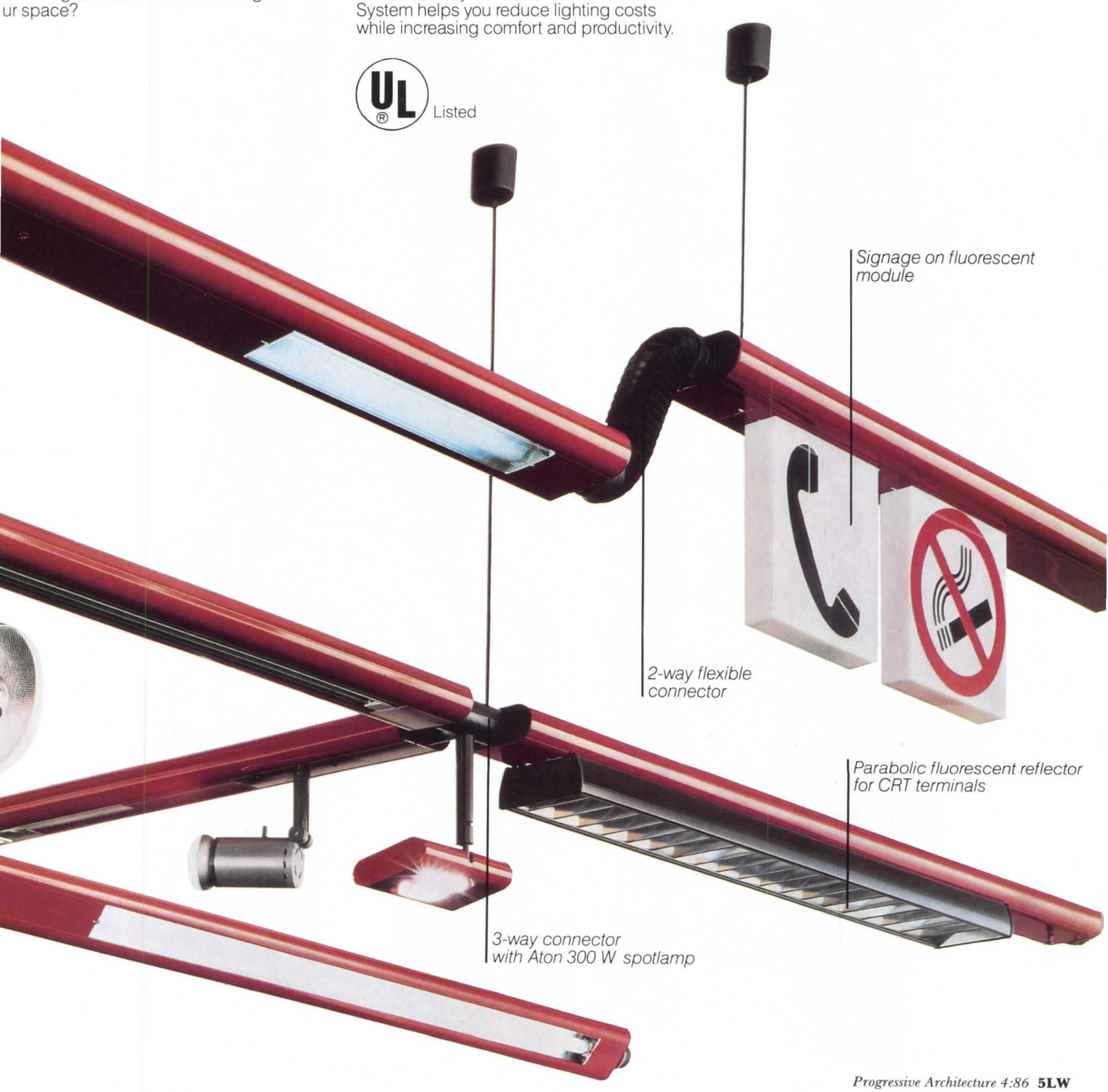
ıally, would you like a lighting system that,
a change, will enhance the design of
ur space?

If your answer to any of these questions is *yes*, Artemide strongly suggests that you take a close look at its Aton Modular Lighting System.

The flexibility of the Aton Modular System lets you adjust its many options to fit the changing needs of your space. Energy efficient and easy to install, the Aton Modular System helps you reduce lighting costs while increasing comfort and productivity.

Artemide can provide for you, free of charge, a computerized layout showing how the Aton Modular System can meet the lighting requirements of your particular space. Would you like a color brochure? Write to Artemide on your letterhead, or circle number **324**

UL® Listed



B O Y D

G L A S G O W

The Glasgow incorporates hardwood, finished in a classic black lacquer or a white limed natural finish. Glasgow is available with translucent panels of either handcrafted white flash glass, or the subtle elegance of silver mica.

Designed by Jack Griffith Mitchell.

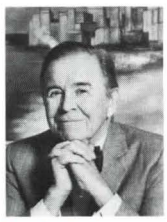
Width: 20″ Square or 51 cm
Overall Height: 26″ or 66 cm
Lamping: Three, A-19/75W
U.L. Pending.

Boyd Lighting Company
56 Twelfth Street
San Francisco, CA 9410
Telephone 415.431.4300

Circle **No. 327**

Schedule of Events


Charles Moore

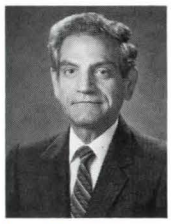

Douglas Leigh


Christos C. Mpelkas


John Levy


John Lomeli


Alfred Scholze


Imero Fiorentino

Sunday, May 11, 1986

8:30–10:00 A.M.
Opening Breakfast
Room 217
Keynote Speaker:
Charles Moore, FAIA

LIGHTING WORLD 4 will open officially with a breakfast attended by a varied cross section of architects, interior designers, engineers, lighting designers, manufacturers representatives, politicians, and the press. Charles Moore, noted architect and leading proponent of the California School of Design, will speak on daylighting and the ways that artificial lighting can supply parallel excitements. The week of May 11 will be proclaimed Lighting Week, and Los Angeles Mayor Tom Bradley has been invited to present the official proclamation in person.

Charles Moore is head of the architecture program at the University of California at Los Angeles, and formerly head of the School of Architecture at Yale University. He is also in private practice in Los Angeles with the firm of Moore, Ruble, Yudell and with Urban Innovations Group, the research and practice arm of the UCLA School of Architecture and Urban Planning. Among his many projects are Sea Ranch, site planning and theme buildings for the New Orleans World's Fair, the Beverly Hills Civic Center, and the San Antonio Art Institute. The *Christian Science Monitor* said of him a few years ago, "He is a wonderfully warm person . . . who looks like he might belong to a barbershop quartet, but who, in fact, goes about the country building wonderfully warm places for people to spend their time."

11:00–12:00 NOON, Session 1
Lighting the Tops of Buildings: An Image for Major Cities
Room 212
Speaker: Douglas Leigh

A city is changed immeasurably when the tops of its buildings are lighted. Though usually undertaken by corporate owners, it is the city that reaps the benefits when the lighting begins to form a collective image for the city itself. This talk will make the point that buildings of the early 20th Century, and many of those being built today, are the best candidates because of their high degree of ornamentation at the top. Each building must be different from the others so that there is no sameness, but taken together they create an image that comes to stand for the city itself.

Douglas Leigh, more than perhaps anyone else, has been responsible for the collective lighted image of New York City. His recent projects include the Empire State Building, the Helmsley Building on Park Avenue, Madison Square Garden, the Citicorp Building, the Con Edison Building, and the Crown Building at Fifth Avenue and 57th Street. His "spectacular" sign revolutionized viewing in Times Square some four and a half decades ago, and his Camel smoke-ring sign, installed in 1941, lasted 27 years. He was appointed to be in charge of City decor for the Democratic Conventions in 1976 and 1980, and for the 1976 Bicentennial celebration.

2:00–4:30 P.M., Session 2
Atrium Lighting Workshop
Room 216
Speakers: Craig Combs, Craig Combs Associates; Cristos C. Mpelkas, horticulturist, GTE Products Corporation; John Levy, Childs Associates; John Lomeli, Ruben John Lomeli & Associates.
Moderator: Alfred Scholze, Alfred Scholze Associates

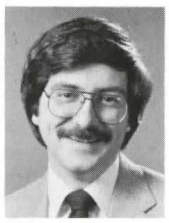
The special problems of lighting an atrium will be discussed in workshop format by an architect, a horticulturist, and two lighting designers. The presentations will discuss the history of the atrium in its present form, and suggest architectural reasons for its current popularity; the lighting requirements and suitable light sources for interior landscaping; a technique for analyzing an atrium space for design purposes, using a typical multiuse atrium as an example; and the use and misuse of decorative lighting to enhance the atrium environment. The workshop will close with a question and answer period. Handout material will be provided.

Craig Combs, AIA, is a principal of the architecture/interior design firm of Craig Combs Associates. A graduate of the University of Southern California School of Architecture, he incorporates atriums into projects as a "humanistic" touch. Christos C. Mpelkas is a plant physiologist and manager of horticultural lighting technology at GTE Products Corporation. John Levy is a Los Angeles-based lighting consultant who, through his diverse theatrical and architectural background, has developed an innovative and dramatic style of lighting large spaces. John Lomeli is an industrial designer and lighting consultant whose design experience has included interiors, architecture, graphics, landscape architecture, and product design. He has been a member of the faculty of UCLA. Alfred Scholze founded the lighting consulting firm of Alfred Scholze Associates in 1977. The firm now has offices in New Canaan, Connecticut, and Los Angeles, California, and has completed several hundred projects of varying types.

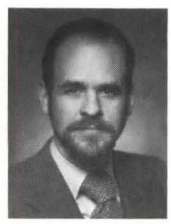
7:00 P.M.
A Night at the *Spruce Goose* Dome and the *Queen Mary*
Speaker: Imero Fiorentino

Howard Hughes' famous airplane, the *Spruce Goose*, now rests in Long Beach, under the world's largest clear-span aluminum dome and next to the *Queen Mary*. The dome itself is a mammoth arena that can accommodate 3,500 guests. During an evening under the dome, the plane itself and exhibits relating to its history and flight can be visited. The festivities will begin with a cocktail reception and


John A. Hofmann


Randal E. Swiech


Douglas Baker


James L. Nuckolls


Eric Zimmerman


Michael Hayden

ing variety of light sources, a cultural drift toward visual sensationalism for its own sake, new directions in lighting equipment design, and further energy restrictions. Using slides of his own work and that of others, Mr. Baker will illustrate solutions to these problems. Lamps and equipment will be demonstrated.

Mr. Baker has been in private practice as a lighting consultant since 1968. His clients are principally architects and interior designers, and he provides services for all types of spaces. Current retail clients include Neiman-Marcus Hermes, Woodward and Lothrop, Circuit City Stores, Coca-Cola Clothes ("Fizzazz").

2:30–3:30 P.M., Session 10
A Lighting Consultant's Approach to Residential Lighting
Room 212
Speaker: James L. Nuckolls, Luxco, Ltd.

Residences, the most personal of spaces, require a special design approach. There must be room within the designer's own design sensibility for the client's needs, wishes, and personality. In this talk, a designer will discuss the importance of natural and artificial light to residential interiors.

James L. Nuckolls, President of Luxco, Ltd., is a lighting design consultant, author, editor, and teacher. He is the lighting editor of *Interiors* magazine and the author of "Interior Lighting for Environmental Designers." Among his other publications are the Architectural Lighting Equipment Directories. He is a founding corporate member and past president of the International Association of Lighting Designers.

4:00–5:00 P.M., Session 11
Neon in Art, Architecture, and Consumer Lighting
Room 212
Speakers: Eric Zimmerman, Archigraphics;
Michael Hayden, sculptor in light

Neon light as an art form and in architectural and consumer lighting, including its uses and misuses, will be discussed. Slides will be used extensively during a presentation, which will include background on the process of making neon, low voltage and amperage power supplies, and dedicated logic developed to address architectonic scale sculptures. Recent major installations will be shown.

Eric Zimmerman specializes in design, fabrication, and installation of custom neon lighting and its related components for lighting designers, architects, and interior designers. His work has been represented in exhibitions and appears in public and private collections. Michael Hayden is a sculptor in light whose work appears in hundreds of public places and private collections throughout the United States, Canada, and Europe. He creates art by diffracting light and using color in new and brilliant ways, incorporating computer technology to make movement and patterns.

ShowLight '86

The Theatre, Television and Film Lighting Committee of the IESNA will hold its annual conference, ShowLight '86, in conjunction with LIGHTING WORLD 4. Leading lighting designers and cameramen from the entertainment industry will discuss and demonstrate their art and craft, at a variety of exciting locations in Los Angeles, including the Los Angeles Convention Center. Registrants for ShowLight '86 will receive complimentary admission to the exhibition at LIGHTING WORLD 4, where many theater lighting and controls manufacturers have booths. Transportation will be provided for tours.

Sunday, May 11, 1986

Day
Arrival, Registration at ShowLight Headquarters Hotel, LIGHTING WORLD 4 Exhibits, and Events at L.A. Convention Center

Evening
A Night At the Spruce Goose (See LIGHTING WORLD schedule and use registration form in this brochure)

Monday, May 12, 1986

Day
Transportation to L.A. Convention Center for presentation of ShowLight Papers (Room 211). LIGHTING WORLD 4 exhibits and events also available.

Evening
Poolside cocktail party, Hollywood Roosevelt Hotel

Tuesday, May 13, 1986

Morning
Tour of Los Angeles Theatre Center, papers on theater lighting, paper on theater design by John Fisher

Afternoon
Papers session including Disco Lighting by Tim Tunks at ShowLight Hotel

Evening
New Products Session

Wednesday, May 14, 1986

Morning
Tour of television studio and presentation of papers headed by Bill Klages

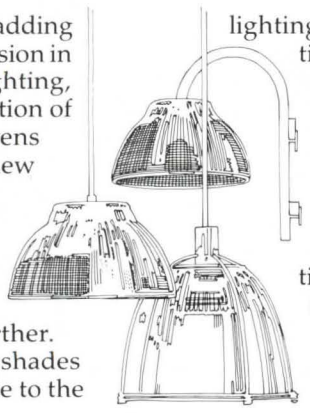
Afternoon
Tour of film studio sound stage. Presentation of papers headed by George Dibie

Evening
Grand Banquet and finale at Hollywood Roosevelt Blossom Ballroom, site of the first Academy Awards ceremony.

HOLOPHANE CLASSICS. THE EDMUND STEVENS COLLECTION.

Holophane is adding a new dimension in prismatic glass lighting, with the introduction of our Edmund Stevens Collection. Two new ceiling-mounted fixtures and a wall-mounted design that take the best idea in lighting a step further.

Prismatic glass shades give subtle sparkle to the lighting. Holophane construction assures you of long-lasting durability. And Edmund Stevens added his personal touch for a timeless statement of unequaled elegance.



Contact your local Holophane representative or call Jodi Swanson, (303) 978-2451, for ordering and product information.

Holophane Division, Manville, P.O. Box 5108, Denver, Colorado 80217. Available for Export.

HOLOPHANE
LEADER IN LIGHT CONTROL

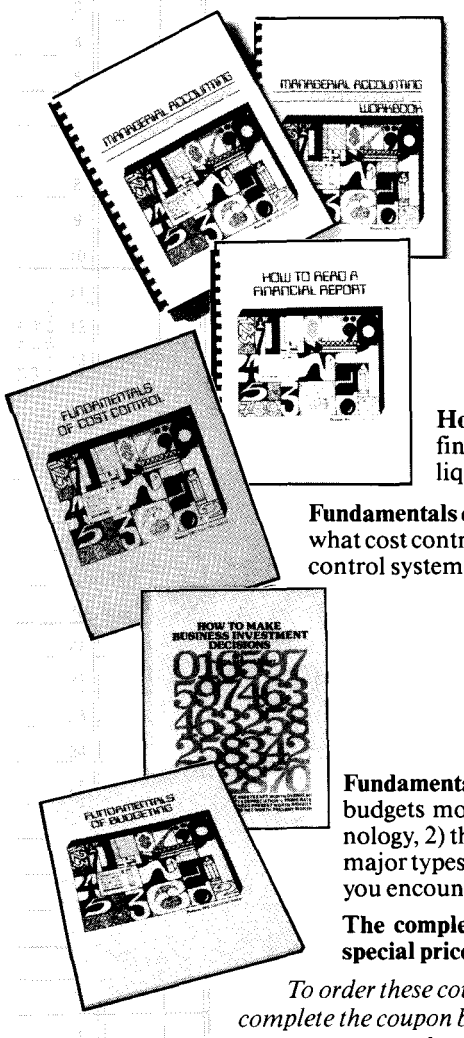
Manville

Circle **No. 375** on Reader Service Card

WHAT EVERY MANAGER NEEDS TO KNOW ABOUT FINANCIAL PLANNING

in this easy-to-use self-study course series

Five programmed learning courses . . . 50 hours of instruction . . . at less than $1.60 per hour. Study them one-at-a-time, or buy all five courses at a special savings. Either way, 15-day review option applies. Order toll-free 800-321-7003 In Ohio call collect 216/696-7000



Each course in the series is written in programmed learning format, so you can study at your own pace, in the privacy of your home or office. And when you complete each course, you can test your own comprehension.

Begin your personal financial development program today!

Managerial Accounting for Non-financial managers — You'll work as a company controller in this course. You'll learn to properly record all the company's business transactions and how to prepare the company's financial statements. When the fiscal year ends, you'll prepare the annual report, balance sheet, income statement, and the funds-flow statement. When you've finished the course, you'll understand better the role of accounting and how to use the information accounting gives you to be a more effective manager. Two volumes . . . course book and workbook $25.00

How to Read a Financial Report — In this course you'll learn how to assess the financial position of your company through the use of ratio analysis . . . analyzing liquidity, activity, profitability, and coverage ratios $16.00

Fundamentals of Cost Control — You may never design a cost control system, but you must know what cost control is, how to use it, and how to make the best decisions based on the facts your cost control system gives you $16.00

How to Make Business Investment Decisions — This course helps you understand how the relationship between money and time affects management decisions. The course covers: Present value concepts, how to use compound interest tables and equations to calculate the time value of money, and how to use these computed values and make the best economic decisions. Case studies are included $16.00

Fundamentals of Budgeting — This course shows the non-accountant manager how to use budgets more effectively. The course presents: 1) the nature of budgets and budget terminology, 2) the manager's role in the budgeting process, 3) the steps involved in budgets, 4) the major types of budgets, and 5) planning, control and data reports — the media through which you encounter and use budgets $16.00

The complete Financial Planning Series . . . all five programmed learning courses at the special price of $79.00, an $89.00 value.

To order these courses, complete the coupon below and mail to:

Penton/IPC Education Division
Penton Plaza
1111 Chester Avenue
Cleveland, Ohio 44114

For faster service call toll-free 800-321-7003 (Ohio residents call collect 216/696-7000)

Please send the courses indicated. I understand that I may review them for 15 days and, if not completely satisfied, return them for full credit or refund.

	Qty.
Accounting for Non-Financial Managers	_____
How to Read a Financial Report	_____
Fundamentals of Cost Control	_____
How to Make Business Investment Decisions	_____
Fundamentals of Budgeting	_____
Sets of all five courses at a special savings	_____

☐ My payment is enclosed for postage-free shipment in the U.S. and Canada.
☐ Bill my company and include shipping and handling charges. My purchase order is enclosed.

Charge my: ☐MasterCard ☐Visa ☐American Express card.

Acct. No. _____ Exp. date _____

Name _____ Title _____

Company _____

Address (not P.O. box) _____

City _____ State _____ Zip _____

Signature _____

Penton/IPC Education Division • Penton Plaza • 1111 Chester Avenue • Cleveland, Ohio 44114

GUARANTEED. FOREVER.

ALKCO LITTLE INCH™ that's all they had to write about undercabinet lighting

As long as there's electricity, ALKCO LITTLE INCH™ undercabinet lights will still be working. Designing a commercial "heirloom" was the last thing we had in mind. We simply wanted the first useful lights that would slip under cabinets in barely one inch of vertical. Naturally, we made them out of sturdy cold rolled steel, coated them with bonderized enamel and installed electrical components designed to our own exacting specifications.

Our unique lens of proprietary ALKCORYLIC™ maintains maximum light transmission and won't brittle or yellow. Options are unlimited — lengths from 12″ to 42″, output from 8 to 26 watts, superior incandescent or white light rendering from exclusive ALKCOLUX™ lamps. Rocker switches, plug-in models, grounded convenience outlets, fuses, stainless steel construction and more.

But our lifetime guarantee is standard equipment. So all you have to write for undercabinet lighting is Alkco Little Inch. Like they did for our refurbished Statue of Liberty . . . and for homes, schools, offices, hospitals and institutions . . . everywhere they wanted an undercabinet light to last through the next millenium.

P.S.: Please keep our other contemporary classics in mind . . . VARILUX™ three-level task lights . . . LINCANDESCENTS™ ribbons of incandescent warmth for accent ambiance . . . WALLSCAPES™, soft-lighting wall-mounted fluorescents.

For information, contact your Alkco representative or distributor, or write ALKCO, 11500 West Melrose Ave., Franklin Park, ILL 60131.

ALKCO
where quality comes to light

Circle No. 312

Booth 638
American Lantern
Highway 67 North
Newport, AR 72112
(501) 523-2705

Solid brass beveled glass outdoor lanterns. Decorative indoor styles including ribbed glass, Art Deco, and brass chandeliers.

Booth 1010
The American Light Glass Co. Showroom
49 W. 27th St./10th Fl.
New York, NY 10001
(212) 213-1200

Decorative incandescent and fluorescent sconces and pendant uplights and downlights for high end commercial use.

Booth 110
American Lighting Corp.
38 Bellvue Ave.
Newport, RI 02840
(401) 849-9795

Booth 929
American Louver
7700 Austin
Skokie, IL 60077
(312) 470-3300 or
(800) 323-4250

Paracube Lighting lighting louvers, including a new Paracube I louver with a "tipped" back for higher efficiencies, and flange for easy mounting.

Booth 646
American Scientific Lighting Corp.
669 E. 7th St.
Brooklyn, NY 11218
(718) 851-4577

Energy efficient lighting; H.I.D. & *fluorescent* indoor-outdoor fixtures; H.P.S. and fluorescent screw-in conversions and wire-in retrofits.

Booth 135
American Society of Interior Designers
1430 Broadway
New York, NY 10018
(212) 944-9220

Information on ASID membership program and activities.

Booth 701
Amerlux
15 Patton Dr.
West Caldwell, NJ 07006
(201) 228-4242

Light tube systems; HQI display and down lighting systems.

Booth 922
Appleton Electric Co.
1701 Wellington Ave.
Chicago, IL 60657
(312) 327-7200

High-bay; marine; explosion-proof; floods; poles; glomitrics; quartz; incandescent; m.v.; low bay.

Booth 650
Architectural Area Lighting Co.
13901-B S. Carmenita Rd.
Santa Fe Springs, CA 90670
(213) 921-7766

Specification grade outdoor lighting in traditional and contemporary designs that operate all types of high intensity discharge and incandescent lamps.

Booth 647
Architectural Record
1221 Avenue of the Americas
New York, NY 10020
(212) 512-2858

Architectural Record is edited for architects and engineers engaged in building design and product specification.

Booth 505
Architel Systems, Inc.
920 Broadway, 16th Floor
New York, NY 10010-6004
(212) 475-0900

Total programmable lighting control systems for use in creating energy-saving, visually exciting lighting environments.

Booth 722
Art Temple, Inc.
225 Kearny St.
San Francisco, CA 94108
(415) 433-0464

Solid brass contemporary and antique replica lamps.

Booth 136
Artemide Inc.
1980 New Highway
Farmingdale, NY 11735-1102
(516) 694-9292

Aton Modular Lighting System, a linear lighting system with quartz halogen and fluorescent light sources. UL Listed.

Booth 1106
Aster Publishing Corp.
320 North A St./P.O. Box 50
Springfield, OR 97477
(503) 726-1200

Booth 346
Atelier International Lighting
595 Madison Ave.
New York, NY 10022
(212) 644-0400

Decorative lighting consisting of floor lamps, ceiling fixtures, wall fixtures, and table/task lamps.

Booth 113
BEGA
Box 50442
Santa Barbara, CA 93150
(805) 565-1575

Outdoor oriented architctural lighting; wall, ceiling, freestanding and pole mounted luminaires.

Booth 957
BWF/Bayerische Wollfilzfabriken KG
Offermann, Zeiler, Schmid & Co.
P.O. Box 11 20
D-8875 Offingen, FRG
8224/71 0; Tlx.: 531 122

Profiles of acrylics and polycarbonates for interior/exterior lighting applications (e.g., lamp covers, decorative lamps, prismatic diffusers—also multi-coloured).

Booth 842
Louis Baldinger & Sons, Inc.
19-02 Steinway St.
Astoria, NY 11105
(718) 204-5700

Decorative lightings suitable for hotels, restaurants, lobbies and other commercial installations.

Booth 1022
Barovier & Toso Srl.
Fondamenta Vetrai N.28
30121 Murano-Venezia, Italia
041/739.049; Tlx. 411084

Hand made artistic glass factory-accessories-decorative lighting-custom and architectural illumination.

Booth 840
Barrie Lighting Co.
P.O. Box 8
Mason, OH 45040
(513) 398-3548

Indoor, outdoor, H.P.S. and fluorescent lighting fixtures.

Booth 513
BeamO Corp.
24 Thorndike St.
Cambridge, MA 02141
(617) 864-0094

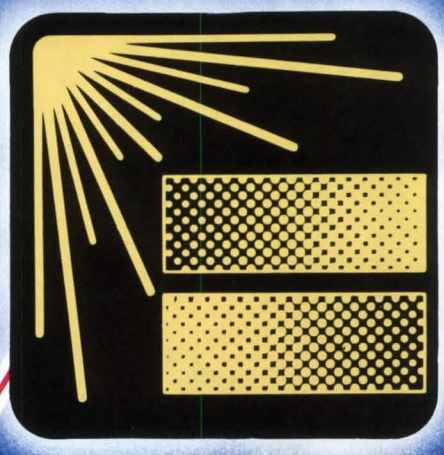
Light conveyance systems including Designers resource series, fiber optic systems, light tapestries, and optical wall sconce systems.

Booth 431
Norbert Belfer Lighting Mfg. Co.
2111 Rte. 35
Ocean, NJ 07712
(201) 493-2666

Low voltage, high output linear light strips and functional lighting for marquees—curves, angles and straight configurations—with interior and exterior uses.

The Architel Strategies For Programmable Lighting

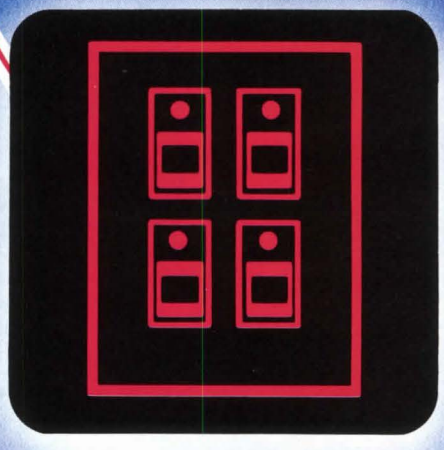
Clock/Calendar Scheduling



Light-Level Balancing

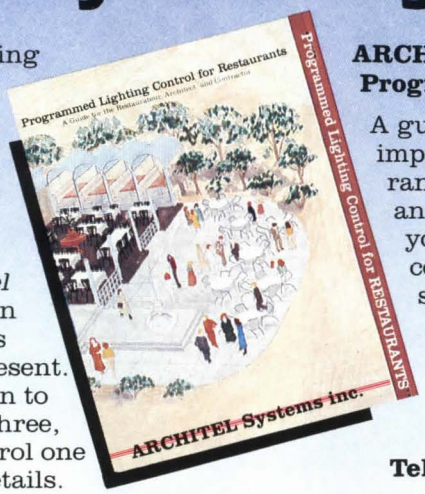
Occupancy Sensing

Manual



They invite your design talent.

Your assignment: design state-of-the-art lighting for a building. Your approach: install an Architel programmable, software-driven lighting control system. Why? Because its four-strategy control format means new freedoms for you in meeting your aesthetic, functional, and energy-saving design goals. *Clock/Calendar* lets you switch lamps on and off to exact schedules, year-round. *Light-Level Balancing* helps you reduce lamp lumens when sunlight is present. *Occupancy Sensing* allows you to turn on lights only when people are present. *Manual* controls permit the building custodian to override automatic controls. Best of all, two, three, or all four strategies can be integrated to control one lighting zone. Your Architel rep has all the details.



ARCHITEL presents:
Programmed Lighting for Restaurants.

A guide to the aesthetic and energy-saving impacts of programmed lighting for restaurants. Covers software, hardware, operation, and installation. Helps you show clients what you can accomplish in visual excitement, eye comfort, energy savings, lighting decor, and special effects. Call or write for your copy.

Coming: guides for hotels, offices, museums, stores & malls, residences, plants.

ARCHITEL Systems, inc.
920 Broadway, New York, N.Y. 10010
Telephone 212-475-0900

ARCHITEL Systems, inc.

a subsidiary of DCS Controls Corporation

Circle **No. 319** on Reader Service Card

Booth 112
Benjamin Div./Thomas Ind. Inc.
P.O. Box 180/Rte. 70 South
Sparta, TN 38583
(615) 738-2241

Fluorescent, incandescent and HID commercial and industrial lighting.

Booth 1205
Betec Munich
8687 Melrose Ave.; Suite 404
Los Angeles, CA 90069
(213) 659-6510

Picture lights; lamps.

Booth 953
Bieber Lighting Corp.
626 S. Isis Ave.
Inglewood, CA 90301
(213) 776-4744

Outdoor lighting poles and luminaires.

Booth 234
The Bodine Co.
236 Mt. Pleasant Rd.
Collierville, TN 38017-2752
(901) 853-7211

Emergency lighting equipment which allows use of H.I.D and fluorescent lamps for both AC and emergency illumination, and an energy management system.

Booth 1055
Boyd Lighting Co.
56—12th St.
San Francisco, CA 94103
(415) 431-4300

Table and floor lamps; torcheres; wall sconces; pendants; ceiling fixures; custom designs manufactured for residential and contract applications.

Booth 616
Brandhurst Inc.
87 Sand Pit Rd.
Danbury, CT 06810
(203) 798-1131

Self-luminous exit and safety signs consume no energy, require no wiring. Provide maximum life safety for 20 years.

Booth 947
Brilliant Lighting, Inc.
1323 Truman St.
San Fernando, CA 91340
(818) 365-6976

Lighting fixtures and lamps for both indoor and outdoor use. High tech contemporary products designed in West Germany and produced in California.

Booth 250
Brownlee Lighting
2634 Taft Ave.
Orlando, FL 32804
(305) 422-1370

Fluorescent and high pressure sodium light fixtures.

Booth 647
Building Economics
1221 Avenue of the Americas
New York, NY 10020
(212) 512-2858

Building Economics is edited for executives responsible for managing buildings and facilities owned by corporations, institutions, government agencies and real estate companies.

Booth 536
CONTRACT Magazine/A Gralla Publication
1515 Broadway
New York, NY 10036
(212) 869-1300

Current issues of CONTRACT Magazine.

Booth 520
C. E. W. Trading Inc.
15775 N. Hillcrest/Suite 508
Dallas, TX 75248
(214) 960-1998

"Eye" Brand HPS, metal halide, mercury vapor and halogen lamps including the Dichrocool 120vMR16 and Sunlux Super Ace HPS lamps.

Booth 717
C.W. Cole & Co., Inc.
2560 N. Rosemead Blvd.
South El Monte, CA 91733
(818) 443-2473 or
(213) 283-6688

Specialty, custom commercial, institutional lighting fixtures.

Booth 447
California Artup Corp.
3000 S. Shannon St.
Santa Ana, CA 92704
(714) 850-1966

High-tech, energy-efficient lighting. Halogen, incandescent, fluorescent. Suspension, task, floor, wall, etc. All European manufactured.

Booth 856
Capitol Lighting Products
159 Alexander St.
Yonkers, NY 10701
(914) 969-3400

Toki tape lights; Flex-a-lite; various rope lighting; display & running belt lights.

Booth 201
Capri Lighting/Div. Thomas Inds.
6430 E. Slauson Ave.
Los Angeles, CA 90040
(213) 726-1800

Track, low voltage, recessed, H.I.D., architectural lighting.

Booth 919
Celestial Products
5400 Cahuenga Blvd.
North Hollywood, CA 91601
(818) 985-1376

Low voltage tube lighting products; Liteform; chandeliers; light curtains; tree lights; border lights; chase light systems.

Booth 641
Chloride Systems
Mallard Lane
North Haven, CT 06473
(203) 642-7837

Life safety products including emergency lights for industrial, NEMA classification and decorative commercial applications.

Booth 134
Classic Illumination Inc.
2743 Ninth St.
Berkeley, CA 94710
(415) 849-1842

Brass lighting fixtures in period styles from Victorian through Contemporary.

Booth 655
The Coast Light Works Inc.
1359 Channing St.
Los Angeles, CA 90021
(213) 623-3331

Contemporary tubular lighting for fluorescent, H.I.D., quartz and low voltage lamps. HI Tec Industro Lites for Incandescent, PL and H.I.D. Lamps.

Booth 427
Colortran, Inc.
1015 Chestnut St.
Burbank, CA 91506
(818) 843-1200

LMS—Light Management System—a series of electronic controls and dimmers. A complete selection of control systems are available—slide control stations; raise/lower operations; single preset and multi preset.

Booth 559
Columbia Lighting
P.O. Box 2787
Spokane, WA 99220
(509) 924-7000

Various size models of the P4 Parabolume series. Two new designer oriented fluorescent fixtures.

Booth 620
Computer Aided Lighting Analysis (CALA)
P.O. Box 1674
Boulder, CO 80306
(303) 530-5232

A CAD system for lighting design and analysis which runs on an IBM PC. Useful for sports, roadway and indoor applications.

When it comes to lighting systems, everybody likes security.

Crouse-Hinds will never leave you in the dark...

Isn't that nice to know.

Manufacturers of commercial fluorescent, industrial HID and fluorescent lighting, roadway, specialty, area and site lighting, floodlighting and poles.
Crouse-Hinds, lighting America since 1897.

COOPER INDUSTRIES

CROUSE-HINDS LIGHTING

P.O. Box 824 / Vicksburg, MS 39180
601/638-1522

Booth #707 LIGHTING WORLD IV

Circle No. 332 on Reader Service Card

Booth 1049
Consulting Engineer Magazine
1301 S. Grove Ave.
Barrington, IL 60010
(312) 381-1840

The magazine for the engineer in private practice.

Booth 219
Crescent Lighting/A Genlyte Co.
120 East Gloucester Pike
Barrington, NJ 08007
(609) 546-5500

Fluorescent lighting.

Booth 459
Crestron Electronics
101 Broadway
Cresskill, NJ 08626
(201) 894-0660

Booth 707
Crouse-Hinds Lighting
Hwy. 61 South/P.O. Box 824
Vicksburg, MS 39180
(601) 638-1522

Indoor and outdoor energy efficient lighting for industrial, commercial, floodlighting, special, hazardous and roadway use.

Booth 653
Crown Elkamet, Inc.
2445 Northline Industrial Dr.
Maryland Heights, MO 63043
(314) 567-1566

High quality seamless lighting enclosures, from polycarbonate/acrylic for exterior lighting fixtures. Typical products: spheres, cubes, lanterns, and cylinders in various colors.

Booth 1105
Custom Lighting Inc.
9150 Live Oak
Fontana, CA 92335
(714) 350-4505

Outdoor lighting; fixtures; decorative cast aluminum poles.

Booth 1053
DHA Lighting Ltd.
533 Canal St.
New York, NY 10013
(212) 219-2218

Booth 834
Dabbco, Inc.
5983 Smithway St.
Commerce, CA 90040
(213) 722-0080

Decorative, energy efficient lighting for indoor and outdoor applications, as well as a full line of recessed lights.

Booth 514
Day-Brite Lighting
P.O. Drawer 1687
Tupelo, MS 38802
(601) 842-7212

Commercial/industrial indoor and outdoor fluorescent and H.I.D. lighting fixtures.

Booth 719
Dazor Manufacturing Corp.
4455-99 Duncan Ave.
St. Louis, MO 63110
(314) 652-2400

Portable, adjustable-arm task lighting.

Booth 627
Delta Lighting Systems, Inc.
1328 Virginia Ave.
Baldwin Park, CA 91706
(818) 960-7611

Contemporary, decorative and nostalgic street, walkway, tennis court, parking lot and site lighting fixtures and poles.

Booth 305
Devine Lighting
4645 E. 11th St.
Kansas City, MO 64127
(816) 241-9440

Architectural outdoor lighting.

Booth 350
Devoe Lighting Corp.
7 Kohner Pl.
Elmwood Park, NJ 07407-0605
(201) 791-0880

Architectural extruded aluminum luminaires; illuminated handrails; bollards; area, ambient, fluorescent and H.I.D. lighting. Racquetball; indoor and outdoor tennis courts.

Booth 149
Diva Inc.
8845 Beverly Blvd.
Los Angeles, CA 90048
(213) 278-3191

Lighting fixtures.

Booth 621
Diversitronics, Inc.
215 Wrightwood
Elmhurst, IL 60126
(312) 833-4495

Special effect entertainment lighting controllers; audio responding nightclub and discotheque lighting effects; theatrical and amusement lighting; stroboscopes; tubelights.

Booth 820
D'Lights
533 W. Windsor Rd.
Glendale, CA 91204-5656
(818) 956-5656

Decorative contract lighting specializing in turn-of-the-century and Art-Deco styles including pendants, chandeliers, wall brackets and portables, with custom capabilities.

Booth 352
Dual-Lite, Inc.
Simm Lane
Newtown, CT 06470
(203) 426-8011

Emergency lighting products and exit signs featuring SPECTRON™ series self-diagnostic equipment, plus power communication poles and flexible wiring products.

Booth 1108
DYNARAY Emergency Lighting
P.O. Box 567
Cambridge, MA 02139-0567
(617) 661-4401

Emergency lighting and systems. Battery units; exit lights; inverter systems.

Booth 943
ECP/Energy Conservation Products, Inc.
511 Canal St.
New York, NY 10013
(212) 925-5991

TWIST-OF-THE-WRIST® brand energy saving lighting fixtures; energy efficient retrofit and conversion fixtures; fluorescent, H.I.D. and low voltage.

Booth 546
ELA Co./Environmental Lighting for Architecture
17891 Arenth Ave.
City of Industry, CA 91748-1197
(818) 965-0821

Custom manufacturing, engineering and design or product line fixtures in decorative interior and exterior specification market. Commercial, residential and contract.

Booth 418
EMCO Environmental Lighting
7300 50th St.
Milan, IL 61264
(309) 799-3111

Specification grade outdoor lighting fixtures for walkway, roadway and area lighting and functional and decorative, state-of-the-art light distribution.

Booth 117
EMR Lighting
325 Rabro Dr./P.O. Box 403
Hauppauge, NY 11788
(516) 348-0444

Contract chandeliers and wall brackets for hotels, casinos and restaurants.

Booth 805
Edison Price Inc.
409 E. 60th St.
New York, NY 10022
(212) 838-5212

Track lighting, line and low voltage; incandescent downlights and wallwashers; fluorescent fixtures and photos of many famous projects.

flexibility in graceful design combines incandescent-fluorescent low voltage-track lighting

Card Party Store—Boston, MA
Jon Greenberg & Associates—Store Designers & Planners
Lighting Consultants: Illuminating Concepts.

LINEAR CYLINDRICAL SYSTEMS
LCS2 LCS4

The art of lighting for merchandising—the creativeness of the designer of commercial interiors—the unlimiting solution: Monopoll—2″ dia. Varipoll—4″ dia. systems.

- shapes to adapt with the architectural concept of the ambient—countless possibilities.
- decorative, display, and functional general lighting in a single suspended structure including incandescent, fluorescent, low voltage and track luminaires.
- lighting perfection where it's wanted—by means of inserts matching a module suitable for the most complex layouts.
- extruded aluminum, white, bronze, polished anodized.

OMEGA
the lighting specialist for the architectural interior

EMERSON®

OMEGA® LIGHTING

EMERSON ELECTRIC CO.
270 LONG ISLAND EXPRESSWAY/MELVILLE, NEW YORK 11747 516-293-8500
In Canada. Emerson Electric Canada Ltd., P.O. Box 150, Markham, Ontario, Canada, 416-294-9340

Circle No. 384 on Reader Service Card

Booth 267
Electrical News
P.O. Box 3807
Arcadia, CA 91006
(818) 446-8652

Local industry newspaper covering California, Arizona, Nevada.

Booth 647
Electrical Wholesaling Magazine/ EC&M Magazine
1221 Ave. of the Americas
New York, NY 10020
(212) 512-3081

Publication.

Booth 1028
Electrix Inc.
45 Spring St.
New Haven, CT 06519
(203) 776-5577

Task lights; low-voltage tracklights; torchieres and sconces.

Booth 601
Electro Controls, Inc.
2975 S. 300 West
Salt Lake City, UT 84115
(801) 487-9861

Architectural lighting controls; wall box dimmers; low voltage lighting systems.

Booth 1020
Electronic Advanced Systems Corp.
5 Portland Rd.
West Conshohocken, PA 19428
(215) 828-5060

REFLUORS—the original reflector fluorescents—5 to 18 watt compact fluorescent lamps in reusable glass reflectors replace *up to 150 watt* incandescents.

Booth 714
Electronic Ballast Technology, Inc.
2808 Oregon Court/#K-4
Torrance, CA 90503
(212) 618-8733

Solid state ballasts for fluorescent lamps; solid state dimmers.

Booth 518
Electronics Diversified, Inc.
1675 NW 216th Ave.
Hillsboro, OR 97124
(503) 645-5533

Architectural/energy management and performance lighting control equipment. Products include dimmers, controllers, and motion and ambient light sensors.

Booth 560
Electrosonic
815 Woolwich Rd.
London SE7 8LT, England
01-855 1101

New microprocessor based lighting control/dimming systems for restaurants, hotels, conference centres, offices and other commercial buildings. Dimming equipment for tungsten or fluorescent loads.

Booth 527
Elliptipar Inc.
145 Orange Ave.
West Haven, CT 06516
(203) 932-2266

Asymmetric lighting for wallwashing and indirect applications. Fluorescent, task/ambient lighting for open plan offices.

Booth 743
Elsco Lighting Products, Inc.
633 San Juan
Stockton, CA 95203
(209) 466-0511

Area lighting; bollards; tennis lighting.

Booth 150
Elteva Danmark A/S
Maltgørervej 6
5471 Søndersø, Danmark
(09) 892121

Fluorescent tubesystem combined with halogen spots, loudspeakers and connections as 45/90 degree bendings, T and X—pieces to suit any purpose.

Booth 718
Emergency Lighting & Systems, Inc./Div. Innovation Inds., Inc.
P.O. Box 2996/Hwy. 64 East
Russellville, AR 72801
(501) 968-2232

Emergency lighting units and exit signs.

Booth 517
Emergi-Lite, Inc.
P.O. Box 548
Westbrook, CT 06498
(203) 399-7991

Complete line of factory tested, field proven, emergency lighting equipment including unit equipment, exit signs and A.C. inverter systems.

Booth 835
Encon Industries Inc./ Beach Solar Supply
15865 Chemical Lane
Huntington Beach, CA 92649
(714) 898-0526

Fluorescent power reducers; Starlite 10,000 reflector floods; assorted fluorescent lighting products.

Booth 1054
Enercon Data Corp.
7464 West 78th St.
Minneapolis, MN 55435
(612) 829-1900

RCSS—Remote Control Signaling System (low voltage lighting control); microprocessor lighting controller.

Booth 712
Energy User News
7 E. 12th St.
New York, NY 10003
(212) 741-4428

A weekly newspaper intended to deliver information key to energy-related decisions of executives in the institutional, industrial, commercial and government sectors.

Booth 1027
English Electric Corp.
106 Purdy Ave.
Port Chester, NY 10573
(914) 937-7450

H.I.D. lamps—both high and low pressure sodium. Street lighting and security lighting.

Booth 812
Envel Design Corp.
1940 Cotner Ave.
Los Angeles, CA 91401
(213) 478-2524

Standard modular ceiling panels from stained and beveled glass.

Booth 948
Environmental Lighting Products Inc.
% Groberg/7002 Blvd. East, Apt. 215C
Guttenberg, NJ 07093
(201) 868-8374

Lighting equipment; architectural lighting products.

Booth 853
Exide Electronics
3301 Spring Forest Rd.
Raleigh, NC 27604
(919) 872-3020

Emergency lighting unit equipment; central system AC—Inverter/UPS.

Booth 1130
FM Productions
3775 Bayshore Blvd.
Brisbane, CA 94005
(415) 468-6500

A transformerless low voltage dimmer that takes 110 line voltage and outputs either 12 or 28 VAC.

Booth 538
Facilities Design & Management/A Gralla Publication
1515 Broadway
New York, NY 10036
(212) 869-1300

Current issues of FACILITIES DESIGN & MANAGEMENT Magazine

END GLARE

LAM lighting systems illuminate spaces appropriately. No glare. No harsh shadows. No undue hot spots.

From open spaces to VDT stations to private offices, LAM systems help you realize your lighting design objectives.

No matter what the period or the plan, specify LAM indirect lighting systems. Turn light into day.

LAM LIGHTING SYSTEMS, 94 New Salem Street, Wakefield, MA 01880, 617-245-5115.

LAM
LIGHTING SYSTEMS
A Subsidiary of Jac Jacobsen Industries, Inc.

Circle **No. 370**

Booth 1143
Fail Safe Lighting Systems
4501 S. Tripp
Chicago, IL 60632
(312) 847-0200

Booth 937
Feeling Flame A/S
Thorsgade 59
22 Copenhagen N., Denmark
+ 45 1 81 18 44

The light bulb "Feeling Flame," an artificial electronic candle light with a unique similarity to a real candle and with a flickering flame.

Booth 434
Feit Electric Co., Inc.
1734 S. Los Angeles St.
Los Angeles, CA 90015
(213) 747-7505

Light bulbs; fluorescent tubes; quartz lamps; energy saving fixtures.

Booth 441
Feldman Lighting Co.
600-612 S. Wall St.
Los Angeles, CA 90014
(213) 627-6731

Decorative lighting fixtures including direct & indirect light sources from traditional to transitional to contemporary styles.

Booth 252
Forecast Lighting Co.
500 N. Oak St.
Inglewood, CA 90302
(213) 678-5151 or
(800) 421-6049

Contemporary and traditional decorative lighting fixtures for both residential and light commercial (hospitality industry specialists) applications. Incandescent and fluorescent versions.

Booth 359
Foremost Manufacturing Co.
941 Ball Ave.
Union, NJ 07083
(201) 687-4646

ALZAK reflectors.

Booth 236
Forum Inc.
214 N. Lexington Ave.
Pittsburgh, PA. 15208
(412) 244-8780

Environmental lighting systems; H.I.D. indirect; fluorescent direct/indirect; hospital bed lighting; specialty fixtures.

Booth 625
Fyrnetics Inc.
1021 Davis Rd.
Elgin, IL 60120
(312) 742-0282

Solid state electronic ballasts; power converters.

Booth 212
Gardco Lighting/Div. Thomas Inds.
P.O. Box 2013
San Leandro, CA 94550
(415) 357-6900

Landscape and site lighting products; interior extruded aluminum fluorescent lighting.

Booth 157
Gebrueder Mitterhuber GmbH
Ennser Str. 150A
A-4407 Dietach b. Steyr, Austria
011-49-7253-21948
All Correspondence to:
Melville Crystal Chandeliers
Mozartstrasse 4
6909 Malsch, West Germany
011-49-6221-21687/6

Crystal Chandeliers—with Swarovski STRASS trimmings, fixtures with 24 carat gold-plating and protective finish. Detachable designs for easy cleaning.

Booth 435
General Electric Lighting Control
225 Service Ave.
Warwick, RI 02886
(401) 886-6200

Relay-based lighting controls: remote control—flexible switching components; smart remote control—low cost lighting automation panels; programmable control—integrated system for intelligent buildings.

Booth 437
General Electric Co./Lighting Systems Dept.
Spartanburg Hwy.
Hendersonville, NC 28739
(704) 693-2000

High intensity discharge lighting systems for use in roadway, industrial, hazardous location, area-floodlighting and post-tops, and commercial applications.

Booth 227
The Genlyte Group
One Lighting Pl.
Secaucus, NJ 07094
(201) 333-5120

Parent company of Basic Concept, Crescent, Diamond F, E-Lite, Hadco, Imperial Bronzelite, Keene Lighting Products, Lightolier, Stonco, Timely Lighting, Wide-Lite.

Booth 461
Georgian Art Lighting Design
P.O. Box 325
Lawrenceville, GA 30246
(404) 963-6221

Residential and commercial lighting fixtures; solid brass oversized outdoor lanterns; cast chandeliers; Art Deco and custom fixtures.

Booth 746
Globe Illumination Co.
1515 W. 178th St.
Gardena, CA 90248
(213) 321-9000

Specification grade fluorescent lighting. Recessed and surface mounted; parabolic; "ultrapar" and "tripar" or lensed units, for all commercial applications.

Booth 651
Greenlee Landscape Lighting
1220 Champion Circle/
Suite #116
Carrollton, TX 75006
(214) 484-1133

Specialty fixtures specifically designed for landscape illumination. Recessed well lights; bullet downlights; direct burial units; floodlights. Design and application assistance.

Booth 339
Guardian Light Co.
5125 W. Lake St.
Chicago, IL 60644
(312) 378-2200

Energy efficient decorative outdoor area lights; floodlights; security, canopy and sign lights.

Booth 105
Guth Lighting/Sub. Jac Jacobsen Inds.
2615 Washington Blvd.
St. Louis, MO 63103
(314) 533-3200

H.I.D. indirect; interior wall sconces; exterior wall and canopy H.I.D. and fluorescent units; clean room fluorescents.

Booth 324
Hadco
100 Craftway/P.O. Box 128
Littlestown, PA 17340
(717) 359-7131

Architectural Outdoor Lighting: contemporary and traditional fixtures, poles, landscape lighting, custom and accessories.

Booth 231
Halo Lighting/Div. Cooper Inds.
400 Busse Rd.
Elk Grove Village, IL 60007
(312) 956-8400

Recessed, track, H.I.D. and emergency lighting systems for commercial and residential use.

Booth 555
Highline Products Corp.
330 Boston Post Rd.
Old Saybrook, CT 06475
(203) 388-3506

Fiberglass lighting poles; polymer composite replica lighting standards.

Booth 631
Holophane
Box 5108
Denver, CO 80217
(303) 978-2677

New technology area lighting; decorative interior, exterior luminaires, H.I.D., incandescent.

ENLIGHTENING.

Impeccable form.
The significance of attractive, functional lighting cannot be underestimated. The Integralite Designer Series from JW Lighting is designed with this in mind. Serving not just as illumination, but as part of the overall interior design, these imaginative linear lighting concepts help complete the image and mood of the space.

Whatever environment you seek to create, the Integralite Designer Series' variety of styles and colors reflect an understanding of the importance of lighting design to any setting.

Superior function.
From entryways to executive suites, from corridors to conference areas, energy-efficient Integralite designs fit virtually any lighting need. A variety of extruded aluminum architectural profiles and a complete assortment of connectors, diffusers and mounting arrangements provide maximum design flexibility—ensuring that form is not forgotten.

Call or write today for a free, full-color brochure on the Integralite Designer Series. We think you'll find our approach...enlightening.

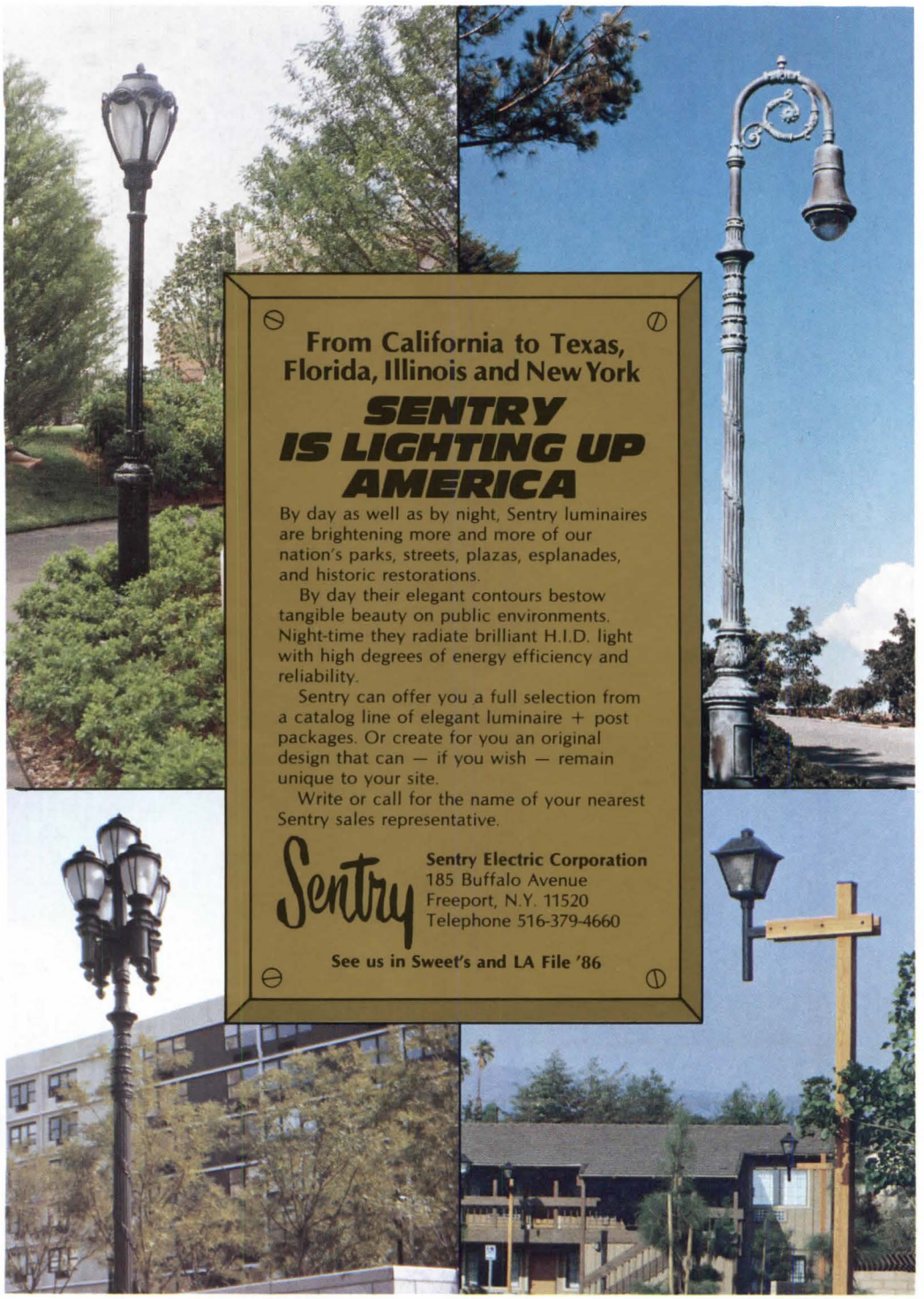
1-800-255-9520
1-800-833-8371 (In Texas)

JW LIGHTING, INC.
Subsidiary of Kidde, Inc.
KIDDE

INTEGRALITE DIVISION

P.O. Box 45919
Houston, Texas 77245

INTEGRALITE
Designer Series



Circle **No. 395** on Reader Service Card

Booth 1021
Home Lighting and Accessories Magazine/Ebel-Doctorow Publications
1115 Clifton Ave.
Clifton, NJ 07013
(201) 779-1600

Since 1923, the authoritative monthly magazine of the residential lighting business, for retailers, electrical distributors, manufacturers and all lighting professionals.

Booth 849
Hunt Electronics
P.O. Box 670
Addison, TX 75001
(214) 248-1808

Architecturally styled incandescent and fluorescent dimming controls/systems for 120V–277V or low voltage lighting.

Booth 731
Hydrel
12881 Bradley Ave.
Sylmar, CA 91342
(818) 362-9465

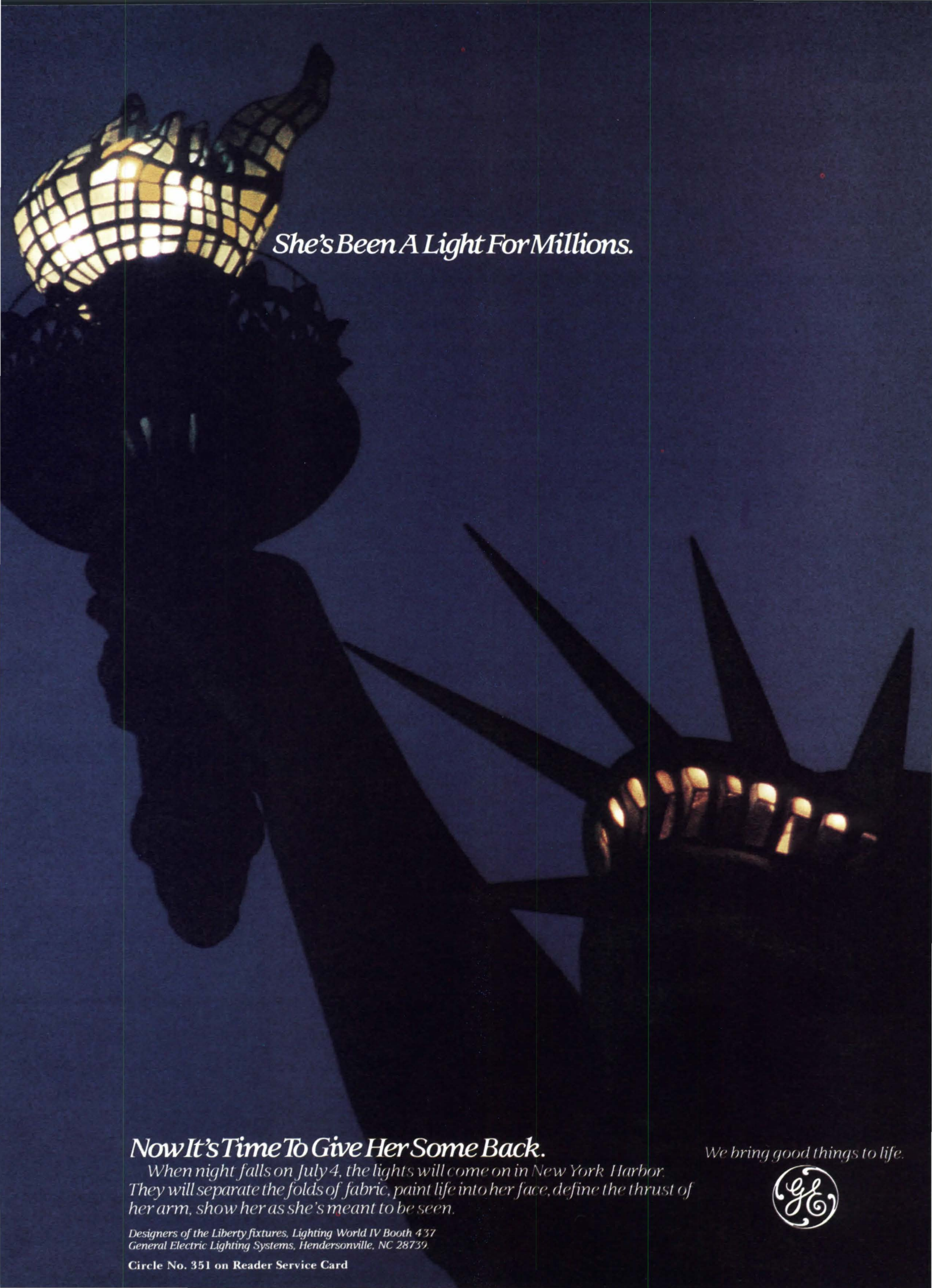
Fountains; fountain lighting; pool & spa lighting; underwater lighting; architectural and landscape lighting.

Booth 735
Hytron Electric Products/ Div. Trojan Inc.
114 Poplar St.
Meadville, PA 16335
(814) 336-4460

Extended service lighting products. Incandescent; fluorescent; SB mercury quartz; Saf-T-Cote lighting products.

Booth 1035
***INLITE* Corp.**
939 Grayson St.
Berkeley, CA 94710
(415) 849-1067

Streamlined duo circuit track lighting; display lighting; low voltage lighting; modern applications of directional lighting.



Now It's Time To Give Her Some Back.

When night falls on July 4, the lights will come on in New York Harbor. They will separate the folds of fabric, paint life into her face, define the thrust of her arm, show her as she's meant to be seen.

Designers of the Liberty fixtures, Lighting World IV Booth 437
General Electric Lighting Systems, Hendersonville, NC 28739.

We bring good things to life.

GE

Circle No. 351 on Reader Service Card

Booth 142
IPI/Innovative Products for Interiors, Inc.
315 E. 62nd St.
New York, NY 10021
(212) 838-2900

Comprehensive collection of Italian products including wall sconces, pendant fixtures, floor lamps, table lamps, and recessed fixtures.

Booth 706
Illumination Concepts & Engineering
500 Callahan Rd.
North Kingstown, RI 02852
(401) 295-2533

Contemporary architectural lighting.

Booth 237
Illuminating Engineering Society of North America
345 E. 47th St.
New York, NY 10017
(212) 705-7926

"Lighting Design and Application," publications including technical, design, application, and recommended practices. Membership, seminars; education for lighting community.

Booth 750
Illuminating Engineering Society–Southern California Section
P.O. Box 800/G01/Room 390
Rosemead, CA 91770
(805) 257-0286

The exhibit illustrates activities of the Southern California Section Illuminating Engineering Society, the Roadway Lighting Forum Subcommittee, Southern California Section and the San Diego Section current events and membership requirements.

Booth 314
Imperial Bronzelite
2300 I.H. 35 South
San Marcos, TX 78666
(512) 392-8957

Architectural fountain systems; landscape, underwater and architectural lighting.

Booth 837
Institute of Business Designers
8687 Melrose Ave./Suite M-50
West Hollywood, CA 90069
(213) 657-7730

Promoting higher ethical and design standards; provide educational programming; seek legal recognition; increase public awareness; advance the practice of contract design.

Booth 216
Integralite
P.O. Box 45919
Houston, TX 77245
(713) 433-4511

Linear fluorescent fixtures—tubular and rectangular; aluminum and steel recessed and surface perimeter fixtures.

Booth 1036
Interior Design Magazine/ A Cahners Publication
475 Park Ave. South
New York, NY 10016
(212) 576-4141

Magazine literature.

Booth 822
Interiors Magazine
1515 Broadway
New York, NY 10016
(212) 764-7521

All contract design publication featuring a total directory of lighting suppliers. Available at the show. Monthly lighting editorial section.

Booth 540
International Association of Lighting Designers, Inc.
30 W. 22nd St.
New York, NY 10010
(212) 206-1281
Contact: Marion Greene, Administrator

IALD, a co-sponsor of Lighting World, is the professional association of the architectural lighting designer. Founded in 1969 in recognition of the importance of the role of light in architecture and interior design, IALD sponsors programs for both the established lighting designer and the student just entering the field. In addition to Lighting World, IALD administers a student intern program, an awards program, an educational program, and is involved in energy conservation standards and research.

Booth 637
International Conservation Systems, Inc.
4020 S. Industrial Blvd./Suite 100
Austin, TX 78744
(512) 444-5821

Sonilight/ultralight occupancy sensing technology automatically turns out the lights in unoccupied areas. Saves energy in numerous commercial/residential areas.

Booth 635
International Express Manufacturing
13747 Excelsior Dr.
Santa Fe Springs, CA 90670
(213) 921-1999

Table lamps; floor lamps; ceiling lamps; touch lamps; brass lamps; brass switch plates.

Booth 354
International Lighting Review
P.O. Box 721
5600 As Eindhoven,
Netherlands
+ 31 40 755252

The international lighting magazine.

Booth 230
Interstate Marketing System Inc.
P.O. Box 34278
San Francisco, CA 94134
(415) 822-5111

Space frames; triangle truss systems; fluorescent lighting; temporary accessories.

Booth 846
Ismos Spa
Via Torino 5
Borgo a Buggiano, Italy
572/32985

Lighting fixtures.

Booth 216
JPL Lighting
P.O. Box 45919
Houston, TX 77245
(713) 433-4511

Outdoor H.I.D. cutoff luminaires; floodlights; wall lights; canopy lights/poles.

Booth 722
J & R Import Corp. Inc.
2920 Kirby Dr.
Houston, TX 77098
(713) 521-9490
Telex: 750148 IBMS UD

Wide selection of custom designed lighting fixures. Three production lines manufactured in Taiwan with U.L. certification and U.S. warehouse. Warranty and after sale service.

Booth 916
Jefferson Electric
% MGI
312 E. Buffalo
Milwaukee, WI 53202
(414) 347-4150

A complete line of reliable and energy efficient ballasts and transformers.

Booth 160
Jensen Electric Co.
140 Jensen St.
Reno, NV 89502
(702) 322-3100

Low voltage and decorative lighting. Low voltage, micro processor based lighting controllers.

Lighting the Open Office

The traditional downlight isn't the answer. It was never meant for an office full of VDTs.

Most of today's lighting simply wasn't designed for today's office.

Now partitioned furniture systems block off the light, energy codes demand lower light levels and VDT screens cause eyestrain.

Even the most sophisticated low-brightness downlights dictate the exact placement of computer terminals. If you rearrange the work stations, bright spots of glare appear on the screens.

These problems don't exist in the office shown below. The difference comes from a highly-engineered indirect lighting system that's based on a better understanding of what office lighting should do.

Keeping glare off the VDTs

There's been much talk about "ergonomic lighting" lately, especially for VDT installations.

Downlighting isn't the answer, even though over 90% of America's offices use it. Any down light puts a bright light source in an unlit ceiling. The resulting strong contrast produces glare on any reflective surface: the cover of a magazine, a polished desk top or, unfortunately, a VDT screen.

To correct the problem, you need an indirect system designed with exceptionally wide distribution. This produces an evenly-lit ceiling which reflects as a soft, barely-noticeable veil. Since the VDTs don't reflect hot spots from the fixtures, workers are more comfortable. And since the screens can face in any direction, the floor plan becomes flexible.

There's a research study from a major university that discusses this in depth. Ask us and we'll send you the results.

Getting good light on the work surfaces

Footcandle levels tell us how much light there is on the work surfaces, but they don't tell us how much light we think there is. And if we don't think there's enough light, there isn't.

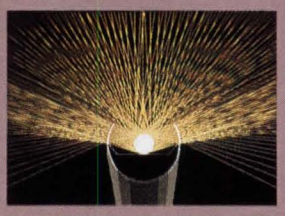
Another recent university study offered an important new insight: if you add a low-brightness visible source to an indirect fixture, you'll immediately perceive 10% to 25% more light.

We'll be happy to send you those results, too. They show how much the visible strip of low brightness lens on the fixture in this picture actually does. It spreads the light evenly over the ceiling and upper walls and, just because it's there, it creates a higher level of perceived illumination.

The fixtures in the photo are 6″ Round High Efficiency Softshine Indirect by Peerless. Under ceilings 8′6″ or higher, Softshine Indirect fixtures give more good light per watt than any other fixtures made. Research computers at Peerless generated this diagram to show how the fixture's lensed optics distribute the light facet by facet into precisely the right viewing areas.

The office at 10 p.m., done right: evenly-lit ceilings and upper walls keep the surroundings cheerful, minimize eyestrain by preventing bright glare spots that overpower VDT readouts.

Project: Green Tree Acceptance, Inc., St. Paul
Architect: Culver Adams Associates, Minneapolis
Electrical Engineer: Pace Engineering, Inc., Wilmington MN
Electrical Contractor: Sterling Electric Construction Company, Minneapolis



The new answer: lensed indirect fixtures. They deliver even, glare-free illumination enhanced by the sparkle of a low-brightness lens.

No other fixture in the world has been so carefully designed for the exact purpose of lighting a workspace.

Peerless invented and patented it. Only Peerless makes it.

It's the lighting of the future. If you'd like to see what else the future holds, just call.

PEERLESS

BOX 2556, BERKELEY CA 94702-0556 (415) 845-2760

"PEERLESS" AND "SOFTSHINE" ARE TRADEMARKS OF PEERLESS LIGHTING CORPORATION

Circle **No. 385** on Reader Service Card

Booth 547
Joslyn Corp.

4000 E. 116th St.
Cleveland, OH 44105-4398
(216) 271-6600

Joslyn-Thompson fixture lowering devices including the Thompson Hanger®. These products enable safe, convenient servicing of lighting fixture whose installation height or other factors prohibits access for servicing.

Booth 1019
KEI, Inc.
84 Minnesota
Troy, MI 48084
(313) 583-1173 or
(313) 588-6820

Energy conserving lighting control systems.

Booth 320
KLP
Industrial Way
Wilmington, MA 01887
(617) 657-7600

Specification grade indoor, outdoor, medical, and industrial lighting featuring KLP's parabolic family and silhouette series.

Booth 419
K-S-H, Inc.
10091 Manchester Rd.
St. Louis, MO 63122
(314) 966-3111

Precision extruded-embossed, and injection molded lenses for use with fluorescent, high intensity discharge and incandescent light sources.

Booth 1206
Kalmar Vienna
8687 Melrose Ave./#404
Los Angeles, CA 90069
(213) 659-6510

Chandeliers; wall brackets; lamps.

Booth 1206
Kenro Light Inc.
8687 Melrose Ave.
Los Angeles, CA 90069
(213) 659-6510

High end chandeliers; lamps; sconces; ceiling fixtures; picture lights; predominantly contemporary.

Booth 559
Keystone Lighting
Rt. 13 & Beaver St./P.O. Box 700
Bristol, PA 19007
(215) 788-0811

Commercial and industrial fluorescent lighting fixtures (recessed and surface mounted), including a line of decorative, solid wood trimmed fluorescent luminaires.

Booth 347
Kim Lighting
16555 E. Gale Ave.
City of Industry, CA 91749
(818) 968-5666

Exterior luminaires, including the outdoor tube system, precast concrete bollards, low level floodlights and landscape lighting, introducing a new fixture.

Booth 1030
Kingston Industries Corp.
Kingston Way
White Lake, NY 12786
(914) 583-5000

King-Lux optical aluminum reflector sheet and coil; parabolic louvers, double wedge, symmetric and assymmetric distribution. Reflectors for all light sources.

Booth 904
Kliegl Bros.
32–32 48th Ave.
Long Island City, NY 11101
(718) 786-7474

Custom and standard lighting fixtures and computerized control systems for architectural applications such as hotels, office buildings, restaurants, private residences and outdoor areas.

Booth 526
Koch + Lowy Inc.
21–24 39th Ave.
Long Island City, NY 11101
(718) 786-3520

Contemporary lamps and lighting fixtures.

Booth 824
George Kovacs Lighting, Inc.
24 W. 40th St.
New York, NY 10018
(212) 944-9606

Contemporary lighting fixtures consisting of wall sconces, ceiling fixtures, halogen torchieres, table and floor lamps, and other home accessories.

Booth 725
Kulka Wiring Devices, Inc.
520 S. Fulton Ave.
Mount Vernon, NY 10551
(914) 664-4024

Electric wiring devices, including lampholders for fluorescent, H.I.D. and PL style lamps.

Booth 101
LAM Lighting Systems, Inc./
Sub. Jac Jacobsen Inds., Inc.
94 New Salem St.
Wakefield, MA 01880
(617) 245-5115

Quality indirect fluorescent and H.I.D. systems; glare-free lighting to meet today's critical requirements from VDT stations to tennis courts.

Booth 821
LIMN Co.
821 Sansome St.
San Francisco, CA 94133
(415) 397-7471

Japanese lighting designs for architectural and decorative uses. Produced by Yamagiwa.

Booth 604
LSI/Lighting Systems Inc.
P.O. Box 42728
Cincinnati, OH 45242
(513) 793-3200

H.I.D. outdoor lighting fixtures; bollard style site lighting; steel and aluminum lighting standards.

Booth 146
Lampi Corp.
7272 Governors Dr. West
Huntsville, AL 35806
(205) 837-3110

Fluorescent lighting for home use.

Booth 521
Lazin Lighting Inc.
53 Greene St.
New York, NY 10013
(212) 219-3888

Contemporary American made lighting fixtures for contract and residential use.

Booth 141
Ledu Corp.
25 Lindeman Dr./P.O. Box 358
Trumbull, CT 06611
(203) 371-5500

Functional task lighting.

Booth 425
Leecraft Manufacturing Co.
21-02 44th Rd.
Long Island City, NY 11101
(718) 392-8800

Lampholders (halogen, fluorescent and incandescent); reflector lights; par lights; indicators (LED, neon and incandescent).

Booth 509
Leviton Manufacturing
59-25 Little Neck Pkwy.
Little Neck, NY 11362
(718) 229-4040

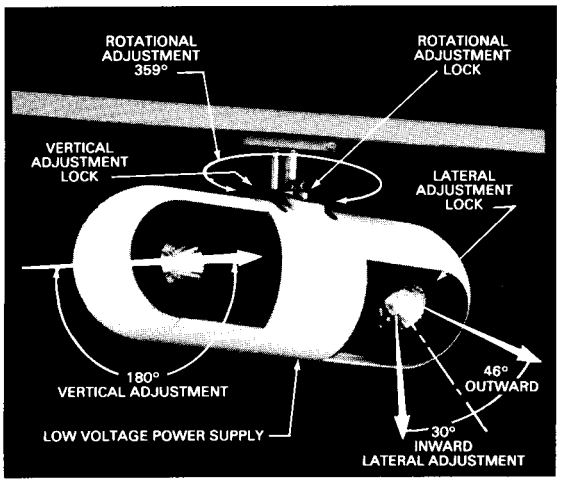
Network of electrical control components; lighting control systems via power line carriers.

Booth 818
Leviton Manufacturing Co.
8350 Rex Rd.
Pico Rivera, CA 90660
(213) 949-6575

Designer line of wiring devices, dimmers, and lighting controls.

Booth 246
Light Sources Inc.
P.O. Box 569/410 Main St.
Ansonia, CT 06401
(203) 932-9468

LiteTrac® by PRESCOLITE



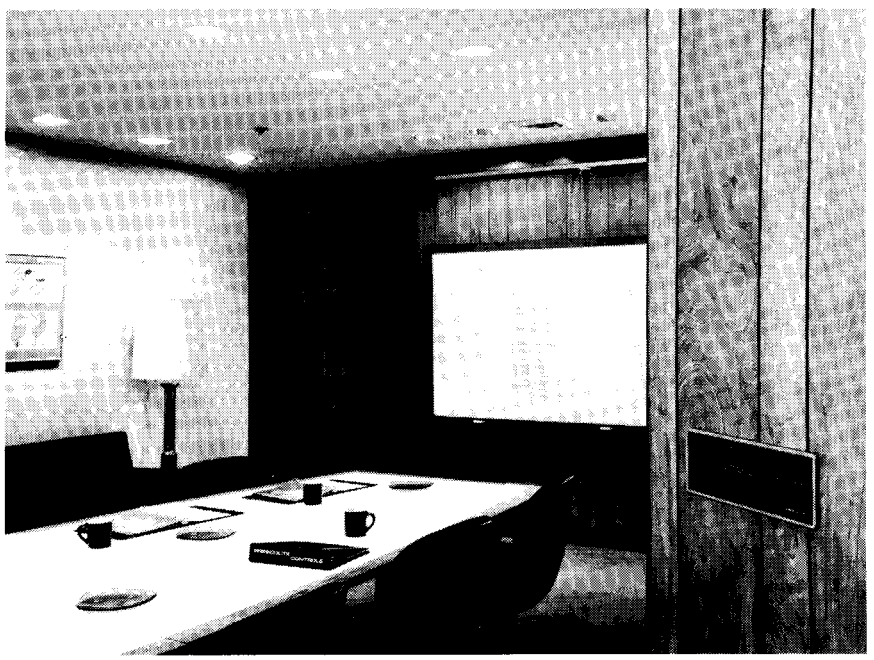
TWIN BEAM LOW VOLTAGE *LITE CAPSUL™

Three *Twin Beam Lite Capsuls™* neatly spaced and aligned on the ceiling, to the right, illuminate every object in the room.

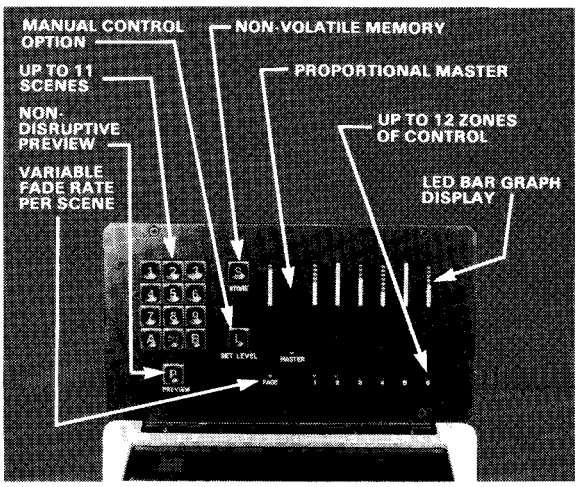
Prescolite's Lite Capsul™ series of low voltage, quartz and compact fluorescent fixtures highlight an entirely new line of innovative track lighting products. The Twin Beam model affords the designer an unprecedented opportunity to reduce by one half the number of fixtures required resulting in a remarkably uncluttered ceiling appearance.

Circle **No. 401** *Patent Pending

Lite Trac® is a precision engineered system of track lighting products with high quality features such as aiming locks, glare-reducing baffles, rugged diecast adaptors, and innovative designs including dimmable solid state transformers and an extensive package of unique optical accessories. For free 48-page Lite Trac® brochure, call Prescolite **800-824-2709.**



SERIES 7™ by PRESCOLITE CONTROLS



NEW *SERIES 7™ DIMMING CONTROLS OFFER YOU MORE. . .
. . . MORE ZONES OF CONTROL . . . MORE PRE-RECORDED SCENES

The unique **SERIES 7™** design enables skilled professionals to create striking visual environments and yet retain the simplest possible day-to-day operation. Up to 12 zones of control and 11 pre-recorded scenes are available in a highly reliable 'off-the-shelf' product both visually attractive and extremely compact.

Circle **No. 402** *Patent Pending

Prescolite Controls produces one of America's most complete lines of quality dimming equipment suitable for any application within demanding residential and commercial installations. For additional product information or applications assistance, call Prescolite Controls **800-DIMMERS** or write 1206 Tappan Circle, Carrollton, Texas 75006.

Booth 421
Lightalarms Electronics Corp.
1170 Atlantic Ave.
Baldwin, NY 11510
(516) 379-1000

Battery operated emergency lighting units and fixtures; fluorescent inverter ballasts; exit signs and A-C stand-by systems.

Booth 710
Lighting By Kenneth Inc.
3816 N.E. 1st Ave.
Miami, FL 33137
(305) 573-5040

Contemporary hanging fixtures. Floor and table lamps in brass, chrome and colors—many styles are halogen. Custom sizes and colors our speciality.

Booth 738
Lighting Dimensions Magazine
135 Fifth Ave.
New York, NY 10010
(212) 677-5997

The magazine for lighting professionals.

Booth 841
Lighting Methods, Inc.
P.O. Box 1411
Rochester, NY 14605
(716) 546-8710

Lighting control equipment for theatres, architecture, film and video studios including analog or digital control from manual or computer consoles.

Booth 1048
Lighting Research Institute
1170 Broadway, Room 1114
New York, NY 10001
(212) 685-8680

Results of LRI Research Program including reports, pictures of on-going research and future requests for research.

Booth 1202
Lighting Sciences Inc.
7830 E. Evans Rd.
Scottsdale, AZ 85260
(602) 991-9260

Lighting design software; testing equipment and services.

Booth 730
Lighting Services Inc.
150 E. 58th St.
New York, NY 10155
(212) 838-8633

Specification grade, UL listed, track, accent and display lighting systems in both standard and low voltage configurations. Accessories include integral dimmers, glass color filters, spread lenses, louvers, hoods and light blocking screens. Made in U.S.A. (IBEW).

Booth 825
The Lighting Source
1651 B 18th St.
Santa Monica, CA 90404
(213) 829-3321

Ambient cove lights; custom metal fixtures; direct & indirect luminaires; recessed trims; miniature low-voltage spot lights; track lighting systems.

Booth 829
Lighting Technologies
3060 Walnut/Suite 209
Boulder, CO 80301-2530
(303) 449-5791

Lumen Series microcomputer software for designers, specifiers, reps and manufacturers. Calculations and graphics. Lumen-Micro, Lumen$, and Lumen-Point will be shown.

Booth 1007
Lightning Bug Ltd.
1721 W. 170th St.
Hazel Crest, IL 60429
(312) 335-1063

Architectural fixtures and lamps featuring designs in incandescent, fluorescent, PL, halogen. Architectural louvers; ceiling products; maximum and minimum security fixtures.

Booth 211
Lightolier, Inc./A Genlyte Co.
346 Claremont Ave.
Jersey City, NJ 07305
(201) 333-5120

Track, recessed and surface lighting for commercial and residential applications.

Booth 215
Lightolier Controls
1 Lighting Place
Secaucus, NJ 07094
(201) 333-5120

Electronic dimming controls.

Booth 1056
Lightway Industries
25345 Ave. Stanford/#213
Valencia, CA 91355
(805) 257-0286

Energy efficient, low wattage decorative fluorescent fixtures and retro-fits.

Booth 541
L'Image Industries Inc.
Town Industrial Park/
R.D. #2/Box 15
St. Albans, VT 05478
(514) 353-8760

Innovative, contemporary, decorative lighting. A complete track lighting program and linear lighting.

Booth 338
Linear Lighting/Contemporary Ceilings
31-30 Hunters Point Ave.
Long Island City, NY 11101
(718) 361-7552

Extruded aluminum linear type fixtures.

Booth 522
Lite Source, Inc.
2660 Pacific Park Dr.
Whittier, CA 90601
(213) 692-0248

Drafting, desk, clip-on, pin-up and solid brass lamps.

Booth 1043
Lite-Tronics International
5317 W. 123rd Pl.
Alsip, IL 60658
(312) 371-4950

SUPER SERVICE line of 20,000 hour commercial/industrial incandescent lamps. LUX PAQ™-20—compact fluorescent lamp replaces incandescent lamps at reduced energy/labor costs.

Booth 530
Litecontrol
P.O. Box 100
Hanson, MA 02341
(617) 293-5421

Mod 66 II; Tube 6, 8 & 9; Wall Slot II; Videolux; sconces; Cove 45, Quadrus; Opalesse—linear architectural sources.

Booth 313
Litelab Corp.
5800 S. Eastern Ave./Suite 255
Commerce, CA 90040
(213) 936-6206 or
(213) 720-1200

Low and line voltage track and surface-mount fixtures; linear lighting fixtures and control systems for architectural and specialty lighting applications.

Booth 242
LiteTouch
2975 S. 300 West
Salt Lake City, UT 84115
(801) 487-6111

Switching and dimming system designed for custom residential and commercial applications.

Booth 124
Lithonia Lighting
P.O. Box A/1335 Industrial Blvd.
Conyers, GA 30207
(404) 922-9000

Parabolics; downlighting; track; recessed linear systems; emergency lighting; wiring systems; lighting controls.

Booth 607
Lucifer Lighting Co.
P.O. Box 370375
Miami, FL 33137
(305) 531-7978

A low voltage incandescent and halogen linear light and tube system with high lumination.

KOCH+LOWY
Headquarters: L.I.C., NY 11101 Telex 620056
Showrooms: NY/LA/Dallas/Chicago/SF/High Point

WINNER
INTERIEUR
9TH INTERNATIONAL BIENNIAL OF INTERIOR DESIGN CREATIVITY

WINGS

Diffusore rivestito di vetro sopra una lampada fluorescente PL13 watt. Rifinito in NEXTEL® camoscio e colori smalto. Stili da tavolo, applique o sospensione.
PL13ワット蛍光ランプのガラス包囲拡散器。ネックステル・スエードまたはエナメル色仕上げ。卓上、壁掛、またはペンダント・タイプ。
Cased glass diffuser over PL13 watt fluorescent lamp. Finished in NEXTEL® suede or enamel colors. Table, wall or pendant versions.

Manufactured in USA. Design: KOCH+LOWY/Piotr Sierakowski

Circle No. 367 on Reader Service Card

Booth 935
Lumatech Corp.
148 Grand Ave.
Oakland, CA 94612
(415) 444-8802

Low wattage decorative fluorescent lighting fixtures.

Booth 531
Lumec Inc.
C.P. 633
Boisbriand (Quebec), Canada
J7E 4K3
(514) 430-7040

Beyond an extensive, standard luminaire selection, Lumec responds to unique applications with a dynamic designer team, developing innovative units from architects' and engineers' original concepts.

Booth 151
Lumen Center
% Diva Inc.
538 N. La Cienega Blvd.
Los Angeles, CA 90048
(213) 854-0650
Telex: 441597 LUCE

Booth 648
Lumieres de France
BP 149/rue de Carpentras
84300 Cavaillon, France
90 716933/Telex: 431917

Booth 839
Lumiram Electric Corp.
110 Greene St./Suite 301
New York, NY 10012
(212) 925-4770

Full spectrum light sources; low voltage fixtures.

Booth 941
Lumitrol Corp.
110 Bi-County Blvd.
Farmingdale, NY 11735
(516) 752-1411

Entertainment lighting; electronic sound-to-light control systems; low voltage lighting; tube lights; special effect lighting.

Booth 404
Lutron Electronics Co., Inc.
Box 205, Suter Rd.
Coopersburg, PA 18036
(215) 282-3800

Light dimming and control systems for all light sources used in architectural and energy management applications.

Booth 202
Luxo Lamp Corp.
Monument Park/P.O. Box 951
Port Chester, NY 10573
(914) 937-4433

Task lighting products; decorative portable lamps, sconces, ceiling and wall brackets; illuminated magnifiers; electric copyholders.

Booth 259
MWC Lighting
10870 Kalama River Rd.
Fountain Valley, CA 92708
(714) 962-2286

Outdoor lighting products featuring bollards, small floodlights, wall mounts and decorative pole mounted luminaires.

Booth 1001
Marco/Marvin Electric Manufacturing Co.
6100 Wilmington Ave.
Los Angeles, CA 90001
(213) 583-6551

Recessed downlights, decorative architectural, track, exits, vandalproof and surface mount fixtures in incandescent, H.I.D., low voltage, fluorescent sources.

Booth 1024
Mark Lighting Fixture Co., Inc.
25 Knickerbocker Rd.
Moonachie, NJ 07074
(201) 939-0880

Indirect fluorescent lighting that creates a warm, comfortable work environment and eliminates glare on computer screens.

Booth 553
Master Dim
2220 Shorecrest Dr.
Dallas, TX 75235
(214) 358-4527

Booth 720
Max International
2235 Ralston Ave.
Hillsborough, CA 94010
(415) 340-1270

7-wire chase rope lights; non-neon lights; clip-on, repositionable-bulb, string lights; touch-dimmer brass lamps.

Booth 1017
Maxim Lighting
401 E. 54th St.
Los Angeles, CA 90011
(213) 233-3251

Residential lighting fixtures.

Booth 508
mcPhilben/Omega Lighting/ Div. Emerson Electric Co.
270 Long Island Expressway
Melville, NY 11747
(516) 293-8500

Exit signs; bollards; area lighting; tracklighting; incandescent and H.I.D. downlights; tubular systems; low voltage lighting.

Booth 925
Mecho Shade Corp.
42-03 35th St.
Long Island City, NY 11101
(718) 729-2020

Manual, motorized and computerized solar shading systems.

Booth 815
Mercury Lighting Products Co., Inc.
25 Brighton Ave./P.O. Box 719
Passaic, NJ 07055
(201) 779-5400

Commercial, industrial, residential, institutional and outdoor fluorescent lighting fixtures.

Booth 847
Metalloxyd, Inc.
207 Greenwich Ave.
Stamford, CT 06902
(203) 324-7115 or
(800) 325-7115

Anodized aluminum for reflectors and louvres; products made from metalloxyd anodized aluminum; anodized aluminum for decorative uses.

Booth 912
Metalux/Lumark Lighting
P.O. Box 619270
D/FW Airport, TX 75261
(214) 258-8253

Commercial/industrial light fixtures.

Booth 742
Mid-West Chandelier Co.
100 Funston Rd.
Kansas City, KS 66115
(913) 281-1100

Fluorescent lighting featuring parabolic fixtures, staggered length fixtures, air handling fixtures, wall washers and undercabinet lights.

Booth 608
Minolta Corp.
101 Williams Dr.
Ramsey, NJ 07446
(201) 825-4000

Luminance and illuminance meters; color meters.

Booth 415
Miroflector Co. Inc.
40 Bayview Ave.
Inwood, NY 11696
(516) 371-1111

Specification grade architectural/commercial incandescent and H.I.D. lighting fixtures, featuring fixtures that utilize the Osram® 70w HQI® metal halide lamps.

Booth 901
Mitsubishi Electric Sales America
5757 Plaza Dr.
Cypress, CA 90630-0007
(714) 220-2500

Mitsubishi marathon lighting products.

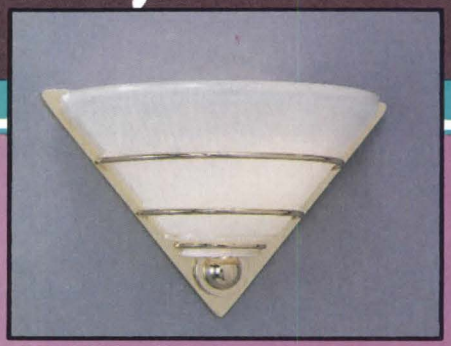
Booth 1012
Modulightor Inc.
54 W. 57th St.
New York, NY 10019
(212) 765-1480

Custom, contemporary architectural lighting systems.

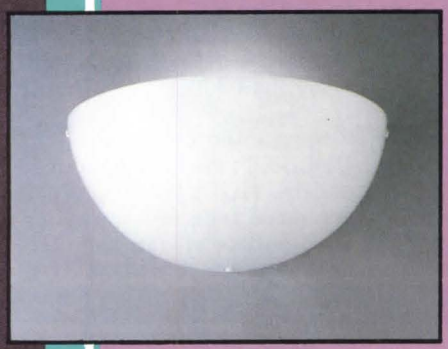
VISIT US AT LIGHTING WORLD IV
LOS ANGELES, MAY 11, 12, 13
BOOTH NO. 325

the brightest and newest in brass and glass

CB 1400: 12" dia. glass bowl with polished solid brass arm and mounting plate.



CB 1300: 12" dia. prismatic glass cone with polished solid brass retaining rods.



CB 1100: 14" dia. opal glass quarter sphere.

CB 1210: 14" dia. opal glass quarter sphere with polished brass retaining ring.

CB 1150: 14" dia. opal glass quarter sphere with lip.

CB 1475: 12" dia. prismatic glass cone with polished solid brass arm and mounting plate.

CB 1550: 12" dia. polished solid brass stepped reflector with polished solid brass tubular arms.

Various lamping available including twin tube fluorescent, quartz halogen, and incandescent.
Painted finishes available.

Visa Lighting

8600 WEST BRADLEY ROAD, MILWAUKEE, WIS. 53224 (414) 354-6600

Circle No. 412 on Reader Service Card

Booth 754
P D West Lighting
6909 E. Washington Blvd.
Los Angeles, CA 90040
(213) 728-6878

Decorative lighting, including Art Deco, Art Nouveau, contemporary, beveled brass and glass, outdoor, and decorative fluorescent fixures.

Booth 450
PSI West
255 S. Seventh Ave.
City of Industry, CA 91746
(818) 968-9669

Lenses and diffusers for lighting industry; prismatic sheet; extruded profiles; formed panels; pressure molded lenses.

Booth 931
Panasonic Industrial Co./ Special Products Div.
One Panasonic Way
Secaucus, NJ 07094
(201) 348-5304

Light Capsules™ (screw-in fluorescents); Compact™ U lamps; Color Corrected™; fluorescent straights; Current-C-Savers™ (energy saving F40's); circular fluorescents; mercury and halogen lamps.

Booth 851
Panel Optics
36 W. 56 St.
New York, NY 10019
(212) 265-0391

Electrical, illuminated writing boards of special clear acrylic aluminum framed. Art work or writings on board glow like neon and can be easily erased.

Booth 1006
Paraflex Industries
P.O. Box 920
Beacon, NY 12508
(914) 831-9000

Plastic and aluminum parabolic louvers; emergency battery packs; H.I.D. aluminum wall pack; plastic lighting enclosures; vandalproof plastic diffusers.

Booth 1007
Paul D Metal Products
1721 W. 170th St.
Hazel Crest, IL 60429
(312) 335-1063

Architectural fixtures and lamps featuring designs in incandescent, fluorescent, PL and halogen. Architectural louvers, ceiling products, maximum and minimum security fixtures.

Booth 550
Peerless Lighting Corp.
P.O. Box 2556
Berkeley, CA 94702-2556
(415) 845-2760

Linear fluorescent lighting systems.

Booth 753
Permapost
P.O. Box 100
Hillsboro, OR 97123
(800) 828-0222

LAMPOLE™—laminated and pressure treated wood lighting poles. Architectural shapes and designs for residential, highway and custom applications.

Booth 534
Permex/NRD Div.
2937 Alt Blvd. North
Grand Island, NY 14072
(716) 773-7634
168 Vista Ave.
Pasadena, CA 91107
(818) 795-9238

Self-illuminated emergency exit sign.

Booth 1013
Phoebus Manufacturing
2800 Third St.
San Francisco, CA 94107
(415) 550-1177

The ULTRA Family of followspots, including ULTRA ARC SERIES II, ULTRA ARC, ULTRA QUARTZ, and MIGHTY ARC.

Booth 921
Polarized International Inc.
Box A
Tarzana, CA 91356
(818) 881-5525

Polarized and Radialens panels. A line of light polarizing panels to remove glare, improve vision and conserve electric operating costs.

Booth 235
Pole-Lite Industries, Inc.
RD1, P.O. Box 143
Champlain, NY 12919
(518) 298-8211

Aluminum, steel lighting and traffic standards for highway, street and architectural lighting applications.

Booth 360
Poulsen Lighting, Inc.
18350 N.W. 2nd Ave.
Miami, FL 33169
(305) 652-3737

Danish contemporary lighting designs for interior and exterior architectural specification applications. Introducing a luminaire range with a real European flavour.

Booth 121
Power Controls Corp.
1067 Bandera Rd.
San Antonio, TX 78228
(512) 436-9511

Solid state electronic incandescent, fluorescent, and low-voltage dimmers; electronic fan controls; no-noise fan controls; touch switches.

Booth 465
Powerline Communications Inc.
123 Industrial Ave.
Williston, VT 05495
(802) 658-6445

PowerLine Carrier (PLC) lighting, HVAC controllers and control equipment for medium to large buildings. One-way and two-way Powerline Carrier equipment.

Booth 559
Prescolite
1251 Doolittle Dr.
San Leandro, CA 94577
(415) 562-3500

LITE TRAC® track lighting system and PL3 Energy Saving Products. Highlighting the LITE TRAC® display is LITE CAP-SUL™, an innovative fixture which houses two independently aimable MR-16 lamps as well as tubular quartz or PL sources. Unique LITE TRAC® optical devices will be displayed in an actual merchandising use.

Booth 559
Prescolite Controls
Box 173/1206 Tappan Circle
Carrollton, TX 75006
(214) 242-6581

Dimming components and systems for architectural lighting.

Booth 612
Prodel Inc.
370, av. des Laurentides
Beauport (Quebec) Canada
G1C 4N3
(418) 663-3112

Architectural outdoor lighting.

Booth 626
Progress Lighting
"G" St. & Erie Ave.
Philadelphia, PA 19134
(215) 289-1200

Commercial and residential lighting. Indoor and outdoor. Track systems, recessed, low voltage, H.I.D., "non-destructibles," decorative incandescents and fluorescents for all areas.

Booth 335
Progressive Architecture
600 Summer St./P.O. Box 1361
Stamford, CT 06904
(203) 348-7531

Monthly architectural publication edited to provide information for all architectural professionals on the latest developments in their field. The magazine is directed to those individuals who take part in design and product specification.

The New MR·11™ Series by Capri.

Capri proudly introduces a remarkable new achievement in lighting design . . . the MR-11. Crafted with the precision elegance of a fine Swiss watch, the MR-11 represents the ultimate in refinement and technological sophistication in a miniaturized fixture. Perfect for display and under-shelf uses where other fixtures find it hard to fit, the MR-11 is sleek and ultra-compact, with a dazzling array of accessories and finishes.

Its tiny low voltage halogen reflector lamp performs brilliantly, creating an intense light in 20 or 35 watts with excellent color rendition and superb beam control. And, the uncommonly reliable, energy-efficient MR-11 makes a highly economical and versatile solution for numerous applications, both residential and commercial.

The MR-11.
A new landmark in the Capri Lighting tradition of innovation.

CAPRI LIGHTING

6430 E. Slauson Ave., Los Angeles, California, 90040 • (213) 726-1800 • Telex: 69-8688 THOMAS INDUSTRIES INC.

Circle No. 331 Reader Service Card

Booth 116
Sentry Electric Corp.
185 Buffalo Ave.
Freeport, NY 11520
(516) 379-4660

Ornamental outdoor luminaires for park, street, plaza, and promenade. Complete luminaire + post packages. Lamps in metal halide, HPS, mercury.

Booth 934
Sentry-Lite
15 St. Marks Ave.
Rockville Centre, NY 11003
(516) 678-2272

Emergency lighting products; two-headed units; exit signs; AC power inverters.

Booth 525
Shakespeare
P.O. Box 733
Newberry, SC 29108
(800) 845-7750

Fiberglass light poles—smooth finishes, seven colors, anchor base and direct burial.

Booth 1037
Sherman Engineered Fiberglass Products
P.O. Box 815
Estill, SC 29918
(803) 625-3131

Fiberglass reinforced composite light poles—round tapered, square & nostalgia series.

Booth 715
Siltron Illumination
7915 Center Ave.
Cucamonga, CA 91730
(714) 980-4484

New emergency lights; emergency power packs for all fluorescent lamps; power supplies.

Booth 613
Sim-Kar Lighting Fixture Co.
601 E. Cayuga St.
Philadelphia, PA 18901
(215) 831-7700

Decorative—utility—commercial—industrial fluorescent; H.I.D. wallpaks—floodpaks—high bay (baypaks)—nitepaks; fluorescent—H.I.D. vandal-proof fixtures; wall brackets.

Booth 907
Spaulding Lighting, Inc.
1736 Dreman Ave.
Cincinnati, OH 45223
(513) 541-3486

Lighting fixtures and equipment for outdoor and indoor. Indirect lighting for office, C-store.

Booth 755
Spero Electric Corp.
18222 Lanken Ave.
Cleveland, OH 44119
(216) 486-0666

Indoor and outdoor lighting—floods, broadlites, H.I.D., poles, incandescent, reflectors, high bays and specialities, area lighting, Profile "4," and Balla Hi.

Booth 401
Staff Lighting Corp.
Route 9W North
Highland, NY 12528
(914) 691-6262

Architectural lighting products.

Booth 321
Starfire Lighting Inc.
317 St. Pauls Ave.
Jersey City, NJ 07306
(201) 656-7888

Low-voltage tube lighting; custom chandeliers; fiber optics.

Booth 1200
Sternberg Lanterns Inc.
5801 N. Tripp Ave.
Chicago, IL 60646
(312) 252-8200

Outdoor ornamental posts, bollards and H.I.D. luminaires in "Turn-Of-The-Century" and "Art Deco/Post-Modern" designs with wall units.

Booth 1029
Sterner Lighting Systems
351 Lewis Ave.
Winsted, MN 55395
(800) 328-7480

Lighting—interior, exterior, custom. Floodlighting displayed in a photographic gallery format. Emphasis is on showing lighting effects and application.

Booth 223
Stonco
2345 Vauxhall Rd.
Union, NJ 07083
(201) 964-7000

Outdoor lighting; fixtures and accessories for industrial, commercial and residential markets.

Booth 317
Strand Lighting
18111 S. Santa Fe Ave.
Rancho Dominguez, CA 90224
(213) 637-7500

Environ 2—architectural dimming and control systems.

Booth 925
Stretchwall +
42-03 35th St.
Long Island City, NY 11101
(718) 724-2020

Fabric wrapped acoustical wall and ceiling treatments.

Booth 412
Strong International
1712 Jackson St.
Omaha, NE 68102
(402) 342-4444

Professional level follow spotlights, accessories and xenon bulbs.

Booth 814
Sun Valley Lighting Standards
7900 Clybourn Ave.
Sun Valley, CA 91352
(818) 767-3031

An extensive collection of traditional, classic, ornamental and contemporary poles and lighting fixtures; with matching arms and wall sconces. The line features durable cast aluminum construction and lasting beauty.

Booth 622
Sunnex Inc.
87 Crescent Rd.
Needham, MA 02194
(617) 444-4730

Halogen work/task lights; halogen hospital/medical examining and patient bed/reading lights; residential work/task lights.

Booth 951
Sunray Lighting, Inc.
3012 S. Croddy Way
Santa Ana, CA 92704
(714) 556-3630

Miniatures; seal beams; foreign; specialized microscopes; hard-to-find lamps; lamps made-to-order.

Booth 231
Sure-Lites
400 Busse Rd.
Elk Grove Village, IL 60007
(312) 956-8400

Emergency lighting.

Booth 739
Sutton Publishing Co.
707 Westchester Ave.
White Plains, NY 10604
(914) 949-8500

Electrical trade magazine serving the total electrical construction market.

Booth 341
Swivelier Co. Inc.
33 Route 304
Nanuet, NY 10954
(914) 356-3047

Architecturally oriented track lighting systems and universally adjustable luminaires.

Booth 923
Sylvan Designs, Inc.
8921 Quartz Ave.
Northridge, CA 91324
(818) 998-6868

Low-voltage lighting: LIGHT BUDS ribbon lighting, LIGHT STREAMS tubular lighting; LIGHT BUD CHANNEL linear lighting, ALESCO architectural lighting; Redwood lighting.

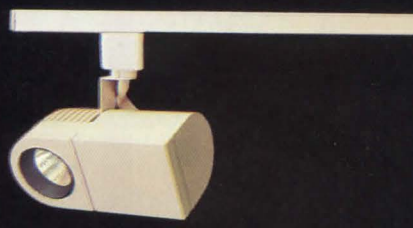
Color.

Alive with the magic of light. Halo makes the magic.

Shade. Tone. Intensity. Hue.
A spectrum of living colors by Halo.
We paint your visual canvas.
Because Halo makes the magic of Color.

New. The Architectural Lighting Collection, by Halo. Quality, performance-assured recessed and track lighting fixtures, for optimum color rendition. Magic. For any design idea.

Contact your local Halo representative, or write us, at:
Halo Lighting, 400 Busse Road,
Elk Grove Village, Illinois 60007.



These vibrant colors were precision-lit using Halo Architectural Lighting, with low voltage MR16 lamps, for clean, defined highlights.

Circle No. 353

HALO

COOPER INDUSTRIES

Booth 409
Sylvania Industrial/ Commercial Lighting
Sylvania Lighting Center
Danvers, MA 01923
(617) 777-1900

Incandescent, fluorescent, high pressure sodium, metal halide and tungsten halogen sources.

Booth 423
Sylvania Lighting Equipment/ GTE
21 Penn St.
Fall River, MA 02724
(617) 678-3911

Low wattage, high performance H.I.D. fixtures.

Booth 930
TIR Systems Ltd.
2227 Quebec St.
Vancouver, British Columbia
V5T 3A1
(604) 873-1683

LIGHT PIPE—Unique illumination utilizing 'Total Internal Reflection.' Remote light sources, unlimited applications.

Booth 721
Teron Lighting Corp.
2650 Bobmeyer Rd.
Hamilton, OH 45015
(513) 896-5030

Decorative, energy saving fluorescent and HPS fixtures.

Booth 740
Theatre Crafts Magazine
135 Fifth Ave.
New York, NY 10010
(212) 677-5997

For professionals in theatre, film, video, and the performing arts.

Booth 524
Thomas & Betts
920 Route 202
Raritan, NJ 08869
(201) 685-1600

LITE-SENSE™ lighting control system saves energy in buildings by automatically turning out lights when an office is vacated and on when someone enters.

Booth 255
Thomas Industries Inc.
245 N. Baldwin Park Blvd.
City of Industry, CA 91746
(818) 369-6621

Residential lighting.

Booth 819
Thorn EMI Lighting
1400 Meyerside Dr.
Mississauga, Ontario L5T 1H2
(416) 677-4248

Street, area, industrial and commercial lighting equipment plus specialty, unique light sources, including the new "2D" Thorn EMI Lamps.

Booth 147
Thunder & Light
230 Fifth Ave.
New York, NY 10001
(212) 696-0262

Lamps; ceiling systems.

Booth 440
Times Square Lighting
318 W 47th St.
New York, NY 10036
(212) 245-4155

Low voltage architectural and display luminaires; theatrical and special effects equipment.

Booth 446
Tishman Research Co./ INFRACON
666 Fifth Ave.
New York, NY 10103
(212) 399-3657

INFRACON, a passive infrared lighting control/occupancy sensor, reduces lighting energy consumption by turning lights on and off automatically.

Booth 806
Tivoli Industries, Inc.
1513 E. St. Gertrude Pl.
P.O. Box 11523
Santa Ana, CA 92711
(714) 957-6101

Complete line of light tubing, chandeliers, guidelights and starlite panels plus new lines: bulb channel, tivolines and micro-channel.

Booth 127
Trakliting Inc.
14625 E. Clark
City of Industry, CA 91746
(818) 330-3106

Trakliting; line and low voltage recessed down lights; line and low voltage H.I.D. and a lamp; wall sconces and lanterns.

Booth 918
Triad-Utrad
1124 E. Franklin St.
Huntington, IN 46750
(219) 356-6500

Solid-state fluorescent ballasts for 1, 2, 3, and four lamp applications. Light-level switch system.

Booth 926
Triluzco, Inc.
110 W. Lancaster Ave.
Wayne, PA 19087
(215) 688-2800

Self-luminous non-electric exit and safety signs.

Booth 756
Trim Trac Lighting Corp.
800 N.W. 159th Dr.
Miami, FL 33169
(305) 621-4416

Single and three circuit track lighting system. Low voltage and stereotrac, the patented light and sound track system.

Booth 554
TrimbleHouse Corp.
4658 Old Peachtree Rd.
Norcross, GA 30071
(404) 448-1972

Out door lighting fixtures, posts, and low light bollards.

Booth 816
UNENCO, Inc.
208-B Industrial Ct.
Wylie, TX 75098
(214) 442-5493

Occupancy sensors for lighting control, heating and air conditioning. Fluorescent power reducers with reduction from 20% to 70%, featuring the Super Low-Watt.

Booth 559
USI Lighting Inc.
1251 Doolittle Dr.
San Leandro, CA 94577
(415) 562-3500

Manufacturers of quality lighting products including Keystone—fluorescent products, Colombia—architectural fluorescent, Prescolite—architectural indoor and outdoor, Moldcast—high performance outdoor, and Prescolite Controls—dimming.

Booth 452
U.S. Powerbeam Inc.
32 Trepton St.
Little Ferry, NJ 07643
(201) 641-5888

Stock and custom design, low voltage MR16, MR11; tubular, square continuous run nonvisible fixtures; tracklighting; low volt retrofitters; high hats.

Booth 455
Union Metal Corp.
1022-9th St. S.W.
Canton, OH 44707
(216) 456-7653

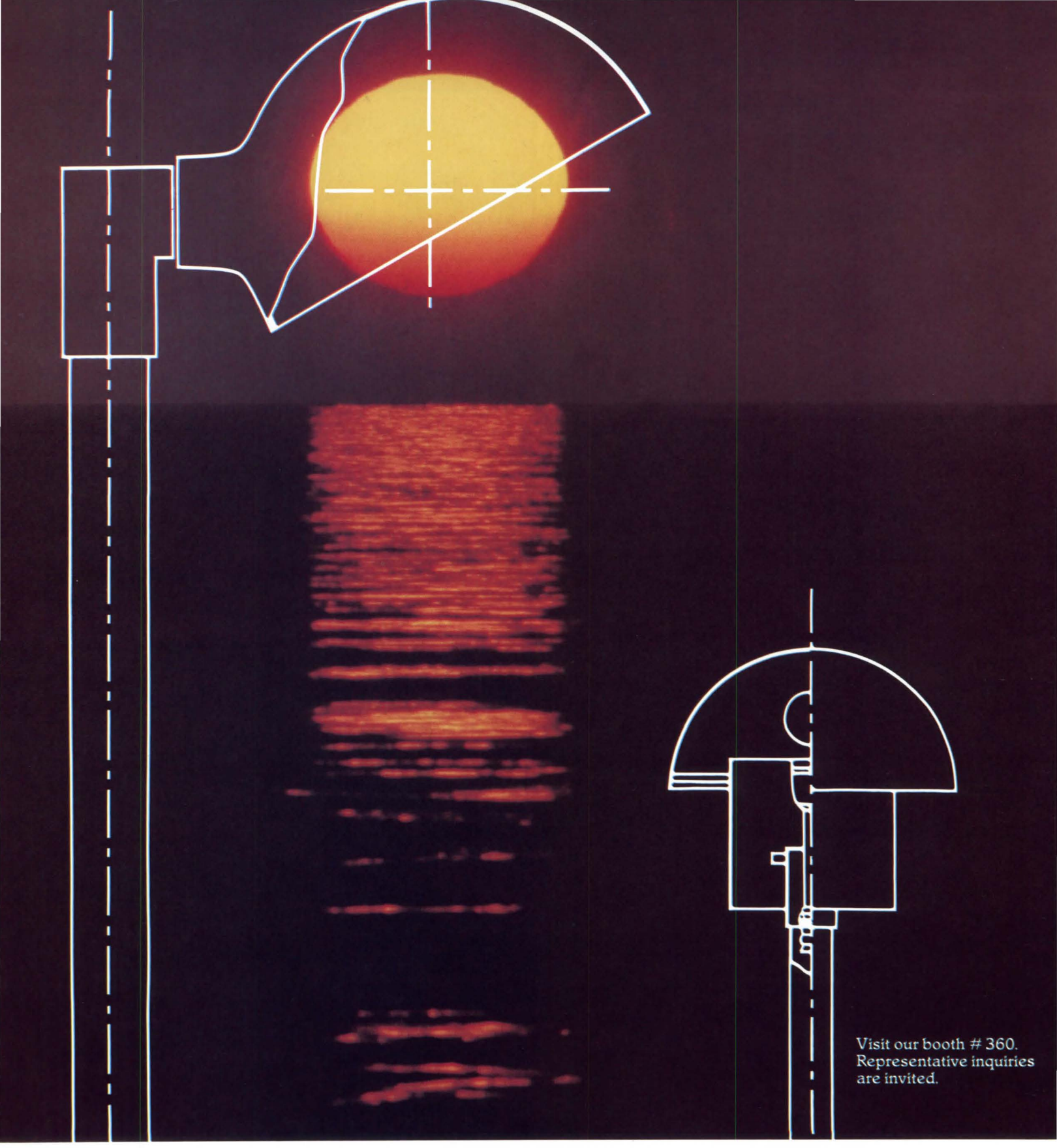
Steel ornamental nostalgia lighting poles and luminaires; aluminum, concrete and steel lighting poles; Abacus raising and lowering lighting poles.

Booth 222
Universal Manufacturing Corp.
200 Robin Road
Paramus, NJ 07652
(201) 967-7600

Fluorescent and high intensity discharge lamp ballasts; electronic ballasts.

Booth 734
Valley Iron & Steel Co. (VISCO)
29579 Awbrey Lane
Eugene, OR 97402
(503) 688-7741

Cast iron ornamental lighting fixtures and related streetscape equipment.



Poulsen lights up your life.

Louis Poulsen outdoor and indoor luminaires designed by celebrated Scandinavian architects offer the professional lighting designer timeless classic design, with precision quality components.
Louis Poulsen offers the discriminating designer an outstanding array of lighting products to enhance architecture from the interior to the site.

Poulsen Lighting Inc.

18350 N. W. 2nd Ave.
Suite 407
Miami, Florida 33169
Tel. 305-652-3737
Telex 80-8023

louis poulsen

Circle **No. 387** on Reader Service Card

Booth 426
Valmont Industries, Inc.
Hwy. 275
Valley, NE 68064
(402) 359-2201

Street furniture; area and street lighting standards; sports lighting and high mast.

Booth 240
Venture Lighting Int'l
625 Golden Oak Pkwy.
Cleveland, OH 44146
(800) 437-0111

Display lamps; tungsten halogen lamps; metal halide and high pressure sodium lamps for general lighting and special uses.

Booth 928
Kurt Versen Co.
10 Charles St.
Westwood, NJ 07675
(201) 664-8200

Incandescent, H.I.D., H.P.S., low voltage, emergency exits, and P.L. lamp recessed and surface mounted fixtures.

Booth 325
Visa Lighting
8600 W. Bradley Rd.
Milwaukee, WI 53224
(414) 354-6600

Energy-saving decorative wall sconces and pendants.

Booth 737
Vision Unlimited Equipment Inc.
287 Glidden Rd./Unit #14
Brampton, Ontario, Canada
I6W 1H9
(416) 453-5767

MorVue light reflector to improve performance of fluorescent lamps; reduce energy use without loss of light levels.

Booth 103
Vista Lighting
2200 S. Anne St.
Santa Ana, CA 92704
(714) 549-9765

Aluminum fluorescent wall brackets; ceiling linear fluorescent; patient room lighting.

Booth 108
Vista Manufacturing Inc.
52864 Lillian Ave.
Elkhart, IN 46514
(219) 264-0711

Low voltage accent and tubular lighting. Chandeliers; light curtains; aisle and step lighting.

Booth 1016
Visual Impact Corporation
470 Broadway
New York, NY 10013
(212) 219-9573

Electronic message, graphic displays for exhibitions, meetings.

Booth 757
Visual Merchandising & Store Design/Div. S.T. Publications
407 Gilbert Ave.
Cincinnati, OH 45202
(513) 421-2050

Monthly magazine of store design and display; related books.

Booth 724
Voltarc Tubes, Inc.
Box 688
Fairfield, CT 06430
(203) 255-2633

Compact fluorescent lamps, featuring the Thorn EMI 2D Lamps, and neon products.

Booth 264
The Watt Watcher
P.O. Box 2058/296 Brokow Rd.
Santa Clara, CA 95955
(408) 988-5331

Booth 617
W.J. Whatley Inc.
6980 E. 54th Pl.
Commerce City, CO 80022
(303) 287-8053

Round tapered, square tapered, square straight, and ornamental fiberglass poles.

Booth 649
H.E. Williams Inc.
831 W. Fairview/P.O. Box 837
Carthage, MO 64836
(417) 358-4034

Fluorescent lighting fixtures featuring "THE BLADE."

Booth 356
Wendelighting
9068 Culver Blvd.
Culver City, CA 90230
(213) 559-4310

Interior and landscape accent lighting products including our newest zoom optics contour projector complete with cassette package and photographic kit.

Booth 111
Westerfield Co.
4775-B Home Ave.
San Diego, CA 92105
(619) 263-6672

Energy efficient systems.

Booth 265
Western Lighting Industries
11580 Hesby St.
North Hollywood, CA 91601
(818) 769-3687

OMEGALUX 1200 Series of specification grade floodlights utilizing high-intensity fluorescent PL/DULUX Lamps. Sizes include 7, 9, 13 & 26 watt. All "Wet Location Approved" by L.A. Electrical Testing Laboratory.

Booth 247
Western Lighting Standards
18060 Euclid
Fountain Valley, CA 92708
(714) 549-0650

Lighting fixtures; standards; signs; architectural amenities.

Booth 1108
Westinghouse Electric Corp.
Westinghouse Bldg./Gateway Center
Pittsburgh, PA 15222
(412) 642-2415

Booth 1040
Wiko Ltd./Lany Fax of America, Inc.
10490 W. 164th Pl.
Orland Park, IL 60462
(312) 349-1570

Wiko av/photo, stage & studio, display, micrographic, flash tubes, and general lighting lamps. Both incandescent and quartz halogen.

Booth 751
Woodform, Inc.
9705 N.E. Colfax St.
Portland, OR 97220
(503) 253-9626

Contemporary outdoor wooden lighting fixtures.

Booth 216
Wright Light
P.O. Box 45919
Houston, TX 77245
(713) 433-4511

Fluorescent parabolic and lensed troffers; strips, wraparounds, industrials, and wet location fixtures; clean room lighting.

Booth 611
XO Industries
110 Pioneer Way
Mountain View, CA 94041
(415) 962-0420

Booth 451
Yorkville Industries
550 New Horizons Blvd.
Amityville, NY 11701
(516) 225-2100

Energy saving lightbulbs and retrofits; special effects lighting.

Booth 938
Zero Interiors Inc.
501 Pacific Ave.
San Francisco, CA 94133
(415) 956-6160 or
(415) 986-5994

Desk top, wall mounted and ceiling mounted lighting.

Booth 241
Zumtobel Lighting, Inc.
311 Route 46 West
Fairfield, NJ 07006
(201) 882-9600

Fluorescent ceiling fixtures; styled floor stand and wall-mounted direct/indirect H.I.D. and fluorescent fixtures; desk and partition mounted task lighting.

DAYFORM

Cruciform. Low level, wall bracket, bollard. Appearance integrated lighting. Part of the Companion Landscape System. Nine beautiful ways to illuminate structure and grounds.

Quality. All aluminum construction. UL listed, CSA approved. High performance optics.

We want you to know more. For a comprehensive brochure, call our toll free number **1-800-826-5496** in the U.S. **1-800-361-1441** in Canada.

DEVINE
Subsidiary of Kidde, Inc
KIDDE
KANSAS CITY ■ MONTREAL

Circle No. 333

237 Illuminating Engineering Society of North America
706 Illumination Concepts & Engineering
314 Imperial Bronzelite
837 Institute of Business Designers
216 Integralite
1036 Interior Design Magazine/ A Cahners Publication
822 Interiors Magazine
540 International Association of Lighting Designers, Inc.
637 International Conservation Systems, Inc.
635 International Express Manufacturing
354 International Lighting Review
230 Interstate Marketing System Inc.
846 Ismos Spa
722 J&R Import Co.
216 JPL Lighting
916 Jefferson Electric
160 Jensen Electric
547 Joslyn Corp./Hi-Voltage Equipment Div.
1019 KEI Inc.
320 KLP
419 K-S-H Inc.
1206 Kalmar Vienna
1206 Kenro Light Inc.
559 Keystone Lighting
347 Kim Lighting
1030 Kingston Industries Corp.
904 Kliegl Bros.
526 Koch + Lowy Inc.
824 George Kovacs Lighting
725 Kulka Wiring Devices, Inc.
101 LAM Lighting Systems, Inc./Sub. Jac Jacobsen Ind., Inc.
821 LIMN Co.
604 LSI/Lighting Systems Inc.
146 Lampi Corp.
521 Lazin Lighting Inc.
141 Ledu Corp.
425 Leecraft Manufacturing
509 Leviton Manufacturing
818 Leviton Manufacturing
246 Light Sources Inc.
242 Lite Touch
421 Lightalarms Electronics
710 Lighting By Kenneth
738 Lighting Dimensions Magazine
841 Lighting Methods Inc.
1048 Lighting Research Institute
1202 Lighting Sciences Inc.
730 Lighting Services Inc.
825 The Lighting Source
829 Lighting Technologies
1007 Lightning Bug Ltd.
211 Lightolier, Inc./A Genlyte Co.
215 Lightolier Controls
1056 Lightway Industries
541 L'Image Industries Inc.
338 Linear Lighting/ Contemporary Ceilings
522 Lite Source, Inc.
1043 Lite-Tronics International
530 Litecontrol
313 Litelab Corp.
124 Lithonia Lighting
607 Lucifer Lighting Co.
935 Lumatech Corp.
531 Lumec Inc.
151 Lumen Center
648 Lumieres de France
224 Luminoptics
839 Lumiram Electric Corp.
941 Lumitrol Corp.
404 Lutron Electronics Co.
202 Luxo Lamp Corp.
259 MWC Lighting
1001 Marco/Marvin Manufacturing Co.
1024 Mark Lighting Fixture
553 Master Dim
720 Max International
1017 Maxim Lighting
508 mcPhilben/Omega Lighting/Div. Emerson Electric Co.
925 Mecho Shade Corp.
815 Mercury Lighting Products Co., Inc.
847 Metalloxyd, Inc.
912 Metalux/Lumark Lighting
742 Mid-West Chandelier Co.
608 Minolta Corp.
415 Miroflector Co. Inc.
901 Mitsubishi Electric Sales America
1012 Modulightor Inc.
559 Moldcast
515 Moore-Lambert Inc.
723 Moorlite Electrical Ltd.
619 Motoko Ishii International Inc.
158 NEL New Elegant Lighting Inc.
104 NEMRA/National Electrical Manufacturers Representatives Assn.
831 NL Corp.
251 NTS Products Group
351 Neo-Ray Products, Inc.
549 Ness Imports Inc.
1031 Nessen Lamps Inc.
454 New Horizons Lighting
266 Nightscaping/Loran Inc.
727 North American Philips Lighting Corp.
817 North Star Lighting Inc.
748 Northern Light Co.
726 Novitas, Inc.
205 OSRAM Corp.
535 OTT International GmbH
747 Orgatech Inc.
810 Otteson Co.
1023 P&H Co., Inc./ Flex-A-Lite
754 PD West Lighting
450 PSI West
931 Panasonic Industrial Co./ Special Products Div.
851 Panel Optics
1006 Paraflex Industries
1007 Paul D Metal Products
550 Peerless Lighting Corp.
753 Permapost
534 Permex/NRD Div.
1013 Phoebus Manufacturing
921 Polarized International
235 Pole-Lite Industries, Inc.
360 Poulsen Lighting, Inc.
121 Power Controls Corp.
465 Powerline Communications Inc.
559 Prescolite
559 Prescolite Controls
612 Prodel Inc.
626 Progress Lighting
335 Progressive Architecture
830 Prudential Lighting
519 QL Inc.
458 QOR Technology Inc.
132 Q-COM Corp.
949 Quicer Industries
1047 RWL/Welsbach Lighting
123 RAAK Lighting Inc.
942 RAB Electric
521 RELCO/Lazin Lighting
827 Radiant Illumination, Inc.
564 Fredrick Ramond, Inc.
1203 Remcraft Lighting Products
634 Restaurant and Hotel Design
137 Ron Rezek Lighting & Furniture
1026 Ribbonlite
1050 Rig-A-Lite Co., Inc.
836 Robertson Transformer
366 Rocky Mountain Automation, Inc.
422 Roctronics Entertainment Lighting, Inc.
915 SEBCO Distributing
363 Saunders-Roe Developments, Inc.
623 Scientific Lighting Products
1025 Scott Lamp Co.
811 Sentinel Lighting/Airey-Thompson Inc.
116 Sentry Electric Corp.
934 Sentry-Lite
525 Shakespeare
1037 Sherman Engineered Fiberglass Products
715 Siltron Illumination
613 Sim-Kar Lighting Fixture
907 Spaulding Lighting, Inc.
755 Spero Electric Corp.
1208 Staco Powernetics
401 Staff Lighting Corp.
321 Starfire Lighting Inc.
1200 Sternberg Lantern Inc.
1029 Sterner Lighting Systems
223 Stonco
317 Strand Lighting
925 Stretchwall +
412 Strong International
814 Sun Valley Lighting Standards
622 Sunnex Inc.
951 Sunray Lighting, Inc.
231 Sure-Lites
739 Sutton Publishing Co.
341 Swivelier Co. Inc.
923 Sylvan Designs, Inc.
409 Sylvania Industrial/ Commercial Lighting
423 Sylvania Lighting Equipment/GTE
930 TIR Systems Ltd.
721 Teron Lighting Corp.
740 Theatre Crafts Magazine
819 Thomas Industries Inc.
524 Thomas & Betts
255 Thorn EMI Lighting
147 Thunder & Light
440 Times Square Lighting
446 Tishman Co./Infracon
806 Tivoli Industries, Inc.
127 Trakliting Inc.
918 Triad-Utrad
926 Triluzco, Inc.
756 Trim Trac Lighting Corp.
554 Trimble House Corp.
816 UNENCO, Inc.
559 USI Lighting Inc.
452 U.S. Powerbeam Inc.
455 Union Metal Corp.
222 Universal Manufacturing
734 Valley Iron & Steel Co. (VISCO)
426 Valmont Industries Inc.
240 Venture Lighting International
928 Kurt Versen Co.
325 Visa Lighting
737 Vision Unlimited Equipment Inc.
103 Vista Lighting
108 Vista Manufacturing Inc.
1016 Visual Impact Corp.
757 Visual Merchandising & Store Design/Div. S.T. Publications
724 Voltarc Tubes, Inc.
264 The Watt Watcher
356 Wendelighting
111 Westerfield Co.
265 Western Lighting Industries Inc.
247 Western Lighting Standards
1108 Westinghouse Electric Corp.
617 W.J. Whatley Inc.
1040 Wiko Ltd./Lany Fax of America, Inc.
649 H.E. Williams Inc.
751 Woodform, Inc.
216 Wright Light
611 XO Industries
451 Yorkville Industries
938 Zero Interiors Inc.
241 Zumtobel Lighting, Inc.

GUTH

Lighting Excellence by Tradition

How To Turn-On Interiors

Nothing adds mood and excitement to interiors like accent lighting. And nobody offers more ways to enhance architectural details than Guth.

You can choose from individual units like our new Silhouette wall sconce series, with 18 tambour faceplates to select from, or incorporate our Perimeter 600 wall-washing system to create soft, rich ambiance throughout interiors.

Other accent groups include units that rotate for directional light control, undercabinet fluorescents, wood-framed fluorescents and numerous wall brackets and pendants. Many available in designer colors.

Accent Lighting is just one of six *Divisions of Light* offered by Guth. Write for new brochure to Guth Lighting, P.O. Box 7079, St. Louis, MO 63177, 314-533-3200.

Send Literature: Circle No. 429
Have Representative Phone: Circle No. 430


Undercabinet Lighting

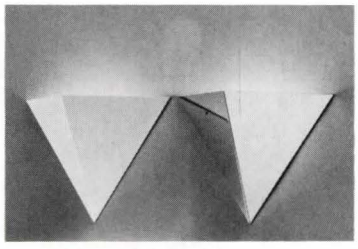

Rotating Fluorescents

Wall-Wash Systems

A Subsidiary of Jac Jacobsen Industries

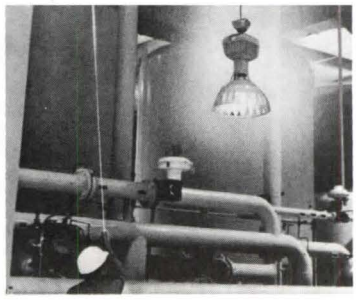
Guth Divisions of Light: Indirect Systems • Designer Accent • High Tech Lighting • Energy Saving Ambient • Glare Free Industrial • Outdoor Security

International Lighting Review: ILR is a richly illustrated quarterly magazine devoted to all aspects of lighting world-wide.
Circle 134 on reader service card

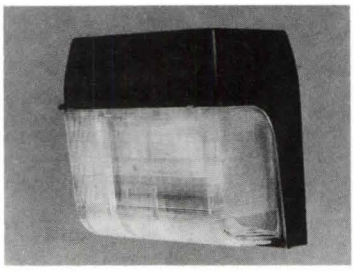


IPI: Designed by Gruppo Lefsina for Eleusi, Argo is an incandescent wall sconce available in two sizes and either brass or enamel finish.
Circle 135 on reader service card

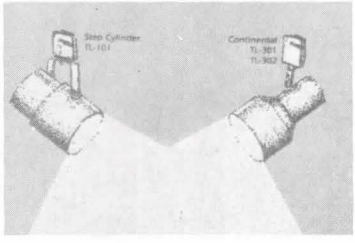
Imperial Bronzelite: The GM-400 Series of grade-mounted uplights features a new lightweight composite housing that allows easy installation and exceptional durability.
Circle 136 on reader service card



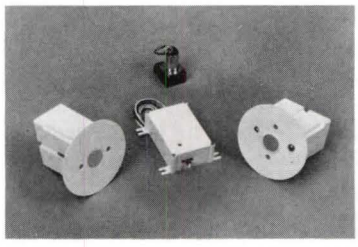
Joslyn: Wherever fixture height creates problems, Joslyn-Thompson® lowering systems are the solution. Available for surface-mounted, flush-mounted, and area outdoor lighting pole applications.
Circle 137 on reader service card



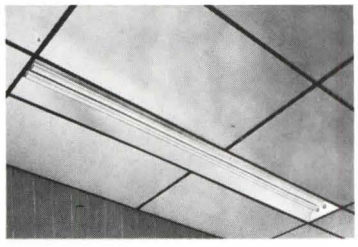
JPL Lighting: Wall Sentinel is available with the new 100-watt Metal Halide lamps as well as 35 to 150-watt HPS. An 8:1 S/MH ratio is achieved.
Circle 138 on reader service card



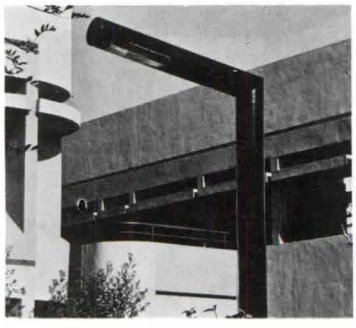
J & R Import Corp.: Lighting fixtures, leading Taiwan manufacturer, UL Certification, U.S. warehouse, 3 production lines, custom designs, wide selection, warranty and after-sale service, co-op advertising.
Circle 139 on reader service card



Kesser Electronics International: Energy-saving lighting control systems for commercial applications, which can reduce lighting energy costs from 30 to 50 percent, will be on display.
Circle 140 on reader service card

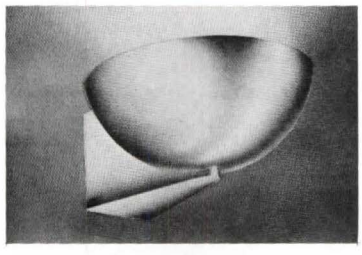


Keystone: The LB series provides a low brightness alternative to bare strip lighting. High-efficiency open reflector recessed strips for installation in inverted-tee grid ceilings.
Circle 141 on reader service card

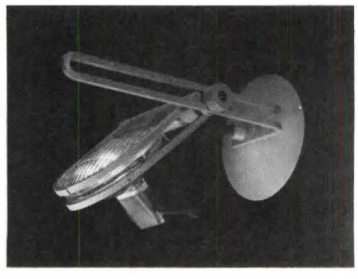


Kim Lighting: The Outdoor Tube System, in single, dual or quad mounting configurations, combines pure aesthetics with high performance optics and functional installation and maintenance features.
Circle 142 on reader service card

Koch + Lowy: Nottingham, designed by Antony Howard, features a shade finished in gray Nextel, with stem finish options of polished metal or glossy enamel. A PL13-watt bulb is included.
Circle 143 on reader service card



Kurt Versen: Fixtures designed for the critical demands of atria spaces. Narrow distribution adjustable HID sources, low brightness downlights for pedestrian spaces, uplights for ceiling illumination.
Circle 144 on reader service card



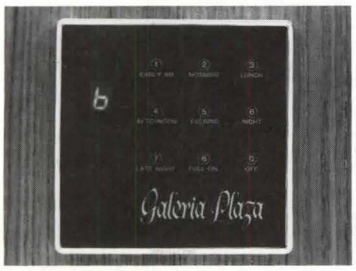
Lazin Lighting: The Grip 36 is available as both track and surface-mounted units. Formed of wrapped aluminum rods, the Grip 36 holds line or low voltage PAR 36 lamps. UL listed.
Circle 145 on reader service card

A commitment to affordable quality.

Booth #347, Lighting World IV

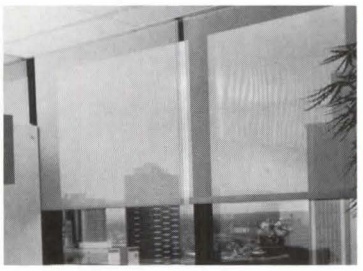
KIM LIGHTING
Subsidiary of Kidde, Inc.
KIDDE
16555 East Gale Ave., Post Office Box 1275
City of Industry, Calif. 91749 • 818/968-5666

Circle No. 366 on Reader Service Card



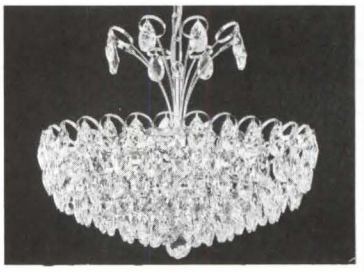
Master-Dim: Experience élan—the proprietary ELM panel that features illuminated custom legends and logo activated by a mere touch of its neutral gray face.

Circle 158 on reader service card



MechoShade Systems: The Mecho and Electro Shade Systems are well-constructed and well-conceived shading systems for operating solar control shades on any size and style glazing.

Circle 159 on reader service card

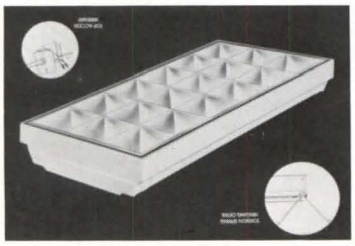


Melville Crystal Chandeliers: Made of highest quality materials: Strass trimmings, 24-carat gold plated fixtures with a kiln-enameled finish, and a unique detachable design for easy cleaning.

Circle 160 on reader service card

Metalloxyd: Reflector quality anodized aluminum and products will be on display. Metalloxyd will also introduce their products in wide widths of over 48 inches.

Circle 161 on reader service card

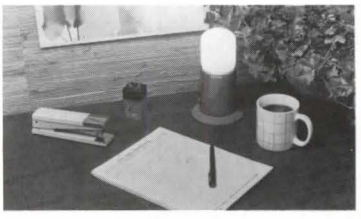


Mid-West Chandelier Co.: The ultimate in visual comfort with an architecturally pleasing appearance, this luminaire offers high efficiency while maintaining excellent VCPs.

Circle 162 on reader service card

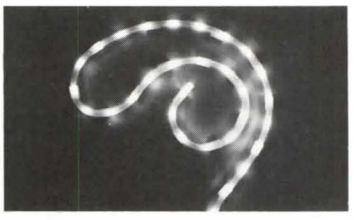
Minolta: The Illuminance Meter measures illuminance instantaneously and continuously. The versatile hand-held meter offers capabilities previously available only with much larger and heavier instruments.

Circle 201 on reader service card



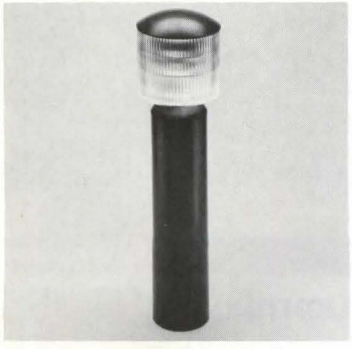
Mitsubishi: The Marathon Torch lamp/bulb combination is available in table or wall-mount versions. Marathon bulbs (available separately) produce light equal to standard 60-watt bulbs with a mere 15 watts, making them 75 percent more efficient.

Circle 202 on reader service card



Modulightor: An architectural lighting company specializing in linear lighting systems and contemporary chandeliers. Ten modular linear lighting systems are available and can be fabricated to designer specifications.

Circle 203 on reader service card

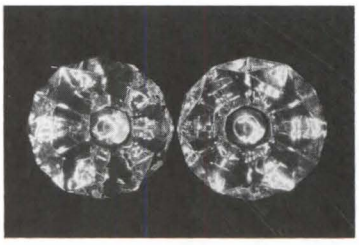


Moldcast: The Epistyle Series is a new family of small-scale outdoor luminaires for pedestal, bollard, column, pole, and wall mounting.

Circle 204 on reader service card

MorVue: Reflector by Vision Unlimited Equipment will improve fluorescent lighting, increase light levels without additional cost, and decrease consumption while maintaining present light levels.

Circle 205 on reader service card



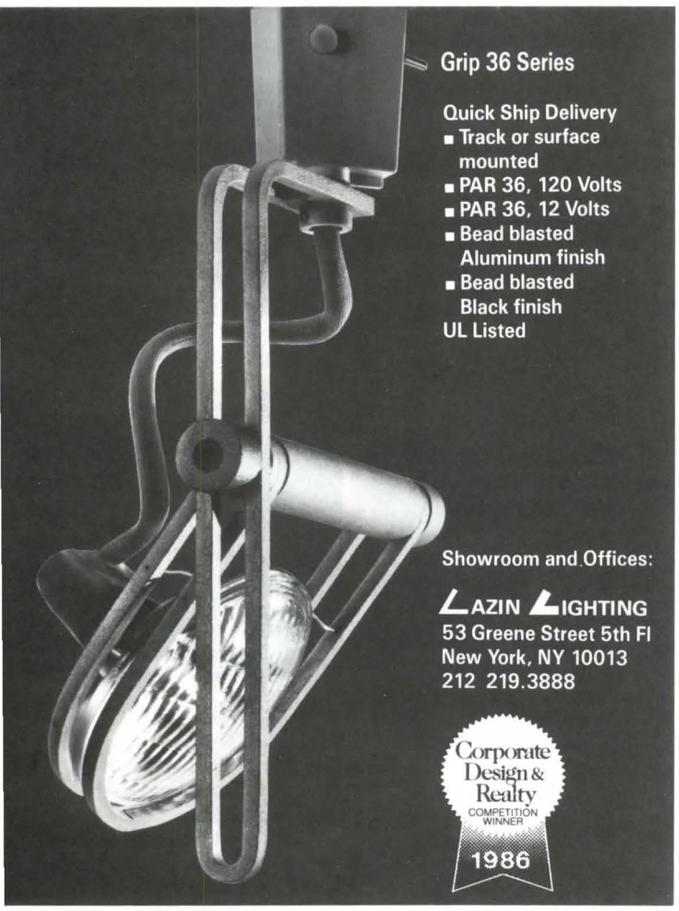
Motoko Ishii International: Introduces Dia Bulb, a 10,206-hour long-life, multifaceted incandescent lamp designed to create brilliant lighting effects of its own accord, designed by Motoko Ishii.

Circle 206 on reader service card

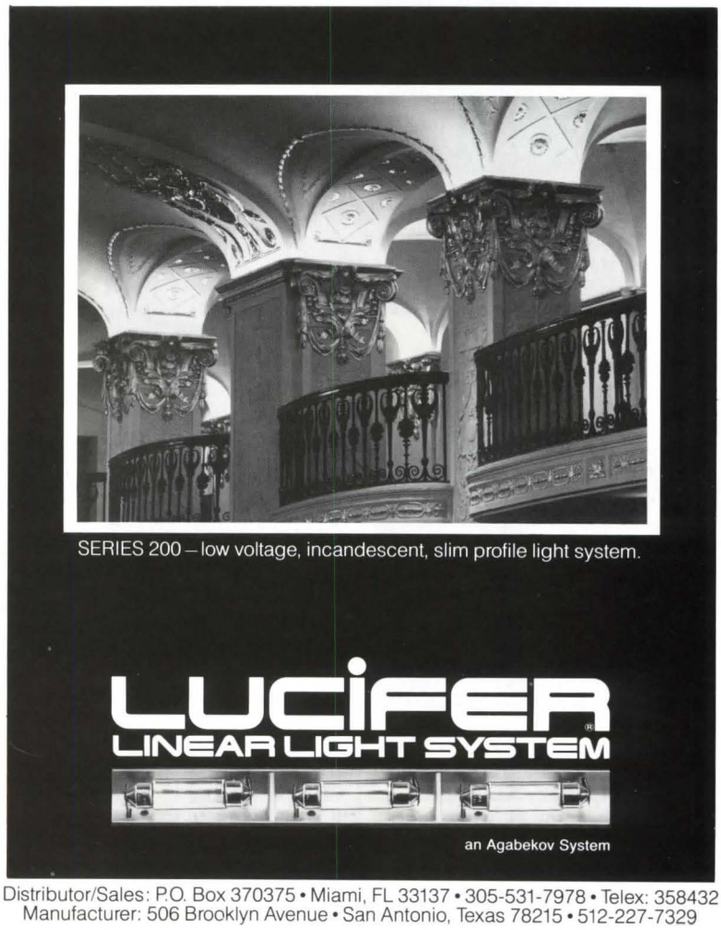
MWC Lighting: Spectra 70 is an aesthetically pleasing, multiple reflector site light, which provides a uniform, glare-free light distribution extending an outstanding distance from the pole.

Circle 207 on reader service card

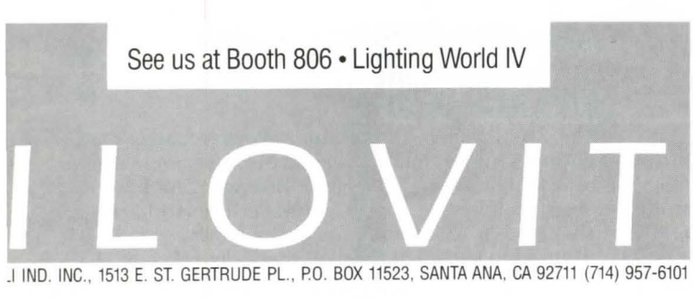
Circle **No. 321** on Reader Service Card



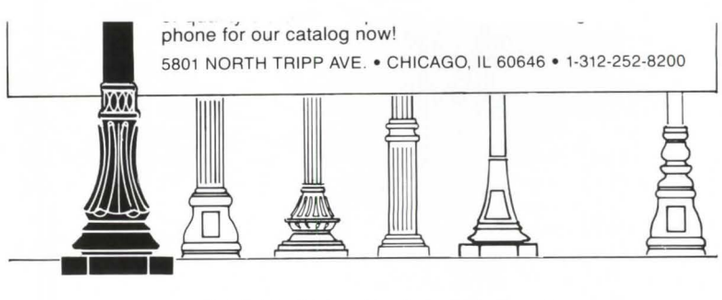
Circle **No. 368** on Reader Service Card



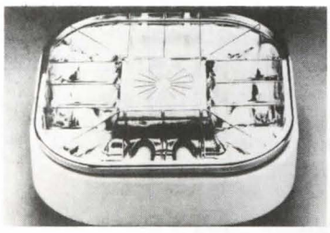
Circle **No. 372** on Reader Service Card



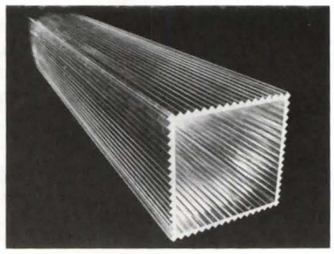
Circle **No. 404** on Reader Service Card



Circle **No. 397** on Reader Service Card



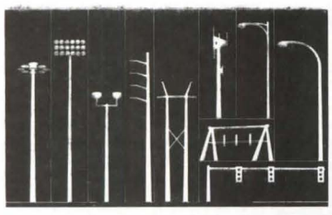
Thorn EMI Lighting: The new 2D Hyform energy-efficient, compact commercial luminaire provides an economical alternative to standard linear fluorescent fixtures.
Circle 240 on reader service card



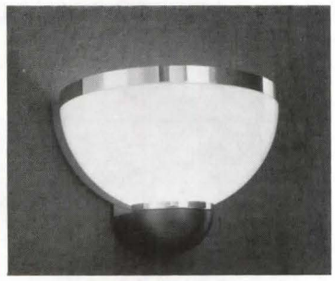
TIR Systems: Light Pipes transmit and uniformly distribute light from a remote source. Suitable for difficult access, hazardous and cold storge areas, sculptural lighting, and office and general lighting.
Circle 241 on reader service card

Triluzco: Recently developed and licensed, the Isolite "low lite" pathway marker, self-luminous and nonelectric, is unconditionally guaranteed to work forever with no maintenance, no electricity, and no hassle.
Circle 242 on reader service card

Union Metal: The Nostalgia Lighting Series is a combination of unique and historically based families of lampposts and fixtures, which have been manufactured since 1906.
Circle 243 on reader service card

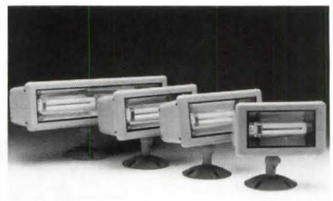


Valmont: Steel pole structures from 10 feet to 250 feet in height will be on display. Valmont also introduces CityScape, a total family of street furniture.
Circle 244 on reader service card

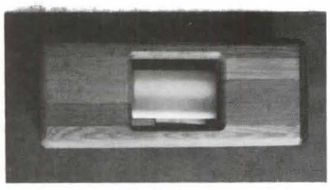


Visa Lighting: The CB-800-CB814 series offers an individually crafted wall sconce that provides a soft glow of wall-wash uplighting. It is available in incandescent, halogen, mercury vapor, or metal halide lamping.
Circle 245 on reader service card

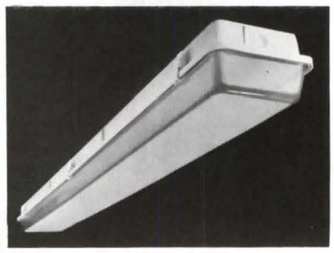
VISCO: Ornamental lighting fixtures and related streetscape equipment utilized in downtown restoration projects are featured. See us in Booth 734.
Circle 246 on reader service card



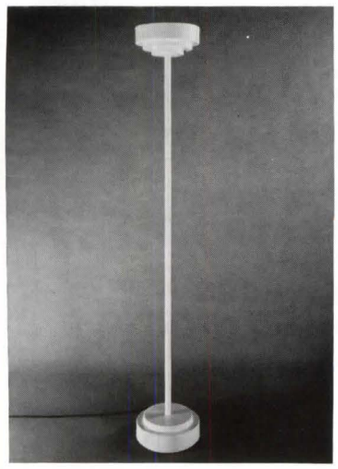
Western Lighting: Omegalux 1200 Floodlights—low cost—energy efficient—featuring PL/Dulux fluorescents in all-metal housing with baked enamel finish and unbreakable lens. Approved for wet locations.
Circle 247 on reader service card



WoodForm: Four different series of contemporary outdoor lighting provide architects and designers with a broad choice of over 100 wood lights.
Circle 248 on reader service card



Wright Light: New SST shallow troffer has wide lamp spacing for uniform distribution. Both steel and aluminum door frames have 45-degree mitered corners and cam-operated latches.
Circle 465 on reader service card



Zumtobel: The 6-foot-tall IDHR uses a 70- or 150-watt HQI metal halide lamp in an asymmetric or symmetric distribution for placement anywhere in a room.
Circle 466 on reader service card

You don't have to reinvent the light bulb to win, just use it brilliantly.

This prestigious award is sponsored annually by General Electric to acknowledge outstanding achievement and excellence in lighting system design.

The competition is open to all designers, architects, engineers and consultants. And the striking Steuben crystal creation is presented to the designer who most innovatively and effectively uses GE products to achieve specific lighting design objectives.

Last year's award winner was Janet Lennox Moyer, of Luminae, Inc., Oakland, CA, whose creative use of GE 12-volt Precise™ display lamps added dynamic sparkle, ambiance and drama to the Franco Ferrini Shoes retail store.

This year's competition will focus on lighting designs which excel in architectural compatibility, effective use of lighting products and techniques, attention to color, form and texture, and energy cost effectiveness.

For details and entry information on the 1986 Edison Award program, write to General Electric Company, Edison Award, Nela Park–4164, Cleveland, Ohio 44112.

It's the perfect opportunity to let your most brilliant lighting design application shine.

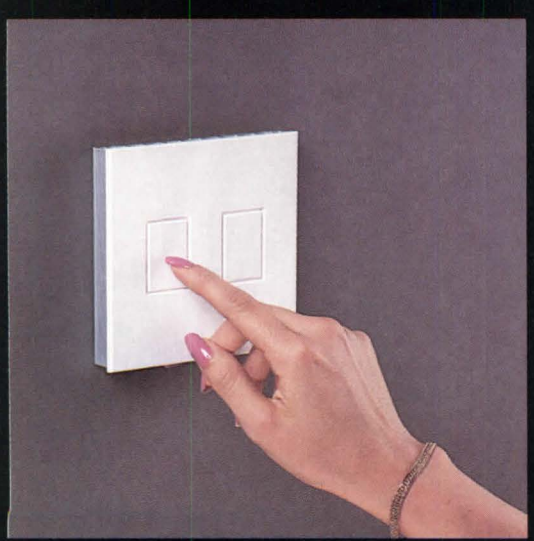
We bring good things to life.

Be sure to see our new products at the Lighting World IV Show. Booth 331.

Introducing

nova®
Electronic Touch-Switch

A new concept in lighting control systems.*



Light touch, micro-travel activation

Architectural Switches

- 1 to 10 locations
- On/off control - Incandescent, Fluorescent
- 1000W capacity
- Full voltage, 120V wiring
- Full ganging and retrofit capability
- White is standard; black, gray, brown, and beige available from stock
- U.L. Listed

Call today for free color brochure
800 523-9466
800 222-4509 in Pennsylvania

Or write: Lutron
Suter Road, Box 205
Coopersburg, PA 18036

LUTRON®

* This product is covered by one or more of the following U.S. Patents: #3,442,309; 3,735,020; 3,746,923; 3,927,345; 3,824,428; 3,919,592; 3,927,345; 4,350,935; 4,207,498; 3,731,142; DES 227,557; and corresponding foreign patents. Foreign and U.S. Patents pending. Lutron, Nova, and Save Energy are registered trademarks.

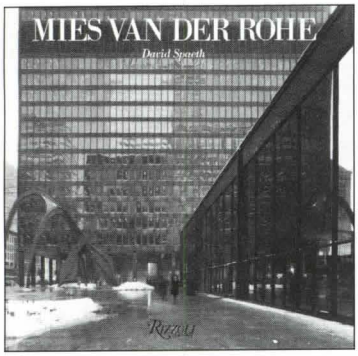
Circle No. 345 on Reader Service Card

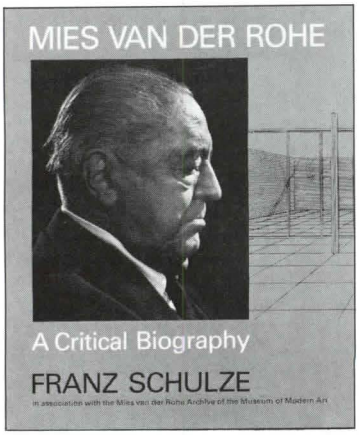
Books

Mies van der Rohe: The Villas and Country Houses *by Wolf Tegethoff. The Museum of Modern Art, New York, distributed by The MIT Press, Cambridge, Mass., 1985, 225 pp., illus., $55.*

Mies van der Rohe *by David Spaeth, Rizzoli, New York, 1985, 208 pp., 235 illus., $25 paper.*

Mies van der Rohe: A Critical Biography *by Franz Schulze, in association with the Mies van der Rohe Archive of the Museum of Modern Art. The University of Chicago Press, Chicago and London, 1985, 355 pp., 219 illus., $39.95.*





Mies van der Rohe

The 1986 centennial of the birthday of Ludwig Mies van der Rohe provides the welcomed occasion for a reexamination of one of the 20th Century's greatest and most influential architects.

Before and after World War I, Mies designed imposing country and suburban villas in stripped variants of traditional styles, but following the war, he announced his commitment to Modernism with a series of designs that would leave a lasting impact. Several trenchant, though unbuilt, projects for villas and office buildings were followed in the mid- and late-1920s by a series of built structures that would quickly become monuments of Modern architecture, including the Liebknecht-Luxemburg Monument, Berlin, 1926; the apartment building at the Weissenhofsiedlung, Stuttgart, 1927; the Lange and Esters houses, built side by side in Krefeld, Germany, 1928; the German Pavilion at the Barcelona Exposition, 1928–29; and the Tugendhat House, Brno, Czechoslovakia, 1928–30.

Mies was the last director of the German Bauhaus from 1930 to 1933, when it was finally closed by the Nazis. With steadily dwindling work and influence, he remained in Berlin until 1938, when political and economic pressures forced him to emigrate to Chicago. There he became director of architecture at the Armour Institute, subsequently renamed the Illinois Institute of Technology. Between his arrival in America and his death in 1969, he designed the new IIT campus (1940s and 1950s); the elegant and controversial Farnsworth House, Plano, Ill. (1945–50); the canonical steel and glass office towers of the 1950s and 1960s, most notably the Seagram Building, New York, and the Federal Center, Chicago; and several museum pavilions, of which the most significant was the New National Gallery, Berlin (1962–68).

Three new books interpret this achievement. Wolf Tegethoff's exhaustive study of Mies's villas and country houses is an English translation of a work first published in German in 1981. Originally conceived as a doctoral dissertation in conjunction with an exhibition sponsored by the Krefeld museums, the study ignores Mies's work before 1920 and concentrates on 21 house designs that were indisputably "Modern," of which 8 were built. The work follows the "no stone unturned" approach of traditional Germanic scholarship. Practically all major drawings and most extant photographs are reproduced. For each project, there is a painstaking assessment of all the available verbal and visual documents, a history of the origins, precedents, and legacies of each design, and a comparative analysis, in staggering detail, of all major elements (e.g., fenestration patterns) of each building through its various design stages.

For Mies scholars and True Believers, Tegethoff's work will surely yield the Rhine gold. Other readers may simply drown in the details. The author makes numerous astute observations such as that the concrete country house design of 1923 was not just a visionary fantasy, but was likely a house the architect intended for himself. Its ground plan, Tegethoff also argues, influenced Walter Gropius's design of the Dessau Bauhaus. Yet such nuggets frequently get lost in the labyrinth. Tighter editing and more distilled conclusions would have made a valuable work even more useful.

If Tegethoff's catalog errs on the side of thoroughness, David Spaeth's essay does the same on behalf of brevity. His *Mies van der Rohe* is, in essence, an introductory sketch. Though it contains occasional inaccuracies in such matters as dating, it still provides a useful synthesis of Mies's life and work. Moreover, the volume's physical design by John Bradford is perhaps the most appropriately elegant of any Mies book to date.

Between these extremes of thoroughness and brevity, Franz Schulze's *Mies van der Rohe: A Critical Biography* strikes an almost perfect balance. Schulze presents a sufficiently detailed but carefully shaped analysis of the integral relationship of Mies's life and work. He is especially effective in his vivid evocation of time and place, the ambience of Mies's milieus in Aachen, Berlin, Dessau, and Chicago. Skillfully integrated flashback portraits of Schinkel, Paul, Behrens, and others explicate the major influences on his subject's art. In Schulze's hands, Mies is no longer the impassive monolith he has sometimes seemed to be, but a complex human being whose varying moods reflected and affected the vicissitudes of his life and work.

Schulze sensitively explores Mies's strained marriage to Ada Bruhn and his closer, more lasting relationships with Lilly Reich, Lora Marx, his daughters Marianne, Dorothea, and Waltraut, and his grandson, Dirk Lohan, who, with Gene Summers, provided crucial professional support in Mies's last years. The analysis of Mies's puzzlingly slow disengagement from Nazi Germany is the most convincing treatment of that issue to date. The fascinating stories of his relationships with clients and how commissions were won and lost are told with an appropriate sense of drama. Finally and most important, the buildings themselves are beautifully explicated with both appreciative empathy and critical distance. Schulze never loses sight of the fact that the work, itself, is the *raison d'être* of his probing. Yet in this model architectural biography, he also knows and brilliantly demonstrates the integral nexus of architecture and life.

Thomas S. Hines ■

The reviewer teaches cultural and architectural history at UCLA. He is the author of Burnham of Chicago: Architect and Planner *and* Richard Neutra and the Search for Modern Architecture.

128 MILLION SQ. FT. OF BRAI ROLLED OUT ACROSS AMERICA IN 1985

U.S. Intec is the world's largest producer of A.P.P. modified bitumen, used to manufacture our Brai single-ply roofing systems. And Brai is being used more everyday.

There are loads of reasons for Brai's acceptance, from its extraordinary heat resistance and low-temperature flexibility, to the exceptional warranties and ease of application and inspection. But what's made us the tops is Brai's performance.

Our roofing systems have proven they can stand up to virtually all climates and the most difficult design projects. Brai is a clean, cost-effective choice.

Brai has passed the tests of time and the demands of the most demanding architects, contractors and building owners. Our company and our product are on a roll and here to stay.

u.s.intec/
brai

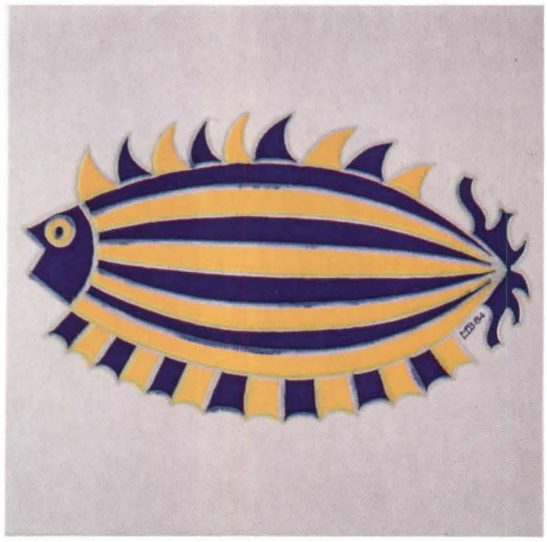
We're on a roll

ROOFING
AND WATERPROOFING
PRODUCTS

For technical information, call
1-800-62INTEC.

Circle **No. 410** on Reader Service Card

New Products and Literature



Two examples from a collection of Sardinian tiles by Cerasarda.

Decorative Tiles

Ceramic tiles from Cerasarda, the only ceramic production facility in Sardinia, come in a range of sizes. Besides colorful solids, there are many designs in both bold and delicate colors, some taken from old rugs and fabrics. A 16-page brochure illustrates in color more than a hundred solid and patterned tiles, and provides information about weight and size. Cerasarda.

Circle 200 on reader service card

The Julia Morgan tile collection consists of 11 trim styles, hand pressed from patterns she used at Hearst Castle, San Simeon, Calif., and other buildings worldwide. The cloisonné-type low-fired tiles have hand-inlaid glazes. The current line can be ordered in custom colors. Later additions will include murals, interlocking patterns, and Art Deco, Victorian, Spanish, and Moorish images. Deer Creek Pottery.

Circle 100 on reader service card

Three tiles from the Julia Morgan collection by Deer Creek Pottery.

Wall sconce Model 3012 combines polished brass, perforated metal, and a 10-inch-diameter cased glass shade. Illumination is by a 60-watt standard bulb, with modifications possible to accommodate other bulb sizes and types. It is also available with a polished stainless base and custom color finishes. Harry Gitlin Lighting, Inc.
Circle 270 on reader service card

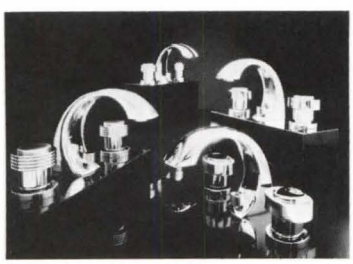
The Ragtime fabric collection for upholstery and wallcovering, designed by Laura Deubler Mercurio, consists of two weaves. Counterpoint, 80 percent nylon, 20 percent wool, uses three different yarn sizes to produce a highly textured surface. It is 54 inches wide and comes in 31 colorways. Bagpipes, 70 percent wool, 30 percent nylon heather-yarn fabric, is 54 inches wide and comes in 26 colorways. Both are flame retardant and abrasion resistant. Adam James Textiles.
Circle 271 on reader service card

Dimensional signage catalog illustrates a selection of ⅛-inch-thick, injection molded Plexiglas® letters and numerals that are available in 22 styles, in heights from ¼ inch to 10 inches, in standard, painted, or two-toned colors. Decorletters® made of smooth-surface, high-density polystyrene foam are available in 28 styles in heights from 4 to 24 inches, and in 38 standard colors. Custom sizes and logos are available upon request. Scott Plastics Co.
Circle 272 on reader service card

The Antares III floor lamp, designed by architect/sculptor Utkan Salman, is constructed of anodized aluminum. It uses two 12-volt MR 16 quartz halogen bulbs, one spotlight, one floodlight. Set into two hinge-action light heads, the bulbs provide varied lighting. Power is changed at the base by means of an electronic transformer into 12-volt direct current. The lamp has a four-position, touch-operated dimmer switch, which is activated through the center strip. Antares Incorporated.
Circle 273 on reader service card

Commercial windows catalog features projected casement, top-hinged, fixed, double-hung, and horizontal slider windows. The four-color, 12-page catalog illustrates each product in detail and contains product specifications and performance information. A section on accessory items includes panning systems, hardware, trim, and anchors. Capitol Products.
Circle 274 on reader service card

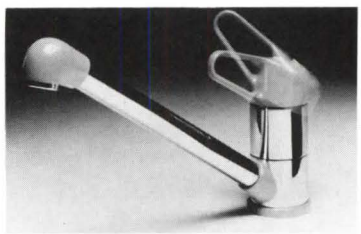
BeamBoss™ interactive graphics driven 2-D frame analysis system analyzes 2-D structures composed of beam and/or truss members. It runs on IBM-PC or compatible, 256K RAM with two diskette drives and color graphics board. Software Consulting Specialists, Inc.
Circle 275 on reader service card



The Ambiance faucet line is one of six faucets among the 60 new products introduced by Eljer at the NAHB show. The high-arched spout incorporates an aerator. Faucet handles are available in round or oval designs, both offered in a combination of chrome and polished brass finishes. Eljer Plumbingware.
Circle 276 on reader service card

Checkroom Equipment catalog for systems 1100–1250 includes both electric and stationary coat and hat racks and accessories. The systems are designed for use in restaurants, hotels, theaters, clubs, resorts, hospitals, and other places where clothing checking is required. Railex Corporation.
Circle 277 on reader service card

Advanced Function Penta™ **Task Seating** brochure illustrates its swivel-tilt articulation and tension adjustment; adjustable, lockable backrest and seating angles; free-float back and seat; and free-float back with fixed seat angle. The four-page, full-color literature shows how freedom of choice to the user enhances comfort and productivity. All-Steel, Inc.
Circle 278 on reader service card



Hi-Fi kitchen faucets of solid brass, designed for single-hole installation, have a durable epoxy finish. Available in chrome, brass, or colors, Hi-Fi features convenient single-lever control, washerless valve, and a wear-resistant ceramic disc cartridge. Shorter lengths are available for bathroom sinks. Hastings Tile & Il Bagno Collection.
Circle 279 on reader service card

ThermoCon spray-on insulation, made from chemically treated hollow wood fibers, has thermal and acoustical applications. It bonds to clean bare or painted steel, wood, masonry, glass, and plastic interior surfaces, providing seamless insulation and sound control. Binders in the insulation permit it to form monolithic seals around plumbing and electrical penetrations. Information about thermal, acoustical, and condensation control are contained in a loose-leaf binder, along with Spec-Data® sheets. Send request for a copy of "ThermoCon Spray-Tec Insulation Systems," on professional letterhead, to Thermo Products Co., 1457 N. Main St., Delphos, OH 45833.

Neatniks accessories, designed by Paul Mayén, include ash/trash containers, umbrella stands, and wall hooks, for use in high traffic areas. The accessories, described and illustrated in a 40-page, four-color brochure, are available in several sizes and shapes. There are metallic finishes and 16 nonmetallic colors that match the company's other furniture and accessories. Ash/trash containers, some with marble tops, are floor or wall-mounted. Architectural Supplements, Div. of Habitat International.
Circle 280 on reader service card

Bituthene® waterproofing is a self-adhering membrane of high-strength polyethylene and rubberized asphalt. It forms a continuous impervious water barrier that stays flexible. A 12-page brochure that describes the product and its applications includes detail drawings of its use on decks, foundation walls, tunnels, and underground structures. A table of properties is provided. Construction Products Div., W.R. Grace & Co.
Circle 450 on reader service card

Cerrage acrylic-based artificial marble, manufactured by Fukuvi Chemical Industry of Japan, is durable, and stain, heat, and weather resistant. It can be fabricated in the same way as wood, bent to form a curved surface, and beveled. Special adhesives are available for joining and bonding. Colors are white, ivory, beige, light green, and a custom black-and-white marble look. Cetex Distributing.
Circle 451 on reader service card

Architectural metal products catalog lists bars, channels, tubing, and pipe railing components such as brackets, baluster collars and spindles, starting posts, and post collars. There are also post caps, finials, and pickets, and ornamental scrolls and panels. Drawings show installation details. J.G. Braun Co.
Circle 452 on reader service card

'Contemporary' window profile with aluminum clad exterior is added to a line of custom arch-top windows. Three existing clad styles and Contemporary complement most manufacturer's clad styles. All surfaces are baked and painted in two standard colors: dark brown and white. A contoured aluminum curved drip cap is available for extra weather protection. Standard options include: any required jamb depth; special and high-performance glass; removable sunburst muntins; true-divided lites; varied interior casing; and special mini-blinds. New Morning Windows.
Circle 453 on reader service card
(continued on page 216)

When it comes to innovation, we show our true colors.

When we created the revolutionary Bali Micro® Blind, we expected imitators. To stay a step ahead, we continually create new colors with you in mind. And we custom-make our blinds to fit any size or shape window, providing dependable service and prompt delivery. For a free copy of our Commercial Design brochure on how Bali Blinds help you create colorful windows, call 1-800-233-8756.

BALI®

The name to look for in blinds.™


Presenting...
The American Classics:
from The Georgia Marble Company
The Georgia Marble Company, quarriers and fabricators of famous Georgia Marble® for over a century, introduces a new line of marble tile. There are eight varieties, never before available except by custom order. The marble tile comes in a standard size, 12" square, 3/8" thick. These are some of the most beautiful marbles in the world.
Please contact us for more information.
Marble Tile: Georgia Peach.
Interior Shown: Flamingo Grill,
Myrtle Beach, SC.
Call us toll free for further information.
In Georgia: 1-800-342-1382.
Other States: 1-800-334-0122.
georgia marble company
structural division
nelson, georgia 30151 (404) 735-2591
a Jim Walter company
Circle No. 348

P/A in May

Tom Crane

Middleton Inn, near Charleston, S.C. Architects: Clark & Menefee.

Inn for a Garden Setting

Prominently featured in this issue will be the Middleton Inn, adjoining one of South Carolina's famous gardens. The first nationally published work of Charleston architects Clark & Menefee, the low-rise complex impressed P/A's editors for its simple elegance.

P/A Inquiry: Public Housing Rehab

Something now has to be done with the vast stock of aging public housing in the U.S., much of which is deteriorating physically or socially, or both. Analysis, expert opinions, and numerous examples will indicate options open in this expanding area of practice.

P/A Technics: High-Tech Labs

In this technical feature, the planning and environmental demands of various kinds of research labs will be analyzed; effective solutions will be illustrated and discussed.

P/A International Furniture Competition

A report on the sixth annual P/A competition for furniture design will be illustrated with winning designs and jury commentary.

NEOCON

P/A's annual special section on the Chicago interiors conference and show, scheduled for June 10–13, will include information on the latest product introductions.

Future Issues of P/A

Look for special features on Computers in Architecture in the June issue, along with information on the A/E Systems show to be held in late June in Chicago. The July P/A will include a number of new houses. All of the spring issues will present work by architects not previously published in the national architecture magazines.

P/A Job Mart

Situations Open

The New York Chapter of the American Institute of Architects, located at the Urban Center in the Villard Houses, New York City, seeks an individual to succeed its executive director, who is retiring after 17 years. Applicants should be prepared to recommend Chapter programs as well as to implement them; to communicate effectively within the Chapter and to the public, including public presentations of Chapter positions; to work closely with architects in matters of professional practice; and to be responsible for the administration of the Chapter.

A job description is available.

Resumes, should be addressed to the Search Committee, New York Chapter/AIA, 457 Madison Avenue, New York, NY 10022.

The New York Chapter/AIA is an Equal Opportunity Employer.

Design Position, 1986-87

The Department of Architecture, College of Environmental Design, University of California, Berkeley, is seeking candidates for a tenure track position at the Assistant Professor level to teach architecutral design.

The position will require teaching in studio, conducting seminars and giving lectures to undergraduate and graduate students in architecture and environmental design.

Candidates should be able to motivate and guide effective design exploration, marshall appropriate technical information and shape the intellectual context for design evaluation and criticism. They should themselves be architects of achievement and promise.

Deadline for receipt of applications is June 1, 1986.

The University of California is an Equal Opportunity, Affirmative Action Employer.

For further information and application forms, contact:

The Secretary
Faculty Search Committee
Department of Architecture
232 Wurster Hall
University of California
Berkeley, California 94720

UNIVERSITY OF COLORADO AT DENVER
College of Design and Planning
Graduate Divisions

FOUR FACULTY POSITIONS/ARCHITECTURE/ Anticipated.

DESIGN: Associate Professor/Professor
Salary: $32,000 - $42,000
Position: Senior Designer
Masters in Architecture, professional registration, significant professional experience and/or research, and teaching experience.

ENERGY: Assistant/Associate Professor
Salary range: $30,000.
Position: Energy Program Coordinator
Masters required; Ph.D. preferred; professionally licensed.

COMPUTERS: Assistant Professor
Salary approximately $26,000.
Position: Computer applications
Ph.D. or Masters in Architecture or related fields. Professional registration preferred. Part-time responsibilities in other Divisions.

GRAPHICS: Assistant Professor
Salary approximately $26,000.
Position: Graphics for Designers
Masters in a design field. Professional registration preferred.
Part-time responsibilities in other Divisions.

The Graduate Division in Architecture is the sole accredited professional program in the State of Colorado. Located in downtown Denver.

Applications are invited by April 1, 1986. Recruiting will continue until positions are filled. Full time, Tenure Track, nine month Academic Year appointments anticipated for Fall 1986. Please send for more complete information.

Send letter of application, resume or current curriculum vitae, portfolio of professional work (including examples of student work under direction of applicant), one letter of recommendation and three additional references to:

Paul J. Heath, Chairperson, Search Committee
College of Design and Planning
University of Colorado at Denver
1100 14th Street
Denver, Colorado 80202

The University of Colorado is an equal opportunity, affirmative-action employer.

ARCHITECTS

Expanding architectural division in a well established engineering and architectural firm has an immediate need for individuals in our district offices.

CLEVELAND, OHIO — This position offers you an opportunity to combine marketing skills and design capabilities. You'll be responsible for business development, project scheduling and design for architectural projects in the northeast Ohio region. You must be a registered architect and have a minimum 5 years experience, preferably in commercial and institutional projects.

PARKERSBURG, W.V. — You will assist the architectural director in Parkersburg with concept design, schematic presentations, client consultation, contract document production and supervision. You must have a bachelor's in architecture, a minimum of 2 years experience under a registered architect, preferably in commercial and institutional projects.

We offer excellent salaries and benefits. If interested, send resume in confidence or **CALL COLLECT at (614) 459-2050, Human Resources Department.**

bn 1912

Burgess & Niple, Limited
Engineers and Architects
5085 Reed Road • Columbus, Ohio 43220

An Equal Opportunity Employer M/F

ARCHITECTS

A challenge awaits you if you are aggressive, innovative and possess an affinity for success. Many positions located in RS&H's Jacksonville, Florida, Corporate Headquarters; others in desirable locations throughout the Southeast.

Project Manager/Project Director for Airport Projects

The selected individual will possess a minimum of 10 years' experience in airport design and project management. College degree and registration as an architect or engineer required. Management capabilities must include a well developed planning ability and a high degree of originality for organizing work and improving and adapting routines and standards. The individual will assume responsibility for quality control and scheduling of projects and related activities. Proven abilities in the areas of client liaison a must.

Project Architect/Project Manager for Commercial Projects

To qualify you will possess a minimum of 7 years' experience in the design and supervision of design of multi-million dollar commercial projects. Architectural registration in Florida or ability to obtain same within 6 months required.

Please send your resume in complete confidence including expected salary amount to D. M. Petersen

RS&H®

Architects-Engineers-Planners, inc.
P.O. Box 4850 • Jacksonville, Florida 32201
EOE

Architect
CLAREMONT-BRANAN, INC
Professional search and placement for the architecture & interior design industry. Specialists in senior level technical & managerial positions. Phil Collins, 2900 Chamblee-Tucker Rd., Bldg 6J, Atlanta, GA 30341.
404-451-1983

Architects/Senior Designers

Established international planning and design firm is growing dramatically. Dynamic working environment offers real growth potential and competitive compensation. Candidates must be committed to design excellence. Reply to Box #1361-476, *Progressive Architecture*.

Architect Wanted—Responsible for the design, construction, remodeling, and repair of office buildings, private residences, hotels and restaurants; consulting with client and other staff members to determine needs and in-house capabilities; determine functional and spatial requirements of client; and preparing budgetary, scheduling, materials and equipment information. 2 years experience. Bachelor of Science, Major in Architecture, $2,600.00 x month. Job site and interview: Los Angeles. Send this ad and your resume to Job #NOF5572, P.O. Box 9560, Sacramento, CA 95823-0560, not later than May 1, 1986.

Extruded Polystyrene Insulation

Foamular®

puttin' on the pink

Architects are specifying it in a whole variety of insulation applications. Here's why:

- Outstanding moisture resistance properties that enable Foamular® to retain its high R-value of 5 per inch of thickness even after exposure to moisture. It's extruded, so year after year, it keeps on insulating.
- Tough, easy-to-handle, easy-to-install, lightweight panels offered in a broad selection of sizes, thicknesses and compressive strengths.
- A "Family of Products" concept that lets you choose just the right product for your application—without overspecifying.
- Meets codes and standards.

For details, contact UC Industries, Inc., 2 Sylvan Way, Parsippany, N.J. 07054 • (201) 267-1605

UC INDUSTRIES, INC.

Higher R-values mean greater insulating power. Savings vary. Find out why in the seller's fact sheet on R-values.

WARNING: COMBUSTIBLE. This product will ignite if exposed to fire of sufficient heat and intensity.

Circle No. 418

See Sweet's Catalog, 7.14/Ubi & 7.15/Uci

PROFESSIONAL SALES POSITION

Leading national designer and manufacturer of highest-quality, custom residential architecture offers selected high-level sales positions in major metro locations, eastern and midwestern states. Responsibilities include selling architectural services and selected materials to successful professionals, and working with quality custom builders to assure fine workmanship and construction.

Candidates should have an independent temperament and a strong record of achievement in high-value sales. Successful experience in architecture, design, residential construction or premium building products required.

Potential for high first-year income, with major advances thereafter. Excellent benefits and training. Moderate travel.

Send resume and earnings history to:

National Sales Manager
Deck House, Inc.
930 Main Street
Acton, MA 01720

DECK HOUSE
930 Main Street, Acton, MA 01720

CITY PLANNING ASSOCIATES (2)

One position emphasizes Urban Design. Second position emphasizes Planning. Design and Development Guidelines and Development Framework planning in Central Business District. Participate with inter-disciplinary team to prepare detailed land use and development plans. Research/analysis; evaluate data; conduct studies; prepare reports related to zoning ordinances, social profiles, socio-economic and market trends. 2 - 4 years related professional experience, more preferred. Strong written, verbal, analytical skills. Comprehensive knowledge required of socio-economic and behavioral considerations influencing approaches to land use. Valid California driver's license and insurability. Salary Range: $2,868.00 - 3,565.00/monthly. Send resume to Planning Associate Position, Human Resources Department, Community Redevelopment Agency, 354 South Spring Street, Los Angeles, California 90013.

M/F EEO/AA/H

ARCHITECTURAL DESIGNER

Excellent opportunity to join an established A/E firm. Requires Bachelor of Architecture or Master's degree plus 3-5 years experience as a designer of medium to large scale projects. We offer a competitive salary and benefits package plus opportunity for continued professional development. Qualified applicants are invited to reply to: **Hansen Lind Meyer,** 455 S. Orange Avenue, Suite 400, Orlando, FL 32801. An Equal Opportunity Affirmative Action Employer.

Temple University Department of Architecture

The Department of Architecture at Temple University solicits applications for appointments commencing Fall 1986. Some positions are contingent upon funding.

Distinguished visiting professor/visiting critic: Full or part time. Applications or nominations sought for senior level visiting positions in design and/or history and theory.

Assistant/Associate Professor: Full time. Teaching emphasis in theory, behavioral factors, in a design oriented atmosphere. Strong record or potential for publication and research. Prefer candidates who are also qualified to offer design studio instruction. Additional responsibilities include departmental administrative work.

Assistant Professor: Full time. Teaching emphasis on early years of design studio and a related area for lecture/seminar instruction. Other responsibilities include scholarship, research, and departmental administrative work.

Adjunct professors/studio critics: at various ranks, part time at all levels. To teach studio and lecture courses.

Please respond with a letter of interest stating the position sought, a curriculum vitae, and the names of three references before April 15, 1986 to: George L. Claflen, Jr., Chairman, Department of Architecture (084-53), Temple University, Philadelphia, PA 19122. Temple University is an Equal Opportunity/Affirmative Action Employer.

ARCHITECTS

Paul C. Parks Engineering has several positions opening in our growing Architectural Department. Our Clients know us for thorough, quality design, and fast service. We are one of the best in our field of expertise, and we are developing a national Client base.

This is a great opportunity to work in a prosperous, growing firm. We've doubled in size in the last year and a half, and we're still growing!

We're looking for people with 2-10 years solid experience in construction documents production. Different positions are available depending upon experience. Our deadlines are very stringent, so you must be production-oriented!

We offer competitive pay, profit-sharing, and possible ownership. PCPE is based in the beautiful Ozarks, with fishing, boating, and golfing right in our backyard. Send resume with salary history to Jim Parks at:

PAUL C. PARKS ENGINEERING
ROGERS, ARKANSAS 72756
(501) 636-5004 121 WEST WALNUT ST.

University of Cincinnati, School of Architecture and Interior Design

Assistant Professor. Primary responsibilities: teaching of design, and aesthetics of light and sound. Desirable, though, not essential, experience and background in computer graphics. Master's Degree minimum qualification, with some professional experience and/or academic research experience. Ph.D. desirable. Send curriculum vitae and examples of design and scholarly work by May 1, 1986 to: John Meunier, Director, School of Architecture and Interior Design, College of Design, Architecture, Art, and Planning, University of Cincinnati, Cincinnati, OH 45221-0016. Telephone (513) 475-6426. Affirmative Action Employer. Women and minority candidates encouraged to apply.

Architectural Designer—Planning, design, development of large condominium, commercial, institutional projects; custom home design; onsite supervision; contact with clients, subcontractors. 40 hrs/wk 8:30 A.M. to 5:30 P.M. $12.00/hr. Req. B.A. degree in Architecture & 4 yrs exp in job. Job Site: Incline Village, NV. Send this ad & your resume to Nevada Employment Security Dept., P.O. Box 923, Reno, NV. 89504 not later than 4/30/86.

ARCHITECTS

Black & Veatch, one of the nation's largest design firms, is experiencing continued growth and expansion. We are seeking seasoned professional architects with project and office management experience to establish architectural services in existing regional offices as well as staff architects for our home office. Challenging and rewarding opportunities for professional growth are available in the following cities:

San Francisco, California—Successful candidate will have experience and client contacts in and around California as well as California registration. Will establish new architectural services group and be responsible for contract administration, design supervision, project administration and marketing. CADD experience helpful.

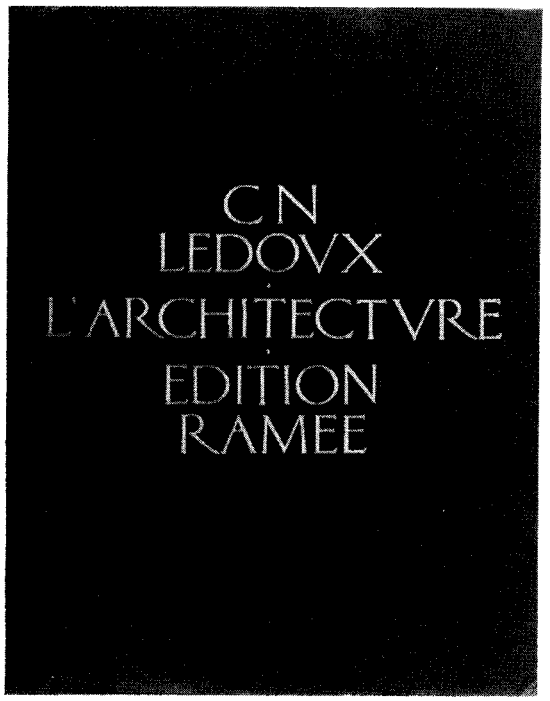
Cary, North Carolina—Candidates should be registered in the Southeast and have client contacts in and around North Carolina. Will establish a new architectural group and have considerable client contact and marketing duties. Will be responsible for design administration of architectural projects such as office buildings, shopping centers, small industrial projects, etc. CADD helpful.

Kansas City, Missouri—Architects with 3-7 years experience in the design of small industrial or commercial projects. Will be responsible for sitework, plumbing, specifications, contractor contact, and some structural design. Registration preferred.

Black & Veatch offers competitive salaries and a comprehensive benefits program. Reach your full potential in a professional design environment built on a tradition of excellence. For confidential consideration, send your resume and salary history to: Tom Grogan, Dept. PA486, Black & Veatch, Engineers-Architects, 1500 Meadow Lake Parkway, Kansas City, MO 64114.

Black & Veatch
Engineers-Architects

An Equal Opportunity Employer M/F



1★ The most important and beautiful book on the architecture of Ledoux.

Progressive Architecture

BOOK STORE

Each book has been selected for its usefulness to you in your professional practice. **Prices slightly higher in Canada. Foreign orders must be accompanied by payment.** It is not necessary to send payment with the order. Circle appropriate numbers on the Reader Service Cards in the back of this issue, add your name and address and mail. Local sales tax **must** be included with payment. Prices subject to change. **For faster service, send the card in an envelope to:**

Marie DeFelice
Progressive Architecture
600 Summer Street
PO Box 1361
Stamford, Ct. 06904

P/A Back issues

A limited supply of the following issues of P/A are available at $7.00 per Copy. **Check MUST accompany order!** Connecticut Residents Add 7½% Sales Tax.

March . . . . . .Special Issue: Foster's Hong Kong Bank/ British High-Tech
February . . . . . .Two Churches/Berlin's IBA/London Docklands
January . . . . . .33rd Annual P/A Awards
December . . . . .Beeby/Taveria/Jahn/Gehry/Entrances
November . . . . .Adaptive Reuse/Tax Credits/Substitute Materials
October . . . . . .KPF's Procter & Gamble/Apartments/ Below-ground Technology

NEW★

1 C.N. Ledoux: L'Architecture, Edition Ramee

324 pp., illus. . . . $55.00

C.N. Ledoux: L'Architecture is the finest monograph of Ledoux's work in circulation. Among the projects in this edition is the Town of Chaux and other Ledoux designs, inspired by his belief that a building should be characterized by its functions. It is reprinted as one volume, including the first English translation of Ledoux's "Prospectus" and an introduction by Anthony Vidler.
Circle B601 under Books.

2 Computers in the Architectural Office

by Natalie Langue Leighton
192 pp., illus. . . . $26.50

Gives you practical, A-to-Z know-how on using computers in an architectural practice. It spells out the details for acquiring, operating and maintaining an in-house computer system as well as provides low-cost, low-risk methods for familiarizing yourself with computers before buying a system.
Circle B602 under Books.

3 Structural Systems

By Henry J. Cowan and Forrest Wilson
256 pp., illus. . . . $16.95

This is a comprehensive guide to preliminary structural design using a minimum of mathematics and numerous illustrations to describe structural forms and their mathematics. It has a strong emphasis on graphic presentation and is an instant-access reference to structural design. Full consideration is given to the internal and external forces that a building must withstand, and the interaction of structural and environmental design.
Circle B603 under Books.

4 Architecture: Form, Space and Order

By Francis D.K. Ching.
294 pp., illus. . . . $24.95

Written to foster understanding of design concepts, this rich source of architectural prototype demonstrates how to extract the fundamental principles of form and space from the environment, whether in the architectural one views or inhabits, in architectural visualization, in drawing, or in actual design.
Circle B604 under Books.

5 Affordable Houses Designed by Architects

Edited by Jeremy Robinson,
168 pp., illus. . . . $44.50

This lavishly illustrated volume shatters the myth that architect-designed houses are more costly than developer-built houses. The superb photographs, floor plans, drawings, and details of interiors and exteriors present a wealth of ideas on how to construct beautiful and unique houses within limited budgets.
Circle B605 under Books.

6 Earth-Sheltered Habitat History, Architecture and Urban Design

By Gideon S. Golany, Ph.D.
240 pp., illus. . . . $14.95

This book explains the energy-saving advantages that earth enveloped shelters offer for heating or cooling, weather-proofing, comfort, benefits of lower land and maintenance cost, durability, privacy and maintenance safeguards against noise, strong wind, and pollution. It discusses all types of potential land uses belowground.
Circle B606 under Books.

7 Design and Planning of Swimming Pools

By John Dawes,
276 pp., illus. . . . $52.50

A comprehensive manual that describes the essential characteristics and consequent design requirements of every type of pool imaginable. Also deals in great detail with more technical matters, such as structural problems and how to solve them, finishes, filtration, circulation and water treatment, heating and ventilating.
Circle B607 under Books.

8 Architectural Rendering: The Techniques of Contemporary Presentation

By Albert O. Halse, 326 pp., illus., 2nd edition, 1972 . . . $69.00

This completely up-dated revision of the most widely used guide to architectural rendering covers all working phases from pencil strokes to finished product — and shows how to obtain the desired mood, perspective, light and color effects, select proper equipment and work in different media.
Circle B608 under Books.

NEW★

9 Shopping Malls: Planning & Design

by Barry Martland
183 pp., illus. . . . $49.95

This book presents a dynamic and rapidly evolving building form, concentrating on two aspects — design and impact. Analyzing over one hundred examples of malls, the author traces the way in which their design has evolved. Amounts to the most comprehensive and up-to-date study available on this subject.
Circle B609 under Books.

10 Rendering Standards in Architecture and Design

By Stephen W. Rich
340 pp., illus. . . . $32.50

Organized for quick reference, this book shows how to make drawings rapidly and accurately. Easy-to-read charts and step-by-step instructions guide you through each phase of perspective development. Clear explanations of special terms help in understanding theories and methods presented.
Circle B610 under Books.

SADDLEBROOK

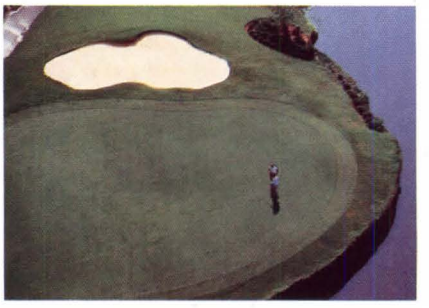
A WORLD-CLASS RESORT

Now offering Florida residences and investment condominiums

Few Florida communities promise the rich selection of residential designs and solid real estate investments found at Saddlebrook, the Golf & Tennis Resort near Tampa.

From stylish single-family homes and investment condominiums to home-sites for custom-designed executive residences, golf-front living was never better...or smarter.

Call or write C&A Investments, Inc. at Saddlebrook Resorts, Inc. Offer not valid in states where prohibited by law.



What could be more intelligent than a resort condominium that generates income...as well as personal enjoyment? You'll find both at Saddlebrook.

All homes come with complete maintenance services, 24-hour security as well as a membership to the Saddlebrook Golf & Tennis Club with its 36 holes of golf designed by Arnold Palmer, 17 tennis courts and expansive Superpool complex, luxurious spa and fine dining.

Certainly, all this sounds extraordinary, but it's just par for the course at Saddlebrook.

Condominiums from $86,000
Cluster Homes from $119,900 to $193,000
Custom Homes from $207,000
Homesites for Custom Homes from $65,000

SADDLEBROOK
The Golf and Tennis Resort
P.O. Box 7046
Wesley Chapel (Tampa), Florida 34249
(813) 971-1111
Phone Toll Free
Continental U.S. 800-237-7519
In Florida 800-282-4654

Saddlebrook
The Golf and Tennis Resort

Circle **No. 393** on Reader Service Card

Situations Wanted

Position Wanted
Architect — Planner

With 20 years diversified international experience in design and management seeks senior position or partnership. Experience includes project and contract development, negotiation and client liason, budgeting, administration and managerial skills. Work includes master plan, new townships, residential, commercial, institutional, educational and sports buildings. Winner of competitions and awards. Buildings illustrated in professional publications in U.S. and Europe. All locations will be considered. Send replies to: Box 1361-474, Progressive Architecture

Architect—NCARB Certificate, Florida registration, seeks position of responsibility and growth potential with Gulf Coast firm in architecture, construction management, or property development. Primary area of interest is housing including single family, multifamily, and institutional. Six years experience as principal in practice, project, and construction management. Relocation and required travel not a problem. Reply to Box #1361-475, *Progressive Architecture.*

Services

ACQUISITION OF LIGHTING FIXTURE COMPANY

AE CAPITAL, a New York investment bank, is representing a company, that seeks to acquire a company in the commercial lighting fixture industry. The company must be profitable and have a strong sales force and management team. The products should be at the higher end of the market. Please direct all inquiries to Linda Jessee or Martin Jaehn, 745 Fifth Ave on the 19th floor, New York, New York 10151. 212-888-6800

THE DIMENSION
FEET-INCH-FRACTION CALCULATOR
SPECIAL: $59.95 ea.
3 or more: $49.95 ea.
800-526-7228
SC Applied Technology, P.O. Box 7185
Columbia, SC 29202

RitaSue Siegel Agency™

A recruiting service to find architects, interior, graphic and industrial designers, marketing and sales support people for consultants and business. Confidential. Nationwide, international.

60 W. 55 St., New York, NY 10019
212/586-4750

UNIVERSITY DEGREES!

Economical home study for Bachelor's, Master's, Doctorate. Prestigious faculty counsels for independent study and life experience credits. Free information — Richard Crews, M.D. (Harvard), President, Columbia Pacific Univ., 1415 Third St., Dept. 2A64, San Rafael, CA 94901; Toll Free **800/227-1617, Ext. 480;** California: **800/772-3545, Ext. 480.**

Edwards + Shepard Agency, Inc. is the leading, most effective personnel placement agency for architects and interior designers. Call Valerie Glod for current listing of available candidates or submit resume for confidential interview. 1170 Broadway, N.Y., N.Y. 10001 (212) 725-1280.

Notice

Please address all correspondence to box numbered advertisements as follows:

Progressive Architecture
% Box
600 Summer Street
Stamford, Connecticut 06904

Advertising Rates

Non-display style: $135 per column inch. Approximately 35 words per inch. Column width approximately 1¾". No charge for use of box number. Situations wanted advertisements: $65 per column inch. Noncommissionable.

Display style $160 per column inch, per your layout. Maximum 8 inches. Commissionable to recognized advertising agencies.

Check or money order should accompany the advertisement and be mailed to Mary Miller, P/A Classified, 1111 Chester Avenue, Cleveland, OH 44114 (Telephone 216/696-7000, Ext. 2524).

Display style advertisements are also available in fractional page units starting at ¼ page and running to full page.

Insertions will be accepted no later than the 1st of the month preceding month of publication. Copy to be set due seven days earlier.

The White House Fellowships

A unique opportunity for outstanding Americans early in their careers to work for a year at the highest levels of the Federal Government

For more information:
The President's Commission on White House Fellowships
712 Jackson Place, N.W.
Washington, D.C. 20503
(202) 395-4522

SUPER GOLF PACKAGE

$79 Per person/per night
Double occupancy
(state tax and gratuities not included)
February 2, 1986 - May 3, 1986

Package includes (per night of stay):
- Accommodations
- Unlimited daily greens fees
- 18 holes guaranteed daily
- Advance reserved tee times
- Golf bag storage
- Daily admission to Jockey Club Spa
- Gift Set upon arrival

DIFFERENT

Select Saddlebrook for Super Golf or Tennis Holidays

Whether you want to improve your ground stroke, take a few strokes off your game or practice your backstroke in the Superpool, Saddlebrook has a special package that will help make it happen. Improve your golf game on Saddlebrook's 36 championship holes. Designed and built by Arnold Palmer and Dean Refram, Saddlebrook's golf courses are both beautiful and challenging. For tennis, Saddlebrook has 17 courts – 13 Har-Tru (five lit for night play) and 4 Laykold. Clinics and pros are available for golf and tennis, as well as complete Pro Shops. Saddlebrook is close to Busch Gardens (Tampa) and convenient to the Walt Disney World Vacation Kingdom® and EPCOT Center. Write or call toll-free **800-237-7519,** in Florida **800-282-4654** or **813-973-1111,** P.O. Box 7046 Tampa (Wesley Chapel), FL 34249.

Daily, weekly, monthly and annual rates available.

Saddlebrook
Tampa Bay's Great Golf and Tennis Resort

STROKES!

$67 Per person/per night
Double occupancy
(sales tax and gratuities not included)
February 2, 1986 - May 3, 1986

Package includes (per night of stay):
- Accommodations
- Unlimited tennis, with 3 hours guaranteed court time daily
- 45 minutes use of electronic ball machine daily
- Daily admission to Jockey Club Spa
- Gift Set upon arrival

Billie Jean King, winner at the recent Ladies Legends of Tennis Tournament at Saddlebrook.

SUPER TENNIS HOLIDAY!

Circle **No. 394** on Reader Service Card

P/A Advertisers' Index

Advertising Sales Offices

Stamford, Connecticut 06904:
600 Summer Street
P.O. Box 1361 *203-348-7531*

Peter J. Moore
Publisher

Charles B. Selden, *National Sales Manager*

Francis X. Roberts, James J. O'Brien, Donald J. Roberts, *District Managers*

Chicago, Illinois 60601:
2 Illinois Center Bldg
Suite 1300 *312-861-0880*
John M. Brannigan, Mark Nugent, *District Managers*
Gail Grzybowski, *Sales Service*

Cleveland, Ohio 44114:
1111 Chester Ave *216-696-7000*
John F. Kelly, *Western Sales Manager*
Richard A. Strachan, *District Manager*

Los Angeles, CA 91436:
16255 Ventura Blvd, Suite 301
818-990-9000
Philip Muller, Ed Sexton, *District Managers*

Atlanta, Georgia 30326:
3400 Peachtree Road, NE-Suite 811
Lennox Tower *404-237-5528*
Ronald L. Miller, *District Manager*

Houston, Texas 77401:
5555 West Loop South, Suite 505
713-664-5981
Calvin Clausel, *District Manager*

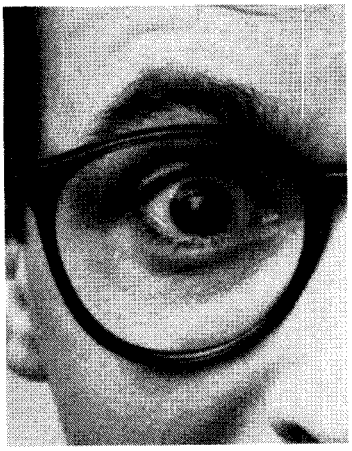
United Kingdom:
Reading, RG10 OQE, England
Wood Cottage, Shurlock Row
0734-343302
Cables:
TEKPUB, Reading
Malcolm M. Thiele
Managing Director, U.K.

Tokyo, Japan 101:
Bancho Media Service
Dai-Ichi Nisawa Bldg, 5th Fl.
3-1 Kanda Tacho 2-chome
Chiyoda-Ku
03-252-2721
Genzo Uchida, *President*

Paris, France:
Continental Europe
37 rue de Miromesnil 75008
742 66 78
Yvonne Melcher, *Manager*

Recruitment/Classified
1111 Chester Ave. *216-696-7000*
Cleveland, Ohio 44114
Mary Miller, *Sales Representative*

Frank Bodoni, regular guy



Bodoni Bold (400%)

Bodoni, Small Face (35%)

Bodoni Italic (20 degrees)

Bodoni Condensed
(50% horizontal x 130% vertical)

Bodoni Expanded
(110% horizontal x 35% vertical)

Bodoni Reversed

Bodoni Edited

Canon presents the many faces of Bodoni.

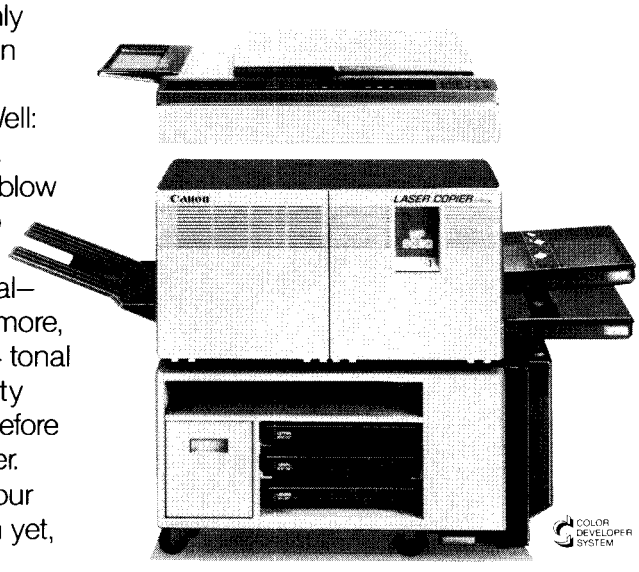
Only the Canon Laser Copier System gives you so many ways to be creative.

Canon presents a copier that does things no copier has ever done before. In fact, it does a lot of things stat cameras and studios do–only faster and cheaper. It's the Canon NP-9030 Laser Copier System.

And just what can it do? Well: Stretch an original, or squeeze it. Slant it. Shrink it down to 35%, or blow it up to 400%. Turn a positive into a negative. A negative into a positive. Edit out part of an orginal–or edit in part of another. What's more, the NP-9030 digitally resolves 64 tonal gradations, producing high-quality position-ready half tones–never before obtainable from an ordinary copier.

And while the NP-9030 is our most advanced copying system yet, it also breezes through everyday copying jobs. You get crisp, clear copies up to 11″ x 17″, and 30 letter-size copies per minute.

The Canon NP-9030 Laser Copier System. It'll put a smile on *your* face.



Canon NP 9030
LASER COPIER SYSTEM

For more information about the NP-9030, call toll free **1-800-OK CANON.** Or write **Canon, U.S.A.,** P.O. Box 5023, Clifton, N.J. 07015.

NAME

TITLE COMPANY

ADDRESS

CITY STATE ZIP

TEL (82) PAR 0486

The Canon Laser Copier System.

P/A Information Guide

On the postage-paid card facing this page, circle the numbers listed below to learn more about products and services advertised in this issue.

People who want the perfect faucet end up going to pieces.

The Amarilis Faucet System.

Even your pickiest customers will love it. Because American-Standard's Amarilis™ Faucet System lets them pick out a faucet piece by piece.

With a choice of several spouts, 5 finishes, 4 handles and 13 color handle inserts, they'll have no trouble putting together the perfect faucet.

And you'll have no trouble supplying it (our flex-set™ packaging system is simple and saves you money).

Of course, every Amarilis faucet features brass construction, washerless ceramic valving, and a lifetime drip-free warranty.

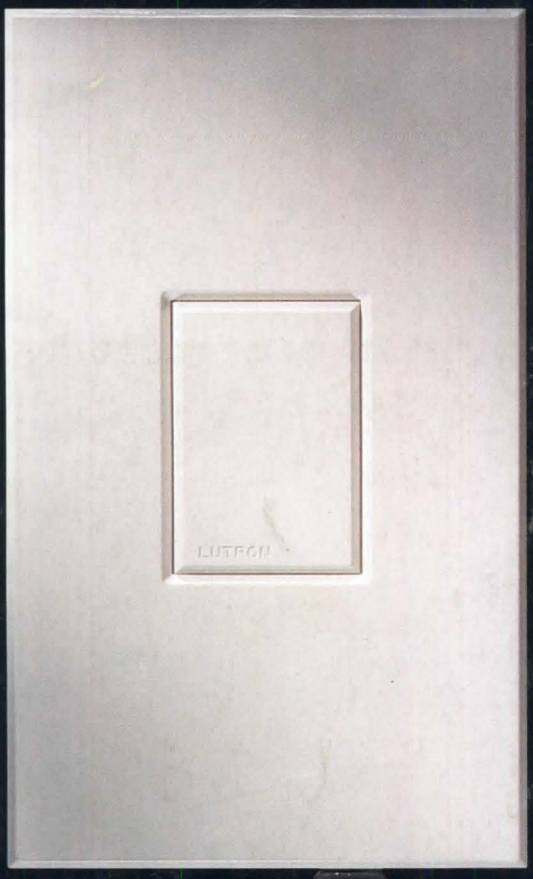
So offer your customers the Amarilis Faucet System. Nothing will make them happier than going to pieces.

AMERICAN STANDARD

Pure luxury

For our luxury products brochures, write to American-Standard, Department ARR P.O. Box 2003, New Brunswick, NJ 08903. To see Amarilis, visit our Showplaces: Chicago (3 Crossroads of Commerce, Suite 100, Rolling Meadows); Dallas (12344 Inwood Rd.); Los Angeles (116 N. Robertson Blvd.); New York (40 W. 40th St.); Pittsburgh (100 Ross St.). Or call 1-800-821-7700 (ext. 4023) for your local showroom.

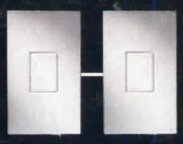
Introducing



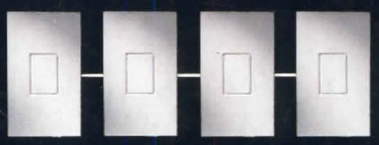
nova®
Electronic Touch-Switch

A new concept in lighting control systems.*

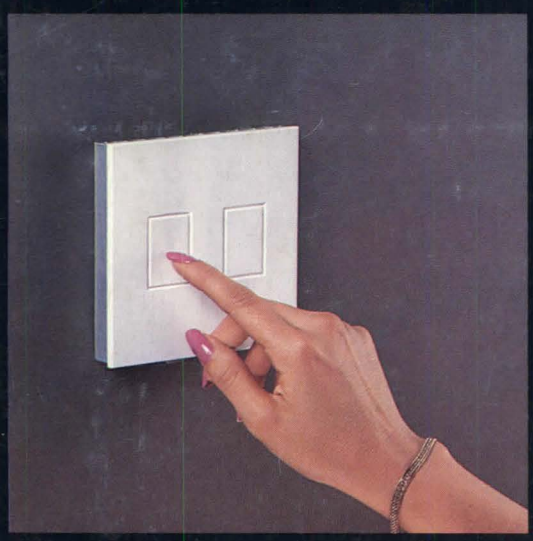
Single Location



Two Locations



Multiple Locations



Light touch, micro-travel activation

Architectural Switches

- 1 to 10 locations
- On/off control - Incandescent, Fluorescent
- 1000W capacity
- Full voltage, 120V wiring
- Full ganging and retrofit capability
- White is standard; black, gray, brown, and beige available from stock
- U.L. Listed

Call today for free color brochure
800 523-9466
800 222-4509 in Pennsylvania

Or write: Lutron
Suter Road, Box 205
Coopersburg, PA 18036

LUTRON®

* This product is covered by one or more of the following U.S. Patents: #3,442,309; 3,735,020; 3,746,923; 3,927,345; 3,824,428; 3,919,592; 3,927,345; 4,350,935; 4,207,498; 3,731,142; DES 227,557; and corresponding foreign patents. Foreign and U.S. Patents pending. Lutron, Nova, and Save Energy are registered trademarks.

Circle No. 345 on Reader Service Card