ARCHITECTURAL RECORD (Combined with AMERICAN ARCHITECT, and WESTERN ARCHITECT AND ENGINEER) (ISSN0003-858X/92) February 1992, Vol. 180, No. 2. Title ® reg. in U. S. Patent Office, copyright ©1992 by McGraw-Hill, Inc. All rights reserved. Indexed in Reader's Guide to Periodical Literature, Art Index, Applied Science and Technology Index, Engineering Index, The Architectural Index, the Architectural Periodicals Index, and the Construction Index.

Every possible effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage.

Executive, Editorial, Circulation and Advertising Offices: 1221 Avenue of the Americas, New York, NY 10020.

Officers of McGraw-Hill, Inc: Chairman, President and Chief Executive Officer: Joseph L. Dionne. Executive Vice President, General Counsel and Secretary: Robert N. Landes. Executive Vice President: Walter D. Serwatka. Senior Vice President, Treasury Operations: Frank D. Penglase. Senior Vice President, Editorial: Ralph R. Schulz.

Associated Services: Sweet's Catalog Files (General Building, Engineering, Industrial Construction and Renovation, Light Residential Construction, Interiors), Dodge Reports and Bulletins, Dodge/SCAN Microfilm Systems, Dodge Construction Statistics, Dodge regional construction newspapers (Chicago, Denver, Los Angeles, San Francisco).

Subscription rates are as follows: U. S. Possessions and Canada $47.00; Europe: $150.00; Japan: $160.00 (including Air); all other Foreign: $125.00. Single copy price for $7.00; For Foreign: $10.00. For Subscriber Services: 609/426-7070.

Change of Address: Forward changes of address or service letters to Fulfillment Manager, ARCHITECTURAL RECORD, P. O. 566, Hightstown, NJ 08520. Provide both old and new address; include zips code; if possible attach issue address label.

Guarantee: Publisher agrees to refund that part of subscription price applying to unfilled part of subscription if service is unsatisfactory. Publisher reserves right to accept or reject any subscription.

Subscription List Usage: Advertisers may use our list to mail information to readers. To be excluded from such mailings, send a request to ARCHITECTURAL RECORD, Mailing List Mgr., P. O. Box 555, Hightstown, NJ 08520.

ARCHITECTURAL RECORD (ISSN0003-858X/92) published monthly by McGraw-Hill, Inc. Second-class postage paid at New York, NY and additional mailing offices. Postage paid at Montreal, Quebec, Canada. Registration Number 9617. Registered for GST as McGraw-Hill, Inc. GST Number R123075673

Postmaster: Please send address changes to: ARCHITECTURAL RECORD, Att: Fulfillment Manager, P. O. Box 566, Hightstown, NJ 08520. THIS ISSUE is published in national and separate editions. Additional pages or separate editions numbered or allowed for as follows: Eastern Section 50Ea through 50Ed. Sunbelt Section 51S.

Minority architects

With reference to your November 1991 editorial ["Prospects for African-American Architects: A Time for Basics," RECORD, page 9], your stated "items" of truth are incorrect or misleading at best. The causes for the dropout rates of minority students are many, including racial and social reasons, along with the issue of economics that you singularly pointed out. Marketing may explain why some black architects don't succeed, but to imply that it is the only or main reason why black architects fail is, again, misleading. In your talk at the National Organization of Minority Architects (NOMA) convention, you also stated that the RECORD's staff often solicits selected architects for new or interesting work to publish. Although you told NOMA that the members should help by contacting you, how often does your publication contact African-American architects, educators, and critics? We are all too familiar with the exclusionary effects of this type of limited networking system.

Consistently, black architects have stated that racial issues have at least some part to play in their experiences in practice and in architecture education. How can you deny that these experiences and statements are true? Statistics would also suggest that something more than poor marketing, business trends, or student economics account for the low representation of African-American architects. The African-American architect is one of the least represented in the profession, comprising slightly under one percent of all architects.

You question the African and African-American cultural influences and attitudes in design. There is a host of scholarly work on the issues of these influences, although they are not presented in our schools or publications. The early slave-built structures of the South, the built works of the early African-American architects, and the works of contemporary black architects, artists, and scholars all demonstrate these attitudes and influences in work, theory, and research.

Lastly, the Booker T. Washington approach that you talk about, although loaded with a common sense type of power, has also been a consistently debatable and somewhat controversial strategy. Washington's direction has always been important to the development of African-Americans, but not always the only or best direction, as you suggest.

Bradford C. Grant, Architect
Assistant Professor of Architecture
CalPoly
San Luis Obispo, California

Value engineering

Re "Value Engineering the Disney Way" [RECORD, December 1991, pages 24-25]: to those professionals who " . . . have come away bruised by the design and value engineering process," welcome to the real world. Although Disney and Michael Eisner's recent penchant for "name" designers has focused publicity on Disney, the "chosen architects," and to some extent architecture in general, what has truly been gained? The resulting designs have neither improved the practice of architecture technologically or theoretically.

Sheldon L. Dobrin, Architect
Chicago

February 6
"Opening All Doors," ADA Videoconference at 200 sites, sponsored by the AIA [see Briefs, page 23]. 800/343-4146.

February 27
"Architectural Forum," cosponsored by Yerba Buena Gardens Marketing Alliance and San Francisco Redevelopment Agency. Speakers include architects Fumihiko Maki, James Stewart Polshek, Romaldo Giurgola, and James Ingo Freed. Esplanade Ballroom, Moscone Convention Center, San Francisco. 415/421-1553.

March 7
"Rethinking Design of the Sixties," sponsored by Architects, Designers and Planners for Social Responsibility, Parsons School of Design, and *Perspecta.* New School for Social Research, 65 Fifth Ave., New York City. 212/344-8104.

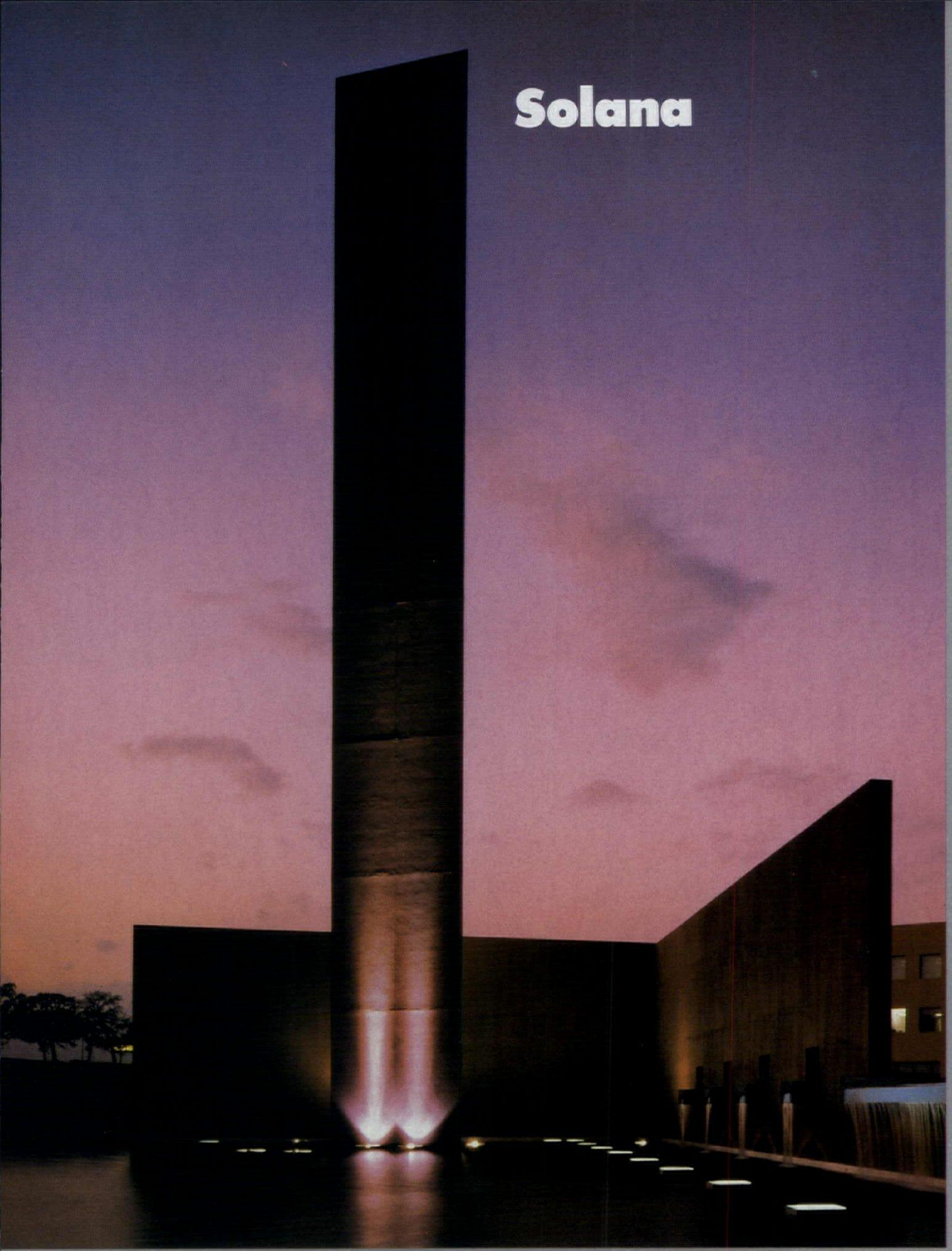
Through March 8
"Potential Architecture: Construction Toys from the CCA Collection," Canadian Centre for Architecture, 1920 rue Baile, Montreal, Quebec. 514/939-7020.

March 18-20
WestWeek '92: "Counterforce/Counterbalance: Emerging Attitudes and Aesthetics in a Changing World," the Pacific Design Center's 17th international design exposition. 8687 Melrose Avenue, Los Angeles. 310/657-0800.

Through March 23
"Frank Gehry: New Furniture Prototypes," Museum of Modern Art, 11 West 53rd Street, New York City. 212/708-9400.

May 6-8
Lightfair International, Jacob Javits Convention Center, New York City. 404/220-2136.

June 14-19
"Get Real! Four Chairs in Search of Reality," 42nd International Design Conference, Aspen, Colorado. 303/925-2257.



Reach everything under the sun on 52 Dover elevators.

Solana means "a place in the sun." This stunning office/retail complex rises from the plains on 900 acres north of Fort Worth.

Designed by an all-star team of architects, Solana is served by 52 Dover elevators. And no one is happier than Senior Manager, Operations, Jerry D. Hackney, "Dover has the right attitude, 'Get it done, get it right.'"

To get the same Dover approach on your project call your local Dover office. Or write Dover Elevator Systems, Inc., P.O. Box 2177, Memphis, TN 38101.

Solana, Westlake/Southlake, TX

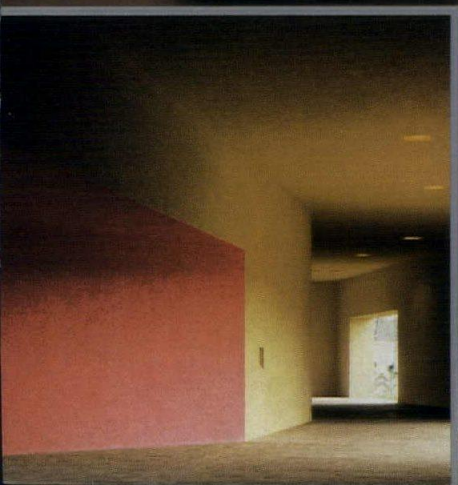
Managing Partner:
Maguire Thomas Partners

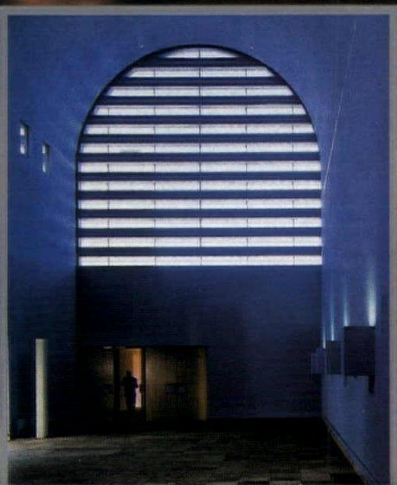
Architects:
Ricardo Legorreta Arquitectos, Mexico City
Mitchell/Giurgola Architects, New York, NY
Harwood K. Smith & Partners, Dallas, TX
Leason Pomeroy Associates, Orange, CA
Skidmore, Owings & Merrill, Los Angeles, CA

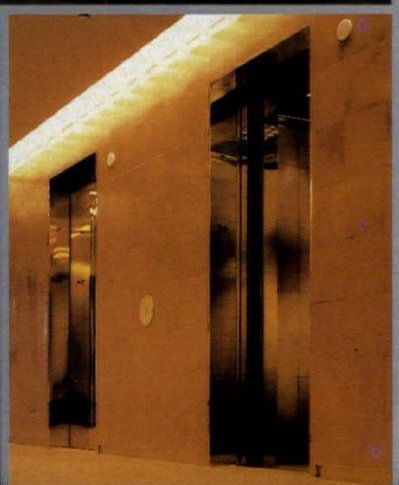
Contractor: HCB Contractors

Elevator Consultants:
John A. Van Deusen & Associates, Inc.
Lerch, Bates & Associates

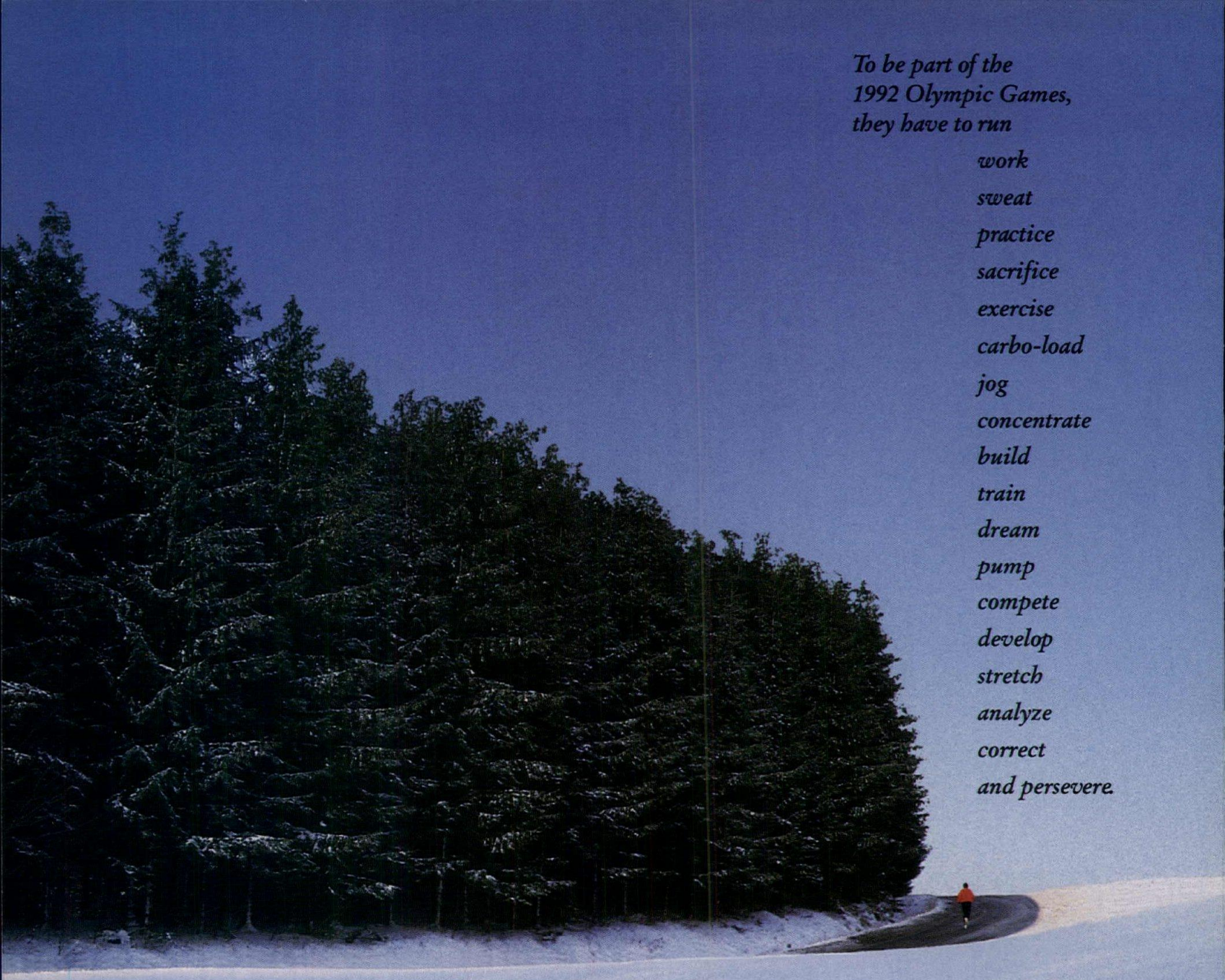
Dover Elevators sold and installed by Dover Elevator Company, Dallas, Texas







DOVER®
ELEVATORS
MAKING MORE ELEVATORS MAKES DOVER NO. 1



To be part of the 1992 Olympic Games, they have to run

work
sweat
practice
sacrifice
exercise
carbo-load
jog
concentrate
build
train
dream
pump
compete
develop
stretch
analyze
correct
and persevere.

All you have to do is buy Georgia-Pacific building products.

We're proud to be the official forest products sponsor of the 1992 U.S. Olympic Team. When you purchase G-P products, you help take American athletes to the Olympic Games. Thanks for being part of the team.

GP Georgia-Pacific USA

OFFICIAL SPONSOR OF THE 1992 U.S. OLYMPIC TEAM

Circle 3 on inquiry card

Cover:
Knoll Chair designed by Frank Gehry
Grant Mudford photo

SUPPLEMENT ON LIGHTING IS INCLUDED WITH THIS ISSUE
(with U. S. and Canadian copies only)

Forms + Surfaces®

Paleo™ (Pā'-lē-ō)

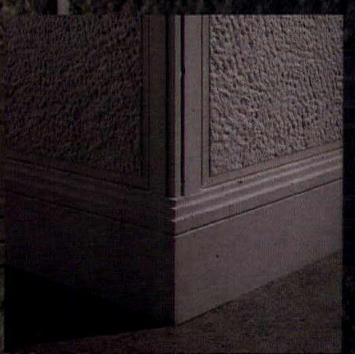
New components and textures enhance the original collection of wall panels, column covers and mouldings. Light weight and easy to install mineral composition meets Class I fire test standards. For more information and the name of the Forms + Surfaces representative in your area, call: (805) 969-7721











Total Quality Management (TQM) Gives You That Competitive Edge

Never has the concept of quality been so crucial and relevant to the business of architecture as in these bleak days of recession. Yet never has this same concept offered so much opportunity to architects in cultivating, to use manufacturing jargon, quality delivery of the architectural "product." And, frankly, never has the architectural profession needed more to build up its image as a dependable source of quality buildings delivered on time and in the money. One can only admire the full-page ad taken in *The New York Times* by a major purveyor of running shoes the day after the President returned from his Far East trip accompanied by the three car maker presidents who wanted the Japanese to give favored treatment to imported cars that few there wanted to buy. "Here's one American-made vehicle that has no problem competing in Japan," said the ad, referring to the shoe—"... when you build a product people really, truly need, something amazing happens. People buy it."

This shoemaker has for decades prided itself on its quality. But what does quality *really* mean? The greatest mistake is to think of quality as something costing a lot of money, or as some absolute standard that every product or building has to meet. Phillip Crosby, one of the gurus of the quality-management field, years ago defined the concept perfectly in his book "Quality is Free" (McGraw-Hill, 1984). In it he says that quality is *conformance to specifications.* In other words, a well-conceived, well-executed refreshment stand (such as the one designed by Max Levy for the Dallas Arboretum and winner of a Texas Society of Architects 1991 design award) can rank higher on the quality scale than a museum at $350 per square foot.

What does all this mean when translated into everyday practice? For one thing, it means a conscious, conscientious effort to bring into every firm's practice quality *assurance* and quality *control.* Quality control is a technique consisting of design checklists, comprehensive document review, reliance on manuals, and other steps that merely seek to undo mistakes already in the system. Quality assurance, on the other hand, or as it is getting to be known more and more, Total Quality Management, or TQM, entails a steadfast management effort, whatever the size of the firm, and embracing every staffer, to think quality as each project moves from programming through design, contract documents, bidding and construction.

This page is too brief for presenting in great detail the various quality-management tools available to architects. But the benefits are enormous, in terms of solidifying relationships with clients (who after all are the final arbiters of quality); in terms of time and money saved in not having to correct defective work; dollars saved in reduced errors and omissions insurance premiums; as a motivating force for every staff member; and as a mighty competitive advantage in a tough marketplace. David Ballast's excellent two-page article [RECORD, May 1991, page 34] gives a full overview, along with suggested reading (a stamped envelope will get you a copy). And those northern readers seeking an excuse for a bit of sun and warmth could do worse than sign up for the February 19-21 workshop by the Design and Construction Quality Institute in Orlando, featuring speakers from the client side as well as architects, engineers, and contractors sharing their TQM experiences (call 202-347-7474 for details).

TQM is not just another acronym. It's the road to gaining and keeping that competitive edge, at home and globally. *Stephen A. Kliment*

Some architects are joist system. And they're

No architect wants to hear that he's over budget, or that a client has called back complaining about squeaky floors. In both cases, silence is preferable.

So listen closely: If you've been specifying solid sawn joists and beams, there's a way to keep costs under control and design a better floor at the same time.

Specify engineered I-Joists and Gang-Lam® laminated veneer lumber beams from Louisiana-Pacific.

L-P's engineered wood products are longer and stronger than solid sawn lumber, so it takes fewer of them to do the same job. Floors and roofs framed with L-P I-Joists can usually be spaced 24" o.c., as compared to 16" o.c. for solid sawn lumber. All told, the savings on material, nails, glue, and labor could add up to as much as 36%.

And the finished product is a stiff, quiet, predictable floor.

switching to a less expensive keeping it quiet.

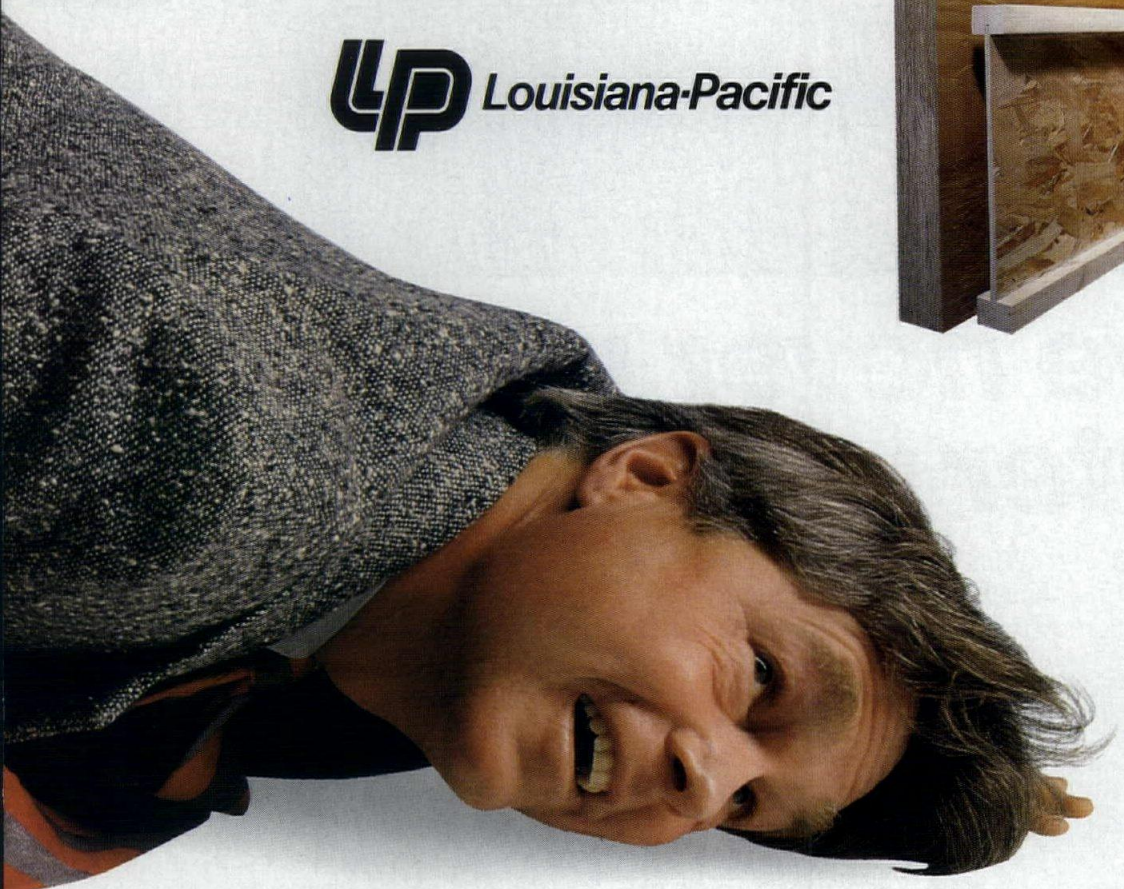
With L-P's I-Joists and Gang-Lam LVL beams, the idiosyncrasies of solid wood are engineered out. There's no crowning, shrinking, twisting, splitting, or warping – all the things that ultimately cause bouncy, squeaky floors.

One last word: All our engineered products are made from small- and medium-diameter fast-growing trees. So when you choose them over solid sawn lumber, you're helping to reduce our country's dependence on old-growth forests.

Because we believe in happy clients, affordable products, and quiet floors, we have no intention of keeping silent about our engineered wood products.

For more information, call us from east of the Rockies at 1-800-999-9105 in Wilmington, NC; west of the Rockies at (208) 772-6011 in Hayden Lake, ID; or 1-800-223-5647 in Red Bluff, CA.

Louisiana-Pacific



XEROX

We've never met a computer we didn't like.

Computers are sometimes difficult to get along with. Each one is, well, unique. And with different operating systems and software, they can be downright peculiar.

So the last thing you need is a fickle plotter.

With this in mind, we've designed a whole host of connectivity solutions. To suit just about any computer. In any configuration or environment.

Which means we can give you the same outstanding performance whether you use mainframes, minis, workstations or PCs.

What's more, we can support everything from RS-232 and Centronics to our own high performance parallel interface.

And Versatec plotting systems support more data formats than anyone else. Like HP-GL/2, 906/907, VRF and VCGL. So you can easily run the most popular CAD software packages.

We even have software that manages network plotter workflow. Just the thing to make your network more productive.

And every solution comes with the industry's only three-year guarantee. If you're not satisfied for any reason, we'll replace it free. No questions asked. It's just what you'd expect from Xerox Engineering Systems. The leading supplier of engineering copiers, printers, Versatec plotters and other products for document management.

So give us a call at 800-538-6477. In California, call 800-341-6060. Or write for a free copy of our connectivity guide.

You'll find us very accommodating.

XEROX

The engineering document company.

Xerox Engineering Systems

2710 Walsh Ave., Santa Clara, CA 95051 Xerox is a trademark of Xerox Corporation. All other brands or products are trademarks of their respective holders. © 1991 Versatec, Inc.

Circle 6 on inquiry card

The Grand Performance of EIFS

The remarkable performance, light weight, economy and ease of application of Sto wall systems, and a range of nearly 400 colors and textures, provide incomparable results in new structures and the inspiration to renew older ones. Consider St. Enoch Center, in the heart of chilly Glasgow.

Sto wall systems and finishes were utilized along with other energy efficient materials for this massive 280,000 sq. ft. urban mall. The results: a stunning appearance and outstanding thermal efficiency. The proof: the heat needs to be turned on only four days a year and the mall enjoys capacity crowds.

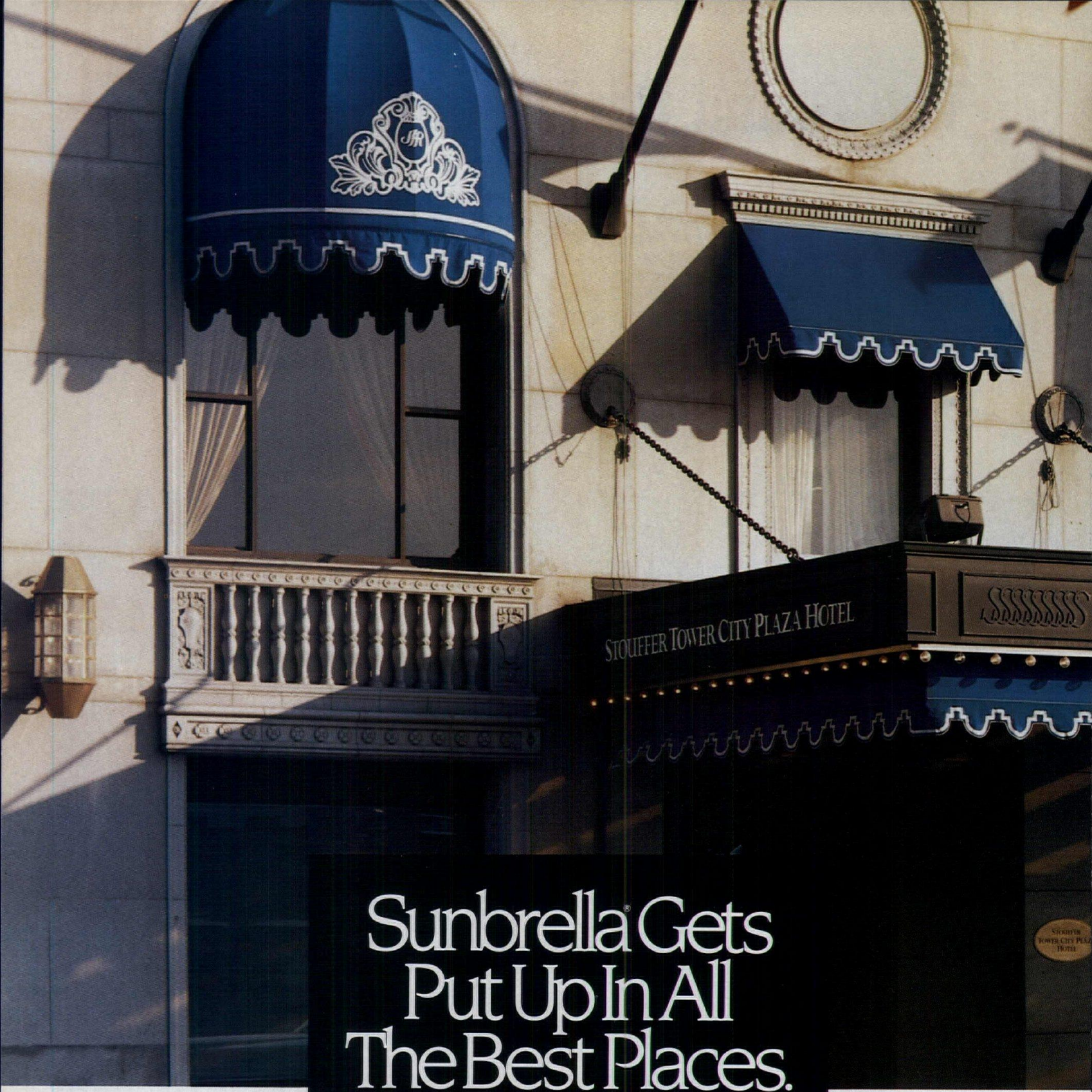
St. Enoch Centre Glasgow, Scotland; Architects: Reiach and Hall, G.M.W. Partnership

100% ACRYLIC POLYMERS

Circle 7 on inquiry card

sto®

Sto Industries
Atlanta, GA; Tel: 800-221-2397
A division of Sto Corp., the Systems Technology Organization



Sunbrella® Gets Put Up In All The Best Places.

From grand hotels to office buildings to shopping centers to restaurants, most any building can accommodate Sunbrella acrylic canvas or Sunbrella Firesist® canvas. Sunbrella Firesist meets the specifications of the National Fire Protection Association and the California Fire Marshal's test.

Both fabrics are ideally suited for customized graphics, backlit or not. And indoors or out, our fabrics are perfect for everything from awnings to canopies to privacy screens to cabana covers, and we always have a design to suit. Sunbrella is available in over 90 handsome solids, stripes and patterns—more than any other acrylic—and Sunbrella Firesist is available in 23 styles.

But more than looking great, our fabrics are incredibly tough. Since they're solution-dyed acrylic, they retain their colorfastness and strength for years. And they resist damaging mildew and mold attacks. So it's no wonder we offer the best five-year limited warranty in the business.

Fact is, Sunbrella is the #1 acrylic awning and marine fabric in America, which means you can specify it without reservation. Just look in the Yellow Pages under "Awnings and Canopies" for the name of the dealer nearest you.

sunbrella
GLEN RAVEN MILLS, INC.
Quality...every stitch of the way®
MADE IN U.S.A.

Sunbrella Firesist®

Glen Raven Mills, Inc., Glen Raven, NC 27217

®Registered trademark Glen Raven Mills, Inc. All fabric treatments made of Sunbrella Firesist

Circle 8 on inquiry card

Shoppers' Oasis

Store entrance canopy membrane structure
H.E. Butt Grocery Company, Laredo, Texas.
Architect William H. Triplett, AIA.

A giant membrane structure shades shoppers by day...brightens the skyline by night.

When H.E. Butt Grocery Company, Texas' legendary food chain, was planning a new superstore for Laredo, Texas, they decided a huge shade structure could be an important attraction for customers in that hot part of the world. Their architect and Helios Industries' designers developed the spectacular tensioned membrane structure pictured here. Besides providing shade and shelter from rain, the 80' tall structure also gives the store a highly visual identity both day and night.

In the past twenty-five years structures of tensioned membranes have proved their usefulness in a variety of applications in every sort of climate. Their very special attribute is the ability to span great distances between upright supports. Another is translucency, which reduces electric lighting needs by day, and with underside lighting, provides a welcoming luminous glow at night.

Large membrane structures are widely used for amphitheaters, gymnasiums, shopping malls and sports facilities. Smaller structures are popular as park performance stages, playground or picnic shelters, and open-air structures for outdoor dining or lounging.

Helios Industries, Inc., the International Operations Division of Taiyo Kogyo Corporation, is a world leader in developing new technologies in the design and fabrication of fabric membrane structures. Our expertise and experience in membrane structures is ready and available to assist you. For more information or assistance with a specific project, please call or write:

Helios Industries, Inc.
20303 Mack Street
Hayward, California 94545, U.S.A.
Facsimile: (510) 887-0134
Telephone: (510) 887-4800

Helios Industries, Inc. has local representatives in the following countries:

Spain: Boetticher Y Navarro, S.A. (BYNSA)
Avda. De Andalucia, Km.9
28021 Madrid, Spain
Facsimile: (1) 796-6892
Telex: 47964 BYNSAE
Telephone: (1) 797-8266

Hong Kong: L.F. Sam (H.K.) Ltd.
7/F First Commercial Bldg.
33-35 Lighton Road, Hong Kong
Facsimile: 834-5283 / 836-0134
Telex: 62872 LFSAM HX
Telephone: 891-8448

Helios Industries, Inc.
International Operations Division

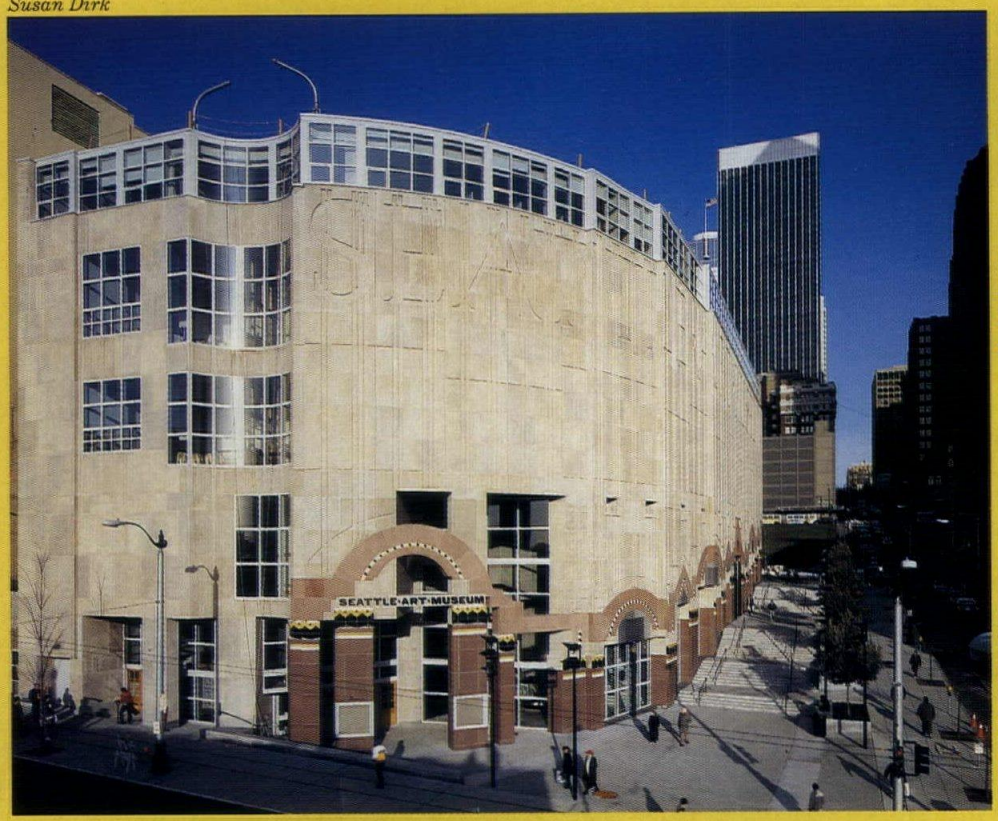
Taiyo Kogyo Corporation

Circle 9 on inquiry card

Washington

Complexity and Contradiction at New Seattle Art Museum

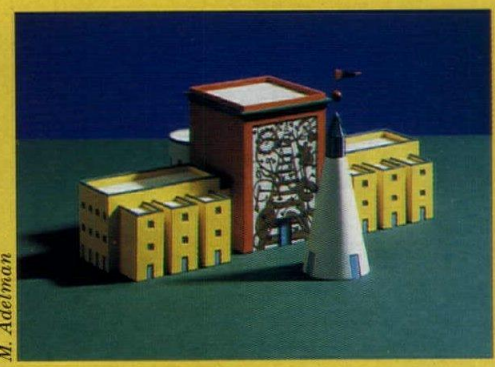
Susan Dirk



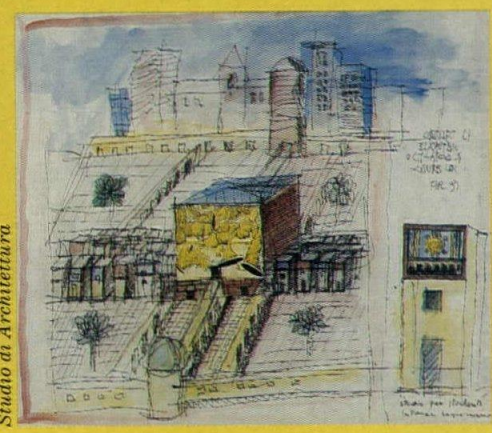
Robert Venturi and Denise Scott Brown are treading familiar ground at the new Seattle Art Museum, which opened in December. The museum appears both big and small, monumental yet inviting. "I guess I like the 'both/and,' " says Venturi. Many of the building's contradictions stem from the nature of the commission itself: the new building sits on a steep slope at the edge of downtown, bordered by skyscrapers and humbler commercial buildings. To bridge the slope and fit into this disjointed scale, Venturi and Scott Brown used the full range of unabashed decoration and signage as well as the subtle compositional shifts that have made their work famous. The 155,000-sq-ft, $62-million building is basically a granite-clad box, except for the south side, a gently curving facade into which the museum name is cut in 14-foot-high letters. A grand flight of steps, not unlike those that grace VSB's Sainsbury Wing, spills from inside to outside while connecting entrances at different levels. Fanciful Moorish arches, painted Chinese red on one side ("This is the Pacific Rim, after all," says a museum official), frame the interior progression; multicolored terra-cotta tile panels line the outside path. This playful grandeur regrettably breaks down as one attempts to enter the upper-level galleries, accessible only by fire stairs or elevator. These galleries, by curatorial mandate, are lightless containers for the eclectic collection. Only in the central corridor, a gently curving spine that entices visitors tightly through two columns and then releases them to a view of the harbor through a concave window, does the baroque eloquence of the team's architecture return. *Aaron Betsky*

New York

Rossi Art School for the South Bronx



M. Adelman

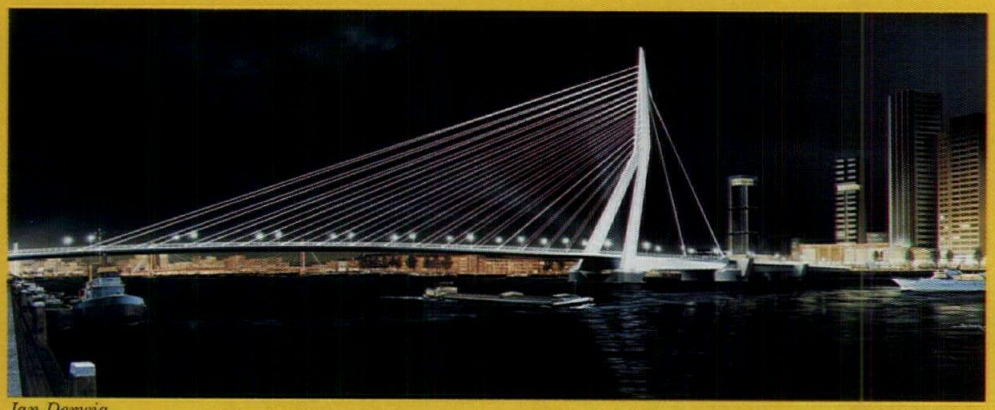


Studio di Architettura

Aldo Rossi's proposed South Bronx Academy of Art, a 30,000-sq-ft alternative high school, is clustered at one end of a walled park located in a devastated but slowly rebuilding community. The school shares an unusual block with a Dominican cloister and a juvenile detention facility. Rossi's client and collaborator in the $5-million project—on a city-owned lot—is artist Tim Rollins and Kids of Survival (K. O. S.), neighborhood teenagers deemed "learning disabled" whom Rollins leads in after-school arts activities. A lighthouse commands the entrance to a square five-story main building featuring a K. O. S. mural and flanked by buildings containing offices and classrooms; the school library is in a small tower to the rear. Now in fundraising, Rossi's building blocks could become learning and play tools for a truly appreciative audience. *P. D. S.*

The Netherlands

Rotterdam Drawbridge Opens Redevelopment Push

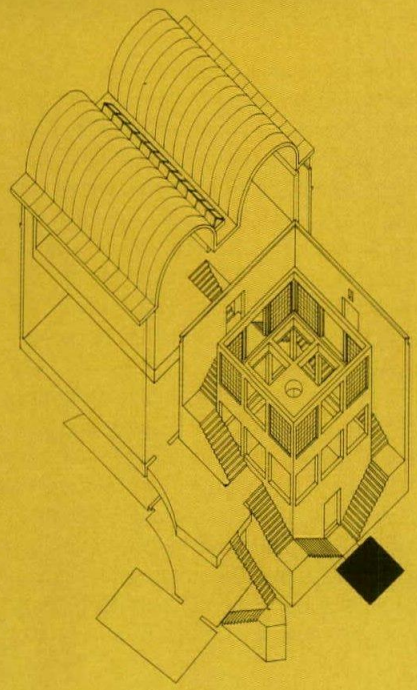


Jan Derwig

For its new bridge across the River Maas, Rotterdam, the world's busiest port, has chosen a design with a single inclined 430-foot-tall pylon. The bridge, designed by young Amsterdam architect Ben van Berkel, is the centerpiece of an extensive redevelopment of the port, rebuilt after German bombs flattened it at the outset of World War II. The span is the first that ships encounter as they enter the city from the sea. The bridge connects the modern city center with the former harbor area on the south bank of the Maas, know as Kop van Zuid. This ambitious waterfront rehabilitation project will take 10 years to complete. It includes 5,300 mixed-income housing units, 1.2 million sq ft of high-rise offices and 450,000 sq ft of retail and government buildings. Extensive street and mass-transit renovation is also planned. The main span of the bridge, with a deck only seven feet thick, measures 900 feet; the longest stay cable is 1,000 feet and consists of 121 steel strands. A 160-foot segment—the longest in Europe—opens to allow ship passage. The $170-million project is to be completed in 1995. *Tracy Metz*

South Korea

New Museum Honors Korean Master Painter



The Whanki Museum in Seoul, by Cambridge, Massachusetts-based Korean architect Kyu Sung Woo, pays homage to its artist namesake, Kim Whanki, by mixing traditional Korean courtyard design with a series of discrete modern spaces. The complex includes permanent and temporary exhibition halls, offices, and a visiting artists' residence. Set in a valley on Seoul's northern edge, the museum is bounded on two sides by houses and by a mountain on a third. Circulation paths among the buildings combined with terraced landscaping reinforce a shifting composition. The main hall is a square embedded in the earth and lit by an oculus. Stairs wind around it, providing access to each level, while water flows down granite walls, adding its sound to the sensation of movement from lower darkness toward an upper light. ■

Design

Briefs

Awards

The 30-year-old practice of James Stewart Polshek and Partners of New York City won the American Institute of Architects Architecture Firm Award for 1992. (For a list of 1992 AIA Honor Award winners, see page 21).

Projects

• JSK/Perkins & Will International, Norman Foster Associates, Skidmore Owings & Merrill, and Hellmuth Obata & Kassabaum are four of the names being quietly bandied about as design participants in a fierce eight-way competition for a huge new Hong Kong airport. Island business and government leaders have been pushing the project for a decade, but the last major planning hurdle wasn't removed until last fall, when the mainland dropped certain objections. The Hong Kong government has established a statutory body, the Provisional Airport Authority, to oversee the estimated $1.7-billion airport, named Chek Lap Kok, which is to be built on a large dredge-and-fill island.

• The Canadian firm of Zeidler Roberts has been named to replace the Richard Rogers Partnership as architects of the Christopher Columbus Center of Marine Research in Baltimore.

• The Walt Disney Co. has finally settled on Anaheim as the future home of a new multi-billion-dollar resort, after pitting the home of Disneyland against the city of Long Beach in a pitched battle for the plum project [Design News, RECORD, July 1991, page 65]. Infrastructure and land-use planning and environmental review processes are under way.

Archive established

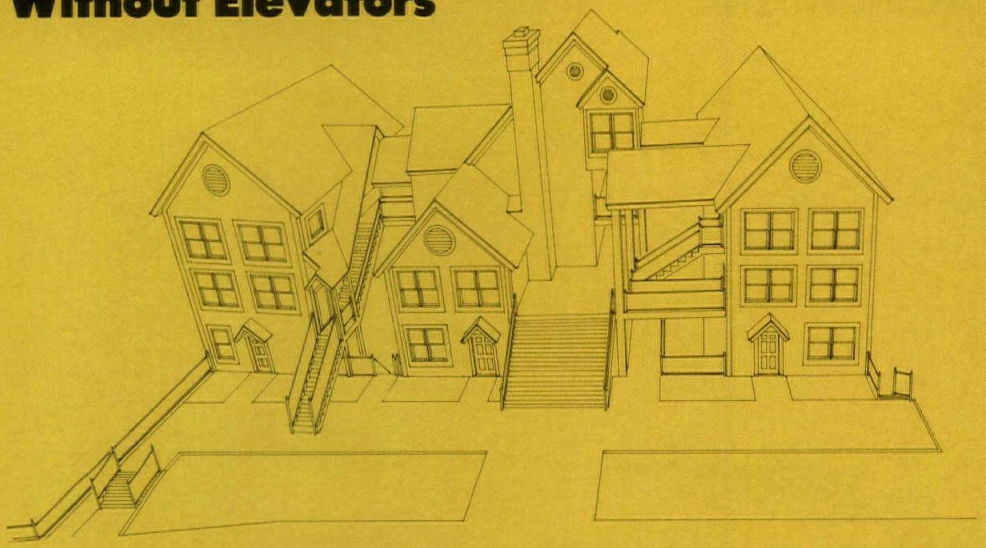
The Cooper-Hewitt National Museum of Design is establishing a research archive of contemporary African-American design and designers, including published materials, taped interviews, letters, and visual documentation. For information, contact Ethel W. Williamson, Department of Decorative Arts, Cooper-Hewitt Museum, 2 East 91 Street, New York, N. Y. 10128; 212/860-6960.

Prizes

The Queen of Denmark, the New Carlsberg Foundation, and the Danish Center for Architecture have established the Carlsberg Architectural Prize, a biennial award worth some $225,000 to its honoree. The first award will be given this spring. ■

New York

Yonkers Housing: Accessibility Without Elevators



"The client wanted an assemblage of houses, not just housing," says Connecticut architect Duo Dickinson of this 15-unit complex in nearby Yonkers, New York, for homeless families. "The last thing they wanted was a 'project.' " The client, Cephas Housing Corp., a church-based nonprofit community-development group, wanted the design of the 10 three-bedroom and five smaller units, which blend in with rowhouses across the street, to help instill "pride of occupancy" in the preselected tenants. The program for the 16,000-sq-ft, $1.6-million development stipulated no elevators, common corridors, or lobbies, calling instead for an exterior entrance for each unit. Despite its location on a steeply sloping quarter-acre vacant lot (now a trash pit), the scheme meets accessibility requirements with three units at grade and one reachable by ramp. Construction should begin early this spring. *P. D. S.*

New York

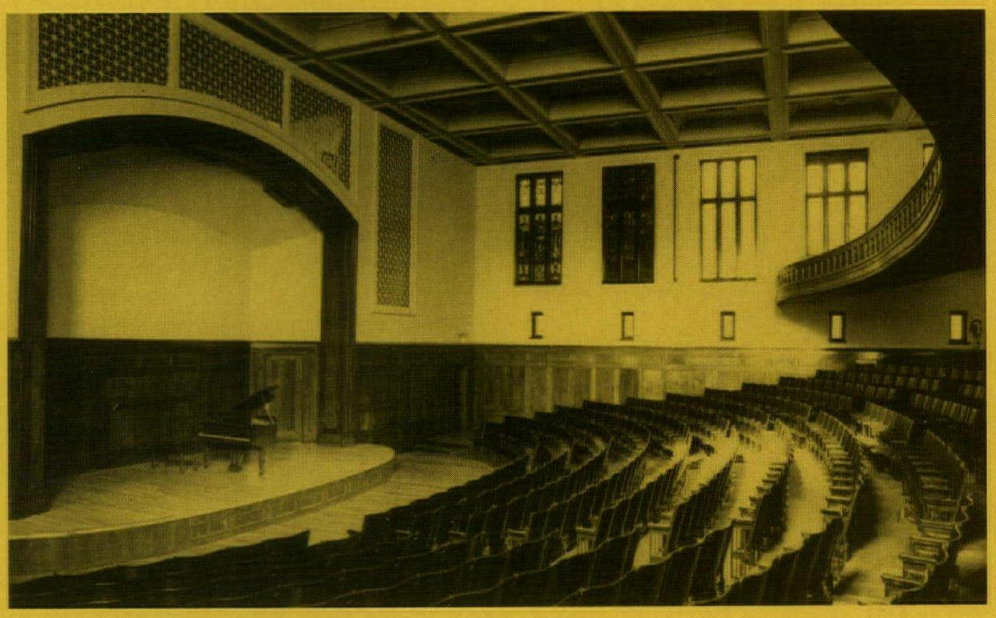
UN Commemorates Its Architects

Wallace K. Harrison and his Board of Design got their names on a plaque commemorating their work as the team that designed the United Nations buildings in New York City 40 years ago. Former Secretary General Javier Pêrez de Cuéllar said that so far as he was aware this was "one of the few creative triumphs produced by the work of a committee." He quoted Le Corbusier, one of the design team, as saying: "There are no names attached to this work—there is simply discipline." The Board of Design also included Sweden's Sven Markelius, Brazil's Oscar Niemeyer, and Britain's Howard Robertson. *S. A. K.*

United Nations

Missouri

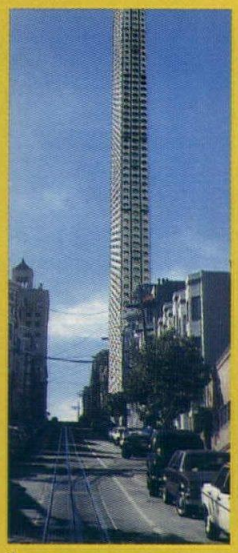
Curtain Still Rises at Sheldon Theater



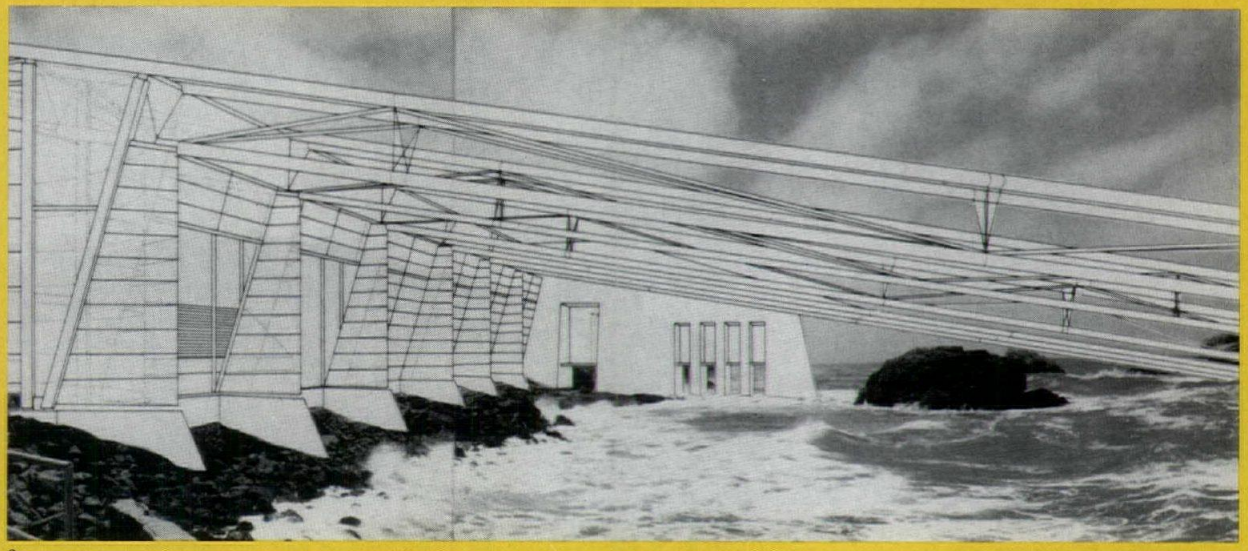
The Sheldon Theater, a 1912 landmark in St. Louis's reviving Grand Center district that was threatened with closure last year, is being expanded to the tune of 42,000 sq ft in an adjoining, now-vacant parking facility. The first phase of the project, to be finished this October and designed by Professor Lorens Holm of Washington University School of Architecture in conjunction with David Davis Associates of St. Louis, includes construction of a 10,000-sq-ft glass-enclosed atrium. The atrium, which includes a 150-seat black-box theater, provides much-needed handicapped accessibility to the Sheldon. Only minor cosmetic restoration to the concert hall is planned, to avoid interfering with its acoustics. The remaining program, to be completed by 1998, includes exterior restoration, new workshop space, and a recording studio. ■

California

San Francisco MoMA Explores Moribund(?) Modernism



1

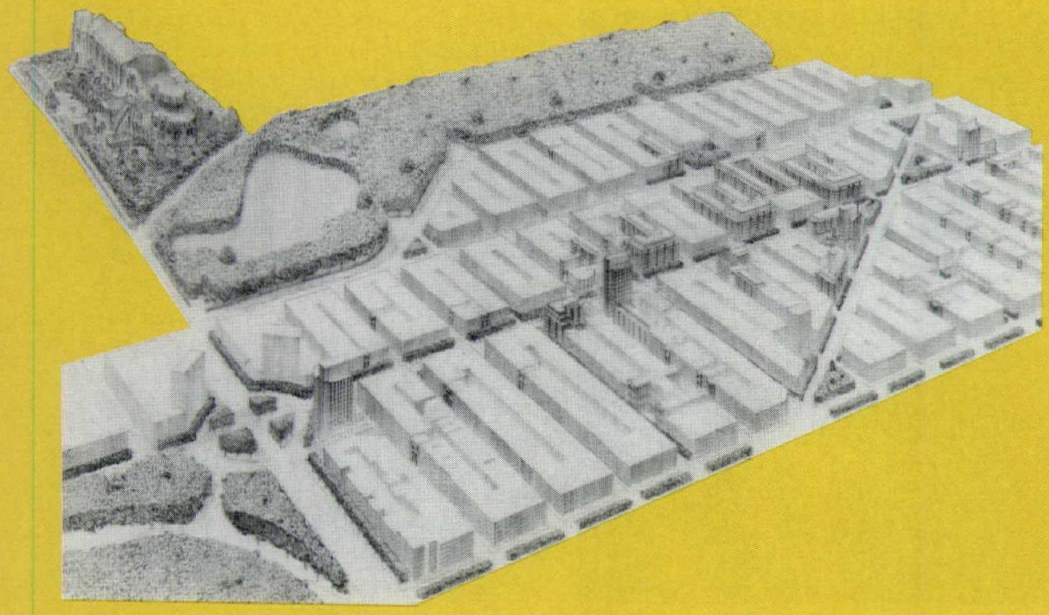


2

"Modernism," says San Francisco Museum of Modern Art curator Paolo Poledri, "is about incorporating modern technologies to design buildings that are cheaper to build and maintain and more pleasant to inhabit." Putting himself to the test, Poledri this fall invited four local firms to participate in "In the Spirit of Modernism." Focusing on the work of Tanner Leddy Maytum Stacy, Jim Jennings, William Stout, and James Shay, the exhibit shoves aside the notion of a moribund Modernism that never had a place in the self-consciously cute Bay Area. Along with built works, the architects contributed theoretical projects. Especially notable were Tanner Leddy Maytum Stacy's proposal for the resurrection of the Sutro baths *(2)*, which, coupled with a desalination plant, bridges the city's steep cliffs and uses technology to reveal landscape. Also strong was Jim Jennings 100-story polymer-skin skyscraper on a 100-by 30-foot lot, stabilized by a musclelike set of plungers and wires, with maglev elevators and greenhouse. *Aaron Betsky*

New York

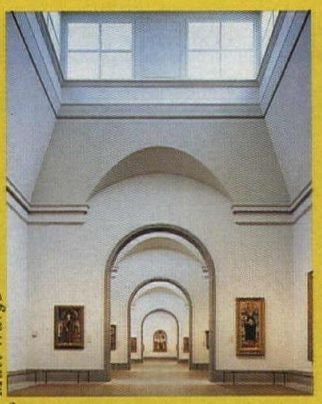
Harlem Renaissance Begins in Streetscape

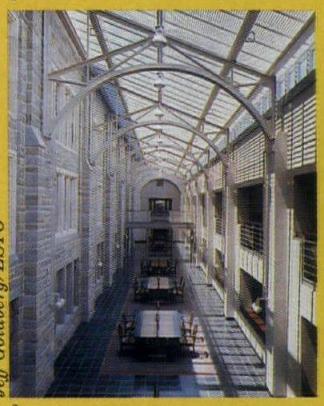


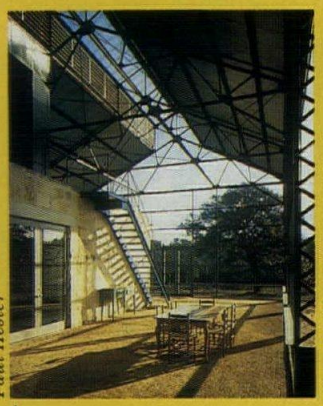
Addressing a 46-block area crammed with most known urban ills, a Manhattan firm has proposed 2,500 units of new housing on large and small sites (and a nearly equal number of rehabbed units); 100,000 sq ft of commercial space; a new park and open-air market; SRO hotel; community theater; employment center; and YMCA. "Boulevard Manhattan," a revitalization scheme for Frederick Douglass Boulevard (a grand Harlem avenue gone to seed) was the theme of a recent exhibit at Columbia University and the latest in the School of Architecture's "Miniseries" of publications. The Hudson Studio—Roy Strickland, Linda Gatter, August Schaefer, and Carolyn Carson—devised the plan for the Harlem Urban Development Corp. "We wanted to create a new avenue for New York," says Strickland,"to create a neighborhood focus for people." *P. D. S.*

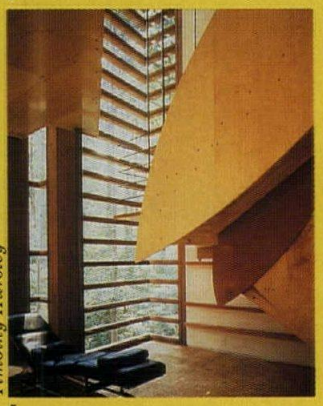
Ten Buildings Receive 1992 AIA Honor Awards

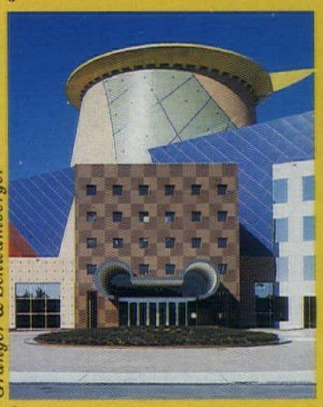

Timothy Hursley
1

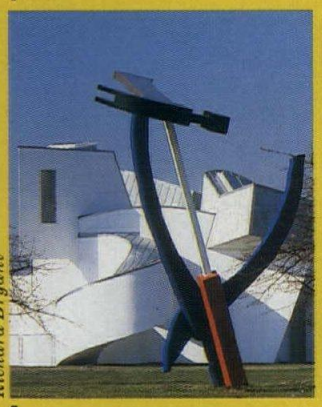

Matt Wargo
2

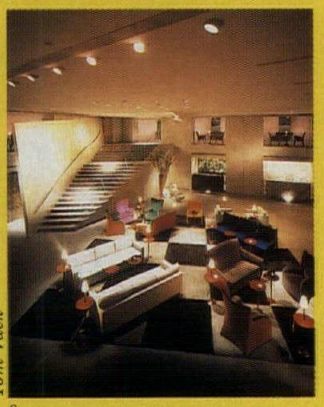

Jeff Goldberg/ESTO
3

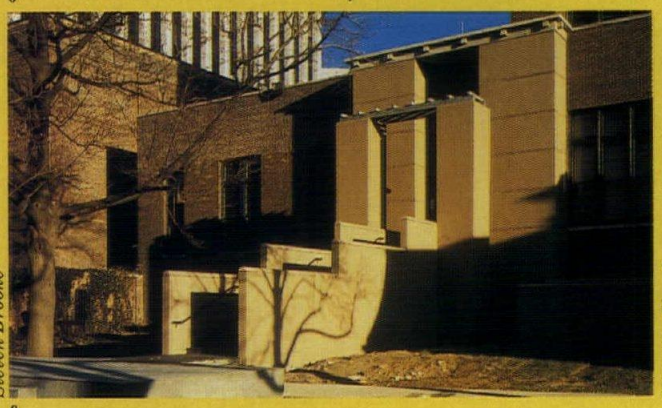

Paul Hester
4

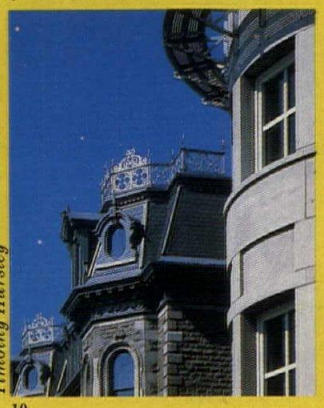

Timothy Hursley
5


Granger & Schwamberger
6


Richard Bryant
7


Tom Vack
8


Steven Brooke
9


Timothy Hursley
10

Ten projects received 1992 American Institute of Architects Honor Awards at last month's Accent on Architecture. Jury chairman James Freed praised both the quality of submissions and range of winning projects as reflecting "widely varying approaches to and philosophies of architecture."

1. Croffead House, Charleston, South Carolina; Clark and Menefee Architects [RECORD, *Mid-April 1990, pages 42-47*].
2. National Gallery Sainsbury Wing, London; Venturi, Scott Brown and Associates [RECORD, *October 1991, pages 72-79*].
3. Firestone Library Expansion, Princeton, New Jersey; Koetter, Kim & Associates.
4. Carraro House, Kyle, Texas; Lake/Flato Architects [RECORD, *April 1991, pages 86-91*].
5. House Chmar, Atlanta; Scogin Elam and Bray Architects [RECORD, *April 1991, pages 76-85*].
6. Team Disney Building, Lake Buena Vista, Florida; Arata Isozaki & Associates.
7. Vitra International Furniture Manufacturing Facility & Design Museum, Weil am Rhein, Germany; Frank O. Gehry & Associates.
8. Paramount Hotel, New York City; Haigh Architects with Philippe Starck [RECORD, *January 1991, pages 72-75*].
9. Newark Museum, Newark, New Jersey; Michael Graves Architect.
10. The Canadian Centre for Architecture, Montreal; Peter Rose Architect [RECORD, *August 1989, pages 57-61*]. ■

Recession Strategies

Six Steps to Surviving the Recession

New times demand new strategies, and at a breakfast panel in the resplendent Starlight Terrace of New York's Waldorf-Astoria last fall, the urgent lessons put on the table were as down to earth as the heaping plates of scrambled eggs and bacon placed before several hundred construction-industry leaders. The panel at "Recession Forecast: How to Survive Until the Turnaround," organized and led by attorney Barry LePatner (left above), included New York State Lieutenant Governor Stan Lundine (right), architect and AIA President-Elect Susan Maxman, and New York City Commissioner of Business Services Wallace Ford II.

While the politicians tried to sound encouraging, Maxman and LePatner each pointed the way to different—but interdependent—changes in practice necessary for survival. For Maxman, who called on architects to draw on their "fundamental optimism," those changes are rooted in sound environmental thinking and fiscal management. She urged architects to shape not just their design work but also their practices in response to micro and macro ecosystem requirements. "We have an obligation to evaluate all of our projects in terms of how they enhance the quality of life of the user... [and] a direct responsibility to design in the most efficient and resourceful way." She called for an architecture of "appropriateness" in the 1990s.

Barry LePatner wasted little time getting down to the nuts-and-bolts of his speech: a six-point survival strategy. *(1)* Avoid taking on bad business; it is not true that *any* business is better than *no* business. Yet *(2)*, staying in business over the long term is more important than current firm size. To that end *(3)*, "aggressively pursue monies due you." *(4)* Much of the best talent in the field is out looking for employment. Don't ignore this resource. *(5)* "Marketing is everything in a recession"—i. e., it's the groundwork for future growth. LePatner gave the most weight to the sixth point in his program: strong consideration of merger and acquisition as the best way for firms to take advantage of "the vast amount of new, post-recession business to come.... Mergers and acquisitions make enormous sense today—no matter what the size of your business." Drawing an important distinction between what he had in mind and the debt-laden M&A frenzy of the 1980s, LePatner pointed out that instead these new unions "will help strengthen capital resources, improve cash flow, and allow firms to acquire new talent."

What these two presentations had in common was an emphasis on responsiveness and responsibility as the keys to not simply surviving the recession, but also to prospering beyond it by adapting to future design and business needs. *P. D. S.*

Services

Insight, Hindsight at Two Conventions

"Develop joint ventures," was an answer for even the large architectural firms seeking work from big corporations these days, according to a client panel at the Professional Services Management Association's annual meeting in Chicago on November 6-8. Other hints reported by Advanced Management Institute for Architecture and Engineering head Louis Marines: Do not expect so much work from IBM in the near future, according to Big Blue's Donna Gibbons. But Humana projects $242 million in construction in 1992. Representative Jack Lane emphasized that at least one firm in a partnership must have done work for the health-care group before: "We're looking for codependencies." Added Jeff Markowitz of developers Draper Kamer: "We check references thoroughly."

Health care, corporate interiors, aviation, and internationl work are the fields that have helped Perkins & Will's net fees grow from $9.6 million in 1986 to $35 million in 1991, said former chairman Robert Barnes. Another key to P&W's success: a merger with giant engineering firm Dar al Handasah.

Awards in PSMA's annual program included the Sear-Brown Group for finding the right balance of branch control and autonomy; Morris & Ritchie for revamping itself to meet the changing times; David Jay Flood Architects for quality control; and Freese and Nichols for employee management. (The jury was headed by Warzyn, Inc. chief executive Charles Stoll and consisted of PSMA head Robert Bailey, Louis Marines, CH2M Hill head O. C. Tiretta, and RECORD's Charles Hoyt.

"Taking on too much hampers effectiveness," said keynote speaker Dr. Robert Kriegel at The Society for Marketing Professional Services' annual gathering in Washington, D. C., September 3-6.
For the results of its awards program see pages 28-29.

Construction

Six (More) Steps to Recession Recovery

A new study issued by the New York Building Congress, a nonpartisan public policy coalition of labor and business leaders and governmental organizations, has charted the effect of the recession in the construction industry on the economy of the region as a whole. Although similar studies have yet to be undertaken elsewhere, this report, titled—somewhat optimistically—"Fast Track to Recovery," is significant beyond its regional purview. Through analysis of New York City's boom 1980s and bust early 1990s, it ties construction spending and employment to the rest of the city's economy, rather than treating it as an isolated sector, and shows the fuel that building activity can inject into—or drain from—a region. The report, put together by Urbanomics, a New York consulting firm, found that each construction dollar generated over two dollars in economic activity, and each construction-site job has a similar doubling effect. In contrast, industry losses bled the city's economy of nearly $3 billion and over 27,000 jobs in 1991. "What surprised us most," says Louis Coletti, president of the Building Congress, "is that this multiplication effect is so large." Despite some differences, Coletti added, the basic thrust "would be consistent across the country." The report uses its own ammunition to propose a six-point program of increased funding, expedited capital-development programs, and expanded tax incentives, the most brazen of which is a four-year freeze on commercial real-estate (and associated transaction) taxes in the city. The authors claim the disincentive to build caused by these taxes can actually result in reduced revenue, and New York Mayor David Dinkins is considering the proposal. ■

Alliances

AIA, Sweet's Launch New Electronic Spec-Writing System

A new electronic specification-writing system allows architects and engineers to produce construction documents efficiently using the MASTERSPEC database. The new system is a joint venture of the American Institute of Architects and the Sweet's division of McGraw-Hill, which also publishes ARCHITECTURAL RECORD.

The AIA/Sweet's SPECSystem was developed primarily for architecture and architecture/engineering firms concentrating on creating spec systems for large-scale projects such as institutional, industrial, and office buildings. Available in a CD-ROM format, SPECSystem is a "knowledge-based" specifications system that includes over 400 sections geared to CSI divisions 1-16. Following a logical decision-making order that derives from the specifier's response, the system presents a series of questions in each section to obtain appropriate product options along with context-specific tutorials. Upon selection, the system automatically assembles and edits each section.

Especially useful is the audit trail the system creates, which keeps a complete record of the specification-development process for each section. The user benefits from SPECSystem's high degree of automation, which allows both customized project specs and global formating, as well as providing a hard-copy backup. Coordination notes are produced with each section to help correlate information on drawings. For further information on SPECSystem, contact Cindy Flynn, American Institute of Architects, 1735 New York Avenue, N. W., Washington, D. C. 20006; 202/626-7446. ■

Practice

Briefs

Highway bill update

Late last year, Congress came together long enough to pass a reauthorization of the Surface Transportation Act, and President Bush signed it into law [Practice News, RECORD, August 1991, page 26]. Rather than minutely specifying where its money should be spent, the $151-billion, six-year reauthorization contains some flexibility for states and metropolitan regions in spending its funds. For example, up to 100 percent of $21 billion allocated to the National Highway System can go either to the highways or to mass transit. Some $6 billion in flexible spending has been directed toward an urban-congestion and air-quality program. The act also provides: $24 billion for surface transportation, with funds eligible for uses from bicycle and pedestrian paths to highways; $31.5 billion for transit; $1.5 billion in planning funds; matching programs for pro-community investments in highway, transit, and other projects; and a ban on billboards along scenic highways.

ADA preparedness

With the Americans With Disabilities Act, which took effect January 26, private companies and public institutions are coming up with programs to educate architects, facilities managers, and potential clients. On February 6, the AIA kicks off a three-part series of videoconference seminars, "Opening All Doors: Understanding the ADA," which will be broadcast via PBS's Adult Learning Satellite Service. Panelists from architectural and facilities-management firms, government agencies, and the disabled community will participate. The three-hour video conferences, which include nationwide viewer questioning of panelists, are followed by an hour of local discussion; subsequent programs are March 18 and April 21. Gensler and Associates, which is studying over 40 public facilities for California's Marin County to determine their compliance with the ADA, has issued a series of brochures on the subject with Kim R. Blackseth, a consultant working with them on the Marin County study. ■

Roofing

New Lessons of Hurricane Hugo

Roof experts now know that Hurricane Hugo, the five-day storm that ravaged the Virgin Islands and the coast of South Carolina in 1989, was a much less severe storm on the mainland than initially thought [RECORD, February 1990, pages 144-148]. Winds were, in fact, "less than recommended design values," according to the Institute for Disaster Research at Texas Tech. What this means is that far too many roofs failed. Though both products and construction practices were to blame, the main conclusion of the Institute's report (see below) is stark: "The majority of the roofs investigated did not appear to have received sufficient attention by the roof designer."

The weakest link

All too often one element doomed an otherwise adequate design. Several buildings that used prefabricated roof trusses sustained damage because they weren't united with the building structure in a wind-resistant *system* (top right). The weak link in several pre-engineered metal service structures was improper and poorly attached large doors, according to Joe Hale of the Roofing Consultants Institute. Winds swept them away, then ripped off cladding from within through huge internal pressure. In other structures, gusts pulled off inadequately attached metal edges and flashings—or blocking that was nailed, not bolted—taking along a good portion of the roof. Some roofs failed because the deck was not properly attached to the structure.

Many roof types affected

Though most Hugo failures could be attributed to poor design or construction, considerable damage also stemmed from product flaws. *Asphalt shingle* tab seals failed and tore off, leaving nails still embedded in decking. "The critical element is how effective the seal is," says Tom Smith, director of technology and research at the National Roofing Contractors Association. "Our current tests [UL 997 and ASTM D 3161] are old and definitely limited." On the other hand, *traditional metal* roofing stayed intact but tore nails out of the deck. (Use screws, says Smith.) "*Slate* roofs experienced significant damage," according to the report, and the slates often became airborne missiles. There is, however, little research to suggest better means of attachment. Clips proved inadequate in some standing-seam *architectural metal* roofs (which are laid on a substrate) and *structural metal* roofs (supported on purlins, above left). Experts said that designers should discuss the clip attachment system with manufacturers to be sure that provision for thermal movement does not also permit the panel to disengage from the clip. Architects should realize that aggregate and stone ballast can be scoured from *built-up* roofs and *loose-laid EPDM* roofs, harming people and damaging adjacent structures. (High parapets reduce the problem; some ballast material didn't meet specifications.) A *PVC* roof failed due to material fatigue, which must have been evident before Hugo. (Inspect after every storm, says Smith.) Some *fully adhered EPDM* roofs were not. Smith says that new tests for asphalt shingles, fatigue in single-ply roofs, and performance of metal roofs are being considered. *J. S. R.*

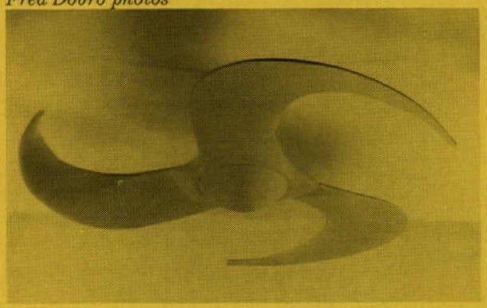
Further information

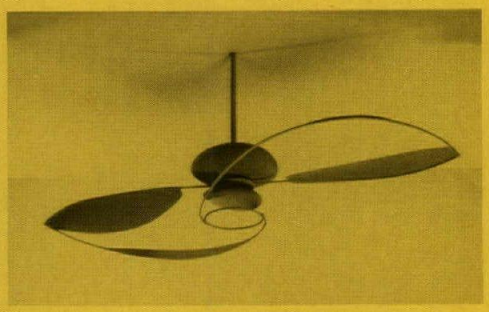
Performance of Roofing Systems in Hurricane Hugo, by James R. McDonald and Thomas L. Smith, $6. Available from the Institute for Disaster Research, Texas Tech University, Lubbock, Texas 79409.
The Roof Consultants Institute offers a referral service and is developing a Disaster Response Program for the East and Gulf coasts. RCI, 7424 Chapel Hill Road, Raleigh, N. C. 27607; 919/859-0742.

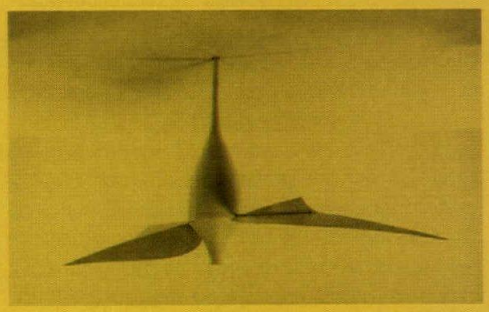
Design

Pratt Contest Yields Streamlined Ceiling Fans

Fred Dobro photos







These ceiling fans, from a competition for industrial design seniors at Pratt Institute sponsored by Emerson Electric's Builder Products Division, show that appliance design is not a wasteland. The designs, which incorporate lighting, seemed to take an anthropomorphic turn. "Whirlwing" (above left), by David Siegel, moves air with concave wings riding above a glass dome. (First-place winner Marian Hayes's design, which Emerson may produce, was not released to the press.) An untitled design (center) by Patrick Townsend combines fiberglass "wands" with blades stamped from a single metal sheet. Adopting oblique, angular forms is "Perpetua" (right), by Amanda Magalhaes. Next: window air-conditioners? ■

Technicalities

Metrication Gets Foot in Feds' Door

It has been a long time coming, but the move to metrication in the U. S. is finally on track. What seems to have made the difference is an executive order signed in July mandating that every federal agency go metric "to the extent possible" in new construction and in its publications. The order requires that each agency develop and implement a "Metric Transition Plan," and calls for designation of a "Metric Executive" to coordinate compliance with groundwork laid out in the Metric Conversion Act of 1975.

The Construction Subcommittee, geared to push the switch in federal construction, is one of 10 metric subcommittees under the Metrication Operating Committee of the National Institute of Building Sciences. Late last year it published the *Metric Guide for Federal Construction*, a 34-page booklet with sections on metric usage, documents, and management and training. At a November subcommittee meeting, representatives of major standards organizations—the AIA, ASTM, ASHRAE, and PCA among them—pledged to "cough up" their support for going metric, says William Brenner, an architect with the NIBS. "It's a different story from 10 years ago," explains Brenner. "Everyone sees where we're going in world trade," so the motivation for compliance is stronger.

The subcommittee intends all federal construction documents to be in metric for projects bid on after January 1, 1994, and Brenner is confident that this goal will be met. A tougher task will be to get commercial construction on-line, and Brenner holds out little hope for compliance from residential builders. "Who knows if the federal government's tail is large enough to wag the whole dog?" he says. (For a copy of the *Guide*, write the National Institute of Building Sciences, 1201 L Street, N. W., Suite 400, Washington, D. C. 20005.) *P. D. S.*

Environment

Briefs

Bush wetlands manual bogs down
New federal guidelines defining wetlands have drawn so much opposition from scientists testing their validity for the four agencies involved that a December 15, 1991, deadline for public comment has been extended [RECORD, Technology News, October 1991, page 32]. The Bush Administration's revised wetlands proposal, scientists found, could result in reclassified wetlands of from 30 to 80 percent in some areas, flying in the face of the President's "no net loss" promise to environmentalists.

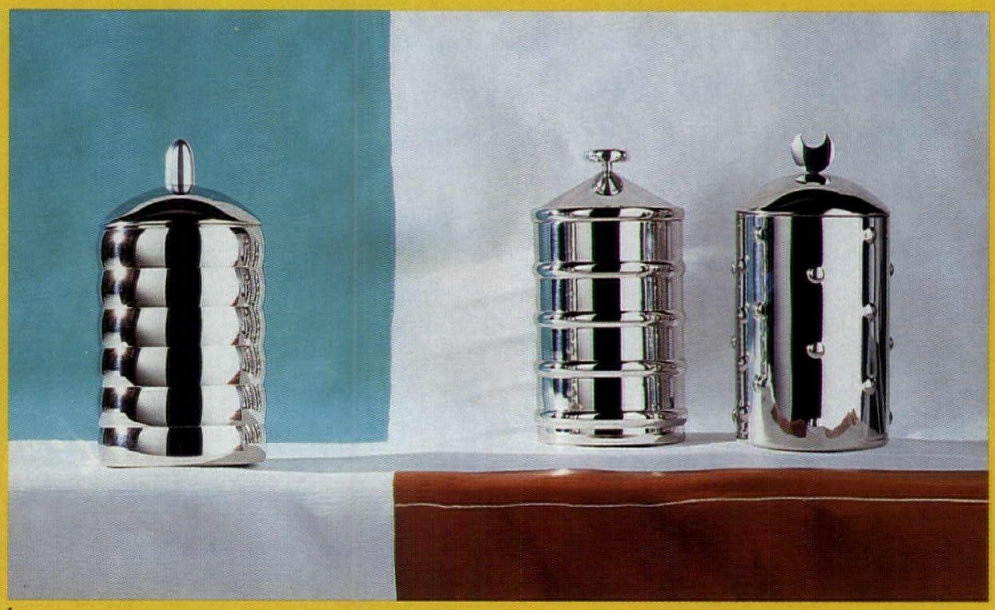
Publications
Trust for the Future, a Nashville-based nonprofit group, has published *Healthy Building for a Better Earth: The Proceedings of the First National Conference in on Environmental Sensitivity in Construction.* The book, which focuses on materials and costs, is available for $9.95 from the Trust, 2704 12th Avenue, Nashville, Tennessee 37204; 615/297-2269. ■

The Good Object

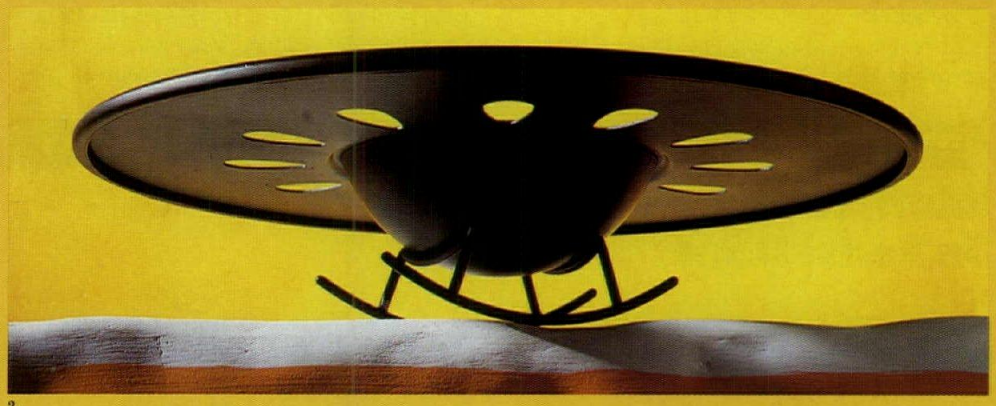
For more information, circle item numbers on Reader Service Cards.

300. Full circle. Alberto Alessi wants to sell "good" objects, machine-made items that do not alienate but rather reconcile the industrious Producer and the somewhat feckless Consumer. Last October, Officina Alessi, source of architecturally correct clocks and sparrow-topped tea kettles as well as curvaceous restaurant utensils, inaugurated the Centro Studi Alessi to design and manufacture such benign wares. The goal of this subsidiary, under the direction of Laura Polinoro, is to create what Alessi terms meta-projects: articles (a chair, a dish, a pot) that unite the appearance and design of the object with the process of how it is made. An ad hoc international consortium of young architects, artists, and designers (serendipitously all of them women), brought together by the Centro and working with an Alessi metalworking team, considered the initial meta-project to be one involving food: its preparation and its presentation, using their own cultural or personal experience for design inspiration. The resulting collection, which includes the serving, display, and storage pieces shown here in photos 1 through 6, is called Memory Containers.

Also inspired by the same respect for the well-made object, but from a retrospective point of view, are Alessi's limited-edition reproductions of tableware by Christopher Dresser (bottom photo). The teapots, carafe, and dishes were made by Brian Asquith of sterling silver, ebony, and crystal. Dresser, who worked in England in the last quarter of the 19th century, believed in the machine as a creative tool; that designing objects for production by machine clarified the shape of the object itself. The Markuse Corp. ■



1



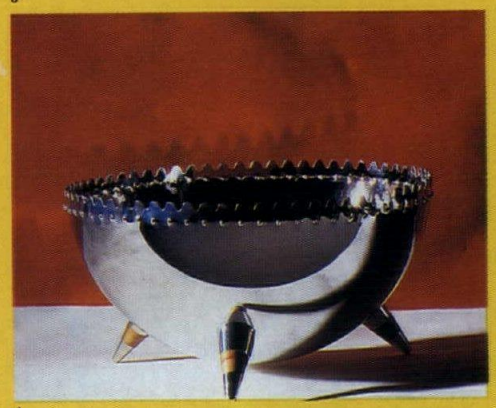
2

1. Kalistò pots by English designer Clare Brass.
2. Swing centerpiece by Cristina Cappelli and Laura Gennai, both on the Architectural Faculty, University of Florence.
3. Helmut, a fruit basket by Italian architect Cecilia Cassina.
4. Chimu centerpiece, by Joanna Lyle, England.
5. Brasero chafing dish by Argentine-born industrial designer Maria Sanchez.
6. Diablo ovenware by Spaniards Sandra Figuerola and Marisa Gallen.

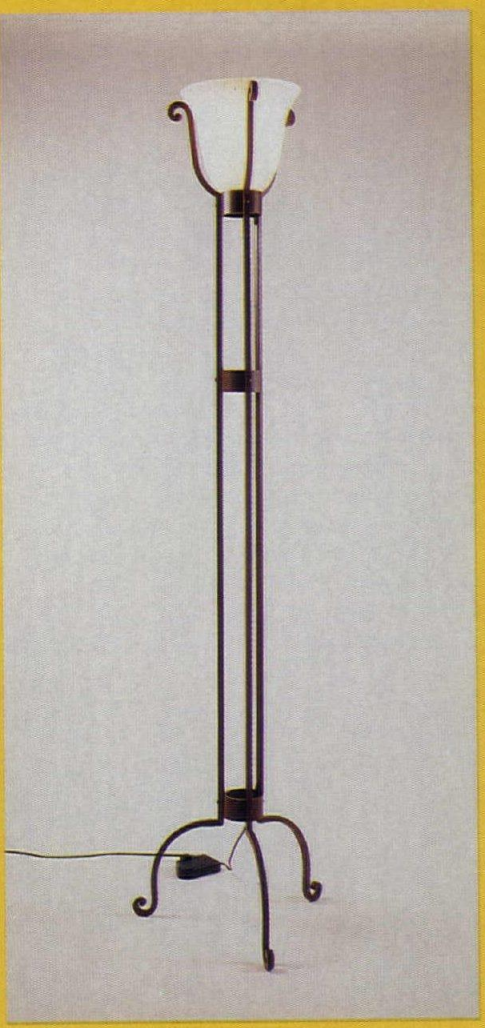
Modernism Reinterpreted

3

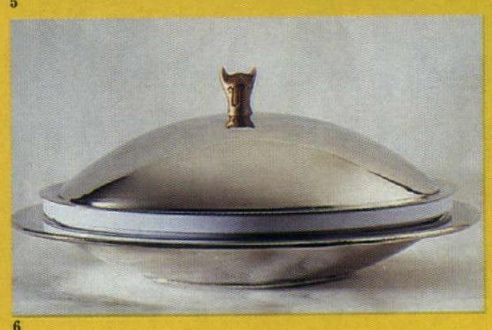
301. Moving on. Jazz, the Los Angeles-based firm headed by designer Marina McDonald Rezek, is moving from primarily residential design into the contract market with pieces to be shown at WestWeek, March 18-20 at the Pacific Design Center. Their new glass-topped Racetrack table (bottom) comes in a conference-scale shape (oval) and size (78-in. long by 42-in. wide). Shown here with Jazz's Modernism chairs, the table has a base of hand-bent chromed steel tubing and is produced to list at under $4,000. The Aries Torchière, of wrought iron finished in either hand-applied patina or powder-coat paint, holds a bell-shaped shade of opal glass. The Fitzgerald Club chair incorporates the classic Deco elements integral to the line, with leg details of Sedjua wood. Jazz. ■



4



5



6

Practice

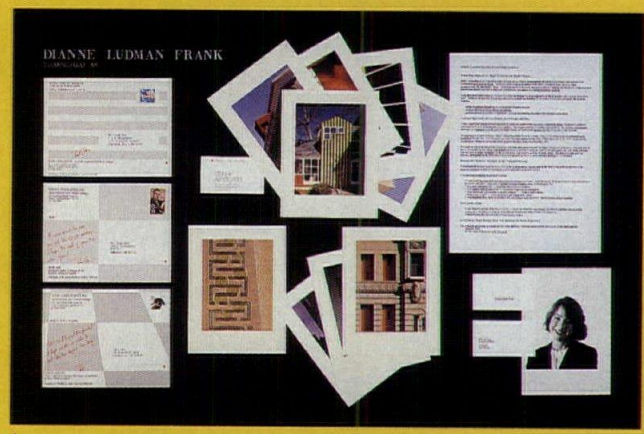
This Month

Charles K. Hoyt

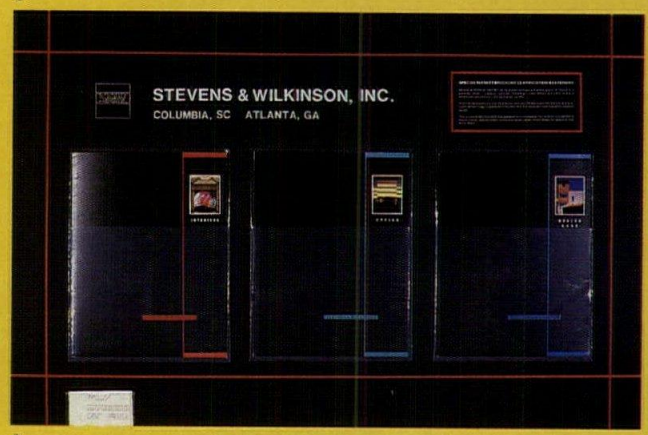
SMPS Awards Show What Works

Several years ago, The Society for Marketing Professional Services started inviting clients for building-design services to judge submissions in its annual program to award the most effective design-firm brochures, direct-mail programs, newsletters, and other marketing materials. There was a suspicion that they might see submissions' merits differently from the previous juries made up of marketing peers.

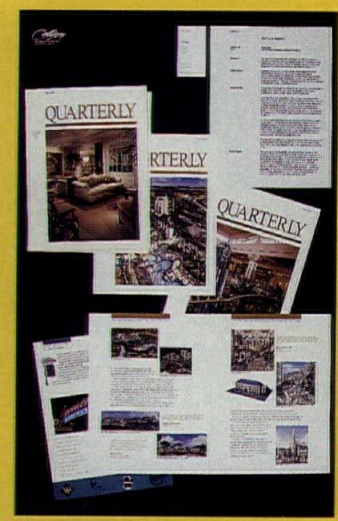
They did indeed. Out went spartan graphics and verbose generalized texts. In came a whole new set of criteria that now form the basis for awards—clear ideas about what it is that materials are to accomplish based on research of specific markets, appeal to those markets, concise texts with meaningful content, proven results, value for cost, and creative and visual impact (which can mean something quite different from purity of design). The judges continue to be clients. For the most recent awards, they included executives from the military, major corporations, the Federal Reserve, and the U. S. Postal Service.



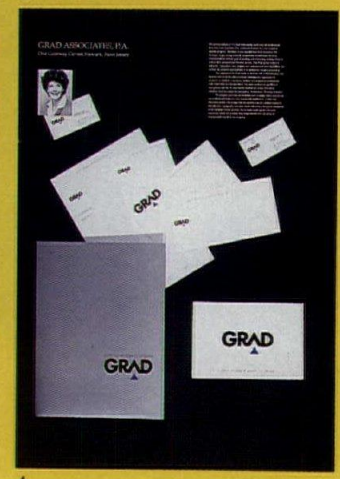
1



2



3

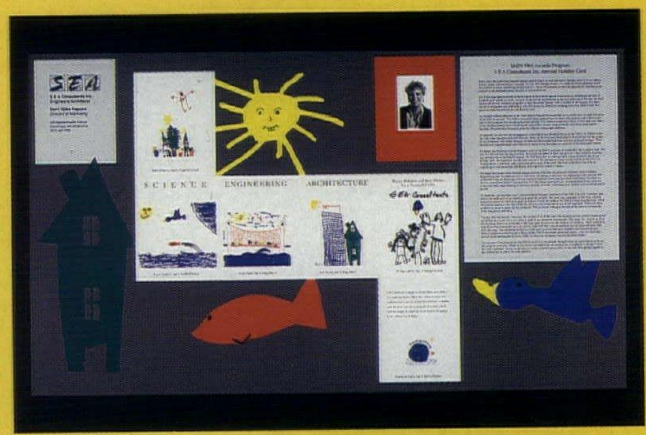


4

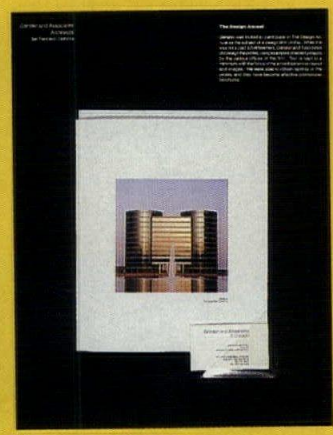
1. Best of show: direct-mailings for a small firm.
2. Special-market brochure: adaptable to each target.
3. Newsletter: giving information, not advertising.
4. Corporate-identity graphics: crisp and consistent.

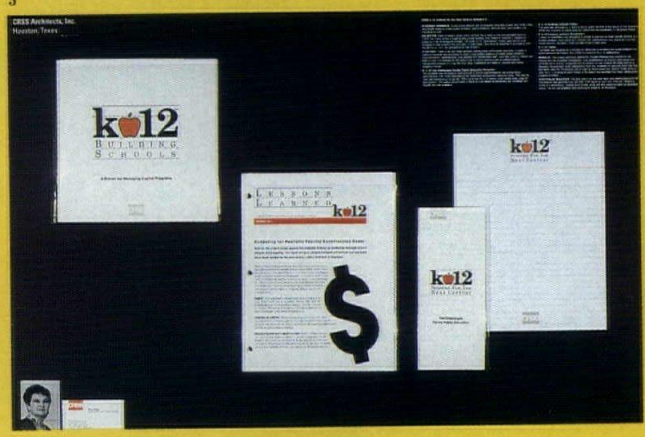
The awards:
There were 185 entries submitted in 11 categories—including a new one for internal communications. According to jury chairwoman Jane Cohn, this large number of submissions limited the time that could be devoted to evaluating each one and produced jury reactions similar to those of typical clients reviewing materials in everyday situations. "If information is not readily identifiable," said one judge in referring to his regular client practices, "that design firm may not be further considered." Priority went to presentations that made it easy to know what the firm does. It also went to "the 'you' message, not the 'I' one."

"In many cases, consensus was not easily reached," says Cohn. Arguments could be heated when there was time. Design quality was not ignored. "Excellence in photography was expected." When entries in a category satisfied other criteria, but failed to break new ground, design quality was the deciding factor. First-place awards are listed with jury comments:

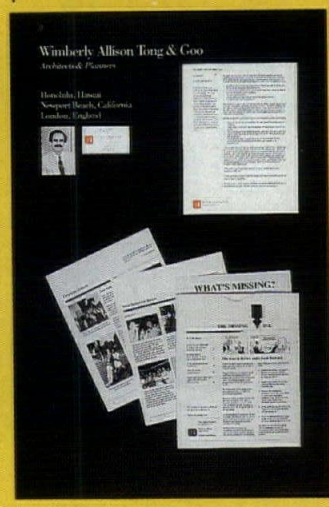


5


7



6



8

5. Special-events announcement: making it fun.
6. Publicity: zeroing in on the academic market.
7. Advertising: a bow to dignity.
8. Internal communications: getting across to employees.

- **Best of show:** Public-relations consultant *Dianne Ludman Frank* representing architects *Stein + Associates (1).* A low-budget direct-mail program for a small firm makes the most of both built projects and those in progress. Postcards sent out over an extended period keep the firm visible.
- **Firm brochure:** *Hedrich Blessing Photography.* A simple design lets images convey the message.
- **Special-market brochure:** Architects and engineers *Stevens & Wilkinson (2).* Appropriate insert pages economically adapt this brochure to health-care, commercial, and interior-design clients, and give "just enough of the right information."
- **Newsletters:** Architects *The Callison Partnership (3)* tied with engineers *CH2M Hill.* Both are succinct. Callison was cited for design and organization; CH2M, for giving information of lasting value.
- **Annual report:** Engineers *The ERM Group.* More information of value.
- **Corporate-identity program:** Architects *Grad Associates (4).* Simple, striking, and consistent.
- **Special events:** Architects and engineers *SEA Consultants (5).* These announcements gave the greatest opportunity for creativity and originality—here using children's paintings to capture interest.
- **Publicity/combined media:** *CRSS Architects (6).* Very focused on the academic market in an innovative way.
- **Advertising program:** Architects *Gensler and Associates (7)* tied with developers *Kojian Properties.* The jury opted for the dignified approach in Gensler's case.
- **Internal communications:** Architects *Wimberly Allison Tong & Goo (8).* Concepts and information that build employee morale and knowledge were criteria in these newsletters.
- **Audiovideo:** Architects *Archimage.* Tapes meant to win clients needed professional quality to work. Brevity (four to five minutes) and quickly getting down to the point decided this one. *C. K. H.*

Construction Costs in the Doldrums

Moderation is the word as construction slowly picks up.

The question last fall was whether costs were about to rise in response to a then-reviving construction volume [RECORD, November 1991, page 40]. While costs had historically stayed in tune with the general health of the market, cracks in that pattern were beginning to show in recent years as cost increases stayed well below the usual reactions to supply and demand. In last fall's quarterly costs report, industry analysts noted that they were seeing regional declines even during periods of robust construction activity.

This indicated that, despite a significant recovery in construction volume in the second quarter of 1991—the period covered in this report—cost increases would be modest. Which is what happened. Costs rose across the country less than 1/10th percent—at a pace not too much greater than when volume was just beginning its recovery in the prior period.

What should we expect for the third quarter? Construction slipped back slightly in September at the end of the period, but it surged ahead by 9 percent going into the next period in October, reaching a year-long high. Moderation seems to be the watch word in construction costs as it is in the rest of the economy. Thus the answer is probably more of the same cautious growth.
Charles K. Hoyt

Data supplied by Dodge Cost Systems Marshall + Swift.

U.S. Summary of Building Construction Costs (in per cent)

DISTRICTS	# METRO AREAS	4/1991 TO 7/1991	7/1990 TO 7/1991	1977* TO 7/1991
EASTERN U.S.				
METRO NY–NJ	18	0.37	–0.01	2009.49
NEW ENGLAND STATES	33	0.02	0.01	1858.39
NORTHEASTERN STATES	120	0.11	–0.60	1757.16
SOUTHEASTERN STATES	106	0.09	0.16	1827.48
AVERAGE EASTERN U.S.	277	0.11	–0.20	1812.52
WESTERN U.S.				
WEST CENTRAL STATES	122	0.06	–0.64	1704.14
PACIFIC COAST STATES	106	0.02	–0.86	1808.17
AVERAGE WESTERN U.S.	228	0.04	–0.74	1752.51
UNITED STATES: AVERAGE	505	0.08	–0.44	1785.43

*USING ONLY CITIES WITH BASE YEAR OF 1977.

HISTORICAL BUILDING COSTS INDEXES

Average of all Nonresidential Building Types, 21 Cities

1977 average for each city = 1000.0

Metropolitan area	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991 1st	1991 2nd
Atlanta	2098.6	2078.0	2360.6	2456.7	2448.7	2518.3	2561.9	2580.9	2697.3	2740.4	2711.3	2729.7	2727.0
Baltimore	1446.5	1544.9	1639.5	1689.7	1703.7	1743.8	1765.2	1780.2	1849.1	1886.8	1895.2	1900.1	1888.2
Birmingham	1407.2	1469.9	1468.1	1535.7	1594.7	1565.7	1587.4	1542.6	1612.5	1643.0	1634.5	1628.3	1638.1
Boston	1283.7	1432.5	1502.0	1569.9	1646.0	1721.0	1773.6	1883.0	1921.6	1917.2	1918.4	1908.3	1904.7
Chicago	1323.6	1344.7	1425.8	1439.5	1476.7	1528.0	1599.9	1591.4	1636.5	1672.8	1690.9	1714.3	1709.5
Cincinnati	1385.2	1350.4	1362.6	1430.8	1484.5	1486.6	1499.4	1510.9	1526.8	1560.7	1552.3	1542.9	1539.9
Cleveland	1388.2	1459.5	1511.4	1475.9	1464.0	1474.1	1525.7	1541.8	1550.7	1556.3	1526.1	1515.9	1500.8
Dallas	1481.9	1750.6	1834.3	1925.9	1958.0	1963.3	1973.9	1947.2	1927.2	1877.3	1837.0	1839.3	1831.6
Denver	1487.4	1632.2	1679.1	1800.1	1824.3	1821.8	1795.8	1732.7	1725.3	1725.9	1663.7	1658.0	1656.8
Detroit	1447.4	1580.3	1638.0	1672.1	1697.9	1692.6	1696.6	1689.3	1734.4	1751.2	1737.4	1724.0	1712.6
Kansas City	1233.2	1323.4	1381.8	1407.5	1447.1	1472.5	1484.7	1493.7	1505.6	1518.8	1510.8	1515.4	1515.0
Los Angeles	1387.5	1474.3	1503.3	1523.9	1555.1	1571.0	1609.7	1675.1	1789.5	1813.7	1800.9	1788.7	1778.2
Miami	1380.6	1369.1	1392.1	1467.6	1522.2	1540.6	1566.2	1589.2	1625.2	1641.3	1638.8	1642.0	1639.4
Minneapolis	1327.7	1442.6	1576.8	1624.6	1640.4	1661.0	1674.0	1677.0	1690.6	1712.5	1676.0	1670.9	1654.3
New Orleans	1505.7	1572.7	1616.9	1650.5	1691.4	1762.5	1760.2	1699.8	1707.3	1685.0	1695.3	1707.4	1711.4
New York	1319.4	1419.2	1491.8	1672.5	1747.2	1806.7	1899.9	1980.9	2065.3	2157.2	2126.2	2104.6	2117.3
Philadelphia	1539.5	1660.7	1769.4	1819.5	1922.1	1967.9	1992.7	2023.5	2171.4	2244.3	2249.0	2239.5	2227.0
Pittsburgh	1341.7	1493.2	1479.5	1497.2	1576.1	1611.0	1665.8	1647.3	1700.3	1721.3	1688.7	1678.3	1690.6
St. Louis	1320.0	1397.3	1451.2	1524.9	1625.5	1641.8	1647.4	1653.5	1705.7	1761.1	1732.5	1747.7	1752.0
San Francisco	1644.8	1776.4	1810.1	1856.8	1935.3	1961.8	1995.5	1992.0	2090.9	2114.3	2156.0	2150.5	2149.2
Seattle	1616.8	1814.9	1962.7	1979.0	1948.9	1937.9	1925.3	1874.7	1968.0	1987.0	2017.6	2015.0	2014.2

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0 divided by 200.0 = 75%) or they are 25% lower in the second period.

Marketing: Shaking Old Habits

By Mark C. Zweig

The problem with most design firms' marketing is that it is too reactive. First and foremost, they wait to react to opportunities that walk in the door. They read the *Commerce Business Daily*, submit 254/255s, and wait for RFPs to come in the mail. Only then do they call the client's facilities staff to arrange a meeting. They keep hoping an old client will call. When they are aggressive, they devote their marketing resources to expensive proposals for jobs they may have little chance of getting. What's wrong with this approach?

- When firms simply react to opportunities, they will always have more competition than if they had gotten to the opportunity ahead of everyone else.
- A lack of focus in marketing means many design firms cannot stand to turn down any possible opportunity—so they end up going after all of them. Because they have squandered their marketing dollars chasing after projects with a low probability of success, they do not have enough time or money left to make an impact in the market in which they have the most chance. If they do land a job outside of their expertise, they will probably spend so much time producing it that they won't make a profit.

- While simply reacting is valid if firms generate enough possibilities to react to,

Mr. Zweig is president of Mark Zweig & Associates, a Boston management consultant serving the design profession.

most firms are reluctant to spend even their usual marketing budgets in tough times. Most design-firm principals really don't believe marketing affects sales. They want instant results. And they are more inclined to think that the general economy is the most important factor in determining their success or lack of it.

Taking the long view

Fortunately, none of us is a mere victim of the environment. We all have choices. When we are busy, we think we do not have time to market. And while that may be true of *selling*, i. e., knocking on doors, it certainly doesn't apply to *marketing* in the broader sense, which has a longer-term focus. There is a lot a firm can do to position itself as an expert in a specific service area, and that is what will bring new clients to the door and new opportunities to react to. Here are three proactive, results-oriented marketing techniques:

1. Survey potential clients

Develop and send direct-mail questionnaires to selected clients who may be in the market for your specific services. Surveys help architectural, engineering, and planning firms better understand the needs and problems of that group of buyers so that they can make better appeals *and* deliver better services to those clients. Surveys also tend to establish the design firm as a valuable provider to that particular type of client.

Questionnaires should be simple, short, and ask such direct questions as: "Are you considering a project in the near future?" Allow clients with an immediate need to step forward. Not only will you get fresh leads from the questionnaires mailed back, but you will almost always get phone calls. Examples of specific questions:

- What do elementary school teachers want in a classroom?
- What do major local office-space buyers look for in building amenities?
- What are industrial-facilities maintenance managers' biggest problems?

For even more marketing mileage, publish the tabulated results *and* get others to publish them—particularly publications that potential clients read.

2. Publish a regular, informative newsletter for clients in targeted markets

This is not a new idea, but what will set your newsletter apart from the others is making it *informative*. Do not tout what the firm has done for others, but give real information clients can use. The best newsletters make no attempt to sell, yet they can do wonders to establish the design firm as a credible source of expertise in a particular area. For example:

- A land-planning firm's newsletter might talk about how to increase the value of land or how to overcome development obstacles.
- An architect specializing in higher-education facilities might report on trends in classroom design.

3. Pick out key services, package them, and promote them aggressively

Using the results of your questionnaires and other sources, build target lists of buyers of specific services or facility types. Use clients' own survey responses in figuring out how to present the specific services in such a way that these potential buyers can recognize yours as distinctive and valuable. Then produce mailings to the target lists. These might consist of a cover letter and a tailored brochure. Follow up with phone calls. One New England engineering and surveying firm recently used this approach to market its wetlands mapping services to municipalities. It sent a sample survey with a specialty brochure and letter to 40 potential clients. The immediate result was two projects and opportunities to do several others. Here are a few special-market opportunities for architects:

- Food-processing laboratories.
- Grocery chains.
- Renovation of existing retail malls and shopping centers.

Architects must get back to basics—putting energy and dollars into multiple, smaller, more focused, and less glamorous marketing campaigns that *work*. Meanwhile, as long as architects continue to chase after every possible commission using elaborate general-market brochures, we can expect to hear complaints about the economy. ■

Specification Series: Modified-Bituminous-Membrane Roofing

By Dean Walker

Bitumen and modifying compounds provide flexibility, elasticity, cohesive strength, resistance to flow at high temperatures, and toughness. Roofing thicknesses range from 40 to 160 mils.

Standards: None of the existing ones has been accepted by manufacturers or design professionals. ASTM is working on a standard that has yet to be accepted and published. Two standards are needed—one to identify the manufactured properties of modified bitumen and another to describe the material's in-service performance.

Many factors affect selection of modified-bitumen roofing and it is up to architects to do their own evaluations. The following considerations are offered by the National Roofing Contractors Association:

- Application: new or replacement.
- Building characteristics: use, climate zone, roof configuration, time of year for application, projected service life, roof traffic, penetrations, and maintenance anticipations.
- Generic types of membranes and insulations available in geographic area: Evaluate products, performance history, warranties, slope restrictions, past experience, recommendations of other architects and contractors, application methods, climate restrictions, and code and use limitations.

After choosing generic type, choose system manufacturers. Investigate experience and reputation; completeness of the product system; production facilities and quality controls; design, engineering, and technical assistance available; stability of the company; and reliability of representative.

Systems often include related items that provide a single source of responsibility. Items often included are base flashings, vapor retarders, roof insulation, and surfacings. Related items by other trades include: the roof-deck construction; concrete pavers on top of the membrane; treated-wood nailers and edge strips; sheet-metal roof flashing; and accessories such as expansion joints, roof hatches, vents, skylights, and drains.

Mr. Walker is chief specifier for architects Lohan Associates.

Regulatory requirements: Fire- and wind-resistance ratings are published in the Underwriters Laboratories *Building Materials and Fire Resistance Directories*, including Class A, B, and C external-fire and roof- and ceiling-assembly ratings. Factory Mutual ratings can be found in its *Approval Guide* and cover fire spread, windstorm, hail, leakage, weathering, and corrosion.

Pre-installation conference: Approximately two weeks prior to starting work, the contractor, owner, architect, manufacturer's representative, roofing subcontractor, and the installers of each component of associated work should meet at the site to review methods and procedures of application.

Warranties: Various types of warranties are offered by manufacturers. Sample copies are usually available from each. An extensive comparison of the terms is published in the National Roofing Contractors' *Roofing Materials Guide.*

The location of reinforcing is crucial to performance. If the membrane is torch-installed, reinforcing must be in the upper part of the sheet. If mop-applied, in the lower.

Membrane types: These depend on the polymers added to asphalt bitumen before reinforcement. Most common polymer types are APP (atactic polypropylene), SBS (styrene butadiene styrene), and SBR (styrene butadiene rubber). Reinforcing, consisting of polyester, fiberglass, or a combination of both, is saturated with the modified bitumen. The location of the reinforcing is crucial to the membrane's performance. If the membrane is torch-installed, the reinforcement must be in the upper part of the sheet. If it is mop-applied, the reinforcement must be in the lower part.

Bituminous materials: Asphalt for mopping is ASTM D312, Type III Steep or Type IV High Temperature Steep. Asphalt primer is ASTM D41. Plastic roofing cement should be asbestos free.

Insulation: Beside thermal efficiency, consider fire resistance, traffic indentation, moisture, anchorage, weight, and dimensional limitations. Some more common types are glass-fiber, mineral-fiber, polystyrene, and polyisocyanurate.

Flashing: The intersections of membrane and vertical surfaces are most vulnerable to moisture infiltration. Because flashings are often subject to movement, they must be flexible. Membrane sheets usually are, and many manufacturers use their membrane as flashing. Others use proprietary products.

Surfacings: SBS or APP membranes manufactured with ceramic-granular surfaces do not need field-applied surfacing, nor does APP manufactured with a metallic surface. If APP types are manufactured without surfacing, various types of emulsions or aluminum coatings can be applied after installation. Hot asphalt or asphalt emulsion with gravel can also be applied.

Expansion joints: Building sections should be separated from adjacent sections by expansion joints to allow structural expansion and contraction. Other requirements for expansion joints depend on structural and climate conditions.

Vapor retarders: Vapor retarders are installed beneath roof insulation, if needed. Need depends on building design and climate conditions.

Roof drainage: A minimum of 1/4-inch-per-foot slope and warping of membranes into drains and scuppers are recommended. Manufacturers will not warranty their roof if it is ponding water. Tapered insulation or fills can be used to create slopes. Manufacturers must be consulted before specifying some types of tapered products.

Relatively new, but used by a growing number of architects, this roofing offers benefits that are only now about to be standardized in the U. S.

Preparation of substrate: All outside edges must have wood nailers. On steel or concrete roof decks, treated-wood nailers must be provided along all open or flush eaves so that gravel-stops or edging strips may be securely nailed. Wood nailers may also be needed at other penetrations through the roof.

Vapor-retarder installation: Any gases created between the retarder and the membrane during application must be vented.

Insulation installation: Done mechanically or in hot asphalt to meet manufacturer's, UL, and FM requirements. Require tightly butted boards and staggered joints.

Membrane installation: Method determined by type of membrane. APP and SBS membranes can be heat-welded with hand-held propane torches, a gang of torches mounted on a rack called a dragon wagon, or a hot metal plate. Heat-fused layers of MBM sheets must be hot enough that the modified compound in each becomes liquid. Too little or too much heat can cause problems. MBM membranes can also be adhered with cold-process adhesives or have self-adhering bottom surfaces. The most common application method is melting the bitumen on the roll with steep asphalt.

Flashing installation: Metal flashings are coated with asphalt primer, placed on top of the membrane, and covered with a second ply of membrane. Flashing sheets are extended up vertical surfaces at least 8 inches.

Surfacing application: Aggregate surfacing should be installed as soon as possible to prevent membrane exposure. Weather or UL-rated emulsions should be installed within three weeks.

References

- American Institute of Architects MASTERSPEC Specification System.
- National Roofing Contractors Association *Roofing Materials Guide*, Volume 17.
- David Allen and Steven Hardy, "Mod Bits," *The Construction Specifier*, November 1991.
- Stephen D. Wing, "Making Progress," *The Construction Specifier*, November 1991. ■

Guide Specification: Modified-Bituminous-Sheet Roofing

PART 1 GENERAL

A. Summary

1. Included in section: modified bitumen sheet roofing with base flashings, roof insulation, and surfacing.
2. Not included: wood nailers, sheet-metal flashing, and trim.
3. Related sections: roof accessories, roof drains, scuppers, and sumps.

B. Submittals

1. Product data.
2. Installation instructions.
3. Product certificates.
4. Samples.

C. Quality Assurance

1. Use of experienced installer certified in writing by manufacturer as qualified to install modified-bituminous-sheet roofing.

D. Regulatory Requirements

1. Underwriters Laboratory.
2. Factory Mutual Engineering Corporation.

E. Delivery Storage and Handling

1. Materials stored in weather-protected environment.

F. Environmental Requirements

1. No application during inclement weather or to damp or frozen surfaces.
2. Materials not exposed in quantities greater than can be covered in one day.
3. Bitumen temperatures maintained at effective rates.

G. Pre-Installation Conference

1. A pre-installation conference convened at least two weeks prior to starting work.
2. Scope of work and responsibilities of owner, contractor, roofing contractor, and material supplier confirmed at conference.

H. Warranty

1. Standard warranties for 10, 15, or 20 years.

PART 2 PRODUCTS

A. Manufacturers

B. Materials

1. Membrane type: atactic polypropylene (APP), styrene butadiene styrene (SBS) or rubber (SBR).
2. Bituminous materials: asphalt bitumen, asphalt primer, plastic cements.
3. Insulation: rigid type approved by membrane manufacturer.
4. Flashing: membrane or proprietary type.
5. Surfacing: aggregate or smooth, weather emulsion, UL-rated, traffic type.
6. Accessories: nails, pressure-relieving vents, insulation fasteners, control- and expansion-joint covers, vapor retarder.

PART 3 EXECUTION

A. Examination

B. Protection

C. Application

1. Vapor retarder.
2. Insulation: mechanical or hot-asphalt-mop installation, butted boards, staggered joints.
3. Membrane and flashings: membranes and flashings installed according to manufacturer's instructions.
4. Surfacing: Evenly distributed aggregate in a flood coating or uniformly applied liquid surfacing material.

D. Cleaning

1. Bituminous markings removed from finished surfaces.

E. Protection

Utility Incentives Power Up

In real terms, fuel costs today are lower than they have been in years. Yet, rebates and other incentives for installing or retrofitting energy-conserving systems and components have never been so enticing. Virtually any project, whether new construction or remodeling, is today eligible for some kind of incentive program, which can significantly lower the cost of conservation.
What's happening here? Utilities now recognize that conservation is by far the cheapest and most rapidly available source of "new" power. And with some companies generating electricity uncomfortably close to capacity, these "demand-side management programs" can buy a margin of safety relatively quickly. Increasingly, public utility commissions are also requiring electric companies to provide least-cost power even if that means lowering customers' usage. Because conservation cuts back pollution and other waste, reduces dependence on foreign sources of fuel, and is safe, we see today the spectacle of power companies embracing their traditional enemies, the environmental community. Utilities have been permitted to share in the value of savings over new construction, so these "negawatts," according to Amory Lovins, Research Director of the Rocky Mountain Institute, "are by far the most profitable activity of utilities today."

The stakes are growing rapidly. Utilities invested about $2 billion in 1991 on incentives, a figure matched by consumer spending, says Lovins. He claims budgets will grow to $10 billion to $15 billion *per year* by 2000. Just one utility—the Bay Area's Pacific Gas and Electric—will spend $2 billion by that year, intending to generate 75 percent of its projected peak demand growth through more than 30 energy-efficiency programs. Architect Randolph Croxton says his firm, the Croxton Collaborative, consultant to New York's Con Edison, has identified rebate opportunities on the order of $500,000 in a single building.

Though the easy reductions are said to have been made already (after all, energy intensity—the amount of energy required to produce a dollar of U. S. gross national product—has already fallen by 27 percent since the oil embargo of 1973), researchers contend that enormous savings—ranging from 30 to 75 percent of use—are still reasonably obtainable. In the last five years, technology has improved enormously and utilities now know better where the savings are. The average cost of saving a kilowatt hour has dropped by about two thirds, with many of the newest technologies (advanced lamps and ballasts, for example) falling in price as use widens. This combination has doubled the potential to save electricity, according to the Rocky Mountain Institute.

Tailoring incentives

Until recently most incentive programs were hardware oriented (such as popular compact fluorescent-for-incandescent giveaways). Robert Sardinsky, president of Rising Sun Enterprises, which designs energy-efficient lighting fixtures and installations, says, "a lot of incentives were being offered for technologies now considered obsolete. A 34W fluorescent lamp uses less energy than a standard 40W one, but it's no more *efficient.* T8 lamps with electronic ballasts, with greater efficacy and efficiency, are what utilities are now looking for."

Hardware rebates are rapidly being supplemented by a menu of programs oriented to different users. Northeast Utilities, which serves Western Massachusetts and Connecticut, offers case-by-case assistance on large projects, and, apparently uniquely, extends incentives to the design team.

Of increasing interest to utilities are performance-based incentives in which a series of strategies is designed to work together. (One method: lighting and glazing improvements that allow downsizing of mechanical equipment.) It is in these programs that architects can play an ever larger role in conservation. The opportunities are enormous; reductions are on the order of 50 to 75 percent over today's commercial standards. Pacific Gas and Electric and Southern California Edison, for example, offer more aggressive incentives when potential savings are great. The utility's consultants will model proposed-versus-standard energy use in order to reward designs that include upgraded insulation, shading devices, and daylighting. Both utilities have begun soliciting cutting-edge solutions. PG&E's Pacific Energy Center (above) lets designers try out items as simple as shower-head restrictors or build full-scale daylighting mockups.

The Pacific Energy Center includes this demonstration of upgraded insulation.

Performance-based programs are also used to shift energy use away from peak periods. Since a utility must build enough power plants to meet demand spikes, it is to their advantage to spread usage more evenly. Thermal-energy storage systems use power at night to make ice for daytime cooling; "smart" glazing can retain winter heat.

Using incentive programs

The nature and usefulness of utility incentive programs vary with geographic location, fuel used (by both project and utility), and type of project. The EPA's Green Lights Program (202/479-6936) sounds like a product certification program; it isn't. It's a sometimes-useful intermediary that mainly jawbones big companies and institutions into conserving energy. Utilities are anxious to educate architects about their programs (most have representatives who will visit offices), and are increasingly building facilities to demonstrate efficient products, such as Seattle City Light's Lighting Design Lab. Many will offer technical assistance or pay for consultants to analyze a design's energy consumption, using computer-modeling programs like DOE-2 that require specialized experience. Knowing at the beginning of a project what a utility offers means that the design can exploit every rebate opportunity. Utilities are even target-

With electric companies investing billions, conservation is a better deal than ever for both the owner and the design.

ing developers: "It takes a great deal of persuasion to convince developers that first cost is not the only criterion," comments Peter Schwartz, a consultant in Pacific Gas and Electric's Energy-Efficient Services department, "but they can see paybacks as short as six months."

Though incentive programs can create new opportunities for architects, the success of any conservation measure in the field depends greatly on its integration with other techniques and whether the quality of the project environment is improved, or at least not made worse. The problem with too many programs, says Gary Steffy, of Gary Steffy Lighting Design, Inc., is that "No one seems to understand anything but kilowatt hours. No one understands luminance, color, quality. These are all things that relate to visibility, glare, perception of space, perception of color." Utilities *are* aware of the quality issue ("If people badmouth our effort it's counterproductive," responds PG&E's Schwartz), but architects and their consultants are, or should be, the experts in this area. There have been plenty of problems with incentives (story right), but a great desire to solve them. "Utilities are investing in thousands of tiny 'power plants' instead of one costing one to two billion dollars," comments Robert Sardinsky, "and they have to show a return." Companies are now auditing before-and-after electricity use and installing meters on building subsystems to verify savings.

High-performance buildings require more than a higher upfront investment. Some systems are more complex to operate and require increased maintenance. Architects need to tailor solutions to what the client can reasonably manage. While some utilities will analyze sophisticated design solutions, efficient installations require considerably more design and engineering effort. For now, the client alone realizes the benefits in lower costs, though it behooves architects to negotiate with owners to share in savings or rebates. Amory Lovins, for one, argues that utilities need to encourage such spreading of negawatt wealth more directly. As he puts it, "All the design fees of a building represent about one percent of energy costs over its life." *James S. Russell*

Learning from Bonneville's Energy Edge

The Bonneville Power Administration, the Pacific Northwest's bastion of staggeringly cheap hydropower, needs new capacity. Yet it is haunted by the gigantic bankruptcy of the Washington Public Power Supply System, a consortium including Bonneville that sought to build several nuclear-power plants in the '70s. Its Energy Edge was a five-year incentive program to add cost-effective conservation measures in 28 otherwise entirely typical buildings ranging from skyscrapers to elementary schools to fast-food restaurants. Because most projects were admitted to the program relatively late in the design process, many of the measures involved lighting or mechanical improvements because these could readily be added on. The program was essentially unable to reward designs that integrated architectural strategies such as advanced glazing, shading, solar orientation, or daylighting, though the Emerald People's Utility District Headquarters (Equinox Design and the W. E. Group, architects, below) funded daylighting and trellis shading itself. Once seven of the buildings had been in service three to four years, a post-occupancy evaluation (POE) was conducted and completed in 1991.

The POE showed that many of the conservation measures for which Bonneville paid were either not installed, not installed correctly, or never properly commissioned. Most problems were in mechanical systems. Users couldn't understand programmable thermostats; economizers and computerized energy-management systems weren't installed or calibrated properly; occupancy sensors were often poorly located; sensors for daylight controls were sometimes placed incorrectly or disabled because users were uncomfortable with lighting suddenly stepping down or up (fixtures that dim more subtly are now more common). Architectural measures were usually more successful. These included upgraded lighting, insulation, glazing, and vestibules.

In spite of the problems, the buildings were on average over 20 percent more efficient than computer models of their baseline counterparts (ASHRAE's Model Conservation Standard). Compared to then-standard practice, "office buildings, for example, are using about half the energy," comments Rick Diamond, of Lawrence Berkeley Laboratory, one of the project's evaluators. The computer models themselves came in for some criticism as too complex, too dependent on operator assumptions, and lacking the means to adequately assess infiltration and daylighting—yet they were deemed essential for defining which techniques would deliver the greatest benefits.

Unanticipated uses and poor designs doomed some conservation measures, but Judith Heerwagen, an environmental psychologist, found that most didn't measurably affect user satisfaction with the exception of daylighted buildings, which users found more pleasing and cheerful. The POE's most important conclusion (one utilities increasingly recognize): *commissioning* systems is essential. That is, assuring that devices are properly installed and client and operating personnel know what they are for and how to use them. *J. S. R.*

© Richard Alexander Cooke, III

Where There's Smoke . . .

The year 1991 was not a good one for fires. At about this time last year three firefighters lost their lives in the One Meridien Plaza fire in Philadelphia. In May, fire swept through a mall in Huntington, N. Y. In October, wind-driven flames killed 25 and consumed thousands of houses in Oakland and Berkeley, Calif. The inevitable political response to big fires is enactment of tougher fire codes—more annunciators, more detec tors, and always, more sprinklers.

It's hard to keep up—for fire-protection experts, let alone architects. The enormous improvement wrought by wide use of inexpensive smoke detec tors has caused firefighter groups, insurance companies, and code officials to push for greater use of other effective technologies. Increasingly, code officials are mandating smoke-control, fire-detection, and fire-suppression systems not only in new construction but in existing buildings as well. Some of these devices are complex; all are subject to breakdown, and require monitoring and maintenance. This has raised a series of questions within the fire protection community: how much is enough? Do we know enough about the interaction of techniques when used together? To lower costs, can we trade passive compartmentalization and detection (the traditional, "conservative," containment route) for active suppression (highly effective, but high-tech and high cost)? The outcome of these debates will say much about the form buildings can take, what they will cost, and whether they give users protection that is apparent or real.

Sprinklers: more is better

After every big fire, someone (usually the fire marshal) says, "if there had only been sprinklers . . ." Sprinklers contained the fire at One Meridien Plaza after it had burned 18 hours through 8 unsprinklered floors (RECORD, June 1991, page 39). They were overwhelmed, however, at the Walt Whitman Mall fire, but only after the conflagration had gotten well underway in the 40,000-sq-ft unsprinklered store where it began. Spurred by tragic blazes at the MGM Grand Hotel in Las Vegas (1980, 100 dead) and the Dupont Plaza Hotel in San Juan, Puerto Rico (1986, 97 dead), the lodging industry has moved quickly to install smoke detectors and sprinklers. As a result, deaths and injuries have plummeted. Though a recent regulation that prohibited federal employees from staying in lodging lacking both protections angered the industry, complying facilities are becoming the rule.

Installation can be costly but it's hard to argue against the effectiveness of sprinklers, and they are increasingly being mandated in new construction (if not by codes than by corporate policy and insurance companies). Within the next few years, virtually all new highrises will have sprinklers, as will most health-care and hospitality facilities. Already several communities mandate sprinklers even in single-family residences. This has spurred the development of new system types that respond to a wider range of fires. Quick-response heads (which come in several varieties), for example, are more sensitive than standard types, recognizing the nature of fires that start in relatively small rooms in houses and hotels.

Halon: the search for a substitute

Halon-gas fire-suppression systems have been used in computer and telephone equipment rooms, library stacks, and restaurant kitchens to control fires where sprinklers are either inappropriate (electrical and grease fires) or where contents are extremely valuable. Halon must be phased out, however, because it is a chlorofluorocarbon (CFC) that harms the earth's protective ozone layer. "Though quantities are being reduced, Halon is still being manufactured," states Carl Miller, of Factory Mutual. "One of the arguments for leaving existing systems in place," he continues, "is that we don't think we are able to adequately dipose of the Halon we take out of commission."

Halon substitutes are under study, but researchers have not found the level of toxicity acceptable when the gas is released. (The type of Halon now used may be toxic when combined with products of the extinguishing process, which is why persons must evacuate the area—usually a small room—once the system is activated.) Miller says that Factory Mutual may sponsor research on ultrafine water mists as an alternative. He describes any such system as "very much off in the future."

Furnishings, the new prevention frontier

While we all focus on detection and suppression technologies, many fire-protection experts would like to see a greater emphasis on prevention, and the most potent area of improvement is in building contents. Regulators have traditionally seen what users put into buildings as too difficult to control, but this is changing. The '70s and '80s saw code revisions restricting the flammability of, and smoke density produced by, interior finishes in exitways and fabrics for furniture, especially for health-care occupancies. With smokers still among the chief causes of fires (chart opposite), research and regulation is focusing not only on performance of furniture fabrics but of the entire piece. Much of the regulation contemplated or in place is based on California's Technical Bulletin 133 (RECORD, November 1991, page 17), a fairly restrictive standard. According to Richard Bukowski of the National Institute of Standards and Technology, "a solid wood piece with a little padding on the seat and back might pass the TB 133 flammability test. A fully upholstered piece will probably not make it." These regulations are now mostly applied to "certain occupancies classified as high risk, where people have limited self-preservation capabilities," continues Bukowski, such as hospitals and long-term care facilities. The standard may be extended to cover nursery schools and day-care centers.

Finding the way out

Smoke kills not only through asphyxiation. As it fills a room, it obscures paths to safety. When occupants panic, they often fail to methodically analyze where an exit might be. Recognizing this, the State of California has adopted legislation mandating low-level exit markings (which can be seen by someone crawling under a layer of smoke), and requiring exit-path markings on floors or low on walls that are both visible and can be found by touch. According to Tom Dusza, operating manager of the Concord, Calif., office of Rolf Jensen Associates (a fire-protection consultant), "The requirements were spelled out in legislation but are not yet in code language. There are technical issues to work out." Such devices are more

New fire-protection requirements are proliferating. Here's how to make your way through the regulatory haze.

subject to everyday damage and vandalism than are high-level signs. Underwriters Laboratory has only promulgated interim standards (devices must be listed). Exit doors may open full width in corridors, for example, and so lack a surface to mount the devices. To follow continuous wall-mounted markings, "you may, technically speaking, be required to take someone down a dead-end corridor and back again," comments Dusza. For now, enforcement is left to local officials, but a new state code due early this year will likely specify requirements more precisely.

Are "balanced" systems redundant?

The wider use of sprinklers suited to a variety of specific tasks is raising a new debate within the fire-protection community. Does superior suppression render detection less important? The easy answer, and the one given by proponents of systems that offer detection *and* suppression, is that both are needed. Of greater importance, many feel, is the need to retrofit existing buildings (many of which have outdated fire protection accepted under building-code "grandfather" clauses) with better systems at reasonable cost. While sprinklers, for example, may add only $2 per sq ft in new construction, the cost of threading pipes and heads through existing walls and ceilings may be enormous. If pulling wires and installing detectors, alarms, pulls, and annunciators (which tell firefighters which units sent the alarm) are also mandated, building owners argue that costs become prohibitive. Take Philadelphia, where retrofitting of sprinklers in highrises has only just been enacted after the traumatic experience of the One Meridien Plaza fire. Owners claim that retrofit costs may range from $2 to $12 per sq ft.

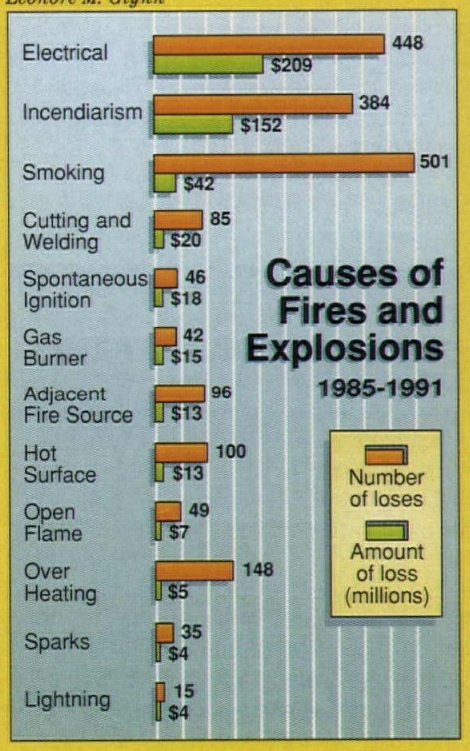
In health care, too, the debate rages as pressure is brought to do more about spiraling costs. According to Ed Reid and Bob Schifiliti, writing in *The Construction Specifier*, health-care groups are petitioning code authorities to scrap requirements for smoke detectors where quick-response sprinklers are provided. Another argument against detectors is the dangerous complacency brought about by recurring false alarms. (Ignored alarms contributed to the delay in responding to a fire in the First Interstate Bank Building in California, one of the worst highrise fires of the 1980s.) Regulations that limit the ability of furnishings and finishes to support flames may have a perverse effect: items smolder longer at temperatures too low to actuate sprinklers.

The interaction of smoke detectors and quick-response sprinklers was tested by the United States Fire Administration (USFA) in a hotel-room mockup. The sprinklers rapidly and effectively put out flaming fires. Depending on the state of ventilation, though, the smoke detectors were actuated in the presence of fires at half the temperature of the sprinkler heads. This meant a difference of only three minutes, long enough for smoke to completely obscure the way out. "Presumably, an occupant failing to escape but not in contact with the fire could still be rescued more than 30 minutes after the fire began," writes Robert G. Bill, Jr., describing the study in the National Fire Protection Association's *Fire Journal*. In smouldering tests, smoke detectors responded well before the air became toxic (a considerable time in the tests); sprinklers were actuated only when the smouldering turned to flames. From these tests, Bill concludes (and authors Reid and Schifiliti agree) that detectors and sprinklers do indeed provide balanced protection.

The tradeoff debate

The USFA tests confirmed what many experts have been saying: the performance of sprinklers is phenomenal. John McCormick, engineering manager of Rolf Jensen's New Jersey office, asks, "Do we need to get too concerned about low-level exit markings or interior furnishings if a building is properly protected throughout by an automatic sprinkler system?" But the argument goes farther: many are asking whether providing sprinklers means we can reduce or eliminate some types of fire protection required in the past. Thus, if an owner provides sprinklers, walls rated for one, two, and three hours of fire resistance could be reduced or eliminated; requirements for the compartmentalization of floors (to halt the spread of smoke and flames) could be loosened; requirements for fire-resistive finishes could be eliminated. This is a particularly virulent debate in terms of health care where cost

Leonore M. Glynn



Figures were collected by Factory Mutual Engineering and Research and its insurance subsidiaries and represent insured losses from mercantile occupancies, schools, public assembly buildings, and residences. Excluded are losses for manufacturing occupancies and storage/warehouse uses. Loss amounts are indexed to 1991 dollars. The cause was unknown or there was no data for 3,400 incidents with losses of more than $1.1 billion.

concerns are paramount and the vulnerability of the population is offset by a high level of monitoring and surveillance. Reid and Schifiliti note that various groups have proposed changes to the Life Safety Code (NFPA 101) that include scrapping requirements for annunciators and loosening finish and compartmentalization requirements when sprinklers are installed.

Dick Bukowski, of NIST, says representatives of the National Concrete Masonry Association and fire alarm manufacturers have contacted NIST hoping to cosponsor research to determine the extent to which tradeoffs for sprinklers should be allowed. He thinks they have a point. "A great question to ask a fire marshal," he says, "is now that you've put in your fast-response sprinklers and you've reduced your two-hour wall to one hour, what do you do when the water company wants to shut down your water main for maintenance? We've got to test the reliability of various sprinkler systems with regard to pressure drops in the water supply, such as in drought conditions or, in the case of Southern California, during natural disasters like earthquakes."

California is also being looked at as an example of the risks of the sprinklers-as-panacea approach. Several California communities now require sprinklers in nearly every structure, not as an additional measure, but as primary protection. The tax-limiting Proposition 13 has prevented these towns from building new fire stations. Sprinklers, however, may place more, if different burdens on local governments. As use of systems spreads from more sophisticated large institutions to smaller, more widely scattered owners, Bukowski asks, "Who monitors installation, testing, and inspection?"

In Oakland and Berkeley, local officials are debating a variety of code changes even as owners seek to rebuild hillside communities destroyed in last fall's giant brush fire. Measures under discussion include prohibiting popular cedar-shingle roofs, requiring gypsum-board sheathing under wood siding, restricting the type and location of certain kinds of landscaping, and mandating sprinklers on roofs and under eaves. Whether sprinklers would have protected buildings against the scale of the Oakland fire is speculative, though. And George Famous, an architect working in the area, reports that the impact on hydrant pressure of a neighborhood full of sprinkler systems activating at once "is a major concern."

Enter performance codes

Computer power is causing experts to reassess the way we analyze buildings for fire safety. For now, computers are primarily used in fire research. but John Klote, of NIST, sees a much wider use by architects and their consultants. "With the decreased cost of hardware and software we'll have designers and consultants in the next five years or so using field modeling to solve fire-related engineering problems in buildings." In terms of smoke-control modeling, computer analysis has arrived (story right). Computers may soon be used to model fire barriers that prevent the movement of flames vertically from floor to floor on a building's exterior, which is of increasing concern among fire officials. With such tools Klote sees "an inevitable evolution to performance codes" in which computer models would be used to demonstrate compliance.
James S. Russell

Further information:

The National Fire Protection Association publishes the *NFPA 101 Life Safety Code* (the model or reference for most local codes) and the *Life Safety Code Handbook*, which explains the code provisions. The former is $27.50, the latter, $62.50. NFPA, 1 Batterymarch Park, Quincy, Mass. 02269 (800/344-3555).

"A Life-Safety Team: Smoke Detectors and Sprinklers in Hotels," by Robert G. Bill, Jr., in *Fire Journal*, May-June 1990, published by NFPA.

The National Fire Sprinkler Association has just published a new edition of its *Guide to Fire Sprinklers in the Life Safety Code (NFPA)*, $20. Contact Kathy Morgan, NFSA, P. O. Box 1000, Patterson, N. Y. 12563 (914/878-4200).

"A Balanced Approach to Fire Protection Detection and Suppression Systems," by Ed Reid and Bob Schifiliti in *The Construction Specifier*, February 1991, Construction Specifications Institute, 601 Madison Street, Alexandria, Va. 22314 (703/684-0300).

Smoke Control at Stansted

Smoke kills more people than fire, and it is particulary worrisome within large open interior spaces, where it can spread rapidly. At Stansted, London's newest aiport terminal, the fire protection consultants, Ove Arup Partnership, took advantage of the architectural conception in designing a smoke control system. The architects, Foster Associates (now renamed Sir Norman Foster & Partners), designed an undivided 300,000-sq-ft glass-sheathed shed in response to a specific directive of the British Airport Authority to permit maximum flexibility for the arrangement of facilities within the envelope. The entire 43-ft-high ceiling is visible to passengers, while shops, offices, and other functions are in enclosed or semi-enclosed "cabinets."

The structural system is a series of steel "trees" which support the square base of shallow domes. To express this structure, the architects placed all of the mechanical ductwork in a deep floor underneath the concourse level. Lighting (it's all uplighting except for indirect skylighting from the roof), supply air, and return air are all handled from pods set within the trees (photo opposite). Arup used the high ceilings as a smoke reservoir, and provided powerful fans to extract the smoke through a large duct in the center of the pods (which also contains a service stair—section opposite), giving patrons enough time to escape.

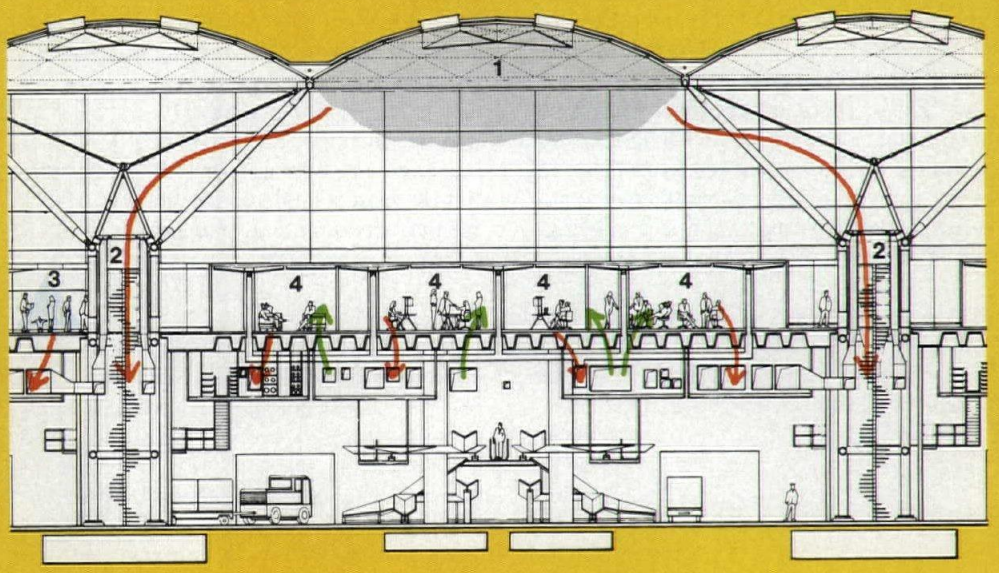
A great deal of research and engineering has gone into smoke extraction systems for multi-level shopping malls and office-building atriums. Such spaces are not readily sprinklered and form chimneys that can spread smoke rapidly between floors. Stansted departed sufficiently from precedent that Arup devised computer models to test its assumptions under several fire scenarios. Margaret Law, the former director of fire protection engineering at the firm—now an independent consultant—was in charge of fire-safety design. "Because the concept was so novel," she relates, "the local fire authorities were a bit worried about the quite long distances to exits. The Authority commissioned us to do a study using computational fluid dynamics—a technique

employed quite extensively by environmental physicists—to compute the smoke flow in the building." By combining this data with information collected from other terminals on walking speeds of passengers, the firm was able to demonstrate, as Law explains, "that there was plenty of time for passengers to escape before the smoke became life-threatening."

Separate systems were devised for the enclosed areas, which could contribute much more fuel to a fire than the open concourses. Those spaces that partly open to the concourse, such as shops and restaurants, are protected by separate smoke extraction systems and sprinklers. Essentially enclosed spaces, such as offices and kitchens, were equipped with smoke removal systems and fresh makeup air.

Computerized models of fires and smoke movement are likely to become more widely used in the U. S., predicts John Klote of NIST. Now, most codes require the system, when activated, to extract smoke (with makeup air added to avoid unwanted negative pressure) by a rule-of-thumb method. Computers can "model" the progression and extent of fires based on real experience, and smoke control systems can be designed using more realistic performance criteria. "We understand that smoke rises above a flame plume and forms a smoke layer on the ceiling," explains Klote. "We maintain an area that is free of smoke below that layer by exhausting from it. In the new method, you determine the likely size of the fire, then you use some not terribly complicated equations to calculate the amount of smoke that would go from the plume up into the smoke layer, and design the fans to handle that flow rate plus a safety factor." With James Melke, of the University of Maryland, Klote is co-author of a revision of ASHRAE's guide to smoke control systems, available later this year. The method is already recognized by the UBC and will likely be adopted by the other model codes.

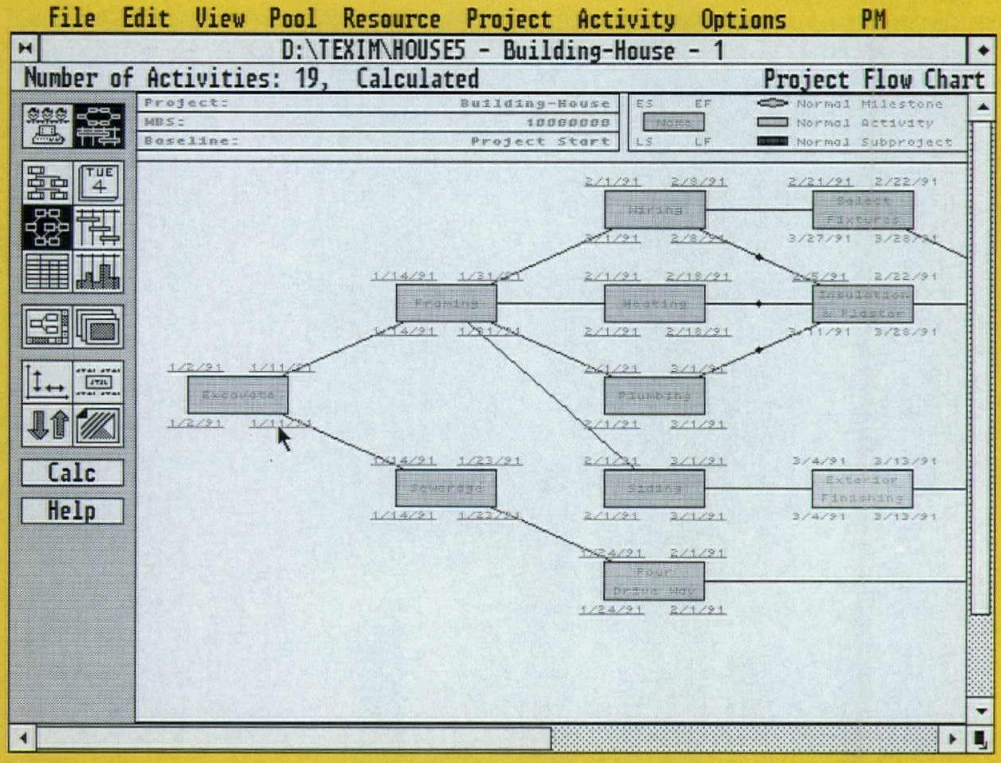
In smaller spaces other devices successfully control smoke: sprinklers (by reducing the extent of a fire), smoke barriers (partitions with sealed openings that prevent the movement of smoke), and pressurized exit stairs (that prevent smoke from entering along with escaping people). *J. S. R.*



In case of fire at London's Stansted Airport, smoke accumulates at the ceiling (1, above), and is drawn by extraction fans down central return-air plenums (within the structural "trees," top) containing stairs (2). Semi-enclosed spaces are protected by sprinklers and smoke extraction (3); fully enclosed rooms use smoke extraction with makeup air (4).

Texim Project 1. 1

Steve Ross reviews project-management and scheduler packages; new Virtus Walk-Through version; a construction specs service.



By Steven S. Ross

This is a full-featured project-management package with Gantt, PERT, and other charting options. Although DOS-based, the GEM-based interface is quite graphical and interactive. There are good provisions for modifying calendars, establishing times and costs for tasks, leveling resources, showing work and organizational breakdown structures, and calculating chances of meeting schedules.

Although the program can run on a small PC, it can exchange files with SuperProject project-management software. Small and medium-size practices working on projects as large as fair-size commercial structures should look at it. It's perhaps the most interactive project-management software for DOS computers, but the manual and supplementary manual are tough to use together.
Circle number **302**

Texim Summary

Equipment required: Any IBM PC or compatible with 640K of RAM and fixed disk. Mouse or graphics tablet recommended. Output to LaserJets and other printers.

Vendor: Texim, Inc., 833 Portland Ave., St. Paul, Minn. 55104-7148. 612/290-9627, fax 612/290-9631, single user: $1,295; multiuser: $2,495; additional user, $395.

Manuals: There's a good architecture-oriented tutorial, a fair guide to project-management basics, and a poor reference manual, supplemented with a guide to changes in version 1. 1.

Ease-of-use: The on-screen action is better organized than the reference manual. File export is through comma separated variable (CSV) or plain-text ASCII; reading such files into a spreadsheet or database for further processing requires some knowledge not always available in smaller practices. Fortunately, for exporting files, the built-in standard report system will give you just about everything you need.

Error-trapping: As with many full-featured project-management packages, it is possible to lose track of which calendar or level of task is being worked on.

Scitor Project Scheduler

We looked at version 4 for the Macintosh and version 5 for IBM personal computers and compatibles. Both are fine packages with good setup systems, graphic interfaces, and nicely formatted output reports. The DOS version is the more advanced, with numerous ways to sort, categorize, and report information. But the Mac version is a strong performer, too, with many features that upstage MacProject II from Claris.

Both handle the standard Gantt and PERT charts, resource leveling, work breakdown structure, and organizational breakdown structure reports.

Those who tried to plow through DOS version 4 will find many improvements, especially in setting up the output reports for printing and plotting.

Both packages will run on small computers in a pinch, but use high-end machines for big projects. Linking tasks can slow these systems to a crawl.
Circle number **303**

Scitor Summary

Equipment required: DOS version: IBM XT or newer, or compatible, 640K, fixed disk. Mouse strongly recommended. Macintosh version: Macintosh II series or higher and plotter strongly recommended.

Vendor: Scitor Corp., 393 Vintage Park Dr., Suite 140, Foster City, Calif. 94404. 415/570-7700, fax 415-570-7807. DOS version: $685. Macintosh version: $685. Trial versions: $40, PC; $20 Mac—applied to full price if purchased.

Manuals: For DOS, 120 pages of tutorial and 550 pages of reference. For Mac, 180 pages combined. Both are excellent.

Ease-of-use: Both versions make good use of graphic interface.

Error-trapping: Good. As with many complex project-planner packages, you can misapply rates and calendars to tasks, but the good interface makes this unlikely.

For more information, circle item number on Reader Service Cards.

DesignCAD 2-D/3-D Macintosh

In a pinch, this economical package will run on as small a system as the Macintosh Plus with 2 megabytes of random-access memory, although a Mac II or faster machine, with math coprocessor support, would be better. The 2-D part of the program has all of the basic drawing tools for production drafting—including associative dimensioning, import and export of DXF, PICT, PICT2, and IGES files, and multiple windows. The 3-D part offers shading and textured surfaces.

DesignCAD even comes with a library of architectural symbols.
Circle number **304.**

DesignCad Summary

Equipment required: Macintosh Plus, 2MB RAM, at least 2 MB fixed-disk space. Macintosh II or higher strongly recommended.

Vendor: DesignCAD, Inc., One American Way, Pryor, Okla. 74361, 918/825-4848, fax 918/825-6359.

Manual: One large paperback with good command reference and detailed installation instructions. The material is arranged menu-by-menu.

Ease-of-use: Good in both 2-D and 3-D. The package is slow on a Macintosh Plus without math coprocessor, but fast enough for production work on a bigger machine. The interface follows Macintosh standards.

Error-trapping: Good.

Virtus Walk-Through 1.1

WalkThrough [reviewed in RECORD, August 1991, page 40] allows users to build 3-D models and move through them in real-time on the Apple Macintosh. This new version adds Apple QuickTime as an output option. Saving a walkthrough in QuickTime as an animation allows it to be pasted into files created by other System 7-savvy software to create fancy presentations.

The QuickTime file can, for instance, be run through software that allows the addition of sound for a multimedia presentation. Or, the animation can be called from a HyperCard stack. The animation's speed can even be varied by the final software, apart from Virtus WalkThrough itself.

Version 1.1 also includes import and export of PICT and PICS files, and output of EPS (PostScript) files. System 7 support includes balloon help.

The price is $395, with free upgrades for owners of Version 1.03. Virtus Corp., 117 Edinburgh South, Suite 204, Cary, N. C. 27511, 919-467-9700.
Circle number **305.**

Construction Specs on CD ROM

There are close to one million pages of specification documents from scores of governmental and private organizations on the four CD-ROM disks that make up this package. The documents can be searched and sections can be pasted into your own specifications. While the process is fundamentally simple, there are a lot of things to keep straight—mainly because the various standards issued by these organizations are arranged differently.

A subscription to this service should prove substantially less expensive than using an on-line service or paper files, especially for practices involved in government work. An on-line or floppy-disk service might still be used for accessing the AIA Masterspec; it may or may not be cheaper, depending on the number of Masterspec libraries normally needed.

All specifications are on the CD-ROM disks themselves; there is no need for an external modem connection through the phone system.
Circle number **306.**

Criteria Base Summary

Equipment required: IBM PC or compatible, 640 kilobytes random-access memory, CD-ROM player.

Vendor: National Institute of Building Sciences, 1201 L St., NW, Suite 400, Washington, D. C. 20005. 202/289-7800, fax 202/289-1092. One-year subscription (four quarterly updates, with four CD-ROM disks in each), $970. One-time fee of $130 to access BOCA National Code Series; $185 one-time fee to access SBCCI Standard Codes; fee depending on libraries ordered for access to AIA Masterspec.

Manual: One for CCB disks, one for Software Bridge (used to translate files into standard word processor formats). There's also a quarterly user newsletter.

Ease-of-use: Good. The split of various databases among the four CD-ROM disks is logical; you will generally not have to change disks during a search. Some databases on the disk cannot be printed or transferred to a fixed disk, or can be printed only in small chunks. The biggest problems are due to individual databases themselves. Navy, Army, and NASA specifications need the SPECSINTACT program for searching and for document creation. This program cannot be used with other databases on the disks, however. And it requires that you purchase VolksWriter software and Superkey (a total cost of about $250).

Error-trapping: Good.

A Finnish Tale

Alvar Aalto: The Mature Years, *by Göran Schildt. New York: Rizzoli, 1991, 328 pages, $50.*

Reviewed by Kaarin Taipale

In reviewing *The Mature Years*, the third installment of Göran Schildt's biography of Alvar Aalto, it pays to remember that the author is a Swedish-speaking Finnish novelist who lives in an Aalto house and often sailed on the Nile with the great architect. This background offers Schildt a variety of perspectives on his subject: as observant historian, fluent storyteller, and old friend.

Schildt's two earlier volumes cover Aalto's life until the age of 40 and offer insights on the sources of the architect's work. *The Early Years* (1984) describes Aalto's childhood, his cultural background, and the Classicist beginning of his career. *The Decisive Years* (1986) examines Aalto's engagement with "the technocratic utopia" of Functionalism and his architectural evolution culminating in the Villa Mairea of 1938.

Covering the period from 1939 to Aalto's death in 1976, *The Mature Years* discusses some buildings and projects at length, but makes no attempt to analyze the architect's work theoretically. Rather the book—whose original title, *The Human Factor*, is more indicative of its contents—is the captivating story of his life: of journeys, lectures, letters, and encounters with clients. Schildt is planning to extend the trilogy with a fourth volume that will catalog the architect's complete works.

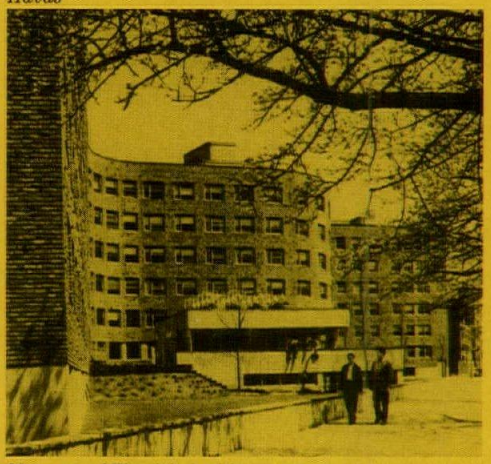
Schildt portrays Aalto as a flamboyant hero who cultivated casual manners with liquor, women, and memory. During World War II the architect avoided combat and later made up stories to suggest a more active role in the war. A "born actor," Aalto told a tale of telegraphing Laurence Rockefeller after the Soviets had invaded Finland in 1939, pleading "Send Lafayette Fighters To Help Us, Aalto." According to the story, Rockefeller replied with a million-dollar check and best regards to the architect.

Kaarin Taipale is the editor of the Finnish architectural review Arkkitehti.

While the telegram may have been a fiction, Rockefeller and architect Wallace Harrison did invite Aalto to tour the United States for six weeks in 1940. America fascinated Aalto and he ended up staying eight months, spending some of that time at MIT. After several more trips from 1945 to 1948, Aalto's Baker House opened at MIT in 1949. Later, Harrison invited Aalto to visit him in New York and make some sketches for Lincoln Center. Although Aalto never received a commission there, the studies he did for the project formed a conceptual foundation for his design of the Essen Opera in Germany.

After Aalto's death, Robert Venturi wrote, "Like all work that lives beyond its time, Aalto's can be interpreted in many ways. Each interpretation is more or less true for its moment because work of such quality has many dimensions and layers of meaning." For any true understanding of Aalto, it is essential to know the story that Göran Schildt tells so eloquently.

Havas



Museum of Finnish Architecture

Vuoksenniska Church, 1951, (above) and Baker House at MIT, 1949, (top)

Urban Concepts, *by Denise Scott Brown. New York: St. Martin's, 1990, 97 pages, $20 (paper).*

Reviewed by William Lennertz

After two decades of social neglect, architects are slowly being called back to public work. In the process, they are once again wrestling with such diverse disciplines as transportation engineering, economics, preservation, and social planning. Perhaps no other person today comes as well equipped to address these issues as Denise Scott Brown—architect, planner, teacher, and champion of the public-design process.

Urban Concepts is a collection of essays by Scott Brown plus a portfolio of six urban design projects from the office of Venturi Scott Brown and Associates. The book's first two articles are loosely autobiographical, charting Scott Brown's days at the University of Pennsylvania and describing the formation of her inclusive, interdisciplinary theory of design. A third essay on design in the public realm is a practical guide for architects, urban designers, and planners. It provides a concise history of 20th-century city planning, while also presenting various approaches to working within the system.

But the real pulse of Scott Brown's work is found in her manifesto, "Rise and Fall of Community Architecture." Scott Brown believes an architect "should not merely understand the way a society operates but should try to work with its forces," while maintaining the "obstinate hope that socially responsible architecture can be beautiful." Hers is a theory rooted in social concerns and learning from Las Vegas. At its core is a commitment to serve the client. Relying on a "democratic planning process," she rolls up her sleeves and works with neighborhood and business leaders, social workers, economic strategists, and whoever is crucial to the success of a project. For those who know Scott Brown's work only as a collaboration with Robert Venturi, this book is a good opportunity to appreciate her special contribution to the field of urban design.

William Lennertz heads his own architecture and town-planning firm in Boston.

Frank Furness: The Complete Works, *by George E. Thomas, Jeffrey A. Cohen, and Michael Lewis. New York: Princeton Architectural Press, 1991, 386 pages, $65 (cloth), $40. (paper).*

Reviewed by Martin McNamara

A recent visit to the AIA Bookstore in Philadelphia revealed six books on Louis Sullivan, five on H. H. Richardson, and 22 on Frank Lloyd Wright (not to mention calendars, notecards, daybooks, and cut-out models of Wright's works). But what of home-grown genius Frank Furness, Philadelphia's greatest 19th-century architect, whose work blazed the way for subsequent masters like George Howe, Louis Kahn, and Robert Venturi? Until a few months ago, there was just one book, James F. O'Gorman's *The Architecture of Frank Furness*, which came out in 1973 as the catalog to an exhibit of the architect's work.

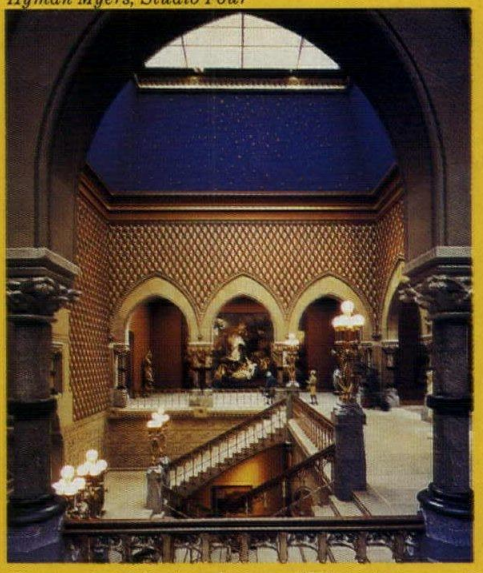
Admirers of Furness will be pleased to find that *Frank Furness: The Complete Works* picks up where O'Gorman left off and fills in many of the hows and whys of the architect's career.

In his introduction, George E. Thomas explains that the dearth of printed material is a result both of Furness's precipitous fall from favor and the loss of his office's records and drawings after it was dissolved in the early 1930s. Furness's hearty expressionist creations in red brick and fieldstone were anathema to the neoclassicists of the early 20th century and even more so to the Modernists who followed. As a result, the backlash against Furness was severe and long-lived, greatly obscuring the truth about the architect and his work.

Thomas dispells one of the major myths regarding Furness—that he was a maverick architect, operating on the fringes of society. The author asserts that Furness was, in fact, a highly successful businessman, who built what was one of Philadelphia's most active and influential practices of the late 19th century.

Thomas explains that Furness's bold style was perfectly suited to the vision of a new

Hyman Myers, Studio Four



Pennsylvania Academy of Fine Arts

generation of post-Civil-War politicians and businessmen. Thomas's three essays, as well as his introduction, are precise and informative in rendering a new image of Furness. Michael Lewis's essay, "Furness and the Arc of Fame," enriches this portrait with a look at Furness's place in the Philadelphia firmament. Lewis argues that Furness dominated and, by his example, directed architecture in Philadelphia in the late 19th and early 20th centuries. Unfortunately, Jeffrey Cohen's essay, "Styles and Motivations," does little to extend the territory explored by the other authors. Sandwiched between the work of Thomas and Lewis, Cohen's piece, written in heavy academese, suffers by comparison.

The book includes a catalog of Furness's works, proof he was indeed very successful. Although some people may be disappointed that the catalog isn't more richly illustrated, it is a document that fills a great hole in our understanding of Furness. Robert Venturi's foreword offers a wonderfully personal prespective from an architect who grew up despising Furness's buildings but later developed an "absolute, unrestrained adoration and respect for his work."

Martin H. McNamara is a Philadelphia-based architectural writer whose work has appeared in Metropolis *and* Landscape Architecture.

Houses by Bart Prince: An American Architecture for the Continuous Present, *by Christopher Mead. Albuquerque: Univ. of New Mexico Press, 1991, 99 pages, $30.*

Bart Prince has never been everyone's cup of tea. In a country that claims to encourage individualism but in fact rewards conformity, Prince's flamboyant buildings, most located in his native New Mexico with a few significant examples in California, have provoked more scorn than admiration. But as Christopher Mead notes in this slim, well-produced volume, which began as a catalog for an exhibition at the University of New Mexico in 1989, the *idea* of Prince's architecture (if not his actual choice of form, material, and structure) is anything but revolutionary. Rather, Mead observes, "it is rooted in the peculiarly American tradition of Organicism," a school of thought that values the specific needs of each design while rejecting any stylistic imitation of the past.

Like the best work of Frank Lloyd Wright (his spiritual mentor) and Bruce Goff (his actual mentor and one-time boss), Prince's most characteristic buildings are houses commissioned by clients who share the architect's iconoclastic spirit. Mead accordingly has chosen as a framework for his study eight of Prince's residential projects—five built, three unbuilt—designed between 1971 and 1989. They range from the 1971 Sandersier project, designed before Prince was a registered architect, to the 1989 Price House, a complex series of pods covered by overhanging biomorphic roofs, built by Prince's great patron, Joe Price. What is perhaps most telling about Prince's work is not how *much* it has progressed since 1971, but how *little*. Unlike most of his contemporary colleagues, Prince graduated from architecture school (Arizona State University) with his artistic sensibility fully developed. Without the constraints of International Style Modernism or adobe-swathed New Mexican regionalism, he was free, notes Mead, "to formulate the essential idea of his work." Prince remains true to his principles today, pleasing only himself, his clients, and a few sympathetic critics like Mead who recognize in his buildings a successful—and remarkably original—integration of geometry, space, structure, and materials. *P. M. S.*

Briefly Noted

A Celebration of Art & Architecture, *by Colin Amery. London: National Gallery Publications, 1991, 144 pages, $30 (paper).*

The history of Venturi, Scott Brown and Associates' Sainsbury Wing of London's National Gallery is one of the most contentious architectural stories in recent memory [RECORD, October 1991, pages 72-79]. In telling it, Colin Amery is hardly a disinterested observer—he was on the architectural selection committee. Yet his account is fair and thorough, and the story is fascinating, pitting, among other players, the Prince of Wales against the Thatcherites. A more independent appraisal might have taken in more of the juicy critical debate, but would have lacked Amery's direct access to all the principals. *J. S. R.*

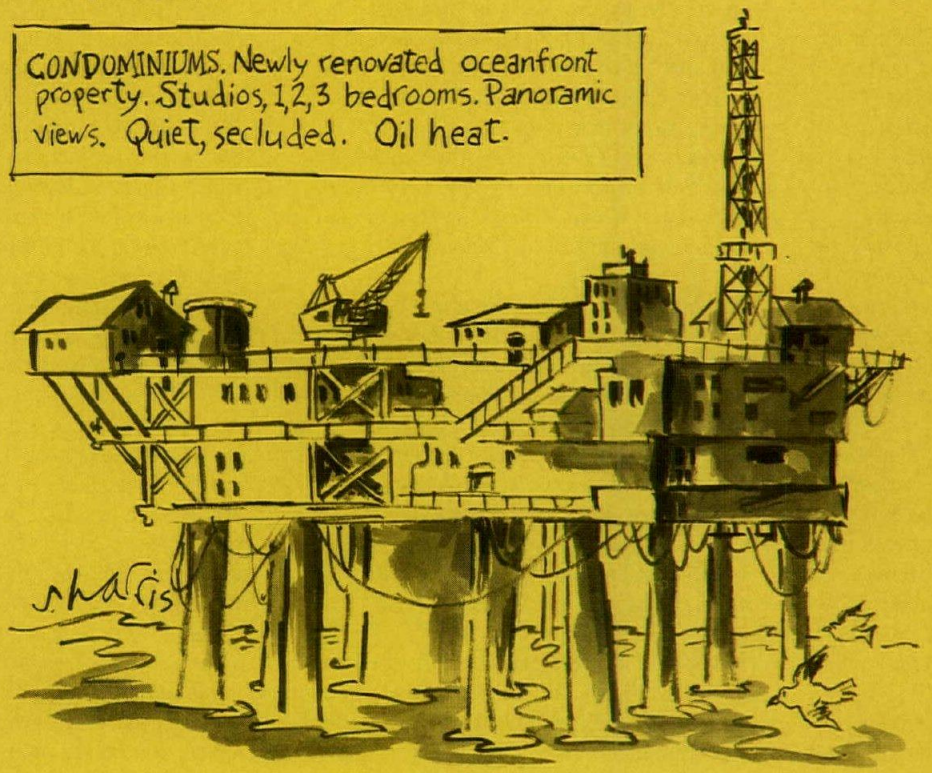
Horta, *by Franco Borsi and Paolo Portoghesi. New York: Rizzoli, 1991, 414 pages, $85.*
This revised edition of a 1970 volume is a rich treasury of Victor Horta's energetic architecture. Although it focuses on the Belgian designer's turn-of-the-century Art Nouveau masterpieces, it also sheds light on his later work such as Central Station and the Palais des Beaux-Arts, both in Brussels. Spectacular photographs and thoughtful essays make this book a real treat.

Classical Architecture: A Comprehensive Handbook to the Tradition of Classical Style, *by Robert Adam. New York: Harry N. Abrams, 1991, 320 pages, $45.*
Written in a flat, lifeless tone, this primer on Classicism reduces topics such as Hellenism, the Renaissance, and Palladio to one-page lessons. Illustrations by Derek Brentnall are equally joyless. The book's message seems to be: Classicism is good for you. Now, open your mouth and swallow your medicine.

The Architecture of Mott B. Schmidt, *by Mark Alan Hewitt. New York: Rizzoli, 1991, 164 pages, $50.*
One of the last residential architects in America to devote his career to the Classical idiom in general and the Georgian style in particular, Mott Schmidt left his stamp on New York's Upper East Side and on country estates throughout the region. Best known for making Manhattan's Sutton Place the pinnacle of restrained elegance, Schmidt practiced from 1912 to the 1970s, impervious to artistic movements and fads alike. This is an oversized book with solid text and a graceful introduction by Robert A. M. Stern.

A Journey to Turkey: Architectural Notes, *by Pierre Zoelly. Boston: Birkhäuser, 1991, 74 pages, $15.*
Essentially a sketchbook of drawings and photographs, this half-foot-square volume presents one architect's quirky look at an exotic land's built environment. Free of pretentions and practically any text, the book is a fascinating charcoal-and-paper journey into the author's perception of Islamic forms, space, structure, and materials. Zoelly, a Swiss-American architect with a sure sketching hand, also has an eye for the telling detail and view. ■

Drawn for ARCHITECTURAL RECORD *by Sidney Harris.*



Tools Of The Trade

SELECTION: Think of us as your one-stop source for every ceramic tile need. Select from ceramic floor and wall tile, porcelain ceramic mosaics, porcelain pavers, quarry tile and natural stone products. Add your talent and the possibilities become endless.

SERVICE: Our more than 150 company-owned and operated office/showroom/warehouse facilities nationwide stock product for immediate delivery. Each facility staffs highly-trained professional representatives to help with product selection, specification and installation information.

SUPPORT: Our colorful product literature and complete sampling program puts our product at your fingertips. Let our custom design department help create a one-of-a-kind custom porcelain ceramic mosaic mural. Or contact us about our personalized on-site product seminars.

SEND FOR YOUR FREE COPY OF OUR NEW 48 PAGE 1992 PRODUCT CATALOG TODAY!

DAL-TILE

7834 Hawn Freeway
Dallas, Texas 75217
(214) 398-1411
(800) 933-TILE

KOHLER® COLOR COORDINATES

A Participant In The Kohler Color Coordinates Program.

Circle 10 on inquiry card

Spend more time here.

You've got better things to do than sit around and wait for plots. That's why Hewlett-Packard has designed the revolutionary new HP DesignJet. The faster way to high-quality monochrome plots.

You see, DesignJet uses HP's proprietary inkjet technology. The same technology that has proven itself in nearly 3 million desktop printers. So you get the kind of quality you'd expect from Hewlett-Packard, a company that's built a reputation for exceptional output.

The new HP DesignJet also gives you convenience. Two easy-to-change, maintenance-free ink cartridges help ensure you get a good plot every time. And the DesignJet can use commonly available media.

*Suggested U.S. list price. †In Canada call 1-800-387-3867, Ext. 2697. Plot image courtesy of Autodesk, Inc. © 1991 Hewlett-Packard Company PE12119

THEY ALWAYS WILL.

It's the busiest time of day. Thousands of people are coming and going. Most are in a big hurry. A few seem to have all the time in the world. All want to make a clean exit. Help them get out easily with a cleanly designed Russwin Exit Device.

Those who slam it hard won't know that it has exceeded ANSI Grade 1 standards by a test of over 250,000 cycles. Children and disabled persons will never know that they were responsible for its ease of use with no pinch points. And prowlers will never know that its ¾" deadlocking stainless steel latch is what's keeping them out.

But you will.

Because these are some of the features you look for in a quality exit device. And they're what you will get with Russwin products.

So leave people with the dependability of a Russwin 572 Series Exit Device.

To find out more about our complete line of exit devices, locksets, door controls and key systems, give us a call at (203) 225-7411. You'll get the support you need from our factory-direct sales force and inside sales representatives.

Russwin Architectural Hardware,
225 Episcopal Road, Berlin, CT 06037.

RUSSWIN
WHEN YOU WANT IT TO WORK

CORBIN & RUSSWIN ARCHITECTURAL HARDWARE
A **BLACK & DECKER** Company

Circle 12 on inquiry card

1991 BUSINESS IN THE ARTS AWARD WINNERS

FIRST TIME

Affiliated National Bank of Greeley, Greeley, Colorado

Fredrick J. Urbaska Investments, Billings, Montana

John Hancock Financial Services, Boston, Massachusetts

The News-Journal Corporation, Daytona Beach, Florida

South Carolina National Bank, Columbia, South Carolina

RETURN

General Mills, Minneapolis, Minnesota

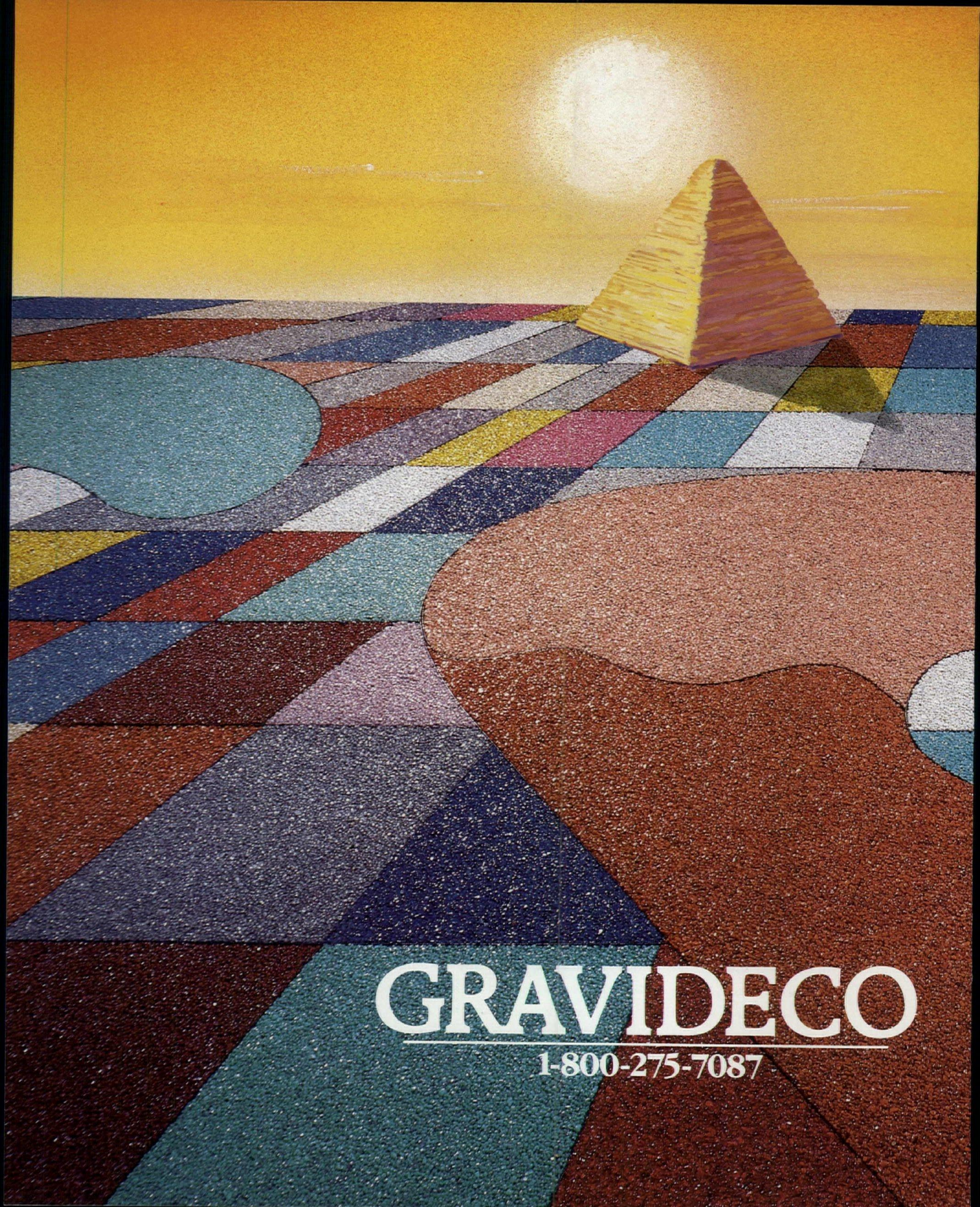
I.W. Marks Jewelers, Inc., Houston, Texas

Pacific Telesis Group, San Francisco, California

DISTINGUISHED ACHIEVEMENT

Dayton Hudson Corporation, Minneapolis, Minnesota

Metropolitan Life Insurance Company and Metropolitan Life Foundation, New York, New York


GRAVIDECO
1-800-275-7087

INTRODUCING GRAVIDECO

THE ULTIMATE FLOORING

Timeless beauty is only the beginning.

INFINITE VERSATILITY.

Any combination of color and design that can be dreamed of can be created in seamless grandeur with GRAVIDECO.

INCREDIBLE STRENGTH AND DURABILITY.

Rated at *more than 11,000 p.s.i.* GRAVIDECO is virtually weatherproof, stainproof, skidproof and crackproof. Want proof? Call us for complete documentation and details of how GRAVIDECO can transform your design dreams into timeless reality.

WHAT IS YOUR CHILD TAKING IN SCHOOL THIS YEAR?

Your child isn't just learning about History and English in school. He's also learning about amphetamines, barbituates and marijuana.

Drugs are rampant in our schools today.

Kids are taking them before school. They're taking them between classes. School has even become one of the more convenient places to buy drugs.

The sad part is that all this doesn't just affect those kids who are taking the drugs. It affects all the kids. Drugs keep everyone from learning.

Our schools need our help.

As a parent, you can do your part. Talk with your child. Find out how bad the problem is at his school.

Then talk to other parents. And decide what you as a group can do to get drugs out of the classroom.

Also, contact your local agency on drug abuse. They can provide you with valuable information as well as sound advice.

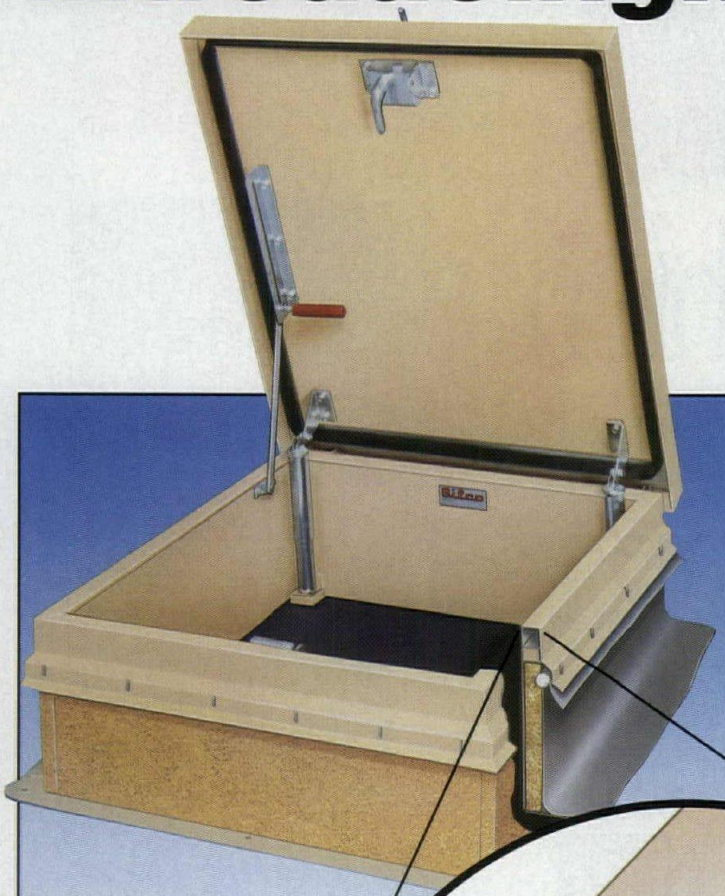
School is your child's best chance to get ahead in life. Don't let drugs take that chance away.

PARTNERSHIP FOR A DRUG-FREE AMERICA

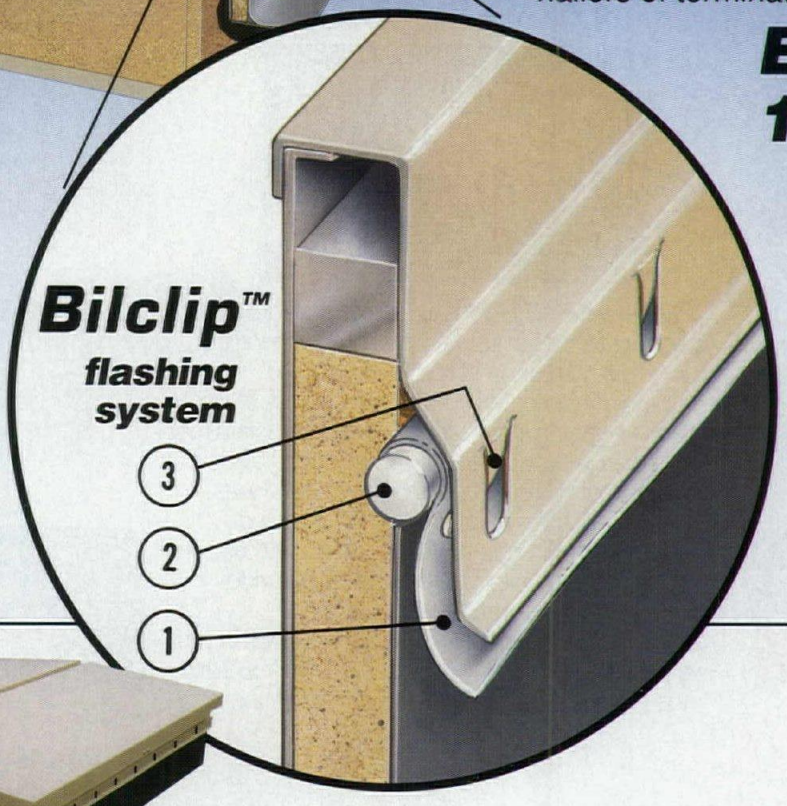
Introducing...

Bilclip™

BILCO'S UNIQUE NEW FLASHING SYSTEM FOR MEMBRANE ROOFS



The new Bilco Bilclip™ flashing system provides an innovative method to quickly and easily secure single ply roofing material to Bilco roof products.* Approved by leading single ply roofing manufacturers, the Bilclip flashing system is a part of the integral capflashing on the Bilco curb. Installation time and related installation costs are greatly reduced. A more effective termination is provided that does not rely on adhesives alone. It's fast, easy, reliable and there is no need for wood nailers of termination bars.



Easy as 1-2-3...

① Roof membrane skirt flashing is folded over and inserted under the cap-flashing.

② The Bilco "Pak-Rope" (included) is pushed up into the membrane hem under the capflashing.

③ Each Bilclip is then bent inward to securely hold the membrane in place.

U.S. Patent #4,941,300

*The Bilclip integral capflashing is now standard on all Bilco roof products. When installation is on built up or modified bitumen roofs, the Bilclip tabs are not used.

Send today for full information on Bilco roof products... the products known for the design, operation, and workmanship that give your customers lasting satisfaction.

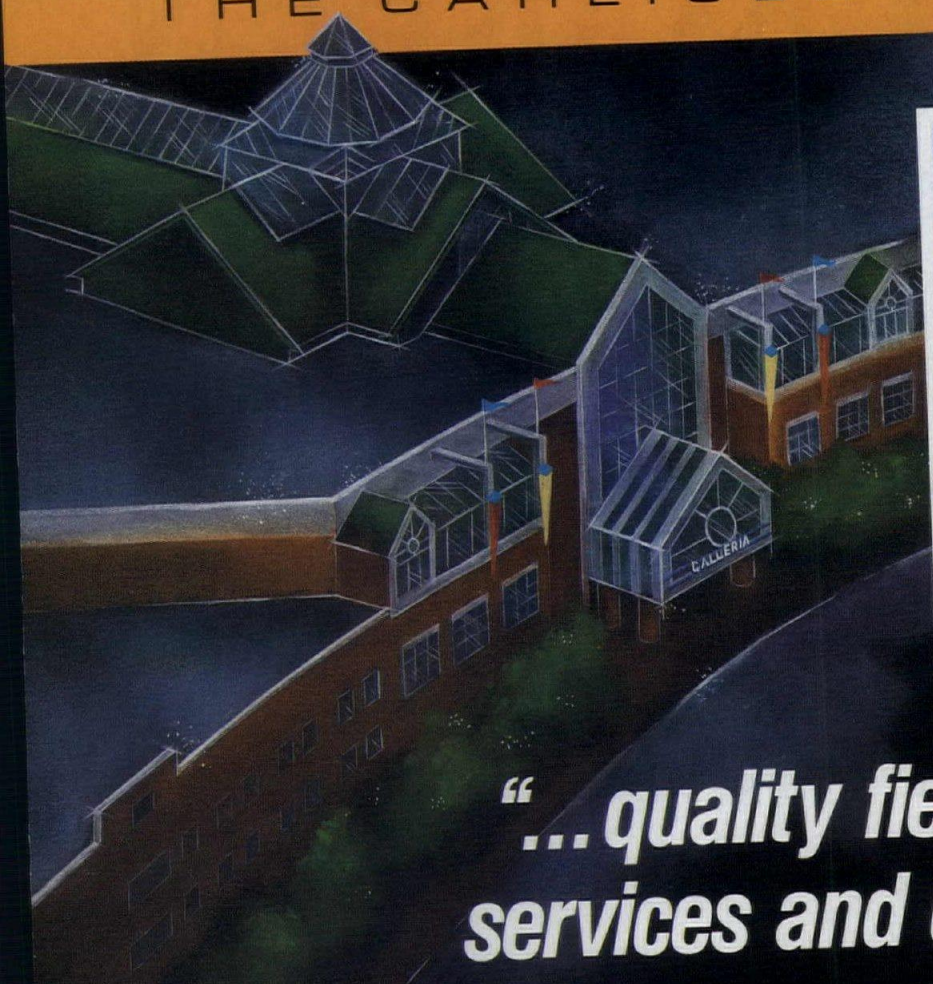
Your Assurance of Quality, Since 1926.

Bilco® DOORS FOR SPECIAL SERVICES

The BILCO Company, P.O. Box 1203, New Haven, CT 06505
Tel: (203) 934-6363, Fax: (203) 933-8478

Circle 16 on inquiry card

THE CARLISLE DIFFERENCE



Architect: Arrowstreet, Inc., Somerville, MA
Developer: New England Development Co., Newton, MA
Consultant: Engineering Management Consultants, Inc., Newton, MA
Roofer: The Hartford Roofing Co., Inc., Glastonbury, CT

"...quality field representatives, services and customer support."

"We specified Carlisle SynTec Systems as a quality roofing standard," said Peter Belford, architect, Arrowstreet, Inc., Somerville, MA. "They usually are our first choice because of the quality of their field representatives, service and customer support. "The technical back up available provides us with a solid base for drawings and specifications assuring a quality installation."

When the fast-tracked $150 million, CambridgeSide Galleria shopping complex near Boston was kicked into overdrive by New England Development Co., The Hartford Roofing Co., Inc., of Glastonbury, CT, recommended a combination of Carlisle's Fully-Adhered and Mechanically-Fastened systems for the 167,000 square foot roofing project.

"Two of the beauties of this roof are it goes down fast and is essentially watertight right away. That helped us fast-track the work going on below," said Bill Daigle of Engineering Management Consultants, Inc., Newton, MA.

Carlisle's design professionals also set quality standards for you, the specifier, in other areas; conducting informative regional and in-house design conferences and delivering quick responses to your inquiries. Carlisle's technical representatives conduct the most demanding inspections resulting in the issuance of meaningful membrane system warranties.

When you look at roofing design conferences, services, systems, products and warranties, Carlisle Really Has No Equal. Let us help you with your next roofing project. Call us for additional information about the Carlisle Difference (USA) 800-233-0551; (PA) 800-932-4646; (Canada) 416-564-5557.

THERE *Really* IS NO EQUAL.

CARLISLE

Carlisle SynTec Systems

P.O. Box 7000
Carlisle, PA 17013-0925

Carlisle is a trademark of Carlisle Corporation

Circle 17 on inquiry card

EVERGREEN™
The first glass designed

GLASS by LOF from the inside out.

More than a new glass color, a new glass breakthrough that embraces a revolutionary concept.

EverGreen Glass. The only architectural glass created with the interior environment in mind. A soothing green tint that blocks 78% of the UV light, transmits 66% of the visible light, yet offers nearly 20% less solar heat gain than other tinted glasses on the market today.

EverGreen Glass. Offering a crisp, clean view from the inside out. And a cool, comfortable feel from the outside in.

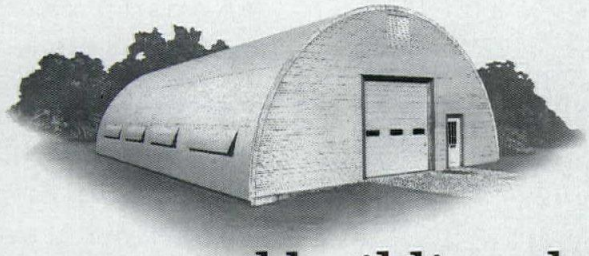
EverGreen Glass. One of the many new light- and heat-managing innovations from Libbey-Owens-Ford. Makers of the new first family of glass.

LOF Libbey Owens Ford

A member of the Pilkington Group

light years ahead

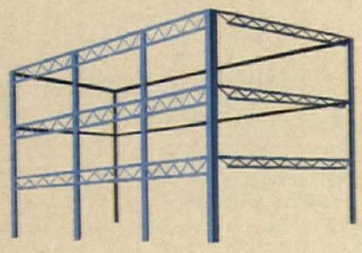
Circle 18 on inquiry card

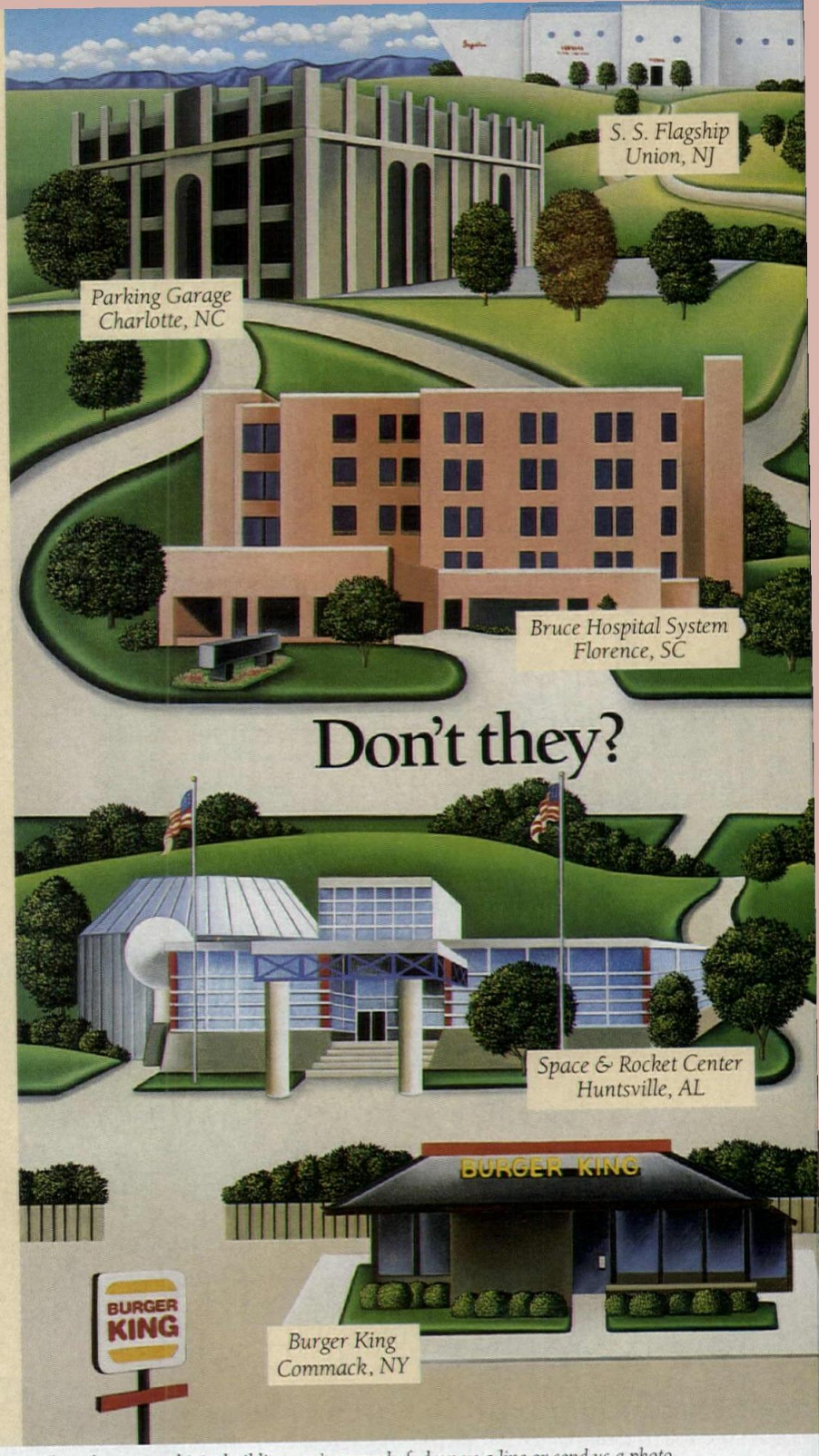


This *was* metal building design.

Times have changed

Everybody knows what you can build with steel joists.





If you have a steel joist building you're proud of, drop us a line or send us a photo.

Don't stop with the first picture that comes into your mind. Instead, take a look all over town.

For instance, that new corporate headquarters downtown. Maybe that dramatic suburban condo complex everybody's been talking about. Or a very interesting new grouping in that west side office park.

That's the steel joist picture today. Beautiful stores, auditoriums, hospitals, churches, motels—because using steel joist construction is an idea that's catching on everywhere.

You get complete design flexibility—the freedom to do exactly what you want. And steel joist construction is a great time saver, too, with the economics all in your favor.

But then all you have to do is start building your own beautiful ideas with steel joist construction. And you'll get the picture.

STEEL JOIST INSTITUTE STANDARD JOIST

1205 48th Avenue North
Suite A
Myrtle Beach,
South Carolina 29577

Circle 21 on inquiry card

SLICE OF LIFE SAFETY

USG® AREA SEPARATION WALLS

Give Superior Fire/Sound Ratings

Go Up Fast To Cut Costs.

USG® Area Separation Walls provide tried, true, tested assemblies that have been proved in thousands of multi-housing installations nationwide. In fact, these superior systems consistently exceed code authority expectations. Over 16 years of continuous R&D in system design from USG makes the dependable difference. Other solid reasons from the leader in fire, sound and systems technology:

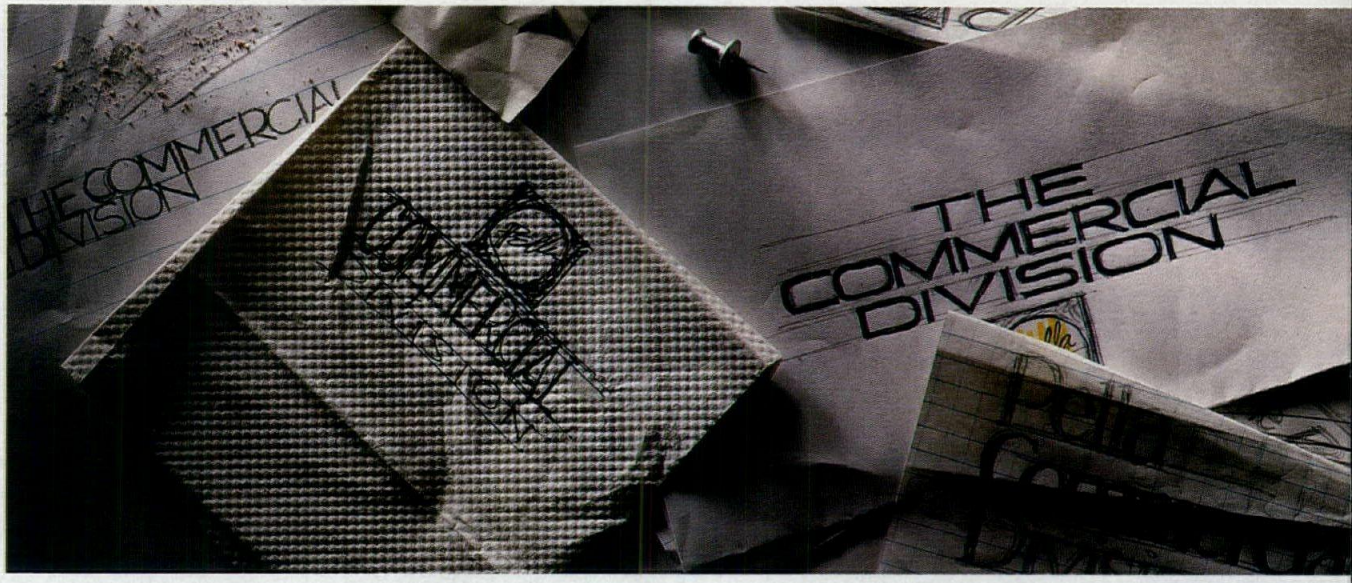
- **1, 2 or 3-hr. fire ratings. Exclusive UL Design U336 establishes 2 hour fire protection and structural stability up to four stories.**
- **Up to 60 STC ratings.**
- **Can be erected same day as framing and roof trusses.**
- **Minimum number of components including unique USG attachment clip-provides reliable lateral stability and breakaway features under fire.**
- **Permits all-weather dry construction—minimizes costly delays.**
- **Installed easily by contractor trades.**
- **Reduced labor and material costs.**
- **Substantial floor space and cost savings—when compared to masonry . . . and a fraction of the weight of masonry methods.**
- **Choice of two types: solid or cavity assemblies.**
- **Code conformance under BOCA Research Report No. 87-63, SBCCI Report No. 9033.**

For specifics, contact your United States Gypsum Company representative. See section 09250 of Sweet's General Building & Renovation File. Or write to us at 101 S. Wacker Drive, Chicago, IL 60606-4385.

United States Gypsum Company

Circle 22 on inquiry card

USG



These days any window company can think up a name, design a fancy logo and announce to the world that they have a commercial division.

UNLIKE OUR COMPETITORS, THAN THIS TO CREATE OUR

But present them with a complex commercial project, and you suddenly discover it's all smoke and mirrors.

Bring that same project to Pella,® however, and you quickly realize there's something real behind the name and logo. A highly-tuned organization with 25 years' experience serving the commercial market.

You discover that Pella offers an array of commercial products that are unsurpassed. Products that very often exceed industry standards in strength and performance. Pella also has the largest and most sophisticated testing facilities in the window industry.

Pella COMMERCIAL DIVISION

Support teams made up, not of glorified salesmen, but local architectural

representatives teamed up with highly trained engineers, architects and technicians. Specialists who can provide energy audits, performance

WE'VE DONE A LOT MORE WORK COMMERCIAL DIVISION.

analysis, initial site surveys, preliminary design or final shop drawings, product mock-up field testing and on-site installation guidance.

And when it comes to Computer Assisted Design in the realm of windows, Pella pretty much invented the game. Our designer software makes our entire product line available to users of the AutoCad Systems, including cross sections, three dimensional window and door elevations, and floor plan views.

All of which goes a long way to explain why more architects today specify Pella windows than any other brand.

You see, it's not just the window. It's all the things that support it.

PELLA. BUILT TO IMPOSSIBLY HIGH STANDARDS.™

Circle 23 on inquiry card

IF YOU THINK THE COST OF A COPPER ROOF IS SKY-HIGH, THINK AGAIN.

The myth: although more elegant and functionally superior to steel, copper roofing is too expensive. *The reality:* the installed cost of a properly designed copper roof may be only 12–18% more than a painted steel roof.

Keeping costs down is a matter of design and installation. The Copper Development Associations (CDAs) in the United States and Canada can help you with both.

CAD from CDA
Often, the cost of a copper roof is inflated by unforeseen errors in the initial design. To help architects spot these problem areas up front, CDA offers CAD details and specifications. Other design aids available include full detail and specification handbooks.

Preformed panels cut installation costs.
The use of preformed copper roofing panels can reduce the costs of installation and on-site work for many designs. These panels are made to your specifications by the same manufacturers who preform other roofing materials—and preforming copper costs no more than for other metals.

Power roofing equipment saves time—and money.
Automatic roll formers and seamers can speed up installation on some roofs by as much as 30% over traditional techniques while achieving a uniform, more consistent look. And many times, forming copper on site can help you save significantly on materials, fabrication and transportation costs.

Use experienced contractors.
An experienced contractor is familiar with copper. He can spot a problem before it costs you time and money. If you can't locate an experienced contractor in your area, CDA can help.

For information on any aspect of architectural copper, call 1-800-CDA-DATA. Or write: Copper Development Association Inc., Box 1840, Greenwich, CT 06836-1840. In Canada, call (416) 421-0788. Or write: Canadian Copper & Brass Development Association, 10 Gateway Boulevard, Suite 375, Don Mills, Ontario M3C 3A1.

Circle 24 on inquiry card

Copper.
The smart choice.

IBM Tower, Atlanta, GA
Architect: John Burgee & Associates, New York, NY
Roofing Contractor: Armetco Systems Inc., Irving, TX

© 1991 Don Rank Photography Inc. Atlanta, GA

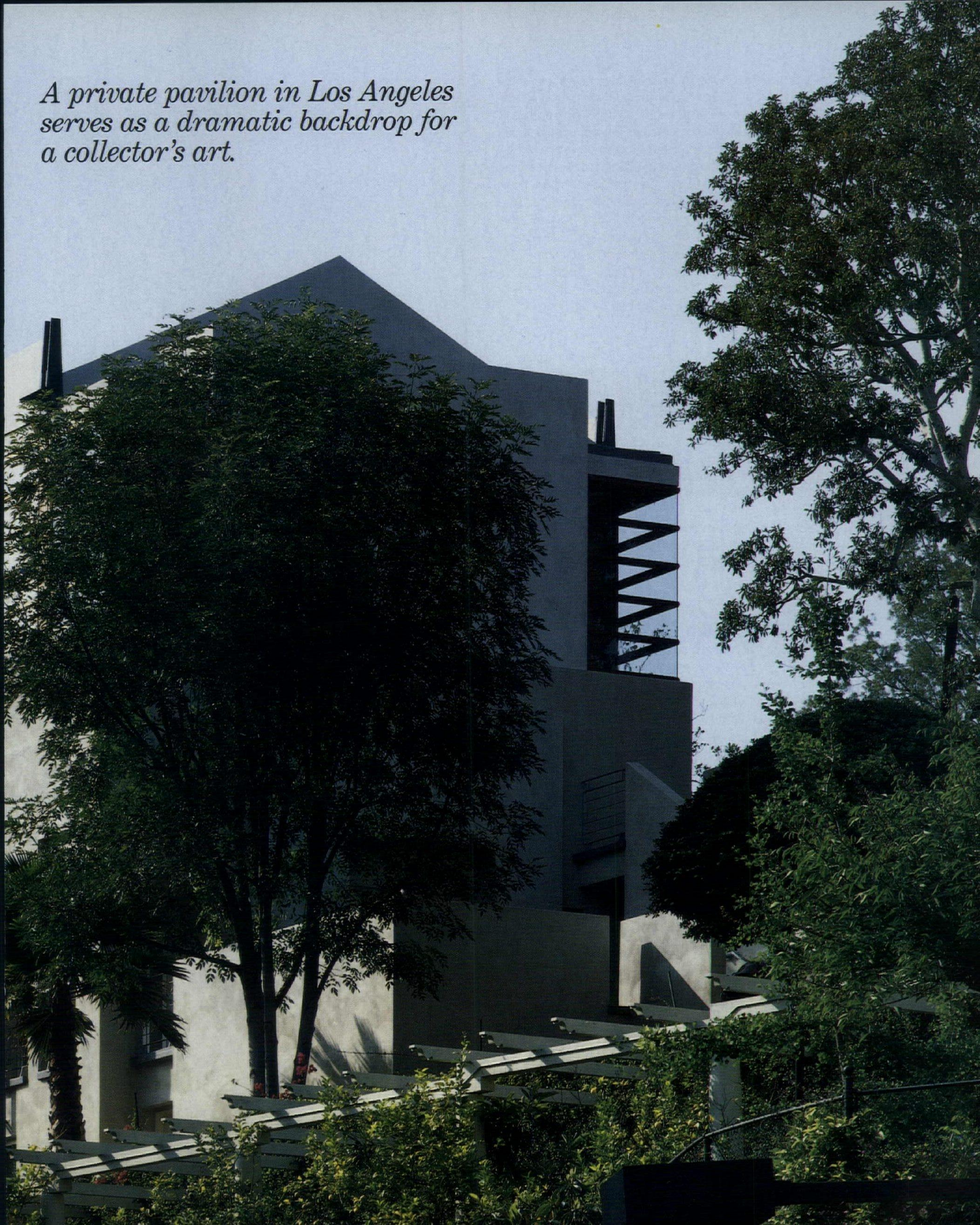
The last time we featured a chair on our cover was in 1984, when Knoll unveiled its collection of furniture designed by Venturi Scott Brown. This month Knoll is once again on the cutting edge of architect-designed furniture with a new group of woven, laminated-wood chairs, tables, and ottomans by Frank Gehry (page 74). If the pieces seem to owe their inspiration to Alvar Aalto and Charles and Ray Eames, they have also been shaped by Gehry's own imagination and the structural gymnastics of his buildings.

At the opposite end of the architect's domain, Jonathan Barnett addresses what might be called accidental cities, the formless "technoburbs" that have sprouted up near freeway intersections throughout the country, and he suggests ways to make such environments more livable and less automobile-dependent (page 94). Although their clients could not have been more different, the architects of three other featured buildings—the Shedd Aquarium in Chicago (page 80), a private art museum in Los Angeles (page 66), and Hostos Community College in New York (page 88)—illustrate three ways to enhance the existing urban character of the country's three largest metropolises. Finally, by eliminating assembly lines and the usual barriers that separate white- and blue-collar workers, the architects of a small plastics-manufacturing plant near Minneapolis (page 102) have successfully given form to a manufacturer's people-centered style of management. *P. M. S.*

Art Barn

Private Art Museum
Los Angeles
Franklin D. Israel
Design Associates, Architect

A private pavilion in Los Angeles serves as a dramatic backdrop for a collector's art.



This Frank Israel-designed "art barn" in an exclusive neighborhood of Los Angeles is a hybrid building: it is both a showy showcase and a discreet private screening room. It presents itself as part cultural monument, part storage-shed-behind-the-house. What appears from the front as an isolated object (opposite top) is revealed in the back to be Italian villa-like, with a garden wall emerging from a steep ravine (opposite bottom and pages 66-67). As to style, the architect intended the building to meld with its vaguely Mediterranean neighbors, even though its forms and materials serve as a tribute to the California Modernist tradition of Rudolph Schindler and Richard Neutra and as a bow to the owner's business interests in Japan. Despite its apparent simplicity of space and form, there is nothing straightforward about this artful little box. In Israel's words "It's not a building of colliding forms, but of artful borrowing, and of carefully made connections."

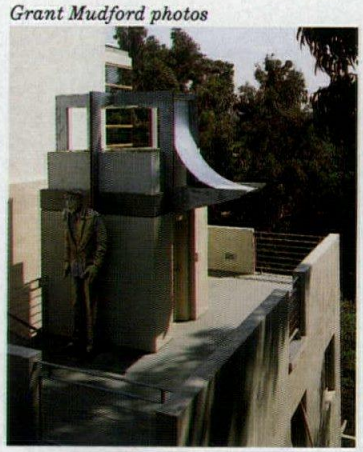
Not that the architect had a choice. The owner, who prefers to remain anonymous, demanded a building that could display his extensive collection of modern art, but that could also be used for parties, for showing movies and, eventually, for living (in the future, scholars may take up temporary residence). His influential but equally "private" neighbors, fearing a tourist attraction in their neighborhood, insisted on something low-profile. The site, a narrow sliver of land next to the owner's sprawling, stylistically mixed mansion atop a steep hill, has shifting soil. Israel's response to these demands and restrictions was to keep the overall form of the building simple, a decision that won community approval. After establishing a horizontal volume of stucco walls and a tile roof, the architect focused his design effort on the individual pieces of the structure.

The pavilion is a symmetrical 30- by 70-foot space, with the entrance located in the middle (plans page 70). The only structural elements to intrude into this monumental hall are six wood trusses that support a wooden ceiling. On the rear of the structure, a boat-shaped steel balcony is suspended over the ravine. A sculptural staircase cuts through the floor at one end of the space, leading visitors down to a warren of support offices and study rooms (pages 72-73).

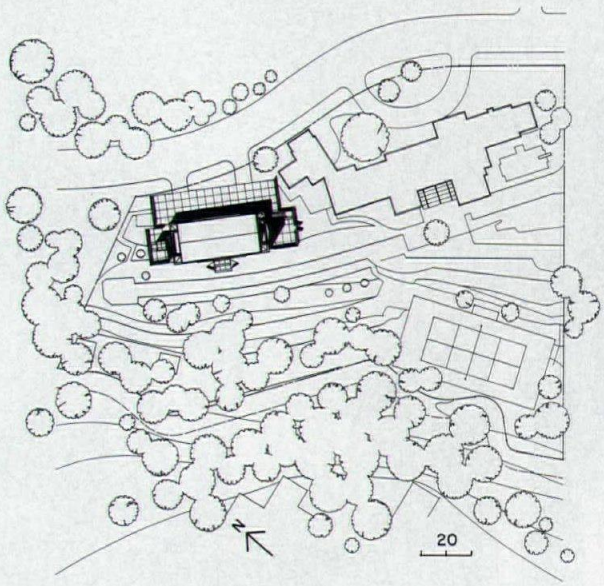
The building can be seen as one large space with three appendages or modifications: the trusses, the boat-shaped balcony, and the staircase. These functional objects are consciously over-designed: they are, for Israel, rhetorical elements, each making a point of some sort about the building in particular and architecture in general. Against the backdrop of heavy masonry enclosing walls, which recall Californian architecture's Mexican roots, the gridded truss structure links the building to the bungalow tradition of the Greene brothers and, through their work, to the more ephemeral structures of Japan. The balcony is an "ark of art,"—a symbol of the building itself, hovering precipitously over the hillside. The architect used an elaborate steel staircase to introduce function and scale into this otherwise rarefied and seemingly scaleless space.

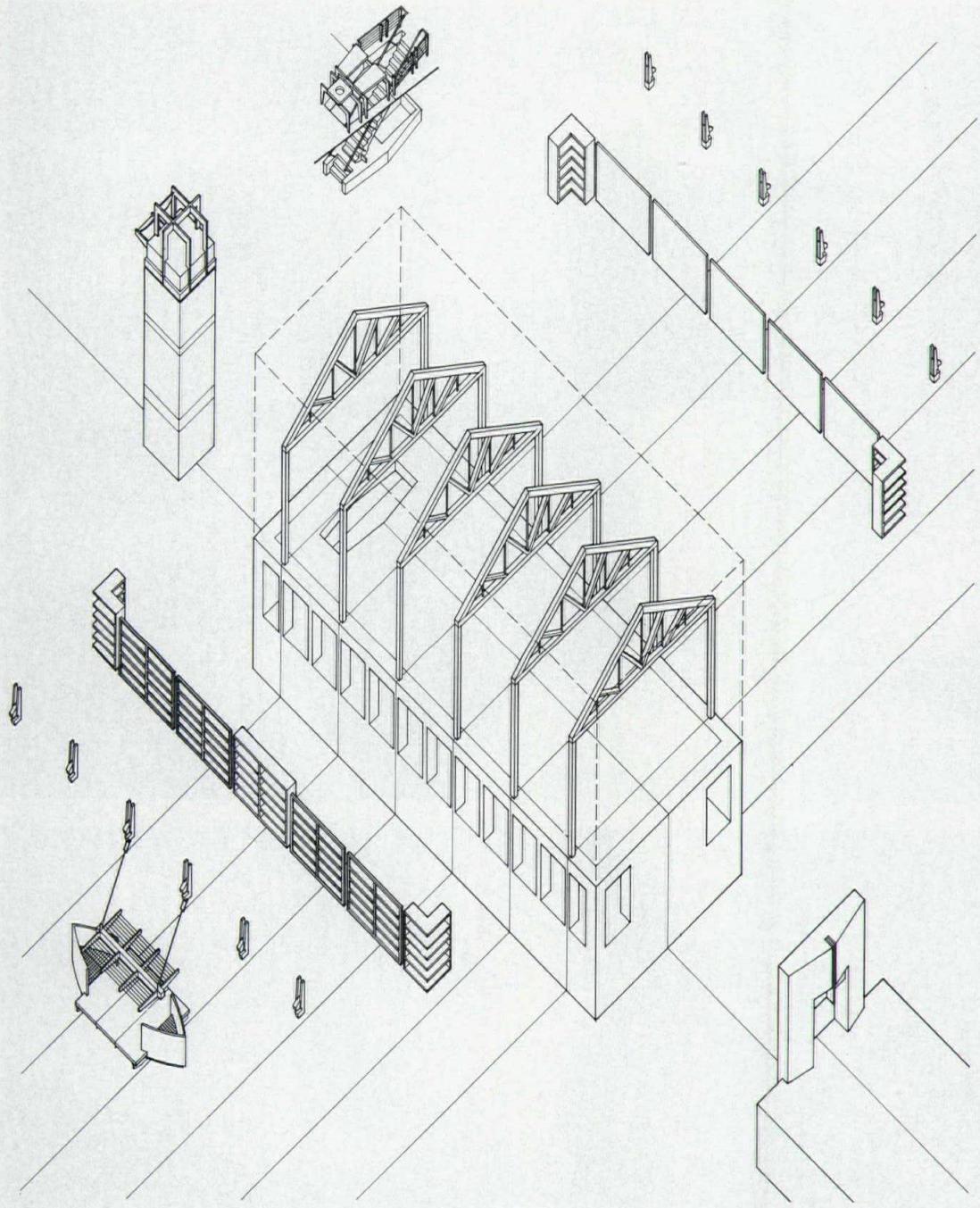
We are thus given a box and then told what it is about. The box is a properly Modern container presented with Classical monumentality. Eschewing an overtly grandiose private museum, Israel clad the building in modest materials typical of the surrounding houses. But then he went on to garland this scrupulously proportioned, restrained shed with a string of metal scuppers and to affix to the back a giant, gleaming metal brooch. This hybrid pavilion transforms the mandate of a private museum and study center into a jewel box of architecture as well as art. *Aaron Betsky*

Grant Mudford photos



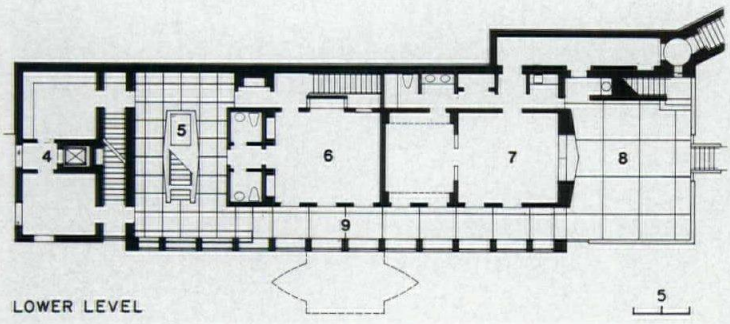
Frank Israel's art pavilion is a box with many faces: on the street side, the poured-in-place concrete and concrete block volume presents itself with a stucco base beneath a facade of composite concrete panels framed in wood (opposite top). Trusses protruding from inside support lead scuppers. Seemingly seamless corner windows echo Rudolph Schindler. An elevator shaft repeats the composition of the main building (above). On the garden side, an arcaded walkway and balcony link the building to its site (opposite bottom).



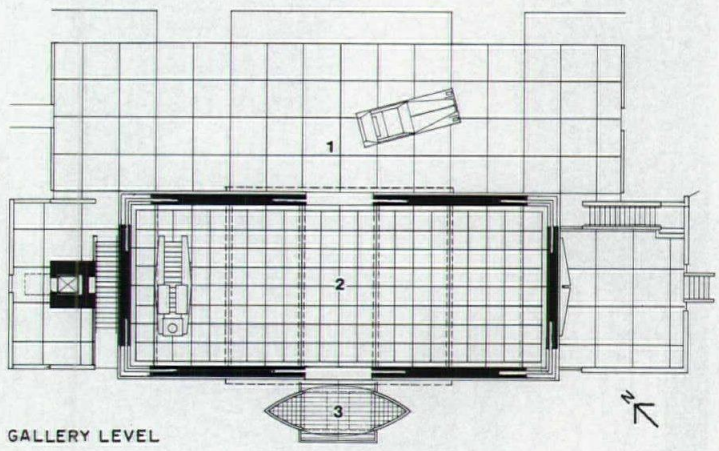


The pavilion is anchored to its site by a poured-in-place concrete base. In addition to the interior staircase, the rooms in the base can be reached by way of an elevator set apart from the main building and a covered passageway (axonometric left and floor plans below) that connects to the client's sprawling house next door. Inside are a few small offices, a study room, and intended living quarters for a scholar-in-residence. Above is the 28-foot-high main space, which is dominated by six wood trusses supported by recessed steel posts. The wood floor is laid over concrete deck panels. Facing the street, the building has a facade of concrete panels set into mahogany frames, recalling at once California's brand of Modernism and Japanese shoji screens. For ornament, Israel added a row of finial-shaped scuppers attached to protruding ends of the wood trusses. The back side of the pavilion supports a metal boat-shaped balcony, which eventually will be wrapped in bougainvillea and wisteria, to overlook the garden and ravine below (opposite).

1. *Entrance courtyard*
2. *Gallery*
3. *Balcony*
4. *Service*
5. *Lower gallery*
6. *Study*
7. *Guest apartment*
8. *Lower court*
9. *Loggia*



LOWER LEVEL



GALLERY LEVEL

Like a traditional art gallery, the main space of the pavilion is a white box with few openings (top left). The walls are two feet thick, and contain air-handling systems, projection equipment, and a system of mahogany panels that screen both windows and doors, allowing the owner to control the amount of natural light (and visitors) entering his large-scale treasure room. The architectural focus of the space is an elaborately designed but discreetly positioned staircase leading to support spaces below (opposite). It is made of galvanized metal, its color tamed by sandblasting and sealing. One section of the surrounding balustrade contains a granite-topped bar (bottom left), and the base is a chunk of concrete rubbed with pigment.

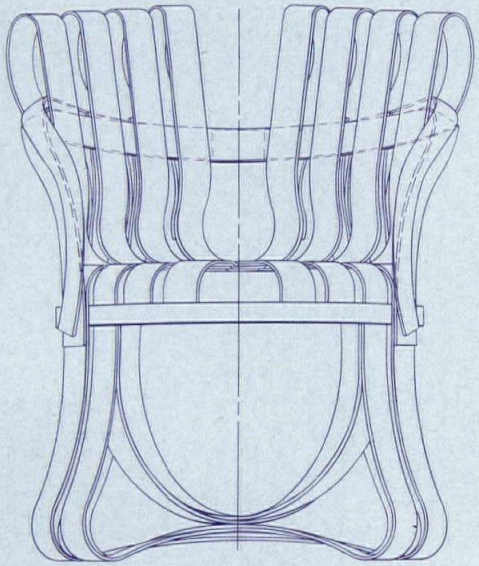
Credits

Private Art Museum
Los Angeles
Architect: *Franklin D. Israel Design Associates, Inc.—Frank Israel, principal-in-charge; Seth Rosenthal, project architect; Andre Bilokur*
Engineers: *Gary Davis (structural); Kovac Byer and Associates (geology/soils); Silver Engineering (electrical); SW Group (civil); Mel Bilow (mechanical)*
Consultant: *Glen Johnson (lighting)*
General Contractor: *Archetype—Richard Loring, principal-in-charge; Richard Clark, superintendent*

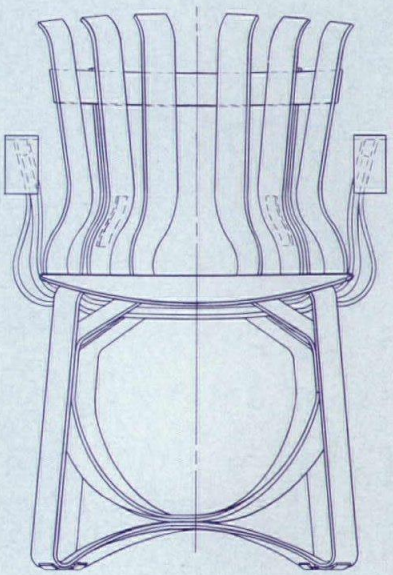
Birth of a Chair

To get Frank Gehry to design furniture, Knoll set up a workshop next door to his office.

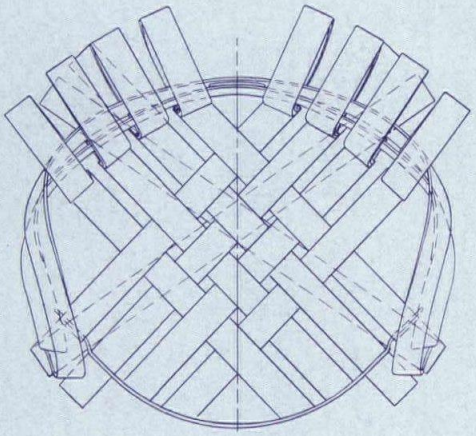
Some three years and 115 prototypes later, a seven-piece collection is unveiled.



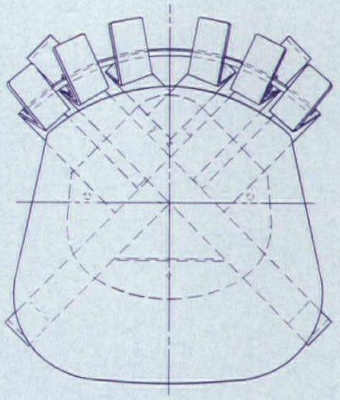
FRONT VIEW



FRONT VIEW

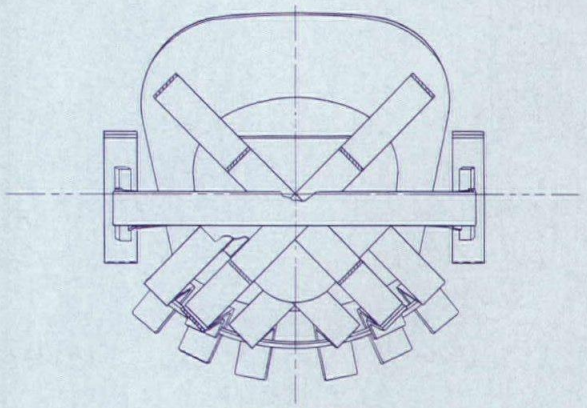


TOP VIEW



TOP VIEW

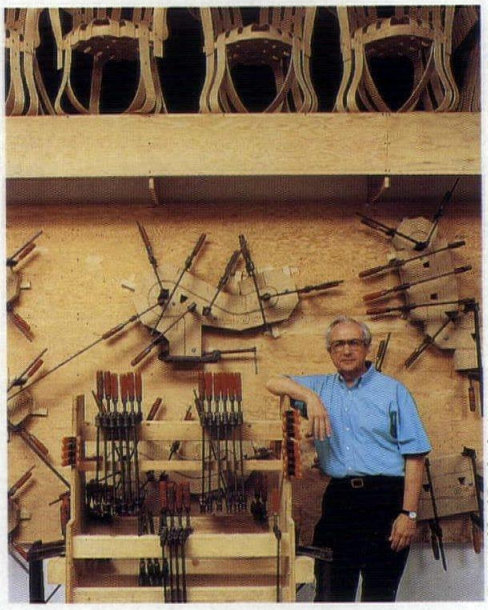
The Gehry Collection, including Cross Check (above and top left) and Hat Trick (right—shown with and without arms), is made of nothing but glue, wood—seven laminated layers of 1/32-inch-thick reforested maple—and the occasional glass table top. Some 115 prototypes were developed in a workshop that Knoll provided for Gehry adjacent to his Santa Monica studio. The collection's four chairs, two tables, and one ottoman incorporate no nuts, bolts, screws, staples, metal or plastic underpinnings, nor any reinforcements. The slender bentwood laminate also has a springy flex that responds to the user's postural adjustments. Thin enough to suggest the magical world a child might build out of tongue depressors, the pieces require so little wood that they qualify as forest-friendly. Stains and finishes are waterbased, and glues and finishes for outdoor versions are being tested for introduction later. According to Knoll sources, the side chair's net prices are "in the $200 range."



BOTTOM VIEW

Last winter, RECORD stopped by the Knoll-Gehry workshop to see how work was progressing and to talk with the principals involved, including Gehry; Andrew Cogan, Knoll's vice president of design management; and Daniel Sachs, project designer. K. D. S.

RECORD: *What was the design program?*
AC: *Knoll said it wanted a chair that could be made for $50—the next Bertoia chair. That was the entire design brief. You could call it the Mona Lisa brief. Our agreement with Frank was that wherever the exploration took us we would go. Marketing is only coming into play now.*
DS: *Frank said he wanted to work in the language of Alvar Aalto, with an orange crate as the starting point. We also looked at deck chairs, but we diverted from the Adirondack idiom and Americana.*
AC: *We've made chairs that are beautiful and uncomfortable. Here we wanted to work with someone who was innovative to make comfortable, affordable chairs.*
RECORD: *What about manufacturing?*
AC: *We're trying to reduce the number of parts of each piece. We're striving for thinness and lightness. [Recently] we've been adding tapered laminations in some sections: it gets wider at stress points and then goes back to thinner layers.*
DS: *At some point the sourcing people said we had too many parts. We began using triangular shapes. We started [manipulating] the Z-axis.*
RECORD: *How did you decide exactly what would go into the collection?*
FG: *Knoll took care off that. I just weigh everything. I'm competing with Gio Ponti.*
Continued on page 78



Grant Mudford photos

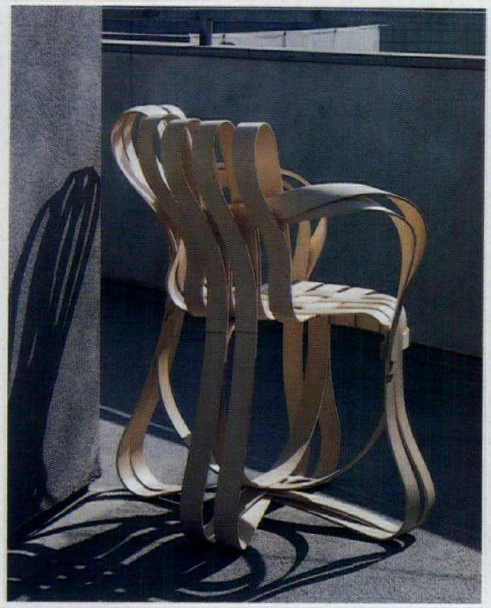
Frank Gehry bounces up and down on an airy ottoman from his laminated bentwood collection for KnollStudio, a division of The Knoll Group. The ottoman responds with nary a crackle or squeak. The four chairs, two tables, and one ottoman in the Gehry Collection, formally unveiled this month in an exhibition at New York's Museum of Modern Art, have ice-hockey names that reflect Canadian-born Gehry's passion for the national sport of his homeland and, not incidentally, indicate their ruggedness. In fact, preliminary Business and Institutional Furniture Manufacturing Association (BIFMA) tests already prove a 300-pound person can safely tilt back in the chairs, but frequent blows may be needed over the next few months to convince skeptics that what they see—delicate forms of 1/32-inch-thick layers of laminated maple that can be lifted with one finger—are sturdy enough for the hectic office, restaurant, and home.

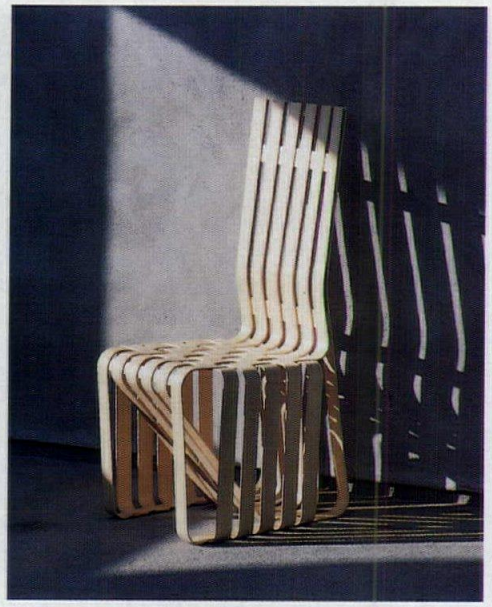
Descended from the furniture of Thonet, Alvar Aalto, and Charles and Ray Eames, the pieces stem from Gehry's conviction that "architects make uncomfortable chairs." Several years ago, European manufacturer Vitra discussed bentwood designs with Gehry, but concluded that ultra-thin wood did not lend itself to mass production. Then Knoll, positioning itself for a return to its roots in experimental design, offered an open program, built a 2,500-square-foot workshop next to Gehry's Santa Monica studio, and took his word when he refused to believe it couldn't be done. "He's going to do it anyway," thought Knoll vice president for design management Andrew Cogan at the time. "He challenged us; he called us 'thickies.' "

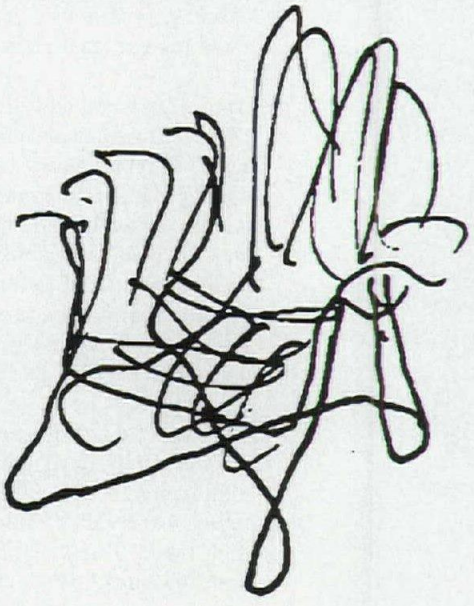
Led by Daniel Sachs, the workshop purchased 1/32-inch veneer by the flitch (slices bundled in a tree-form), glued seven layers together, pressed them in plywood forms shaped to Gehry's sketches, dried them with electric heaters in plastic tents, and made furniture. The weave of compound curves, of a thinness previously unheard-of in chairs, provides not only esthetic drama but also a supportive ergonomic flex, and an integrated structure that needs no structural underpinnings or reinforcements, not even nuts, bolts, screws or staples. Some 115 prototypes were produced (including a version that fell apart moments before presentation to Westinghouse Electric Corp., owner of New York-based Knoll since July, 1990). Shipping furniture and people from coast to coast added about a year to concept-to-production schedules. Workshop operation, prototype development, tooling for 80 forms, assembly and finishing development, and market introduction, cost close to $1 million but, as Knoll Group executive vice president for design Don Rorke points out, it could take at least as much to develop a metal or plastic chair.

Ironically, Knoll had sold off its laminating equipment in the early 1980s but, explains Cogan, "We were better off not locked into a process." Tracking down wood vendors worldwide, Knoll found two willing to push the limits of their expertise. A newly established firm handles assembly and finishing, using an automotive process developed by Knoll's finishing group to tank-dip and spin-dry the pieces so the matte finish retains the look of finely sanded raw wood. Last fall, the chairs were previewed by potential buyers in the U. S. and Europe; well over half responded with orders: 1,200 chairs for office use, 200 for a café, 30 for a conference room.

For those taken with the chairs' curves, it's worth noting that they originate in Gehry's immersion in the technology. "I didn't want high-tech affectation," insists Gehry, who regularly placed his prototypes next to Mies van der Rohe's Brno chair "to see if they held their own." The structural gymnastics didn't faze him. "I'm used to that," he says. "It's how I build buildings." *Judith Davidsen*







Continued from page 77

His Superleggera chair [Cassina, 1957] is four pounds. But he didn't have to pass BIFMA [industry stress standards], so I spotted myself two more pounds. Now we're at seven pounds; I'm going for six.

AC: *We get back [from BIFMA] the broken ones and analyze what went wrong.*

RECORD: *What is the projected price? Is it important to the collection's success?*

AC: *Optimistic projections [for net prices] at this point are between $250 [for the café chair] to $2,000 [for the lounge chair].*

FG: *My idea is the Volkswagen [of furniture]; that's what my cardboard furniture was about. Emotionally and politically I'm geared toward that ideal.*

RECORD: *What would make this a "Volkswagen"?*

FG: *Cheap. $99.50.*

AC: *I want to make [the furniture] as accessible as possible, but I don't want to make it too cheap. It's important for the company that we make money on a project like this so we can do more. We've done "designer" furniture that hasn't made money. The Venturi Collection was a smashing success in terms of design, but we never sold more than 400-500 units a year. Here we are talking about [eventually] selling 5,000-10,000 café chairs a year.*

FG: *What the Knoll people first said to me was, "It probably won't work, but maybe it will. You've been thinking about it. Something will come of it." They knew how to work with someone like me. Within three months we had something. Then we had to get into the Z-axis for structural stability. When we did the first costing on the chair it came to $133 in the box. We gradually understood how to make it simpler. My interest in the weight is this—I'm sure that the lighter it is, the cheaper it is to make. Let's cut it to the essence; lighter means the structure is at the ultimate. We are trying to keep the flexible quality while making it secure. The curves are not decorative; they are structural. I haven't gone Postmodern.*

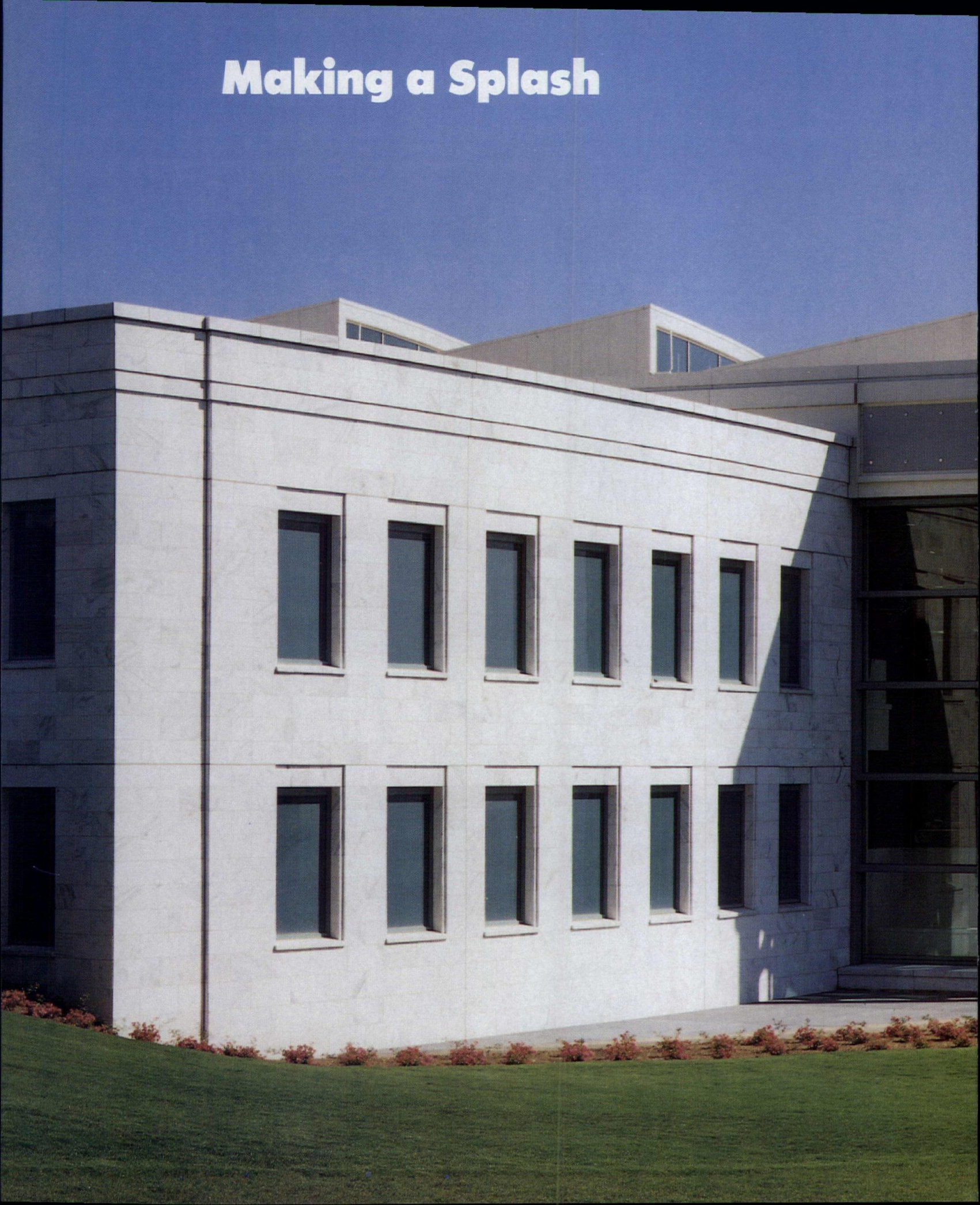
Credits

The Frank Gehry Collection, The Knoll Group

Design: *Frank O. Gehry & Associates—Frank O. Gehry, principal-in-charge. The Knoll Group—Andrew Cogan, project manager. The Knoll-Gehry Workshop—Daniel Sachs, project designer; Thomas C. MacMichael, design technician*

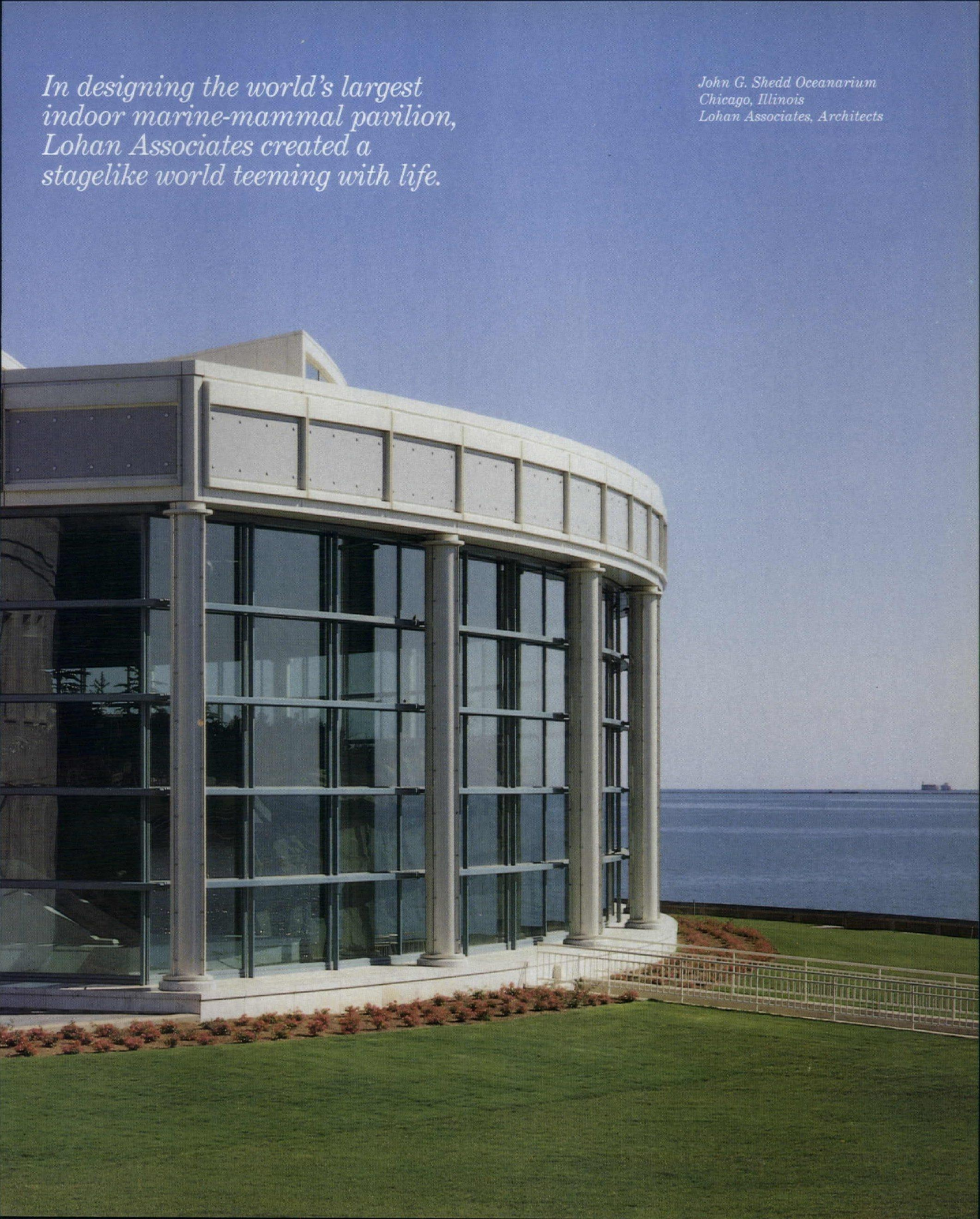
Production: *The Knoll Group—Jeff Crawford, Al Schmidt, Henk van Hekken, engineering team; Jane Rozanski, Tom Cressman, purchasing/finishing*

Making a Splash



In designing the world's largest indoor marine-mammal pavilion, Lohan Associates created a stagelike world teeming with life.

John G. Shedd Oceanarium
Chicago, Illinois
Lohan Associates, Architects



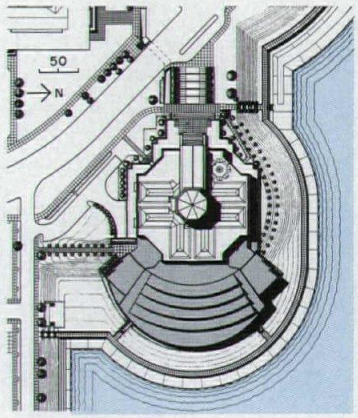
Asked to design a new marine-mammal pavilion for the 1929 Shedd Aquarium on Chicago's Lake Michigan waterfront, Lohan Associates first envisioned a separate building connected underground to its parent institution. But an independent structure seemed either too aloof from or competitive with the Neoclassical aquarium. So the architects brought the two halves together and created a sweeping extension to a cherished landmark. Without sacrificing the new facility's identity or echoing the style of its predecessor, Lohan designed a structure that not only complements its older neighbor but forges new ties to its waterfront site.

Although clearly a Modern building with its glass-and-steel curtain wall fanning out toward the lake, the oceanarium acknowledges its Neoclassical elder by its metal columns and its coat of white Georgia marble. (The architects literally borrowed the marble from the older building, removing the four- to six-inch-thick stone from the aquarium's now-hidden eastern facade and slicing it into enough 1.5-inch-thick cladding to cover the appropriate surfaces of the new building.) While the old aquarium offers dimly lit, almost reverential interiors that focus all attention on its tanks and exhibits, the new oceanarium features a sun-filled space that brings the majesty of Lake Michigan inside. At times, the lake seems to be but an extension of the oceanarium's display pools.

Populated by whales, dolphins, sea otters, and harbor seals, the 170,000-square-foot steel-frame oceanarium houses displays simulating the environment of the Pacific Northwest. Visitors to this saltwater habitat enter from the old aquarium at the top level of the new facility, then wind their way down a jarrah-wood path to an artificial rain-forest valley. Simulated boulders made of painted concrete help separate the various tanks and displays, while also hiding mechanical and service facilities such as holding tanks and animal food-preparation rooms. Real and artificial trees, moss, shrubs, and rocks along with recorded sounds of Pacific birds and animals (emanating from small, camouflaged speakers) create a series of engaging habitats. The museum's five tanks include a small tidal pool with crabs and anemones, a 17-foot-deep sea otter display, a seal cove, a 400,000-gallon pool, and a 2-million-gallon pool for whales and dolphins.

The magic of the oceanarium is in the way it combines the intimacy of the small sea-otter tank with the grand sweep of its column-free, steel-trussed main space. "We wanted to give the impression that the space is even bigger than it actually is," explains Dirk Lohan. At the same time, the painted-steel roof trusses and the exposed mechanical ducts set up a striking contrast between the natural and the man-made. But instead of being at odds with each other, nature and architecture work together to create a theatrical world where beluga whales perform for appreciative audiences and penguins swim behind 5-inch-thick acrylic windows. Underscoring the stagelike character of this world is a 1,000-seat amphitheater opening onto the 180-foot-long main pool. As with every theater, lighting is important here. While the 1-inch-thick insulated and tinted curtain wall allows sunlight to flood in from the east, north, and south, the architects balanced this source with four ridges of clerestory windows to prevent glare on sunny days. In addition, 31 incandescent lamps suspended from above help illuminate pool areas.

Housed in two wings flanking the central curtain-wall sector are two restaurants and a 270-seat auditorium, while a gift store and special exhibits gallery are tucked behind a curving arcade adjacent to the old aquarium building. *Clifford A. Pearson*

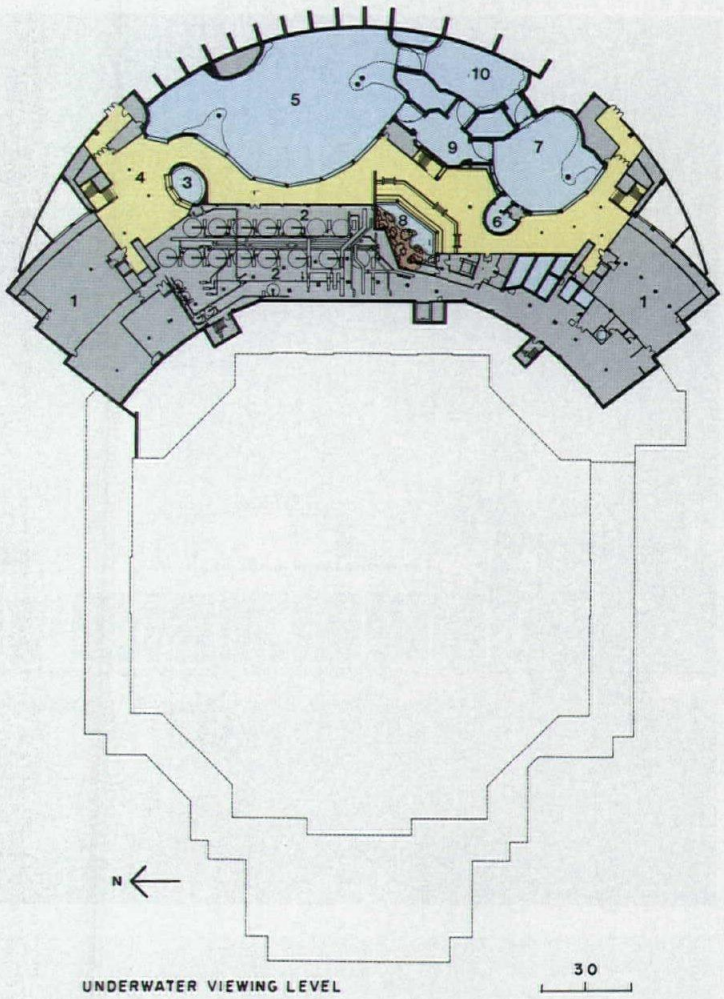


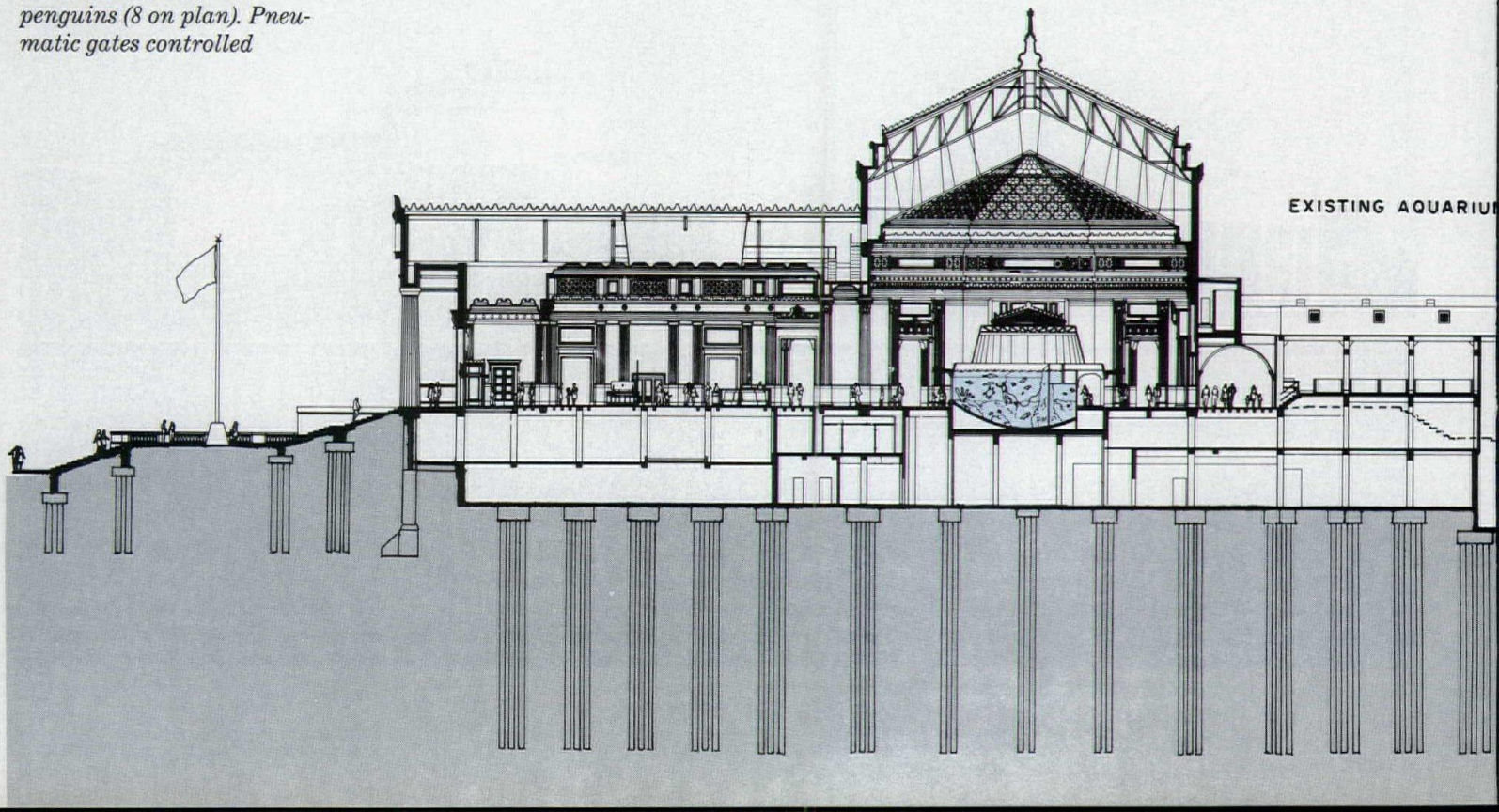
Built on 1.8 acres of landfill on Lake Michigan, the 170,000-square-foot oceanarium is an addition to the 1929 Neoclassical aquarium designed by Graham, Anderson, Probst, and White (site plan above). Lohan Associates considered schemes in which the new facility was pulled away from the old building, but concluded that such designs often end up putting the new in competition with the old. The scallop-shaped oceanarium is attached to what had been a mostly blank rear wall of the aquarium and helps orient the entire complex to both the lake and the city (opposite). Placement of the extension maintains the major axis of the Beaux-Arts-inspired old building and defers to its elder in scale and massing. White Georgia marble taken from the old building's now-hidden east facade was used to clad the new structure.

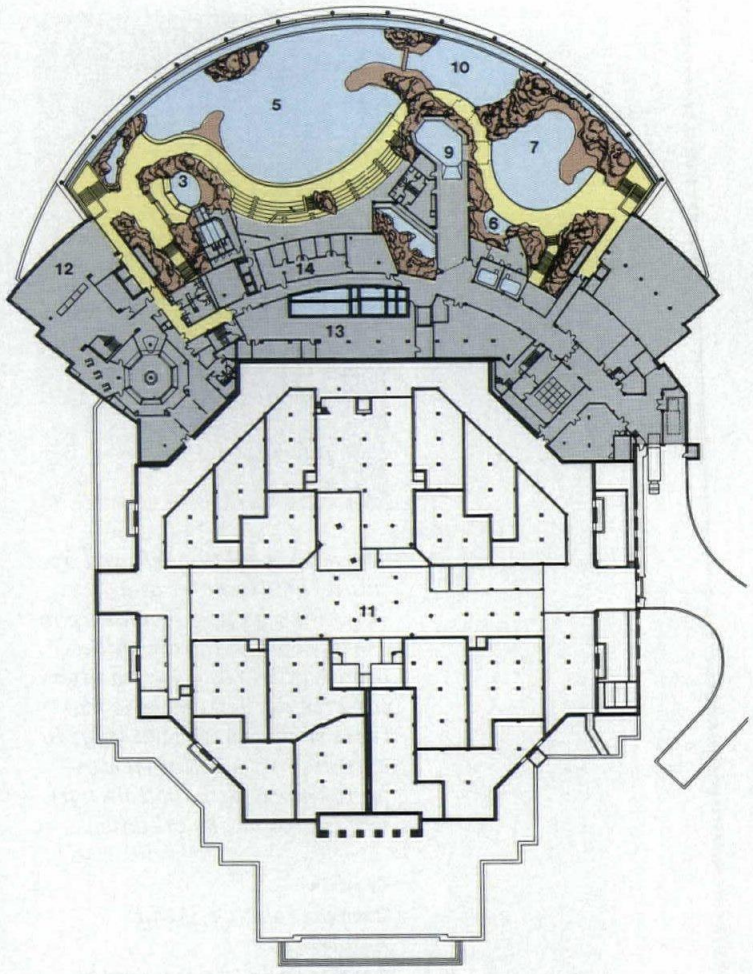
Nick Merrick, © Hedrich-Blessing photos, except as noted

To bring the world of marine mammals fully to life, Lohan Associates designed a facility that offers views of the animals from both above and below water (plans right). Along with the Shedd's curators and exhibit designers, the architects created habitats that mimic the animals' natural environment and allow them to behave as they would in the wild. For example, the large whale pool is irregularly shaped not only in plan, but also in elevation (its depth varies from 20 to 30 feet), forcing the animals to use their natural ability to swim expertly. Similarly, the sea otter habitat—a small but deep tank—allows the animals to dive 17 feet down to find mollusks and other food. The pools are massive poured-concrete structures; the bottom of the main pool is 2.5-feet thick. The oceanarium's filtration system (2 on plan) cleans 3 million gallons of water every hour and a half, using 27 mixed-media filters and 27 high-rate pumps (all of which are duplicated in a backup system). Although most displays focus on the marine life of the Pacific Northwest, a separate exhibit on the lower level features Falkland Island penguins (8 on plan). Pneumatic gates controlled electronically can connect the largest tank with several of its neighbors. Thanks to elevators and wide pathways, the entire facility is accessible to wheelchairs.

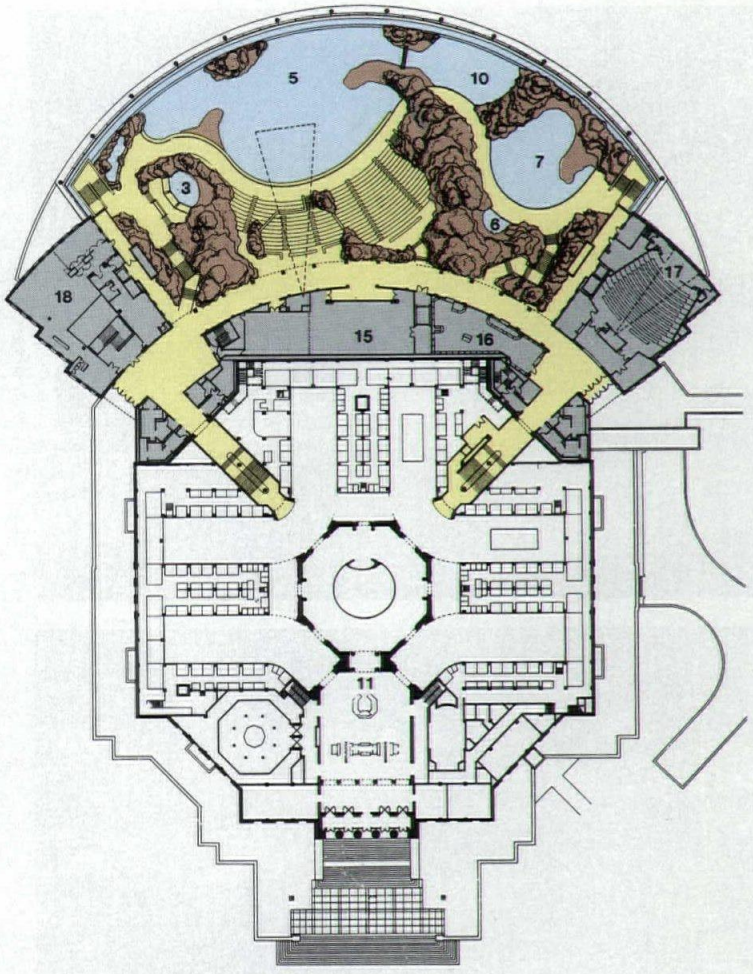
1. *Mechanical*
2. *Filtration equipment*
3. *Sea otter habitat*
4. *Underwater viewing*
5. *Large whale habitat*
6. *Seal cove*
7. *Small whale habitat*
8. *Penguin exhibit*
9. *Hospital pool*
10. *Shared habitat*
11. *Aquarium*
12. *Cafeteria*
13. *Library*
14. *Offices*
15. *Changing exhibits*
16. *Gift shop*
17. *Auditorium*
18. *Restaurant*





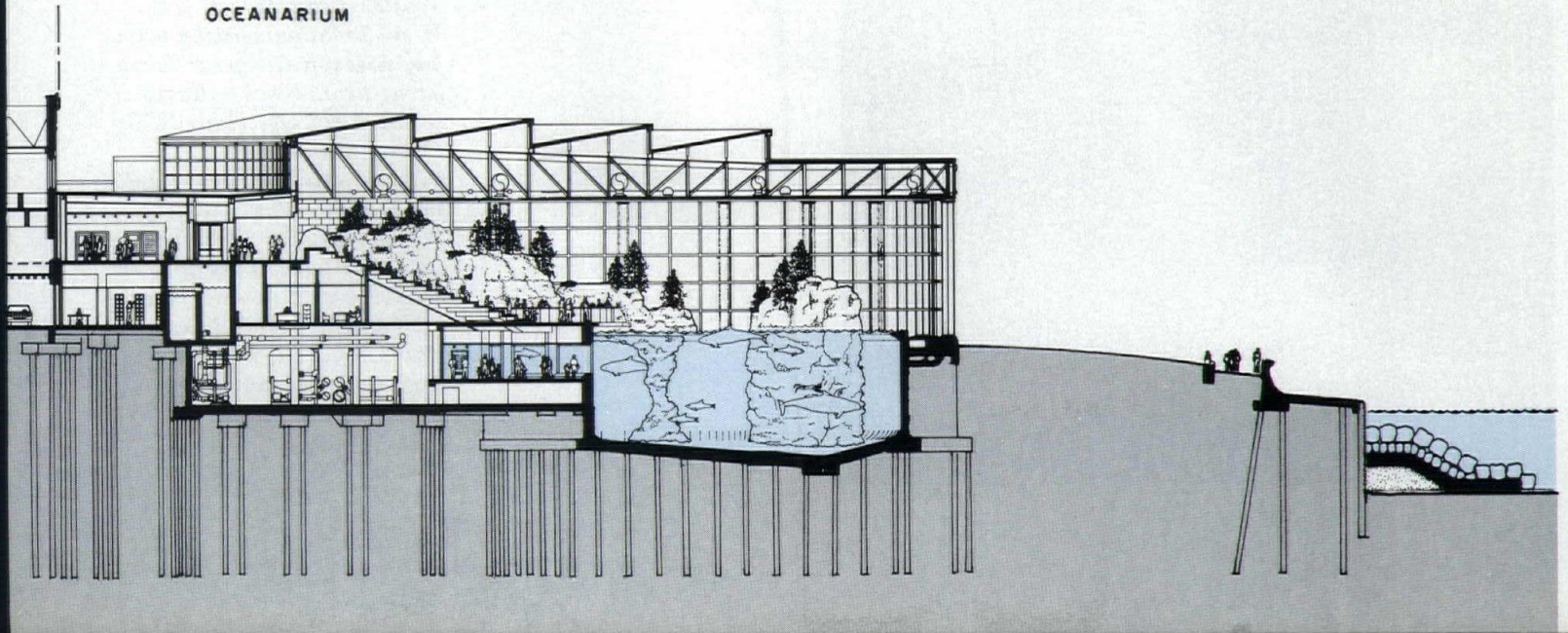


HABITAT LEVEL



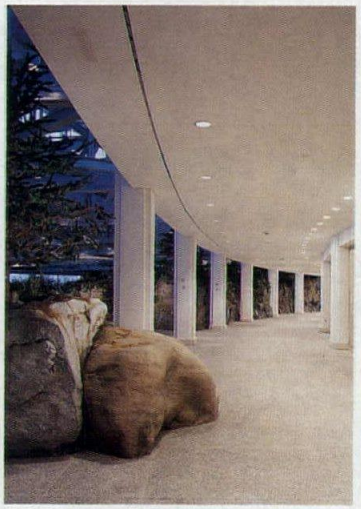
MEZZANINE LEVEL

OCEANARIUM



Jon Miller, © Hedrich-Blessing

Samuel Fein



The main pool (top left and opposite) holds whales and dolphins who perform for up to 1,000 people in the amphitheater. Exhibits like the sea otter tank (center left) include features such as a wooden ledge to help kids get a better view. A jarrah-wood path (bottom left) winds around the exhibits.

Credits

Owner: *John G. Shedd Aquarium*

Architect: *Lohan Associates—Dirk Lohan, principal-in-charge; Al Novickas, project architect; Joseph Antunovich, project manager; James Schubert, Jean Marker, Michael Barnes, Cheryl Baughman, Ken Crocco, Dick Fencl, Gil Gorski, Tim Hubbard, Karen Lindblad, Allen Lurie, Phuong Nguyen, Mark Osorio, Jeff Pavur, Art Salzman, Bill Sitton, Tim Vacha, Vytas Vepstas, Dean Walker, Ted Witte, Tom Chan, design team*

Engineers: *Rittweger & Tokay (structural); Flack + Kurtz (mechanical, electrical); STS Consultants (civil)*

Consultants: *Enartec Consulting Engineers (animal life support systems); The Larsen Company (exhibit design); John G. Shedd Aquarium (exhibit design)—Paul Bluestone, David Lonsdale, Judith Bacal*

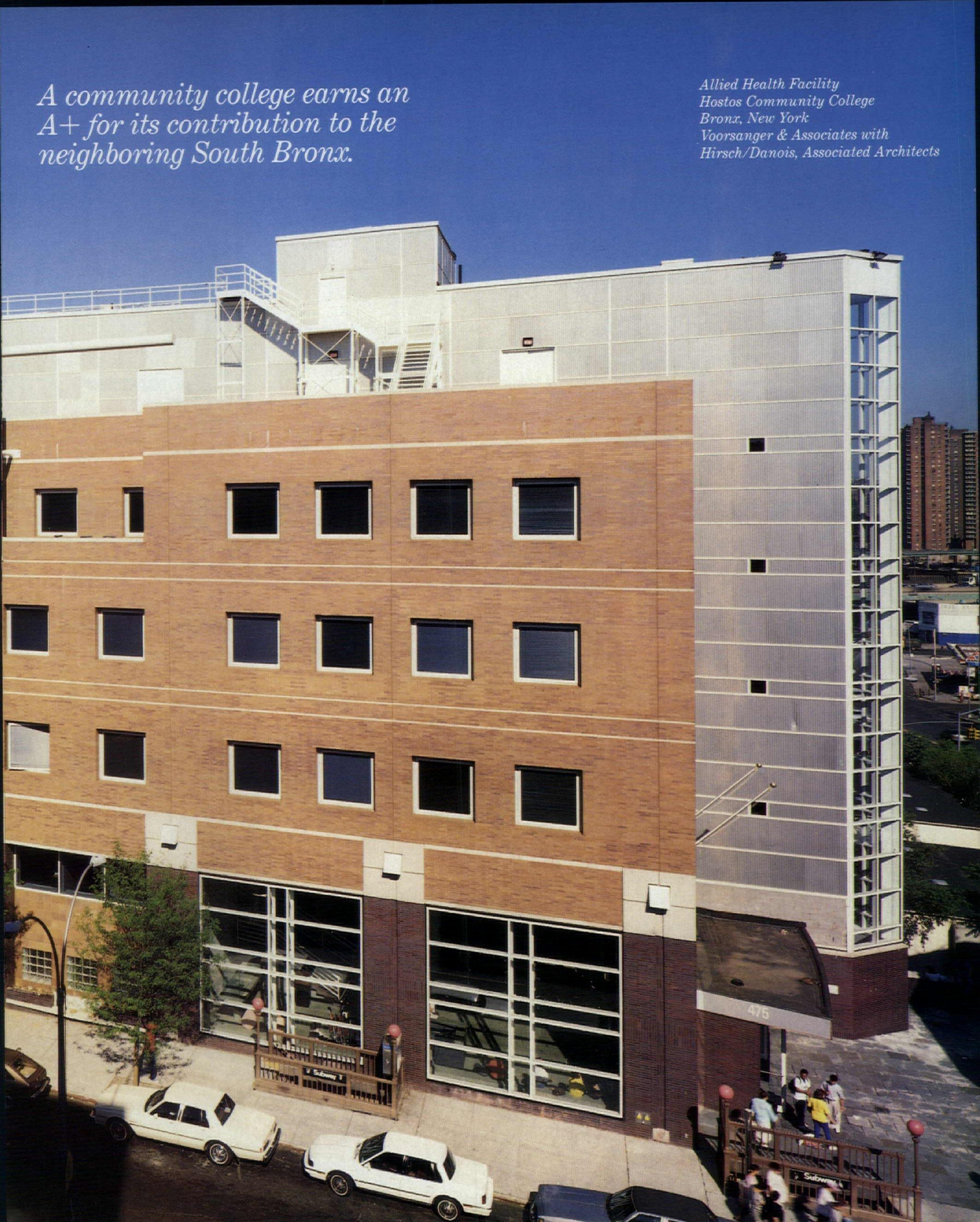
General Contractor: *Pepper Construction*

Samuel Fein

Street Life

A community college earns an A+ for its contribution to the neighboring South Bronx.

Allied Health Facility
Hostos Community College
Bronx, New York
Voorsanger & Associates with
Hirsch/Danois, Associated Architects



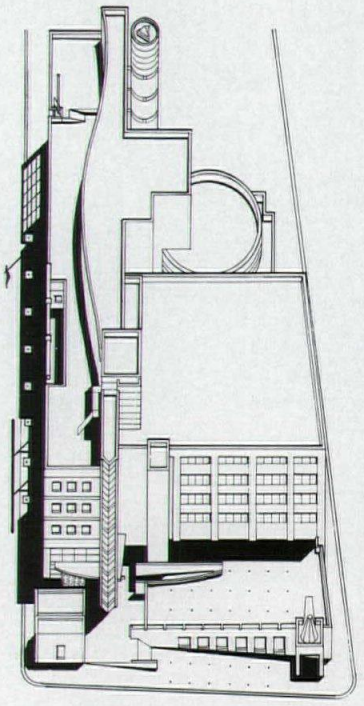
Until the 1990 fall term, the 7,500 students of the Eugenio Maria de Hostos Community College attended a South Bronx "campus" cobbled together from a former savings and loan institution and a converted warehouse on either side of the Bronx's historic but badly decayed Grand Concourse. To the north and south, landmarks—a school and a WPA-era post office—recall the substantial apartment houses, public buildings, and parks that once made the Grand Concourse grand. Together with a commuter rail line on the east, however, they also squeeze anticipated campus expansion into a block-wide belt reaching toward the west.

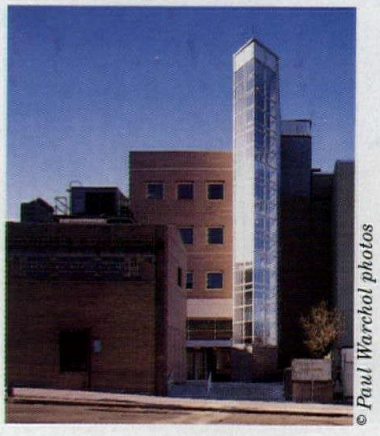
Current development focuses on strengthening the college's physical presence along the Grand Concourse and its role in student life. A student center under construction to the east will offer such amenities as food service and recreational and cultural resources to encourage commuting students—almost all of them African-American or Hispanic, three-quarters of them women—to spend more out-of-class time on campus. The facing building shown here is nominally an academic facility housing classrooms and labs for the school's popular programs in health services. But it too assumes a wider role. An anchor for the west campus, it also boasts the main library and reading room as well as a preschool/daycare center.

In addition to meeting these oddly assorted needs, Voorsanger & Associates' brief was to meld the new structure with the converted factory and link it to the buildings opposite via a bridge spanning the Grand Concourse at the third floor, the principal pedestrian level of this internalized campus. The firm's response layers the disparate functions within a sidewalk-hugging five-story slab building and a three-story ell that adjoins the older building behind. For easy drop off and access to adjacent play areas, the daycare center and the preschool—a five-classroom city school also used for teacher training—are on the ground floor. The library, which combines ample space and a strong image with controlled access, occupies the second floor, but is entered from the otherwise largely transitional third floor. The fourth and fifth floors of the shallow block efficiently array classrooms and laboratories along a single-loaded corridor.

To weave the various elements into a coherent whole, a 12-foot-wide street at campus level engages the building's important spaces—and creates one. From a ground-floor lobby on the north a splayed staircase sweeps to the third floor, where the spine continues between the library's single entrance and an overlook to its study mezzanine and second-floor reading room. Its route culminates in a three-story "sun porch," a window to light and views that also acts as a circulation hub joining the cross-campus bridge, a circular stair tower, and the through-building passage. (At the opposite end of the spine the stair tower becomes a building-high glass-tipped metal "prow" that announces the entry plaza to students emerging from the adjacent subway stop or approaching along the Grand Concourse.)

The internal logic reveals itself in a street facade where mannerly files of punched windows and precast-concrete trim set against Norman-size canyon-stone brick bring order to the three upper floors. In the two stories below, infill panels combining strip windows and glass block with foot-square brick tiles alternate with piers of rusty-gray iron-spot brick to suggest a street-level arcade enhanced by integral benches and planters. But it is less through its powerful street presence than through its lighthearted lapses—unexpected terraces, the transparent expanses at entrances from campus and concourse—that the building embodies the aspirations of its students and their community. *Margaret Gaskie*

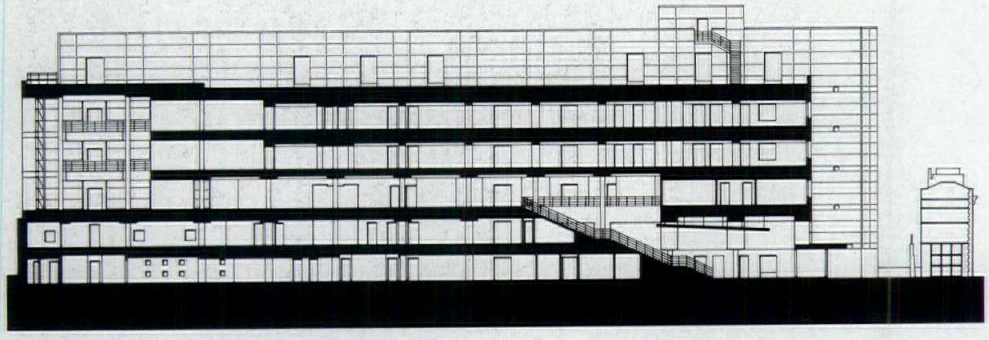




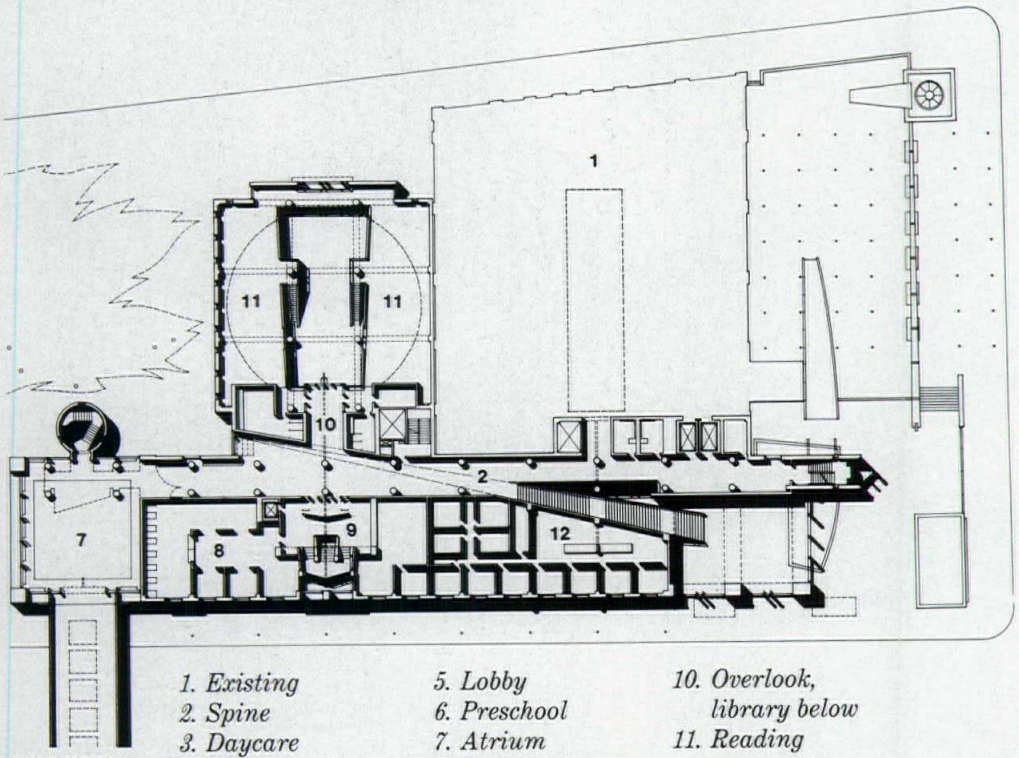
© Paul Warchol photos

At street edge, a shallow slab stretches across the converted warehouse, augmented by an ell with a crowning drum over the library reading room. The third-floor bridge emerges in an atrium (opposite) that joins with the stair tower and building-long spine. Handsome but durable surfaces of terrazzo, dry wall, and standard and ground-face concrete block typify building interiors.


EXIT

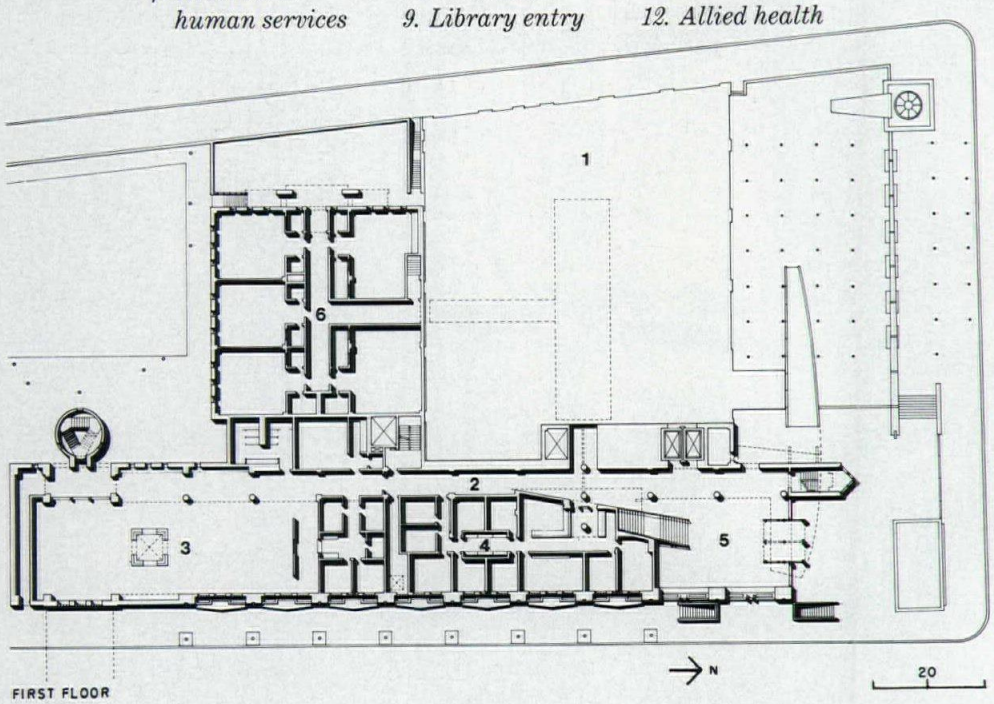


LONGITUDINAL SECTION AT LOBBY STAIR



THIRD FLOOR

1. Existing
2. Spine
3. Daycare
4. Health and human services
5. Lobby
6. Preschool
7. Atrium
8. Periodicals
9. Library entry
10. Overlook, library below
11. Reading mezzanine
12. Allied health



FIRST FLOOR

Appropriately, the grandest of Hostos's "public" spaces is the library reading room (opposite and below), where collegiality is signaled by a single long study table and privacy by individual reading lights and a low, sinuous partition. Carrel-equipped mezzanine studies over stacks on either side are framed by a grid that reveals the surmounting drum.

Credits

Allied Health Facility
Hostos Community College
City University of New York
Bronx, New York
Owner: *Dormitory Authority of the State of New York*
Associated Architects: *Voorsanger & Associates Architects with Hirsch/Danois Architects—Bartholomew Voorsanger, partner-in-charge of design, with David Danois, partner; Tom Brashares, Robert Chicas, associates; Satoshi Ohashi, Paula Mary Murphy, Shu Hashimoto, Noel Clarke, David Sassano, Daniel Alter, George Jell, Enrique Colmenares, Peter Serafin*
Engineers: *Weidlinger Associates (structural); Ambrosino, DePinto & Schmieder (mechanical)*
Consultants: *H. M. Brandston & Partners (lighting); Weintraub & diDomenico (landscape); Calori & Vanden-Eynden (graphics)*
General Contractor: *HRH/ Arawak*

Accidental Cities: The Deadly Grip of Outmoded Zoning

By Jonathan Barnett

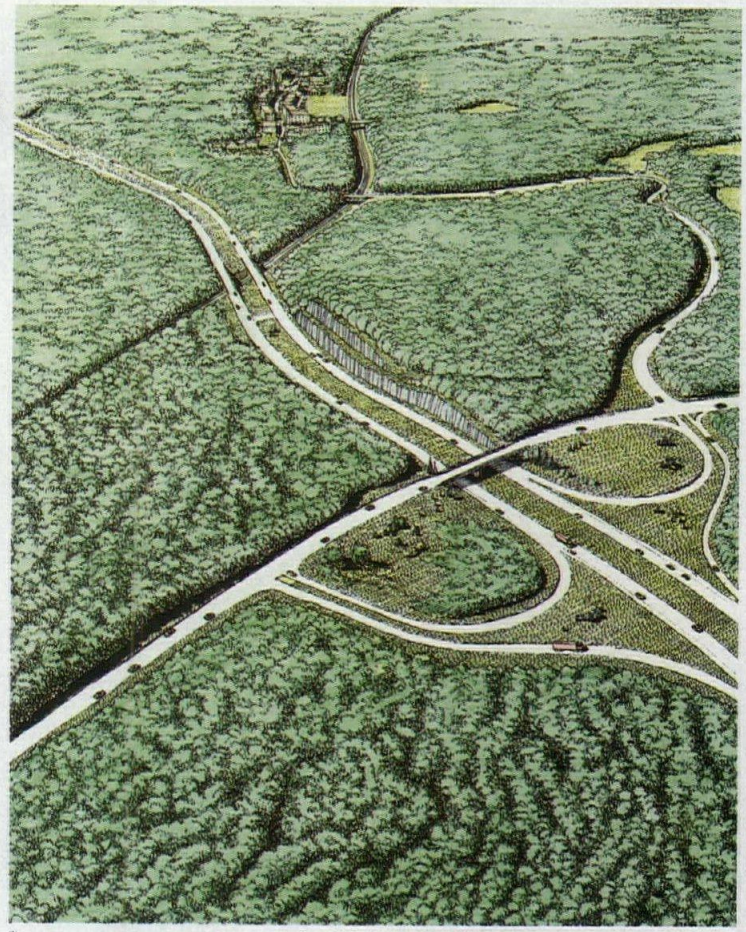
Edge Cities, Urban Villages, Technoburbs, or just plain urban sprawl have changed U. S. cities and suburbs into something much more difficult to understand, use, or plan. Activities that once took place downtown have been distributed over the countryside in patterns so widespread, and by now so familiar, that they are creating a new way of life.

Joel Garreau's recently published *Edge City: Life on the New Frontier* is one of the best descriptions of these significant economic and social changes, but what puzzles Garreau, and the people he interviews, is the new urbanization is so fragmented it seems accidental.

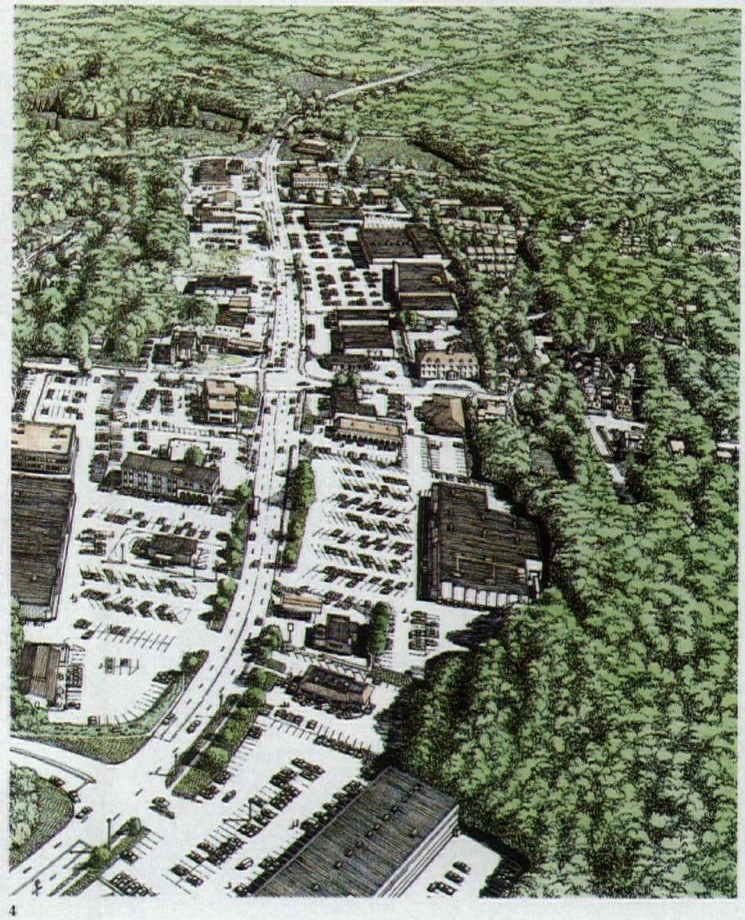
The drawings at right, prepared for the Regional Plan Association of New York, show the way urbanization frequently takes place in suburbs or rural areas, and what might be done to improve it. In the first sequence, the land around a newly completed highway interchange was made a commercial zone *(1)*, a move intended to accommodate gas stations, fast-food restaurants, and other businesses that serve travelers. Instead *(2)*, the ingredients of a small city center gradually appeared: a hotel, a shopping mall, offices, and industry. Each required some modification of the zoning and a separate approval process, but no one saw what was happening until it was too late. If the investors and the community had understood that they were shaping several million square feet of urban development, they might well have preferred to concentrate new buildings in a single quadrant of the interchange *(3)*, nearest to an existing railway line and town, tying new investment to transportation and other communities. There would still have been direct access from the highway, but the road would lead to a district, with office buildings, a hotel, and a shopping mall, sharing a series of landscaped parking courts.

The second sequence of drawings shows a typical commercial strip *(4)*. The idea that commerce belongs in narrow strips along highways made sense when small-city and suburban zoning ordinances were first being drawn up in the United States during the 1920s. Zoning confirmed existing Main Street shopping patterns, and many major streets had streetcars on them. The streetcar produces a linear form of commercial development, as passengers can get on and off at almost every block, and both visibility and accessibility—and thus commercial value—drop off sharply a block or two from the street-car line. By continuing to extend commercial strip zoning along highways, communities have created a development pattern

Jonathan Barnett is professor of architecture and director of the Graduate Program in Urban Design at the City College of New York. He is also a consultant to the cities of Pittsburgh, Cleveland, Norfolk, Charleston, South Carolina, and Sioux City, Iowa.



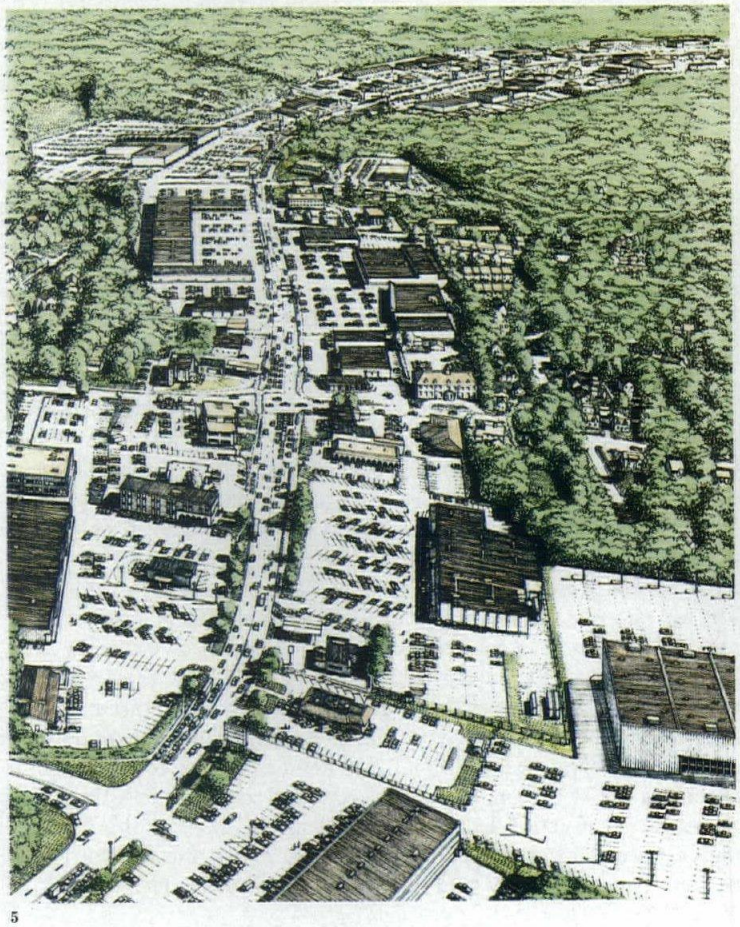
1



4

2

3



5

6

Overleaf: Ad hoc zoning decisions at a typical highway interchange (1) permit the equivalent of a small city downtown to be scattered around the intersection (2). Local powers of zoning could shape the same development into a compact cluster (3). Typical strip commercial development (4) is mandated by local zoning. Growth means extending the strip (5). A zoning alternative (6) would map more intense commercial zones in selected locations. Drawings prepared for the Regional Plan Association: Richard T. Anderson, president, Robert D. Yaro, senior vice president; Dodson Associates, consultants: Harry Dodson, Peter Flinker, Kevin Wilson; Jonathan Barnett, consultant; Robert Geddes, advisor.

What has directed the new urbanization up to now is not so much the invisible hand of the marketplace as the deadly grip of outmoded zoning ordinances.

that no longer makes any sense, wastes valuable land, and produces irreconcilable traffic conflicts. In most suburbs the available business locations are all within these zoning strips, which continue to grow *(5)*. The alternative *(6)* is to zone a few places along the strip for more concentrated development, supported by public parking garages and other investment incentives long understood in city centers but not yet much used in the suburbs. The drawing shows that zoning has been changed to match the surrounding area along segments of the highway where strip development has not yet taken place. Where commercial uses are to be phased out, the commercial zoning has been changed to multifamily. Locations for townhouses and garden apartments are often scarce in the suburbs, and can have a comparable value to low-density commercial districts. The apartments and townhouses are shown facing the adjacent neighborhoods rather than the highway, which is landscaped to create a visual and acoustic buffer.

These alternatives are possible. What has directed the new urbanization up to now is not so much the invisible hand of the marketplace as the deadly grip of outmoded zoning ordinances. Many suburban localities did not adopt zoning until the 1950s or '60s, but zoning advocates were so anxious to create some kind of land-use control that they did not stop to ask whether the established zoning concepts they were adopting might belong to the street-car age and not to the present. Cities and towns gave up on the streetcar much too easily, but are now locked into development patterns made possible only by the automobile; and the dispersal of downtown activities into suburban and rural areas was not anticipated by most zoning ordinances. It is depressing to contemplate how much bad development has been caused by faulty public policies, but communities are beginning to realize that they can revise their codes and reassert control over their own future, and designers are finding ways to make sense out of dispersed urban elements.

Why compact regional centers are important

Lewis Mumford called the highway cloverleaf American's national flower, but even Mumford at his most pessimistic and sarcastic did not imagine broad bands of highway pavement or grasslands owned by the state transportation department becoming the permanent centerpiece for so much new development. Someone with business at a suburban office park might stay overnight at a hotel in one quadrant of the cloverleaf, and face an intricate drive in the morning to reach the office park diagonally across the intersection. At lunch a cavalcade of cars takes everyone to the restaurant in yet another quadrant. The distances might be walkable, but no one should cross so many lanes of swiftly moving traffic, and the highway department usually puts up fences, removing any temptation to be a pedestrian.

Elsewhere in suburbia, a morning's errands might start with a trip from a residential neighborhood out to the strip to leave clothes at the dry cleaners, followed by driving a mile along the strip to the hardware store, and then two miles in the other direction to the supermarket. In the meantime, other drivers are using the same highway to go from one town to another. Moving on and off the highway to reach local businesses inevitably conflicts with through traffic, particularly when cars make mid-block left turns from "suicide lanes" in the middle of the roadway.

In a traditional suburban downtown the same errands could be accomplished from a single parking space; in a traditional urban neighborhood (where some of us still live) all the errands could be done on foot.

Many highway corridors are now experiencing all-day traffic jams, with a short respite in mid-morning before people go out to their lunch-time appointment, and another brief interval in the afternoon before everyone starts heading home. This suburban gridlock is just the most obvious symptom of what is wrong with these new development patterns. The high ratio of parking lots to buildings, the unwalkable distances across highways and service roads, make it impossible to design any kind of architectural ensemble, as well as wasting land and raising infrastructure costs. Having to drive to every destination and appointment precludes the variety of incidents and the potential for casual contact that traditionally have made downtown districts good business locations: the ability to set up a meeting on short notice, the chance to run into someone you know at lunch, the opportunity to shop on the way to and from work.

Most important, dispersed development patterns cannot be served by public transportation, and additional development must then become even more dispersed to accommodate parking, making traffic problems even worse. The public policy implications of compact urban centers in the suburbs were illustrated in the Vision 2020 project sponsored by the Puget Sound Council of Governments. A newspaper supplement was published in May 1990, outlining the development alternatives summarized in the aerial perspectives at right. The top perspective *(7)* shows the Seattle-Tacoma region as it exists today. It was contrasted with four alternative growth scenarios. The first *(8)* assumes that local governments continue with their current plans, resulting in the urbanization of 750 additional square miles by 2020. The second alternative postulates a tight urban growth boundary, with development co-ordinated to keep most new construction within six major centers in the region, which reduces the estimated urbanization of undeveloped land to 450 square miles. A third alternative, with a larger number of urban centers distributed over the region, reduces the new land required to 400 square miles. The

Compact communities have an effect on regional growth. The Puget Sound Council of Governments' Vision 2020 project illustrated the regional design consequences of different transportation policies. The perspective (7) of current development in the Seattle metropolitan region is contrasted with 30 years of future growth based on current plans (8), and (9) the same amount of development around a system of compact centers with strong growth boundaries. The compact centers support rapid transit and save move than 300 square miles from unnecessary urbanization.
Drawings by Hewitt Isley, with assistance by Jack Sidener and Barbara Seymour.

fourth scenario extrapolates the current trend toward decentralized development without any contravening public policies, resulting in growth over 950 square miles of currently rural land.

The last image *(9)* shows the agreed-upon regional plan, adopted in October 1990. It combines the second and third alternatives to create a hierarchy of compact centers from Seattle down through five metropolitan cities (Bellevue, Bremerton, Everett, Renton, and Tacoma), to sub-regional centers, small towns, and suburban developments planned as towns. This public policy will be implemented through the design and funding of rapid transit and highway improvements, although selection of the smaller centers has yet to be completed.

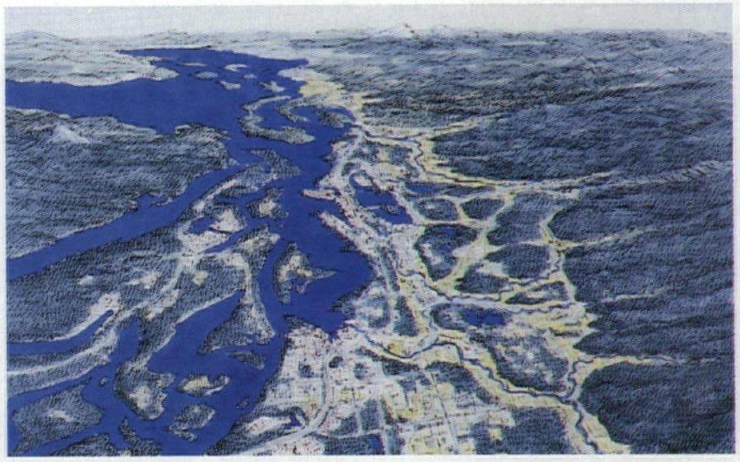
These illustrations demonstrate that compact development is an issue that goes beyond the design and experience of individual centers to affect the way that everyone in a metropolitan region will live in the next few decades. Achieving this kind of regional design might require new kinds of special zoning districts, and possibly land assemblage by a public authority to promote compact centers. Skeptics may wonder whether such a public effort can be justified even if compact new urban centers are served by rapid transit and provide an environment where people can walk from place to place. However, there are potentially decisive economic advantages from sharing parking spaces and thus reducing land and construction costs, plus important public policy dividends for environmental conservation and improved infrastructure efficiency.

Shared parking: the key to suburban design

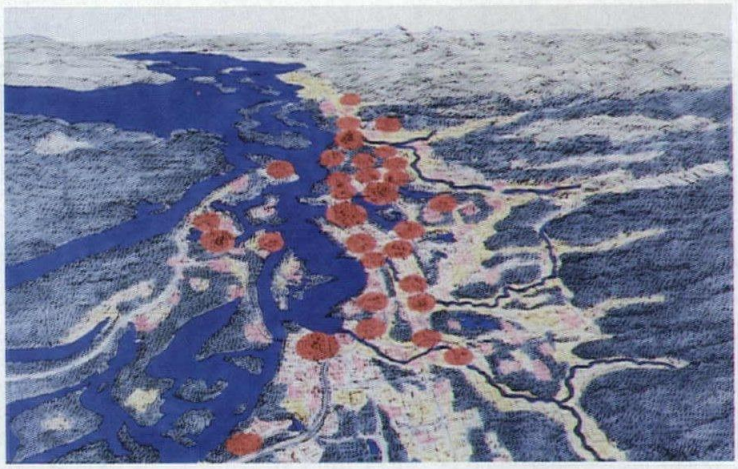
Because each conventional suburban shopping center or office building is separate, each must satisfy its own parking requirement on its own property. A shopping center parking lot is rarely filled. It can happen, but usually only on a few peak weekend days between Thanksgiving and Christmas. In zoning terms, at-grade parking for a shopping center of five cars per thousand square feet produces floor area ratios of about 0.33, compared to typical downtown densities of 8, 10 or 15. Most of the time, most of this parking is not used.

Over at the office park, at-grade parking for an eight-story building with a 25,000 square foot floor-plate requires roughly ten times the land area devoted to the building. On evenings and weekends, when the parking lot at the shopping center is filling up, the parking lots for the offices are almost deserted. The parking lot at a hotel is not heavily used during the day, and could be used by both office workers and shoppers, if it were anywhere near either one. Le Corbusier foresaw the city of the future as towers in a park; he did not imagine that the new reality would be towers in a parking lot.

If it were possible to park in one place and walk from hotel to office



7

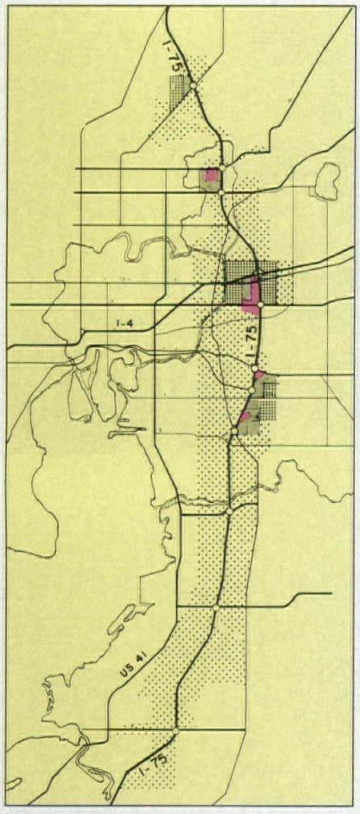


8

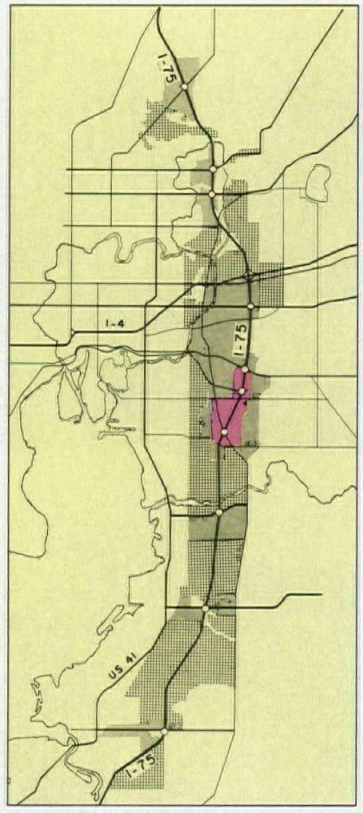
9

Maps by students at the University of South Florida show how too much high-density zoning leads to low-density suburban sprawl. Current zoning in the I-75 corridor east of Tampa, Florida (10) yields 2.5 times all the office space on Manhattan Island. The alternative map (11) shows the most optimistic market projections concentrated in five compact centers.

The perspective drawing by Duany and Plater-Zyberk (12), developed for the planned community of Avalon Park, near Orlando, Florida, illustrates how a compact commercial center could be developed next to a highway interchange. Drawing by Duany and Plater-Zyberk Architects: Andres Duany, Elizabeth Plater-Zyberk, Charles Barrett, Manuel Fernandez-Noval.



11



10


12

building, and from office building to the mall, the amount of spaces provided could be reduced, as spaces used by office workers during the day could be used by shoppers and hotel guests at night and on weekends. It might even be possible to save enough money on land and access roads to justify some structured parking, which could make the whole development still more compact and efficient. Overflow parking for peak days could be provided in peripheral areas, which in some climates may not even need to be paved. Because development is concentrated in a compact location, it could be served efficiently by a bus line, or even a rail rapid-transit system, making it possible to have even fewer car spaces.

Too much commercial zoning: but not enough in one place

Current zoning patterns of strips along highways and nodes around cloverleafs provide both too much land and too little space to encourage a compact alternative form of development. Too much land is zoned commercial to make it worthwhile for investors to investigate joint development with other entrepreneurs. At the same time, the extent of commercial zoning is sharply restricted to the vicinity of highways, so that sufficient commercially zoned space is rarely available at any one highway location to put offices, shops and a hotel together the way they might be found in an older city center.

A map *(10)*, at left, prepared for a study at the University of South Florida, shows the existing zoning mapped along the I-75 highway corridor as it bypasses Tampa, Florida—regulations that in theory could permit something like 800 million square feet of development (more than twice the office space in all of Manhattan). A very optimistic estimate of actual development potential might be 80 million square feet over a 25-year period. As so much land has been allocated for high-density development, there is no incentive to use it well. A proposed shopping center, for example, uses about one-tenth the permitted density. If the zoning is not changed, it will produce the familiar fragmented pattern: an office park in one place, a shopping mall five miles away, and so on—all completely dependent on the automobile and each surrounded by vast parking fields.

The University of South Florida students, not having to deal with vocal landowners demanding high-density zoning, could produce an alternative zoning map, *(11)*, that accommodates optimistic growth projections in five compact locations, real urban areas that could be served by mass transit.

The design of new compact centers

Compact development does not mean replicating early twentieth century downtowns. The enclosed shopping mall, for example, can be incorporated within a compact center. A design by Andres Duany and Elizabeth Plater-Zyberk for Avalon Park *(12)*, a large planned

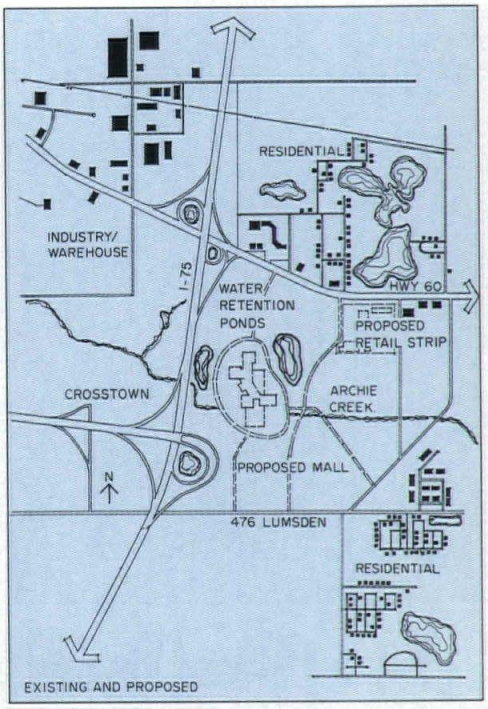
Suburbs can revise their codes and reassert control over their own future, and designers can make sense out of dispersed urban elements.

A study by University of South Florida students compares the current proposal for a shopping center at one interchange along the I-75 corridor (13) with a plan that makes the shopping center a nucleus of a future compact community (14). Plan by Jeffrey Conner and J. Texada; studio critics: James Moore and Jonathan Barnett.

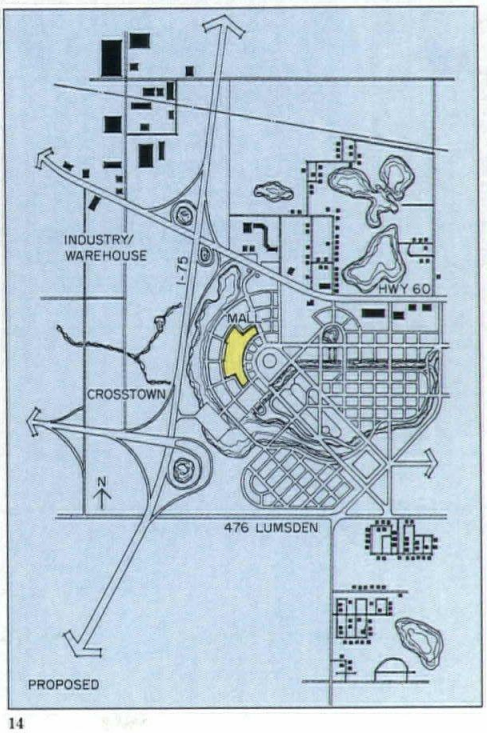
community east of Orlando, Florida, takes a regional shopping mall with three department stores and assimilates it into the street pattern of the surrounding community. Two of the three anchor stores are placed at the end of major streets, the third store faces a highway as in a conventional shopping center. An office tower is located to become a marker for the whole complex, which is ringed with smaller-scale multiuse buildings. Parking is shown as three car spaces per 1,000 square feet; overflow at peak times can be accommodated at curbside on the streets, or at remote locations. Diagrams *(13)* and *(14)*, prepared by students at the University of South Florida as part of the I-75 corridor study, use these Avalon principles to show how a proposed shopping mall could be transformed into the nucleus of a city center, with the drainage basins required by Florida environmental law combined into an ornamental lake. Initially, the street pattern would be just divisions in a conventional parking lot. Later office buildings could be added, sharing the parking, and then—as land values increase—parking garages would permit even more intense development along what would become city streets. Only then would the area begin to approach the kind of urban densities that have already been mapped for the highway corridor.

There are already some real-estate developments that can serve as models of compact suburban centers. One of the most interesting is Reston Town Center in the Virginia suburbs of Washington, D. C., *(15)*. Reston was actually planned on Ebenezer Howard's model of a self-sufficient community surrounded by rural areas, and a downtown district was part of the original plan by Conklin and Rossant, prepared in the early 1960s.

By the time RTKL began designing the center, however, Reston had become an island of relative coherence in a sprawling urban corridor leading from Washington to Dulles Airport. In a regional context, the Reston Town Center is just another development; but the first phase of the center combines 550,000 square feet of offices, 200,000 square feet of retail, 11 film theaters and a 500-room hotel, all organized in blocks, much like a traditional downtown. The retail is at street level with circulation along Market Street and Fountain Square, not along an internal mall (although there are mid-block concourses with shop frontages). Right now, the Reston Center only looks like a city if you walk or drive up Market Street; around the periphery of the four completed blocks you are still looking at buildings surrounded by parking. Ultimately, however, these parking spaces become blocks housing another 10,000 square feet of retail, close to two million additional square feet of office, another 700 hotel rooms, plus 600 to 800 apartments—which would be confirmation that there is a marketable alternative to accidental suburban development around highway interchanges, with real city blocks, storefronts and a traditional mix of uses.

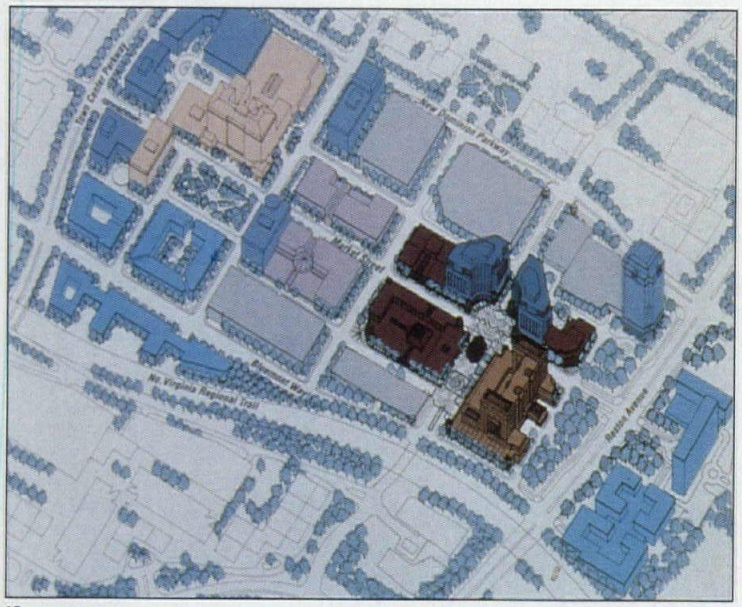


13

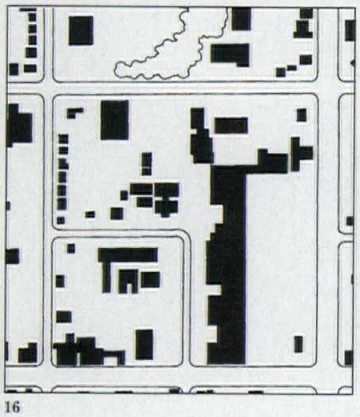


14

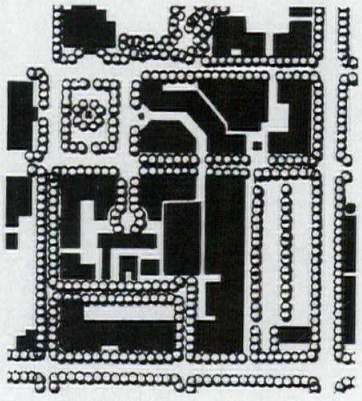
The Reston Town Center (15) is an alternative to conventional shopping malls and office parks that uses street-front retail and garage parking. The four blocks with the brown tone and blue towers have already been constructed. Urban design plan by RTKL; principals: George Pillorge, David Hudson, Bernard Wulff. In Pinellas Park, Florida, a strip shopping center at a central cross roads in the community (16) has been identified as the nucleus (17) of a proposed new compact center. Multifamily residential will replace some commercial strip zoning (18). Plans prepared by Hanson, Neiswender, Taylor: David Taylor, Randall Hollingsworth; Jonathan Barnett, Benjamin Withers, consultants.



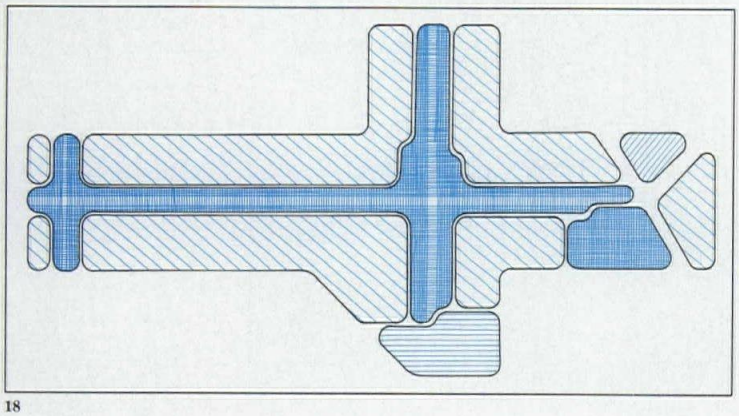
15



16



17



18

Transforming the strip

The commercial strip can be transformed, if communities are willing to adopt new zoning policies. A strategy similar to that described in the Regional Plan Association diagrams is being implemented by the city of Pinellas Park, Florida. Instead of continuous commercial zoning, the plan by Hanson, Neiswender, Taylor and Jonathan Barnett keeps commercial zoning at important locations, and the rest of the strip has been rezoned to a special mixed-use district that permits garden apartments or townhouses with possible ground-floor office or commercial space *(18)*. An existing strip shopping center has been identified as the nucleus of a new, much more concentrated civic and commercial center. The figure-ground plans, *(16)* and *(17)*, show how the existing widely spaced and scattered buildings can be pulled together into a more coherent street and block pattern.

A generalized description of suburban zoning principles for compact communities is contained in the Transit Oriented Development Design Guidelines prepared by Calthorpe Associates as part of the Sacramento County general plan. The preferred, radial residential block pattern leading to a cluster of shops along the arterial road, *(20)*, is contrasted with cul-de-sac streets branching off the arterial and unrelated shopping strip, *(21)*.

The drawing at right *(19)* describes a neighborhood commercial district at Avalon Park, Florida, the planned community mentioned earlier designed by Duany and Plater-Zyberk, which could be the kind of center indicated in the Sacramento diagram. It has a grocery and a drug store, each of 50,000 square feet, plus other related shops, and offices or apartments on the upper floors. The Avalon plan also includes local convenience shopping and smaller neighborhood centers. The parking ratio at each of these centers is three cars per 1,000 square feet of shops, a reduction from the more usual five-car standard made possible by close integration with the surrounding areas. All lots are designed to permit trees to be placed between each parking bay.

What about existing accidential cities?

Joel Garreau lists 123 Edge Cities in North America (four are in the Toronto metropolitan area, the rest in the U. S.). An Edge City in Garreau's definition has five million leasable square feet of office space or more (and thus is clearly a work center and not a suburb), has at least 600,000 square feet of retail of a type that makes the area a destination, and is located in a place that 30 years ago was overwhelmingly residential or rural in character. According to Garreau there are another 78 incipient Edge Cities (five near Toronto). Most of the places Garreau calls Edge Cities have the accidental character described in the Regional Plan Association drawing of typical development around an intersection *(2)*.

A neighborhood center (19), designed by Andres Duany and Elizabeth Plater-Zyberk for Avalon Park in Florida, is on an arterial street, but connected back into the community so it is accessible to pedestrians as well as cars. A more general statement of this principle can be seen in the diagram (20) prepared by Calthorpe Associates in association with Mintier & Associates for Sacramento County's proposed Transit Oriented Development Design Guidelines. The commercial center is also a transit stop; centers occur at intervals, as focus of a radial street pattern. This preferred organization is contrasted with typical suburban development (21), where access to residential neighborhods is mainly from an irregular pattern of cui-de-sac and collector streets.

How to improve these places

Local governments already have the power to make incipient or future edge cities into something much more like the Avalon or Reston town centers through zoning and development incentives. What has been missing until recently has been an understanding of development forces, plus the political will to take charge of the community's future. Intervention in existing areas of fragmented "Edge-City" development is much more difficult, requiring either reconstruction, which needs an economic justification for tearing down relatively new buildings, or replacement of parking lots with garages, which frees infill sites for development, but may raise densities beyond the capacity of the transportation system.

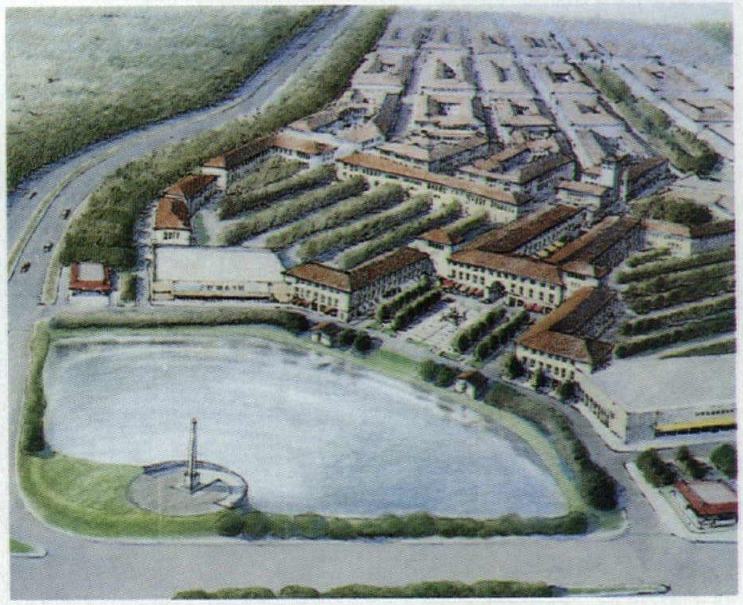
Tyson's Corner, Virginia, the Irvine business center in California, and the Parkway Center district in suburban north Dallas are all accidental cities that have recently been the subject of studies seeking ways to transform them into more workable and livable places. (Tyson's Corner study is by EDAW, Inc.; ADD, Inc.; Leggatt McCall Advisors and The Partners for Livable Places. Irvine study is by HOK and Sasaki Associates. Parkway Center study is by Barton-Aschman Associates, Sasaki Associates, Hammer, Siler, George Associates.) Tyson's Corner is perhaps the most famous of all Edge Cities and one of the most accidental. It has more than 15,000,000 square feet of offices, two massive regional shopping centers, plus 3,000 hotel rooms and 2,500 apartments. The proposals for Tyson's Corner included an internal transportation link, a public open-space system, and small areas of infill.

Building patterns similar to a city center were proposed at Irvine, requiring both reconstruction and infill, but the plan proved too controversial, and has been withdrawn for further study.

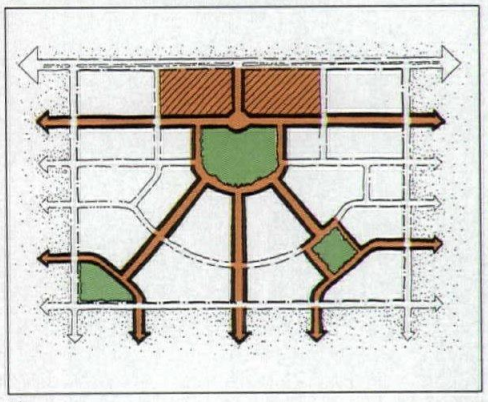
The proposals in Dallas are directed toward making property owners realize that they are part of a district that can be identified, linked by transportation and open space, and added to coherently.

These studies are small steps towards ex-post facto design of accidental cities; more comprehensive methods should emerge as designers look at these places, evaluate them, and invent ways to improve them.

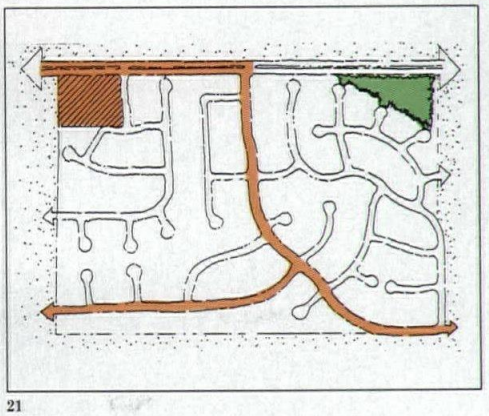
Accidental cities happened because conditions changed faster than either investors or government officials could figure out what was going on. But now that these places exist, there is no excuse not to do something about them. Revising zoning codes to head off new city-development accidents should be at the top of every local government agenda. Remaking existing accidental development should be built into every master plan. It will take a generation or more to correct the mistakes of recent decades, but it can be done. ■



19



20



21

Industrial Resolution

With a nod to Behrens and Gropius, a young firm translates a manufacturer's people-centered management into architecture.

Phillips Plastics
Short Run Factory
New Richmond, Wisconsin
James/Snow Architects

You won't find an assembly line at the Phillips Plastics Corporation's factory in rural New Richmond, Wisconsin, 40 miles east of Minneapolis. Nor will you encounter the typical division of labor, in which work is chopped into small mindless tasks, and blue-collar employees are separated from their white-collar counterparts. This is not your ordinary factory, cranking out small quantities (short runs) of plastic parts. And with its one great space and all-embracing bow-truss roof (axonometric, opposite), the architecture is a bold expression of the company's innovative management philosophy.

"We don't believe in reserved parking spaces or private offices," explains Bob Cervenka, chief executive officer of Phillips Plastics. "We've tried to eliminate all 'we-they' practices," he adds. In expressing these attitudes, architects Julie Snow and Vincent James kept the interiors of the 32,000-square-foot factory as open as possible and used eight 160-foot-long trusses to tie together the building's production and office sections. Because of noise from machines in the manufacturing area, some kind of wall between production and offices was required. But the architects made it as transparent as possible, designing a 22-foot-high glass wall divided into four-foot-square panes of 7/16-inch laminated glazing (pages 106 and 107). For other rooms requiring sound protection, the architects also specified clear-glass partitions and doors. The result is indeed an interior that underscores the importance of the whole rather than the pieces.

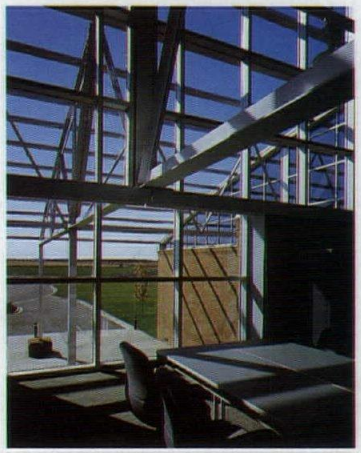
Instead of organizing production into assembly lines that reduce manufacturing to a series of repetitive tasks, the factory employs "work cells" that bring workers together into teams. Each cell performs all of the tasks—molding, painting, assembling, and even packaging—required for a particular product and does it in one place. Thus, the factory becomes a network of work stations supplied with electricity and other mechanical services from three utility trenches running along the floor. Two overhead cranes lift and move heavy molds from supply shelves to work stations. Washed in sunlight from both its north and south ends and accorded a ceiling that rises from 22 to 38 feet, this interior offers a sense of importance and vitality uncommon in a factory.

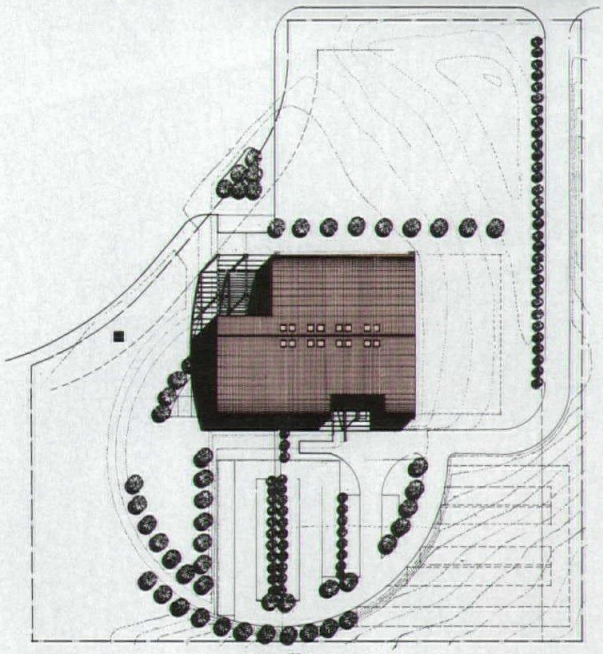
A simple steel-frame structure enclosed by masonry walls and double-sided insulated aluminum panels, the factory sits on a prairie as a formal, manufactured element in an otherwise undistinguished setting (site plan, right). When the plant's third 8-hour shift arrives at night, the building's barrel roof seems to float on an arc of light and the entire factory turns into a beacon in the dark landscape.

To mark the entry to the factory the architects stripped away the galvanized aluminum roofing and exposed the building's steel frame and bow trusses (pages 102 and 103). The result is an open porch that is literally an extension of the internal structure. Based on a 20- by 28-foot module, the building was designed to be easily expanded. In fact, the architects are currently working on adding three 28-foot-wide bays to the west end (top right).

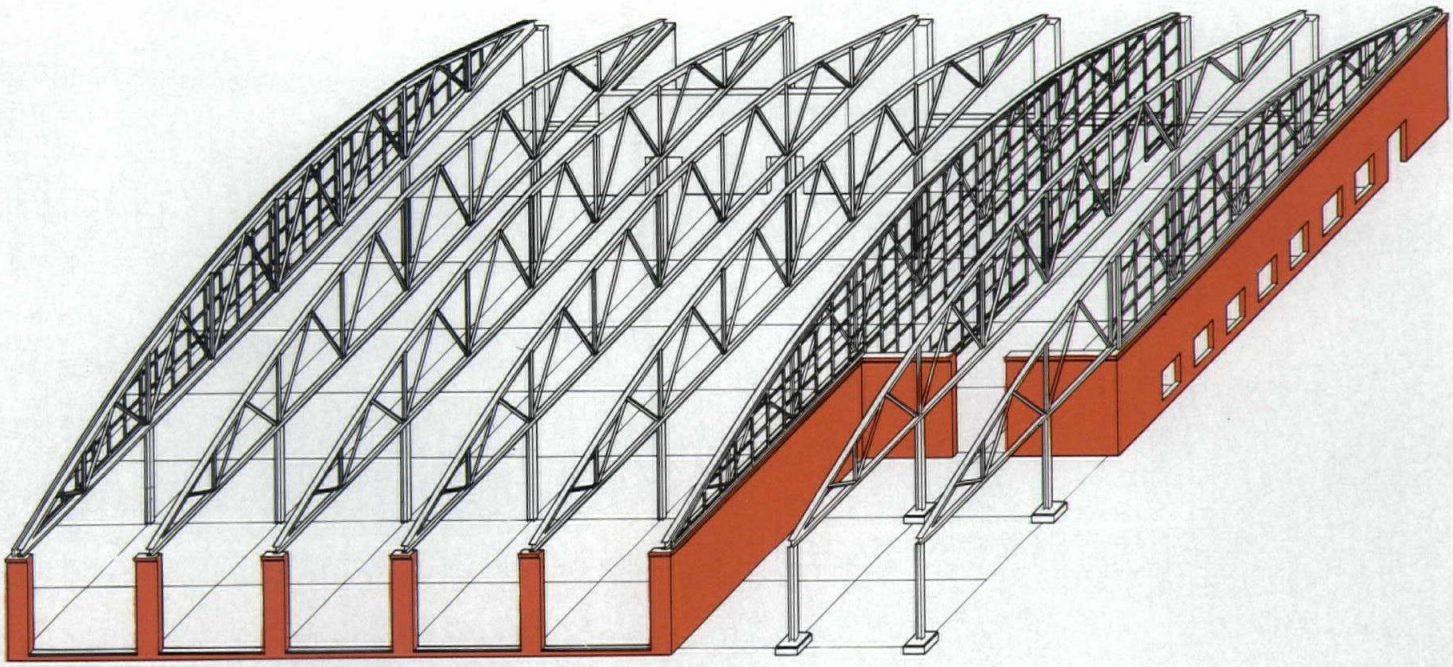
Before designing the factory, Snow and James sought inspiration in some of the Modern movement's early icons. With its barrel roof and juxtaposition of glass and masonry, the Phillips plant bears a familial resemblance to Peter Behrens's famous Turbine Factory in Berlin. And in its straightforward glass-and-steel structure, it recalls Walter Gropius's Fagus Factory. Although the Phillips plant's open interior was a response to the client's management philosophy, it also alludes to the unified spaces of 19th-century train stations and rural barns, admits Snow. *Clifford A. Pearson*

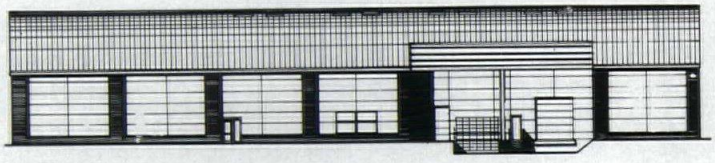
Don F. Wong photos



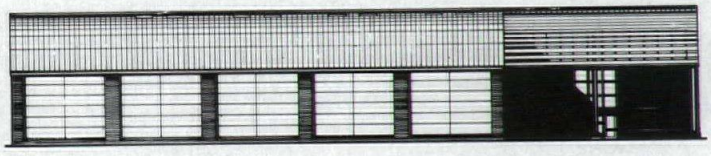


Credits
Owner: *Phillips Plastics Corp.*
Architect: *James/Snow Architects—Julie Snow, principal designer*
Associate Architect: *P. S. I. Design Architects—Mike Piene, project architect; Ali Hesmati, Chris Schmidt, Joe Sturtz, design team*
Engineers: *Harwood Engineers (structural/electrical); Irv Smith (mechanical)*
Consultants: *Steve Kvernstoen (acoustical)*
General Contractor: *Peter Swabe, Inc.*

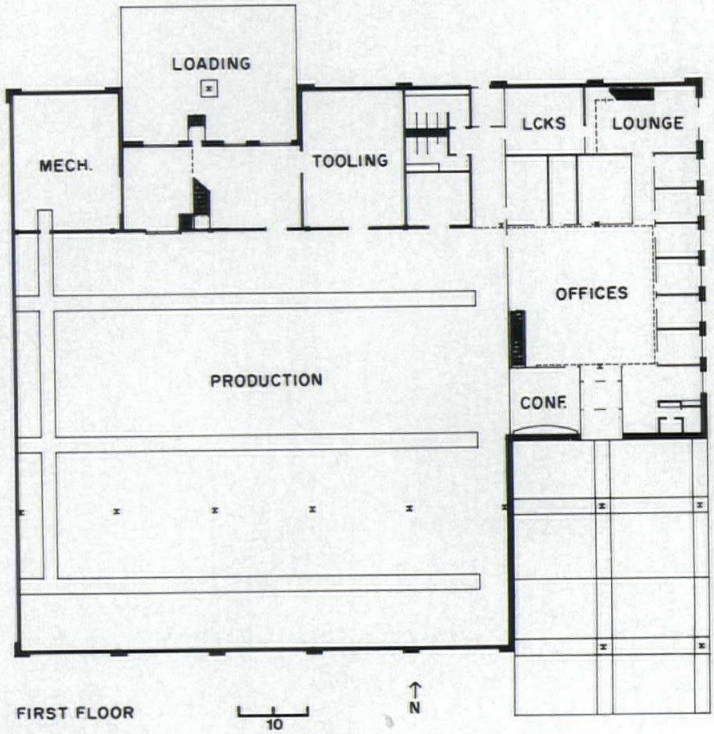




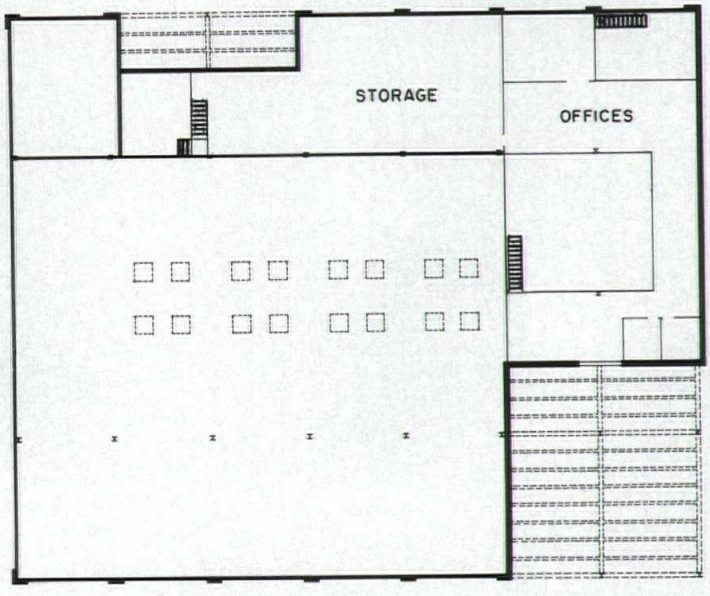
SOUTH ELEVATION



NORTH ELEVATION



FIRST FLOOR



MEZZANINE


EXIT


DEMAG

NEW for 1992!

A.R.E. Candidates!

NCARB's 1992 A.R.E. Handbook Available Now

If you are planning to take the Architect Registration Examination, don't miss out on one of the most valuable study guides. Complete your examination preparation with the all-new A.R.E. Handbook from NCARB. This comprehensive volume covering all divisions of the exam was prepared by the NCARB Examination Committee. It is recommended as part of a well-rounded study program and demonstrates the types of questions you will encounter in the A.R.E.

Graphic problems selected from three previous administrations of Division B: Site Design – Graphic form a sample examination for you to solve. Test your ability by applying the grading criteria to your solutions, and follow along with carefully detailed critiques of actual candidate solutions to understand the level of competence necessary to pass the exam.

Both the Division B: Site Design – Graphic as well as the Division C: Building Design examples have significant aspects noted in color and have been carefully structured for maximum benefit to Handbook users. Three complete examinations, including program requirements, sample test pads as well as actual candidate solutions and grading criteria are presented. Examinations are included from December 1989 (Student Union Building), June 1990 (Architect's Office) and December 1990 (Family Lodge). A strategy suggests a logical thought process that can be useful when completing the Building Design exam.

Make the A.R.E. Handbook an essential part of your preparation for the A.R.E.

SHIPPING

Books shipped to addresses within the continental United States are shipped by regular (surface) UPS at no additional cost. • If your book is shipped to an address in Alaska, Hawaii, Puerto Rico, Virgin Islands or Canada, please add $8.00. • Residents of the District of Columbia should add $5.10 DC sales tax. • Please include a daytime address. UPS does not deliver to post office boxes.

PLEASE SEND ME THE 1992 A.R.E. HANDBOOK.

Name .....

Company .....

Daytime Address (no PO Boxes) .....

City ..... State .....

Zip .....

Daytime Phone .....

Quantity..... @ $ 85 $ .....

Book Total $ .....

Additional for shipment to Alaska, Hawaii, Puerto Rico, Virgin Islands, Canada $ **8.00**

TOTAL PAID $ .....

☐ Check Enclosed ☐ Charge My: ☐ Visa ☐ Mastercard

Account Number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

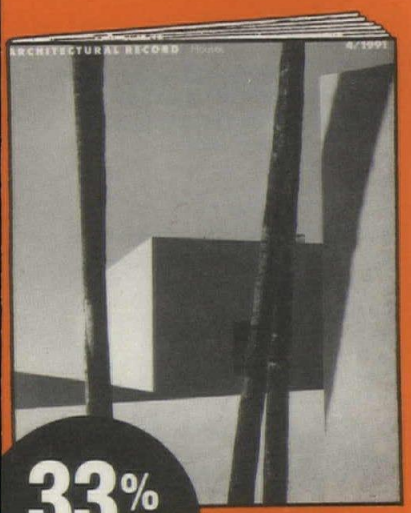
Expiration Date: Mo ☐☐ Year ☐☐

Signature .....

Detach and mail payment to: NCARB, A.R.E. Handbooks, 1735 New York Ave. NW Suite 700, Washington, DC 20006
Make checks payable to NCARB. Delivery takes 2-3 weeks.

Do not write in this space	D/R	CK/MO	AMT	DUE	A

Enter your own personal subscription to the **best in the business...**



33% SAVINGS!

ARCHITECTURAL RECORD keeps you fully in touch with the architectural profession. And our readers tell us we consistently do it better than anyone else. RECORD is provocative. Innovative. In-depth. Providing each month the best in design ideas, new technology, tips on managing your business better, and much more. Judge for yourself the many benefits of RECORD—subscribe now!

YOUR GUARANTEE.
You may cancel at any time and receive a full refund for all unmailed issues.

Save $47 with a three-year subscription...It's like getting one year free! Just fill out and mail one of these handy, postage-paid order cards. Do it today!

Order your 1992 A.R.E. Handbook now from NCARB! →

(Pass the extra order cards along to associates.)

SAVE UP TO $47!

YES. Please enter my subscription to ARCHITECTURAL RECORD for the period indicated:

- ☐ 36 months $94. **Your best buy,** $47 savings!
- ☐ 24 months $71. **A terrific buy,** $23 savings!
- ☐ 12 months $47 **A great buy,** only $3.92 an issue!

☐ Payment enclosed ☐ Bill me ☐ Bill my company
☐ American Express ☐ VISA ☐ MasterCard

Acct. # Exp. Date

Signature Date

Name

Title Check here ☐ if owner

Company Type of Firm

Mailing address

City/State Zip

This is a ☐ Business address ☐ Home Address ID22205

ARCHITECTURAL RECORD
P.O. Box 564, Hightstown, N.J. 08520

Subscriber Information
All information must be completed to qualify.

1. TYPE OF FIRM
- ☐ (10) Architect, Architect/Engineer
- ☐ (20) Consulting Engineer
- ☐ (60) Commercial, Industrial, Institutional
- ☐ (41) Contractor
- ☐ (42) Sub-contractor
- ☐ (32) Interior Design
- ☐ (51) Government
- ☐ Other

2. CHECK IF YOU ARE:
- ☐ Registered Architect
- ☐ Chief Architect
- ☐ Staff Architect
- ☐ Job Captain
- ☐ Owner, Executive, Partner
- ☐ Self-employed, Principal, Gen. Mgr., Mgr.
- ☐ Project Manager
- ☐ Draftsman
- ☐ Chief Engineer
- ☐ Engineer
- ☐ Interior Designer
- ☐ Designer
- ☐ Other

Allow 6-8 weeks for shipment of first issue. Rates good only in U.S., U.S. Possessions, and Canada.

SAVE UP TO $47!

YES. Please enter my subscription to ARCHITECTURAL RECORD for the period indicated:

- ☐ 36 months $94. **Your best buy,** $47 savings!
- ☐ 24 months $71. **A terrific buy,** $23 savings!
- ☐ 12 months $47 **A great buy,** only $3.92 an issue!

☐ Payment enclosed ☐ Bill me ☐ Bill my company
☐ American Express ☐ VISA ☐ MasterCard

Acct. # Exp. Date

Signature Date

Name

Title Check here ☐ if owner

Company Type of Firm

Mailing address

City/State Zip

This is a ☐ Business address ☐ Home Address ID22205

ARCHITECTURAL RECORD
P.O. Box 564, Hightstown, N.J. 08520

Subscriber Information
All information must be completed to qualify.

1. TYPE OF FIRM
- ☐ (10) Architect, Architect/Engineer
- ☐ (20) Consulting Engineer
- ☐ (60) Commercial, Industrial, Institutional
- ☐ (41) Contractor
- ☐ (42) Sub-contractor
- ☐ (32) Interior Design
- ☐ (51) Government
- ☐ Other

2. CHECK IF YOU ARE:
- ☐ Registered Architect
- ☐ Chief Architect
- ☐ Staff Architect
- ☐ Job Captain
- ☐ Owner, Executive, Partner
- ☐ Self-employed, Principal, Gen. Mgr., Mgr.
- ☐ Project Manager
- ☐ Draftsman
- ☐ Chief Engineer
- ☐ Engineer
- ☐ Interior Designer
- ☐ Designer
- ☐ Other

Allow 6-8 weeks for shipment of first issue. Rates good only in U.S., U.S. Possessions, and Canada.

PLEASE SEND ME THE 1992 A.R.E. HANDBOOK.

Name

Company

Daytime Address (no PO Boxes)

City State

Zip

Daytime Phone

Quanity..... @ $ 85 $

Book Total $

Additional for shipment to Alaska, Hawaii, Puerto Rico, Virgin Islands, Canada $ **8.00**

TOTAL PAID $

Charge My: ☐ Visa ☐ Mastercard

Account Number

Expiration Date: Mo Year

Signature

ID22205

Do not write in this space D/R CK/MO AMT DUE AP

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 42 HIGHTSTOWN, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

ARCHITECTURAL RECORD
Subscription Department
P.O. Box 564
Hightstown, NJ 08520-9885

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 42 HIGHTSTOWN, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

ARCHITECTURAL RECORD
Subscription Department
P.O. Box 564
Hightstown, NJ 08520-9885

N C A R B

Post Office will not deliver mail without postage.

A.R.E. HANDBOOKS
NATIONAL COUNCIL OF ARCHITECTURAL REGISTRATION BOARDS
1735 NEW YORK AVENUE NW
SUITE 700
WASHINGTON DC 20006

Your *best buy* for the *best* architectural magazine—a multi-year subscription!

Subscribe to ARCHITECTURAL RECORD for two or three years and you lock in *savings of 24-33%* off the one-year rate, avoid interruption of service, guard against possible future price increases, and guarantee yourself a steady flow of profitable information and ideas...

Record Houses
Special issue (April)—up-to-date review of the best in today's residential housing.

Record Interiors
Special issue (September)—award-winning designs for a variety of interior types.

Building Types Studies/ Individual Buildings
In-depth design reports each month with more drawings, larger photos in full-color, more critiques.

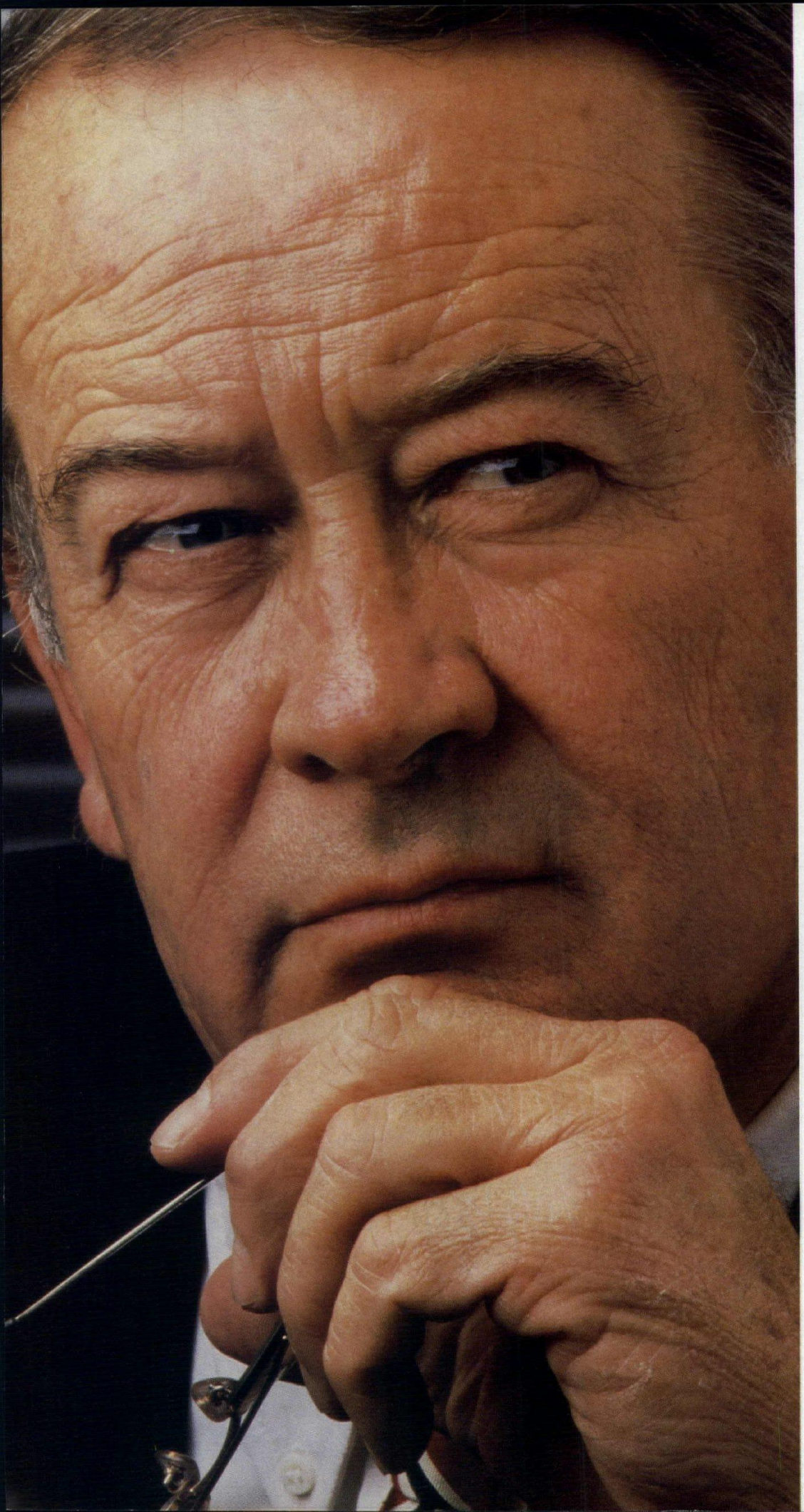
Building Technology
Regular features that help you understand advances in engineering and technology.

News
One convenient "yellow pages" section each month features timely news reports on design, practice, products, computers/software reviews, and more.

FREE BONUS SUPPLEMENT
RECORD subscribers also receive RECORD LIGHTING. At no extra cost, this supplement provides additional coverage of four lighting design areas—commercial, retail, landscape and interiors. Plus you get reports of the latest in lighting technology and new products.

Subscribe Today!

(Pass the extra order cards along to associates.)



"FLY-THRUS, ASSOCIATIVE DIMENSIONING, GLOBAL EDITING . . . ALL I KNEW WAS THIS HAD BETTER WORK."

Our search for CAD software was intense. Being a small architectural firm, we *couldn't* afford to make a mistake.

By Architects, For Architects

Fortunately, we discovered DataCAD,® a versatile, easy to learn, easy to use PC-based design and drafting tool. DataCAD was developed *by* architects, *for* architects, (unlike the "name brand" we almost bought).

Works Like An Architect

DataCAD allows us to do 2-D and 3-D designs faster and more easily than we ever thought possible. Create with built-in wall, door, window and column commands. Easy editing, symbol libraries and "live views" are also standard.

We now spend more time designing, while we've reduced our costs. And in this tough market, we can use all the help we can get.

Even The Price Is Easy

Not only was DataCAD simple to learn (and a pleasure to use), even the price was easy. We got everything we needed in one basic package with *no* costly add-ons.

If you could design CAD software for your firm, this is what you'd invent. Ask for a live demonstration and see for yourself. You've got nothing to lose except the drudgery.

Courtesy William Riseman Associates, Inc.

Render option available.

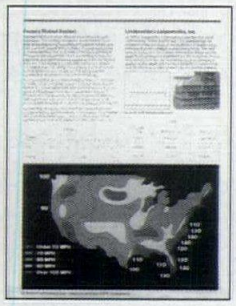
DataCAD®

Cadkey, Inc.
4 Griffin Road North, Windsor, CT 06095-1511
(203) 298-8888 FAX: (203) 298-6401
Toll Free: 1-800-654-3413

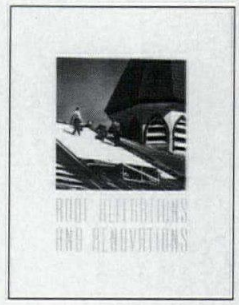
Circle 25 on inquiry card

Roofing

For more information, circle item numbers on Reader Service Cards.
** Product data also offered on CAD disk*

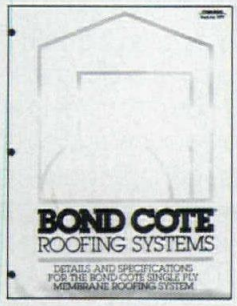


Wind uplift
Research study summarizes the roof-damage potential of air-pressure differentials, and describes correct design and material-selection guidelines to resist wind uplift forces. JPS Elastomerics.***400**



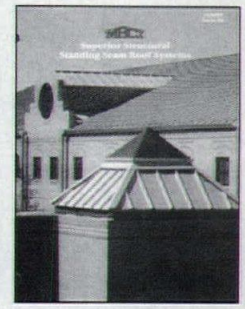
Wood roof decks
A 16-page before-and-after booklet describes reroof projects that used lumber and structural-wood panels, such as adding pitch to flat roofs and reroofing historic buildings. American Plywood Association. **401**

Commercial roofing
Full-line catalog has 72 pages on built-up, modified bitumen, and single-ply roofing systems, roof insulations, and accessories in color-coded sections. Manville, Roofing Systems Division. ***402**



Custom color
Acrylonitrile butadiene polymer sheet now comes in new Spectrum colors such as teal, used on Walt Disney World's Swan and Dolphin hotels; custom colors can be combined in patterns. BondCote Corp. **403**

Modified bitumen
A 1992 40-page manual discusses the selection of built-up and modified-bitumen roofing, ply-sheet membranes, and cap sheets, with installation details and code-compliance information. Celotex Corp. **404**

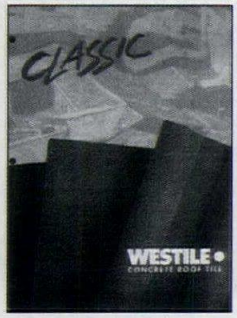


Structural metal
Architectural catalog features standing-seam roofs that snap together or can be field seamed; panels offer three finishes and 38 colors. An articulating clip permits unrestricted thermal movement. MBCI. **405**

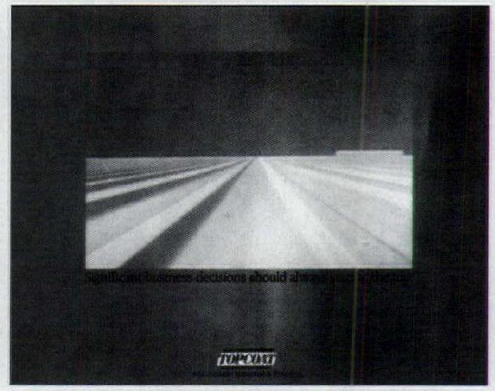
Thermoplastics
The Trocal single-ply membrane, in 50-, 60-, and 80-mil thicknesses, offers different reinforcements for specific roofing needs. Computerized detail and layout assistance services available. Hüls America, Inc. ***406**

Architectural
The vaulted roof on Chicago's new Harold Washington Library is featured in the 1992 Pac-Clad catalog. Includes details on metal-panel profiles, roof-edge treatments, and finish options such as Terne. Petersen Aluminum. **407**

Single-ply roofing
A 12-page catalog outlines performance features of all five SynTec roofing systems, and explains the range of design, technical, and installation services available to the architect. Carlisle SynTec Systems. ***408**

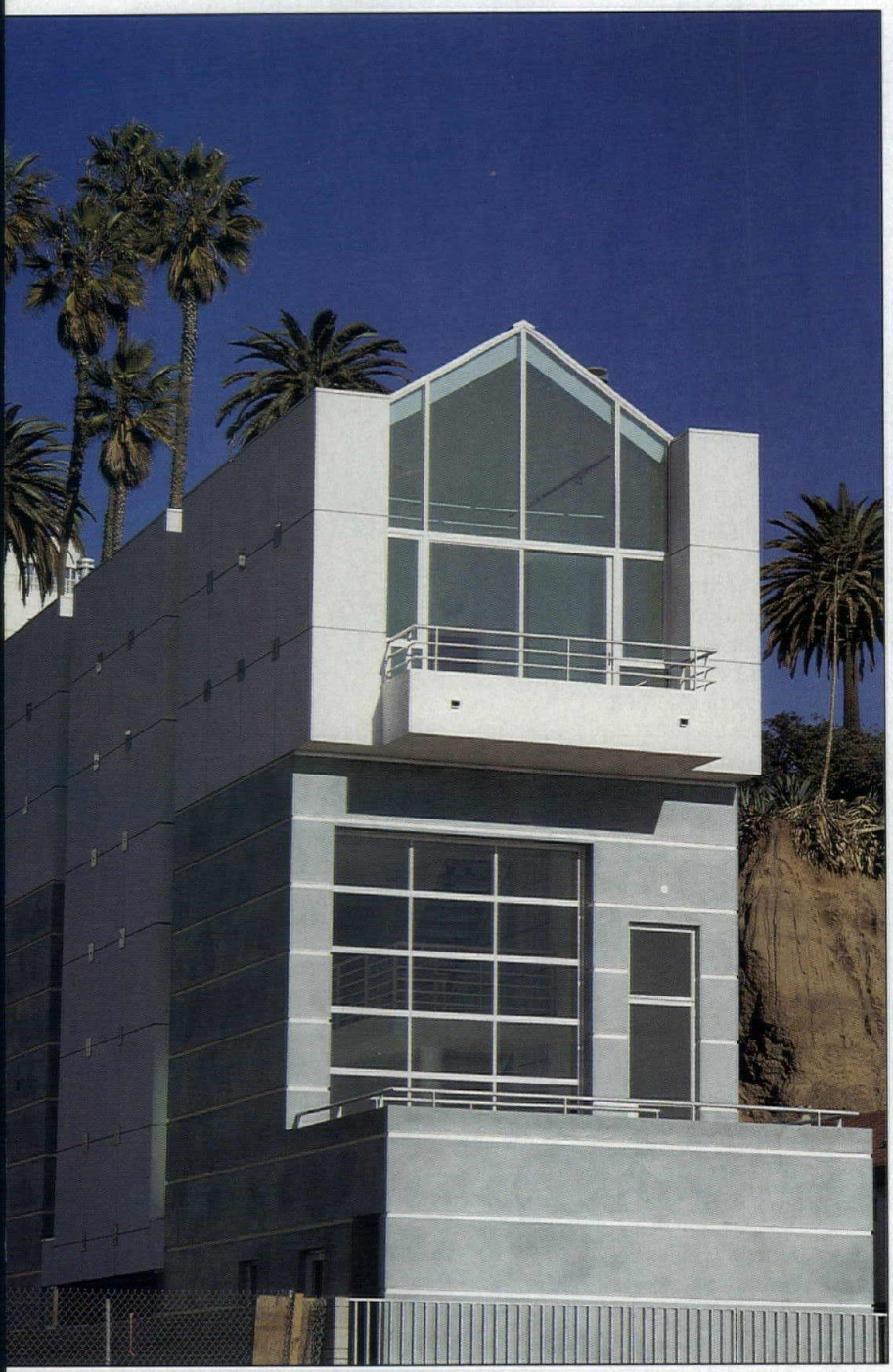


Concrete tiles
Foldout has color close-ups of three roof-tile designs: a shake/slate look; a classic Roman shape; and a new Ultralite tile. Its installed weight of 6.2 lbs. psf gives it expanded reroof potential. Westile. **409**



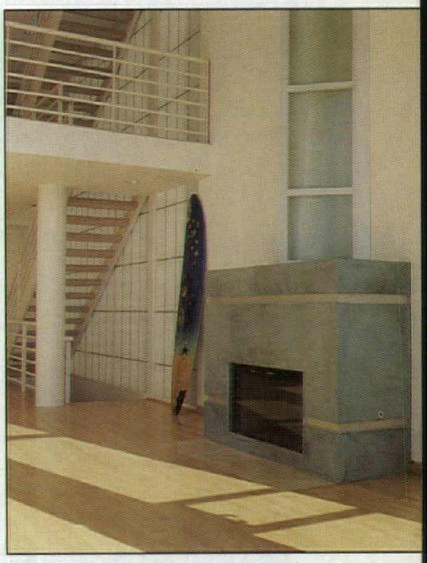
Seamless reroof
Color booklet explains how Topcoat liquid-applied synthetic rubber forms a seamless weatherproof membrane to recondition deteriorating metal roofs while maintaining a FM Class 1 rating. Step-by-step installation photos illustrate spot-priming, flashing, and application of the water-based two-coat membrane. Color range includes standard white and gray, and 14 custom shades. The Major Group, Inc. **410**

Fry Moldings: At home, anywhere.



Fry Reglet's channel screeds and casing beads enhance the visual impact of Steven Ehrlich Architects' design.

"Santa Monica House" perched on a gentle slope fronting the blue Pacific Ocean, provides an effortless segue from teeming city life to lazy sand and surf. Fry Reglet's channel screeds and casing beads, sealed with a standard clear anodized finish, elevate this saltbox-styled enclave to a new design plateau. Horizontal and vertical reveals accentuate the angular plaster surfaces, creating the grid pattern dominating the north and south exposures.



The Fry reveal pattern is continued on the interior walls and around the fireplace.

Be it commercial exteriors or interiors, schools, hospitals, institutional buildings, airports and now residences, Fry's moldings are at home anywhere.

Specify Fry - we give your imagination a place to play.

FRY REGLET®
Aluminum Architectural Moldings

Architect:
Steven Ehrlich Architects
Venice, California

Developer:
Ehrman-Coombs
Malibu, California

General Contractor:
Michael MacDowell Construction
Malibu, California

Plastering Contractor:
Eddie Carrillo, Inc.
Los Angeles, California

625 South Palm Avenue, Alhambra, California 91803 ▪ (818) 289-4744 ▪ Fax (818) 289-0537
2777 Peterson Place, Norcross, Georgia 30071 ▪ (404) 441-2337 ▪ Fax (404) 441-3194

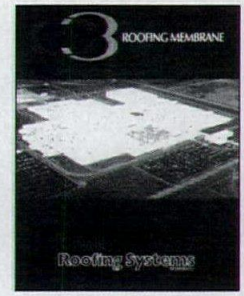
Circle 26 on inquiry card

Roofing

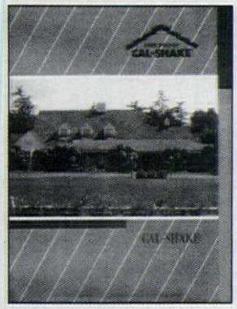
For more information, circle item numbers on Reader Service Cards.
** Product data also offered on CAD disk*

Built-up systems
A 26-page technical guide includes asphaltic, coal tar, and modified-bitumen materials; discusses general requirements and design considerations for roofs from dead level to steep. Koppers Industries, Inc. **411**

Enclosure systems
Catalog highlights the appearance and performance features of roofing and siding offered in galvanized, stainless, and aluminized steel. Explains how SRS panels resist negative pressures of 150 psf. Steelite, Inc. **412**

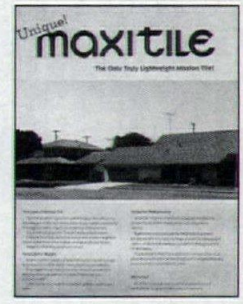


Tri-polymer sheet
Folder introduces the C3 single-ply membrane, a new hot-air-weld material based on DuPont's Elvaloy polymer, which is said to combine the benefits of EPDM, PVC, and Hypalon. Cooley Roofing Systems. **413**



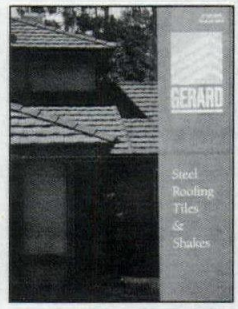
Composite shake
Made of perlite, low-alkaline Portland cement, acrylic fibers, and iron-oxide pigments in an equal-mass process, 50-year shake- and slate-look roofing is designed to offer easy double-lapping installation. Cal-Shake, Inc. **414**

Metal system
A 28-page catalog shows VersaLok and other panels used on resorts, schools, and retail buildings. Can be specified in Galvalume sheet steel, aluminum, copper, and Terne metal. ECI Building Components. **415**

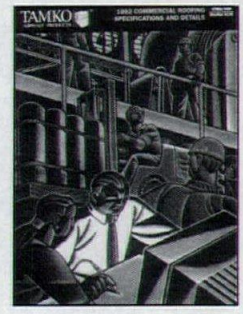


Fiber-cement tile
Made of Portland cement, silica, and cellulose fiber by a subsidiary of the Saint-Gobain company, roofing line includes cedar shake, Mission tile, and slate reproductions that weigh less that 4 psf. MaxiTile, Inc. **416**

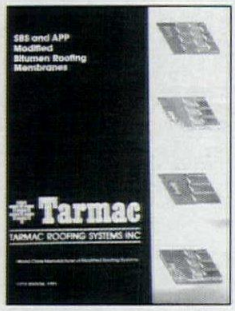
Modified bitumen
Technical guide has 42 pages on SBS-modified roofing and waterproofing for torch, hot mop, self-adhesive, and cold-applied installation. Useful text discusses performance of modified asphalts. MBTechnology. ***417**



Tile-look panels
Steel-panel roofing in Mission-tile or wood-shake patterns is surfaced with stone granules in eight solid colors and seven Mediterranean blends. Panels interlock and are self-flashing. Gerard. **418**



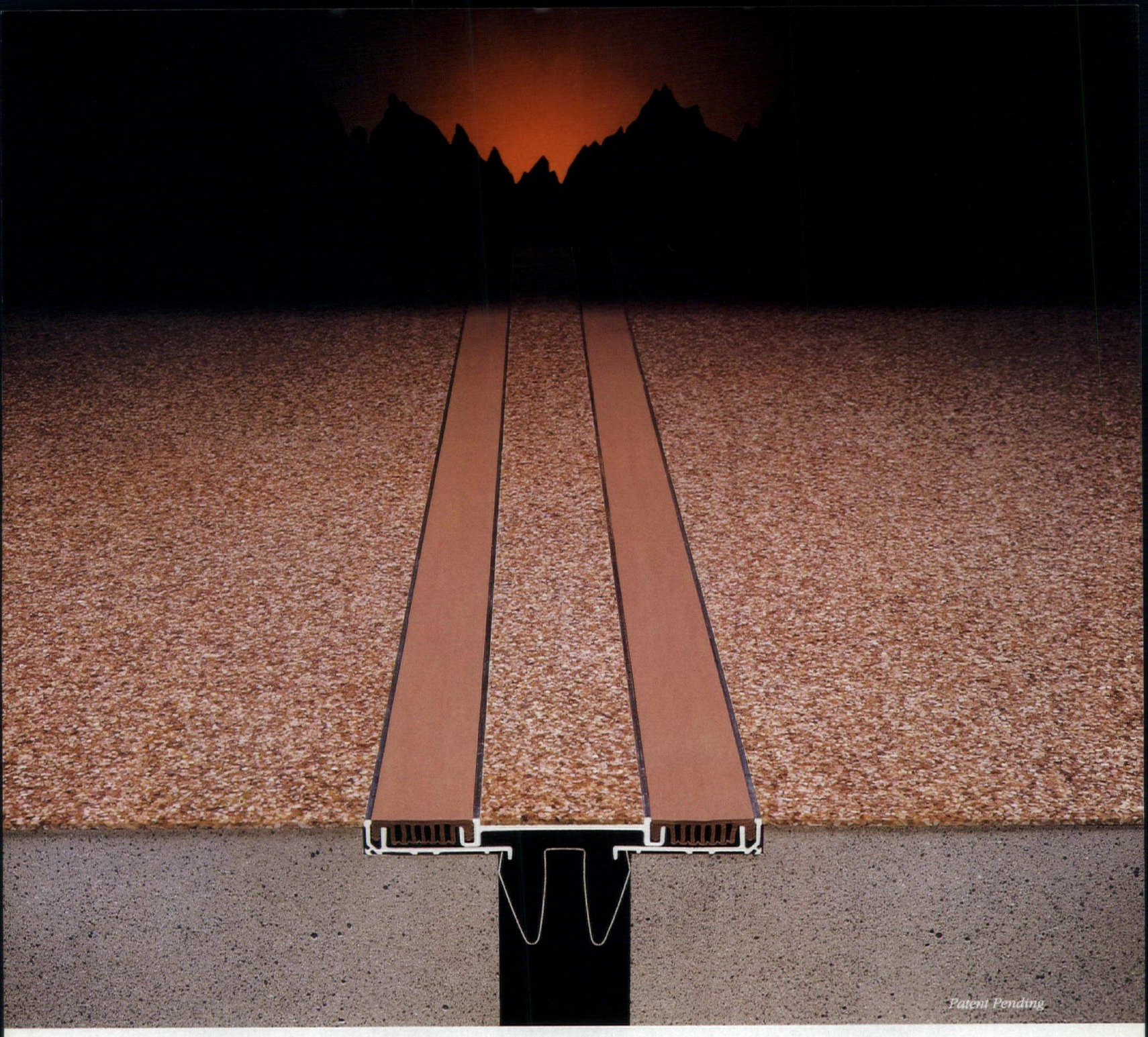
Bituminous roof
A 48-page manual, 1992 Commercial Roofing Specifications and Details covers both built-up and SBS-modified roof products. Full-color, well-done details accompany each specification. TAMKO Asphalt Products, Inc. ***419**



Modified systems
Covers both SBS- and APP-modified bitumen for torch and mop application. Full-color cut-away details cover all the most troublesome roof areas, such as a curb for rooftop AC units. Tarmac Roofing Systems, Inc. **420**

Glass-reinforced
Concise brochure lists roof membranes, insulations, and accessories, telling what their best applications are, what the system or product is made of, and the most pertinent code approvals. Owens-Corning Fiberglas Corp. **421**

Custom roof
The Duro-Last membrane is factory seamed to minimize the need for on-site labor. Sheet is made of a thermoplastic alloy said to exhibit excellent resistance to UV radiation, acids, and oils. Duro-Last, Inc. **422**



C/S Announces The Dawn Of A New Age In Expansion Joint Technology

Unsightly floor joints with missing gaskets and dirt collecting voids have been a serious maintenance problem, tripping hazard and visual disgrace for years.

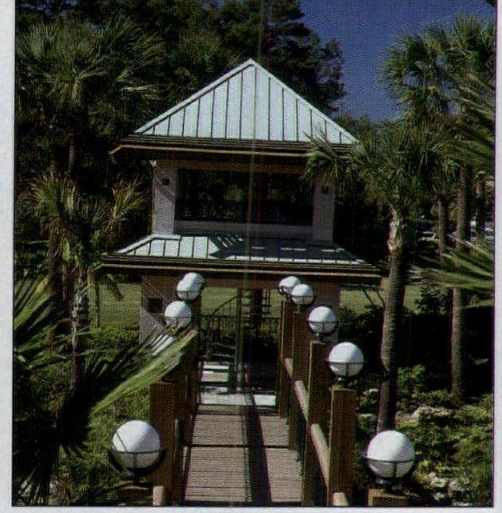
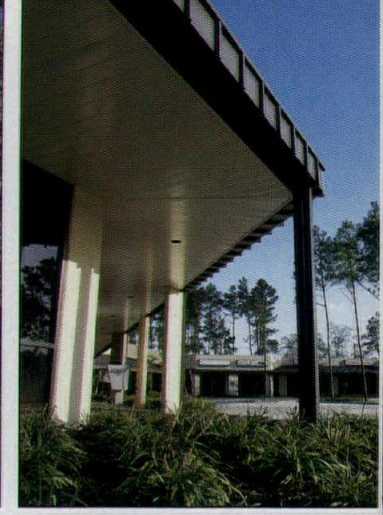
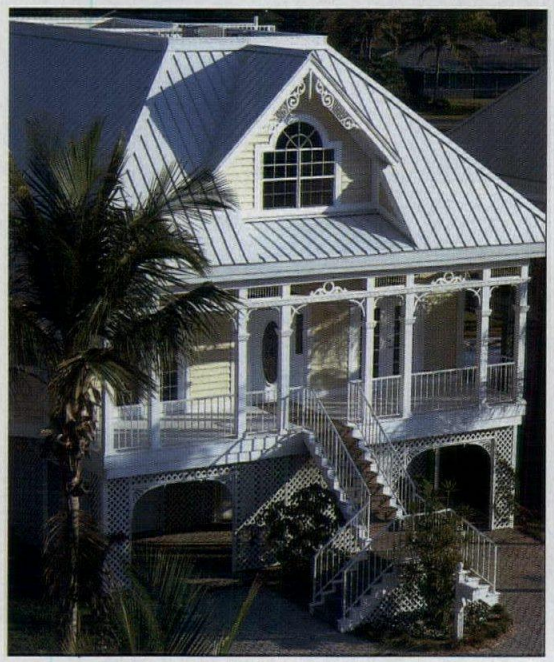
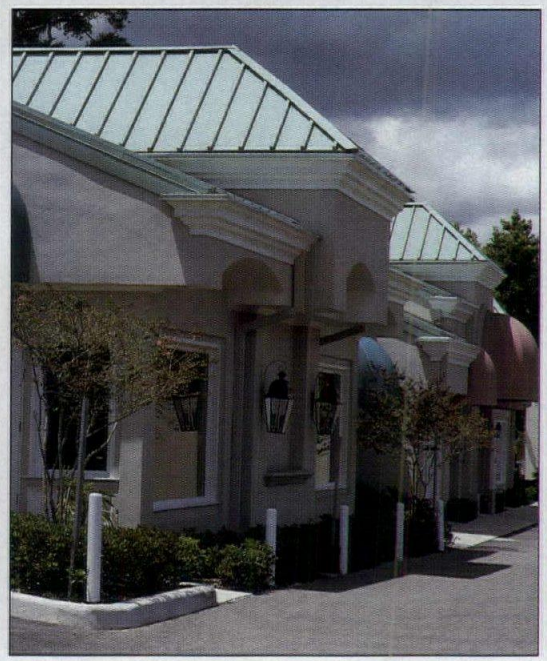
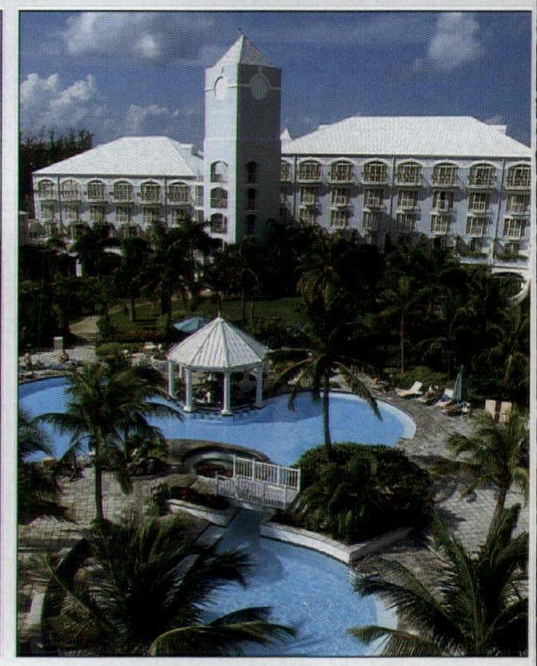
But now there's a solution! C/S has developed a flush expansion joint cover system with clean, simple lines. It provides for multi-directional movement — up to 50% — *without loss of seal* and is available for 1" through 16" openings.

The design features rugged aluminum components and gaskets of a co-extruded thermoplastic material to smoothly accommodate both pedestrians and wheeled equipment. Gaskets may be custom colored for larger projects and the center plate recessed to accept tile or carpet for the ultimate unobtrusive look. Best of all, C/S Flush Seals cost no more than conventional joint systems.

A new age in expansion joint technology is now here — even for seismic applications! Call 800-233-8493, our technical staff is ready to assist you.

THE CS GROUP

Circle 27 on inquiry card

If you're considering metal, talk to the trend setter.

MBCI has long led the industry in developing new solutions to the age–old challenge of how best to cover a building. Our specialty is custom metal roofing — the increasingly popular alternative for residential, commercial and municipal projects.

Today's standing seam metal roofs offer unprecedented design flexibility, long–term watertight reliability, and a strong sense of craftsmanship and durability. As the industry leader, MBCI offers the widest available selection of profiles, trims and colors, backed by in–depth technical support at every level. Whether you want to determine how to satisfy your uplift requirements, evaluate the performance specifications of alternative finishes, or keep up with new developments, MBCI can provide the answers.

If our products don't fit your requirements for a particular project, we'll be the first to tell you. If they do, you can be sure that your client will have the best preformed metal roofing system that money can buy. You can also be sure that every MBCI roofing system is backed up with whatever it takes — from preplanning assistance, engineering data and technical backup, to on–the–job consultation — to make sure that you and your client are completely satisfied.

If you're considering metal, give us a call. We have the information you need.

MBCI®

Metal Roof and Wall Systems

Houston 713/445-8555
Lubbock 806/747-4291
Oklahoma City 405/672-7676
San Antonio 512/661-2409
Dallas 214/988-3300
Atlanta 404/948-7568
Tampa 813/752-3474
Richmond 804/526-3375
Indianapolis 317/398-4400

Circle 28 on inquiry card

1	Exxon
2	General Motors
3	Mobil
4	Ford Motor
5	IBM
6	Texaco
7	E.I. du Pont
8	Standard Oil (Ind.)
9	Standard Oil of Cal.
10	General Electric
11	Gulf Oil
12	Atlantic Richfield
13	Shell Oil
14	Occidental Petroleum
15	U.S. Steel
16	Phillips Petroleum
17	Sun

Manufacturer Sources

For your convenience in locating building materials and other products shown in this month's feature articles, RECORD has asked the architects to identify the products specified.

Pages 66-73
Art Pavilion
Frank Israel Design Associates, Inc., Architect
Composite panels: Eternit. (Glasweld). Sand-finish stucco: Thoro System Products (Thoroseal). Mahogany windows and entrance: custom by architects, fabricated by Archetype.

Pages 80-87
John G. Shedd Oceanarium
Lohan Associates, Architect
Exterior stone: Georgia Marble Co. Curtain walls (aluminum): Illinois Bronze Co. Spandrel and punched windows: Marmet. Glass: Spectrum Glass Products. Modified-bitumen roofing: Owens-Corning Fiberglas Corp. (Derbigum). Laminated-glass and metal railings: Globe-Amerada Glass Co.; Hordis Brothers. Entrances: Tubelite Div., Indal. Acrylic underwater- viewing windows: Reynolds Polymer. Ceiling tile: Celotex. Suspension grid: Chicago Metallic. Downlighting and other fixtures: Halo. Hydraulic elevator: Dover.

Pages 88-93
Eugenio Maria de Hostos Community College
Voorsanger & Associates Architects, PC
Brick: Endicott/Merrit. Curtain wall, aluminum windows, and entrances: Lynbrook Glass & Architectural Metals Corp. Glazing: PPG Industries, Glass Group. Precast panels: Snellco. EPDM roofing: Firestone Building Products. Ground-face block: Plasticrete. Ceiling tile and grid; vinyl flooring: Armstrong World Industries. Paints: Glidden Co. Special coatings: PPG Industries, Coatings & Resins Group. Laminate surfaces: Abet Laminati. Fluorescent troffers: Lightolier. Stairwell fixtures: Louis Poulsen. Pendants (in Library) and atrium torchières: Sterner Lighting Systems. Reading tables and carrels: Lake Country Woodworkers. Chairs: Jasper Seating. Upholstery: DesignTex.

Pages 102-107
Phillips Plastics
James/Snow Architects, Inc.
Brick: Glen-Gery. Roofing: ECI Building Components. (Galvalume). Windows and entrances: Kawneer Co. Glass: PPG Industries, Glass Group. Loading-dock doors: McKee Door Co. Bollards and step lights: Bega. Ceiling tile and grid: Armstrong World Industries. Office systems furniture: Steelcase. ■

CALL FOR ENTRIES

RECORD INTERIORS 1992

The editors of ARCHITECTURAL RECORD announce the 23rd annual RECORD INTERIORS issue. Architects and interior designers are invited to submit recently completed interior design projects in all categories; work previously published in other national design magazines is disqualified. There are no entry forms or fees, although submissions must include photographs (transparencies, slides, or prints), floor plans, and a project description—bound firmly in an 8½ by 11-in. folder—and be post-marked no later than April 30, 1992. Winning entries will be featured in the September 1992 RECORD INTERIORS. Other submissions will either be returned or scheduled for a future issue. If you would like your entry returned, please include a self-addressed envelope with appropriate postage.

Submissions should be mailed to:
Karen D. Stein
RECORD INTERIORS
ARCHITECTURAL RECORD
1221 Avenue of the Americas
New York, New York 10020

Danpalon
Since 1976

Safeway MarketPlace, Portland, OR
David Hickman Associate Architects

Excellence in Translucent Systems

Still Like New in 2002

Danpalon® translucent insulating systems installed in 1992 will still be like new well into the 21st century!

Danpalon's unmatched 10-year warranty* protects you, your client, and your project in all areas where daylighting problems most commonly occur.

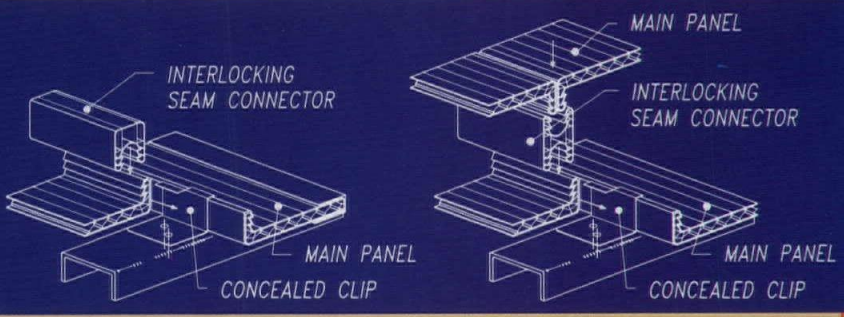
When you specify **Danpalon** panel systems by CPI, you are specifying the only system that's immune to fiber "bloom," that won't delaminate or discolor.

Danpalon panels retain like-new structural properties, high-tech architectural appearance, and all-important light-transmission — year after year after year.

Your specification of **Danpalon** panel systems is backed by more than a decade of actual field performance under a variety of weathering conditions.

Before you specify your next daylighting application, find out more about Danpalon® systems by CPI.

Danpalon's dry/mechanical standing seam technology does not rely on adhesive bond, provides ultimate short and long term protection against leakage.



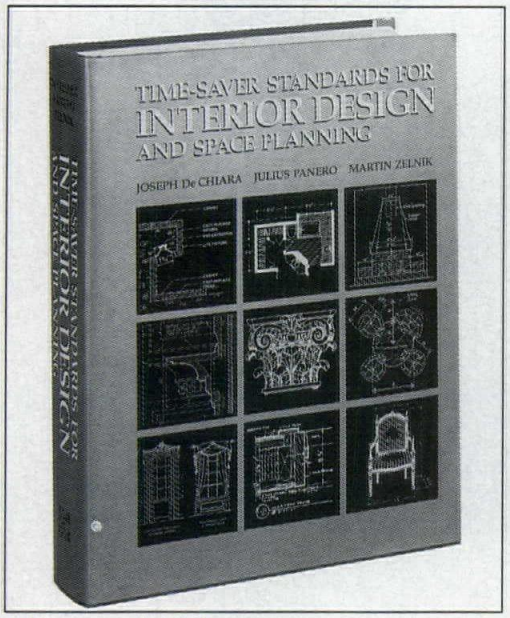
CPI Clear Plastics International, Inc.
Excellence in Translucent Systems

Clear Plastics International, Inc.
1371 Wilhelm Rd., Mundelein, IL 60060
Tel. (708) 816-1060/FAX (708) 816-0425
Toll Free: 1 - (800) 759-6985

*See us in **Sweet's** - 07820/CLE - BuyLine 4424.

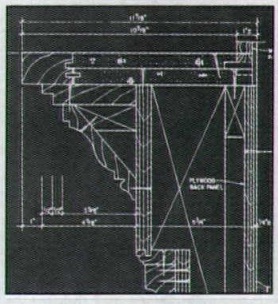
Circle 30 on inquiry card

An Interior Design Reference So Complete it Comes with More Time to Create—FREE!

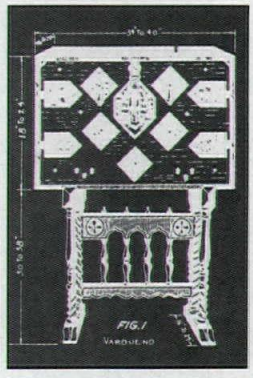


1,100 pages. • 1,200 illustrations

Introducing the new ***Time-Saver Standards for Interior Design and Space Planning.*** It's not only the most comprehensive professional sourcebook available for everything from design data to decorative details ... it's also the only book to give you more of your most precious commodity—the time to create. Now, when you hit a design problem, instead of hunting for hours through journals and out-of-date manuals, you can find all the time- and cost-effective interior design solutions you need in one place—*before* you lose your creative impetus.



The latest in McGraw-Hill's acclaimed *Time-Saver Standards* series, this essential desktop reference features 1,100 pages packed with easy-to-find ideas, options, suggestions, and actual working drawings contributed by today's most creative design firms. If you're in need of fast solutions to design dilemmas involving furniture, drapery, woodwork, lighting, cabinets, windows, colors, floor- and wall-coverings—even plantscaping and signage—your best bet is the most complete source of interior design information ever published, ***Time-Saver Standards for Interior Design and Space Planning.***



So, send for your Free Trial copy today, and give yourself more time to create—FREE!

FREE TRIAL ORDER COUPON

☐ **YES ...** Rush me my 15-day Free Trial copy of **TIME-SAVER STANDARDS FOR INTERIOR DESIGN AND SPACE PLANNING** (016299-9) and bill me for $95.00 per copy, plus local tax, postage, and handling. If after 15 days I'm not completely satisfied I can return the book and owe nothing.

Mail or fax this coupon to: R. Handler, McGraw-Hill, Inc., 11 W. 19th St., New York, NY 10011; Fax (212) 337-4092. Or ... call toll-free 1-800-2-MCGRAW and charge to your Visa, MC, or Amex card.

Name_____

Address_____

City_____ State_____ Zip_____

Prepayment required on all order to P.O. box addresses
Prices subject to change. 03RH016

Classified Advertising

To Advertise Call
801-972-4400
FAX 801-972-9409

POSITIONS VACANT

Architects — $25,000-95,000. The Shaddox/Csutora Group Executive Architectural Recruiters. Key positions nationwide at all levels with Regional & National firms. Experience in research/development, health care, commercial, criminal justice, educational, institutional, industrial and sports complexes. Confidential. No fee. Include salary requirements. The Shaddox/Csutora Group. Send resume to P.O. Box 460010, Denver, CO 80046. (303) 690-3440.

Civil/Structural Engineer Wanted: 40 hrs. per week, no overtime; 8 a.m. to 5 p.m. $37,440 per year. Duties include being project manager in the integration of the O'Hare Safety and Security Communication Center. Civil/Structural design and analysis projects using CAD, COGO, MMS, DTM systems. Development of civil engineering software using FORTRAN and C computer languages. MS in Civil Engineering and 6 months experience in job offered or as engineering intern required. Also required is each of the following college level courses: Geodetic Science, Computer Methods in Civil Engineering, Introduction to Transport Systems, Hydraulics and Hydrology, Structural Model Analysis, Bridge and Structural Design. Must have proof of legal authority to work permanently in the U.S. Applicants must send two resumes to Illinois Department of Employment Security, 401 S. State St. - 3-South, Chicago, IL 60605, Attn: E. Reed, Ref. No. V-IL-4326-I. No Calls. An Employer paid ad.

Project Architect, 40 hrs./week, 7:30 a.m. to 4:30 p.m., $28,600/year. Provides professional services in research, development, design, construction, alteration, or repair of real property, including automobile factories, office buildings or public buildings. The duties include consulting with clients to determine their functional & spatial requirements & prepare information regarding design, specifications, materials, equipment, estimated costs & building time; planning the layout of projects and integrate size drawings; design development from conceptual to working drawings using Intergraph CADD computer program; furnishing sample recommendations & shop drawings to client; assisting client in obtaining bids & awarding construction contracts; conducting periodic on-site observation of work in progress; assisting in conducting a study to evaluate the condition of hotels & other buildings in the Arab Gulf Region; preparing project designs for projects in the Arab Gulf Region, including assisting in project criteria development, developing coordinated project solutions, preparing construction documents, reviewing submittals for conformance with contract documents; coordinating & providing guidance to assigned personnel, gathering required on-site data, assisting in the preparation of specifications & preparing written materials regarding project documentation; travel approximately 15% of the year to the Arab Gulf Region. Education must include Bachelor of Architecture degree; 4 years exp. in job offered or 4 years as Project Manager. The four years of experience shall include designing building for the Arab Gulf Region & using a personal computer & Intergraph CADD program. Must read, write and speak Arabic. Send resumes to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 88191. "Employer Paid Ad".

Michael Latas & Associates, Executive Search and Professional Recruiting Consultants, Specialists in the architectural and engineering fields. Operating nationally. Inquiries held in the strictest of confidence. 1311 Lindbergh Plaza Center, St. Louis, Missouri 63132; (314) 993-6500.

Marketing Coordinator for established Indianapolis architectural design firm. Develop marketing strategy, prepare proposals, cold calling. Salary negotiable. Send resume, experience, references to Lynn H. Molzan, FAIA, Woollen, Molzan and Partners, 47 South Pennsylvania Street, Indianapolis, Indiana 46204.

FACULTY POSITIONS VACANT

Dean-College of Art and Architecture, University of Idaho: The University of Idaho invites nominations and applications for the position of Dean of the College of Art and Architecture. The U of I is a comprehensive research and teaching institution. The College of Art and Architecture, with an enrollment of approximately 600 undergraduate and graduate students, offers degree programs in Art, Architecture, Interior Planning and Design, and Landscape Architecture. Search and selection procedures will be closed when a sufficient number of qualified applicants has been identified. Initial screening of applicants will begin on March 15, 1992. For a position announcement and application requirements contact: Dean Robert Bartlett, Chair, A & A Dean Search Committee, College of Mines and Earth Resources, University of Idaho, Moscow, ID 83843, (208) 885-6195. AA/EOE.

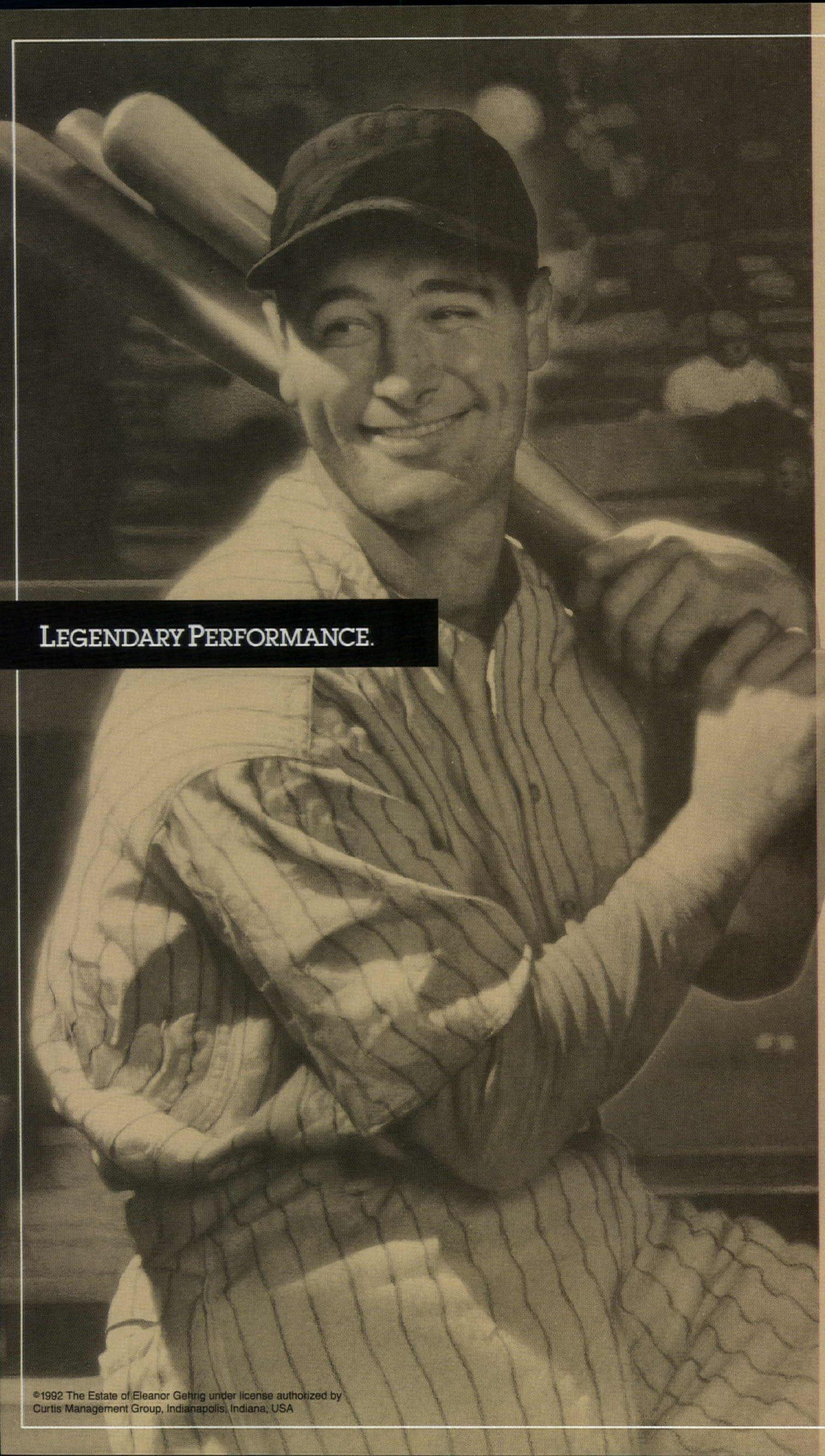
FOR SALE

Blueprint Mailing Bags Five Sizes in stock for immediate shipment. Middlesex Office Supply, Inc., 361 Watertown St., (Dept. AR), Newton, MA 02195, Phone: 617 332-5156, Fax: 617-965-8827.

BOOKS FOR SALE

Old and rare books. Architecture and Decorative Arts. Send for free illustrated catalog to: James Beattie, 105 North Wayne Ave., Dept. R, Wayne, PA 19087 or call 1-800-441-6705.

SPECIAL SERVICES



LEGENDARY PERFORMANCE.

LOU GEHRIG.

Baseball's Iron Man.
2,130 consecutive games.
Hall of Fame.

SARNAFIL.

At Sarnafil, we believe that to be a top performer, you need the right combination of quality products, technical expertise and dedication. And as Lou Gehrig's performance standards remain unmatched in baseball today, so do the standards Sarnafil set 25 years ago for single-ply roofing.

From our first project to the present, countless properties worldwide continue to benefit from the long-lasting performance of a Sarnafil system.

You see, only Sarnafil can offer you the greatest system flexibility and durability of any in the industry, with a choice of five different attachment systems in 48 to 96 mil thicknesses.

So, if you're looking for a roofing system that will withstand the test of time, look to Sarnafil for legendary performance surpassed only by the Iron Man.

Comiskey Park, Chicago, IL
SarnaFast™ System

Sarnafil®
ROOFING SYSTEMS
Top Performance Every Time

100 Dan Rd., Canton, MA 02021
Toll-Free 1-800-451-2504
Circle 32 on inquiry card

THE MARKETPLACE

Commercial Sunrooms

A variety of sunroom models with variable widths and projections allow the designer to fit sunrooms on existing foundations without expensive retrofit.

- Free brochure -

COMMERCIAL SUNROOM PRODUCTS
div./Patio Enclosures, Inc.
patio ENCLOSURES, INC.®
1-800-468-0720 x350
Fax 216-467-4297

Circle 33 on inquiry card

VELUX Roof Windows and Skylights- New 1992 full-color brochure features helpful information and design ideas for the complete line of VELUX Roof Windows, Skylights, Sunscreening Accessories and Controls. New 1992 products include the Round Top Accent Roof Window and hand-held Infrared Remote Controls for operating out-of-reach skylights, roof windows and venetian blinds. Pricing and dealer list also included. Phone (803) 223-3149.

Circle 34 on inquiry card

ARCHITEXT™

ARCHITECTURAL FONTS FOR AUTOCAD

NEW
ARCHFAST — 25% - 34% FASTER THAN ACAD'S TXT FONT. ABCDEFabc123&%⅛⅜⅝
ARCHQUIK — SINGLE STROKE 14% QUICKER THAN SIMPLEX. ABCDabc123&%⅛⅜⅝
ARCHITXT — THE ARCHITECTURAL STANDARD. ABCDEFGabcde12345&%⅛⅜⅝
ARCHTITL — HIGHER RESOLUTION FOR TITLES. ABCDEFGabcde12345&%⅛⅜⅝
ARSTENCL — OUTLINE STENCIL FONT ABCDEFGH12345&789&!?

"HERE IS A REASONABLE PRICED SET THAT LOOKS GOOD. HIGHLY RECOMMENDED." CADALYST MAGAZINE 1990

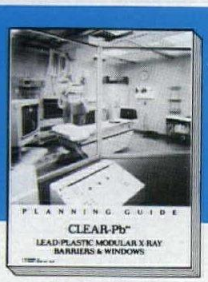
SET ALSO INCLUDES FOUR MONOSPACED LETTERING FONTS & ALL .SHP FILES.

SET NINE FONTS $49
SHIPPING & HANDLING $2.00 MC/VISA
(816) 795-7333

DIGITAL ARCHITECT SOFTWARE™
18213 25TH TERRACE COURT
INDEPENDENCE, MISSOURI 64057

Circle 35 on inquiry card

FREE X-Ray Room Planning Guide

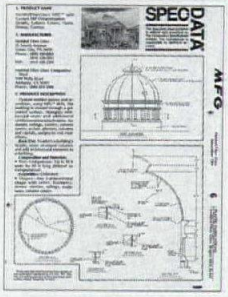


Made of lead-impregnated, transparent plastic, CLEAR-Pb® X-Ray Room Shielding provides complete radiation protection with panoramic viewing. Features include prefabrication for quick on-site assembly, attractive, space-saving decorator look and shatter resistance with a choice of lead equivalencies. Free CLEAR-Pb X-Ray Room Planning Guide is available.

NUCLEAR ASSOCIATES
A Division of VICTOREEN, INC.
100 VOICE ROAD
CARLE PLACE, NY 11514-1593 U.S.A.
(516) 741-6360
FAX (516) 741-5414
VICTOREEN

Circle 36 on inquiry card

MFG Spec-data®
"Molded Fiber Glass Shapes With Relief"



Molded FiberGlass MFG™ 6610 Custom FRP Ornamentation. Details, Column Covers, Fascia, Domes, Cornice

Used to adorn a building's facade, cover structural columns and add architectural elements to a building. For more info. **Molded Fiber Glass** (800) 458-0863.

Circle 37 on inquiry card

Keep Dodge In Your Plans!

Don't forget to provide your local Dodge Reporter with the details and plans for your next job. Thousands of Dodge Report and SCAN customers count on Dodge for leads. And you don't want them to miss out on the best bid for your next job. Contractors can't bid on jobs they don't know about. Thank you for your input. We appreciate your cooperation.

F.W. Dodge
McGraw-Hill Construction
Information Group

Circle 38 on inquiry card

SPEC TECH®

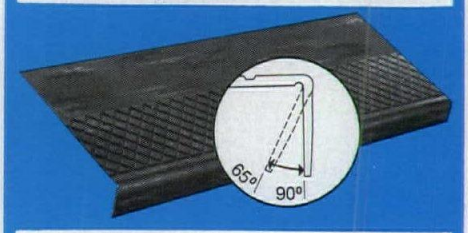
Computer Assisted Specification Writing Program

FREE Specification Service

MBTechnology is offering a specification writing service called SPECTECH. Based on the specifics of each project SPECTECH produces a customized, detailed CSI formatted modified bitumen roofing specification. Details can be obtained by calling 1-800-621-9281.

Circle 39 on inquiry card

MUSSON
New Adjusta-Nose Treads



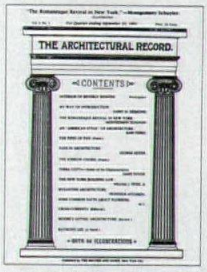
New design nose easily adjusts and adheres to steps with return angle nosings between 90° and 65°; allows snug fit on safety designed stairs.

Adjusta-Nose treads are available in our medium gauge Diamond Design, Long nose Grit-Strip, Smooth Surface and Disc-O-Treads.

For Free Brochure & Samples, write:
MUSSON RUBBER CO.
P.O. Box 7038 • Akron, Ohio 44306

Circle 40 on inquiry card

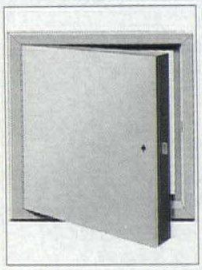
Limited Numbered Edition



ARCITECTURAL RECORD's first issue (1891) is reprinted to celebrate our centennial. 150 pages . 64 illustrations. Every architect should have this collector's issue. Only $16.95 ppd. For information call: 212-512-3443.

Architectural Record, Circulation Dept., 1221 Ave of Americas, N.Y., N.Y. 10020

Circle 41 on inquiry card



Cesco Products... announces it's new fire rated access panel. The style "FB" has been tested & approved for: One hour combustible & three hour noncombustible ceiling systems, as well as two hour wall systems, utilizing one fire rated access panel for four separate applications. Cesco Products is the only manufacturer in the industry to offer an interchangeable latch option. Cesco has a complete line of non-rated ceiling and wall access panels to meet any application. ***Contact Scott or Darcy for more information at: 612-424-4919, FAX 612-425-0870.***

Circle 42 on inquiry card

New Site Catalog

Shown: TimberForm® Madison™ Bench

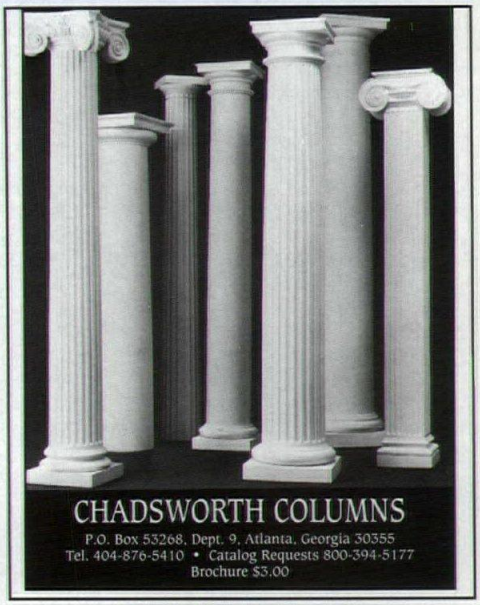
Choose from over 350 cast iron, steel and wood **TimberForm® Site Complements.** The new 88 page catalog presents traditional through contemporary design families. Matching benches, ash receptacles, litter containers and planters in more than 170 colors are offered.

Call toll-free 1-800/547-1940 Ext. 577

Columbia Cascade

1975 S.W. Fifth Ave. Portland, OR 97201 503/223-1157

Circle 43 on inquiry card



CHADSWORTH COLUMNS

P.O. Box 53268, Dept. 9, Atlanta, Georgia 30355
Tel. 404-876-5410 • Catalog Requests 800-394-5177
Brochure $3.00

Circle 44 on inquiry card

Impressions Are Important !!!

Insure you make a professional one by carrying your blueprints in a THOMAS CASE. Each case is meticulously handcrafted and only the finest materials are used. Makes the carrying of your prints easy and convenient while it also protects them.

Leather covered:	4" dia. x 32" length	$190.00
	3" dia. x 32" length	$175.00
Vinyl covered:	4" dia. x 32" length	$95.00
	3" dia. x 32" length	$85.00

(Available in Burgandy, Black & Tan)
Custom sizes available. Allow 3 weeks for delivery.
To order call 1-800-544-7929.

Call (800) 544-7929 for information

There's ONE fabric wrapped acoustical wall panel system that can take regular office abuse and still look good.

TECTUM Fabri-Tough™

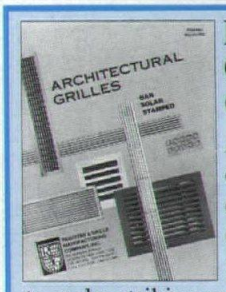
NOW OVER 45 FABRIC COLOR CHOICES

For new or remodeling use, Fabri-Tough wall panels take abuse without showing dents or bruises, because underneath is a 1" thick, sound absorbing Tectum wall panel famous for abuse resistance. And they're tackable! Also Decor panels and sound blocks for existing space. See Sweets, write or call.

FREE BROCHURE

TECTUM INC. 105 S. Sixth St. • P.O. Box 920 Newark, Ohio 43055 • (614) 345-9691

Circle 46 on inquiry card

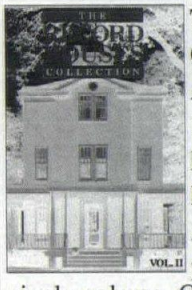


Decorative Grilles in Color

Add a new dimension to your designs with these decorative grilles which can be used to make striking unusual effects. Choose from an array of custom colors to match or contrast existing grilles. Designers can also create numerous metal forms for interior or exterior applications. Write for a catalog:

Register & Grille Mfg. Co.
202 Norman Avenue, Brooklyn, NY 11222
Call 718-383-9090 or 1-800-521-4895,
Fax# 718-349-2611.

Circle 47 on inquiry card

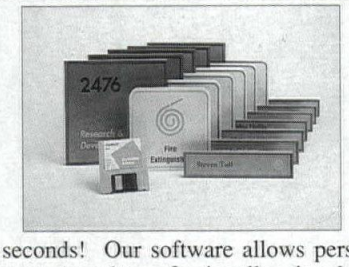


The Record Houses Collection.

A compilation from 1987/1988/1989. Everyone loves **RECORD HOUSES!** And we have put three years' worth into a single volume. Over 260 pages, in full-color, with plans and text directly from the pages of ARCHITECTURAL RECORD'S RECORD HOUSES issues. Just $19.95 (includes postage and handeling.) Send to Architectural Record Books- 41st Floor-1221 Avenue of the Americas, N.Y., N.Y. 10020.

Circle 48 on inquiry card

APCO OFFERS SIGNWORD™ IN-HOUSE AND IN COLOR...



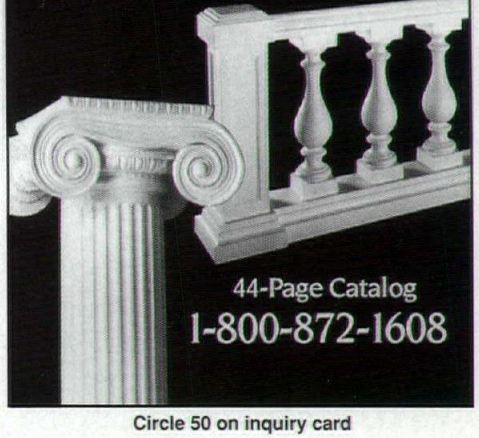
...in seconds! Our software allows personal computers to make professionally printed signs in the office. With 140 colors to choose from, color can be added to any laser printed document, symbols or company logo. Pre-punched inserts fit within our award-winning IM System holders. No special training is required.

APCO
388 Grant Street SE
Atlanta, GA 30312-2227
(404)688-9000

Circle 49 on inquiry card

WORTHINGTON

COLUMNS • BALUSTRADING MUCH MORE



44-Page Catalog
1-800-872-1608

Circle 50 on inquiry card

Advertising index

Bold face—page number
Italics—Reader Service number

For detailed data, prefiled catalogs of the manufacturers listed below are available in your 1991 Sweet's Catalog File as follows:

(G) General Building & Renovation
(E) Engineering & Retrofit
(I) Industrial Construction & Renovation
(L) Homebuilding & Remodeling
(D) Contract Interiors

"S" after page number indicates supplement advertising location

Sales offices

Main Office

McGraw-Hill, Inc.
1221 Avenue of the Americas
New York, New York 10020

Publisher
Roscoe C. Smith III (212) 512-2841

Administrative Assistant
Anne Mullen (212) 512-4686

Director of Business and Production
Joseph R. Wunk (212) 512-2793
Fax: (212) 512-4256

Classified Advertising
(212) 512-2422

District Offices

Atlanta
4170 Ashford-Dunwoody Road
Atlanta, Georgia 30319
Gregory Bowerman (404) 843-4781
Fax: (404) 252-4056

Chicago
2 Prudential Plaza
180 N. Stetson Ave.
Chicago, Illinois 60601
Anthony Arnone, (312) 616-3339
Thomas P. Kavooras, Jr., (312) 616-3338
Fax: (312) 616-3323

Cleveland/Philadelphia/Pittsburgh
1221 Avenue of the Americas
New York, New York 10020
Frank Rose (212) 512-2409
Fax: (212) 512-4256

Dallas/Houston
2 Prudential Plaza
180 N. Stetson Ave.
Chicago, Illinois 60601
Thomas P. Kavooras, Jr.
(312) 616-3338
Fax: (312) 616-3323

Denver
John J. Hernan (415) 954-9704
Fax: (415) 954-9786

Los Angeles
Media Sales Associates
1493 Temple Hills Drive
Laguna Beach, Calif. 92651
William Hague (714) 494-8419
Sherylen Young
Fax: (714) 497-7261

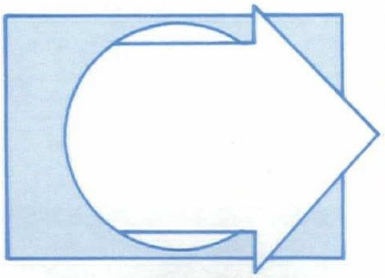
New England/New York
1221 Avenue of the Americas
New York, New York 10020
Louis Kutscher (212) 512-2814
Frank Rose (212) 512-2409
Fax: (212) 512-4256

New York
1221 Avenue of the Americas
New York, New York 10020
Laura Viscusi (212) 512-3603
Fax: (212) 512-4256

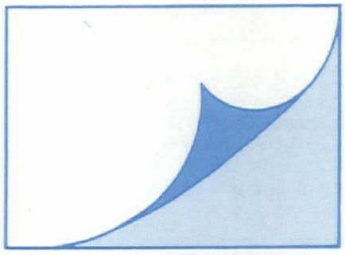
San Francisco/Seattle
Media Sales Associates
9017 Peacock Hill
Gig Harbor, WA 98332
William Hague (206) 858-7575
Fax: (206) 858-7576

The Marketplace/ Product Literature Showcase
Kevin Beatty
John Haddock
1-800-544-7929
Fax: (212) 512-4256

This card expires: 7/92



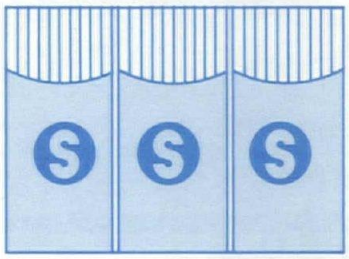
CIRCLE THE NUMBER...
Circle the key number on the card corresponding to the number under each advertisement, new product item or manufacturer's literature item for which you want more information.



USE YOUR LABEL.
Instead of lettering or typing your name and address information on this card, you may affix the address label from the wrapper in which this magazine was mailed. It's an easy peel-off label designed just for that purpose.

U.S.
POSTAGE

MAIL TODAY!
Just place a stamp on the card and mail it today.



CHECK SWEET'S
Check Advertiser's Index for phone number and Sweet's Catalog File number.

ARCHITECTURAL
RECORD
Reader Service Cards

Architectural Record Reader Service Card February 1992

ADVERTISED PRODUCTS

01	09	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137	145	153	161	169	177	185	193	201	209	217	225	233
02	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138	146	154	162	170	178	186	194	202	210	218	226	234
03	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139	147	155	163	171	179	187	195	203	211	219	227	235
04	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140	148	156	164	172	180	188	196	204	212	220	228	236
05	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141	149	157	165	173	181	189	197	205	213	221	229	237
06	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142	150	158	166	174	182	190	198	206	214	222	230	238
07	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143	151	159	167	175	183	191	199	207	215	223	231	239
08	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216	224	232	240

NEW PRODUCTS ITEMS

300	306	312	318	324	330	336	342	348	354
301	307	313	319	325	331	337	343	349	355
302	308	314	320	326	332	338	344	350	356
303	309	315	321	327	333	339	345	351	357
304	310	316	322	328	334	340	346	352	358
305	311	317	323	329	335	341	347	353	359

MANUFACTURERS LITERATURE

400	406	412	418	424	430	436	442	448	454
401	407	413	419	425	431	437	443	449	455
402	408	414	420	426	432	438	444	450	456
403	409	415	421	427	433	439	445	451	457
404	410	416	422	428	434	440	446	452	458
405	411	417	423	429	435	441	447	453	459

PLEASE PRINT OR USE YOUR PEEL-OFF ADDRESS LABEL

Name_____
Title_____
Company_____
Address_____
City/State_____ Zip_____
Country (if other than U.S.)_____
Telephone(_____)_____ Fax(_____)_____

1

Please check profession and type of business

I. Profession (check one)
- Registered Architect . . . . . 01 ☐
- Engineer . . . . . 02 ☐
- Architectural Intern . . . . . 03 ☐
- Interior Designer . . . . . 04 ☐
- Designer . . . . . 05 ☐
- Draftsman . . . . . 06 ☐
- Other_____ 07 ☐ (please specify)

II. Type of business (check one)
- Architectural or Architectural/ Engineering . . . . . 08 ☐
- Consulting Engineering . . . 09 ☐
- Contracting . . . . . 10 ☐
- Commercial/Industrial/ Institutional . . . . . 11 ☐
- Government . . . . . 12 ☐
- Other_____ 13 ☐ (please specify)

III. Send me information regarding a subscription to ARCHITECTURAL RECORD . . . . . 999 ☐

PLACE STAMP HERE

Architectural Record
Reader Service Management Department
P.O. Box 5132
Pittsfield, MA 01203-5132

Architectural Record Reader Service Card February 1992

ADVERTISED PRODUCTS

01	09	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137	145	153	161	169	177	185	193	201	209	217	225	233
02	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138	146	154	162	170	178	186	194	202	210	218	226	234
03	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139	147	155	163	171	179	187	195	203	211	219	227	235
04	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140	148	156	164	172	180	188	196	204	212	220	228	236
05	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141	149	157	165	173	181	189	197	205	213	221	229	237
06	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142	150	158	166	174	182	190	198	206	214	222	230	238
07	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143	151	159	167	175	183	191	199	207	215	223	231	239
08	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216	224	232	240

NEW PRODUCTS ITEMS

300	306	312	318	324	330	336	342	348	354
301	307	313	319	325	331	337	343	349	355
302	308	314	320	326	332	338	344	350	356
303	309	315	321	327	333	339	345	351	357
304	310	316	322	328	334	340	346	352	358
305	311	317	323	329	335	341	347	353	359

MANUFACTURERS LITERATURE

400	406	412	418	424	430	436	442	448	454
401	407	413	419	425	431	437	443	449	455
402	408	414	420	426	432	438	444	450	456
403	409	415	421	427	433	439	445	451	457
404	410	416	422	428	434	440	446	452	458
405	411	417	423	429	435	441	447	453	459

PLEASE PRINT OR USE YOUR PEEL-OFF ADDRESS LABEL

Name_____
Title_____
Company_____
Address_____
City/State_____ Zip_____
Country (if other than U.S.)_____
Telephone(_____)_____ Fax(_____)_____

3

Please check profession and type of business

I. Profession (check one)
- Registered Architect . . . . . 01 ☐
- Engineer . . . . . 02 ☐
- Architectural Intern . . . . . 03 ☐
- Interior Designer . . . . . 04 ☐
- Designer . . . . . 05 ☐
- Draftsman . . . . . 06 ☐
- Other_____ 07 ☐ (please specify)

II. Type of business (check one)
- Architectural or Architectural/ Engineering . . . . . 08 ☐
- Consulting Engineering . . . 09 ☐
- Contracting . . . . . 10 ☐
- Commercial/Industrial/ Institutional . . . . . 11 ☐
- Government . . . . . 12 ☐
- Other_____ 13 ☐ (please specify)

III. Send me information regarding a subscription to ARCHITECTURAL RECORD . . . . . 999 ☐

PLACE STAMP HERE

Architectural Record
Reader Service Management Department
P.O. Box 5132
Pittsfield, MA 01203-5132

Architectural Record Reader Service Card — February 1992

ADVERTISED PRODUCTS

01	09	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137	145	153	161	169	177	185	193	201	209	217	225	233
02	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138	146	154	162	170	178	186	194	202	210	218	226	234
03	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139	147	155	163	171	179	187	195	203	211	219	227	235
04	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140	148	156	164	172	180	188	196	204	212	220	228	236
05	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141	149	157	165	173	181	189	197	205	213	221	229	237
06	14	22	30	38	46	54	62	70	78	86	94	102	110	118	126	134	142	150	158	166	174	182	190	198	206	214	222	230	238
07	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143	151	159	167	175	183	191	199	207	215	223	231	239
08	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216	224	232	240

NEW PRODUCTS ITEMS

300	306	312	318	324	330	336	342	348	354
301	307	313	319	325	331	337	343	349	355
302	308	314	320	326	332	338	344	350	356
303	309	315	321	327	333	339	345	351	357
304	310	316	322	328	334	340	346	352	358
305	311	317	323	329	335	341	347	353	359

MANUFACTURERS LITERATURE

400	406	412	418	424	430	436	442	448	454
401	407	413	419	425	431	437	443	449	455
402	408	414	420	426	432	438	444	450	456
403	409	415	421	427	433	439	445	451	457
404	410	416	422	428	434	440	446	452	458
405	411	417	423	429	435	441	447	453	459

PLEASE PRINT OR USE YOUR PEEL-OFF ADDRESS LABEL

Name_____
Title_____
Company_____
Address_____
City/State_____ Zip_____
Country (if other than U.S.)_____
Telephone(_____)_____ Fax(_____)_____

Please check profession and type of business

I. Profession (check one)
- Registered Architect . . . . . 01 ☐
- Engineer . . . . . 02 ☐
- Architectural Intern . . . . . 03 ☐
- Interior Designer . . . . . 04 ☐
- Designer . . . . . 05 ☐
- Draftsman . . . . . 06 ☐
- Other_____ (please specify) 07 ☐

II. Type of business (check one)
- Architectural or Architectural/ Engineering . . . . . 08 ☐
- Consulting Engineering . . . 09 ☐
- Contracting . . . . . 10 ☐
- Commercial/Industrial/ Institutional . . . . . 11 ☐
- Government . . . . . 12 ☐
- Other_____ (please specify) 13 ☐

III. Send me information regarding a subscription to ARCHITECTURAL RECORD . . . . . 999 ☐

2

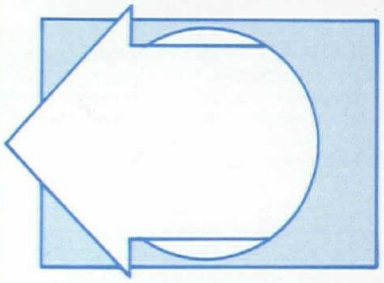
PLACE STAMP HERE

Architectural Record
Reader Service Management Department
P.O. Box 5132
Pittsfield, MA 01203-5132

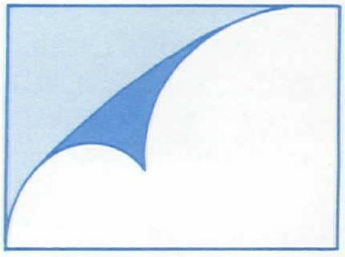
This card expires: 7/92

ARCHITECTURAL RECORD

Reader Service Cards

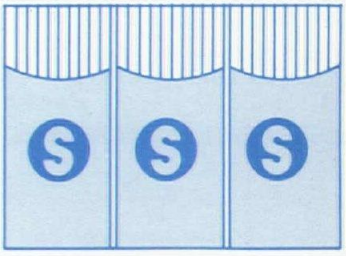


CIRCLE THE NUMBER...
Circle the key number on the card corresponding to the number under each advertisement, new product item or manufacturer's literature item for which you want more information.



USE YOUR LABEL.
Instead of lettering or typing your name and address information on this card, you may affix the address label from the wrapper in which this magazine was mailed. It's an easy peel-off label designed just for that purpose.

MAIL TODAY!
Just place a stamp on the card and mail it today.



CHECK SWEET'S
Check Advertiser's Index for phone number and Sweet's Catalog File number.

When you see the ACCU-R EPS Program label, you can be assured that this EPS roofing insulation has been certified by the manufacturer to comply with ASTM-C-578 specifications. The ACCU-R EPS Program label, along with the ASTM specifications, proudly bears the name of that manufacturer and the stamp of the independent third party testing laboratory that closely monitors adherence to ASTM specifications. This independent third party also sees to it that stringent quality control levels are maintained.

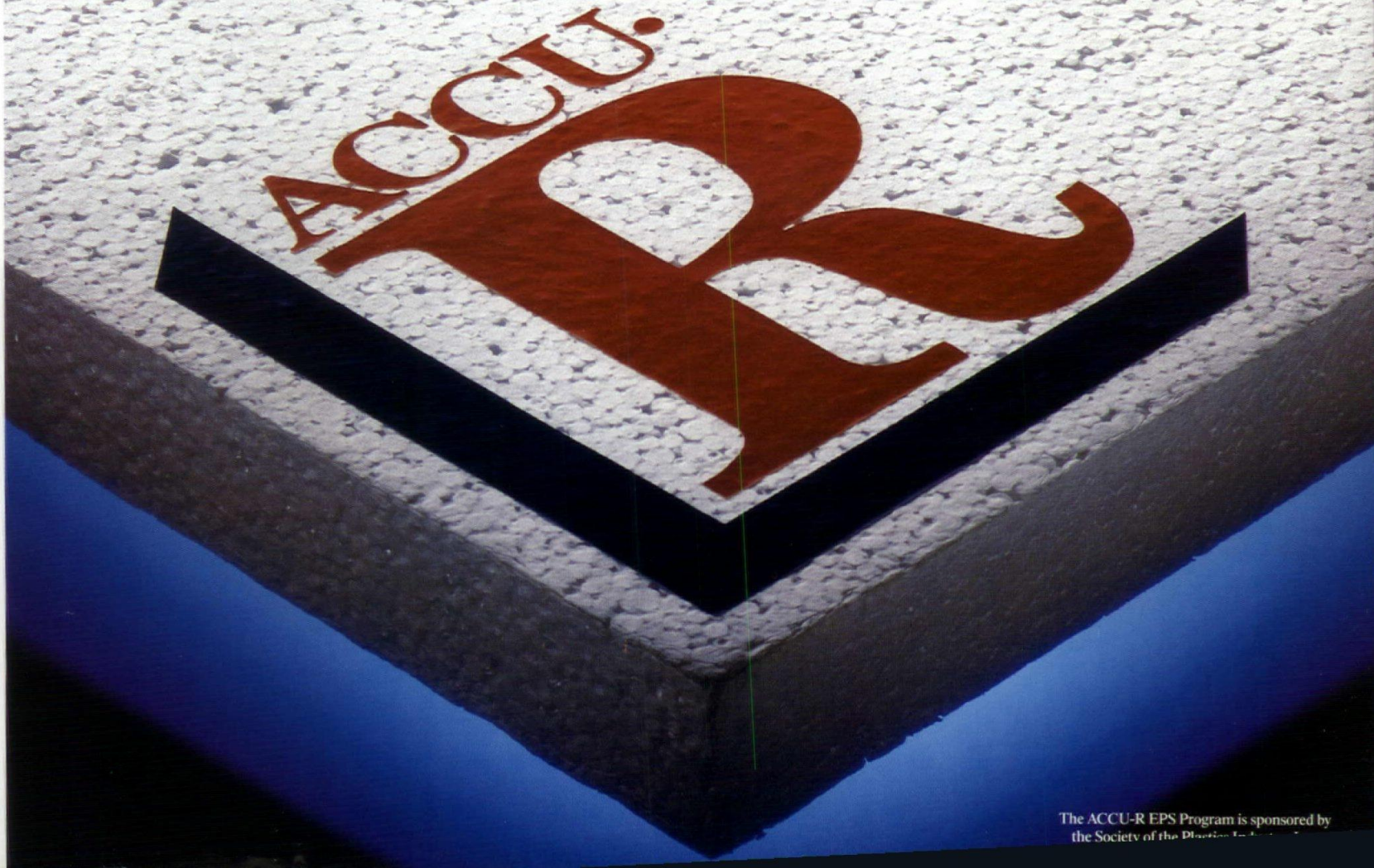
Molded EPS has been a tried and true roofing insulation material since the 1950's. Independent tests of early installations have shown that, when properly installed, the original R-value remains constant. The ACCU-R EPS Program is striving to improve on this already proven performance by creating a nationwide network of participating manufacturers.

For more information or the name of the nearest manufacturer participating in the ACCU-R EPS Program, call toll-free 1-800-951-2001.

Circle 51 on inquiry card

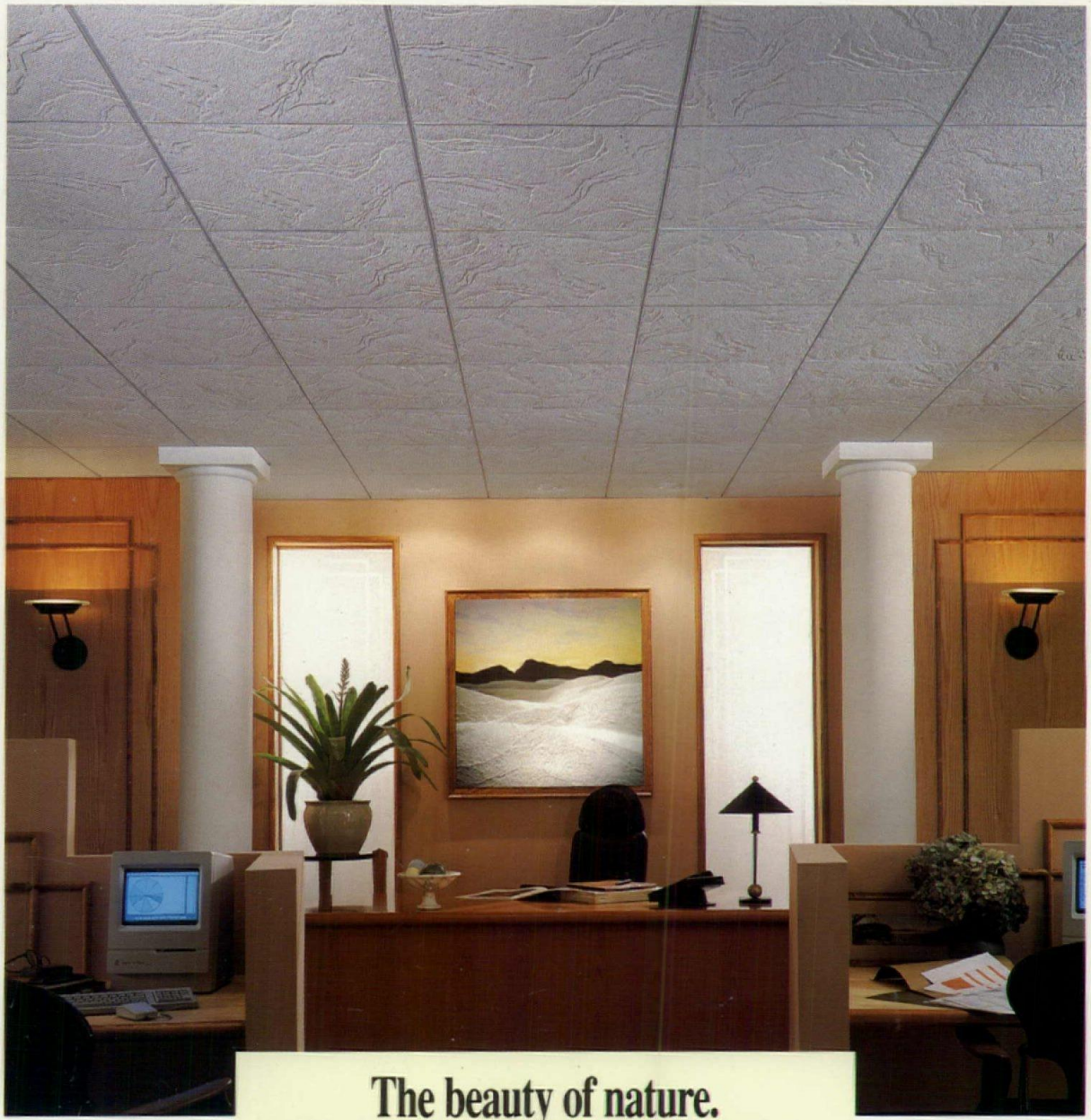
ACCU-R Molded EPS

Consistent R-value and zero thermal drift. The accurate facts about Molded EPS.



The ACCU-R EPS Program is sponsored by the Society of the Plastics

Sandrift™
CEILING PANELS



The beauty of nature.
The performance of Acoustone.®

Windswept sands. Textured. Tactile. Etched by the breeze. ■ Sparking your imagination. ■ Sandrift™ ceiling panels bring you the infinite variety you expect to find only in nature. Just as no two snowflakes are alike, no two Sandrift ceilings will ever be the same. ■ One-of-a-kind. Random. Non-repetitive. And strikingly beautiful. Bringing to mind the shifting patterns of sand. ■ Move the ambience of nature indoors with Acoustone Sandrift ceiling panels from USG Interiors, Inc. To see the depth and diversity a Sandrift ceiling can bring to any room, ask your USG Interiors distributor, or call 1-800-950-3859.

USG

USG Interiors, Inc.

Circle 52 on inquiry card