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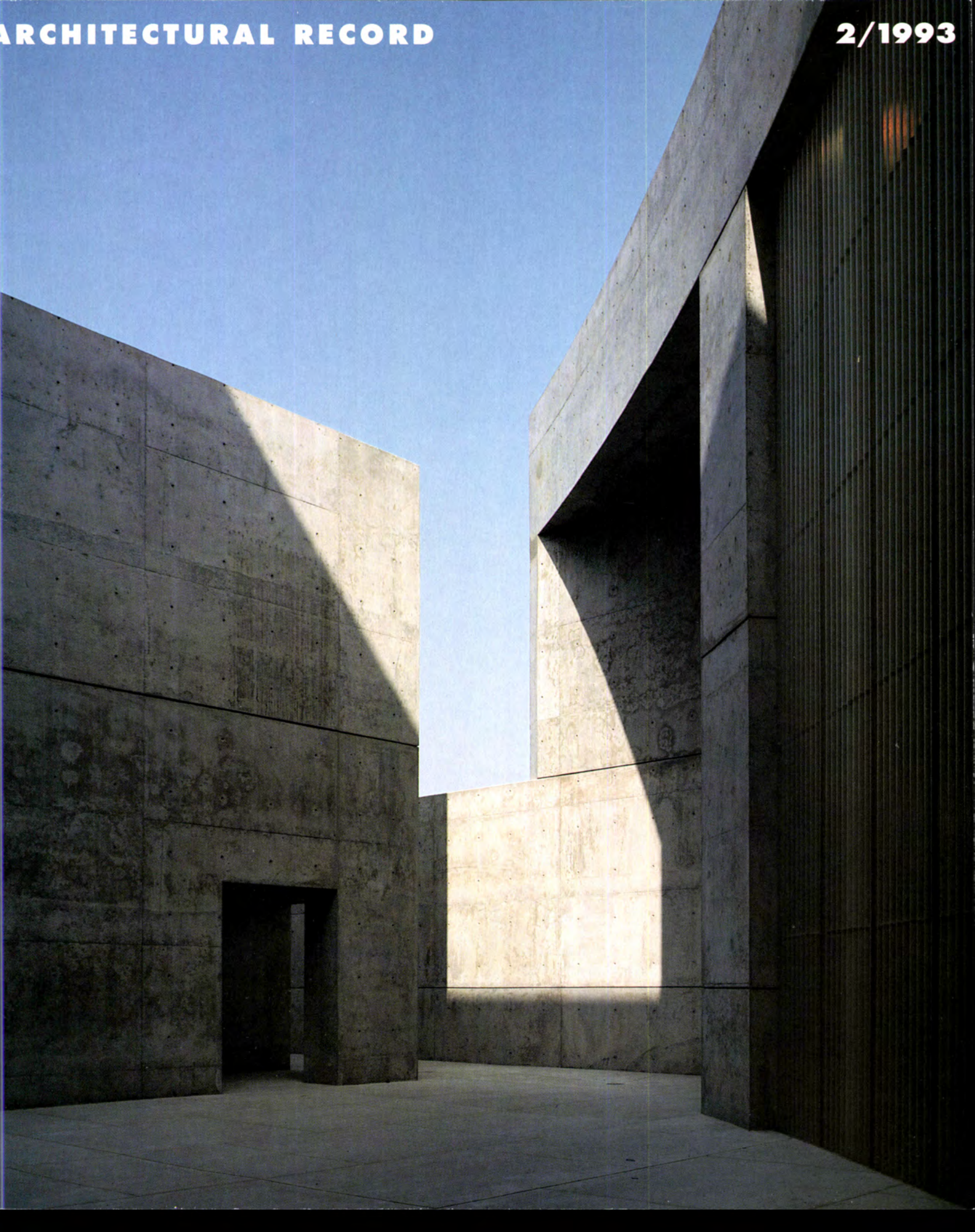

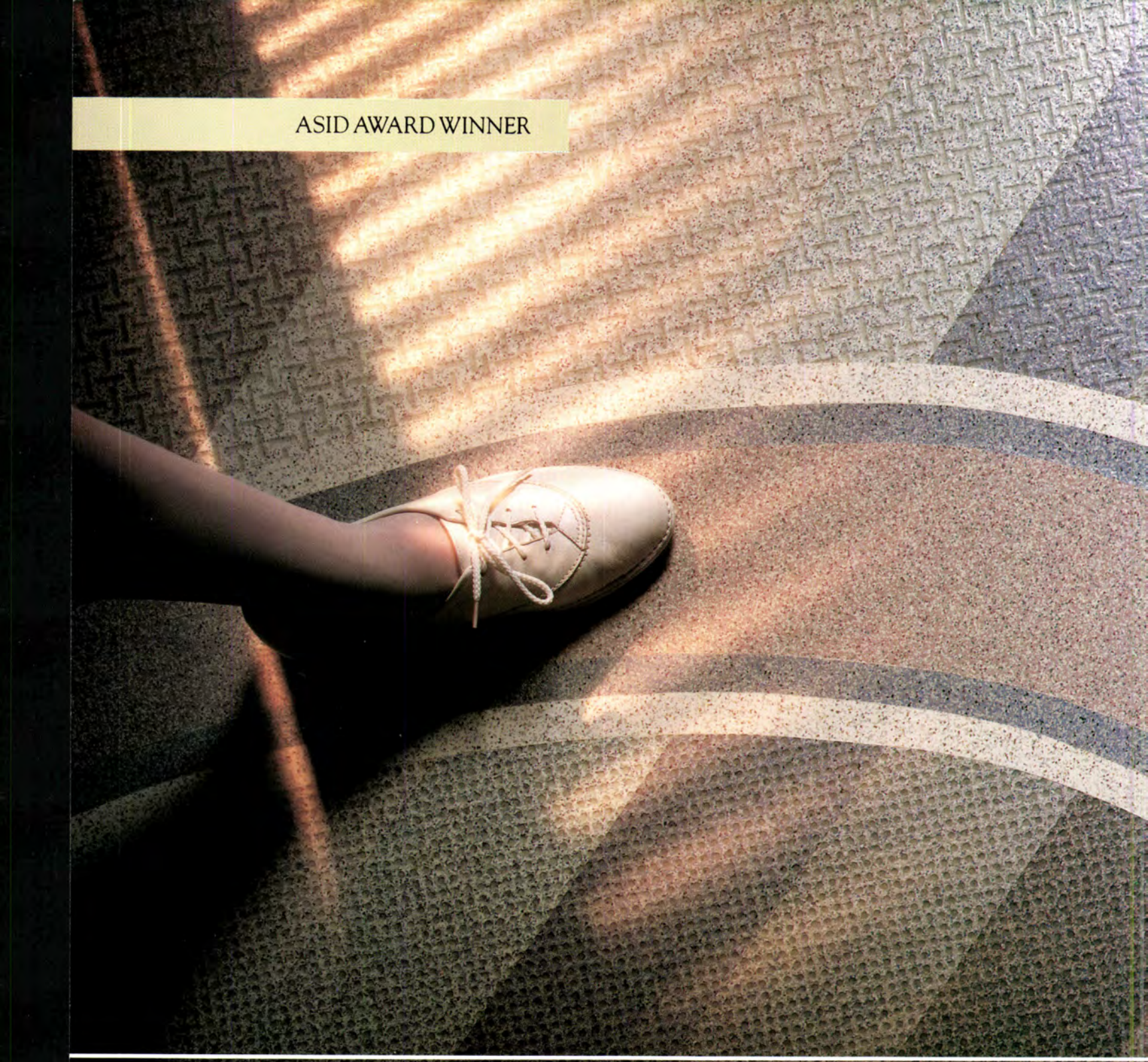

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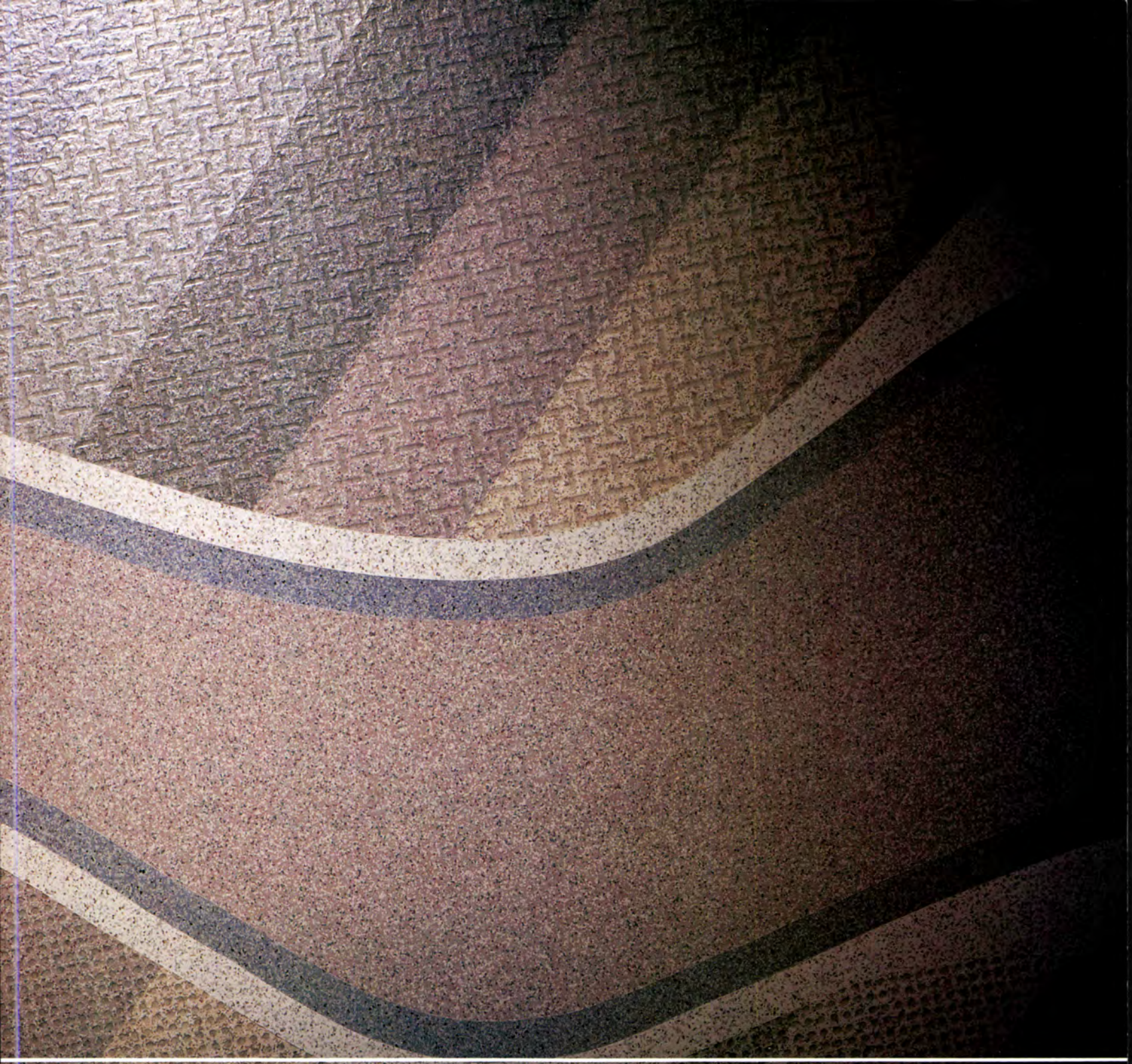

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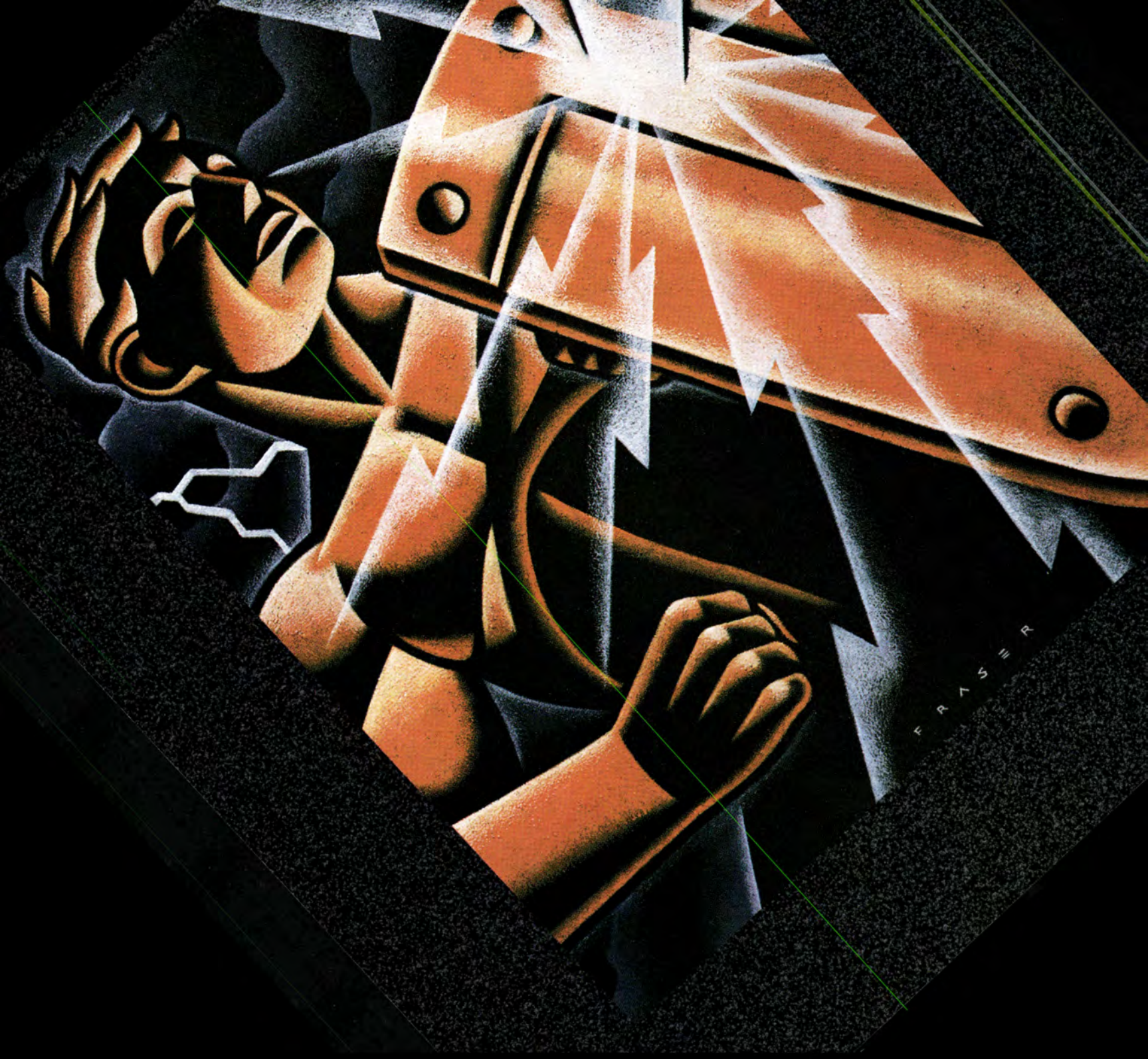
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Executive, Editorial, Circulation and Advertising Offices: 1221 Avenue of the Americas, New York, NY 10020.

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Subscription rates are as follows: U. S. Possessions and Canada $54.00; all other Foreign (including Air): $160.00. Single copy price $7.00; For Foreign: $10.00. For Subscriber Services: 609/426-7070.

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ARCHITECTURAL RECORD (ISSN0003-858X/93) 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

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Clash of Symbols

I write to you regarding your Design News piece entitled "Prime Minister Collaborates on Regional Skyscraper Design" [RECORD, December 1992, page 11]. Due to the highly sensitive political and religious climate in Malaysia, I felt it necessary to address certain inaccuracies in the article.

Use of the phrase "Prime Minister Collaborates . . ." is inaccurate. The Prime Minister, while having a strong interest in architecture, is not an architectural historian. Our office recognized that traditional Islamic symbols and forms would play an important role in the design of the Kuala Lumpur City Center. As a result, we analyzed these as well as indigenous architectural forms and materials. The project was wholly designed by Cesar Pelli & Associates.

Of greater concern to us was the following sentence: "Islamic forms and geometries influenced the rotated-square floor plates that mold its overall minaret silhouette with setbacks and recall the area's Hindu roots." While Malaysia is a nation of many ethnic and religious backgrounds, its Moslem religious heritage should not be confused or equated with Hinduism. It is well known that Islamic religious and cultural traditions predominate in Malaysia.

Jack A. Gold
Public Relations Director
Cesar Pelli & Associates
New Haven, Connecticut

Implement ISTEA!

In keeping with President Clinton's assertions that rebuilding America's infrastructure, restoration of the economy, and job training are priorities, there is a major move he could urge the new Congress to make that would go a long way to achieving the above objectives. The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) was originally budgeted for $151 billion over six years. It has been subsequently reduced. Acceleration of public works, infrastructure programs, and transportation improvements *now* are the kind of things we need to continue the regrowth of our economy. The spin-off will be an expanded tax base. ISTEA funding is essential.

Also vital to the brick and mortar in rebuilding our cities is training for our youth and other unemployed. We cannot just be content with introducing new mortar to our cities while ignoring the sense of hopelessness (which is the core of urban unrest and violence).

R. Dan Ritchie
Somerset House, Inc.
Washington, D. C.

Corrections

The new wood-stud plywood shear walls installed for cross-bracing to meet seismic requirements of the restored Bradbury Building [RECORD, January 1993, page 110] were indicated in red on the floor plans, but this color designation was not explained in the caption.

The correct price of the CalComp DesignMate—a new D-size, 8-color pen plotter featured in the PRODUCT REPORTS issue [December 1992] is $1,992.

The correct address for Builder Guidelines, Builder Guide [RECORD, December 1992, page 15] is Passive Solar Industries Council, 1511 K Street, N. W., Suite 600, Washington, D. C. 20005, 202/628-7400.

March 8-12
14th International Making Cities Livable conference, Charleston, S. C. Organized by IMCL Conferences, P. O. Box 7586, Carmel, Calif. 93921. 408/626-9080.

March 10-13
Urban Waterfront Development-Pacific Rim Conference, Convention Centre, Darling Harbour, Sydney, Australia. Contact Pacific Rim Conference, P. O. Box 787, Potts Point, NSW 2011, Australia, 61-2-357-2600 or fax 61-2-357-2950.

March 17
Redefining and Renewing the American City: The Role of Architects of Color, Cooper-Hewitt Museum, 2 East 91st St., New York, N. Y. Call Education Department, 212/860-6321.

March 17-19
WestWeek 93, Pacific Design Center, 8687 Melrose Ave., Los Angeles, Calif. 310/657-0800.

March 19
3rd Annual Symposium on Public Monuments, 1271 Avenue of the Americas, New York, N. Y. Call Dila De La Paz, 212/889-6960.

March 19-21
Monterey Design Conference. Contact conference coordinator Donalee Hallenbeck, 800/886-7714.

March 30-April 3
Baucon Asia 93. International. Trade Fair for building design, construction, products, and equipment. World Trade Centre, Singapore. Contact MMG, Munich, Germany, 49-89-5107, Fax 49-89-5107-171.

April 4
The Parthenon: Glory on the Acropolis, Arthur Ross Gallery, University of Pennsylvania, Call Sally Young, 215/977-7383.

April 21-24
International Tile & Stone Exposition, Miami Beach Convention Center, 407/747-9400.

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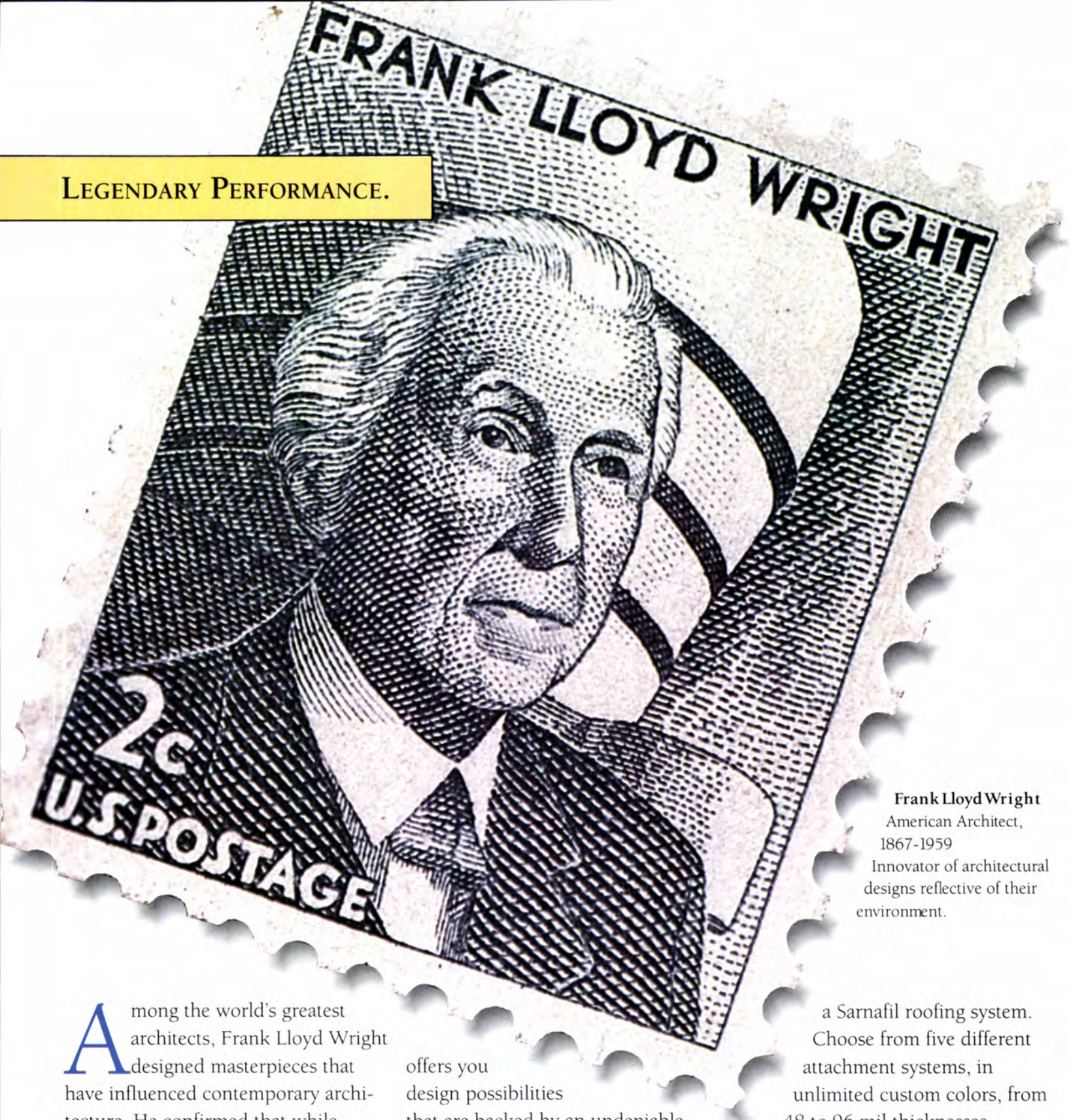

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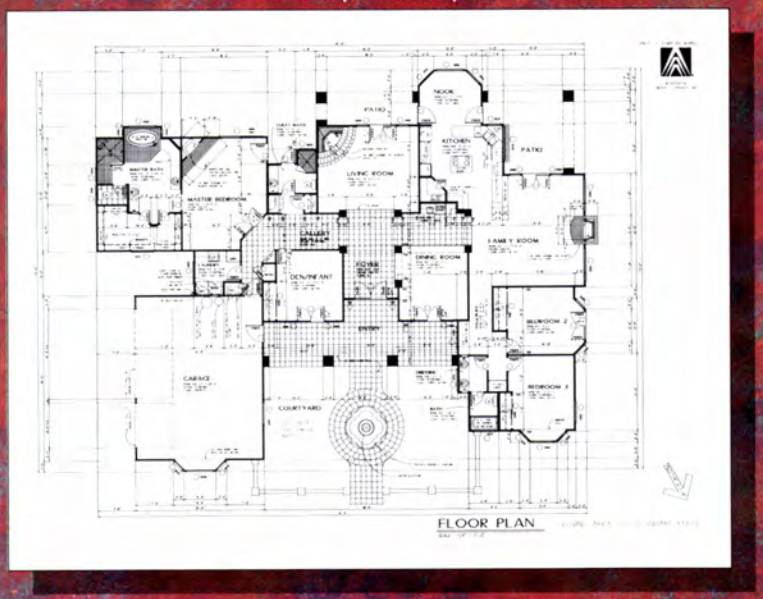

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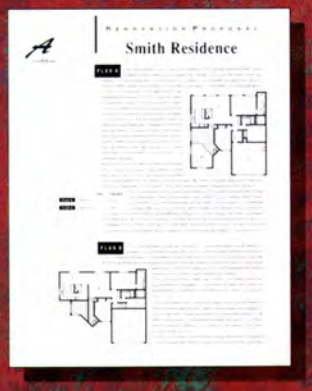

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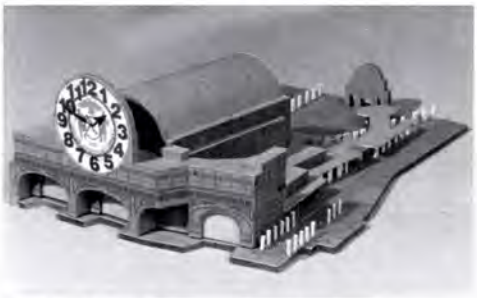
Flawed Signal

Austrian Cultural Institute



Staten Island Ferry Terminal

It's easy to second-guess a design jury. The judges' task is not enviable. It commonly reviews more projects than there is time for, and judges are often handicapped in never knowing whether or not entries technically meet the rigorous demands of the program. Nowhere is the judging process more crucial than when the end result is a commission to the winner, especially if it's a high-profile building or a building in a sensitive setting that a city or neighborhood must live with for generations.

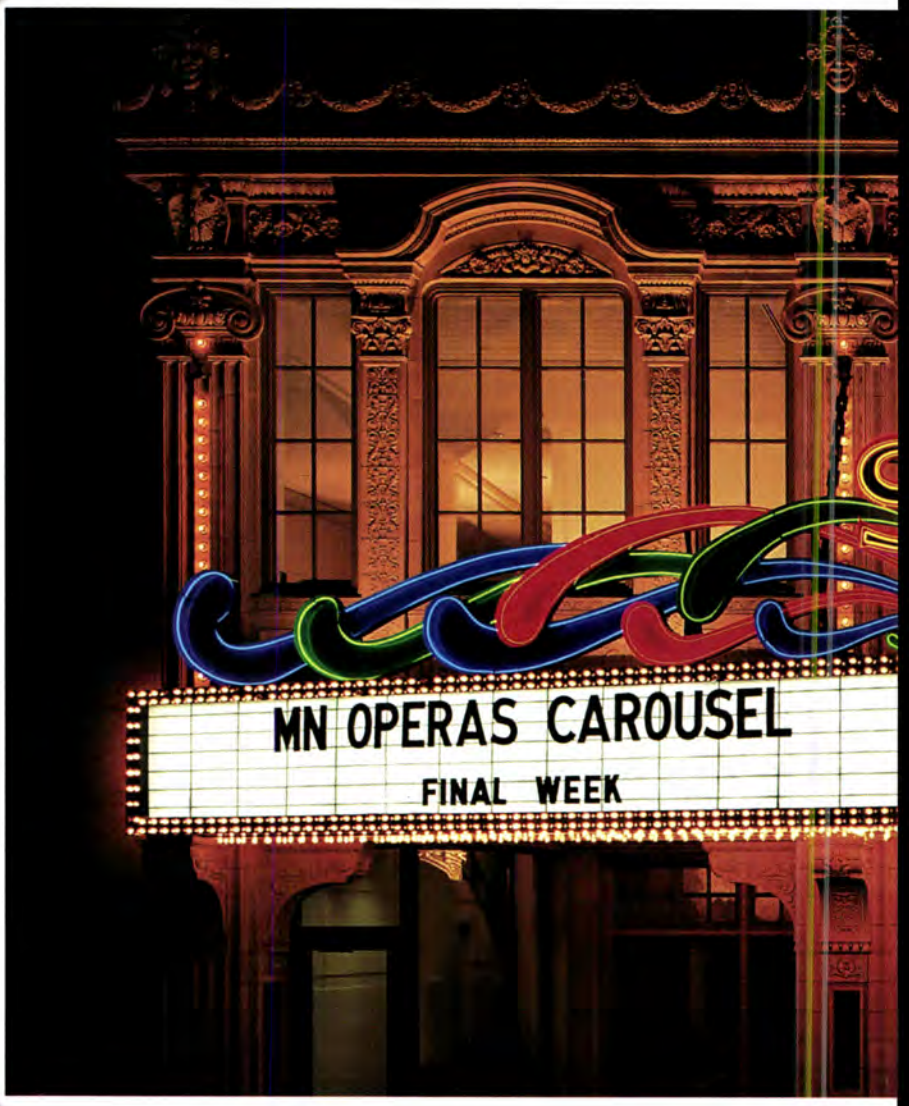
As a veteran of many juries, I hesitate to toss brickbats or bouquets at two recent competition winners. Yet, perhaps because both are virtually in my back yard, I have difficulty making my peace with one of them, but will probably get to love the other. One of them is the winning design to replace the burnt down Staten Island Ferry Terminal, by Venturi Scott Brown Associates and Anderson/Schwartz Architects [RECORD, December 1992, page 12]. The terminal will come equipped with a 10-story-high clock that informs morning commuters in no uncertain terms how early (or late) they are for work. Aside from casting a rather deep shadow over one of the few large sunny spaces to be found in the city of New York (and aside from costing a fortune), the quirky quality of the design combined with the grand entry hall is a strong, simple solution that should wear well.

Not so the Austrian Cultural Institute, designed by Raimund Abraham, an Austrian and long-time instructor at the Chanin School of Architecture at Cooper Union. Oddly, the Institute design likewise invokes time as an icon—in this case the building (see photo) looks like a giant metronome for reasons that clearly have nothing to do with this East 52nd Street block. There is an obtrusiveness about the design, a reach for originality at any price, that in its present form risks becoming an obstreperous neighbor on a block that badly needs a touch of elegance and grace. Now, for all I know the building will function well, providing the Institute with the types of spaces it needs. What fails is the public face. We see a hostile confection, which at least one reviewer has sought, through words, to elevate to the status of genius. *The New York Observer*, a usually sanguine and often pleasantly caustic spectator on the New York scene, gushes with praise. Some samples: " . . . Mr. Abraham's haunting design resembles an abstract metronome to usher in the coming millenium;" "It will have a disturbingly mysterious yet elegant sculptural presence, one that turns its back on the decorative historicism often exploited in recent commercial building . . . "; "[the] architecture has metaphysical atavistic origins . . . ;" this is backed up by a quote from Mr. Abraham " . . .I think [of] history in terms of the possibility to go back as far as one can, into geology, into something before architecture." And, unkindest cut of all, in the words of jury chairman Kenneth Frampton, "the assertiveness of the form will put it on a level that makes the Guggenheim or the Seagram Building worth visiting."

All of which sounds impressive but in fact says next to nothing about how the building will look to New Yorkers, nor about the dire challenge to those architects who will eventually be designing the replacement buildings for its architectural neighbors on the block.

The selection process failed to come up winners on this one. That's too bad, because this building is a slap in the face to the block, and sends a flawed signal to every other block in the land. *Stephen A. Kliment*

THEY DON'T MAKE THEATRES LIKE THIS ANYMORE. WHICH IS WHY THEY



When it opened in 1921, the State Theatre in Minneapolis was hailed as the most luxurious showplace between New York and San Francisco. Sixty years later however, when planning began for a $130 million office/retail complex for the site, it appeared this grand old theatre would go the way of the silent films it once screened.

But in 1985, a determined group of preservationists succeeded in getting the State placed on the National Register of Historic Places. And one of the first companies to become involved in its restoration was Marvin Windows and Doors.

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The editors of ARCHITECTURAL RECORD announce the 24th 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, 1993. Winning entries will be featured in the September 1993 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
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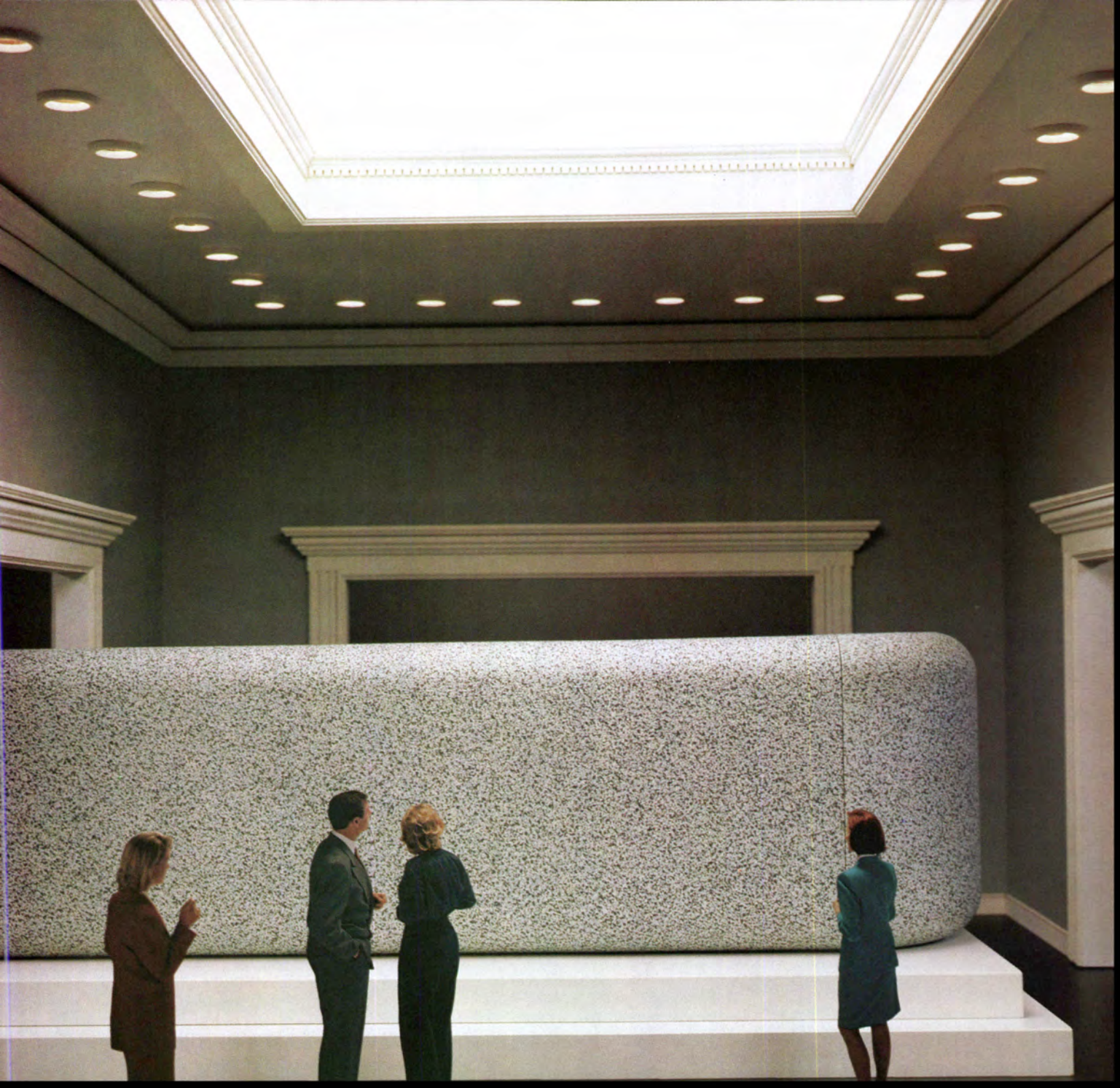

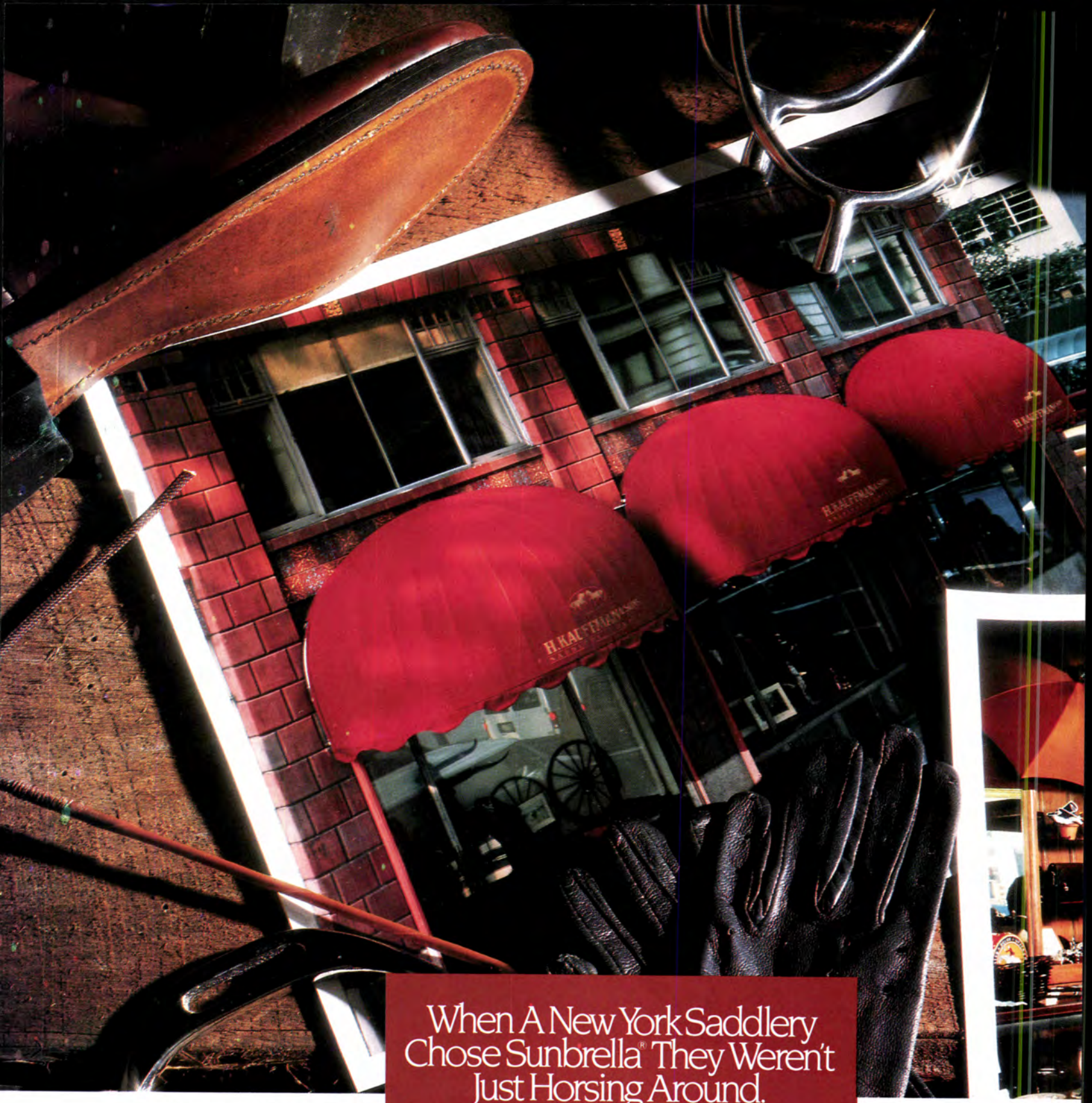

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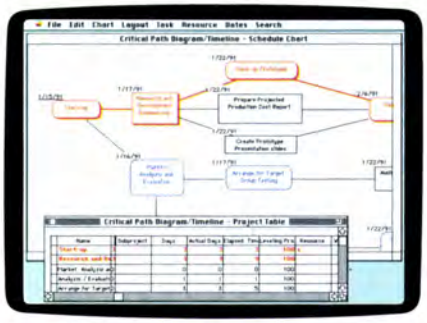
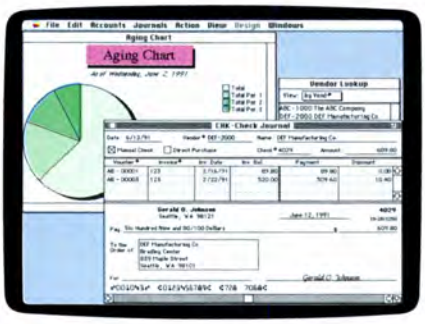


Project Manager?



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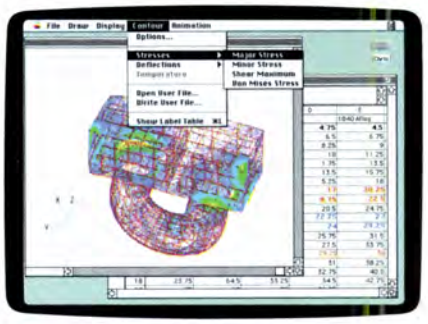

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We can't resist giving a plug to the great software products that were used to create the screens shown here. From left to right, starting at the top, they are: DynaPerspective from Dynaware (rendering by Photoshop from Adobe Systems); Persuasion 2.0 from Aldus; MacWrite II from Claris; MacProject II from Claris; Components from Satori; MSC/pal from MacNeal-Schwendler; and shown above, Persuasion 2.0 from Aldus.

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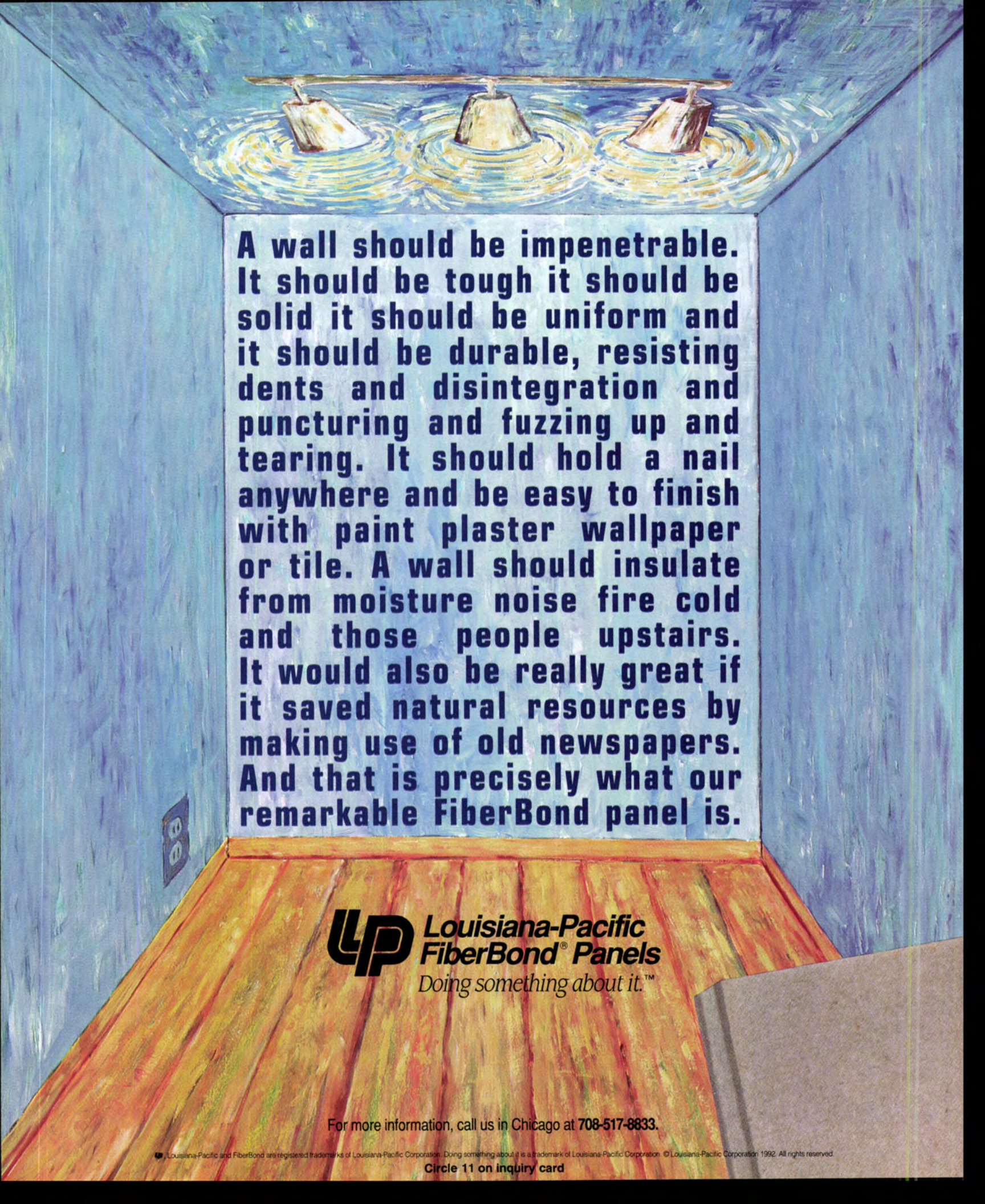
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Prague

Rounding the Corners and Tilting the Angles, Gehry Style

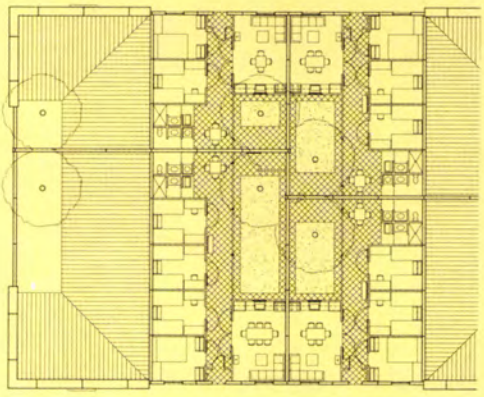
Judging by the 55,000-sq-ft commercial office building in a historic district on the banks of the Vltava River, Frank O. Gehry & Associates seems to be entering a new phase that values sculptural roundness over assertive angles. The design honors local 18th- and 19th-century use of skylights, intricate plaster facades, and twin towers on corner sites—in this case, a corner empty since a U. S. bomb fell on it in World War II, one of only three sites in the Czech capital's historic district available for new construction. Gehry's twin towers are gently opposing circular volumes, one of concrete poured in wave patterns, widening as it rises; the other a double-layered cylinder of clear glass sweeping into a canopy extending to the sidewalk's edge. Scheduled for completion in late 1994, the project includes ground-floor retail and a roof-level five-star restaurant. ■

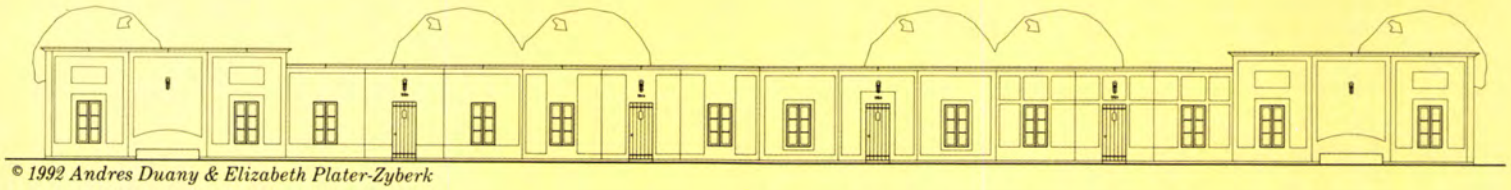
Joshua White

Florida

Immovable Homes for Migrant Farmers to Help Batten Down Hatches After Hurricane Andrew

Most Americans didn't realize that migrant farm workers establish permanent homes until Hurricane Andrew demolished their trailer parks in Dade County. Andres Duany and Elizabeth Plater-Zyberk have now designed new communities, using prefabricated elements from the warehouse industry, which, unlike swamped conventional builders, is under-utilized simply because most of its product escaped damage. Wall elements are cast in local Mediterranean Revival motifs to disguise traces of industrial technique; roofs are punched through to form private courtyards for the two- to four-bedroom units. Cornices straddle the slab joints and lock the units together against hurricanes. "I *thought* I knew how they lived," says Duany, who learned from the householders to provide distinct male and female hang-outs at opposite ends of each unit. Since armoires are important room ornaments, there are no built-in closets. Serving the 290 units—15 per acre—are a social center, church, playing field, and two day-care/laundry centers. Per-unit costs are in the $30,000 range. ■

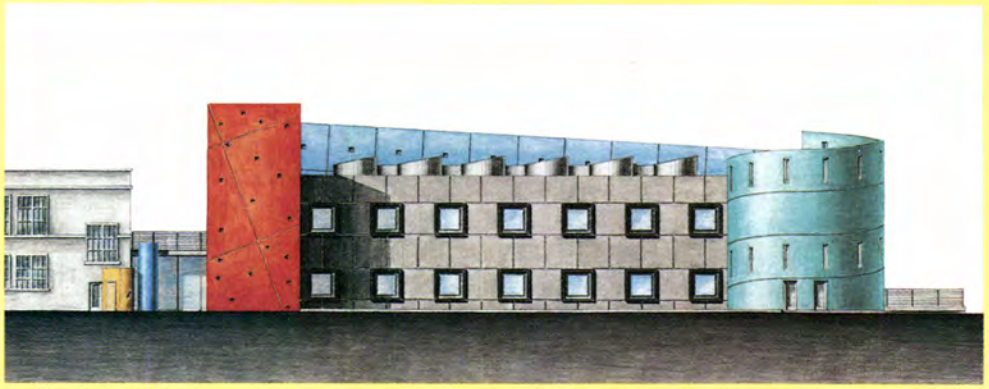




© 1992 Andres Duany & Elizabeth Plater-Zyberk

Los Angeles

Primary Colors Cover Up Primary-Grade Graffiti



A new wing at the Nevins Elementary School "strives to instill some spirit in an urban area unfortunately typical of many inner cities that have become socially neglected and architecturally void," says Stephen Kanner. The scheme erupts into exuberant forms and primary-color paint (a graffiti remedy, i. e. another coat of paint) that outperforms graffiti-resistant finishes. Kanner Architects skylit spiral stairwell and trapezoidal corridors to provide non-regimented transition points. ■

PCA Awards

Eight Projects Win Concrete Honors

Marc Lullier

Eight projects ranging from a church to a wastewater treatment plant won 1992 Portland Cement Association Concrete Building Awards. The winners: 460 North Canon Drive, Beverly Hills (Rockefeller/Hricak Architects); Chapelle De L'Amitié, Montreal (Lemay & Associates, architect); a parking structure at the Children's Hospital, Oakland, California (The Ratcliffe Architects); Epson America Corporate Headquarters, Torrance, California (Gensler and Associates, architect); Iona Island Regional Park Facility, Richmond, British Columbia (Neale Staniszkis Doll Adams, architect); Montreal South-Shore Wastewater Treatment Plant (Boudrias, Boudreau, St-Jean, architect—above); a science library at the University of California, Santa Cruz (Esherick Homsey Dodge and Davis, architect); York University Student Center, North York, Ontario (A. J. Diamond, Donald Schmitt and Co., architect). Judges for the awards were Tom Brashares of Voorsanger & Associates, Duncan Hazard of James Stewart Polshek & Partners, Gregg Jones of Cesar Pelli & Associates, and RECORD senior editor James S. Russell. ■

Design

Briefs

U. S. design summit
A pre-Inaugural design roundtable—at least one-third architects/urbanists—was held in Little Rock by Christopher Hyland, President Clinton's deputy political director and New York design resource showroom owner, and *International Design* editor Chee Pearlman. Recommendations (to be printed in *ID* in March) include end-user rather than master planning, building 10 visionary cities on retired military bases, and making the government a model client for sustainable, diverse, and accessible design.

Building height not a crime factor
High-rises are no likelier than low-rises to cause crime and unrest, says sociologist Herbert Gans in Walker Arts Center's *Design Quarterly*. He targets social isolation, noting that alcohol abuse is greater in fraternity houses than in high-rise dorms, and the most peaceable dorms are co-ed. "Architects cannot shape the behavior of the organizations and people inside the structures," he says.

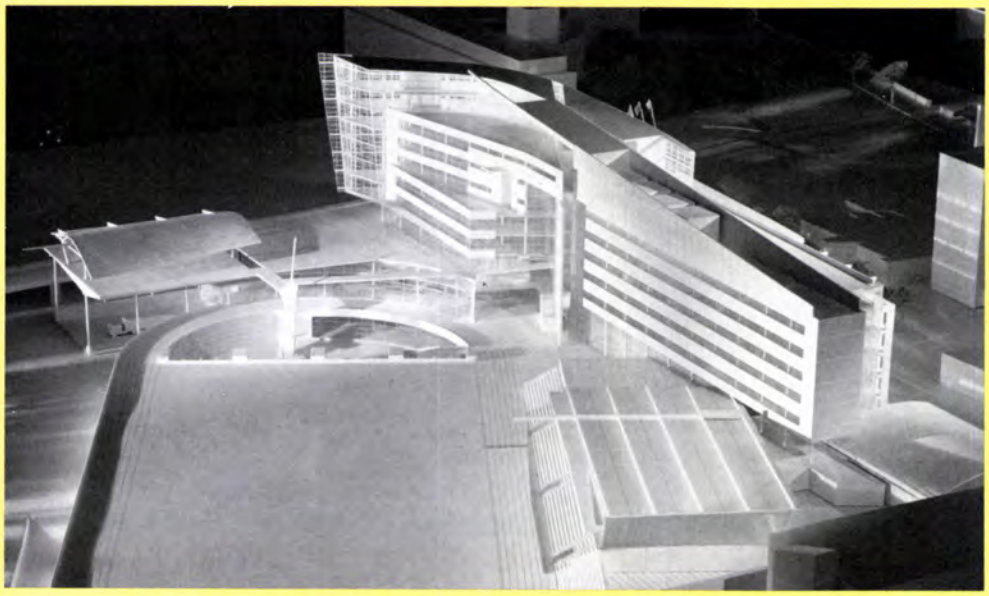
Architecture gagged
Protesting "the naked body . . . doesn't have anything to do with architectural design," a University of Wisconsin-Madison urban-planning chairman took a project off display because a half-inch drawing of a nude female and clothed male was used to show scale. Citing power issues raised when nude and clothed occupy the same scene, male students, professors, and dean backed the ban lest female students feel sexually intimidated. Reportedly, the women would have preferred to debate the matter.

Courthouse Commission
The Spectorgroup in association with Richard Meier & Partners is designing the new Federal Building and U. S. courthouse in Islip, N. Y. The $195-million project is expected to open with 21 courtrooms in 1998.

Competitions
- Registration deadline is April 1 for the AIA/International Union of Architects $50,000 "Call for Sustainable Solutions," May 1 for submissions. Call 800/365-2724.
- April 22 is the fence-design deadline at Los Angeles' Village Green. Contact The End, Box 1332, Culver City, Calif. 90232.
- The first Du Pont/ACSA laminated glass contest has an April 15 professional deadline, June 1 for students. Contact ACSA, 1735 New York Ave. N. W., Washington, D. C. 20006, 202/785-2324, Fax 202/626-7421. ■

New York

Ellerbe Becket Design Wins South Bronx Police Academy Competition



Dan Cornish

Ellerbe Becket and Michael Fieldman & Partners have won an international competition to design the new 1,300-student police academy that begins construction in the South Bronx in 1996. Design principal Peter Pran joins a 400-ft-long six-story academic block to a physical-education block by means of an eight-story administration building that sweeps 250 feet around a corner. The resulting angle shelters the street-level track and obstacle course, and gives them the best solar orientation. The corner building also houses a computer-heavy library for student and staff use, an atrium lobby, a police museum, and an auditorium open to the community. Runners-up were Davis Brody/Richard Dattner; Venturi, Scott Brown with Grad Partnership and Anderson/Schwartz Architects; and Rafael Vinoly. ■

New York

Comforts of Home For Sick Youngsters

The world's largest Ronald McDonald House provides an 84-room home away from home for young out-of-town cancer patients undergoing treatment at area hospitals. Designed by Schuman Lichtenstein Claman Efron with interiors by Wilson & Associates and construction by Tishman, the facility provides terrace playrooms, rooftop winter garden, library, chapel, a 740-gallon salt-water aquarium in the living room, and 16 individual kitchens opening into a common dining room so that families can prepare favorite meals but dine in a supportive community setting. ■

New York

Children Record Architecture

The two drawings shown above are from the guide "A Children's Walking Tour Guide of the Lower East Side" researched, written, and illustrated by 20 students from Manhattan's Public School 110 as part of the Henry Street Settlement project. This project was funded by the New York State Council on the Arts and Community School District #1, and is intended to teach social studies through architecture. At left is St. Mary's Church (1832) as seen by Carlos Morales; at right, the Henry Street firehouse, a remodeled 1854 brownstone, as drawn by Raymond Sanchez. Teachers were Janet Sygar and Julie Maurer. The model of the Parthenon (above, right) is one product of a series of courses teaching ancient civilizations to 6th grade students, in this case a class at PS 19 taught by Nina Drooker and Julie Maurer. Teachers are taught at a series of workshops organized by the Cooper-Hewitt Museum and the Learning by Design Committee of AIA's New York Chapter. Workshop instructors were Julie Maurer and two architects, Jerry Maltz and Linda Yowell. *S. A. K.*

Chicago

Preservationists Struggle to Save Marina City; But a College Campus May Be "Surgically Destroyed"

Questions about if, when, and how to preserve deteriorating Modernist edifices that are too young for official landmark status have focused on two mid-1960s Chicago projects, with consequences at opposite ends of the preservation spectrum. Bertrand Goldberg's Marina City (right)—a seminal multi-use urban complex that's a favorite among tourists—has endured a decade of Dickensian ownership transactions since its "corn-cob" residential towers were sold off as condos. The remaining property became a maintenance nightmare and chain-of-title hot potato in the wake of bankruptcy, foreclosure proceedings, and the Resolution Trust Corporation's abrupt abandonment of the complex in September 1992. Now, the icon is plagued by asbestos, millions in back taxes, and $50,000-a-month losses since a rent hike five years ago all but emptied the office building.

Two years ago, when developers announced plans to buy Marina City, demolish the theater, and convert the office building into a hotel, the Chicago Planning Commission issued a planned-development amendment that protected, in part, Goldberg's original design, and the project was dropped. Recently, another developer, Roger Levin, expressed interest in revitalizing the property with Goldberg's input, restoring some of the architect's uncompleted plans in the process. Whether this scheme for the proto-landmark can move forward remains to be seen.

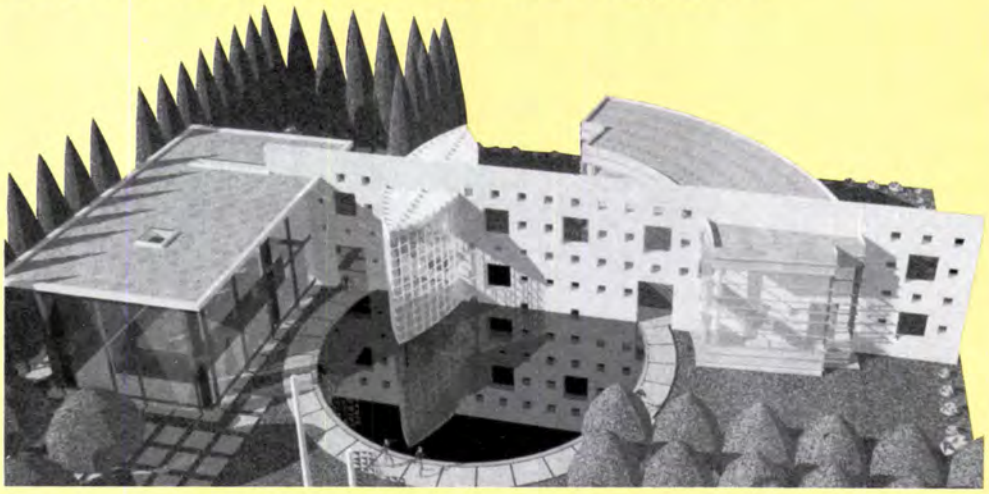
Across town, the University of Illinois campus at Chicago Circle (far right) is facing some "revitalization" of its own. Designed by Walter Netsch for Skidmore, Owings & Merrill as one of the first instant campuses created in the urban institutional explosion of the 1960s, U. I. C. is a brutalist concrete and granite complex surrounding a central forum and linked by a double-decker walkway. A variety of issues ranging from bad maintenance to perceived security hazards led university trustees to hire Chicago's Daniel P. Coffey & Associates to present five options for revamping the campus core. The plan chosen was Coffey's most radical modification of Netsch's design, since it dismantles the upper walkway and the forum entirely. "It's the surgical destruction of the campus's heart," according to Netsch, who admits there's room for improved landscaping and maintenance. Thus far, Circle Campus has not enjoyed the kind of preservation-group crusade that was mounted for Marina City. "We did an internal evaluation of all the underage landmarks that merited our protection, and Marina City has a special significance that we didn't feel was the case at U.I.C.," according to Vince Michael, Chicago program director for the Landmarks Preservation Council of Illinois. *Victoria S. Lautman*

© Hedrich-Blessing

Orlando R. Cabanban

Budapest

Expo Pavilion Circles the Square



Skidmore, Owings & Merrill design partner Joseph Gonzalez employs transparency and curved form to transcend the "relentlessly" gridded environment of the Kontrax Telecom pavilion in an industrial area converted to exposition uses. Within the 150-sq-ft parcel, an eye-shaped observatory, an office-and-sales arc and an equipment display rectangle are strung on a see-through wall with a second-story walkway hung on its back. A round pool slips serenely through the wall and gives a lift to the observatory. ■

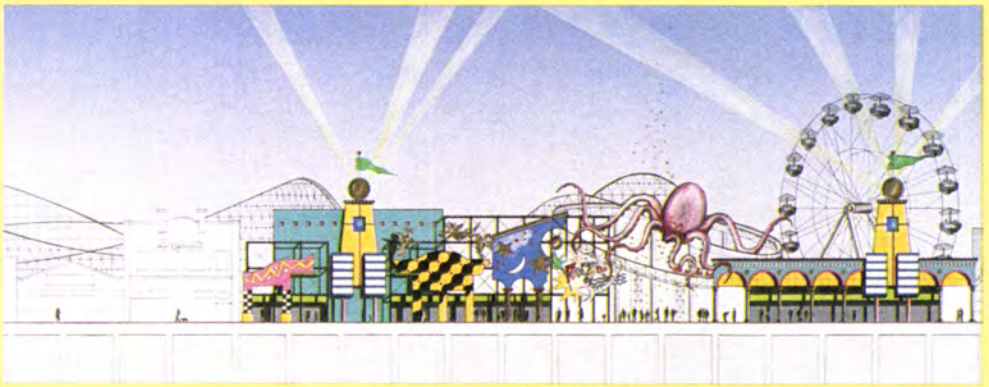
Denver

Ponti Design Is Centennial Focus

The only public building by Gio Ponti in the western hemisphere—the 1971 Denver Art Museum designed in collaboration with the Denver firm of James Sudler Associates—is a major focus of the museum's centennial celebrations. A year-long multimedia exhibit (ending February 6, 1994) explores what curator of design and architecture R. Craig Miller calls "really a rather extraordinary building," one that departed from archetypical Beaux Arts and Modernist designs for American museums to take on urban and regional issues, loft-like open-plan gallery designs, colors based on Le Corbusier's Maison Jaoul, and forms reminiscent of Ronchamp. Positioning itself as the latest center for Modern design and architecture, the Denver Museum also picks up the good-design torch with a "Good Design 1993: Italy" show that opens April 1, 1993. ■

Santa Monica

Amusement Pier Returns to Life



Architect Ken Stein is the unanimous winner of a competition to design a new amusement zone on a vacant 70,000-sq-ft patch of the historically sensitive Santa Monica Pier. The scheme evokes the glory days of the pleasure pier with corner towers based on photos of the old LaMonica Ballroom, a roller coaster and other rides, a serpentine games arcade, retail, and food. On a clear night, the good times will be visible for six to eight miles along the Pacific Coast from Malibu to Palos Verdes. ■

Dresden

Frank Stella Trades Art for Architecture To Design Museum of Contemporary Art

Steven Sloman

The Dresden City Parliament has decreed that a privately-sponsored museum of contemporary art can be erected in a park near the lavishly Baroque Zwinger Museum and the recently reconstituted-from-scratch opera house—but only if the project carries out a design by American artist Frank Stella. Collectors Rolf and Erika Hoffman commissioned Stella after proposals from architects made them "absolutely sure we would not go ahead with conventional post-modern architecture," says Rolf Hoffman. "There is a great danger that Dresden—along with other German cities—will be rebuilt as a fake Baroque city." The scheme is less a rebuff of tradition than a 21st century reworking of it; the swirled domes above, for instance, are orange-section takes on an 1841 orangerie left in fragments after Allied firebombing in 1945. "Stella understands the Baroque spirit," says Hoffman. "Even the Zwinger was never meant to be a serious building." The galleries occupy the top floors of five office buildings whose rents will support museum activities without carrying the influence of corporate sponsorship. ■

Berlin

Greening a 1950s Office Building

Using conventional technology and resources, Louisa Hutton and Matthias Sauerbruch of LHMS Architects have gotten the nod for an air-conditioner-free extension to the 1950s headquarters (center) of Gemeinnutzige Siedlungs-und Wohnungsbaugesellschaft (GSW), a government housing society that has been client to Mies, Gropius, and Scharoun. To begin building later this year with Ove Arup as consulting engineers, the first phase (right) runs a glass-skinned three-ft-deep solar flue the full length of the western exposure. In the summer, fresh air enters operable windows on the east and is drawn through 21- to 27-ft-deep floors by warmer, used air rising up the western flue; high temperatures only make air in the flue rise faster, pulling more fresh air from the east. Overnight, mechanical fans blow cooler air through floor slabs to counteract morning heat, and the east facade's individually controlled shutters control early glare; the randomly colored pink, yellow, orange, and purple shutters change the facade as weather conditions dictate, offering employees a new approach to work each day. In the winter, mechanical extract fans atop the flue pass stale used air over a thermal wheel to warm up chilly intake air. The design links the drastically different buildings on every floor—creating a Berlin-Wall-side metaphor for the union of the two Germanies—but the natural ventilation does not extend to the older structure; Ove Arup's Guy Battle estimates its efficiency would drop with a building depth greater than 27 ft. Energy savings could pay for the double curtainwalls in roughly 10 years, a payback period that European banks welcome more readily than their American counterparts do. ■

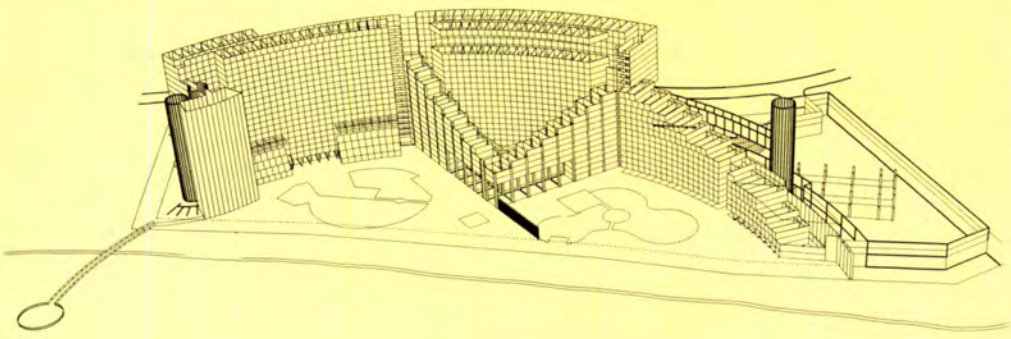
North American Free Trade Agreement

Going for Gold South of the Border

This may well be the activity *du jour* for architects looking for new work. The tantalizing promise of rich markets in newly liberated Eastern Europe has turned out to be ho-hum. And with the recent downturn of Japan's economy, which dominates the Orient, the allure of the Far East is now limited to the more growth-geared nations such as Korea, Singapore, Taiwan, and even mainland China. But efforts by the Mexican government to crank up its economy, combined with the expected leveling of the Canadian, American, and Mexican playing fields for many businesses by the still-gestating North American Free Trade Agreement, are convincing some prominent design firms that new action may well be south of the border.

"Mexico is certainly considered a boom market now," says Harold L. Adams, chairman of RTKL in Baltimore, Maryland, which has office buildings and interiors, and mixed-use and urban-planning projects underway in Mexico City, Monterrey, and Guadalajara. "Many American architects are working in Mexico right now on the assumption that the NAFTA treaty will be signed," Adams adds. There are indeed a lot of American architects that have set up shop in Mexico already, "generally working on larger projects," agrees James Diaz, of Kaplan/McLaughlin/Diaz, in San Francisco. His 200-person firm, which has offices in Portland, Seattle, Los Angeles, and Tokyo is a prime example: His company set up a wholly-owned subsidiary—a novelty in itself—in Mexico City with 15 staffers headed by Mexican-born Juan Diego Perez-Vargas, who has worked some 15 years for the firm in the U. S. Among its projects is the resort in Cancún (below). In the past, Americans could set up shop only when a Mexican national held majority ownership. But that is changing in an ongoing process of removing trade barriers that had begun even before NAFTA. Still, Diaz warns: "I don't think it's going to be as huge a market as some people expect." Perez-Vargas is more optimistic, citing strong demand for U. S. expertise. "NAFTA will only broaden a strong market further by bringing in U. S. clients," he says.

The basic NAFTA agreement was signed by former President Bush late last year. But President Clinton has indicated he wants to do some finetuning, especially in areas of environmental concerns and American jobs. Also, it still must be ratified by Congress, which may not do that until November—if then. "We can't say with absolute certainty that it will pass," says Dena Sollins, director of international relations for the AIA, which has been working with its Canadian and Mexican counterparts to assure a smooth transition satisfactory to everyone. "It will be harder to pass in the House than in the Senate," she believes, because there are so many new Representatives.



In 1987—just prior to the signing of the U. S.-Canada Free Trade Agreement—the AIA and the Royal Architectural Institute of Canada signed an accord that established guidelines for a common set of professional standards; that now serves as a model for the same concerns under the expanded NAFTA agreement. These guidelines cover education, internship, examination, practice standards, and ongoing professional development, explains James A. Scheeler, another AIA expert on international relations. And while the relationship with Canada is "very clear," obstacles remain in the relationship with Mexico, in part because of different cultural and educational heritages, he says.

Mexican architects' educational process is "significantly different," says Donald Hackl, president of Loebl, Schlossmann and Hackl in Chicago. He explains that "if you matriculate from a Mexican school of architecture, you are considered an architect upon graduation. There is no internship, no testing, no licensing. To resolve these differences, the AIA and NCARB began talking with the Federation of Colleges of Architects in the Republic of Mexico about three years ago. At the group's last meeting in Vancouver, B. C., in September (the next one is this month in Monterrey, Mexico), a draft covering architecture was reviewed and is expected to be attached to NAFTA. Its core principle: "No discriminatory treatment in the delivery of services in North America, based on a common set of standards for the profession," according to Scheeler.

For now, the bottom line is that Mexico offers some previously unavailable opportunities. Diaz believes his firm's exposure to foreign ways via KMD's Tokyo office helped: "We were able to move quickly because we had experience in Japan which is much more complex and far away." Americans, he adds, may have advantages. "American thinking and design has value for some people." Also, there are some tech-

nical areas such as computers, in which American expertise is more developed. Some Mexican firms have that as well, but on the whole, he believes, "they have a long way to go." Also, American know-how in the design of large facilities like hotels, hospitals, shopping malls, and office buildings gives American architects a leg up, he says.

Canada, on the other hand, is not regarded as a very promising prospect now. "Canada is a fairly mature market and Mexico is a growth market," says RTKL's Adams, whose firm has designed primarily large retail centers there. "There is a larger opportunity for growth [in Mexico] than north of the border," seconds Hackl. "The Canadian economy is weak, like our own." NAFTA's flip side, of course, is that Canadian and Mexican architects are likely to be looking for work in the U. S. To Adams, the Canadians will not present an increased challenge: "The U. S. market is already more open to Canadians than the Canadian market has been to U. S. architects."

But for Mexican professionals looking to the U. S., it may indeed be a different matter, he observes. "Yes, I think it *will* open the door for Mexican architects. We have faced up to this prospect in the past. It's part of increasing global competition." Hackl is not very worried: "For established American firms, accustomed to working internationally, it's not perceived as a threat," he says. "For smaller ones, perhaps."

In practice, he believes, a Mexican architect would almost have to work with an American partner: "They are not equipped to do projects [on their own], they are not used to the same codes and standards." Adds Hackl: "Americans will just have to accept the quid pro quo: "If we want to export our services, we have to recognize that there are foreign investors who will want to bring in *their* own people."

Peter Hoffmann, Washington, D. C.

Taking Ecology Abroad

Sustainability To Guide Selection of Architects for Hannover 2000 Expo

Principles to guide the selection of architects for commissions at the ambitious Hannover 2000 World's Fair were recently issued by New York architect William McDonough, commissioned by Oberstadtdirektor Jobst Fiedler, who heads the fair. The principles were conceived "to inform the international design community of the issues of sustainable design, rather than provide an ecological checklist for construction," says McDonough. *The Hannover Principles* are meant to guide selection of winning designs for the fair's structures and include:

- Accepting "responsibility for the consequences of design upon humans *and* natural systems, and their right to co-exist."
- At the same time, recognizing that design does not solve all problems nor last forever.
- Evaluating "the full life-cycle of products and processes to eliminate waste."
- Reliance on solar-energy sources.
- Constant improvement by sharing knowledge between designers and manufacturers.

The report calls for flexible buildings that can be adopted to other purposes after the fair and that extend the present built fabric—both criteria for fairly permanent structures. It also calls for the use both of indigenous *and* the most advanced materials, especially for thermal glazing, and water and waste treatment. There are those who question whether holding a huge fair in a medium-size city like Hannover is in itself sustainable and some feel the fair's venue should be distributed over several cities and, perhaps, even countries.

Government Work

A/E Groups Hope to Raise Federal Fees

A group made up of architects and engineers is going into full swing to raise the 6-percent ceiling on federal contracts for professional services in what it hopes, during the new administration, will be a more friendly environment. Known as the Council on Federal Procurement of Architect and Engineer Services (COFPAES), it consisted of mainly engineering organizations including the ACEC and ASCE until it was recently joined by the AIA. Pointing to state work, for which fees can be much higher, the seven-member group has hired lobbyist Mark Price to go after the appropriate House and Senate commitees. RECORD will follow developments and report more on this as action develops.

Practice

Briefs

Getting published. In what its producers call *The Publicity Directory*, architects can see specifically what it takes to receive coverage in a wide range of publications including those for designers (such as RECORD) and those read by specialized clients, such as *Hotel & Motel Management* and *Corrections Today.* Listed are the names of contacts, the types of material being sought, prospective authors' qualifications, and "editor's tips." Cost: $195 per year. Contact The IDPR Group, 596 Tremont Street, Boston, Massachusetts 02118 (617/437-8493).

Don't be a GC in D. C. Warns Washington attorney Arthur Kornblut, a recent ruling in the district has found that an architect who subcontracts for carpentry or painting (a common practice on small residential projects) can be considered a general contractor and must be licensed as such.

Specification Series: Manufactured Metal Roofing

View inside complex metal roof on Visitor Pavilion, Port of Houston, designed by MCCM Architects and built by R. W. Honea Sheetmetal.

Courtesy MBCI Metal Roof Systems

By W. Dean Walker

There are two types of preformed roof systems: water shedders and water barriers. Barriers resist the passage of water under hydrostatic pressure.

Water shedders must have slopes of 3 in 12 or greater, and decking for support. Base felts or rubberized asphalt membranes are also needed for additional moisture protection. Water barriers can have slopes as small as 1/4 in 12 and need no supporting structure.

Types of water shedders include: batten-seam (covered with snap-over caps); Bermuda (panels continuous across slope); corrugated (ribbed panels with exposed fasteners); flat-seam (one panel edge folded back on itself to interlock with the next panel edge); shingle panels (formed to look like tile); and standing-seam (vertical edges folded one over the other). Standing-seam systems can also be water barriers. Batten-seam and standing-seam are the most commonly used. Find illustrations of all types in the Sheet Metal and Air Conditioning Contractors National Association's *Architectural Sheet Metal Manual, Metal Roofs.*

System-performance requirements should include no air leakage in testing according to ASTM E 283 at pressure differentials up to 1.57 psf, and no water penetration in testing according to ASTM E 331 when the inward static-air pressure differential is not less than 6.24 psf and not more than 12.0 psf.

Submittals: Require manufacturer's product specifications, standard details, certified product-test results, and samples and color chips for proposed finishes. Sample panels should be a minimum of 12 inches long. It is a good idea to get samples of clips, battens, fasteners, and closures. Require shop drawings showing layouts of panels, details of edge conditions, joints, panel profiles, supports, accessories, and anchorages.

Quality assurance: An industry-respected test for wind uplift is UL 580. The key is that the system must be installed exactly as it was tested, including material gauges, clips, fasteners, secondary-structural-member gauges and spacings, rib heights, and panel configurations without even minor modifications. Typically, you might specify that the roof-panel system, including supports, meets UL 580 for Class 90 wind uplift resistance.

Although principally developed for curtain walls, ASTM E 330 has been modified for testing standing-seam systems. Currently, a new standard, E.06-57, is under development by ASTM, but is still at the committee stage.

Finishes and installation: Protective coatings provide corrosion prevention by sacrificing themselves, or by forming a barrier. With the exception of the last two listed below, which cost a premium for their natural appearance, they may be painted.

- Zinc coating G-90 on steel ASTM A525 provides primary sacrificial protection.
- A minimum 0.65-ounce aluminum-coating on steel ASTM A-463 provides barrier protection, except in a marine environment where it becomes sacrificial.
- A 55-percent aluminum and 45-percent zinc-coating on steel provides sacrificial and barrier protection.
- Terne (20-percent tin and 80-percent lead) on copper-bearing carbon steel or stainless steel 304 provides sacrificial protection.
- Microzinc, a zinc-copper-titanium alloy is both base metal and finish.

The wide variety of coatings for steel and aluminum can be seen in the National Coil Coaters Association's *Comparative Properties and Performance Chart.*

Installation: The expansion rate of the metal selected will affect stress and "oil canning." Prevent stress problems with expansion joints. Thermal movement can be controlled with concealed clips that typically allow movement of one inch in each direction when installed in a centered position. Also consider galvanic corrosion from dissimilar metals in contact with each other or water runoff from one to the other. Water draining from some metals can stain other building materials if not adequately diverted. Require an underlying layer of roofing felt as a moisture barrier, and of building paper above it, which prevents the metal from bonding to the felt.

Insulated roof panels

- Honeycomb core slabs of kraft paper or aluminum with hexagonal cells no larger than one inch across.
- Poured-in-place modified isocyanurate foam with a minimum of 90-percent of its cells closed.
- Rigid or semi-rigid boards of polyisocyanurate (urethane), extruded polystyrene, molded polystyrene, or glass fiber.

Insulation may also be installed as the panels are being erected and is generally a glass-fiber blanket, ASTM C 991, of 0.5-pcf density, with UL flame-spread classification of 25 or less with 2-inch-wide continuous vapor-tight edge tabs. A facing of vinyl-reinforced polyester, vinyl-reinforced foil, foil-reinforced kraft paper, or polypropylene-reinforced polyester retards the migration of moist air. Insulation of this type is generally 1 1/2-inch to 4-inches thick held in place with 26-gauge galvanized steel retainer strips. Or you may call for flexible, resilient, noncombustible blankets of mineral or glass fiber, ASTM C 665, Type I, II, or III; Class A may be used on the underside of panels.

Fasteners: These must be strong and corrosion resistant. Self-tapping and self-drilling screws are usual, although self-locking rivets, self-locking bolts, and end-welded studs are sometimes used. Use corrosion-resistant or stainless-steel exterior fasteners and galvanized or cadmium-plated interior fasteners. Cushion outdoor exposed fasteners with metal-backed neoprene washers. Locate exposed fasteners in true vertical and horizontal alignment. Felts under roof panels should be asphalt-saturated and organic, conforming to the requirements of

Mr. Walker is senior associate and chief specifier in Lohan Associates.

ASTM D 226, Type II (No. 30). You will get better moisture protection from polyethylene-sheet-backed rubberized-asphalt membrane, 40-mils thick.

Accessories: Frequently included with systems are closed-cell, self-extinguishing, expanded cellular-rubber closure strips, pressure-sensitive 100-percent-solids polyisobutylene compound with release paper-backing sealing tape, and one-part elastomeric polyurethane, polysulfide, or silicone-rubber sealant. Fabricate panel joints with captive gaskets or separator strips, which provide a tight seal and prevent metal-to-metal contact.

Panel supports and anchorage include secondary framing of C- or Z-shaped roof purlins of cold-formed galvanized steel, eave struts of unequal-flange C-shaped sections formed to provide adequate backup for roof panels, and flange and sag bracing of shop-painted, roll-formed steel. Secondary structural members are usually the manufacturer's standard sections of cold-formed galvanized steel. Call for purlins, angles, channels, and other secondary structural-panel supports and anchors installed according to *AISC Manual of Steel Construction*, "Code of Standard Practice," and for roof panels installed according to manufacturers' instructions.

For lap-seam panels, call for sealant tape at lapped joints of ribbed or fluted sheets, and between roof sheets and accessories. For standing-seam panels, call for panels fastened to supports with concealed clips according to manufacturer's instructions.

Also require panel units shimmed and aligned within installed tolerance of 1/4 inch in 20 feet on level, plumb, and slope and on location line, within 1/8-inch offset of adjoining faces and of alignment of matching profiles. ■

Guide Specification
PART 1. GENERAL

A. Summary
1. Formed roof panels with applied batten. 2. Lapped standing-seam roof panels. 3. Insulated roof panels. 4. Fiber insulation. 5. Accessories including trim, copings, fascias, gravel stops, ridge closures, clips, seam covers, battens, flashings, gutters, gaskets, fillers, and closure strips. Match metal materials and finishes of roofing.

B. Not included: Structural-support steel and rough carpentry.

C. System performance requirements
1. Air infiltration. 2. Water penetration.

D. Submittals
1. Manufacturer's product specifications. 2. Samples. 3. Shop drawings.

E. Quality assurance: Wind uplift.

F. Delivery, storage, and handling: Prevent bending, warping, and surface damage.

G. Finish warranty: Furnish panel manufacturer's 20-year finish warranty.

PART 2. PRODUCTS

A. Manufacturers: (list)

B. Sheet metal
1. Hot-dip-zinc-coated structural steel: ASTM A 446; G90 coating ASTM A 525, Grade C. 2. Commercial-quality galvanized steel: ASTM A 526, G90 coating, ASTM A 525. 3. Structural-quality aluminum-zinc-alloy-coated steel: ASTM A 792, Class AZ-50 coating; Grade 40. 4. Aluminum-coated steel: ASTM A 463, T1-40 coating. 5. Stainless steel: ASTM A 240, Type 304; ASTM A480, No. 4 finish. 6. Aluminum: ASTM B 209, Alclad alloy 3003 or 3004 with embossed finish.

C. Metal finishes
1. Apply coatings before forming and fabricating panels. Protect coating. 2. Finish panels with fluoropolymer (PVDF), siliconized polyester or acrylic enamel.

D. Roof panels
1. Panel face sheets: Fabricate to the profile or configuration shown of zinc-, aluminum-zinc-, or aluminum-coated steel sheets, 24-gauge (0.0239-in., stainless-steel sheets, 16-gauge (0.0598-in.), or Alclad alloy stucco embossed-finish aluminum sheets 0.040-in. thick 3003 or 3004.
2. Batten-seam roof panels. 3. Standing-seam roof panels. • Clips and cleats.
4. Insulated roof panels: Factory assemble:
• Honeycomb-core slabs.
• Poured-in-place modified isocyanurate foam.
• Rigid or semirigid boards.

E. Fiber insulation: Glass- or mineral-fiber blanket insulation installed with panels. 1. Retainer strips.

F. Miscellaneous materials including fasteners, felts, underlayment, closure strips, sealing tape, and joint sealant.

G. Panel fabrication
1. Fabricate and finish panels and accessories at the factory.
2. Fabricate panel joints with captive gaskets or separator strips.

H. Provide panel supports and anchorage
Include secondary framing, eave struts, flange and sag bracing, and secondary structural members.

PART 3. EXECUTION

A. Installation
1. Install purlin, angles, channels, and other secondary structural-panel support members in accordance with AISC.
2. Comply with manufacturers' instructions and recommendations for installation.
3. Anchor panels and other components of the work securely in place, with provisions for thermal and structural movement.
• Install panels with concealed fasteners.
• Install panels with exposed fasteners.
4. Install component accessories.
5. Install gaskets, joint fillers, and sealants for weatherproof performance of system.
• Shim and align panel units.

B. Cleaning and replacement
1. Clean finished surfaces as recommended by panel manufacturer. 2. Replace damaged components.

How One Firm Broke into CAD Through Design, Not Production

By John Hughes

James Stewart Polshek and Partners used CAD from the first for 3-D modeling, but not without initial problems. Despite hardware upgrades in 1989 to '386/33MHz and '486/25MHz machines, JSPP's stand-alone PCs were isolated in a distant corner of the office. Anyone wanting to use them had to leave their desks and teammates. It was also difficult to track and protect CAD files. "Keeping track of and protecting drawings became a chore that could only be solved by networking," says Benedict Okoh, JSPP's systems manager. "The machines also were put on an automatic tape-backup system that runs every 24 hours to protect against data loss."

The decision to network all of the firm's PCs was made in 1990, allowing JSPP to develop its first complete set of construction documents with CAD. The project selected was Inventure Place, Home of the National Inventors Hall of Fame (photo above right), an 80,000-square-foot technology and science center in Akron, Ohio.

The project is three distinct blocks set on a landscaped plaza. A stainless-steel wing rises above the plaza and shelters a wall. Within, five tiers carry exhibits exalting innovation. Below the plaza is an underground exhibit "laboratory," where visitors explore invention concepts using a hands-on approach. A four-story service building contains a lobby, gift shop, cafe, classrooms, access to an underground large-screen theater, mechanical spaces, and a resource center. A 200-foot-high tower completes the composition.

JSPP first used CAD to build a 3-D model of downtown Akron and illustrate how the Hall of Fame would fit in. (The model has since become useful for another commission the firm secured about three blocks away from the Hall of Fame: the Akron Convention Center.) As the architects focused on the Hall of Fame itself, the project team continually updated its 3-D database, which now covers the entire building down to handrails and stair treads."The Hall of Fame's 3-D model has been both a design and analytical tool for studying the character of spaces and details, and for showing how the building's functions relate," says Donald Weinreich, a JSPP senior partner.

Mr. Hughes is a freelance writer in Ft. Collins, Colorado.

Easier response to program changes

When JSPP began design development, the client asked the firm to produce documents for a building to be built in phases. So the architects produced documents for a 37,000-square-foot first phase. They came up with their own layer naming system and developed drawings with about 20 layers, which show column grids, structure, enclosure, glazing, furniture, dimensions, and ceiling systems. The layers would allow information to be easily transported to other drawings of similar areas in later phases. "On this first project, we placed great emphasis on the quality of the drawings," says Weinreich. "Using colored lines on the screen indicating seven pen widths, we were able to establish a drafting standard that mimics high-quality inked linework."

At the end of each project phase, JSPP filled a tape with all of the data as a record set. The architects continued to develop and embellish the data to complete the construction documents. CAD became invaluable when, toward the end of construction-documents, the client changed the scope of the project and gave the go-ahead to develop the entire 80,000-square-foot building as one package.

"This would be very inconvenient if you were drawing in a conventional manner," says Weinreich. "How do you transfer all the information from one drawing to another without going through the enormous expense of paying for mylar washoffs? CAD made it simple to change the size of sheets and add or extend all of the building components to create a much bigger project. An added bonus was that, in the end, our drawings still looked new. In this case, CAD benefitted the client and kept us from having to do a lot of drudge work."

Keeping use flexible

After JSPP's CAD success on the Hall of Fame, the technology sold itself. Now junior draftspeople and associates use it. They are encouraged to fit it to their own needs and to consider it as one of many tools at their disposal. No one has had any formal CAD training; new users are trained on the job by those with more experience, although they must show enough interest to become competent fairly fast. According to Weinreich, JSPP can have people working productively after about 30 hours of learning time. "CAD has worked well for some of us and less well for others," says Weinreich. "The more general exposure one has had to computers before learning CAD, the better off one is. Computers demand a level of precise thinking that many people find constraining and annoying until they get used to it."

© Jock Pottle ESTO

National Inventors Hall of Fame.

Now CAD covers the range of drafting tasks within JSPP's offices. The system is a comfortable tool for about 10 of the firm's architects, who do everything from developing perspectives and modeling complex buildings to working out details and generating door and window schedules.

Managing the system

JSPP's systems department is managed by Okoh, who is responsible for researching, developing, and integrating new software and hardware products into the office, as well as for supporting PC users, troubleshooting, and overseeing the daily operations of networks and systems.

Although DataCAD is still JSPP's CAD software of choice, the firm has expanded its automated arsenal significantly in the last few years. JSPP's primary CAD stations are '486/33MHz and '486/25MHz PCs, each with at least 16MB of RAM, a 200MB hard disk, a high-resolution graphics card, and a 16-inch-

While many offices first look at CAD for its production efficiencies, James Stewart Polshek and Partners looked at the creative possibilities first.

or-greater multifrequency monitor that meets the Swedish Board for Technical Accreditation's maximum recommended values for electric and magnetic fields. The firm's architects share a C-size Hewlett Packard 7550A pen plotter for in-house test plots, as well as a Versatec 8500 Series electrostatic plotter for large-format output. Moreover, JSPP has a high-speed modem (19,200 baud) for sending files to its plot bureau, and sharing files with consultants and others.

All CAD computers are networked via a central computer running Novell's SFT Netware with duplexed, external 650MB drives. According to Okoh, the duplexed drives provide tremendous fault tolerance as data on a primary drive are mirrored automatically to a secondary drive, thus virtually eliminating the possibility of data loss. Furthermore, since the drives are external, a failed drive can be replaced without disrupting people at work, which cuts costly down-times.

Complementing JSPP's CAD system are numerous "satellite" '486DX and '386DX-based computers (each of which also is CAD capable and ready) running Microsoft Excel for spreadsheets, schedules, management, and financial analysis and reporting; Aldus PageMaker for desktop publishing; WordPerfect for word processing; Micrografx Designer and Graph Plus, Alias Upfront, and Corel Draw, Deluxe Paint II, and Picture Publisher for graphics work other than drafting; and a Benelog Tracking System for logging shop drawings.

Printing is done on several networked Hewlett Packard Laserjet Series III, IID and II printers. Most Series IIs are outfitted with Postscript boards for faster and clearer text and graphics printing. The firm's "satellite" PCs are networked through a second server also running Novell's SFT Netware. This file server is seamlessly bridged to the CAD server, thus making it possible to access and share both CAD and non-CAD files across the network and to absorb sudden workload increases.

"In setting up and configuring a computer system, in addition to making it as simple as possible to use, there should be as much input as possible from those who will ultimately use it daily," says Okoh. "The idea is to provide our people with tools powerful enough to do their work without sacrificing safety, comfort, or efficiency."

CAD did substantially boost JSPP's productivity. "My advice to those interested in their own CAD system is to learn as much as they can about how PCs, networks, and software work," says Weinreich, "even if they will not be setting it up. This will help communicate unique needs to specialists who will. *And* a few basic computer management skills will help handle minor daily problems. ■

CAD's Evolution in Polshek's Office

• 1984. First use CAD by agreeing to be a beta tester for a manufacturer. Get 3-D/2-D software to run on one PC. Package proves slow, unsophisticated, and of little use.

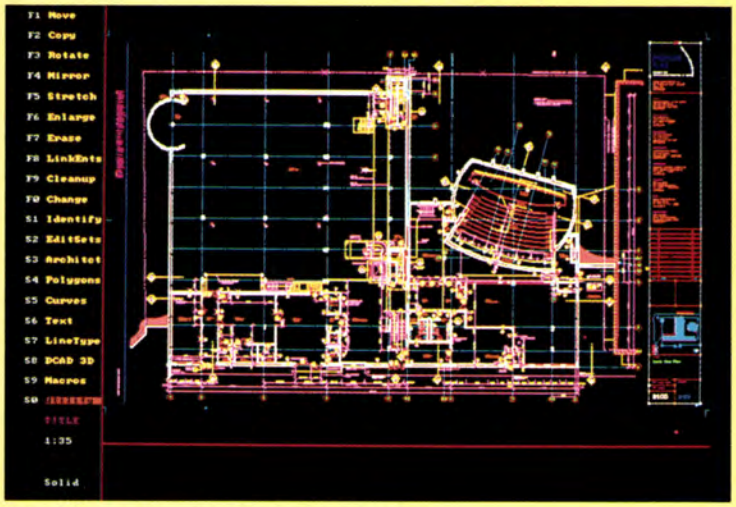
• 1988. CAD permanently introduced with purchase of CADKEY's DataCAD package and two '386-20MHz workstations. Two architects are trained to use the program as a design tool for mainly 3-D modeling.

• 1989. Three additional architects are trained in 2-D and 3-D modeling. Hardware upgrades to '386-33MHz and '486-25MHz computers.

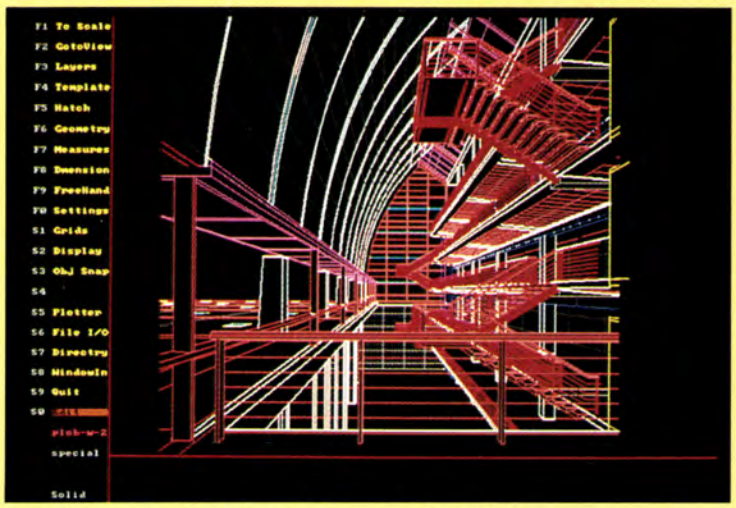
• 1990. Purchase of two additional workstations and the first set of construction documents done entirely with CAD. Installation of a dedicated CAD network with automated daily file backups.

• 1991. '486-33MHz PCs replace four slower units. Direct modem connection established to blueprinting service for all plotting. Two projects placed fully on CAD, and other projects partially.

• 1992. Firm up to six workstations. Develops screen-capture and image-painting techniques. Five projects on CAD and more expected.



First floor plan showing colored lines that translate into varied line widths on prints.



Interior perspective showing great wall and tiers.

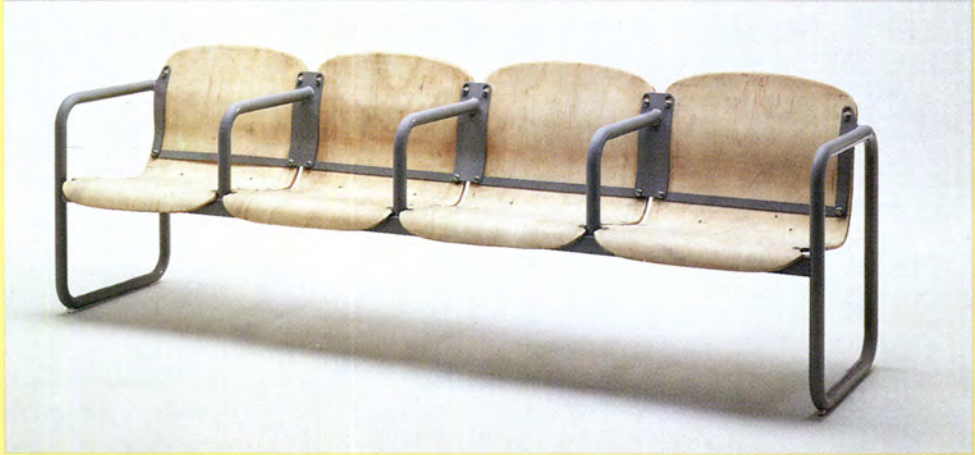
Just What the Doctor Ordered

300. Therapeutic seating
Architect Roger K. Leib has been designing and manufacturing patient chairs and other seating pieces for hospitals and healthcare facilities for over 16 years, winning awards and market share in the process.

With current post-operative protocol insisting that patients get moving within hours of surgery, and wheelchairs never intended for use as long-term seating, the lightly scaled Rose chair (top photos) fills a recognized need by supporting an invalid and encouraging physical exercise. Now offered in a brand-new bentwood version in oak or maple, the furniture combines unique materials and patented mechanics in a design that has been classified as a registered medical device by the U. S. Food and Drug Administration—the only patient-room chair on its list.

Unlike clunky visitor chairs that depend on bulk to help you get up out of the chair, Leib's chair uses its rounded arms and broad base to provide stable support. The seat platform, set at a standard 18-in. height, is made of a resilient, steam-cleanable polyester mesh that conforms to the user's body while distributing weight evenly, avoiding the concentrated load points and heat buildup that can cause bedsores. The spring-steel back is a lordotic curve that supports the spine, making breathing easier. The back flexes independently of the seat in a subtle rocking motion that enhances muscle tone. Leib has backup clinical studies.

Another "unbulky" Leib design is the Clairespan bench for waiting rooms. Engineered to suit the needs of the fussy five percent of the population said to find most chairs uncomfortable, Clairespan is made of molded-plywood modules joined by steel plates. This connection of adjacent seat backs creates a series of shear panels that acts as a rigid structural beam without a beam's weight or underseat depth. (Leib describes the design as a segmented modular bridge that spans gracefully between its two legs.) Each seat is fully upholstered, and can be specified in configurations of up to four-seats-wide, each with armrests.
Add Interior Systems, Inc., Los Angeles. ■



Roofing: On the Level

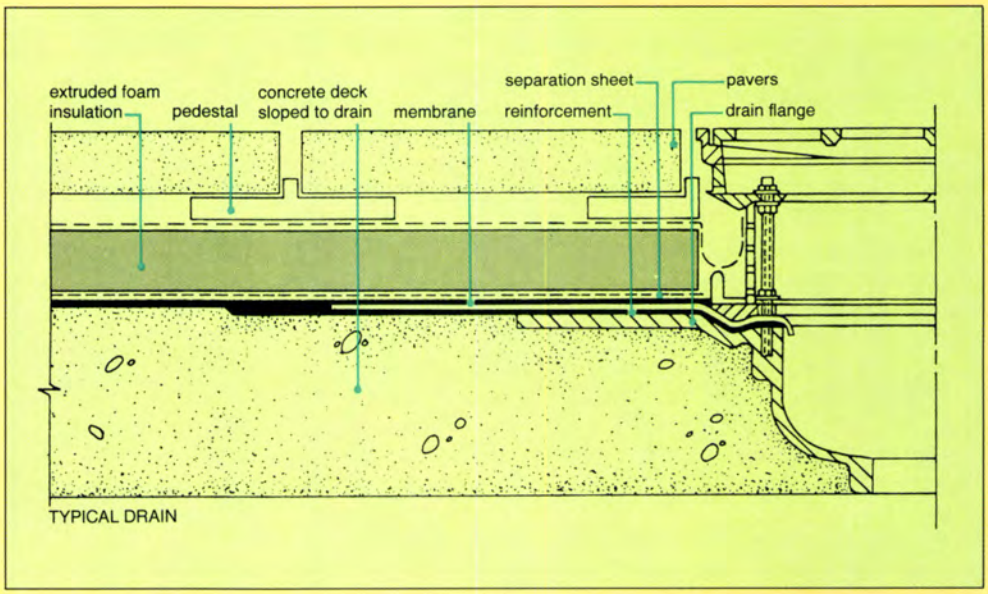
For more information, circle item numbers on Reader Service Cards.

301. Seamless recovery

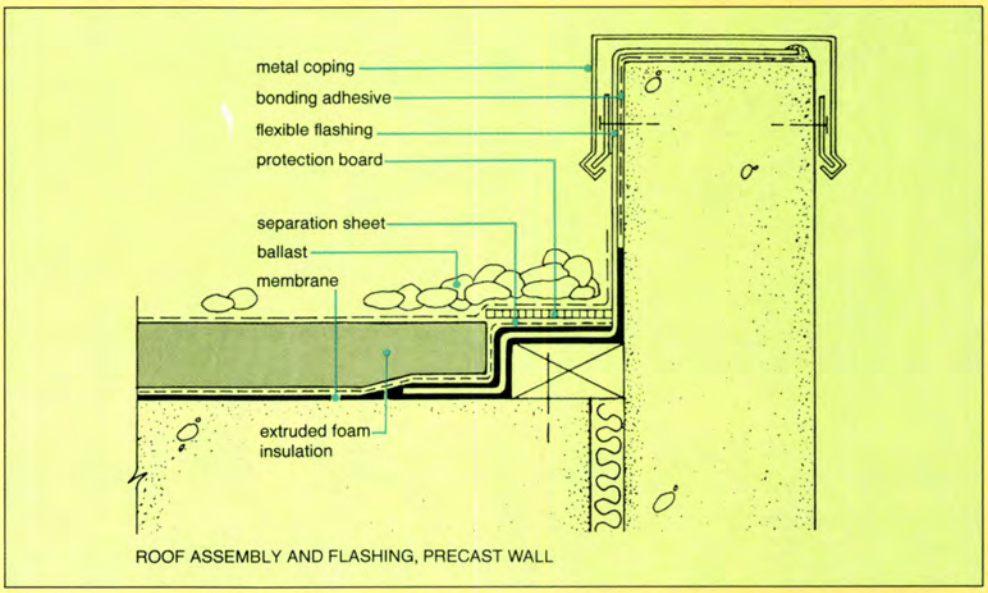
The facility architects at Boeing Company faced a daunting list of site and performance conditions when they specified the seismic upgrade and re-roofing for an enormous manufacturing building in Seattle. Job restrictions included an installation schedule phased over three years, during which work could not impact plant operations, and each reroofed section had to bond with prior work, without cold joints. The concrete roof-deck itself was only 1 1/2-in. thick, and the earthquake work included a perimeter shear collector and seismic topping, which further reduced the available weight allowance. There were literally hundreds of roof penetrations, and more were anticipated. None of the rooftop utilities could be moved, which precluded a sloped system, so the membrane had to accept (and guarantee) a dead-level condition.

Monolithic Membrane 6125, a fluid-applied elastomeric in use for over 25 years, was selected for its ability to meet all of these disparate job requirements. A blend of asphalt and synthetic rubber, the thermoplastic material adheres to a range of deck substrates and can bridge small voids. (Besides concrete surfaces and some remaining BUR, the Boeing roof had wood blocks, hundreds of metal vents and other penetrations, and it tied into three abutting buildings: the membrane bonded to all these without changing materials at any point.) It is said to remain flexible, filling voids such as those around penetrations (lower right).

The details at right call out system components: a separation membrane on top of the waterproofing, to protect it from construction traffic and shield it from ultra-violet degredation; extruded-foam board (Styrofoam) for insulation and to resist impacts; and a ballasting (stone, concrete pavers, or a cement-surface version of the insulation board) that brings the roof its FM I-90 rating. The sheer size of the roof suggested a unique delivery method to the roofing contractor: pumping kettles were located on the ground, with heated rods sending the 6125 up onto the roof and into heated jugs mounted on wheels for moving where needed on the roof. American Hydrotech, Inc., Chicago. ■



TYPICAL DRAIN



ROOF ASSEMBLY AND FLASHING, PRECAST WALL

Windows CAD

Cadvance 5.0 for Windows

By Steven S. Ross
This month we describe two CAD packages. One shows progress in one of the Windows CAD pioneers (Drafix). The other defines the new high end (Cadvance).

There's a revolution brewing in computer-aided design, one that strikingly simplifies the way 2-D, 3-D, models, and data are merged. For the past six months we have been testing numerous Windows-compatible CAD and modeling packages for DOS computers. Although Windows promises a more standard interface, these packages vary in speed, features, and—yes—interfaces. They also vary in their ability to exchange data with other Windows software.

Data exchange is the key. Using the Windows clipboard, it should be possible to import and export images, at least as bitmaps. Packages vary in their implementation of the clipboard, however. A "TWAIN"-capable package can receive a scanned image right off a scanner. One that does not have TWAIN may be able to import the image, but only after it has been saved as a file, and perhaps translated by some other software. Usually, text pasted from the clipboard is treated as a graphic by the receiving software.

Using Microsoft's "object linking and embedding," or OLE for short, you (or a third-party vendor) can create a link between data in your drawing and an external database, spreadsheet, or desktop-publishing package. Some packages can send and receive OLE (that is, if something changes in the database, it will be automatically updated in the drawing, or vice-versa). Some can only send (they are OLE "servers" but not "clients," in the argot of the computer-techie world).

If you have the right software and enough disk space, you can even embed sound into your Windows presentations.

Interfaces need some work. Windows encourages "deep" pulldown menus (there are not many menus in most Windows packages, but each one has lots of commands. Production drafting requires more menu bars, each less deep, for easier access to commands.)
Continued on page 113

This is the most sophisticated Windows implementation of 3-D CAD software yet produced. It includes a powerful macro language, excellent links to other Windows software through OLE (object linking and embedding), rough rendering, and translation to and from AutoCAD binary (DWG) as well as DXF files.

Although this version is a radical departure from earlier (non-Windows) Cadvance software, it retains many of the features that gave Cadvance a niche in the market. There's good behavior on networks (you sign on with a three-digit code that helps define the temporary files' names, for instance), and files can be referenced (viewed but not edited) by one user while being updated by another. Multiple users can update the same database, but not the same record at the same time. It is also easy to change object properties (line weights, style, color, and layer).

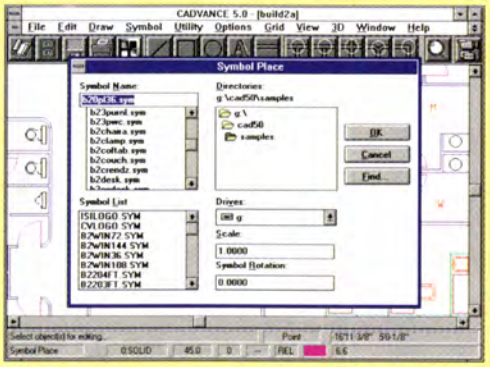
There's good control of symbol libraries, in the sense that you can place symbols anywhere in your computer or network. But you can't view them until you bring them into the drawing. One way to get to know new symbol libraries: print them out and create a "book" of them. Or, open a new window (on an unused layer), and import the symbol to it before moving to the main drawing. Symbols from older versions of Cadvance can be translated (the documentation says one at a time, but you can use the DOS wildcard SYM for the old symbols and just specify the path without wildcard for the new ones) using a DOS utility included with the package.

There are about two dozen file types thrown off by the system—enough to drive network managers a bit crazy. But the variety seems unavoidable. You can save drawing defaults in any number of "INI" files, for instance. Dimension settings are in DIM files, macros in CBL, CBX, or CBN, digitizer menu templates in DTF, and so forth.

Cadvance 5.0 is one of a growing number of packages that can pick up an AutoCAD DWG file directly, without DXF translation. The system is not absolutely foolproof, because some entity types in DWG are not supported by Cadvance, and polylines may

Cadvance summary

Equipment required: IBM PC or compatible with 80386SX or higher CPU, VGA monitor (800x600 recommended, to see all on-screen data cues), Windows 3.0 or higher in enhanced mode (Windows 3.1, the current version as of January 1993) strongly recommended), 4 MB of random-access memory (8 MB or more strongly recommended), mouse or digitizer (the mouse is fine). Coprocessor recommended by not required on computers with 80386 CPU chips or equivalent. Full installation, including bonus files, requires 9 MB of fixed disk space. Supports any devices supported by Windows itself, including voice input and output, digitizers, printers, plotters, and high-resolution displays.
Vendor: Isicad, Inc., 1920 West Corporate Way, P. O. Box 61022, Anaheim, Calif. 92803-6122, 714/533-8910, fax 714/533-8642. $1,995 includes unlimited telephone (toll-free), fax or CompuServe support. Competitive upgrades are $395; includes support.
Manuals: Good. There are two large paperbacks. They contain an architect-oriented tutorial, guide to 3-D, guide to accessing external databases (for creating bills of materials and so forth), and a reference to the "BASIC-like" macro language.
Ease-of-use: Good. All the Windows bells and whistles are included, it seems. Despite that, Cadvance is reasonably nimble. As with any feature-laden Windows software, we recommend plenty of memory and a fast computer. Our standard review computer, a 486-equipped machine with 16 MB of RAM



You can't view a symbol from the extensive library before placing it, but you can scale or rotate it. Symbols can be 2-D or 3-D. Note horizontal tool bar near top of screen.

Drafix Windows CAD 2.10

not keep their resolutions. The translator is licensed from Sirlin Computer; it reads files from AutoCAD 9 through 12, and saves to AutoCAD 11.

There's complete control of the clipboard, too—it picks up objects as a bitmap or Windows metafile (with some vector information), as well as in Cadvance's own 2-D/3-D format. And, OLE links can ride along, too. The 3-D objects can be pasted into a 2-D drawing for quick display and faster printing. You can create macros simply by "recording" a task and saving the result.

All in all, a fine successor to Cadvance 4.0, the DOS version. Even large practices should find it worthy. It is perhaps more production-oriented than "creative" oriented—in the sense that you will probably want to work mainly in 2-D rather than to move 3-D blocks around. But once the work is done, you will find it easier than with most—if not all—DOS software to move your design into an on-screen or printed presentation.
Circle number **303**

running at 33 MHz, ran Cadvance easily. Such a computer with large fixed disk and 1024x768 non-interlaced color monitor should cost under $4,000 these days. A 16 MHz 386SX with 4 MB (2 MB available to Windows) and a coprocessor (about $1,200 at current prices), was sluggish. But freeing up another 4 MB improved speed dramatically.
Error-trapping: Good. There's an "undraw" function that deletes objects in the order you draw them. But beware: Bad office practices can get you into trouble because the program is so flexible, you can edit a drawing while it is being referenced by someone else on a network, for instance. The cure is to frequently update ("regen") files you are referencing, if you believe someone else is changing them. You can also set the system to update linked files manually—and then forget to do so. The macro system is quite stable and error-aware; you can't read and write to the same macro, for instance.

Be careful about adding attributes all at once, through a database. When you do, a dialog box opens; once you choose the database to link, you can't change it. ■

This full-featured 2-D package has a long pedigree and features that make it a good choice for production drafting. Foresight Resources was the first software firm into the Windows CAD market, in 1989. This version, released this fall, supports Windows 3.1 TrueType fonts, has a better help system, more speed, and more flexible printing options.

Despite its low price, Windows CAD 2.10 includes sophisticated symbols handling (you can view symbols before they are brought up), associative dimensioning, a good internal database, and good file translation (although AutoCAD is via imperfect DXF only).

The clipboard allows export as Windows metafiles as well as bitmaps. There's import and export of files from Drafix CAD Ultra and HPGL format, as well as IGES.

There's no OLE, but the package's attribute files can be exported to Excel spreadsheets, database software (as comma separated variables) or as fixed-field-length ASCII.

The Windows pulldown menus are supplemented with a toolbar and user-defined tool buttons (the equivalent of a custom tool bar). Much of the "dialog" that might otherwise take place in dialog boxes can take place in a horizontal "edit bar" above the window.

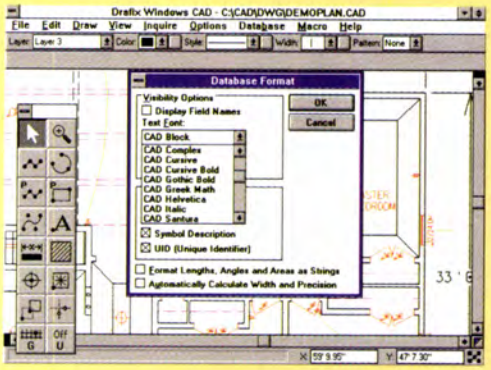
The full Windows viewing flexibility is not implemented; you can split the screen into two or four panes, but you can't overlap views.

Note that Windows CAD 2.1 appeared at the same time as the DOS Drafix CAD Ultra 4.2. Some Ultra add-ons (the landscape symbols library or architectural symbols libraries, at $150 each) are compatible with both packages. But raster-to-vector Drafix CAD Overlay is not.

Consider Drafix Windows CAD when you do not expect to be exchanging files often with other CAD packages, and where OLE and 3-D are not required. It's about the best Windows package around for older computers, too. Given the company's track record, expect continuing improvements over time.
Circle number **304**

Drafix Windows summary

Equipment required: IBM PC or compatible with 80286 CPU or higher (at least 80386 recommended), 2 MB of Windows memory (either in RAM or in a disk swap file; 4 MB of RAM recommended), Windows 3.0 or higher running in standard or enhanced mode (Windows 3.1 in enhanced mode strongly preferred). Math coprocessor strongly recommended.
Vendor: Foresight Resources Corp., 10725 Ambassador Dr., Kansas City, Mo. 64153. 816/891-1040; fax 816/891-8018. $695; Upgrade from Drafix CAD Ultra 3.0 and later is $145; from version 2.0 of Windows version, $45.
Manuals: One excellent 568-page paperback with tutorial and reference section. Command summary sheet and short summary printed on mouse pad.
Ease-of-use: Good. You can set startup preferences in an INI file; if you want more than one set of preferences, you enter them into a file with no drawing in it, and use the empty file as a template. Closing a dialog box after changing an option usually forces a time-consuming drawing regeneration.
Error-trapping: Good. There's an undo. ■



The internal database works fine; it is flexible in format, and can export files to other software—but not dynamically—as you change the drawing or change the external file.

Following the Sun

In the land of the midnight sun, Finnish architects take natural light seriously.

Valokuvaamo Jussy Tianinen

An angled skylight animates the interior of the new Rovaniemi airport.

Clifford A. Pearson

A glass-enclosed atrium creates an indoor street at Technocent in Oulu.

Clifford A. Pearson

New phone booths in Helsinki are Modern pavilions set in the urban landscape.

The First Law of Eco-Dynamics might read something like this: The scarcer a resource, the more fiercely it is coveted. So it is not surprising to find pools of water and bubbling fountains at the heart of hot-climate landmarks such as the Alhambra in Granada, Spain, and the work of Luis Barragán in Mexico. Nor is it strange that the Finns, whose territory extends into the Arctic Circle, worship the sun.

What *is* remarkable is the sophisticated way in which Finnish architects have been able to manipulate sunlight within a Modernist esthetic, marrying the natural to the artificial. A recent tour of Finland reminded me how much designers in sun-rich countries such as the United States take this resource for granted.

A master shows the way

As with other aspects of Finnish architecture, Alvar Aalto set an example for later generations, with his uncanny ability to exploit natural light as a powerful design element. From his tuberculosis sanatorium in Paimio, built between 1929 and 1933, to his Säynätsalo town hall in the early 1950s, Aalto showed how versatile an element sunlight could be—slashing through deeply set ribbons of glazing, cascading through clerestory windows, or washing over interior surfaces.

One of the more imaginative uses of light in recent Scandinavian architecture is at the new airport in Rovaniemi, the northern-most city in Finland, where the sun disappears for months each winter and, according to tourist brochures, Santa Claus resides. Designed by Mikko Heikkinen and Markku Komonen, the terminal is a sharply detailed structure whose roof and entry canopy are suspended from cable towers. Sweeping through the roof is a dramatic skylight that marks the location of the Arctic Circle. As it slices through the rectangular terminal at an angle determined by the earth's latitude and longitude—rather than the building's grid—the skylight serves as a welcome intrusion that adds a strong sense of movement to what could have been a static space. Not just a symbolic gesture to polar geography, the skylight helps bring the building's interior to life.

Heikkinen and Komonen are two architects to watch. Although their Finnish Science Center just outside Helsinki is a somewhat awkward set of Gehryesque forms, their designs for the Rovaniemi airport, as well as a school for rescue operations in Kuopio and the new Finnish embassy in Washington (now under construction) show a bold attempt to combine clean Modern forms and the latest technology with a sensitivity to the natural setting.

Light that softens edges

A similar set of concerns marks the work of Juha Leiviska, but with different results. While Leiviska shares with Heikkinen and Komonen an interest in pulling the outdoors into the center of his work, his buildings use natural light to soften edges and impart an almost spiritual quality. His Männistö church, now nearing completion, promises to be an enticing place for spiritual contemplation—with sunlight filtering through tall, narrow openings and creeping inside in an indirect, mystical way. His design for the new German embassy, now being built in Helsinki, takes full advantage of its irregular site, zigzagging to capture the best views and light.

In the city of Oulu, about three-quarters of the way between Helsinki and the Arctic Circle, architects Tuomo and Heli Juola have been designing all-steel buildings that belie the material's reputation as cold and impersonal. A recent structure, the three-story research and development building called

Vieux Montréal

A long-awaited exhibit and book on the planning and design of Montreal, created by Phyllis Lambert, are lessons in urban scholarship not only for Montreal but for other cities. They achieve that status through intensive research into power and politics as generators of urban form.

Lambert is heir to a distillery fortune, sponsor of the Seagram Building in New York, and founder of the Canadian Centre for Architecture in Montreal. Her exhibit, "Opening the Gates of 18th Century Montreal," the result of 15 years of research, recently closed at the C. C. A., but will continue to have an impact on the architectural profession through its catalog, distributed by The MIT Press (1993, 93 pages, $16). By means of some 400 objects—letters, maps, portraits, drawings, deeds, models, military orders, computer simulations, specifications for fortifications—the exhibit uncovered the sources that shaped today's Montreal.

Lambert and her co-curator/co-author, Alan Stewart, pay due heed to such physical formmakers as geography, the early placement of gates and ramparts, and prevailing architectural styles in the past. But they go beyond these to suggest and document ways in which Montreal was also shaped by forgotten patterns of land proprietorship, by national trade routes, by decisions about troop locations, and much else. They distinguish too, the laws, customs, and mind-sets of France from those of Britain, which conquered Montreal in 1760. They argue that the English overlaid a new, loose, picturesque city—a proto-Romantic, 18th-century ideal—onto a rule-bound, hierarchical, rigidly aligned French one.

Lambert scavenged the archives of Canada and France and uncovered an astonishing lode of rare documents. At one level, the exhibit can be enjoyed simply as a map-lover's paradise, an Eden of exquisitely hand-colored cartography.

The city in 3-D

Less convincing are the computer images. The Center for Landscape Research in Toronto, working off Lambert's database, created three-dimensional images of Montreal at various stages of its early history. Played on TV screens, these include bird's-eye swoops through the simulations, as if the city were being photographed from a helicopter. The images are mildly informative but too diagrammatic and crude to mean much. And they're nothing new: the Pentagon has done this kind of thing for years.

An important sideshow to any exhibit at the C. C. A. is the institution's own piece of architecture—its three-year-old building by Peter Rose [RECORD August 1989, pages 57-59]. A national AIA Honor Award winner, it's a brilliant work, handsomely detailed, yet nevertheless troubling because it's a villa in the city, aloofly withdrawn behind a barrier of lawns and fences from the very urban streetscape it celebrates.

Troubling too is the sculpture garden by Melvin Charney, a plaza filled with something very like tombstones, sculpted as abstract representations of local buildings or famous ones—virtually a reliquary of architecture. Is the Centre telling us that architecture is dead? That it's now something merely to be studied and museumized? *Robert Campbell*

Technocent, combines grey and white steel panels with a rusting Cor-Ten base and a steel space-frame atrium. By varying the color and orientation of the steel panels and sandwiching two office wings on either side of the sun-filled atrium, the architects give the building a sense of playfulness and warmth.

While the office atrium has become something of an architectural cliché, the Juolas are able to make it come alive. Brick paving, careful detailing, and interior windows give the atrium the feeling of an enclosed street—a place where office workers can enjoy lunch or casual conversation.

And like so many other Finnish architects, the Juolas skillfully manipulate sunlight—letting it flood into the atrium, but filtering it through perforated steel bent around stairwells and reducing its strength with suspended metal brise-soleils wrapped around the exterior.

Opening buildings to their settings

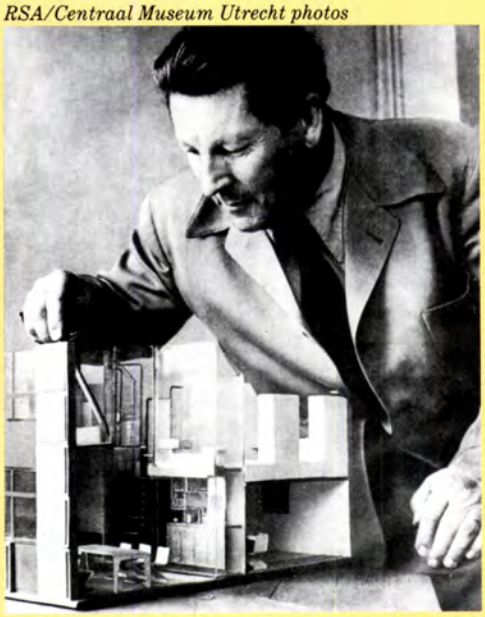
Implied in any discussion of light and architecture is the issue of transparency. While the Finns appreciate enclosed, protected spaces—especially their beloved saunas [RECORD, April 1992, pages 38-39]—they also seem to demand an architecture that opens up to its surroundings. Summer cottages set in the woods or around any body of water often feature at least one wall of glass that breaks down (at least visually) the separation between indoors and out.

An original example of rooms with a view are Helsinki's new telephone booths, designed by architect Juhani Pallasmaa. Modest additions to the urban landscape, the freestanding structures are carefully detailed glass pavilions that seem to hover just above the ground. With glass on four sides and slender metal framing, the booths are perhaps the ultimate in transparent enclosures.

Buildings often express different aspects of their personality, depending on the time of day and the progress of the earth around the sun. At the end of a temperate spring, Finnish architecture impresses with its ability to dance with light. *Clifford A. Pearson*

Beyond De Stijl

RSA/Centraal Museum Utrecht photos



Rietveld explored the idea of "core houses" designed around central stairwells.

Mention Gerrit Thomas Rietveld to a roomful of knowledgeable architects and everyone will have the same two images in mind: the Red-Blue Chair of 1918 and the cubist Rietveld-Schröder House of 1924. Like his colleagues J. J. P. Oud, Theo Van Doesburg, and Piet Mondrian, Rietveld became synonymous with De Stijl, the short-lived but influential movement in Dutch art and architecture in the 1920s.

A new exhibit, organized by the Central Museum in Rietveld's home town of Utrecht and the Rotterdam-based Dutch Architecture Institute, however, asserts that the architect/cabinetmaker's influence continued well beyond the demise of De Stijl. As it turns out, Rietveld, who was born in 1888, maintained an active practice almost until his death in 1964.

A comprehensive inventory

The exhibit, which will spend the summer at the Centre Pompidou in Paris and then probably go to New York, is the first major retrospective on Rietveld's work since 1958 (marking his 70th birthday) and the first to travel outside Holland. The real event, however, is publication of the catalog, the first complete inventory of his work. It contains 681 entries, including not only furniture and architecture, but also typography, urban planning schemes, and experiments with colors and materials.

One of the exhibition's tenets is that Rietveld's furniture and his architecture were tightly linked. He himself stated that the house he built for Truus Schröder was derived from the Red-Blue Chair and vice versa. "As an architect, you have to do a chair every now and then to see how far along you are," stated Rietveld.

From the 1930s on, both Rietveld's furniture and his buildings bear the mark of his fascination with mass production and standardization. These processes, he felt, would not only bring a modern way of life to the masses, but would also increase people's awareness of space and their surroundings.

To Rietveld, architecture went beyond the prosaic function of providing shelter; it included the demarcation of space. For example, his famous Zigzag Chair of 1932—a synthesis of form, function, and construction—does not enclose space, but rather defines it with its four planes.

While his De Stijl compatriots were known for their dogmatic attitudes to materials and colors—Van Doesburg and Mondrian, for example, fought bitterly over whether diagonal lines could be included in their art—Rietveld was more flexible in his ideas and his work. In fact, just before his death in 1964, he made a speech on receiving an honorary doctorate from the Technical University of Delft and speculated on an architecture of the future—one in which walls of brick and stone would be superseded by hydraulic, thermal, and acoustic innovations. While other De Stijl practitioners insisted on only things "modern," Rietveld felt that traditional materials such as wood and thatch were just as suited to his larger purpose as glass, steel, and concrete.

One of Rietveld's major preoccupations was with the "core house," in which functional spaces such as the kitchen, toilets, and bathrooms (preferably molded as a single piece) were concentrated around the stairwell in the center of the dwelling. He experimented endlessly with the industrial production of furniture. In the years following World War II, he also designed some 20 social housing projects, of which only six were built. Try as he might to design for the masses, Rietveld still found himself designing "one-off" buildings. A few of his post-war projects included the Dutch pavilion at the Venice Bienniale in 1958, a weaving mill in the Dutch town of Bergeyk, the press room in the Unesco building in Paris, a Foucault pendulum in the United Nations headquarters in New York, and the Van Gogh Museum in Amsterdam (completed in 1973, after his death).

In retrospect, Rietveld was ahead of his time; the kind of industrial patrons he hoped to attract were not yet alert to his ideas. In his own time, he was imprisoned in his own legend, shelved as a "spontaneous genius," a gifted tinkerer. With a wry sense of humor, he called himself "a pirate in the building business." This new exhibition and catalog, however, broaden our view of the man and his work. Rietveld now assumes pride of place as an architect and carpenter who wasn't searching for new rules, but for new possibilities. *Tracy Metz*

"Gerrit Rietveld, 1888-1964" is at the Centraal Museum in Utrecht until March 21. It travels to the Centre Pompidou in Paris, where it will be from June 23 to September 27. Although plans are not final, the exhibit is expected to come to New York in late 1993 or early 1994.

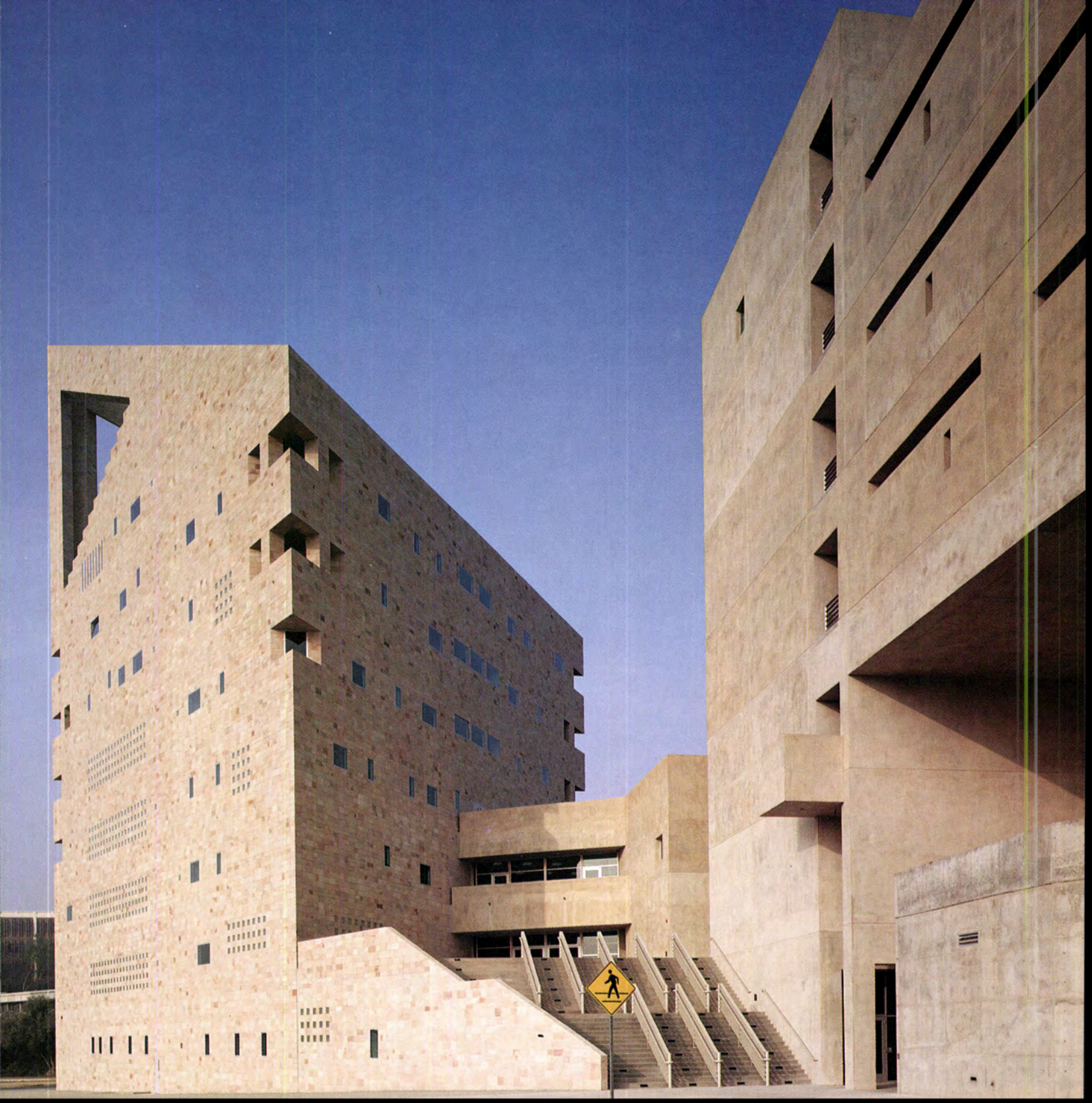
A bent laminated-wood chair shows what Rietveld did after De Stijl.

One of the challenges in writing this page, which introduces the design portfolio section, happens in months when there is no common theme to the projects. The late Paul Sachner was able on occasion to find threads that no one else saw until he pointed them out. But mostly, this very variety is what gives the section its character. To use Paul's words from last year's May issue: " . . . when RECORD elects to publish articles [as a design portfolio], it is with the deliberate intent to show how all works of architecture, despite wide variations in budget, usage, and style, somehow respect and even enhance the existing environment." Indeed, no building is too small (or too large, for that matter) to make it into the portfolio (not long ago we published a small church renovation which cost $10,000). This month opens with Antoine Predock's symbolic mixed-use academic building for The California Polytechnic University, Pomona (page 62), followed on page 70 by Europe's tallest building, Frankfurt's Messe Tower by Murphy/Jahn, and Schwartz/Silver's scrupulously detailed library for a small community near Boston (page 78). Starting on page 84, Santiago Calatrava brings off a technical tour de force with his soaring lobby for BCE Place, Toronto and, by way of contrast, James Cutler's Bloedel Education Center, near Seattle (page 92), is a loving memorial to Prentice Bloedel's wife, who is buried in the grounds. Building Types Study 702: Health-Care Facilities (page 98) reflects two trends—the exodus from inpatient to outpatient facilities; and separation of treatment from nontreatment functions—all designed to control the outrageous cost of medical care. *S. A. K.*

Magic Marker

A new classroom and administration building in Pomona, California is a symbolic gate for a growth-minded Polytechnic.

Classroom/Laboratory/
Administration Building
The California Polytechnic University
Pomona, California
Antoine Predock Architect



© *Timothy Hursley photos*

Seen from the freeway, the CLA building is an artificial mountain whose tip is carved out as a "sky viewing room" (currently unfinished) from which students and faculty can watch airplanes as they approach the Los Angeles airport in the distance. From the vast parking lot in front, the building rises like a modern academic castle.

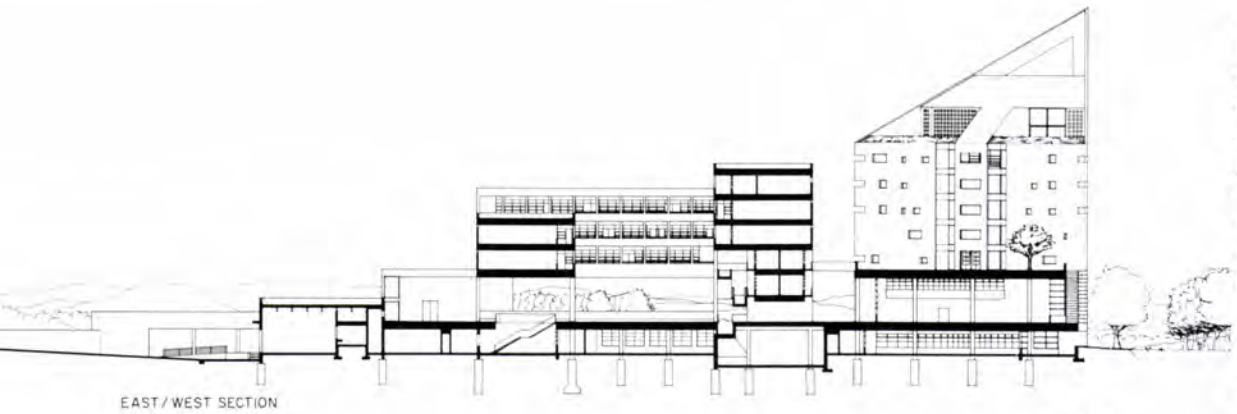
Most people don't know much about the California Polytechnic University at Pomona. "We've been an oasis in Los Angeles, but an unknown one. Those days are over now, thanks to this building," says associate vice president Chris Christofferson. The building that is putting this former agricultural college on the map is the Classroom/Laboratory/Administration (CLA) building, a 183,000-square-foot hybrid designed by Albuquerque-based architect Antoine Predock. The building's sheer size—it's the largest on campus—would make it noteworthy. What's more, Predock and his client intended the structure to be more than just a utilitarian box. "We wanted a building that was a symbol of our transformation from an 'ag school' into a true polytechnic—and we got it. This building stands for a new age," explains Dean Marvin Malecha of the University's School of Environmental Design.

It was Malecha who initiated the idea of holding a competition for the building. He convinced then-president Hugh O. La Bounty that Pomona needed a "gateway" instead of just another piece added to the jumbled and decentralized campus that had grown on this former ranch 40 miles east of downtown Los Angeles. Predock won the competition (beating out The Architects Collaborative and Ricardo Legoretta) because, as Christofferson puts it, "he took what we said about portals and markers figuratively, not literally." Predock responded to the site, located at the edge of a parking lot and the foot of a ridge, by creating a tower that can be seen from the three freeways that intersect at the campus' edge. Having made the building visible, he then split the program's major requirements between two forms. A tower rises from a base of student services to administrative offices, while a donut-shaped building next to it houses the classrooms and computer laboratories.

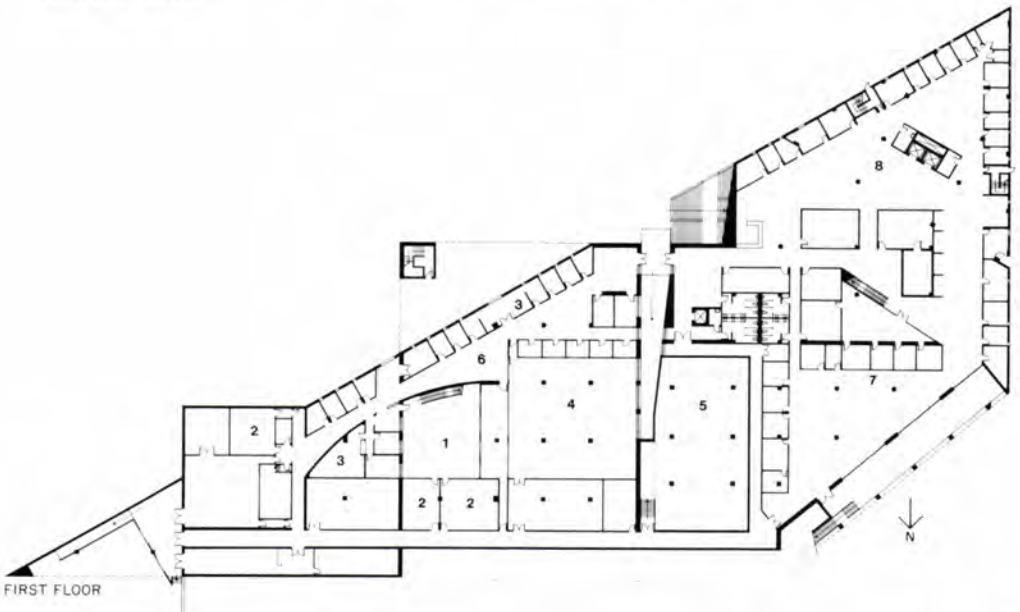
"I did not want to fragment the building for the sake of fragmentation. I wanted it to come apart organically into its natural components," Predock explains of the composition. "The whole building is a threshold: between the desert to the east and the Mediterranean quality of L. A. to the west, between the valley and the university, between the parking and the hills, between the enclosed garden behind the site and the expansive view down the slope. That sense of boundary is repeated at a smaller scale to distinguish functional pieces." The result is a layering of doorways, paths, outdoor courtyards, rooftop gardens, bridges, balconies, and "paseos" (walkways) that mimic paths once existing on the site.

What ties the building together "is a concern for the landscape," in Predock's words. The overall organization echoes the silhouette of the nearby San Bernadino Mountains, while the plaza offers framed views of the valley from underneath the classroom building. Structurally, the triangular shape of the tower requires fewer moment connections to strengthen it against earthquakes, while the classroom building is supported in part by a 100-foot Vierendeel truss. Large windows are screened by colonnades, leaving only small view slots facing direct sun. The open classroom building allows for natural cross-ventilation. It incorporates stepped lighting controls and motion sensors that turn lights off when a room is unoccupied.

Seen from across the campus or the valley, the tower rises up like a machined canyon wall set against the spiraling stack of classrooms. Up close, it's a progression of geometrically posed blocks that dance around you as you find your way through the building. It is monumental, purposely complicated, and hard to ignore. "People either love it or hate it," admits Christofferson; "There's no in between. And that is exactly what we wanted." *Aaron Betsky*

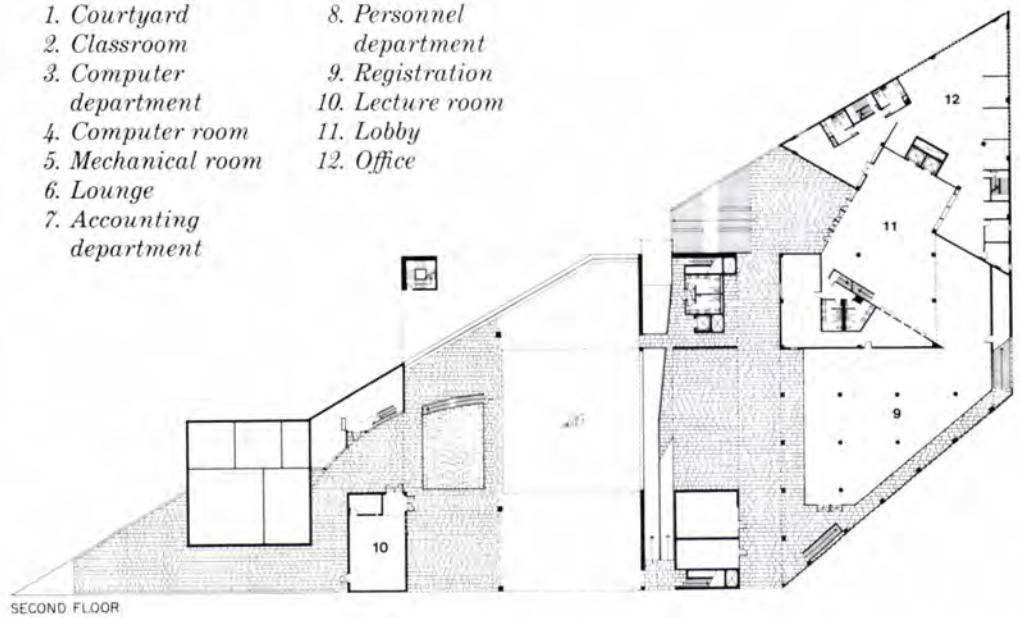


EAST/WEST SECTION



FIRST FLOOR

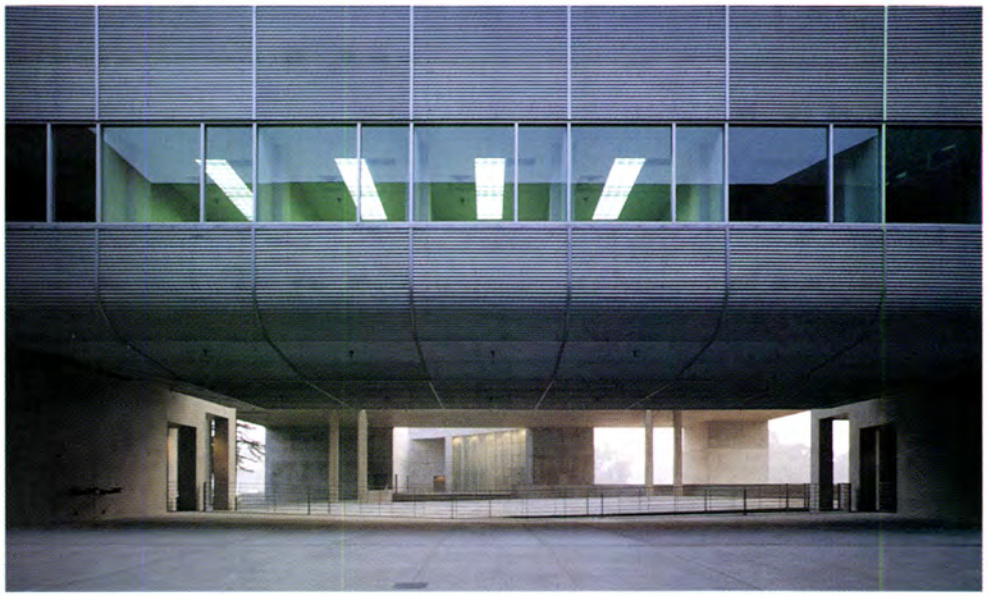
1. *Courtyard*
2. *Classroom*
3. *Computer department*
4. *Computer room*
5. *Mechanical room*
6. *Lounge*
7. *Accounting department*
8. *Personnel department*
9. *Registration*
10. *Lecture room*
11. *Lobby*
12. *Office*

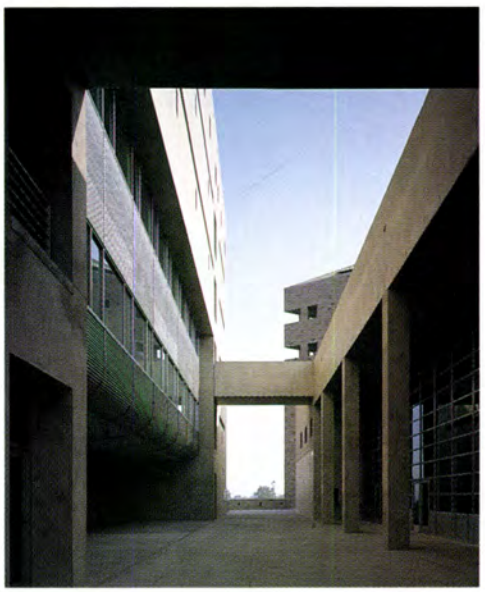


SECOND FLOOR

Plans reveal the underlying logic of the CLA Building. Predock filled out the triangular site and then carved out courtyards. Computers and equipment take up much of the concrete base, except for a financial-aid area in the northwest corner, where students can wait either in a two-story space or by an existing duck pond outside. Most student services are located on the ceremonial plinth (bottom), where a courtyard provides room for outdoor queuing. A second courtyard, separated from the reddish sandstone administration building by a "paseo," is the base for the classroom building, which is clad in tinted-glass fiber-reinforced concrete. Here, a large lecture hall seems to hold up one corner of the building (opposite top). A lower courtyard provides entry to the base. Additional courtyards on the roof of the administration building and the sixth floor of the classroom building overlook the campus.

By opening up the structure, Predock allowed both paths and cooling breezes to criss-cross the building. Predock's interest in movement and rhythm extends to the placement of different-sized windows, with passive solar-heating in mind. Clerestory slots light computer laboratories, while well-placed small windows force workers to temporarily "leave the computer to admire the view," according to Predock. Larger windows mainly face interior courtyards, where they are shaded by arcades. "This is one of the most energy-efficient buildings in the state, and all of this at $110 a square foot," says California State University architect Will Nighswonger.





Budget cuts during construction limited interior finishes. The "inner wrapper" of the classroom building is composition board and extruded aluminum window walls (middle), while a "bustle" of offices is corrugated metal (top). "We rolled the dice as far as costs," says Christofferson, admitting that the $25-million building stretched their financial abilities, "but how can you put a price on that valley view underneath the clear span?"

Credits

Classroom/Laboratory/ Administration Building
The California Polytechnic University, Pomona, California
Owner: *The California State University—Will Nighswonger, State University Architect; George Owen, Construction Manager*
Architect: *Antoine Predock Architect—Antoine Predock, principal-in-charge; Cameron Erdmann and W. Anthony Evanko, project architects; John Bass and Phyllis Cece, job captains; Curtis Scharfenaker, project manager; Geoffrey Beebe, Jon Anderson, Kevin Spence, Jean Pike, Jim Visscher, Hadrian Predock, Dorothy Pierson, Eileen Devereaux, Keith Robertson, Daniel Andrade, Geoffrey Adams, Rebecca Riden, Samuel Sterling, Chris Calott, David Nelson, Rebecca Ingram, John Fleming, Mischa Farrell, Paul Gonzales, Mark Donahue, Brett Oaks, Christopher Stacecki, Jennifer Jardine, Geoffrey Adams, Jeffrey Wren, Jorge Burbano, Robb Romero, and Douglas Friend, team*
Consulting Architect: *Gensler & Associates*
Engineers: *Robin E. Parke Associates (structural); Timmerman Evans Schrieber (mechanical/electrical/ plumbing); Chavez Grieves Consulting (civil); William C. Kelley (specifications)*
Contractor: *HuntCor, Inc.*
Manufacturer Sources:
See Contents page

Frankfurt Campanile

Messeturm (Messe Tower)
Frankfurt, Germany
Murphy/Jahn, Architects

Opposite: the Messeturm ensemble, covering the eastern third of the Frankfurt fairgrounds. The ensemble includes: Hall Number 1, with its 265-foot roof span and, banded in white, the 33-foot-wide access corridors; the steel and glass "city" entrance pavilion with its pyramidal roof visible behind the 1909 Festhalle (foreground) and echoing that of the actual Messe-tower. Total cost: DM 500 million (about $305 million). In typical fashion, Helmut Jahn drew large numbers of soft-tip-pen sketches, such as the one above, to explore massing and scale.

Since its completion in September 1990, Murphy/Jahn's Messeturm has become for Frankfurt what the Eiffel Tower is for Paris—nearly. Helmut Jahn describes this freestanding 63-story 845-foot office tower, the tallest in Europe, as "a glass cylinder penetrating a stone shaft," supported by a 65-foot-tall square base. The building's articulation in base, shaft, and capital harks back to the prototype American skyscrapers of the 1920s, with horizontal aluminum bands adding a Postmodernist scent of Art Deco. This synthesis of old and new, Jahn states, was an act of conscious opposition to the spate of office towers in the impersonal '50s that populate most of Frankfurt's business district (opposite).

In place of the soft and therefore vulnerable red sandstone traditionally used for major public buildings in Frankfurt, Murphy/Jahn used a red granite in alternating honed panels and flamed strips. Windows and stone panels were mounted in aluminum frames and then hoisted into place as prefab units, a novelty in German building practice, says Murphy/Jahn's local partner Raimund Schock.

The square base was given a visual sense of substance and depth by sheathing it in convex lengths of polished granite that suggest pilasters. The base's windows with their dotted enameled coating are an elegant disguise for emergency exits, storage, and security. The tall circular lobby, paved with polished granite and enclosed by butted glass, emphasizes the transparency of the tower at street level and allows the eye to rove freely over the building's surroundings.

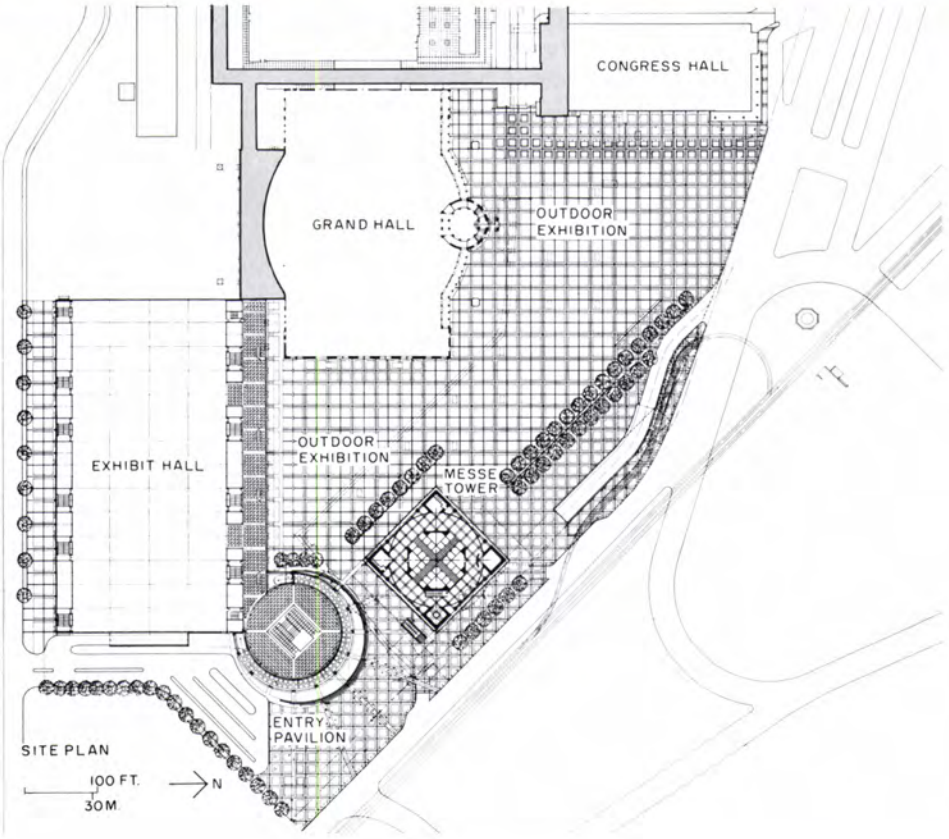
German workingplace guidelines decree that all employees have access to daylight. But rather than the usual configuration of a slab with a corridor in the middle and offices on both sides, the Messe was determined to have a tower. The 24 elevators are therefore concentrated in the octagonal core, with the offices ranged around the rim. This, in conjunction with the shaft's notched facade, has resulted in some awkward corners in the floor plan. Thirty percent of the building is still unlet but, in spite of the impending glut of office space in Frankfurt, developer TishmanSpeyer, which took over the project after a German developer had worked fruitlessly for two years to fill it, is not worried. The company cites the building's high service level, such as operable air conditioning, optional upgrading of interior finishings (carpet, lighting, doorknobs) prior to occupancy, two floors of underground parking space directly connected to the building and—in two or three years' time—a pedestrian tunnel to the subway station.

The Messeturm is actually but one element in a deftly composed three-part urban ensemble—all based on the pure geometric forms of square, pyramid, cylinder, and circle—that also includes a generously proportioned white entrance pavilion and the adjoining Hall Number 1, with its clear span of 260 feet.

As Schock points out, a conscious effort is made to acknowledge the ensemble's context, chiefly the neighboring landmarked Festhalle, by means of the open arcade around the pavilion and its glazed counterpart spanning the front of Hall 1. Only at the back of the Hall, along a derelict road destined to become a four-lane link to the freeway, is the Hall's actual facade visible.

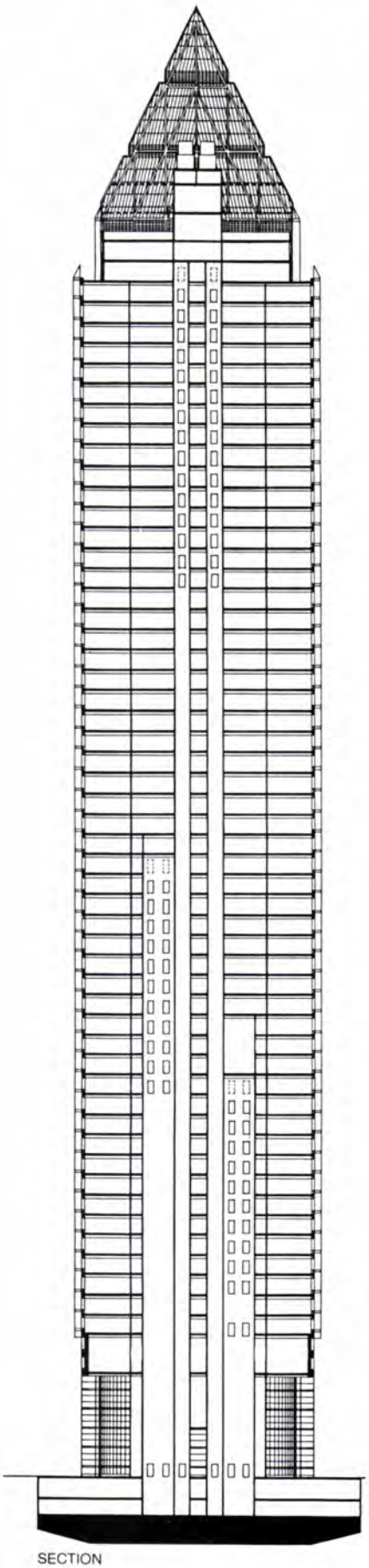
The finishing connective urban touch is the "piazza," paved in white squares bounded by red bands (following page). Jahn himself, never one for understating his case, draws a parallel between the Messeturm ensemble in all its "modern monumentality" and St. Mark's Square in Venice. *Tracy Metz*

Roland Halbe photos

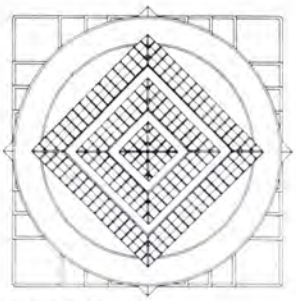

CONGRESS HALL
GRAND HALL
OUTDOOR EXHIBITION
EXHIBIT HALL
OUTDOOR EXHIBITION
MESSE TOWER
ENTRY PAVILION
SITE PLAN
100 FT.
30M.
N

The landmarked Festhalle (below), built by Von Thiersch in 1909 and the oldest building on the fairgrounds, is decorated with the red Main sandstone traditionally used for Frankfurt's representative buildings. With an eye to modern-day corrosives, Murphy/Jahn chose a more resistant but contextual material: flamed and honed red granite. The triple-deck pyramid (top right) capping the Messeturm, its outlines etched in light at night, houses air-conditioning installations. The structure brings the tower up to 845 feet, making it Europe's tallest office building, particularly significant to Jahn, for whom it represents his return as prodigal son to his native country.

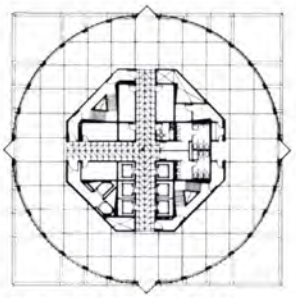
In the glass circle circumscribing the lobby, the tower's main entrance (bottom right) is announced by a canopy of butted glass resting on steel supports, an ever-so-slightly Art Deco touch. For security reasons the Deutsches Bundesbank has exclusive access to a separate entrance and elevators.



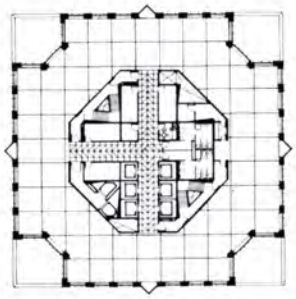
SECTION



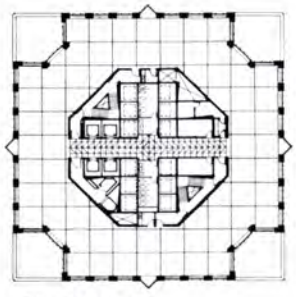
ROOF PLAN



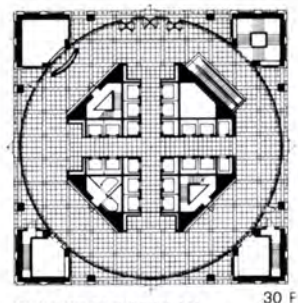
HIGH-RISE CYLINDER PLAN



HIGH-RISE PLAN



LOW-RISE PLAN

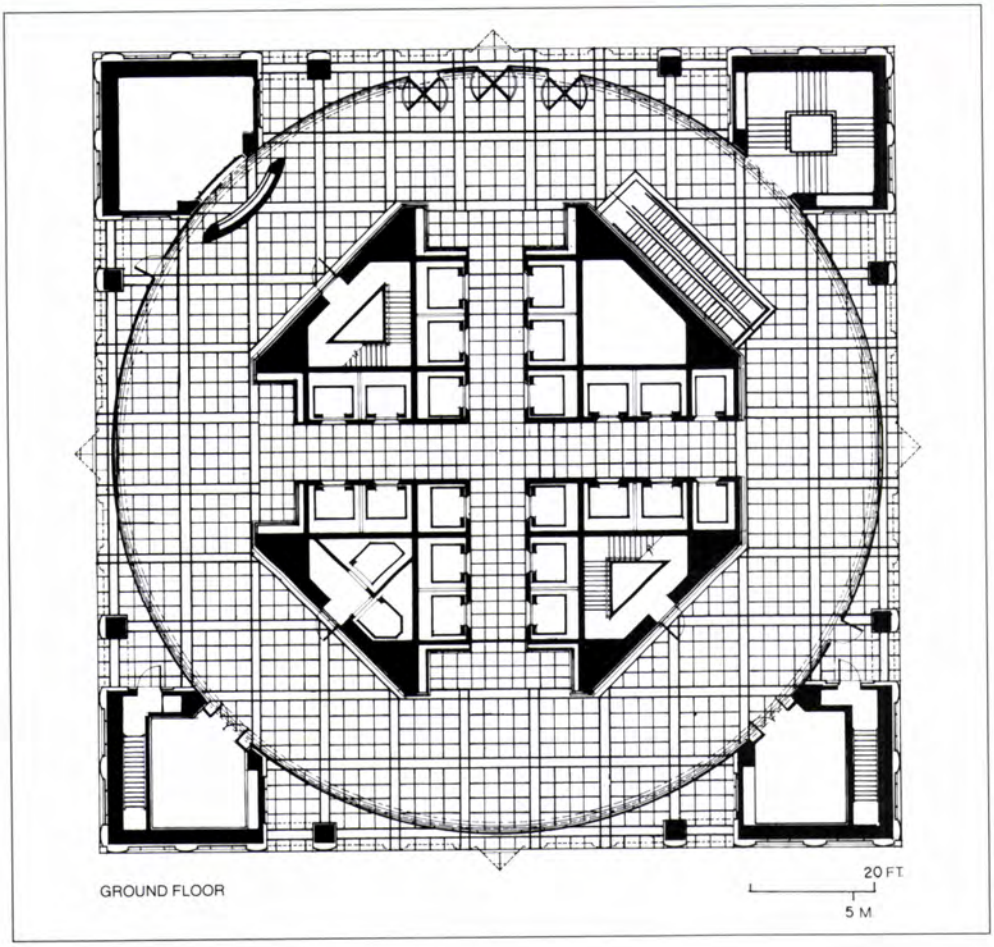


GROUND FLOOR PLAN

30 FT
10 M

The octagonal core accommodates 20 elevators serving four different office levels, plus two each for freight and the tenth-floor restaurant. The cylinder, sprouting from flat stepped gables on four sides, rests on a larger square base. Two underground levels provide 900 parking slots for the tower's tenants.

Cross sections (from top to bottom): the pyramid (a shape recurring in the roof of the entrance pavilion and even in the tower's elevators); the upper floors of the cylinder; the middle and lower zones; and the ground floor with its circular glazed lobby. The cladding, convex strips of polished red granite evoking pilasters, projects a sense of solidity at the base, while the aluminum strips add a Deco touch. The rest of the tower is sheathed in panels and strips of honed and flamed red granite, mounted in aluminum frames and secured to the concrete structure as prefab panels.



Four banks of elevators (top), each providing access to a different section of the tower, form an octagon in its core. The aisles between them, and the clear glazing of the round lobby, bring daylight into the heart of the ground floor and make for unhindered visual contact with the surroundings. Ground floor plan (below): the shaft, with offices arranged around the perimeter of the elevator core, penetrates a square base. The corners, discreetly screened from public scrutiny by ceramic-frit panes, accommodate building security, emergency exits, lobby maintenance, and storage. The lobby itself, paved in a bold geometrical pattern of mirror-polished red and white granite and enclosed by a circle of butted glass panels, is entirely empty, except for the reception desk, the burnished steel elevators and stairs, and an escalator providing access to the underground parking.

Credits

Messe Tower
Frankfurt, Germany
Developer: *TishmanSpeyer Properties*
Architect: *Murphy/Jahn—Helmut Jahn, Rainer Schildknecht, Raimund Schoeck, Lothar Pascher, Sam Scaccia, Steven Cook, Dieter Zabel, Mark Frisch, Stephen Kern, Steven Nilles, project team*
Engineers: *Dr. Ing. Fritz Noetzold (structural); Brendel Ingenieure (mechanical, plumbing, and fire protection); Ebener & Partner (electrical).*
Consultants to TishmanSpeyer: *Office of Irwin Cantor; Jaros Baum & Bolles.*
Consultants: *Dipl. Ing. Walther Pieckert (wind analysis); Rowan, Williams, Davies and Irwin, Inc.; Jaros Baum & Bolles (vertical transportation)*

Frame for Reference

A library/senior center offered Schwartz/Silver Architects new fields of expression for traditional wood-frame construction.

Hanson Library and Senior Center
Hanson, Massachusetts
Schwartz/Silver Architects

A small town between Boston and Cape Cod, Hanson has little in the way of civic architecture. Blink on your way through the town of 8,500 and you'll miss the Citgo station and convenience store. To rectify this situation, Hanson hired Schwartz/Silver Architects to design a library/senior center that would contribute to the public realm. Because he lives nearby, principal-in-charge Robert Miklos remembered the town's history as a popular resort in the 1920s and the legacy of summer camps built at that time. "They're simple timber buildings with wrap-around porches, octagonal projections, and trees for columns," says Miklos.

Like the old camp structures, the new 12,000-square-foot library/senior center establishes an identity based on its straightforward stick construction. "This is a blue-collar town," says Miklos, "and we felt this building should be unpretentious, modest." The result is a low-slung brick-and-wood building with a casual Arts-and-Crafts feeling.

Although combining a library with a senior center may not be the most common mix of uses, it brought support from two different constituencies that don't always agree on how town funds should be spent. In the process, it re-established a link between elders and learning that most traditional societies accept as natural. But the architects soon discovered that while seniors and children could certainly contribute to each other's well-being, they also had separate needs. Schwartz/Silver therefore developed an L-shaped plan in which the senior center is perpendicular to the library and has a more residential character. Linking the two facilities are a common lobby and a shared 1,200-square-foot community room.

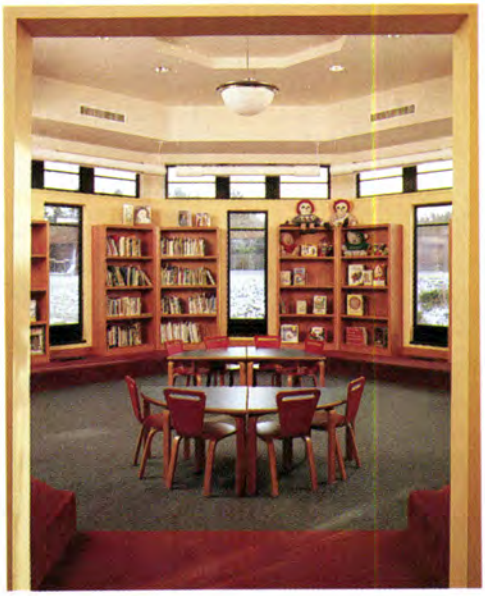
A long narrow site with zoning setbacks forced the architects to take a linear approach, stretching the library component eight bays long. Each bay accommodates three stacks of books, which must be separated by at least three feet for wheelchair access. The resulting 14-foot-8-inch bay became the organizing module for the building's hallmark wooden frame, which is fully exposed on the inside. Southern yellow-pine posts eight inches square support 2-by-4 and 2-by-6 beams and rafters. Holding the frame together are field-assembled wooden trusses and slender metal cross wires. The steady rhythm of the handsome frame gives the library interior a strong sense of balance and proportion.

While most libraries place book stacks in the center of the floor and reading areas around the perimeter, Miklos took a different tack. By creating a double-height reading room that forms a kind of nave and placing stacks in single-height aisles on either side, the architect was able to design an efficient plan that reduces mechanical and sprinkler runs in shelf areas. The extra height in the nave is exploited for clerestory windows that flood the reading room with natural light. The design also provides a passive solar benefit in spring and fall: hot air collects up high and then is sent down by paddle fans. In winter, a gas-fired furnace heats the library.

Two special areas—a children's reading room and a historical collection room—were pulled beyond the envelope of the nave. The octagonal children's area recalls the projecting towers of the town's summer camps and serves as a pleasant foil to the building's grid, while the rectangular history room terminates the library's main axis. Inside and out, the architects layered their design—adding simple planes of drywall and a reserved palette of colors to the interiors and an 8-foot-high veneer of brick on the exterior. Overhanging roofs and bands of clerestory windows tie the building to its flat site like a municipal prairie house. *Clifford A. Pearson*

The building's wood frame (seen during construction, above) is exposed on the inside (following pages), but asserts itself in a less direct way on the exterior. Clad with brick and wood planking, the wood structure seems to emerge from a masonry base on the outside and become lighter as it rises (opposite). Only 3,500 square feet, the senior center (top, opposite) has a more residential character to it—most apparent in its chimney. The entrance to the building (bottom, opposite) is marked by a covered walkway whose post-and-beam construction recalls Arts-and-Crafts houses.

1



2

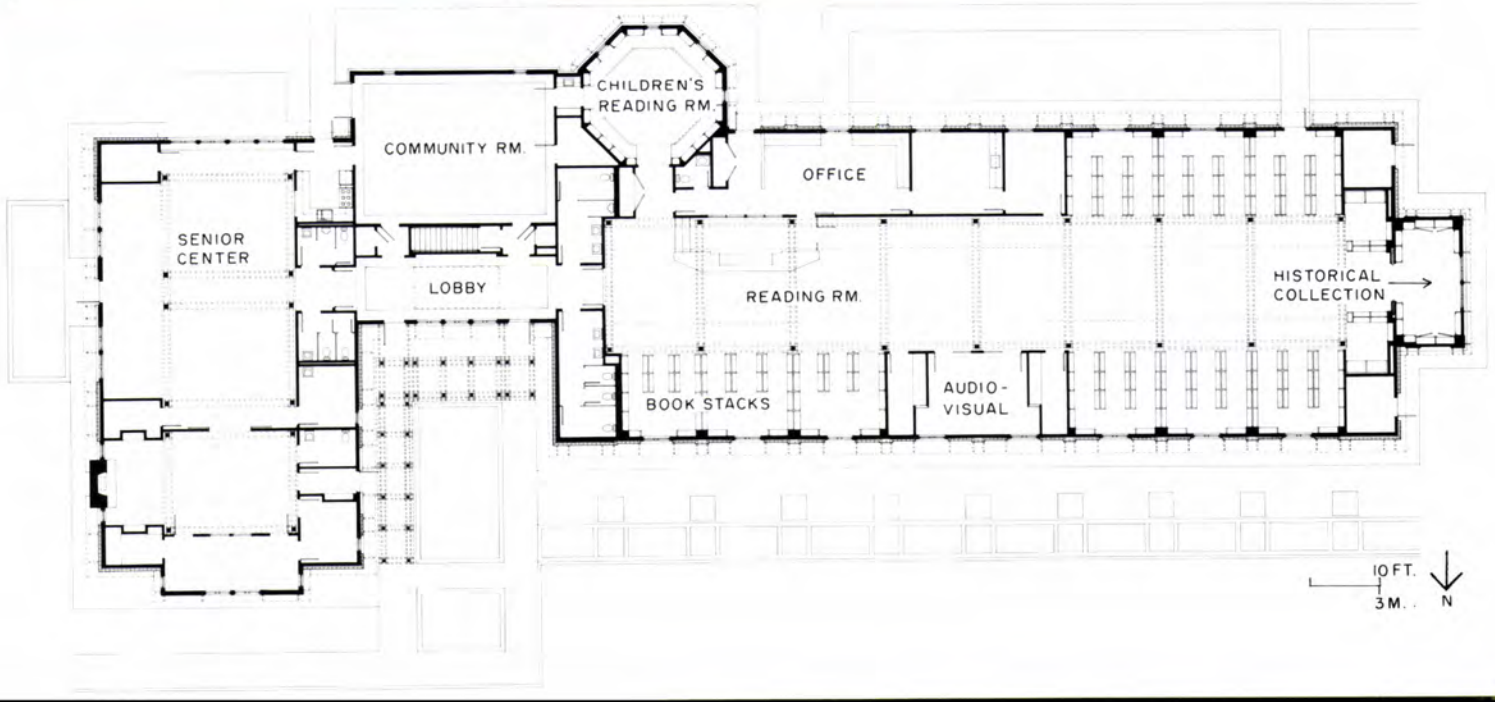
3

4

Interiors of both the library and senior center highlight the exposed wood frame. In the library, the frame defines bays 14 feet 8 inches wide that can be either open for book stacks or enclosed for audio-visual or study rooms (opposite). Projecting out from the main body of the library are two special-activities rooms: an octagonal children's reading room (2) and a historical documents room (3). While the library stresses the linear nature of the building (4), the senior center (1) has a more residential quality.

Credits

Hanson Library and Senior Center
Hanson, Massachusetts
Owner: *Town of Hanson*
Architect: *Schwartz/Silver Architects—Robert J. Miklos, principal-in-charge; David Stern, project architect; Leo Chow, James McQueen, Randolph Meiklejohn, Paul Rovinelli, design team*
Engineers: *Charles Chaloff Consulting Engineers (structural); Architectural Engineers (mechanical/electrical); Steinbeck & Taylor (civil)*
General Contractor: *Travi Construction*
Manufacturer Sources:
See Contents page




EXIT
SPAIN
AMERICA

Steel Connection

Galleria and Heritage Square
BCE Place
Toronto, Ontario
Santiago Calatrava with
Bregman + Hamann Architects

Robert Burley/Design Archive photos

Although only the facades of 12 low-scale brick warehouses were preserved on the northern perimeter, the complex is anchored on the southeast by the 1885 Bank of Montreal, which is being restored as Canada's national hockey museum (top). Projecting forward from its main entrance on Bay Street (middle), the Galleria contrasts sharply with office towers. Inside, facing the entrance (opposite), the Galleria's steel trees touch down atop a historic former bank reassembled on site as office space. BCE's mix of forms is again visible as the Galleria lets out onto artist Scott Burton's Garden Court (bottom).

A jumbled city block of new speculative skyscrapers, infill structures, and 19th-century commercial buildings in downtown Toronto is the setting for Santiago Calatrava's soaring steel Galleria and Heritage Square, the result of a percent-for-art competition and the Spanish architect and engineer's first completed project in North America. The glass-covered atrium bisects BCE Place, a 5.4-acre mixed-use complex, linking building lobbies and creating a retail and restaurant concourse with access to the city's underground transit concourse one flight below. The Galleria fans out for 350 feet from its entry between two new office towers of some 50 stories, presenting an allée of white-painted steel trees held in tension by a two-tiered network of arches and steel latticework and crowned along its entire length by a vault of glass. At midpoint along its south wall, the Galleria leads to another piece of the percent-for-art puzzle, a brick-paved Garden Court designed by the late artist Scott Burton. It then jumps over a landmark building earlier dismantled elsewhere on the site and reassembled here.

The smartly differentiated Galleria and Square, a long, high corridor that is essentially a light court, stand in sharp contrast to the jumpy streetwall of the perimeter facades. The Galleria is intended to be a freestanding structure and each column is tied to the building behind it to provide added strength and permit movement. To form the roof support, columns placed every 45 feet rise and branch twice into twos, first at 22 feet, then at 48 feet above grade. The roof system, a space frame that is also attached to the buildings behind it, contains a lower tier of parabolic arches at 12-foot intervals joined by a lattice of individually angled steel bars to an upper tier of circular arches. These also occur every 12 feet, alternating every six feet with the parabolic arches. Loads are continually transferred in an accelerating tempo that is locked in place, a paradox of movement and stillness. "The roof is autonomous," explains Calatrava. "It's tactical and architectural glue."

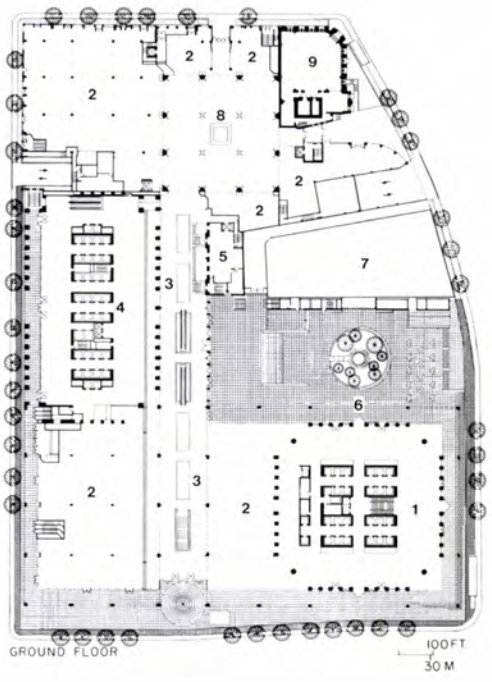
At its east end, the 90-foot-high Galleria drops 25 feet as it passes into the 100-by-100-foot Heritage Square. The transition is signaled by a huge pair of operable steel-and-glass windows suspended in a steel T-frame atop a brick-clad girder. The ceiling of Heritage Square is a series of vaulted squares created by intersecting diagonals. Twelve columns, each branching into two and affixed to surrounding buildings, form the Square's perimeter. Four more columns that rise in four directions are in the plaza, and appear to grow from circular grilles but continue through to the concrete deck. The perimeter columns are welded to brick-clad vertical steel plenums that pump fresh air into the space from grilles located about 20 feet up. (The Galleria's air-circulation system is in adjacent towers.) Sprinklers for both the Galleria and Square are concealed above structural latticework. During design development, the framework was reinforced to comply with strict local guidelines for snow loads.

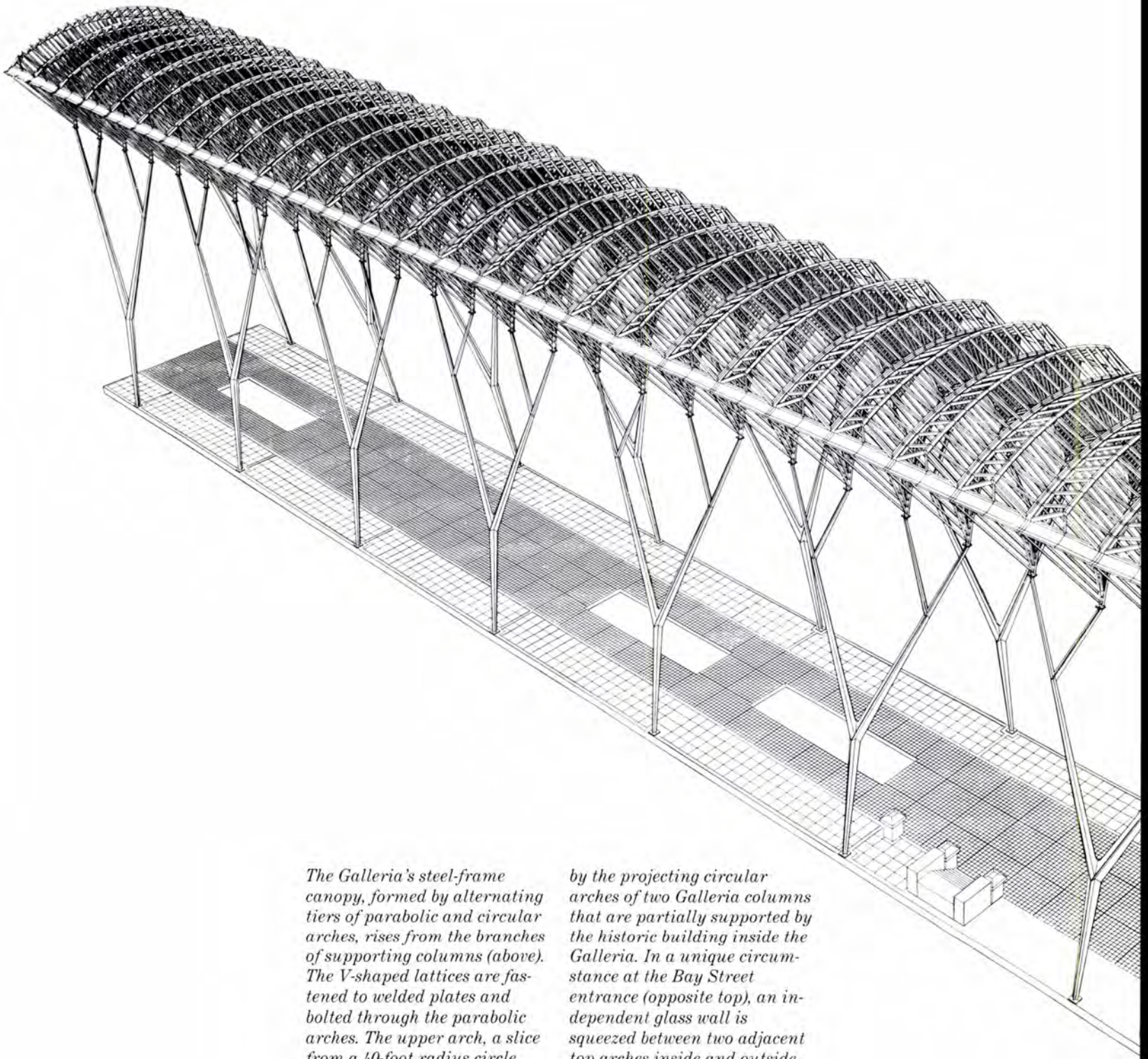
That requirement, along with the difficulty of working with local engineers and contractors unused to Calatrava's intricate designs, posed the greatest challenge. "Their detailing is more industrialized than I'm used to," notes Calatrava, who nonetheless collaborated with the steel fabricator to execute his precise design, avoiding visible nonalignment of intricate parts and pieces.

The clash between overscaled granite-and-glass skyscrapers and the restored 19th-century storefronts and lackluster infill buildings of BCE Place is muted inside the Galleria, which has a controlled presence all its own. "The galleria is an invention of the 19th century," says Calatrava. "It's another kind of city." *Peter Slatin*

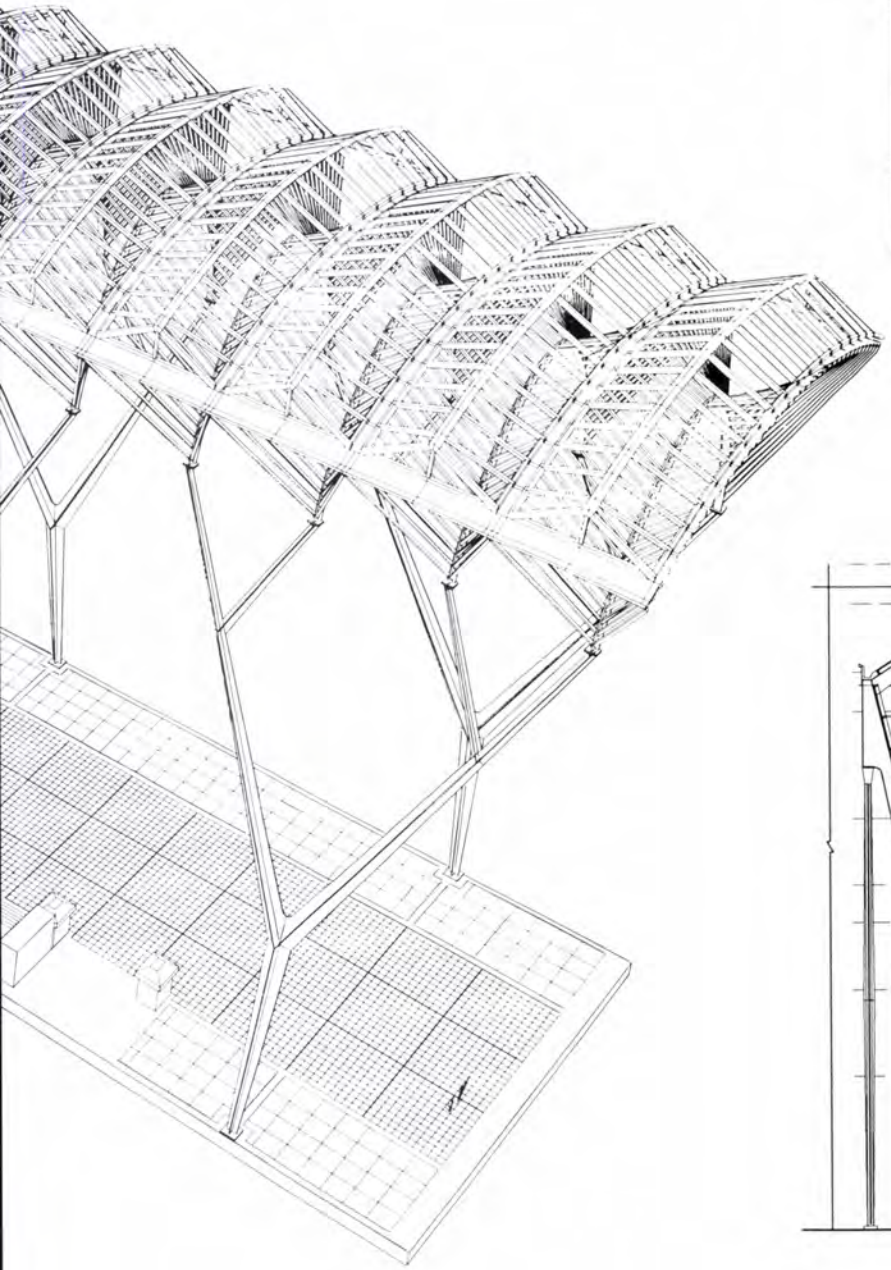
Along with office towers designed by Skidmore, Owings & Merrill and Bregman + Hamann, the complex includes a series of small infill buildings (site plan, below). A stair with a Santiago Calatrava-inspired balustrade designed by Bregman + Hamann leads to Toronto's extensive underground network of subways, offices, and retail spaces (bottom left). A brick-clad steel beam supports a massive steel-and-glass window, which can be used to close off the Galleria (opposite). It adjoins the flexible connection to Heritage Square, whose columns are welded to vertical steel plenums that provide air circulation. At Heritage Square, intersecting diagonals lace together to form vaulted ceiling squares (top left) as opposed to the single-span arches of the Galleria.

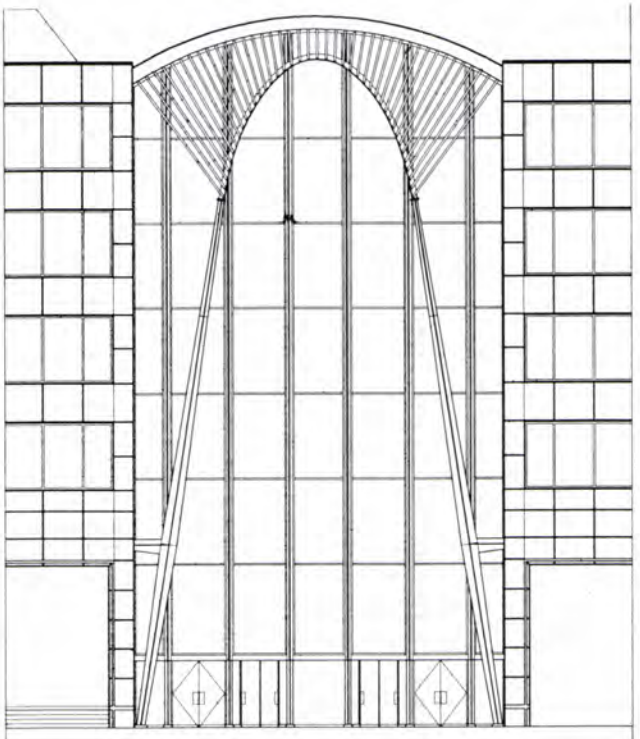
1. *Canada Trust tower*
2. *Retail*
3. *Galleria*
4. *Bay Wellington tower*
5. *Historic building*
6. *Garden court*
7. *22 Front Street*
8. *Heritage Square*
9. *Bank of Montreal*



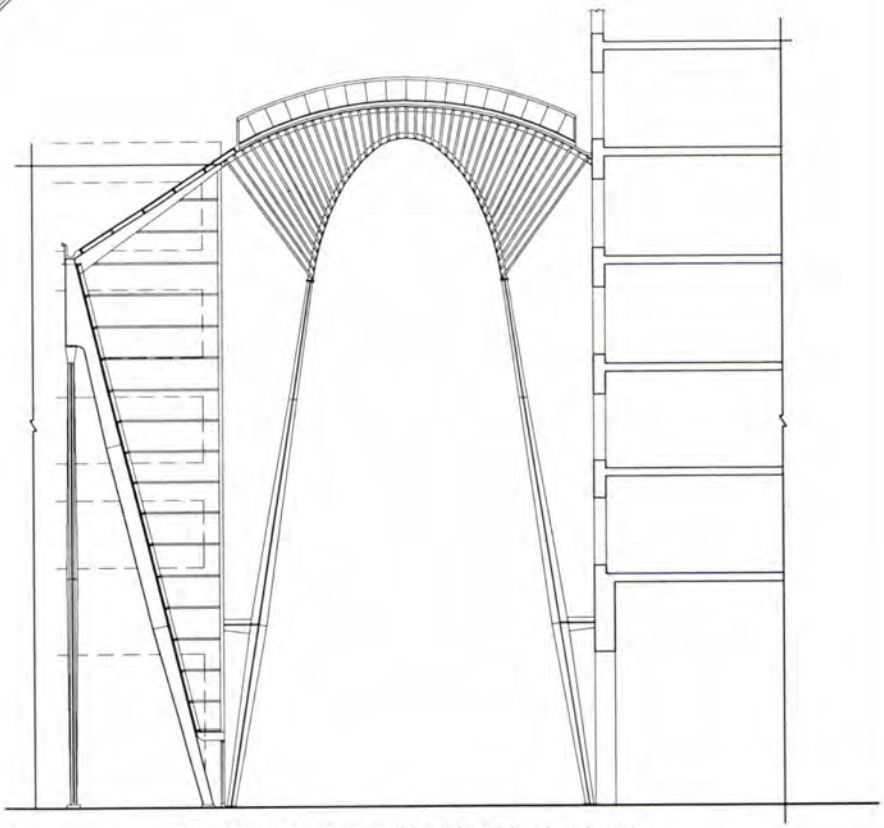


The Galleria's steel-frame canopy, formed by alternating tiers of parabolic and circular arches, rises from the branches of supporting columns (above). The V-shaped lattices are fastened to welded plates and bolted through the parabolic arches. The upper arch, a slice from a 40-foot radius circle, stretches from building to building. Skyline mullions sit on continuous structures that span the top arches and rest atop longitudinal members. Gutters are arranged along the edges of the glass roof. The entrance to the Garden Court features an inclined glass wall (opposite bottom). It is framed by the projecting circular arches of two Galleria columns that are partially supported by the historic building inside the Galleria. In a unique circumstance at the Bay Street entrance (opposite top), an independent glass wall is squeezed between two adjacent top arches inside and outside the Galleria. Outside, a complete "tree" forms an entrance canopy, which is tied to the main structure with a specially designed expansion joint. On the floor, granite pavers surround inlays of illuminated glass block, creating a glowing walkway.

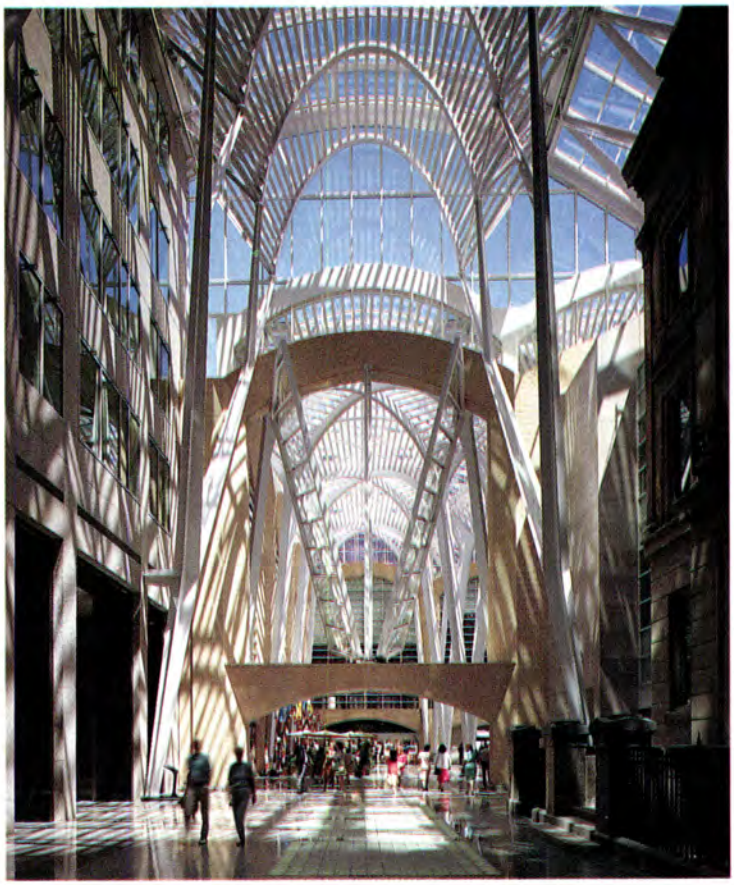




BAY STREET ENTRANCE ELEVATION



GALLERIA SECTION LOOKING WEST AT GARDEN COURT



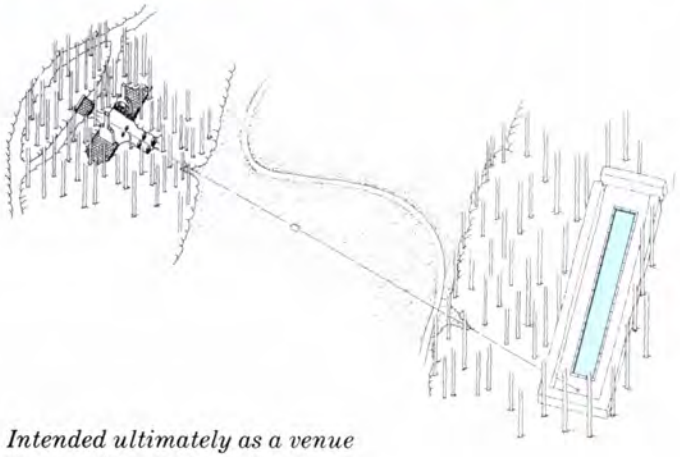
The four interior columns in Heritage Square are bolted to the concrete deck, rising through lighting grilles in four directions. The interior elevations of the surrounding buildings, which are of different heights, are faced in double-glazed sealed panels behind an aluminum grid to create the optical illusion of a consistent backdrop for Heritage Square. Brick-clad arched beams of pre-cast concrete span reinforced steel-frame plenums for air circulation (top left). A fountain designed by Calatrava to be similar in spirit to the Galleria's operable windows is currently under construction.

Credits
Galleria and Heritage Square
BCE Place, Toronto, Ontario
Owner: *Brookfield Development Corporation*
Galleria and Heritage Square
Architect: *Santiago Calatrava*
Architect of record: *Bregman + Hamann Architects—Tõnu Altosaar, partner-in-charge; Gastons Korulis, associate; André Lessard, Alkim Sonmezocak, and Clement C. Wong, associates-in-charge; Neal Barkhurst, Mohsen Boctor, Wayne Upiter, and Ramy Youakim, project team*
Engineers: *Yolles Partnership Limited (structural); The Mitchell Partnership (mechanical); Mulvey & Banani (electrical); Hatch Associates (civil)*
Consultants: *Vision Engineering and Design, Inc. (glazing); Rowan Williams Davies & Irwin, Inc. (snow and ice); Vibron Limited (acoustics); Trow Geotechnical Ltd. (geotechnical); University of Western Ontario (wind tunnel study); Mulvey & Banani International, Inc. and H. M. Brandston & Partners, Inc. (lighting)*
Contractors: *PCL Constructors Eastern Ltd. (general); Canron, Inc., Eastern Structural Division (steel)*
Manufacturer Sources:
See Contents page

House of Reflection

Virginia Merrill Bloedel Education Center
Bainbridge Island, Washington
James Cutler Architects

Art Grice photos except as noted



Intended ultimately as a venue for meetings and seminars, this modest wood-framed pavilion is for now a place of contemplation for Prentice Bloedel. Architect James Cutler has set up an axis linking the entrance bridge (opposite) with his wife's gravesite, at the head of a reflecting pool (site drawing above.)

Tucked so snugly within its site that a forest of Douglas firs appears to have grown up around it, the Virginia Merrill Bloedel Education Center is the latest addition to one of this country's most intriguing, decades-long owner, designer, landscape-design collaborations. It's located on the Bloedel estate, 150 acres of forests, meadows, and marshes that roll down to Puget Sound. Over a period of many years, Prentice Bloedel created a series of landscape-architecture vignettes with such noted designers and environmental planners as Thomas Church, Geoffrey Rauch, and Richard Haag. While many acres have been left wild, parts of the site have been developed as an English landscape, a traditional Japanese garden (with a teahouse by Paul Hayden Kirk), a moss garden, and a sweep of wildflower meadow. Though architect James Cutler's education center continues this tradition of sensitively sited, well-crafted interventions, it's more than that: it's a memorial to a 62-year bond of love.

"Our client and his wife had not been separated for more than a day or two all those years," explains Cutler. At age 90, Bloedel asked Cutler to design a unique memorial to his deceased wife: a place to remember her with a view toward her unmarked gravesite, which is at the head of a reflecting pool set within a "room" of trimmed hedges surrounded by towering firs (this a collaboration of Bloedel, Church, and Haag). By creating a relationship to the gravesite, yet setting the building away from it (site sketch left), Cutler has recognized both the Bloedels' union and the circumstances of the place.

Perpendicular to the pavilion's shed roof, Cutler has formed an axis that leads from a gravel drive across a bridge (opposite) through the pavilion, where paired stone fireplaces suggest a gateway. A wooden deck set on stone piers (top left) draws the axis out of the structure, through trees, and across a meadow (where the axis is marked by a boulder) to the grave.

Typical of many Northwest architects influenced by Japanese prototypes, the structure of the pavilion is completely clear. The metal roof is supported on timber rafters which are in turn held up on perimeter beams strapped to supporting posts and angled braces. (The beams are doubled, symbolically, at the central doorway and as tension members between the outriggerlike braces.) A wood-frame curtain wall is set within this post-and-beam system. Its double-rabbeted profile is identical for jambs and sills, and receives windows, doors, or panels of clear-cedar siding using identically profiled stops.

Though the wood superstructure may not last forever, the foundations, "those series of stone monoliths," says Cutler, "will last, and they'll always be kind of an arrow to [the Bloedels'] relationship and the grave."

Cutler also has strong notions about making his buildings fit the site. "We spotted [the location of] every tree. We designed the building and adjusted it to cut down only two or three trees." To further avoid disturbing the site, the access drive was used as a staging area and a very strict construction area was agreed to—and enforced with fines. Landscaping? "We didn't need any," says Cutler.

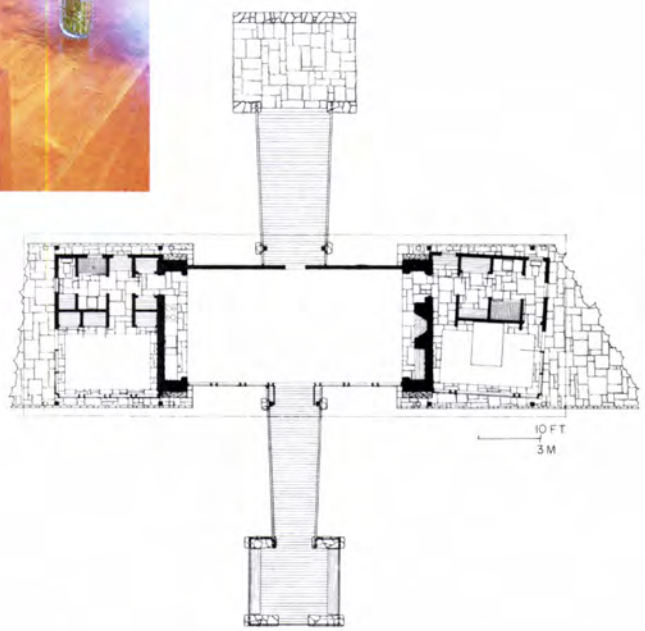
The Bloedels established a foundation to run the estate, which is now open to the public as the Bloedel Reserve. The pavilion will ultimately be converted for lectures and seminars, and will be used, says director Richard A. Brown, to convey the Reserve's lessons of "stewardship and environmental responsibility; nature in the wild and nature managed by man." *Charles Linn*

Chris Eden, Eden Arts

A stone plinth supporting the superstructure is interrupted at its center, expressing the cross axis that begins at the entrance bridge and penetrates the living room (bottom left), which will become a lecture room in the future. Architect James Cutler carried the axis toward the gravesite on a wooden deck supported on stone piers (opposite). A bedroom-and-bath suite is located at each end of the house (they'll become offices and meeting rooms). The client's bedroom was twisted slightly off-axis to align it with the gravesite (plan below). Structural loads are carried on exposed heavy-timber posts and beams clearly separated from the nonbearing wood-framed curtain wall (top).

Credits

Virginia Merrill Bloedel Education Center
Bainbridge Island, Washington
Owner: *The Arbor Fund*
Architect: *James Cutler Architects—James Cutler, designer; David Cinamon, project architect; Nick Reid, Bruce Anderson, project team*
Engineer: *KPFF Consulting engineers (structural)*
General Contractor: *Charter Construction*
Manufacturer Sources:
See Contents page



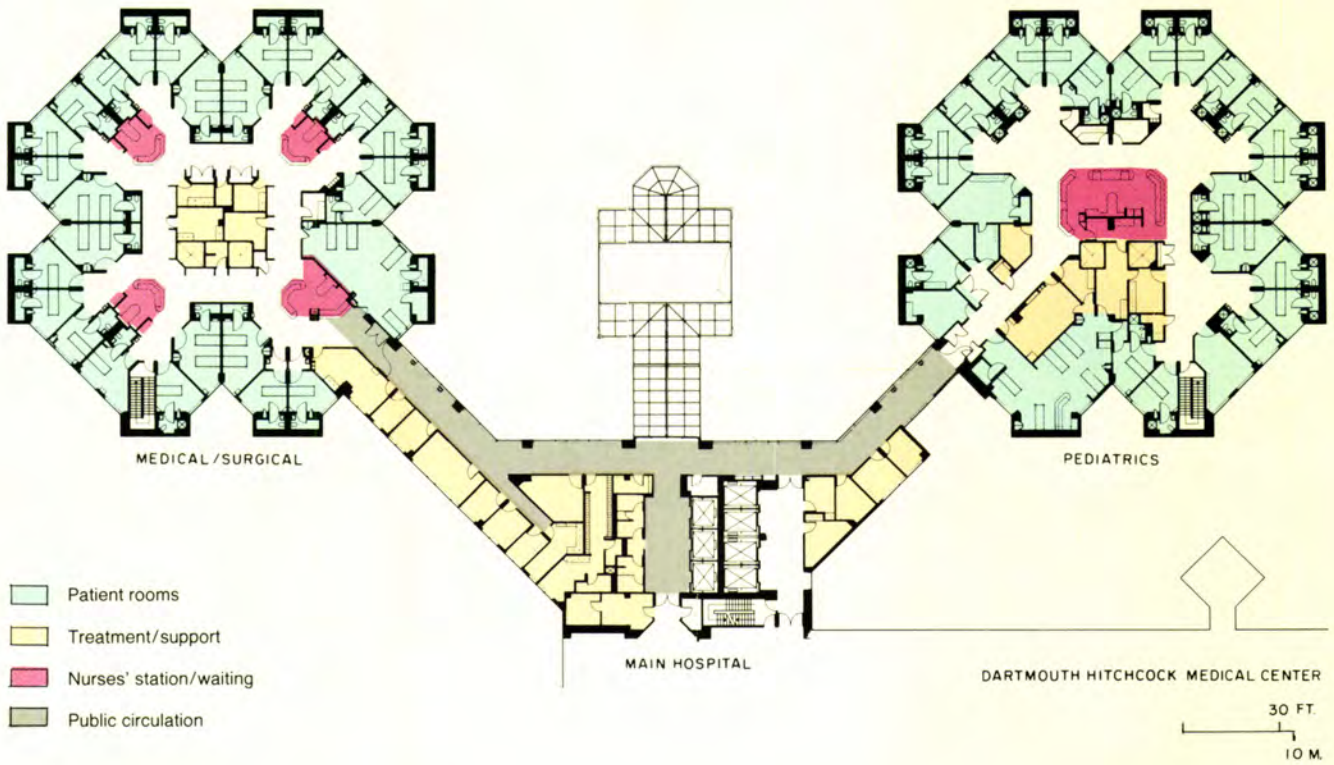
Veterans Administration Outpatient Clinic

Los Angeles, California
Bobrow/Thomas and Associates, Architect

The needs of ambulatory patients are less intense than those of patients confined to beds for days or weeks. Nevertheless, an individual's experience may be very stressful. Patients being treated over repeated visits—such as for cancer—may be subjected to painful and tedious procedures. Likewise, AIDS patients value privacy when shunted from one clinic to another (for care of the wide assortment of conditions that afflict those lacking conventional immune defenses). Because treatment methods are changing very rapidly (along with the required technological support), most hospitals seek the most flexible possible layout for diagnostic and treatment areas. All too frequently the architectural result is a very deep plan

Managing Acute Care

In the last few years, much medical-facility construction has been driven by what insurers want. Hospitals have built facilities for well-reimbursed procedures and closed money-losing ones. Health-maintenance organizations increasingly expect to hold down costs by making prepayment arrangements with doctors and their hospitals. President Clinton has pledged early action on health-care reform, which will likely

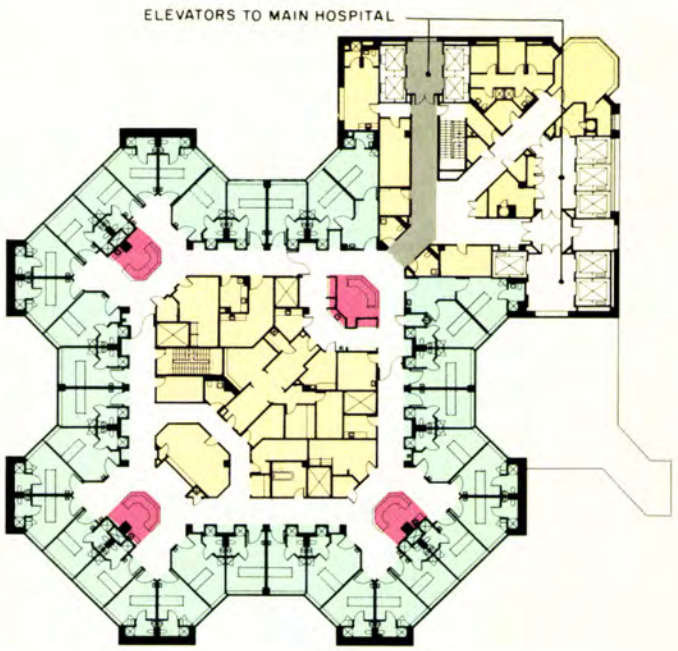


Inpatient-Care Prototype

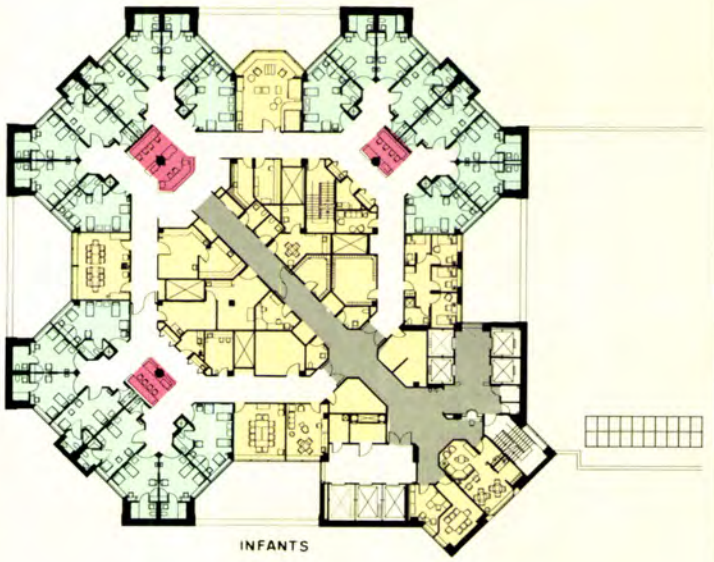
Shepley Bulfinch Richardson and Abbott, Architects

To reconcile short walking distances for staff with varying requirements for near-to-bed support, Shepley Bullfinch Richardson and Abbott have proposed a podlike form for the standard 36-bed, in-patient nursing unit. For units at the Dartmouth Hitchcock Medical Center (above and photo opposite), the first phase of which was completed a year ago, patients in a fully staffed medical-surgical floor are no more than 15 feet from a nursing station. When less staff coverage is provided, they are no more than 80 feet. The most frequently used supply and utility rooms are in a small central pod. A similar floor, arranged for pediatrics, devotes much of its center to a nursing station. Rooms face onto alcoves which become play areas as needed. In both plans, visitors pass the minimum num-

change planners' priorities. Whether the nation goes to Clintonian "managed competition" or a Canadian-style nationwide single-payer system (the two most likely options), the projects on these pages reflect two large-scale trends that are likely to continue: the movement of more procedures from inpatient to outpatient facilities and the separation of treatment functions from ordinary office and administrative tasks so that the latter are not performed in the same high-cost buildings as technology-intensive procedures. Various schemes that make care more "patient-centered" have been tried and been shown to speed healing, even for outpatients, but such hard-to-quantify issues get short shrift in an era of knee-jerk cost containment. The challenge in tomorrow's health-care universe—whatever it becomes—will be to keep these issues on the table. James S. Russell



YALE NEW HAVEN HOSPITAL



HASBRO CHILDREN'S HOSPITAL (FOURTH FLOOR)

ber of patient rooms before encountering a nurse's station. Acute-care and intensive-care patients to be served by new units at Yale New Haven (Connecticut) Hospital, now under construction (opposite left), require more close-by support services, so the center of the pod is larger. With toilet rooms placed at the exterior, staff surveillance is simplified and walking distances are short.

Small alcoves around nurse substations allow informal semiprivate conferences. At the Hasbro Children's Hospital, in Providence Rhode Island (also in construction—above right), a diagonal corridor conveys visitors through the central support pod to a reception desk. Nursing substations place staff close to infant patients. The rooms are large enough so family members can spend the night. *J. S. R.*

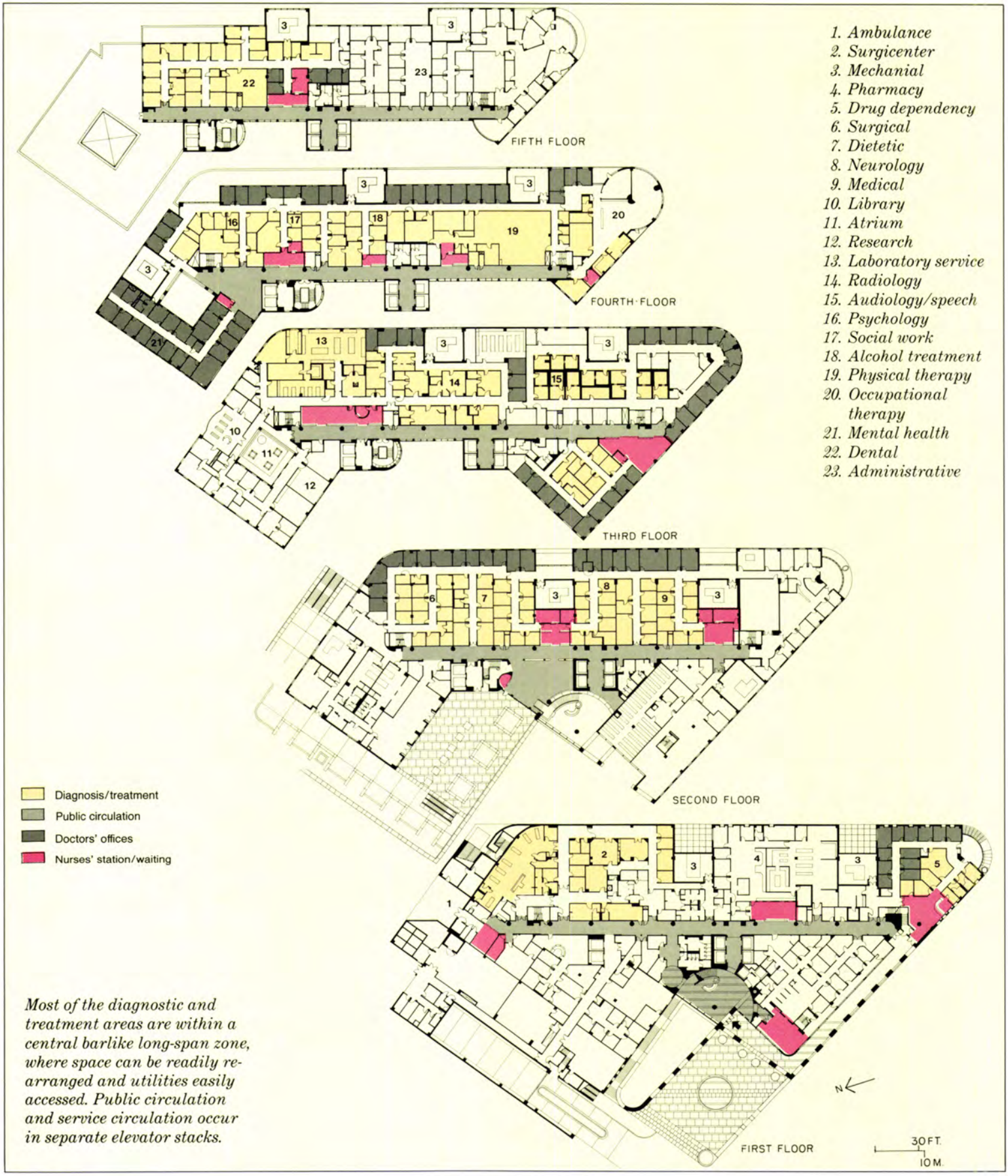
Jean Smith

Veterans Administration Outpatient Clinic

Los Angeles, California
Bobrow/Thomas and Associates, Architect

The needs of ambulatory patients are less intense than those of patients confined to beds for days or weeks. Nevertheless, an individual's experience may be very stressful. Patients being treated over repeated visits—such as for cancer—may be subjected to painful and tedious procedures. Likewise, AIDS patients value privacy when shunted from one clinic to another (for care of the wide assortment of conditions that afflict those lacking conventional immune defenses). Because treatment methods are changing very rapidly (along with the required technological support), most hospitals seek the most flexible possible layout for diagnostic and treatment areas. All too frequently the architectural result is a very deep plan

with identical, disorienting, mazelike corridors. With more construction shifting to ambulatory facilities, architects are focusing on solutions to these problems. At the Los Angeles Veterans Administration clinic, Bobrow/Thomas strove for a clear yet flexible organization that solves functional issues while providing stress-reducing connections to the outside world both for patients and staff. The overall massing of the 340,000-square-foot facility responds to a site that straddles two city street grids and links the civic center neighborhood to the northwest with "little Tokyo" to the east. The entrance side (photos below) faces the quieter midblock and downtown. The main entrance at the center of the complex opens to a sunny plaza (opposite bottom). The architects have oriented public circulation and waiting areas to this quieter, greener side. Physicians' offices face busy Alameda Street. The broad, lower floors are clad in reddish granite. These floors incorporate many of the support functions. The angled slabs of the upper floors, which contain most of the clinics, are smaller, looking onto rooftop gardens. Their banded horizontal mass is visually held together by vertical circulation towers. The gridded aluminum-panel cladding (sun reflections account for the apparently mottled effect) is enriched by the small-scale patterning of window openings, which are filled with patterned and clear glass blocks and set off by gray-granite insets.



Most of the diagnostic and treatment areas are within a central barlike long-span zone, where space can be readily rearranged and utilities easily accessed. Public circulation and service circulation occur in separate elevator stacks.

With technology and cost-containment measures driving design, the result can be poor accommodations for patients and families. At the VA Medical Center the patient finds individual clinics from an external public corridor (instead of an intimidating maze of hallways), which also provides orienting light and downtown views to waiting areas (top right). The treatment suites themselves are relatively small, so patients are never far from accompanying family or friends. Doctors' offices line a rear corridor, assuring privacy during treatment and offering windows for staff (internal atrium, bottom right). Top and bottom left: the two-story entrance lobby. *J. S. R.*

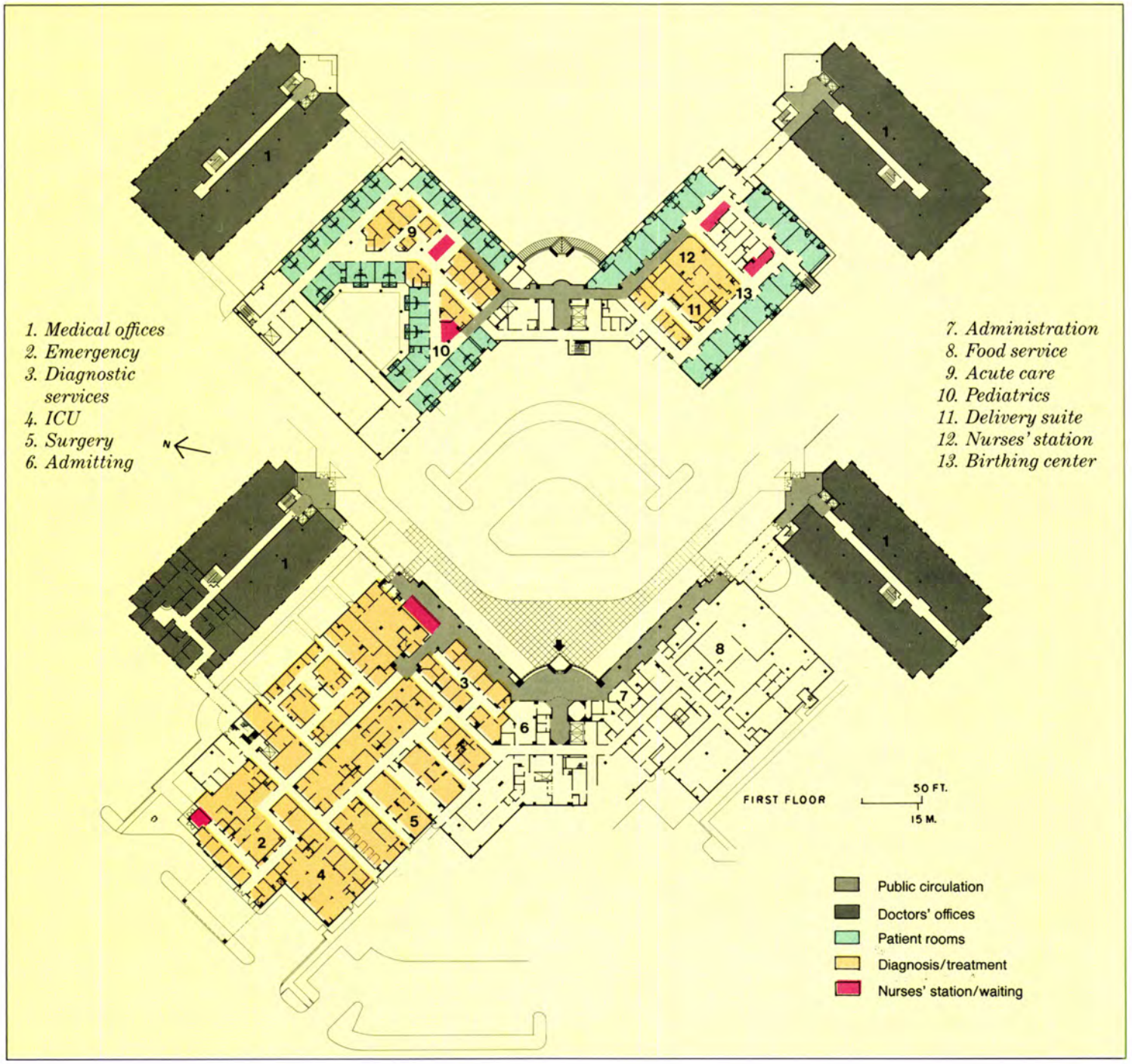
Credits

Veterans Administration Medical Center
Los Angeles, California
Owner: *Veterans Administration*
Architect: *Bobrow/Thomas and Associates—Michael Bobrow, design principal; Julia Thomas, planning principal; Carl Hunter, Robert Wielage, Wayne Fishback, principals-in-charge; Barney Jenson, Joseph Rothman, Mohammed Saeid, Mark Rios, Anthony Morretti, Robert Rawski, design and construction team*
Engineers: *Cygna Consulting Engineers (structural); Hayakawa Associates (mechanical, electrical, plumbing)*
Consultant: *Horton-Lees Lighting Design (lighting)*
Contractor: *J. W. Bateson*

Mercy Southwest Hospital

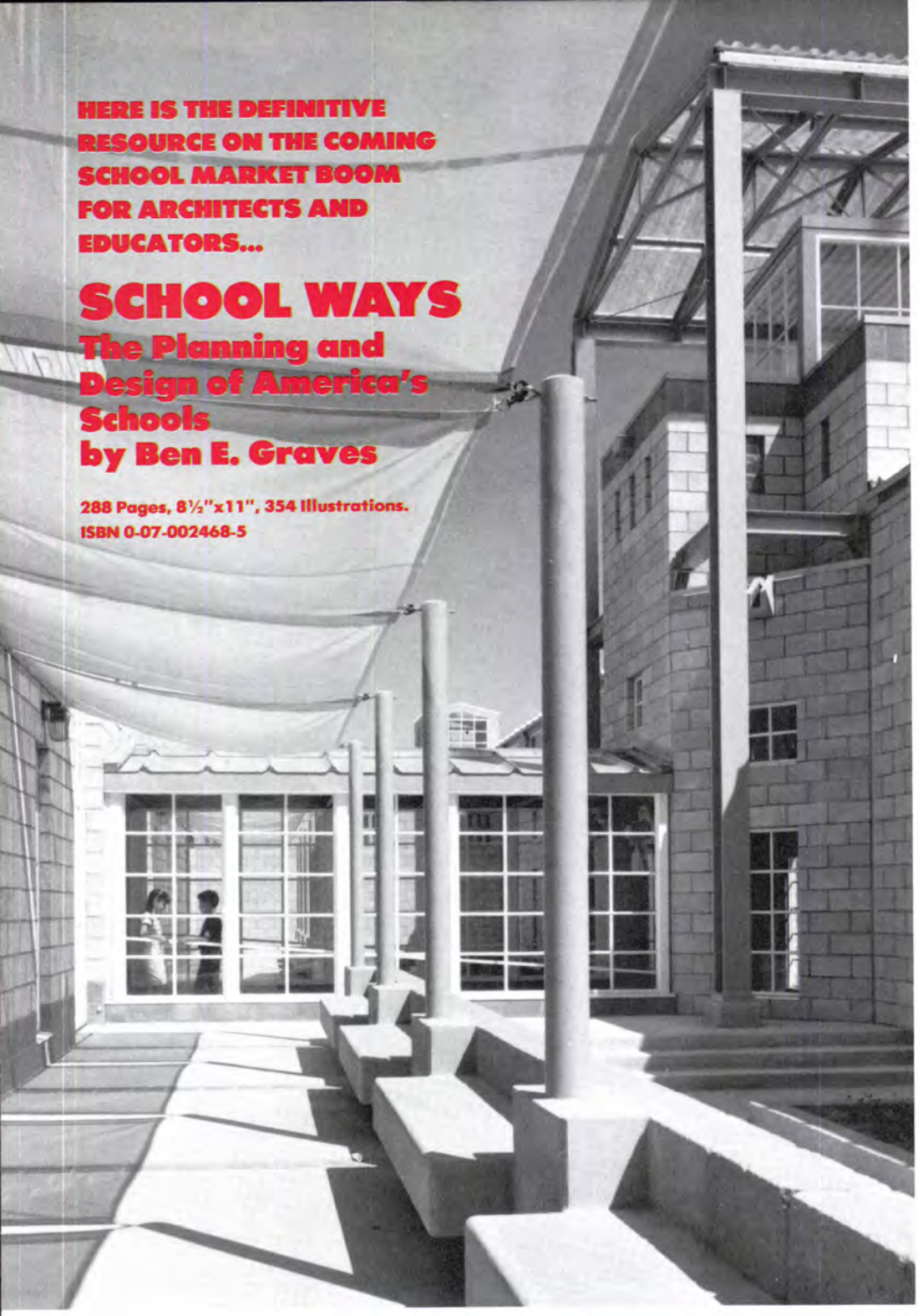
Bakersfield, California
Kaplan McLaughlin Diaz Architects
BFGC Architects, associated architect

Rather than add to an overcrowded site, Mercy Southwest began a new 31-acre campus with this two-story complex incorporating both inpatient and outpatient services. The curved facade of the lobby announces the main entrance to patients and visitors (opposite middle left). Doctors' offices and administrative functions are housed in separate office buildings which were much less expensive to build than the main hospital. The generous, two-story lobby offers an orientation point for visitors and patients (opposite bottom). Symmetrically arranged single-loaded corridors (opposite top and plans) link public areas, and—through a breezeway—the medical office buildings (middle). A small emergency room and four-bed intensive-care unit are



located together (to share staff for the most acute cases) at the rear of a large wing housing clinic and treatment areas. The second, inpatient, level is split into two wings, with public access along the same pattern as the lower level for ease of orientation. In the 18-bed birthing center, uncomplicated labor, delivery, and recovery take place in the patient's room. *J. S. R.*

Credits
Mercy Southwest Hospital
Bakersfield, California
Architect: *Kaplan McLaughlin Diaz*
Associate Architect: *BFGC Architects*
Engineers: *Butzbach, Bar-Din & Dagan (structural); Syska & Hennessy (mechanical, electrical);*
Contractor: *Centex/Golden*



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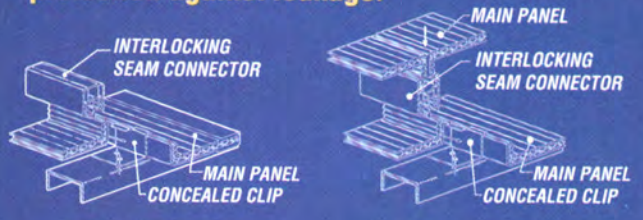

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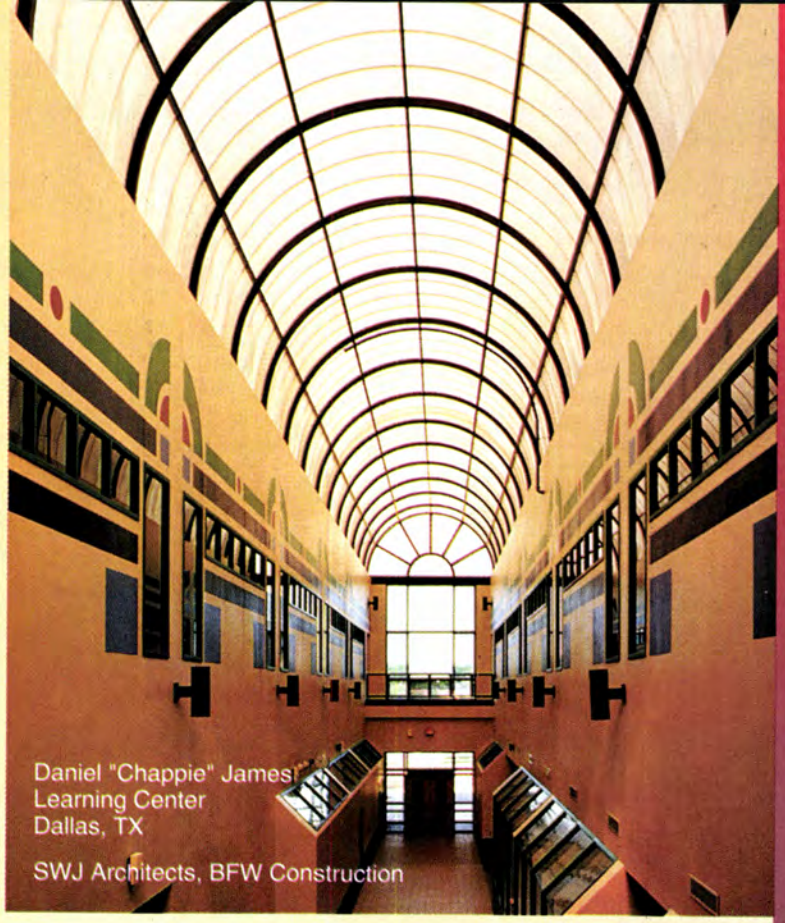
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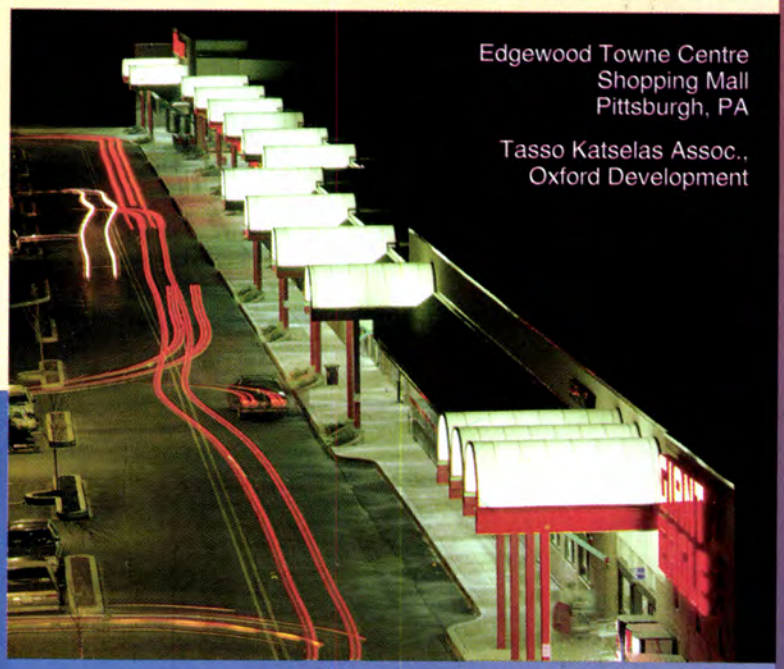
Dallas, TX

SWJ Architects, BFW Construction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Product Literature / Healthcare

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400. Carpet-laying system
A new installation/backing technology from Switzerland, the TacFast system uses Velcro hooks and integral loops to secure contract carpeting without adhesives and seam sealants. Carpet is said to lift up easily, and can be cut-to-fit, moved, and rotated to equalize wear. TacFast Systems, Richmond Hill, Ontario.

401. Resilient flooring products
A 20-page architectural guide illustrates the components of the Coloright Flooring system, color-matched rubber and vinyl products and accessories that are coordinated with leading carpet, ceramic tile, marble, fabric, wallcovering, and laminate surfaces. Johnsonite, Chagrin Falls, Ohio.

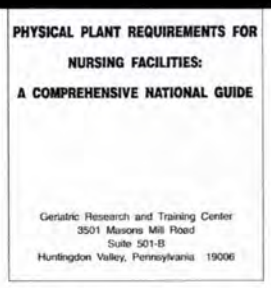
402. Interior doors
Pon-Craft catalog shows colorful laminate- and FRP-faced solid-core doors in institutional, healthcare, and school settings, and introduces Fiberclad doors available in fire-ratings of up to 90 minutes. Doors are furnished with finished edges, ready to accept mortise hardware, and are suited for retrofit use. Poncraft Door Co., Auburn Hills, Mich.

403. Carpeting for healthcare
A technical and design guide stresses the esthetic, comfort, acoustic, and maintenance advantages of Zeftron-nylon carpeting in hospital, geriatric, and other healthcare environments. The solution-dyed fiber is said to resist fading even when cleaned with strong bleach solutions. BASF Corp., Williamsburg, Va.

404. Institutional laundry
Speed Queen washer-extractors, drying tumblers, and flatwork finishers are described as ideally suited for use in healthcare facilities, hotels, motels, schools, and other large-volume on-premise laundry applications. A Sweet's catalog insert provides architectural specifications. Speed Queen, a Raytheon Co., Ripon, Wis.

405. Fire-blocking fabric
A data sheet highlights the fire-resistant benefits of ThermaBlock spunlaced aramid-fiber sheets and quilts in helping upholstered furniture pass the stringent fire tests, such as California 133, required for healthcare occupancies. Du Pont Co., Wilmington, Del.

406. Upholstered lounge seating
Product overview brochure uses color photos to demonstrate the versatility of Elysée modular furniture. Steel-framed units come in corner, armless, multipurpose, and ottoman components for linear, corner, or circular configurations; available in a wide range of contract-upholstery options. Steelcase, Inc., Grand Rapids, Mich.



407. Nursing facility guide
A 500-page binder summarizes the physical-plant requirements for nursing homes in each state. Offers guidelines for decor, design, lighting, and environmental strategies that help provide effective health care in institutional settings. $180 charge; annual updates. Geriatric Research and Training Center, Huntingdon Valley, Pa.

408. Commercial rubber tile
Sampling program assists architects and designers in selecting rubber-tile flooring, cove base, and stair treads. Patterns include raised-disc, marble, travertine, and new Constellation flooring, a speckled design offered in 12 base colors. Test and performance data included. Burke Flooring Products, San Jose, Calif.

409. Vinyl wallcoverings
A brochure introduces new Guard contract damasks, dimensional textures, large-scale florals, and faux finishes in four coordinated, nature-inspired color families. Type I and Type II vinyls are appropriate in healthcare, hospitality, corporate, and retail interiors. Columbus Coated Fabrics, Columbus, Ohio.

410. Woodgrain sheet vinyl
Commercial flooring catalog highlights the new Mature vinyl range, developed specifically for heavy-duty, welded-seam healthcare requirements. Offered in 13 designs and 29 colorways, flooring line includes realistic terrazzo, suede, cork, and woodgrain (parquet and plank) patterns. TOLI International, Commack, N. Y.

411. Patient-room furniture
A 16-page color brochure illustrates solid-oak furniture designed to age gracefully under the stresses incurred in hospital, dormitory, and psychiatric-care facilities. Includes seating and case goods for lounges, client rooms, and reception areas; some pieces can be modified to meet space, budget, or program needs. Adden Furniture, Inc., Lowell, Mass.

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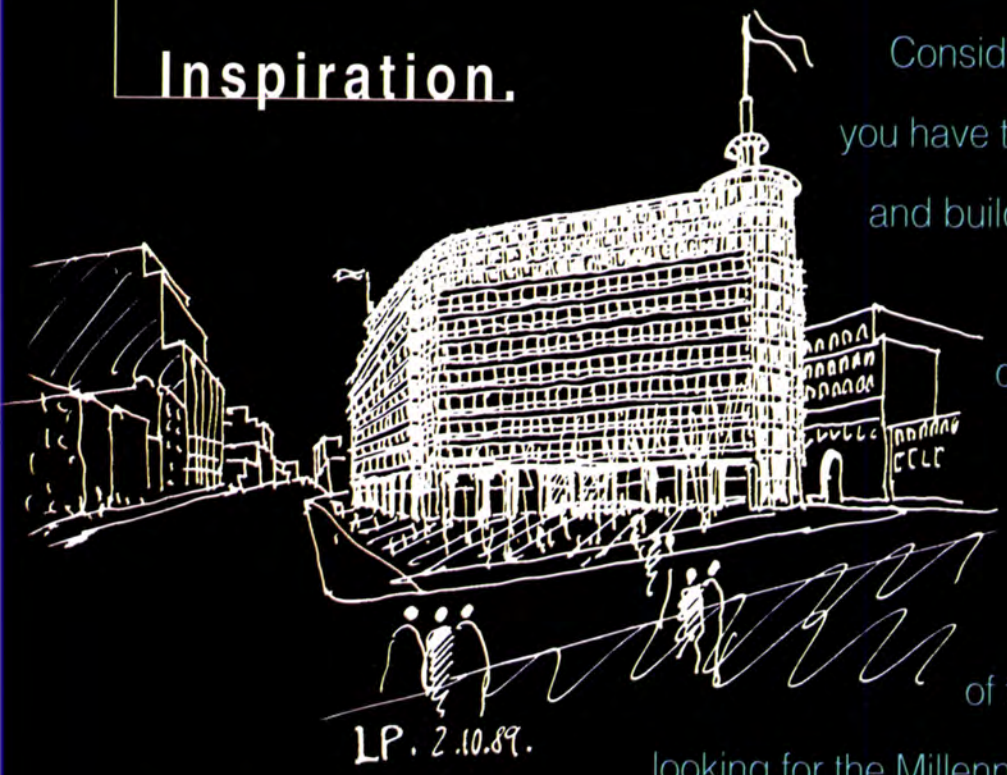

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Product Literature / Roofing

412. EPS insulation
Specification guides discuss the importance of density, fusion, and dimensional stability to the long-term performance of roofing insulation. ThermoSafe EPS boards use no CFC/HCFC blowing agents, and are available as a composite with perlite, fiberboard, Type X gypsum, and other materials. Polyfoam Packers Corp., Wheeling, Ill.

413. BUR specification
ARMA offers a pocket guide to built-up roofing, including sections on deck design, flashing details, vapor barriers, and selection of roofing felts. Code bodies, trade associations, and manufacturers are listed with addresses. Asphalt Roofing Manufacturers Association, Rockville, Md.

414. Roof-penetration seals
An architectural catalog illustrates customized flashings, drains, vents, and pipe seals that accommodate a wide range of roof penetrations without pitch pans. Products are designed for both retrofit and new work; detail drawings demonstrate installations. Portals Plus, Inc., Bensenville, Ill.

415. Built-up urethane roof
A four-page brochure explains how spray-applied urethane, acrylic, or silicone membranes, topped with aggregate, work as both weatherproof roofing and insulation. Lists test data; a coating decision matrix matches specific job requirements with the recommended product. Carpenter Insulation & Coatings Co., Richmond, Va.

416. Tile-roof accessories
Ingenious stack sleeves, vents, and skylights are made of durable PVC in colors and shapes to match standard clay roofing tiles. Snap-together German-designed products are said to save installation time by eliminating flashing and tile cutting. Klober Plastics, Inc., Irvine, Calif.

417. Fire-rated mod bit
Folder describes Ruberoid 20/30FR modified-bitumen roll roofing as qualified for a UL Class A rating without the requirement for additional gravel or coatings. Sales and technical offices are listed. Roofing comes in white, black, and tan colors. GAF Building Materials Corp., Wayne, N. J.

418. Lightweight-cement tiles
Premium Duralite tiles are said to have the distinctive texture and freeze/thaw weather resistance of standard cement tiles, but to weigh less (about 780 lbs. per square), making them suitable for reroof applications. Offered in shake, slate, and Spanish styles. Monier Roof Tile, Inc., Orange, Calif.

419. BUR notebook
Owens-Corning states its case for built-up roofing systems in an informal, notebook-style booklet. Sprinkled with literary quotes and informative doodles, the brochure is a quick seminar on the performance of multi-ply BUR against competitive roofing systems. Owens-Corning Fiberglas Corp., Toledo, Ohio.

420. Cellular-glass insulation
A new 20-page technical brochure explains the manufacture and in-use performance of closed-cell Foamglas insulation. An all-glass, noncombustible board product, Foamglas is claimed to have superior dimensional stability, chemical resistance, sound control, and a high strength-to-weight ratio. Pittsburgh Corning, Pittsburgh.

421. SBS-modified bitumen
Color booklet emphasizes the maximum protection claimed for SBS-modified membrane systems through their durability, resistance to cyclic stresses, and excellent cold weather properties, and explains the importance of specifying compatible roofing components. Manville Roofing Systems, Denver.*

422. Membrane roofing systems
A capabilities brochure highlights this maker's roofing history, from General Tire to GenFlex, describing technical and research efforts in the development of EPDM and reinforced-PVC roofing products. Recent national roofing projects are listed for reference. GenFlex Roofing Systems, Maumee, Ohio.

423. EPDM single-ply
A 1993 technical catalog is offered to architects and roofing specifiers. Ballasted, fully adhered, and mechanically attached membrane systems are keyed to a selection guide. New products include reinforced RubberGard EPDM and UltraPly 78+ single-ply systems. Firestone Building Products Co., Carmel, Ind.
continued on page 119

*Product data on CAD disk

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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 62-69
Classroom/Laboratory/Administration Building
California Polytechnic University
Antoine Predock Architect
Sandstone: Southland Stone. Sealant: Dow-Corning. Backer-board: U. S. G. Corp. (Durock). Customized acrylic stucco: STO. Sealant: Tremco. Sheathing: Georgia-Pacific Corp. (Densglas Gold). Corrugated steel: George D. Widman. Concrete sealants: Sikaflex. Flush-face steel panels: AEP-Span. Standing-seam roof: Berridge Mfg. EPDM roofing: Carlisle Syn-Tec Systems. Aluminum windows: Custom Window Co. Solar-control glazing: PPG Industries (Solex). Entrances, doors, and storefronts: OSAMA Building Products. Concrete finish: Hydrozo. Step lighting: BEGA. HPS lights: Devine Lighting. Drinking fountain: Sunroc Corp. Custom-color fiberglass panels: Glasteel Tennessee. Glass block: Pittsburgh-Corning. Ceilings and resilient flooring: Armstrong World Industries. Grid: Chicago Metallic Corp. Downlights and parabolic troffers: Lightolier. Elevators: Montgomery.

Pages 78-83
Hanson Library and Senior Center
Schwartz/Silver Architects
Timber framing: Southern Yellow Pine. Wire-cut brick: Yankee Hill. Aluminum storefronts and windows: EFCO Windows. Glass: Southwall Technologies. Vinyl flooring: Azrock Industries. Carpet: Shaw. Upholstered chairs and fabric: Stickley. Children's room chairs: Thonet. Library furnishings: Adden. Stacking chairs, folding tables: KI. Six-panel doors: Lag Design Industrial Millwork Corp. Locksets and closers: Sargent. Hinges: Stanley. Exit devices: Von Duprin. Suspension grid: Chicago Metallic. Linear fluorescents: Litecontrol. Downlighting: Staff. Paints and stains: Benjamin Moore. Uplighting: Elliptipar. EPDM roof: Firestone. Shingles: Owens-Corning.

Pages 84-91
Galleria and Heritage Square
Santiago Calatrava with Bregman + Hamann Architects
PVC roofing: Sarnafil. Green-tinted low-E glass and aluminum curtain wall: AFG Glass. Paints on exposed steel: Glidden. Paints on aluminum: DeSoto. Entrances: C. J. Rush; F. L. Metals. Locksets: Schlage. Exit devices: Von Duprin. Elevators and escalators (Phase I): Otis. Elevators (Phase II) Dover.

Pages 92-97
Virginia Merrill Bloedel Education Center
James Cutler Architects
Clear-fir windows: Northwest Window Works. Glazing: Southwall Technologies (Heat Mirror 88). Fir doors: Nicolai. Locksets: The Ironmonger (D Line). Painted-steel roof: Taylor Metal Products. Clear wood finish: Ship 'n Shore. Welded connectors: custom, fabricated by Garrett Metals.
Pages 96-97—Customized low-voltage spots: Lightolier. Sconce: custom by architect, fabricated by J & F Metals. Fir cabinetry: Kevin McDonald & Associates. Pulls: Stanley. Cherry-wood couch and dining tables: Art Grice and Associates. Dining chairs: Thos. Moser Cabinetmakers. ■

Windows CAD *continued from page 38*
Some software designers get around the problem by providing separate menus of "tools" that are always on-screen. Some allow you to customize a toolbar. Some trumpet "shortcut" keyboard commands. Some hide extra commands inside dialog boxes. Some suggest using a digitizer, with commands mapped out on its surface. Some do all of the above.

There's no right or wrong approach. Most experienced drafters end up learning the common shortcut keystroke commands eventually. But if your office turnover is high, drafters may not be fully up to speed by the time they move on. Customized toolbars work well (we prefer them, in fact), but lead to lack of interface standards, even within the same practice.

We also expect CAD and modeling software to lead the march toward Windows NT, which should be released by mid-1993. That "new technology" version of Windows will allow full 32-bit processing of such tasks as rendering, speeding things up considerably. There's no other common task in all of computerdom that so obviously craves the speed.

Nevertheless, computers equipped with the 80486 CPU, running at 33 MHz, are common and cheap (a bare-bones system can be had for under $2,000; double that for a high-resolution monitor, plenty of RAM, and plenty of fixed-disk space). They have more than enough speed to comfortably handle routine production-drafting chores within the current version of Windows, 3.1.

That's part of what is powering the push to Windows. But standardization—OLE, standard printer drivers, and so forth—has the potential to pry away customers from AutoCAD. Many software developers consider Windows their last chance at regaining market share from AutoCAD—a package with so many add-ons available. In turn, Autodesk has not been standing still.

Neither have Apple developers; they have embraced the new System 7 features, faster Macintosh models, and high-resolution monitors. And Apple software developers, with a head start on interface design, are more standard in their approaches.

In the coming months, we'll be exploring many more—they are where much of the "action" is in new software development. *Circle number* **302**

PlotView 3.1

This Macintosh program does one very useful thing, and does it well: It converts HPGL files to PICT files. This allows you to move files into different applications—from CAD to desktop publishing, for instance. It also allows you to print your output on a LaserWriter, ImageWriter, or similar Macintosh printer, instead of on a plotter.

The resulting PICT files are the "object-oriented" kind; if the receiving software allows it, you can edit text in the converted file, for instance. *Circle number* **305**

Equipment required: Any Macintosh, from 512K enhanced to Quadras. System 6 and 7 compatible.
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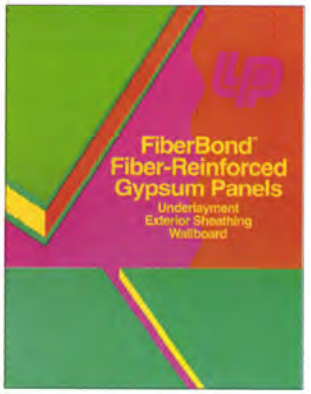

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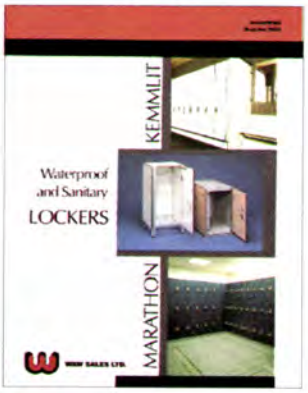
KEMMLIT/MARATHON Brochure



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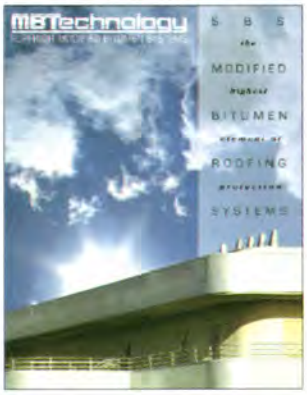

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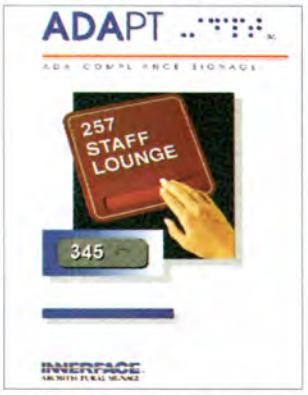

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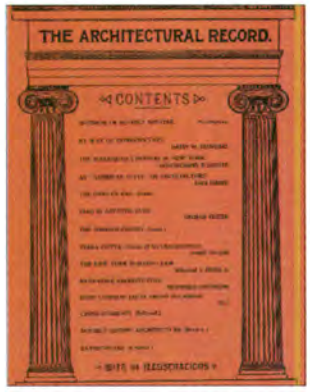

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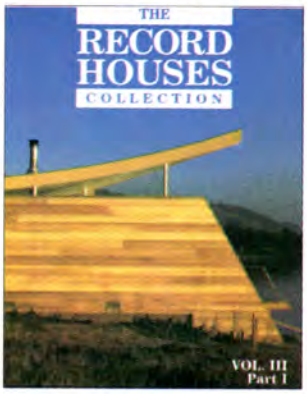

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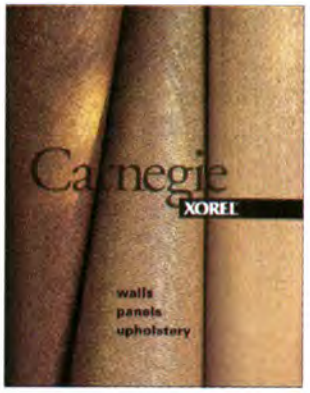

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Product Literature/Roofing

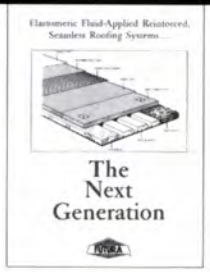
424. World of roofing
An objective publication (without advertising) compiled annually by the National Roofing Contractors Association, the Roofing Materials Guide provides technical information on more than 750 roofing membranes, 130 metal roof panels, 190 types of insulation boards, and 160 fasteners. $65/members; $95/nonmembers. NRCA, Rosemont, Ill.*

425. Coal-tar roofing products
The 1993 Black Armor catalog contains specification and detail information on coal-tar membrane products, roof insulations, and waterproofing systems, and introduces a new line of roof coatings. Technical data is supplemented with charts, tables, and drawings. Allied-Signal, Inc., Morristown, N. J.*

426. Roof-coating systems
A capabilities brochure describes VOC-compliant protective coatings and single-ply roofing systems for applications ranging from structural maintenance and repair to new construction. Interior and exterior products include Rubberflex, Permaroof, Permaply, Geoflex, and Alumanation 301. Republic Powdered Metals, Inc., Medina, Ohio.*

427. Hypalon single-ply
A 12-page, pocket-size brochure details the Hi-Tuff roofing system, based on Du Pont's chlorosulfonated polyethylene (CSPE) synthetic rubber. The lightweight roof is typically mechanically fastened, and comes in white as well as standard colors of airport gray, terra tan, and sky blue. JPS Elastomerics Corp., Northampton, Mass.*

428. Historic tile roofs
A clay-tile roof is a prominent feature in defininig the overall character of a historic building. A new NPS Preservation Brief traces the history of clay roofing, and gives general guidance on how to plan and carry out a project involving the repair and selected replacement of historic tiles. National Park Service, Washington, D. C.



429. Fluid-applied urethane
Illustrated with detail drawings, a catalog describes the characteristics, components, and specifications of one- and two-ply Futura systems, which combine a reinforcing polyester scrim with fluid-applied urethane or acrylic membrane. Futura Coatings, Inc., Hazelwood, Mo. ■

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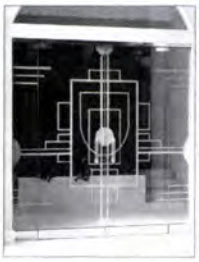

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