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Record Houses

Your choice of publishing houses of different styles [RECORD, April 1991] for me supports the notion of vigorous discussion before agreement, and that as much as anything else is an expression of architectural practice these days.

*Warren R. Schwartz, Architect
Boston*

The RECORD HOUSES issue has traditionally recognized outstanding home designs that have been constructed. For many architects, this was an acknowledgement of the hard work involved in overcoming the difficulties that arise in executing our designs. Unfortunately, RECORD has decided to include a work in progress in this year's issue [April 1991, pages 134-137]. While Steven Holl's house appears to be quite interesting, I don't believe it belongs in this issue.

*Joseph DiMonda, Architect
Hermosa Beach, California*

By including Steven Holl's Texas house in RECORD HOUSES, we were simply showing our readers an intriguing design in its work-in-progress phase. The project was not an official Record House, and we did not give Holl the award that we traditionally confer upon the architects of houses in that issue. RECORD HOUSES remains committed to honoring the architects of completed projects.—Ed.

No problem

Your Editorial in the April 1991 issue ["To Design Is Not Enough," RECORD, page 9] is right on. For the past year our firm has seen the value of stressing our problem-solving capacity in pursuing new work. In addition to clearly demon-

strating our competence, we feel that particular aspect of our services is what will ultimately be the deciding factor with any selection committee. Package building and specialists in the construction industry are absolute realities that must be given serious consideration. Problem solving is the architect's chief asset at this point and a logical tool of professional service.

*Kirby L. Estes, President,
The Estes Corporation
Fayetteville, Arkansas*

Texas pride

Thank you for the terrific article on Texas architecture [RECORD, February 1991, pages 84-93]. This story needs to be told and you did a wonderful job. Every time the story is told, the mythology gets stronger, and I believe that this mythology will help us eventually develop a strong architecture for this region which can be a model to be emulated elsewhere. Keep up the good work.

*Hal Box, Dean
School of Architecture,
University of Texas at Austin
Austin, Texas*

Middle-age makeovers

I don't blame developers for reskinning stick and panel office towers from the 1950s and '60s to better compete for tenants [RECORD, March 1991, pages 156-163]. And I would certainly accept a similar design commission for my office. That said, I am certain that in 20 years or so, these buildings, which appear so prosaic to us, will be the subject of the sort of elaborate restoration work now applied to buildings like the Berkeley [March 1991, pages 90-99]. I can hear the muffled laughter, but imagine the Post-modernization of the glass walls of New
Continued on page 28

June 5-July 19

"Formwork: Art Inspired by Industrial Architecture," American Institute of Architects, 1375 New York Ave. N. W., Washington, D. C. 202/638-3105.

Through June 23

"Edge of a City: An Installation by Steven Holl," Walker Art Center, Minneapolis. 612/375-7600.

June 28-20

"Buildings at Risk: Seismic Design Basics for Practicing Architects"; Vista Hotel, Washington, D. C. Sponsored by the AIA/ACSA Council on Architectural Research. 202/785-2324.

June 28-30

Construction Specifications Institute 35th Annual Convention, San Diego. 703/684-0300.

Through August 13

"Roberto Burle Marx: The Unnatural Art of the Garden," Museum of Modern Art, 11 West 53rd Street, New York City. 212/708-9400.

Through September 1

"Romance in Stone: A History of Mediterranean Revival Architecture," Fort Lauderdale Historical Society, 219 S. W. Second Ave., Fort Lauderdale, Fla. 305/463-4431.

October 20-23

SpecFair '91, in conjunction with Industrial Fabrics Association International Convention, Opryland Hotel, Nashville, Tennessee. 612/222-2508.

Through October 31

"Encounters and Enclosures: Architectural Aspects of Recent Sculpture," Storm King Art Center, Mountainville, N. Y. 914/534-3190.

Permanent Exhibition

"Ideal Places: Rockefeller Visions for America," National Building Museum, 401 F Street N. W., Washington, D. C. 202/272-2448.

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The Sporting Club at Illinois Center, Chicago, Illinois
Kisho Kurokawa Design Consultants/Fujikawa Johnson
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Charles Conklin of Dyer Insulations, Inc. and Eric Takach of Bellemead Construction Corp.

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Split Personality

The trouble with the enduring debate over life, death, and future of the Modernist movement is that it confuses Modernism as style with Modernism as religion.

Modernism got into hot water because it preached one thing and practiced another. It preached that 20th-century society (by which it meant, shortsightedly, only Western industrialized society) rates from the architect a clean, healthy environment, achieved by exploiting contemporary materials and construction technology. Esthetics would take care of itself.

This kind of open-ended esthetic is a quicksand, as the first Modernists discovered early on by having to use costly hand processes to fake a machine-made look.

Also known as functionalism, the movement held that a design that fit the program is its own esthetic reward. Or, as Joseph Hudnut, Gropius's predecessor at Harvard's Graduate School of Design, wrote sarcastically in the May 1931 issue of *RECORD*: "Beauty is the satisfaction that we experience when we perceive the fitness of an instrument for its [function]. Then let an architect merely plan and build intelligently; beauty will dwell unbidden in his organic structure"—whereas the Renaissance "never supposed beauty to be a by-product of science."

Modernism's downfall was not as a philosophy but as a visual expression of that philosophy; in other words, as a style. It ignored people's emotional needs—context; human scale; occasional ambiguity instead of wall-to-wall clarity; surprise rather than total, immediate comprehension. Venturi, Blake, Jane Jacobs, and others pounced on these flaws, and their writings found a ready audience, professional *and* popular. This heady combination ended up spawning Postmodernism and other stylistic movements that sought to supply what Modernism had so signally withheld.

But none of this in any way negates Modernism as ideology. There is nothing wrong, and indeed everything right, in exploiting the efficiencies of current technology, in making buildings affordable and accessible, in reaching for light and clean air, in specifying materials and systems that are environmentally sound.

But to make a well-functioning machine into architecture takes a creative act—witness the work of Mies, Le Corbusier, Kahn, Meier, and others. Corbusier's own infamous dictum that a house is a machine for living only serves to point perversely at the gap between his philosophizing and his design genius.

Moreover, Modernism as an ideology is contained in Postmodernism even in its most extreme appliqué manifestations, as its protagonists will, I suspect, be the first to admit. It is, in its demands for technically and environmentally sound solutions, a creed for all seasons. As a style, it puts great burdens on its champions, burdens from which Postmodernism, for example, with its great dependence on popular forms, or Deconstructivism, with its reliance on shock value and esoteric literary provenances, are subtly protected.

So count on Modernism to be around for a good long while. And look for the champions who can convert its creed into romanticism, poetry and, yes, even ambiguity.
Stephen A. Kliment

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Continued from page 4
York's Park Avenue in the 1950s. At least we saved Lever House.
Steve Lewent, Architect
Queens, New York

Redesign revisited

Re: New magazine design. In a word, Bravo!
Fred L. Good, Architect
New Fairfield, Connecticut

Just a note to congratulate you on the new size and look of ARCHITECTURAL RECORD. Having been involved in several magazine redesigns, I have some idea of what you must have gone through. However, I never had to deal with a readership of men and women who live and breathe visual design. It's clear from your discussion of the magazine as a yearlong "book" that there was much more involved than a simple facelift.

You have rethought the entire publication from the viewpoint of your readers' needs. With any luck, a number of editors in other fields will pick up on your insights.
Alexander Auerbach
Sherman Oaks, California

The yellow (orange) is awful and inhibits photocopying (a goal?). Try again.
Bill Brubaker, Architect
Perkins & Will
Chicago

I just wanted to congratulate you on the new format for the magazine. It's beautiful, readable, thoughtful, and engaging. Now the MEMO has some competition for the best architectural publication in the United States.
Kevin E. Fry
The American Institute of Architects
Washington, D. C.

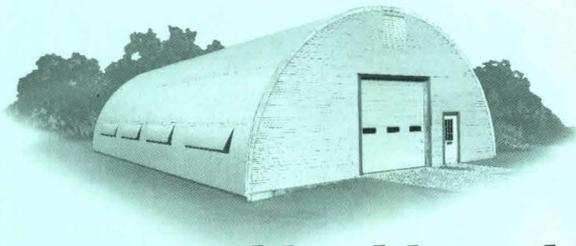
While I'll always remember the larger format fondly, I think that the magazine has done a great job with the photographs and bleeds in the new format to minimize any feeling of smaller size. Congratulations!
John Wieland
Atlanta

Let me be among the many who, I'm sure, will be singing your praises for the creation of the brilliant new design format for ARCHITECTURAL RECORD. You have created a handsome, flexible, and cohesive magazine appearance.

Ronald Gene Bowen, Architect
Bowen Williamson Zimmermann
Madison, Wisconsin

Dangerous notion?

After reading the article in the January issue about the Kimberly-Clark Coosa Pines



This was metal building design.

Times have changed.

Health Center, by Valerio Associates [RECORD, pages 84-87], I felt compelled to express my concerns about the rationalizations of the architect and the editorial comments of your reporter. The building appears to be a straightforward solution of the functional problem with flashes of a poetic design sensibility in the detailing. Certainly the architect's use of formal design concepts from the past ("Early Christian entrance atrium" and "Saxon multistaged wood belfry") is no problem—history provides millennia of solutions that can inspire the designer. But both the architect and the reporter make too much of it. It was the concept that was used, not the artifact itself, as one glance at the massing and detailing will tell. Therefore, there is no "alien historic form" here, as your reporter claims, and no "odd contradiction," unless you worship at the altar of mindless novelty. Unfortunately,

the architect feels compelled to defend himself from the bogus charge by claiming that American culture's "total absence of history and tradition affords perfect freedom." This statement seems to be the descendant of the mindset that has destroyed so our architectural heritage during the past 40 years.

This dangerous notion is capped by the claim that the design "embraces the ambiguities of modern times," a catch phrase whose meaninglessness is matched only by its usefulness in explaining away anything the architect wishes to do. In this case, the architect should have stuck to design, where he's obviously successful, and not detracted from his success by trying to explain it.

*Michael Eversmeyer, Architect
Pittsburgh, Pennsylvania*

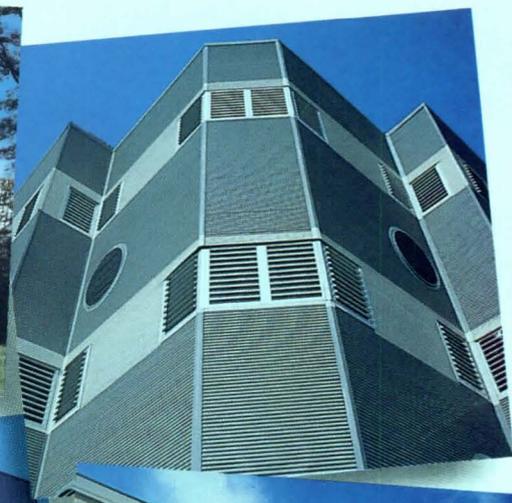
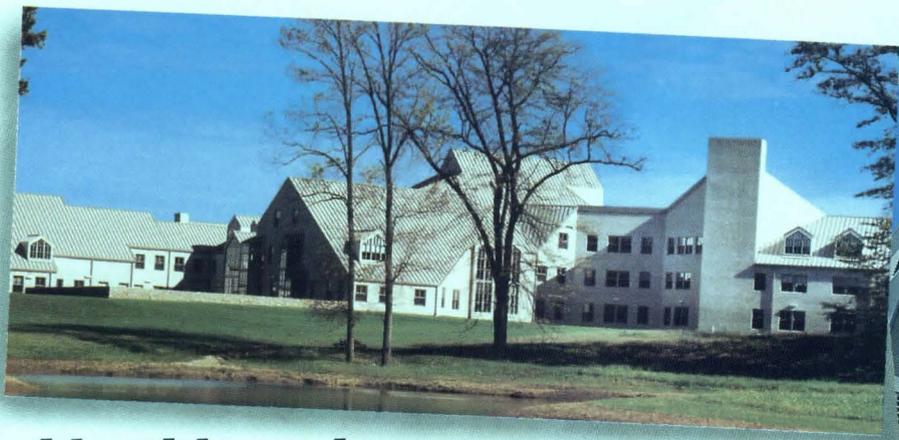
Point taken.—Ed.

Corrections

The credits for Harborside Financial Center in Jersey City, New Jersey [RECORD, March 1991, pages 120-129] should have listed William F. Schacht as Urban Design Consultant for the Master Plan.

Credits for the Bargonetti House [RECORD HOUSES, April 1991, pages 70-75] should have read as follows: Architect: Harris Kuhling Associates—Steven Harris, partner-in-charge; Michael Kuhling, project architect; Lucien Rees-Roberts, Stephen Brockman, Robert Schultz, assistants.

A photo caption on page 110 in the article on the Price House [RECORD HOUSES, April 1991] incorrectly identified "San Diego artist Rick Cross" as designer of Price's desk. The artist's name is Rock Cross.



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Tokyo

**Zaha Hadid:
Tokyo Decon**

Although these two Zaha Hadid projects have been stalled for months in Tokyo, work began in May on Tomigaya (top), an artist's studio and living space located in a residential neighborhood. Hadid has employed cantilevered platforms and a curving glass pavilion in a concrete shell 20 feet above an open first level pierced by two steel columns. At Azabu-yuban (bottom), in a crowded commercial district, Hadid has designed a sliver of a glass and concrete office building on a 12-by-10-foot lot, with a 120-foot-high metal wall reinforcing one edge of the slender site. ■



Arizona

**Mesas Inspire New Central Library
for Phoenix**



Kappas Tevis

William P. Bruder's design for the new Phoenix Central Library transplants the mesas of Monument Valley to downtown Phoenix. The architect uses a palette of red sandstone screen walls and stabilized decomposed granite to bridge the massive, 280,000-

sq-ft structure to the nearby desert landscape. Glass walls display the books to passersby. The site anchors the southern end of a proposed arts district that includes the Heard Museum, the Phoenix Art Museum, and the Phoenix Little Theater. ■

New York

Pelli Designs Art Center for Vassar



Kenneth Champlin

Some impressive names have come together in Poughkeepsie, New York, where Cesar Pelli has designed the Francis Lehman Loeb Art Center at Vassar College. The \$15.6-million, 59,700-sq-ft project is half new construction, including a sculpture garden

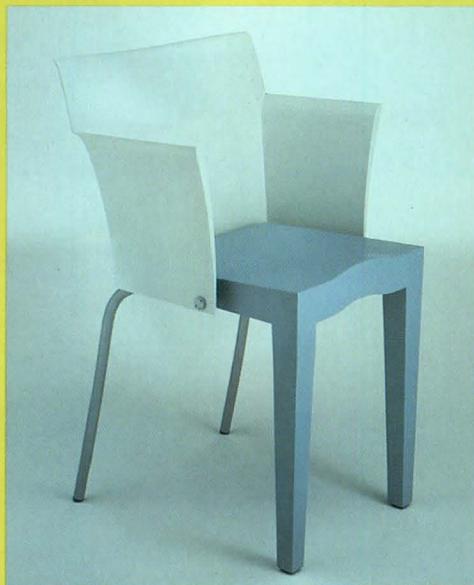
and expanded exhibition spaces. Some 30,000 sq ft of existing facilities for art history will be renovated, and Vassar's collection of 9,000 objects will be cataloged in a digital, color-imaging computer system. The museum, Pelli's first for a college, will open in 1994. ■

Milan Furniture Fair Turns 30

After an 18-month hiatus, Milan once again hosted the Salone del Mobile (Furniture Fair). From April 12-17, the Italian city was home to an estimated 50,000 foreign visitors, who convened with Italian colleagues among the fairground's temporary stands. Here, nearly 2,000 furniture and accessory manufacturers from around the world displayed their wares in some 1.2 million square feet of showroom space. Several companies appeared to have profited from the extra six months in a grueling schedule of new-product introductions that came when the

September 1990 fair was postponed until this year. Aldo Cibic, formerly of Memphis, introduced Standard (1), a collection several years in the making. Cibic sees his new label of modestly priced seating and tables as an un-Memphislike mass-marketable "vehicle for producing everyday objects." Folding tables and carts designed by Antonio Citterio for Kartell (2) reminded repeat fairgoers of the Italian architect's functional simplicity and wit. Zanotta showed Anastasia, a relatively sedate cowhide-covered sofa (5) with matching armchair by self-proclaimed New

Wave designer Andrea Branzi. The pieces will be available in this country through ICF. Prospettive unveiled reproduction 1940s and '50s Richard Neutra furniture (4). The line's shiny metal surfaces, glossy wood finishes, and bright upholstery contrast strikingly with the Modern master's architecture. Peripatetic Philippe Starck was once again a staple of the fair, represented not only at Driade by his Royalton line and at Kartell by his latest stacking chair (3), but also in town by his most recent architectural endeavor (see page 36). *K. D. S.*



Tom Vack photo



1

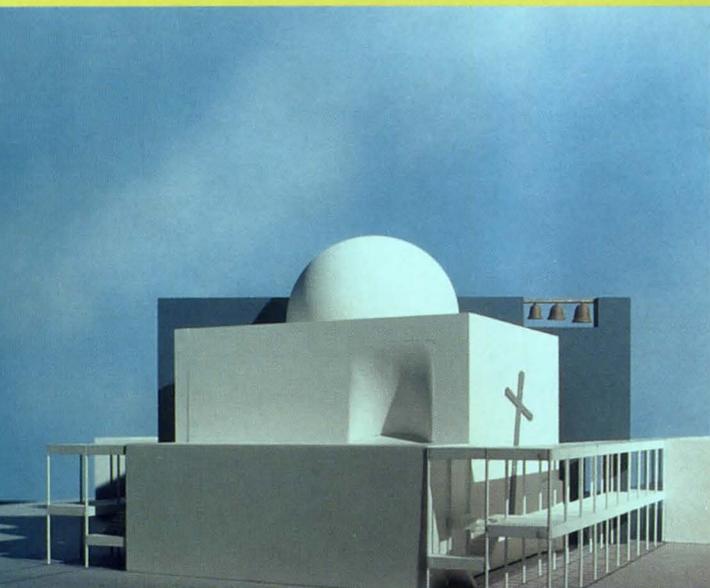
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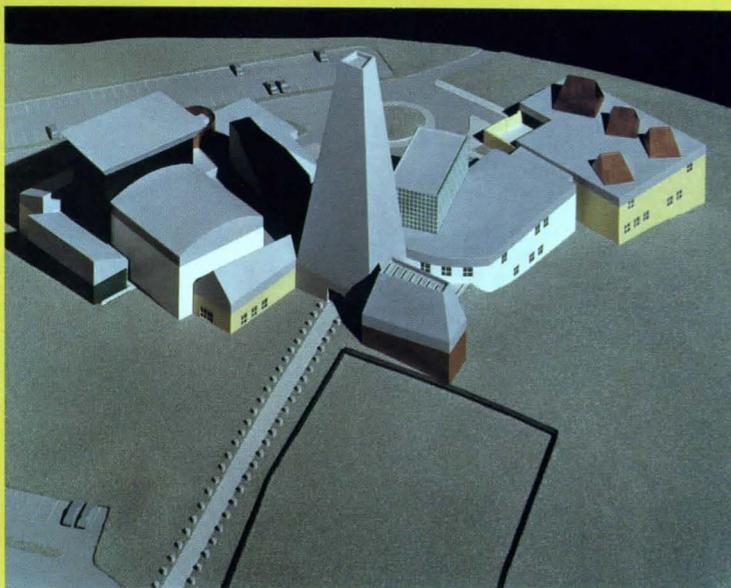
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5

Philip Johnson Flirts with Farewell, But No Fat Lady in Sight



Philip Johnson's hints that his design career ending may only be that. Accepting what he calls "the challenge of a lifetime," Johnson has designed a chapel for Houston's University of St. Thomas (left), completing a Jeffersonian master plan he began in 1956.



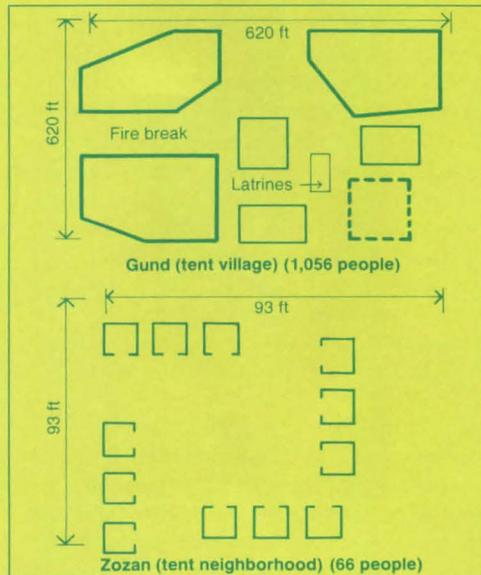
Johnson has struck a spiritual chord with Byzantine simplicity, topping a 60-foot-square cube with a white 70-foot-high dome and illuminating the interior with reflected natural light. In Pennsylvania, Johnson revealed plans for the Ryan Fine Arts Center

at tiny Seton Hill College (right), a complex of discrete studios the architect claims will be his final design. That was before Johnson showed administrators a design for an addition to the University of Houston Law School. *Gerald Moorhead*

Iraq

Kurdish Refugee Camp at Zakho Is Not Just a Tent City

enticing terrified Kurds from their muddy mountain deathtraps on the Turkish and Iranian borders with Iraq, the U. S. Army chewed the typical tent-city layout of identical rows for a modular layout based on traditional Kurdish villages. The camp design creates clusters of 20 or so tent villages (*gundakan* is the Kurdish plural), each housing about 1,000 refugees. A *gund* (top) holds three areas of tent neighborhoods, or *zozan*, with each *zozan* (bottom) of five-person tents for some 60 people. These tents are arranged in an open square, forming a courtyard that functions as family gathering place and children's playground. The army says it hopes that the familiar layout will help ease the transition of the camps from military to civilian control. An administrative center will coordinate medical care, bulk food distribution, and essential services. *P. D. S.*



Washington

Moore Design Takes Tacoma Competition



Charles Moore won a juried competition in early May for a new Washington State Historical Society Museum in Tacoma. The museum will be a renovation and expansion of the city's Union Station. Moore's proposal was selected over designs by finalists Thomas Beeby, Michael Graves, and Arthur Erickson. The jury, which included Joseph Esherick and Allan Temko, was impressed by Moore's "grandeur in restrained scale" for the main building, with its "lofty internal space" filled with "promise and opportunity." ■

Design Storms Dutch Provincial Capital

Tracy Metz

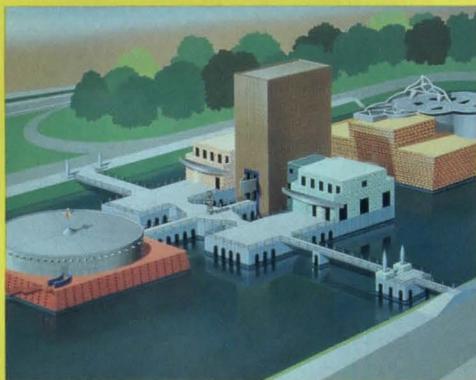


"The Groningers do have a reputation for being suspicious of anything they regard as 'new-fangled,'" says Maarten Schmitt, senior urban-planning adviser in this provincial capital in northern Holland. "But it turned out this was fertile ground." Indeed, that reputation for suspicion is being sorely tested as the city of 170,000 sober Dutch souls celebrates its 950th birthday, in part by promoting the work of some of the fading century's forward-looking architects.

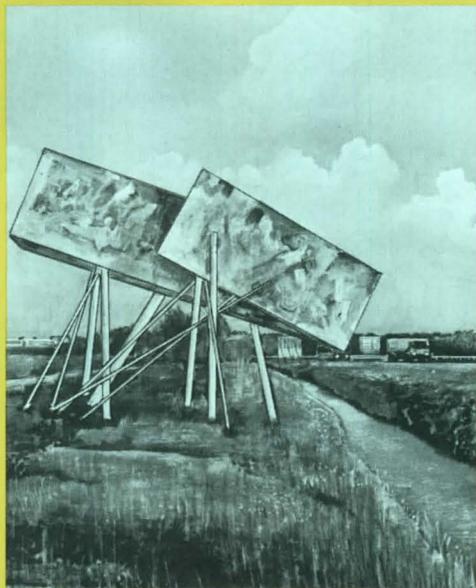
Schmitt (left in photo), who came to Groningen in 1975 feeling as if he were about to leave architecture, is just half of the duo that is the driving force behind Groningen's new-found vigor. He works with Ypke Gietema (right), a Labor Party alderman since 1978, to connect with the architects who could turn the town into a showcase for contemporary design.

Schmitt's first move was to bring in architects from outside, both to build and to provoke a livelier professional discussion locally. The practice has worked, and is spreading beyond Groningen. "I'm gratified that the younger firms here are rising to the challenge," says Schmitt. "And it's gratifying that other cities in Holland are consulting them as well."

Alderman Gietema was an early convert. "It came as a personal revelation that there was more to architecture than just building enough housing to stop the move to the suburbs. I remember visiting a neighborhood in 1981 where we had worked really hard to achieve quantity. But when I saw the quality, I thought, 'We must be able to do better than this.'"



1



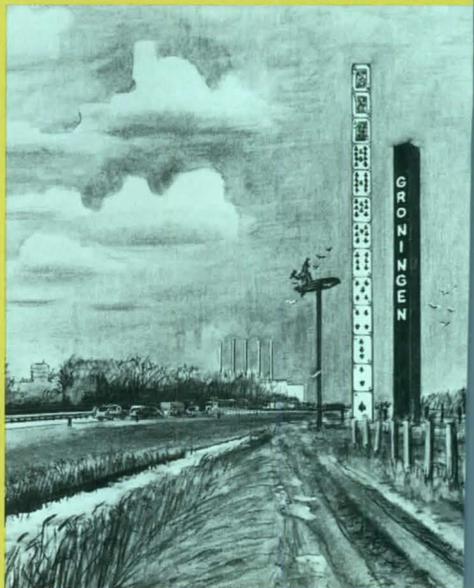
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The most ambitious of the projects is the design for the new Groninger Museum (1), which will sit in the canal across from the city's Central Station. The master design for the 30,000-sq-ft project is by Alessandro Mendini, personally chosen by museum director Frans Haks, who is himself a leading proponent of Groningen's architectural adventures. Mendini proposed a series of pavilions for the museum's different departments, and chose designers for each, including Michele de Lucchi, Philippe Starck, and the American painter Frank Stella.

In conjunction with an exhibit in the existing museum, the city commissioned a series of temporary pavilions for video viewing from architects Zaha Hadid, Peter Eisenman, Bernard Tschumi, and Coop Himmelblau (2). While these have been taken down to make



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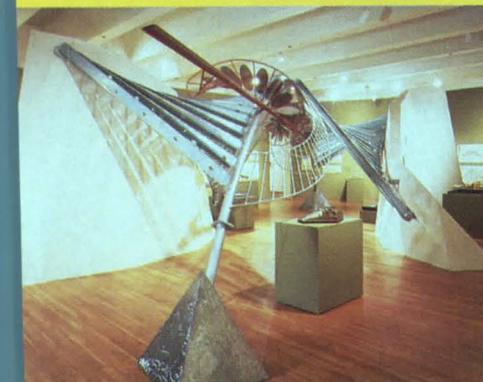
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room for the new museum, a pavilion by Rem Koolhaas will remain standing. To commemorate Groningen's founding in 1040, proposals for nine City Markers were designed and built by, among others, Kurt Forster, Paul Virilio, Daniel Libeskind (3), and John Hejduk (4).

Confirming Maarten Schmitt's early fears, all this activity has provoked some citizens to action, despite a generous share of positive local feeling. Litigation by advocacy groups contesting the museum's site has stalled the start of construction, perhaps for two years. But those struggles could be just beginning. Arquitectonica has joined with local firm to design apartments, Giorgio Grassi's public library is under construction and Henri Ciriani is planning a 300-foot tower. *Tracy Metz*

Organic Architecture Revisited

Over the last 50 years the Organic Architecture movement has produced some of the most original and idiosyncratic forms in the history of American building. "The Continuous Present of Organic Architecture," a small exhibition organized by the Contemporary Art Center in Cincinnati and held March 22-May 11, brought together a collection of strange materials, geometries, and colors, under the heading of natural and home-grown architectural reflections of the American psyche. At the show's center are exuberant commissioned pieces by contemporary architects Bart Prince (below), Herb Greene, and Terry Brown, the young Cincinnati practitioner whose work inspired the exhibition. These pieces frame models and drawings that trace the emergence of this movement from Louis Sullivan and Frank Lloyd Wright to Walter Burley Griffith and Bruce Goff. What is especially compelling about this work is that all of it has been built from bits and pieces of sometimes unrecognizable materials chosen solely for their inherent sensual or structural worth. "Organic Architecture" provides a welcome look at a rich, earthy alternative force. *Aaron Betsky*



in Forth

istrict of Columbia

Maxman Wins AIA Election

Philadelphia architect Susan Maxman will become President of the American Institute of Architects in late 1992. Long active in the AIA, Maxman was elected at the annual convention of the 134-year-old body, held in Washington May 17-21. ■

Final Piece of Met's Expansion Puzzle



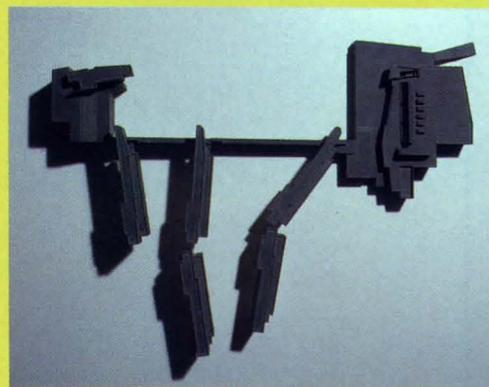
Norman McGrath

Virginia

New Residential College for Jefferson's Campus

Designing a new residential college at the University of Virginia in Charlottesville, Tod Williams Billie Tsien and Associates went directly to founder Thomas Jefferson for inspiration. They used the hilly, wooded site to define a new boundary for the campus, as Jefferson did with his original buildings. A dining hall and principal's residence flank dormitory buildings flung out from a linking path that climbs the hill. Paved courts and lawns weave throughout the site, directing students back toward the main campus or inviting them to linger. *P. D. S.*

When it opened late last year, the Carroll and Milton Petrie European Sculpture Court marked the final phase in Kevin Roche John Dinkeloo Associates' long-term expansion of New York's Metropolitan Museum of Art. The 240-foot-long court, naturally lit through a glass roof that rises to 63 feet in the center, is patterned on the formal symmetry of French classical gardens, although it displays sculpture dating into this century. At the west end, a 44-foot-high glass curtain wall overlooks Central Park, while a trellis wall covers the court's east end. ■



Brett Ettinger

New York

Making Waves for Landmark Parabolic Asphalt Plant

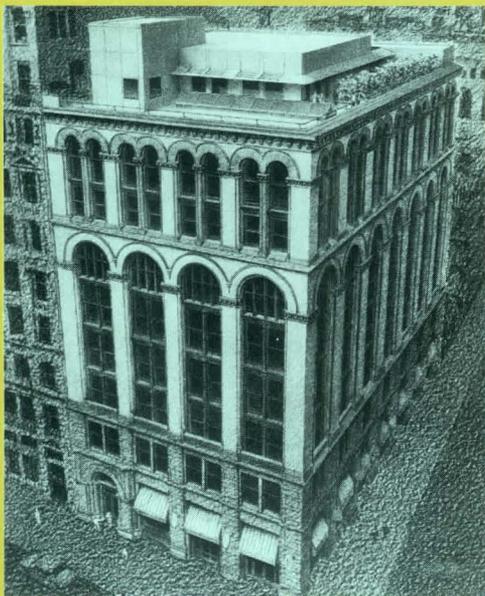
Rather than ignore Kahn and Jacobs' parabolic 1942 Asphalt Plant (now a recreation center called Asphalt Green), on the East River in upper Manhattan, architect Richard Dattner has made it the vertical counterpoint to his design for a swimming pool and sports-training facility. The five-story, triangular steel-frame building will hold a 50-meter training pool along its hypotenuse. The wavelike front elevation avoids encroaching on an existing playground, one element in a difficult site also bounded by a highway and vehicular ramp. ■



Richard Dattner

Environment

Blueprint for Off-the-Shelf Energy Efficiency



The Croxton Collaborative has made a name for itself by designing office renovations tuned to the environmental consciousness of such clients as the Natural Resources Defense Council [RECORD, October 1989, pages 128-132]. Now the firm is taking a step up in scale. The firm will apply lessons learned in smaller projects to an entire 88,000-sq-ft building. The client is another big name in environmental circles: the National Audubon Society.

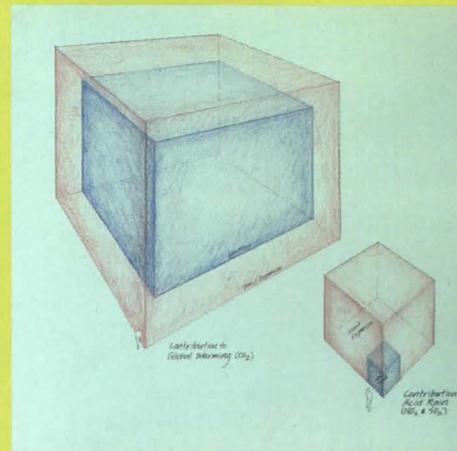
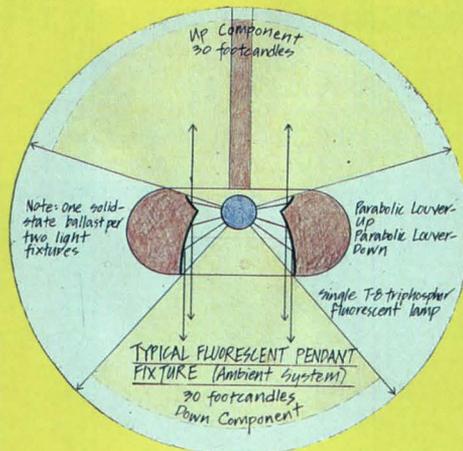
Three principles drive Croxton's design: recycling, energy efficiency, reduced toxicity. The recycling center is the building itself, a 10-story, 1891 George Post structure clad in brownstone and masonry with strong terracotta detailing, on Manhattan's Lower East Side. It will be gutted and refitted as NAS's national headquarters. (Retail tenants on the ground floor will remain.) Most interior materials, including wallboard, subflooring, plastic, and tile, have recycled components. Four recycling chutes transport white paper, plastic, organic materials, and aluminum to basement bins. Audubon's goal is recycling 80 percent of incoming material.

Though intended as a showcase, the Croxton Collaborative approach uses readily replicable off-the-shelf technology that should pay for itself through reduced energy costs within three to five years. "We're not really designing or inventing anything," says Kirsten Childs, Croxton's Director of Interior Design. For example, a gas-fired absorption heater-chiller (drawing below right) eliminates sulfur-oxide emissions and reduces nitrous oxide emissions by 70 percent over the 30-year life of the system. With a rebate from Con Edison (the gas-fired system puts no demand on the power grid), installation costs 11 percent more than spec-grade equipment, but will pay for itself within two years. Because of upgrades to its lighting systems and shell, the building requires only 180 tons of coolant over 30 years, versus a standard 300 tons; the chiller uses a nontoxic refrigerant free of chlorofluorocarbons (CFCs). Although Croxton's program calls for just 6.3 air changes an hour, fresh air circulates at a constant rate of 24 cubic feet per minute per person, well above current standards. That minimizes mold build-up in the ductwork, cutting the risk of sick-building syndrome.

In concert with the hvac, two other components should produce large energy savings.

Major tightening of the shell includes double glazing with a heat-shield film suspended between panes, combined with an upgrade of the surrounding wall insulation, minimizing winter heat loss and reducing summer heat gain. The ambient lighting system (drawing below left) uses low-energy parabolic fixtures with T-8 triphosphor fluorescent lamps and electronic ballasts. These tubes have a much higher flicker rate and produce light in a wider spectrum than conventional core-coil fluorescents, requiring 30 percent less power to achieve equivalent light output.

Low-toxicity interior components round out Croxton's plan: a cementitious blown-in insulation containing no CFCs; carpet of natural undyed fibers installed tackless over hair-and-jute pads; furniture tested to insure minimal emissions of volatile organic compounds, particulates, and formaldehyde; water-based paints with no heavy metals; woods sealed with natural shellac to prevent off-gassing and certified by the distributor as coming from sustainable-growth sources. Childs affirms that these products are increasingly there for the asking. "Three years ago, there was little interest from manufacturers," she says. "Now that has changed." *Peter D. Slatin*



Highrise Fire Concerns Unresolved



More than three months after an 18-hour fire burned through eight floors of a 38-story tower—costing three firefighters' lives—important questions remain unresolved. How did the fire get out of control so quickly? Why were the building's fire-protection systems so vulnerable?

The answers to these questions are critical for owners of older skyscrapers, as this fire is pushing code officials to demand sprinklers in all highrise buildings. One Meridian Plaza, the site of the fire, is shrouded now in protective netting as contractors begin shore up the damaged structure, a daily reminder of the catastrophe for thousands of office workers as they pass to their own highrises and nearby commuter-rail stations.

Meridian is a particularly frightening example of what can go wrong because it is regarded as one of downtown Philadelphia's better properties and—short of missing sprinklers throughout—represented state-of-the-art fire protection. The blaze apparently began when workers who were finishing furniture left 25 lb of rags

soaked with linseed oil on the floor instead of in covered containers. Spontaneous combustion ignited the rags and nearby containers of solvents. Smoke detectors conveyed an alarm to the security desk, but instead of calling the fire department, a guard was sent to investigate. By the time he reached the floor, the smoke was so thick he was nearly overcome. The guard only survived, according to Fire Commissioner Roger H. Ulshafer, because he was able to speak to another guard who recalled the elevator. The fire quickly spread to an electrical room which was supposed to have a one-and-one-half hour fire rating, but had an illegal gap above the suspended ceiling and a second large hole. Within this room, the fire rapidly burned through both the primary and secondary power feed for the building, short-circuiting emergency lighting and elevator power. Pumps intended to move fire-fighting water up standpipes failed.

Philadelphia, unlike many cities, requires installation of sprinklers in all new highrise buildings. The city has not mandated the installation of such systems in older tall structures. In the fire's aftermath there have been renewed calls for sprinkler retrofitting, but at press time, the city council, hesitant to place new burdens on owners in a battered local economy, had not passed any legislation. There has also been criticism of a program whereby the city permits building owners to engage independent contractors to certify that fire-suppression systems are operating according to specifications (implied in the pump failures). With the city facing bankruptcy, though, there is little chance of increased manpower for safety inspections.

The fire department's investigation continues. The building's owners have retained the original architect/engineer, The Kling-Lindquist Partnership, to analyze the damage and devise programs to stabilize weakened areas. *J. S. R.*

Briefly noted

Construction Materials, Types, Uses and Applications, by Caleb Hornbostel. New York: John Wiley & Sons, 1991, \$95.

Entire books are devoted to important construction components, but Hornbostel's book (an updated second edition) is useful as a quick text overview to the properties of over 2,000 materials that may be unfamiliar, or for which memory fails. The text is in encyclopedic order rather than, say, CSI format. Though amply illustrated, it makes a worthy companion to, rather than a replacement for, *Architectural Graphic Standards*.

HVAC Systems Evaluation, by Harold R. Colen. Kingston, Mass.: R. S. Means Company, 1990, \$57.95.

With hvac systems often the costliest single element of a building and with energy conservation increasingly a priority, architects need to remain conversant with strategies and systems. Though oriented to engineers, this book is remarkable for its clarity in a field that seems impenetrable to all too many architects. Chapters focus on each component separately, architectural issues are clearly treated (appropriate location of cooling towers, for example), and both advantages and disadvantages of competing systems are discussed, including such crucial but often-overlooked issues as owner priorities (first cost versus operating costs, to take one), operator skills required, and ease of repair.

Architectural Details from the Early Twentieth Century, By Philip G.

Knobloch. Washington: AIA Press, 1991, \$39.95 (\$35.95, members).

A facsimile of a detail reference first published in 1931, this book will please anyone who loves drawings and be useful to the designer wishing to recapture the details and proportions of traditional architecture. Details were derived from the working drawings of, among others, Mellor, Meigs & Howe, McKim, Mead & White, Paul P. Cr  t, and Carr  re and Hastings. ■

Window Update



300 Line-for-line. The Main Hall of St. Norbert College in De Pere, Wisconsin, a Richardsonian structure designed by W. C. Reynolds in 1903, was renovated as part of a campus-wide expansion program that has seen 40,000 sq ft of new and remodeled space added in each of the past four years. The college's original building, Main had been subjected to a series of ad hoc remodeling efforts over the years, and the large double-hung windows, a major design element in the facade of rusticated limestone and red brick, had weathered badly (top left). While the interior was completely redone to accommodate new administrative, healthcare, and classroom functions, the exterior, on the National Register of Historic Places, was to be restored to an as-built condition, and any new components had to meet state and federal appearance standards.

Concerned with the life-cycle cost and fuel efficiency of replacement units, project architect Michael McMahon of CPR Associates and Jeffrey Kanzelberger of the college's facilities department worked with a Wausau-based aluminum-window maker to develop a framing system that would duplicate exactly the 3/16-in. panning and deep shadow lines of the wood originals. Full-scale CAD-generated drawings of the proposed windows were approved by Wisconsin's compliance officer as meeting both state and Department of the Interior guidelines. Frames, extruded by a custom die that re-created the wood profile, were finished in a cream color that duplicated the original paint. Glazing is clear insulating glass, and all sash tilt in for easier cleaning. The college's fuel bills are lower, too. Milco Windows, Wausau, Wis. ■

NFRC set to meet Congressional deadline

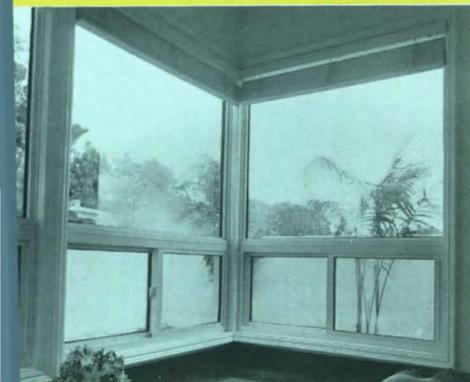
To resolve conflicting claims relative to energy performance and other characteristics in the highly competitive window industry, the National Fenestration Ratings Council (NFRC) is developing rating procedures for thermal resistance, solar-optical characteristics, and air infiltration, which are deemed to have the greatest impact on energy performance. It's not a standards organization, but includes representatives from glass, window, and door manufacturers, trade organizations such as NAHB, ASHRAE, and the AIA, utilities, universities and testing labs, the United States Department of Energy, and consumer-advocate groups. The National Energy Policy Act of 1990 gave the NFRC responsibility for developing a voluntary, nationwide rating and labeling program for windows, skylights, and glass doors by the end of 1992, and an additional push was provided by California's Title 24 Residential Energy Code, which sets a maximum U-value for windows offered for sale in the state after June 1992. In April, the group made considerable progress toward these deadlines by approving an interim procedure that rates a window's total U-value by combining the heat-loss at the center of glass, edge of glass, and the sash-frame area, based on calculation models that are verified by sample testing of the products. Herbert Yeudenfriend of the NFRC feels that it is important for architects to understand the significance of the NFRC energy ratings and labeling system. Advances in window and glass technology have already reached the point where, in heating-dominated climates, windows with low heat loss outperform the best-insulated roof or wall system since captured solar heat gain exceeds thermal loss, even on the north elevation. Incorporating these concepts can be of considerable help in overcoming the limitations on fenestration use presently imposed by ASHRAE 90.1 and 90.2. Within the next decade one could expect that appropriately specified fenestration will provide a net gain for new buildings and eliminate constraints from architects in the use of glass for all building design. The Interim Procedure for determining fenestration product thermal properties (currently limited to U values) is available from the NFRC, 962 Wayne Ave., Silver Spring, Md. 20910. ■

Window makers respond to the demand for ever-better energy performance, historic accuracy, and site-specific sizes and colors.



301 Jeffersonian. A large triple-hung cherry-wood window, designed by architect Stuart Cohen to showcase the fabrication techniques offered by the maker's new custom plant, recalls the windows Thomas Jefferson invented for his study at Monticello. Each equal-size sash is counterweighted, and the center unit lifts automatically as the bottom sash is raised. The full clear height of the open window is 6 ft 8 in., with a frame that fits into a 2 by 4 wall; the lift mechanism is in an accessible pocket. Shown to the rear of the room setting are true-divided-light windows with curved glass. Pella/Rolscreen, Pella, Iowa.

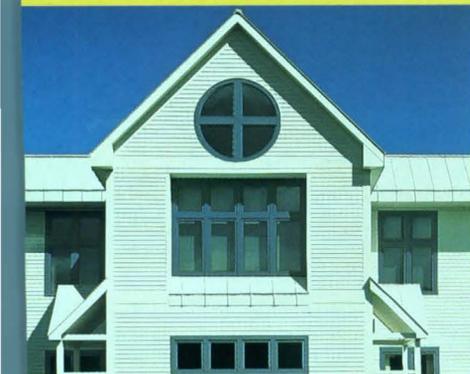
302 Intricate. A new multichambered sash design separates the drainage and reinforcement chambers in Rehau double-hung and slider windows, improving the frame's condensation resistance while ensuring a thin section in the structural-plastic extrusion. For customized large windows, steel reinforcement can be placed within the chambers, stiffening the frame while maintaining a narrow profile. A new lift-rail glazing stop simplifies the appearance of corners, with one common sash profile for each light. Rehau Inc., Leesburg, Va.



303 Colorful. Marvin has greatly expanded the range of colors offered in its Flexacron coating system, a factory-applied two-component finish said to provide durable long-term performance without compromising the natural look of wood windows. Over 50 colors may be specified on a standard, two-week lead time. Color formulations can be made available so that trimwork can exactly match the windows. Marvin Windows, Minneapolis.

304 Thrifty. Available as an option in clad casements, awning, half-round, and other window shapes, InSol-8 glazing has two layers of clear Heat Mirror film set within a one-in.-thick insulating unit, creating three gas-filled spaces with a center-of-glass R value of 8. Using the selective-transmission film almost eliminates UV-caused fading of interior furnishings, and greatly improves the noise-blocking characteristics of the glazing. Spacers are non-conductive, and do not compromise thermal efficiencies. Hurd Millwork Co., Medford, Wis. ■

Products continued on page 126



MicroStation PC 4.0

By Steven S. Ross

Out of the box (a very, very big box), you get 3-D modeling and rendering, links to external databases, and a UNIX-like windows interface. Drawing files are interchangeable with Macintosh and UNIX versions. (For a review of MicroStation 3.5, Mac version, see ARCHITECTURAL RECORD, February 1990, page 177.)

All this makes MicroStation 4.0 a particularly good buy for those who have outgrown their existing UNIX Intergraph system. As

with other Intergraph software, eight views can be open at once. The image windows can be resized and overlapped. Many other new features in this version make upgrade worthwhile. Among them:

- Easier control of image settings.
- Naming or numbering of drawing levels, and hierarchical arrangement of levels.
- Isometric for drawing 3-D objects in 2-D.
- Auxiliary coordinate systems (cylindrical and spherical, in addition to rectangular) for easier 3-D drawing of curved objects.
- More reference files—up to 255.

- Flexible multiline line styles for walls.
- More flexible dimensioning.
- Improved image control, and an optional interface to RenderMan, which has become the industry standard for shaded images.
- Built-in file translation to and from DXF Release 10. Intergraph promises free upgrades as DXF evolves.

By the way, a version for industry-standard Sun computers has been announced for fall. The company delivers on its promises—although typically late. ■ Circle number 305

MicroStation PC 4.0 Nuts and Bolts Summary

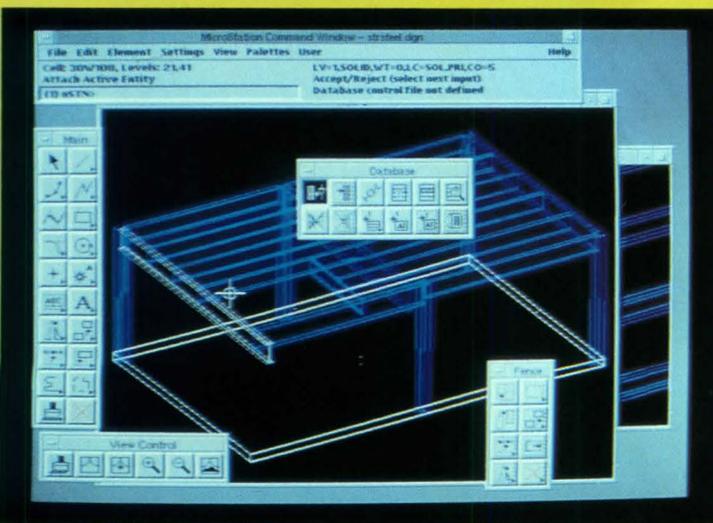
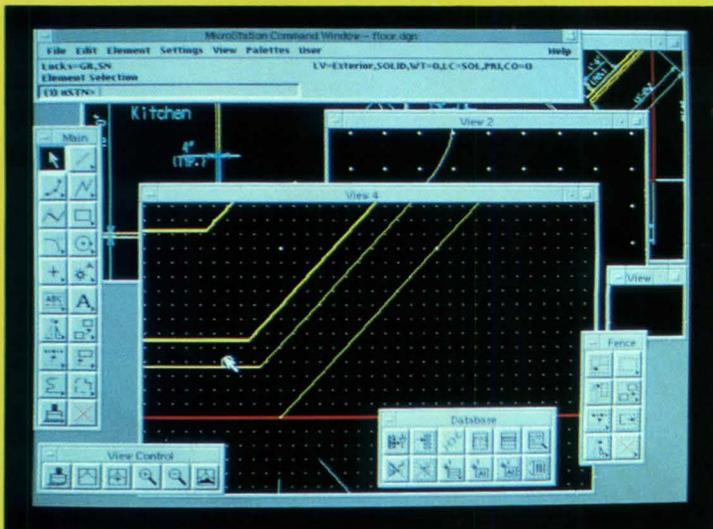
Equipment required: Computer equipped with 80386 or 80386SX CPU and 80387 or 80387SX coprocessor or functional equivalent, or 80486 CPU; 2 MB of random-access memory (at least 4 MB strongly recommended); fixed disk, DOS 3.1 or above (3.3 strongly recommended), mouse or digitizing tablet. This is the first DOS version that works well enough with a mouse to forsake the tablet. If you use a tablet, though, the 12x18 size is strongly recommended, especially in offices that are already using Intergraph's own dedicated workstations. Architects we showed the software to generally preferred the tablet to the mouse. Hardware lock fits on a parallel port. If a printer is connected to the lock, it must be turned on.

Vendor: Intergraph Corporation, Huntsville, AL 35894-0001; 800-345-4856. \$3,450. Support is normally through dealers, but a toll-free 800 number connects you to Huntsville. Upgrade from 3.3, \$500. Service: Through dealers. Networking and multiple copies: Volume pricing available.

Manuals: Four giant loose-leafs, with installation instructions, tutorial, command references, and programming guide for the add-on C-like command language. The manuals are logical, well-written, and absolutely a must-read before installation and use.

Ease-of-use: MicroStation is an astoundingly flexible, full-featured package. Learning to use it efficiently can take months. But the basic moves are intuitive, so you can put it to work almost immediately. Zooming is a bit awkward—you define a zooming point, rather than surrounding the view you want with a box that defines the new boundaries of the image.

Error-trapping: Good. There are lots of little traps, but they tend not to produce errors that can corrupt or destroy files. Errors can be produced by unsophisticated User Command Macros. But because the macros are meant to be used by advanced personnel, this should not be a problem in the typical practice. Operation to store and retrieve files on a Novell NetWare 386 network was smooth, once we sorted out some details about which interrupt address we could use to access the network. We suspect a UNIX network arrangement would be more typical, because of the Intergraph UNIX pedigree.



Top: Views of the main palette and palettes for database, view control, and fencing off sections of the drawing. The look is that of the UNIX OSF/Motif windowing system, similar to Intergraph's dedicated workstations. Above: The database palette.

Coprocessor Substitutes

ou're about to buy a powerful new computer. Your CAD software requires that a math coprocessor chip be installed. Your dealer suggests you can get faster calculations by using a clone coprocessor chip instead of the Intel 80387 or similar Intel chip. The software vendor, however, says only the Intel part is certified.

ur tests of the Integrated Information Technology Advanced Math CoProcessor suggest your dealer is right. While normal CAD software does not deliver the huge speedups that some clone chip suppliers claim, you should realize at least a small speed gain compared to the Intel part. There do not seem to be any compatibility problems. And, most importantly you may save a little money.

ut first, what does a math coprocessor do? Many of the calculations that CAD software must make to place an image on the screen are done with "floating point" math. That is, the calculations are done to whatever number of decimal places are necessary to get the required precision—typically 16 significant digits. A simple line in a 3-D drawing is described by its two endpoints. Each of the endpoints has three coordinates (one for the X axis, one for Y, and one for Z).

o calculate the length of the line, typical CAD software "rotates" the coordinate system so that it lies in a plane, imagines the line as the hypotenuse of a right triangle, then subtracts the X values from each other and the Y values from each other to get the length of the triangle's sides. Using Pythagoras's theorem, the software squares the differences in X and Y, sums them, and takes the square root of the total. Curves require more than two points to define. To create a surface, CAD software imagines the line described by the triangle (or, for photorealistic shading, a polygon with even more sides), checks to make sure other objects (planes) are not between your viewpoint and the surface, and "bounces" imaginary light off the surface in accordance with Snell's law (angle of incidence equals angle of reflection).

ultiply all those calculations by the number of elements in a drawing, and it is

a wonder that even our fast modern workstations can handle them all—shading a drawing in a few minutes, or performing hidden-line removal.

The Intel coprocessor chips, and most of the clone brands, have part numbers with "87" in them. Intel's parts are the 80287, 80387SX, and so forth. The newest Intel CPU, the 80486, has the coprocessor built in.

Reviews of coprocessors in general-interest computer magazines have tended to find little or no difference in speed. But there have been no reviews of really big CAD files. And some of the reviews were clearly done improperly. To see differences in calculation times, we used big models—two DXF files each over 4 MB. One consisted of mainly flat surfaces (95 percent of the 20,000+ elements were lines), the other used curves for about half its 17,000 elements.

To isolate the calculations from slower disk access time, we used enough memory to put all of the models in memory at once. We then used ASG's new Model Vision to render the images, first in "Quick View" mode, and then in high-quality "Full Render" mode. We started timing when the render command was given, after loading everything into memory. (We'll be providing a full review of Model Vision in a future issue, by the way.)

The actual rendering times are irrelevant—your images and your computer speed will differ. The IIT chip was consistently faster, but by small margins. The margins are greater for the drawings with curved surfaces, because more calculations are needed.

This first table shows the results on an IBM PS/2 Model 80 with 9 MB of RAM.

	Intel 80387	IIT 3C87
Flat, quick shade	7:18	6:58
Curved, quick shade	16:01	14:50
Flat, full render	19:42	19:01
Curved, full render	23:02	22:06

When we went to our custom 386SX computer with 16 MHz ELT motherboard and 5 MB RAM, the differences became very small—unnoticeable in normal office use. This was because there was some disk-swap-

ping. The software was storing part of the images on disk, because there was not quite enough RAM to hold them.

	Intel 80387SX	IIT 3C87SX
Flat, quick shade	10:32	10:21
Curved, quick shade	23:10	22:57
Flat, full render	28:18	28:01
Curved, full render	40:17	39:51

We added another 4 MB of RAM to the 386SX and reran the full render, getting values almost identical to the PS/2 Model 80 run. (Both computers used Qualitas memory-management software to turn extended memory into the expanded memory.)

	Intel 80387SX	IIT 3C87SX
Flat, full render	20:03	19:47
Curved, full render	23:37	22:51

In short, if your designs tend to be full of curves, the IIT (and maybe some other clone coprocessors we have not checked) give you a measurable speedup—perhaps from 1 to 10 percent in the real world—compared to Intel's part. ■ *Circle number 306*

Nuts and Bolts

Vendors: For IIT, Specialty Software Development, 1001 Capitol of Texas Hwy. South, Bldg. 1, Austin, Tex. 78746. Phone 512-327-8608.

Cyrix, P.O. Box 850118, Richardson, TX 75085-0118. Phone 214-234-8388 or 800-FASMATH.

Cyrix FasMath Series

Cyrix sells two coprocessor chips for 80386 computers. The FasMath 83D87 is a pin-for-pin replacement for the Intel 80387. It uses the standard 68-pin coprocessor socket. The FasMath EMC87 uses a 121-pin socket. Most 80386 computers (but not the IBM PS/2 series) have a socket that can accommodate it. The EMC87 can work much faster than the other chips because the computer sees it as a block of memory, rather than as a separate peripheral. The software has to be set up to take advantage of this, however. One popular CAD package that works with the EMC87 is FastCAD from Evolution Computing. Other software can use the EMC87, but at a more normal speed. ■ *Circle number 307*

Towns For All Seasons

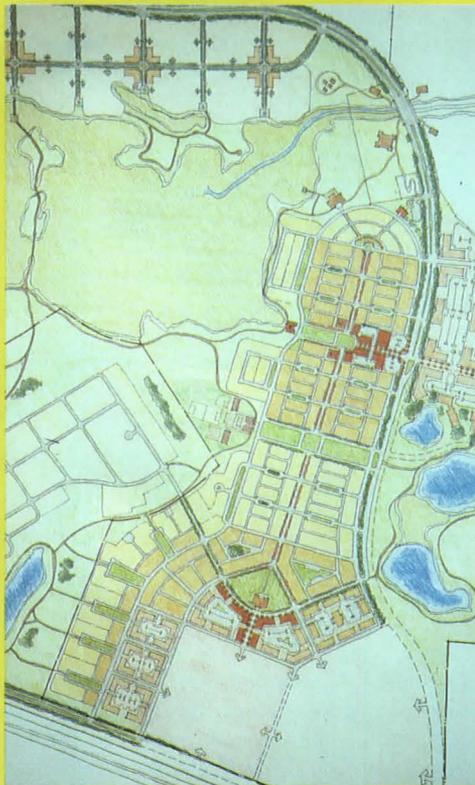
What in classic American towns is meaningful today? A short list of key elements might include streets with pedestrian activities, mixed-use town centers, central public parks, and plans that integrate commercial uses with civic life. Such urban features, though, require a fundamental reassertion of community over isolation, of Main Street over anonymous strips, of place over mobility.

Throughout the post-World-War-II era, Americans have moved to suburbia for privacy, mobility, security, and home-ownership. What they increasingly have found, though, is isolation, congestion, rising crime, and unaffordable housing. Add to these problems the environmental and social stress of sprawl, and you can begin to understand why many people are now demanding profound change.

We cannot, however, return wholesale to the forms and scale of the prewar American town, just as we cannot sustain the Ozzie and Harriet world of the 1950s and '60s. Certainly the automobile—modern suburbia's form giver—will not disappear, even if constrained and balanced by alternatives. The extended family and mom-and-pop stores associated with old towns will not return, regardless of design controls or clever planning. The varied craftsman-built houses put up a few at a time are also a thing of the past. However, finely integrated walkable communities with strong identities, built around usable public places, are still possible, still economically feasible today. The forms these communities employ may vary in time and place, but certain traditional-town design principles will emerge as both timeless and contemporary.

The classic American town had walkable streets that led to neighborhood grocery stores and the post office, rather than collectors and high-traffic arterials. Elm Street led to Main Street or to a local park or the day-care center or the elementary school. Such a pattern is actually cheaper to build than that of today's suburban sprawl, and results in

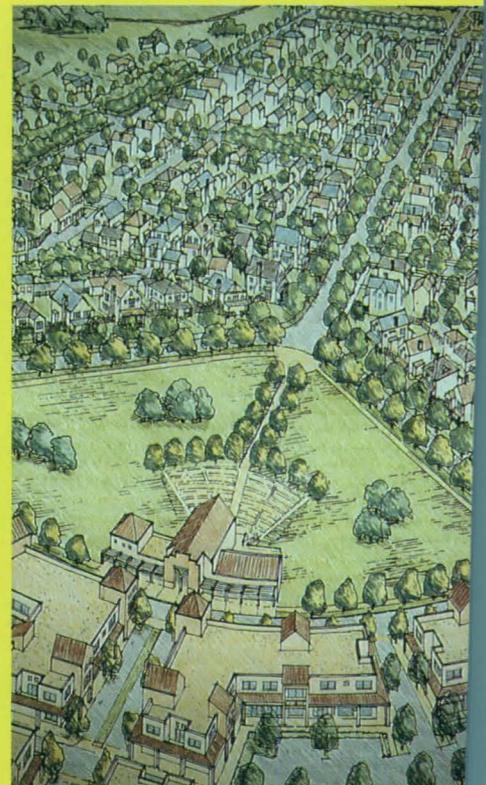
Peter Calthorpe is a principal in Calthorpe Associates, a San Francisco-based architecture and planning firm.



Calthorpe's plans for Northwest Landing, a new community near DuPont, Washington call for mixed-use villages and a street grid skewed by the site's natural features.

shorter trip distances even when cars are used. In communities modeled on classic towns, the streets are narrow, and are lined with sidewalks and trees. They are fronted by porches and entries rather than garage doors and driveways. They allow through traffic, but slow it down with frequent intersections and frugal dimensions. Gone are the extremes of collector streets with soundwalls and cul-de-sacs. Privacy is maintained, but partly shifted from front yard to neighborhood. Security is provided by eyes on the street rather than by gates and patrols. Such streets are not nostalgic, they are practical—practical for the single parent in need of some independent kid mobility, for the elderly couple without a car, for the single person in search of accessibility, for the working family desiring a strong sense of community.

The classic American town had diversity of uses. So does the modern suburb. But while the suburb separates its various elements (residential streets, commercial streets,



school sites, and shopping centers), the traditional town wove them together with connections that were internal and walkable close and direct. The center of the town integrated commercial, recreational, and civic activities rather than isolating them. Such system is still practical today. Commercial centers can benefit from the increased traffic created by trips to civic and recreational facilities. Parks and civic centers are better utilized when located at hubs of activity within walking distance of residential areas. These connections, however, draw into question the architectural language of the modern suburb. A new design problem arises: how to establish an overall identity for a community while avoiding arbitrary architectural controls.

Times have changed

What cannot be adopted from the pre-World-War-II town is its fine grain and scale. We now have commercial enterprises that no longer fit into small packages. The typical supermarket is now pushing 60,000 sq. ft.

eter Calthorpe digs below the surface of nostalgic forms to find the timeless elements of traditional towns.



GPA Architecture and Planning turned a San Diego shopping center into the Uptown District, a mixed-use neighborhood.

and the standard discount store is reaching 100,000 sq. ft. Small shops remain, but anchor tenants in shopping centers keep getting bigger due to consumers' demand for "one-stop shopping" and volume discounts. These anchors resist a Main-Street configuration, mandating the market area and visibility of a major arterial. As a result, hybrid town centers must combine the intimacy of classic American towns with the accessibility of shopping centers—certainly a design challenge.

The scale of development and land assembly has expanded radically in the last 30 years. Towns no longer grow by individual buildings or even small groups of buildings, but by production units of approximately 150 houses or by retail centers of at least 100,000 sq. ft. Because of economies of scale in units of both construction and management, developers rarely build apartment complexes smaller than 100 units. Land developers typically bring over 100 acres (the size of a classic town center) through permits with one master plan. Rather than the

architectural diversity of incremental growth, we have large blocks of development with formula configurations dictated by developer inertia and financing criteria. Such development demands innovative design to avoid the "theme" quality of isolated subdivisions, shopping centers, and office parks. It needs an architecture that integrates these contemporary pieces into a larger community without nostalgically imitating the scale and diversity of classical towns. Simultaneously, the architecture must avoid the sterility and highway scale of the modern suburbs. The scale of development cannot be concealed or denied, but it can be responsive to and contribute to a larger civic order.

Tradition versus nostalgia

There is a fine but important difference between tradition and nostalgia. Traditions are rooted in timeless impulses while being constantly modified by circumstance. Tradition evolves with time and place while holding strong to certain formal, cultural, and per-



Main Street in Corning, New York, is a classic model of mixed-use development.

Paul Sachner

sonal principles. Nostalgia, on the other hand, seeks the security of past forms without the inherent principles. The current interest in the classic American town can tilt to profound and meaningful principles or merely color suburbia with an old-time style. The difference is in the quality and skill of adaptation.

The design challenges of creating a post-suburban metropolis will be many: to devise an architecture that provides continuity over differing building types without resorting to superficial themes; to create an architecture that reinforces the public domain without sacrificing the diversity and character of the individual buildings; to create a planning approach that is more disciplined and integrated than single-use zoning; and to evolve a design approach capable of accommodating modern institutions without sacrificing human scale and identifiable communities. Certainly, these challenges are of greater consequence than the academic style wars now preoccupying the professions. ■

Briefly Noted

Housing Without Houses: Participation, Flexibility, Enablement, by Nabeel

Hamdi. New York: Van Nostrand Reinhold, 1991, 194 pages, \$39.95.

The author, the director of international studies, design, and development at Oxford Polytechnic in Britain, presents a series of innovative ways to attack the problem of housing in "contexts where resources are minimal, demand is high, urgency is acute, and uncertainty is a way of life." The book examines projects in both the Third World and developed countries.

Hillside Building: Design and Construction, by Arthur H. Levin. *Santa Monica: Arts + Architecture Press, 1991, 172 pages, \$19.95.*

A useful handbook, this book takes the reader through the entire process of hillside development—from analyzing and selecting a site, to architectural design and construction. Chapters also cover topics such as code restrictions, survey and geological factors, and structural considerations. Richard Neutra's son Dion, also an architect, contributes an engaging foreword.

Although aimed primarily at people thinking of building a house, this book should prove interesting to architects for its case study of one particular house—a country retreat designed by Stageberg for his wife and co-author, Toth. Sketches of rejected versions of the house (including amusing notes by Stageberg) take the reader on a tour of one architect's design process.

A House of One's Own: An Architect's Guide to Designing the House of Your Dreams, by James Stageberg and Susan

Allen Toth. New York: Clarkson Potter, 1991, 192 pages, \$20.

Although aimed primarily at people thinking of building a house, this book should prove interesting to architects for its case study of one particular house—a country retreat designed by Stageberg for his wife and co-author, Toth. Sketches of rejected versions of the house (including amusing notes by Stageberg) take the reader on a tour of one architect's design process.

Design and Construction Failures: Lessons From Forensic Investigations,

by Dov Kaminetzky. New York: McGraw-Hill, 1991, 600 pages, \$59.

This thorough resource on what happens when things go wrong covers a range of structural systems, from concrete and masonry to steel. The author includes an abundance of case histories, as well as over 500 photographs and line drawings that help prove the impact of Murphy's Law on architecture and construction. ■

Drawn for ARCHITECTURAL RECORD by Sidney Harris



Baseball comes to Istanbul: The Hagia Sophia Dome

Building Types Study 691
Sports and Recreation Facilities

It is just coincidence that three of the five sports and recreation facilities featured on the following pages are located in or near Chicago. As Rick deFlon, partner of HOK's Sports Facilities Group, observes in his essay on the current state of architecture for sports and recreation, Americans and the rest of the world—not just Chicagoans—have rediscovered the positive effects of leisure activity, competitive sports, and physical fitness, both as spectators and as participants.

The architectural response can be reassuringly traditional or daringly innovative, ranging from the new Comiskey Park (page 60), where deFlon and his colleagues have attempted to combine late-20th-century amenity with early-century baseball imagery, to the Sydney Football Stadium (page 74), a 40,000-seat coliseum whose undulating rings of steel masts and cables and bands of exposed concrete are meant, according to the architect, "to convey the impression of gladiatorial combat." For the more active set, Kisho Kurokawa's Chicago Sporting Club conceals a mountain-climbing wall and other fitness apparatus behind crisp white-painted steel facades (cover and page 92); Tigerman McCurry's Hoover Outdoor Education Center offers physically handicapped Boy Scouts summertime recreation in a rustic barrier-free setting (page 84); and Marquis Associates' Sixth and Folsom Community Center (page 68) is a welcome, heavily used sanctuary for low-income residents of a San Francisco neighborhood where the arena of sports and recreation is all too often a city street. *P. M. S.*

Design for Leisure

Throughout the world—and particularly in the United States—sports and leisure facilities are undergoing a renaissance, as more and more people discover the positive effects of recreation and fitness. Those of us who live and work in competitive, stressful environments now find ways to cope with the day-to-day impact of these pressures through a combination of relaxation and competitive leisure activities, both as spectators and participants.

Facilities that enable people to rejuvenate their bodies and compete outside the workplace typically are major projects that have a profound impact on their surroundings. Sports stadiums in particular have long been significant, and at times controversial, structures whose architects must address such issues as scale, access, location, symbolism, and urban pride. Though fitness and community centers as building types are a much newer concept, they too have become emblems of a municipality's social and economic status—and must be carefully planned as such.

Four periods of stadium design

Perhaps no building type better exemplifies the way Americans like to spend their time off the job than baseball and football stadiums. These facilities, often conceived as monuments to community pride or individual wealth and achievement, raise equally monumental architectural issues. The past century of stadium design in the U. S. can be divided into four general categories:

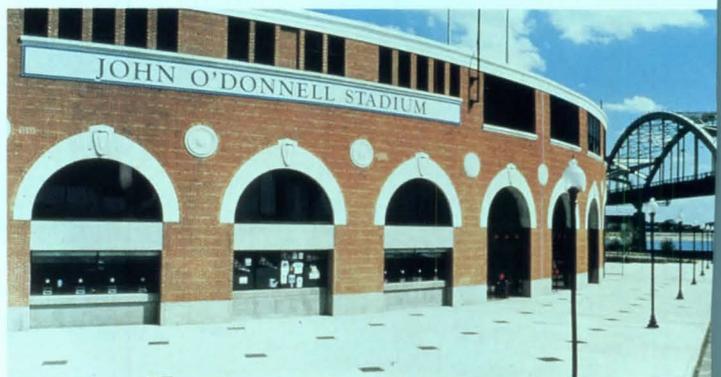
- **The Old.** Primarily constructed as baseball parks due to the relatively recent growth of football's popularity. These were typically built prior to the 1940s, and many were privately financed by team owners. They include Wrigley Field in Chicago, Fenway Park in Boston, Yankee Stadium in New York, and memories of Ebbets Field, Sportsman Park, and the recently demolished Comiskey Park.
- **The Not So Old.** Built at a time when football became a force in its

HOK renovated the John O'Donnell Stadium in Davenport, Iowa, into the upgraded home of the minor-league Quad Cities Angels.

own right and typically as municipally funded public projects. These were mostly dual-use stadiums built from 1960 to 1975. Some examples include Shea Stadium in New York, Busch Stadium in St. Louis, Three Rivers Stadium in Pittsburgh, Riverfront Stadium in Cincinnati, Fulton County Stadium in Atlanta, and Candlestick Park in San Francisco.

- **The New.** Almost always publicly financed, with domes becoming financially and functionally acceptable. A sort of midlife crisis period where functional problems of co-tenancy of football and baseball teams were acknowledged, but financial considerations were strong and design solutions were attempted with mixed results. A few examples generally accepted as models for the future include the twin stadium complex in Kansas City, Giants Stadium near New York, the Hoosier Dome in Indianapolis, and the Superdome in New Orleans.
- **The Present.** The first major-league stadium built solely for baseball in 18 years—the new Comiskey Park—opened this spring, galvanizing a new era in baseball-park design. Joe Robbie Stadium in Miami opened in 1987 as the first, and probably last, privately financed stadium since Dodger Stadium was completed in 1962. The Florida Suncoast Dome in St. Petersburg opened in 1990 as a tribute to the vision of the city's anticipating a major-league baseball franchise; similarly, the new Pilot Field in Buffalo, completed in 1989, stands ready to house that city's hoped-for major-league baseball franchise.

The immediate future of stadium design will be marked by heightened sensitivity to spectators, tenants, and neighbors. These buildings are meant to function not only as optimistic symbols of a entire city's future—witness the projects in Buffalo and St. Petersburg—but also as good neighbors in that same community. Architects must address these seemingly contradictory goals, along



Old-fashioned values mark the design of recent structures for sports and recreation, according to Rick de Flon, principal with the HOK Sports Facilities Group.

With the usual project-related issues of scheduling, budget, and function.

Baseball-stadium design in particular exemplifies a growing trend toward something more than just a good seat in a safe building. Owners, tenants, and spectators are now requesting a return to facilities that reflect the tradition of baseball as a social establishment. City fathers routinely raise issues such as how the stadium embraces the urban fabric, and architects now must carefully study the scale, character, materials, and colors of these buildings.

One example of the current direction is the new Pilot Field in downtown Buffalo [RECORD, November 1989, pages 88-91], which moved from a proposal for a domed multi-use stadium, opposed by the city's historic preservation advocates, to a much-acclaimed ballpark with sensitive detailing and site-specific design. The use of traditional colors, trim, and decorative steel enhanced the ornate precast concrete skin, resulting in a structure that Buffalo's mayor described as looking "like it had always had been there."

Chicago's new Comiskey Park [see following pages] opened to similar acceptance, even as it replaced one of the best-loved ballparks in America. The new Camden Yards Ballpark in downtown Baltimore, scheduled to open next year for the Orioles and their fans, heralds an even brighter future for baseball-park design. Here, the owner and tenant were willing to match their budget to a desire for detailing and unique urban characteristics on a scale not yet seen in modern stadium design.

Enough one sees a similar trend toward sensitivity to scale and the environment in the design of football stadiums, that professional sport has a far briefer history than baseball. The emphasis with football seems to be more on spectator comfort and modern amenities such as private suites and concession variety.

Beyond stadiums

Stadiums, of course, are only one of the subcategories of sports and recreation buildings. Others range from small park and recreation structures to multilevel urban health and fitness centers and stadium-sized arenas for college and professional teams. There are even recent examples of multifunction facilities such as a new arena in Minneapolis that boasts a complete fitness club on its subterranean levels.

Combining sports-related uses is often the only way an owner can make a project economically viable. This practice occurs on many levels, from upscale seating in clubs and private suites to rentable satellite facilities and intricate wiring systems that are leased to television-network users. These income-generating features—and new ones seem to be found each year—are definite programmatic forces that architects need to address in the design process.

The constant search for revenue generators obviously creates yet another source of opportunity for design—renovating and updating existing facilities. Renovations can range from simple modifications such as upgraded mechanical or electrical systems to major rebuilding programs. Perhaps the most celebrated (and notorious) of the latter was the costly overhaul of Yankee Stadium in New York during the early 1970s. This lengthy renovation, which forced the Yankees to spend a season at nearby Shea Stadium, resulted in the elimination of view-obstructing columns from the seating areas. More common renovation projects in spectator facilities today include new private suites and improvements to food service.

It seems clear that the upward curve in money devoted to sports and leisure will continue for the foreseeable future. What's more, clients, tenants, and consumers will continue to demand concern for context whenever inserting these facilities into the existing metropolitan fabric. *Rick deFlon*

HOK's Camden Yards Ballpark, currently under construction in Baltimore, reflects the traditional architecture of old ball fields.

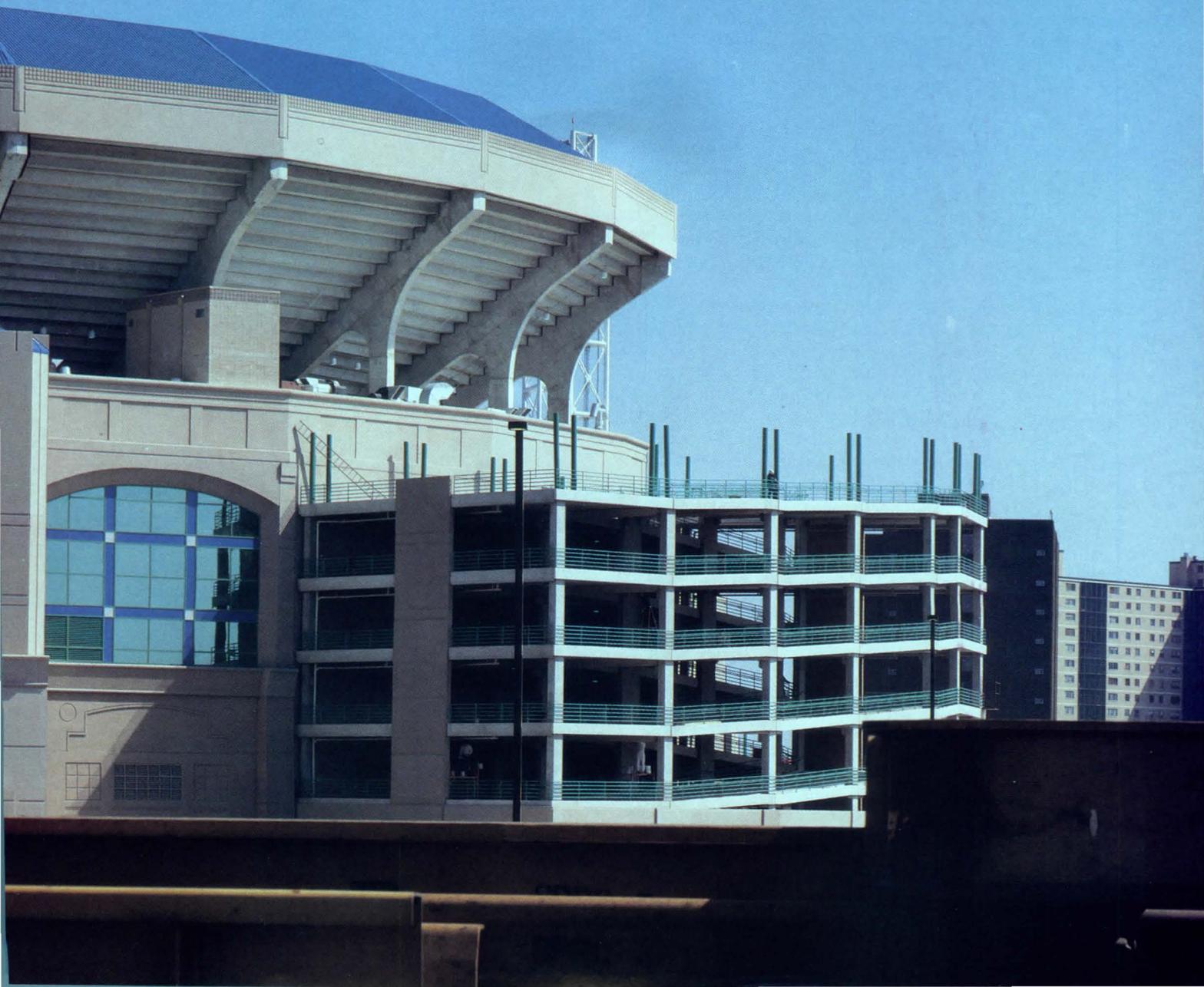


Cracker Jack Palace



The obstructed seats are gone, and luxury suites are in. But can the new Comiskey Park capture the hearts of Chicago's baseball fans?

*Comiskey Park
Chicago, Illinois
Hellmuth, Obata & Kassabaum
Sports Facilities Group,
Architects*



They don't make ballparks the way they used to. No matter what the marketing people say, sports facilities today reflect a different set of values than those of their forebears. Skyboxes for season ticketholders, multilevel restaurants, and upscale concession stands have become driving factors in the construction of the latest stadiums. Indeed, these extra sources of revenue not only make the fancy new playing fields possible, they also help make the expensive new players possible. It's hard to afford a decent starter (let alone a full pitching rotation) these days if you don't have enough \$55,000-a-year enclosable suites to lease.

The new Comiskey Park is clearly a member of the latest generation of baseball parks. Built across the street from its 1910 namesake, it is taller and less intimate than the white-brick pile beloved by White Sox fans since the days of Shoeless Joe Jackson. And as the old park comes down to make way for new parking, some people surely will mourn the passing of an era.

But the old days were never as sweet as some people remember. Shaped like a kite, the old Comiskey Park may have offered a great deal of charm, but not to spectators whose views were obstructed by columns or whose seats angled to the outfield instead of the infield where most of the action takes place. What's more, while seats wrapped around most of the field, creating a remarkably intimate playing environment (too intimate for some visiting athletes), many fans in the upper deck couldn't see portions of the playing field.

And the new era is not as crass as critics think. Handicap-access to all levels of the stadium, generous concourses, and plentiful restrooms reflect today's values, as accurately as expensive skyboxes. Even the controversial changes in seating evoke a more democratic attitude: instead of penalizing some fans with obstructed views, the new park ensures everyone a clear view of the action (but at the cost of distancing many from the diamond).

As designed by HOK's Sports Facilities Group—led by project principal Rick deFlon and design principal Joseph Spear—the new Comiskey has fewer endearing quirks than its predecessor, and fewer annoying ticks. When first approached by the White Sox, HOK was asked to design a retractable-dome stadium. After working up schematics, recalls deFlon, "I told them we could build two stadiums—one with a dome and one without—for the price of a retractable dome." Eventually, everyone came to his senses and realized baseball should be played on grass (known as "natural turf" to the plastic-carpet crowd). So an open-air facility was commissioned. To the White Sox's credit, they always intended to build a baseball-only stadium, the first such major-league facility since Royals Stadium in Kansas City opened in 1973. As a result, they avoided the compromises inherent in multipurpose parks; sight lines, seat placement, and field configuration were designed for the best enjoyment of the game of baseball. The Sox also asked for "a ballpark, not a stadium," says Terry Savarise, vice president of stadium operations. "We wanted a place with character, not a flying saucer."

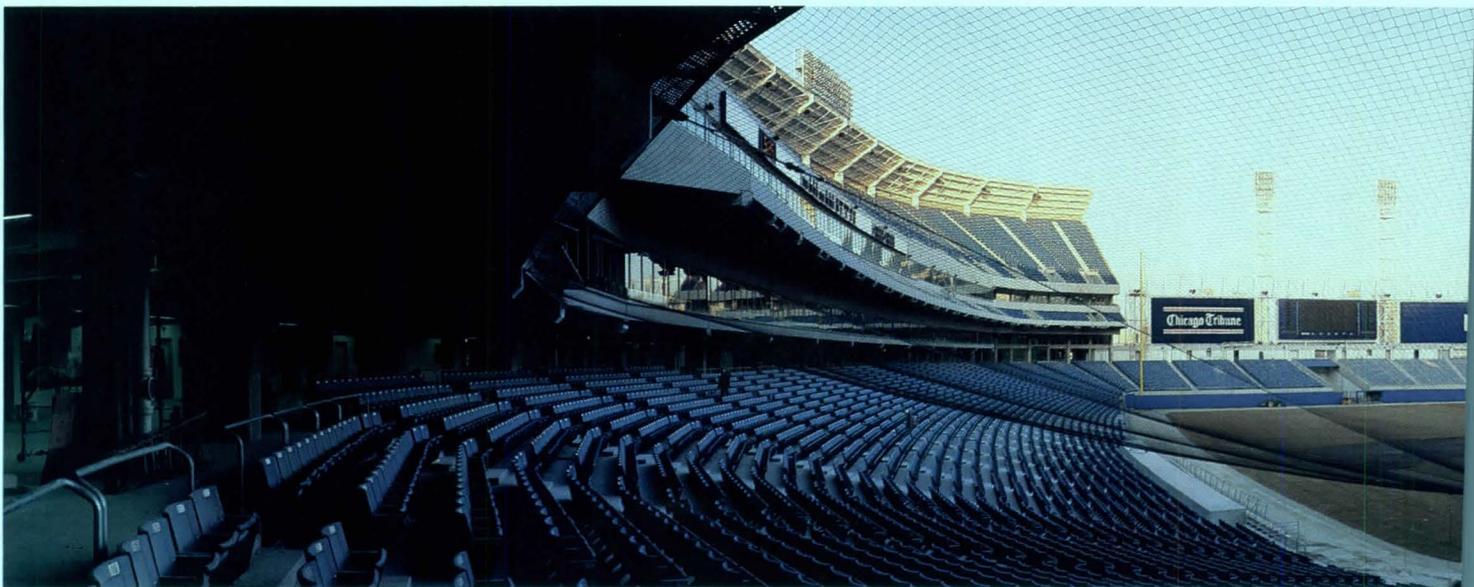
A return to more traditional ballpark designs has been the most important message in HOK's most recent work. Projects such as Pilot Field in Buffalo [RECORD, November 1989, pages 88-91], which opened in 1989, and Camden Yards Ballpark, now under construction in Baltimore, echo the quirky shapes and features of old parks. The new Comiskey Park follows in this tradition, picking up the familiar arches, metal-truss light towers, and masonry look of the old park. Although the stadium is built of reinforced concrete and sheathed



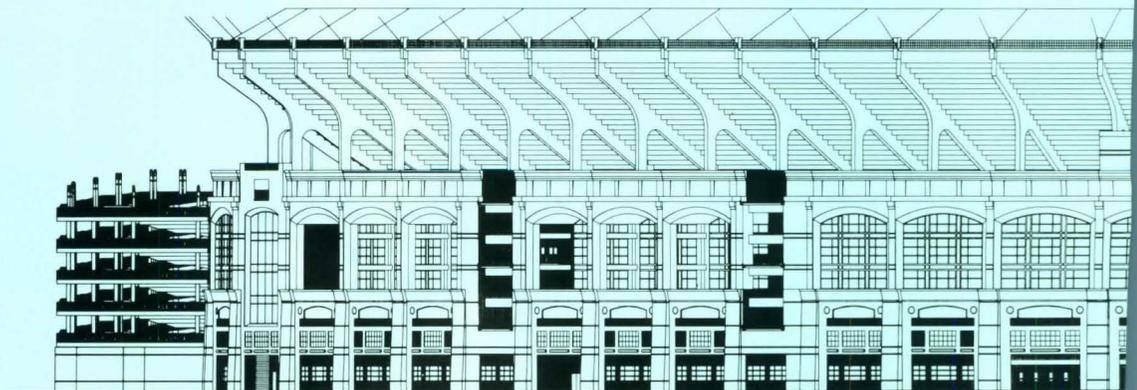
The original 1910 Comiskey Park is now being razed (above). According to project principal Rick deFlon, rehabilitating the old park would have required practically tearing it down to its foundation and rebuilding it. "It would have been a new building anyway." The new stadium (opposite) took 23 months to build and cost \$135 million. HOK specified beige-colored precast concrete to recall the old park's original natural brick, not the white-painted facade that White Sox fans became accustomed to during the last few decades.

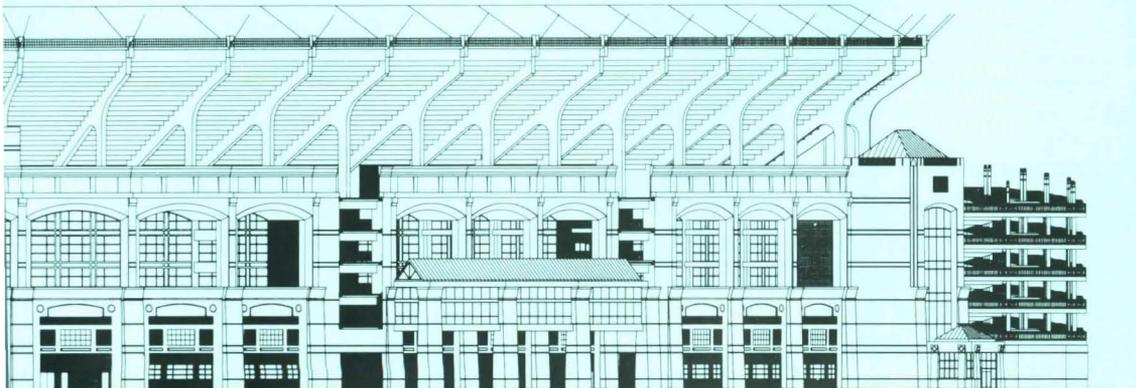
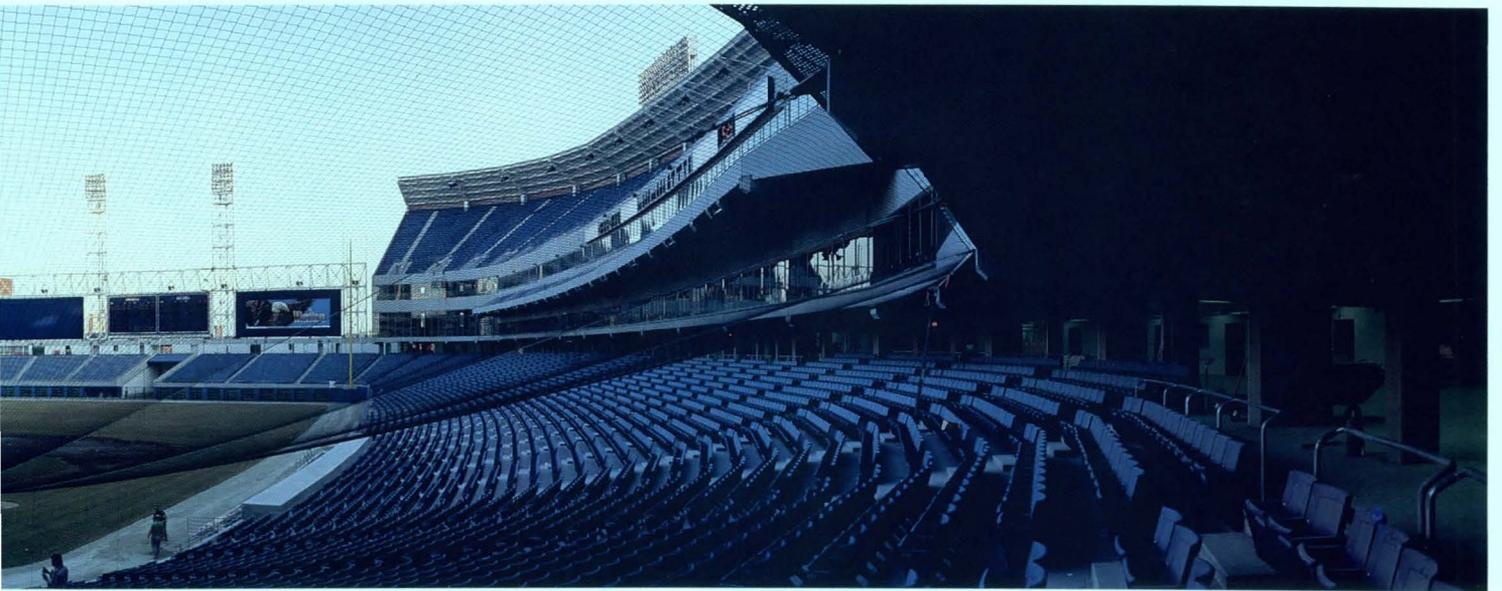
COMISKEY PARK





Instead of the old kite shape, seats in the new park spread out in a boomerang arrangement that focuses views toward the infield.





with precast panels, its exterior detailing is convincing in its reinterpretation of traditional masonry forms (page 63). Less successful are the combination of blue spandrels, green mullions, and reflective glass held within the great arches, and the ungainly access ramps that hide much of the facade.

One lesson HOK might have learned from old urban ballparks has to do with context. The new Comiskey, unfortunately, is isolated by a sea of surface parking reminiscent of the suburban stadiums of recent decades. An alternative plan designed by Chicago architect Philip Bess and supported by the Society for American Baseball Research proposed six-story mixed-use buildings lining nearby streets to create the beginnings of a neighborhood to which a new park could relate. The plan also called for a ballpark oriented toward views of Chicago's downtown Loop. The stadium that was built, however, sacrifices context for convenience—placing as much parking as possible near entrances.

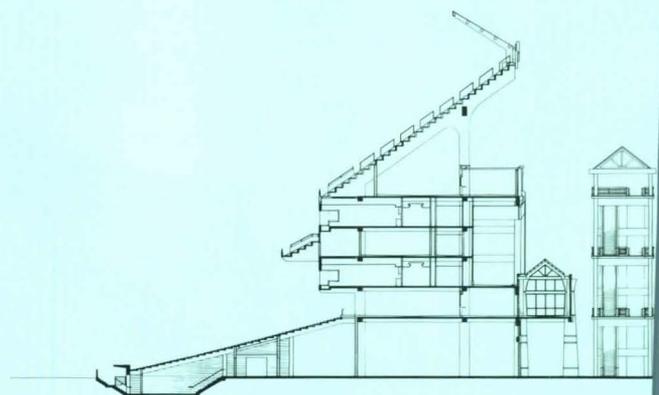
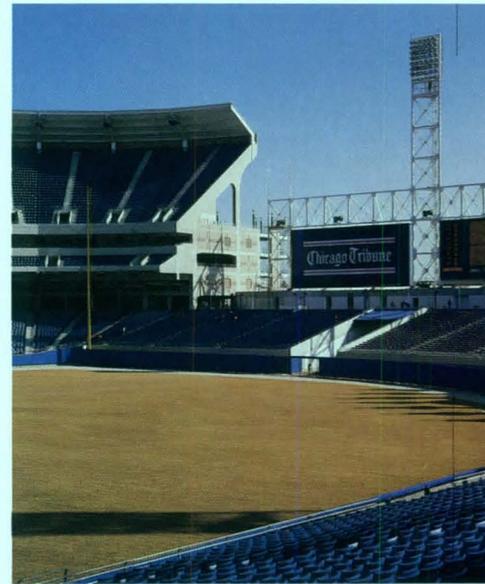
With 44,177 seats, the new Comiskey holds about the same as the old park. But its greater height (175 feet at the top of its light towers) makes it seem much bigger. The extra height is the result of an on-grade service level (something the old park sorely lacked) and three levels of skyboxes and press boxes (the old park had only one). The highest seats in the new house are 128 feet up (compared with 75 feet in the old park) and 160 feet away from the field (instead of less than 100 feet). Using software written in-house for a PC, HOK designers analyzed sight lines and sections for the upper deck, balancing the desire to keep seats close to the field with the need to keep seating tiers from getting too steep. (As built, the rows rise 21 inches for every 32 inches of depth.)

From the outside, the new Comiskey looks big. But inside, it feels more intimate than expected. Bleachers and a series of steel trusses holding scoreboards and light standards envelop the outfield and create a sense of enclosure. And by placing concession stands along the outside perimeter of 40-foot-wide concourses, the architects opened up views to the playing field for fans waiting in line for hot dogs and Cracker Jack, and protected them from cold winds, too.

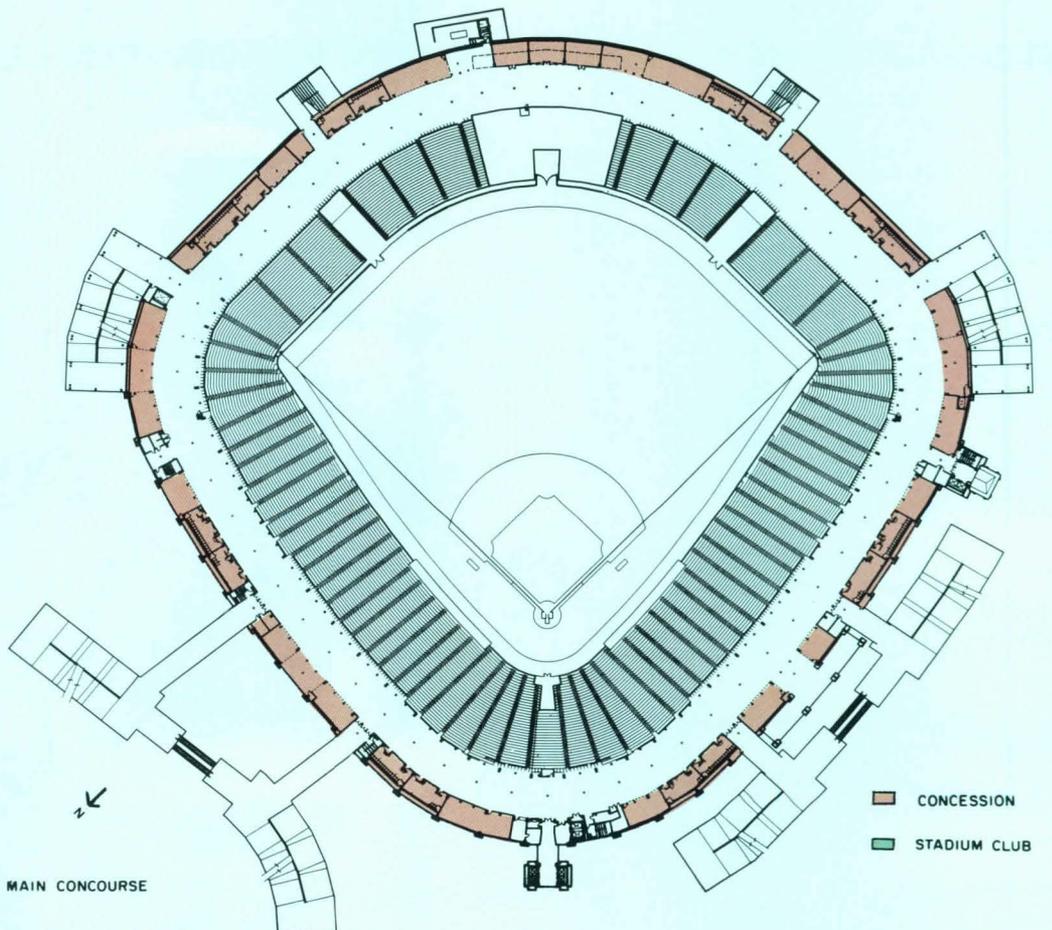
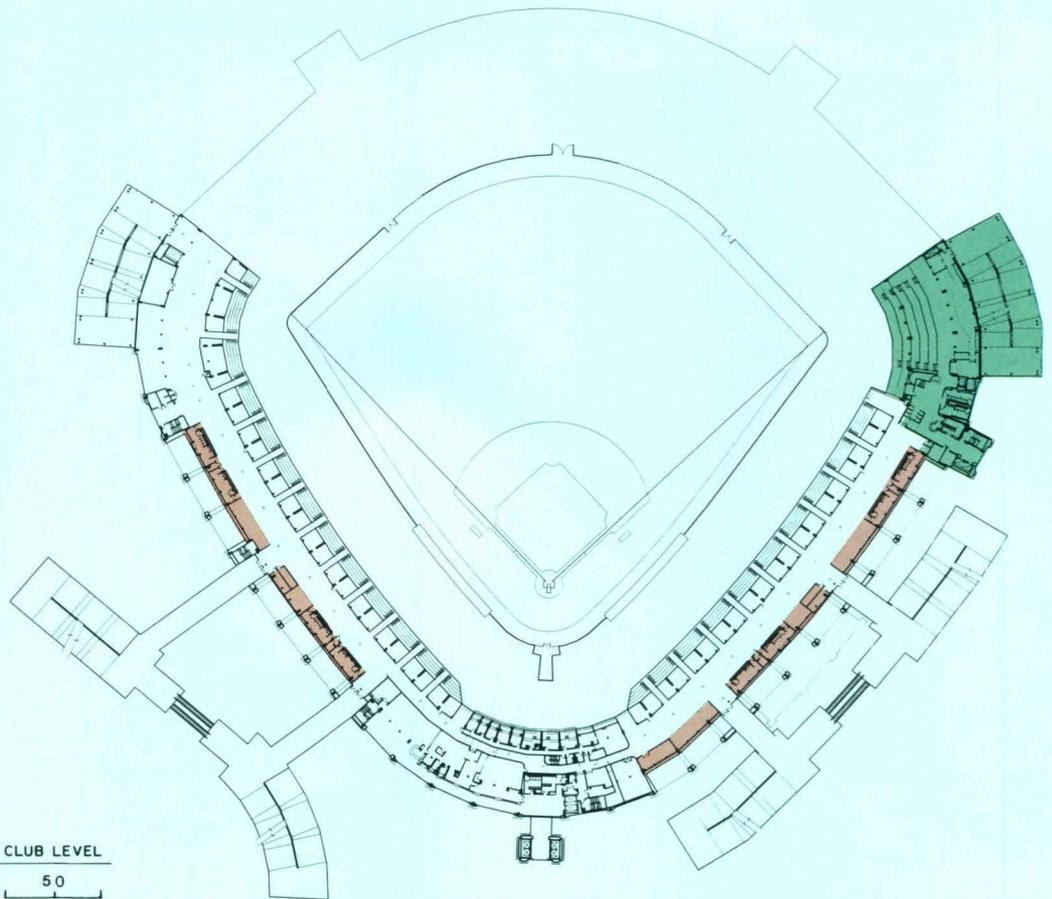
Sandwiched between the main level and the upper deck are two floors of suites, or skyboxes, and one floor for the broadcast press and dining. Most of the 91 suites, which seat between 10 and 26 people and rent for between \$55,000 and \$90,000 a year, have horizontal rolling windows that can be opened in good weather. A two-level Stadium Club restaurant over right field seats 400 fans.

Classified as a "highrise," the stadium is fully sprinklered. A distributed-sound public-address system, which comprises more than 500 speakers, directs sound to fans (but not to the entire neighborhood) and doubles as the fire-safety announcement system. While players often complained about the old park's support facilities, the new Comiskey has the best in baseball: two batting cages behind the home-team dugout, a training room four times the size of the old one, a sophisticated X-ray room, whirlpools, and (thanks to Bo Jackson's bad hip) a soon-to-be-installed swim-in-place lappool.

Without a doubt the new Comiskey Park works better than the old one and is more sensitive to the history and demands of baseball than the banal circular stadiums built in the 1960s and '70s. But its lack of urban values and identifying quirks leave it one step behind the neatly inserted and idiosyncratic Camden Yards Park now going up in Baltimore. *Clifford A. Pearson*



Whereas the old stadium held 3,500 fans, the new one accommodates 44,177. Field dimensions also vary only slightly from the old park: 347 feet to the foul poles, 375 to the fullpens, and 400 to center field for the new Comiskey (347, 380, and 401 for the old stadium). The old stadium had only 23,500 seats between the foul poles (the best area for viewing the game), but the new one fits in nearly 35,000. The main level (plan, right) accommodates 18,000 fans, including 200 in bleacher seats in the outfield. A 40-foot-wide concourse offers concession stands and restrooms on its outside perimeter and views of the playing field on the inside. Access to all levels is provided by two sets of double ramps with escalators, plus two single ramps and several elevators. The club level (plan, right) holds boxes for the broadcast press, private dining areas, a 100-seat Stadium Club restaurant, and some general seating. The seating sections on the club level are cantilevered 15 feet beyond the enclosed boxes (section, opposite).



Credits

Comiskey Park
Chicago, Illinois
Owner: Illinois Sports Facilities Authority
Architect: Hellmuth, Obata & Kassabaum Sports Facilities Group—Rick deFlon, principal-in-charge; Joseph Gear, project designer; Randy Borak, project architect; Jim Walters, project manager; Michael Brady, construction administrator; Dave Hamill, client representative
Engineers: Thornton-Tomasetti (structural); Flack & Kurtz (mechanical/electrical/ plumbing)
Consultants: Joiner Rose Group (acoustical)
Landscape Architect: Howell Knight Associates
General Contractor: Guest K. Woberg/Dugan & Meyers

CONCESSION
STADIUM CLUB

Group Effort

*Sixth and Folsom Park
and Community Center
San Francisco, California
Marquis Associates, Architect*





The Sixth and Folsom Community Center (bottom in aerial photo) is a green oasis in the tightly packed urban web of South of Market, "an area of complexity, tradition, and transition" in the architects' words. The center's multi-function program was developed through a series of participatory meetings during which the community evaluated alternative uses and site plans. In a sand-filled play area local children produced a path that passes ceramic sculptures designed by San Francisco artist Martha Heavenston (opposite).

Despite the legion of architects and other design professionals who recently have reclaimed the old industrial and commercial buildings of San Francisco's South of Market area, this low-lying neighborhood is still something of an urban frontier. Even as the district's eastern end, near the bay, continues to gentrify, its western flank remains a working-class, mainly Filipino-American quarter of 25-foot-wide wood-frame houses squeezed incongruously between factories and warehouses.

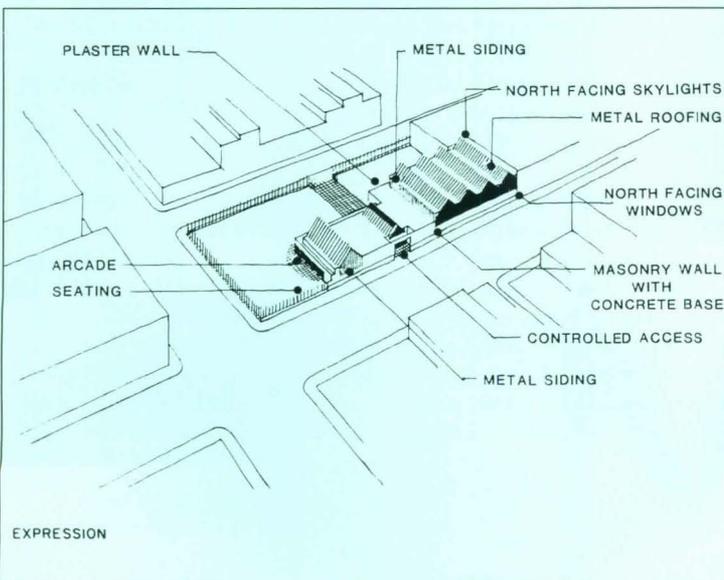
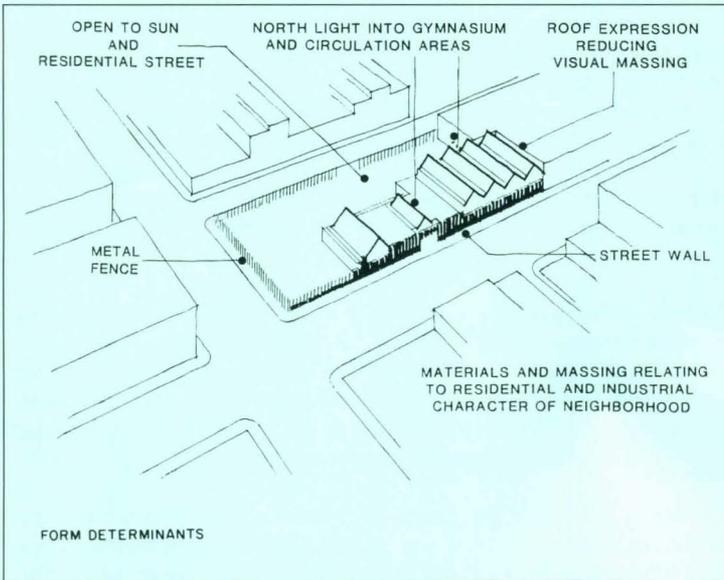
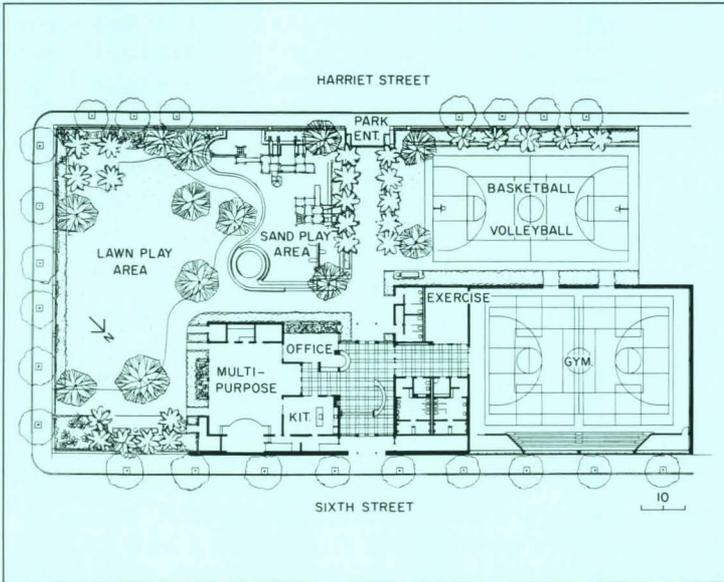
With the construction of the James Lick Freeway during the 1960s, South of Market became the only neighborhood in San Francisco without a park or recreation center. In the mid-1980s, a city proposal for a new park at the corner of Folsom and Sixth streets would have included converting an existing casket factory into a small recreation center. Area residents, however, drew up a list of needs that clearly called for a more substantial building on the 45,000-square-foot site. The result is the Sixth and Folsom Community Center, a model of government-community cooperation that meets the neighborhood's indoor and outdoor recreational needs with a new 16,000-square-foot building and landscaped park.

The center, designed by Marquis Associates, is a congenial addition to South of Market as well as a clear mark of the neighborhood's hybrid character. Facing Sixth Street, a busy four-lane industrial thoroughfare, the center has the esthetic of a sophisticated factory, with a sawtooth roof and walls of rock-faced masonry block. The only glazing is in northeast-facing gables. The center's south-facing park elevation, by contrast, is sheathed in russet-painted stucco meant to harmonize with the residential nature of adjacent Harriet Street.

Marquis developed the project's plan after a series of meetings with neighborhood residents. The center is divided in two by a lobby that connects the park and Sixth Street entrances. One side of the building is given over to a large gymnasium and exercise room; the other side, a multipurpose room and kitchen, with staff stations positioned to oversee all major indoor and outdoor areas.

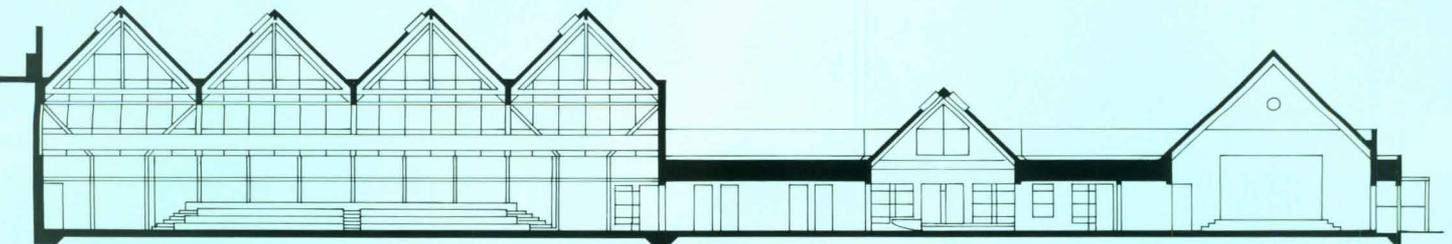
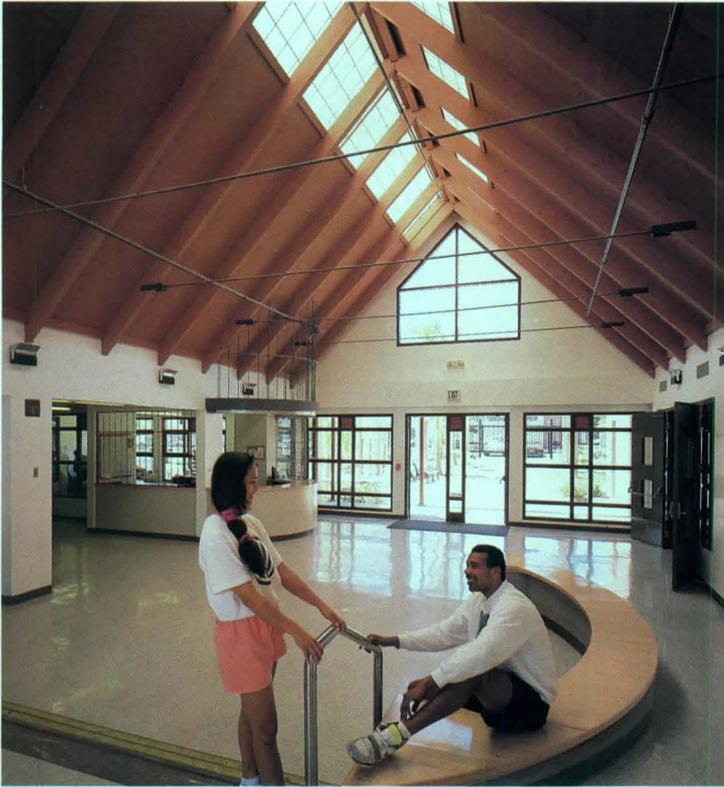
The park too is zoned for a variety of uses. A seating area for senior citizens opens directly from the multipurpose room, where it enjoys both privacy and views of streets and park. At the other end of the park is an outdoor court for basketball, volleyball, and other active sports popular among young adults. In between is perhaps the center's most striking feature—a children's play area enriched by a group of ceramic sculptures and tiles commissioned by the San Francisco Arts Commission and created by local artist Martha Heavenston, along with children from a nearby school.

The center defers to the neighborhood in scale as well as character. Although flat or shed roofs might have seemed an obvious choice for the gymnasium, multipurpose room, and lobby, Marquis instead used metal-sided gables that refer to nearby peak-roofed houses and help break up the structure's bulk. The gym has glue-laminated beams spanning its width and is divided into four equal parts, each with sloping wood rafters. Multidirectional steel tension rods and wood compression struts, together with a plywood diaphragm over the rafters, add seismic integrity. *Donald J. Canty*



Martha Heavenston's ceramic tile lintel (above) is the sole decorative flourish along the center's Sixth Street elevation (top opposite). A split-faced block wall along heavily trafficked Sixth serves as a visual and acoustical buffer between the commercial street and adjacent park land. Along the park (bottom opposite), the architects sheathed the center in russet stucco, a bow to the residential character of Harriet Street. A palm-lined allée lead visitors from Harriet Street to a fountain (not shown), where an interplay of water between a pair of hands and a pool is meant to symbolize the give and take of community life. During the center's early planning, a series of meetings with the community helped the architects come up with a program that they describe as "an expression of dualities"—balance between building and open space, and a combination of active zones for children and young adults and quiet zones for older users.





The center's interior is divided into three main spaces: entrance lobby (top left), gymnasium (bottom left), and multipurpose room (opposite). An administrative office (far left in top photo) gives center employees maximum visibility of all three spaces and the children's play area in the park.

Credits

*Sixth and Folsom Park and Community Center
San Francisco, California*
Owner: Recreation and Park Department, City and County of San Francisco
Architect: Marquis Associates—Hal Brandes and Robert B. Marquis, principals-in-charge; Gita Dev, T. Olle Lundberg, Lucinda Schlawer, Paul Bonacci, Marla Williams, Andre Pierce, project team
Engineers: Raj Desai Associates (structural); S. J. Engineers (mechanical); Silverman & Light (electrical)
Consultants: Omi Lang Associates (landscape); Martha Heavenston (sculptor)
General Contractor: Echo West, Inc.



Stretched Muscles

*Sydney's rugby stadium is a ring of steel masts and cables that dips and peaks along the perimeter of an urban site.
By Graham Jahn*



*Sydney Football Stadium
Sydney, Australia
Philip Cox Richardson Taylor
and Partners, Architect*



The timber and iron sports pavilions of the 1800s have been superseded by the steel and concrete structures of the 1900s. Whether cantilevered or cable-stayed, these arenas have developed their own bold, column-free forms.

One of the most spectacular examples of the 20th-century tradition is the new Sydney Football Stadium, principal site for Rugby League games and also host to Rugby Union and soccer: both sports require similar-sized fields. Rugby originated in the 1860s when a soccer player in the English town of Rugby picked up the game ball and ran with it. Action occurs on a rectangular field whose overall dimensions of 155 by 75 yards include a "dead ball" area. The field is turfed with a natural hybrid couch grass seeded with winter grass laid atop a special drainage system. The various forms of rugby attract national attention in Australia, on television and in situ, and stadium atmosphere—and stadium design—has become a decisive factor in the spectators' enjoyment.

Regardless of the event on the field, stadiums have one true purpose: to enable the greatest number of spectators to enjoy the game. To secure the best possible sight lines for the most spectators, architects Philip Cox Richardson Taylor and Partners employed a time-honored sports-facilities device that amasses as many seats as possible around the halfway line on both sides of the field. This practice produces a swelling in the height of the stands at the midpoint of the long sides, which, when incorporated into an enclosing perimeter around the rectangular field, results in an oval-shaped seating band of varying width.

Using this approach, the Sydney-based architects were able to devise an economic solution to a fast-track design-build project, concentrating their efforts on a swooping roof for dramatic effect. (The stadium was constructed in just 21 months, with only three additional months from the project's initial concept.) Seating terraces are a conventional combination of steel and concrete, rising to an outer ring of concrete columns carrying the roof loads. The client's requirement that 25,000 of the 40,000 spectator seats be under cover was technically satisfied by the continuous cantilever all-metal roofline, which varies in width between 90 feet at the halfway line to 30 feet behind the goal posts.

The continuous amphitheater form provides excellent acoustic control, generating an atmosphere not possible at the old Cricket Ground, the former playing field. Noise-containment was a primary factor in the design, given the stadium's location adjacent to a residential neighborhood.

Like the 60,000-person stadium recently completed in Bari, Italy, by Renzo Piano for the World Cup soccer matches, substantial wind loads on the Sydney Football Stadium are resolved within individual structural units. Unlike Piano's stadium, however, Philip Cox Richardson Taylor and Partners and its engineer, Ove Arup and Partners, chose a suspended beam cantilever system rather than a full cantilever like the one at Bari because it was easier to build and structurally more efficient, although some may argue that the visual integrity of the entire composition is compromised by the choice.

Bifurcated tension/compression struts supporting the roof transfer forces to a braced truss anchored to the ring of concrete columns and walls that connect to the raking beams of the grandstand. Visually, the transition from light steel to a massive concrete base is at

According to architects Philip Cox Richardson Taylor and Partners, the rounded form of the Sydney Football Stadium was intended to continue the tradition of circular sports arenas dating back to the Roman Colosseum. For this technically more contemporary structure, the architects were required to give civic presence to a 40,000-seat stadium (with approximately 60 percent of the spectators under cover), while respecting the residential scale of the immediate neighborhood. Circulation is along an internal ring, with spectators entering the stadium at the concourse level and then ascending or descending to their seats.



times awkward, as the connections are seen from outside the stadium. From inside, however, the hovering roof, which the architects claim is the first mast and stay structure used to completely encircle a sports arena, is sensational, punctuated as it is by slots that reduce wind pressure by 25 percent and reduce flutter. Moreover, continuous bands of lighting accent the roof's undulating edge.

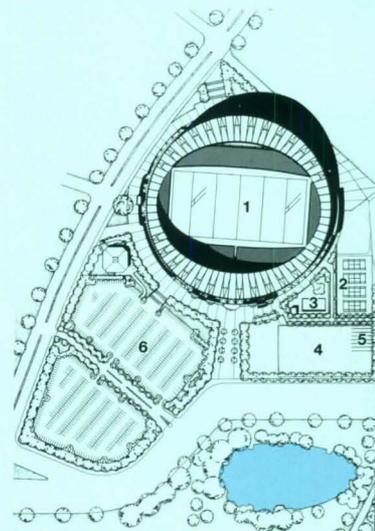
Because of the system's unconventionality, testing was essential and was carried out on a 1:200-scale aerolastic model, the stiffness of its members deduced from 3-D computer modeling. The tests proved the adequacy of the structure and guided fine-tuning, the major addition being a PVC-coated polyester fabric tensioned by cabling.

Construction began in April 1986 and was completed on schedule in January 1988 to coincide with celebration of Australia's Bicentennial. Made available by both state and federal agencies, the site (plan page 78) is adjacent to the Sydney Cricket Ground. The entire sporting complex is located at the edge of recreational parkland in the center of the city.

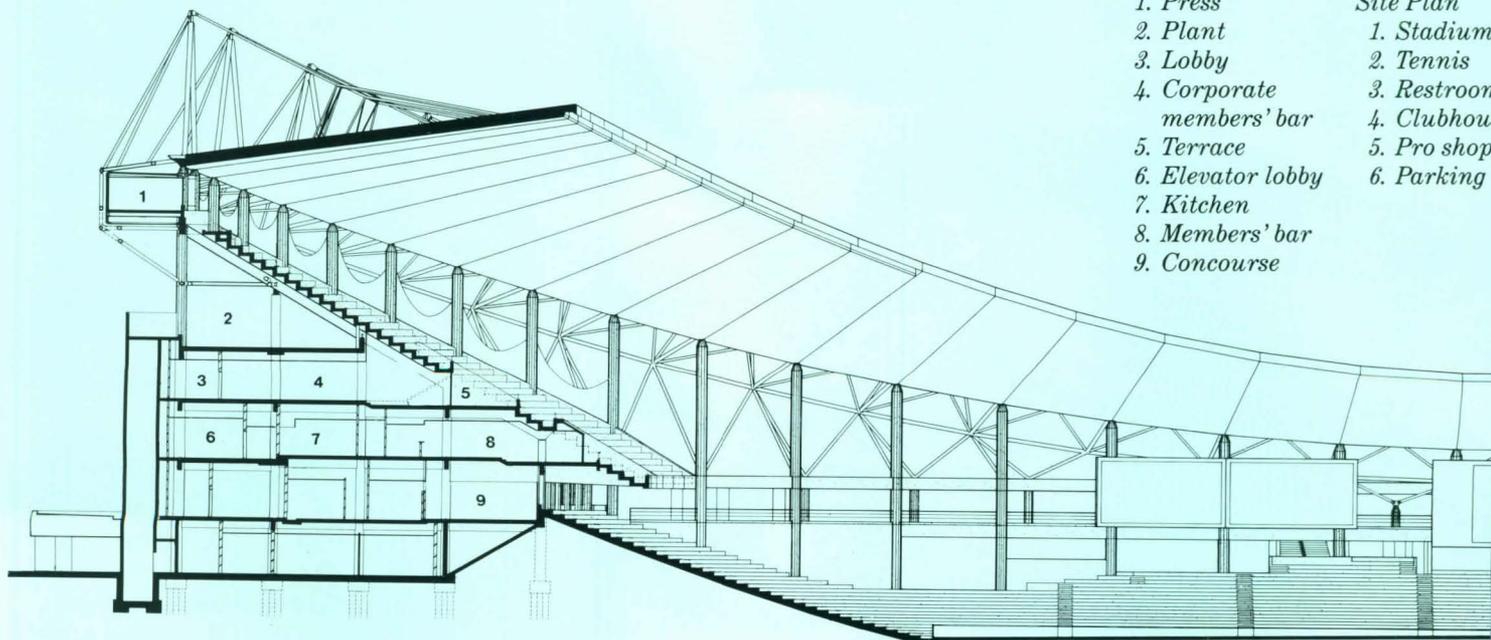
Since the stadium was completed, a number of refinements have been added to increase protection from wind-driven rain and to provide more internal amenities. Nonetheless, the architects' original intention was fully realized: the massive sculptural shape of the stadium's profile, seen dramatically juxtaposed against Sydney's skyline, proclaims the uniqueness both of the building and the sport of rugby. The architects aptly sum up their design as "a sculptural metaphor for its purpose . . . a theater for performance [whose] ring of taut steel masts and cables and its bands of exposed concrete have a muscular quality intended to convey the impression of gladiatorial combat."

Graham Jahn is a Sydney-based architect and critic. He contributes regularly to RECORD.

The playing field is oriented north-south with the members' stand facing west and the public stand facing east. The two spectator stands are marked by the swelling of the seating area and the rising of the roof line. Each stand is accessed by way of external stairs and elevators. The lower level houses training and space for members, including conference, lecture, and audio-visual facilities; a dining room; a gymnasium with a weight-training room and a lap pool. Eight synthetic outdoor tennis courts are located adjacent to the stadium. A nearby parking lot accommodates 800 vehicles.



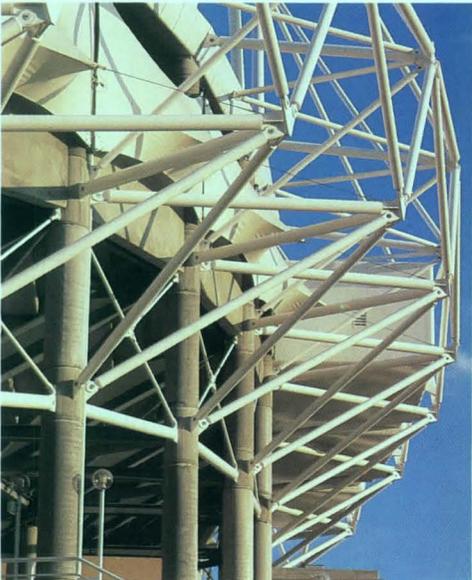
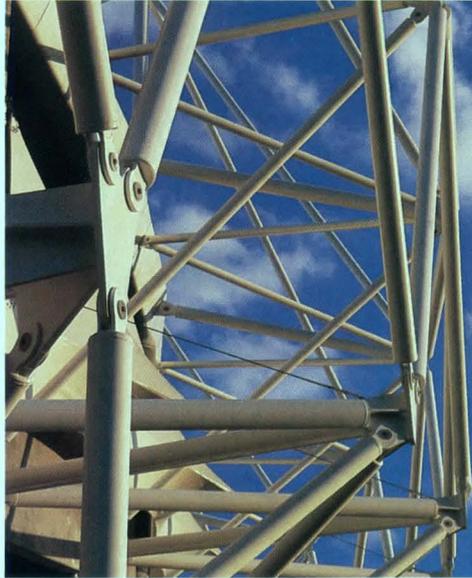
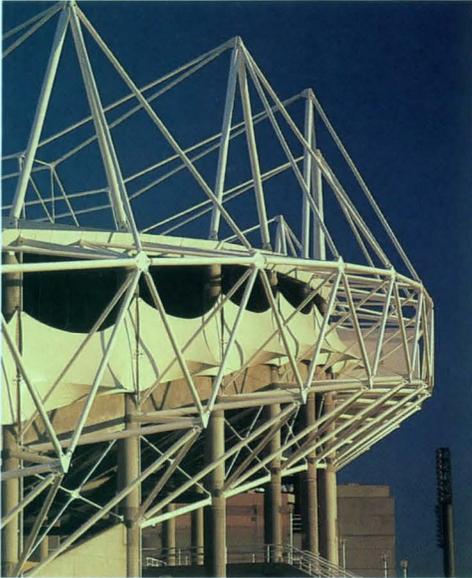
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|---------------------------|--------------|
| 1. Press | Site Plan |
| 2. Plant | 1. Stadium |
| 3. Lobby | 2. Tennis |
| 4. Corporate members' bar | 3. Restroom |
| 5. Terrace | 4. Clubhouse |
| 6. Elevator lobby | 5. Pro shop |
| 7. Kitchen | 6. Parking |
| 8. Members' bar | |
| 9. Concourse | |











The stadium roof is a continuous mast-and-stay structure, which the architects and engineers preferred to a hung-net type of roof to reduce cost. A crucial constraint of the structural design was the restricted site, which prevented the use of any counterweight affixed outside the building. Therefore, the conventional mast-and-stay structure was adapted to a triangulated tensile support system to withstand compressive forces. This system depended on having two support rods for each cantilevered roof beam, with the subsequent benefit of creating a triangular frame that simplifies the construction process. The roof is composed of independent two-bay tension/compression frames with the triangular elements directing the forces to a perimeter space truss, which in turn directs those forces into the grandstand superstructure rather than the ground. The stiffness of the structural members and gusset plates (drawings 1-6, opposite) was tested by 3-D computer-graphics techniques and large-scale models, which revealed the need for a PVC-coated polyester fabric tensioned by cabling within the perimeter space truss to protect the roof's edge

Credits

*Sydney Football Stadium
Sydney, Australia*

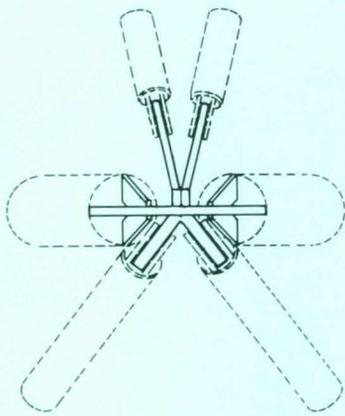
Owner: *Sydney Cricket and Sports Ground Trust*

Architect: *Philip Cox Richardson Taylor and Partners—Philip Cox, partner in-charge; Harry Street, John Richardson, Michael Rayner, Russell Lee, Larry Black, project team*

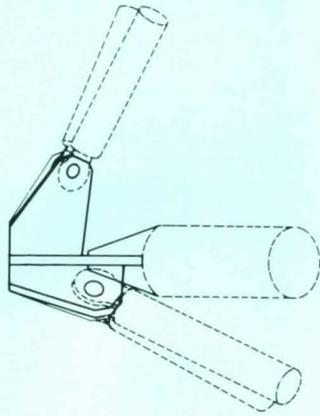
Engineers: *Ove Arup and Partners (civil, structural); Civil and Civic Pty Ltd. (electrical, hydraulic); Addicoat Hogarth and Wilson Pty Ltd. (mechanical)*

Consultant: *Landscan Pty L (landscaping)*

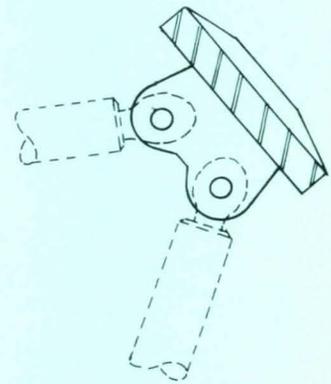
Project Manager: *Civil and Civic Pty Ltd.*



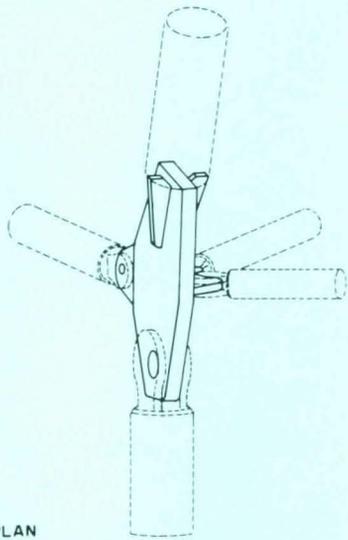
PLAN



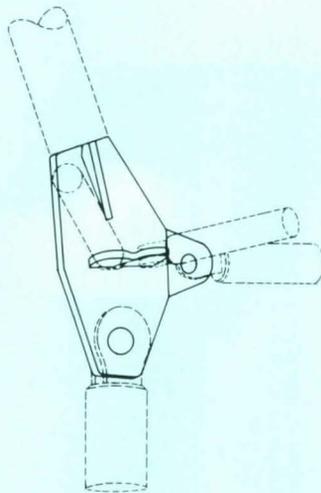
SIDE VIEW



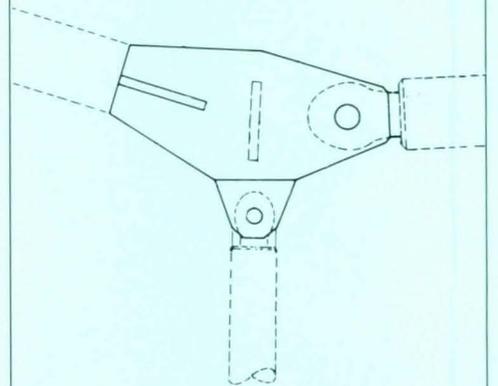
SECTION



PLAN



SIDE VIEW



SECTION

Good Turn

*Tigerman McCurry's barrier-free
Boy Scout camp west of Chicago
offers a rustic environment for
disabled users and others.
By Michael J. P. Smith*



*Hoover Outdoor
Education Center
Yorkville, Illinois
Tigerman McCurry Architects*







...s decorative turret topped by a galvanized metal banner, the Hoover Center's multipurpose chapel (foreground preceding pages) is among the first of six "civic" structures planned to surround a circular grassy commons. A natatorium (background) closes the camp's entrance axis (plan above). For the convenience of the wheelchair-bound and others, paths throughout are asphalt-paved. Deep in the woods, campfire singalongs are sheltered by apsidal activity centers (opposite) whose metal roofs are supported by chimneys and piers of split-face concrete block.

Creating the nation's only barrier-free Boy Scout property—the Hoover Outdoor Education Center, near Chicago—meant radically rethinking a scout camp's role, clientele, and design. This was possible because much about the Boy Scouts of America (BSA) has changed since the 1970s, when the movement's U. S. membership fell 35 percent, from an all-time high of 4.8 million in 1971 to 3.1 million in 1979. To help stem this decline, the BSA turned its attention to boys it had once overlooked—among them, inner-city youths and the handicapped. Today, with American membership at almost 4.4 million, scouts can earn merit badges in architecture and landscape design; the BSA Handbook warns of pederasty and drug abuse; and fitness requirements are tailored to an individual's limitations.

In 1986 the BSA's Chicago Council employed criteria inconceivable in the 1950s when it considered upgrading a little-used, 406-acre facility along the Fox River, 45 miles west of the city. To involve a larger cross-section of the public, 80 percent of the center's visitors would be drawn from nonscouting groups. Urging that the entire facility be barrier-free for wheelchair-bound persons who otherwise had to travel six hours to the nearest suitable camp, Council president Richard Halpern approached Tigerman McCurry, the Chicago firm already responsible for a library for the blind and another camp in the Fox River valley [RECORD, November 1989, pages 84-87].

An Eagle Scout ("with three palms and Order of the Arrow!"), Stanley Tigerman drew on his own camping experiences to lend romance and rigor to a project whose ambitions were exceeded only by its budgetary limits. The Hoover Center ultimately will have enclosed shelters for 350 campers, seven common-use buildings, a man-made lake, and its own aerated sewage-treatment lagoons. About a third of the project—shelters for 112 campers, a chapel, natatorium, dining hall and entrance gate—was completed in 1989 for \$2.3 million.

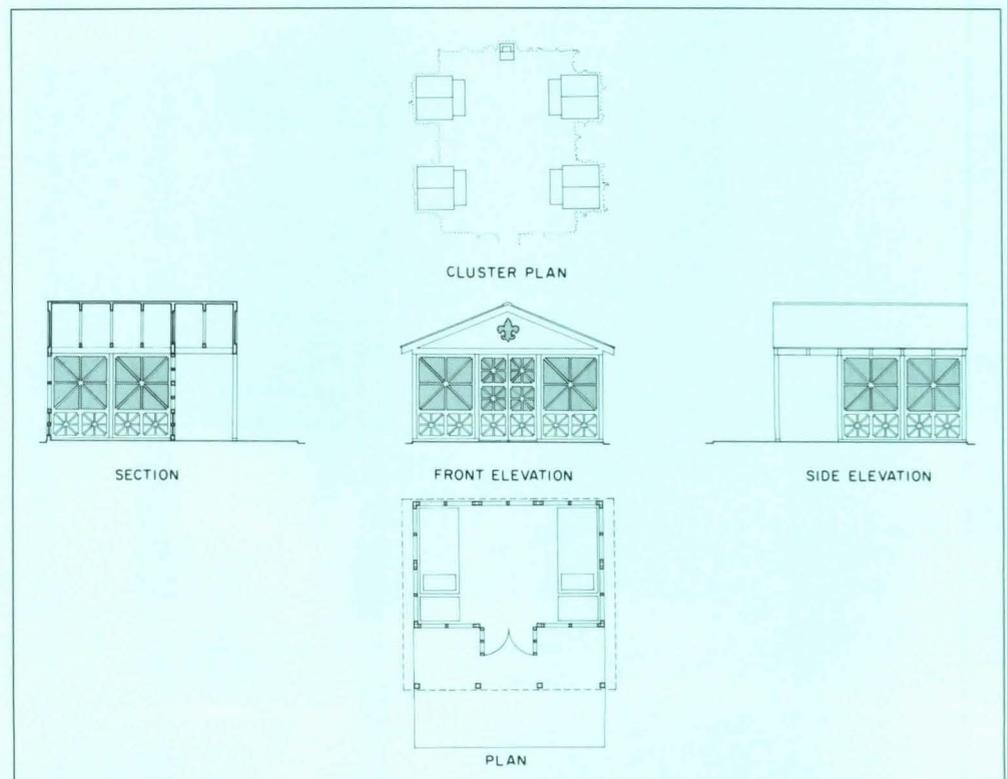
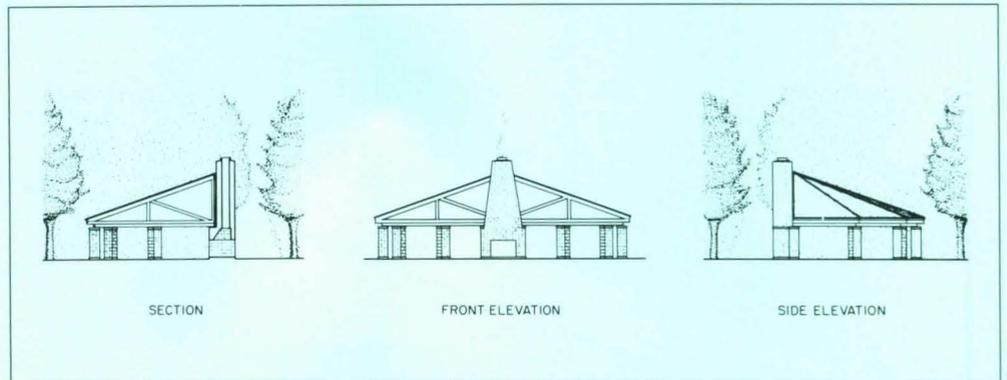
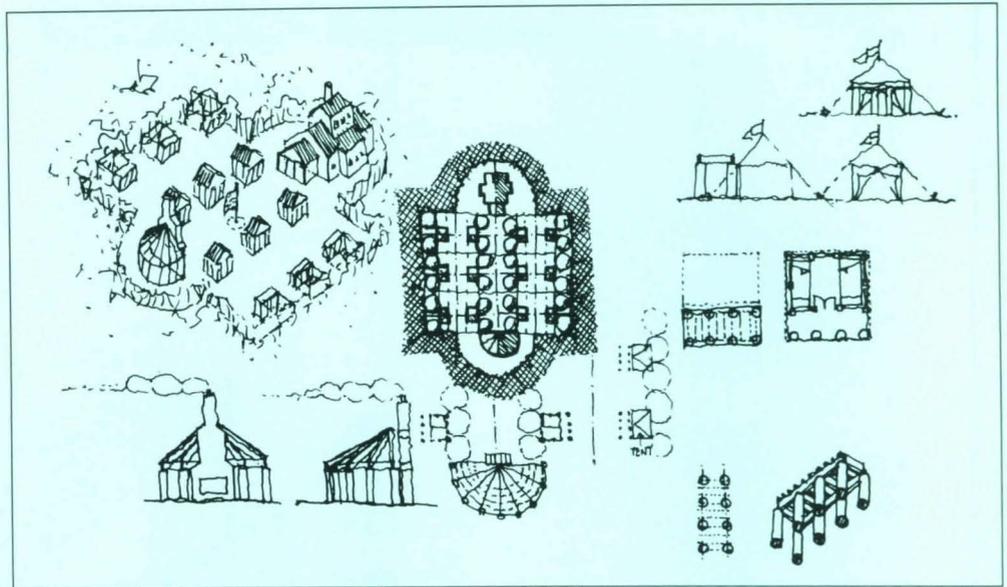
"Of course, we didn't have Paul Newman," says Tigerman, referring to the funding source of Hammond Beeby and Babka's celebrated camp for gravely ill children in Connecticut. Even given such bounty at the Hoover Center, Tigerman says he would have shunned the East Coast camp's picturesque features, aiming instead to offer the disabled a "legitimately primitive" outdoor experience. While allowances for the handicapped are extensive (paved pathways, at-grade entrances, a swimming-pool hoist, faucets and mirrors at handy levels), Hoover Center seems neither institutional nor patronizingly cute. Sharing a spare, porticoed style Tigerman describes as Tuscan, its modestly scaled structures are rendered in rough-faced concrete block and wood, stained a self-effacing gray.

Critical to the center's success are the groups of cabins campers call home. Nestled in the woods that cover 60 percent of Hoover's site, these six-building compounds sleep 40 persons in self-contained, miniature villages. In each, a winterized "municipal" building (kitchen, bathrooms, and beds) faces an apsidal activities shelter (picnic tables and fireplace) along an open space (town square and mustering yard) flanked by four templelike screened shelters. Severe yet snug, the hamlets convincingly express the disciplines of scouting and the elements of outdoor life. In contrast to the timeless perfection of Mies's Farnsworth House, just three miles downstream, the apparent impermanence of Hoover's materials suggests not only the amiably ramshackle condition of traditional camps, but also, to Tigerman, "the built-in poignancy of this project"—the vulnerability of health and the fleeting quality of youth.

Michael J. P. Smith is a contributing editor of *Inland Architect*.



erestories break the roofline
 Hoover's natatorium (top
 opposite), which shares the ce-
 siding, Roman grilles, and
 usswork of all the center's
 w structures. Two of eight
 oposed camping clusters
 ve been completed (bottom
 opposite). The clusters were
 ceived as miniature ham-
 s, their elements arrayed
 erarchically (drawing top
 ight). In a position of author-
 y is a winterized cabin that
 eps 24 and houses the clus-
 r's kitchen and bathrooms. It
 resides over a piazza-like open
 ace closed by an activity cen-
 r's figural fireplace and
 nked by ranks of screened
 -by 18-foot shelters. The shel-
 rs are roofed with corrugated
 uminum backed by four
 ches of rigid insulation; they
 in privacy and some weather-
 roofing from roll-down can-
 s flaps. To underscore
 mping's primitive qualities,
 igerman derived these little
 uts (below right) from the ar-
 etypal aedicule, which
 incorporates cell, porch, and
 "defensible" precinct—the last
 projection of the shelter's
 undation slab.





earing the Boy Scout fleur-de-lis like a royal coat of arms, the greened shelter's templelike dignity (opposite) belies the camping cluster's \$60-a-square-foot cost. A chapel (top right) has white oak floors surrounded by wainscoting of standard beaded pine board and factory-made wooden benches employed throughout the camp. In the natatorium (bottom right), tongue-and-groove wood decking is illuminated by clerestory windows and metal halide lamps. Days of French doors, which admit diffused daylight through outdoor trellises, alternate with heated seating niches for chilly swimmers.

Credits

Hoover Outdoor Education Center
Yorkville, Illinois

Owner: The Boy Scouts of America

Architect: Tigerman McCurry Architects—Stanley Tigerman, design architect; Richard Ragisic, June Nelson-Steinke, Carl Darr, project team

Engineers: Ray Beebe, Inc. (structural); Wallace-Migdal, Inc. (mechanical)

General Contractors:

Annis Builders; Carmichael Builders, Inc.



Buried Pleasure





*The Sporting Club
at Illinois Center
Chicago, Illinois
Kisho Kurokawa Design
Consultants/Fujikawa
Johnson and Associates,
Joint-Venture Architects*

*Among the surprises masked by
the spirited false face of a new
Chicago sports club are four more
stories tucked below street level.*

Among the better entrenched—and better executed—of the downtown multiuse complexes that came into being in the 1970s is Chicago's still-developing Illinois Center, where Mies van der Rohe originals, notably the eponymous Illinois Central building, blend with in-the-style-of towers by such disciples as Fujikawa Johnson and Associates. The latter firm's work began in 1967 with master planning and has continued through the design of eight projects within the center to the recent joint venture with Japanese architect Kisho Kurokawa as design consultant on the newly completed Sporting Club at Illinois Center—Kurokawa's debut in the U. S.

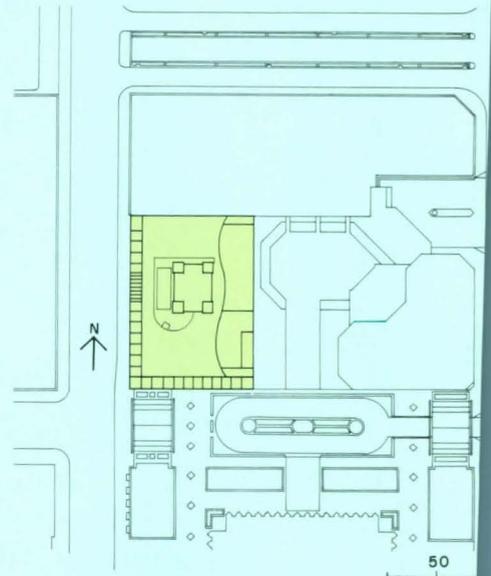
The club is prominently positioned within the center, but skyscrapers tower on every side, dwarfing its 114,470 square feet. In addition, the structure so meshes with the infrastructure of the complex, which includes several below-grade circulation levels, that only two of its six stories rise above the street. Nonetheless the building is assertive enough to hold its own.

A founder some 30 years ago of Japan's Metabolist movement, Kurokawa now espouses "symbiosis" in architecture, the melding of differing—even opposing—influences and ideas. For economy, the Sporting Club was framed of reinforced concrete, post-tensioned to minimize the depth of beam required for relatively long spans (48 and 65.5 feet) accompanying 20-foot structural bays. Outwardly, though, the structure joins its Miesian neighbors as a member of the slick glass-and-metal branch of the latter-day Chicago School. The concrete structural frame is enveloped in a flat grid of uniformly slim aluminum members and panes of clear, tinted, and spandrel glass that frankly declares its function as curtain only. In turn, the curtain wall is caged within a white-painted lattice of wide-flange steel members, again uniform in section and neatly joined. Corner bracing resists wind wracking; upside-down bowstring trusses mark the entry with broad, toothy smiles. Carrying further the whimsy of structure as embellishment, the rooftop of the doubly wrapped building bursts forth with a one-story lantern across the inner atrium, its four corners marked by steel-framed "turrets." (A second rooftop structure houses mechanical equipment.)

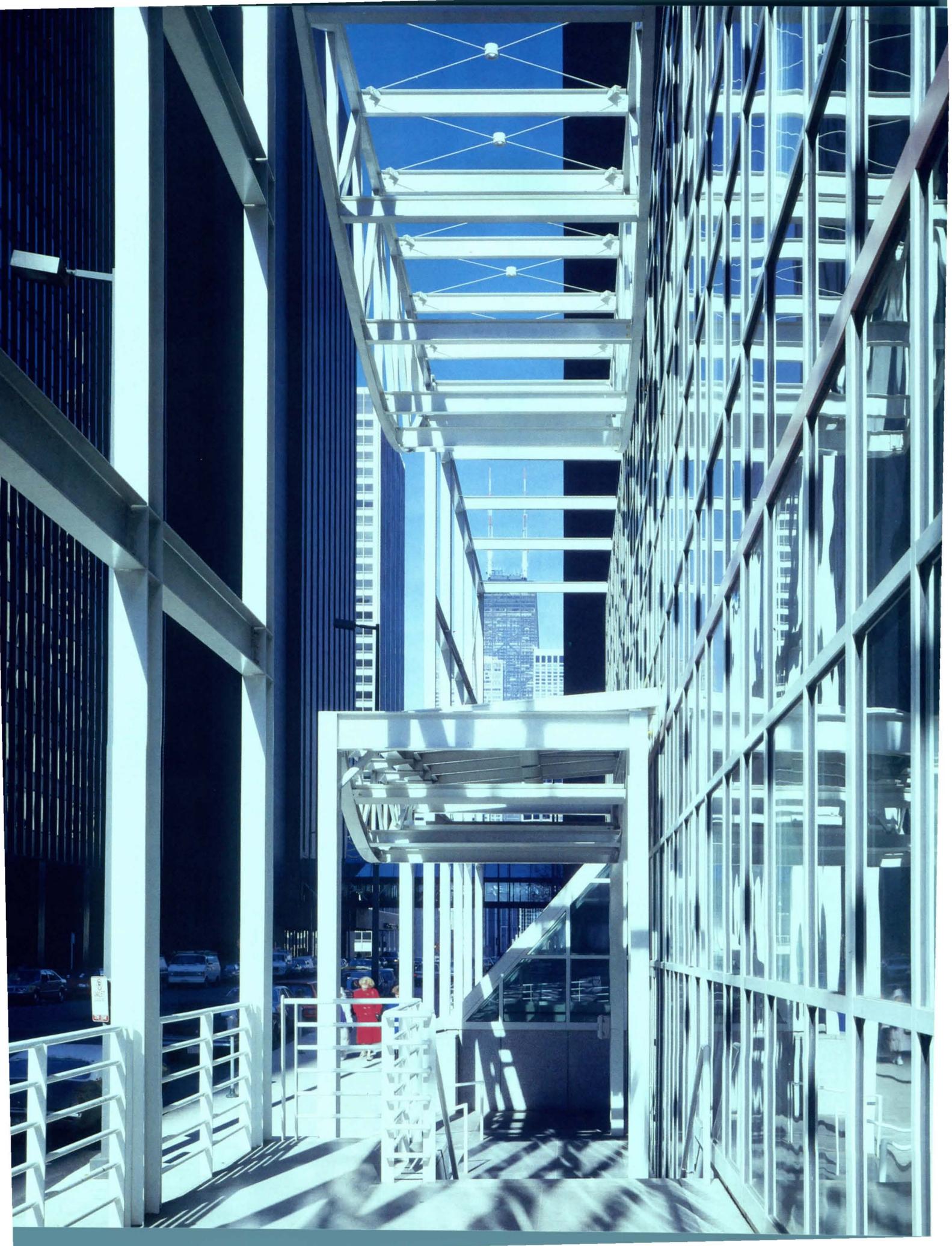
In addition to introducing a vertical component reminiscent of the real towers nearby, the turrets act as pedestals for a captivating quartet of wind sculptures by Osamu Shingu. Titled "Children of the Sun," the 17-foot-long Erector-setlike constructions are made up of hollow metal frames and perforated metal jointed at four axes to twist continually but randomly at the prompting of vagrant winds.

If the cage-in-cage exterior is largely inscrutable, the interiors are a candid progression of large open spaces giving off the building-high atrium. From the street entrance at the fifth floor, a stair leads down to reception and check-in areas at the center's concourse level, where direct passages link a nearby hotel and office towers. This level also offers food services, a day-care room, and a gift shop. The swimming pool and squash and racquet courts are on the lowest level, surmounted by floors containing exercise areas and lockers, while a basketball court with mezzanine running track and additional exercise facilities occupy the uppermost levels. The rooftop provides al fresco dining and a small lap pool. Although the open stairway through the atrium provides handy outlooks for viewing activities in surrounding spaces, the views are also reciprocal. A favorite club pastime is watching from the security of adjoining areas as tethered climbers spider up the 100-foot-high fiberglass rock-climbing wall—complete with ledges and shelves—that backs the atrium's central elevator shaft. *Margaret Gaskie*

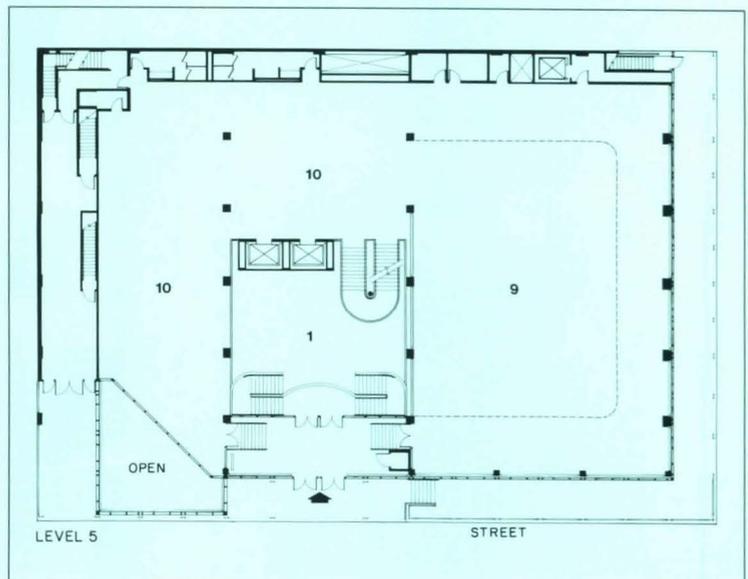
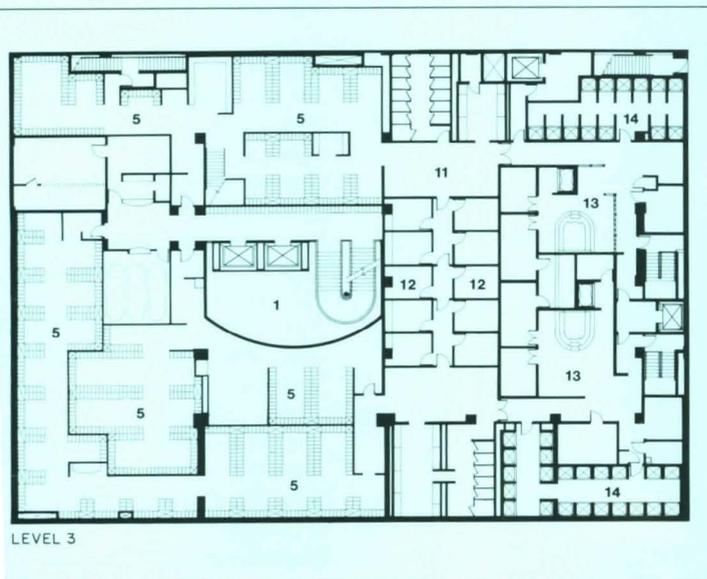
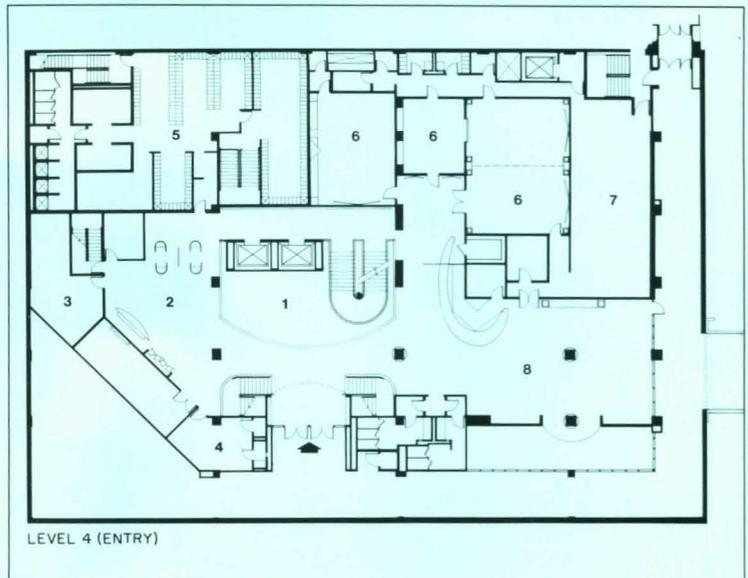
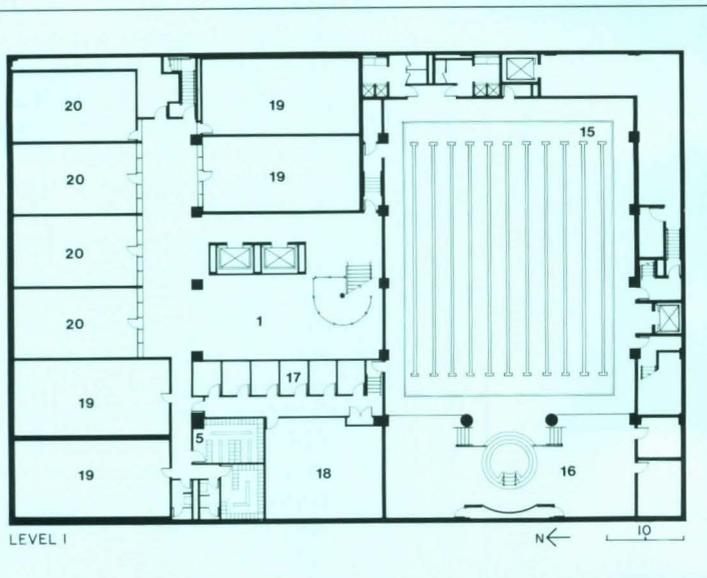
© Greg Murphey photos



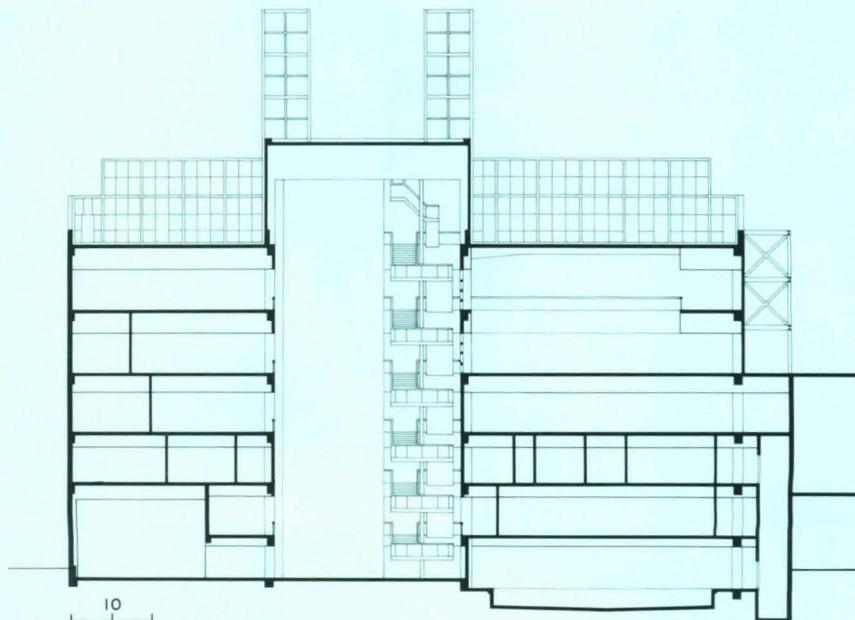
A Lilliputian among the Gullivers of Chicago's 83-acre Illinois Center, the sports club building makes up in vitality what it lacks in volume. The gleaming white metal cage that wraps the club on the sides facing street and plaza is interrupted by upside-down bowstring trusses above the outer entry (opposite), which mediates between two interior levels. Open frames also rise from the rooftop to mark the four corners of the inner atrium with turrets crowned by constantly moving wind sculptures.







The Sporting Club's large, open interior spaces (basketball court at right opposite) focus on the atrium, lending a sense of movement to a pristine black, white, and gray palette. Bathed in daylight from a rooftop "lantern," the atrium itself is dominated by an open stairway with generous landings for people-watching—and a challenging rock-climbing wall that provokes taut action to watch.



1. Atrium
2. Reception
3. Gift shop
4. Day-care
5. Lockers
6. Dining
7. Kitchen
8. Restaurant/bar
9. Basketball court
10. Exercise
11. Lounge
12. Massage
13. Roman pool
14. Showers
15. Swimming pool
16. Whirlpool
17. Tanning
18. Administration
19. Racquetball
20. Squash



Set jauntily off-center, the atrium divides the building into spans of 65 1/2 feet and 48 feet on 20-foot bays. The largest space is the light-filled 29-foot-high basketball court at the club's southwest corner (top left), which is ringed at mezzanine level by a running track that circuits the sixth floor. The concourse-level reception area (bottom left), reached by stair from the street entrance, includes in addition to the check-in desk and entry turnstiles a small day-care room and gift shop. The swimming pool (opposite) and spa facilities at the club's lowest level are accessible via a "wet" elevator from well-appointed locker rooms above (middle left).

Credits

*The Sporting Club at Illinois Center
Chicago, Illinois*

Owner: Illinois Sporting Development

Joint-Venture Architects:

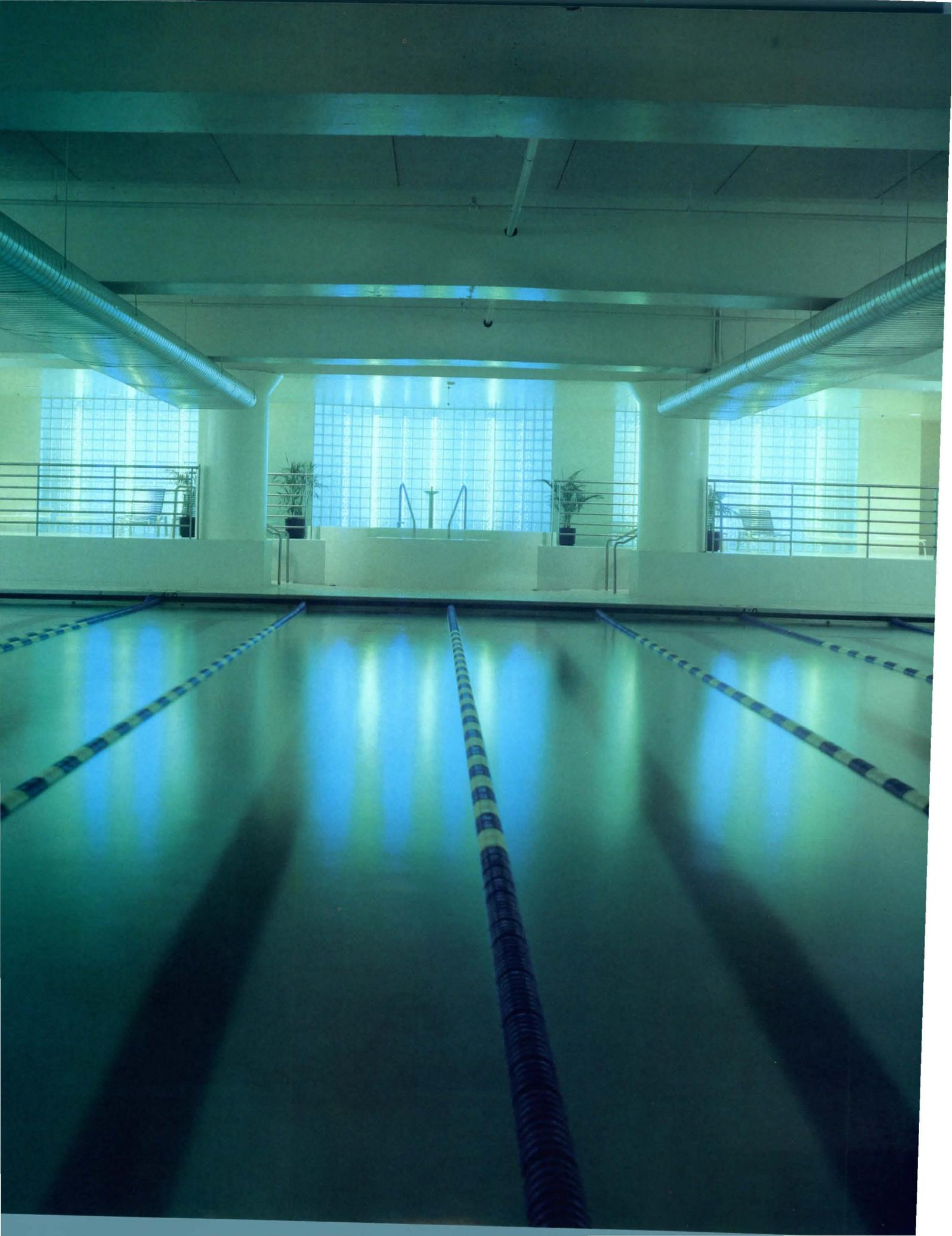
Kisho Kurokawa Design Consultants—Kisho Kurokawa, designer; Yushi Kitigawa, director-in-charge; Richard Chiu, project architect/Fujikawa Johnson and Associates—Gerald L. Johnson, partner-in-charge; James F. Cagnina, project architect

Engineers: CBW Engineers, Inc. (structural); Cosentini Associates, Inc. (mechanical/electrical)

Consultants: The Zimmerma Design Group (restaurant); Thomas Ricca & Associates (kitchen)

General contractor:

E. W. Corrigan Construction



Focus on Sports & Recreation

The five projects featured on these pages illustrate five distinct responses to the problem of designing facilities for sports and recreation. In New York City's landmark Central Park, city workers now vend refreshments from a new pavilion filled with Victorian-era detail. In Tucson, a structurally ingenious addition to the University of Arizona's existing stadium offers Wildcat football fans the opportunity to lease private boxes and help underwrite the university's athletic and academic programs. A similar program in Boston gives Fenway Park a new set of corporate suites while

Ballplayers Refreshment Stand

*Central Park, New York City
Buttrick White & Burtis, Architect*

© Walter Dufresne photos



Scholarship Suites

*University of Arizona
Tucson, Arizona
Anderson DeBartolo Pan, Architect*

© Timothy Hursley, The Arkansas Office photos

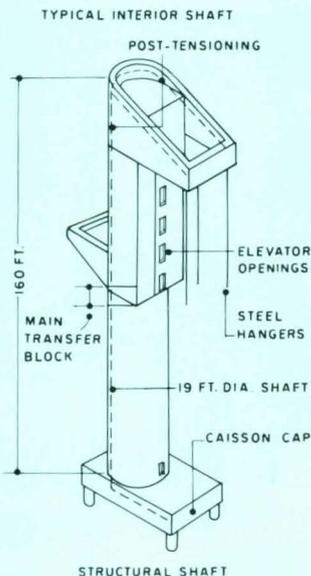


preserving the beloved ballpark's architectural integrity. In northern Minnesota, a program center for a summer camp provides an appropriately rustic setting for its physically disabled users. And in a Chicago suburb, an expanded public sports pavilion occupies a prominent place in the town's civic center, suggesting that facilities for recreation have become as important to a community's pride as town hall or county courthouse.



Vaux populi

The Ballplayers Refreshment Stand in Central Park is the result of a successful public-private collaboration between the New York City Department of Parks and Recreation and the not-for-profit Central Park Conservancy, which raised most of the project's \$500,000 construction funds. The 450-square-foot pavilion occupies the site of the Ballplayers House, an original park building designed by Calvert Vaux in 1865 and demolished in 1969. For the new building Buttrick White & Burtis deftly adapted mid-19th-century details using a combination of period and modern materials. Horizontally striped brick walls are surmounted by a glazed ornamental-tile frieze, while a steeply pitched slate roof is enlivened by polychroming and topped by aluminum cresting. Latticework slats in the gable ends are also aluminum. The pavilion adjoins the baseball diamonds of Heckscher Field and functions as a food concession through a large service window on its south elevation (opposite). It also serves as a base for rangers patrolling the southern end of the park. *P. M. S.*



Suite success

The University of Arizona's Scholarship Suites project represents a trend by some major universities to add leased private boxes to existing football stadiums to help raise funds for academic and athletic scholarships. The four-level, \$5.1-million Arizona project comprises a lower level of 321 open-air seats; two levels housing 23 enclosed luxury suites and a 94-seat President's Box and lounge; and a 110-seat upper-level press box with separate telecast facilities. Private elevator access and catering facilities are also included.

The primary challenge facing Anderson DeBartolo Pan was the project's severely restricted, 105-foot-wide site, wedged between the 55,000-seat stadium and a parking lot and dormitory. The architects' solution was to suspend the four new levels from 20-foot-long horse-shoe-shaped beams, which are cantilevered from four cast-in-place concrete shafts (drawing left). Butt-glazed detailing eliminates visual obstructions in the suites, and the curved face of laminated glass has the effect of angling each box toward the center of the field. Spurred on by the football team's schedule, the project was completed in just nine months. *P. M. S.*

Camp Courage North

Lake George, Minnesota
The Stageberg Partners, Architect

© Christian Korab photos



Courts Plus Athletic Pavilion

Elmhurst, Illinois
Holabird & Root, Architect

© Jamie Padgett, Karant + Associates photos



Renovation of Fenway Park

Boston, Massachusetts
HNTB, Architect

© Peter Vandemark photo





Profile in courage

Camp Courage North, located on a pristine lake in northern Minnesota, provides summertime recreation for the physically disabled and the hearing impaired. Though the camp's growth over three decades has been haphazard in planning terms, its buildings have consistently featured frame construction and wood or stone finishes. And while there are no real log buildings on the site, the sense of log predominates through half-log siding and turned wood poles.

When camp administrators began developing plans for the new King Program Center, they felt strongly that the 7,000-square-foot building should be in keeping with the camp's existing rustic character. The Stageberg Partners agreed, and have clad the new facility in a combination of cedar shingles and half-logs. To make the building usable year-round, the architects developed a compact plan that minimizes heat loss, and they specified six-inch wood studs that allow ample insulation. The interior combines natural wood finishes, extensive daylighting, and carefully selected color accents. A screened gazebo offers mosquito-free outdoor leisure space. *P. M. S.*



Run with a view

A generous supply of daylight pouring through double-height windows buoys swimmers, lifters, and runners at Holabird & Root's Elmhurst Park District Courts Plus Athletic Pavilion. The handicapped-accessible, 46,000-square-foot public building, clad in brick to unite it with an existing sports facility, is part of the Chicago suburb's municipal courts complex. The new pavilion's two-story windows overlook an adjacent park and playing field. Exposed long-span trusses open the interior to unobstructed views both from the entry-level, four-lane running track and from the tennis courts and 75-foot lap pool on the lower level, which also contains weight-training and aerobics areas. By the pool, a textured wall surface reduces wear from moisture. Each of the locker rooms has a steam room where weary exercisers can recover before retrieving their clothes from wooden lockers and their children from an on-site nursery; a communal sauna is at poolside. For those who really overdo it—and for the community at large—the program includes a 5,000-square-foot physical-therapy and sports-medicine clinic, located in renovated space in the existing structure. *P. D. S.*



Updating Fenway Park

No building type commands more allegiance than the early 20th-century ballpark—and no ballpark is more fiercely loved than Boston's Fenway. HNTB surely felt the weight of that loyalty when it undertook an improvement and expansion of the Red Sox's home. Due to site restrictions, all improvements had to be contained within the existing structure; they also had to maintain the park's historic character. High above the home-plate grandstand, the architects created three additional levels for press and corporate services, a solution that avoided disturbing any fan's sight lines. Atop the new structure, HNTB added a press level with new radio and television broadcast booths, public-address facilities, food storage, scoreboard operations—and a new room for the organist. Between the press level and the grandstand, the architects built two levels of corporate boxes, for which they designed an enclosed area for the owner's suite, a series of bars, and a 300-seat restaurant where patrons can watch the game on closed-circuit television. *P. D. S.*

On Shaky Ground

When some scientists predicted a devastating earthquake last year for New Madrid, Missouri, seismic experts didn't know whether to laugh or cry. They were cheered because previously ignored warnings of seismic risk in the middle and eastern parts of the nation finally received widespread publicity. The non-event's circus atmosphere, though, probably persuaded many people that earthquake prediction is still a black science. In reality, our understanding of the relative risks and the real costs of seismic events is evolving: with better information on the geology of the East Coast, for example, researchers now predict that a quake similar in magnitude to the one that struck the Bay Area in 1989 would transmit forces much farther.

A year and a half after the Loma Prieta earthquake, residents of the Bay Area are facing some difficult decisions. Though many of the region's historic buildings have survived quakes from 1906 on, some now pose a danger—and are heartbreakingly expensive to upgrade. As a result, many important buildings have been abandoned for now, and are sheathed in scaffolding or protective shoring. “The good news,” comments Peter Culley, a structural engineer active in seismic design, “is that the city of San Francisco is going ahead with studies and moving forward with upgrading its own buildings.” Preliminary schemes have been developed for the Beaux Arts-style City Hall, the Ferry Building, and the California Palace of the Legion of Honor. The General Services Administration has commissioned seismic redesign for its Customs House and Appraiser's Building and the U. S. Court of Appeals and Post Office. As yet, however, funds are not in hand for reconstructing these buildings. What is more, costs will range in the hundreds of millions. Across the bay, Oakland is in even worse trouble, since it has more damaged buildings per capita and a smaller tax base. (The Henry Hornbostel-designed City Hall—a skyline landmark—is covered by scaffolding; its future is not assured.) Among the institutions most active in seismic-risk mitigation is Stanford University, in Palo Alto. Its tile-roofed, arched

quadrangles have long been regarded as superb regional examples of Richardsonian design, but their unreinforced ochre limestone walls continue to be major seismic headaches.

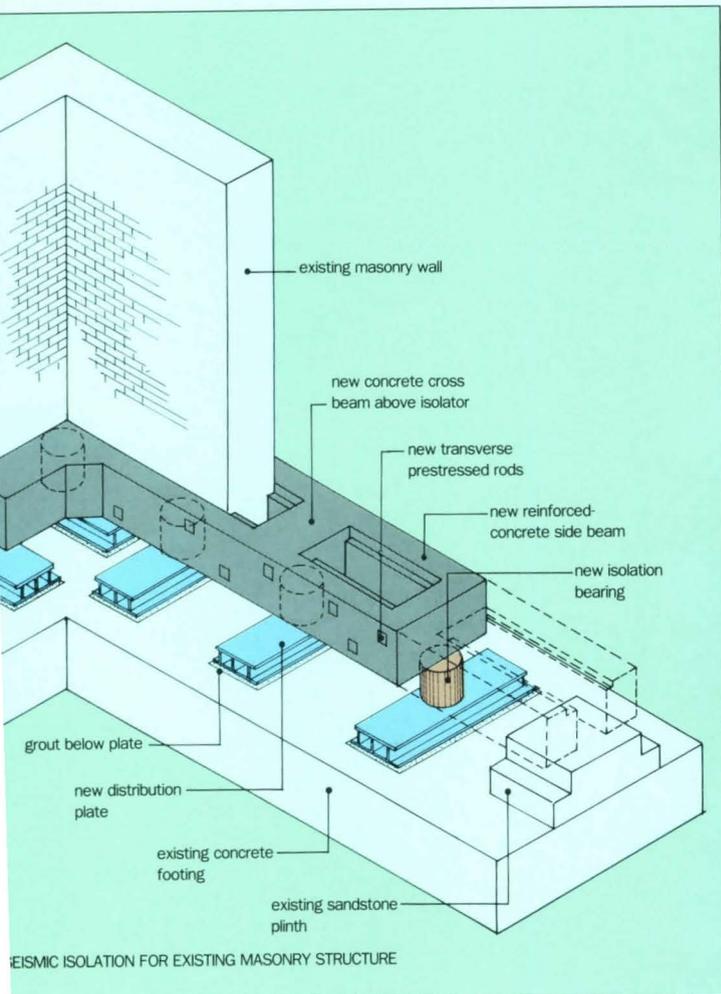
State requirements already mandate improvements to 43 masonry buildings that enclose some 1 million square feet. The university also plans to repair other structures it judges to be at risk. The total program is estimated to cost \$164 million over 10 years—the kind of money that would normally pay for a major capital expansion. And it's a figure Fouad Bendimerad, Stanford's Manager of Seismic Engineering, says, “keeps going up.” Bendimerad explains: “As we begin this work, it triggers other costs that we can't yet know. We must also address requirements for handicapped access and fire-code upgrading.” Two schemes are shown on pages 112-113.

Nowhere to turn

Stanford is, relatively speaking, lucky. It is able to tap federal repair funds and has received generous gifts (although the university, obviously, would rather use these funds to expand programs and facilities). Other owners have nowhere to turn. “Many people who own marginal buildings can't justify the cost to repair them in a poor real-estate market,” comments Culley. “Even structures that have been declared safe can't be marketed if there is cosmetic damage.” Though many churches and schools have been damaged, charitable organizations lack repair dollars, and funds from the Federal Emergency Management Agency are often slow to arrive.

Restoration and upgrading costs are high because procedures are so invasive. Masonry buildings, for example, may be made more rigid by adding shear walls. This process requires stripping interior finishes, adding new foundations, attaching metal reinforcing to a bearing wall, and shotcreting concrete onto it, and then restoring finishes. Relocating users boosts costs further. Other simpler techniques are used in more limited ways: the building frame may be

Technical focus: A greater knowledge of seismic forces has spawned improved designs for new buildings. The high cost of upgrading older buildings, though, defies easy solution.



reinforced with steel bracing; diaphragm action of floors or roofs can be improved; parapets can be braced using steel angles.

Improving techniques for old and new buildings

Though it may seem prohibitively expensive to construct buildings that protect contents from damage during a tremor, hospitals and emergency facilities are already designed to remain in service during severe earthquakes. Now, some private companies have learned that downtime after an earthquake can be financially ruinous. In Silicon Valley, new buildings for computer manufacturers are being designed not just to protect occupants but to limit damage to facilities and equipment. For these owners, the value of the building's contents is many times that of the envelope (which has typically been a low-cost tilt-up concrete warehouse). Seismic design need not impede architectural expression, as McGraw/Baldwin architects have shown in a U. S. Navy training facility that boldly displays its lateral-force-resisting elements (following pages).

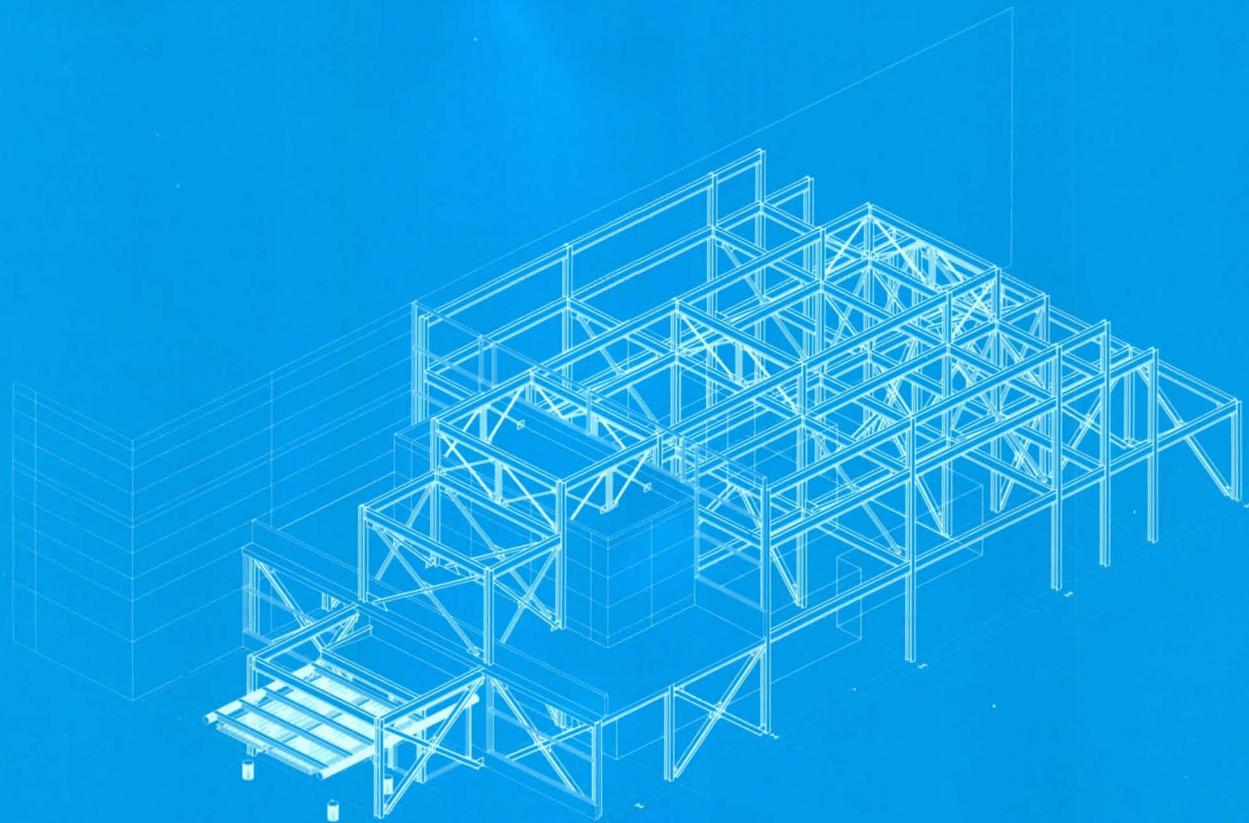
Potentially catastrophic dollar losses in urban areas has spawned the development of new seismic damage-mitigation measures. Base isolation, for example (left), is not new but it is increasingly seen as both an answer for new buildings and a less destructive, less costly technique for existing structures. Rubber bearings (laminated with oil, steel, or lead dampers) that absorb earthquake movements are installed at the bases of walls and columns. Eccentric bracing is another newer technique. Lower-strength links within the structure sacrifice themselves as they absorb earthquake energy. The Ove Arup Partnership is developing an "active resistance" scheme in which movement would activate computer-controlled energy-absorbing hydraulic pistons; a demonstration device is planned for the Inventor's Hall of Fame in Akron, Ohio. *Earthquakes: An Architect's Guide to Nonstructural Seismic Hazards*, by Henry J. Lagorio is useful and includes insights drawn from Loma Prieta (New York: John Wiley & Sons, 1990, \$54.95). *James S. Russell*

Seismic isolation, using motion-absorbing bearings, is increasingly accepted for historic buildings. The details shown were used by Forell/Seisser Engineers with The Vrenkrantz Group, architects, for the Salt Lake City and County Building.

Flight Training Complex San Diego, California

Earthquakes were not the only movements that architects McGraw/Baldwin had to consider for this recently constructed facility, located on a prominent waterfront site within the Navy's North Island base. The structure (built for the Navy's use by United Technologies) houses flight simulators for the Sikorsky SH-60F helicopter and other antisubmarine weapons sys-

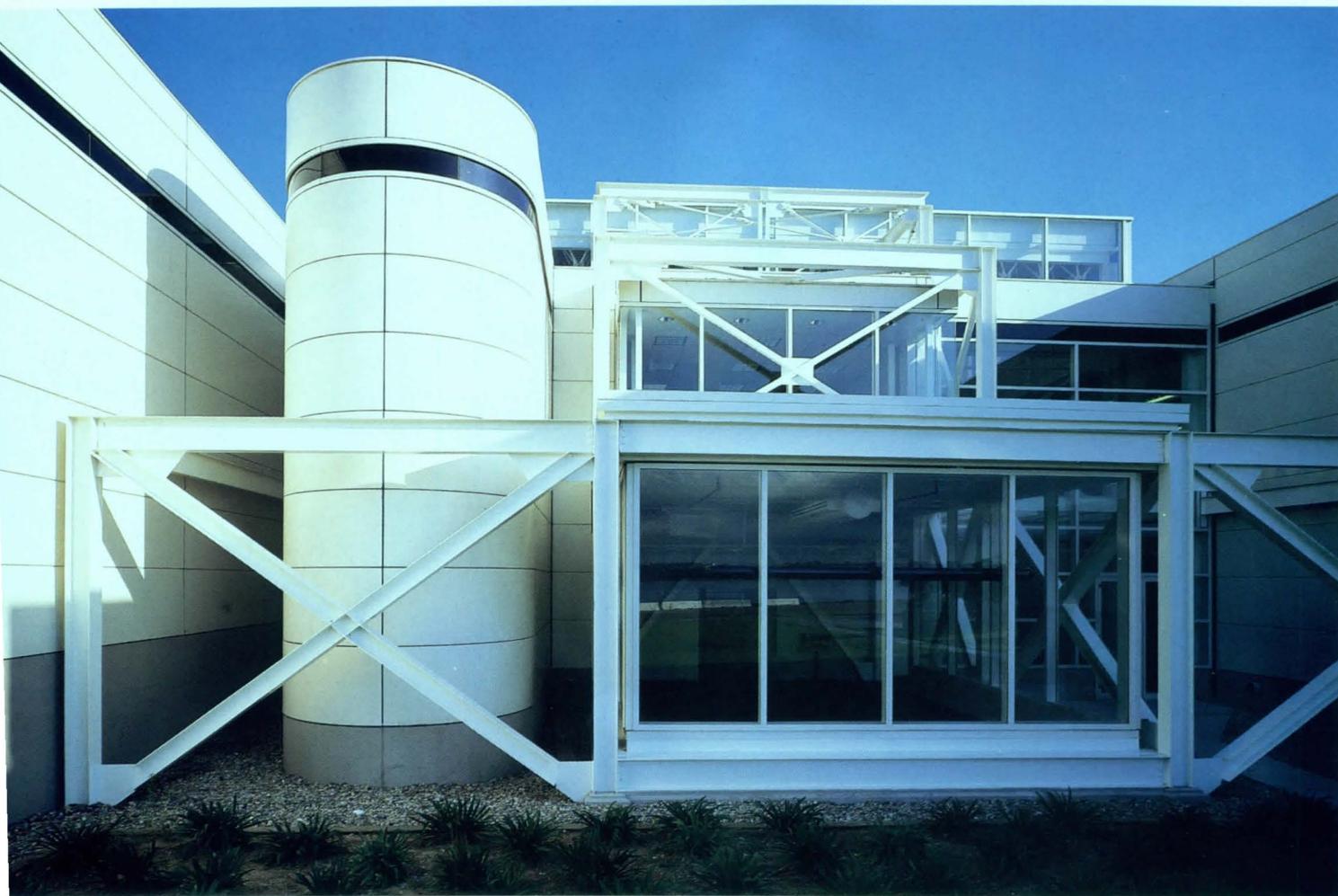
tems. Mounted within high long-span bays, these devices create powerful dynamic forces of their own as they imitate real aircraft movements. In response to these conditions—and to poor soil-bearing capacity and the potential for earthquake-induced liquefaction—the architects designed a very light, braced-frame steel structure. The dead loads are so low that columns are sup-



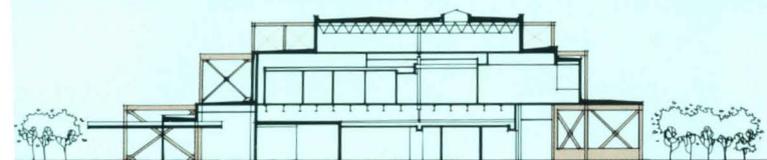
© Franz Hall

ported on conventional spread footings. Simulators, with their much higher loads, are separated from the building's structure and rest on pile-supported pads. Interior clear spans were maintained by moving the "X" and "K" lateral bracing to the exterior (see section bottom), where their force-resisting character is elegantly expressed. To further reduce the force of lateral

accelerations, the building has been divided into seismically isolated thirds: two high-bay hangarlike structures flanking a central concourse containing offices and services. The idea behind the building is most clearly visible at this central pavilion. Its steel framing is shown opposite. Opposite bottom: the entrance elevation; below: the bay-facing side of the central pavilion.



Michael McLoughlin photos, except as noted



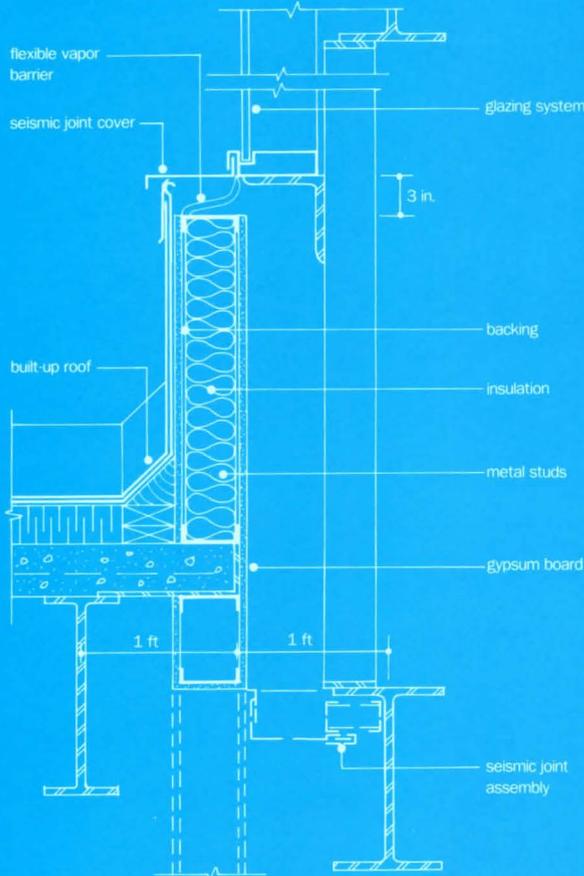
Though the structure is most visible at the central "public" entrance pavilion, the braced frames are selectively revealed elsewhere as well, enlivening elevations that are largely windowless. Bracing is visible through windows at office areas and in glazed stair towers. With so complex a framing system located to such a great extent on the exterior, penetrations had to be care-

fully considered. The architects detailed openings both through the foam-and-metal sandwich panel curtain wall and through the storefront-type window wall. The metal panels were trimmed around the wide-flange beams (below left). Steel plates welded to the beams create a rectangular penetration through the window wall. (A seismic joint is also visible—below right.)

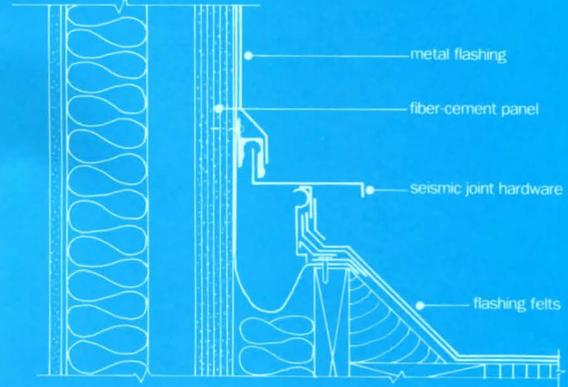


To avoid transmitting lateral movements across seismic joints, framing as well as cladding had to be separated for each of the building's three sub-structures (details below). In keeping with the Navy's modest budget, the architects adapted off-the-shelf low-rise cladding systems to the task. The program also required that the building envelope shield activities within the building from

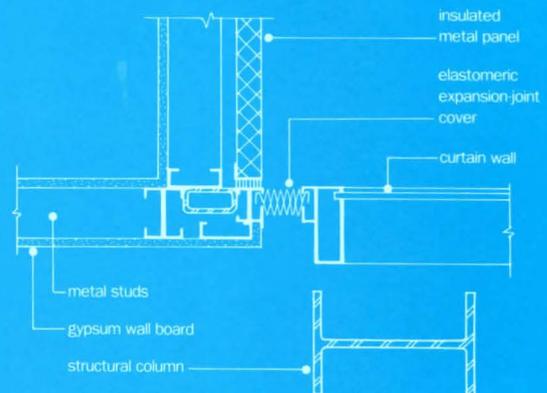
Electro-Magnetic/Radio Frequency Interference. The metal panel system was found to possess inherent shielding with the addition of a specially formulated sealant. Opposite bottom: light is filtered under the entrance canopy through stainless-steel grates.



SEISMIC CONTROL AT CLERESTORY



SEISMIC CONTROL JOINT (SECTION)



SEISMIC CONTROL JOINT (PLAN)

The program called for few conventionally finished interior spaces, so McGraw/Baldwin marshalled exposed structural and service elements into a composition as tightly organized as if trainees were shipboard (the careful alignment of a sprinkler line at a stair, opposite, for example). In this they have eschewed the gratuitously nautical elements so beloved by Modern

architects. James McGraw regards their structural approach as instructive since the hierarchy of braced frames is visible through the central concourse's transparent exterior. "Trainees can clearly see how lateral forces are gathered and resolved to ground," he comments. Below: the framing around a seismic joint is clearly visible.



Credits

*Flight Training Complex
San Diego, California*

Owner: U. S. Navy

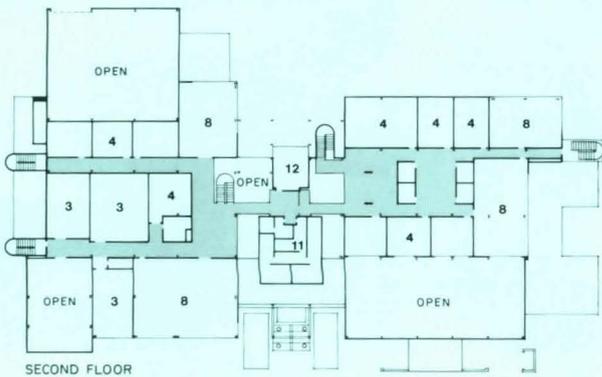
Architect: McGraw/Baldwin
Architects—James McGraw,
principal-in-charge; Ken
Baldwin, project manager

Engineers: Blaylock-Willis &
Associates (structural); Sevier
Engineering, Inc. (mechanical);
Van Buren, Kimper &

Associates (electrical); Nolte &
Associates (civil)

Consultants: Van Dyke &
Associates (landscape); ERC
International (RF shielding);
Conspec Consultants
(specifications)

General Contractor: M. A.
Mortenson Company

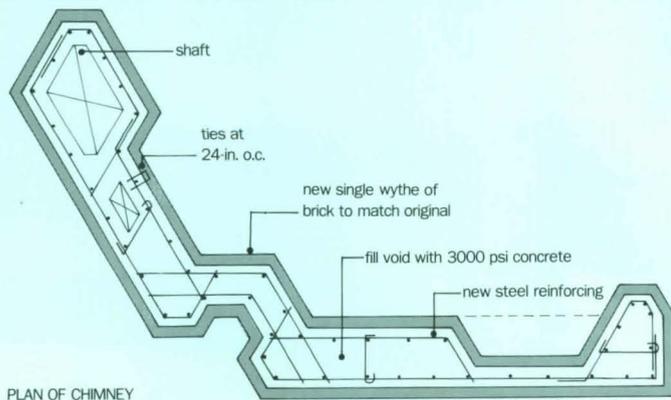
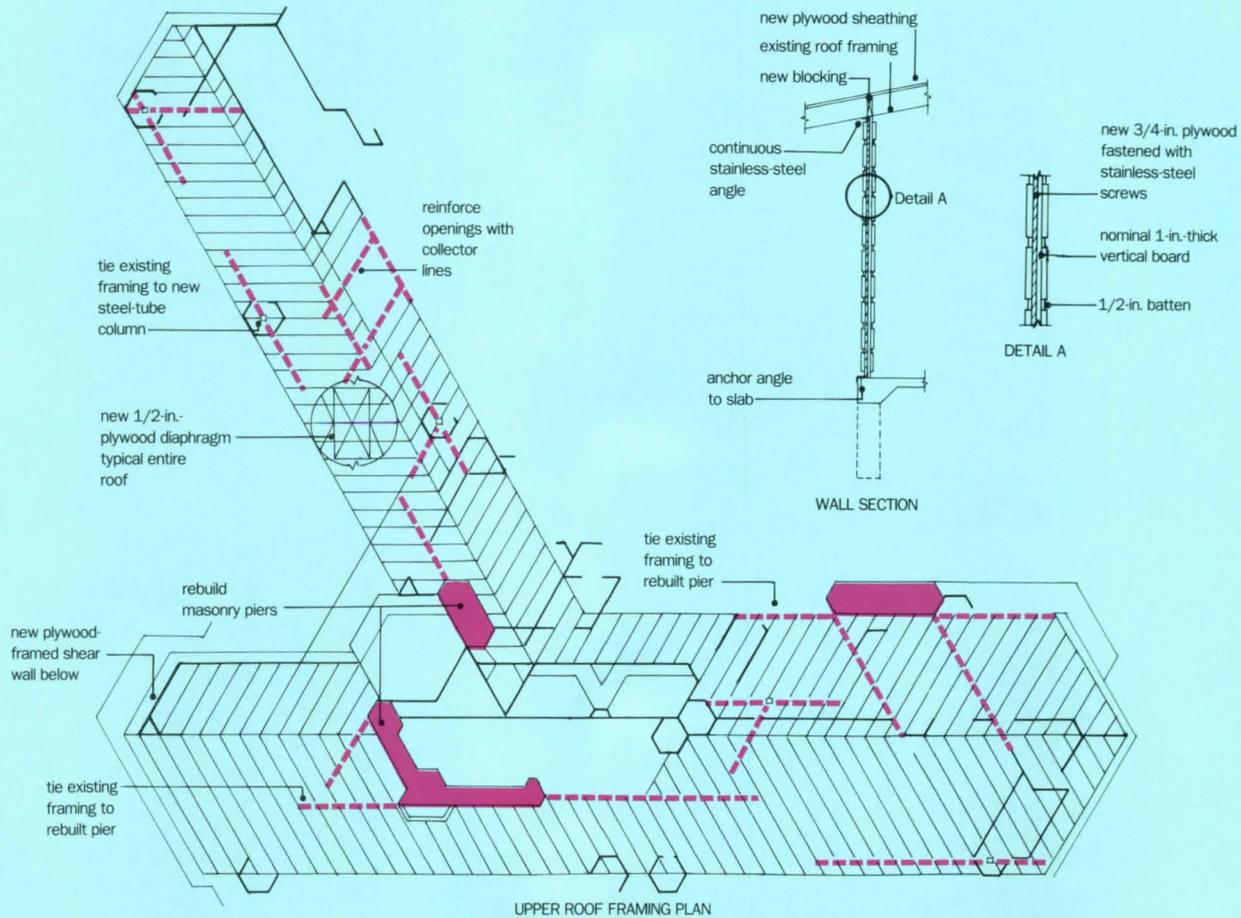


1. Hangar
2. Shop
3. Trainer
4. Classroom
5. Lounge
6. Library
7. Computers
8. Instructors
9. Flight simulator
10. Learning center
11. Services
12. Conference

The Hanna House Stanford University

Though Frank Lloyd Wright proudly proclaimed the efficiency of the 4 by 4 hexagonal grid he used in this house, now owned by Stanford University, the building's unreinforced brick chimneys and complex roof system were damaged in the Loma Prieta quake. The extensive glazing and clerestories gave little lateral load resistance. Forell/Elsesser engineers propose to tie the structure to-

gether with "connecting lines"—wood blocking between rafters for compression and steel straps in tension. Plywood roof sheathing will form a diaphragm and chimneys will be rebuilt with steel reinforcement. Architects are the Architectural Resources Group and Martin Eli Weil. Completed in 1937 for less than \$40,000, the house's repairs will cost an estimated \$1.8 million.



Chuck Painter, Stanford University News Service

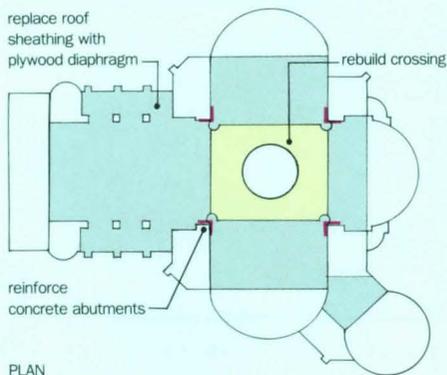
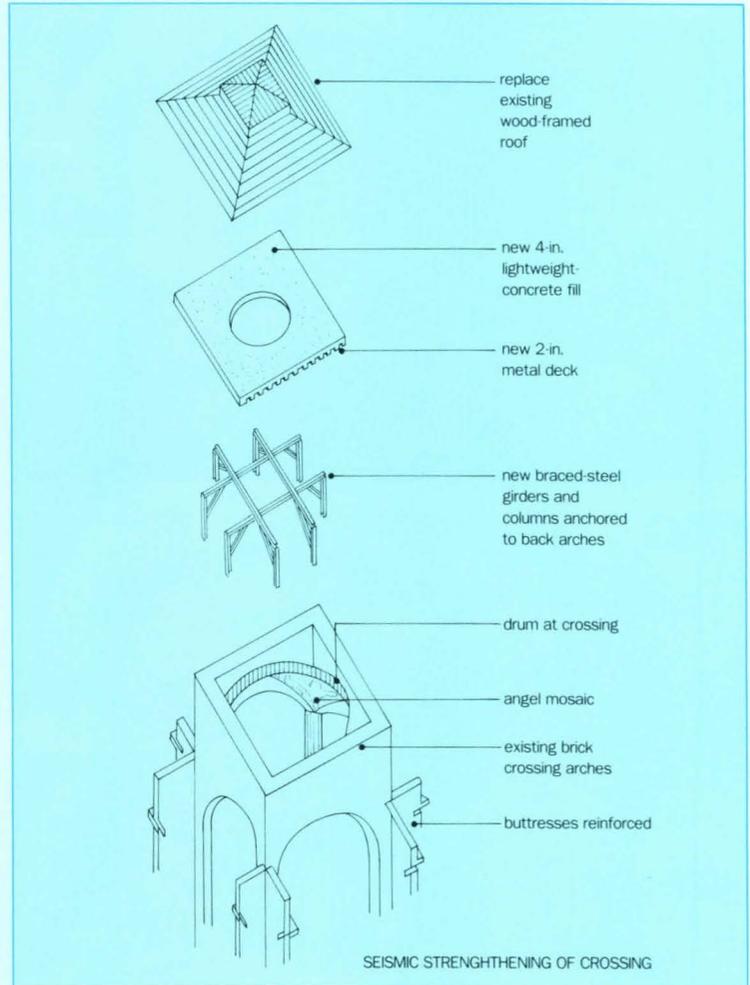
Memorial Church Stanford University

At the center of Stanford University's famous series of interlocking quadrangles is Memorial Church, designed by Charles Allerton Coolidge and C. E. Hodges (top). The church was just three years old when its tower, nave, and apses were destroyed in the 1906 quake. The church was rebuilt without its tower (middle), retaining from the original only its arched crossing. The most re-

cent earthquake weakened the crossing and a rebuilding scheme has been proposed by Degenkolb Associates (drawings below). The firm is working with Hardy Holzman Pfeiffer to preserve as many historic features as possible, including mosaic-tile angels on the pendentives. Other improvements (plan bottom) will lock the crossing to the rest of the structure.



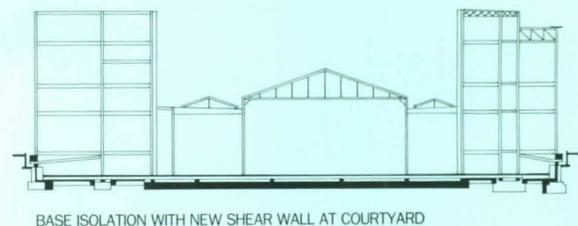
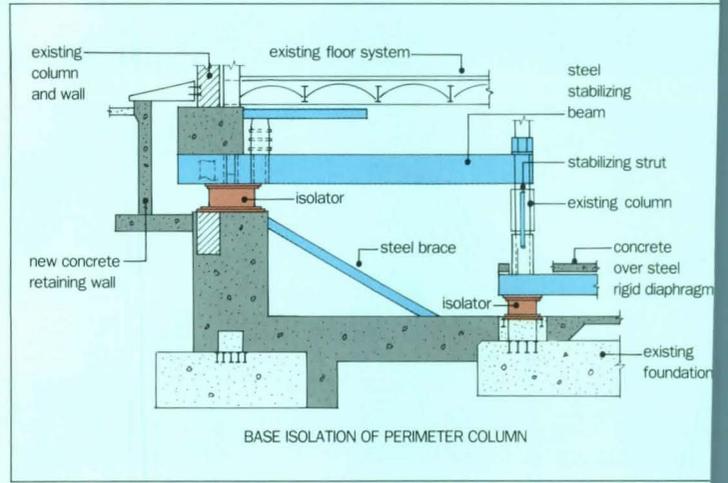
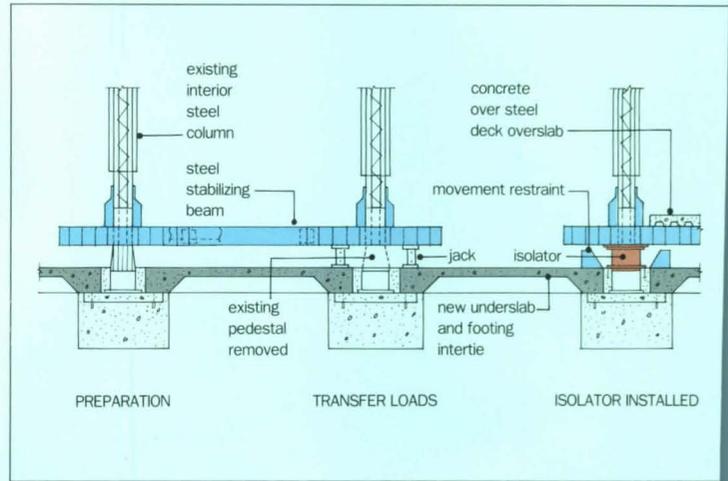
Special Collections, Stanford University Libraries



U.S. Court of Appeals and Post Office San Francisco, California

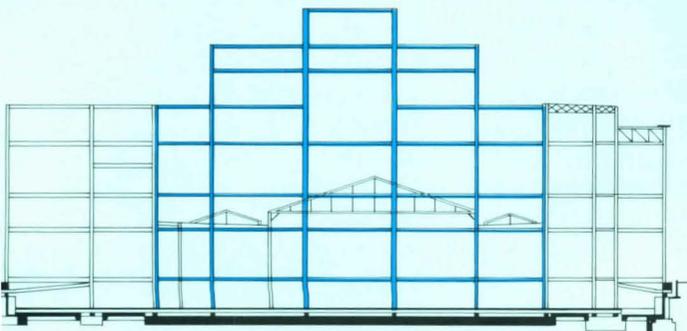
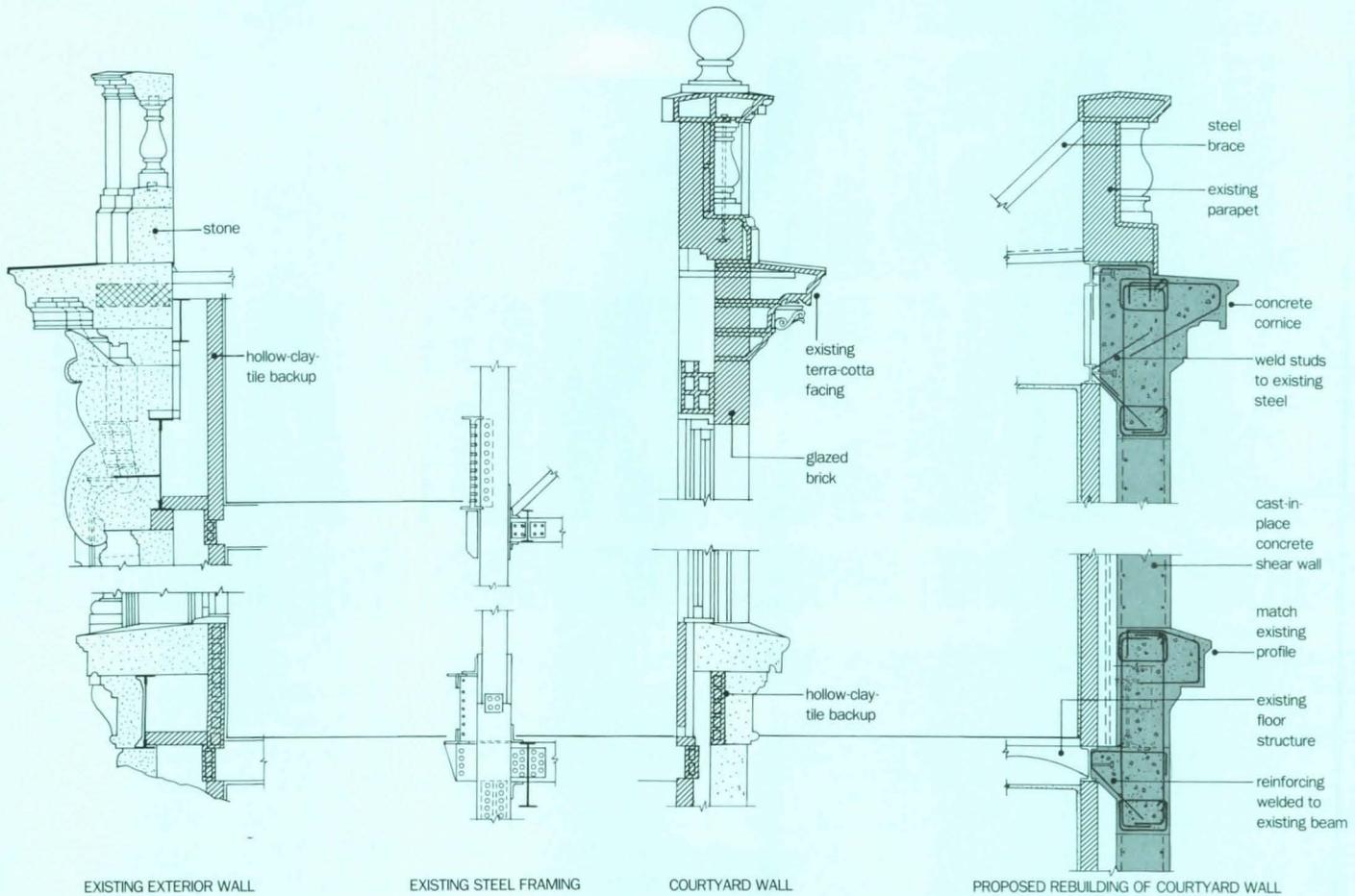
Completed in 1905, this building rode out the 1906 earthquake with a structure that Eric Elsesser, of Forell/Elsesser engineers, describes as "well-conceived for its time." The U-shaped building was designed by James Knox Taylor. (The courtyard was fully enclosed later.) Its masonry-clad steel frame was made rigid by diagonal steel knee braces (details opposite). Occupants

moved out after the Loma Prieta quake, and the building was studied as the General Services Administration's first potential candidate for base isolation. (GSA's most recent guidelines recommend consideration of the technique.) This study's conclusions will be verified by an architect/engineer team that will develop a final design for construction during 1993. The base-isolation scheme



involves casting slabs between internal columns to rigidify the entire foundation, installing a steel-frame system to brace the columns themselves, and then installing isolators below the steel (sequence, top drawings opposite). To minimize excavation at the perimeter, isolators are set much higher on newly reinforced walls (middle opposite). Other remedial work is pro-

posed, including installation of new concrete shear walls at the courtyard sides of the building. The new walls will maintain profiles of the existing terra cotta and brick (top right drawings). Though the engineers proposed one scheme that filled the courtyard with new floor space (this page bottom), the GSA decided to maintain the glass-roofed courtyard (opposite bottom).



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Surfacing Materials

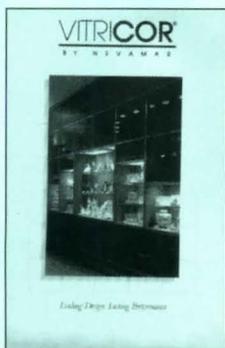
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Stone Looks

Folder highlights the granite, marble, and onyx colorations available in stain-resistant Avonite material, including shaded Gemstones such as Lapis Blue, Emerald Jade, and Smoke Agate. Avonite.

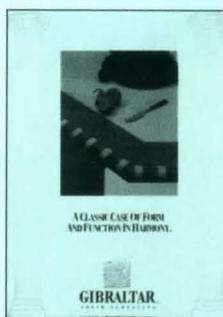
400



Lacquer-like Surface

Design brochure illustrates the reflective gloss and deep colorations possible with Vitricor acrylic, showing the sheet product used on cabinets, walls, and furniture. Nevamar.

401



Edge Details

Design brochure features striking edge treatments done in Gibraltar, Wilsonart's new solid-surfacing material. Color chips show all 16 solid and "stardust" colorations. Ralph Wilson Plastics.

402



Custom Laminates

Illustrates over 160 Pionite laminate colors and patterns, including stones and abstracts. Explains a custom program that permits up to six designs to be silkscreened in up to three colors.

Pioneer Plastics.

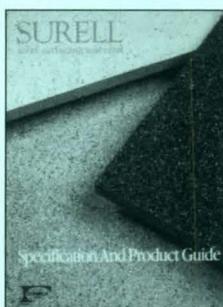
403



Decorative Laminates

New design guides present all of the solid-color, wood-grain, and patterned Micarta laminates, grouped in palettes of associated hues for easier comparison and selection. Westinghouse.

404



Solid Countertops

Design folder suggests creative residential and commercial uses for Surell solid-surface material, supplies technical data, and highlights new colors such as teal.

Sample kit is available. Formica Corp.

405



Solid Composite

Catalog describes the architectural potential of Fountainhead, a polyester/acrylic material available in solid colors and a stone-like matrix range. All colors are UL-listed as Class A. Nevamar Corp.

406



Countertop

German-made DUROpal worktops have a curved drip-proof edge profile, and a lightly textured melamine-resin surface said to be particularly scratch-, heat-, and stain-resistant. Advanced Technology.

407



Granite Look

Solidex comes in six stone-like patterns, including sandstone, burgundy, and jade colorations, as well as eight solid tones. An edge-lock groove facilitates building up of custom edge treatments. Guardsman Products.

408

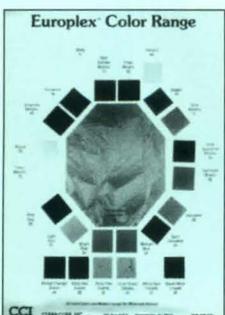


Coordinating

New dark, jewel-tones of Sierra Black Pearl, Sapphire, Garnet, and Jade featured in a Corian selection guide. All 18 colors work together. CAD-format design help available.

DuPont.

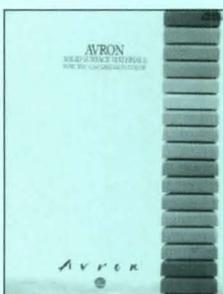
409



Glossy Acrylic

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United States Gypsum Company

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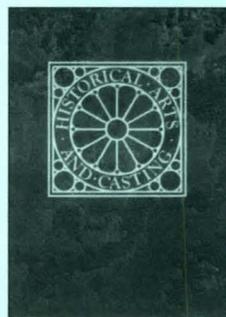
Ceramic Tile
Includes 52 pages on 22 different tile lines, with guide specifications on selecting, laying out, and setting tile floors and walls. Florida Tile.

412



Dual-surface Windows
A new residential window, American Oak has a solid-oak interior frame with an extruded-aluminum exterior, and incorporates high-performance commercial-window features. Season-all.

413



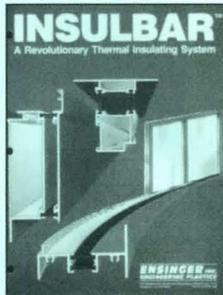
Metalwork
Brochure illustrates cast-metal restoration projects like McKim Mead & White bridges and the Wrigley Building spire, as well as commissioned gates, railings, and furniture. Historical Arts & Casting.

414



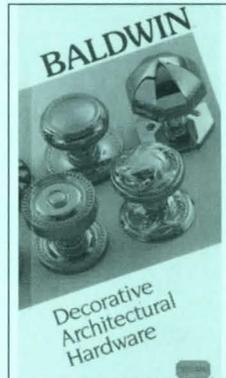
Space Frames
Recent major projects in enclosed shopping centers, airports, and large exhibition areas illustrate the structural efficiency and design potential of long-span and cantilever space frames. Unistrut.

415



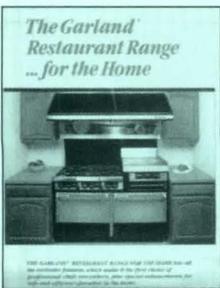
Frame Insulator
Insulbar thermal-break material permits the economical use of two-color aluminum profile extrusions in windows and curtain walls, e.g., Kynar on the exterior and anodized inside. Ensinger.

416



Brass Hardware
Folders highlight locksets, decorative cabinet hardware, and bath accessories made of hot-forged brass, finished with a baked-on clear enamel that preserves the polish. Baldwin Hardware Corp.

417



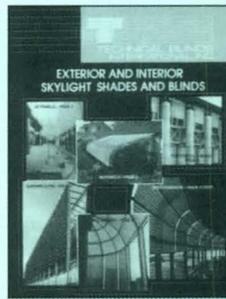
Commercial Range
A Garland stove sized to fit home cabinetry produces the high temperatures required by professionals. Features a waist-level broiler, raised griddle, and stainless-steel surfaces. Welbilt Appliance.

418



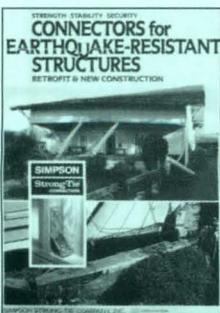
Tile
Full-line catalog covers both commercial and residential products. New items include rope-mold trims in bright colors, porcelain floors, and Southwestern-hued counter and wall tile. Monarch Tile.

419



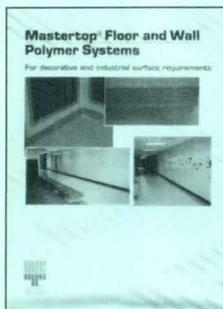
Shading Systems
Manual and motorized blinds and shade assemblies for external and interior applications, and fixed louvers that can also serve maintenance and security functions included. Technical Blinds.

420



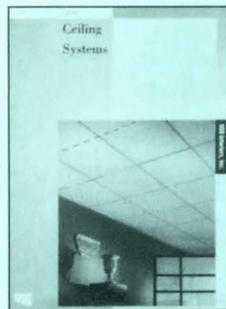
Seismic Connectors
How to use metal fasteners to strengthen new and existing wood structures and increase earthquake safety. Shearwall construction and anchor retrofits described. Simpson Strong-Tie.

421



Anti-static Flooring
Morritex AS seamless epoxy flooring comes in 16 contemporary hues, as well as OSHA and custom colors. Uses include healthcare and clean-room installations. Master Builders.

422



Acoustic Ceiling
Architectural catalog introduces the Eclipse ceiling, with NRC values in the .65-.75 range. The fine-textured panel is guaranteed not to sag, and comes in both Class A and fire-rated versions. USG Interiors.

423

EFCO MAKES A GRAND ENTRANCE.



We wouldn't make an entrance any other way. EFCO Entrances are available in narrow, medium, and wide stile configurations. Each is compatible with EFCO Storefront Systems 401 and 402, and each is available with a wide range of standard and custom hardware. Need a grand entrance? Call EFCO toll free. **1-800-221-4169**. In Missouri, call 1-417-235-3193. EFCO Corporation, P. O. Box 609, Monett, Missouri 65708-0609.

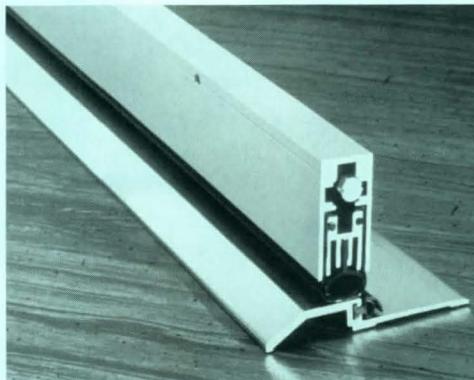


New Diffusions™ and Grid Diffusions Planks feature contemporary abstract patterns with a smart difference. They always arrive on time.

THE

Circle 27 on inquiry card

Product News



308 Sound-control system. Zero's new Sound Trap door gasketing enables an operable rated door to reach a Sound Transmission Class level of 53. Four components interact to form the acoustic seal, including special head and jamb seals, and the door bottom and bronze rabbeted door saddle shown above. The door bottom, which may be mortise or surface mounted, works automatically, with a concealed plunger-activated steel spring that drops a double neoprene seal into place as the door is closed, and retracts when the door opens. Zero International.



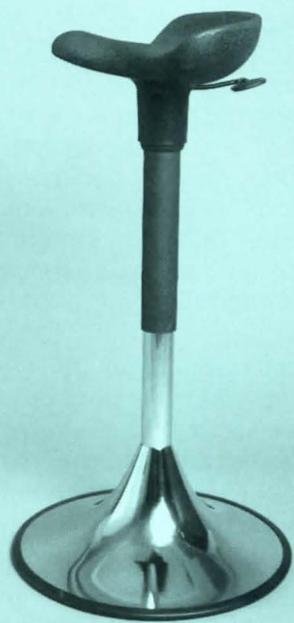
309 Pennsylvania Dutch. Based on the simple cabinets found in an 18th-century homestead, the Kauffman door can have a distressed finish with a warm, time-worn appearance. Heritage Custom Kitchens.

New prefinished Formal Woodgrain Planks use a stunning high-fidelity process to bring out the richness of darker woodgrains. And they go up fast.

SMART

Circle 28 on inquiry card

Product News



310 Task support. Not quite a stool, the SitStand allows a worker to remain in a standing position close to the task, while greatly reducing the load on legs and back. Seat height adjusts pneumatically. Sit-rite Group.



W tabletop. From the 1991 collection of decorative elements licensed by the Frank Lloyd Wright Foundation, gold-edged porcelain dinnerware was designed for the formal dining room of the Imperial Hotel. Furniture, fabrics, wallcoverings, rugs, art glass, and silver objects are now offered directly to the trade. There is a \$9 charge for the catalog. Decorative Designs. (800) 343-9066.



Diamond Classic™ Marlite Planks. A modern palette of refined solids with a smart difference. They're tough.

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16" wide Marlite Planks are prefinished in a richly varied palette. All smart choices for areas where beauty has to be more than skin deep. Marlite, 202 Harger St., Dover, Ohio 44622. (216) 343-6621.

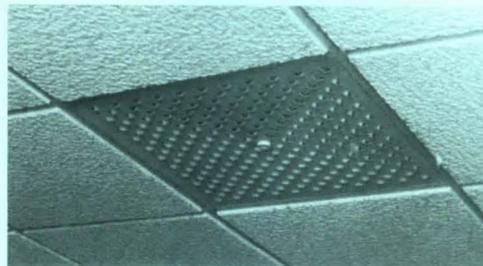
 **Marlite**
WHERE IDEAS COME TO LIFE

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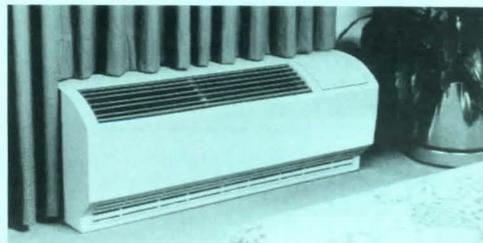
Product News



311 Plan files. Stackable units made of Appalachian red oak come in three sizes, up to 30- by 42-in., and several flat- and tool-drawer configurations. Bookshelf and base units also available. Mayline/Hamilton.



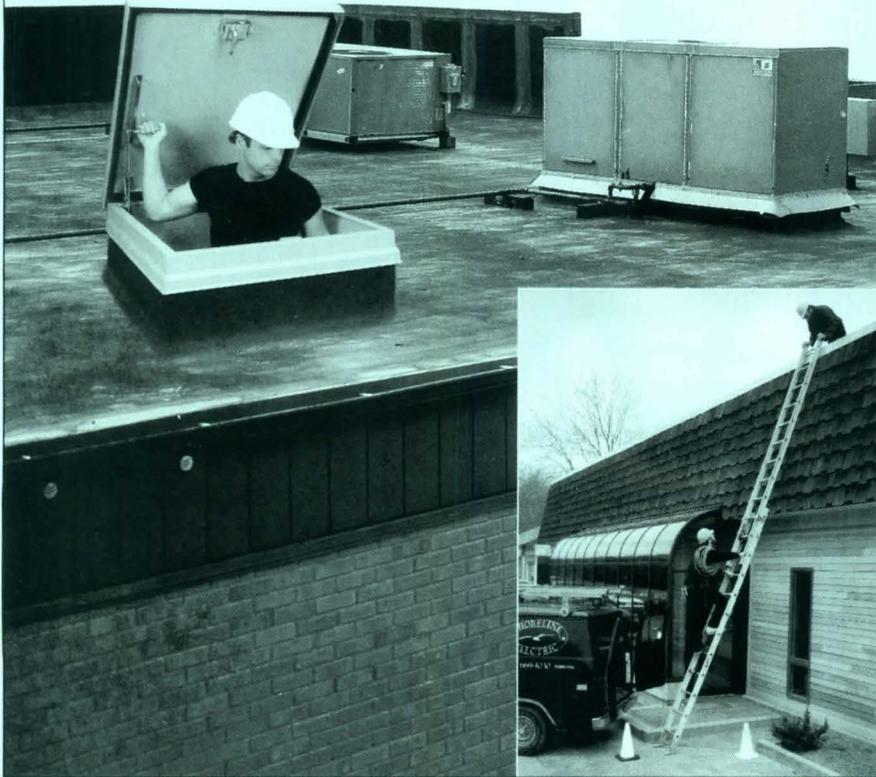
312 VAV diffuser. A self-contained, energy-saving unit, the Leopard Intellivent senses and compares room temperature and supply-duct temperature, then regulates air flow to maintain the temperature desired by the room occupant. For use in any new or existing single-duct forced-air system, including ceiling-plenum installations, the diffuser fits into a standard 2- by 2-ft grid. Dimpled jets and eight-way air-flow pattern prevent drafts. Warren Manufacturing.



313 Packaged AC. Sleek ZoneAire terminal hvac units are only 18 1/2-in. front-to-back, with a gently curved top that discourages clutter or use as a seat. The plastic housing, flame-retardant as per UL 94 5-V, is durable enough for hotel, healthcare, and school use. Inter-City Products.

Product News continued on page 131

On Top of the Situation



Specify a Bilco scuttle and put your client on top of the situation. With a Bilco scuttle, rooftop access occurs from *within* the building itself, eliminating the hazards and inconveniences of outside ladders. No more worries about wet, slippery ladder rungs, the unattractive appearance of a fixed exterior ladder or the need to use an extension ladder. With an inside ladder, opportunities for vandalism are reduced as well.

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For safety, convenience and easy one-hand cover operation, nothing can match a Bilco scuttle. See our catalog in Sweet's or send for a copy. Circle 30 on inquiry card

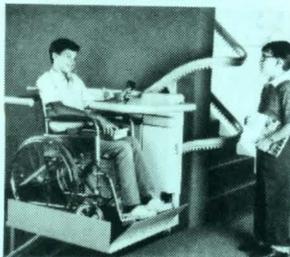
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WIRE CLOTH

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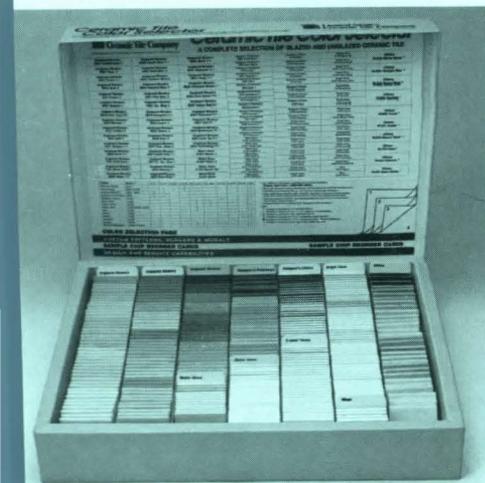
Product News



314 Nouvel chair. Designed by the architect for the lounge and bedrooms of a hotel in the Bordeaux region of southwestern France, Jean Nouvel's Saint James chair exhibits Gallic thrift: no cushioned part goes unused. The heavy-aluminum frame positions each slipcovered, cushioned pod so that they seem to float. Ligne Roset.



316 Glass-block installation grid. The IBP pre-framed aluminum grid eliminates the need for traditional mortar laying up of all thin-series (3 1/8-in. thick) glass block patterns, making for a much quicker and more uniform installation of walls, skylights, and floors. The biggest standard-size grid is 96- by 144-ins., which can be mul-tioned together to create larger panels. Perforations in the grid insure good contact of the silicone sealant. Acme Brick Co. *Product News continued on page 133*



15 Tile selection. Part of an updated range of literature, sample panels, and other re-specification help, an Architectural Color Chip Chest offers all of the manufacturer's glazed and unglazed products in 2- by 2-in. sample pieces. The lid explains the placement of various colors within the kit, suggests custom-mosaic installations, and tells how to order full-scale tiles as needed. United States Ceramic Tile Co.

© 1991 Raynor Garage Doors



5 years, 100 tons of lettuce,
 30 tons of bananas (seven tarantulas),
 25 tons of squash,
 two tons of squashed squash,
 one Raynor Rolling Steel Door,
 one Raynor Distributor.

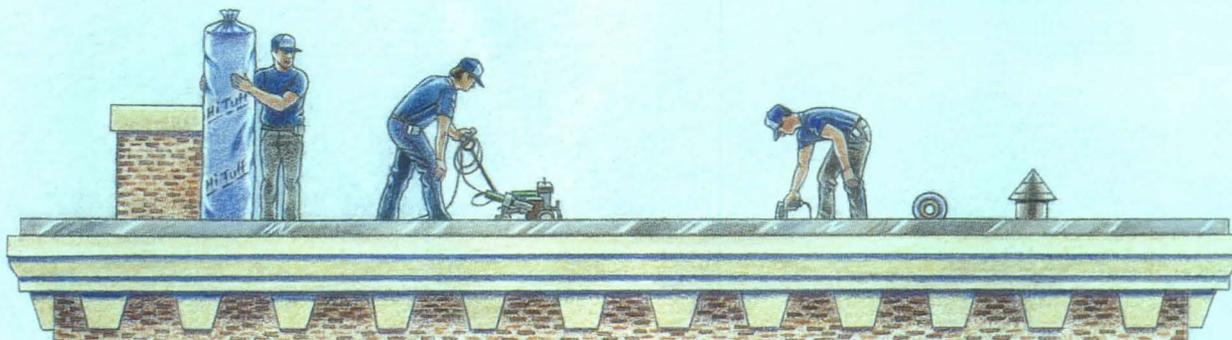
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