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GHOSTS

Improve Gray Architecture

Older Americans deserve better designed environments than the market currently provides.

My father turns 75 this month. He lives in the four-bedroom, suburban house where I grew up and refuses to move. Sociologists call this "aging in place," a rising phenomenon as more older Americans decide to spend their retirement in the neighborhoods where they raised their children. For example, more than 56 percent of the elderly population of New York, New Jersey, and Connecticut live in the suburbs today, compared with only 17.6 percent in 1950. Like my father, they value independence, neighbors, outdoor space, and familiarity with their surroundings.

But what happens when elderly suburbanites become too frail to live independently? As we point out in this issue, they are faced with grim alternatives: retirement communities, nursing homes, and assisted-living arrangements that segregate older people and force them to live away from families and neighborhoods.

According to Victor Regnier, dean of the School of Architecture at the University of Southern California and associate professor at its Andrus School of Gerontology, American architects have much to learn from housing for the elderly in the Netherlands, Sweden, and Denmark. Regnier visited these countries when researching his book, *Assisted Living Housing for the Elderly* (New York: Van Nostrand Reinhold, 1994), and discovered that older people there are cared for in small, communal buildings that are connected to their surroundings. Even older people suffering from Alzheimer's disease live in settings for six to eight people that fit into existing housing. Such solutions are far more personalized than Alzheimer's housing in the U.S., where 60 or more residents may be grouped in institutions. The European models in Regnier's book convey a clear message: Assisted- and long-term-care facilities must be more like houses and less like hospitals.

How can this residential scale be achieved in the U.S., where local officials zone nursing homes out of residential neighborhoods, and

developers segregate the old into gray ghettos with names like Leisure World? Many architects are stigmatized by the association with old folks; most view elderly housing as a domain dominated by specialists and third-rate designers. Several refused to accept our invitation to envision new designs for the elderly (pages 88-99, this issue), citing a lack of interest or experience. "I wouldn't know where to start," averred a Chicago architect who has solid experience in both residential and institutional design.

But a fresh approach is precisely what is needed. Elderly housing should be taken away from the so-called experts and put in the hands of skilled designers. Like the American suburb, which has been studied and revised by such architects as Andres Duany and Elizabeth Plater-Zyberk, retirement communities deserve a second look.

Learning more about such retirement communities is being encouraged through the Aging Design Research Program (ADRP), a nonprofit organization established in 1991 by the AIA and the Association of Collegiate Schools of Architecture. By establishing an awards program and a network for architects designing for aging, ADRP hopes to foster more community-oriented buildings for the elderly. Now it is conducting postoccupancy evaluations of three of its award winners to determine their successes and failures and is developing a curriculum for architecture schools focused on the critical issues of aging. This curriculum will be taught in design studios and eventually will be offered as a continuing-education course for architects.

Given that the fastest growing segment of the population is the "old-old"—those 85 and up—and that by 2030, one in five Americans will be elderly, the need for better "gray" architecture will only become more dire: After all, we all grow old.

Deborah K. Diekmann

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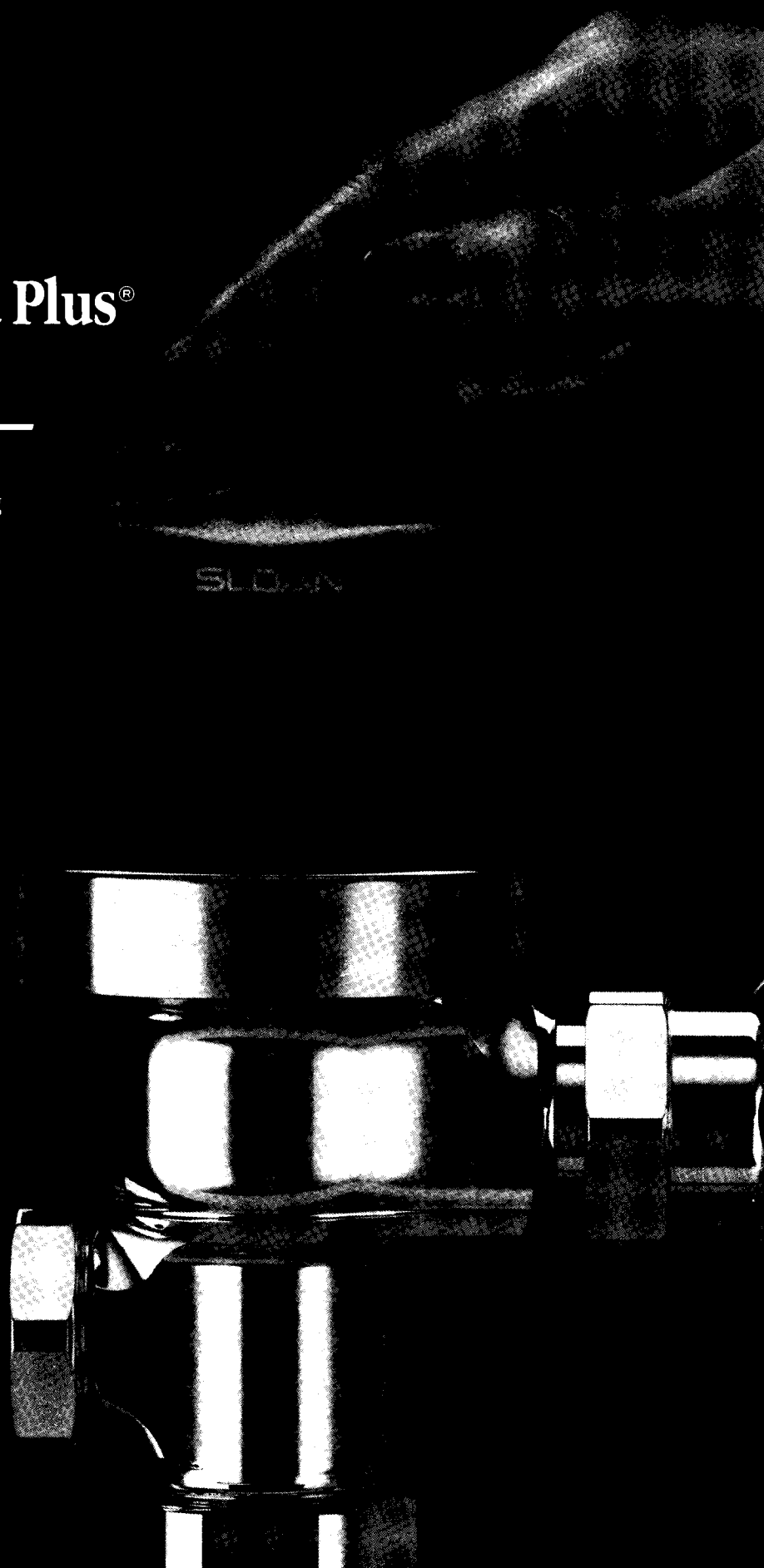
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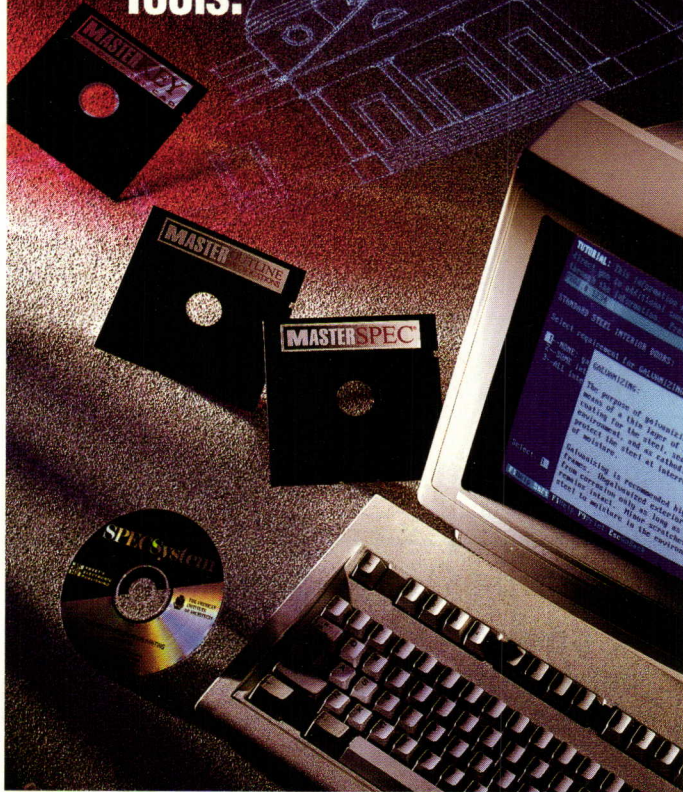
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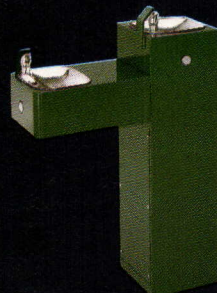
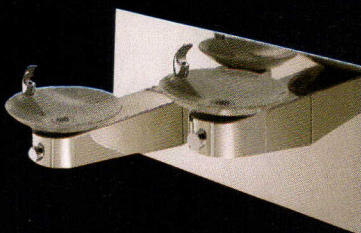
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Events

October 20-21

Design/build conference in Atlanta, sponsored by Georgia Tech's Continuing Education Department. Contact: (404) 894-2547.

October 22-23

Sustainable environments symposium in New York City, sponsored by AIA and the United Nations. Contact: (202) 626-7482.

October 26-30

"Preservation, Economics, and Community Rebirth," a conference of the National Trust for Historic Preservation, in Boston. Contact: Tuesday Georges, (202) 673-4141.

October 29

"Public Libraries: Design for the Next Century," a symposium at the Boston Public Library. Contact: (617) 536-3886.

October 29-January 2, 1995

"Karl Friedrich Schinkel, 1781-1841," at The Art Institute of Chicago. Contact: (312) 443-3600.

November 1

Deadline for submission of papers for the International Making Cities Livable Conference, November 29-December 3, in Carmel, California. Contact: Suzanne H. Crowhurst Lennard, (408) 626-9080.

November 6-9

Conference on Sustainable Construction, in Tampa, sponsored by the University of Florida Center for Construction and Environment, and the International Council for Building Research Studies and Documentation. Contact: (904) 392-1701.

November 6-9

International Facility Management Association's 15th annual conference and exposition, in St. Louis, Missouri. Contact: (713) 623-4362.

November 7

Deadline for submitting entries to the 1995 United States Institute for Theater Technology Annual Architectural Awards Program. Contact: (212) 807-7171.

November 7-10

The Jerusalem Seminar in Architecture presents "Architecture, History, and Memory," in Jerusalem, Israel. Contact: Arthur Spector or Lynne Rosman, 972-2-610-925.

November 7-12

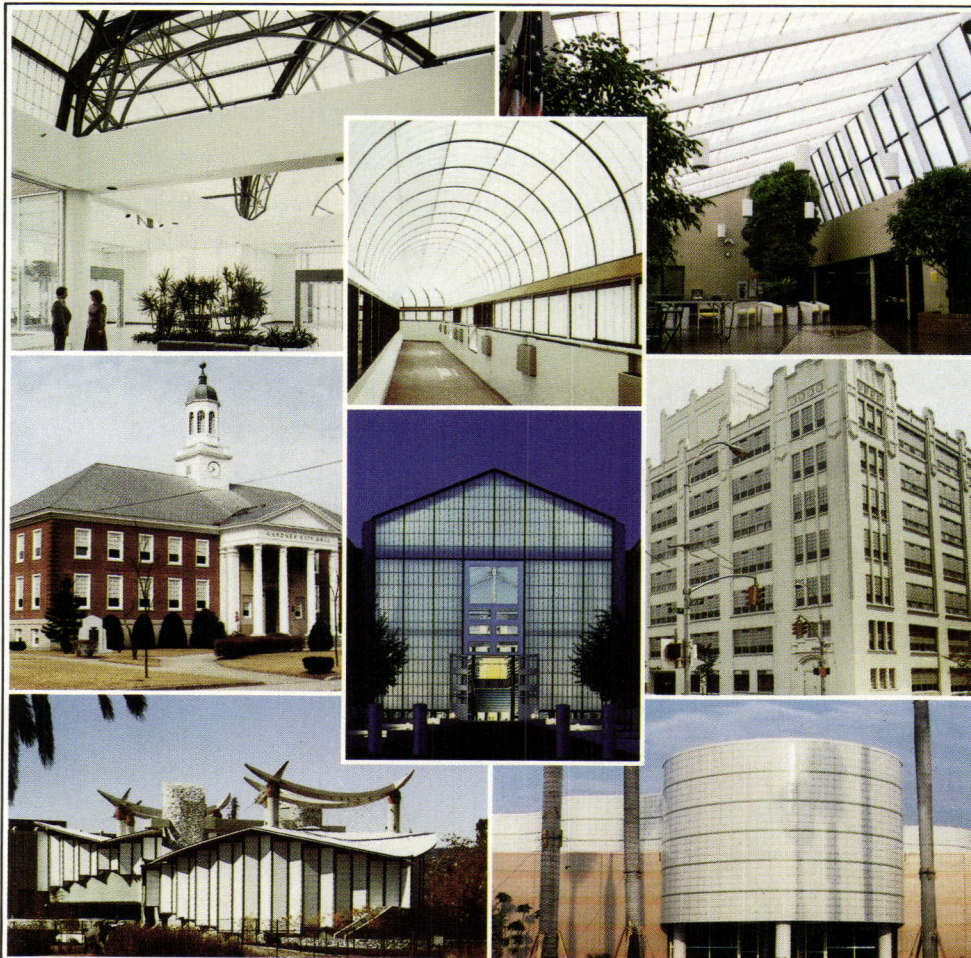
First World Congress on Urban Growth and the Environment, in Hong Kong, organized by the Landscape Institute; the American Society of Landscape Architects; and the Japanese Institute of Landscape Architects. Contact: (202) 686-2752.

November 11-December 31, 1995

"World War II and the American Dream: How Wartime Building Changed a Nation," at the National Building Museum, in Washington, D.C. Contact: (202) 272-2448.

November 18-December 17

I-Space in Chicago presents "Actions+Continuities," an exhibit of work by Thomas Hanrahan and Victoria Meyers, Architects. Contact: (312) 587-9976.



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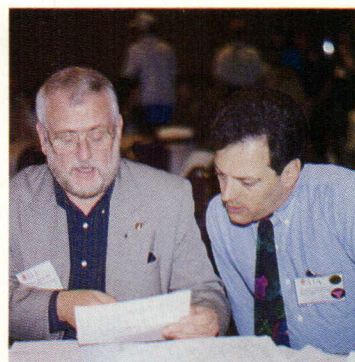
AIA Sponsors First Diversity Conference

Is diversity in the profession possible? According to the architects, educators, and students who attended the AIA's first national conference on multiculturalism, it is. "Breaking the ICE" ("Inviting, Cultivating, and Empowering"), a two-day event sponsored by the American Institute of Architects' Minorities and Women in Architecture Committee and the AIA Expert Panel on Diversity, offered provocative exchanges and encouragement to minority, women, and gay architects. The August gathering, held in Washington, D.C., and cosponsored by the American Institute of Architecture Students and the National Organization of Minority Architects, was a powerful display of the multiculturalism that already exists within architecture and a clarion call to bring more diversity to the profession's leadership.

Discussions focused on grievances such as pay equity, sexual harassment, and promotion in practice and academia, as well as on the competitive advantages of architects who work to establish diverse practices. Architect Harvey Gantt, former mayor of Charlotte, North Carolina, and honorary conference chair, noted that the diversity of his own firm makes it better able to respond to community needs "because of our understanding of what's happening in the environment around us."

Workshops on housing, accessible design, and historic preservation revealed the benefits of practitioners' sensitivity to cultural pluralism. For instance, Jeffrey Samudio, partner of Design AID in Hollywood, California, explained how his firm advocates historic preservation among residents of immigrant communities to help enfranchise new residents in unfamiliar surroundings. Architects Robin Abrams of Austin, Texas, and Katherine Austin of Santa Rosa, California, explained how they have changed public policy to forge innovations in public housing. Additionally, representatives from several federal government agencies attended to explain the procurement procedures and opportunities for minority-owned businesses.

For every new opportunity, however, obstacles remain. Even the conventional definition of "leadership" was disputed. Sharon Sutton, the first black woman to achieve the rank of professor at an accredited archi-



AIA MEMBERSHIP PROFILE		
	members	percent
minorities	3,832	7.03
white	43,394	79.66
women	5,694	10.45
minority women	543	0.99
total AIA membership		54,469

- 28 Houses at Wexner Center
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ecture school, criticized professional culture for equating leadership with "good management of the status quo." Sutton challenged architects to implement "transformative" leadership, which she described as stewardship—taking advantage of one's power to elevate others rather than suppress them. She encouraged architects to consider "radical multiculturalism," a new social order in which power is shared equally.

Participants pointed out that the AIA's inclusion of women and minority architects in its own leadership will provide a role model for the profession at large. At a wrap-up session led by AIA President-elect Chester Widom, members outlined specific priorities: annual national and regional diversity conferences, diversity training as part of the Institute's continuing-education program, and lower fees to open conferences to a wider constituency. Attendees also proposed incentives for firms to address pay equity and related discrimination issues and urged continuing research on the status of minority and women professionals.

AIA President-elect Widom's contributions to "Breaking the ICE" suggest that his presidency will do much to help foster the conferees' goals. Widom urged members to focus on specific, attainable goals at the next conference, proposed for 1995. The AIA, he emphasized, has already taken positive steps over the

TOP LEFT: Speakers included architect Jack Travis (left) and Sharon Sutton, University of Michigan professor.

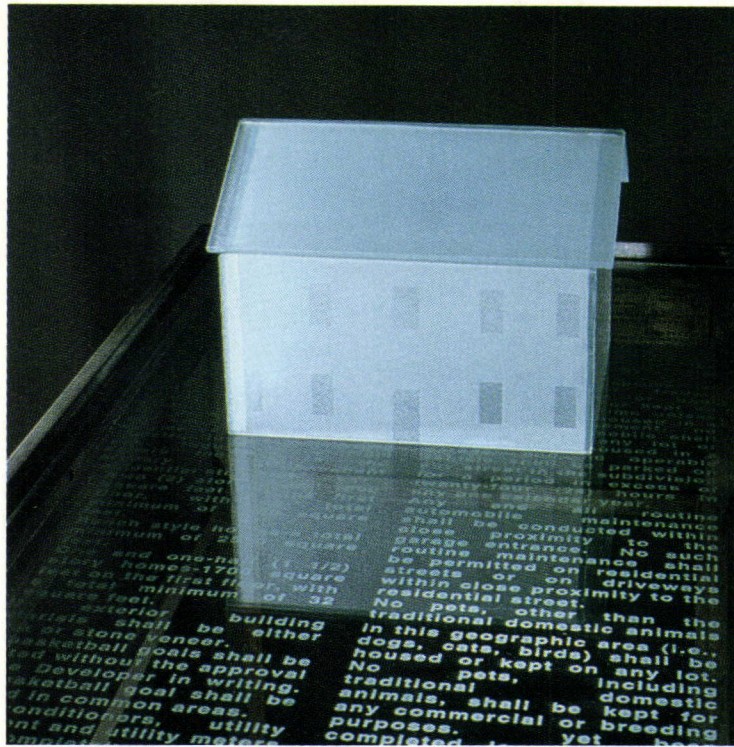
TOP RIGHT: AIA President-elect Chester Widom (left) and Co-Chair Stephen Glassman prepared closing remarks.

ABOVE LEFT: Conference Co-Chair Michaela Pride-Wells (left) and New York architect Thomas Penn summarized responses of participants.

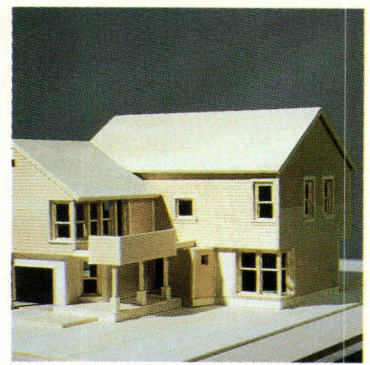
ABOVE RIGHT: Chart reflects current diversity within AIA membership.

past year to promote multiculturalism: Diversity training for AIA component directors began at this year's grass-roots convention and is planned for 1995. And San Francisco architect Sylvia Kwan, appointed by Widom, is the first Asian woman to chair a national AIA convention, to be held in Atlanta next year.

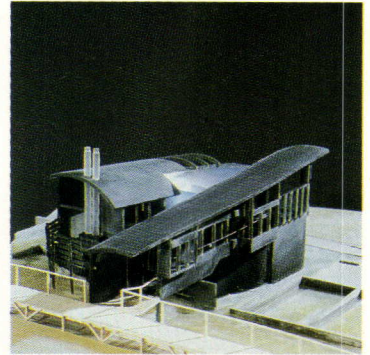
While milestones such as Kwan's appointment represent real progress, some women and minority architects see meetings such as "Breaking the ICE" as merely the tip of the iceberg in a profession steadfast in its traditions. Harvey Gantt expressed hope that diversity conferences will one day be unnecessary and that the AIA's policy-making will continue to promote a diverse constituency. As he exhorted, "We are making progress. Let's carry the message of inclusion back to the firms, chapters, and communities. If we do that, there will be no more need for ice-breakers."—Ann C. Sullivan



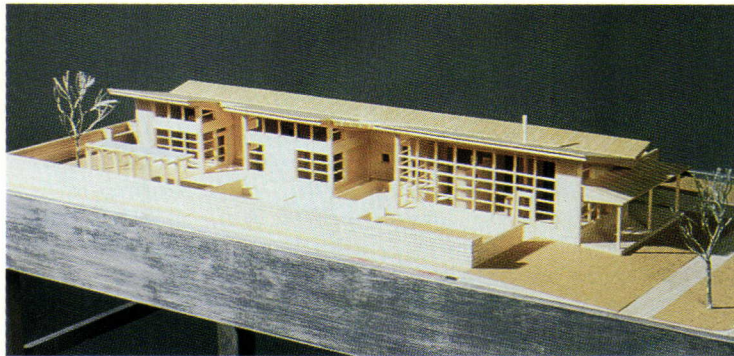
NAST/WILSON: Commentary on traditional house, which is reflected in mirror.



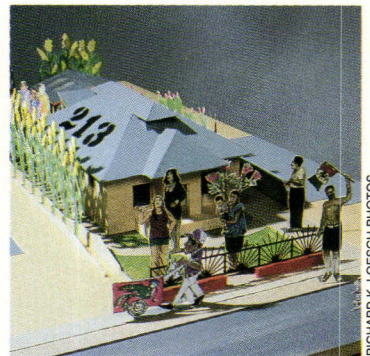
SEDGWICK, MOON/GIANNI, WEIR



URBACH/INTERIM OFFICE OF ARCHITECTURE



LUPTON/MURPHY: Single-story house accommodates disabled, seniors, and children.



CRAWFORD/ADOBE LA: East L.A. diversity.

RICHARD K. LOESCH PHOTOS

Wexner Show Confronts Suburban Living

How sweet it is, the single-family house, that representative of all that is normal and status quo. But when Levittown wasn't looking, things changed behind the walls of the castles. Mom and dad and their 2.7 kids have been joined by grandpa and grandma, or replaced by a gay couple, a single person, a group of doctoral students sharing space, or two or more families under the same roof. Yet across the expanse that is the suburban sprawl of America, houses have not readily changed to accommodate their new dwellers, and neighborhoods continue to be planned in much the same way as has been done for decades.

"House Rules," the first architectural exhibit presented by the 5-year-old Wexner Center for the Arts

in Columbus, Ohio, was organized by Mark Robbins to offer a clear alternative, with houses designed to reflect how Americans really live.

Robbins, who was appointed the first curator of architecture at the Wexner Center in January 1993, developed a two-tiered selection process to determine the exhibit's participants. He corresponded with theorists, architects, and critics around the country and then sorted through nearly 50 responses to his request for proposals before choosing the final 10 theorist/architect teams.

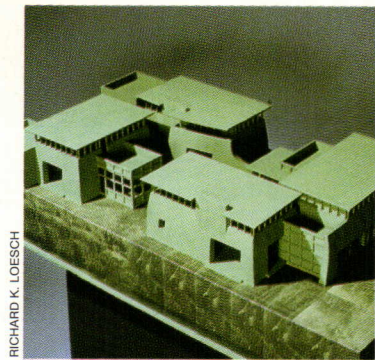
The participants in "House Rules" represent a demographic balance and include both established practitioners and young architects: Joan Copjec/Michael Sorkin; Jonathan Cray/Joel Sanders; Margaret Crawford/ADOBE LA; bell hooks/Koning Eizenberg Architecture; Silvia Kolbowski/Smith-Miller+Hawkinson

Architects; Ellen Lupton/Jane Murphy; Heidi Nast/Mabel Wilson; Eve Kosofsky Sedgwick, Michael Moon/Benjamin Gianni, Scott Weir; Allucquère Rosanne Stone/Susan Selçuk, Steven Fong Architecture; and Henry Urbach/The Interim Office of Architecture.

Their works strive—through models, drawings, and text—to address class, gender, race, and other social and political issues affecting the concepts of residence and neighborhood while dealing with the considerations and limitations tied to them.

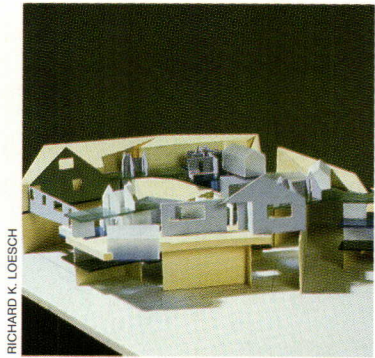
As might be expected when individuals from diverse backgrounds step across the threshold of culture and take on an icon, the results of their efforts are uneven.

"The show treads between the pragmatic and conceptual," remarks Robbins. "It really is about getting a lot of issues on the table."



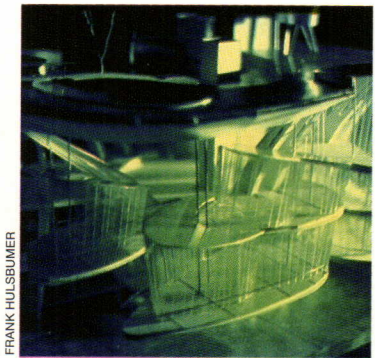
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HOOKS/KONING EIZENBERG ARCHITECTURE



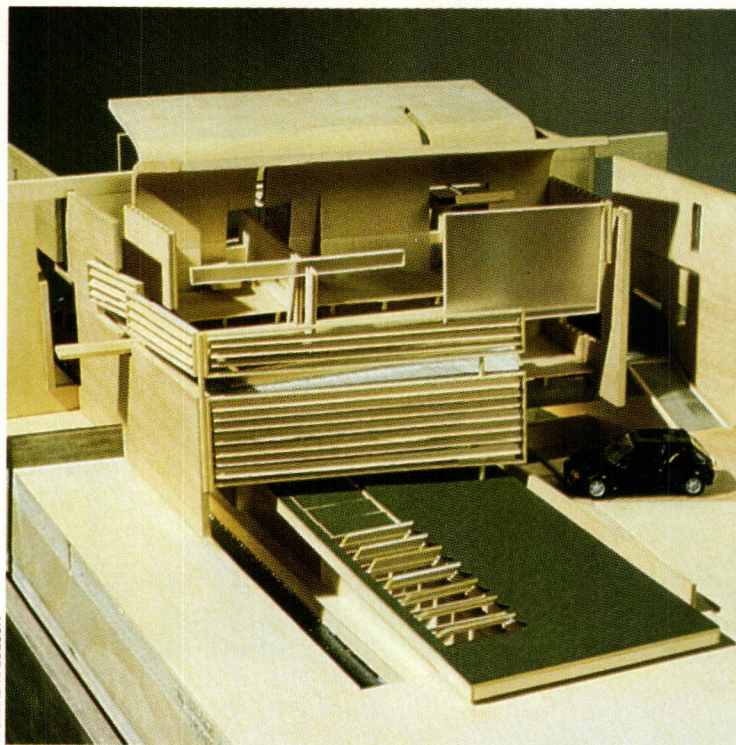
RICHARD K. LOESCH

KOLBOWSKI/SMITH-MILLER + HAWKINSON



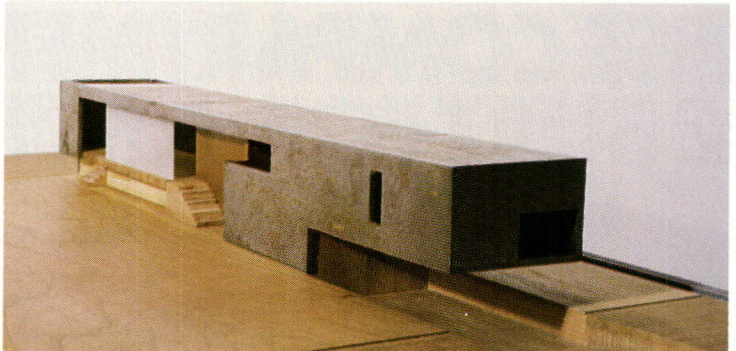
FRANK HUIJSBUMER

COPIEC/SORKIN: Rooftop yard.



RICHARD K. LOESCH

CRARY/SANDERS: Challenges spatial divisions of conventional suburban house.



NILS EDDY

STONE/SELÇUK, FONG: Borders lot to maximize landscape.

In that regard, the teams appear to have succeeded. Their efforts, including the models each built to scale to sit on a typical suburban lot of 80 feet by 160 feet, cover a lot of ground while provoking thought and raising questions.

This certainly is true in the case of the curved, futuristic-looking “private home” from the team of Copjec and Sorkin, which features numerous panes of glass, staggered surfaces, and open stairwells, as well as a rooftop yard, which is “no longer a hemming carpet of private interests but a skyline of possibilities,” as proclaimed in an accompanying description of their work.

Other selections appear more traditional, although, as the Sedgwick, Moon/Gianni, Weir collaboration notes, “It may look like a single-family house, but looks can be deceiving.” This team’s overriding

focus was to build flexibility into a house in order to be as inclusive as possible for a wide range of inhabitants. The offering includes living area above the garage, which is detached to eliminate the suburban image of garages prominently placed at the street; the main house can be divided to serve as everything from a single-family home with five bedrooms to a three-unit complex.

Other works in the Wexner Center exhibition also focus on flexibility to accommodate demographic shifts. The Stone/Selçuk, Fong entry, for example, positions the house at the far end of the site to create a border between adjacent lots while maximizing the open landscape to allow for a wide range of uses that might be required by single occupants or extended families.

Another entry in the Wexner show, from the Lupton/Murphy

team, is a single-story residence that can serve multiple needs—someone in a wheelchair, senior citizens, or a household with young children.

The Crawford/ADOBE LA contribution, meanwhile, doesn’t provide solutions as much as it points out the situation found in East Los Angeles. Residents, often unable to purchase new houses, have tried to customize the existing housing stock to suit their needs and tastes: Colorful paint, minor additions or kitchen expansions, plants, and gardens have created a distinctive look to their residences and neighborhoods.

With their ideas and insight, the team players in “House Rules,” on view at the Wexner Center until December 11, have accomplished similar goals.—Darris Blackford

Darris Blackford is a reporter for the Columbus Dispatch in Ohio.

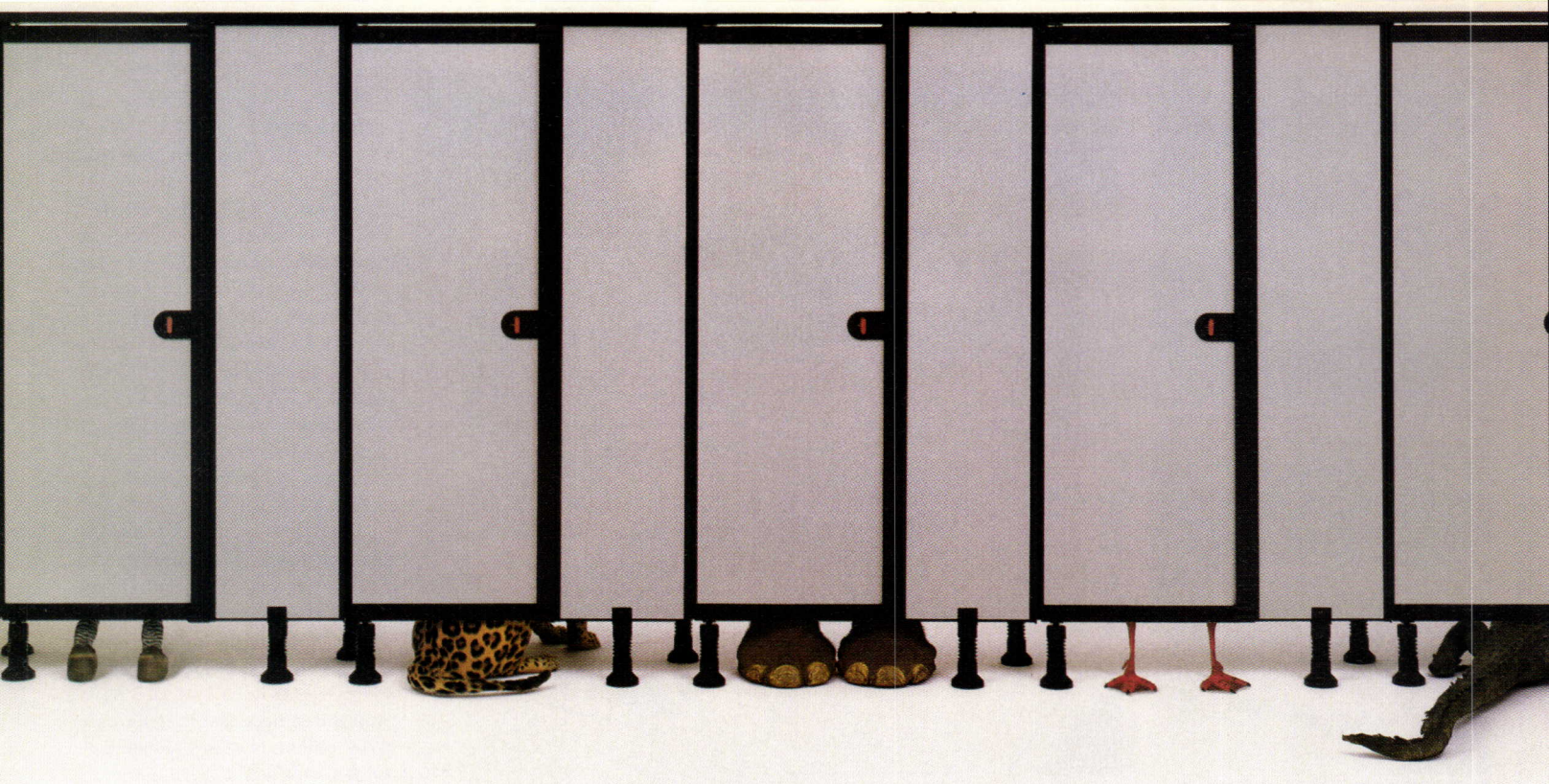
Details

The Los Angeles firm **Keating Mann Jernigan Rottet** has been acquired by **Daniel Mann Johnson & Mendenhall**; Rick Keating will serve as DMJM’s director of design. **Neil Frankel**, former senior vice president of Perkins & Will, has joined the Chicago office of Skidmore, Owings & Merrill as director of interiors. **Pei Cobb Freed & Partners** has been selected to design an Air Force Memorial in Washington, D.C. A memorial commemorating black soldiers in the Civil War, designed by Washington architects **Devroux & Purnell** and **Edward Douglas Dunson**, is under construction in Washington, D.C.

Antoine Predock Architect has been selected to design the Spencer Theater for the Performing Arts in Ruidoso, New Mexico. Honolulu-based **Wimberly Allison Tong & Goo** has won the competition to design the \$200 million Hawaii Convention Center in Waikiki. **Anshen+**

Allen and **Barton Phelps & Associates** are restoring UCLA’s Royce Hall. Vassar College in Poughkeepsie, New York, has selected **Hardy Holzman Pfeiffer Associates** to renovate and expand three campus libraries. Former chair of the Architecture and Environmental Design Department at the Parsons School of Design **Susana Torre** has been named director of Cranbrook Academy of Art and vice president of Cranbrook Educational Community. **Katherine and Michael McCoy**, co-chairs of the design department at Cranbrook, will join the faculty of the Illinois Institute of Technology’s Institute of Design. **Kenneth**

Schroeder, senior principal of Schroeder Murchie Laya Associates, has been named director of the School of Architecture at the University of Illinois at Chicago. **Nicola Solomons**, former associate director of the Los Angeles chapter of the AIA, has been named executive director of AIA Los Angeles. The Oklahoma Historical Society has commissioned **Elliott + Associates Architects** to design the National Route 66 Museum on Highway 66 in Clinton, Oklahoma. **RTKL** is renovating a three-story building in Washington, D.C., as an addition to the National Museum of Women in the Arts. Architect **Deborah Norden** of the New York Council on the Arts died in the USAir flight that crashed outside Pittsburgh, Pennsylvania, in September.



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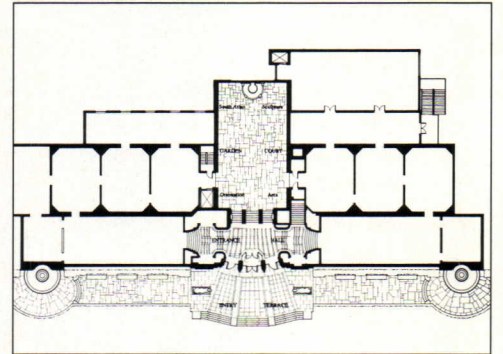
SEATTLE MUSEUM: Gould's 1933 facade.



GARDEN COURT: Links entrance hall to Asian art galleries.



DISPLAY CASES: Pylons frame South Asian artifacts.



PLAN: Gallery enfilade around central garden court.

Asian Arts Museum Opens in Seattle

In 1991, when the Seattle Art Museum moved into its much-discussed Robert Venturi-designed building in downtown Seattle, the museum's original home in Volunteer Park atop Capitol Hill dropped out of the public's consciousness. Now it has returned: The original 1933 Art Moderne building designed by architect Carl Gould has been cleaned up, renovated, and redesignated SAAM, the Seattle Asian Arts Museum.

Woefully undersized for a major city's primary museum, SAAM's intimate scale feels right for its 7,000-piece Asian collection. Seattle architects Rick Sundberg and Walter Schact of Olson-Sundberg Architects collaborated with exhibition designer Michael McCafferty on the renovation; in Sundberg's words, their work has been done "with the lightest hand imaginable."

Although the project was undertaken with a low budget, the paltry \$400,000 spent on architectural renovation (out of a total budget of \$1.65 million) appears to have been sufficient. The entrance hall is a sparkling celebration of Gould's Deco style; Olson-Sundberg cleaned it up and repaired the ravages of time in a damp climate, but otherwise left it alone. Gould accom-

plished a lot with very little in this high-ceilinged space: The ceiling coves are finished in gold leaf and aluminum foil, the green "marble" columns are actually scagliola (plaster treated with a false marble finish), the floor is terrazzo with brass and marble inlays, and the horizontal banding is gold leaf on terra-cotta.

Directly behind and six steps above the entrance hall is the building's largest and most problematic space, the garden court. It is here that the renovators intervened most boldly. In an effort to scale down the awkwardly proportioned room, the architects designed a series of vertical pylons that stand flush against the walls (at the far end they flank a fountain that has been transformed into a display platform); the curators placed a selection of South Asian statuary and fragments of temple friezes against white panels on shelves and platforms in the niches between the pylons. Finished in a gray-green metallic car paint, the Decoesque pylons are banded with horizontal grooves to match similar grooves in the room's original plaster walls. The pylons recall the era of the museum's construction while creating a link between the lively lobby and understated galleries.

The balance of the galleries form a gentle circulation loop, although rooms added at different times to

the rear of the building have thrown a few kinks into an otherwise straightforward floor plan. Each space is dedicated to an art or craft from a specific era or dynasty of a culture, nation, or region of Asia.

Exhibition designer McCafferty selected the color palette, which changes from room to room, ranging from cream to dark gray, in keeping with the origin and nature of the objects on display, as well as the level and technique of illumination. McCafferty also designed the new display platforms, while the architects recycled some of their state-of-the-art designs for display cases from the Seattle Art Museum.

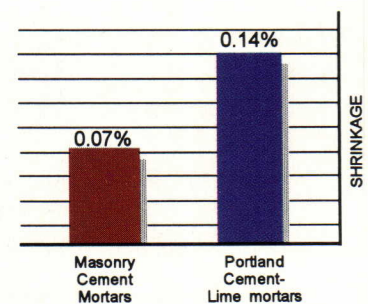
Otherwise, the renovation consisted primarily of removing false ceilings, replacing damaged walls with new sheetrock, adding wainscoting, enhancing illumination with additional track lights, and covering the timeworn masonite floor with a carpet. Beyond the richness of the collections, small details like easy-to-read labels, hidden hardware of display cases, and near-invisibility of mountings that stabilize artwork in position—every piece was custom-made for its specific art object and anchored against seismic upheaval—refine Gould's design. Without cafés, gift shops, or theaters, SAAM is a refreshing addition to Seattle's cultural landscape.—Justin Henderson



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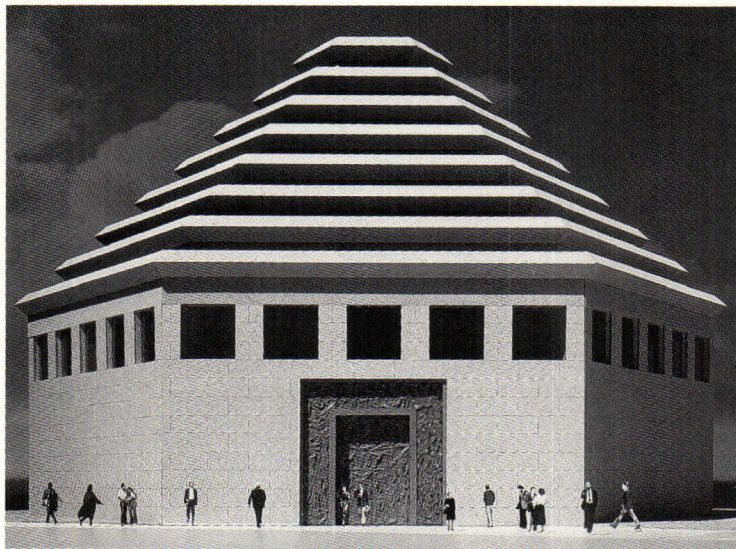
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ROCHE DINKELOO HEXAGON: Louvered roof admits daylight to central memorial.

Construction Begins on NYC Holocaust Museum

After more than a decade of delays, the New York Holocaust Memorial Commission will begin constructing its memorial and museum in New York City this month. Designed by Kevin Roche John Dinkeloo Associates, the museum will be located at the tip of Manhattan in Battery Park City, overlooking Ellis Island and the Statue of Liberty.

The hexagonal form of the 20,000-square-foot gray granite building represents the six-pointed Star of David and the 6 million Jews who died in the Holocaust. The simple, austere structure will rise 85 feet and will be topped by a louvered roof that allows light to penetrate the central memorial space, which contains a full-height shaft rising from a pool of water.

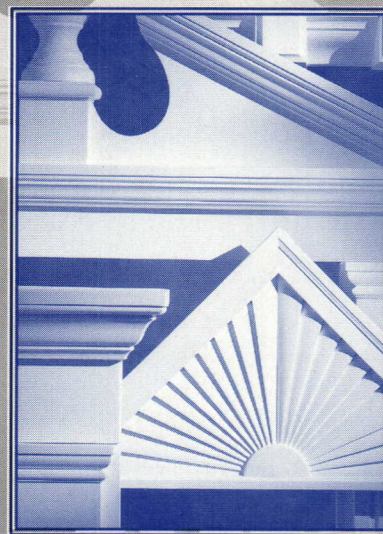
Two levels of exhibition rooms, located around the perimeter of the building, will house the 13,000 artifacts devoted to Jewish culture. The Holocaust museum will be the first cultural institution in the 92-acre Battery Park City complex.

To accommodate its original 1986 scheme, the Holocaust Commission leased a parcel of land from the Battery Park City Authority (BPCA), a public corporation established to develop the eastern tip of Manhattan. Plans to construct the 180,000-square-foot museum were shelved due to lack of funding, however, and the commission has agreed to return the parcel to BPCA. In exchange, BPCA will advance \$7.5 million, based on anticipated development of the parcel, for construction of Roche Dinkeloo's more modest scheme. The remainder of the \$15 million construction cost has been collected from private donors.

"As a living memorial, the museum will teach people of all ages and backgrounds about the unique tragedy of the Holocaust," explains Museum Director David Altshuler. Exhibits and education programs will convey the richness and diversity of Jewish life prior to the Nazi regime and depict the revival of Jewish civilization throughout the world in the latter half of the 20th century. The public opening of the museum is planned for late 1996.—A.C.S.

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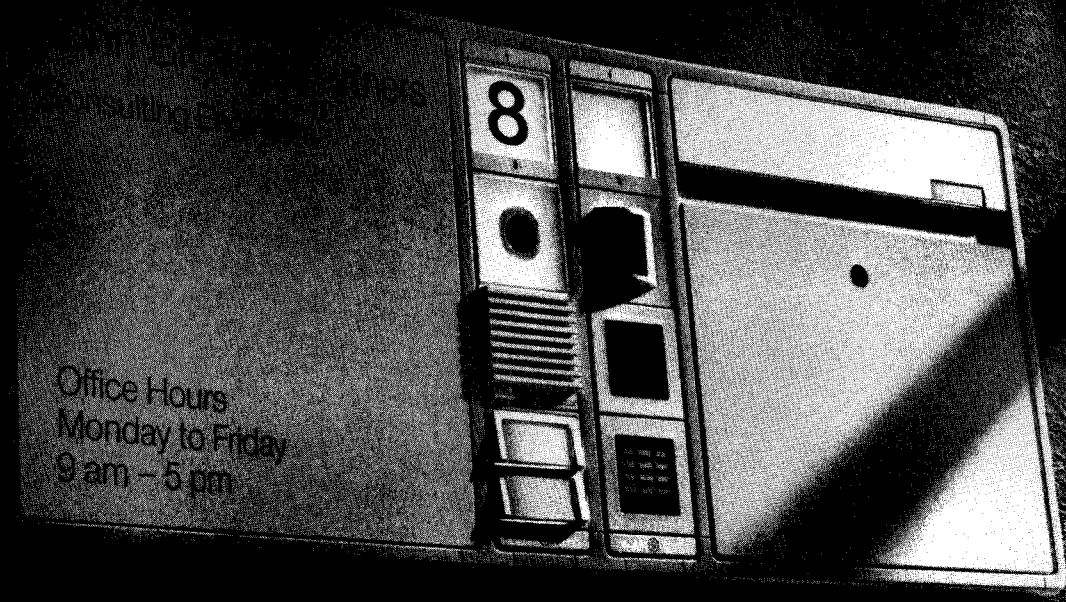
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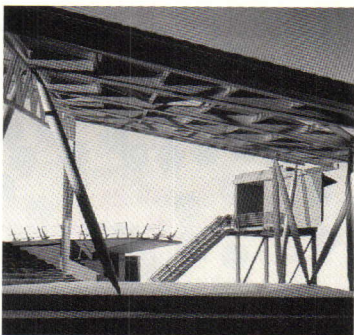
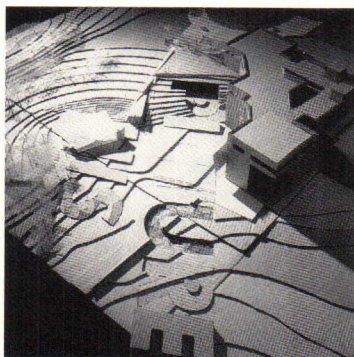
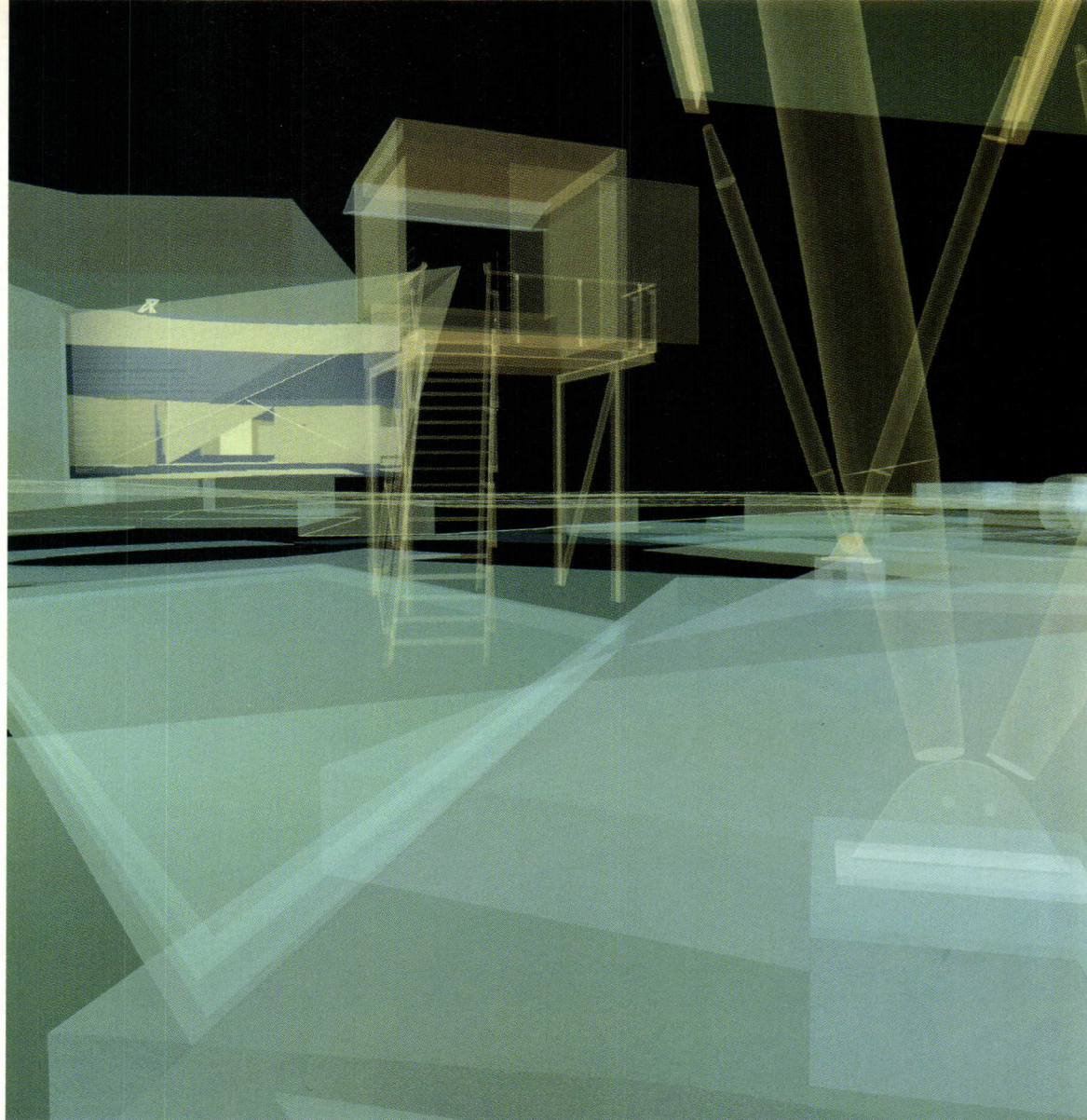
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On the Boards

An amphitheater and cinema extend a museum's public activities into the landscape.



Amphitheater and Cinema North Carolina Museum of Art Raleigh, North Carolina Smith-Miller + Hawkinson

Landscape and architecture will be combined to sculptural effect at the North Carolina Museum of Art. Designed by New York-based Smith-Miller + Hawkinson Architects with landscape architect Nicholas Quennell and artist Barbara Kruger, a new amphitheater and outdoor movie theater will be integrated into the sloping terrain of the existing museum grounds.

The amphitheater at the southwest portion of the 2½-acre site will be sheltered by a corrugated-aluminum and fiberglass roof on steel supports lodged in the concrete stage (left); concentric concrete ledges inserted into bermed levels will comprise the seating for an audience of 500 patrons (above left). The new movie screen, measuring 40 feet by 60 feet,

will be mounted on the west face of the existing art museum, and an informal, grassy slope will accommodate 2,400 moviegoers.

The control booth for the amphitheater (above), positioned near the stage, doubles as the cinema's projection booth. Supported by steel legs and clad in galvanized-steel panels, the raised wood-framed structure straddles the uneven topography and links the two theaters.

Viewed from an airplane, the site reveals the words "PICTURE THIS," which will be imprinted in the landscape by indigenous bluestone boulders, gravel, and brick.

The outdoor theaters are based on Smith-Miller + Hawkinson Architects' 1988 master plan for the 167-acre North Carolina Museum of Art. Pending approval by state authorities, construction of the \$1.8 million amphitheater and cinema and site-works is scheduled to begin this fall.—Ann C. Sullivan



FIBERBOND

WALLBOARD

A bright future for Miami Beach is dimmed by an overscaled condominium.



PORTOFINO TOWER: Sieger Partnership's 44-story condo tower.

Behemoth on the Beach

The southern tip of Miami Beach is a spectacular site, a sliver of land between the Atlantic Ocean and Biscayne Bay. So when wealthy German investor Thomas Kramer acquired control of 35 acres in South Beach and then summoned several renowned architects to propose projects, it seemed a brilliant architectural gesture. Last summer, 10 firms—including Arquitectonica, Duany Plater-Zyberk, Michael Graves, and Robert A.M. Stern—listened to neighbors, studied the site, and proposed solutions. It seemed as though dreary Florida beach development had ended. Not quite.

The most prominent building to be constructed in South Pointe will be a 44-story condo tower, distinguished by little but its height. Designed by the Sieger Architectural

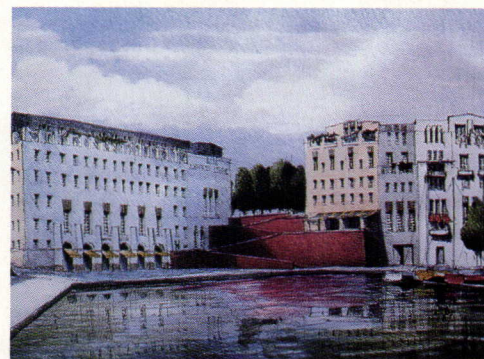
Partnership of Miami, the project maximizes views and floor plan efficiency. But the look of the building counted for less. "It's not architecture in the pure sense," asserts partner Charles Sieger. "People buy a condo for the layout and the view. Everything else is icing on the cake."

The result is a landmark without distinction, a three-pronged, 450-foot stack of balconies. With its pink stucco and tinted glass, the soaring Portofino Tower mimics the very clichés that the architects who met last summer had hoped to avoid. The tower also lacks the visual punch that could mitigate its dizzying multiplication of units, and it will loom 10 times as tall as most of the neighborhood. Moreover, when finished in early 1996, the Portofino Tower will preside like a sentinel over Government Cut, the passage to the Port of Miami. As a promi-

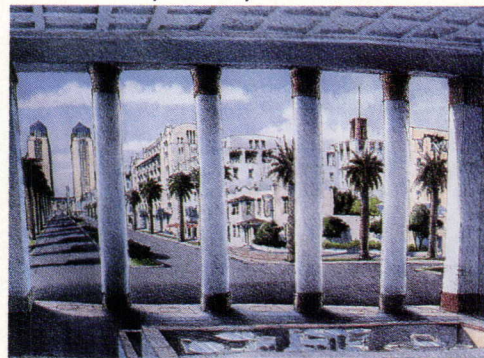
nent emblem of the city, Portofino Tower should bespeak the ocean, the tropics, and ethnic vibrance, but as designed, Sieger Partnership's behemoth only symbolizes Miami's much-maligned Condo Canyon.

Some ideas from the charette may still be realized, however, since Kramer is continuing to develop a master plan. Meanwhile, Elizabeth Plater-Zyberk has been hired by the city to write urban regulations for South Pointe. Among the charette ideas that could be encoded are a promenade along the marina and a public plaza at the end of one of the main streets. While Plater-Zyberk admits she's still optimistic, Portofino Tower rises, a sad contradiction to the urbane vision of Kramer's charette.—*Peter Whoriskey*

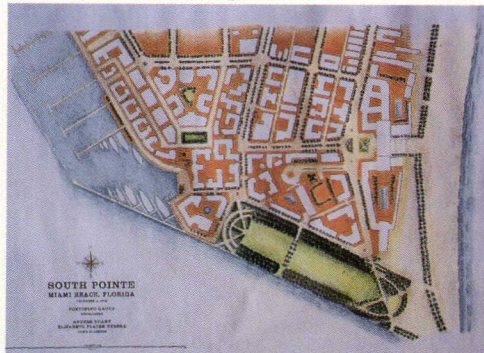
Peter Whoriskey is an architectural writer for The Miami Herald.



CHARETTE: Duany Plater-Zyberk's 1993 scheme.



DPZ'S VISION: Small-scale porticoes.



CHARETTE PLAN: Courtyard blocks and waterfront park.

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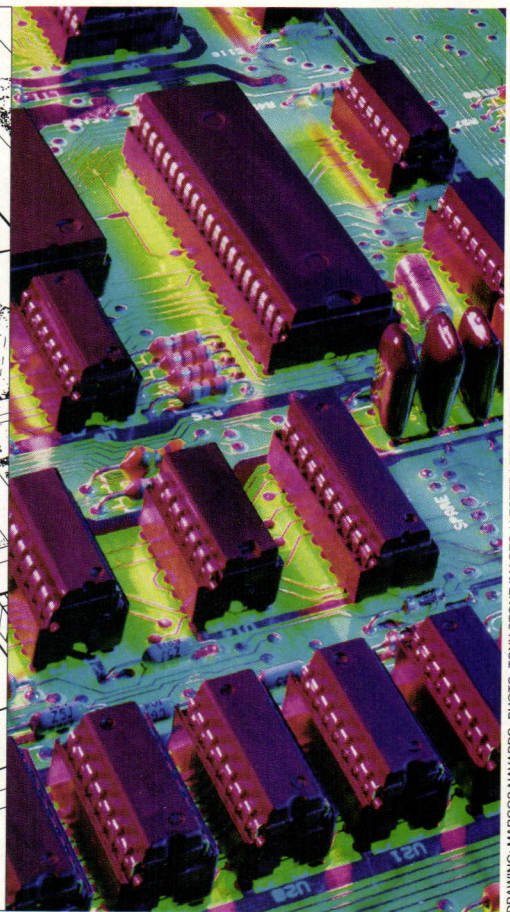
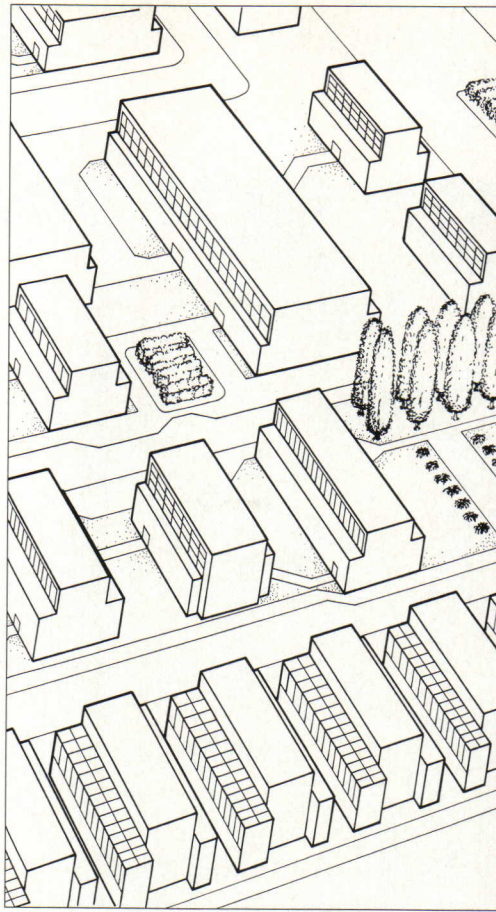
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Confronting the Double Zeitgeist

Architects must respond to both the placebound and placeless possibilities of our age, argues Peter Eisenman.



DRAWING: MARCOS NAVARRO; PHOTO: TONY STONE IMAGES / LESTER LEFKOWITZ

Traditionally, every era has manifested a unitary organizational strategy called a zeitgeist, or spirit of the times. Architecture has always had the capacity to both mirror and be driven by the zeitgeist. For example, Pope Sixtus V's plan for Rome in the late 16th century embodied aspects of the relationship between the church and the state; Haussmann's plan for Paris represented the emergent relationship of the state to technology. Similarly, Le Corbusier's plan for the Ville Radieuse in Paris manifested the relationship between technology and the then-liberal ideology of Modernism. Each of these plans both reflects the status quo and expresses a new emerging spirit. In this sense, architecture has always been the instrument that carries the dual capacity to both form and be formed by the zeitgeist.

Thus, what has traditionally been known as "good" architecture throughout history has two recurrent characteristics: one, the capacity to transform an existing zeitgeist; and two, the ability to sustain that transformation over time. Therefore, "good" architecture must of necessity subvert existing standards for architecture at the same time that it resists absorption into the current culture. For example, Michelangelo's 16th-cen-

tury Laurentian library can be seen as a dislocation, transformation, or subversion of the existing conventional structure of the library. Today when one visits the Laurentian library, one is still struck by its absolute newness, precisely because its dislocation of functional elements and their relationships has not been reabsorbed into the traditional typology of library architecture.

Le Corbusier's chapel at Ronchamp and his monastery of La Tourette were viewed in the 1950s as examples of a transformation of the canons of Modern architecture. However, when one returns to the same two buildings today, Ronchamp seems ordinary while La Tourette still maintains an incredible sense of dislocation. This perception, it could be argued, is because Ronchamp did not dislocate the typology of the chapel, but presented a theatrical and scenographic revision of what we know to be a chapel without in any way disturbing the structural idea of a chapel. La Tourette, on the other hand, maintains its sense of dislocation today precisely because it disturbs the enclosed and rooted nature of the typology of the monastery, a disturbance that has not been reabsorbed into architecture's culture. Architecture, therefore, has the capacity not only to dislocate and transform



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existing conventions, but also to transcend its moment in history.

This argument leads to the hypothesis that what we know to be "good" architecture has little to do with necessity, esthetics, or function. Rather, it can be argued that "good" architecture has always subverted the very relationships between esthetics, function, and meaning. Despite Modernists' claims that theirs was the first architecture of a zeitgeist, architecture has always been informed by a relationship to a zeitgeist.

What characterizes the Rome of Sixtus V, Haussmann's Paris, or the work of Le Corbusier, whether mirroring or transforming, is that their plans derived from a singular body politic, an operating and animating principle where a unitary worldview was possible. Now, ironically, at a time when the entire world can be seen as part of a single operating network, such a singular worldview is no longer possible. There is no one body politic and, thus, no single zeitgeist.

Today, the world can be explained not by a single zeitgeist, but by two divisions. The

first division is a traditional one based on land, industry, and people. Examples are countries that date back to the pre-20th-century political entities that preceded modern states. They are places such as Serbia and Slovakia and all the newly formed nations that are now politically independent precisely because they share characteristics—land, language, or tribe—that bring them together.

The other division is based on information, which links technologically and culturally sophisticated world centers such as Singapore, Berlin, Seoul, Tokyo, and New York. A Berliner today probably has more in common with a New Yorker than with a resident of another German city, so similar are Berlin and New York as cultural and information centers. When physical proximity is no longer a part of the zeitgeist of a place, the traditional notions of city and architecture are thrown into question. Today's computerized global network transcends the traditional symbols and organizational frameworks of the political structures of the last 200 years. What must be understood is that these two

divisions are not of a dual nature, but rather a double nature.

This double zeitgeist, wherein the two animating principles are folded together, is unique to our times. This distinction is important, since these two divisions seem to be mutually exclusive, because an architecture of information represents an enormous conceptual shift from the idea of an architecture of placemaking. The term "dual" implies that both of these forces are internal to the zeitgeist in some oppositional way. The term "double" implies something entirely different, a coexistence or repetition. One can have a dual personality, for example, but one's double is someone else entirely.

This condition creates a new responsibility for the architect, who has yet to understand how to simultaneously symbolize and subvert such a double organizing principle. Thus, it is understandable that certain places are in an architectural crisis.

For example, it is impossible to look at a place like Berlin today as if it were a manifestation of a single zeitgeist, since it neither op-

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HOUSING INNOVATIONS

American architects are designing more flexible living spaces to accommodate society's changing priorities.



ABOVE: A painting by architect Sam Mockbee brightens a playhouse erected between two houses shared by an extended family in Sharon, Mississippi. The project was funded by a grant from the Graham Foundation.

Like the American family, American housing strategies are changing. Today's family realities—single parents, healthier elders, and more urban poor—require architects to redefine how our citizens live, incorporating flexibility and communal areas into new types of affordable housing.

For example, the children who live in urban California housing such as Del Carlo Court and Sunrise Place play in courtyards, where the comings and goings of residents not only ensure their safety, but build a community. In a row of Charleston, South Carolina, duplexes, prefabricated porches inexpensively expand each unit's living space. Even construction methods are changing: A \$15,000 house in rural Alabama built by architecture students is insulated and supported by hay bales.

And for a group of Californians approaching their golden years, shared living made more economic and social sense than maintaining large houses. They opted for a communal retirement complex, tucked into a clearing in the redwoods. Their inventive cohousing prompted us to look for other inspired solutions to housing the elderly. Finding none, we invited a group of architects to design them. The result is not the cute, sentimental housing that forces senior citizens into isolation, but visionary schemes that challenge our assumptions of who the elderly really are.

Shepard Bryant House
Masons Bend, Alabama
Remote Rural Studio,
Auburn University

RURAL EDUCATION



"The social development of the architect is at the heart of our program," explains professor Samuel Mockbee of the Remote Rural Studio, held every year as part of Auburn University's architecture curriculum. For three months, second- through fifth-year students abandon the Auburn campus and move to the heart of Alabama's impoverished Black Belt, where they live a cooperative life and learn about architecture through action.

"We are bringing students face to face with the rural South. It is hands-on, real-world work with clients," Mockbee asserts. While the curriculum includes Beaux-Arts rendering techniques and historic preservation, the quarterly studio concentrates on low-income housing for the rural poor. For an elderly couple rearing three grandchildren, students interviewed the clients, prepared a program, and designed and built a new, 850-square-foot house in Masons Bend.

CLIENT: Community Service Programs of West Alabama, a nonprofit agency focused on housing programs, helped identify the clients, Shepard and Alberta Bryant and their three grandchildren: 11-year-old Richard; Jasmine, age 10; and baby Carlissia, age 2. An abundant garden beside the Bryants' house is a source of fresh produce. The house itself, however, was beyond repair.

SITE: Masons Bend does not appear on any road map. A community of tidy houses beside abandoned trailers down a dusty road, it lies at a bend of the Black Warrior River.

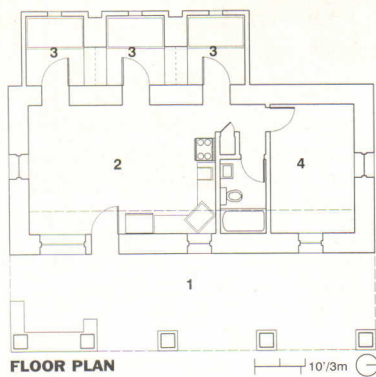
PROGRAM: The family required as much space as the student designers could wrest from a small budget. Prerequisites included a separate bedroom for the couple; three individual sleeping niches for the children, with desks for schoolwork; a private bathroom; and a large open living area with kitchen. A front porch for sitting and visiting was a primary request. Shepard Bryant also asked for a smokehouse for cooking outdoors.

FACING PAGE, TOP: Stuccoed exterior walls of rural farmhouse mask 80-pound hay-bale core construction, designed and built by students.

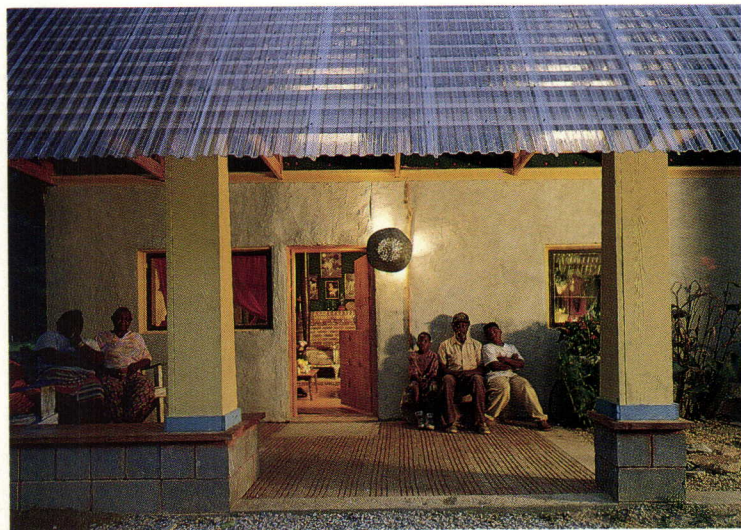
FACING PAGE, BOTTOM: Rolled roofing covers barrel-like sleeping niches on west elevation. Galvanized metal roof and chimney echo local buildings.

BELOW: Students designed translucent acrylic panels to shield east-facing porch from harsh Alabama sun.





- 1 FRONT PORCH
- 2 LIVING ROOM
- 3 SLEEPING NICHE
- 4 MASTER BEDROOM



DESIGN CONCEPT: For nine months, students examined several low-tech solutions, such as rammed-earth housing, before arriving at 80-pound hay bales as the substructure for exterior walls. Two feet thick and covered with wire and stucco, they provide R-40 insulation to lower exterior walls; blown insulation fills higher frame construction. The students organized the house around a large living space containing a wood-burning stove. Grandparents enjoy privacy down a short corridor; children's sleeping areas open directly onto the living space. The design process was interactive: Eleven students in the fall quarter each produced designs that were then reviewed by the clients. Following a three-day charette, a single scheme emerged that was constructed by subsequent classes.

SUCCESSSES: A forceful design tailored to its clients, the Bryant house succeeds in bringing architecture to a group too-often ignored by the profession. From its steeply pitched, galvanized gable roof to its silolike sleeping bays, this is a rural Alabama house true to its place. The project's greatest success may be for the students who programmed, designed, and built the house. Donated labor kept construction costs at a low \$15,000, paid for by a grant from the Alabama Power Company.

FAILURES: While this single building solved the problems for one family, the application of its custom design as housing for other families in the area is limited. Currently, it is difficult for the very poor to qualify for low-income, subsidized houses. Lois Fields, coordinator of the Community Service Programs, reports that so far, no one has approached her agency for similar help.

CLIENT REACTION: The new house was an unexpected gift, although its unorthodox hay-bale-based construction provoked Shepard Bryant's concern. "I thought if the cows got loose, I won't have a house," he admits. However, not only has the project brought shelter, but the company of the students who spent a year working with the Bryants at their isolated site.—Robert A. Ivy, Jr.

FACING PAGE, PLAN: Grandchildren's sleeping areas open onto central living space, which includes kitchen.

FACING PAGE, TOP: Gabled porch shelters brick-paved sitting area. Concrete bench is highway remnant; light fixture is a reclaimed poultry feeder.

FACING PAGE, BOTTOM: View of main living space, with wood-burning stove, reveals grandchildren's sleeping niches.

BELOW: Bottles inset in concrete shard walls illuminate smokehouse. Under-side of roof exposes recycled signs.

**SHEPARD BRYANT HOUSE
MASONS BEND, ALABAMA**

ARCHITECT: Remote Rural Studio, Auburn University, Auburn, Alabama—Samuel Mockbee (professor); Joseph Alcock, Janelle Bell, Josh Cooper, Mark Cooper, Alison Easterwood, Steven Hall, Steven Hand, Melanie Howell, David Hughes, William Jernigan, Kimeran Kelly, Jonathan Kemp, Tae Kim, Thomas E. Lockhart, Josh Mason, David Meier,

William Murner, John Nitz, Gustavus Orum, Thomas Parham, Raymon Rutledge, Nick Sfakianos, Christopher Smith, Scott Stafford, Iain Stewart, Ashley Sullivan, Clint Tomasino, Thomas Tretheway, Kelley Van Eaton, Tim Vault, Ruard Veltman, and Oreon Williams (design/build team)

COST: \$15,000

PHOTOGRAPHER: Timothy Hursley



Race Street Row Houses
Charleston, South Carolina

ROW HOUSE REDUX

Sunrise Place
Escondido, California
Davids Killory, Architect

COURTYARD FIESTA



FACING PAGE: A 20-foot-wide courtyard forms the social center of Sunrise Place.

TOP RIGHT: Parking for 12 cars under a vine-covered pergola buffers apartments from street.

SITE PLAN: Davids Killory drew upon the tradition of Southern California bungalow courts for the design of Sunrise Place, which is adjacent to a church, a school, market-rate apartments, and senior citizen's housing.



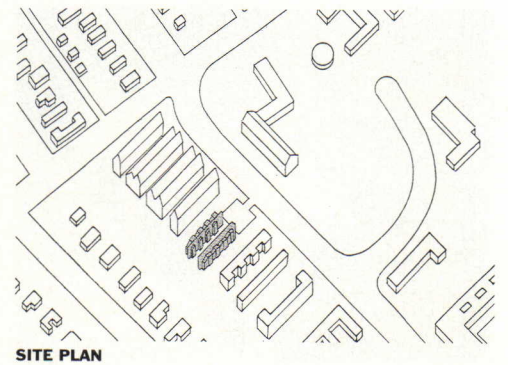
Sunrise Place, designed by young San Diego architects René Davids and Christine Killory, presents an imaginative response to one of the most common housing challenges in Southern California: the small apartment complex on a deep, narrow lot. From turn-of-the-century bungalow courts to 1920s courtyard apartments and stripped-down “dingbats” of the 1950s and '60s, local designers have sought solutions that balance privacy and communality on tight sites.

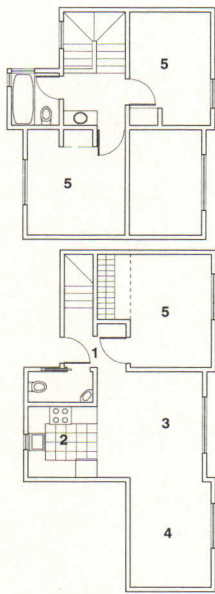
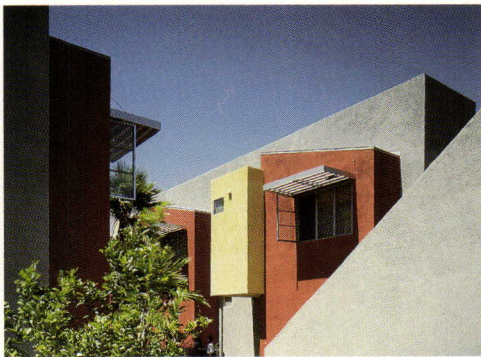
Sunrise Place, in the small city of Escondido 40 miles north of San Diego, houses low-income, mostly Latino families. Commissioned by the nonprofit North County Housing Foundation and completed last year, it was financed by public and private sources, including the city's Community Development Commission, the State of California's Department of Housing and Community Development, Bank of America, Citibank, and the California Equity Fund.

CLIENT: The North County Housing Foundation, founded in 1987, is a community-based developer specializing in low-income rental housing for north San Diego County. Executive Director Amy Rowland believes that small, multifamily housing sensitive to neighborhood character and community is “the wave of the future” in the increasingly built-up landscape of Southern California.

SITE: Sixty-five feet wide and 220 feet deep, the site is located in a district developed in the 1980s that is close to an industrial area. It is flanked by market-rate apartments and a senior citizen's complex; a school and a church are situated across the way.

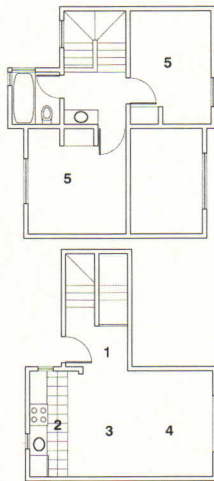
PROGRAM: Sunrise Place comprises eight two-story apartments—four two-bedroom units and four three-bedroom units—arranged in a pair of parallel buildings that enclose a 20-foot-wide courtyard. Rents start at \$275 a month for families whose fixed incomes fall between a qualifying spectrum set by local,





THREE-BEDROOM UNIT

- 1 ENTRY
- 2 KITCHEN
- 3 DINING ROOM



TWO-BEDROOM UNIT

- 4 LIVING ROOM
- 5 BEDROOM

10'/3m

state, and federal agencies. Parking for 12 cars is situated under a steel pergola on the front of the site. At the rear, a children's play area and vegetable garden surround a free-standing structure containing a tiny outdoor theater set over a laundromat.

DESIGN CONCEPT: At a cost of \$120,000 per unit, Sunrise Place employs such design strategies as entry porches for each apartment and small back patios that define the transitions between private and public spaces. All apartments incorporate double-height living rooms to overcome the boxiness of the units. The heart of each apartment is the 65-square-foot kitchen, adjacent to the open-plan living/dining room and overlooking the courtyard so that mothers can keep an eye on their kids. Flexible unit plans provide space for an extra bedroom, small office, or larger living area; and clerestories above the sloping rooflines generate air currents that cool the apartments.

SUCCESSSES: Since room to maneuver was limited, Davids Killory wisely worked within the site restrictions rather than attempting anything too clever. Through configuration of the units, balancing private and public necessities, and sculpted volumes and vivid colors, the architects have created a model for small suburban housing complexes.

FAILURES: Killory admits that she didn't grasp the importance of the oversized TV set in Latino family life and so failed to provide an alcove to accommodate it.

CLIENT REACTION: Amy Rowland, executive director of the housing foundation, feels that the distinctive design of Sunrise Place encourages a sense of identity among tenants. "They are proud to tell friends and neighbors they live in the place with the bold colors," she reports. Despite the 24-unit-per-acre density and the average family size of five members, Rowland notes there is little feeling of being overcrowded. "Sunrise Place will be typical of most of our future projects," she maintains. Report several tenants, "We live like one big family here."—*Leon Whiteson*

TOP LEFT: Mayan-style theater-cum-laundromat terminates courtyard.

CENTER LEFT: Apartment windows are shaded by steel awnings; yellow volume contains bedrooms.

PLANS: Two- and three-bedroom apartments reveal maximum flexibility in minimal space. Living rooms can double as extra bedrooms.

FACING PAGE: Courtyard exudes the intimate social ambiance of a Mexican *placita* or small village square.



**SUNRISE PLACE
ESCONDIDO, CALIFORNIA**

ARCHITECT: Davids Killory, San Diego, California—René Davids and Christine Killory (principals-in-charge)

ASSOCIATE ARCHITECT: Studio E Architects, San Diego, California—Bradley A. Birke (principal)

LANDSCAPE ARCHITECT: Leslie Ryan

ENGINEERS: VTN Southwest (civil); ICG (soils); Design Southwest (mechanical/plumbing)

CONSULTANT: David G. Pettigrew (construction manager)

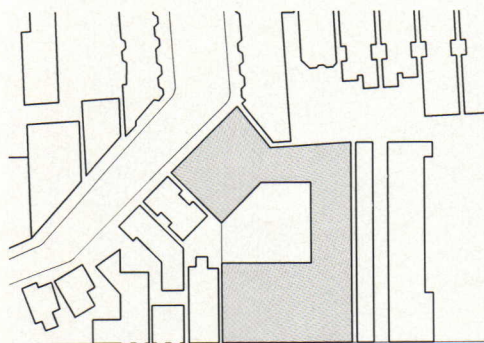
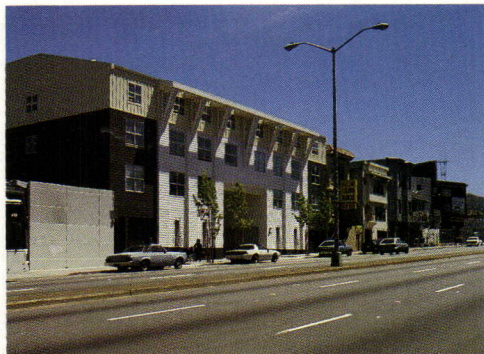
GENERAL CONTRACTOR: Hidden Valley Construction

COST: \$465,116

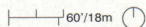
PHOTOGRAPHERS: David Hewitt/
Anne Garrison



MISSION POSSIBLE



SITE PLAN



Completed in 1992, Del Carlo Court in San Francisco's Mission District epitomizes how thoughtfully designed, low-income housing can preserve the character of neighborhoods and strengthen communities. The housing grew out of a grass-roots effort in the Mission to stop high-rise development, which would have obliterated the Latino stronghold's tightly woven fabric of crowded Victorians. Savvy community organizers, led by Mission resident Joseph Del Carlo, gathered at Kerry's Restaurant on Army Street, plotting their strategy against the soulless towers of urban "renewal." What they produced was a sophisticated array of programs designed to serve the Mission's low-income population, including the Mission Housing Development Corporation, which ultimately built Del Carlo Court on the restaurant's site. Carefully planned and detailed by Solomon Architecture, the complex is a bright spot in the Mission District and appropriately named to honor the late Del Carlo.

CLIENT: Mission Housing Development Corporation provides affordable housing in the Mission District by rehabbing existing property and interweaving new units. To qualify for Mission Housing's rental units, tenants must have incomes ranging between 35 percent and 60 percent of the local median income. Del Carlo Court, the agency's newest rental property, builds upon lessons from

older projects, whose residents sought improved shared spaces. The development corporation, which has built 10 new affordable housing complexes in the Mission since it was founded in 1971, encourages residents to assess successes and failures.

SITE: An irregular, 0.39-acre parcel, the site is bordered on the south by Army Street, a major thoroughfare, and on the northwest by Capp Street, a diagonal passage. Rear yards of Victorian houses abut the complex, except at the east, where low commercial buildings dominate. This location is one of only a few places in San Francisco where the dominant orthogonal grid is interrupted for natural features. Anomalous lots such as this one would have been largely wiped away by traditional public housing, which straightened out irregularities in favor of more economical grids.

PROGRAM: Del Carlo Court comprises 25 one-, two-, three-, and four-bedroom walk-up rental apartments within three buildings that embrace a courtyard. Designed to accommodate low-income families, the flats and duplexes range in size from 603 to 1,426 square feet. The complex incorporates parking for 25 cars, a laundry room to meet the needs of up to 75 residents, and a community room for public meetings and family celebrations. The client requested a complex that would maximize informal contact among residents, creating a sense of community in a neighborhood known for drug traffic and crime. Solomon's response was to group the units around a courtyard that all residents must traverse as



FACING PAGE, TOP: South-facing block fits into Mission District scale.

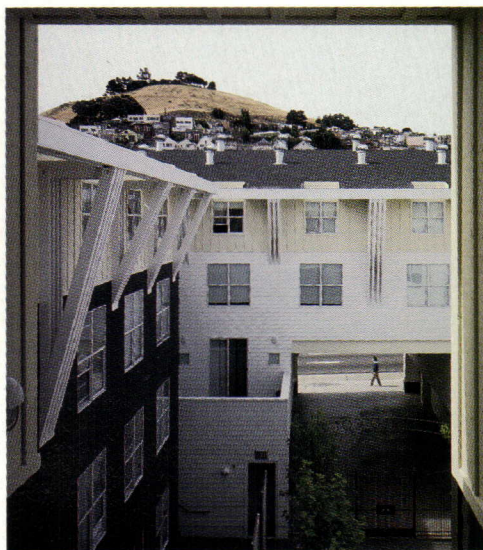
FACING PAGE, CENTER: Northwest entrance reveals integration of Del Carlo Court with existing Victorians.

SITE PLAN: Three buildings of Del Carlo Court break the orthogonal grid typical of San Francisco.

FACING PAGE, BOTTOM: South facade is topped by overscaled cornice and incorporates garages.

BELOW: Army Street gateway opens to courtyard of complex.





they enter and leave, facilitating chance meetings. Within the units, the clients requested that the design include ample storage space—usually a premium in affordable housing—to accommodate bulk purchases.

DESIGN CONCEPT: Dan Solomon designed four-story Del Carlo Court as an integral part of the Mission District, with a density that increases the Mission's affordable housing. Solomon grouped the different combinations of units of varying sizes in three buildings around a court, through which all residents must pass on their way to and from their units. Two large, two-story openings to the courtyard function as both pedestrian entrances and driveways serving perpendicular garages, which hide cars from view.

Solomon took advantage of the site's change in grade within the courtyard, where a monumental stair to the Capp Street entrance creates an outdoor stage. All living quarters have walk-up access from the courtyard, eliminating the need for expensive elevators. Two handicapped-accessible units are located at the courtyard level. Defying the double-loaded corridors associated with most public housing, units within the easternmost volume address a single-loaded, 76-foot-long corridor with windows that face the community and admit daylight.

SUCCESSSES: In its sensitivity to site and context, Del Carlo Court is in every way the precise opposite of Bernal Dwellings, a nearby public housing project designed in 1954. At Del Carlo, overscaled bracketing along the

roof achieves the detailing of neighboring Victorians, without the expense of intricate millwork. The courtyard fosters community interaction and security, and the two portals function as symbolic front porches. The complex discreetly and comfortably supports a more dense population than its surrounding buildings, without disrupting their row-house rhythm and scale. Large windows bring daylight into units and corridors.

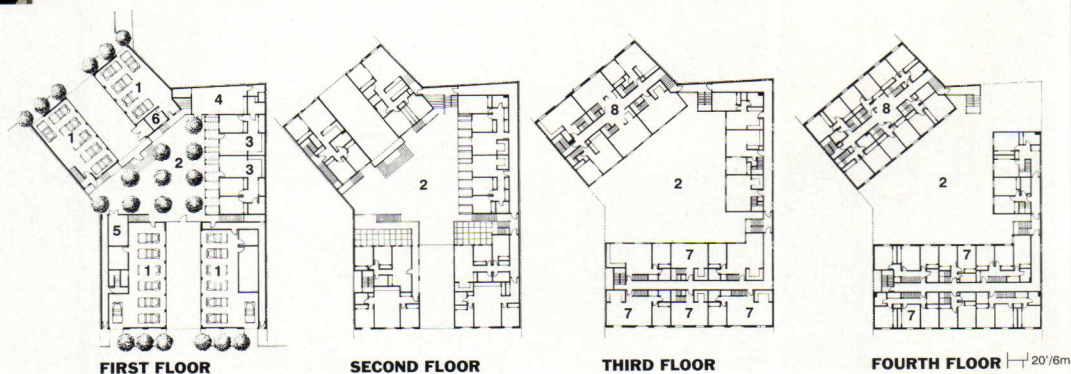
FAILURES: Solomon and his team failed to recognize problems presented by high-heeled shoes on walkways and stairs composed of 2-by-4s. This summer, this decking detail was to be corrected with plywood sheathing.

CLIENT REACTION: In the two years of Del Carlo Court's occupation, only two of the 25 families in the community have left—one graduated to home ownership; the other left for financial reasons.

Margarita Peñate, who lives and works in the building as its resident manager, explains, "This building isn't a box with everyone on top of one another, or next to each other. Here, we get to know everybody who lives here, yet we feel we are at home. This is the building I like."

Mission Housing Development Corporation's Executive Director Daniel Hernandez offers similar praise. "I think the scheme by Dan Solomon and his team was a real turning point for Mission Housing. It shows how architecture can help people communicate toward meeting larger goals—safety, comfort, and a sense of belonging."—*Heidi Landecker*

- 1 PARKING
- 2 COURTYARD
- 3 ACCESSIBLE UNIT
- 4 COMMUNITY ROOM
- 5 LAUNDRY
- 6 OFFICE
- 7 FOUR-BEDROOM UNIT
- 8 TWO- AND THREE-BEDROOM UNITS



FACING PAGE, TOP: Upper units offer dramatic views of hilly Bernal Heights.

FACING PAGE, BOTTOM: Courtyard encourages neighbor interactions and offers a sense of security.

BELOW: Several units are designed with outdoor terraces. Monumental stair to Capp Street entrance doubles as a stage for outdoor gatherings.

**DEL CARLO COURT
SAN FRANCISCO, CALIFORNIA**

ARCHITECT: Solomon Architecture and Urban Design, San Francisco—Daniel Solomon and Susan Haviland (principals-in-charge); Elizabeth Hooper (project architect); Philip C. Rossington (project team)

LANDSCAPE ARCHITECT: Gary L. Strang
ENGINEERS: Peter Cully & Associates (structural); Pete O. Lapid & Associates (mechanical/electrical/plumbing);

Harding Lawson Associates (geotechnical); KCA Engineering (civil)

GENERAL CONTRACTOR: Nibbi/Lowe Construction

COST: \$3.5 million

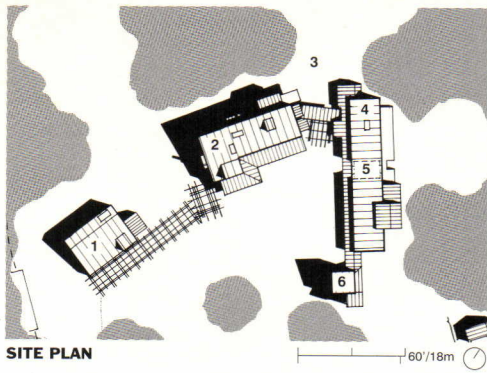
PHOTOGRAPHER: Christopher Irion



Retirement Cohousing
Mendocino County, California
Fernau & Hartman Architects

COMMON GROUND



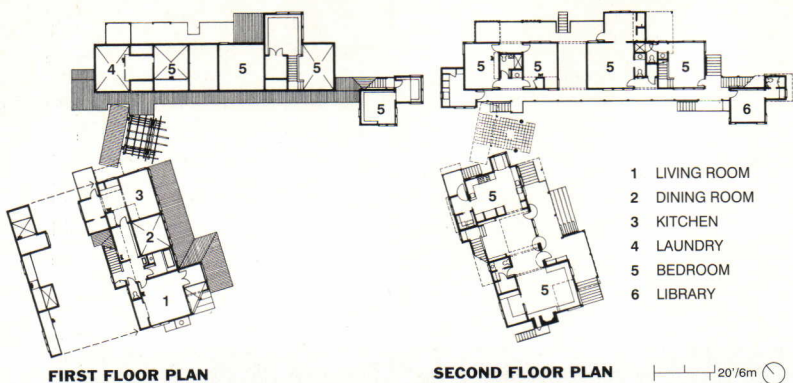


- 1 WORKSHOP
- 2 LODGE
- 3 PARKING
- 4 LAUNDRY
- 5 BEDROOM WING
- 6 LIBRARY

THESE PAGES: Fernau & Hartman-designed cohousing compound in Mendocino County is connected by pergolas and covered porches.

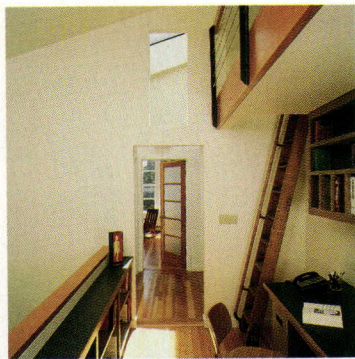
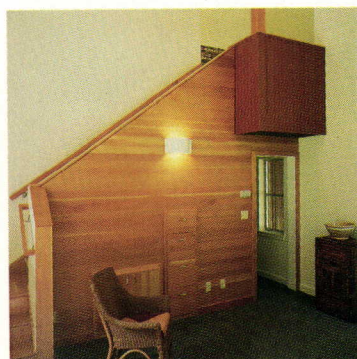
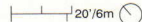
SITE PLAN: Main lodge (left) incorporates shared living/dining room and kitchen, topped by two bedrooms. Library tower (below) accommodates one bedroom at first level topped by a library and reading room.





FIRST FLOOR PLAN

SECOND FLOOR PLAN



Although the partners hope that life in a rural environment will ward off infirmity, the complex is designed to adapt as they age: An elevator can be added to the two-story lodge, porches can be ramped, and 34-inch-wide doorways accommodate wheelchairs.

DESIGN CONCEPT: To achieve a careful balance between independence and togetherness, the architects mixed private and shared spaces: The main lodge, with its communal kitchen and living/dining area, is topped by two private bedrooms; the bedroom wing is flanked by the laundry room at its north end and a library tower at the south. Arranged as a loose compound, the buildings disperse the occupants through the site.

SUCCESES: The tin-roofed buildings exhibit a directness and originality that counter the stereotype of retirement communities. There is nothing sentimental, cute, or even truly vernacular about these dignified buildings, and they have none of the ad hoc, hippie-commune quality that often accompanies cohousing designed by committee.

FAILURES: Private accommodations are small, with add-ons such as lofts and sitting rooms determined on an individual basis. To an outsider, the bedrooms afford a feeling of impermanence that counters the popular notion of retirement. Where will the partners store a lifetime of personal possessions? Cheesecake's limited personal space portends religious-style vows of poverty—or second homes.

CLIENT REACTION: This camplike sparseness apparently troubles no one. Cohouser Jill Myers reports that she relinquished cherished items when she moved to Cheesecake a year ago, but regards that as the trade-off of communal living. Her friend Sophie Otis adds that both private and communal spaces provide exactly what the clients wanted. In the main living room, for example, people congregate along a built-in bench beside the fireplace, near where others play bridge, read, and watch TV. "People can be doing their own thing, and yet be in proximity," reports Otis. That was the whole idea.—Heidi Landecker

PLANS: Compound is entered under canopy between public (left) and private (top) wings.

FACING PAGE, TOP LEFT: Staircase leads from sitting room to bedroom.

FACING PAGE, TOP RIGHT: Sleeping lofts and desks are tucked into balcony above dining area.

FACING PAGE, BOTTOM: Communal kitchen includes breakfast nook.

BELOW: Living room, warmed by fireplace, accommodates large gatherings with built-in benches along walls.

RETIREMENT COHOUSING
MENDOCINO COUNTY, CALIFORNIA

ARCHITECT: Fernau & Hartman Architects, Berkeley—Richard Fernau and Laura Hartman (principals); David Kau, Tim Gray, Kimberly Moses, Emily Stussi (project team)

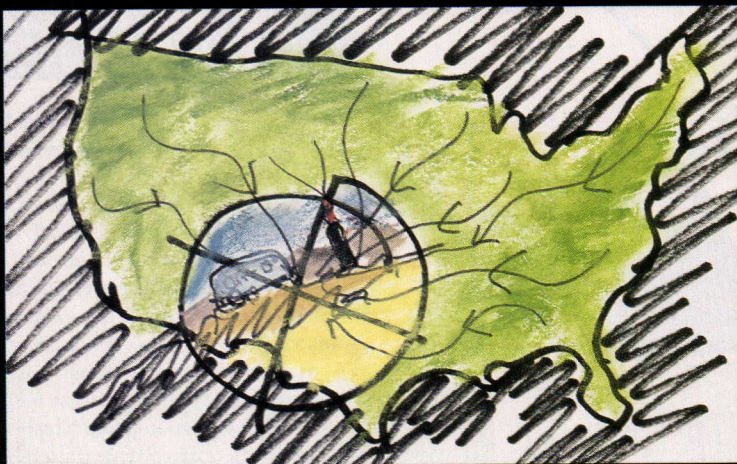
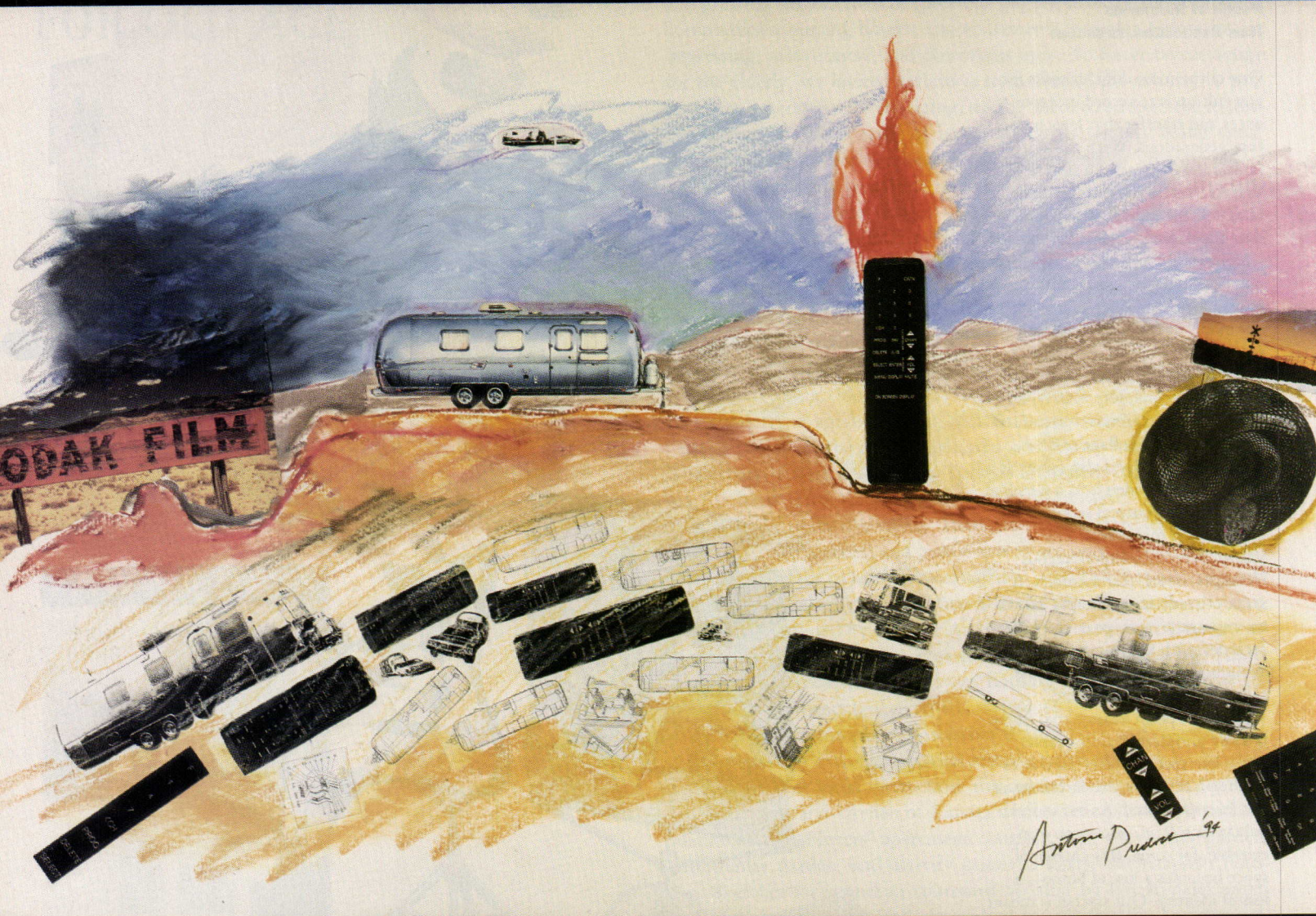
LANDSCAPE ARCHITECT: John Furtado

ENGINEERS: Dennis McCroskey (structural); William Mah (mechanical); Zieger Engineers (electrical)

GENERAL CONTRACTOR: Jim Boudoures

PHOTOGRAPHER: Richard Barnes





Airstream Nomads
Antoine Predock, Architect

The Airstream travel trailer in motion, or at rest, manifests its origins in the aircraft industry. Like a parked airplane, it evokes the American impulse for adventure and the nomadic life. This impulse is played out to the fullest in the elderly community. Gatherings of Airstream owners, particularly in the Southwest, provide a venue for rich social interaction among the elderly on a common, ritualistic ground. The “birds of a feather” migration patterns of this elderly, Airstream subculture—traveling from the North and Midwest to the South and Southwest—track the seasons and the movement of the sun like wildfowl flyways.

At the center of this social web and culture of camaraderie is the object itself—the Airstream—an

iconic example of streamlined postwar design that evokes efficient, nautical space planning. Today, the radical Airstream poignantly plays against a homogeneous array of lookalike travel trailers and RVs. Banding together, its loyal followers, including a high percentage of retirees, seek sun and amenity in their choice of seasonal destination. While the turning radius and maneuverability of the tow vehicle and Airstream ensemble limit site planning options, the electronic hearth of the mandatory cable television hookup ensures both global connections and ritualistic anchorage to the ground.

The television remote control, shaped like an Airstream, also provides mobility—if only in cyberspace. Together, the ubiquitous remote and the legendary Airstream unite the mobile elderly into a tribe.

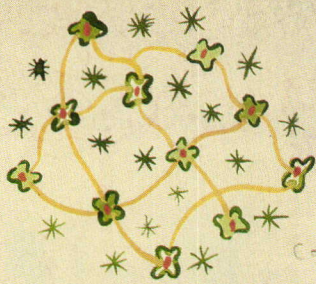
Clustered Living for Seniors
Kanner Architects

Housing for the elderly should be playful, relaxing, and reassuring. Uniform building blocks or repetitive units are neither desirable nor necessary. Our proposal therefore recalls the optimism of Los Angeles in its heyday—the 1950s and '60s.

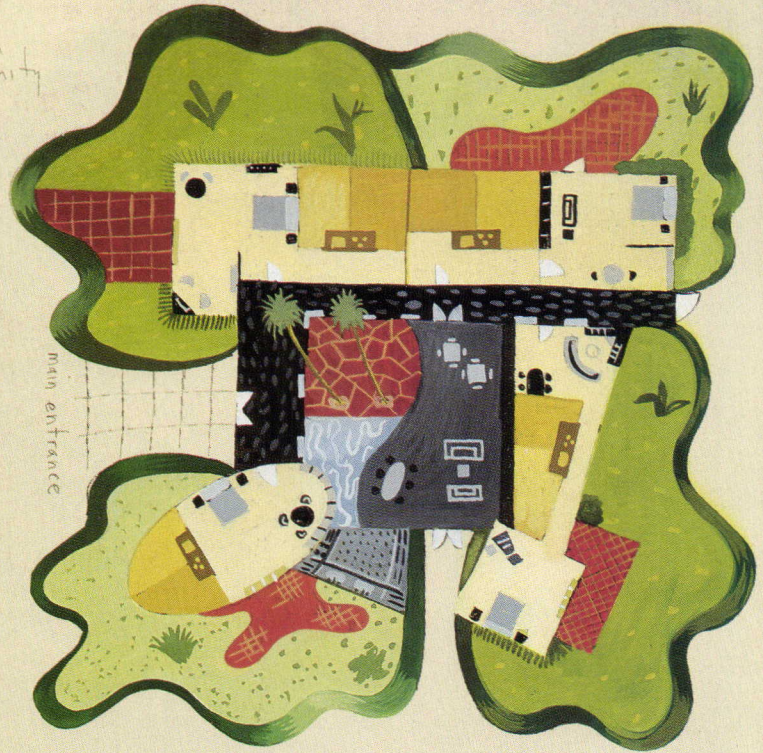
Our project is intended for a rural or suburban setting, with brightly painted, clustered apartments sprinkled in a campuslike setting. Each cluster contains three to five private sleeping areas that share a communal living room, dining room, and kitchen. In plan, this arrangement looks like an irregular doughnut: One-half of the hole defines an outdoor courtyard and pool; the other half contains indoor common areas. The shared living areas allow for a familial interaction among residents. In the kitchen, for example, group meals can be prepared either by a resident or a caterer.

While each apartment encompasses approximately 800 square feet, no two individual residences are the same. Private areas include a compact kitchen for residents to prepare their own meals or entertain privately; an adjoining backyard defined by undulating hedges; and space for a game table, couch, lounge chairs, and TV.

Health facilities, workshops, art and craft studios, music rooms, and sports facilities would be located near the living clusters, establishing shared gathering areas for the entire elderly community.



- Patios
- Bathrooms
- Closets
- Kitchenettes
- Living/Sleeping
- Corridor
- Communal Living
- Communal Kitchen
- Pool
- Private Yards

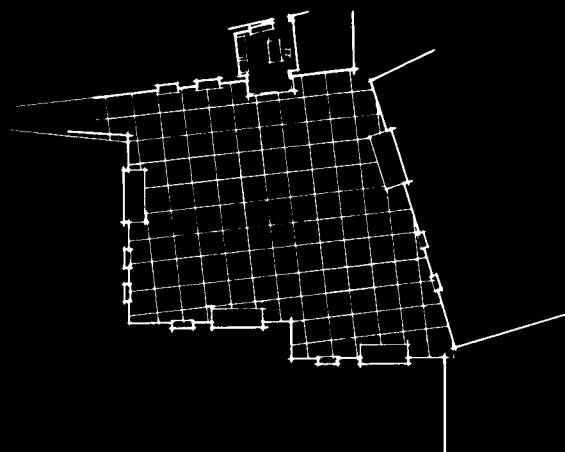


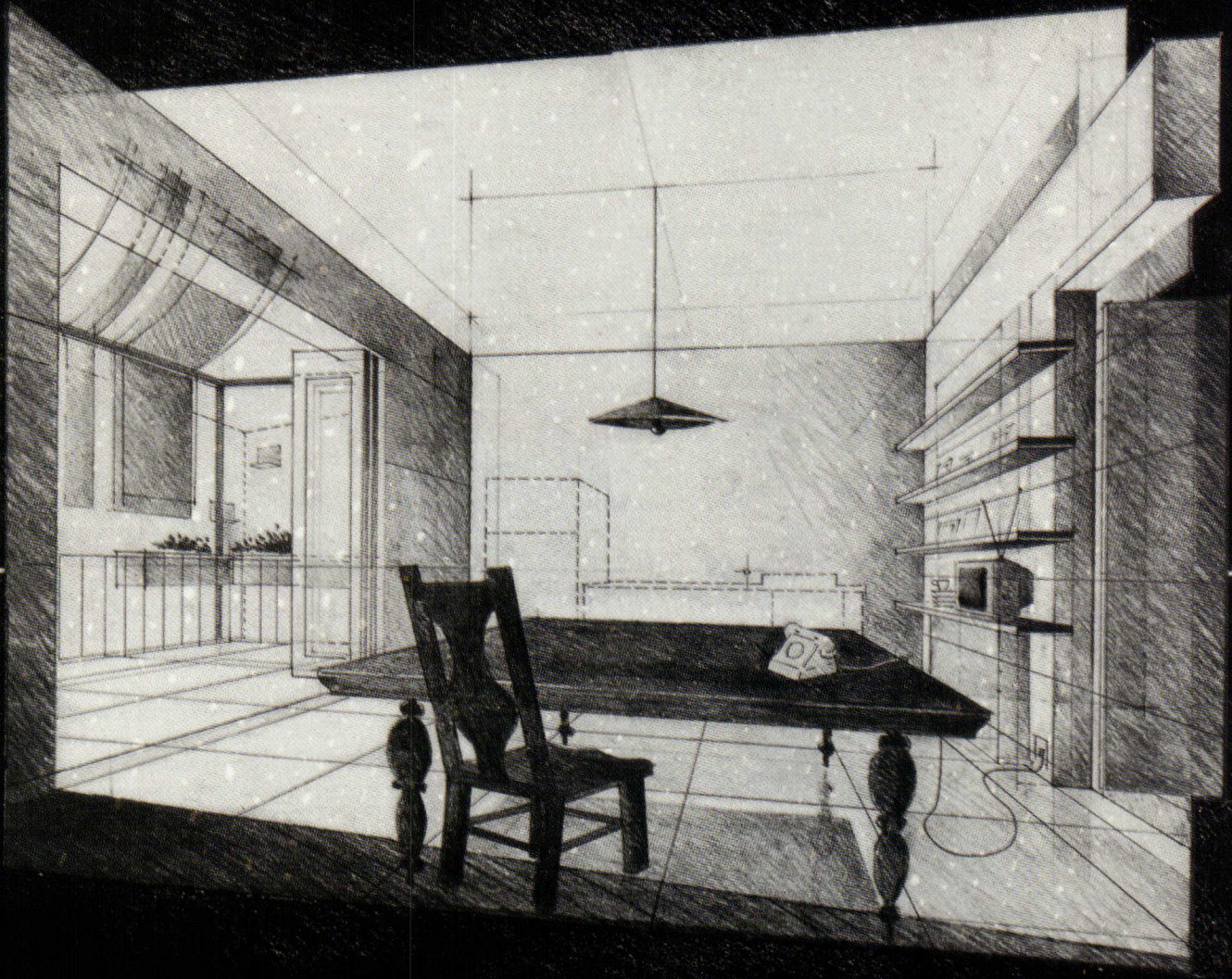


Fedora's Room
Weiss/Manfredi Architects

The elderly are not an abstract category, group, or flock. They are individuals, idiosyncratic and unique. The impersonal character and stylistic limitations of contemporary housing for the elderly inspired our research on the rituals and surroundings of a real person, Fedora Polli, an 85-year-old woman who lives independently in Trieste, Italy.

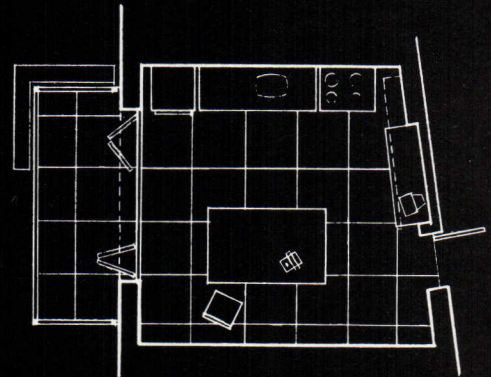
As part of our extended family, Fedora has become our own model for aging. Taken together, the lives of many individuals like Fedora begin to suggest a housing prototype. Fedora's one-room apartment, for example, is an exemplary vision of a place for living—not part of a warehouse for the elderly, but integrated into a socially diverse housing complex. A small balcony spatially extends

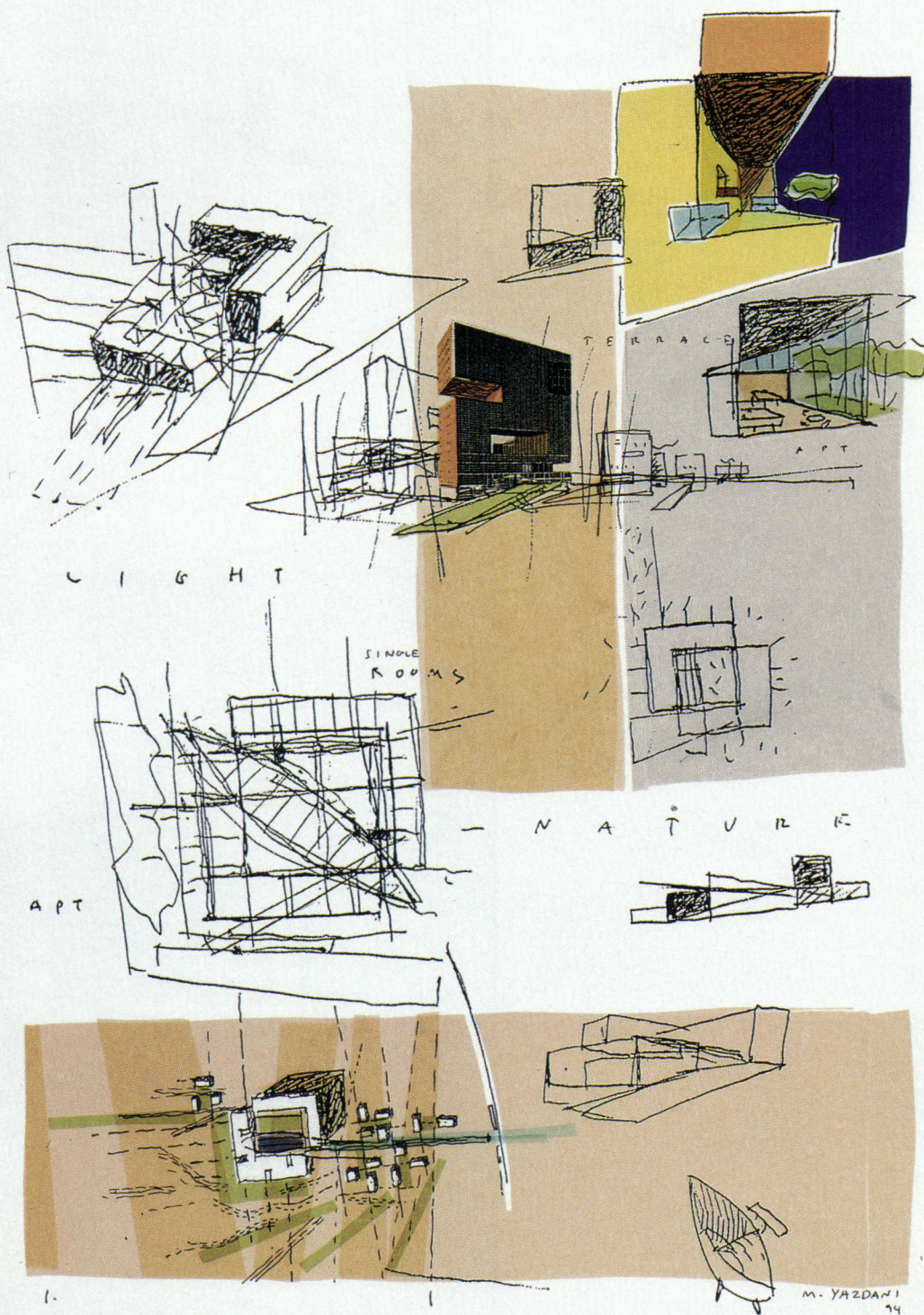




the apartment into an intimate courtyard, where Fedora keeps in constant touch with neighbors of all ages. A broad table at one side of the room doubles as Fedora's dining area and writing desk; shelves opposite the balcony display a television, radio, and mementos of her past.

For us, the essential elements of Fedora's life—the balcony, table, and shelves—remain a critical point of departure toward a visionary architecture for the elderly. To design independent senior housing, a senior center, a retirement community, or an environment for long-term care, an architect's design process must begin with a personal knowledge of how elderly people live.





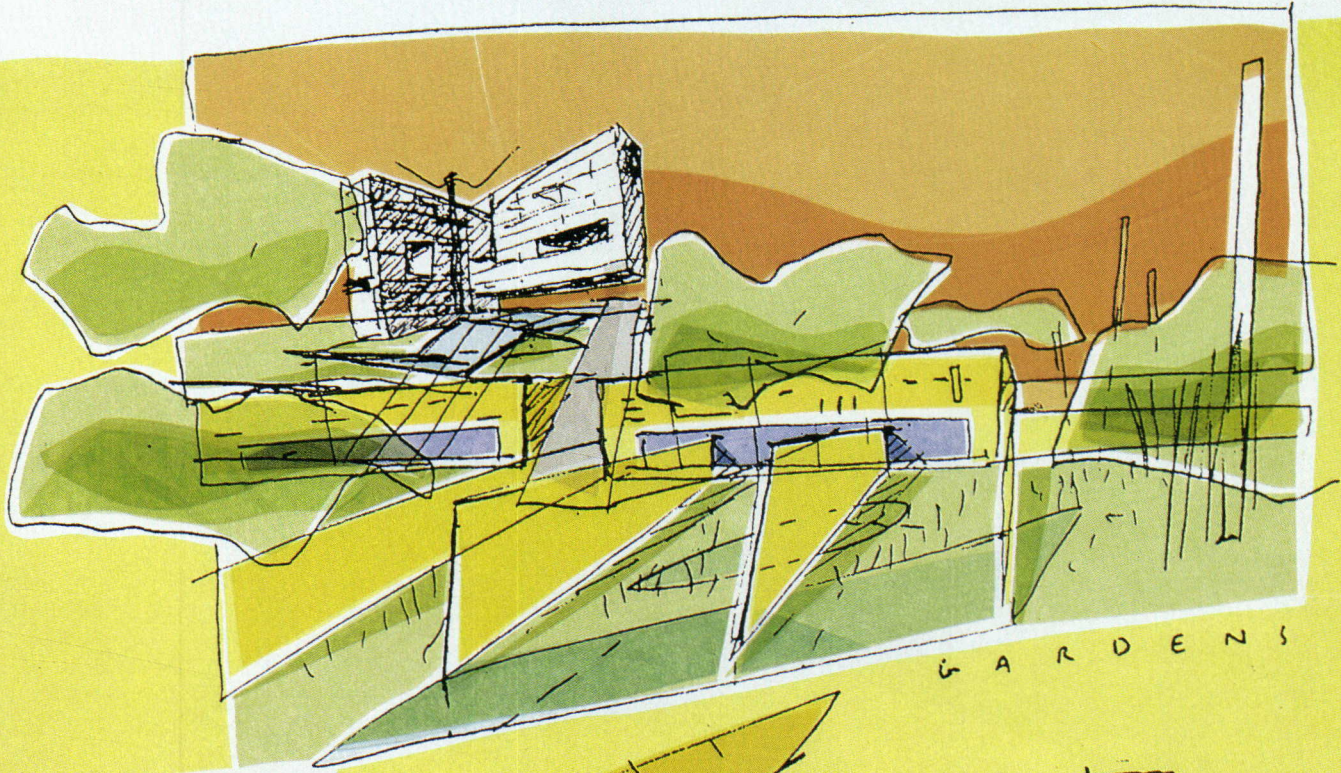
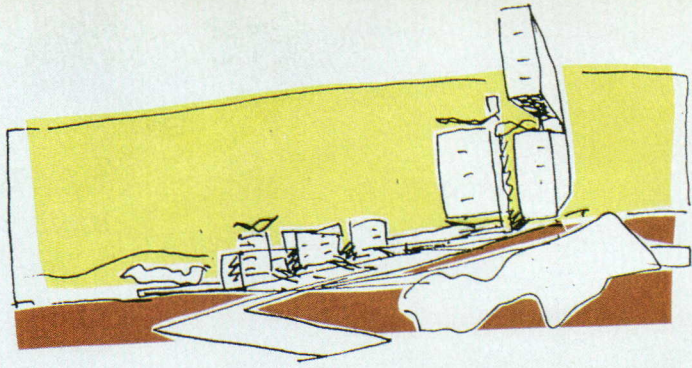
Continuing-Care Community
Mehrdad Yazdani, Architect

This elderly housing model provides a continuum of care for residents by combining apartments, rooms, and cottages for independent living; accessible garden apartments for assisted living; and a dense cluster of single rooms for residents who require skilled nursing care.

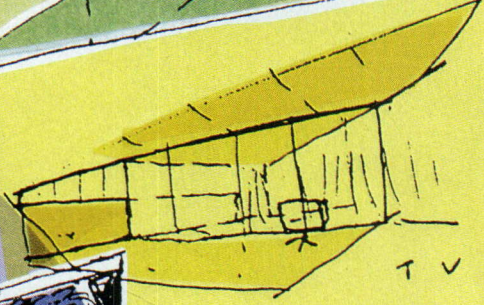
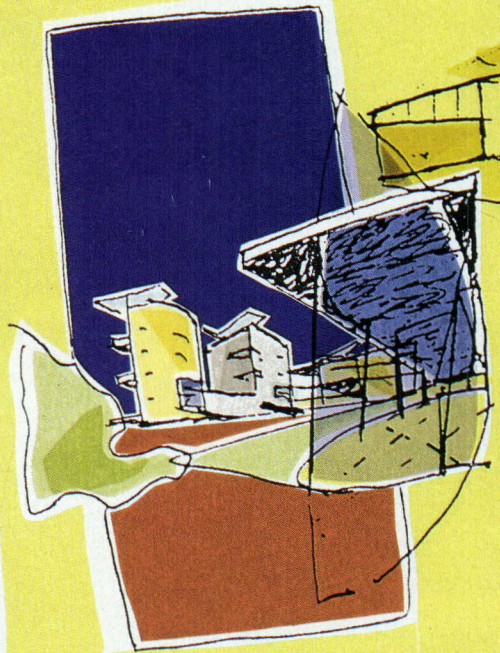
This range of care levels and housing types allows an aging resident to change living units without changing communities. As a result, families and friends who need different levels of care can remain in close proximity. Housing for active retirees is interspersed throughout the complex to encourage new friendships with tenants constrained by limited mobility.

The units are arranged around a central courtyard to maximize each tenant's sense of independence within a larger community. Each apartment has direct access to outdoor terraces and gardens that form a communal backdrop to indoor activities. Outdoor spaces are aimed to stimulate personal expression and social interaction: Individual garden plots are linked by continuous paths and gathering areas.

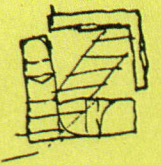
The skilled nursing units are organized in an L-shaped tower, with central nursing care stations and common living areas at the corner of the L, and private rooms flanking single-loaded, daylight corridors in each wing. Elevators connect each floor to dining and recreation rooms. Although terraces adjoining each room overlook the gardens to suggest a continuity of indoors and out, a series of two- to three-story voids in the mass of the building create larger common terraces that may be enclosed by glass in harsh climates.



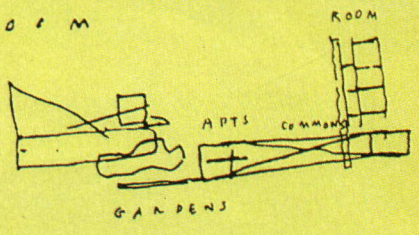
G A R D E N S



T V R O O M



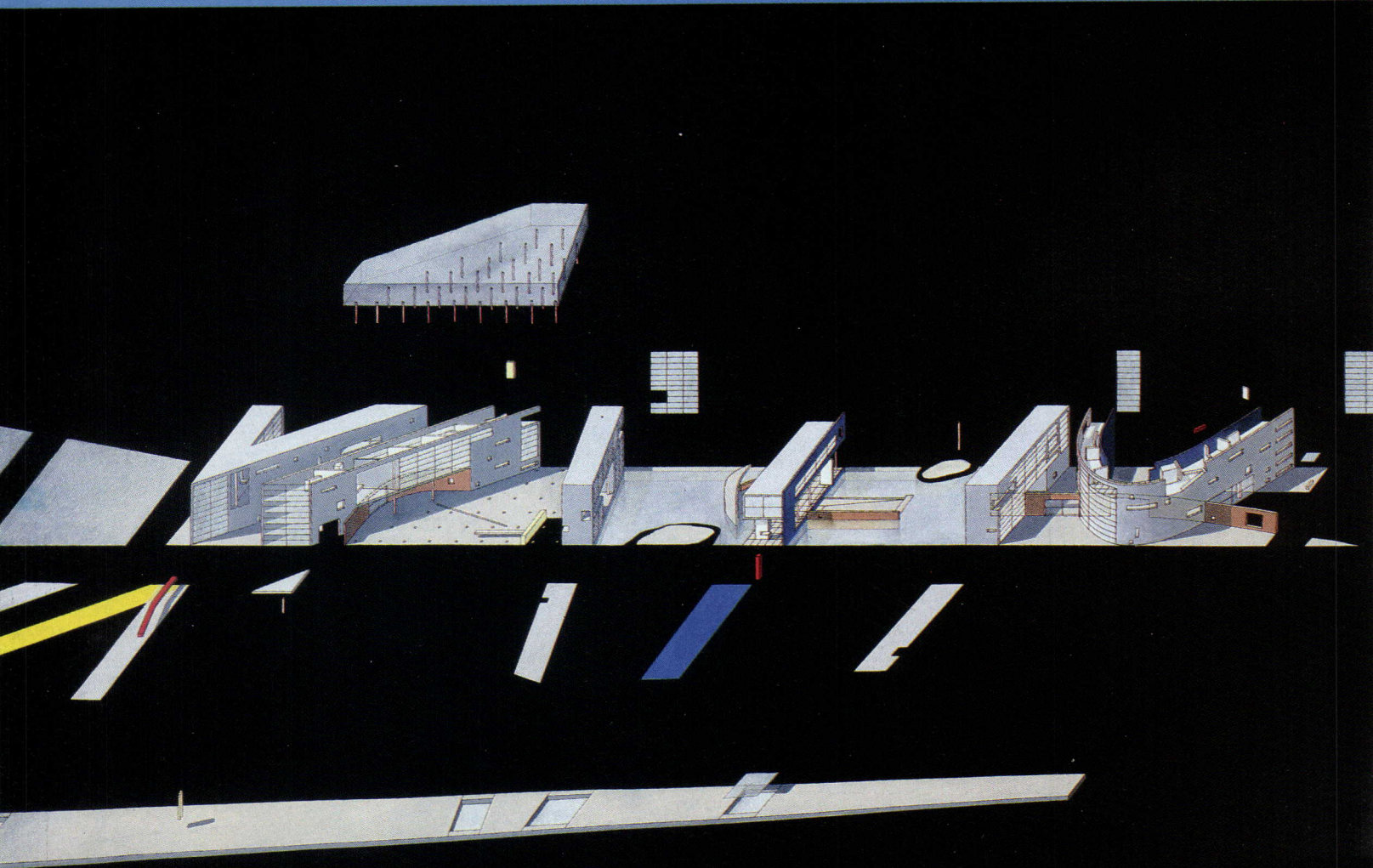
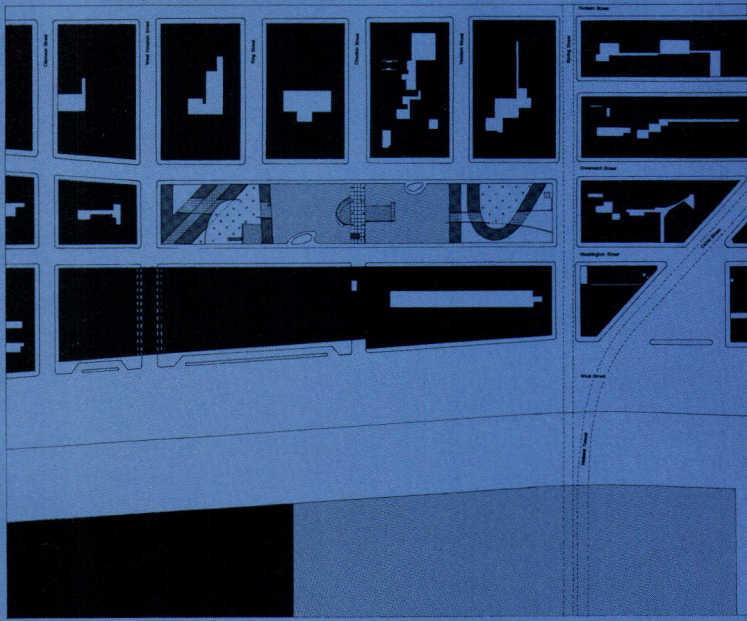
R O O M

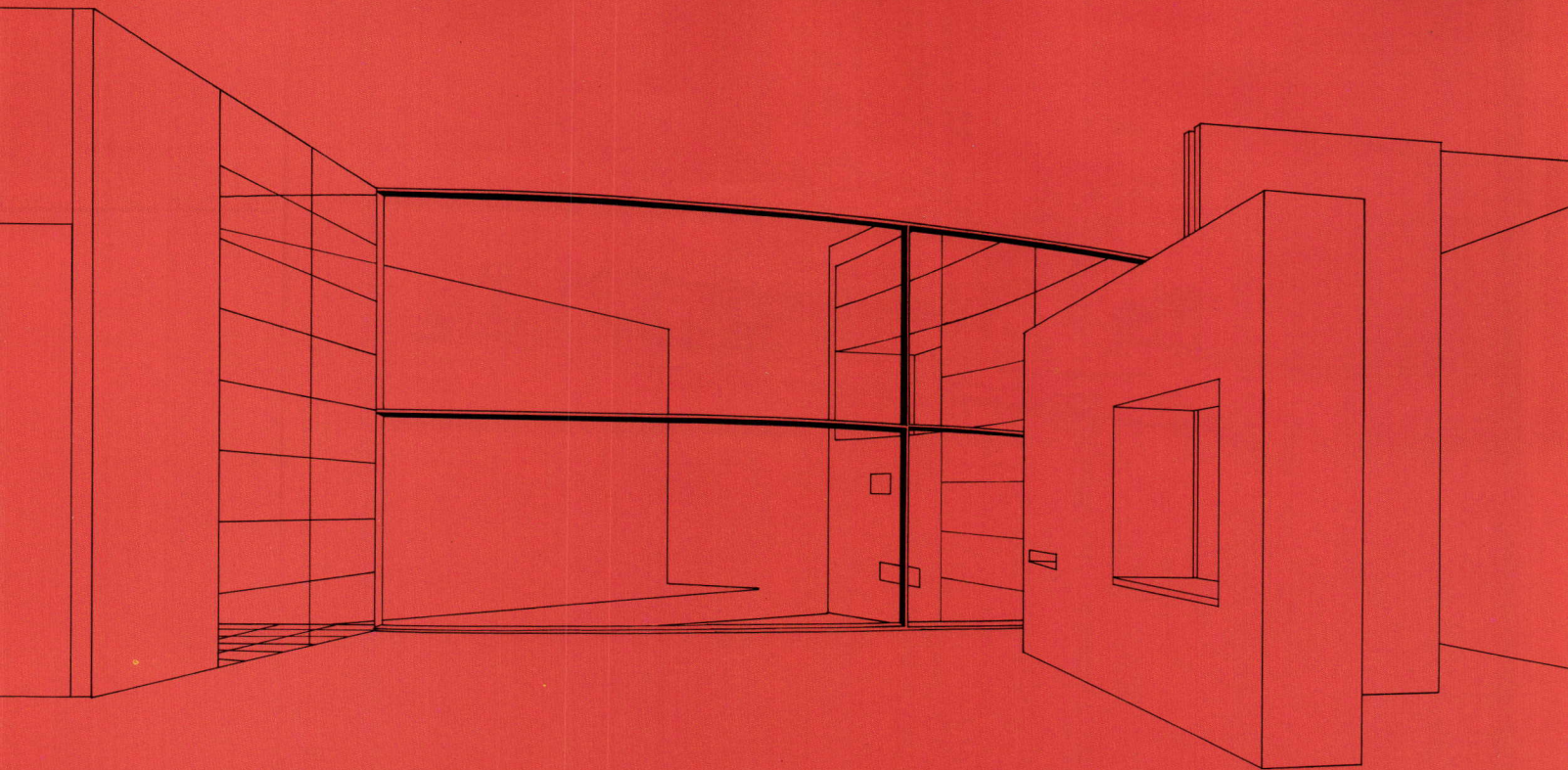


G A R D E N S

C O M M U N A L /
S O C I A L S P A C E

M. YAZDANI 7





**Urban Housing for the Elderly
New York City
Thomas Hanrahan and
Victoria Meyers, Architects**

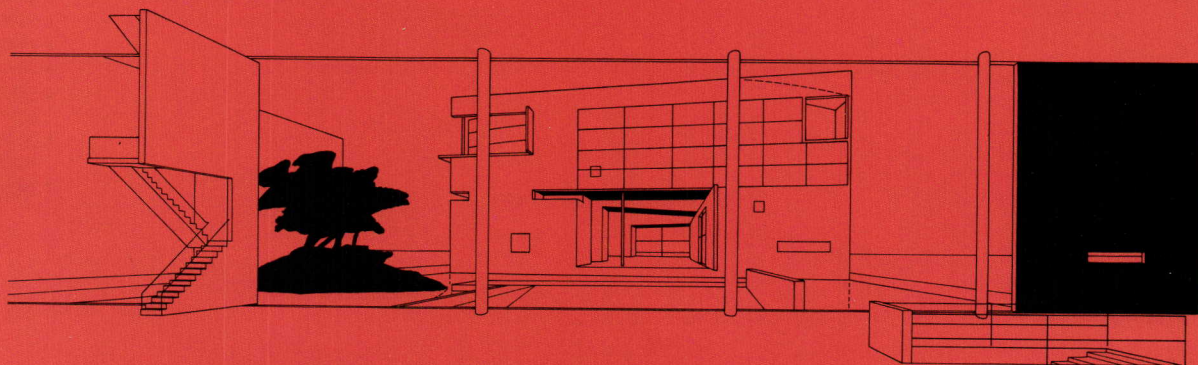
Given the scarcity of retirement housing in dense urban contexts, we chose a block in the SoHo district of lower Manhattan for an urban prototype. Bounded by Spring, Washington, Greenwich, and Clarkson streets, the housing's central location would benefit the elderly who enjoy visiting nearby museums, theaters, and other cultural attractions.

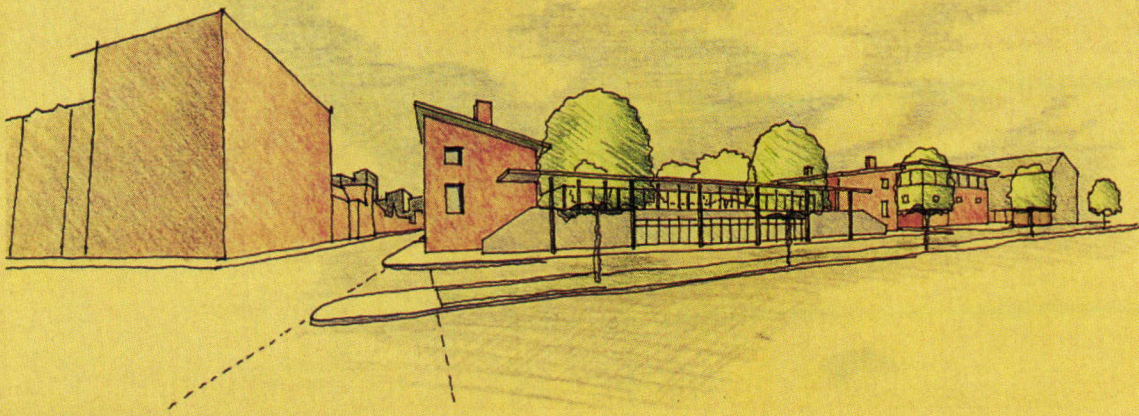
The proposal establishes the sense of an open fabric within SoHo's dense blocks, a place for elderly pedestrians to stroll safely or sit amidst the bustle of Manhattan. The massing of the proposed buildings transforms the existing linear streets into warped and skewed public spaces, allowing free circulation between blocks. Overlapping courtyards are distinguished through different surfaces and natural materials;

a large reflecting pool in the central courtyard creates a serene refuge from the city. Defined by individual buildings, these exterior spaces become microcosms both of nature and the island of Manhattan. Portals through the buildings link the courtyards from north to south. The alternation of built, green, and aquatic spaces creates a bright, open, and colorful spatial procession.

While the affordable housing units are small—only 750 square feet—each apartment opens onto the outdoor public space. Apartments are subdivided by movable wall panels, which allow tenants to determine their own floor plans, or to adjust the scale of individual rooms. A small apartment thus evokes the spaciousness of a loft.

The relationship of the individual apartments to the outdoor public space extends the small scale of the apartments into the public realm, securing a place for the elderly in the heart of downtown.





**Urban Retirement Village
Boston, Massachusetts
Leers, Weinzapfel Associates**

Our urban retirement village combines the welcoming climate, secure environment, and recreational facilities of southern Sun Cities with the “messy vitality” of urban living. Although variations of this project could be integrated into the fabric of most northern cities, our scheme was conceived to revitalize an historic neighborhood in Boston.

The project unites a four-block precinct through the rehabilitation of existing structures and new infill buildings. Glass-enclosed walkways and bridges connect buildings and blocks, creating a climate-controlled, urban hiking trail for the vigorous or a protected route for the frail. Like city streets and squares, open spaces within the urban retirement village establish focal points within the community: These public areas in-

clude a winter garden, community garden, and a public green.

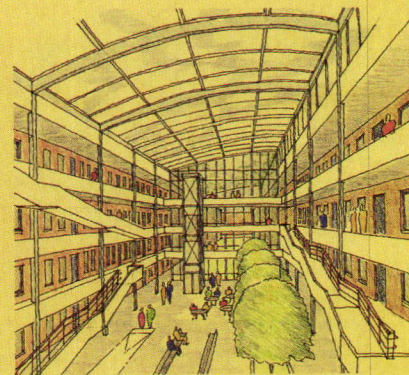
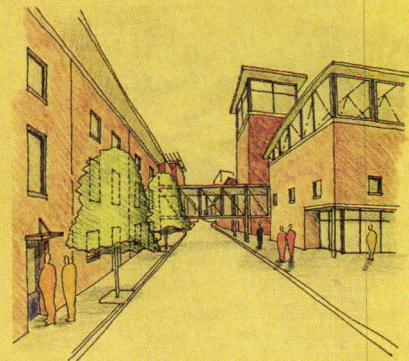
The winter garden replaces a dusty service alley at the center of a nearly complete block of existing row houses. A new, 15-foot-wide, glass-enclosed zone for ramps, elevators, and arcades flanks the rear face of the existing brick row houses, providing easy access to renovated apartments. The ramps in this circulation system provide an exercise route throughout the winter.

New houses and cottages, built on vacant land behind a block of surviving row houses, surround the nearby community garden. This open space is raised on a plinth to provide security for the residents and room for a supermarket at street level. Bridges above the cloister’s alley link the housing to a new comprehensive-care center that includes a clinic, dining hall, and nursing station.

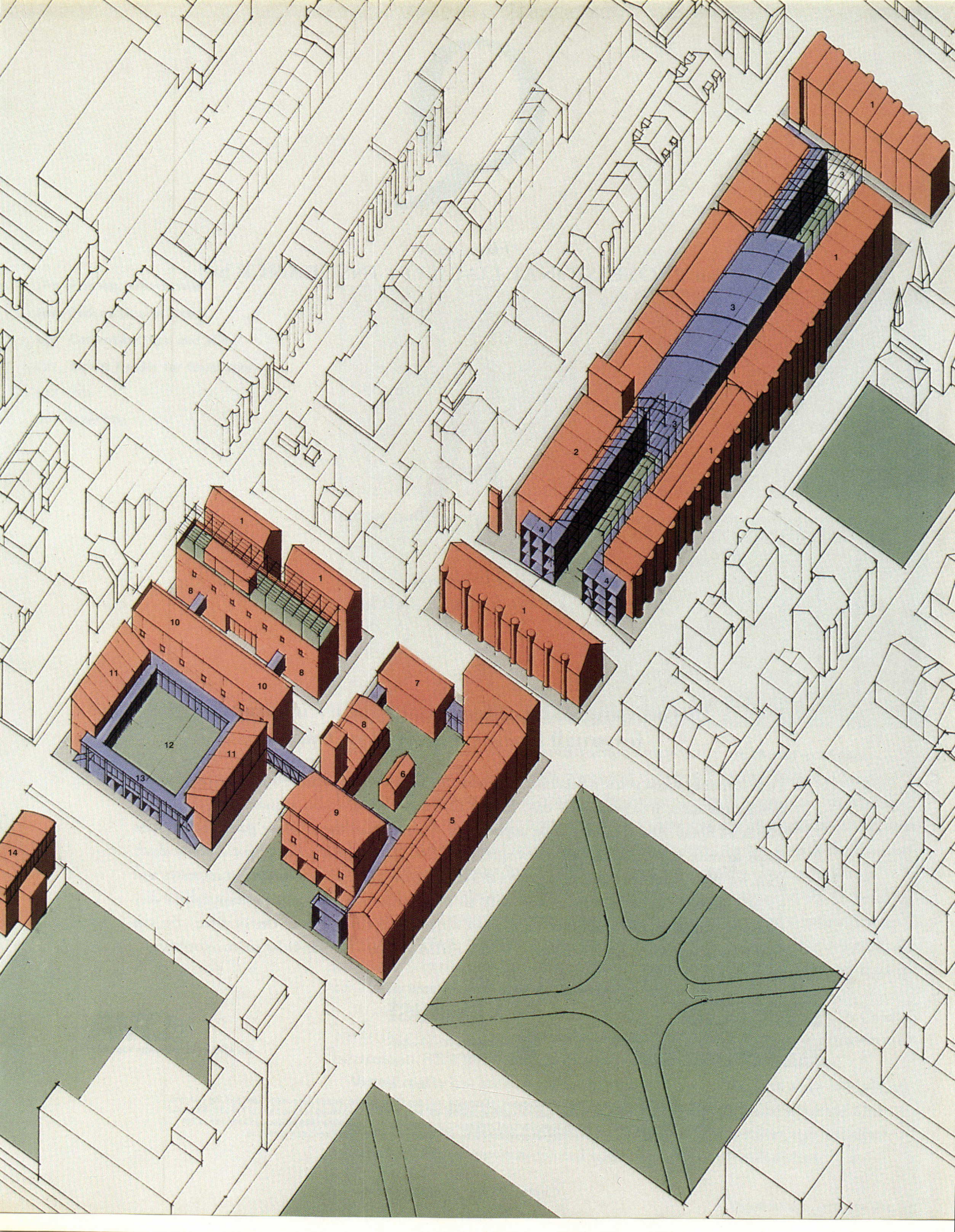
New and existing structures define the green, including a day-care cen-

ter for neighborhood children, partly or wholly staffed by elderly residents. Renovated row houses, converted to condominiums, divide the green on one side from an existing urban square on the other. An historic house museum, located in an existing early dwelling, stands at the center of the green; village residents act as docents for the museum. A new contemplative center across the street from the green looks onto a tranquil cemetery.

The urban retirement village mixes generations by bringing the neighboring community into the elderly community, whether to enroll children in day care, shop at the supermarket, or swim at the health club. Conversely, village inhabitants walk to the existing library across the street, the hospital several blocks away, and bus stops that bracket the project to the north and south. The elderly thus remain vital urban constituents—not suburban exiles.



- | | |
|----------------------------|-----------------------------|
| 1 EXISTING ROW HOUSES | 8 COMPREHENSIVE-CARE CENTER |
| 2 NEW ROW HOUSES | 9 ACTIVITY CENTER |
| 3 WINTER GARDEN | 10 APARTMENTS |
| 4 CIRCULATION | 11 COTTAGES |
| 5 REHABILITATED ROW HOUSES | 12 COMMUNITY GARDEN |
| 6 HISTORIC HOUSE MUSEUM | 13 SUPERMARKET |
| 7 DAY-CARE CENTER | 14 CONTEMPLATIVE CENTER |



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Framing Alternatives

Traditional lumber-based construction is now being challenged by lightweight steel and engineered wood.



ABOVE RIGHT: Architects are exploring substitutes to traditional wood framing (left), such as engineered wood (center) and light-gauge steel (right).

A hot debate is currently raging in the construction industry over residential framing systems. Rising lumber costs and the environmental consequences of timber harvesting have led architects and builders to consider alternative framing methods, including engineered lumber and light-gauge steel. But these substitute materials also present concerns. The conductivity of steel creates tremendous heat loss through structural studs. Engineered-wood members cost more than traditional lumber and have potential environmental drawbacks. Given the unevenly weighted pros and cons of these materials, how can architects specify the right framing system in their buildings?

Search for alternatives

Lumber has been the mainstay of American residential construction, and architects are comfortable in specifying the material and detailing connections. Wood structural components are also strong and quickly erected. But according to Timm Locke of the Portland, Oregon-based Western Wood Products Association (WWPA), stricter federal control over forest lands has caused a shift in available resources from old-growth timber to younger, smaller diameter trees. "Because we're using second-growth trees," explains Locke, "there's a decreased percentage of large members available. There's also a higher incidence of knots in the milled lumber." Higher demand and lower supply of suitable lumber have driven prices up.

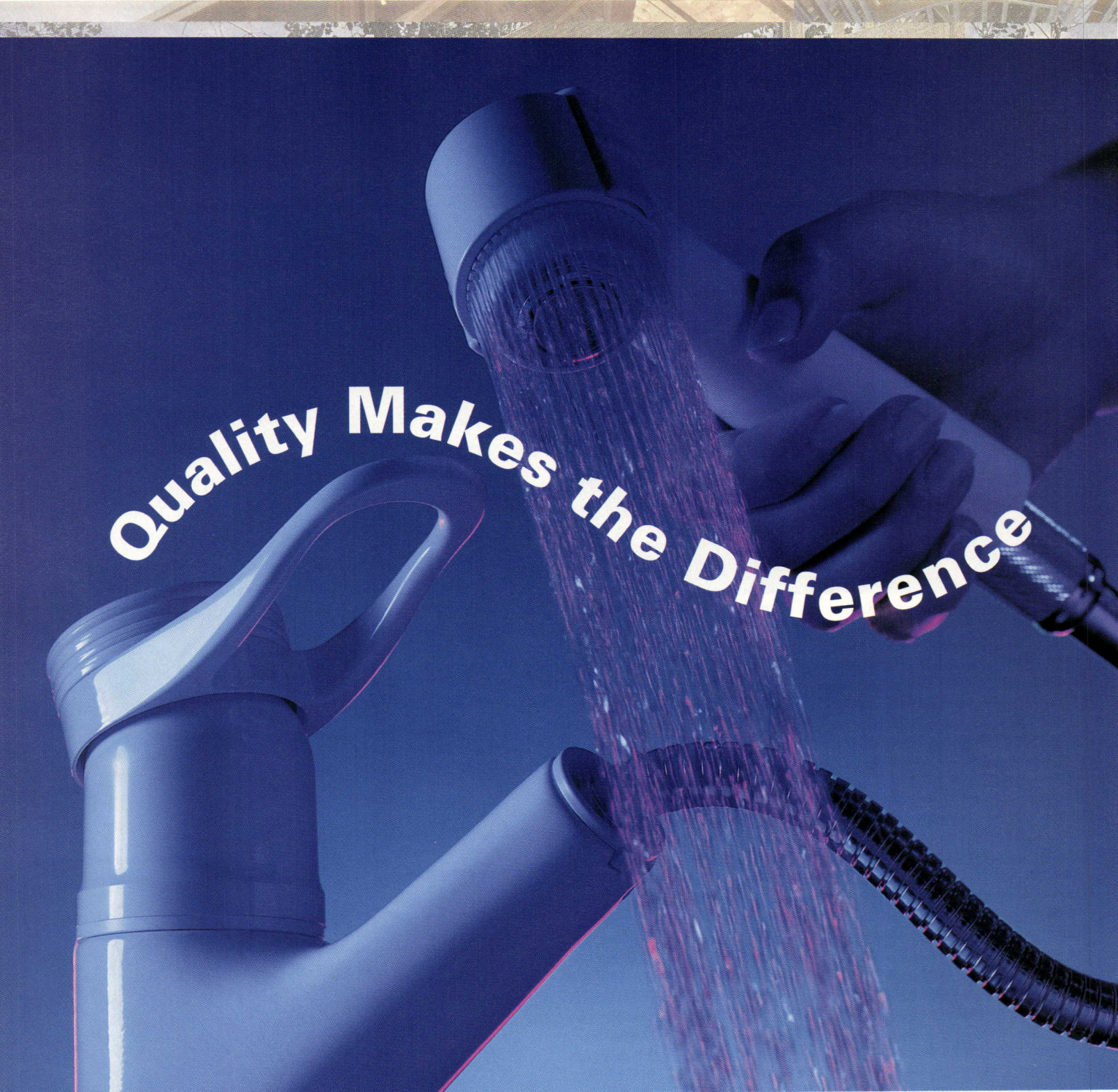
The environmental impact of structural materials is another key factor driving the search for building alternatives, as architects consider the environmental effects of lumber milling. "Architects need to be more environmentally responsible," asserts architect Kate Warner, who is constructing a resource-efficient demonstration house framed in engineered lumber on Martha's Vineyard.

Engineered wood

Engineered lumber—including laminated-veneer lumber, wood I-joists, glue-laminated beams, and oriented-strand board—is one of the most popular framing alternatives. Engineered members are manufactured from weaker tree fibers, such as aspen and poplar. The wood chips are then treated with resins and formed into beams, studs, and I-joists. Lengths of lumber can also be glued together to create laminated beams.

These engineered members eliminate natural defects, such as knots, and don't warp or bow like traditional lumber because moisture from the wood is removed during manufacturing. Deeper laminated beams and I-joists are able to carry greater loads with fewer members than traditional wood beams.

The price of engineered lumber—generally from 12 percent to 15 percent higher than traditional wood framing—can make it less attractive to architects; but because engineered-wood structures can be framed quickly, there is a potential labor savings. But many of the resins employed in engi-



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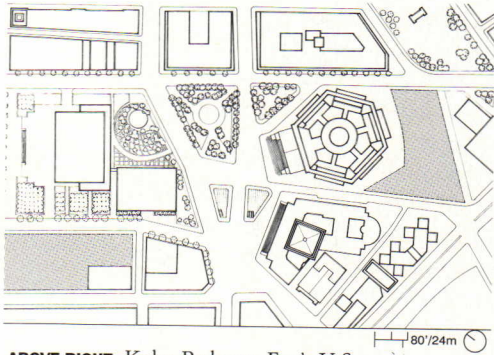
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Federal Design/Build

Six projects reveal how the government has succeeded—and failed—by teaming architects and contractors.



JOCK POTTLE / ESTO



ABOVE RIGHT: Kohn Pedersen Fox's U.S. courthouse (center), among the federal government's first design/build commissions, towers over Guy Lowell's 1912 county courthouse (left) and Cass Gilbert's 1936 federal courthouse (right) at Foley Square in lower Manhattan.
SITE PLAN: Hellmuth, Obata & Kassabaum's federal office building (left) is located across Foley Square from KPF's courthouse (right).

The General Services Administration (GSA), the federal government's real estate arm, began experimenting with design/build in the late 1980s, hoping to copy the private sector's success with this popular delivery method. The agency called on collaborative teams of architects and contractors to submit fixed-cost design and construction proposals for major new federal buildings. "We really like the single point of responsibility with design/build," maintains GSA Deputy Administrator Julia Stasch, "and it has an incredible impact on cost containment."

Design/build seemed an appropriate way of removing complex design and management decisions from the bureaucracy—completion of major federal buildings has taken six years or longer. Yet, while the GSA has saved considerable time with six recent projects totaling more than \$800 million, it has solved only half its problem. "In terms of execution, there can be savings of eight months to a year," observes GSA Assistant Commissioner

Robert J. DiLuchio, "but we eat that time up in bureaucratic procurement processes." The lapse between proposals and construction can take more than two years.

Before Congress passed a federal procurement-reform law in August, legislators considered provisions to streamline design/build commissions at GSA. The changes would have established a clear, two-phase selection process based on qualifications and would have provided compensation to shortlisted teams. Moreover, the proposed reforms would have set criteria to determine when design/build works best. However, they were dropped from the bill because of technical problems cited by U.S. Representative Jack Brooks (D-Texas).

Many of the architects completing federal design/build commissions (following pages) maintain that the GSA must assume more of the risk on its projects, especially if it intends to represent a "reinvented," more competitive government.—Bradford McKee

**Federal Office Building at Foley Square
New York City**
Hellmuth, Obata & Kassabaum
Tishman Foley Partners
Linpro New York Realty

In 1988, the General Services Administration (GSA) solicited design/build proposals for a federal courthouse and a federal office building, two blocks apart across Foley Square in lower Manhattan. Developer-led teams of architects and contractors initially submitted sketches, massing models, and a fixed price tag for the two federal buildings.

The selection process took more than two years. Several GSA technical committees reviewed each preliminary proposal and asked three teams to develop more detailed schemes. The second round of designs circulated among a design advisory group, which, paradoxically, was supposed to ensure only that the proposal abided by the government's program requirements.

"They could only make the most general and suggestive remarks," contends Daniel Dolan, principal of Hellmuth, Obata & Kassabaum (HOK) in New York City, which won the award for the federal office building with contractor Tishman Foley Partners, led by developer Linpro New York Realty. "It was clear that we were not going to win this competition by reinventing federal architecture," Dolan adds. As it stands at 475 feet tall, the 1 million-square-foot office building reflects older towers nearby with midrise setbacks and an upper story colonnade. "It's a New York building," affirms Edward Feiner, the GSA's chief architect of its Design and Construction Division, "with one of the most exciting interior arcade spaces in the city."

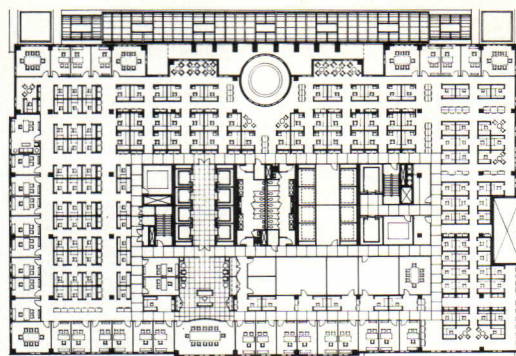
Once the design/build team secured the commission in April 1991, HOK entered design development, Tishman completed cost estimates for construction, and developer Linpro started hiring subcontractors. The team devised simultaneous, interconnecting solutions for design and construction management as if they were working a \$276 million

crossword puzzle—without an eraser: Each team member constantly exchanged information with the other two members.

Structural-steel erection began before design was fully completed. Before irrevocable mistakes could occur, Linpro critically examined floor-plate efficiencies, compared various mechanical systems to obtain optimum utility rebates for the GSA, and verified hundreds of program minutiae. "Linpro Realty was a very hard master," HOK's Dolan observes, but adds that the developer was "extremely decisive."

Design/build allowed HOK to exploit the intelligence of the contractors at every stage, considering advice on design decisions from schedulers and estimators in an ongoing process of value engineering. Dolan recalls his initial qualms about submitting material samples to Tishman and Linpro, anticipating three-quarters of the detailing to be stripped in the interest of cost. "But it didn't happen," Dolan reports. "The refinements Tishman and Linpro made were usually in the direction of greater quality."

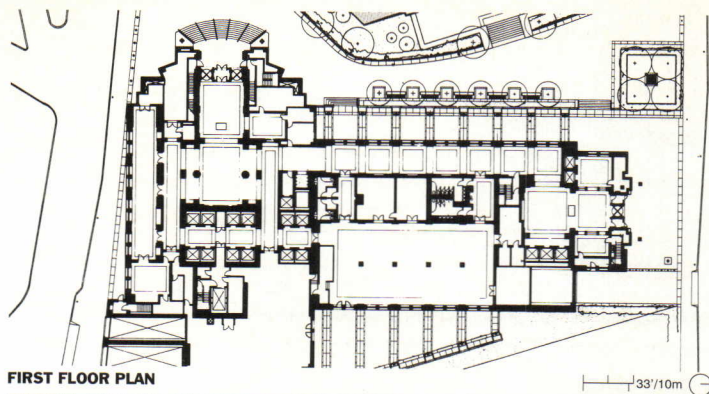
One major design obstacle occurred upon discovery of an historic, African-American burial ground beneath space for a 25,000-square-foot public pavilion planned for the site's northeast side. The pavilion was deleted, with minor modifications to the main building. Contentions also arose over simplifying the 50-foot-high, vaulted storefront arcade along Duane Street—Dolan did not want the structure turned into a "shopping mall skylight." Otherwise, adversity among team members was kept in check because each regarded the winning proposal as an unalterable contract with the GSA. "If we were to fail, we'd fail as a group," Dolan asserts. "The outline specifications became our promise, and we were obliged to deliver this building to the government."



FIFTH FLOOR PLAN



HOK'S OFFICE BUILDING: Arcade was altered upon discovery of burial ground.



Foley Square Courthouse
New York City
Kohn Pedersen Fox
Lehrer McGovern Bovis
Structure Tone
BPT Properties



KPF'S COURTHOUSE: Vaulted volume houses courts and support functions.

After the protracted design/build competition, the U.S. courthouse at Foley Square, commissioned in tandem with Hellmuth, Obata & Kassabaum's federal office building (facing page), presented the prevailing design/build team with a difficult program on a sensitive site. General Services Administration (GSA) officials further aggravated the risks with changes to mandated program sizes once design of the interior was under way. Nonetheless, the team comprising architect Kohn Pedersen Fox Associates (KPF), core-and-shell contractor Lehrer McGovern Bovis, and interiors contractor Structure Tone—all led by developer BPT Properties—designed and built the 921,000-square-foot courthouse in 40 months.

The GSA transferred most of the project's risk to the design/build team by establishing severe penalty clauses for missed deadlines, while only selectively sharing any cost savings on the project. "These clauses are written to the government's benefit," maintains Robert J. Cioppa, partner of KPF. Cioppa explains that his team was able to manage potential liabilities with checks and balances among architect, contractor, and developer during design.

Yet, the same team hierarchy that expedited design and construction effectively isolated the architect from the GSA and the judiciary. "The most difficult situation in design/build is that the [architect's] client is not the GSA or the courts, but the design/build entity or the developer," Cioppa observes. In traditional delivery, the architect and client are relatively free to explore various solutions throughout the design process; but in design/build, the developer must wield firm control over deviations from the established design, because every single one has cost repercussions.

However, the GSA did establish a highly specific program in the re-

quest for proposals (RFP) and set clear deadlines in the beginning, remarks William Louie, design partner of KPF. "It was good that the program specifications were explicit," asserts Louie. "The RFP helps as long as they don't tie your hands in terms of style. In this competition there was no dialogue [with the GSA], but if we had moved away from the Classical esthetic, we would have had some problems."

GSA's architect Edward Feiner applauds KPF's design of the 410-foot-high tower, clad in Kershaw granite with Vermont marble details. "The courthouse looks like it was always there in New York's civic center. KPF and BPT did a spectacular job fitting a million square feet on a site the size of a postage stamp." Forty-four courtrooms, 42 chambers, and 200,000 square feet of offices had to fit onto a 70,300-square-foot site across from the 1936 U.S. courthouse, Cass Gilbert's last design.

The combination of the courthouse's program and New York's floor-area-ratio allowances resulted in an unusual stacking and circulation scheme throughout its 27 stories. In section, each floor housing judges' chambers alternates between two floors of courtrooms, altering the standard plan that places chambers next to courtrooms. Thus, judges required their own elevators and secure corridors. In fact, the architect established three distinct circulation patterns—one for the judges, one for prisoners transported from the jails across Pearl Street, and one comprising public corridors.

The design/build team resolved the program and site restrictions, but did not produce a firm basis for the building's cost. The team originally set the price of the building at \$241 million. However, critics in Congress plan hearings this fall to determine why the cost of designing and constructing the courthouse has exceeded \$300 million.

**United States Courthouse
Shreveport, Louisiana
KPS Group
Brasfield & Gorrie**

To complete the design/build commission of the 242,000-square-foot federal courthouse in Shreveport by November 1993, within 24 months and a \$24 million budget, architect KPS Group and contractor Brasfield & Gorrie, both of Birmingham, Alabama, had to push GSA's regional staff in Fort Worth to speed up review processes and depart from the linear decision sequence of traditional project delivery. "We had GSA staff reviewing things in a week that on other jobs would take weeks or months," recalls Rick Davidson, principal and group vice president of KPS Group. "And while we do many jobs on a fast track, this was probably more of a pain to the government because they had to review our scheme with incomplete information." For example, GSA had to approve the building's skin and structural plan before interiors were completed. "The GSA's ability to coordinate that process was limited," Davidson observes, "but everyone on the project had to trust everyone else to follow the project's requirements."

Before entering the courthouse competition, KPS and Brasfield & Gorrie translated the GSA's schematic floor plan, mechanical system requirements, and choice of finishes into a preliminary scheme with enough definition to state a price. "There was a lot of information in hand from the beginning, and we had to analyze whether the project was worth our risk," Davidson explains. "There are very specific instances when the prescriptive nature of GSA's information keeps you from doing what your judgment says is best."

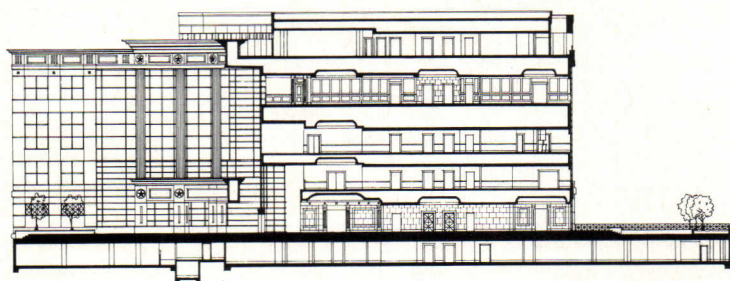
The definition of the competition scheme essentially surpassed conceptual design. Nonetheless, KPS and Brasfield & Gorrie went back to reaffirm that the design of the courthouse made sense. As a result, the team adjusted the arrangement of public spaces, and the perimeter parking deck was moved under-

ground to provide more secure spaces at a lesser cost. Yet, the basic L-shape of the plan, with pairs of courtrooms and chambers all oriented toward a public plaza, satisfied the federal judges who helped develop the initial request for proposals, and so the plan was retained.

The architect and contractor had a "partnering" relationship—having completed 20 projects together—and thus minimized risky guesswork in the fast-track process. "The GSA knew that because we had a history of working together, we would pose a lot less risk going into a project like this," Davidson contends. The team was not led by a developer; therefore, the architect and contractor enjoyed "extremely close" communication with the GSA.

The unfamiliar sequence of design and review involved some coaching of GSA staff: Because the structural system of the building was completed before programming was finished, GSA had to accept that functional requirements would not suffer drastic changes after approval of the structure. "We offered analogies," Davidson points out: "Once the structural drawings were completed, it was the same as if somebody had built the structure years ago, and we were building around it."

Design/build, however, allowed easy interior changes. When the GSA requested, for instance, a change in finishes for public spaces, it was easy for the architect to complete a thumbnail sketch, send it to the contractor to obtain a firm price, and report back to GSA quickly. "That's a fabulous benefit—to be able to say, if you make that decision, here's what it will look like, and here's what it will cost," Davidson asserts. "Design/build can work for the government the way it has for corporate America—to bring professionals together with the confidence to speed decision making and do it in a more informed way."



WEST-EAST SECTION

20'/6m



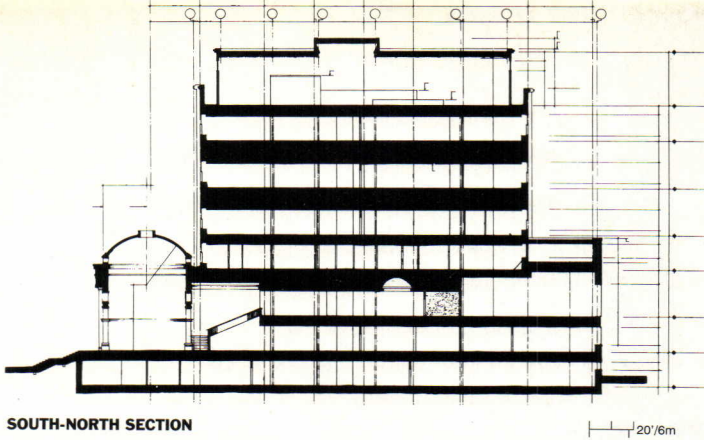
SHREVEPORT COURTHOUSE: Fast-track project required accelerated reviews by GSA.



COURTROOM: Design/build process yielded easily to interior refinements.

JOHN O'HAGAN PHOTOS

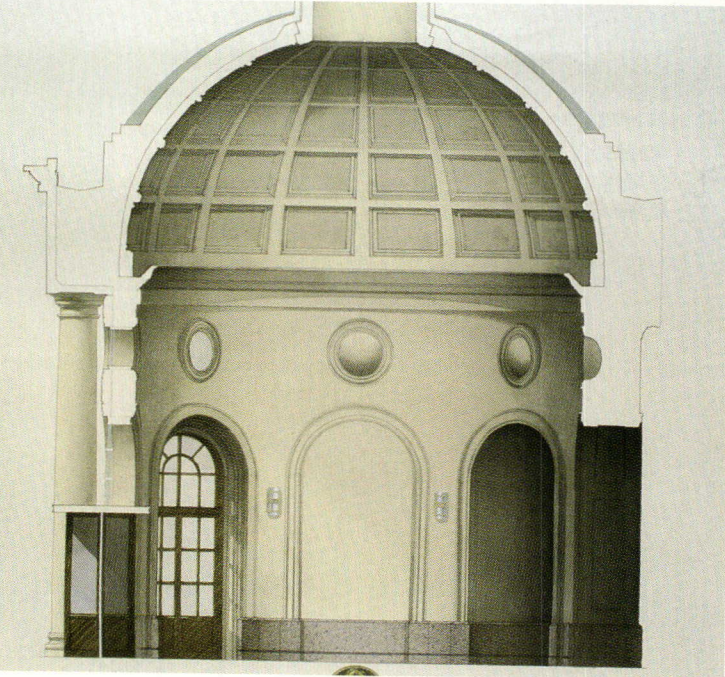
**Federal Courthouse
White Plains, New York
Skidmore, Owings & Merrill
Lehrer McGovern Bovis**



SOUTH-NORTH SECTION



WHITE PLAINS COURTHOUSE: Judges required scheme to reflect public judicial process.



ROTUNDA: Historicist design sets new precedent for White Plains.

The team for the seven-story, 157,000-square-foot federal courthouse in White Plains, New York, found that the GSA is willing to share very little of the risk of its design/build projects. The White Plains courthouse was not originally a fast-track project when construction began in July 1993; however, the team had to accelerate its schedule to make up six months lost—after the award—resolving whether the winning design in fact complied with the contract.

For the competition, the team—comprising architect Skidmore, Owings & Merrill (SOM) in Washington, D.C., and developer/contractor Lehrer McGovern Bovis (LMB) of New York—submitted schematic stacking diagrams, floor plans, a 1/16-inch scale model showing fenestration, as well as a price. “The competition was intended to show your skill and ability to manipulate the program and the massing,” recalls Gary Haney, associate partner of SOM. “But it turned out to be a beauty contest. You have to give the GSA what you think will meet the specifications and provide a decent, dignified design, but everyone is doing a considerable amount of guesswork, which is pretty frightening when you consider the level of drawings you give them at that point.”

The GSA’s four-volume request for proposals exhaustively prescribed the standard format of the building, referring extensively to the *U.S. Courts Design Guide*, a federal publication outlining universal requirements for federal courthouse design. However, the agency’s standard program did not satisfy the district’s “very vocal” group of judges, who took a proprietary stake in the design of their courthouse and demanded naturally lit courtrooms, jury rooms adjacent to public lobbies, and jury boxes that require jurors to walk past spectators in the court’s galley. “It’s a philosophical reason, the notion that

this is a jury of your peers,” Haney explains. Yet, the judges’ advice became clouded as it traveled through official channels back to the GSA; through the contractor and developer; and finally, back to SOM, which had to reassure judges who felt excluded from the design process. “Whether it’s founded or not, there’s a suspicion the judiciary has that the GSA was cutting corners,” Haney contends.

Nicholas J. Grecco, LMB’s assistant vice president and project manager, questions whether design/build was suitable at all for the courthouse commission. “In the time you have to develop the scheme, there’s no way to digest all the requirements and price them properly,” Grecco asserts, “so you have to have contingencies built into the basic design and hope that the hidden items don’t bite you.”

The GSA places the onus of omissions upon the design/build team, Grecco adds, “which covers them cost-wise and legally, but puts too great a burden on the designer/builder. In the design process, the GSA needs to be more active and more responsive.” The owner, designer, and builder all need to function as allies, Grecco contends.

Although the GSA awarded the design/build contract based on schematic drawings and models, the client still required SOM to complete three alternative designs. Haney laments that the exercise—as well as the paperwork involved in the federal project—contradicted the purpose of design/build and ate up SOM’s fixed fee. Nevertheless, the architect remains optimistic about the outcome of the White Plains courthouse: “It’s going to be an excellent building,” Haney concludes. The GSA’s architect Edward Feiner concurs, lauding the design of the courthouse for “setting a benchmark of sensitivity and historicism” in an incoherent urban context.

**Health Care Financing
Administration Headquarters
Baltimore County, Maryland
RTKL Architects
James F. Knott Development
McDevitt Street Bovis
Boston Properties**

Five developer-led design/build teams competed for the Health Care Financing Administration (HCFA) headquarters near Baltimore in 1991, each suggesting a site for the complex. The winning proposal by RTKL, developers Boston Properties with the James F. Knott Development Corporation, and contractor McDevitt Street Bovis succeeded over a proposal for a location in downtown Baltimore. The General Services Administration (GSA) decided that RTKL's scheme of low-rise adjacencies best suited the program of HCFA's facility. Upon completion in 1995, the 900,000-square-foot HCFA headquarters will consolidate five Baltimore locations of the federal agency, which administers federal healthcare entitlement programs. The bulk of program space is housed in a central, six-story building flanked by two three-story wings. Behind office buildings lie a two-story warehouse and central plant. The GSA sought a subtle federal presence for the complex, which verges on farmland.

Design took nine months; the structural package was completed in five months, with architectural drawings and interior design finished in the next four. "The trick was to predict where the design was going to go early on, so that by fixing the structural elements, you could detail it properly," explains Goodluck Tembunkart, senior project architect at RTKL. "We had to jump-start some aspects of design."

For example, during schematic design, the architect worked closely with concrete consultants to develop precast panels for the building's shell—much earlier than in traditional delivery. "We went through a very intense process of developing specifications and preapproved a large sample precast panel that was used as the basis for bidding," Tembunkart recalls. As soon as the team accepted the subcontractors' bids, the subs had shop drawings in hand.

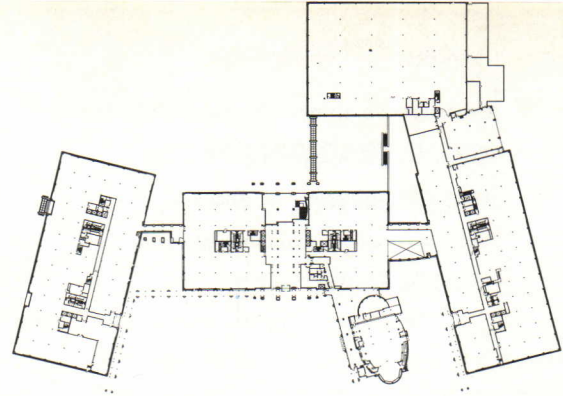
Both the architects and contractors gained a better appreciation for the work of the other, according to RTKL's Tembunkart.

Communication among team members minimized antagonism from the project's outset. McDevitt Street Bovis called weekly progress meetings, during which each team member outlined expectations of the other two members. The contractor also prevented subcontractors from filing requests for information from the architect unless the subs suggested their own solutions in writing first, which helped the subs be creative, notes RTKL Vice President Bernard J. Wulff, and also prompted them to find solutions that made their questions relevant.

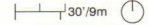
Boston Properties discouraged frivolous claims by negotiating contractors' grievances, explains E. Mitchell Norville, senior vice president of Boston Properties. "The subcontractors deal with us differently from the way they deal with the government," Norville assures. "When the subs work with us, they know we don't put up with a lot of claims. We'll do what's fair and move on."

Norville asserts that the GSA's design/build process would improve if the government stopped spelling out every detail in the request for proposals (RFP). For instance, the GSA itemized the auditorium down to the audiovisual equipment, which may not be available or suitable when it's time to buy. Norville suggests that the GSA instead adopt standards for special spaces based on how they should ultimately perform.

"It would be easier if the government would say, 'Build us an auditorium for \$300,000,' and then we'd design within that budget," Norville suggests. "But the government can't work that way. There needs to be more trust on the government's side to allow the design/build team to push things around a little bit so it can come up with a good project."



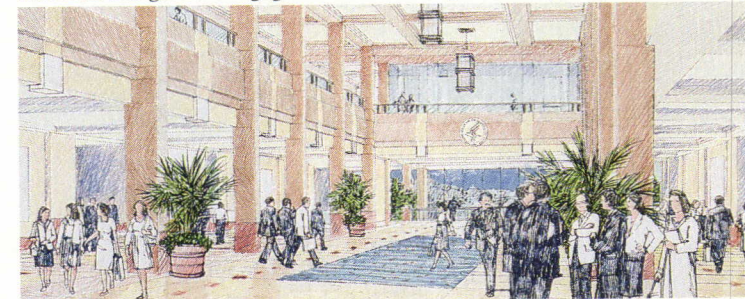
GROUND FLOOR PLAN



HCFA HEADQUARTERS: Low-rise scheme was selected for efficient adjacencies.

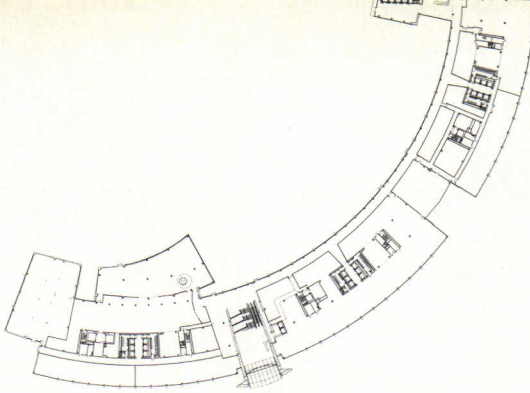


HCFA SITE: Design team engaged contractors early to develop viable specifications.



HCFA LOBBY: Steel structure was erected before interior design was fully defined.

**Internal Revenue Service
National Headquarters
New Carrollton, Maryland
Kohn Pedersen Fox
BPT Properties
Turner Construction**



PUBLIC LEVEL PLAN



IRS MODEL: KPF expects to add a fourth building to its curved scheme.



IRS HEADQUARTERS: Educated guesswork was required to fit systems into structure.



JOCK POTTLE / ESTO

WALL DETAIL: Structural drawings were completed far ahead of exterior detailing.

The commission for the Internal Revenue Service's national headquarters, awarded in November 1993, shows that while the GSA has grown wiser lately about how to handle design/build contracts, fulfilling them remains risky and difficult for design/build teams.

"The process has become increasingly better run," remarks Robert J. Cioppa, partner of Kohn Pedersen Fox (KPF), for which the IRS building is its third design/build job for the GSA, "but if the GSA gets any stricter [about cost], the quality of these projects is going to come down in order to maintain the price." The design/build team based cost estimates on schematic documents, arriving at a bid of \$125 million. "The competitive process forces you to drive that number down," contends Michael Vardell, vice president and project director for BPT Properties in Washington, D.C., "so you're always struggling to score well technically because the government is going to take the lowest priced project—unless the technical merit offsets it."

The construction of the 1.1 million-square-foot headquarters has just begun on 30 acres in suburban Washington, D.C. Three eight-story buildings are sited on a continuous curve, connected by glazed bridges and surrounded by a 75-foot-wide buffer of trees and shrubs.

In fulfilling the program laid out in the request for proposals, the architect and contractors effectively worked in the dark, making educated guesses about appropriate solutions, as they were allowed only minimal contact with the GSA. Missing information created snags once the project began. For instance, since excavation began in July, KPF has had to revise its design of a public plaza at one edge of the complex in response to suggestions by county and state officials.

In August, 900 tons of steel and 70 precast concrete panels were fab-

ricated to be erected in late September. Design and construction will overlap for six to nine months. As design develops in greater detail, the architect will regroup with the contractors to confirm the rationale of their bids, which were based on schematics for the competition. The team's first objective is to fix the floor plates and the building's core and then begin work on the skin. Construction documents and shop drawings for the steel will be finished three to four months before detailing of the curtain wall. "Our process is extremely integral," notes KPF project designer Gabrielle Blackman. "Right now, we're on the phone daily with the engineers to make sure the exterior accounts for the structural conditions."

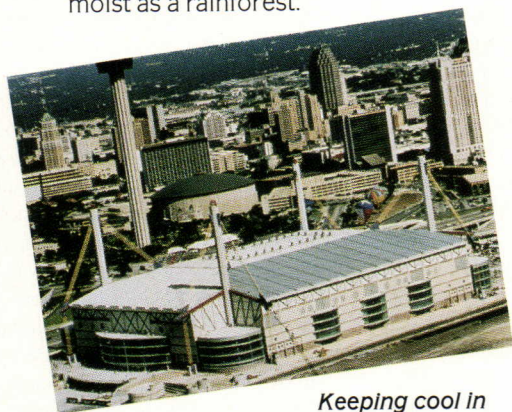
In some cases, the team will design around general parameters rather than specific conditions. For example, the contractor must order HVAC equipment months before the team knows the precise heat loads of special spaces such as the television studio. "The GSA can't tell you the exact equipment they're putting in," Vardell maintains, "so you have to devise guidelines to accommodate their needs without overdesigning."

In spite of the inherent ambiguities of the delivery process, the architect and the developer agree that the relatively simple and straightforward program of the IRS headquarters more readily lends itself to a design/build approach than does a courthouse. And while the GSA's vigilance ratchets down the price of the project, the process still allows dialogue during design. However, design/build compels the GSA to make decisions faster than it is accustomed. "If the GSA can't get certain program information, the process is delayed," Vardell asserts. The team must continuously remind the agency that its delays affect the July 1997 construction deadline, which, in turn, costs the government more money.



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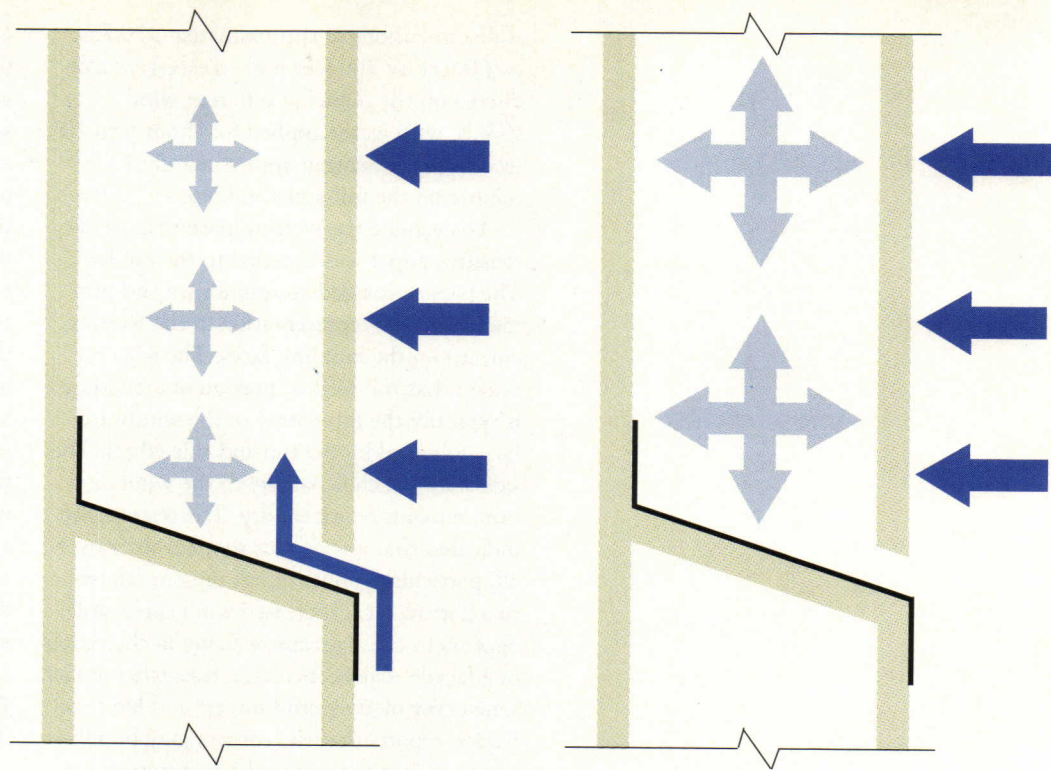
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Controlling Rain and Wind

Canadian research reveals new ways of detailing walls to prevent water penetration.



ABOVE RIGHT: In a pressure-equalized rainscreen wall, air enters the cavity (left), allowing internal cavity pressure to match exterior wind pressure (right) to prevent water penetration.

If water has ever penetrated one of your buildings, you know how costly it can be. Water has a way of showing up on the interior quite a distance from the actual leak, so extensive investigations must be conducted to determine the source. Once located, repairs must be made to correct the leak and damaged interior finishes. And legal claims inevitably ensue as the owner tries to place blame to recoup losses.

One way to stop water penetration is simply to minimize the amount of rain hitting the building. Impossible? Not according to Jacques Rousseau, project manager of Canada Mortgage and Housing Corporation (CMHC), Canada's federal housing agency. Recognizing the serious consequences of water penetration, CMHC has initiated a number of significant research projects to control rain, including a study of the climatic relationships between rain and wind; a simulation of wind-driven rain; field and laboratory testing of pressure-equalized rainscreen walls; laboratory testing of pressure gradients on buildings; and monitoring of wall performance. This research, the results of which are expected to be published by the end of 1994, is intended to develop a better understanding of the causes of water penetration and to improve the detailing of exterior walls.

Wind-driven rain

One of Rousseau's studies, conducted by David Surry, a research director of the Boundary Layer Wind Tunnel Laboratory at

the University of Western Ontario, analyzes the interaction of wind and rain. While most developed countries maintain detailed climatological data, until recently, no one correlated the occurrence of rain with wind speed. Surry and his colleagues are determining whether a significant relationship exists between wind speed and rainfall rate and whether the wind directions associated with wet hours are significantly different from those of prevailing winds.

Preliminary results indicate that the mean wind speed is greater during rain and that, in some cases, it increases fairly steadily with rainfall rate. The prevailing wind direction during rain also appears to differ from the general prevailing winds. In designing building envelopes that may be more prone to water penetration, such as multiple terraces or window walls, architects can take advantage of this data to orient away from the direction of most wind-driven rain.

Rain wetting patterns

In another study begun in 1993, researchers at the Boundary Layer Wind Tunnel Laboratory conducted what they believe to be the first scale-model testing of wind-driven rain in a wind tunnel. The purpose of the project was first to determine if rain wetting patterns could be reproduced in a laboratory and then to test different buildings to determine if certain building shapes or profiles reduce the wetting. A 1:64 scale model was created of an 18-story building in Ottawa, with full-

scale dimensions of approximately 270 feet by 60 feet by 200 feet high. Tests were conducted on the model at different wind speeds, with water applied for about 5 to 10 seconds, representing approximately 1 minute on the full-scale building.

To evaluate the wetting patterns, water-sensitive paper was fastened to the model. The paper provided an immediate and permanent visual representation of the wetting pattern on the building faces. The tests revealed that the wettest portion of a building is typically the top corner of the windward face, followed by the top and side edges. The side wall, which is parallel to the wind direction, remains relatively dry. The testing also indicated that a wide face remains drier overall, particularly in its center region, relative to a narrow face. Increased wind speed also appears to cause greater wetting in the center of a facade. Diana Inculet, a researcher at the University of Western Ontario and lab team leader, reports that the corners may be subjected to 20 to 30 times the rain impact as the central region of the building face. This finding correlates well with observations of wetting patterns on existing buildings.

Having successfully simulated wind-driven rain in the wind tunnel, Inculet and her team are continuing their work to determine the effect of different building features on the wetting patterns on building faces. Preliminary results show that features such as overhangs and cornices can effectively reduce the amount of rain that falls on a building, even on high-rise structures.

Pressure-equalized rainscreen

CMHC has also sponsored a study to develop pressure-equalized rainscreen walls, an approach to wall design popular in Canada. "This design approach is appealing," asserts Rick Quirouette, a building specialist in Ottawa, "because the main force driving water into walls—the wind—is neutralized."

A pressure-equalized rainscreen (PER) wall consists of two layers separated by a cavity. The layers can be constructed of any material or combination of materials, provided the inner layer, generally referred to as the air barrier, is impermeable to airflow and strong enough to withstand high wind loads. The outer layer, generally referred to as the rainscreen or cladding, incorporates holes that allow exterior air to enter the cavity and allow pressure equalization to occur.

The concept behind pressure equalization is simple. When the wind blows on a wall, it creates a positive pressure that forces water

on the surface to flow through any cracks in the wall, no matter how small. When the wind blows on a PER wall, the positive pressure created by the wind causes a small amount of air to enter the cavity between the outside wall layers through the vent holes. As the amount of air in the cavity increases, the pressure inside the cavity also increases; therefore, the positive wind pressure and the negative cavity pressure will be equalized so that rain will not be driven into the wall. In an effective rainscreen wall design, this pressure equalization occurs in fractions of a second. The air barrier remains dry, and rain penetration to the inside of the building is eliminated. Should some water inadvertently enter the cavity due to other mechanisms, such as kinetic energy, gravity, or capillary action, it runs down the back face of the cladding to an exterior drain.

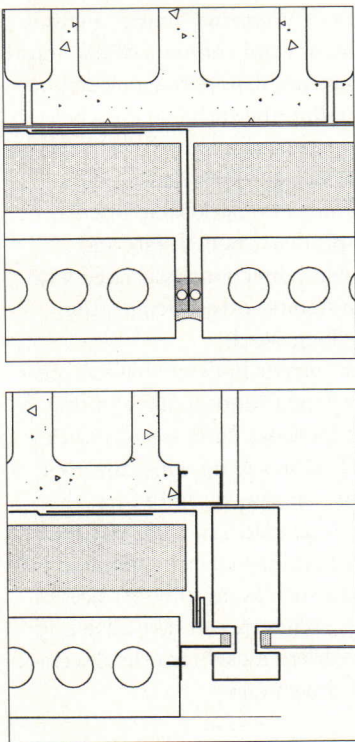
Rainscreen's advantages

The benefits of the PER include reducing the costs associated with rain-penetration damage and litigation. In addition, if the wind load on the rainscreen or cladding can be reduced, it may allow architects to specify lighter weight cladding, thus lowering the cost of the wall and building structure.

Another advantage of PER is that cladding prone to absorb moisture, such as masonry or stone, will dry out faster due to the air circulating behind it—a condition that is particularly important in colder climates, such as the northern United States, because the combination of moisture and cold temperatures can accelerate material deterioration.

A number of factors determine how quickly pressure equalization will occur. Under a CMHC research program, Quirouette developed a computer program that can predict pressure-equalization performance for a given wall design. The program, called RAIN, requires the architect to enter the area of vent openings in the rainscreen, the amount of unintentional leakage in the air barrier, the flexibility of both the air barrier and the rainscreen, and the volume of the cavity.

This program was recently used by building scientist Michel Perreault in the design of the 12-story Canada Life Building addition in Toronto, completed in 1993. The exterior wall system in this building consists of a 5-inch-thick precast air barrier, 1¹/₄-inch-thick mineral fiber insulation boards, 5/16-inch plastic drainage mesh, 3³/₈-inch-thick limestone cladding, and aluminum-framed windows set into the precast panels at the plant. Perreault used the RAIN program to determine the



TOP: Section through brick veneer wall shows vertical cavity closure creating a compartment to equalize pressure.

ABOVE: Section shows vertical cavity closure at curtain wall mullion.

venting area needed for pressure equalization. As a result, the wall cavity is vented at the heads and at the right jamb of each window. The wall was then tested in a lab to confirm its performance prior to construction. The tests revealed some problems with pressure equalization and drying of the limestone cladding, which researchers solved by adding plastic drainage mesh.

Wind pressures on buildings

Because wind pressure is inconsistent over the entire surface of a building, it is possible for air to flow into the cavity of a rainscreen wall at a location of high pressure and flow out at a location of lower pressure. This air-flow not only prevents pressure equalization, but it also carries snow or rain into the cavity. Pressure equalization cannot be achieved unless the cavity is divided into compartments, which involves blocking off the cavity at horizontal and vertical intervals. But what size should these airtight compartments be? This question was addressed in a research study by CMHC and Public Works and Government Services Canada, the agency responsible for managing all federal government property.

This study was conducted at the Boundary Layer Wind Tunnel Laboratory using the scale model from the wetting patterns project. The objective of the testing was to examine the pressure gradients on the exterior of the building wall, the cavity pressures, and the resulting net pressures exerted across the cladding. Researchers designed a compartmentalized pressure module that could be located anywhere on the building model and that spanned roughly 20 percent of the building width when oriented horizontally and 27 percent of the building height when oriented vertically. A row of external pressure taps, spaced approximately 20 inches apart in full scale, was used to obtain external pressure distributions; corresponding internal taps measured cavity pressures. The design of the pressure module allowed the number and size of compartments along the array of external pressure taps to be altered easily.

The tests revealed that pressure equalization is less likely to occur where there are large changes in the external pressure on the wall over a short distance—or large pressure gradients. With smaller compartments, each compartment is exposed to a more uniform distribution of external pressure so that net pressures acting on the rainscreen can be essentially eliminated. Research also showed that perpendicular winds create large horizontal mean pressure gradients near the side

edges of windward walls and large vertical gradients near the top edges of windward walls. The research will lead to guidelines for the spacing of compartments in PER walls.

In the Canada Life Building, the compartments were formed by stainless steel angles cast into the concrete at one side and at the top of each panel. The angles were sealed to the back of the limestone cladding with sealant and sealed at the top to the floor slab with a flexible membrane. To complete the compartmentalization, rubber closure pieces were fastened at the underside of the panels. Special care had to be taken at the corners of the panels to ensure complete compartmentalization. Field tests conducted earlier this year after completion of the building indicate that pressure equalization is in fact occurring. The rainscreen design has also addressed another concern: water staining of the limestone. To date, the limestone appears to be drying out without the creation of visible water stains, since air circulating behind the stone cladding helps remove moisture.

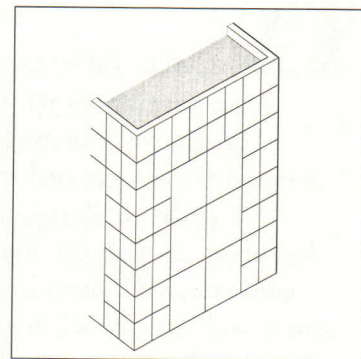
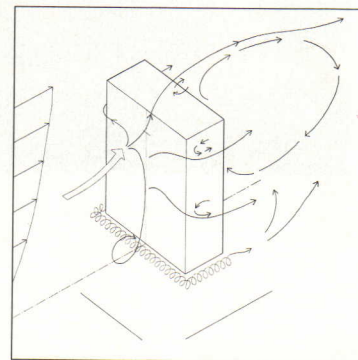
Implications for building design

“When we look at the results of all these research studies together, including the monitoring of completed buildings, we can start to understand the implications for building design,” notes Rousseau. “The areas of the walls that are exposed to the greatest pressure gradients—near the top corners, top edges, and side edges—are the same locations that are exposed to the greatest wetting. Clearly, these areas require special emphasis in design, particularly in the design of compartmentalization of PER walls.”

Rousseau suggests that building designs can incorporate different wall systems at different locations. For example, a curtain wall, which is more impervious to the effects of wetting, could be specified at the tops and sides of the building, and a less expensive system that is more difficult to compartmentalize, such as masonry, could be employed in the central portion of the building walls.

To help architects implement design details that will prevent water penetration, CMHC intends to develop the “Best Practice Guide for the Control of Rain Penetration,” including drawings of applicable details. The guide, which is expected to be published in 1995, will illustrate how the results of the CMHC-sponsored research can be put into practice.—Dale D. Kerr

Dale D. Kerr is an engineer with Ontario-based Gerald R. Genge Building Consultants.



TOP: Typical wind movement around a building produces greater pressure gradients at top and edges.

ABOVE: Building exterior should be compartmentalized at more frequent intervals near edges and top.

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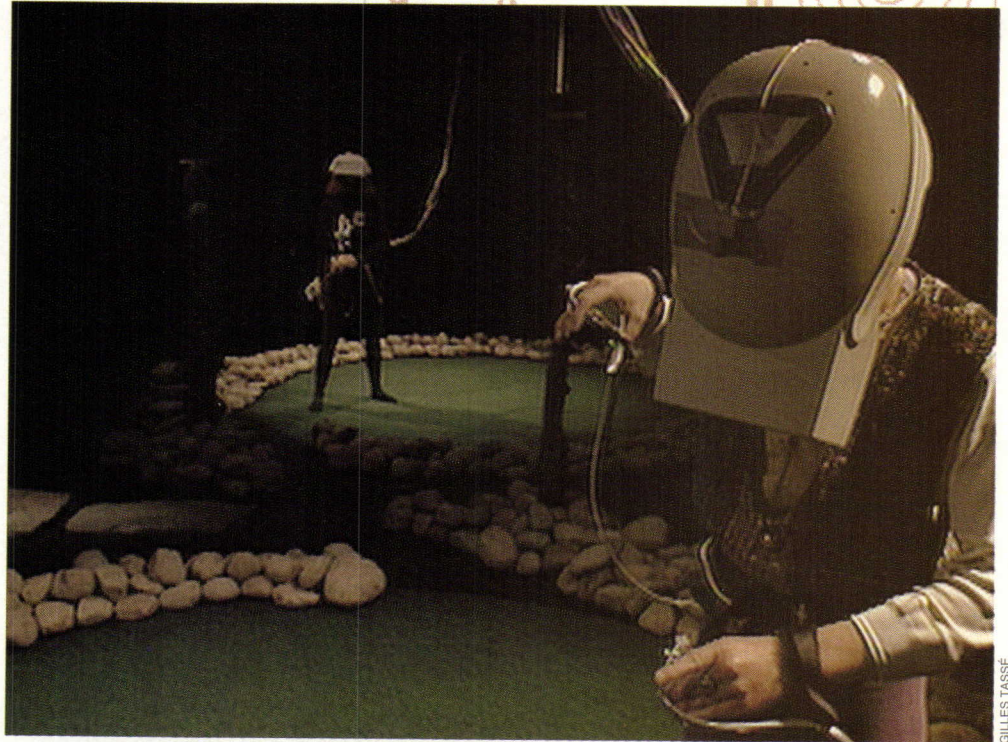
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Virtual Reality for Architects

New technologies simulate moving through space for design study and presentation.



RIGHT: Artists Rachel Strickland and Brenda Laurel have developed Placeholder, a simulated environment for imaginative play. This “virtual reality” incorporates stereo sounds from nature and iconic representations of the players’ characters and actions.

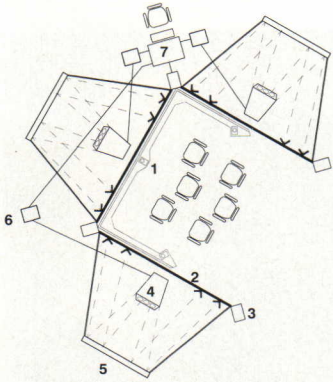
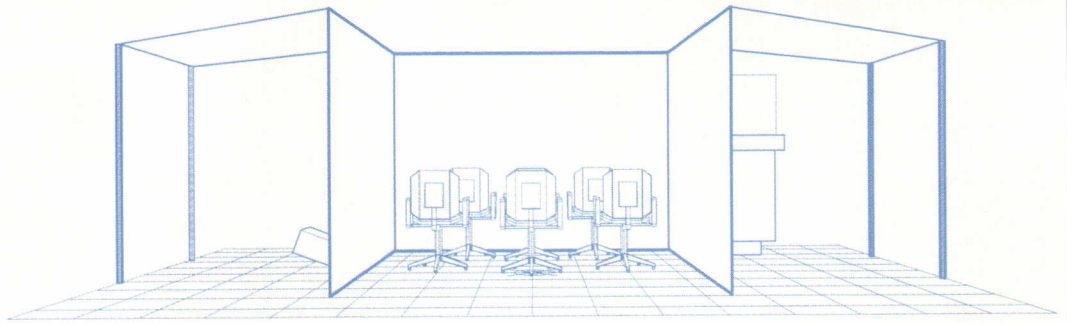
The world’s largest construction project has begun, but not a brick will be laid, nor a nail hammered. Cyberspace, a “place” that exists only in computer bits, is also being constructed largely without architects. As electronic communications grow in sophistication and as computer interfaces become more graphical, electronic meeting places are beginning to look and feel more like physical places. In many cases, their appearance is decided by computer scientists and graphic designers. But a growing number of architects and academics are debating about how and whether the architectural profession can influence the design of cyberspace.

Settling cyberspace

Because these computer-generated virtual places are not constrained by the physical laws of gravity and thermodynamics, or even social convention, cyberspace will be very different from physical space. Exactly how it will differ and how the difference may influ-

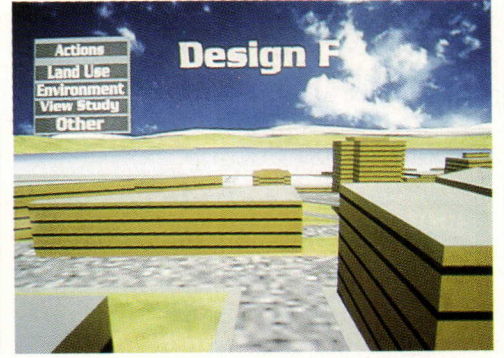
ence the future of architectural education and practice is now the subject of this academic speculation. William Mitchell, dean of the School of Architecture and Planning at the Massachusetts Institute of Technology, describes cyberspace as an invitation to architects. Mitchell notes: “This new settlement will turn classical categories inside out and reconstruct the discourse in which architects have engaged from classical times until now. The task awaits its Hippodamos.”

So far, of course, few architects have inhabited these virtual environments. Hollywood’s mesmerizing images of so-called virtual reality reflect more the fantasies of the moviemakers than the current state of the art. The technology available today for architecture firms unable to make Disney-scale capital investments is relatively modest. Nevertheless, those practitioners who are willing to settle for less than photographic-quality imagery are learning to exploit the technology for practical, professional purposes.



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The expression “virtual reality” refers to a collection of technologies that help participants pretend they are moving through a simulated space. These technologies include a 3D CAD model with enough detail to suggest realism; a display that simulates stereo vision or a wide field of vision; a computer, or several in tandem, fast enough to generate a new perspective 10 to 30 times per second; a controller, such as a mouse, data glove, or full body suit, that senses the participant’s movement and position; software to translate that movement into a redefined view of the CAD model; and stereo sound.

Moving through space

In theory, the combined effect of these technologies gives participants the impression that turning the head enables them to “look” around and that moving the controller allows them to “walk” through the model. In reality, the effect is not convincing. Even the most powerful computers cannot provide both high resolution and an image regeneration rate fast enough to simulate a smooth movement through a convincingly complex 3D model. As a result, most virtual reality displays are simplistic and jerky. Moreover, the slight delay between movement of the controller and the regenerated perspective often gives an impression of sluggishness. Operating the controller may seem unnatural, and head-mounted stereo displays tend to be heavy, awkward, and inadequately calibrated to accommodate individual differences. Head-

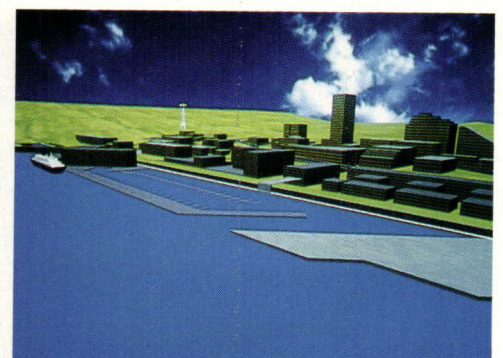
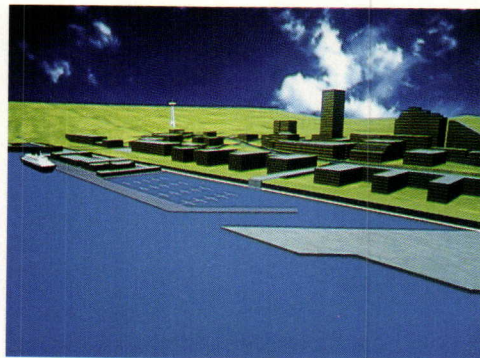
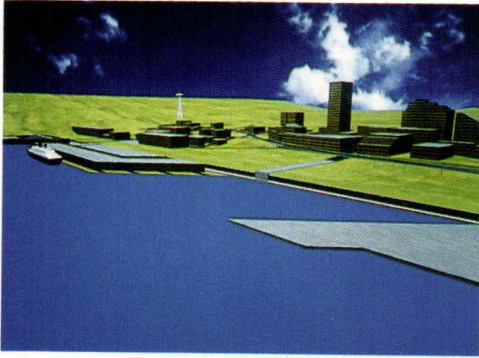
aches, nausea, and loss of balance may result after only a few minutes.

For architects, the most important drawbacks may be that the headgear tends to preclude group participation, and existing software tools do not facilitate effective design manipulations. The architect can walk through the model and see portions of the design that need changing, but the changes must be implemented with conventional CAD.

Navigation by wheelchair

One of these limitations, the awkwardness of the controlling movement through a space, has been overcome ingeniously with a set of technologies known as Wheelchair VR. The Chicago firm of OWP&P Architects has teamed up with software developer John Trimble, of Prairie Virtual Systems, to test accessibility in a hospital under design. The participant sits in a wheelchair mounted on rollers, which, like the sensors in a mouse, communicate the chair’s “movements” to the computer, which generates a corresponding image to simulate motion.

According to OWP&P architect Daniel Cinelli, even someone who has never used a wheelchair before adapts to this means of “locomotion” very quickly and easily. “When both wheels move forward,” Cinelli explains, “you feel like you’re moving straight through the space. Or you put more pressure on one wheel to turn. This is actually more intuitive than moving a mouse, so it helps you think you’re really there.”



Moreover, sitting in a chair avoids the common problem of loss of balance caused by restricted vision, so the wheelchair is also effective as a navigation device even when accessibility is not the issue under investigation. Participants can predict fairly accurately whether doorways are wide enough, view windows are low enough, and interior view angles allow privacy between patient rooms. Although there is no tactile feedback associated with narrow doorways, the viewer's perception of "banging" elbows is strong enough to provide the feedback the architects need.

Cinelli is more enthusiastic about the potential of the technology than he is concerned about its limitations. "When you first put on a headset," he admits, "the images appear fuzzy and strike you as a poor substitute for a scale model. But after a few minutes your eyes adjust and, more importantly, so does your brain. By not letting your eyes expect realism, your brain fills in the blanks."

Virtual worlds

Another approach to immersion is being developed by Worldesign, a Seattle design firm and software developer that models environments it calls "virtual worlds." The company is developing technologies that will enable architects and planners to experience complex urban sites and communicate their ideas to a lay audience. Worldesign has introduced the Virtual Environment Theater™, or VET™, as a substitute for the awkward, isolating headgear usually associated with virtual reality.

The VET is a small chamber that houses up to a dozen people at once. Animated images of a 3D model are projected on three sides, thus filling a 270 degree field of vision. Audio speakers mounted on each wall create an acoustical surround. High-resolution images are generated by networked workstations, one for each screen. One person navigates through the 3D environment by manipulating a controller while all participants are unencumbered, free to discuss what they see and suggest paths to the navigator.

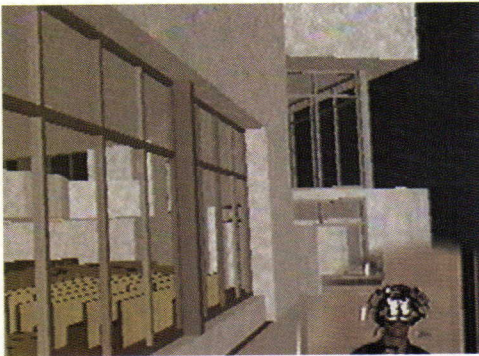
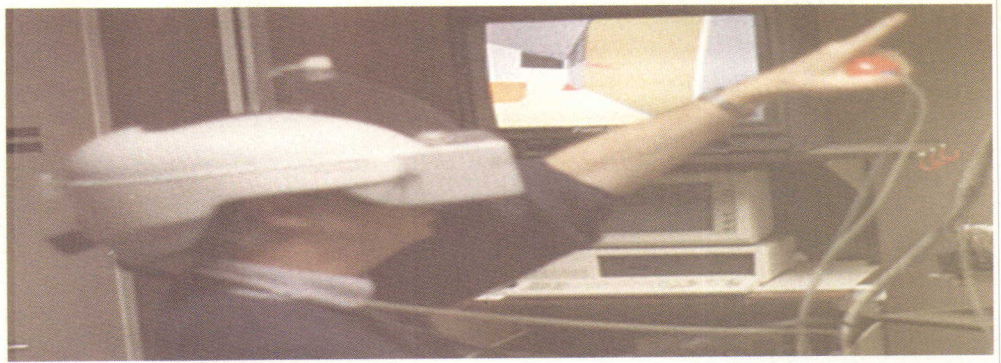
Worldesign has recently developed models of the Port of Seattle's proposed waterfront expansion. Each of the five alternatives, designed by Seattle architect Hewitt Isley, can be virtually driven through or flown over. In contrast to the port's voluminous environmental impact statement in book form, this display makes views and other issues instantly understandable to citizen reviewers.

Urban planner and Worldesign President Robert Jacobson does not call these virtual ports "simulations." He explains: "Simulations give the impression that the knowledge they convey is total and correct. But virtual worlds communicate complex situations. They should breed skepticism about certitude and provide a strong comparative lesson in alternate solutions to problems." Preliminary work on Worldesign's models of the port alternatives was supported by the U.S. Department of Defense Advanced Research Projects Agency. If the project continues to be funded, the models will grow to include representations

FACING PAGE, TOP LEFT: Participants in Worldesign's Virtual Environment Theater™ (VET™) are surrounded by projection screens on three sides.

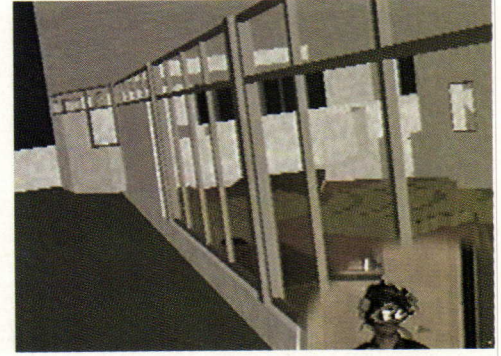
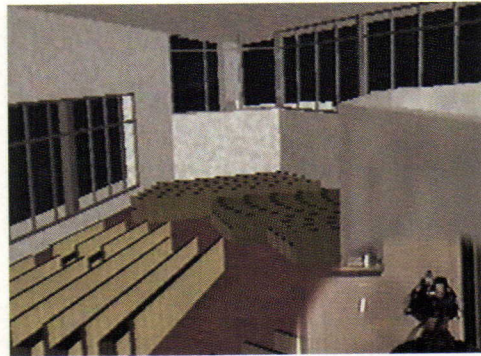
FACING PAGE, TOP RIGHT: One of the six design alternatives for the Port of Seattle is displayed in the VET. A menu allows viewers to request diagrams and statistics about environmental effects.

ABOVE, LEFT TO RIGHT: Animated, interactive computer images in the VET create a feeling of immersion in the environment. Architects and planners in the VET can simulate walking through or flying over the city to view the design alternatives from any perspective.



ABOVE AND FACING PAGE: Richard Zobel, of North Carolina State University (NCSU), shown in his helmet in the lower right of each image, “walks” through his model of Our Lady of Lourdes Church, designed by NCSU architecture professor Roger Clark. Zobel’s hand gestures control the movement through the spaces, the manipulation of objects, and the scaling up or down of the model.

FACING PAGE, LEFT: Large arrow superimposed on the image indicates direction of Zobel’s movement within the simulated space.



of economic growth, traffic patterns, water runoff, and noise pollution.

Worldesign also has plans to create virtual design environments in which architects can change as well as view the projected model. Jacobson notes: “We want to make it easier to design habitations and enable architects to share an appreciation for these designs with those they serve.” So Worldesign has developed RealityWorks® software, allowing architects with sufficiently powerful equipment, though not necessarily a VET, to create and operate their own virtual worlds.

The company is also beginning to collaborate with a large construction firm, a leading developer of software for electric utilities, and a major geographic information system software developer to create methods for the graphic representation of complex data. For example, a planner will be able to “drive” through a neighborhood and examine housing that has been color-coded to represent certain census measures.

Jim Rothwell is Principal of Information Systems at the Callison Partnership, a Seattle architecture firm that has been producing state-of-the-art computer animation for several years. Rothwell is impressed with Worldesign’s technology, although he believes its cost puts it out of reach for architects. “But it’s only a matter of time,” Rothwell concedes, “before *Jurassic Park*-quality animation will be within our reach.” Even when the technology is more accessible, he predicts, the effort required to produce re-

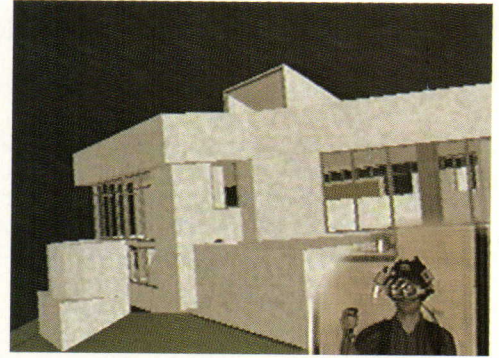
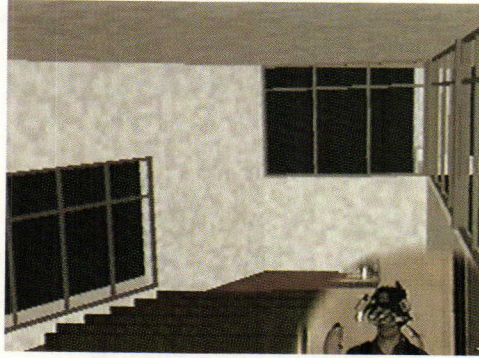
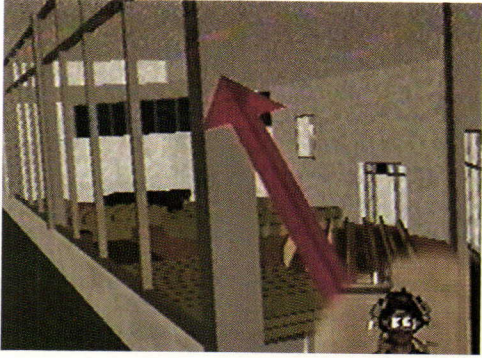
alistic detail will make this a medium more suitable for client presentations than for in-house design discussions. “Among ourselves,” he says, “we can communicate in simple sketches. This technology will become more important when we start talking to clients about materials, colors, and spatial qualities.”

Although he too is concerned about the current high cost of the technology, Daniel Cinelli is enthusiastic about how it can help in his area of interest, design for the elderly. “You can simulate different impairments throughout an aging cycle,” he explains. “For example, you could modify the display to mimic the effects of glaucoma, then test whether there’s enough contrast between the floor and wall for an elderly patient.”

Virtual environments for design

Many experts enthuse about how virtual reality will revolutionize design processes, but no one has yet devised software that facilitates architectural design manipulations within immersive environments. Because the technology is still relatively crude, it is often difficult enough just to navigate through a virtual space, let alone manipulate one. For example, when both movement and manipulations are controlled by a single data glove, remembering the right moves can interfere with the architect’s focus on design. Good design software that supports that focus will signal a major breakthrough.

This is the goal of Richard Zobel and his colleagues at the Virtual Environments Labo-



ratory at North Carolina State University's School of Design. Zobel has been studying the latest in hardware and software technology and, while acknowledging its primitiveness, believes that it compares favorably with traditional media in synthesizing an experience of walking through a real space. "The next step," he says, "is to create a set of tools that will assist in the design process. We need to understand more about how space is perceived and what it means to design at full scale and in three dimensions instead of two."

Zobel has been working with design software created by computer scientists at the University of North Carolina at Chapel Hill. Although this software is a good first step, it is not ideal for architects. "The most important quality for software," Zobel remarks, "is that it be immediate and intuitive; otherwise, design will be a struggle." Also, the medium must reflect an architectural understanding of the experiential qualities of a space. "It is vital to the profession of architecture," Zobel concludes, "that architects get involved in this research and join the teams working to define the next generation of design tools."

One architect who envisions future design environments is Douglas MacLeod, program director of computer applications and research at The Banff Centre, in Alberta. Although MacLeod works primarily with artists, he has intriguing ideas of how technology will aid architects. He predicts: "An architect will walk into an empty space and, through gesture and voice, say, 'I want to put

up a wall that runs from here to here.'" The wall will appear instantly in three dimensions. MacLeod also imagines that geographically remote architects and engineers will meet in virtual space and work together without drawings. He asserts: "The whole design will be done in three dimensions, collaboratively, and interactively."

Experiments in virtual environments

Over the past 20 years, a dismaying proportion of technology has been dedicated to violent "games." In contrast, some of the most innovative experiments in virtual environments are being conducted by artists in developing spaces for imaginative play. At The Banff Centre, artists Rachel Strickland, Brenda Laurel, and others have created Placeholder, an exploration of new types of electronic entertainment. Their "place" was inspired by the natural environment around Banff and by Chinese landscape painting. Their virtual environment incorporates mythical creatures, sounds from nature, and representations of characters and actions.

Although Placeholder is not architectural, its creation of a sense of place suggests great potential for design exploration. MacLeod points out that virtual reality could offer a solution to the employment crisis in the profession. He observes: "There are countless virtual reality environments that need to be designed, whether for entertainment, education, or workspaces. Who better to design them than architects?"—*B.J. Novitski*

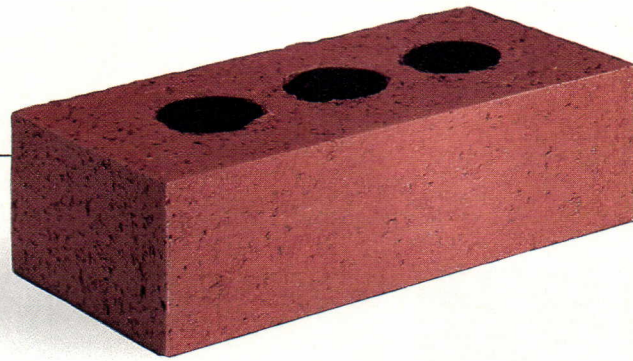
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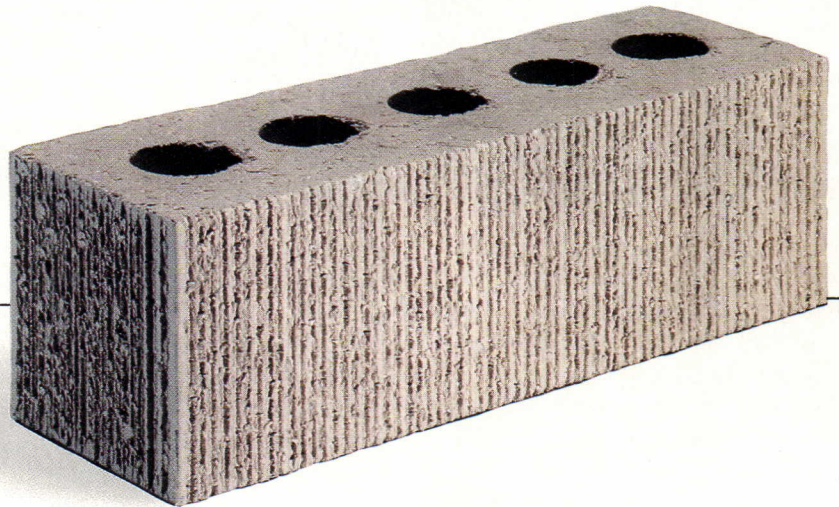
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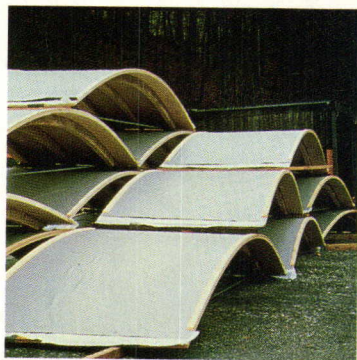


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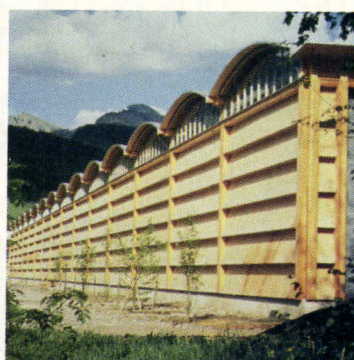
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Austrian Develops Modular Roof

A new modular wood roof system, designed by Austrian wood product manufacturer Anton Kaufmann and Swiss engineer Konrad Merz, combines loadbearing capacity and a protective cover in one gracefully curved form. This "bubble" roof was originally developed for Kaufmann's company warehouse and has since been installed atop other warehouses, several factories, and a grandstand in Austria.

The structure relies on a series of arched shells held in place by steel bars tensioned on site. The arches, formed from engineered-wood panels and stiffening ribs, are prefabricated by Kaufmann from engineered lumber supplied by Boise, Idaho-based Trus Joist MacMillan. This engineered lumber company typically produces sheets, or billets, of wood panels measuring 8 feet wide, 35 feet long, and 1 inch to 5 1/2 inches thick, which are then resawn into smaller dimensions. In the case of the bubble roof, the individual shells are formed by flexing a full 1 1/2-inch-thick billet, thereby eliminating any waste due to cutting.

The prefabricated shells are stacked and delivered to the site by truck. They are lifted onto columns by crane, braced by steel bars, and attached to one another by several techniques, including connecting strips of plywood. Once in place, each shell spans approximately 33 feet. Polystyrene insulation and a polyethylene membrane can be installed on top, following the curved profile.

Patented by Kaufmann, the bubble roof is not marketed in the United States, although the Austrian manufacturer and Trus Joist MacMillan are willing to work with any architect who is interested in the system. The bubble roof has yet to be tested in this country, however.

"Building codes should not be any more discriminatory against this system than any other wood system," maintains Art Schmon, general manager of European operations for Trus Joist MacMillan.

Schmon reports that the bubble roof is suitable for any application that is appropriate for the American Plywood Association's panelized roof assembly, also known as the Berkeley System, composed of glulam beams and plywood panels. The bubble roof, designed to withstand severe wind and snow loads (in excess of 100 pounds per square foot), is ideal for warehouses and certain industrial buildings because of its capacity for large spans. According to Schmon, the system is priced competitively against steel and other wood systems, and it takes less time to erect than conventional methods—10,000 square feet can be erected in a day, notes engineer Merz.—*Katherine K. Chia*

New Insurance Program Targets Smaller Firms

Seventy-three percent of smaller architecture firms practice without liability coverage, which is a scary way to manage risk—to build and pray. Most principals who don't buy insurance cite high premiums as an obstacle, combined with low coverage for the cost. CNA/Victor O. Schinnerer & Company, the AIA's "commended" insurance carrier for architects, recently launched a program to help cover firms with annual billings below \$250,000 and a good insurance history.

Backed by the AIA Trust, CNA/Schinnerer's small-firm program offers a three-year policy with a guaranteed price and a cap on rate increases. Premiums start at \$1,000 per year; a minimum deductible of \$1,000 per claim will apply only to

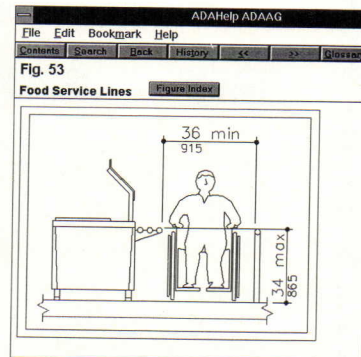
indemnity payments, as CNA will cover the policyholder's defense costs. Liability limits go up to \$1 million per claim and/or per year. Some firms can cover previous work with the policy and take part in CNA's profit-sharing program.

CNA's small-firm policy will not allow additional limits for individual projects, although project insurance is available separately. Twenty-four states have approved Schinnerer's small-firm plan, and the insurer has applications filed in the remaining states. Call Schinnerer & Company at (800) 762-5534.—*B.A.M.*

Software Assists ADA Compliance

Architects frustrated with navigating the voluminous Americans With Disabilities Act (ADA) should consult a new software version of the law. ADAHelp, from Kelley Computer Software, is a stand-alone Windows application that also works in conjunction with AutoCAD Release 12 and most other Windows programs. It contains the complete text of the *ADA Handbook*, including Public Law 101-336, the Accessibility Guidelines, and the regulatory provisions in Titles 1 through 5. Also included are final guidelines and rules that were not part of the original handbook as well as a resource listing of related organizations.

One can search for specific material and cross-reference related sections. Architects can add their own notes to the text and mark passages for easy retrieval. Regular updates will be available. For more information, call Kelley Computer Software at (206) 696-2690.—*B.J.N.*

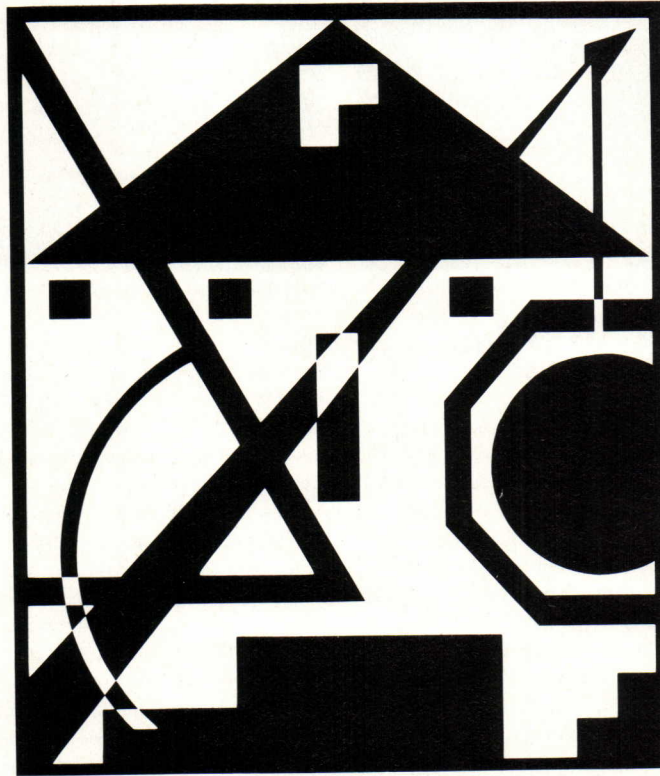


ABOVE: One of 56 available graphics in ADAHelp's ADA Accessibility Guidelines illustrates clearances for accessible food service lines. These graphics can be copied directly into CAD drawings or printed out for reports.

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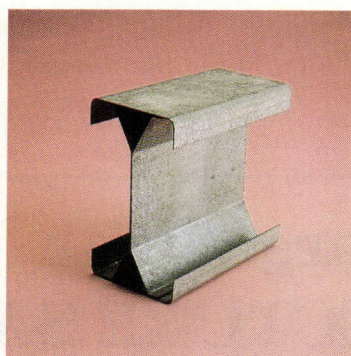
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Products

Engineered lumber and steel members offer alternatives to conventional framing systems.



TOP: From brilliant yellowheart to dark mahogany, flooring from International Hardwood Flooring (IHF) is 100 percent solid wood, not laminated, veneered, or stained. The company's more than 30 imported woods allow architects to exploit a variety of colors and textures. Standard flooring thicknesses range from 1/2-inch-thick strips to 3/4-inch-thick planks; standard widths range from 2 to 5 inches. IHF will custom-mill any size. Moldings, baseboards, treads, risers, handrails, countertops, cabinets, and doors are also available from IHF.
Circle 401 on information card.

ABOVE: Georgia-Pacific residential framing products include I-beam joists, laminated veneer lumber, and glue-laminated beams. Manufactured from kiln-dried veneers that resist shrinking, warping, or splitting, engineered lumber is purportedly stronger and performs more consistently than dimensional lumber. Appropriate for residential roof and floor systems,

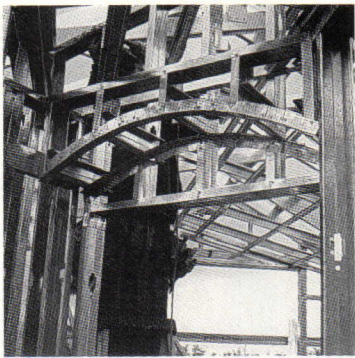
wood I-beam joists require up to 50 percent less wood fiber than conventional beams; laminated veneer lumber utilizes 30 percent more of a log than solid lumber. The company's glue-laminated beams and headers are available in lengths up to 60 feet.
Circle 402 on information card.

ABOVE: LBN Corporation has introduced Light Beam, a lightweight, cold-rolled-steel beam capable of spanning 75 feet without bracing. Designer Rammi Navon developed the system with Los Angeles-based engineers S.B. Barnes Associates. Precut members do not require on-site welding; structural beams and joists are assembled in the field with bolted connections. The members range from 8 to 30 inches in depth; an automated fabrication process allows custom sizes.
Circle 403 on information card.

TOP RIGHT: FiberBond wall sheathing from Louisiana Pacific combines cellulose fiber and gypsum in a reinforced

panel designed for interior and exterior use. Fire- and moisture-resistant, FiberBond is purported to be stronger and more stable than competitive gypsum sheathing. Panels may be installed over wood or steel framing systems; spaced 16 or 24 inches on center; and fastened by nails, staples, or screws. FiberBond sheathing is available in 1/2 or 5/8 inch thicknesses.
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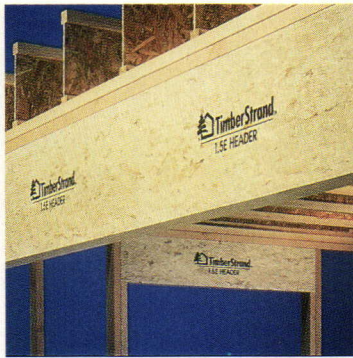
ABOVE: A new fiber-reinforced laminated beam from American Laminators challenges traditional wood framing methods. A composite of adhesive, wood, and plastic, the FiRP glulam beam replaces the tensile laminate layer of glulam beams with a high-strength, fiber-reinforced plastic. Developed by Canadian engineer Dan Tingley, FiRP beams feature smaller cross sections and are capable of longer spans than other laminated-wood beams, making them more competitive in steel framing markets.
Circle 405 on information card.



Residential steel framing

California Building Systems, a subsidiary of Angeles Metal Systems, offers a complete line of residential light-gauge-steel framing products, including studs, joists, trims, and fasteners. Steel members are lightweight, fire-proof, stable, and corrosion-resistant. Studs are spaced 16 to 48 inches on center in the company's Galva-Frame system (above) and may be clad in stucco, wood, brick, siding, and other materials.

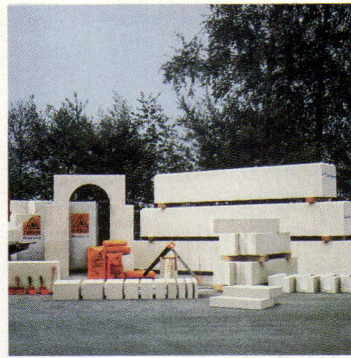
Circle 406 on information card.



Laminated wood

TimberStrand laminated lumber from Trus Joist MacMillan is engineered from aspen and poplar trees. The company's steam injection process utilizes up to 75 percent of a log. Pressed into massive blocks measuring 35 feet by 8 feet and 5 1/2 inches thick, the engineered lumber can be cut to exact specifications. Ideal for short-span beams, the TimberStrand LSL Header (above) reduces twisting and shrinkage.

Circle 407 on information card.



Lightweight concrete

Hebel USA manufactures aerated concrete building products (above), including 4-, 8-, and 10-inch units; roof panels; stairways; U-shaped blocks; and lintels. An alternative to wood or steel frame, these products are manufactured of sand, cement, lime, and an aerating agent. At one-fifth the weight of standard concrete, Hebel USA's aerated concrete is purported to be energy efficient, durable, and virtually fireproof.

Circle 408 on information card.



Corner window

Traditional wood framing and mitered glass create the distinctive profile of the CornerView window by Pella Corporation (above). Inspired by Frank Lloyd Wright's 1911 house in Spring Green, Wisconsin, the CornerView is available in a wood or aluminum finish. Constructed of 5/8-inch clear insulating glass, it is available as a 36-inch-square, a 30-inch-by-48-inch, and a 30-inch-by-60-inch window.

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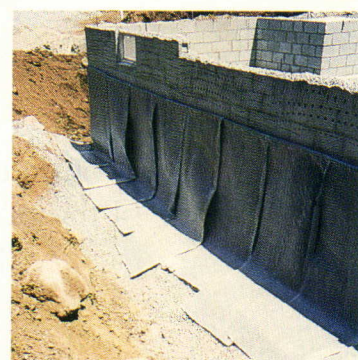
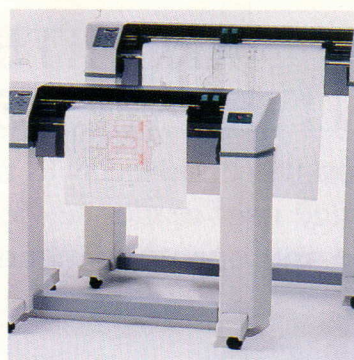
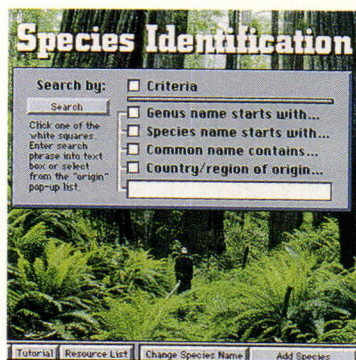
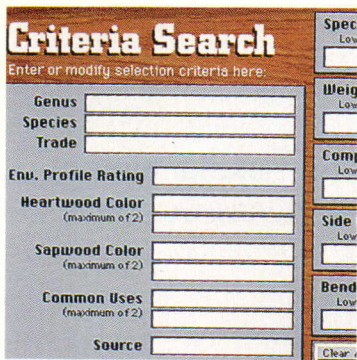
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Wood species software

Tree Talk, a Vermont-based non-profit educational organization, has developed Woods of the World, a database cataloging over 800 of the world's wood species. Designed in cooperation with New York architect William McDonough, the program assists architects in the specification of environmentally sensitive woods. Architects enter structural information in five fields: grid, column, beam, joist, and load. The software searches for matches to user-defined

criteria (above left) and compares up to nine species simultaneously (above). Properties such as color, texture, grain, compression strength, and sawing and planing characteristics are distinguished, and a high-resolution image of each type of wood is displayed. The software is available in both Macintosh and IBM-compatible versions. Tree Talk includes a CD-ROM player, which requires less hard-disk space and displays higher resolution images. *Circle 410 on information card.*

Wide-format plotters

Two new plotters unveiled by Summagraphics this summer represent the company's first contributions to the large-format inkjet plotter market: the D-size SummaJet 2C color inkjet plotter (foreground) and the E-size SummaJet 2M wide-format monochrome inkjet plotter (background). The color plotters feature interchangeable tricolor and black ink cartridges and provide eight primary and 1 million secondary colors. *Circle 411 on information card.*

Basement protection

Enkadrain drainage control matting from Applewood Construction is an inexpensive safeguard against basement leaks. A lightweight alternative to gravel, Enkadrain features a flexible, nonwoven fabric surface bonded to a nylon core and easily handles corners and surface irregularities. Appropriate for foundations, retaining walls, and roof gardens, Enkadrain is manufactured in 39-inch-wide rolls, 100 feet long. *Circle 412 on information card.*

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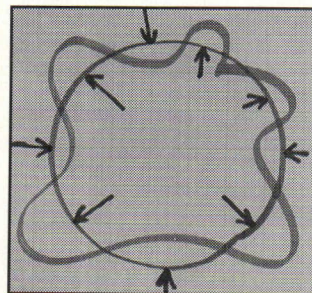
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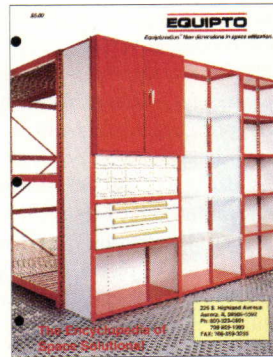
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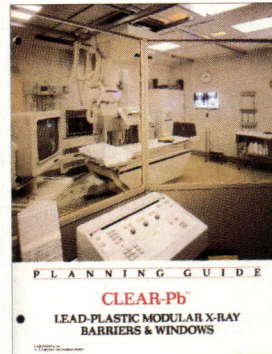
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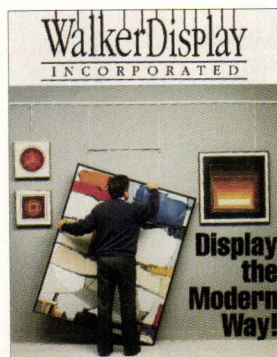
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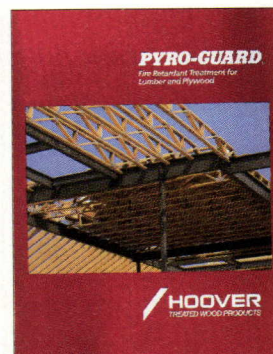
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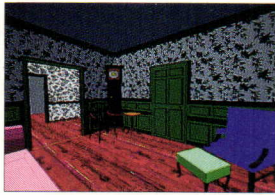
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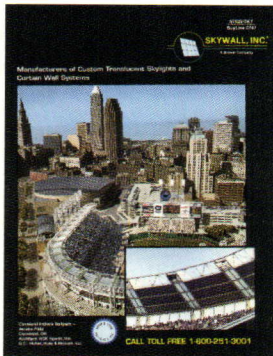
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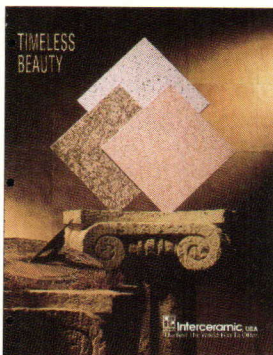
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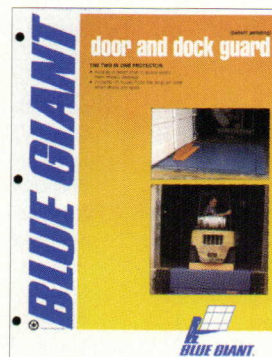
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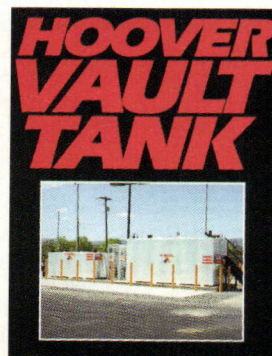
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TWO IN ONE PROTECTOR—The latest BLUE GIANT innovation in loading dock equipment is the "DOOR AND DOCK GUARD." It is an integral part of the dock leveler and acts as a stop to protect overhead doors from impact damage. Danger to lift truck operators from the drop off zone created when overhead doors are left open is also reduced. Blue Giant Equipment Corporation, One Industrial Park Dr, Pell City, AL 35125, Phone 800-USA-BLUE or Fax 205-884-1504. **Circle 41.**

Hoover Containment Systems, Inc.



Aboveground Fuel Storage—Approved for aboveground storage of flammable and combustible liquids, 2-hour fire-rated Hoover Vault Tanks consist of a rectangular steel inner tank, 6" of lightweight concrete, and 360 degree outer steel secondary containment. Vault Tanks meet NFPA-30 and 30A, UFC-79-7, UL/Canada and UL-2085 PROTECTED. Vault Tanks feature \$22 million product liability insurance. Lifetime maintenance-free fiberglass exteriors available. **Circle 45.**

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EDITORIAL OFFICE

1130 Connecticut Avenue, N.W., Suite 625
Washington, D.C. 20036
(202) 828-0993

EXECUTIVE OFFICE

994 Old Eagle School Road, Suite 1010
Wayne, Pennsylvania 19087
(610) 254-9800

Robert Hoover Production Director
Barbara Falk Circulation Manager
Nancy A. Perri Assistant to the Publisher
Robert G. Kliesch Publisher

ADVERTISING SALES OFFICES

New York/Connecticut (610) 935-8522
D. Douglas Johnson
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PA/VA/MD/New England (610) 254-9800
George T. Broskey, Eastern Sales Manager
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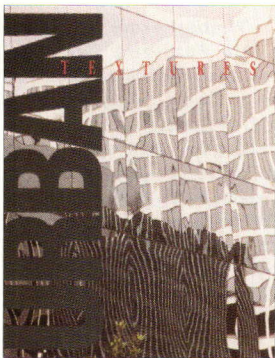
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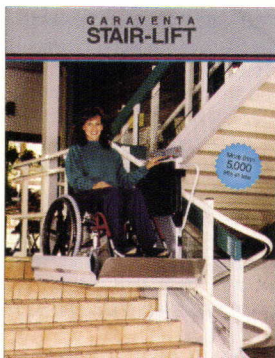
Mohawk Commercial Carpet



Urban Textures Brochure—A collection of coordinating patterns and solids from Mohawk Commercial Carpet and AlliedSignal Fibers. A wide variety of commercial carpets—from solid color cut piles to graphics and wovens. The brochure features photographs of the carpets paired with the Urban Textures which inspired them. MOHAWK COMMERCIAL CARPET, 800-618-1234.

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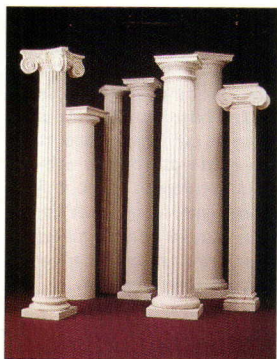
Garaventa (Canada) Ltd.



New Stair-Lift Brochure—If you've been wondering why the Garaventa Stair-Lift is the first choice of building owners around the world, get a copy of our new brochure. It'll spell out the reasons why Garaventa is the world's most popular stairway access solution. It's more attractive, durable and reliable, and safer and easier to use than any other platform lift. Quite frankly, Garaventa is the best value. Call today: 800-663-6556 or 604-594-0422.

Circle 51.

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Color brochures feature wood, fiberglass, polyester, E.P.S., stone and marble columns. Variety of sizes and styles. Round, square or octagonal with plain or fluted shafts for commercial or residential and interior or exterior application. Job site delivery. Largest selection anywhere. CHADSWORTH . . . The Column Source for one-stop shopping. For catalog (800) 486-2118. Sales (404) 876-5410. Free brochures.

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Circle 59.

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Schluter Sytems Offers A Planning Data Booklet—A 22-page guide with 28 construction diagrams and pertinent comments on exterior installations of ceramic tile and natural stone. Schluter®-TROBA, a water drainage system, and other waterproofing systems are featured in the booklet. This FREE guide offers architects, engineers, and planners assistance in providing the proper specification on exterior installations. For additional information, call Schluter®-Systems at 800-361-3127.

Circle 49.

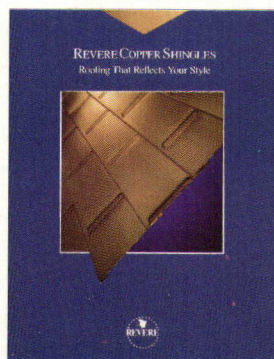
Louisiana-Pacific



Louisiana-Pacific Nature Guard insulation costs less than fiberglass and has a 3.8 R-value per inch—higher than any blown-in fiberglass or rockwool on the market. Its fluffy, natural fibers completely seal the wall cavity, resulting in lower air infiltration and greater sound absorption. Made from 100% recycled newspaper, it helps keep our environment cleaner.

Circle 53.

Revere Copper Products



Revere Copper Shingles are quicker and easier to install than ordinary asphalt shingles. There are no special skills required and no special tools. Because Revere shingles are manufactured from solid copper, not a foil laminate, they will likely last as long as the building they protect. To learn more about our copper shingles, or any of our other copper products, call us toll-free at 800-490-1776.

Circle 57.

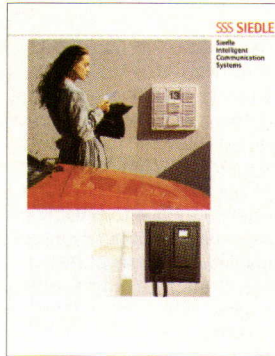
INTERIOR SYSTEMS — LA CROSSE



Arkidecture Funscapes is the newest addition to **Interiors Systems' Signature Series**. The Arkidecture collection uses a unique computerized cutting system to produce standard and custom acoustical ceiling tile designs for schools, children's clinics, hospitals, daycare centers, retail stores. Use single or multiple panels with any design, logo, or color. Call 1-800-782-0070.

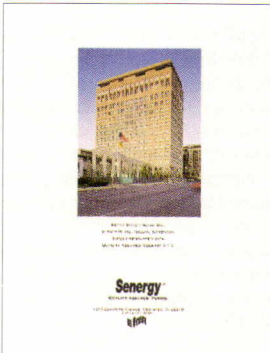
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Siedle



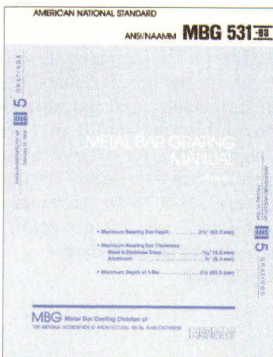
Siedle Intelligent Communication Systems—Featuring Siedle Vario® Intercom Lobby Units—Video Security for apartments, residences, and offices . . . Easikey, the Intelligent Key—Letterbox System—and the System telephone HT 611-01—the fastest way to the house door and around the house, complete with watchdog, doorman and nameplate. For full catalog, set up information and architecture specs, call toll free 800-874-3353 or 215-353-9595.
Circle 79.

Senergy Inc.



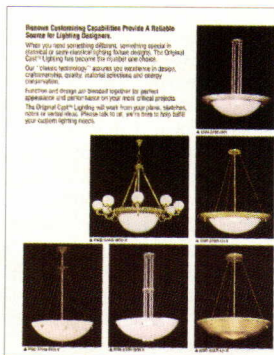
Senergy Inc. has introduced a new exterior insulation and finish system (EIFS) designed for situations requiring performance that exceeds conventional EIFS standards. This brochure outlines the unique program of materials, upgrades, design review, field support, and quality assured application which ensure the high performance. SENERGY INC.
Circle 83.

NAAMM



Revised Metal Bar Grating Manual from NAAMM—Metal Bar Grating Manual, Fifth Edition, 1993, ANSI/NAAMM MBG 531-93. Includes current technical data on bar gratings and stair treads of steel, stainless steel and aluminum. Load tables are based on design formulas found in MBG Engineering Design Manual, which discusses the procedures used in the design of grating. Manual includes metric equivalents using the modernized metric system from ASTM E380.
Circle 87.

The Original Cast Lighting Inc.



The Original Cast Lighting's "classic technology" assures you excellence in design, craftsmanship, quality, material selections and energy conservation. Function and design are blended together for perfect appearance and performance on your most critical projects. The Original Cast Lighting, 6120 Delmar Blvd, St. Louis, MO 63112, 314-863-1895, FAX 314-863-3278.
Circle 91.

Horton Automatics



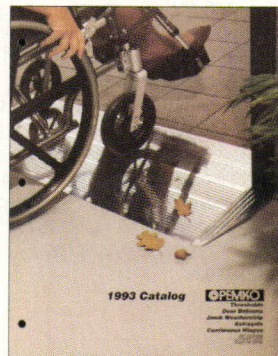
Pushing a Switch Automatically Opens the Door. EasyAccess™ Series 7000 swing door operator makes complying with ADA 1990 barrier-free entrance mandate "readily achievable" and "easily accomplishable...without much difficulty or expense." EasyAccess turns most ordinary doors into affordably priced, automatic, barrier-free entrances for the physically disabled. Horton Automatics, 4242 Baldwin Blvd, Corpus Christi, TX 78405, 1-800-531-3111.
Circle 81.

Truebro



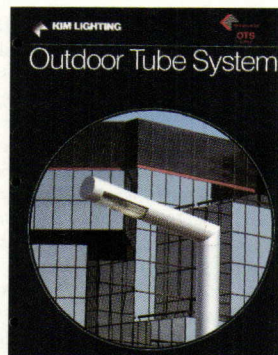
Insulation protects wheelchair users from hot pipes. Available in kit form, *Handi Lav-Guard®* insulation thoroughly covers waste and supply lines under "accessible" lavatories to cushion and shield wheelchair users' knees from touching hot or abrasive piping. Universally sized for new construction or retrofit. Aesthetically pleasing. Meets Disabilities Act requirements.
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Pemko Manufacturing Co.



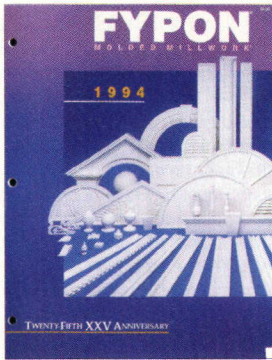
Weatherstrip/Thresholds/Continuous Hinges. Pemko's full-line catalog illustrates a broad line of weatherstripping and threshold products. Pemko offers many fire labeled, smoke labeled, barrier-free access, sound tested, and custom fabricated products. New products include: ADA compliant ramp threshold assemblies, Pemko-Hinge™ continuous geared aluminum hinges, non-handed reversible automatic door bottoms, a series of locking astragals, and smoke-labeled gasketing. Call (805) 642-2600; toll-free (800) 283-9988.
Circle 89.

Kim Lighting



The Outdoor Tube System will give any city a progressive, forward-looking image. It is the ultimate expression of simplicity combined with performance, and includes all the installation and maintenance features required in a roadway lighting system. As a single mount, the OTS provides excellent street lighting from a curbside location. For streets with a median strip, the dual mount provides complete illumination with fewer poles and simplified underground wiring.
Circle 93.

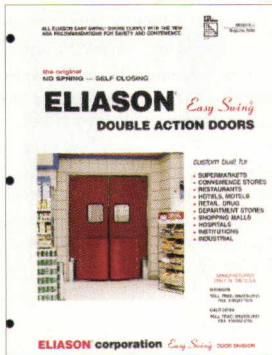
Fypon, Inc.



FYPON, Inc. is the manufacturer of over 3,000 millwork items made in the exclusive Molded Millwork® process. It is made from high density polymer, will not rot and is virtually maintenance free. New for 1995 are poly-steel columns. They have the strength of steel, the durability of polymer and are available in different diameters and styles. Call or write FYPON, Inc., 22 W. PA. Ave., Stewartstown, PA 17363, 1-800-537-5349.

Circle 95.

Eliason Corporation



ELIASON EASY SWING Double Action Doors. Complete specifications and new 1994 price information is currently available from Eliason. Color illustrations and technical data on all Easy Swing doors make this catalog a must for all technical reference files. A light nudge opens the door with automatic self closing. Catalog is free and doors are sold direct. Eliason Corporation, P.O. Box 2128, Kalamazoo, MI 49003.

Circle 99.

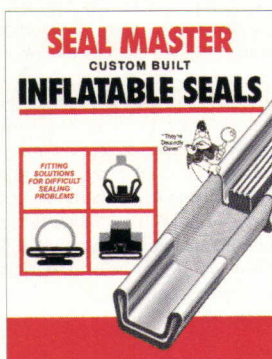
EIMA



The EIFS Industry Members Association (EIMA) has published a generic EIFS Class PB Details Manual, revised guideline specifications, and quality standards brochure. These new materials represent EIMA's commitment to providing updated technical information about EIFS to building professionals. For a copy of these publications, contact EIMA at (813) 726-6477 or FAX (813) 726-8180.

Circle 103.

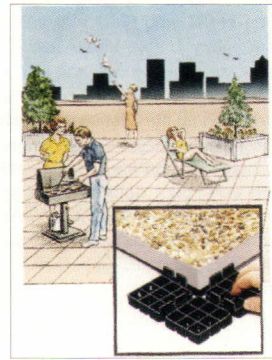
Seal Master Corporation



SEAL MASTER INFLATABLE SEALS—New six-page brochure shows typical inflatable seal construction, configurations, retaining systems and air connections. Custom designed seals offer solutions where gaps exist in sealing weather, liquid, noise, hot/cold, light/dark, pressure, EMI, RFI, radiation, contaminants, dust, pastes, pellets and powders. Inflatable seals are used virtually anywhere a positive seal is needed between two opposing surfaces. Design assistance available. Seal Master Corp, 368 Martinel Dr, Kent, OH 44240 (216) 673-8410, Fax (216) 673-8242.

Circle 107.

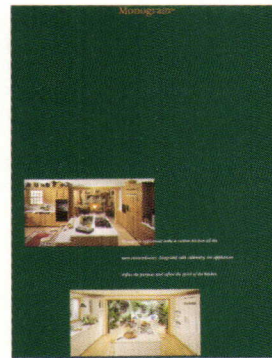
Envirospec, Inc.



Turn your roof tops into people places! New literature shows a better way to transform a roof into a patio, terrace, balcony, walk-way, plaza podium, promenade, or just plain roof deck, using the Pave-El Pedestal System. Designed to elevate, level, and space paver stones for drainage in any weather. Pave-El reliably **protects roof, paver-stone, membrane and insulation**. ENVIROSPEC, INC., Elliott Station Box 119, Buffalo, NY 14205, Phone (716) 689-8548, Fax (716) 689-7309.

Circle 97.

GE Appliances



Appliances Designed for Integration—Sleek, stylish and highly functional, the GE Monogram™ line of appliances is designed to fully integrate with the spirit of the custom kitchen. This brochure offers designers and homeowners alike a guide to the complete Monogram line of built-in refrigerators, cooking products and dishwashers, and includes information on both specifications and installation. GE Appliances, (800) 626-2000.

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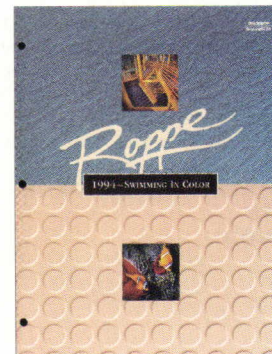
Landscape Forms, Inc.



Hyde Park™, designed by Brian Kane, combines the graceful shape of interior furnishings and the durability of powdercoated metal to create a unique bench for exterior or interior applications in heavy use areas. Specify 59" or 75" length; metal rod or wood seat, powdercoat color. Surface-mount tabs standard.

Circle 105.

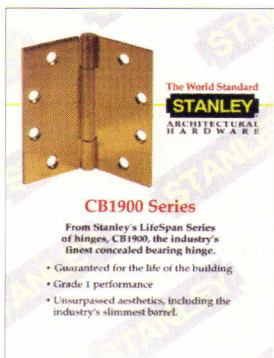
Roppe Corporation



ROPPE FLOORS—Swimming in Color. Roppe offers a full line of commercial flooring products and accessories in both rubber and vinyl. Our Match-Mates™ color selection system helps you coordinate tile, cove base, stair tread and stringers. And our new Designer's Choice is the industry's first true custom flooring system, allowing you to design an almost infinite number of patterns from 11 basic shapes. For more information, call 1-800-537-9527; or 419-435-8546.

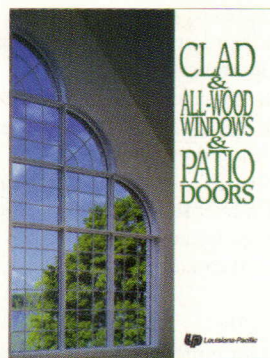
Circle 109.

Stanley Hardware



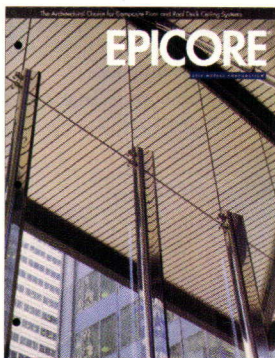
Stanley Hinges Guaranteed for Life—Stanley Hardware remains the only manufacturer with a complete series of hinges guaranteed for the life of the building. Included are gear continuous hinges, spring hinges, and detention hardware. Our CB series of concealed bearing hinges features Grade 1 performance, unsurpassed aesthetics, and the lifetime guarantee. Contact Stanley Hardware for more information on the CB series--the new industry standard.
Circle 111.

Louisiana-Pacific



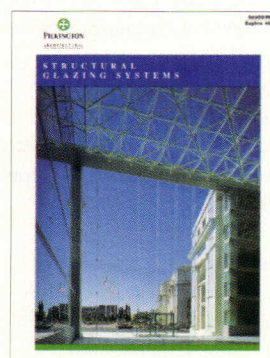
Louisiana-Pacific's wood windows and patio doors are available with three exterior finishing options: aluminum-cladding, fully-primed wood, or a high performance factory-coated finish (48 colors). Available in all the basic styles, plus complementary round-tops and custom shapes. Double insulating glass is standard. Full line of vinyl windows and doors also available.
Circle 113.

Epic Metals Corp.



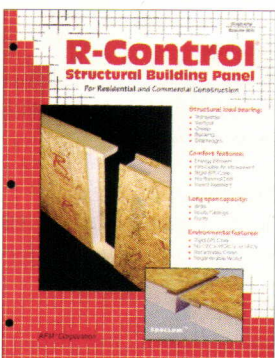
EPICORE—The Architectural choice for composite floor and roof deck ceiling systems. The EPICORE composite floor system introduced more than 25 years ago has now been developed into two more exciting systems. Send for our new 16-page catalog describing how these three EPICORE systems present you with highly functional and aesthetic structural system choices. Epic Metals Corp., Call 412-351-2018.
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W&W Sales, Ltd.



PILKINGTON STRUCTURAL GLASS SYSTEMS BY W&W—This colorful, 8-page brochure describes and illustrates Pilkington by W&W structural glass design concepts and installations that exploit the full potential of glass as a structural material. The world renowned PLANAR system offers flush glass surfaces continuously flowing in any plane and allows complete freedom in support structure design.
Circle 117.

AFM Corporation



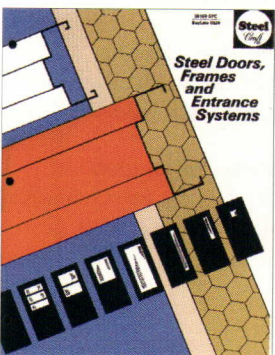
Structural Building Panels—R-Control® Panels, a strong one-piece structural system, provide superior insulation in exterior walls, roofs/ceilings, and floors. Pre-engineered lumber facings and solid EPS insulation create a monolithic structure. R-Control has passed structural and fire tests as prescribed by national building code authorities. AFM's EPS contains no CFC's, HCFC's, HFC's, or formaldehyde. R-Control is manufactured across the nation. Call 1-800-255-0176, or write AFM Corporation, P.O. Box 246, Excelsior, MN 55331.
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Kroy, Inc.



KROY LABELING SYSTEMS—MORE FEATURES, MORE AFFORDABLE. Kroy's DuraType 240 labeling system boosts your efficiency with neat, professional-looking labels you create in seconds. And now that it's priced as low as \$99 (SRP \$169) at participating dealers you have no reason to settle for less than the finest quality labeler. Call 800-733-5769 for free literature.
Circle 121.

Steelcraft



Steelcraft is the world's largest manufacturer of steel doors and frames. The catalog covers the broad range of doors and frames available. Included are insulated, embossed and entrance doors, fire rated doors and frames, retro-fit units and more. Complete product specifications in the CSI format are included plus a product selection guide.
Circle 123.

ARCHITECTURE LITERATURE PORTFOLIO UPCOMING ISSUES

ISSUE DATES	CLOSING DATES
January 1995	November 23, 1994
April 1995	February 24, 1995
July 1995	May 25, 1995
October 1995	August 25, 1995

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Did you miss valuable information offered by advertisers in last month's issue of ARCHITECTURE?

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ACCI Business Systems

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Alucobond Technologies

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American Olean Tile

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Bradley Corporation

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CRSI

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Dal-Tile Corporation

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Dow Chemical

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DuPont Antron

Find out more about Antron® nylon carpet fiber. *Circle No. 102*

EFCO

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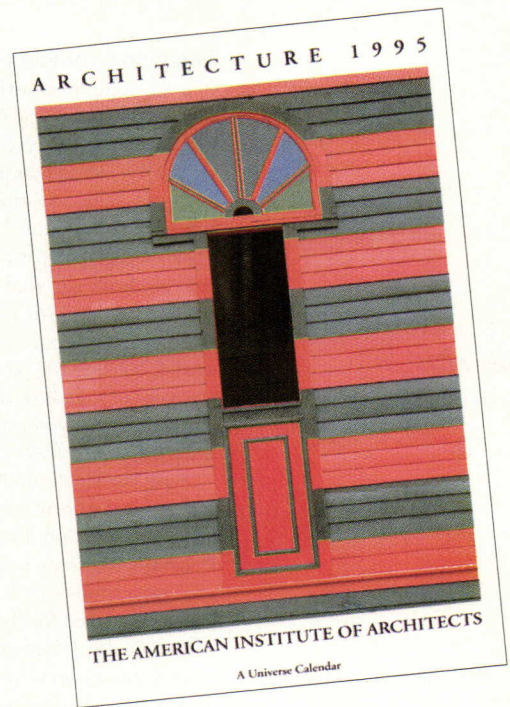
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Wood Framing

CSI Section 06110

Designing complex curves

In 1981 sculptor Martin Puryear was commissioned by the Fairmount Park Art Association to design a work for a site in Landsdowne Glen, in Philadelphia's Fairmount Park. Based on a tree house, *Pavilion in the Trees* was designed as a lattice-covered platform elevated on posts high enough to blend with the foliage of adjacent trees. Puryear made a model, crafting the lattice canopy in the form of a shallow dome by bending square basswood strips over the spherical top of a wooden fence post.

Using the small model (top right) as a guide, our firm's task was to develop construction documents for Puryear's sculpture and solve the problem of full-scale fabrication. Drawings called for the lattice members to be composed of three plies of clear heart redwood laminated into a 2-inch-by-2-inch square section (right). The spherical shape of the canopy required that each lattice member be formed in the shape of an arch. In addition, each member had to be twisted in section in order for the top and bottom surfaces to remain flush.

Fabricator Bob Taylor, of Taylor's Mill in Hockessin, Delaware, recognized the desired result would be more easily achieved if the curved lattice members were composed of nine strips laminated in a 3-by-3 array (far right). This allowed the members to take on the requisite curve and twist at the same time. By opposing the direction of the grain between adjacent plies, the effect of the grain on the behavior of the laminated member was minimized.

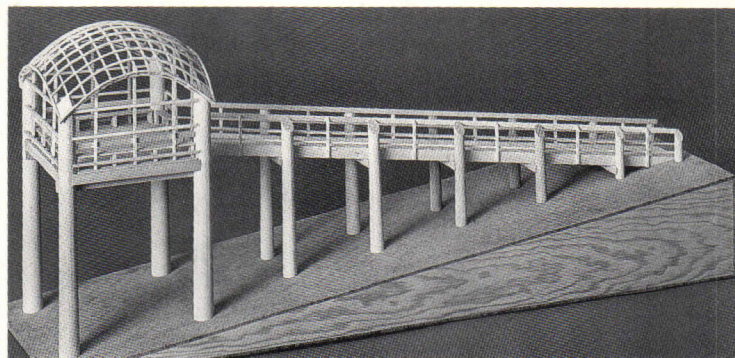
*Richard Hodge
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Philadelphia, Pennsylvania*

Metal Fabrications

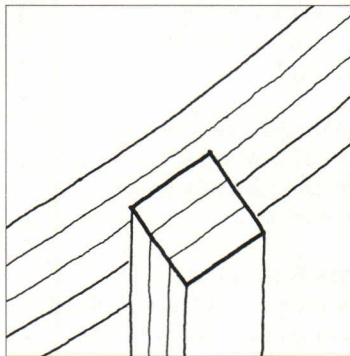
CSI Section 05500

Detailing exposed steel

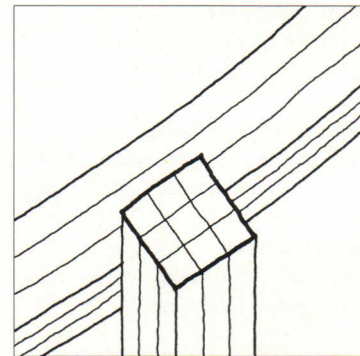
Architectural exposed steel is normally installed shortly after a building's structural frame is erected. The sequence of how this steel is attached to the frame, how pieces are connected to one another, and how other elements attach to the exposed steel must all be thought out by the architect and, ideally, reviewed by a fabricator and installer. The point is



PURYEAR SCULPTURE: Model shows latticework dome.



LATTICE DETAIL: Three-strip design.



LATTICE DETAIL: Built with nine strips.

not to dictate the construction sequence, but to understand it in order to draw details correctly.

For instance, if architectural steel goes in before sheathing systems or backup walls, it may be impossible to maintain waterproofing behind the steel. If the backup wall is completed first, it may be very difficult to connect the steel unless the connections are designed to be accessible. In the scenario with the backup wall in place, the contractor may run into conflicts trying to erect large pieces of steel with scaffolding for other trades already in place.

Architects should refer to the *AISC Manual of Steel Construction*, which defines tolerances of architectural exposed steel to be approximately half of the tolerances of structural steel. In order to approach these optimistic tolerances, provisions have to be made for connections that are fully adjustable in the field. Enlist the project structural engineer's help in designing connections that are adjustable, that accommodate building and thermal movements, and that are easy to erect quickly.

Steel pieces should be designed with the size of local galvanizing tanks in mind. Connections should be designed so that the integrity of the zinc coating is not compromised in the field by cutting and welding, especially in situations where other elements are attached to the archi-

tectural steel. The galvanizer should be made aware that exposed architectural steel is a finish element that must be watertight. The architect should approve any holes required for pressure relief of closed-off air pockets, as well as those required for drainage of molten metal during the dipping process. Any pieces whose watertightness has been compromised should be returned to the fabricator's shop to be fixed and "cold galvanized" with a zinc-rich primer.

Combinations of different steel sections are likely to warp and twist during galvanizing. Ample tolerance should be maintained around these pieces to prevent conflicts with other elements in the final construction. Temporary cross-bracing welded in place can often mitigate this problem. Specifications should include provisions for shop priming shortly after galvanizing and before the zinc has a chance to oxidize and inhibit proper adhesion of the primer.

Specifications should include provisions for surface preparation of all elements at all stages of fabrication to ensure proper adhesion of all applied coatings. Coating failures are costly, consequently, the architect should consider budgeting for constant monitoring and inspection during this important portion of the work.

*Bradley Johnson
Leers, Weinzapfel Associates
Boston, Massachusetts*

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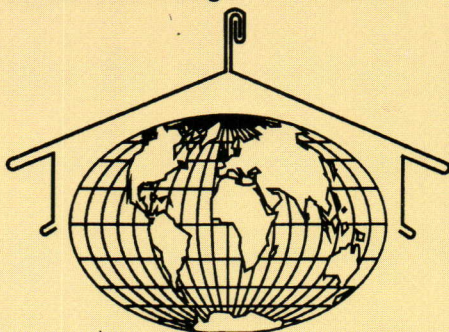


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