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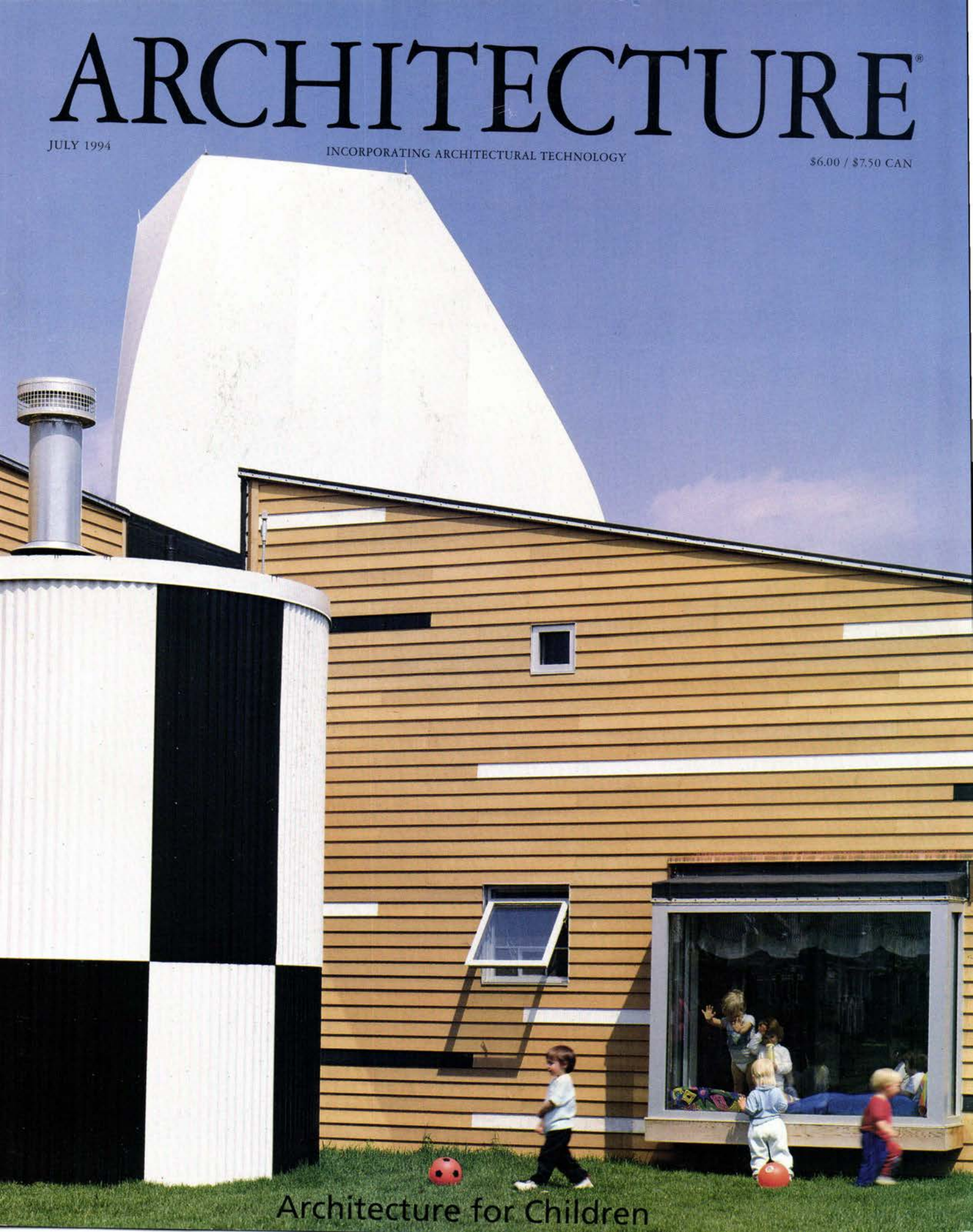

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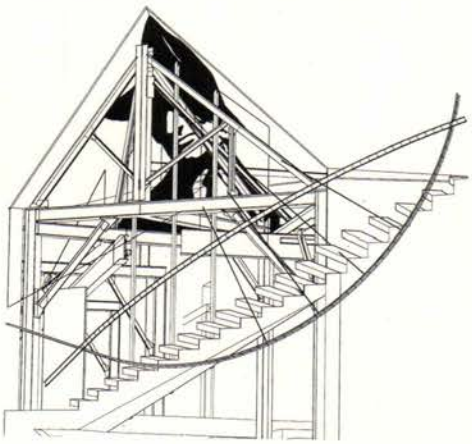
Percent for Architecture

Culver City sets an important civic precedent by considering architecture as public art.



PUBLIC ART: Eric Owen Moss-designed headquarters for IRS, an entertainment company, incorporates a roof canopy that may qualify as public art under Culver City's newly revised ordinance.

Percent-for-art programs, which set aside a small percentage of a building's construction costs for commissioned or acquired artworks, have become routine devices for sprucing up public spaces. While well intentioned, these laws rarely foster a happy coexistence between art and architecture. In most cases, public art is tacked onto buildings as an afterthought rather than as an integral part of the surrounding architecture. Where the architecture is particularly strong, the artistic integrity of the building is compromised with paintings or sculptures that are as irrelevant as a fig leaf on Michelangelo's *David*.

Why not consider a percent-for-architecture program? This question was recently posed to the city council of Culver City, California, by local developer Frederick Smith in defending the artistic merit of buildings designed by internationally recognized architect Eric Owen Moss. Since 1987, Smith and Moss have jointly focused on transforming a 50-acre district of abandoned warehouses in Culver City, a community to the southwest of downtown Los Angeles, into a lively assemblage of studios and offices that is now attracting redevelopment and investment by a number of major entertainment companies.

In pleading his case to the city council, Smith argued that the sculptural roof assembly of a Moss-designed structure constitutes artwork, fulfilling the council's Art in Public Places requirement. After two years of appeals, the developer, supported by testimony from critics, academics, and architects, finally convinced the council to amend its policy in March. Culver City now permits architecture to be considered public art on a case-by-case basis, "if the artwork can be clearly distinguished from the building architecture and standard design features." A building that meets this requirement is exempt from the city's 1 percent for art law.

Culver City's ruling sets a progressive precedent for other cities to follow. It encourages developers to invest in quality architecture and challenges architects to design extraordinary public spaces, rather than neutral backdrops to applied artwork. The council's decision to review the circumstances of individual building commissions is wise: Not every building should qualify, just as not every painting, sculpture, mural, or decorative artwork is worthy of installation. A rare example of enlightened patronage, the Smith-Moss relationship is, unfortunately, the exception—not the rule.

The debate over public art must be expanded, not only in Culver City, but in other communities across the country as well. Criteria for judging artistic merit must be revised and tested. A building should qualify not only based on ornamentation that can be "distinguished from the building architecture," as required by Culver City, but also for the overall innovative expression of "standard design features," such as doors, windows, and walls, which contribute to a building's artistic whole. Through such reexamination of criteria, the quality of public art and architecture will be elevated.

The first public art ordinances were passed to humanize the boxy buildings of the 1960s and '70s. Architecture has improved since then and deserves to be seriously considered as a civic amenity by public art advocates and local governments. "If we really want to change our cities," maintains developer Fred Smith, "we have to look at architecture differently." In viewing architecture as art, Culver City has broadened the definition of what makes a good public place, recognizing that buildings, as well as art, offer the potential to enrich our civic realm.

Deborah K. Dietsch

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Letters

Defending CityWalk

I share M. Lindsay Bierman's concern for the decline of genuine urban life as reflected in CityWalk (April 1994, page 41). However, his thinly veiled contempt is a classic example of blaming the victim. The shopping mall, of which CityWalk is but the latest variant, is a response to the death of American cities already in progress. To dismiss flight from cities as a "nostalgia for a carefree, crimefree urban environment that never existed" shows a disregard for a basic human instinct—protection of self and loved ones—and an ignorance of crime statistics.

Milton W. Grenfell, AIA
Grenfell Architecture
Charlotte, North Carolina

I take issue with M. Lindsay Bierman's critique of CityWalk. Why is it "ersatz streetscape" to have a piece of the city without graffiti; with adequate parking; without panhandlers; and with shops and attractions? It is alarming that Bierman seems to want a city with more problems than we chose to include in CityWalk. No private developer would intentionally build a collection of urban problems, and I sincerely doubt that CityWalk portends "the death of real American cities."

David S. Froelich, AIA
Daniel, Mann, Johnson & Mendenhall
Panorama City, California

Road to respect

As one who has fought for good design while railing against the fraudulent sale of Postmodernism to an unsuspecting public, I applaud your editorial (May 1994, page 15). Our disagreement in viewpoint centers on your heralding of the authors and advocates of that dead-end street. Many Postmodernists are now returning to more contemporary design objectives. This redirection will allow our profession to regain the loss of respect which no movie or mass media publicity will achieve. Architects must again be seen as individuals sensitive to the philosophical, social, and esthetic attributes of good, humanly scaled architecture.

William J. Brown, AIA
Brown Architects
Cincinnati, Ohio

After reading your May editorial, I wondered, are architects shying away from design or looking for other ways to promote it? Current methods of "presenting buildings in purely theoretical or formalist terms" do not work because we have no proof of their benefits. So, we assume the role of contractor, engineer, and construction manager to overcome our deficiencies. To end this decline, we need to believe in what we do, provide evidence to support it, and not back down from what it costs. Design is our trademark. Let's not sell ourselves short.

Earl W. Hilchey, AIA
Albuquerque, New Mexico

Repaying Disney's bounty

I support the "Author's reply" to Disney (April 1994, page 14).

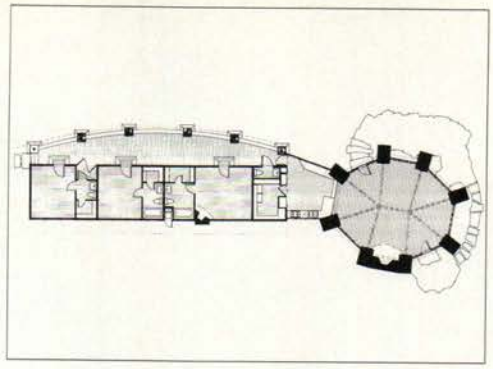
Americans have made Disney rich, and it would be fitting for Disney to repay that bounty by encouraging interest in existing historical sites.
Charles F. Schillinger
Clearwater, Florida

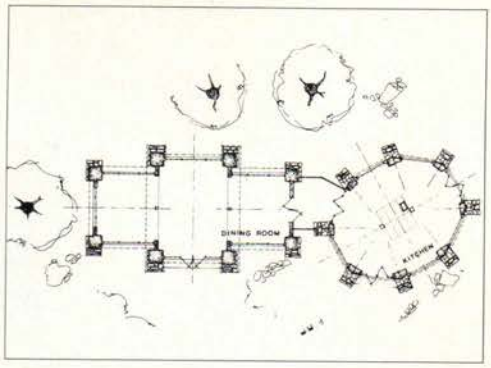
Southwest similarity

I was dismayed to see Lake/Flato Architects recognized for their design of the Chandler house (May 1994, page 86) without any reference to Bernard Maybeck and his 1921 Glen Alpine Springs resort (far right). Considering the remarkable similarity between the two—living room plan, elevations, roof, and materials—it seems these southwestern architects have gone beyond referential in their design solution.
Peter Herman, AIA
Boston, Massachusetts

Correction

Preliminary design of the Environmental Education Center (May 1994, page 69) was by Janet Youngberg, National Park Service.





ROBERT GRABLE

LAKE/FLATO: Chandler house, 1993.

BERNARD MAYBECK: Glen Alpine Springs resort, 1921.

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1994 Educational Conference and annual meeting, sponsored by the Association of Higher Education Facilities Officers in San Antonio, Texas. Contact: (703) 684-1446.

July 12-14
Dialogue '94, a three-day symposium on technology and techniques for historic preservation, sponsored by the National Association of Corrosion Engineers International, at Johns Hopkins University in Baltimore. Contact: (713) 492-0535.

July 14-17
The Search for the American Place II: Southwestern Cross-Culture, a symposium sponsored by the AIA Committee on Design in Santa Fe, New Mexico. Contact: (202) 626-7482.

July 15
Deadline for the International Aluminum Extrusion Design Competition, sponsored by the Aluminum Association. Contact: (202) 862-5163.

July 17-August 5
Summer program on the study of urban development in Chicago, sponsored by the Institute for Advanced Architectural Studies and Ecole d'Architecture Athenaeum, Lausanne. Contact: (301) 699-9146.

July 27-28
International Conference on Climate Change, in Washington, sponsored by the Alliance for Responsible Atmospheric Policy, with the Center for Global Change at the University of Maryland. Contact: (301) 695-3762.

August 1
Projects submission deadline for Advanced Technology Facilities Design: 1994-1995 Review, sponsored by the AIA. Contact: Todd S. Phillips, (202) 626-7366.

August 7-11
Illuminating Engineering Society of North America's annual conference in Miami Beach, Florida. Contact: (212) 248-5000.

August 16-17
Symposium on knowledge-based environmental design systems held during the Seventh International Conference on Systems Research, Informatics, and Cybernetics. Contact: Dr. Jens Pohl, (212) 248-5000.

August 17-20
What Drives Design? The annual conference of the Industrial Designers Society of America in Dearborn, Michigan. Contact: (703) 759-0100.

August 26-28
Breaking the Ice: Building New Leadership, a program sponsored by the AIA Minorities and Women in Architecture Committee in Washington. Contact: (202) 626-7482.

August 29-September 4
International Congress on Architectural Rehabilitation, sponsored by the Centro International para la Conservacion del Patrimonio, in Mar del Plata, Argentina. Contact: Gustavo Arraoz, (301) 229-6506.

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AIA Convention Hails Changing Profession

Los Angeles survived its share of cataclysmic events this year, including the influx of over 11,000 architects, building experts, and exhibitors who attended the AIA's May convention in Pei Cobb Freed's glassy new addition to the city's convention center. The four-day event offered the usual range of seminars, exhibits, and consultations to help architects keep up with new developments in specialities, ranging from historic preservation to seismic technologies to strategic planning. The most helpful development was unveiled by the AIA's new CEO Terrence M. McDermott: a revamped version of the Institute's Online, a national computer network for AIA members.

On the convention's opening day, Frank Gehry delivered the keynote address, challenging the profession to move away from what he called a "childlike relationship" among players in the design and construction process toward a more democratic collaboration between architects and related disciplines. To illustrate this idea, Gehry cited examples of his own collaboration on various projects—not with community groups and local governments, but with the likes of sculptor Claes Oldenberg, architect Philip Johnson, and the Sheet Metal Contractors Association.

More engaging than Gehry was the convention's second-day speaker, architect Sharon Sutton, who noted the irony of her presence as an African-American female before an audience dominated by white males. In a colorful musical interlude, she played pop singer Tracy Chapman's folksy "Material World" to offer, as Sutton explains, "a warning about the foolishness of the consumer values that are shaping the landscape and the conduct of our profession."

Sutton advocated an architecture of social and environmental justice, which was clearly evident in the presentation by 1994 AIA Gold Medalist Norman Foster. Indeed, Foster's London-based practice represents a departure from the typical architectural firm in its attention to energy efficiency, sustainability, and meticulous craft. Given his humanist and environmentalist agenda, Foster remains the most convincing avatar of the AIA convention's theme of "Succeeding Through Change" without forsaking the art of architecture.—*Raul Barreneche and Lindsay Bierman*

OSCAR AND ASSOCIATES INC. PHOTOS

TOP: Conventioneers met in Pei Cobb Freed-designed convention center. **CENTER:** AIA elected new officers (top row, left to right): First Vice President/President-Elect Raymond G. Post, CEO Terrence M. McDermott, Vice President Ronald A. Altoon, Vice President Phillip H. Gerou; (bottom row, left to right) 1995 President Chester A. Widom, Vice President Carole J. Olshavsky, Treasurer Lawrence P. Segrue.

ABOVE LEFT: AIA President L. William Chapin congratulates 1994 Gold Medalist Norman Foster. **ABOVE:** Sharon Sutton challenges profession to foster socially and environmentally responsible architecture.

SERVICE STATIONS: Projects for L.A.'s poor neighborhoods.

KOREATOWN STATION: Social services from platform (center).

AFTER-SCHOOL STATION: Van expands Watts/Willowbrook club.

HOMELESS STATION: Flexible assembly provides secure shelter.

VENDING STATION: Scheme by Cocurator Norman Millar.

HEWITT / GARRISON PHOTOS

Los Angeles Exhibit Proposes Small-Scale Urban Remedies

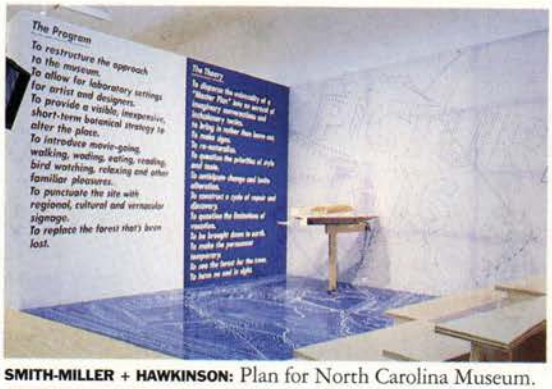
From their budgets to their ambitions, the contrast between the exhibitions "Urban Revisions" at the Museum of Contemporary Art (MoCA, facing page) and the "L.A. Service Station Project" at the Municipal Art Gallery in Barnsdall Park (above) couldn't be greater.

At a cost of $500,000, MoCA's "Urban Revisions" takes a grand, sometimes grandiose, point of view toward urban design, while the Barnsdall's L.A. Service Station show costs a mere $15,000 and sets its sights firmly at street level. As the text accompanying one of the Service Station projects puts it, "The true issue [of urban design] is not making beautiful cities or well-managed cities, it is to make a work of life."

All of the 11 architectural case studies presented at the Barnsdall show keenly observe the ways in which people in Los Angeles's poorer neighborhoods actually use the often chaotic urban environments they inhabit. These low-key interventions include a van, designed by a team led by architect Judith Sheine, with dismountable sides and expandable units to support after-school programs in Watts; a sidewalk home repair advice and training facility for South Central L.A. designed by cocurator Chris Jarrett and University of Southern California students; and booths for social services in Koreatown designed by Ken Min and Hak Sik Son. The ethnically diverse architect-exhibitors claim that their proposals can be affordably duplicated.

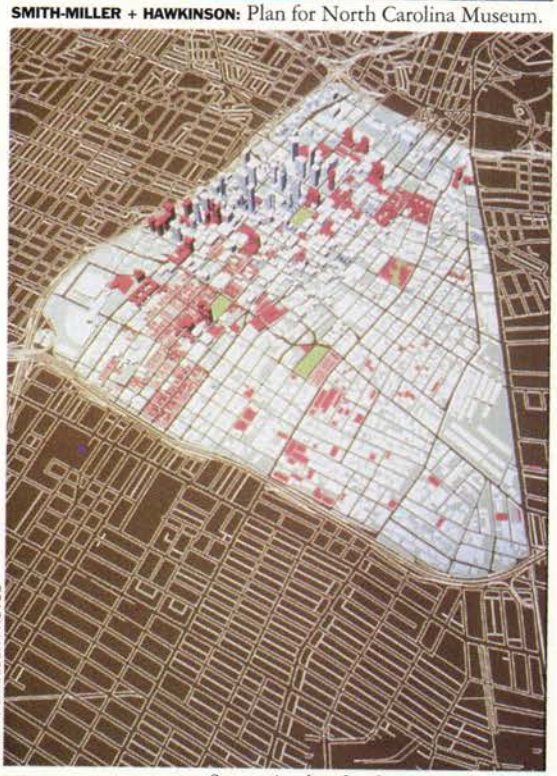
The Service Station Project grew out of a University of Southern California summer school program run by Los Angeles architects Chris Jarrett and Norman Millar. Begun just after the April 1992 Los Angeles riots, the Service Station Project has turned out to be timely, given the impact of the disturbance on those areas, from Watts to Koreatown to East Los Angeles, covered by the case studies. "We don't claim we can solve social problems," Cocurator Millar explains, "but we can connect with citizens for whom the notion of urban design is as remote as the man in the moon."

Both Millar and Jarrett see their social message conveyed through affordable design: The cheap corrugated metal, steel scaffolding, and canvas and fiberglass panels installed in their inventive exhibit transform commonplace materials into metaphors for contemporary urban experience.—*Leon Whiteson*

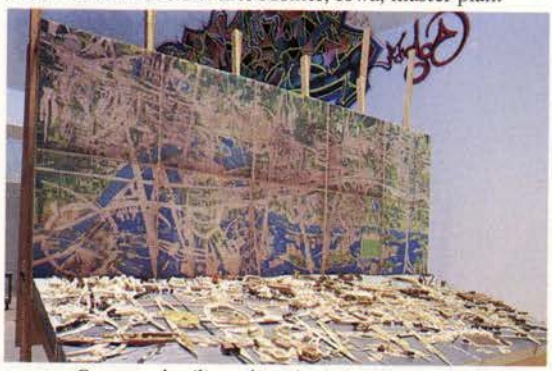


SMITH-MILLER + HAWKINSON: Plan for North Carolina Museum.

AGREST & GANDELSONAS: Des Moines, Iowa, master plan.



MOULE AND POLYZOIDES: Strategic plan for downtown L.A.



SORKIN: Converted military base in Arizona.

BENZINBERG STEIN: Public garden for South Central L.A.

HEWITT / GARRISON PHOTOS

Urban Proposals Focus on Grass-Roots Design

"Urban Revisions: Current Projects for the Public Realm," on display at the Museum of Contemporary Art (MoCA) in Los Angeles until July 24, covers a wide spectrum of proposals for decaying downtowns and sprawling suburbs. The 10,000 square-foot exhibition provides a critical forum for urban design in a city that boasts the alienating landscape of Pershing Square as its most public space. MoCA Curator Elizabeth Smith chose 18 projects that express the sanctity of nature and the primacy of the public realm, including buildable greenways, land reclamation projects, and urban parks.

The title "Urban Revisions" reflects the current penchant for minimal intervention and grass-roots design; few of the schemes evoke the grand idealism of visionaries like Frederick Law Olmsted, Daniel Burnham, or Frank Lloyd Wright. The exhibition severs the architect's authoritative hand, avoiding the imposition of a sweeping, singular vision in our conciliatory age of political correctness.

To display the projects, a design team headed by architect Michael Rotondi and graphic designer April Greiman created a loose sequence of spaces defined by wooden partitions. Graffitilike murals color the white walls, aimed to represent the soul of the inner city. Whereas urban graffiti transforms building facades into political billboards, in MoCA's galleries it has been reduced to a patronizing formal motif.

Each project corresponds to one of four categories: transportation corridors; new neighborhoods; master plans; and community spaces. Visitors should ignore these themes and concentrate on the individual proposals, lest an assemblage like Rashid + Couture's much-acclaimed "Steel Cloud: West Coast Gateway," grouped with the master plans, be taken for anything other than an industrial folly. Although New York architects Smith-Miller + Hawkinson's site plan for the North Carolina Museum of Art similarly defies categorization, the firm's architectonic installation of a platform, seating, and video sets the exhibition's highest standard for presentation.

Nearly every project in MoCA's "Urban Revisions" exhibit manifests disdain for the automobile, which may prove unrealistic for car-oriented L.A. "Urban Revisions" reunites the practice of urban design with fundamental human values, but its response to the failures of Modernist urbanism appears more apologetic than self-assured.—*M. Lindsay Bierman*

Details

New York architect **William McDonough** has been named Dean of the School of Architecture at the University of Virginia. The Wilkes-Barre office of **Bohlin Cywinski Jackson** has been awarded the commission for a federal building and U.S. courthouse in Scranton, Pennsylvania. The Columbus Neighborhood Design Assistance Center has awarded **David C. Mazzocco** and **David L. Schrader** of Norristown, Pennsylvania, first place in a housing competition for Columbus, Ohio. Boston-based **Schwartz/Silver Architects** has won a competition to renovate four buildings comprising Cornell University's College of Architecture, Art, and Planning. **Polshek and Partners** has won a competition to rebuild and expand the Stanford University Museum of Art. **Perkins Eastman Architects** has been selected to renovate Cass Gilbert's 1936 Foley Square courthouse in Manhattan. The American Academy of Arts and Letters has awarded Santa Monica architects **Craig Hodgetts** and **Hsin-Ming Fung** the Academy Award in Architecture; **Renzo Piano** is the recipient of the academy's Arnold W. Brunner Memorial Prize in Architecture; and **James Ingo Freed** has been inducted as a new member of the academy. The Royal Institute of British Architects has awarded its Royal Gold Medal to the London-based husband and wife design team **Michael and Patty Hopkins**. Dean of the School of Architecture and Urban Planning at the University of Wisconsin, Milwaukee, **Robert Greenstreet**, has been elected President of the Association of Collegiate Schools of Architecture. AIA CEO Emeritus **James Cramer** was awarded the Distinguished Service Award from the University of Minnesota. **Rob Wellington Quigley** is opening an office in Palo Alto, California, and designing the town's first new single-room-occupancy hotel. The North Carolina School of the Arts has selected **Backen Arrigoni & Ross** of San Francisco to design a facility for its School of Filmmaking. Yale University has selected **Architectural Resources Cambridge** to design a new boathouse on the Housatonic River in Derby, Connecticut. San Francisco-based architecture firm **Fisher-Friedman Associates** has won a competition to design a new city hall for Redwood City, California.

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MAIN GALLERY: Skylit seventh floor displays *Shadows*.

WARHOL MUSEUM: Terra-cotta facades are restored.

REAR FACADE: Addition houses theater and offices.

PAUL ROUCHELEAU PHOTOS

FIFTH FLOOR GALLERY: Paintings framed by concrete.

ARCHIVES STUDY CENTER: Time capsules in boxes.

THEATER: Chairs designed by Marcel Breuer.

Andy Warhol Museum Opens in Pittsburgh

Famous and blasphemous, Andy Warhol transformed the mundane into the extraordinary, and the new Andy Warhol Museum expresses the Pop artist's dual persona. The street facades of the renovated warehouse are clad in a riot of glazed terra-cotta ornament, much like Louis Sullivan's Bayard Building in New York City, to which Warhol fled from his native Pittsburgh in 1949. But the rear facades of the 1911 structure are working-class yellow brick, which inspired New York-based architect Richard Gluckman's 15,000-square-foot addition, housing offices, archival storage, and circulation.

Inside, the warehouse's concrete structure forces its presence everywhere. Gluckman skillfully manipulates the frame, however, to create galleries of varied proportion and height on the museum's seven floors. Visitors funnel into the 88,000-square-foot building through a forced-perspective foyer with cobalt-walls and an aluminum-leaf ceiling—a perfect preamble to Warhol's painterly love of glossy surface. Throughout the building, Gluckman removed slices of floor to force daylight into lower level spaces and to create two-story spaces that accommodate big paintings, like Warhol's 1986 *Last Supper*. New skylights have been punched into the roof of an immense, 5,000-square-foot gallery devoted to a frieze of paintings titled *Shadows*.

Gluckman pulls this spatial variety together by repeating on every floor the same configuration of corridor, elevator lobby, and stairway. Floor directories ("Success" on 6; "Fame, Fortune, and Fashion" on 7) reverse Warhol's observation that department stores are a lot like museums. The circulation spaces are finished in ochre-colored plaster to distinguish them from the white-painted galleries. Gluckman lights the stair through a translucent glass window rising the building's full height.

Ironically, this ceremoniously cadenced progression ultimately disappoints visitors by seducing them into a heightened state of anticipation that the museum's collection fails to satisfy. There are too few works from the 1960s, the artist's salad days, and too many rooms filled with mediocre, late work.

Still, the museum offers many architectural and curatorial treats. Some galleries re-create wonderful Warhol installations, including a 1966 exhibition in New York where the artist filled a white room with his helium-filled *Silver Clouds*. Others mimic Warhol's penchant for displaying paintings on his boldly patterned *Cow* and *Mao* wallpapers. A first-floor gallery painted Halston-ultrasuede-gray and displaying double celebrity portraits excites a nostalgia for the minimalist 1970s.

The museum's Archives Study Center protects some 8,000 cubic feet of material, including 42 volumes of Warhol scrapbooks; pop culture sources from which Warhol fashioned his famous Jackies, Micks, and Lizas; and more than 600 "time capsules," uniform cardboard boxes with the stuff of everyday life, which are visible behind glass in mock-Laurentian-Library seriousness. Glazed vitrines hold treasures like Warhol's wigs and childhood toys. The study center is a space that goes to the heart of Warhol's puckish stance: a high-art genuflection in the wink of an eye.—*Donald Albrecht*

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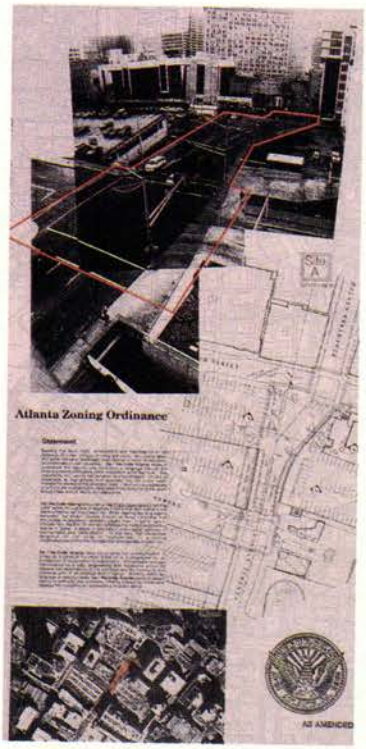
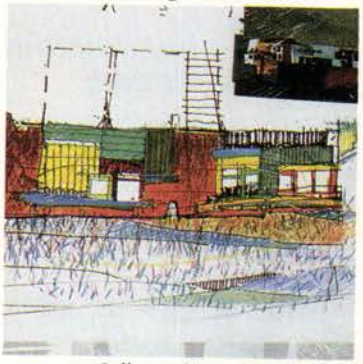
PARKING LOT: Garages near Dome.



STREETSCAPE: New zoning by Iowans.



OFF RAMP: Collage of homelessness.

OVERPASS: Windmills on plaza.

Competition Designs Atlanta's Public Image

The City of Atlanta is rethinking its downtown core in preparation for the 1996 Olympics. To improve the city's streetscapes, the Architecture Society of Atlanta and the Corporation for Olympic Development in Atlanta (CODA) recently held a competition to design small-scale interventions on four sites—a viaduct, overpass, off ramp, and parking lot. Announced in May, the winning entries will link discontinuous areas and visually orient both vehicular and pedestrian traffic.

Iowa architects William F. Conway and Marcy Schulte were recognized for their handling of a linear streetscape bounded by 19th-century viaducts; their scheme challenges existing zoning codes. The commission for the second site, two street-level bridges that span an interstate, was won by a collaboration of Georgia architects and artists—Robert D. Clements, Roberta Unger, Tony Loadholt, Chito LaPena, and Kenneth Beal. The team proposed a plaza to link fragmented residential and commercial areas.

A gateway to the city, the off-ramp site designed by New Jersey architect Brian Wurst is a collage of materials reminiscent of homeless encampments in underpasses. Similarly addressing the reality of the American dream, Rachel Kisker, a graduate student in landscape architecture at the Rhode Island School of Design, will position 288 single-car garages on a parking lot south of the Georgia Dome.

Construction of the four winning proposals will be administered by CODA and is scheduled for completion in 1996.—*Ann C. Sullivan*

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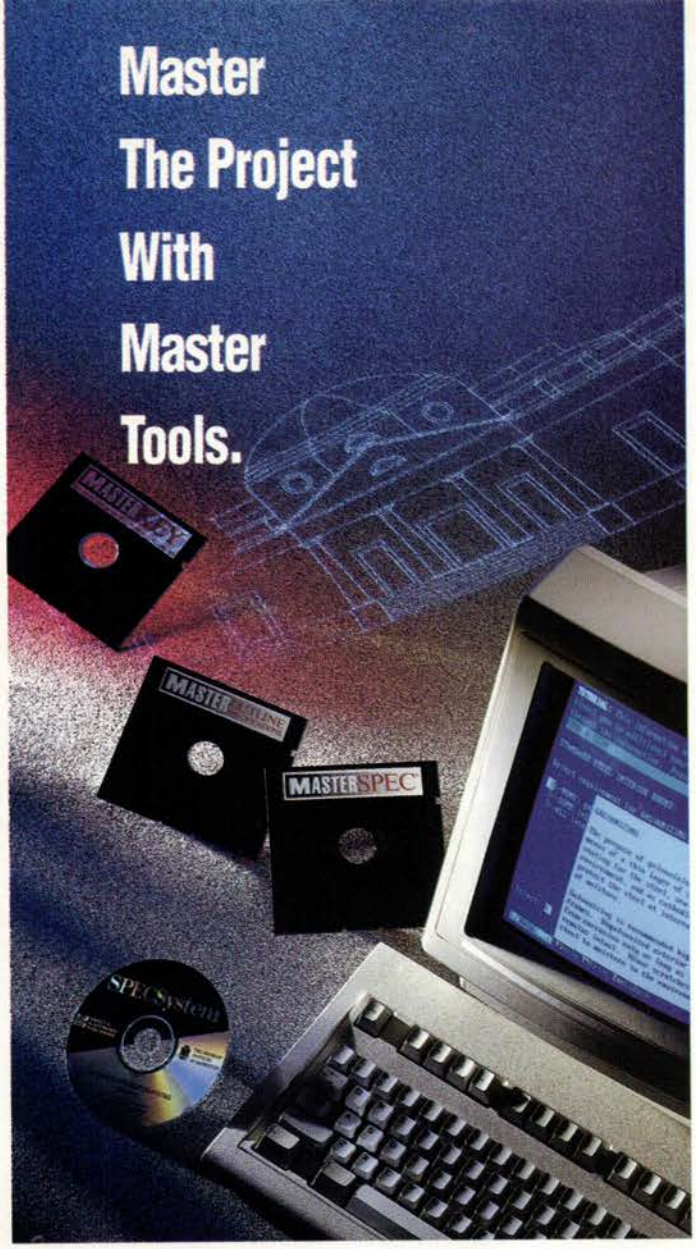

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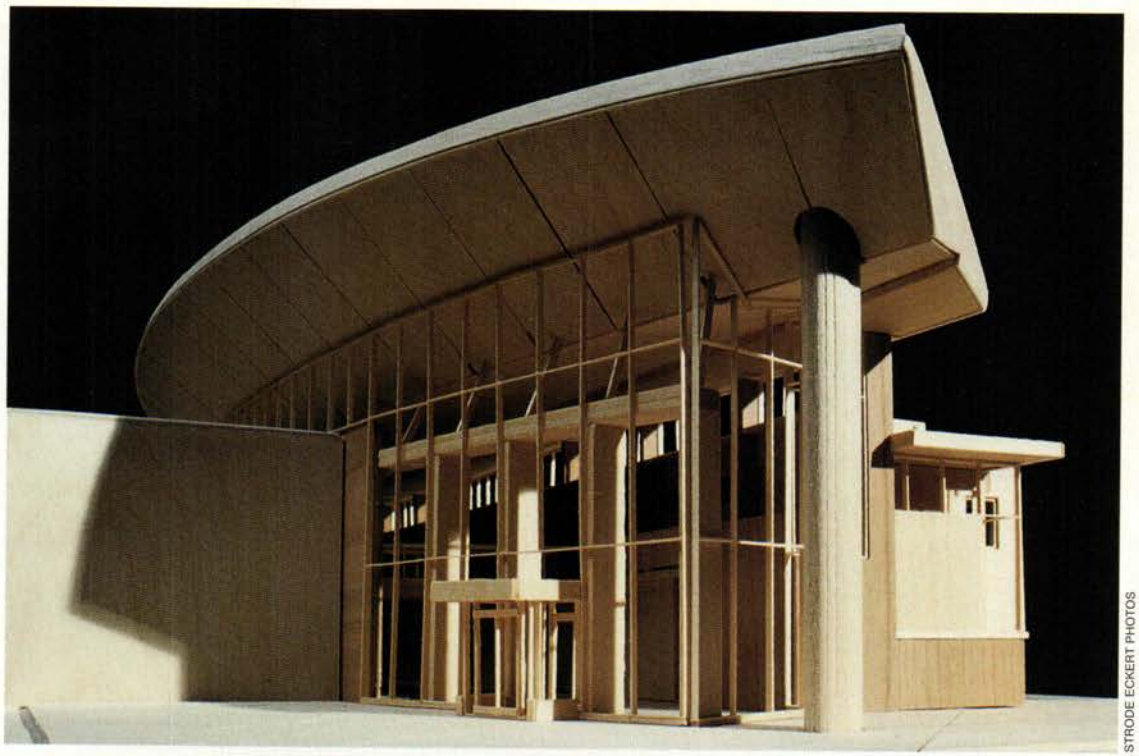
On the Boards

A Portland firm designs a safe haven for urban youth.



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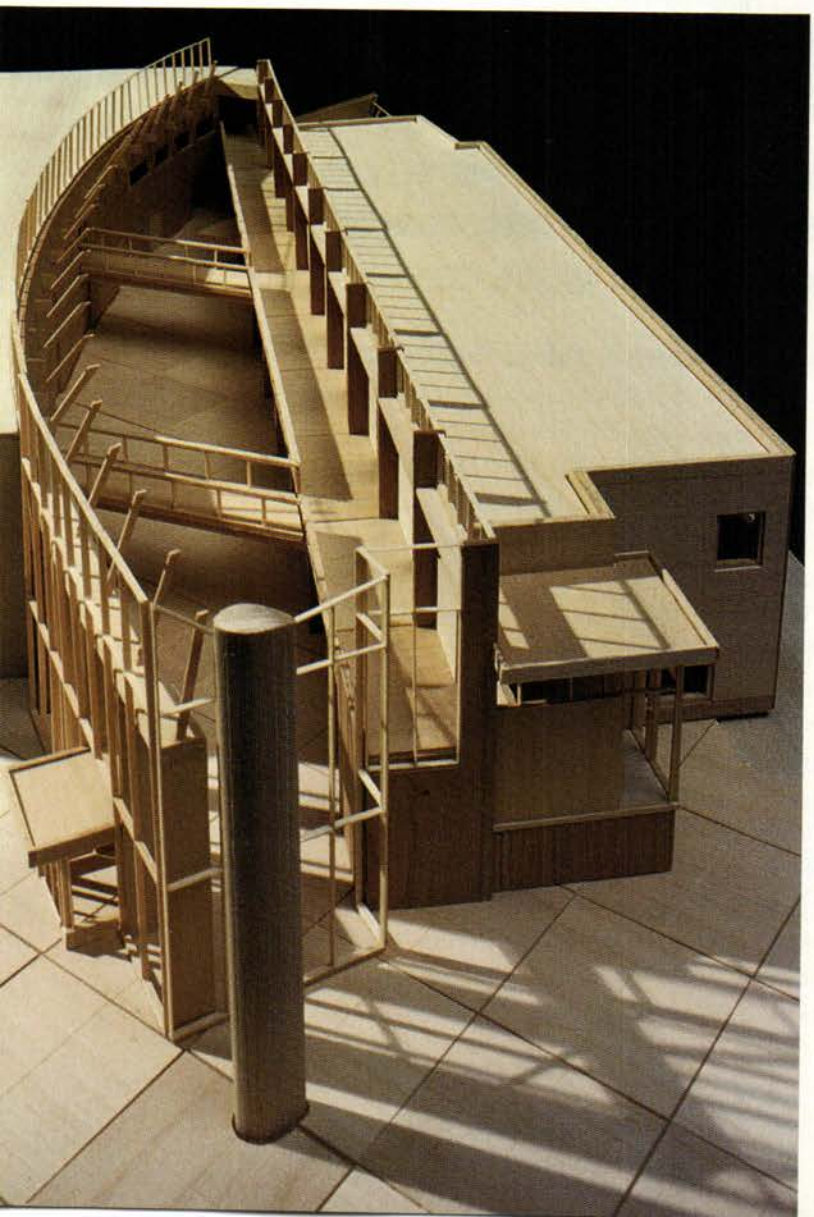

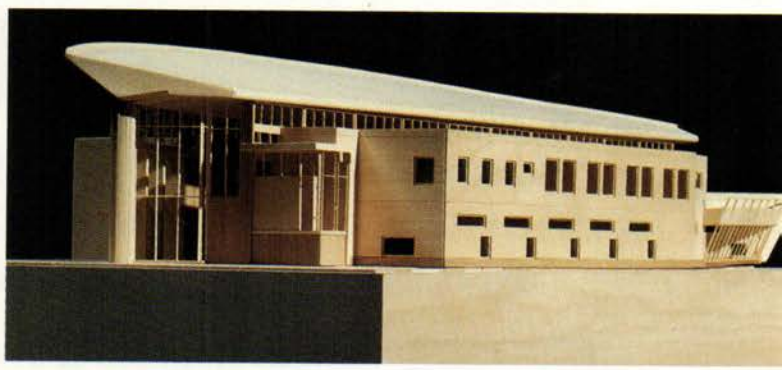

Center for Self Enhancement
Portland, Oregon
Yost/Grube/Hall/Johnson, Architect

Sited on an existing park in Portland, the Center for Self Enhancement will command a formidable presence in a neighborhood ravaged by gang warfare. The 61,000-square-foot building will house one of the country's most successful youth programs, Self Enhancement, Inc. (SEI), and centralize components previously administered by SEI in borrowed facilities. Designed by Yost/Grube/Hall/Johnson, it will consolidate classrooms, a health clinic, day-care facilities, and a gym.

To be clad in exterior insulated stucco over concrete block, the center will knit together public and private spaces with a two-story atrium, animated by pedestrian bridges. The east wing will house classrooms, administrative and medical offices, and dining facilities; the west wing will contain recreational amenities, including an auditorium and dance studio.

A dynamic, sloped metal roof distinguishes the atrium from the adjacent flat-roofed spaces, which are supported by steel trusses. Rooms are designed to be flexible, in order to accommodate varying age groups and programs. The café converts to a classroom or a catering facility for events held in the auditorium or second-level recording studio, which contains a balcony for spectators.

Yost/Grube/Hall/Johnson has selected modest finishes, such as drywall and painted concrete block, for the interiors; manufacturers have donated some materials. As part of fund-raising efforts for the $8.4 million facility, bricks inscribed with donors' names will pave the main corridor of the center.—*A.C.S.*

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TERRY ASHE

TROUBLE IN THE CAPITOL: GAO report finds Architect of the Capitol's employment practices biased against minorities.

A federal study finds job discrimination in the office of the Architect of the Capitol.

Racial profile of Architect of the Capitol's federal wage system (hourly/skilled) employees, 1992

Grade	Wage/hour Salary (range)*	Number of Employees	(Minority)	(Nonminority)
2	$ 8.03 — 14.45		402	15
3	$ 8.73 — 15.24		144	26
4	$ 9.55 — 16.19		130	34
5	$ 10.35 — 17.13		103	38
6	$ 11.16 — 18.07		33	26
7	$ 11.95 — 18.99		16	12
8	$ 12.75 — 19.86		26	61
9	$ 13.45 — 20.71		13	105
10	$ 14.20 — 21.56		36	303
11	$ 14.94 — 22.10		7	76
12	$ 15.70 — 22.81		8	41
13	$ 16.43 — 23.68		0	2
14	$ 17.16 — 24.73		0	2
15	$ 17.91 — 25.93		0	1
16	$ 23.38 — 27.28		0	2

Racial profile of Architect of the Capitol's general schedule (salaried/professional) employees, 1992

Grade	Wage/hour Salary (range)*	Number of Employees	(Minority)	(Nonminority)
4	$ 17,086 — 22,208		0	3
5	$ 19,116 — 24,847		18	19
6	$ 21,308 — 27,696		9	11
7	$ 23,678 — 30,779		7	24
8	$ 26,223 — 34,094		0	11
9	$ 28,964 — 37,651		4	26
10	$ 31,898 — 41,466		3	7
11	$ 35,045 — 45,561		6	33
12	$ 42,003 — 54,601		4	23
13	$ 49,947 — 64,928		2	16
14	$ 59,022 — 76,733		2	19
15	$ 69,427 — 90,252		1	9

*local earnings rates reflect 1993 and 1994 adjustments. Source: U.S. General Accounting Office; Office of Personnel Management

Capitol Bias

A "plantation mentality" toward fair, equal employment of minorities and women pervades the office of the Architect of the Capitol in Washington, D.C. That is how Senator Barbara Mikulski (D-Maryland) characterizes the findings of a two-year General Accounting Office (GAO) investigation into employment practices in the Architect of the Capitol's office, headed since 1971 by Nixon appointee George M. White.

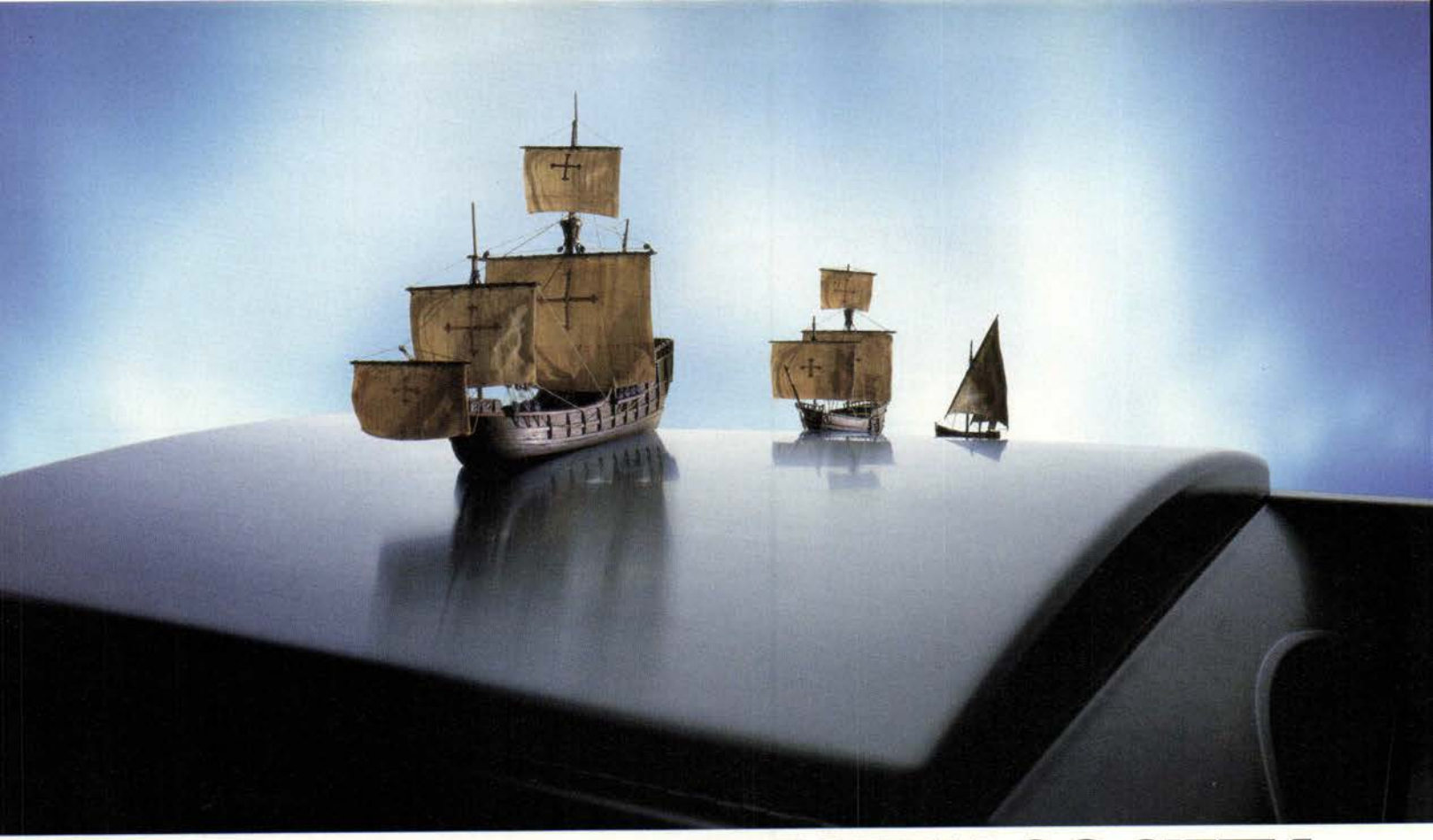
The GAO studied the employment patterns of White's office and found that among the 2,233 staff members who oversee the design and upkeep of the U.S. Capitol, the higher level, higher paying jobs are overwhelmingly held by white men. African-Americans and women hold lower prestige, lower paying jobs in numbers disproportionate to the federal and private-sector work force.

For example, all of the Capitol architect's high-voltage electricians are white men; but in the Washington area, black men hold 24.8 percent of comparable private-sector jobs. In the architect's housekeeping department, 90 percent of custodians are black women—a startling rate when compared locally, where black women compose 19.6 percent of custodians.

Minorities' placement along the entire pay scale (above) reveals a striking bias. Minority workers are segregated in the lower echelons of pay, while white workers are generally clustered in higher earnings brackets. As the GAO report states: "[M]any generally accepted principles of modern personnel management are not present." The Capitol architect's office isn't covered by civil-rights laws because Congress is exempt from these statutes.

In his response to the GAO report, White claims he has instituted a new staffing policy that would "eliminate many of the noted issues." Meanwhile, in April, Senator Mikulski and U.S. Representative Kweisi Mfume (D-Maryland), chairman of the Congressional Black Caucus, called for White's resignation.

Although Mikulski withdrew her demand during a subsequent hearing—stating that she would rather see the Architect of the Capitol resign himself to change—White's post is up for review by President Clinton next year. Clinton can either retire or reinstate White. Before the president makes his decision, he should be advised of the AIA's code of ethics, which states that "members shall not discriminate in their professional activities on the basis of race, religion, gender, national origin, age, disability, or sexual orientation." President Clinton should replace White with an architect who upholds these principles.—*Bradford McKee*



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Schoolhouse of the Future

The head of our largest school system challenges architects to reinvent learning environments.

With a million students, 66,000 teachers, and more than 1,100 schools, the New York City public school system is the nation's largest. Thanks to an ambitious program undertaken by the New York City School Construction Authority, 50 new schools have been built over the past five years. Schools Chancellor Ramon C. Cortines wants to continue this effort with a $7.5 billion budget, which Mayor Rudolph Giuliani opposes. In the following article, Cortines describes his vision for achieving a better learning environment in New York's aging schools.

It is 1994; students in grade 7 and below in New York City public schools will graduate from high school in the 21st century. Yet most of them are being educated in buildings designed and constructed at a time when the needs of students were very different than they are today. Some 50 percent of our schools are 50 years old; some 20 percent are 70 years old or more. With remarkably few exceptions, the conditions of our schools are deplorable, reflecting decades of delayed maintenance and neglect. That these buildings even remain standing is a testament to the thought and effort that went into their original design and construction. Yet despite their sturdiness, these buildings will prove inadequate for schoolchildren being educated for the 21st century; they are as unsuitable for their purpose as an 18th-century mill to the needs of modern manufacturing.

Our problems are hardly unique. From Connecticut to California, this nation's school districts face a daunting crisis: A 1991 study by the American Association of School Administrators revealed that one in eight school buildings is substandard; and no district has been harder hit than New York City.

Now is the time to contemplate not only what we want our schools to deliver, but also how architecture can support that mission. We must challenge ourselves to look forward, designing new schoolrooms and new schoolhouses that will facilitate new ways of conducting school business.

JEFF GOLDBERG / ESTO

STUYVESANT HIGH SCHOOL: Designed by Cooper Robertson and Partners in association with Gruzen Samton Steinglass, the 405,000-square-foot science and math school for 3,000 students is designed to give each learning environment its own identity.

Teach through technology

Virtually every business uses computers. From record-keeping to word processing to data analysis, the modern office is a digital environment. But in most New York City classrooms—the training ground for our future work force—a visitor would hardly know anything had ever changed in the workplace. To equip our children for an increasingly sophisticated and complex world, we must fundamentally change the design and administration of our schools.

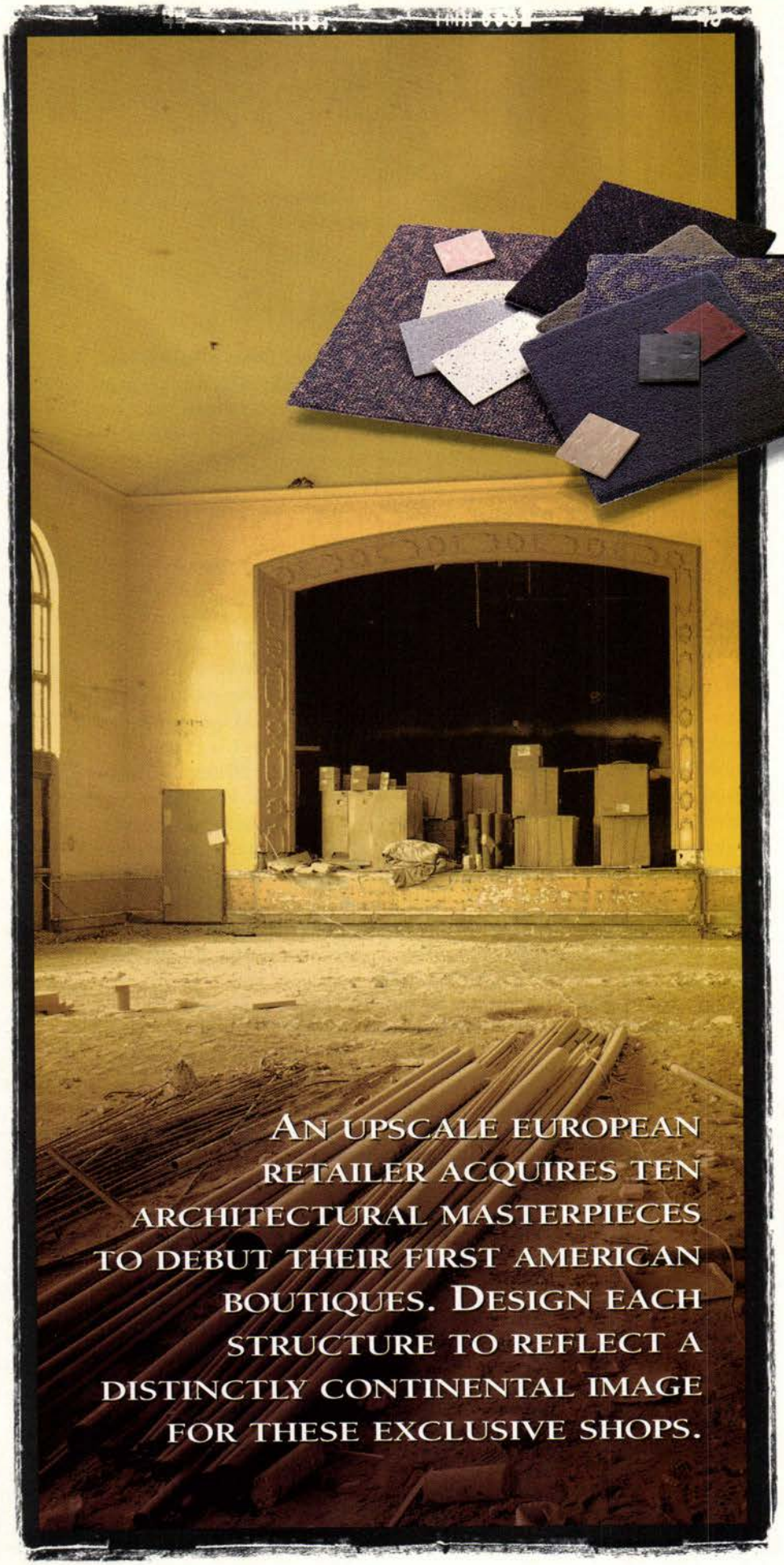
Children should have hands-on science programs beginning in elementary school. They should have hands-on familiarity with computers. Classrooms should be able to take advantage of media, telecommunications, and digital technology. But the infrastructure needed to make these advances possible—sophisticated electrical wiring and fiber optic cabling, for example—does not exist in most of our schools. Unfortunately, with current levels of funding, such an infrastructure will be unlikely for many years to come.

As we build new schools and modernize existing ones, architects must help us reinvent our classrooms, which can no longer be defined by four walls with books and desks: Children must have on-line access to libraries, research institutions, universities, broadcast systems, and interactive multimedia systems. The real challenge is to redesign and equip existing facilities for the information age.

Transform the education factory

Too many of our high schools are cavernous and anonymous. For decades, the "bigger is better" theory prevailed in education. The most economical way to provide students with laboratories, gyms, art studios, and performance spaces was to house these various facilities all under one big roof.

But increasing numbers of our students are not well served by these vast structures. Over the past 40 years, many of the social institutions that had once supported young people have declined. Neighborhoods, recreational



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THEO COULOMBE

PRIMARY SCHOOL 7: Ehrenkrantz & Eckstut-designed school in Elmhurst, New York, incorporates classroom bays that echo adjacent housing. Classroom integrates computer technology with trellis to shield terminals from glare.

programs, and even family life have changed dramatically since the time when most of our high schools were built. In short, the schoolhouses of today play a much larger role in helping to raise our children.

Smaller schools appear better suited for the educational and developmental needs of today's students. In contrast to the impersonality of large high schools, small schools foster a sense of academic community. In so doing, they can produce higher attendance rates and better class participation.

In New York City, these smaller schools present several challenges to architects. How can a small school be designed to provide the same degree of academic support as a large school? How will the student in a 300-student school have access to a fully equipped library or a laboratory-based science class?

Architects must help us cope with an ever-worsening capacity crisis brought on by expanding enrollment. In New York, the school system is growing by 20,000 to 25,000 students per year. To offer some perspective: Over the past four years, the New York City school district absorbed the equivalent of the entire Washington, D.C., school system. While scholastic imperatives may push us toward smaller, more intimate spaces, the need to educate all the children who are coming into the system forces us toward greater square footage. How can we make the most efficient use of space without compromising the quality of academic programs?

Given the scarcity of vacant land in New York City, we must accommodate large school programs on small urban sites. These schools must house the whole range of student and staff needs without creating cramped quarters: Architects must give us buildings that house many more programs than traditional schools, within less space.

Beacons in the neighborhoods

There are more than 1,100 schools in New York City. No other aspect of local government is as widespread or as much at the core of our city's neighborhoods and communities. As an ever-expanding range of social needs—including substance abuse, child abuse, and mental health services—increases the existing demands on New York City's government, the infrastructure for delivering social services bows to greater stress. More and more, urban schools must double as facilities to house these services: This multipurpose role is a natural outcome of the schools' citywide distribution and their central location within individual neighborhoods.

Relying on schools to provide social services is entirely consistent with what we now want and expect from our institutions. The use of a school building should not end with the last bell of the day. When regularly scheduled classes end, new classes should begin, providing not only additional academic opportunities, such as after-school classes and tutoring, but also activities that serve the community of which students are a vital part.

But these are new expectations for our school buildings. From the design standpoint, it means that our future schools must incorporate common spaces that serve both the needs of students during the day and the needs of the community in the evening. This flexibility may require new access patterns for these spaces—new approaches to design that support a wider range of activities. Most importantly, the design of our schools must allow for their future growth and expansion.

Paying for the future

Whatever designs are ultimately chosen for our future schools, the largest hurdle remaining is how to pay for them. Last fall, I proposed a $7.5 billion five-year plan to rehabilitate existing facilities and to build new ones, providing 33,000 additional student seats. The Board of Education approved the plan in April. But City Hall proposed less than half this amount—$3.4 billion.

Some 60 percent of my $7.5 billion plan is dedicated to the modernization of 196 schools and the replacement of some 4,600 building systems. However, the proposed rehabilitations will not turn the schools of the past into the schools of the future. Instead, these projects concentrate on sealing the envelope of existing buildings or upgrading or replacing basic systems such as heating and roofing. At the drastically reduced level of school system funding proposed by City Hall, no new building or full-scale modernization projects will be possible. The limitations of this funding mean that our students will see no improvement inside their classrooms.

Both educators and architects offer an abundance of ideas about the schoolhouse of the future. But these dreams will never be realized unless local governments invest immediately in the transformation of existing schools or in the construction of new ones. If they do not provide the finances now, the school of the future—at least in our nation's largest school system—may have to wait for the future. And it will be our children who pay the price in a future that is less bright, less stable, and less prosperous.—*Ramon C. Cortines*

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ARCHITECTURE

Designing for America's Children

Innovative architecture makes a difference for children troubled by poverty, crime, and violence.

GREG HURSLEY

ABOVE RIGHT: Children encircle a stairwell in Harrington Elementary School, designed by Anderson Mason Dale in a gang-beleaguered section of Denver.

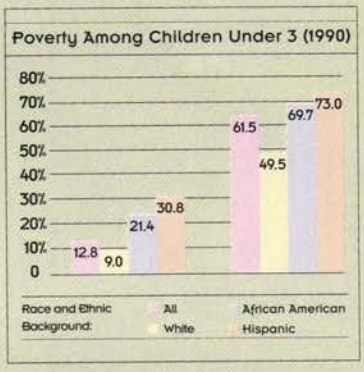
Tonight, 3 million to 5 million American children will go to bed hungry. Tomorrow, 14 American children under age 19 will die in suicides, homicides, or accidental shootings. This fall, more young African-American men will go to jail than to college. This year, a million American teenage girls will become pregnant, surpassing the number in any other of the world's industrialized nations.

As these figures and a recent Carnegie Corporation study of infants and toddlers confirm, America's children face a tough future. In 1970, one in seven American children under age 3 was poor; this year, that number has increased to one in four. Among minorities, the number is an untenable one in two. The changing American family—a result of a higher divorce rate, more working mothers, more single-parent families, and more children having children—means dramatic differences in the care of young children, with a proportional increase in

Day Care for the Disadvantaged

WALTER PUFRESNE

ABOVE LEFT: Sherman Heights Community Center in San Diego by Rob Wellington Quigley offers child care and other social services.
ABOVE RIGHT: In Connecticut, Kagan Architects' Mill River Day-Care Center incorporates Head Start program.
RIGHT: Haber Early Learning Center in the Bronx by Caples Jefferson accommodates delayed children.
FAR RIGHT: LEA/Passantino + Bavier's early childhood center in Buffalo includes care for children of teenagers.



troubled adolescents. Today, 25 percent of America's children live in single-parent households, where they are more likely to experience poverty, up from 10 percent in the 1960s. Similarly, between 1987 and 1991, the number of children entering foster care increased by 30 percent. And in 1992, there were 2.9 million cases of child abuse reported in the United States; three children die every day as the result of maltreatment.

Offering our children a brighter future will not be easy. The Clinton administration has introduced several strategies, including allocation of funds for school-based health centers, expansion of successful programs like Head Start, and an aggressive campaign to immunize all 2-year-olds. But the wheels of government turn slowly, and children in need cannot wait. Across the country, private nonprofit organizations have responded to the children's crisis with programs ranging from family therapy centers, to youth centers, to therapeutic homes for abused children.

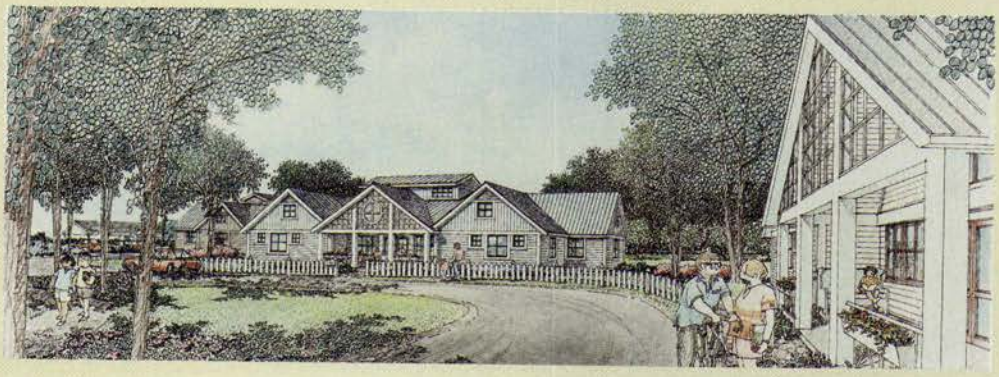
Architects working for these organizations, within limited budgets or on a pro bono basis, are designing new building types to house a myriad of child-related services. Projects range from affordable day-care centers for children from families with drug-related pathologies, to group homes for abused children, to after-school centers that encourage teens to stay in school. In the Bronx, New York, Caples Jefferson Architects has designed the Howard Haber Early Learning Center, an accessible child-care center for developmentally delayed children, many of whose parents are victims of drug abuse. "These projects are so intensive and hands on, their design has to emerge from a true love and commitment to the process," notes architect Sara Elizabeth Caples. "These are the most gratifying projects an architect can have."

Fighting child abuse

With the rise in reported cases of child abuse, centers for treating and counseling abused children and their families are being constructed across the nation. One of the nation's oldest child-abuse treatment centers is the Los Angeles-based Children's Institute International, whose recently completed Burton E. Green Child and Family Development Center (pages 80-85) serves as a group home for infants and toddlers removed from abusive parents. Designed by architect Barton Myers, the center fosters parenting skills and treatment for dysfunctional families, aiming to reunite children with parents.

Although it does not provide housing, the Richstone Family Center, designed by Siegel Diamond Architects, was guided by a program similar to Children's Institute International. Located in South Los Angeles in a predominantly low-income, mixed ethnic neighborhood, the stuccoed child-abuse treatment center incorporates a two-story vaulted room that affords an uplifting environment for social gatherings. "Special events

DAVID HEWITT / ANNE GARRISON



ABOVE LEFT: Siegel Diamond Architects' 12,500-square-foot stucco complex for Richstone Family Center in Hawthorne, California, houses services for abused children and their families.
ABOVE RIGHT: Casa Pacifica, a crisis center with housing for abused children in Camarillo, California, is designed by Bobrow Thomas and Associates.
LEFT: Childhelp USA, Susan Maxman's scheme for a community for victims of abuse in Lignum, Virginia, links cottages with bike paths.

are very important in this place," explains Principal Kate Diamond. Because of the tragic circumstances of abusive families, few of the children have access to holidays, so every possible holiday is celebrated at Richstone. "We had to build in a great party room, which may sound strange for a place with such a serious mission," Diamond continues. "But part of the serious mission is building better lives for these kids."

Diamond's design challenges the notion of home and the cute imagery usually associated with children's facilities. "It's not a Disneyland, white-picket-fence 'home,'" Diamond explains, because "home doesn't carry positive connotations for these kids: Most of these children were abused at home. We had to create a unique environment that had its own qualities, making it a safe haven set apart from everyday life."

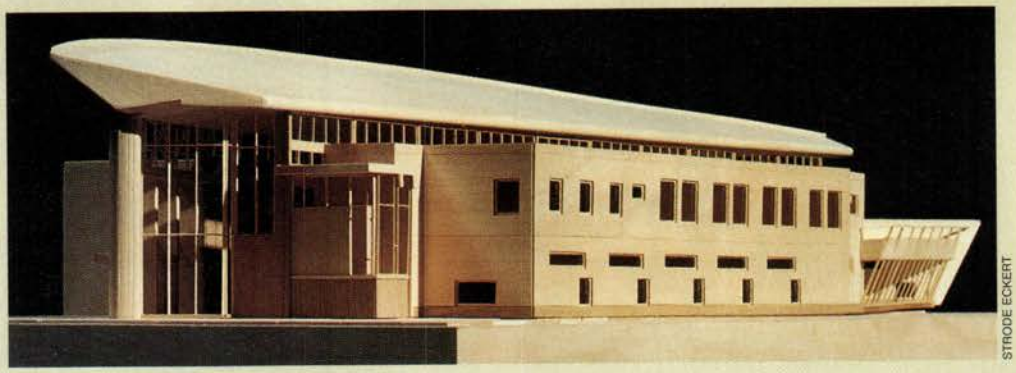
Explicitly homelike images, however, turned out to be appropriate for Childhelp USA, another California-based organization dedicated to caring for abused children. Childhelp commissioned architect Susan Maxman to design an 11-acre residential treatment center sited on a 260-acre horse farm near Lignum, Virginia. Maxman's response is a complex of eight, one-story clapboard cottages joined by bike and pedestrian pathways to a 21,000-square-foot elementary school. "We thought a lot about scale, and about how kids idealized a typical neighborhood—white picket fences and all," Maxman explains. "These kids should be able to look in a storybook, and say, 'I live in a town like that.'" Childhelp USA strives to create a suburban homelike environment for abused children, many of whom have been removed from their true homes by the state. Each new child entering the residential center receives a bicycle, and children live in family-style cottages where they dine with china and glassware to avoid institutional overtones.

Programs for troubled teens

Studies indicate that 80 percent of the adults who abuse children were themselves victims of abuse. Inevitably, children who grow up with abuse and violence spawn more violence: A 10-year-old in Detroit is sentenced to a detention home for his role in murdering a mother of three; a 15-year-old gang member in Iowa serves a life sentence for abducting and killing his 17-year-old friend. These crimes make horrifying statistics: Arrest of teenagers under 18 for violent offenses rose 47 percent between 1988 and 1992.

Programs across the country are struggling to put troubled children back on track before gangs and drugs lead them to disaster. A particularly successful agency in Portland, Oregon, will be housed in a new complex designed by local architects Yost/Grube/Hall/Johnson. Self Enhancement, Inc. (SEI) is a nationally recognized program to help teenagers designated as at-risk for drug abuse or dropping out of school. SEI, a winner of former

Youth Centers for Troubled Adolescents



STRODE ECKERT

STEVE DUMEZ

ABOVE: Designed by Yost/Grube/Hall/Johnson of Portland, Oregon, SEI center will house an award-winning program that keeps teens in school.
RIGHT: Latino Youth Development Center in New Haven is designed by Swanson Architects to afford prominence to Hispanic youth program.
FAR RIGHT: Led by architect Judith Sheine, UCLA School of Architecture students designed Watts/Willowbrook Boys' and Girls' Club expansion.

President George Bush's Points of Light awards, lures kids away from drugs and the streets by offering them programs aimed at keeping them in school. The architects' contemporary glass and concrete building with a sweeping, curvilinear roof and exposed structure, is intended to give the organization and its clients a sense of prominence.

The nonprofit organization's new building, located at the edge of a park in a neighborhood overrun by gangs, houses a recording studio, a 300-seat theater for kids' drama productions, several classrooms for after-school and night courses, a health clinic, a community center, and a kitchen designed for cooking classes. "The building is to be symbolic of the neighborhood regaining its park," explains Principal Nels Hall. SEI will be lighted at night and provide both activity and neighborhood policing. "It was felt that the building should remain open and not appear to be fortified in any way," Hall adds. "The architecture had to be cost-effective, reflective of the programs within, and flexible."

The new headquarters for Latino Youth Development, a New Haven, Connecticut, agency formerly housed in a wing of an abandoned police precinct, offers a similarly bold statement, but its owners were concerned about broad expanses of glass. "Expanses of glass in a neighborhood like this beg to be broken," maintains Charles Swanson of Swanson Architects, the four-person firm that designed the concrete-block building, which houses counseling and drug prevention services, as well as after-school programs, and serves as a cultural center for New Haven's Latino community.

Swanson notes that not only are the windows of the youth center intact after a year, but its striped concrete-block walls have yet to be marred by graffiti. Latino Youth Development Executive Director Dennis Hart explains why: "We are the only Hispanic agency to own its own building, and that has a very positive impact. Most of our people are accustomed to mom-and-pop storefronts; now we are a prominent part of the neighborhood and have a sense of ownership."

Collaborative design

In San Diego, Rob Wellington Quigley's recently completed Sherman Heights Community Center—backed by federal, city, and private funding—houses child care, a prenatal clinic, AIDS counseling, and a 25-foot-high community meeting room in a tilt-up concrete building adjacent to offices in a restored Victorian. "The Sherman Heights Community Center was created through a series of community workshops in which the participants told us how to design the building," notes Quigley.

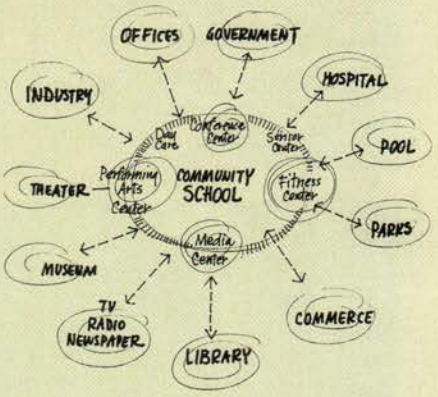
In the gang-controlled Watts section of Los Angeles, architect Judith Sheine similarly worked with community leaders and a team of students to design the Watts/Willowbrook Boys' and Girls' Club, a recreational commu-


NORMAN MCGRATH


MILROY & MCALEER


NICK WHEELER

ABOVE LEFT: Architect Richard Dattner's IS 218 in Manhattan offers adult education, health clinic, dental clinic, and family therapy.
ABOVE RIGHT: Garfield Elementary School, designed by Dougherty + Dougherty Architects, doubles as a community center for Santa Ana.
LEFT: Warren Community School by Flansburgh + Associates includes a meeting room for the elderly.
BELOW: Perkins & Will illustrate relationship between school and services.



nity center with a swimming pool, gymnasium, and multipurpose meeting room.

Community-oriented schools

As a response to the plight of children, even mainstream educational programs are growing more diverse. Intermediate School 218, a public high school in partnership with a social services agency, offers one-stop shopping for immigrant families in Washington Heights, one of New York City's most crime-ridden neighborhoods. Designed by architect Richard Dattner, IS 218 includes dental and health clinics; counselors trained in suicide prevention and family crises; before- and after-school care; and even English language, sewing, and computer instruction for adults.

"This neighborhood had a great need for such programs," notes Dattner, who admits that the social and health services, funded by the Children's Aid Society, were not a part of the building until after construction began. Dattner went back to the drawing board to give the school medical services on the ground floor, a dental suite, and offices for Children's Aid. "It's like a second shift that comes in to use the building before and after school hours," he explains.

Beyond New York City, community-oriented schools that provide social services are emerging wherever enlightened boards of education are responding to families' needs. In Buffalo, New York, for example, the Stanley M. Makowski Early Childhood Center, designed by the Arlington, Virginia-based firm of LEA/Passantino + Bavier, includes not only before- and after-school care, but adult education classrooms, a day-care center for the children of teenage parents, an infant-care clinic, social services offices, and a physical and occupational therapy center as well.

In Santa Ana, California, Dougherty + Dougherty Architects designed Garfield Elementary School as the sole community meeting space in a gang-scarred neighborhood that lacks a public building. By separating the classrooms from the library, Partner Betsey Dougherty explains, the neighborhood gained a meeting place that allows classrooms to be secured after hours. The message to architects is clear: Schools are more than classrooms. They must be designed as resources for the entire community.

These many projects reveal how instrumental architecture can become in helping to improve children's lives. A majority of America's young people may never enjoy the corporate day-care centers and private schools featured in this issue, yet through the union of committed agencies and responsible architects, the problems of a needier, poorer, more desperate constituency are being addressed. "As responsible members of communities," notes Charles Swanson, architect of the New Haven Latino Youth Development cultural center, "architects must take a bigger role in bettering the environment for disadvantaged kids."—*Heidi Landecker*

Lucy Daniels Foundation and Preschool
Cary, North Carolina
Clark & Menefee Architects

Concrete Foundations

TOP: Clark and Menefee housed the preschool (left) and foundation (right) in discrete volumes, divided by a shared assembly room (center).
ABOVE: Concrete forecourt marks lower level entrance to foundation.
FACING PAGE: Glass-block wall on east facade (right) is treated as a rusticated base to upper level library window. North-facing corner entrance is framed by exposed concrete slab.

Four years ago, Lucy Daniels Inman established two independent, psychoanalytic programs in Cary, North Carolina: a foundation to study the relationship between adult creativity and analysis, and a preschool focused on the needs of emotionally troubled 3- to 6-year-olds. As a psychologist and mother of four, 58-year-old Daniels Inman is no naïve patron; her gentle demeanor belies a strong, inner voice that was nurtured, she admits, by the family conflicts of her youth. In 1957, Daniels Inman wrote the best-selling novel, *Caleb, My Son*, which chronicles the conflict between a black father and a son who refuses to accept old traditions—this from the quiet granddaughter of Josephus Daniels, founder of the century-old family dynasty, *Raleigh News and Observer*. Daniels Inman sold her stock in the paper not only to build the Lucy Daniels Foundation and Preschool (LDF), but also to liberate herself from her family's male establishment.

For Daniels Inman, the work of Charlottesville, Virginia-based architects W.G. Clark and Charles Menefee III best embodied her vision of a sanctum for research and education. As professors of architecture at the University of Virginia, Clark and Menefee advocate clarity and restraint by the example of their work: Since the late 1980s, the pair has garnered a cult following for the design of the Middleton Inn and the Croffead House outside of Charleston, South Carolina. In both projects, the architects transformed a spare palette of raw concrete, wood, and steel into a monastic refuge; and indeed, the material sanctity of these buildings resonates at Daniels Inman's foundation and preschool.

Following the advice of Raleigh architect Frank Harmon, Daniels Inman chose Clark and Menefee over such luminary firms as Gwathmey Siegel & Associates, James Stewart Polshek and Partners, and Bohlin Cywinski Jackson because, as Harmon recalls, "other architects showed buildings that evoked little red schoolhouses." With characteristic


LUCY DANIELS FOUNDATION

FACING PAGE: Clark and Menefee detailed parapet to expose gutter and skylight. Interior partitions permit transparency through building.
BELOW LEFT: Steel-supported glass canopy shades preschool entrance.
BELOW RIGHT: South-facing corridor doubles as children's art gallery.
BOTTOM LEFT: Modular construction allows for extension of classroom wing.
BOTTOM RIGHT: Playground flanks north-facing classrooms.

FACING PAGE: Architects tailored 7-foot-high cabinets in classrooms to scale of children. Clerestory and shared skylight above partition (top) suggest spatial continuity of adjoining classrooms. **BELOW AND BOTTOM:** Assembly room is used for preschool's events and foundation's lectures.

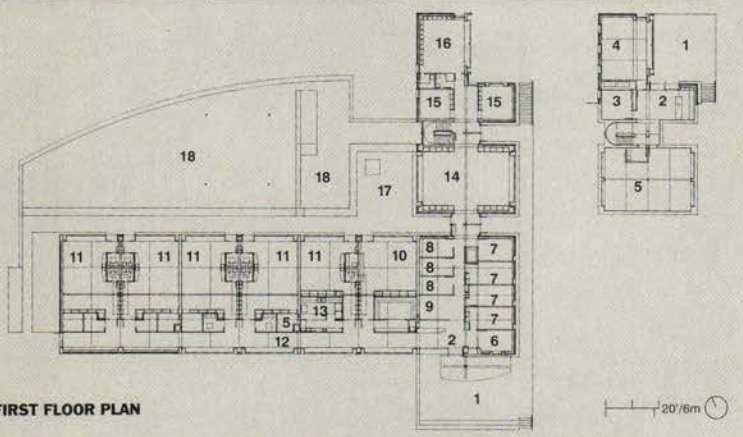
fervor, both Clark and Menefee deplore the strident primary colors and disjointed, "childlike" forms that characterize many contemporary school designs. "We refused to do anything cute," Clark snaps. "Children are full of fantasy and invention. Architects shouldn't pander to them by imposing an adult's vision of a childlike place."

In contrast to the surrounding office park, replete with Raleigh's most ambitious manifestations of cheap, corporate Classicism, LDF's abstract planarity appears nobly stark, even cathartic. Daniels Inman describes the building as "strong, subdued, and serene—like an analytic setting." These qualities have a calming effect on the children, who inevitably transform nearly every surface of the building with their art. Clark and Menefee's penchant for Modernist austerity, rendered in concrete-block walls and glass enclosures, creates a neutral background to the colorful products of a child's imagination.

The architects nonetheless temper the brutality of sheer rationalism with a didactic elaboration of form. For them, the poignancy of architecture derives from the eloquence of a building's plan, massing, and tectonics; and with characteristic deference to the landscape, they initially conceived the building as an L-shaped retaining wall, reconciling the slope of the land with the need to locate the preschool and playground on one level. Daniels Inman rejected this proposal, however, because it embedded the foundation into the hillside, rather than elevating it to the same level as the preschool.

The need to express the dual purpose of the building thus determined the architects' final parti. Clark and Menefee reduced LDF's building to three essential blocks, linked by glass vestibules to form the shape of an L. The long arm of the L houses the preschool at the top of the hill; the foundation stands downhill, at the end of the short arm; and a shared assembly room links the two. The foundation's monumental image prevails: a

BELOW: Oak partitions and floors adorn foundation's upper level reception area.
PLAN: Classrooms flank south-facing preschool entrance and corridor. Assembly room separates foundation (top) from preschool (bottom).
FACING PAGE: View of foundation's library shows concrete structure and oak cabinetry. Metal sculptures by Thomas Sayre echo natural forms.



FIRST FLOOR PLAN

1 FORECOURT
2 ENTRY
3 INTERVIEW ROOM
4 RESEARCH ROOM
5 STORAGE
6 PRINCIPAL'S OFFICE
7 THERAPIST'S OFFICE
8 PLAY THERAPY ROOM
9 WAITING ROOM
10 LOUNGE
11 CLASSROOM
12 CORRIDOR
13 KITCHEN
14 ASSEMBLY ROOM
15 OFFICE
16 LIBRARY
17 TERRACE
18 PLAYGROUND

LUCY DANIELS FOUNDATION & PRESCHOOL
CARY, NORTH CAROLINA
CLARK & MENEFEE ARCHITECTS

ARCHITECT: Clark & Menefee Architects, Charlottesville, Virginia—W.G. Clark, Charles Menefee III (principals-in-charge); Robert Amerman, Francisco Gomes, Jim Rounsevell, William Vukovich (design team)
LANDSCAPE ARCHITECT: Greg Bleam
ENGINEERS: Shoolbred Engineers (structural); Engineering Technology (mechanical); Dennis Hoyle & Associates (civil)
CONSULTANTS: Dian Boone (interiors)
GENERAL CONTRACTOR: Clancy & Theys Construction
COST: Withheld at owner's request
PHOTOGRAPHER: Timothy Hursley

cubic volume, four-square in plan, with one quadrant devoted to a concrete forecourt.

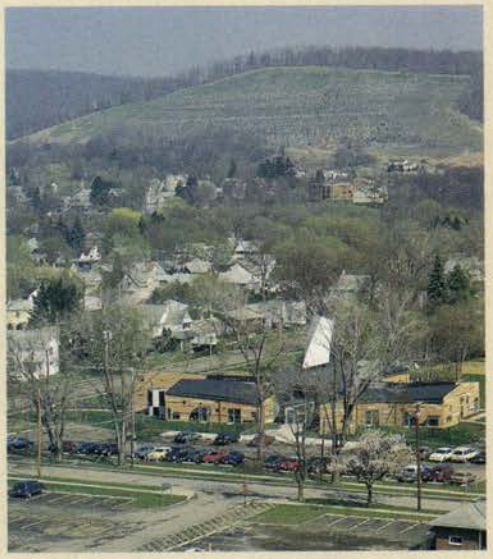
In the architects' study models, the assembly room connecting the foundation and school is represented as an outdoor parterre, defining the two functions as separate, but related. This intention is manifest in the room's parallel glass enclosures, facing east and west: At dawn and at dusk, sunlight blazes through the space, transforming it into a minimalist garden. In the rest of the building, too, the architects blur the distinction between indoors and out. The preschool's south-facing corridor reads as a concrete loggia; and the flanking zone of skylit classrooms opens onto the playground through broad, north-facing windows. Even on an overcast day, neither the corridor nor the classrooms require artificial lighting.

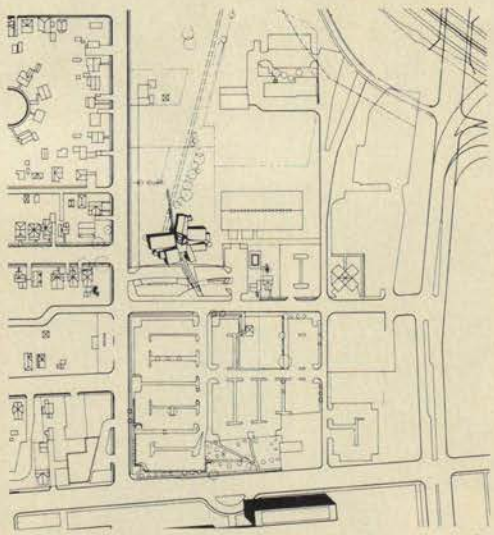
Given the preschool's didactic program, Clark and Menefee took considerable pains to expose the structure of the building. No finishes conceal the perimeter bearing walls, inside or out; and, mercifully, no mechanical plenum looms overhead. In the classrooms, 10-foot-high ceilings, transparent skylights, and clerestoried partition walls evoke the air of an artist's loft. An internal system of structural steel columns and beams frames the center of each room, as clearly as the parts from a child's erector set.

The architects' detailing of the windows reinforces the modular structure and the fluid boundaries between indoors and out. Window seats in the classrooms and corridor become a habitable space between the interior and the landscape—a place for a child to build a sequestered fort, endure a disciplinary "time out," or merely take an afternoon nap. Within Clark and Menefee's precise assemblage, from the concrete, marblelike floors that evoke the depths of the site to the skylights that focus the path of the sun, children can begin to establish their own inner foundations, secure in their relationship to the physical world.—*M. Lindsay Bierman*

Corning Child Development Center
Corning, New York
Scogin Elam and Bray Architects

Children in Motion





SITE PLAN

TOP: Gently inclined and curved roofs of the Corning Child Development Center complement the hills defining Corning's river-valley setting.
SITE PLAN: Child-care center acts as a transitional building between a residential neighborhood (left) and Corning's corporate campus (bottom).
FACING PAGE: Quizzical clapboard facade with disparate windows and "sailing" light scoop consummate the view down a residential street.

Despite their proliferation across the country, day-care centers are often "charity" spaces improvised in warehouses, office buildings, church basements, or houses. Although some day-care providers have developed standardized plans and some corporations have built freestanding structures, remarkably few investigations have been made into day-care centers as a building type. With unusual institutional insight and exemplary patronage, Corning Incorporated, a conglomerate known for its glass products, realized the task could yield special and constructive results, as evidenced in the Corning Child Development Center.

The building's principal clients are infants and preschoolers, and it was for their sensibilities that Scogin Elam and Bray of Atlanta designed the center, financed by Corning for its staff and the community. Mismatched windows, quizzical roofscape, and accidentally patterned clapboard seem to eschew the order architects spend their careers cultivating.

Anthropologists call aboriginal cultures untouched by modern culture "precontact," and in this sense the preschool building is precontact: Like the children who have not yet had their spontaneity trained out of them, the building itself has not been schooled and ruled. Or as one taxicab driver put it, pulling up to the long, low, dynamically shaped, occasionally awkward structure: "It looks like some kid drew it."

Working with Sam Frank, former director of architecture and design for Corning, Mack Scogin and Merrill Elam, partners-in-charge of design, realized that children bring a different point of view to a building. The goal of designing for a child's emotional, perceptual, and physical accessibility proved difficult because few building types are more regulated than day care, with rules and codes for materials, security, life safety, and square footage. "All the regulations push you toward maintenance and surveillance and overlook the unquantifiable ways that children see and learn from the world," points out Scogin, chairman of the architecture department at Harvard. "These buildings should also address the imagination and fantasy—the antithesis of control. In the end, having a little of both is right for a day-care center."

Many centers, including those built from the ground up, assume that teachers and kids will simply slap colors and animal graphics onto a neutral background—that the joy of a center is in the surface finishes. "We went in the other direction, believing the building itself is as much a tool for caregivers as any of the other paraphernalia," explains Scogin. "The overall spatial experience teaches about light, sound, and spatial progression."

The architects state their position immediately at the entry to the Corning Child Development Center, where adults can walk through a tall door, and children, through a short one. The entry leads to a two-and-a-half-story space that is the center of an octopuslike plan with three arms for three "family" groups of children of mixed age.

BELOW: Entrance, with short and tall doors set in trapezoidal aedicula, is located between children's wing (left) and administration wing (right).
BOTTOM: Side elevation of the day-care center, viewed from adjacent residential neighborhood, reveals tall, multipurpose space common to all wings.
FACING PAGE: Center is designed to maximize contact between inside and outside. Checkerboard-patterned turret conceals mechanical systems.

The 11,000-square-foot, $1.2 million center was designed for about 100 children.

The central space is occupied by a translucent cone flaring down from a skylight. Luminous on a sunny day, its corrugated fiberglass materializes light, but it also works as a stall surrounding a wet-play area. An adjacent spiral staircase winds up to an observation balcony leading to one wing; beyond the staircase, a tall, bright, and colorful play space and eating area complements an open kitchen, so children can see food prepared. In a corner, a stairway to nowhere suggests a magical spot, perhaps good for storytelling, and the open space beneath the stairs suggests a space for hiding out.

Each long arm contains a wide corridor—furnished with half-moon booths, carpets, and play areas—which serves as a communal living room for the three classrooms accommodating three age groups: infants, toddlers, and preschoolers. Windows are low, high, and irregular. Shed roofs enclose classrooms that are tall on one side and short on the other; ceiling ducts, joists, and light fixtures are exposed. The interior oscillates between being a clearly planned, three-wing school building and a spatial exploratorium.

The basic issue for Scogin and Elam was how to see through a child's eyes. "Subtle shifts of scale are very important," explains Elam. "The kids are all about growing up, so if you make it all childlike, then you take away that aspirational aspect for them to get taller and become adults. Likewise, if you make

BELOW: As in nearby wood-frame houses, the Corning center boasts a wide variety of windows—some loopy, some proper—that constitute a lesson in geometry and in point of view.
FACING PAGE: Classrooms open directly into the yard; some feature window seats in window boxes scaled to children. Light scoop is constructed of a translucent vinyl laminate stretched over a tubular-aluminum frame.

the building all about children, you worry about grown-ups. You also have to pique the imagination of the child in the adult."

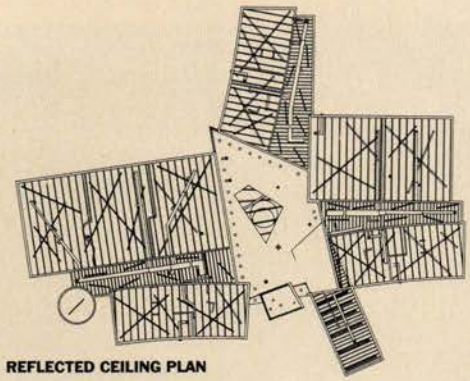
The architects also noticed that children move constantly, which is critical to learning, so they suffused the building with the idea of motion: Not only are there things to climb, but forms shaped with suggestions of movement as well. "We tried to translate the idea of motion as a learning process into the building," remarks Elam.

Though the Corning Child Development Center differs significantly from surrounding structures, it is not estranged. Located between a suburban neighborhood of two-story frame houses and an edge of Corning's corporate campus, the building had to mediate between the two scales (while responding to a nearby hill). "We tried to bump up the forms without resorting to peaked roofs, to make the building slightly larger than the houses, but still related," explains Scogin. "Through its abstraction, the design also acknowledges the old Corning headquarters tower by Harrison and Abramovitz in a Modernist way."

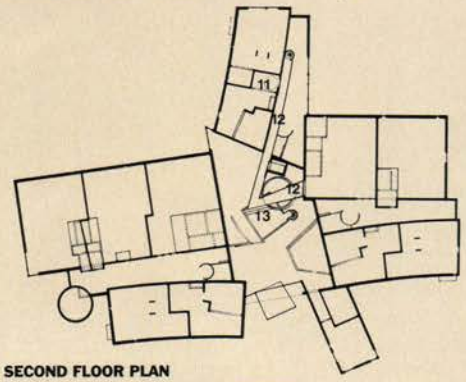
By relating the design to the context, Scogin believes he is teaching children about place, locating them in the specifics of their community. "I can't think of a better place for architects to make a contribution than the critical moment of shaping young lives. Just imagine, if every major corporation in the United States did just one little building that is open to the public. Think of the profound difference."—*Joseph Giovannini*

BELOW LEFT: Children enjoy a built-in banquette in the living room corridor.
BELOW RIGHT: Playful window offers lesson in construction, with exposed studs and window clips.
BOTTOM LEFT: Preschoolers pose for a portrait at their play tables.
BOTTOM RIGHT: Scogin Elam and Bray Architects designed tables for multipurpose uses, such as a window seat.
FACING PAGE: Low and high windows illuminate a room under a ceiling exposed to reveal structure, lights, and vents.

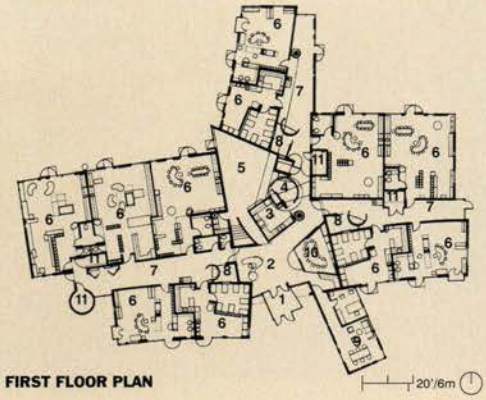
BELOW: Fiberglass tipi carries light into multipurpose room and acts as a shower stall for a wet-play area inside.
PLANS: Children's wings and administration wing wheel off central entrance, adjacent to kitchen and multipurpose room. Second-floor plan indicates elevated observation corridor (center).
FACING PAGE: View of multipurpose room, looking back at kitchen, reveals fiberglass shower stall and skylight, with observation deck.



REFLECTED CEILING PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

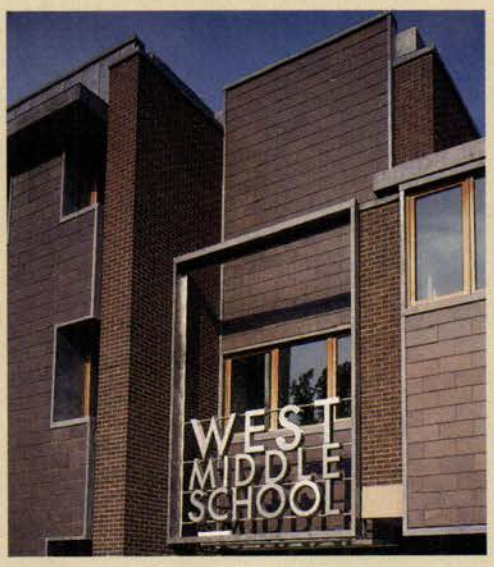
1 ENTRY
2 RECEPTION
3 PANTRY
4 WET-PLAY AREA
5 MULTIPURPOSE ROOM
6 CLASSROOM
7 GROUP PLAY AREA
8 OFFICE
9 STAFF LOUNGE
10 CONFERENCE ROOM
11 MECHANICAL/STORAGE
12 OBSERVATION WALKWAY
13 OBSERVATION/PLAY AREA

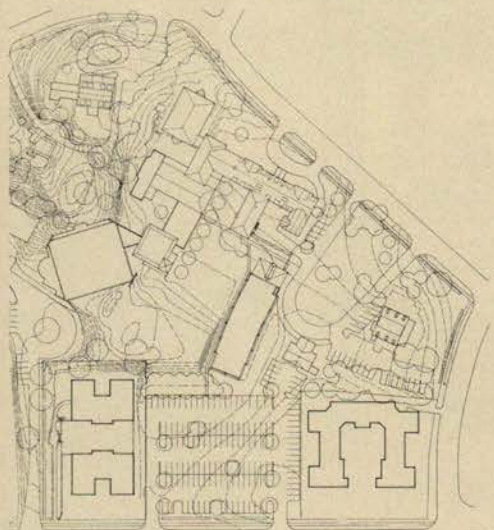
CORNING CHILD DEVELOPMENT CENTER
CORNING, NEW YORK
SCOGIN ELAM AND BRAY ARCHITECTS

ARCHITECT: Scogin Elam and Bray Architects, Atlanta—Merrill Elam, Mack Scogin, Lloyd Bray (principals-in-charge); Jeff Atwood, Denise Dumais, Martha Henderson, Ingrid Dannecker, Carlos Tardio (design team)
ENGINEERS: Pruitt Eberly Stone (structural); Adams Davis Partners (mechanical/electrical); Hunt Engineers and Architects (civil)
CONSULTANTS: Ramon Luminance Design (lighting); Costing Services Group (cost); Raymond and Raymond Associates (food service); William S. Lucas (graphic design)
GENERAL CONTRACTOR: Wellco
COST: $1.2 million
PHOTOGRAPHER: Timothy Hursley

West Middle School at
The Shipley School
Bryn Mawr, Pennsylvania
Kieran, Timberlake & Harris

Tectonic Teaching





SITE PLAN

TOP: Brick-and-block structural walls are infilled with slate-clad panels.
SITE PLAN: Clearing the site for new building made room for green (left) and horseshoe-shaped drive (right).
FACING PAGE, TOP: Building height is reduced at east end, where prominent lantern spills light into music room.
FACING PAGE, BOTTOM: View of north facade reveals zipper effect created by windows at stair landings. Double-height windows (left) allow light into two-story resource center.

Like many academic campuses, the grounds of The Shipley School in Bryn Mawr, Pennsylvania, grew over a century in deliberate, but largely shortsighted, ways. So by 1989, when Philadelphia architect Kieran, Timberlake & Harris (KTH) was engaged to plan a new phase of expansion, the firm found a scattered collection of perfectly respectable, but rather anonymous, Neo-Georgian and 1960s Modern buildings.

Reorganizing the school's upper campus became a primary concern, and the firm's design for the 240-student West Middle School (named for benefactor Al West) emerged as the first tangible step toward giving the ill-defined campus "a new address," explains KTH Principal James Timberlake.

The architect started by clearing the site, replacing a tennis court with a new horseshoe-shaped driveway. The resulting green defines the east campus edge and focuses attention on an old carriage house, slated for renovation as the admissions office. Placing the school beside the entry green also creates a second lawn behind the building for play.

In its form, the new school resembles nothing else on campus, but its palette is sympathetic to the long-lasting materials of other buildings, including slate, metal, brick, and limestone. The architect's decision to design the building as a teaching tool by revealing its tectonics made the selection of exposed, self-finishing materials a natural choice. Paint, caulk, and drywall are minimized.

Moreover, the building extends a pattern of inquiry into the fabric of construction established by KTH in its earlier work, an approach characterized by dividing the program into simple repetitive units, fitting those units into a rational scheme of assemblage, expressing structural elements forthrightly, and developing a compatible but separate language for the infill enclosure.

At Shipley, structural walls appear as brick piers or large expanses of brick where the sides of classroom cells are exposed at the west end of the building. Slate infill walls between the piers are essentially a modified roofing system that satisfies the school's low-maintenance requirements.

The patterning of the slate infill walls, while playful and energetic, is somewhat jarring and difficult to decode. This disparity occurs despite the fact that the staggered gear-tooth openings beside the structural piers resulted from a formal logic. Each classroom is expressed identically on the exterior with a central window and small casements at the corners; the zippered effect occurs where the aligned classroom windows are broken by nonaligned windows at stair landings.

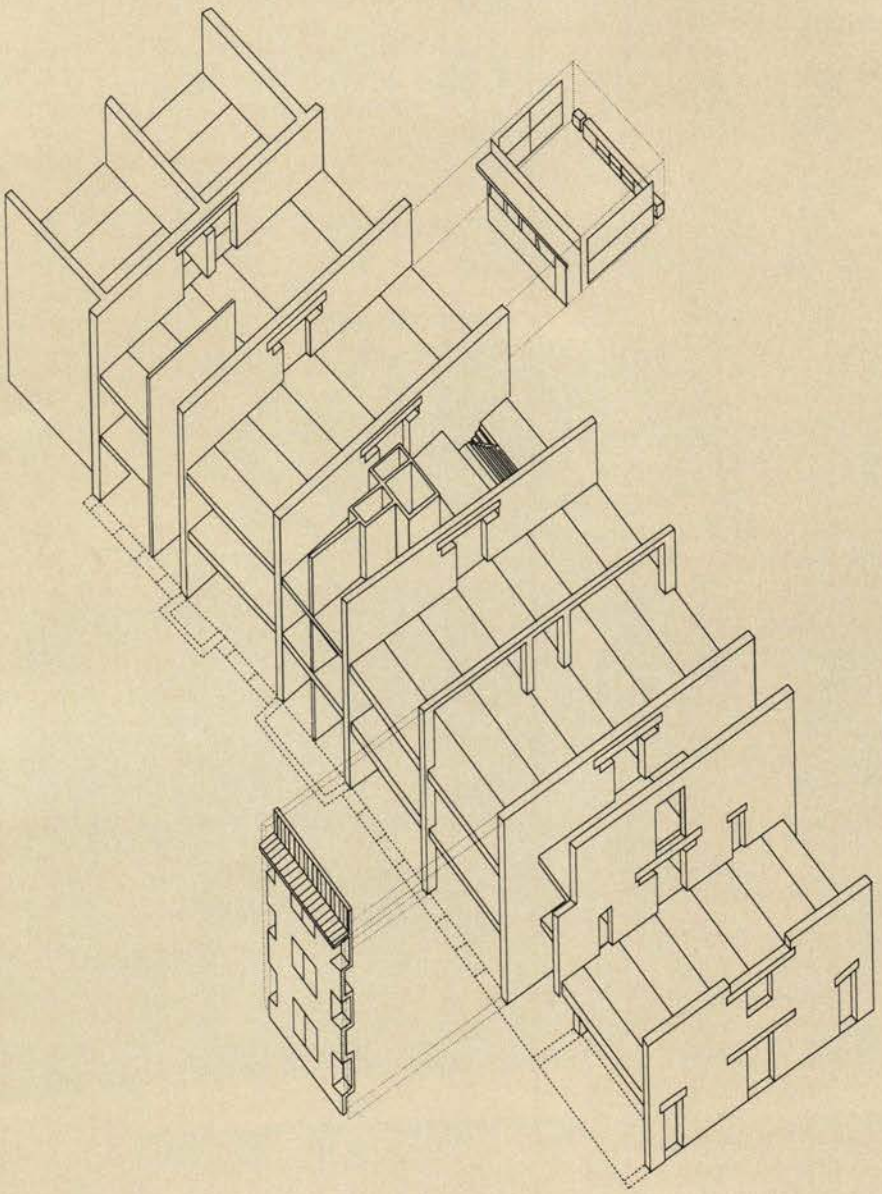
The fundamental unit of the three-story building is the classroom cell, four of which are clustered around a central gathering space on each floor. The 22-foot-by-22-foot cell dimension sets the structural rhythm for the remainder of the building, with large program areas such as the science labs and double-height resource center requiring the width of two cells. The structural grid shifts in the center to create a functional division between the clusters and specialty classrooms inside the building. As urban design, the resulting cranked floor plan accommodates a spreading of the play green to the north and subtle enclosure of the entry green to the south.

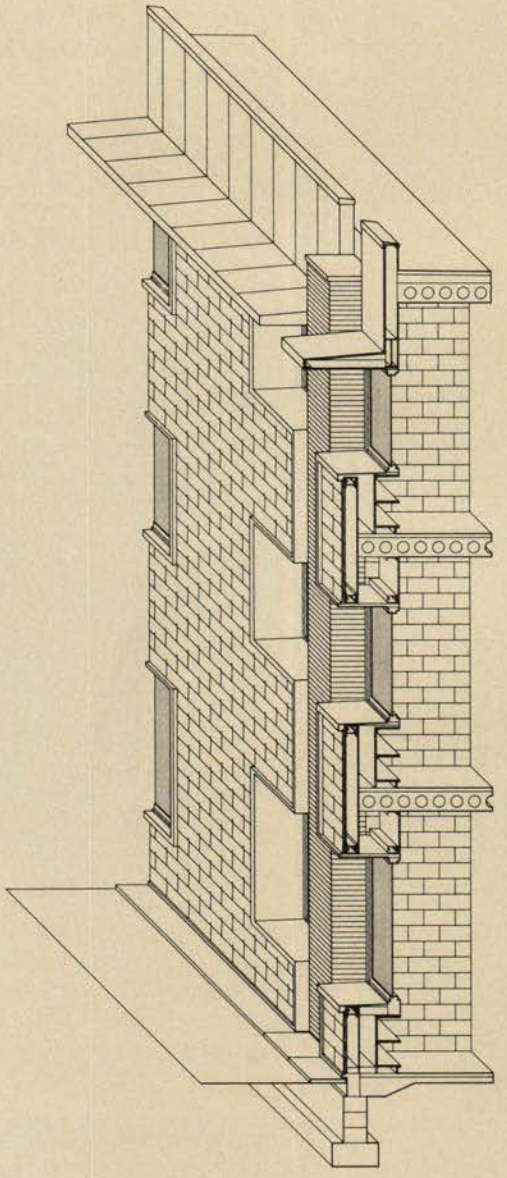
Insufficient program to justify a third floor created an opportunity for new expression at the east end of the building, which contains the public entry and administrative offices. Benefiting most was the second-floor music room, an austere but uplifting space whose high ceiling opens into a lantern.

Beyond the architect's motive to teach children about architecture, there was further method behind the strict repetition of the structural bays, the studied simplicity of the lighting, and the organization of the individual classrooms. The clear ordering of the parts and absence of ambiguity is a settling counterpoint to the spirits of middle schoolers, where chaos reigns.—*Vernon Mays*

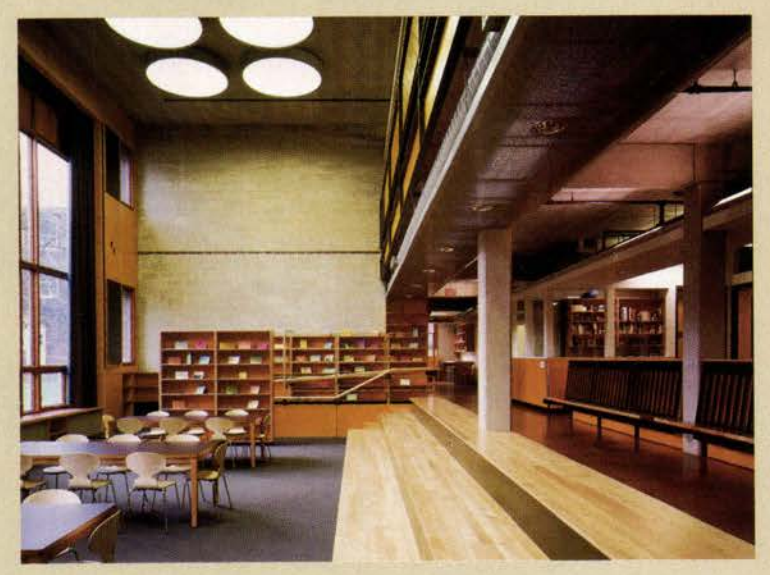

WEST
MIDDLE
SCHOOL

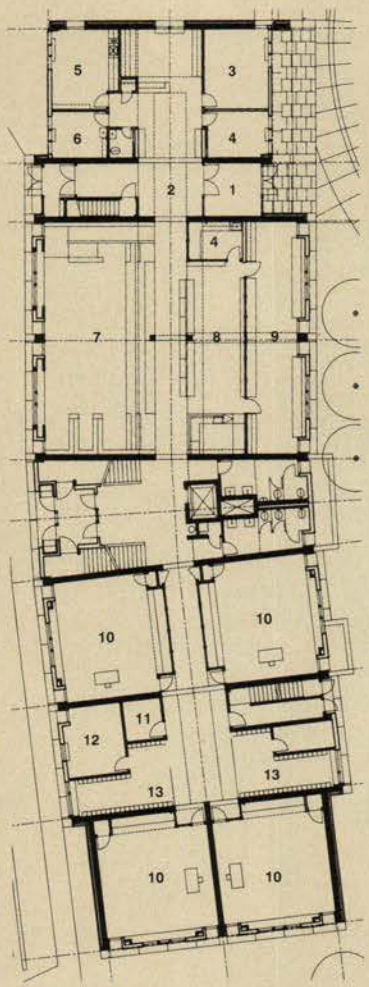
AXONOMETRIC: School is divided by structural walls of loadbearing block.
WALL SECTION: Slate infill panels are supported by steel-stud-framed wall with plywood sheathing. Plywood shelves are built in beneath windows.
FACING PAGE, TOP: East volume containing music room and administrative offices (left) is separated from classroom block by emergency stair.
FACING PAGE, BOTTOM: Slate is hung on series of stainless steel pins.



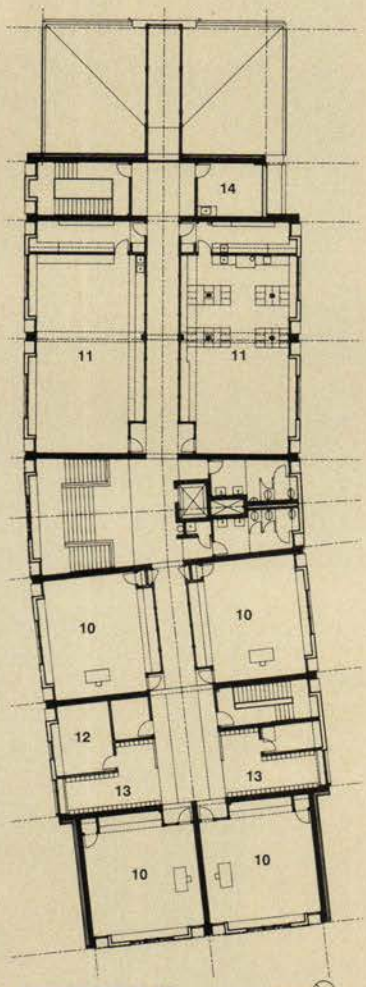


BELOW LEFT: Classrooms are carpeted to deaden sound and feature built-in cabinets and work tables.
BOTTOM LEFT: Multipurpose resource room incorporates bleachers.
PLANS: Organizing grid widens at service core and main stair, separating academic classrooms (bottom) from specialty classrooms and labs (top).
FACING PAGE: Self-finishing materials include concrete block, cork floor, and plywood balcony partitions.





FIRST FLOOR PLAN



THIRD FLOOR PLAN

10'/3m

1 ENTRANCE
2 RECEPTION AREA
3 HEADMASTER'S OFFICE
4 OFFICE
5 LOUNGE
6 INFIRMARY
7 LIBRARY
8 READING AREA
9 COMPUTER ROOM
10 CLASSROOM
11 LABORATORY
12 FACULTY WORKROOM
13 LOCKERS
14 DARKROOM

WEST MIDDLE SCHOOL AT THE SHIPLEY SCHOOL
BRYN MAWR, PENNSYLVANIA
KIERAN, TIMBERLAKE & HARRIS

ARCHITECT: Kieran, Timberlake & Harris, Philadelphia, Pennsylvania—Scott Wing (project architect); James Timberlake, Stephen Kieran, Samuel Harris, Patreese Martin, John Poros, Richard Blender (design team)
LANDSCAPE ARCHITECT: George Patton
ENGINEERS: French and Parello (structural); Vinokur-Pace Engineering Services (mechanical/electrical/plumbing); Yerkes Associates (civil)
CONSULTANT: Tigue Lighting (lighting)
GENERAL CONTRACTOR: Haverstick-Borthwick Company
COST: Withheld at owner's request
PHOTOGRAPHER: Catherine Bogart, except as noted

Corinne A. Seeds
University Elementary School
Los Angeles, California
Barton Phelps & Associates

Modular Learning

TOP: Viewed from the UCLA campus, Phelps' two-story University Elementary School addition appears to be a single-level building.
ABOVE: Entrance to school, with an open waiting area (left) and classroom (right), leads to a staircase (center).
FACING PAGE: Second-floor classrooms capture morning light through roof monitors. Block, steel, and other materials are left exposed.

The relaxed geometries and organization of the east building of the Corinne A. Seeds University Elementary School hardly reveal that the territorial tensions on this small patch of the University of California, Los Angeles (UCLA), campus are nearly Bosnian. The commission handed to Barton Phelps & Associates to construct the equivalent of the seven classrooms built by Robert Alexander and Richard Neutra in 1958, which were demolished for the construction of the new UCLA School of Management, made the design process a mine field of requirements from educators, preservationists, alumni, and parents. But these requirements were just what architect Barton Phelps wanted: "I like to take clear modular forms and let circumstance have its impact."

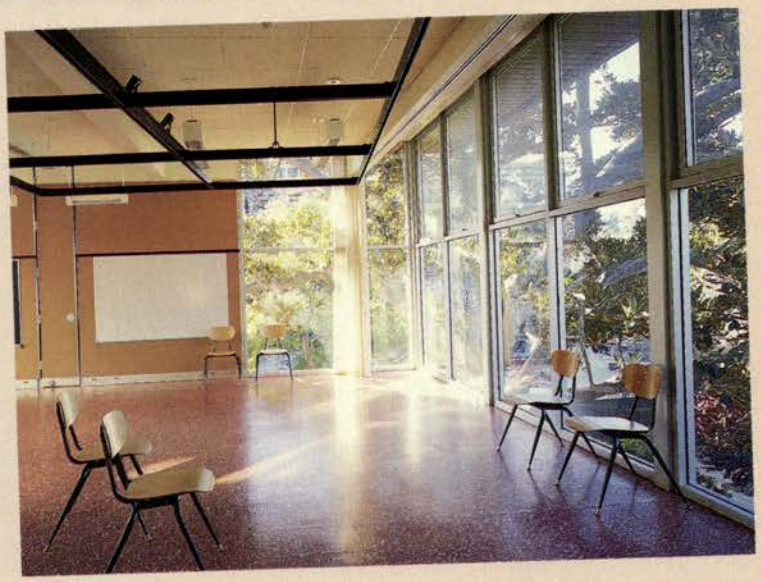
The University Elementary School (UES) is an experimental school with a floor plan to match: Most of the classrooms are twinned, in order to group students beyond the usual divisions. Discussions between the architect and teachers led to the notion of incorporating a small room set between the paired classrooms, accessible from each.

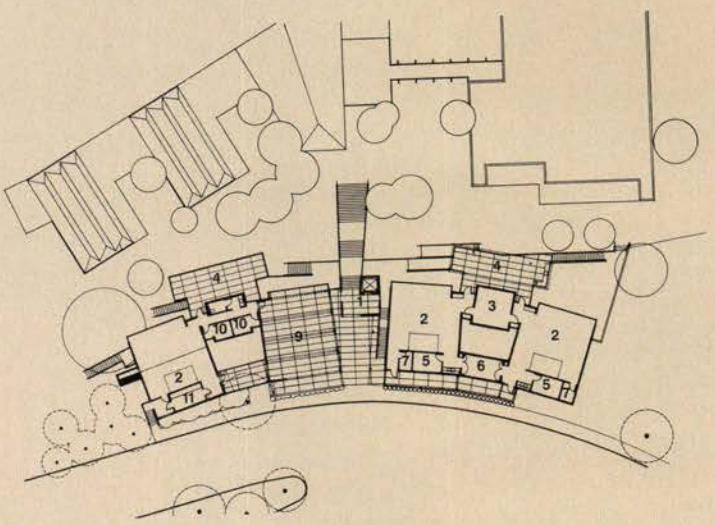
The 1958 buildings by Alexander and Neutra, constructed in a simple industrial vernacular, had been placed according to a suburban mindset then typical of Modernists, who treated buildings as machines in the garden. Rethinking UES was an opportunity for Phelps to reconfigure the campus as a village, placing buildings to define squares and streets. UES is thus a microcosm of a university shifting from a suburban to an urban model.

Challenging the California convention of school design as dominantly horizontal, Phelps double-decked the classrooms and inserted the two-story structure into the up-slope at the back of the site. The building forms a vertical connector between the elementary school and the UCLA campus, located over the school's shoulder on higher ground.

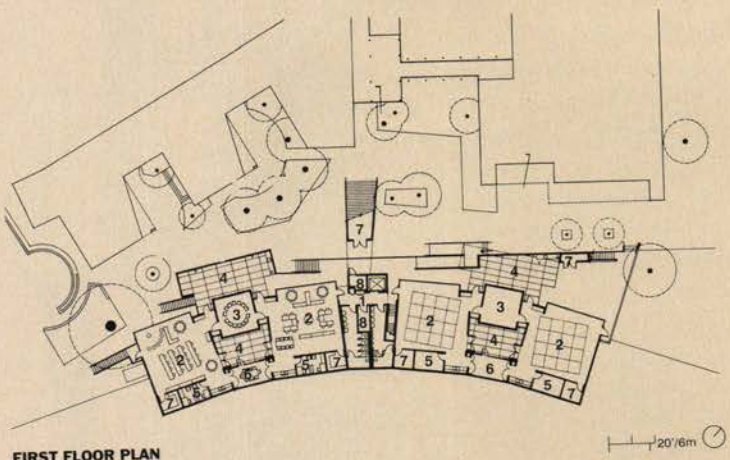
Phelps built a two-story row of general classrooms and adapted each to its particular

DAVID HEWITT / ANNE GARRISON





SECOND FLOOR PLAN



FIRST FLOOR PLAN

1 LOBBY
2 CLASSROOM
3 GROUP STUDY ROOM
4 PATIO
5 OFFICE
6 WORKROOM
7 STORAGE
8 MECHANICAL
9 DROP OFF AREA
10 INTERVIEW ROOM
11 OBSERVATION ROOM

TOP: Second-floor waiting area is located adjacent to top of staircase.
ABOVE: Classroom interiors are framed by floor-to-ceiling windows oriented to new campus center.
PLANS: Classrooms are divided by staircase and segmented by smaller spaces between paired classrooms.
FACING PAGE: Dropped ceiling grid lowers the height of 10-foot-high classrooms, establishing intimate scale.

CORINNE A. SEEDS UNIVERSITY ELEMENTARY SCHOOL
LOS ANGELES, CALIFORNIA
BARTON PHELPS & ASSOCIATES

ARCHITECT: Barton Phelps & Associates, Los Angeles—Barton Phelps (principal-in-charge); Markku Kari (associate-in-charge); David Haggerty, Don Aitken, Yvonne Yao (design team)
LANDSCAPE ARCHITECT: Burton & Spitz
ENGINEERS: William Koh & Associates (structural); Mel Bilow & Associates (mechanical/plumbing); G&W Consulting Engineers (electrical); S.W. Group (civil); Walker/Celano (acoustics)
CONSULTANTS: Robert Alexander (planning); Hak Sik Son (school); Adamson Associates (cost); CMS Consultants (specifications)
CONSTRUCTION MANAGER: Lehrer, McGovern, Bovis
GENERAL CONTRACTOR: Mallcraft
COST: Withheld at owner's request
PHOTOGRAPHER: Grant Mudford, except as noted


EXIT

Burton E. Green Child and Family Development Center
Los Angeles, California
Barton Myers Associates, Architect

Village of Hope

TOP: From Normandie Avenue, the Burton E. Green Child and Family Development Center presents symmetrical stucco volumes in tune with the district's modest, Spanish-style houses.
ABOVE: Main entrance is designed to resemble facade of a toy castle, reassuring newly arrived children of a wholly noninstitutional atmosphere.
FACING PAGE: Each of the four nurseries, which house living quarters for children and parents undergoing care, embraces a private courtyard.

Of those most at risk in our confused, stressed-out urban culture, children rank highest on the scale of vulnerability. The current levels of child abuse and neglect in the United States are staggering, yet dysfunctional families are often left without either help or support.

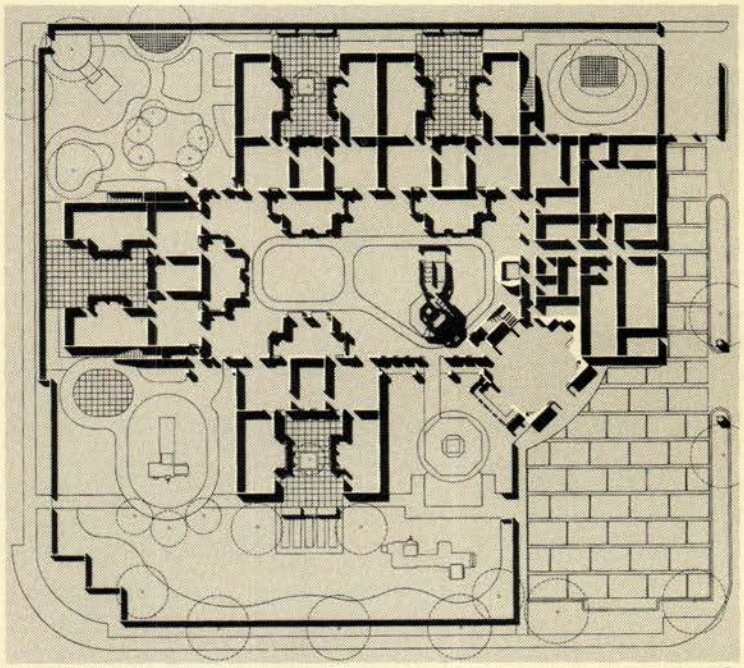
The new $3.5 million Burton E. Green Child and Family Development Center in South Los Angeles is one of the few facilities created to meet this dire need in Southern California. Funded and operated by the nonprofit Children's Institute International, in partnership with the County of Los Angeles, the center is situated on the grounds of the Harbor/UCLA Medical Center, 13 miles south of downtown Los Angeles.

The 24,000-square-foot center provides shelter and treatment for 2,000 children and parents annually, including infant care, therapeutic day care, and services for drug-exposed infants, and operates training programs for parents, foster families, and interns. The facility is staffed round-the-clock and offers emergency services for child victims of rape, beatings, and even attempted murder.

The Children's Institute International, founded in 1906, is one of the oldest private family support organizations in the U.S. The Burton E. Green Center is its second L.A. facility; the first, opened in 1976, is situated west of downtown. Both are located in the poorest districts of the city where the levels of child abuse and family dysfunction are highest.

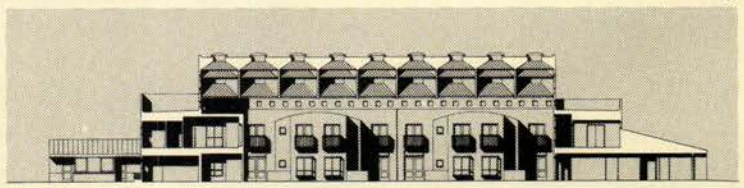
Designed by L.A. architect Barton Myers Associates, the two-story Burton E. Green Center brilliantly re-creates an idealized, homelike atmosphere in an institutional setting. The front entry facade has a playful, castellated silhouette, and the reception area incorporates a welcoming fireplace.

At the heart of the center is a double-height atrium play area, a courtyard filled with toys, a cork running track, plywood play castles, and gazebos where parents can enjoy a moment of privacy with their children.

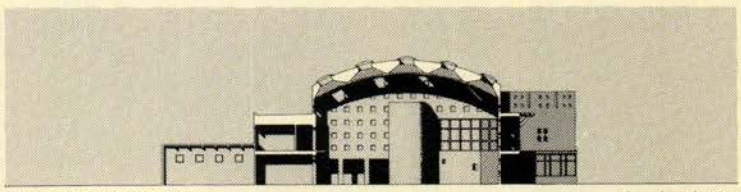


FIRST FLOOR PLAN

20'/6m



WEST-EAST SECTION

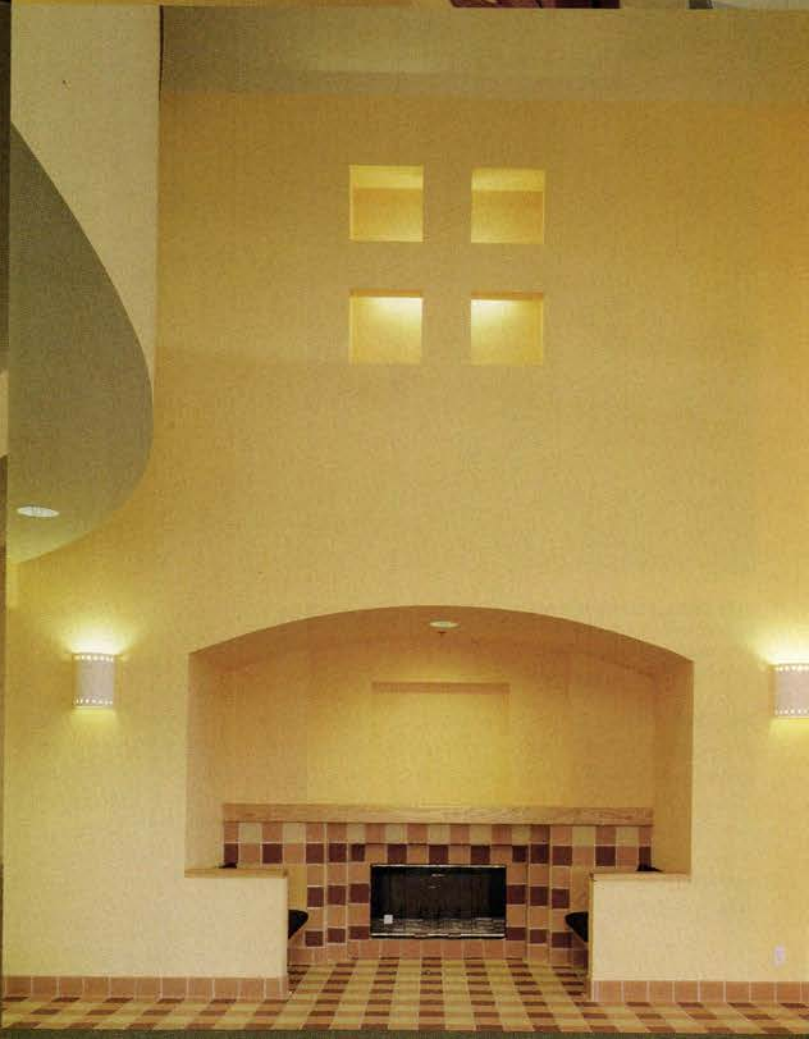


NORTH-SOUTH SECTION

20'/6m

TOP: Stairs lead to supervisor's office.
ABOVE: Courtyard of south nursery opens into communal area.
PLAN: Central play space is surrounded by four nurseries, with entry and kitchen-dining areas on eastern edge. Duplexes contain flexible living and sleeping rooms to accommodate a variety of ages and family groupings.
SECTIONS: Longitudinal and transverse sections reveal spatial relationship of nurseries to central skylit atrium.

FACING PAGE, TOP LEFT: Corner staircase leads from reception area to administrative offices.
FACING PAGE, TOP RIGHT: Viewed from stair, central play area presents a landscape of miniature buildings constructed of plywood and stucco.
FACING PAGE, BOTTOM LEFT AND RIGHT: Grand fireplace with intimate alcove provides a homey setting for visitors waiting in reception area.



BELOW: Nursery duplex is divided into sleeping rooms, living rooms, washrooms, and kitchen-dining areas that can accommodate various age groups.
BOTTOM: Each of the four nursery units is distinguished by a differently colored facade, opening onto central play area.
FACING PAGE: Skylit ceiling reduces sound level and gives a feeling of being under open sky. Cork running track encircles play space and creates sense of a neighborhood sidewalk linking individual nursery units.

BURTON E. GREEN CHILD AND FAMILY DEVELOPMENT CENTER
LOS ANGELES, CALIFORNIA
BARTON MYERS ASSOCIATES

ARCHITECT: Barton Myers Associates, Los Angeles—Barton Myers (principal-in-charge); John R. Dale (associate-in-charge); Patsy Shigetomi (project manager); Princesita Torres, Donald Mills, Shawn Sullivan (design team)
LANDSCAPE ARCHITECT: Stephen A. Ormenyi & Associates
ENGINEERS: William Koh & Associates (structural); Levine/Seegal Associates (mechanical/electrical); Rogoway/Borkovetz & Associates (civil)
CONSULTANTS: Sussman/Prejza (graphics/color); McKay, Conant, Brook (acoustics); Pafford Associates (surveyor); Cini-Little International (food service)
GENERAL CONTRACTOR: Peck/Jones Builders
COST: $3.5 million

Surrounding the atrium on three sides are four nursery complexes. Each houses up to 12 children and four staff members and accommodates a variety of ages and family groupings. The nurseries look into the atrium to create the sense of a self-contained community. In this friendly context, infants, toddlers, and kindergarten-age children mingle under the watchful eyes of parents and staff.

The east end of the first floor houses a central kitchen and service wing. The second floor contains the library, offices, and meeting rooms serving the center's training programs. Every part of the complex overlooks the central atrium to ensure constant visual contact between staff and visitors. "The whole idea is to create unobtrusive supervision in a nonthreatening, spacious atmosphere," Barton Myers explains. "Everything from the spatial proportions to the palette of materials is designed to enhance that purpose."

Vividly painted stucco covers a wood-frame construction braced by steel tubing. Between the atrium's curved, galvanized steel roof and fabric ceiling, a layer of acoustic baffles reduces the racket even a small bunch of kids can create. Within the center, cork vinyl tile and carpeting also moderate the sound level.

Reaching out from the building are four distinct gardens, one for each nursery complex, plus a communal playground. A ring of shade trees defines the center's boundaries in the context of the hospital grounds on three sides, and Normandie Avenue on the west. The center is entered on its east frontage from South Drive, in the medical center complex.

The life histories recorded by the center are harrowing: "Timmy is 9 months old and has had two major hospital stays. His young mother is in drug treatment....Susie, aged 3, was raped in a mall....Jane is a young mother. Abused as a child, she is now beaten by her husband...." In this humane, thoughtful building, such injured young lives can begin to be repaired. The Green Center lays a solid foundation for a hopeful future.—*Leon Whiteson*


Avon
TAKES

Customizing Hardware

Architect-designed pulls, knobs, and handles reveal a sensitivity to materials, craft, and ergonomics.

JACK POTTLE

ABOVE: Architect William Pedersen's prototype for a door pull illustrates an ergonomic approach to hardware.

From Louis Sullivan and Frank Lloyd Wright to Alvar Aalto and Carlo Scarpa, architects have traditionally incorporated their own hardware designs into their buildings. But today, as construction costs increase and project budgets shrink, such detailed work is becoming a rare commodity. Notes New York architect George Ranalli, "Hardware has become a specialty object that's an exercise in industrial design, not an integral part of a building." A few architects, however, are still lucky enough to be commissioned to design door pulls, handles, and other hardware as part of their architecture; some are even creating lines for well-known hardware manufacturers.

Tactile elements

Why should architects take an interest in designing hardware that can easily be specified from a catalog? One reason is that elements such as door pulls often provide the first tactile experience in a building and can set the tone for the character of the architecture. "Since the hand is the first part of the body to make physical contact with a building," observes Ranalli, "the experience of opening a door should communicate the intensity of the spaces, colors, and forms to follow."

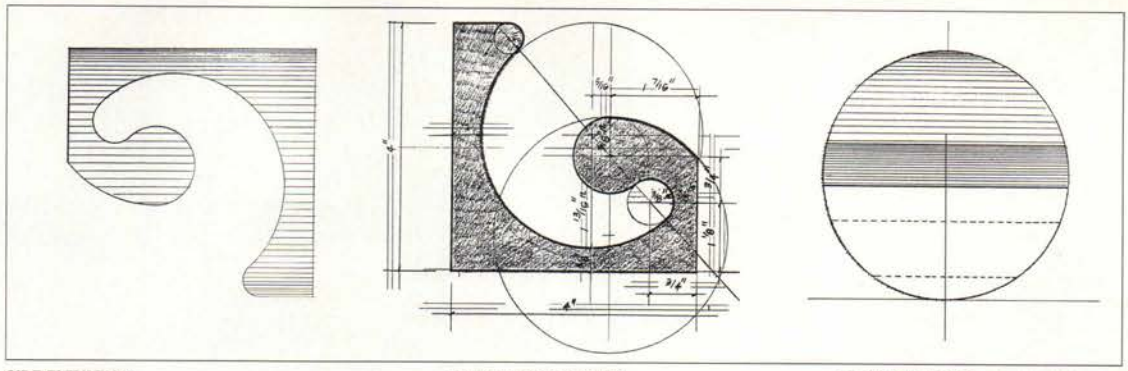
As an intimate connection between the human body and a built object, hardware requires close attention to ergonomics—the interplay between the body and man-made objects. William Pedersen, principal of Kohn Pedersen Fox Associates, for example, designed a door knob prototype that is curved to conform to the motion of the hand as it reaches to grab the pull (above).

Manufacturing and mechanics

Designing hardware requires detailed attention to materials and manufacturing. Ranalli recalls constant communication with craftspeople in Osaka while designing a line of door pulls and levers for a Japanese hardware company. The architect adjusted the smallest details to accommodate an economical manufacturing process.

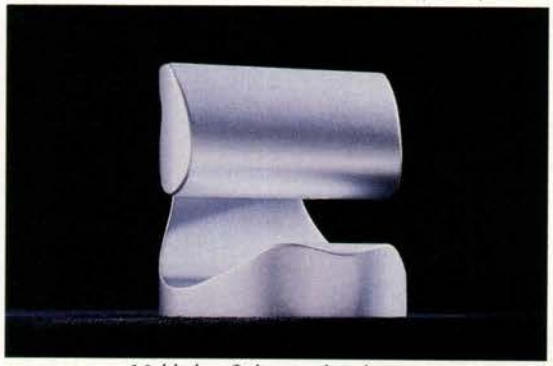
A basic understanding of hardware mechanics is also helpful. Some pieces, such as architect Harley Swedler's line of door handles, are designed to operate with standard lever mechanisms, to create more affordable custom elements. Other projects, such as NBBJ's movable wall panels in a Seattle art gallery, are custom-engineered and celebrate hardware as elegant interactive elements.

Incorporating custom hardware into a building may not always be a possibility for architects, but it still represents an important, small-scale means of communicating an esthetic vision. Such detail-oriented work can also be a learning tool for architects, in terms of designing a three-dimensional object and supervising its construction. As Harley Swedler explains: "Although they're not as complex as a building, I've learned more about the design and construction process by creating doorknobs than I have on any job site."—*Raul A. Barreneche*

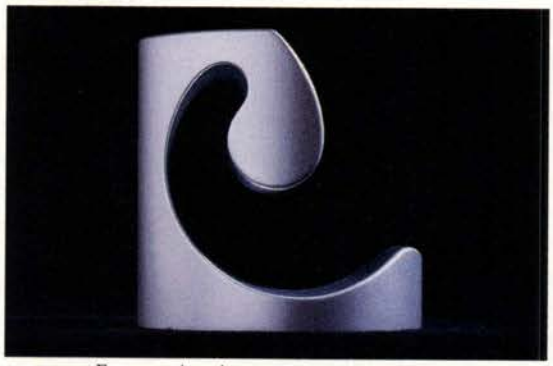


SIDE ELEVATION **ELEVATION GEOMETRY** **FRONT ELEVATION** 1"/25.5mm

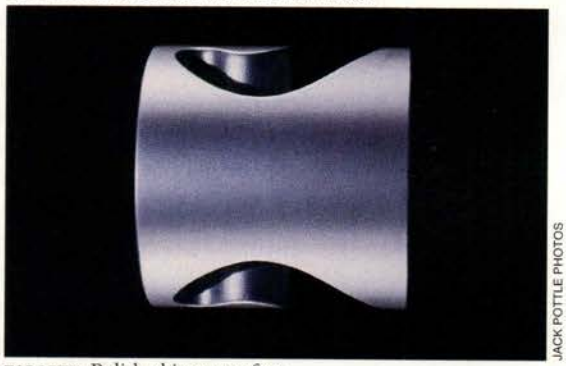
BOTTOM VIEW: Brushed outer surface.



STEEL CURVES: Molded to fit human hand.



SIDE VIEW: Ergonomic grip.



TOP VIEW: Polished inner surface.

JACK POTTLE PHOTOS

Door pull prototype
Forms + Surfaces
William Pedersen, Architect

New York-based Kohn Pedersen Fox Associates (KPF) often incorporates custom hardware in the firm's architecture and regards such objects as an integral part of the design process. KPF has designed hardware for such projects as the Bank Niaga headquarters in Indonesia; the World Bank headquarters in Washington, D.C.; and the London offices of Goldman Sachs. But a more interesting opportunity emerged when partner William Pedersen was commissioned—along with architect Richard Meier and designer Massimo Vignelli—to create a door pull prototype for the Santa Barbara, California-based hardware manufacturer Forms + Surfaces. "While we invariably design hardware for most of our projects," notes Pedersen, "this particular opportunity was different, as the object wasn't tailored to follow the design of a specific building."

Pedersen began his investigation with a series of study models and drawings. His earlier schemes were orthogonal, but the architect eventually moved away from this initial direction: Instead of assembling planar elements, Pedersen excavated a cylinder. An elegant investigation of ergonomics, Pedersen's metal pull measures 4 inches in diameter and 4 inches deep; it is carved to accommodate the grasp of the human hand, with sinuous curves that allow users to slip their hand into the pull.

As the architect's geometric analysis reveals (top center illustration), in section, the cuts are generated by two $3\frac{3}{8}$-inch circles whose diameters are displaced $\frac{5}{16}$ inch. The resulting curves approximate the form of a cupped hand grabbing the pull.

To visually emphasize the carving of the original cylindrical volume, Pedersen proposed treating the exterior surface of the cylinder—which could be fabricated of stainless steel or brass—with a brushed finish and polishing the inside surfaces of the sculptural curves to a high luster. The pulls can be attached to any type of door, whether interior or exterior, but Pedersen envisioned the prototypes to be mounted back-to-back on glass doors.

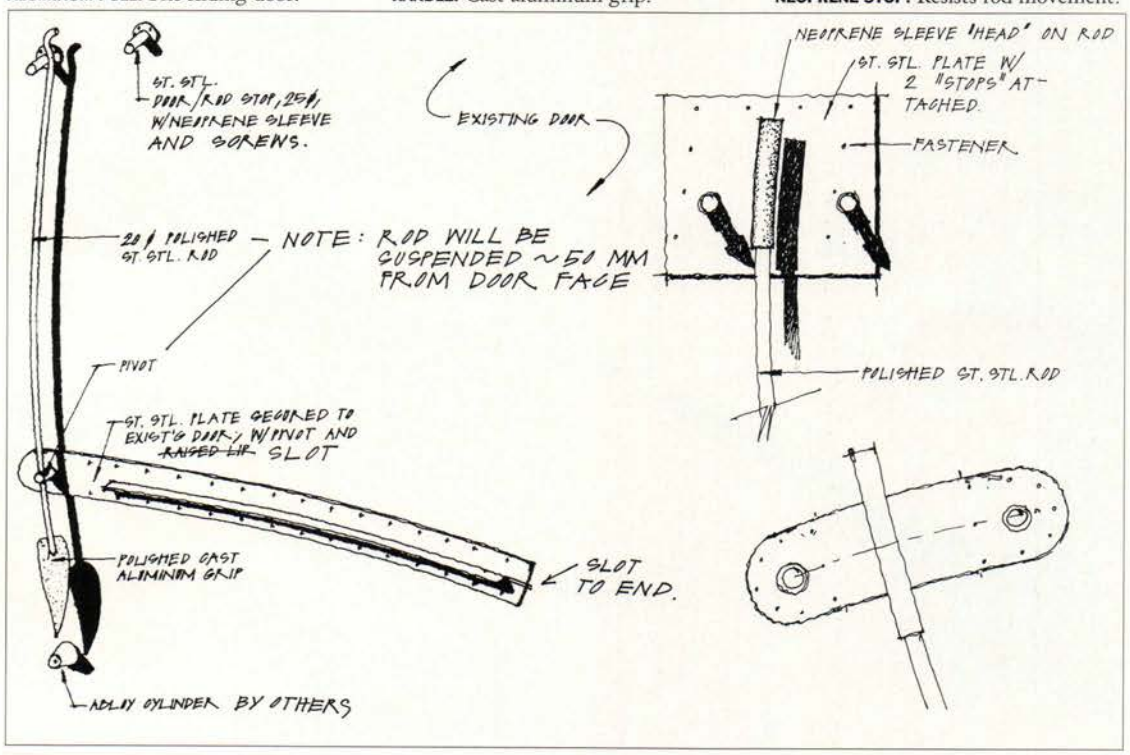
Although Forms + Surfaces abandoned the project, Pedersen's door pull remains both a provocative sculptural element and a tangible extension of his architectural thinking. The door pull also provides a striking transition between the scale of the building and the scale of the human hand, which, as Pedersen notes, is "one of the most provocative interactions" a person can have with a building.

JOHN KELLER PHOTOS

ALUMINUM PULL: Fits sliding door.

HANDLE: Cast aluminum grip.

NEOPRENE STOP: Resists rod movement.



DETAIL ELEVATIONS

Regneg Hardware Series
db+A door pull
Harley Swedler, Architect

New York City-based architect Harley Swedler designs a wide range of industrial objects, from religious ceremonial candle holders to dinner plates. Recently, Swedler has focused his efforts on a line of stainless steel and cast aluminum door pulls, lever handles, and knobs, titled the Regneg Hardware Series. The line was originally commissioned as part of a 1993 New York City apartment renovation. But after the project was completed, Swedler elected to continue exploring the pieces he created, which incorporate forms that the architect claims "sensuously invite the tactile participation of the inhabitants." The line—whose forms and material finishes can be customized—is now being produced and sold through Swedler's studio.

The pieces in the Regneg series all feature aluminum handles, whose amorphous shapes were created by pouring concrete into latex balloons and molding them to Swedler's gripped hand while the concrete set. After experimenting with a number of shapes and selecting a final form, a sand cast was created, from which the grips are molded in aluminum. In the fixed door pulls and knobs, the handles are connected to 1/2-inch-diameter stainless steel rods by means of a pin; as all of Swedler's metal work is "cold connected," no welding is employed.

The lever handles in the series also feature amorphous grips fastened to steel rods, but these are proportioned to fit standard locksets in order to reduce the cost of the custom pieces and facilitate their mass production.

Swedler also designed a large aluminum pull for the front door of a residence in Sydney, Australia. The pull, titled db+A after the firm Dawson-Brown & Ackert that designed the residence, is crafted of an arched, 36-inch-long stainless steel rod fitted with a cast aluminum handle similar to the fluid forms of the Regneg Hardware Series.

The rod is attached to a pivot on a 33-inch-long steel plate, which is fastened to the sliding solid-wood door. As the front door of the residence is pulled laterally, the rod is resisted by a pair of neoprene-covered stops, which are screwed into a steel plate near the top of the door. The stops resist the force of the handle, and the door is simply dragged open or shut. This signature piece, which actively responds to the movement of the sliding door, helps set the tone for the surrounding architecture. "The handle is the first point of contact with the house," architect Harley Swedler observes, "and is thereby sensuous."

ROBERT PISANO PHOTOS

MOVABLE PANELS: NBBJ's partitions on wheels create flexible display spaces.

Seafirst Gallery
Seattle, Washington
NBBJ Architects

When NBBJ Architects was commissioned to design Seattle's Seafirst Gallery, the firm was charged with creating highly flexible display areas in an irregularly shaped basement space within an office tower. The architects responded by devising movable walls that can be rotated to create a variety of spatial configurations, depending on the size and type of exhibition being shown. Flexibility, notes project architect Brent Rogers, was the scheme's most important feature, as the program called for displaying both two- and three-dimensional work. By inserting movable partitions, NBBJ Architects more than doubled the amount of display surfaces.

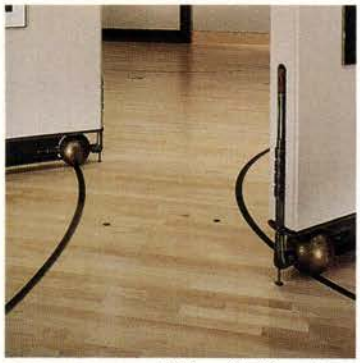
Rogers framed the gallery's seven pivoting walls in structural steel tubing with light-gauge steel and clad them in 1/2-inch-thick sheets of plywood finished in gypsum wallboard. The plywood layer allows an increased amount of flexibility in hanging artwork, as the hangers can be fastened anywhere along the wall surface, not just at the structural members. The bottom of each wall is framed in a standard wide-flange steel beam, which is zinc-plated, acid-etched, and left exposed.

Each of the display panels pivots around a steel column that is placed off-center within each panel, permitting all of them to rotate about two different radii. This allowed the architects to create a greater variety of positions. Circulation around the perimeter of the gallery can be increased or decreased, depending on the exhibition requirements and the position of the panels.

Each panel is guided by means of 8-inch-diameter bronze wheels at its base, which follow 1 1/2-inch-wide, bronze-plated tracks laid into the gallery's maple floor. To allow the wheel's unobstructed movement, the end of the beam under the panel is curved to the shape of the wheel.

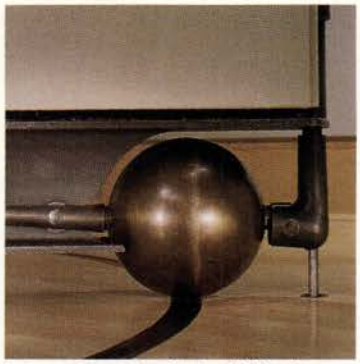
The wheels are held in place by a custom-engineered axle assembly, developed in collaboration with local metal fabricator Garrett Metals. To move a wall, gallery staff pull out a maple handle, which is hinged and set into reveals at both ends of the panels, and raise or lower a 1/2-inch-diameter steel rod. This rod is threaded through the top flange of the beam framing the display wall, as well as through the bent steel section that forms the wheel axle.

The double axle contains two pins—one on either side of the bronze wheel—which are left exposed on the exterior of the axle. A cane bolt, a heavy bolt whose top is bent at a right angle, is inserted into



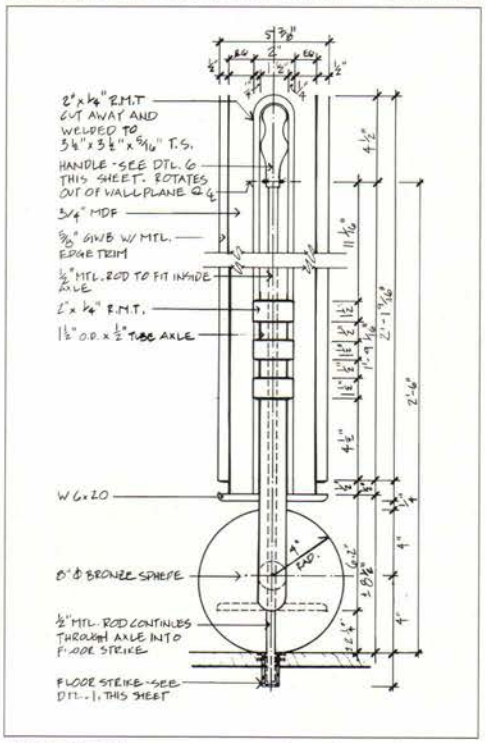
ROTATING PANELS: Follow inlaid tracks.

END DETAIL: Inset handle.

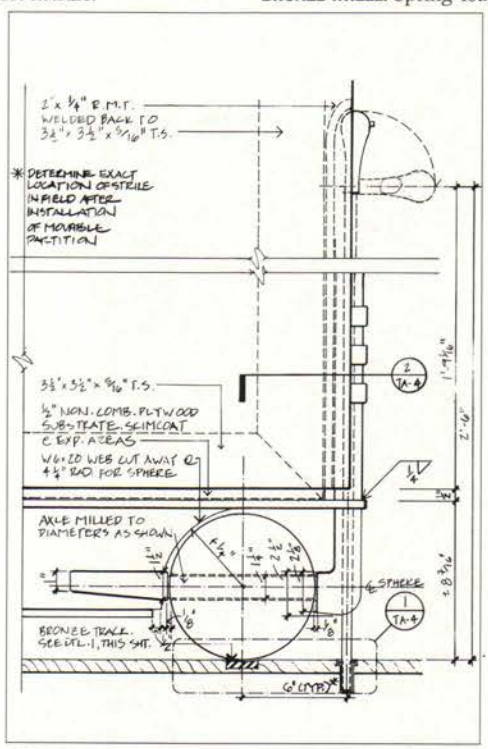


BRONZE WHEEL: Spring-loaded axle.

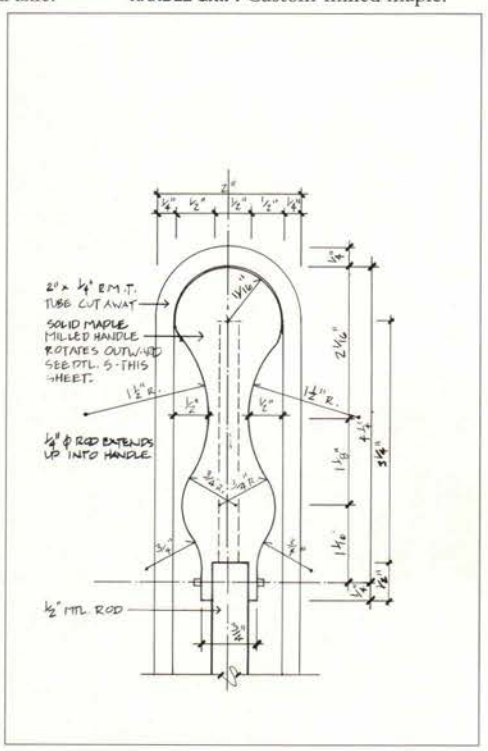
HANDLE GRIP: Custom-milled maple.



END ELEVATION 7.5"/187.5mm



SIDE ELEVATION 7.5"/187.5mm



HANDLE DETAIL 1.5"/37.5mm

the axle to engage a floor strike and lock the wall panel in a fixed position. The strikes drilled into the gallery floor allow roughly 30 different panel configurations. Garrett and NBBJ's design team had considered a number of options, including the installation of small, external brake pads on the rolling spheres, before deciding on cane bolts, which were eventually specified.

According to Rogers, the architects chose the location of the strikes only after the panels were installed. "We went into the space once the panels were in and experimented with them in a variety of combinations," he notes.

To allow for more strikes that meet the needs of future exhibitions, the gallery's maple floor is floated 1 inch above the underlying concrete slab; new strikes can simply be drilled into the floor as required to create more configurations.

Rogers and the other design team members worked closely with the fabricator to develop and engineer the particulars of the gallery's hardware system. The architects selected Seattle-based Garrett Metals after seeing the company's work on a number of custom-designed metal gate assemblies. NBBJ wanted to incorporate rolling elements as the primary movement system in the gallery and wanted to clearly and visibly express all the components.

"We then sketched back and forth," recalls fabricator James Garrett, "to work out the architects' conceptual ideas." To create a functional hierarchy, the architects paid careful attention to the interplay and selection of materials for their system. They specified bronze only in areas that enable motion—wheels at the base of the movable panels and tracks in the floor; steel in the structural frames of the display panels; and maple in the wood elements touched by users—cane bolt handles and floor boards.

Additionally, the materials of NBBJ's flexible wall system represent appropriate solutions for the individual functions within the panels. For example, the architects specified maple for the handles because of the wood's neutral grain and color, as well as its density and structural stability; the custom-designed hardware must resist significant forces applied to it by art gallery staff.

As the Seafirst Gallery was constructed, it became clear that the maple floor was not level. So Garrett was asked to provide a means of allowing the wheels to function smoothly on an uneven floor surface. This adjustment occurred after the initial scheme had been selected. In order to save time and avoid costly last-minute alterations to NBBJ's scheme, Garrett developed a mechanism that could be concealed in the axle assembly, thus leaving the earlier design unchanged. The fabricator therefore specified a 1-inch-diameter spring hidden inside the cane bolt, which functions in compression as an internal shock absorber and allows the wheels to counter level changes as they rotate on the track.

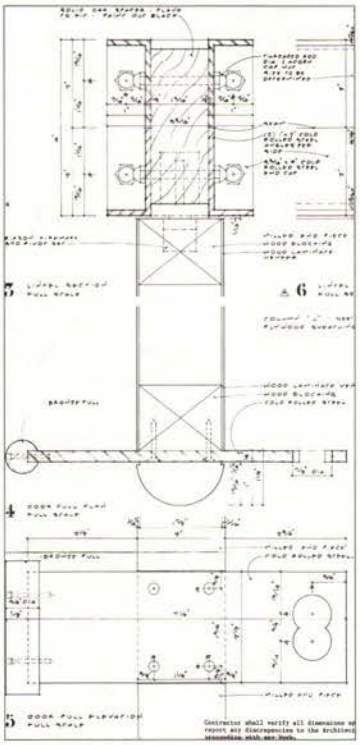
Rogers comments on his collaboration with metal fabricator Garrett: "To successfully complete this project, we had to work closely with the craftspeople from the very beginning. Otherwise, it would have been virtually impossible. The close collaboration allowed us to adjust small details that we couldn't foresee." The new Seafirst Gallery not only provides for tremendous flexibility in displaying artwork, but also allows NBBJ's custom-engineered hardware components to be viewed as crafted artifacts.

DOOR PULL: Two-sided.

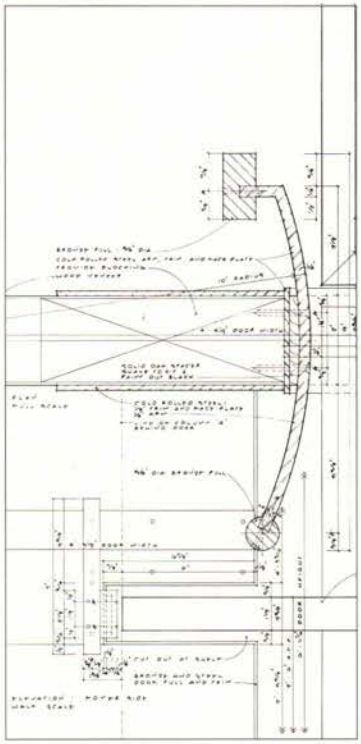
DOOR PULL: Rod and square.

CATHERINE BOGERT PHOTOS

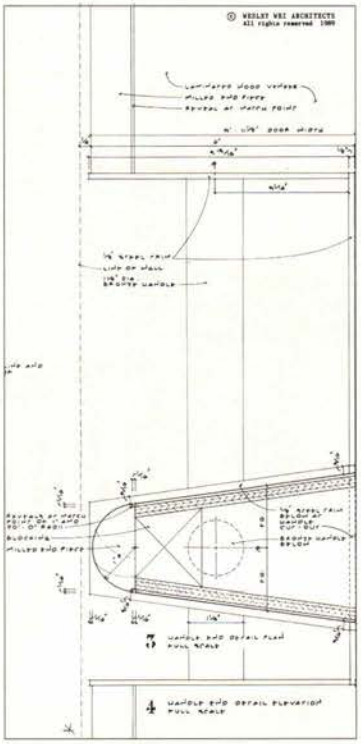
BRASS TUBE: Provides grip.



PLAN AND ELEVATION 1.5"/37.5mm



PLAN AND ELEVATION 3"/75mm



PLAN AND ELEVATION 3"/75mm

Door hardware
Wesley Wei Architects

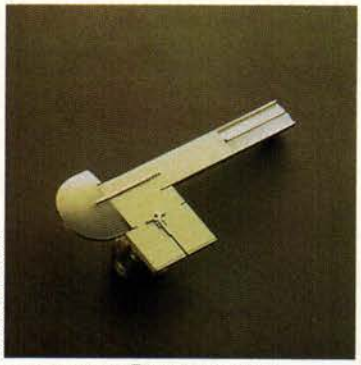
In designing a Philadelphia apartment interior, architect Wesley Wei created partitions, cabinets, and a series of original door pulls for three 4-foot-wide doors in a central, T-shaped foyer. The pulls comprise brass and cold-rolled steel elements, which echo the vocabulary of materials found throughout the apartment. But each of the three pulls is distinct; some are even articulated in varying metals on either side of the same door to underscore the functional differences of the rooms on either side. Together, the three door pulls illustrate how Wei skillfully integrates small-scale, utilitarian elements into a comprehensive interior scheme.

The first pull is designed for a rounded, pivoting door that is finished in a laminated wood veneer. At the curved end of the door, which opens from the foyer onto a bedroom suite, an 11-inch-deep cutout in the door is trimmed with a thin sheet of steel. The pull, inserted within this void, is simply fashioned from a $1\frac{1}{4}$-inch-diameter bronze rod, which is gripped to open and close the door. This hardware solution allows interaction between the foyer and bedroom.

A second door, which opens from the foyer to the study, juxtaposes a different type of pull on either side. The edge and outermost sides of the wood veneer-finished door are trimmed with a steel face plate; a continuous arched bar crafted from a plate of cold-rolled steel is then bolted to the end of the door. On one side, the bar engages a $\frac{3}{4}$-inch-diameter bronze tube, while on the other, it is fastened to a $1\frac{1}{2}$-inch bronze square with a small hole milled into the center. This hole functions as a finger pull, and provides a different method of opening and closing the door.

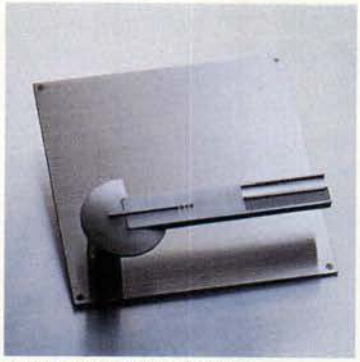
Wei's third piece similarly articulates differences within the same door pull. A 3-inch-wide rectangular steel bar is bolted to the end of a laminated wood door separating the foyer and kitchen. On one side of the door, the bar engages a bronze cylinder that acts as a pull; on the opposite side two overlapping 1-inch-diameter circles are milled into the bar to allow for a pair of fingers to grip and pull the door.

These residential hardware elements reveal not only Wei's sensitive attention to creating a unified palette of materials, but also a skillful translation of his rationalist vocabulary into the smallest details. By integrating custom hardware into his design vision, Wei also celebrates the tactile experience of engaging a functional object.



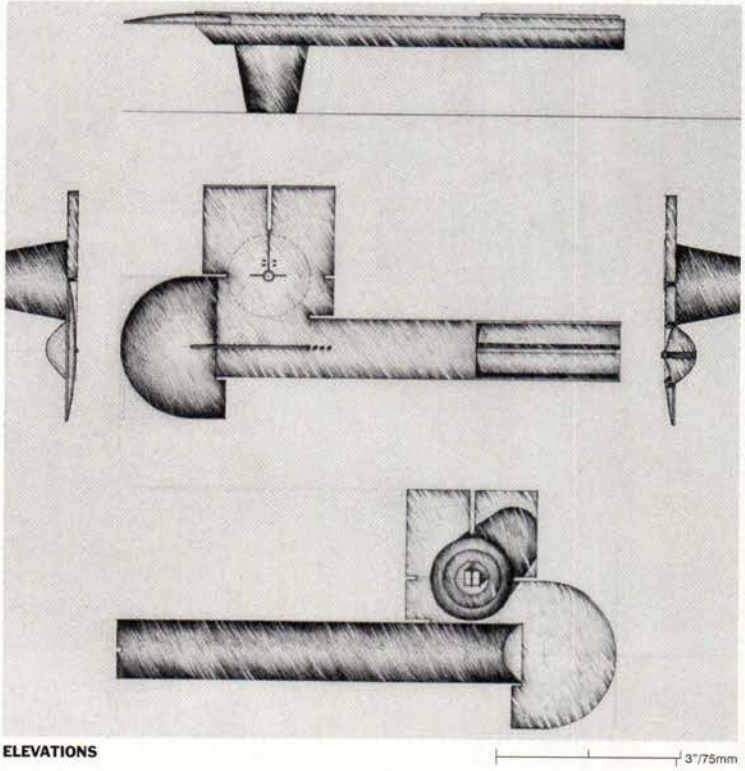
UNION CO. PHOTOS

LEVER HANDLE: Brass prototype.

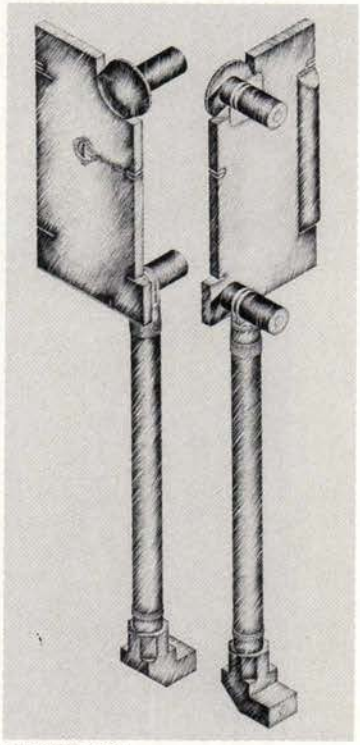


LEVER HANDLE: Cast aluminum.

PUSH/PULL BAR: Brass and steel.



ELEVATIONS



AXONOMETRICS

Door hardware
Union Company
George Ranalli, Architect

New York City architect and Yale architecture professor George Ranalli has designed metal objects, including brass canopies and steel tables and chairs, as a part of his practice since the mid-1970s. So when Ranalli was given the opportunity to design a custom line of door hardware for the Japanese manufacturer Union Company, he viewed it as a logical extension of his architectural work. But the commission also represented a new direction for Ranalli: "It was the first time I was given the opportunity to work with molten metal, not standard sheets, angles, or I-beams," he explains. "It allowed me to explore a richer vocabulary of curves and more elaborate shapes."

Ranalli designed the pieces much as he would a building, working first in sketches, then in scaled orthographic drawings, and later in a series of cardboard-and-plaster models. More precise, final models were crafted with both left- and right-hand variations. The architect collaborated closely with Union Company to ensure that the level of detail specified was possible, given the metal casting and manufacturing process. He refined and adapted his design to reflect limitations in the number of raised detail elements and incisions. Keeping manufacturing costs low was also a concern for both Ranalli and the client; more details and cuts would only increase production costs.

Ranalli's push-plate/pull-bar combines both brushed brass and stainless steel and is sized to mediate between the scale of a building and the human hand. The lever handles, meanwhile, are crafted entirely in brass or aluminum, as the architect chose to express these elements as primary forms composed of a singular material. Additionally, combining both brass and aluminum in the same piece would have required much more hand finishing, an expensive and time-intensive proposition. All the pieces are first sand cast as solid elements, and are later milled, detailed, and hand-polished.

"Designing the handles was an exercise in fusing form and material, as well as an essay on utility," the architect asserts. "For me, the process is a very natural part of architecture. But it's faster than designing a building, and you get to see the results much quicker." Ranalli's hardware, which is commercially available from Union Company, has also been elevated from simple utilitarian door handle to artwork—the two lever handles have been installed in the permanent collection of 20th-Century Architecture and Design at the Denver Art Museum in Colorado.

Award of Excellence

CALL for ENTRIES

1994 CONCRETE BUILDING AWARDS

Children's Hospital Oakland,
Parking Structure, Oakland, CA
One of eight winners,
1992 Concrete Building Awards
Architect: The Ratcliff Architects
Photo by: Richard D. Barnes

OBJECTIVE

To recognize outstanding concrete buildings in the United States and Canada.

ELIGIBILITY

Buildings can be new, restored, or remodeled. Residential and non-residential buildings are eligible. Buildings completed between September 30, 1992, and September 30, 1994, can be submitted. There is no entry fee.

JUDGING CRITERIA

Winning entries will be distinguished by appearance, design creativity, construction economy, technical innovation, positive environmental impact.

DEADLINE

Entries must be received by September 30, 1994.

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To obtain your entry brochure, contact the
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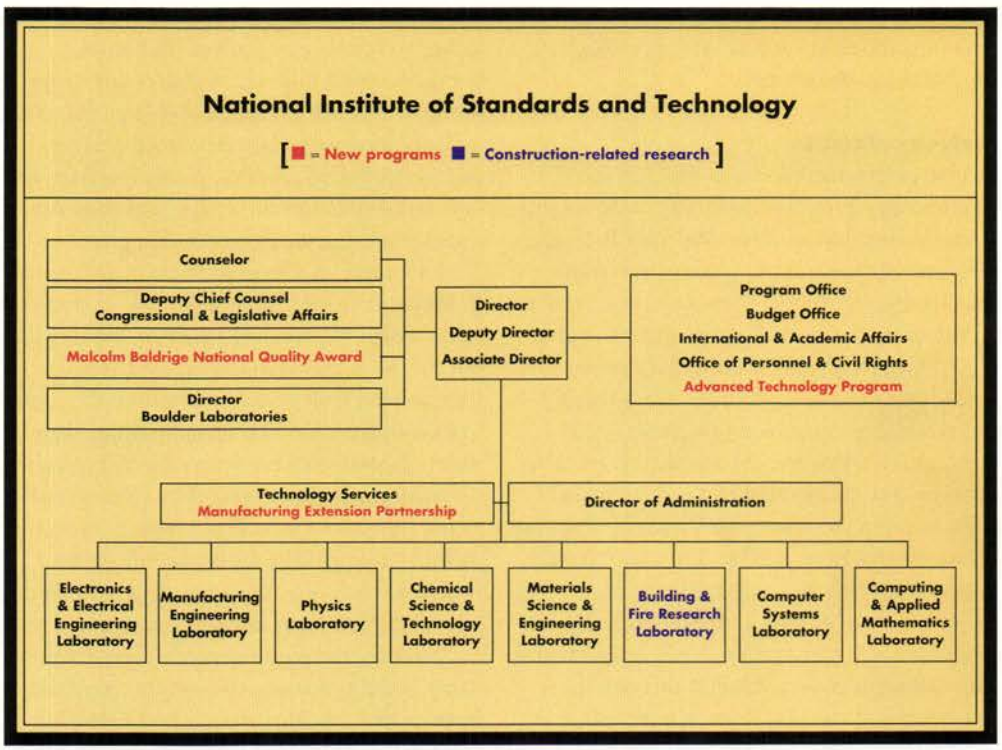
Investing in Building Research

The National Institute of Standards and Technology offers resources to develop new systems for construction.



ABOVE RIGHT: As its mission has expanded in recent years, NIST has added three new programs (red) to its in-house laboratory services. The Building and Fire Research Laboratory (blue) has the primary responsibility for the building and construction industry.

In developing innovative building materials and systems, the design and construction industries have a promising ally: the National Institute of Standards and Technology (NIST). Headquartered in Gaithersburg, Maryland, this arm of the U.S. Department of Commerce was established in 1901 as the National Bureau of Standards to oversee the fundamental measurements of industry—from the length of a ruler to the speed of a clock. In 1988, eager to achieve a competitive edge in the global market, Congress renamed the obscure bureau and expanded its mission. Now, in addition to its role as custodian of standards, NIST is a catalyst for new civilian technologies. Its staff of 3,200 is forging closer ties to industry through a host of new programs designed to propel U.S. companies into the forefront of international competition.

NIST's role is being expanded further by President Clinton. His administration is proposing a sizable boost in funding for the agency, a move that could make NIST as critical to the development of civilian industries as the National Institutes of Health is to healthcare research and as the U.S. Department of Defense once was to advancements in military machinery. This federal initiative could significantly enhance the U.S. construction industry, which has historically invested little in the areas of research and development because of its fragmentation and fears of legal claims against any new products and techniques that fail.

President Clinton has requested that Congress approve $935 million for NIST's 1995 fiscal budget, an increase of 80 percent over total federal appropriations in fiscal year 1994. As part of his long-range economic plan, Clinton envisions allocating $1.4 billion for NIST by 1997, which would include a doubling of the budget for NIST's eight labs from its 1993 level. As it stands, the labs are hoping for $316 million in 1995, an increase of more than 50 percent from 1993. But the biggest chunk of funding—$519 million—is

earmarked for three relatively new programs that are aimed at forging stronger alliances with the private sector .

Industry alliances

These programs, known as the Advanced Technology Program, Manufacturing Extension Partnership, and the Malcolm Baldrige National Quality Award, have been implemented since 1987. They augment NIST's array of more traditional research laboratories, which continue to uphold its sacred measurement responsibilities and scientific research. The technology program is intended to stimulate new research; the extension program aims at expanding technical education in the work force; and the Baldrige Award encourages quality and client satisfaction within private companies.

Of this trio of initiatives, the technology program is the largest. It fosters research and development of technologies through cost-sharing mechanisms between government and industry. Such research is otherwise too financially risky for one company to undertake on its own. Rather than dictate direction, NIST looks to industry to suggest areas ripe for advancement. The yearly grants program is divided into an open competition for any type of promising technology and a focused competition limited to specified subject areas that warrant additional emphasis.

How much of the technology program will address building construction? For the open competition, explains Richard N. Wright, director of NIST's Building and Fire Research Laboratory, "it's as much as the construction industry wants to invest." The focused competition will vary year by year. One of the five targeted subjects for 1994—manufacturing composite structures—seeks to improve the production of advanced polymer matrix composites so that these high-performance materials, for example, can help reinforce the nation's dilapidated bridges.

Meanwhile, James E. Hill, chief of the Building Environment Division at NIST, is currently working with industry to develop other technology initiatives that more directly benefit buildings. Subjects currently under consideration include high-performance construction materials; advanced environmental systems; robotics in construction; and advanced concepts for design and construction of housing and other building types.

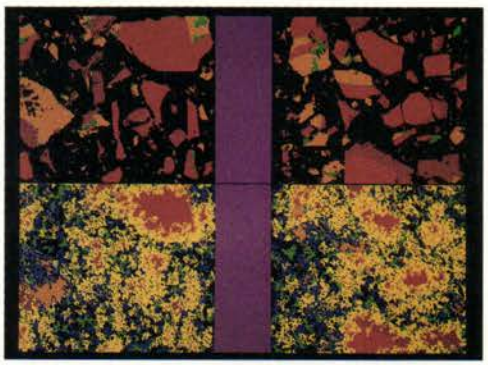
Like the U.S. Department of Agriculture's highly successful Cooperative Extension System, which has educated farmers nationwide for 80 years, the Manufacturing Extension Partnership is designed to improve the country's economic base by disseminating the results of applied research on new technologies to small manufacturers and businesses and other potential users. This program of technology transfer calls for a nationwide network of regionally managed centers funded in part by NIST and in part by a local sponsor.

To date, the regional centers have concentrated on the manufacture of discrete parts, such as in a machine shop. The program, however, is entirely open to the construction industry. Explains Wright, "AIA could formulate a proposal for a technology transfer center that would serve architects." Wright suggests that this architectural center should function as a prototype in developing and testing teaching materials that would then be made available to the existing network of architecture schools or AIA's growing continuing education program.

Better known by the public, NIST's Malcolm Baldrige National Quality Award identifies and recognizes quality in American companies. Firms are evaluated according to detailed criteria established by NIST. Any U.S.-based, for-profit company, including an architecture firm, can apply.

NIST laboratories

Although the largest portion of NIST's 1995 budget request targets these extramural programs, the Clinton administration has not lost sight of NIST's eight labs: Electronics and Electrical Engineering; Manufacturing Engi-

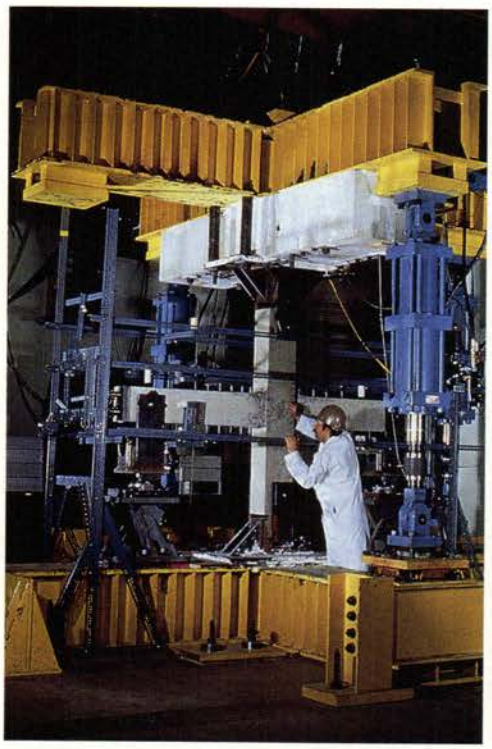


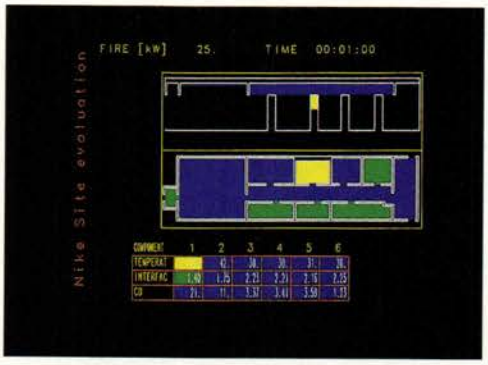
Building Materials Division

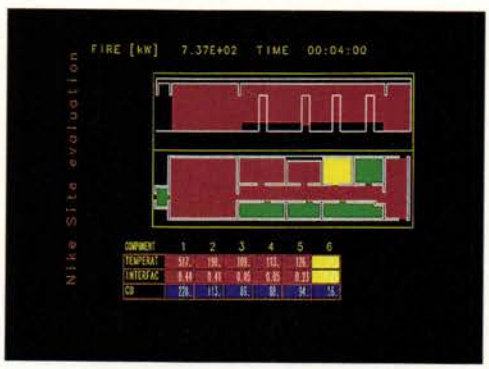
This division of NIST's Building Fire and Research Lab (BFRL) examines the science and technology of construction materials. Researchers are currently investigating the service life of building materials—particularly roofing, paints and coatings, and cement and concrete—and developing tools to assist in the manufacture and selection of high-performance concrete and steel.

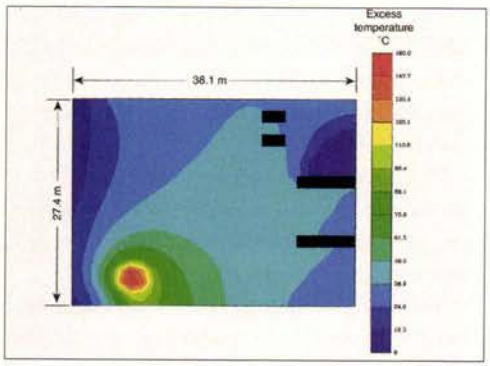
One such technique is a computer model that simulates the microstructural development of curing concrete (top). In one image (above), researchers can compare an actual picture of Portland cement (top half of screen) that has just been mixed with water, to a simulation of the subsequent setting process (bottom half of screen). The red, orange, and green flecks indicate different chemical compounds in the cement grains, which range in length from less than one micrometer to 100.

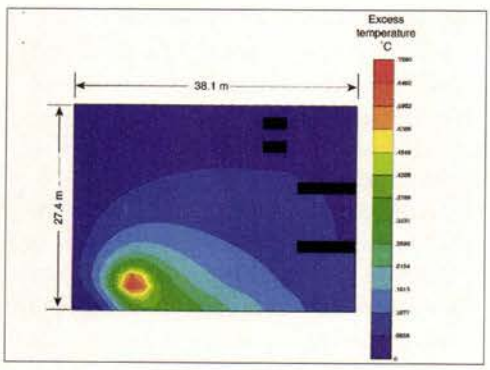
In this simulation, a narrow band of space along a sand grain (purple strip) contains less cement and is therefore more porous and weaker than other areas. To achieve high-strength concrete, this juncture must be strengthened. Computer modeling helps concrete manufacturers determine the appropriate mix.











Structures Division

From soil properties and seismic design of frames to wall system performance standards, the Structures Division investigates the engineering of buildings. One of its recent innovations is a precast concrete beam-to-column assembly under investigation at NIST's structural test facility (above). The prototype is designed to withstand high winds and severe earthquakes.

Prestressing strands, positioned horizontally through the beams and column, provide the clamping force necessary to connect the precast elements so that the whole assembly acts as one unit. In addition, reinforcing steel bars are placed at the top and bottom of the beams to absorb energy resulting from high wind or seismic activity. Severe lateral forces may cause the reinforcing bars to yield, but the prestressing strands remain elastic. Easily accessible, the bars can be replaced, leaving the structure as good as new.

After seven years of research, the lab determined that this structure was as sound as conventional methods, yet saved construction costs and time. The assembly is now being reviewed by code organizations; a demonstration project in California is being designed.

Fire Safety Engineering Division

Practical, cost-saving tools for improving life safety are the goal of the Fire Safety Engineering Division. "Architects are working with codes that say, 'Here is how thou shalt construct,'" explains Walter W. Jones of the fire modeling group. Jones believes these prescriptive regulations inhibit innovative, cost-effective solutions to fire safety. Many advanced countries, including Australia, Japan, and Canada, are turning to performance-based standards, which give architects more flexibility in meeting life-safety requirements.

These countries are increasingly relying on computer modeling tools such as BFRL's HAZARD to simulate the progress of a fire within a specified building. In one example (top), after one minute has elapsed, conditions in the upper half of the room in which the blaze began are intense enough to physically incapacitate an occupant (yellow). After four minutes (above), all connected spaces except one are considered lethal (red). Using the model, an architect can determine how variations in construction methods, ventilation systems, or room adjacencies affect safety. Version 2.0 of HAZARD, with a more friendly graphic user interface, will be released in 1995.

Fire Science Division

Studying the fundamental pyrolytic characteristics of building materials is the primary focus of this division. Projects include a comparison of various types of piping incorporated in fire sprinkler systems; evaluation of fine water sprays to replace traditional fire sprinklers, which can cause water damage, and halon fire-suppression systems, which threaten the ozone layer; the development of furniture flammability test methods to provide manufacturers with an affordable tool for evaluating new designs; and a study of smoke movement in spaces that soar above 60 feet.

The study of high spaces, which include warehouses, aircraft hangars, hotel atriums, and enclosed stadiums, was initiated to determine whether smoke from a fire will ever reach and trigger a ceiling-mounted sprinkler system, and whether the water from the sprinkler will ever reach the fire below. As part of the investigation, NIST staff documented heat patterns emanating from a 32 MW fire (top) and a 400 kW fire (above) ignited in an existing 90-foot-high space. Once the study is completed, the researchers will develop design recommendations for sprinkler locations in these building types.

neering; Physics; Chemical Science and Technology; Materials Science and Engineering; Building and Fire Research; Computer Systems; and Computing and Applied Mathematics. Most of the increases proposed in the 1995 laboratory budget will be directed to five initiatives—advanced materials and processing, advanced manufacturing, and environmental technology, which affect the construction industry, as well as national information infrastructure and biotechnology.

Building standards and research

Of the eight labs at the institute, the Building and Fire Research Laboratory (BFRL) has primary responsibility for construction-related technologies. The 200-person lab is organized into five divisions: Building Materials; Structures; Fire Safety Engineering; Fire Science; and Building Environment. In addition to working with its sister labs, BFRL researchers collaborate with all sectors of the building industry to provide technical tools that encourage practical improvements at all stages in a building's life, from design and construction to maintenance and demolition.

Many of these tools have traditionally been established through the process of writing standards. BFRL staff are active participants in the national and international standards bodies that affect construction, such as the American National Standards Institute and the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

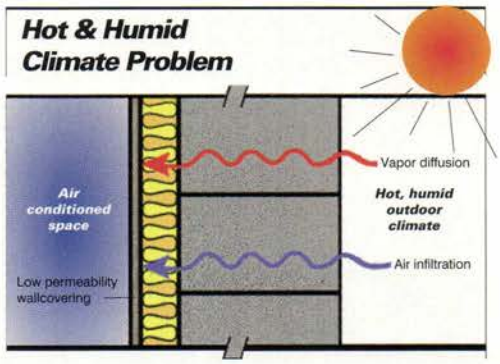
Even without the proposed 1995 funding, which Congress will not vote on until the fall, BFRL continues to conduct a diverse mix of building-related research. Its five divisions are currently studying improvements in high-performance concrete, development of a precast concrete structure for seismic areas, fire modeling tools for performance-based standards, investigation of fire control in atriums, and analysis of innovative insulation systems (following pages). The Building and Fire Research Laboratory plans to expand this exploration through its continuing programs on advanced building technologies, advanced technologies for fire safety, and green building technologies.

NIST's ties to architects

In recent years, NIST has worked more closely with building product manufacturers and code officials than with architects. But its researchers have offered valuable advice to the few inquisitive practitioners who have sought them out. For example, H.S. Lew, chief of the Structures Division, reports that an architect interested in specifying a base-isolated system recently contacted NIST to inquire about the appropriate criteria. "At the present time, base isolators are not available as off-the-shelf items, so the architect wanted to know how he could go about designing one." The Structures Division provided the guidance, explaining how the new seismic technology can be applied. Lew also reports an increase in the number of calls from architects designing projects abroad. "They want us to help them obtain local wind and seismic load requirements for structural design."

Now, NIST officials express interest in strengthening the agency's ties with the architecture community. "We are very interested in hearing architects' views," says Arati Prabhakar, the new director of NIST. The degree to which architects benefit from the agency's expanding programs may largely depend on how active a role practitioners and the AIA take in helping NIST to set its construction-related priorities.

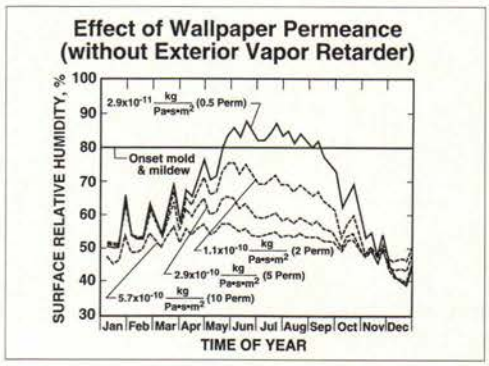
Architects familiar with NIST are encouraged by Clinton's proposed funding boost. "The Center for Building Technology was fundamental in the development of solar energy and fire protection standards," notes Harry T. Gordon, principal of Burt Hill Kosar Rittelmann in Washington, D.C., recalling NIST's research in the 1970s before Reagan-era budget cuts. "NIST is going to play an important role in the advancement of the construction industry again," Gordon asserts. "Its star is rising."—*Nancy B. Solomon*

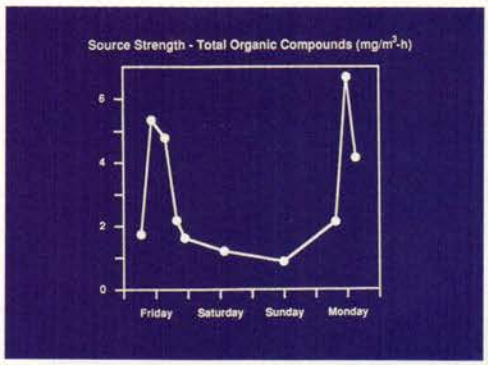


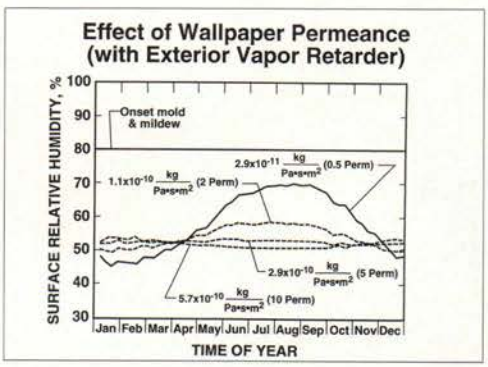
Building Environment Division

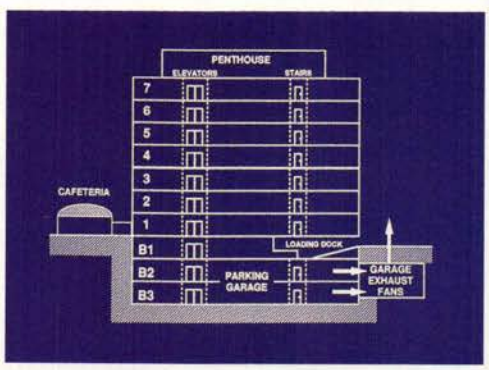
Much of the work undertaken by this division falls under BFRL's green building program, formally established last year. While the division has been engaged in aspects of sustainable architecture for many years, the new initiative has given researchers the opportunity to study building processes from a more holistic viewpoint. There is now more incentive, for example, to study the relationship between two different environmental phenomena, such as energy efficiency and indoor air quality. The new program is also administering five pilot projects selected by the U.S. Congress to investigate green building technologies.

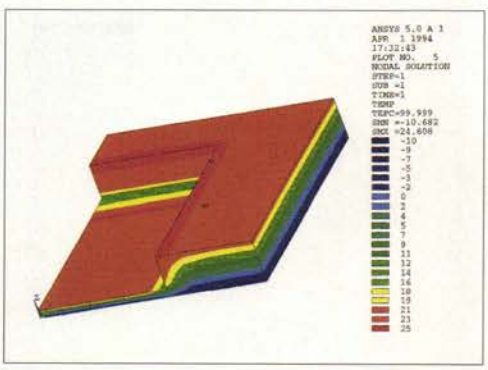
Although research activities under the green building umbrella will not be expanded until funding increases, which is anticipated for fiscal year 1996, researchers in this division have already made contributions to the environmental arena. One NIST scientist, Douglas M. Burch, working with William C. Thomas of Virginia Polytechnic Institute and State University, recently developed a computer modeling program called MOIST (top) that allows architects to study the effects of moisture on various construction assemblies (above) in different climates in the U.S. and Canada.











Based on hourly weather data for the selected city for an entire year, the model calculates the relative humidity present in each component of the building assembly over time. These data can be plotted on a graph (top), and the architect can then adjust the building envelope by inserting an exterior vapor retarder, for example, and rerun the calculations. In this case (above), the additional layer prevents moisture from the hot humid outdoors from creeping into the vinyl-covered gypsum layer on the interior.

To verify the accuracy of MOIST, researchers constructed and tested the moisture content and heat-flow characteristics of 12 different panel assemblies (facing page).

Research into indoor air quality is another ongoing activity in this division of BFRL. Scientists develop measurement and prediction tools necessary to understand building ventilation and indoor contaminant levels. Their research supports other agencies, such as EPA, that are trying to provide guidelines as to how to achieve good indoor air quality in buildings.

Projects undertaken by the indoor air quality group include year-long monitoring of ventilation and air quality in buildings. In one example (above), the NIST team examined emissions of volatile organic compounds (VOCs) in a new building. At that time, it was commonly assumed that offgassing of new materials was the dominant source of VOCs.

In this office building, the ventilation system was turned off Friday night and switched on Monday morning. Presumably, VOC emissions from furnishings would increase over the weekends and decrease during the week. However, the team found that VOC rates rose when the employees came in on Fridays and Mondays, and decreased on Saturdays and Sundays (top). It turned out that the VOCs were emitted from liquid process copiers, which should have been located in rooms with dedicated exhaust systems.

Standardized measurement techniques are fundamental to the pursuit of innovative products, which cannot be proven successful unless accepted test methods can be applied to measure them. The Building and Fire Research Lab assists trailblazing building product manufacturers by establishing these procedures. In addition, this NIST lab investigates computer-modeling techniques that allow producers to more quickly evaluate design modifications. For example, the heat transfer group of the Building Environment Division is currently analyzing prototype insulation panels that claim R-values as high as 25 per inch thick.

One product now being studied is an advanced insulation panel based on the principle of a thermos jug: a hard vacuum encapsulated by a stainless steel cover. To prevent the steel from collapsing under pressure, this panel is filled with a low-conducting powder. The lab has begun modeling a prototype (above) in the hopes that the manufacturer can investigate the thermal resistance of different fabrication options—such as covering the panel with thicker stainless steel or injecting it with a different type of powder—through computer simulation.

Although NIST's labs have broadened their focus in recent years, they have not abandoned their original mission as the nation's keeper of the standards for various measurements. The Building Environment Division is home to a large-capacity guarded hot plate (top), which measures the thermal resistance of building insulation materials. This apparatus provides samples against which other laboratories can calibrate their own instruments to ensure accurate, quality products in the marketplace.

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Design/Build Gains Appeal

Commissioning architects and contractors as a single entity draws mixed reviews, reports our first article in a series.

STEVEN TURNER / AER PHOTO

ABOVE RIGHT: HNTB/Gilbane constructed the new Rhode Island Convention Center, in Providence, below budget in 32 months.

Some architects scoff at design/build and wish it would go away. Many fear that this integrated project-delivery method —in which architect, builder, and contractor are commissioned as a team—compromises their role by ceding power to developers, contractors, and builders. Whether architects like it or not, however, design/build is gaining momentum. In a recent AIA/Roper Organization survey of clients, 60 percent of respondents said that the ability to provide design/build services was "very important."

The recent revival of design/build among architects began at the AIA in 1978, when the Institute repealed its ethical prohibition against the delivery method, which had been considered a conflict of interest for architects. By 1985, the AIA had developed three standard design/build contracts. At its April 1993 board meeting, the AIA endorsed design/build as an acceptable—and an inevitable—method of project delivery, admitting its growing popularity among clients.

Mixed results

The appeal of design/build to clients is easy to explain: It contains project costs with a price cap. Design/build commonly calls for a fixed schedule, which owners find more reassuring than open-ended construction timetables. Moreover, design/build offers clients a single source of responsibility on projects—a simplified alternative to the antagonistic, litigious relationships that intensified between architects and contractors in the 1980s.

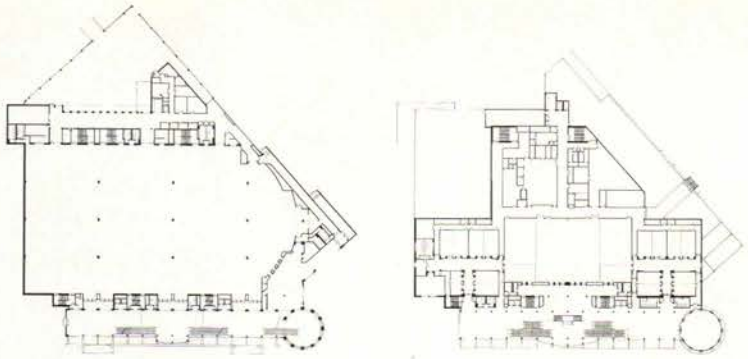
Architects, however, still express mixed emotions about design/build, and as the case studies that follow reveal, the results are also mixed. Design/build often puts smaller firms at a disadvantage, maintains William Donohoe, managing principal of Ehrenkrantz & Eckstut Architects in New York, because the architect must spend money developing a design and may not be reimbursed by the builder until construction begins. "If you've got a lot of work, and cash flow is fine, then you can afford to do design/build," Donohoe remarks. "But we tend to stay away from it."

Bridging the gap

Chester "Chet" Widom, principal of Widom Wein Cohen in Santa Monica, California, prefers to practice the "bridging" method of design/build. In this format, the design architect settles design priorities with the owner, and the owner then hires a design/build team, which includes an architect of record, to execute the project.

Richard Keating, partner of Keating Mann Jernigan Rottet in Los Angeles, contends that the success of a design/build project depends on the chemistry among team members. Keating ruefully describes past experiences where "the quality of team members was erratic." On the other hand, Keating's firm is now "happily" participating in a California state design/build project in Oakland, attributing its success to "a contractor who has the same set of values that we have as architects."—*Bradford McKee*

Rhode Island Convention Center
Providence, Rhode Island
HNTB/Gilbane Building Company



SECOND FLOOR PLAN THIRD FLOOR PLAN 40'/12m

CLIENT: The Rhode Island Convention Center Authority (CCA), appointed by the state legislature in 1986 to oversee creation of the civic amenity.

PROGRAM: The project called for a 365,000-square-foot convention center on a site in downtown Providence. The main exhibition hall had to measure at least 100,000 square feet to remain economically viable. To support expected visitor volume, the program also required a 350-room hotel and parking for 750 cars. Bond financing introduced a cost ceiling of $86 million and 32-month completion deadline, after which returns on bonds had to be realized.

DESIGN/BUILD STRUCTURE: CCA retained design/build entity Metro Partners, a partnership between Marshall Development Corporation and Gilbane Building Company. Metro Partners contracted architect HNTB of Boston for design. TRA Limited of Boston served as client's representative. Morse Diesel served as program manager.

CONSTRUCTION TIME: 32 months; completed on schedule.

COMPLETION: December 1993.

COST: $82 million; $4 million below budget.

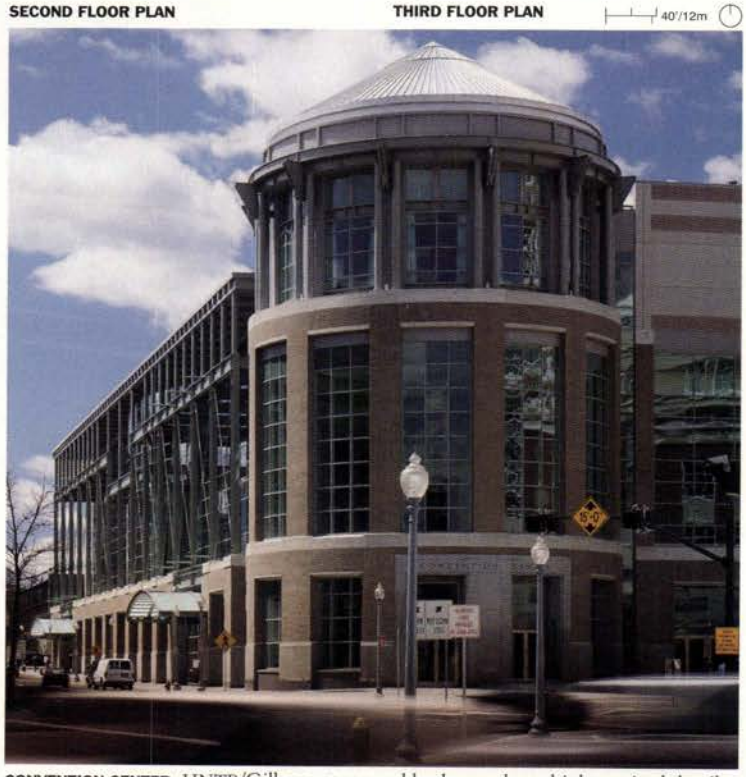
SUCCESSES: Metro Partners assumed responsibility for conforming to the labyrinth of state laws regarding the procurement of materials and labor. "To deal with the public-policy requirements, the CCA would have had to establish an immense organization," notes TRA Principal Peter Haney. "The authority could have 5,000 contracts, or they could have one," hence the CCA decided on design/build. The CCA also sought to "depoliticize" the bidding process by turning all bidding over to the private design/build concern, placing itself beyond reproach.

HNTB Project Director Donald Grinberg maintains that the design/build team met the schedule by simplifying the lines of decision-making. The architects and contractors worked on the project simultaneously; thus, if the contractors discovered money left over in the budget, the architects could discuss the surplus with the client and put the money toward details and finishes. For example, the team was able to keep the granite near the front entrance and incorporate poured-in-place terrazzo floors in the lobby rather than precast. The architects also specified stainless steel doors for the entrance rather than aluminum.

REGRETS: The developer was uncomfortable with the design team's sketchy response to the request for proposals. "We guaranteed all design and construction based upon the proposal," explains Joseph Hohman, vice president of Metro Partners. "But you wouldn't have even called [the RFP submission] schematic documents." In July 1989, when the agreement was signed, Hohman recalls, "there was very little subject matter to put your arms around." However, HNTB's Grinberg counters that the initial proposal contained ample detail to establish the cost and schedule. To accommodate the lack of detail at the outset, each contractor set aside a percentage of anticipated costs to cover items missed or underpriced.

Also, contrary to the design/build team's proposal, the convention center hotel was not built. The economic assumptions upon which the convention center hotel plan was based did not prove viable in the economic downturn in New England, Haney discloses, and no bank would finance the hotel. Thus, a major part of the design/build proposal did not materialize. "If the mission and requirements aren't clearly stated," Haney asserts, "you'll get what's delivered, and it may or may not be what you want."

CLIENT'S LAST WORD: Client representative Haney asserts that "the CCA selected the best business deal as well as the best design."

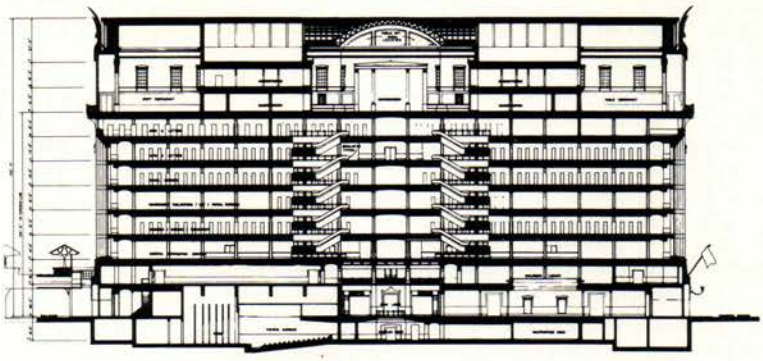


CONVENTION CENTER: HNTB/Gilbane conserved budget to keep higher priced details.

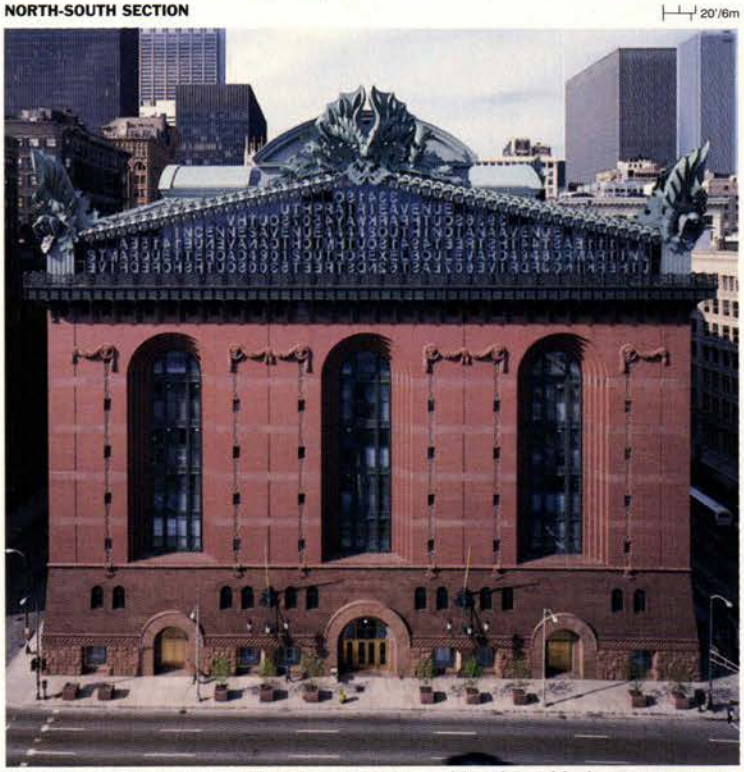
WARREN JAGGER PHOTOS

LOBBY: Tight site and budget dictated elevated exhibition hall.

Harold Washington Library Center
Chicago, Illinois
Hammond Beeby and Babka
SEBUS Group



NORTH-SOUTH SECTION 20'/6m



WASHINGTON LIBRARY: Design/build responded to public's loss of faith in government.

JUDITH BROMLEY PHOTOS

LIBRARY INTERIOR: Cladding budget spared funds for higher quality materials inside.

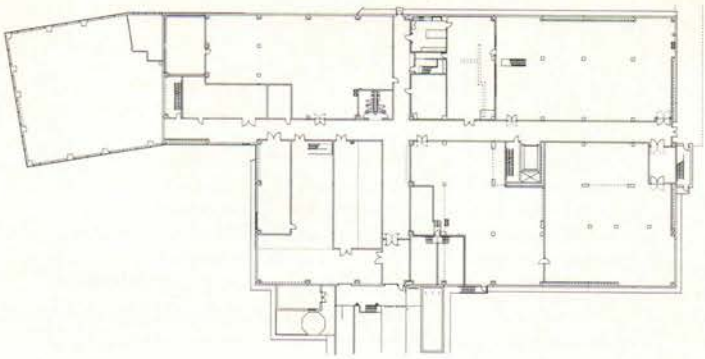
CLIENT: Chicago Public Library.
PROGRAM: The City of Chicago wanted to develop a 756,000-square-foot public library for more than 2 million books on a site downtown.
DESIGN/BUILD STRUCTURE: Project was announced as a two-part design/build competition. In the first round, an 11-member jury screened 15 design/build concepts. The jury then directed five candidates to develop full proposals for the second round. The winning design/build team comprised U.S. Equities Realty as developer, leading construction firm Schal Associates, design architects Hammond Beeby and Babka, and architect of record/structural engineer A. Epstein and Sons International.
CONSTRUCTION TIME: 35 months; completed on schedule.
COMPLETION: October 1991.
COST: $144 million; within budget.
SUCCESSES: The Harold Washington Library Center probably represents the most controversial design/build competition in recent history. The city chose design/build in response to the public's loss of faith in the government's ability to build public projects, as the McCormick Place expansion (1986) and Helmut Jahn's State of Illinois building (1985) both fell far behind schedule and exceeded their budgets. "There was a general feeling that government could not build," recounts Charles Thurow, deputy planning commissioner for the City of Chicago. Bernard Babka, principal of Hammond Beeby and Babka, recalls that "the city felt that design/build was the way to control time and cost."

Also, the city's requirement that 25 percent of contracting firms be minority-owned and 5 percent be women-owned was more flexibly met by design/build. No longer did each separate subcontract—for instance, for steel or for HVAC systems—have to meet the quotas; rather, the overall project could reflect those percentages.

The palette of materials was chosen to respect the decidedly finite budget: Granite was specified only at the base of the building, with the remainder of the building clad in brick. This choice left money for marble floors and wainscoting inside, where library patrons could see it.
REGRETS: The Chicago chapter of the AIA strongly objected to both the competition format and the design/build nature of this commission, charging that the city was "abdicating its role as client." In a 1987 letter to city officials, the local AIA chapter supported the concept of design/build, but made clear its bias against a design/build competition for a public project. "It was not a satisfactory process," maintains Cynthia Weese, then president of the Chicago chapter of the AIA, now dean of architecture at Washington University. "It was enormously expensive for the designers." Each team spent between $350,000 and $750,000 developing competition proposals. "We recommended that the city hold a design competition and then have the winning designers team up with the builders" to develop full proposals, Weese explains. "But the city government didn't know how to be a client."

In retrospect, Thurow of the city's planning department admits that Chicago found little precedent for its project—at the time, the only major municipal design/build commission was the Public Service Building for Portland, Oregon, by Michael Graves. "We didn't have much to go on," Thurow says, "and of course that made us nervous."
CLIENT'S LAST WORD: Thurow notes that design/build may have streamlined the chain of command, but the sheer number of subcontractors involved increased, rather than reduced, the number of lawyers overseeing the project. Thurow recalls, "With a project this big and complicated, the number of lawyers was enormous."

Hershey Chocolate Processing Facility
Hershey, Pennsylvania
Sverdrup Corporation



FIRST FLOOR PLAN 20'/6m

CLIENT: Hershey Chocolate U.S.A.
PROGRAM: To design a chocolate-processing facility comprising a 170,000-square-foot production building, an 11,400-square-foot milk receiving building, and a 12,300-square-foot utility building. The plant was planned to produce in one day the volume of chocolate Hershey formerly made in one week, chiefly by switching from a "batch operation" to an automated, semi-continuous production line.
DESIGN/BUILD STRUCTURE: Sverdrup provided all design/build services as Hershey's process engineers devised new process technology.
CONSTRUCTION TIME: 23 months; on schedule.
COMPLETION: October 1993.
COST: $100 million.
SUCCESSES: Most clients choose design/build to distance themselves from project details and complications, whereas Hershey wanted to engage its process engineers at each stage in the design and construction of its new facility. Furthermore, most clients like design/build because it calls for a finite scheme, schedule, and cost. However, Hershey wanted exactly the opposite—a totally flexible, open-ended project environment for the West Hershey plant. Nonetheless, Hershey chose design/build to obtain its expertise from one source—Sverdrup.

Craig Moyer, manager of process engineering, notes that Hershey owns a construction company for routine upgrading and streamlining of its industrial campus, but in this case turned to Sverdrup for its capability to handle very large projects. Design/build also allowed Hershey to stay flexible in terms of scope. "If we'd have done it the traditional [design-bid-build] way, we'd have spent so much time changing contracts and modifying the scope," Moyer asserts.

Sverdrup Corporation not only designed and built the plant, but also wrote the software required to run the manufacturing equipment and manage its 9,000 controls. Much of the processing equipment was proprietary and being fabricated for the first time. Therefore, the layout of the equipment and the exact sequence of the chocolate-making process was always a variable, even as construction began; thus, so was the final configuration of the Hershey factory's architecture.

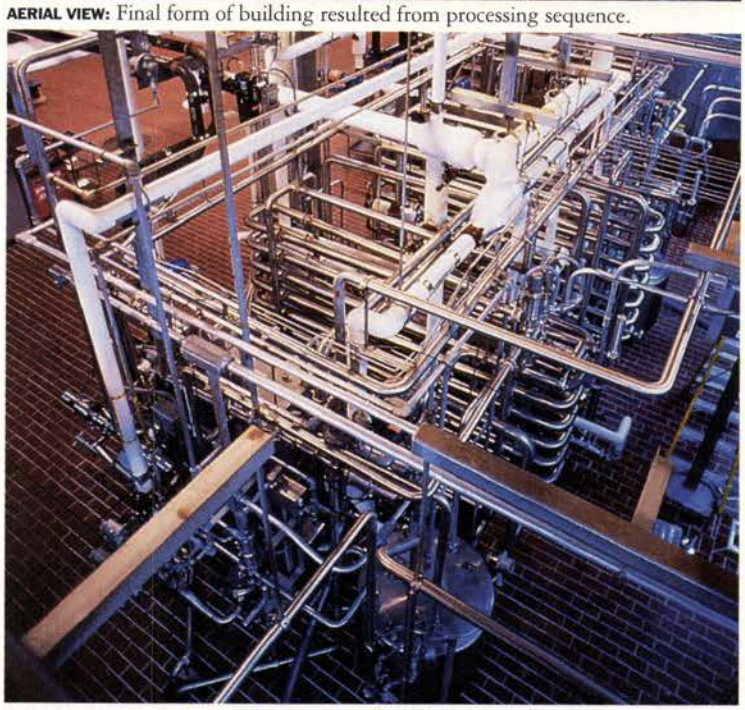
As construction started, Hershey's engineers were still studying the results of pilot production runs under its experimental automated systems, translating the results to the design/build team, and occasionally calling for significant changes to the design of the plant.

Additionally, the size and shape of the plant's evaporating equipment—which removes the water from milk added to chocolate—dictated that it be installed while the building's steel was erected—two years before the plant began operation.

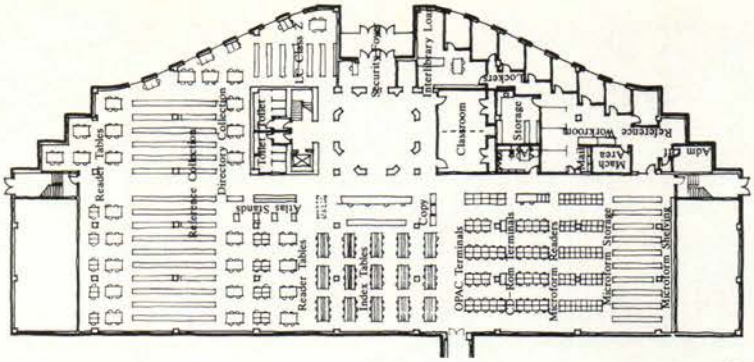
"We completed this processing facility through an evolutionary design/build process—although you do reach a point where you say enough is enough and you go build," Moyer says, "but we [Hershey] were the ones to call that shot."
REGRETS: "It would have been nice to have completed the pilot-plant research before we started to design and build," admits Carl Wagner, Sverdrup's project director, "but we would never have gotten the plant on-line." As it was, the design team and engineers "had to make some educated guesses about equipment and process materials," notes Moyer. "Some key design decisions were never really vindicated until start-up. It was a high-risk operation."
CLIENT'S LAST WORD: "Chocolate plants of this size aren't built often," maintains Moyer. "Our main concern was overall coordination. We chose design/build so we could have one place to go for answers."

WEST HERSHEY FACILITY: Design/build kept project scope flexible until completion.

AERIAL VIEW: Final form of building resulted from processing sequence.



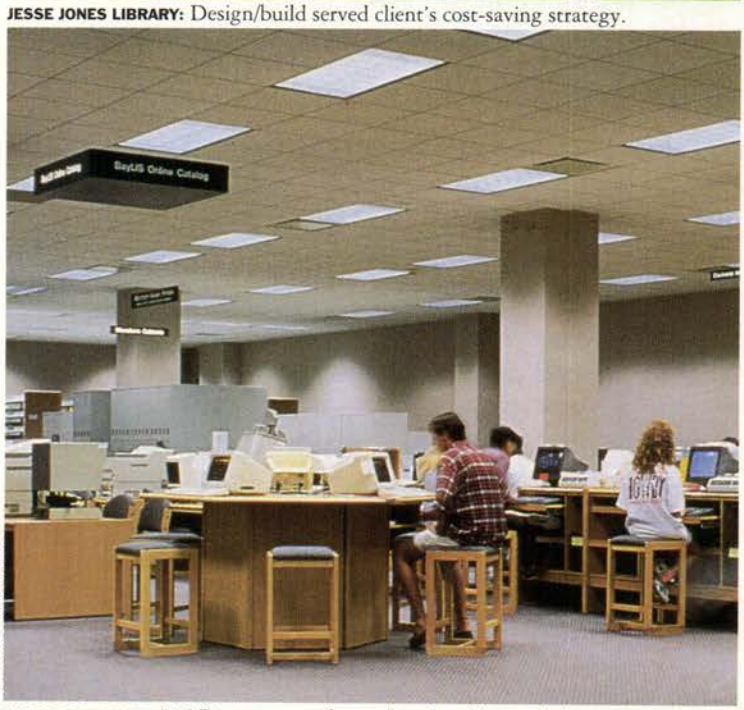
PRODUCTION LINE: Automated process required 9,000 control points.



FIRST FLOOR PLAN 20'/6m

LIBRARY CONSTRUCTION: Client reviewed all subcontractors' bids to builder.

JESSE JONES LIBRARY: Design/build served client's cost-saving strategy.



CRAIG BLACKMAN PHOTOS

LIBRARY INTERIOR: F&S Partners was chosen based on library design experience.

Jesse Jones Memorial Library
Waco, Texas
F&S Partners/Waco Construction

CLIENT: Baylor University.

PROGRAM: To design and build a 55,000-square-foot library as an extension of Moody Library.

DESIGN/BUILD STRUCTURE: Since 1989, the university has retained Waco Construction as its exclusive design/build contractor, commissioning $60 million worth of design and construction services. In addition, Waco Construction serves as Baylor's facility manager, supervising 75 buildings daily. Waco Construction serves as lead contractor, reporting to the client. Structural and mechanical engineers report to architects at F&S Partners, who report to Waco Construction.

CONSTRUCTION TIME: 15 months; ahead of schedule.

COMPLETION: 1992.

COST: $5.5 million.

SUCCESSES: "In our case, going to design/build is a reaction to our past experience," says Ken Simons, Baylor's assistant vice president and business manager. Simons notes that whenever conflicts arose on conventional, design-bid-build projects among the architect, builder, and contractor, Baylor, as the client, always wound up on the losing end. "The design/build concept seems to work much easier from a management standpoint," says Simons. "Everybody works together."

Once Baylor officials set the budget, they turned over the entire search for architects to the builder. "We only interview those firms that have specific project experiences," notes Robert Hoover, project manager for Waco Construction. "If we're doing a library, we won't even discuss the project with a firm unless they've done a lot of libraries." Even so, Baylor reviews all decisions made by the builder, Simons maintains. "We look at all the bids of all the subcontractors, and we even prequalify the subs prior to the bidding, so everything's out on the table, and we see all of the bids."

Waco Construction then selected "four architects that we would be happy to use" and asked each to develop a program and a parti for the library—indicating the degree of control the client has given over to Waco Construction to lead the design/build team and to act as gatekeeper to contractors.

Owing to the organization of the project, realistic cost estimates were more attainable at the outset, contends Ronald J. Shaw, president of F&S Partners. "Having the contractor on board from day one made it possible to start value engineering early, concurrent with the design process." Design development wrapped up completely before construction began. Shaw recalls that the main advantages of design/build came in construction administration, where he noted far fewer change orders and scarce conflicts among the various subcontractors. "There are no change orders per se for extras when you work from a guaranteed price," Shaw explains. "It's no longer an adversarial position, but a question of what we need to do to finish the job on time."

REGRETS: Simons contends that Baylor has no regrets on the project. "For the dollars expended, it was one of the finest projects we've ever completed," he asserts. Hoover of Waco Construction also was pleased with the process and the result. Shaw of F&S Partners laments that the architects had to surrender design control of the project to Waco and to the client, but recognizes that as an inevitable outcome of design/build.

CLIENT'S LAST WORD: Simons notes that Baylor officials intend to execute all of the university's future large-scale projects by design/build. The library was finished well under budget, he remarks, and ahead of its time target. "Design/build gives us a greater degree of control," Simons adds, "and I think there's been less risk for us as the client."

Not only are you looking at a building that doesn't exist. You're about to ride the elevator to the 6th floor, walk across the boardroom and watch the city as the fog rolls in.

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CAD Systems at a Glance

Reviews of the top 10 programs highlight new developments in software for architecture firms.

ABOVE RIGHT: Architects should consider advances in dedicated hardware, such as Intergraph TD-2 workstation, before buying new software.

Change may still be a given in the software industry, but fluctuations in the architectural CAD software market are more cosmetic than substantive, refining basic drawing mode performance, or adding more intuitive access to features.

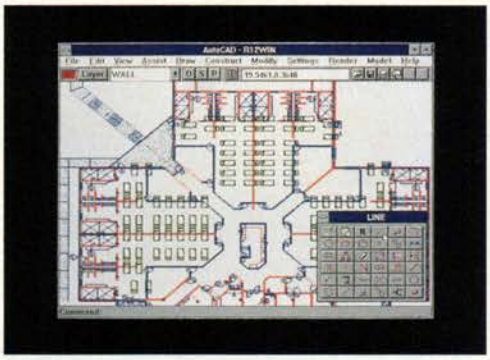
An increasing array of hardware platforms boast the muscle to run through computationally intensive CAD programs more easily, whether a firm relies on Windows; Mac; or a dedicated workstation such as Sun, Silicon Graphics, Intergraph, and others. Owing to a number of factors, high-end hardware prices are spiraling steeply downward. For instance, a complete Pentium-based system, the most powerful processor that runs Windows, is now available in the $2,500-or-less range. Products in Apple's PowerMac line are similarly priced, competing with the Silicon Graphics Indigo² workstation.

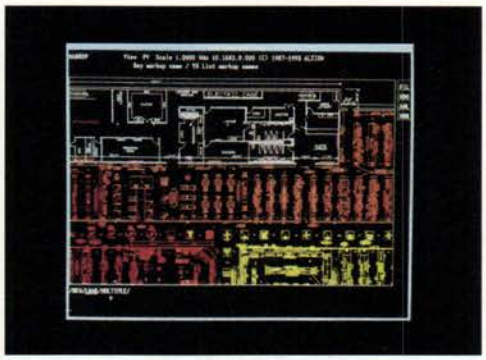
For the savvy architect, this competition translates into savings. Firms can now spend less for hardware and see existing CAD software run faster by a factor of 2, 5, or even 10. In fact, many architects are finding that upgrading their software—or staying put—might be wiser than buying new programs.

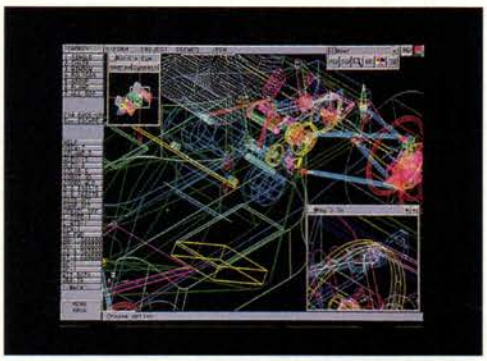
Without question, Autodesk's AutoCAD remains the leader, with over 40 percent of the CAD market, maintains Christopher R. Clark, staff director of the AIA Computer-Aided Practice Professional Interest Area. Clark reports that one emerging software trend is the integration of 2D and 3D modeling into a single package. And more comprehensive systems, such as Sonata, handle complete facility management.

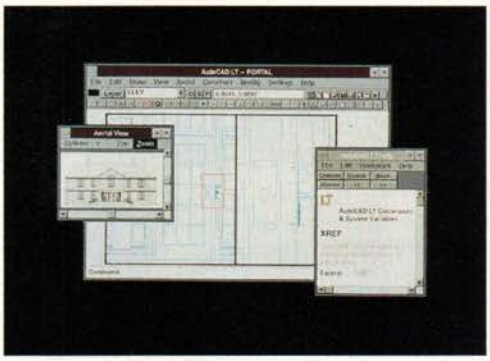
The following review of CAD programs focuses on the current top 10 sellers, such as AutoCAD and MicroStation, as well as others, from entry-level design to sophisticated all-in-one systems that can run an entire architectural practice.—*Jon Pepper*

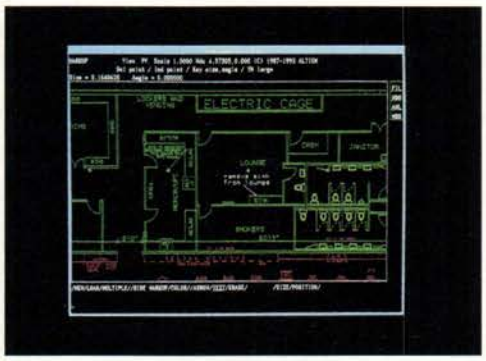
Jon Pepper, based in Sunderland, Massachusetts, is a free-lance writer specializing in computer topics.

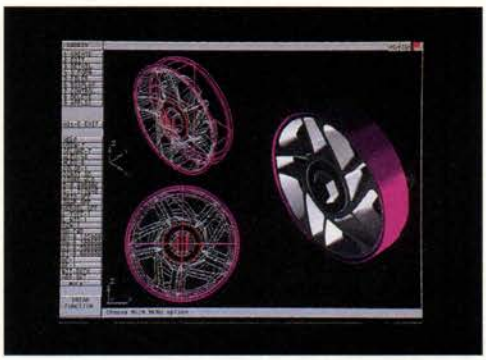












AutoCAD Release 12 for Windows
Autodesk
Sausalito, California
(415) 332-2344

THE BASICS: The mother of desktop CAD programs, AutoCAD is the market leader and benefits from its huge base of users and files. It has a thriving industry of third-party add-ons that extend functionality. Windows version is much easier to use than earlier iterations and offers zesty performance.

HOT STUFF: Plenty of great add-ons, including Advanced Modeling Extension, AutoCAD Visualization Extension, and others for 3D. AutoCAD's popularity has spawned an industry of third-party products.

SECOND THOUGHTS: Improved interface, but still deals with baggage of less-than-elegant earlier versions of the program.

WHAT YOU NEED: Windows; 8MB RAM, 33MB hard disk space.

BOTTOM LINE: Despite some flaws, AutoCAD is still a can't-miss product for most architects.

MicroStation v. 5
Intergraph Corporation
Huntsville, Alabama
(800) 345-4856; (205) 730-2000

THE BASICS: MicroStation is one of the heavyweight competitors to AutoCAD. Suitable for all types of general 2D and 3D work. Includes associative or automatic dimensioning, simultaneous open multiple views, support for free-form NURBS surfaces, and ability to manipulate each drawn element in a variety of measures. Precise, powerful system.

HOT STUFF: Multiple-level design files, undo and redo commands, autocalculation of dimensions once working units are set, and strong 3D modeling.

SECOND THOUGHTS: Not many beyond the price.

WHAT YOU NEED: UNIX system (Silicon Graphics, Sun SPARCstation); Mac; Windows. Memory and hard disk requirements vary by platform.

BOTTOM LINE: A powerful, comprehensive solution, MicroStation is a cross-platform gem that can handle most any design task.

CADKEY 7
Cadkey, Inc.
Windsor, Connecticut
(203) 298-8888

THE BASICS: Excellent 2D and 3D design features at a modest price. Sports a Motiflike graphical user interface; an advanced drafting module (with symbol libraries for fluid, piping, and electrical); and dual dimensions to support imperial and metric units.

HOT STUFF: Now bundled with FastSURF Light, a surfacing package; bird's-eye and worm's-eye views; compatibility with AutoCAD file formats; and multilanguage (17) support.

SECOND THOUGHTS: Probably not as strong for pure architectural design as AutoCAD or MicroStation. No Windows or Mac version; steeper hardware requirements than comparable lower priced programs.

WHAT YOU NEED: DOS, 8MB RAM (16 recommended), 25MB hard disk space.

BOTTOM LINE: New pricing and integrated extras make CADKEY a strong value.

Sonata v. 8.2
Sonata Software Systems
Toronto, Canada
(416) 214-0575

THE BASICS: Sonata is another complete and integrated 2D and 3D design and modeling tool with its own integrated database and scripting languages. Sonata covers initial design through construction documentation and building management.

HOT STUFF: Seamless integration, along with the ability to render sites from both real and imagined views. Outstanding graphics and photorealistic imaging.

SECOND THOUGHTS: Impressive features, but many elements make this version of Sonata more difficult to pick up than AutoCAD and less ambitious systems.

WHAT YOU NEED: Silicon Graphics (Iris, Indigo², or Indy), HP (Series 400), or IBM (RS-6000) workstation.

BOTTOM LINE: Powerful, productive, and richly featured; can tackle almost any assignment.

Personal Designer v. 6.0
Computervision Corporation
Bedford, Massachusetts
(800) 248-7728; (617) 275-1800

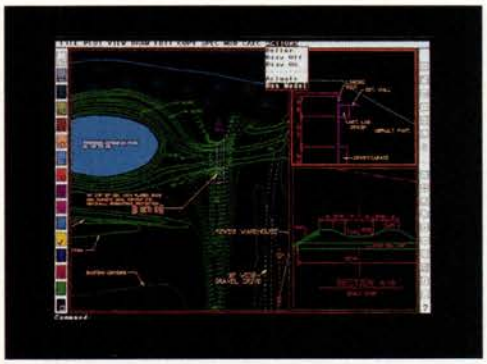
THE BASICS: High-powered CAD with special orientation toward drafting and mechanical design. Includes tools for 2D drafting, a strong programming language, and 3D wireframe and surface modeling tools.

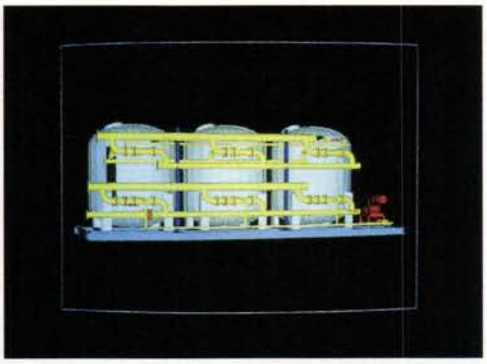
HOT STUFF: Up to 256 layers for keeping designs clear; a user-defined parts library; special tools for easily entering forms or logos into drawings; ability to visualize designs from any point of view; changes made in one view automatically update all others.

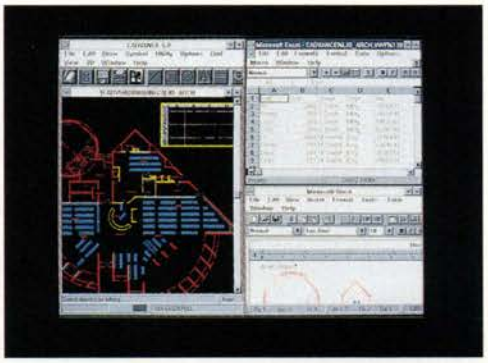
SECOND THOUGHTS: Expensive, compared to available alternatives, and perhaps more oriented toward nonarchitectural needs.

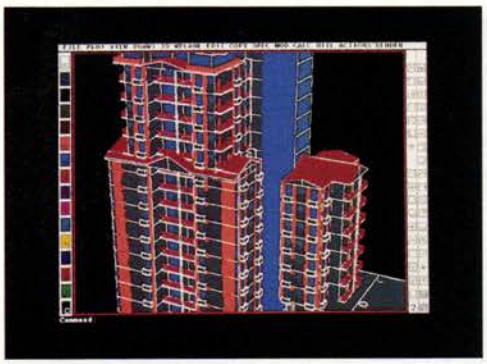
WHAT YOU NEED: DOS, 6MB RAM, 20MB disk storage.

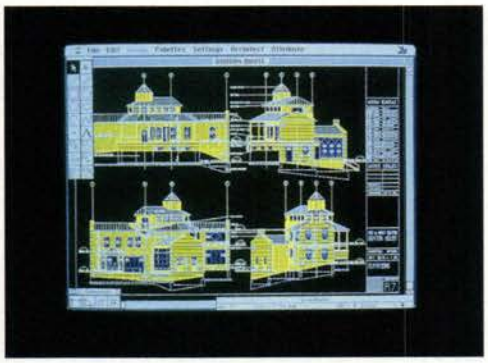
BOTTOM LINE: A rich program with lots of tools for mechanical design, dimensioning, and lots of flexibility in its design approach.

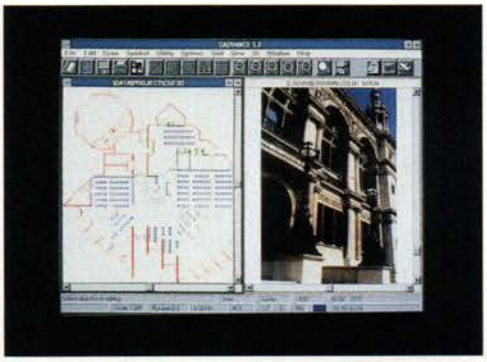












FastCAD
Evolution Computing
Tempe, Arizona
(800) 874-4028

THE BASICS: Evolution Computing combined its 2D and 3D products. Eight interactive windows, 256 layers, drawing and editing tools, precision line control, and more. The 3D features include solid entities and a depth mode.
HOT STUFF: Good 3D performance, relatively easy to learn, and a hot RenderMan for Windows module that adds visual properties.
SECOND THOUGHTS: Lack of graphical user interface could be a drawback if your office is settled on Windows or Mac. A few high-end features are missing, such as comprehensive network support and freehand sketching.
WHAT YOU NEED: DOS, 640K RAM, 4MB hard disk space; 10MB with RenderMan, which requires MS Windows.
BOTTOM LINE: Good choice for 2D and 3D feature combination. From building design to interior work, FastCAD is a worthy competitor.

VersaCAD Design
Computervision Corporation
Bedford, Massachusetts
(800) 248-7728; (617) 275-1800

THE BASICS: Production-level CAD with all the trimmings: 2D and 3D design and modeling, color shading, report generation, orthographic views. Up to 30,000 objects per drawing, ability to mix views in any of 16 windows, wireframe and back-face views, and much more.
HOT STUFF: A nifty bill-of-materials feature that totals, sorts, and categorizes drawings. Up to 20 views can be saved and redisplayed in sequence. Precise dimensioning.
SECOND THOUGHTS: Performance just a shade behind AutoCAD, and no current Windows version is available.
WHAT YOU NEED: DOS, Mac, Unix. Requirements vary by platform.
BOTTOM LINE: VersaCAD has long been a strong contender with a robust feature set and cross-platform capabilities. An eminently usable program for all sorts of architectural work.

CADVANCE 6.0
ISICAD
Anaheim, California
(714) 533-8910

THE BASICS: CADVANCE for Windows is an impressive product. Full 2D and 3D drawing and design, superb dimensioning, ability to keep multiple documents open and cut-and-paste among them, and an integrated word processor to annotate drawings.
HOT STUFF: Full Windows support, integrated electronic mail support, several snap options, and support for importing pictures and video.
SECOND THOUGHTS: Some features are less obvious than with simpler programs. Windows interface requires overhead and slows performance down a bit, compared to DOS-based CAD for pure design.
WHAT YOU NEED: 4MB RAM (8 recommended), 5MB or more hard disk space.
BOTTOM LINE: Innovative use of the Windows interface and a strong feature set make CADVANCE for Windows a leading contender.

Architecture & Engineering Series (A&ES)
International Business Machines Corporation
White Plains, New York
(203) 932-8137

THE BASICS: IBM's A&ES is a fully integrated, comprehensive 3D tool. Includes a huge array of drawing and design tools, plus project management, communications, and other related tasks for large-scale projects. A soup-to-nuts solution for a busy office.

HOT STUFF: Multiple view generation, raytracing, rendered images, massing studies, and sophisticated 3D manipulation are just some of the features.

SECOND THOUGHTS: This is not a system for the smaller office. Everything here is high end, from performance to price. Also, the learning curve is steeper than PC-based systems.

WHAT YOU NEED: IBM and HP Workstations; IBM PowerPC (can access workstation from DOS or Windows PC, too).

BOTTOM LINE: A super solution for a large office with a budget to match.

Generic CADD v. 6.1
Autodesk
Sausalito, California
(800) 964-6432; (415) 332-2344

THE BASICS: Autodesk's attempt to cover the entry-level market, Generic CADD delivers a surprising amount of power for its modest price. Complete 2D drawing tools, 256 layers, plenty of editing tools, and precision to sixth decimal place.

HOT STUFF: Extremely modest hardware requirements, and the ability to directly load AutoCAD files.

SECOND THOUGHTS: Older style DOS interface could use some updating. Addition of some 3D tools without going to a more expensive program would be a plus.

WHAT YOU NEED: DOS, 640K RAM, 10MB hard disk space.

BOTTOM LINE: Fewer bells and whistles than more expensive programs, but still a viable buy, especially if you want to wring rapid performance from less expensive hardware.

Stadiums Revamped for World Cup Soccer

In June, the U.S. began hosting the World Cup soccer tournament, the first to be held in this country. Nine stadiums nationwide, none built for soccer, are hosting 24 national teams vying for the cup in 52 games.

To simplify the tremendous planning task for the World Cup, the Fédération Internationale de Football Associations commissioned the football-to-soccer retrofits as a single design/build job, headed by Anderson DeBartolo Pan (ADP) of Tucson and Marshall Contractors of Rumford, Rhode Island. The team set up a network of nine satellite offices, dispatching an architectural team and construction manager to each of the stadium sites.

Jerry Anderson, managing director of ADP's sports group in Denver, remarks that while the design/build team found stadiums such as the 102,000-seat Rose Bowl—"a classic bowl with the finest sight lines"—ready-made for soccer, other sites proved unwieldy. For example, the "minimal" design of Foxboro Stadium near Boston affords little space for adding tents and other temporary support buildings for sideline attractions, Anderson notes. Stanford University's stadium presents intractable circulation problems remedied only by marshalling fans about with bullhorns and loudspeakers.

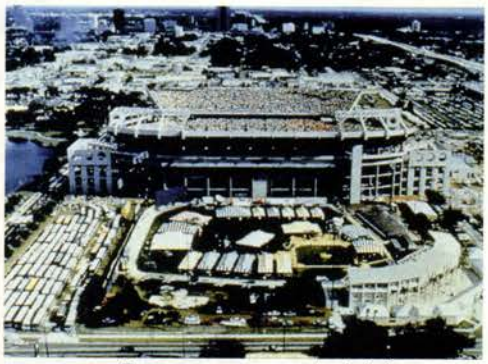
Site planning at each venue focused primarily on deterring terrorism and providing safe pathways in and around the stadiums for athletes, dignitaries, and the media.

Of the many renovation challenges facing the design/build team, the most crucial was regrading the fields at each facility. American football fields rise 18 to 24 inches higher in their centers than at their sides—a "humpback" design for drainage. Soccer fields should be nearly flat—no more than 7 inches higher in the middle—and spread 20 yards wider than football fields. Dallas's Cotton Bowl was widened to meet this requirement by removing eight rows of seats. Up to 90 seats came out of mezzanine sections to make room for the press and official observers. All seats must be restored by the ADP's team after the games, and temporary stairways and camera platforms built of 1/2-inch plywood at each site must be removed.

Programmatic peculiarities at each stadium ranged from the provisional, such as sheltering amenities at Orlando's Citrus Bowl from frequent thunderstorms, to the draconian. Soccer is played on grass, never the synthetic turf popular in this country. Detroit's Silverdome, for instance, couldn't grow grass indoors, so $2.4 million worth of rye and bluegrass was grown in the parking lot on 3,000-pound trays. "Somebody suggested sod," Anderson recalls, "but this is soccer's greatest moment. You can't have anything less than a perfect field."—*B.M.*

SILVERDOME: Grass grown in parking lot.

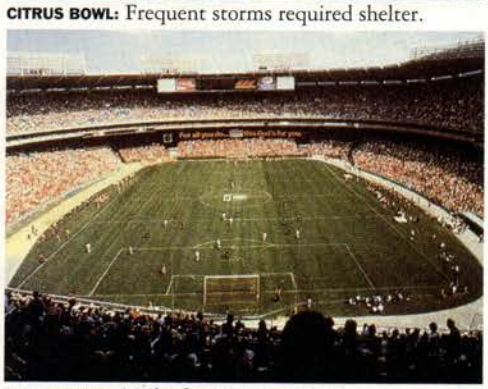
SOLDIER FIELD: Ideal soccer conditions.



CITRUS BOWL: Frequent storms required shelter.

ROSE BOWL: Excellent sight lines for final games.

COTTON BOWL: Front rows removed to widen field.



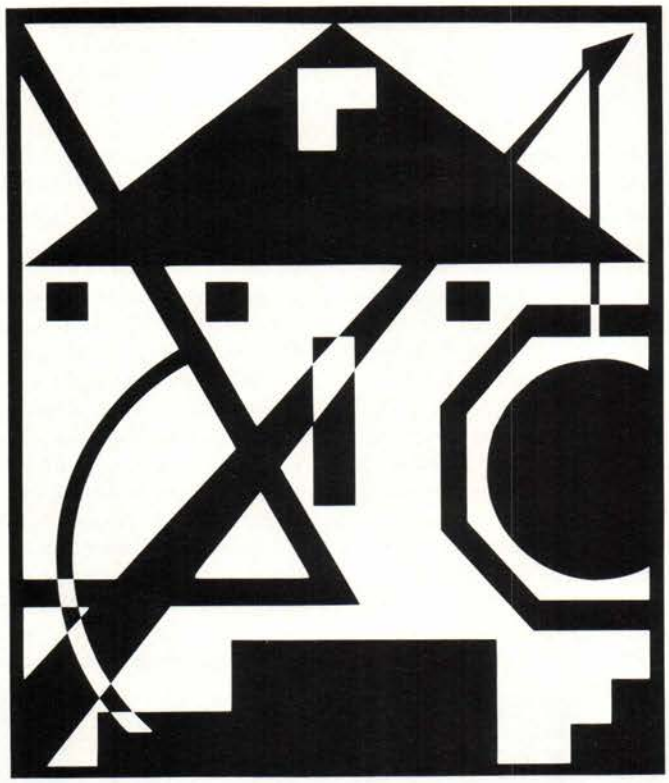
RFK STADIUM: Tight form engages fans.

GIANTS STADIUM: Modern hardware eased conversion.

STANFORD STADIUM: Required new circulation patterns.

FOXBORO STADIUM: Scarce space at difficult site.

CELEBRATE THE BUILDING OF AMERICA



The National Building Museum celebrates American Achievements in Building.

Established in 1980, the National Building Museum focuses on all aspects of building, from the architects' and engineers' role in the original design to the finishing touch of skilled craftsmen.

Become a member of the National Building Museum and see our exhibitions on buildings, construction techniques, landscape design, and architectural drawings; participate in our public programs on issues such as redevelopment in American cities and rebuilding our nation's infrastructure; and enroll your children in education programs on architecture, design, and urban planning. Take part in the annual Festival of the Building Arts where young and old can try their hand at building crafts; receive our award-winning quarterly publication BLUEPRINTS, which keeps you up-to-date on the world of building; and join our tours of construction sites and the museum's home, the landmark Pension Building.

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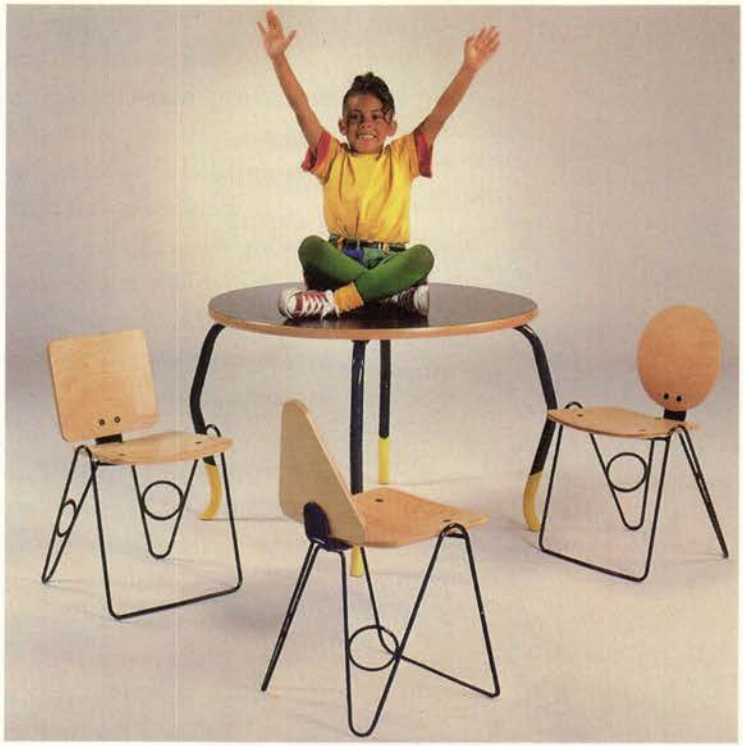
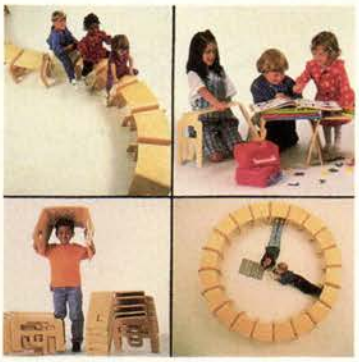
Make checks payable to the National Building Museum. Contributions are tax deductible to the extent allowed by law.

Products

Furniture piques children's imaginations with bright, colorful geometric shapes.





TOP: The Tip Toe table and Shape chairs, designed by Christopher Murray for Children's Furniture Company, cultivate a learning atmosphere for children who are beginning to recognize geometric shapes and colors. The table and chairs are purported to endure children's rough play and safely support an adult. Tubular steel legs cushioned with red, yellow, or blue plastic protectors support the table top, which can vary in size and geometric shape. The tops are constructed of $1\frac{1}{8}$-inch-thick plastic laminate or maple veneer with an exposed hardwood plywood edge. Steel tubing, measuring $\frac{3}{8}$-inch-thick, supports the chair's seat and back, cut from $\frac{1}{2}$-inch-thick plywood and finished in natural maple veneer.
Circle 401 on information card.

ABOVE: Scott Willens, based in San Francisco, designed Wonderland children's furniture for Design America. The folk art-inspired series includes a chair, table, and rocker that can be easily assembled. Brightly colored supports incorporate a keyhole pattern cut from nine-ply birch plywood. Red, green, and yellow aniline-dyed birch panels are lacquered and interlocked with half-lap joints.
Circle 402 on information card.

TOP RIGHT: Fast/Kids stacking chair offered by Lowenstein of Pompano Beach, Florida, is one of four chair models in the company's Kids collection. This model is constructed of oval steel tubing welded to a single sheet of molded perforated steel to form the back and seat. Protective rubber caps cover the ends of the tubing to safeguard children from injury as well as to prevent floor skids. Five custom textures, 26 powder coatings, and 22 color options are available. A five-year warranty is also offered.
Circle 403 on information card.

CENTER RIGHT: Kin•der•Link children's furniture designed by Bashir Zivari of Skools, Inc., offers a work/play station, chair, and desk for children ages 3 through 8. Each unit can either stand alone or can be linked together. The seating is constructed of $\frac{1}{2}$-inch bent maple, a wedge-shaped seat supporting up to 500 pounds, and enlarged notches that link the units together and prevent finger entrapment. The water-based polyurethane finish is nontoxic and washable. Each unit measures 12 inches high, 21 inches wide, and 18 inches deep.
Circle 404 on information card.

ABOVE: Finnish architect Alvar Aalto's multisection, semicircular, square, and rectangular tables were originally designed in 1933 for the Viipuri Library. Each section can be specified as $23\frac{5}{8}$ inches high for children's applications. Table-top finishes include birch veneer; black, gray, and red linoleum; and white plastic laminate. International Contract Furnishings also offers Aalto's 60 series chairs, stools, and table-bench as complementary pieces.
Circle 405 on informational card.

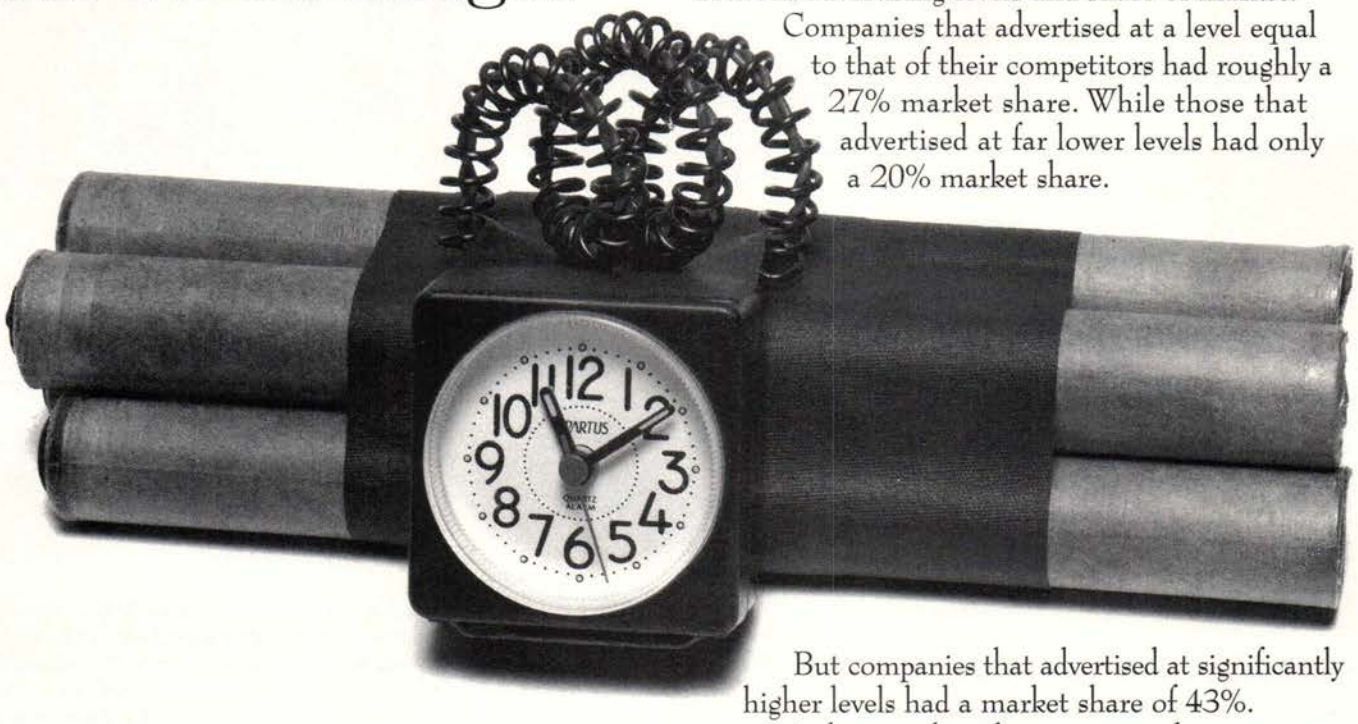
Your CFO says, "Sales are down; cut the ad budget."

The unenlightened always see advertising as nothing more than an expense. And easily expendable when times get tough. But it's only a matter of time until that catches up with you.

Studies conducted during seven recessionary periods since 1923 prove companies that keep advertising levels up during difficult times emerge far ahead of their competitors in terms of sales and profits. And there may be no better time to gain market share.

A recent study by Cahners Publishing and the Strategic Planning Institute analyzing more than 2,000 companies showed a direct correlation between advertising levels and share of market.

Companies that advertised at a level equal to that of their competitors had roughly a 27% market share. While those that advertised at far lower levels had only a 20% market share.



But companies that advertised at significantly higher levels had a market share of 43%.

Indicating that when you stop advertising, you lose market share. And recapturing it almost always costs far more than maintaining normal ad levels.

Desperate times call for desperate measures. But a financial strategy that leaves out advertising will eventually blow up in your face. For more information on how advertising works for you even in tough times, write the American Association of Advertising Agencies, Dept. Z, 666 Third Ave., New York, NY 10017-4056.

AAAA/ABP/ANA

American Association of Advertising Agencies
American Business Press
Association of National Advertisers

This advertisement prepared by Sawyer Riley Compton, Atlanta.

Products

Doors and hardware offer profiles and finishes with a human touch.

TOP LEFT: Trout Studios, based in Venice, California, offers contemporary furniture and hardware. The company offers over 300 gold- and aluminum-finished residential accessories that include bath fixtures, drawer and door handles and pulls, single and double switchplates, and door knockers. Trout's hardware line features the Star and Double Star switchplates; Helix, Grapt, and Hob door handles; Twip, Cyclone, and Copious drawer pulls; and tadpole towel holder.
Circle 406 on information card.

ABOVE: Peachtree Doors offers the Avanti French swing-in model as part of the company's insulated patio doors. Avanti's swinging and French styles have a three-point locking system that automatically engages all three locking bolts when the door is closed. With an additional 1/2-inch turn of the locking system, the three bolts become deadbolts. A safety release system instantly retracts the bolts for a quick escape.
Circle 407 on information card.

ABOVE: Next Door Company, specializing in polished stainless steel doors and framing, offers three metal-embossed geometric designs: The Dome series, a 1/2-inch elliptical pattern; the Orbital series, a 1 1/2-inch round pattern; and the Cubic series, a 1 1/2-inch square pattern. The doors are recommended for humid outdoor environments and harsh industrial environments. The cores of the doors are constructed of polystyrene bonded to stainless panels; honeycomb and steel-stiffened internal constructions are available. Seamless edges are continuously welded and hand-polished. The doors offer three-hour, Class A fire ratings.
Circle 408 on information card.

TOP RIGHT: Forms + Surfaces offers a new collection of handcrafted, sculpted door pulls. The DP7500 series consists of eight designs in solid bronze and stainless steel with 10 finish options. These options include both stippled and wrought stainless steel and bronze, plus satin, oil-rubbed, black patina, or polished finishes. The pulls' sleek lines and elegant curves are designed to provide a comfortable grip. This line of door pulls can be single mounted or mounted back-to-back on wood, metal, and glass doors, and is compatible with all of the Forms+Surfaces' door series.
Circle 409 on information card.

ABOVE: Italbrass, a decorative hardware manufacturer, offers extensive lines of handcrafted solid-brass door handles, cabinet pulls, and accessories from Italian designers. Six finishes are available, as well as the company's Inoxbrass finish, which is guaranteed for 15 years. Inoxbrass is a vacuum-treated finish that wears well against harsh environmental pollutants and friction, as well as in heavy traffic areas.
Circle 410 on information card.

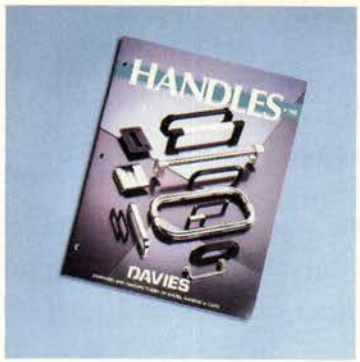
Fiberglass seating
Krueger International manufactures the 4000 series (above) with a special keyhole locking system that incorporates a steel knob located on each chair's crossbrace that can be slipped into an opening on a neighboring chair. The fiberglass chairs are available in heights of 12, 14, 16, and 18 inches. Features include a vented back to reduce heat buildup and tubular chrome legs with self-leveling nylon glides.
Circle 411 on information card.

Eco-friendly furniture
Homasote Company offers a line of children's furniture and games designed by New York architect Michael McDonough. This environmentally friendly furniture is constructed of recycled newspaper. "Eco-sTuff" rockers and chairs feature back panels shaped as hearts, stars, numbers, and letters of the alphabet. Water-soluble paints are recommended for children to decorate the furniture.
Circle 412 on information card.

Healthcare seating
Nemschoff addresses children's healthcare needs with JR/672 (above). All-metal tubing is finished with a powder coating available in 20 colors. This furniture is upholstered in vinyl for easy cleaning and sterilization and can be specified in fabrics that are removable. The sofa measures 57 inches wide by 24 1/2 inches deep by 25 1/2 inches high. The chair measures the same in depth and height, but is only 21 inches wide.
Circle 413 on information card.

Garden furniture
Reed Bros., specializing in hand-carved redwood and pine garden furniture, offers a line of children's garden benches, chairs, and tables with floral and animal motifs. Storybook benches and chairs can be personalized, and custom carving is available. A weathered silver-gray finish is applied to the redwood, while the pine is offered in 16 finishes. Animal accessories and planters are also available from Reed Bros.
Circle 414 on information card.

Dinosaur gym
Landscape Structures offers a dinosaur-shaped jungle gym (above) that is constructed of 3/4-inch compression-molded polyethylene for preschool age children. The creature's tail, which forms a slide, is reached by rungs on the side of the dinosaur. A stepladder forms the animal's head and neck. The dinosaur jungle gym measures 3 feet, 2 inches by 15 feet, 6 inches and rises to a high point of 32 inches.
Circle 415 on information card.



Door handle literature
Davies Molding Company offers a 56-page catalog (above) introducing its Rohde handles for machine tool, medical, electrical, and transportation equipment applications. The hardware is fabricated of aluminum, stainless steel, and duroplastic. Applications include 19-inch racks, test instruments, and medical lab equipment. The catalog describes surface finishes, colors, thread types, and mounting information.
Circle 416 on information card.

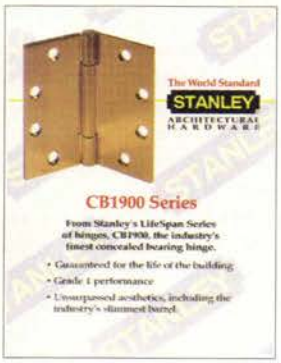
Door guards
LCN Closers manufactures safety guards (above) to conceal a door hinge edge to prevent hand and finger injuries. The lightweight folding vinyl strip is attached to an interior door and frame with a precoated adhesive. Safety strips are available in an aluminum or dark bronze finish. Suggested guard installations include schools, day-care centers, restaurants, and nursing homes. A one-year warranty is available.
Circle 417 on information card.

Low-energy powered door
Dorma Door Controls manufactures a surface closer-based, low-energy power door operator. ED 800 (above) is available with a left- or right-hand door configuration, push- or pull-side mount, power-assist option, or low-energy operation system. Installed with a low-energy power-operated door, the force of the door will not exceed 15 pounds. Dorma Door Controls' ED 800 is available for retrofit and new installations.
Circle 418 on information card.

ARCHITECTURE'S LITERATURE PORTFOLIO

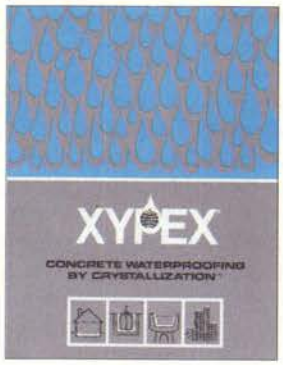
The Literature offered on these pages (with rare exception) are free for the asking. Simply fill out one of the postage paid reader service cards located elsewhere in this issue, circle the appropriate numbers and drop it in the mail.

Stanley Hardware



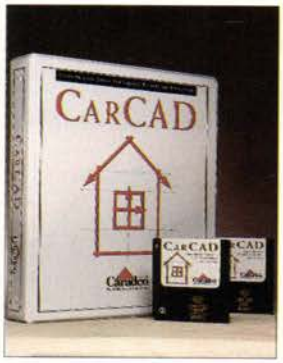
Stanley Hinges Guaranteed for Life—Stanley Hardware remains the only manufacturer with a complete series of hinges guaranteed for the life of the building. Included are gear continuous hinges, spring hinges, and detention hardware. Our CB series of concealed bearing hinges features Grade 1 performance, unsurpassed aesthetics, and the lifetime guarantee. Contact Stanley Hardware for more information on the CB series—the new industry standard.
Circle 14.

Xypex Chemical Corporation



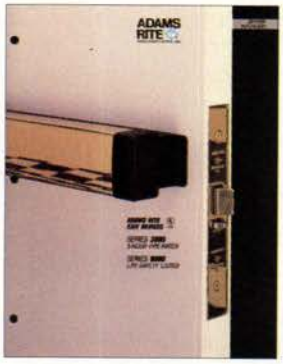
Concrete waterproofing by crystalization. Although applied as a slurry coating, Xypex is a chemical treatment which waterproofs by penetrating the concrete with a crystalline formation which `plugs' the pores of the structure preventing water seepage. Xypex is ideal for use on the `inside' of wet underground structures. Xypex Chemical Corp, 604-273-5265.
Circle 16.

CARADCO CarCAD SYSTEM



CarCAD, a state-of-the-art computer aided design program from Caradco, helps architects, builders, and designers create with the full line of Caradco wood windows and patio doors. Can generate CSI specifications and .DFX files for use in AutoCAD®. Call (800) 238-l866,ext.2237.
Circle 20.

Adams Rite Manufacturing Co.

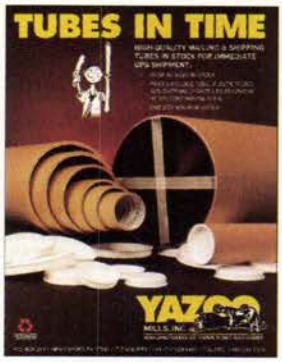


Exit devices—32-page catalog shows Adams Rite Mfg. Co. touchbar exit devices Series 8000 (listed for life safety) and Series 3000 (listed for fire doors rated up to 3 hours). Ten finishes of aluminum, brass, bronze and stainless materials are shown along with various matching entry trim, electric operation, monitoring and other options. Contact: Adams Rite Mfg. Co., 4040 S. Capitol Ave., P.O. Box 1301, Industry, CA 91749; 213-699-0511, Fax 213-699-5094.
Circle 22.

Transwall Corporation

Reasons Stacking System For Improved Office Spaces—REASONS by Transwall, is a new stacking system designed to provide improved office space facilities with maximum flexibility and a minimum of parts inventory. It offers quick off-module changes for work surfaces and overhead storage, which can easily be rearranged on horizontal rails without structural panel changes. Total wire management is provided in the 4" thick panels, as well as an unlimited choice of aesthetic color selections.
Circle 24.

YAZOO MILLS, Inc.

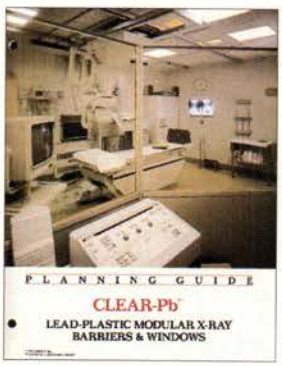


TUBES IN TIME—Need a mailing tube fast for your blue prints, mylar or vellum tracings? Need storage tubes to organize your office? We have mailing and storage tubes in the length and quality you need. Factory direct and immediate shipment. Packed in cartons with end plugs in over 30 sizes. Minimum order is one carton. Call Yazoo Mills, 305 Commerce Street, New Oxford, PA 17350 (800-242-5216.)
Circle 26.

Hoover Treated Wood Products

NATIONAL EVALUATION REPORT ISSUED. PYRO-GUARD third generation fire retardant treated lumber and plywood is thoroughly strength-tested at high temperatures for roof sheathing, trusses and other structural applications. NER-457 on PYRO-GUARD contains strength adjustments and use recommendations based on a 50-year predictive period. Like all NER reports, it is subject to re-examination, revisions, and possible closing. Hoover Treated Wood Products, Inc.
Circle 28.

Nuclear Associates

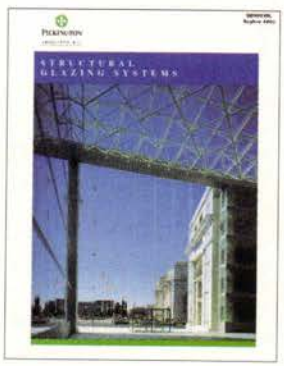


FREE X-RAY ROOM PLANNING GUIDE. Made of lead-impregnated, transparent plastic, CLEAR-Pb® X-Ray Room Shielding from Nuclear Associates provides complete radiation protection with panoramic viewing in hospital x-ray, CT and special procedures rooms. Features include prefabrication for quick on-site assembly, shatter-resistance, 200 stock sizes, choice of lead equivalencies. Free CLEAR-Pb Planning Guide available.
Circle 32.

Simpson Door Company

For the latest designs in entry and interior doors, call for our brand new catalog. Distinctive, dramatic styles. Wood and glass artfully balanced in exacting proportions. Everything you're looking for is showcased in our brand new catalog. To order, call 1-800-952-4057.
Circle 36.

W&W Sales, Ltd.

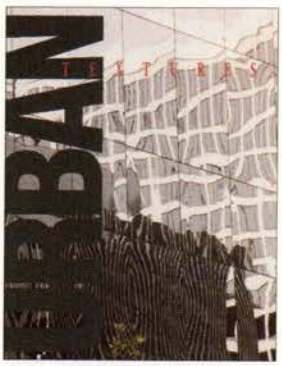


PILKINGTON STRUCTURAL GLASS SYSTEMS BY W&W—This colorful, 8-page brochure describes and illustrates Pilkington by W&W structural glass design concepts and installations that exploit the full potential of glass as a structural material. The world renown PLANAR system offers flush glass surfaces continuously flowing in any plane and allows complete freedom in support structure design.
Circle 40.

Blue Giant Equipment Corp.

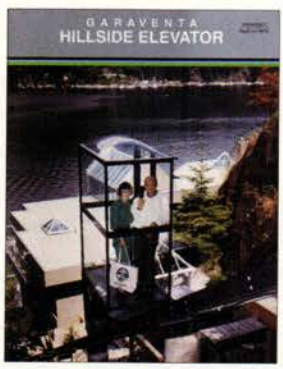
TWO IN ONE PROTECTOR—The latest BLUE GIANT innovation in loading dock equipment is the "DOOR AND DOCK GUARD". It is an integral part of the dock leveler and acts as a stop to protect overhead doors from impact damage. Danger to lift truck operators from the drop off zone created when overhead doors are 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-l504.
Circle 30.

Mohawk Commercial Carpet



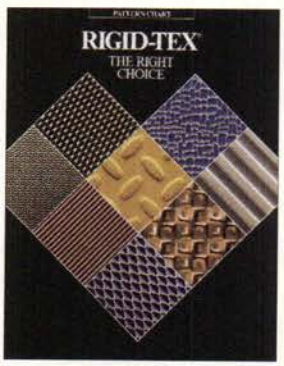
Urban Textures Brochure—A collection of coordinating patterns and solids from Mohawk Commercial Carpet and AlliedSignal Fibers. A wide variety of commercial carpets—from solid color cut piles to graphics and wovens. The brochure features photographs of the carpets paired with the Urban Textures which inspired them. MOHAWK COMMERCIAL CARPET, 800-618-1234.
Circle 34.

Garaventa



Garaventa Hillside Elevator—Make your client's beautiful hillside terrain accessible with the Garaventa Hillside Elevator. Ideal for both residential and commercial applications, the Hillside Elevator is custom-designed to meet your client's needs for value, size or comfort. Starting at $35,000, the Garaventa Hillside Elevator is a valued addition to your client's lifestyle. For more information, call 800-663-6556 or 604-594-0422.
Circle 38.

Rigidized® Metals Corp.



TEXTURED METALS BY RIGID-TEX. Rigid-Tex® metals combine beauty and durability in Rigidized® and etched metals. Dozens of patterns and custom designs for interior and exterior use. For elevator doors and interiors, column covers, walls, ceilings, entrances, signage and trim. Available in a wide selection of metals, gauges, sizes and colors. Rigidized® Metals Corp, 658 Ohio St, Buffalo, NY 14203-3185, (800) 836-2580.
Circle 42.

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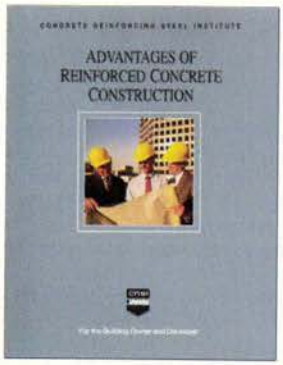
Structural Board Association

STRUCTURAL BOARD ASSOCIATION

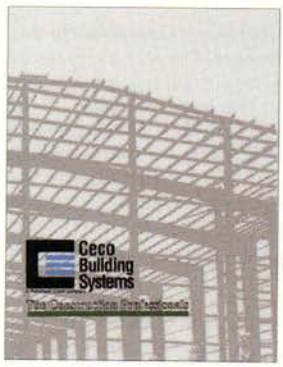
The SBA represents member companies who manufacture quality OSB wood structural panels. For more information on these popular panels, contact the SBA, circle 44 on information card or phone (416) 730-9090.
Circle 44.

Concrete Reinforcing Steel Institute



Concrete Construction for Building Owners/Developers—Produced by the Concrete Reinforcing Steel Institute, this 4-page, 4-color brochure discusses the aesthetics and cost effectiveness of cast-in-place reinforced concrete in structures from one-story to skyscrapers. Seven areas of cost-savings are discussed. Four dramatically different structures are described to demonstate the versatility of cast-in-place reinforced concrete.
Circle 48.

Ceco Building Systems

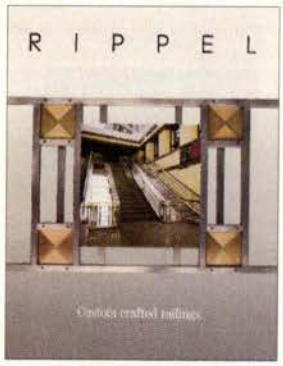


The Construction Professionals. This new 16-page brochure is an overview of the capabilities of Ceco Building Systems in pre-engineered metal building construction. The Construction Professionals includes dramatic photography of completed projects, plus technical data including Frame Systems, Tilt-Wall Construction, MultiStory Construction, Covering Systems, Roofs, Architectural Treatments, Retrofit, Accessories and Mini-Warehouses.
Circle 52.

REAL-TOOL, INC.

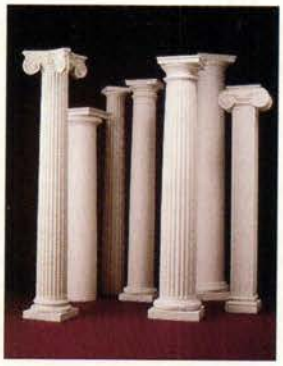
Real-Tool, Inc. now offers a new one-piece, non-penetrating, seam-mounted Snow Guard line specifically designed for use with structural and non-structural prefinished architectural roof systems. Having been developed with the cooperation of major architectural panel manufactuers, the AP line of Snow Guards fits most high seam snap-lock capped, Z-clip, C-type and similarly configured seams which range in width from 3/8" to l3/16". Contact Real-Tool for specific product/system compatability and availability at (703) 338-4544.
Circle 56.

Rippel Architectural Metals, Inc.



Custom Crafted Railings of stainless steel, aluminum and bronze are a specialty at Rippel Architectural Metals. We are committed to quality craftsmanship in the fabrication of custom railing systems and ornamental components for a variety of architectural applications. Rippel has over 45 years of experience and professional competence to create your vision. Call (312) 772-0600.
Circle 46.

CHADSWORTH COLUMNS™



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.
Circle 50.

Door-Aid

MAKE YOUR DOORS HANDICAP ACCESSIBLE—A simple, economical automatic door operator designed to easily retrofit to commercial and residential doors. Specifically engineered to meet ANSI and ADA requirements, its rugged construction and on-demand design will provide years of virtually maintenance-free service. Versatile, patented design allows for various mounting applications and will interface with electronic security hardware. UL, DHI & CSI listed. Door-Aid, 5148 Lovers Lane, Kalamazoo, MI 49002, 1-800-527-5672.
Circle 54.

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 58.

Conwed

Tedlar™ Encapsulated Wall & Ceiing Panels—Conwed's Tedlar Encaps lated Acoustical Wall and Ceiling Panels solve the need for a clean, sanitary product that offers excellent acoustical absorption. The acoustical core is surrounded on all faces and edges with Dupont's Tedlar white polyvinyl fluoride film. Ideal for use in high technological, medical, food processing and other areas. Conwed, 1205 Worden Ave. E., Ladysmith, WI 54848 - 800-932-2383.
Circle 60.

California Redwood Association

REDWOOD LUMBER GRADES AND USES - NEWLY REVISED GUIDE TO SPECIFYING REDWOOD. Free four-page color booklet is a visual exploration of the range of grades, grains and textures available to those specifying redwood. Photographs of each grade make it easy for specifiers and consumers to visualize finished appearance. The booklet also offers a useful guide to specialized grades and redwood grademarks. CALIFORNIA REDWOOD ASSOCIATION, 405 Enfrente Drive, Novato, CA 94949, 415-382-0662.
Circle 64.

The Original Cast Lighting Inc.

ADA SCONCES—The Original Cast Lighting is proud to introduce our series of ADA compliant wall sconces which compliment our full catalog. All fixtures are standard with energy-efficient compact fluorescent lamping. A variety of classic finishes is available. The Original Cast Lighting, 6120 Delmar Blvd., St. Louis, MO 63112, 314-863-l895 or fax 314-863-3278.
Circle 68.

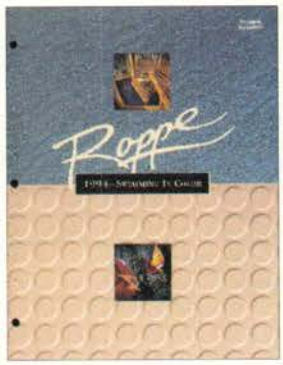
W&W Sales, Ltd.

NT NORMBAU RAILING AND BALUSTRADES BY W&W—NT Normbau Railing Systems by W&W is the product of a revolutionary new nylon formulation that was produced to be environmentally safer by removing all cadmium from the mixture, in addition to being completely lead free. This colorful, 4-page brochure describes many addtional features and technical specifications about the product that comes in several new and exciting colors.
Circle 72.

Interceramic, USA

INTERCERAMIC TILE—We provide tile to enhance any environment—both commercial and residential. From exceptional floor tile and graceful mosaics to glistening marble and natural granite. Whatever your design, Interceramic tile will add that distinctive touch of beauty. Call today for a free brochure: 1-800-496-TILE. Interceramic, USA—The Best the World Has To Offer.
Circle 62.

Roppe Corporation



ROPPE FLOORS—Swimming in Color. Roppe offers a full line of commercial flooring products and accessories in both rubber and vinyl. Our MatchMates™ 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 66.

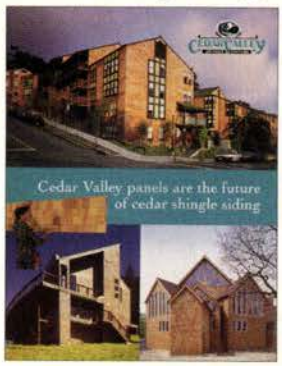
Pemko Manufacturing Co.

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 70.

ACCI Business Systems, Inc.

ACCI's integrated Project Management/Accounting System Version 10.1 for A/E firms offers two unique features: Consultant Reimbursable Tracking (CRT) and Staff Scheduling. The CRT Module is the only known software capable of tracking consultant and reimbursable expenses for project accruals, general ledger and also "tells you" during cash receipt entry that a portion of this receipt is due to a consultant or vendor. Core package consists of project management, A/R, billing, payroll, A/P and general ledger.
Circle 74.

Cedar Valley Shingle Systems



The future of cedar shingle siding. New color brochure details exterior siding system of 3, 4 and 5-course shingle panels with exclusive features of smooth one-piece 5/16" CDX plywood backer, interlocking end joints, asphalt impregnated fiberglass interply, real keyways, shingles that can move and Certi-Panel label of quality. Included are specifications, descriptions and illustrations, finishing and application information. Cedar Valley Shingle Systems. Phone 800-521-9523, FAX 408-636-9035.
Circle 76.

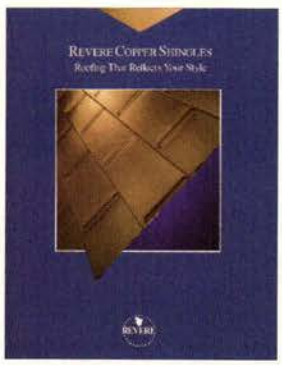
Robertson

Robertson, A United Dominion Company, manufactures and installs a wide range of architectural and commercial wall systems. From high performance curtain wall systems to field assembled walls, all have a variety of aesthetic and performance options. Everything we make reflects our history of producing products that offer superior performance, easy installation and outstanding appearance and value.
Circle 80.

Style-Mark, Inc.

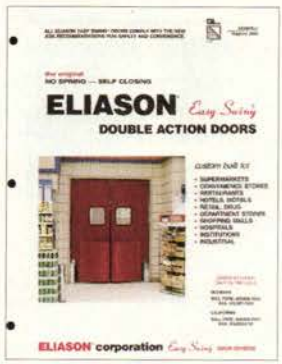
Style-Mark—manufacturing quality moulded architectural products since 1974. Entrance Systems, Window Treatments, Mouldings, Brackets, Corbels, and Dentil Blocks. Products have the natural characteristics of wood. . . without the natural shortcomings. Can saw, nail, drill and glue; won't crack, splinter or decay. For catalog call 800-446-3040.
Circle 84.

Revere Copper Products



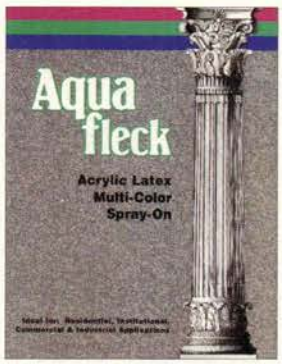
Revere Copper Shingles are quicker and easier to install than ordinary asphalt shingles. There are no special skills required and no special tools. Because Revere shingles are manufactured from solid copper, not a foil laminate, they will likely last as long as the building they protect. To learn more about our copper shingles, or any of our other copper products, call us toll-free at 800-490-1776.
Circle 88.

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 78.

California Products Corporation



Aquafleck® Acrylic Latex Multi-Color Finish. Aquafleck is a completely water-based multi-color finishing system that consists of a 100% acrylic latex basecoat and an acrylic latex finish coat containing colorful flecks. The Aquafleck system is VOC/VOS compliant, virtually odorless, seamless, quick drying, extremely durable, easy to clean-up, and requires no hazardous waste disposal. California Products Corporation, Cambridge, MA, 1-800-533-5788.
Circle 82.

Truebro

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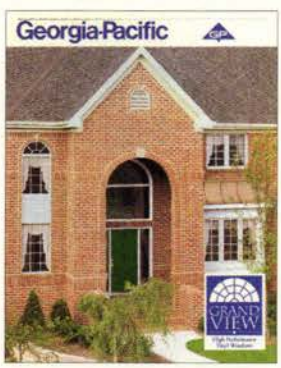
Georgia-Pacific



Georgia-Pacific Grand View™ Vinyl Windows offer the warm look of real wood, yet are virtually maintainence-free. Since the color of uPVC is solid throughout, there is no need for preparation or painting. The line of windows features a spectrum of styles, from single- and double-hung to bay, bow and garden windows.
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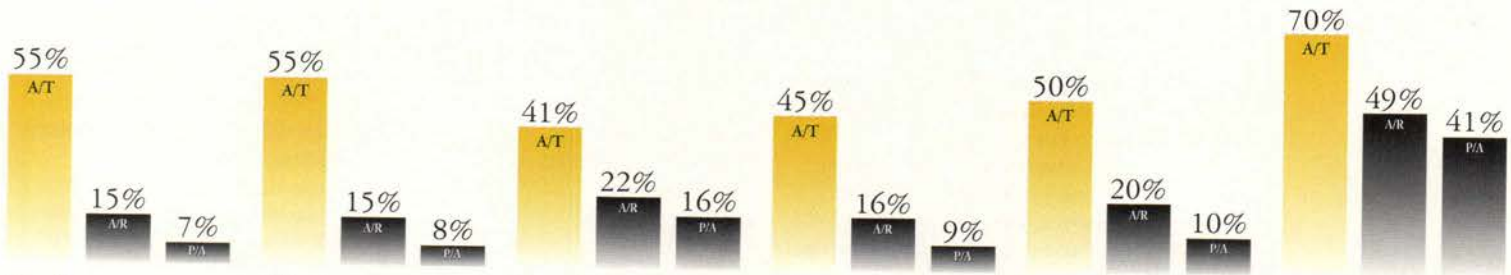

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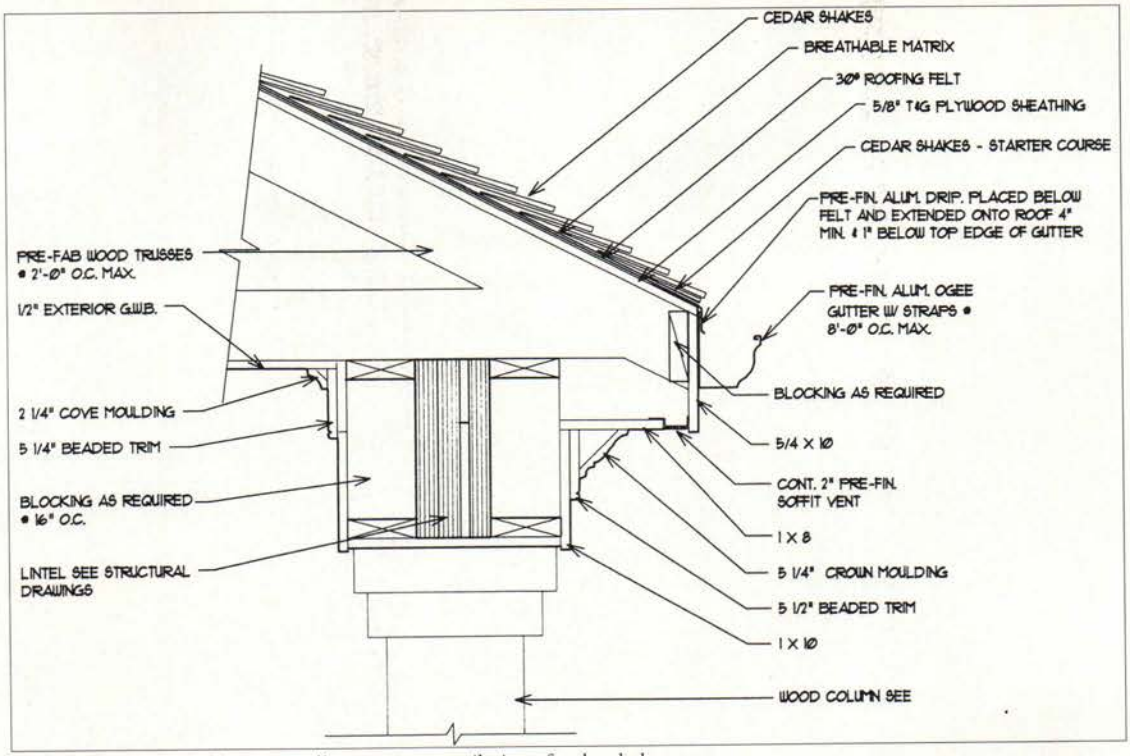
No excuses after this information exchange



ROOF SECTION: Breathable matrix allows proper ventilation of cedar shakes.

Sealants

CSI Section 07900

Custom-colored sealants

Exposed joint sealant colors may be specified in two ways—either selected by the architect from a manufacturer's standard range or as a custom color. When multicomponent polyurethane sealants are selected, custom coloration does not usually add significant cost. However, with silicones, which normally are supplied only in single-component form, the costs of custom colors are frequently prohibitive.

Consider the following information furnished by one of the major silicone sealant producers:

The minimum order for custom colors is four pallets. Each pallet contains 1,080 cartridges, each holding 10.3 ounces of sealant, for a total of 4,320 cartridges.

A cartridge typically yields 27 linear feet for a $^1/_4$-inch-by-$^1/_4$-inch sealant bead, or 11 linear feet for a $^3/_8$-inch-by-$^3/_8$-inch sealant bead.

Based on the above figures, to deplete the minimum order of custom-colored sealant would require 112,320 linear feet of $^1/_4$-inch-wide joints or 47,520 linear feet of $^3/_8$-inch-wide joints. There is also a $2,500 charge for the custom-coloration service from this particular manufacturer.

Unless your project actually requires these large quantities of custom joint sealant colors, the logical choices are the following:

Use stock colors. If at all acceptable from an esthetic viewpoint, this option eliminates storing, for maintenance purposes, a small reserve stock of a custom-formulated product with a relatively short shelf life.

Use multicomponent polyurethane sealants for custom colors.

If you have valid reasons for favoring silicone formulations (such as construction in extremely cold climates, where silicone performs well) and you must have custom colors, understand that $2,500—plus the cost of a supply beyond the actual quantities required—will be an additional project expense.

Martin M. Bloomenthal, AIA
The Hillier Group
Princeton, New Jersey

Wood Shingles and Shakes

CSI Section 07315

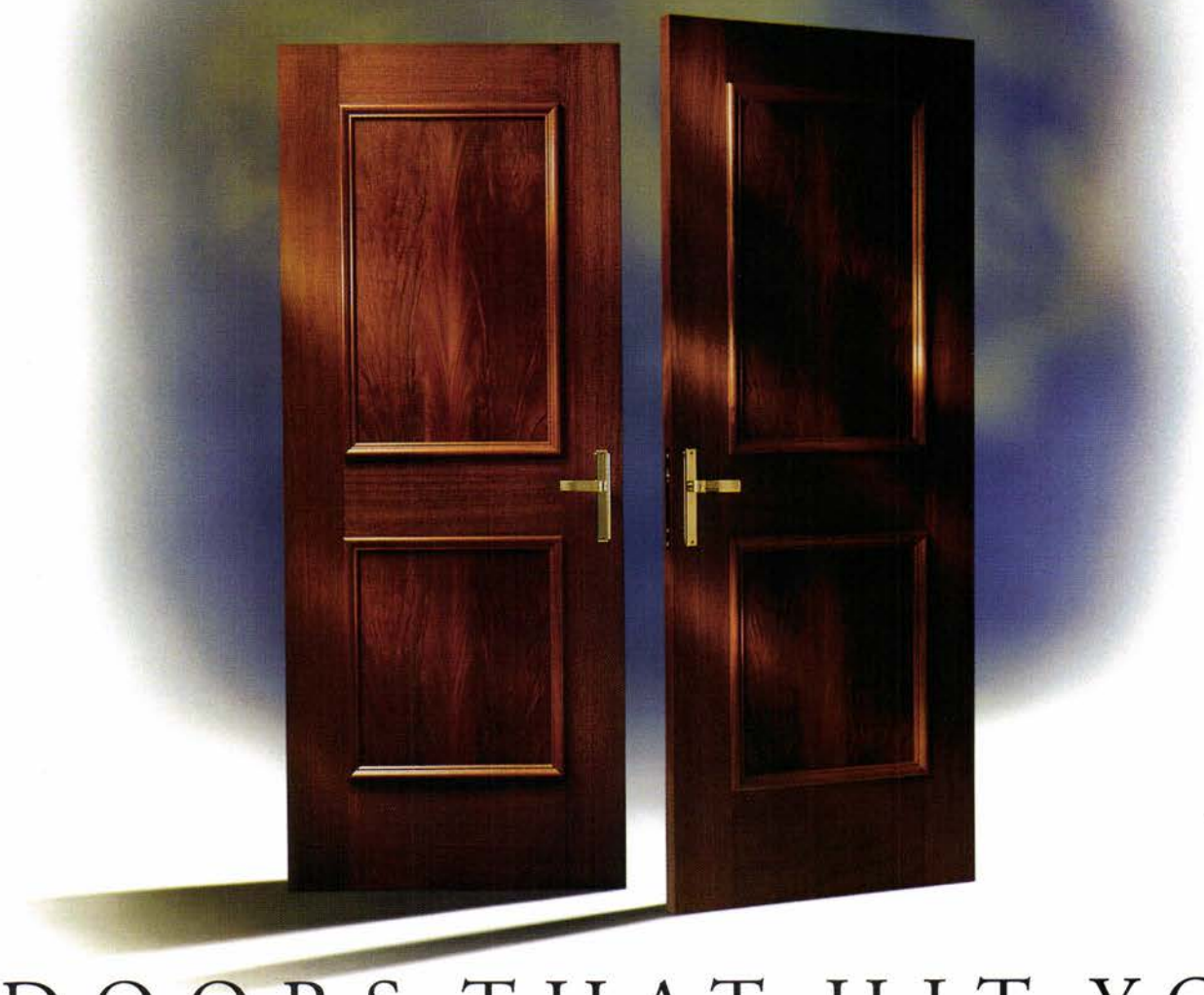
Ventilating cedar shakes

Despite claims that cedar shake roof systems should last for decades, many building owners find themselves having to replace such roofs as soon as five years after their installation. The problem is not inherent in the shakes, but in the way they are applied. Prior to the widespread use of plywood tongue-and-groove roof decking, cedar shakes were installed over plank decks, with gaps left between the planks. This arrangement allowed air to circulate behind the shakes, which allowed moisture to evaporate from the unexposed side.

Ensuring the longevity of cedar shake systems calls for raising the shakes above the deck to allow air to circulate behind them. This solution may be accomplished by several means. Furring strips can be nailed at appropriate intervals beneath the shakes, and the shakes can then be nailed to the strips. While this allows adequate air movement behind the shakes, the strips can rot over time. Also, the shakes are prone to break if they are stepped on between the furring strips.

A newer—and, in our experience, more successful—method (see illustration above) involves the application of a synthetic "breathable matrix," available under several trade names. This matrix consists of a pliable, meshlike nylon material that is laid in butt-jointed strips between the shakes and the felt-covered deck. Unaffected by moisture or humidity, the matrix separates the rows of shakes from the deck, permitting the shakes to breathe. Use this technique, and your roof will age gracefully—not prematurely.

Stephen C. Weisensale, AIA, CSI
Architects Dayton & Thompson
Richmond, Virginia



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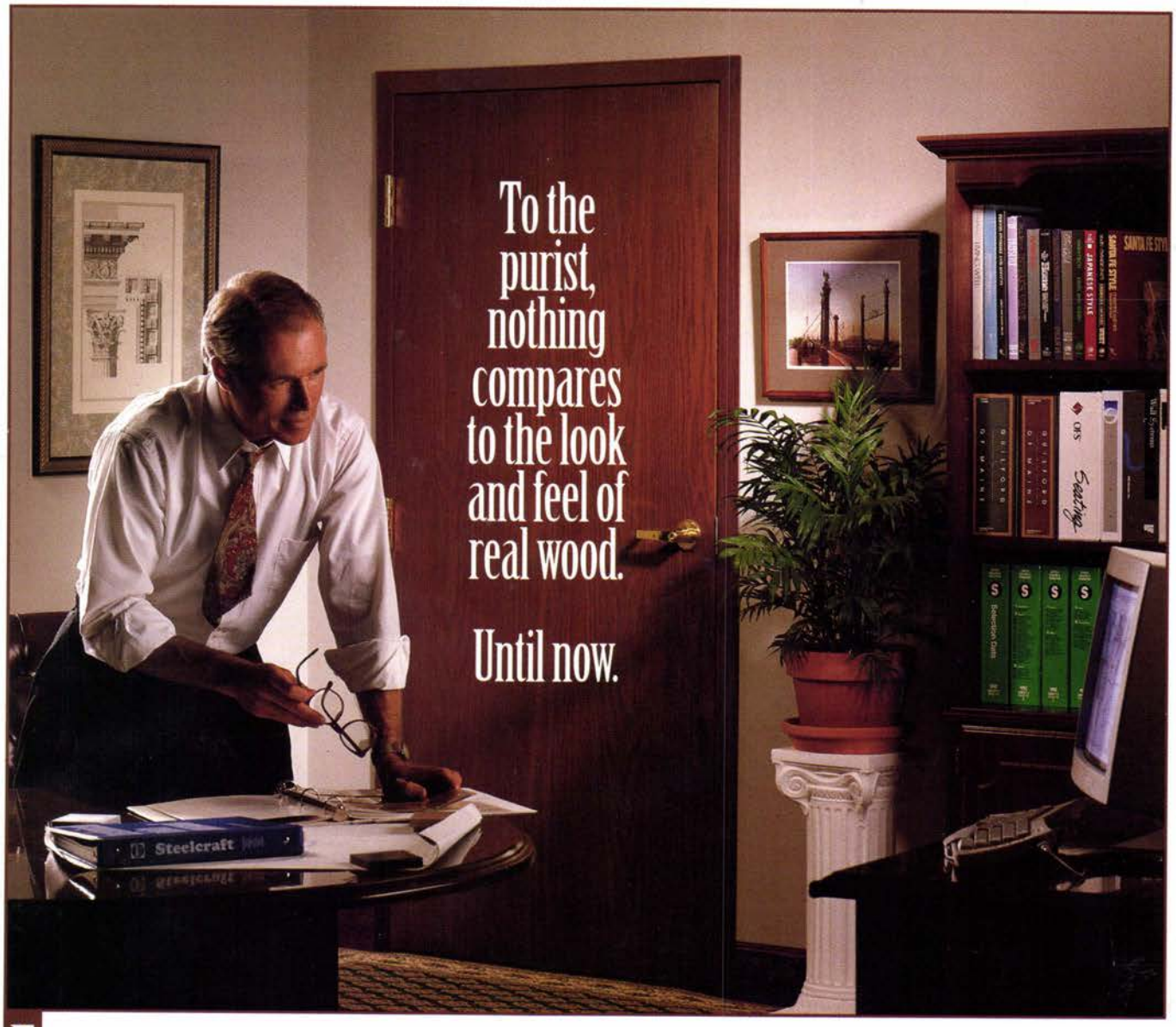

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