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## Workplaces of Change

*The office of the future will require design based more on transience than technology.*

In the 1980s, you couldn't attend a trade show or a conference without hearing about the "office of the future." Speaker after speaker predicted the computer would revolutionize not only the work of the information age, but its workplace as well. The paperless office was upon us, warned the contract design industry. Prepare your corporate clients by specifying the latest modular furniture, ergonomic chairs, and glare-free lighting fixtures for their offices.

The personal computer and its attendant furnishings are now firmly planted in the interior landscape of most companies, but the office of the future has turned out to be far from paperless. Moreover, the ways in which the computer has changed the nature of office work are demanding a far more complex, multifarious approach to the design of the corporate workplace than predicted.

Smaller companies, shared workspaces, flexible hours, and teleconferencing are forcing architects to think beyond neat rows of workstations with a computer and phone on every desktop. Isolated tasks are being replaced by collective efforts. And as evidenced by a survey of nine progressive U.S. companies conducted by this magazine (pages 33-37, this issue), corporate clients are not so much interested in technology-driven environments as in improving the quality of their employees' office life through natural light, operable windows, and good indoor air quality. On-site amenities such as day-care centers, exercise rooms, and outdoor recreational areas are also becoming paramount to attracting white-collar employees.

As more people work at home or in locations outside the office, corporations have come to view their offices less as formal, hierarchical enclaves and more as relaxed, residential settings. "When you walk into our offices, it feels like you're walking into someone's home," explains Susie Tompkins, founder of the San Francisco clothing manufacturer Esprit de Corp. "We have no cubi-

cles or closed-door offices, so we can focus on being creative and excited about our work." Adds Richard Klysa of The Microsoft Corporation, "We dislike anything that appears stark or overly corporate."

Such change demands that architects consider more than the physical layouts of open versus closed environments and conventional office decor. They must develop flexible spaces that expand and shrink as companies change with shifts in the economy, staff mobility, and new technologies. Ultimately, notes British architect and workplace design expert Francis Duffy, "we're talking about the architecture of change, an architecture that physically manifests transience, an architecture in which a building is treated like a sponge, soaking up information." Such concepts should encourage architects to consider new paradigms of space and time.

Given the current recession, the design of new offices will prove more difficult than expected. More than likely, corporations of the 21st century will be housed not in gleaming new headquarters designed by star architects, but in speculative office buildings recycled from the 1980s. Architects will be forced to do more with less, designing flexible spaces within inflexible floor plates serviced by outdated systems. This restriction requires architects to understand the social and spatial ramifications of new office concepts such as telecommuting, group address, and hoteling (pages 41-43, this issue).

Designing for new modes of work will involve more than accommodating the computer workstation. The office of the future may never be paperless, but it will continue to move far beyond the confines of the desktop, demanding more imaginative design solutions than ever.

*Debra K. Dietz*

**More on Amendment 2**

I want to correct information about Colorado's Amendment 2 in two letters published in your August 1993 issue (pages 18-20). Americans have passed legislation to prevent discrimination against individuals because of race, gender, and religion. We passed these laws because Jews, Italians, African Americans, and others have all suffered denial of their basic rights as citizens.

Discrimination and violence against gay and lesbian Americans are sadly widespread in our nation. Nine states and many municipalities across the country have passed legislation to protect the human rights of gay men and lesbians—preserving their right to a job and a place to live. But in Washington, Oregon, Idaho, Florida, Maine, and Michigan, many of the national organizations that sponsored Amendment 2 are planning to introduce similar ballot initiatives for next year's elections. If they pass, people in those states would lose their rights to deal with the problems of discrimination based on sexual orientation.

Amendment 2 forces all government agencies in Colorado, including the courts, to take the ridiculous position that they cannot hear or help anyone with a claim of discrimination based on sexual orientation. Let's stop this misleading campaign now. It has divided us as a profession, and it will tear apart our communities as it has in Colorado.

*Jeff Harris, AIA  
Seattle, Washington*

**Design backlash**

Your editorial, "Design Backlash" (July 1993, page 15), followed a few pages later by "Salk Addition: Pro and Con" (pages 41-45) raises some serious questions surrounding the issue of design ownership. At the Salk Institute, architects feel an ownership of Louis Kahn's masterpiece and have responded as a community to its addition. In Lawrence, Kansas, local citizens feel an ownership of the parks for which sculptures are planned. I do not think that design guidelines are written to "undermine the enrichment and diversity of our environments." These guidelines are

a demand by citizens to be included in the decisions which many architects feel they alone should make.

*Mark Spitzer, AIA  
Seattle, Washington*

The editorial advocating more liberal design guidelines as an answer to the public backlash against art and architectural proposals with which they disagree was most disappointing. Reducing public influence over designs is a sure method for decreasing architects' influence over the shape and quality of the American scene. For every architectural masterpiece that was choked to death by an outraged public, architects have created a thousand misformed monstrosities. We cannot participate in American public life from our high horse of design arrogance.

*Tom Morris  
Denver, Colorado*

**Corrections**

The San Diego light rail station (August 1993, page 57) was designed by Erickson Associates with Loschky Marquardt & Nesholm.

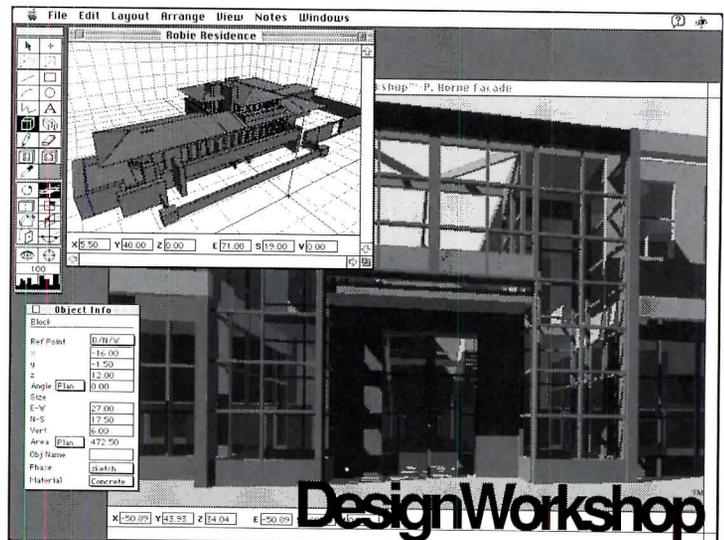
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## Events

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Registration deadline for Future Build, a conference on intelligent buildings, hosted by the Intelligent Buildings Institute in Washington. Contact: (202) 457-1988.

October 14-17

Inside New York, a conference combining the annual meetings of the AIA Design and Interiors committees, will focus on the diverse interior architecture of New York City. Contact: (202) 626-7566.

October 14-17

Education and Practice: The Critical Interface, a conference at Texas A&M University. Contact: (409) 847-8677.

October 15-16

Sustainable Strategies for Communities and Building Materials, a symposium hosted by the Seattle AIA chapter. Contact: (202) 626-7596.

October 19-21

1993 Architecture Engineering and Construction (AEC) Expo in New York. Contact: (609) 987-9400.

October 26-28

The 1993 World Energy Engineering Congress, a conference held in Atlanta. Contact: (404) 447-5083.

October 26-28

Environmental Technology Exposition & Conference, in Atlanta. Contact: (404) 447-5083.

November 2

Submission deadline for Design of an Affordable, Environmentally Sustainable House, a competition hosted by Architects Designers and Planners for Social Responsibility and the Virginia AIA chapter. Contact: (804) 644-3041.

November 8

Submission deadline for Unbuilt Architecture Awards, held by the Boston Society of Architects. Contact: (617) 951-1433.

November 8-10

The General Electric Lighting Institute conference on architectural and interior design lighting in Cleveland. Contact: (800) 255-1200.

November 15

Deadline for the 98th Rome Prize fellowship competition, hosted by the American Academy in Rome. Contact: (212) 751-7200.

November 15

Submission deadline for San Jose Veterans Memorial Design Competition. Contact: (408) 277-2789.

November 17-19

Build Boston '93, hosted by the Boston Society of Architects at the World Trade Center in Boston. Contact: Beth Torrey, (617) 439-5019.

November 18-21

Design: Contributing to the Quality of Healthcare, a conference held by the National Symposium on Healthcare Design in Chicago. Contact: (510) 370-0345.

November 30

Single-Family New Construction, a design and technology competition sponsored by the Housing Advisory Committee of the City of Winston-Salem. Contact: (919) 727-8597.

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\*The AIA is a three-tiered membership organization. Architect, associate, and international associate members who reside in the U.S. must join at the national, state, and local levels and are obligated for the dues assessed by each. You will be invoiced for your state and local dues following application processing. For the telephone numbers of your local and state chapters consult your local yellow Pages.

\*\*If you reside outside of North America, include an additional \$100 to cover first-class postage.

\*\*\*For more information about allied individual and allied organizational membership and the current dues structure, please contact the director of allied membership, (202) 626-7514.

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CHARLESTON: State-appointed redevelopment group is coordinating conversion of naval shipyard closing in 1996.

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- 23 Details
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- 29 On the Boards



BASE CLOSINGS: Map shows major military installations that will be shut down over the next six years.

### Military Base Closings Raise Community Planning Questions

By the end of the decade, the federal government will close 130 military installations across the country, in accordance with the Defense Base Closure and Realignment Act of 1990. At present, the government has no proper protocol for transferring military lands back to local planning jurisdictions.

For cities like San Francisco, which will lose 33,000 jobs when five nearby naval bases close over the next few years, this lack of planning spells collateral damage: Not only will defense-based livelihoods be liquidated, but citizens won't have much say either in how the resulting physical void will be filled.

"There ought to be a planning process, so communities can be involved," contends Albert Eisenberg, an AIA government affairs specialist.

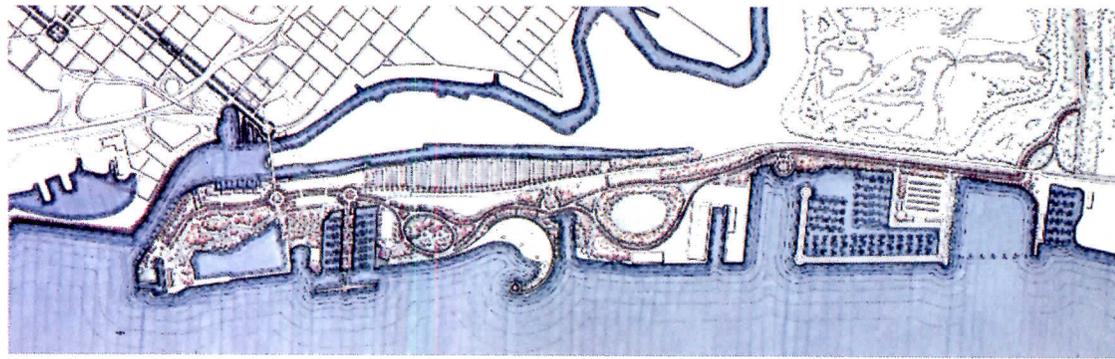
As the process now stands, base commanders will preside over the transferrals of ownership. The AIA objects to that approach: "Conversion is not a Defense Department issue—it's a community issue," Eisenberg maintains. The AIA wants the federal government to develop a set of planning guidelines and enact them into law to ensure that former military bases fit into the economy and structure of their surroundings.

Robert A. Peck, the AIA's group vice president for external affairs, recently suggested to a U.S. House of Representatives subcommittee on government operations that for the economic benefit of host cities, the government should sell back military land and facilities to local entities at the customary discount rate charged for surplus federal properties. If local groups gain affordable access to abandoned military lands, they also need a say in the planning process for base reuse, according to

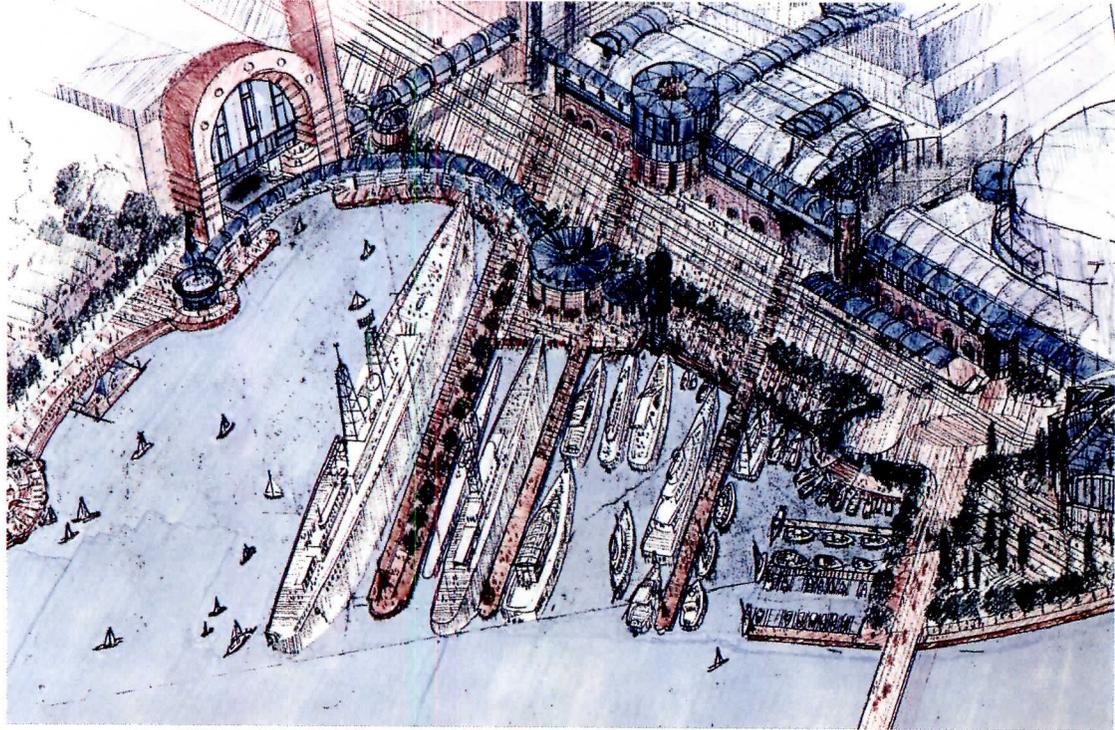
the AIA. In Charleston, South Carolina, a state policy committee is working on reuse plans for the city's major naval shipyard, scheduled to close in April 1996.

At Williams Air Force Base near Mesa, Arizona, which was scheduled to close at the end of September, a planning group formed by several local governments is coordinating the creation of a commercial airport as well as a new campus for Arizona State University. Architects hoping to find work at former bases should contact local redevelopment groups in charge of the transitions.

In the meantime, the AIA's Eisenberg says the Institute is using the time until Congress convenes next year to craft a strategy for setting planning recommendations into law. "Not everybody understands the notion of planning," Eisenberg contends. "We'll have time to educate [federal officials] over the next year." —Bradford McKee



**BUFFALO WATERFRONT:** Ehrenkrantz & Eckstut opens four miles of Erie lakefront (bottom) to marinas and parks.



**ERIE HARBOR:** Waterside promenades connect new Harbor Center (left, with arch), Naval Museum ships, and retail.

## Buffalo and Wilmington Unveil Waterfront Plans

The success of waterfront revitalization projects in Baltimore, New York, and Boston has led smaller cities to develop similar projects: Cleveland, Chattanooga, Norfolk, and Pittsburgh all have waterfront face-lifts in the works. From larger cities, planners in second- and third-tier towns have learned that modest, incremental proposals work better than blockbuster development. Smaller is better; they can plan now and build later, according to market demand. Reflecting that wisdom, Buffalo, New York, and Wilmington, Delaware, both unveiled long-range plans in August to revamp the profiles of their waterfronts.

In Buffalo, a master plan developed by Stanton Eckstut of New York City-based Ehrenkrantz &

Eckstut Architects ultimately calls for \$800 million in new waterfront development, a sum to be amortized over decades. "Our design is for the next 50 to 100 years," maintains Eckstut, a veteran planner of several urban waterfronts. "You have to begin the development in increments. Large-scale designs have failed to realize how they get built, how many participants are needed, and the true complexity of most plans."

Eckstut's plan for Buffalo is derived foremost from its variety of relationships with Lake Erie, the Buffalo River, and several canals. The design calls for a dense, urban inner harbor at the foot of downtown, extending to a more parklike, recreational outer harbor stretching along four miles of lake shoreline.

Eckstut conceived the new Buffalo waterfront as a year-round attraction—a casual pedestrian venue

in the summer and a winter park for ice skating and ice fishing. The commercial inner harbor will be lined by new pavilions and an esplanade; at the center will be new piers for three large vessels belonging to the Naval Museum. At the water's edge downtown, the Buffalo Harbor Center and the Crossroads Arena are under construction, scheduled for completion toward the end of 1995.

Buffalo's outer harbor is planned as a quieter string of parks, beaches, and small-craft marinas, which would realize Frederick Law Olmsted's vision of a linked park system for the city. Eckstut also has proposed a small residential area near the water. A footbridge would connect the inner and outer harbors, and between them, an intermodal transportation center is planned, where local light-rail, bus, and water-taxi traffic all would converge.

Eckstut's method of master-planning emphasizes infrastructure before development. In Buffalo, as in his other projects around the country, funds from the city and state will pay for improving utilities, so that private developers can either lease or buy the sites for development. Building then depends on the market. Such an approach, Eckstut adds, tends to rule out overbuilding.

Far less sweeping is Wilmington's small-scale waterfront plan, called Riverview Plaza, designed by Stoutenborough Architects & Planners of Irvine, California. Architect Todd Stoutenborough conceived a \$16 million entertainment, civic, and transportation nucleus on an unused, 3.7-acre industrial tract between the Christina River and Wilmington's Amtrak station, away from the city's main port on the Delaware River. Avers Stoutenbor-



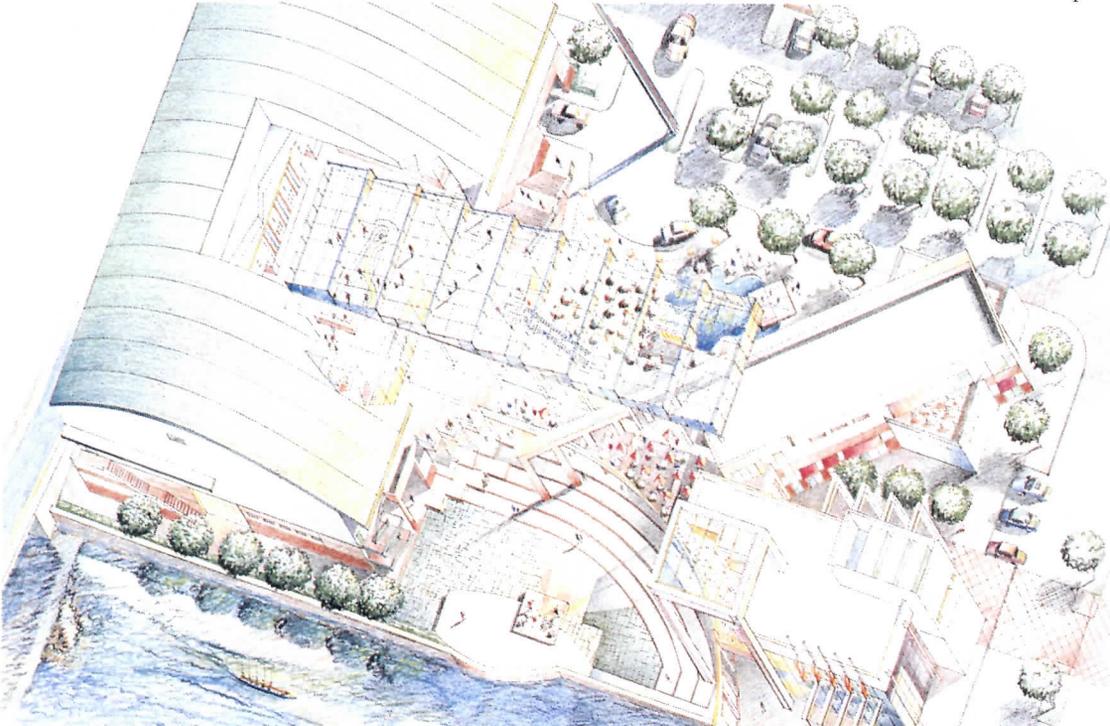
**WILMINGTON:** Stoutenborough's cinema.



**EXISTING WATERFRONT:** Christina River.



**RIVERSIDE PLAZA:** Leads to new complex.



**WILMINGTON WATERFRONT PLAN:** Complex includes cinema (left), amphitheater (bottom), and cultural center (right).

ough, "It's a starter project to encourage other development around it." Wilmington's anticipated light-rail line is planned to connect the new waterfront enclave and adjacent railroad station to outlying neighborhoods within a few years.

The Wilmington project comprises a 50,000-square-foot cinema complex; a 1,000-seat outdoor amphitheater; a high-technology amusement center; a multilevel parking garage; restaurants; and retail, civic, and exhibition spaces. Dominating the scheme will be the cinema complex, with a gigantic, arching roof. From the middle of the cinema, a large sawtooth glass canopy will emerge, linking the larger building to the smaller structures on the site's opposite side. The amphitheater will be cradled at the center, facing the riverfront at the end of a detached colonnade. Com-

pletion of the cinema and amphitheater is expected in November 1994.

Stoutenborough—who was commissioned by a development corporation owned by basketball star Julius Erving—explains that the waterfront plan incorporates uses that will overlap throughout the day and night. For instance, restaurants need lunchtime trade, which an evening entertainment center cannot provide. Thus, Stoutenborough's plan depends partly on the creation of a three-block pedestrian street leading to the site and amenities in a variety of price ranges to draw traffic from newly built offices nearby.

Moreover, the plan must draw local residents from the city and suburbs to succeed, not just tourists. But "to compete with the suburbs, you have to compete with the car," Stoutenborough insists, and hence his design provides onsite parking

for vehicles. Safety is a major factor as well. Stoutenborough designed the axes of the buildings and plazas so that the entire complex can be supervised from a single point.

Wilmington "has been trying for years" to draw in people and entice them to spend money, according to Michael Beyard, a research analyst at the Urban Institute in Washington, D.C.; local leaders hope the waterfront plan provides such a catalyst. Stoutenborough envisions a more entertaining Wilmington that draws visitors from Baltimore and Philadelphia. The waterfront project's chief aim, however, is to create enthusiasm at home. Stoutenborough expects to invite children to the site during construction to help make bricks for the buildings, because "for this project to be successful," he declares, "it has to address the whole community."—Bradford McKee

## Details

Korean Air Lines has commissioned **Skidmore, Owings & Merrill** to design an operations center and aircraft hangar at Kimpo International Airport in Seoul. **Esherick Homsey Dodge & Davis** is designing an aquarium at Stanford University. **HNTB** has been commissioned to design the new Lawrence Welk Resort in Branson, Missouri. **The Stubbins Associates** of Cambridge, Massachusetts, has formed a joint venture with **Anhui Architectural Design Institute** of Hefei, China, to design the 60-story Anhui International Trade Center. **Longoria/Peters** of Houston is designing a 9,000-seat bullfighting arena in Nuevo Laredo, Mexico. **Payette Associates** of Boston has been selected to renovate and expand a science building at Phillips Andover Academy in Andover, Massachusetts. AmSouth Bancorporation has selected **Lehman/Smith/Wiseman & Associates** of Washington, D.C., to design the interiors of its new administrative and training facility in Birmingham, Alabama. **Hellmuth, Obata & Kassabaum** is designing a new federal courthouse in Tampa. **Einhorn Yaffee Prescott** of White Plains, New York, has been selected to complete a \$24 million renovation at the High School of Fashion Industries in New York City. The City of New York has chosen **Brennan Beer Gorman Architects** to renovate the existing Fort Washington Armory homeless shelter. **The Hillier Group** has been commissioned to design a master plan for the Inanc Lisesi school for gifted children in Gebze, Turkey. **Van Dijk, Pace, Westlake and Partners** has been retained to rebuild Carver Park, a public housing complex in Cleveland. **Davis, Brody & Associates** has completed design of a \$200 million research and clinical facility at the Mount Sinai Medical Center in New York City. Southern California Gas has selected **Wolff/Lang/Christopher Architects** of Rancho Cucamonga to design an energy-efficiency center in Downey, California. **Moore/Andersson Architects** of Austin is designing an art museum for Kansas State University. **Thomas F. Schutte**, president of the Rhode Island School of Design since 1983, has been appointed President of Pratt Institute. British architect **Alison Smithson**, instrumental in developing New Brutalism in the 1960s, died at age 65 in London.



**Sex, Lies, and Washing Machines in New York**

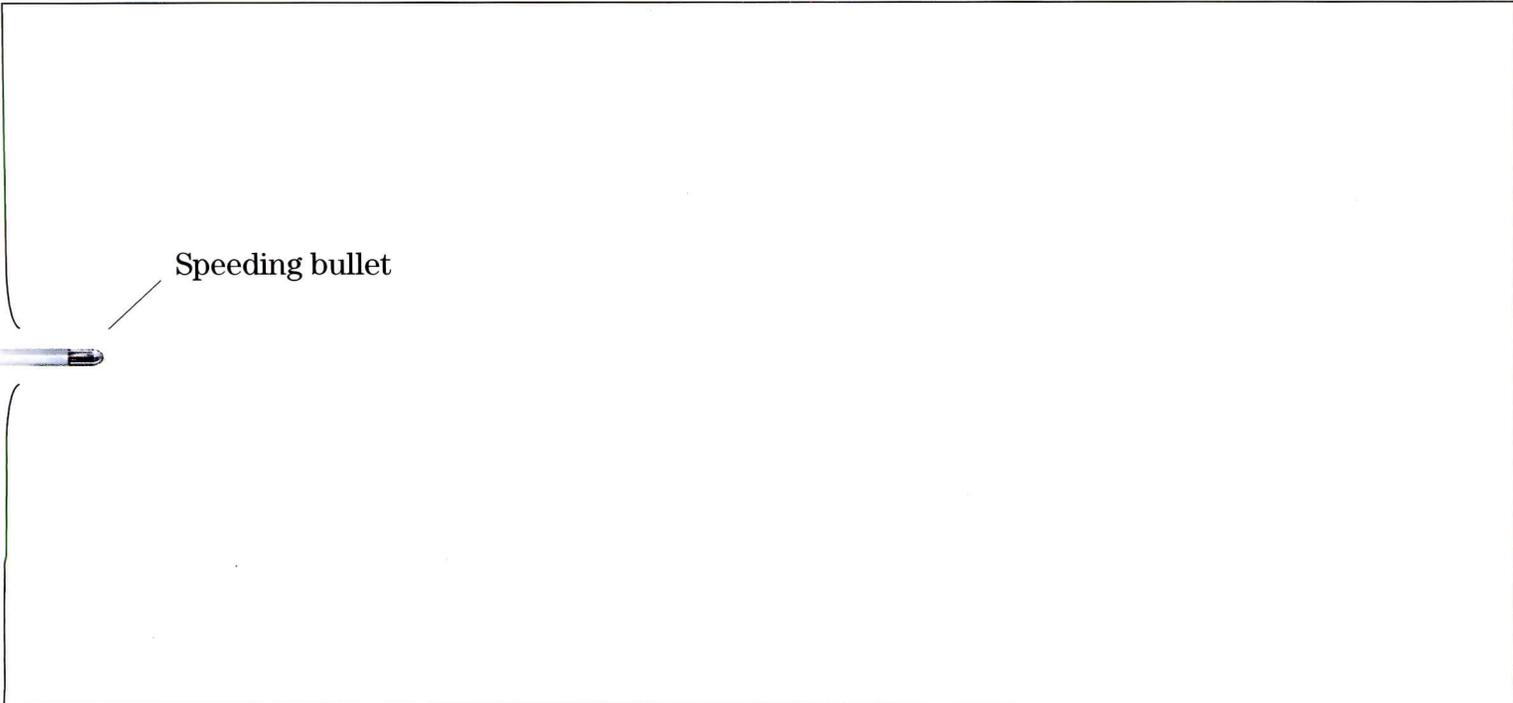
Like cockroaches under the cupboard, an insidious form of sexual persuasion has been lurking for decades beneath the inanimate surfaces of America's domestic appliances and office equipment. Exposing these seductive deceptions is the goal of "Mechanical Brides: Women and Machines from Home to Office," an exhibition on view at New York's Cooper-Hewitt Museum through January 2. Conceived, organized, and designed by Ellen Lupton, the museum's curator of con-

temporary design, "Mechanical Brides" explores how male-dominated media images mirror and shape women's ideas about gender. The show juxtaposes about 100 washing machines, telephones, irons, and typewriters with their alluring representations in advertisements, film stills, and instruction manuals.

The sexist connotations ascribed to these machines seem obvious today. The gleaming curvy chrome of a Sunbeam Coffeemaster in a 1950 ad reflects the face of a contented husband being served by his all-but-invisible spouse. Other ads urge middle-class white women of the

"Ozzie and Harriet" generation to look upon household chores as dreamy romance. A 1953 promo shows a smiling wife embracing her domestic "partner," a Magla silicone ironing-board cover.

"Mechanical Brides" makes less obvious points about stying. During the Depression and immediate post-war years, the design of machines evolved from frank functionalism to swank formalism. Planned obsolescence was one factor, as was the desire to integrate machines into home and office decor. Design and advertising, notes Lupton, glamorized household chores as "exalted rituals



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for achieving domestic bliss, promoting housekeeping as appropriate work for women, and women only.” Early washing machines, for example, expressed the apparatus’s cylindrical tub, which later versions hid in squared-off metal boxes to blend with other built-in appliances.

Turn-of-the-century typewriters, already icons of “women’s work,” were clunky contraptions of dark metal and exposed parts. Eschewing the supposedly masculine realm of engineering for the feminine one of styling, postwar typewriters submerged their mechanical reality beneath streamlined, colored enclousures.

At the same time, interior designers turned dreary offices into comfortable nine-to-five nirvanas, encouraging women to enter clerical occupations. Lupton points out that “jobs such as receptionist and customer-service agent remain ‘pink-collar ghettos’ today.”

The telephone was no less transformed. From 1900 through the 1920s, erotic postcards portrayed telephones as conduits of sexual accessibility without breaching Victorian strictures against physical contact. In the 1950s and ’60s, women were targeted as consumers of new phones. AT&T promoted a 1956 wall

phone as a kitchen counter space-saver. Advertisements for the Swedish-designed Ericofon celebrated its one-piece construction as outstanding domestic decor.

The feminist critique of “Mechanical Brides” sometimes glosses over complex realities. The female movie stars who are portrayed in stills throughout the exhibit, for example, were often beacons of liberation both on screen and off. Few male interior designers influenced the shape of the postwar office like Florence Knoll. And the insistent focus on the impact of advertising and design on women precludes discussion of their

effect on men. Nevertheless, Lupton’s exhibition design of “Mechanical Brides” adds conceptual and architectural zing to the rather staid Cooper-Hewitt. Especially clever is a laundry line of sheets strung across the museum’s glass conservatory, bearing quotations from a social cross section of women.

Anne Morrow Lindbergh states the show’s most disturbing message in a quote from her 1955 autobiography. Housework, she bemoans, is so often automatic, that in many instances “woman herself begins to feel like a telephone exchange or a laundromat.”—Donald Albrecht



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## Women's Rights Park Opens in Seneca Falls

When Elizabeth Cady Stanton, the wife of a Boston lawyer, moved with her family to Seneca Falls, New York, in the middle of the 19th century, she faced a conundrum familiar to modern-day American women: How could she pursue her customary political and cultural life and perform the duties of a homemaker? Stanton might have simply hired a governess, but she was an activist who saw her plight through the eyes of poorer women who would never have that choice. With the help of local Quakers and noted abolitionists Frederick Douglass and Lucretia Mott, Stanton organized a convention to reform women's rights.

When the town fathers got wind of the event, the group was denied a meeting place, but finally gained access to the tiny Wesleyan Methodist Chapel on Fall Street. On the 19th and 20th of July in 1848, more than 300 women and men convened in the chapel for two days, hotly debating the Declaration of Sentiments, a treatise drafted by Stanton and oth-

ers that demanded women's rights to own property and to vote.

Today, the remnants of Wesleyan Chapel form the architectural focus of Women's Rights National Historical Park, designed by two young women architects, Ann Marshall of Brooklyn, New York, and Ray Kinoshita of Amherst, Massachusetts, and executed by The Stein Partnership of New York City.

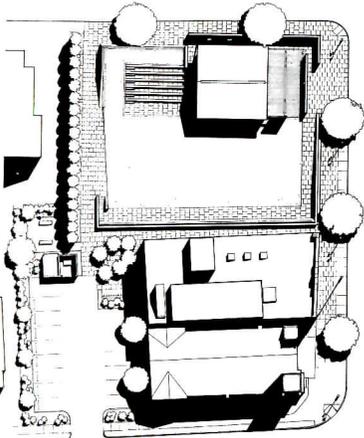
The new memorial park is part of a local women's history tour that includes a visitor center, Stanton's house, and the houses of other reformers. Entering through the chapel, visitors proceed to a stone amphitheater to the north, where, across a grassy slope, they can contemplate a 140-foot water wall of bluestone panels inscribed with the Declaration of Sentiments.

Kinoshita and Marshall's design was selected in a 1987 competition, sponsored by the National Park Service and the National Endowment for the Arts, from a field of 212 entries. Instead of restoring the chapel, of which no photographs or drawings exist, the architects retained only its evocative and fragmentary

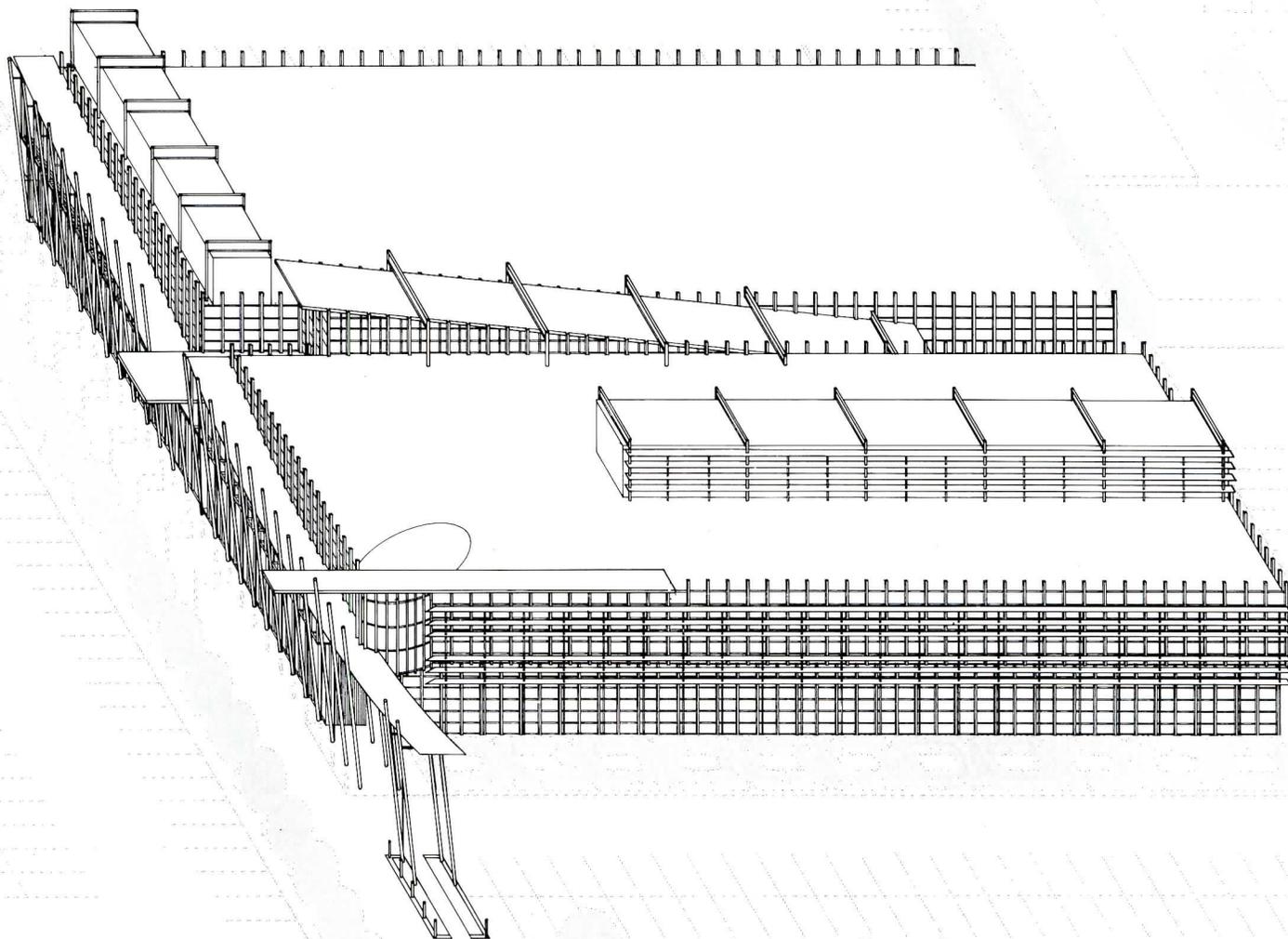
1848 shell. Over the 145 years since the women's rights convention, the Wesleyan Chapel underwent a series of renovations, housing a movie theater, opera house, used-car dealership, apartments, and a laundromat.

Since the fragments of the chapel comprised only its east and west elevations, four wooden roof trusses, and a few brick lintels, Kinoshita and Marshall braced these elements with stainless steel and concrete blocks. A flat-seamed, lead-coated copper roof creates a shelter, where park rangers give talks about the Declaration of Sentiments.

Kinoshita points out that the unfinished nature of the Wesleyan Chapel symbolizes the fact that the women's movement, too, is unfinished. While some of the goals of Stanton's Sentiments have been realized, many women still struggle to succeed in careers while shouldering the burdens of raising a family. "We are of a generation that has reaped the benefits of enormous changes," says Kinoshita. "We created a monument that celebrates both that which has been achieved and the work that lies ahead."—H.L.



SITE PLAN: Chapel (top) and park. ⊕



### **Office and Manufacturing Center Chicago, Illinois Valerio Associates**

Chicago's Valerio Associates has consolidated the traditionally disparate elements of corporate offices and a factory in its proposed headquarters for an electronics firm. Valerio's scheme accommodates the client's need for constant communication between administration and manufacturing by linking the two functions on the same site, a mixed-density manufacturing and commercial area in the northern suburbs of Chicago. Zoning in the area already allows the construction of both offices and manufacturing facilities.

Valerio separated the center's two primary functions to accommodate the programmatic requirements of each. Sales, marketing, research and development, and administration will be housed in a three-story,

75,000-square-foot office block. A separate, 50,000-square-foot building will contain manufacturing operations. A wedge-shaped space comprising shared support functions, including food service facilities, will connect the factory and the corporate office wing.

All three volumes will be linked by an arcade—conceived as the center's main street—on the west side of the complex. The arcade will also provide access to two separate parking areas, as well as to the street. Its sloping steel roof will be supported by a forest of angled steel columns.

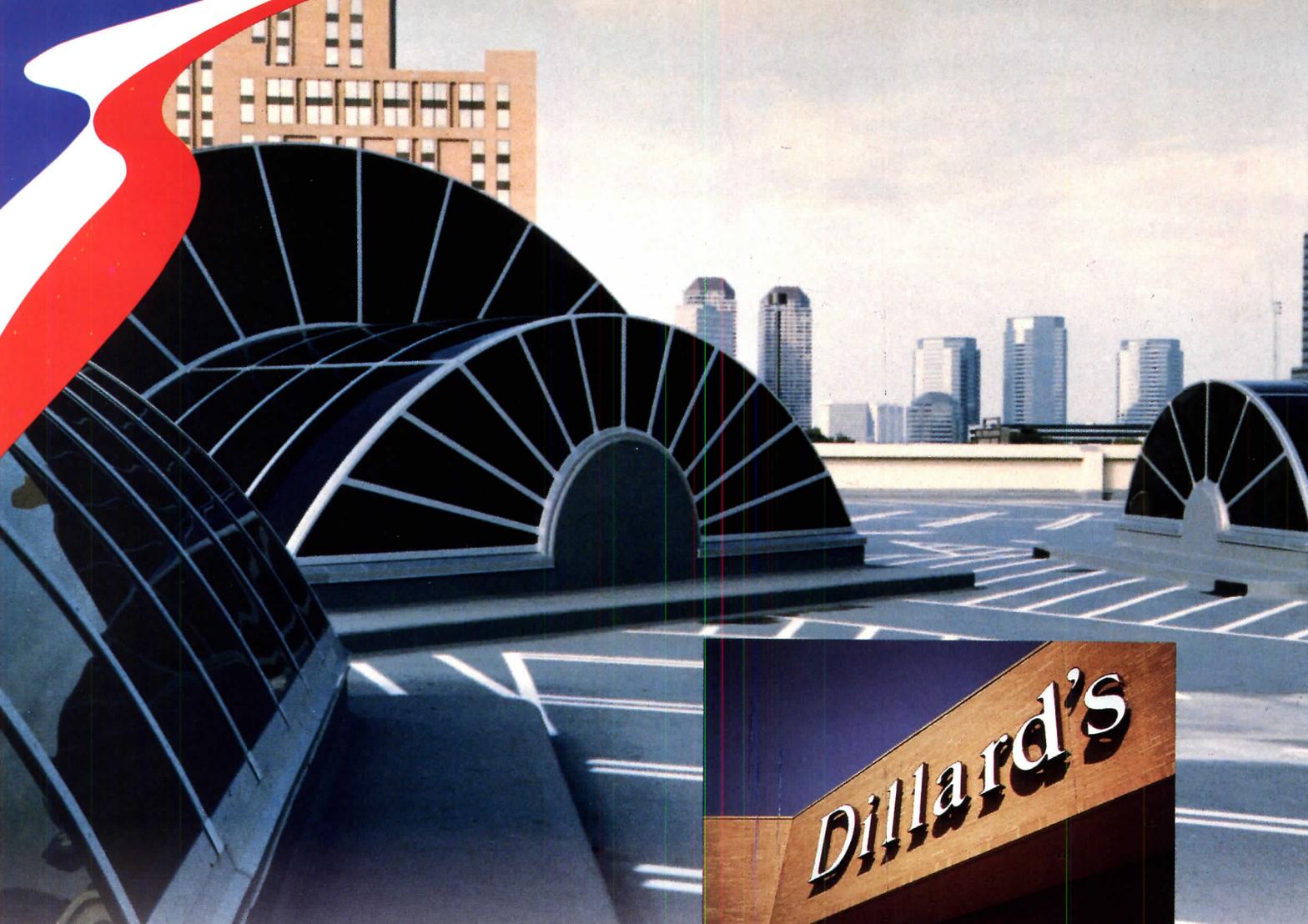
Both the factory and the office block will be clad in floor-to-floor, aluminum-framed glass, in a repetitive orthogonal rhythm. The offices along the building's south elevation will be shaded by a freestanding steel brise soleil that continues the building's glazing patterns. The headquarters' regular horizontal and

vertical interplay will extend to the building's rooftop enclosures for mechanical equipment.

Valerio Associates' office and manufacturing center addresses both the rapid pace and quick changes of high technology by encouraging communication between specialists in different areas. The adjacent departments will eliminate costly business trips and allow impromptu meetings in the boardroom and on the assembly line.

Valerio draws comparisons to the idealized factories designed by Walter Gropius in 1920s Germany, where the Bauhaus architect updated the building type to reflect changes in industry and society. The Chicago architect speculates on his own project, "It's a new and different typology, where the company's functions are all in one location. Perhaps this is the corporate facility of the future."—*Raul A. Barreneche*





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## Ideal Workplaces

Nine new-fashioned employers reveal what corporate clients want in their headquarters.



What do savvy corporate clients expect of architects in the 1990s? ARCHITECTURE tried to find out by surveying nine companies known for their progressive attitudes toward employees and their workplaces. By no coincidence, some of these firms are among the most steadily growing and well-respected clients emerging today. Several are charter members of a coalition called Businesses for Social Responsibility, a group of several hundred employers founded in 1992 that recognizes “the value and dignity of the individual worker, the importance of family-supportive policies and cultural diversity, the variety of challenges facing women, and the need for both worker safety and ethical conduct.”

The impressive accomplishments of the companies surveyed follow policies that may seem far-fetched in corporate America. Clothing manufacturer Esprit de Corp., for example, has run advertisements urging consumers not to buy what they don't need, even if it means not buying Esprit products. The Body Shop, founded by Anita Roddick, runs no advertising whatsoever, convinced that its customers are tired of hype. Microsoft Corporation has become the nation's leading software maker, owing substantially to its realistic accounting of employees' needs both within and outside the workplace.

We asked these employers how the nature of their business is reflected in workplace design, and what architects could do to satisfy their programmatic needs. We also asked them to describe their ideal headquarters. A few said they were already working in them.

The surveyed companies all told us they want open, environmentally responsive workplaces: operable windows, daylight, natural settings, ecologically sound materials, and renewable energy. Most full-time employees spend about 2,000 hours at work every year and need a humane work environment, as these employers affirm. From the comments that follow, architects should gain an idea of how inspiring future workplaces should be.

### **Aveda, beauty and home products manufacturer, Blaine, Minnesota**

Aveda uses ingredients derived from plants and flowers in place of petroleum-derived synthetics. Our new 272,000-square-foot corporate headquarters consolidates all of Aveda's operations, including research and development, manufacturing, packaging, customer service, and corporate offices in one location. It allows for the growth of the company. Our state-of-the-art laboratories include clinical labs, and psychophysiology labs where our chemists and botanical technicians discover new capabilities in plant engineering. We are creating sustainable production for present and future generations.

The headquarters is surrounded by 65 acres of park land, adjacent to a 1,000-acre nature preserve—a fitting environment for our mission of corporate responsibility. Every room receives direct sunlight via windows and skylights—even in manufacturing and warehouse areas. The complex includes a high-tech exercise and game room, racquetball and basketball courts, walking trails, and in-house day care. It meets all employee needs.—Tom Balf, environmental affairs director

### **The Body Shop, personal-care products manufacturer, New York City**

What I love about our company's environment is that it is very relaxed and casual—the surroundings are very bright, laden with artwork and artifacts from around the world. The nature of our business is reflected in the presence of this global artwork. It adds a cultural and ethnic atmosphere to the office. We also recycle and reuse everything we can, including fruit crates, wooden boxes, and tins. The ideal headquarters would incorporate renewable energy, such as solar panels and natural lighting, to create a more inviting, self-sufficient headquarters—more in sync with the changing needs of the world. We would have architects incorporate more storage space—space that doubles as a products showcase.—Julio Trabanco, exhibitions manager

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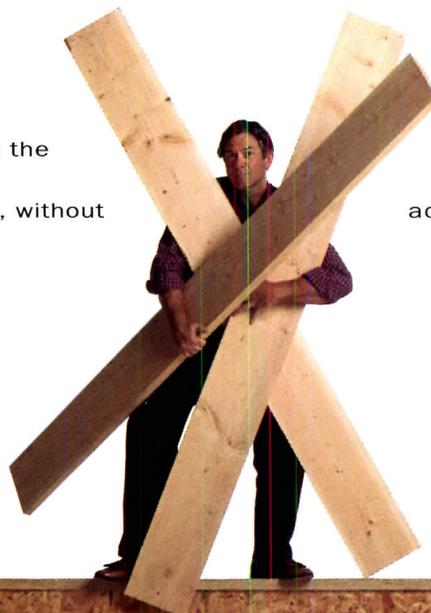
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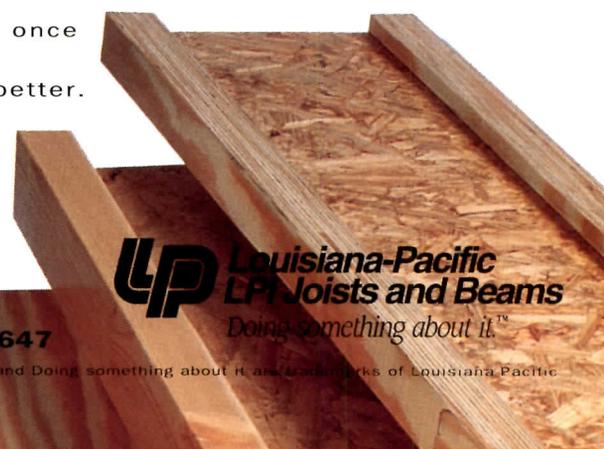
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**Esprit de Corp., clothing manufacturer,  
San Francisco, California**

When you walk into our offices, it feels like you're walking into someone's home. We have lots of open space with skylights and floor-to-ceiling windows that let in plenty of natural light. When we designed this space, we wanted to be sure that our employees would be comfortable and inspired by their work environment. We have no cubicles or closed-door offices, so we're relaxed and can focus on being creative and excited about our work.—*Susie Tompkins, founder*

**Microsoft Corporation, software developer,  
Redmond, Washington**

The Microsoft corporate grounds are designed with the employee in mind. All buildings are designed on a human scale to achieve a campus atmosphere, an open and user-friendly complex to enhance and encourage employee productivity. We dislike anything that appears stark or overtly corporate. The campus is designed to be as reactive as the software industry itself. It's based on a modular system to be altered and expanded as needed. This approach allows for maximum efficiency and flexibility, so there is as little business disruption as possible during times of change. The ideal headquarters for our company would promote employee synergy above all else. We constantly work toward this theme to promote an atmosphere of openness and flexibility.—*Richard Khlysa, manager of development and construction*

**Rhino Records, Los Angeles, California**

Rhino's primary business is reissuing rock 'n' roll records. Our new building reflects both a feeling of nostalgia and a look to the future in the way we've used retro materials in forward-thinking designs. I like the extensive space devoted to employee comfort, like our galley and gym areas. We've tried to eliminate an office caste system with designs that minimize hierarchy. The company's democratic nature is reflected in the emphasis on common areas, like the lunchroom, and open support areas that promote employee interaction. Rhino is committed to community issues, reflected in our wide use of recycled materials.—*Brian Schuman, vice president of operation and production*

**Rocky Mountain Institute,  
Snowmass, Colorado**

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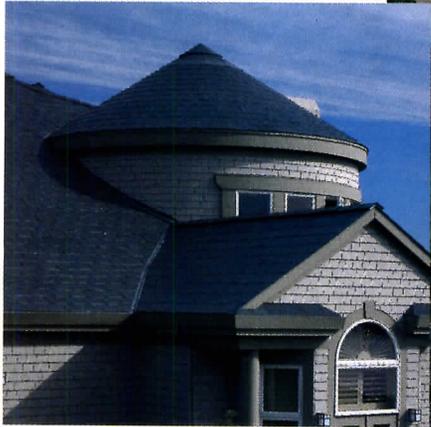
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ity. Our main building is a 4,000-square-foot bioshelter with a 900-square-foot greenhouse, which also serves as the furnace—a superinsulated passive solar structure without conventional heating. We're doing a study on productivity and green buildings which reveals that people respond to better daylighting, ventilation, thermal performance, and air quality. We've observed measurable increases in productivity in the green facilities we've studied, and we've seen significant drops in absenteeism.—*William Browning, director of green development services*

**South Shore Bank, Chicago, Illinois**

We're in the business of economic community development. South Shore Bank's primary mission is to lend in the neighborhood. As such, we're an institution with no historical commitment to tradition. However, we do have a traditional bank setup.

Yet this is an organization that has had very little focus on its physical surroundings—it's focused on what it does out in the community. But when the heat and air don't work, you've got to start looking inside.

South Shore Bank occupies two buildings in a three-building complex that's quite old. One of the buildings used to be a resident hotel, and the offices used to be rooms. They have different sized windows, aging casings—they've been carved up over the years.

We have more people than places to sit down. Fortunately, people travel, so there's always some extra room. When I joined South Shore Bank, it was clear that this is not the work environment we want all our employees in. There's no office format. But we have one thing going for us: We have a really collegial group of professionals. It's less important that they have any status in the office than the ability to work together. If we weren't locked into this present structure, we would have a lot of open spaces.—*Will Hartsborn, chief administrative officer*

**Stride Rite, shoe manufacturer, Cambridge, Massachusetts**

I love the close proximity among co-workers in our headquarters. Everyone works in one building. However, we could use more space with natural lighting and windows that open. Our business is reflected in our workplace design by offices that accommodate footwear and point-of-purchase displays. Our ideal headquarters would have better lighting and windows that open. We have everything else.—*David Fuhrman, director of corporate communications*

**Tom's of Maine, personal-care products manufacturer, Kennebunk, Maine**

Our workspaces are spread out in four buildings, each about one mile apart. Each location has its particular beauty and function, and each group in a particular building acts as a minicommunity. As one of our employees described it, we are less like a family than we used to be, and more like a village.

Two of our buildings are recycled railroad structures, across the tracks from one another. Our corporate offices and outlet store are in a recycled shoe factory. Recycling these spaces is in keeping with our environmental

roots. It is important to us that our windows can be opened and that they look out onto scenes of beauty. A local architect, Scott Teas of Portland, has helped make our offices beautiful, light, and natural-looking.

An ideal headquarters would be in a natural setting with an energy-efficient building; a durable but nonpaved parking lot; and space for health, fitness, and child-care facilities. Ideally, a train would stop at our depot, bringing workers to the site from park-and-ride lots in southern Maine. People living in Kennebunk would bicycle or walk to work.—*Colleen Myers, vice president of community life*



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## OFFICES IN FLUX

*Architects must develop more flexible designs to suit the shared workplace of the '90s.*

**BOTTOM LEFT AND PLAN:** Frank Lloyd Wright's 1904 Larkin Building represents rigid hierarchy of early offices.

**BOTTOM RIGHT:** Digital Equipment Corporation, Espoo, Finland, reflects informal setting of new workplace.

These are trying times for designers of corporate work environments. Gone are the halcyon days when Trumpian developers competed to build designer skyscrapers and office parks. Today's corporate executives are more interested in the bottom line than the skyline. As a result of their new approaches to management and continuing breakthroughs in communications, the traditional office environment of single-occupancy workstations and private executive suites is rapidly giving way to concepts such as "hoteling," "team space," and the "free address." The need for conventional office space will continue to drop as more employees "telecommute" from home or the road, aided by laptop computers and portable fax machines, and convene in "virtual offices" that bring staffers together from around the world through videoconferencing.

Gloomy predictions about white-collar layoffs and the shrinking workplace, combined with already high office vacancy rates,

may lead architects to think there won't be much work in office design. But as corporate America reinvents itself for the 21st century, architects are in a better position than anyone else to help companies adjust. Companies are looking for ways not only to downsize and consolidate operations, but also to take advantage of new computer and communications technologies and make their space more productive. To succeed on this corporate ladder, today's "cybertects" must be as knowledgeable about computer technology and organizational theory as they already are about building technology and architectural theory. The challenge for architects is to figure out how to respond to the new technology.

"The office of the future has to help companies attract and retain staff, stimulate their creativity, and multiply organizational productivity," explains Francis Duffy, chairman of the DEGW Group, a London-based architectural practice that specializes in office environments, and president of the Royal Insti-

*past*



*present*

tute of British Architects. "It's one of the great design challenges, and it opens up incredible opportunities for architects." Others agree that architects have a key role to play in reshaping the workplace, if they can figure out the changing office landscape. If they can't, experts warn, clients may bypass architects in favor of interior designers, facility managers, and furniture manufacturers.

Spurred by the economic downturn of the 1990s, companies seriously have begun to explore the implications of recent advances in information technology on their deployment of personnel and use of office space. The corporations most likely to be on the cutting edge of these trends are sophisticated international firms—financial services, electronics, pharmaceuticals, and utilities—that employ "knowledge workers," defined by Steelcase as people who "analyze, create, decide, collaborate, and act on information." Some theorists predict that the emergence of a new form of workplace will be a 20-year process, but several trends are already clear:

- Advances in computers will change work patterns; flextime and working from home will become more common.
- Workers will be expected to have many skills and be self-directed.
- Management will evolve, with new priorities of product quality and customer satisfaction transcending concerns about workers' attendance and job performance measures.
- Large corporations will shrink as technology enables work to flow to smaller units,

especially outside contractors, who will flourish in an information-driven economy.

Instead of working from the home office, the new knowledge worker may be based at a customer's location and communicate with the office by computer. White-collar professionals will work at least part of the time from telecommuting or satellite offices. Already, almost 7 million Americans work at home and communicate with their offices by computer at least once a week.

A more distinct change in the office itself is the shift to a "group address" or "free address" model. In these shared arrangements, companies typically provide fewer workstations than the number of employees on the premises; there is usually also some dedicated storage space for personal items. IBM, AT&T, and Ernst & Young are among the companies exploring these concepts. Early studies indicate that such working methods can increase employees' control over their days, reduce commuting time, and improve productivity. Real estate benefits for the company include reduced square footage requirements, based on shared workstations, and lower operational costs. Reliance on computerized data storage, rather than hard files, further reduces companies' space requirements.

The key issue for architects is that corporate managers are reevaluating what is critical to their operation. With the advent of portable computers, much of the knowledge work of the new information age has shifted from being place-bound to task-bound or

person-bound. Thus, the value of office furniture and other work conditions will be based on their ability to aid the knowledge worker, regardless location. To help architects understand this new corporate landscape, the AIA's Corporate Architects and Public Architects Professional Interest Areas have published a report, "Future Beginnings: Directions in Officing," that explains a number of the latest trends affecting the workplace:

- **Traditional office:** Designed for a single occupant, it is usually configured as an enclosed office with four walls and a door, or as an open-plan workstation.
- **Shared office:** A single workstation or enclosed space, it is occupied at different times by two or more company employees who perform the same type of work.
- **Group address:** Workstations are configured to support a greater number of workers, typically ratios of three-to-one or five-to-one. Hardware, telephone, and commonly used office supplies remain with the stations. Personal files are located nearby or are mobile and can be wheeled into the station. An alternative concept is the group room, which clusters four to six workstations in one large room, often including a meeting area.
- **Free address:** Similar to the group address in configuration, the free address serves users who are less dependent on files. They spend considerable time out of the office so that more people can work within one area.
- **Deskless address:** Virtually no space is assigned to the worker at the base office. In-

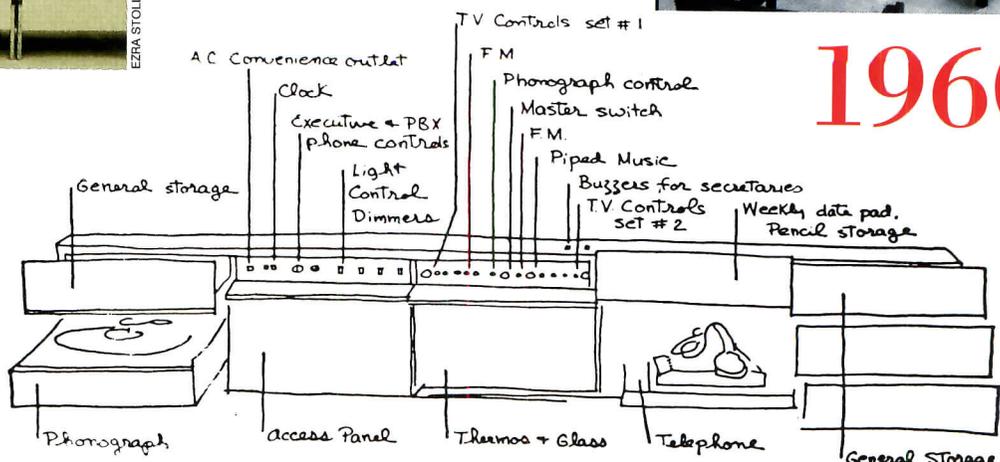


## 1950s

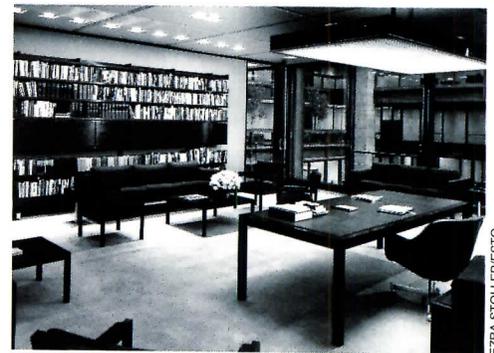
**ABOVE:** Union Carbide's 1959 headquarters, designed by SOM, reflects one of the first integrations of office furniture and architecture.

**ABOVE RIGHT:** Warren Platner-designed offices at Roche Dinkeloo's 1968 Ford Foundation headquarters features customized, interchangeable components.

**DRAWING:** Florence Knoll's 1954 sketch of a cabinet for the office of CBS President Frank Stanton.



## 1960s



stead, company employees work in a variety of locations, staying in contact with the main office through communications technology.

■ **Hoteling:** A worker makes a reservation at a company's headquarters for the use of an office for a particular amount of time, typically a full day. Arrangements are made through a concierge-style administrator.

■ **Telebusiness center:** This work setting can be reserved much like a hotel room. These "instant offices" house workers from more than one company at the same time, usually on a one- or two-day basis.

Many companies seek a flexible design that will adapt to their changing organizational approaches, and individual architectural firms are responding in a variety of ways. Several are thinking more like managers, to meld organizational design with physical design and create workplaces that increase efficiency and productivity. They are forming alliances with organizational theorists and other consultants, and are finding that clients want to be involved in the design process from the start. Some are focusing on ways to help companies downsize—not so much as a response to reductions in work force but by assessing the limited time staffers actually spend in the office.

Others are concentrating on methods to help clients improve the surroundings of people who still come to the workplace, including heating, ventilation, and air-conditioning systems and lighting. They contend that improving workplace design enhances the com-

fort and productivity of workers. And many companies are providing more amenities, such as lounges and gyms, as a way of attracting and maintaining top personnel.

Flad & Associates of Madison, Wisconsin, for example, specializes in working for team-based companies to create "group spaces" that reflect their management structure, making architectural decisions part of organizational decisions and developing a common language that binds the organizational and architectural design processes. This approach increases users' understanding as to why certain decisions regarding space are made.

Meanwhile, Hinrich Oltmann and Associates of Danville, New Jersey, is busy pioneering "virtual offices," environments for professionals who spend most of their time on the road. With sophisticated voice equipment and other technology, Oltmann's firm helps companies create the illusion for their customers that employees work from a main office center, when actually they can be anywhere. Oltmann designed a New York office for AT&T Network Services, for example, to support a core staff of 50 and a telecommuting staff of more than 100 professionals. The virtual office design enabled the AT&T affiliate to slash its space needs from 72,000 square feet to 26,500 square feet and to reduce rent costs by 60 percent.

With six offices worldwide, RTKL Associates is one of many practices now hiring architects who also have business degrees and who understand the latest thinking about

"reengineering the corporation." Associate Vice President Kurt Haglund maintains, "In order to communicate effectively, architects have to put their ideas in terms clients can understand. That's why we're hiring architects with MBAs—people who are skilled at looking at the big picture and who can really help companies figure out their space requirements. We can't just be seen as decorators. We have to be seen as enablers."

To further explore the office of the future, Carnegie-Mellon University is creating "The Intelligent Workplace." Designed by Bohlin Cywinski Jackson and others as a rooftop extension of an existing campus building, the 6,000-square-foot structure will serve as a research and teaching facility and a working office for faculty, students, and staff at the university's Center for Building Performance and Diagnostics, part of its architecture department. Expected to open next spring, the \$3 million learning laboratory will "showcase the latest innovations in office building components and systems, and will test the performance of these elements when integrated into a realistic office setting," notes architecture professor Volker Hartkopf.

For architects to remain key contributors to office design, they must be able to show clients that capital expenditures on workplace environments can help maximize employees' performance and improve the work process itself. "It's all about imagination," Duffy concludes. "The role of the architect is to show the way."—Edward Guntz



## 1980s

**LEFT:** Offices in SOM's 1971 Weyerhaeuser headquarters are landscaped with freestanding partitions and desks.

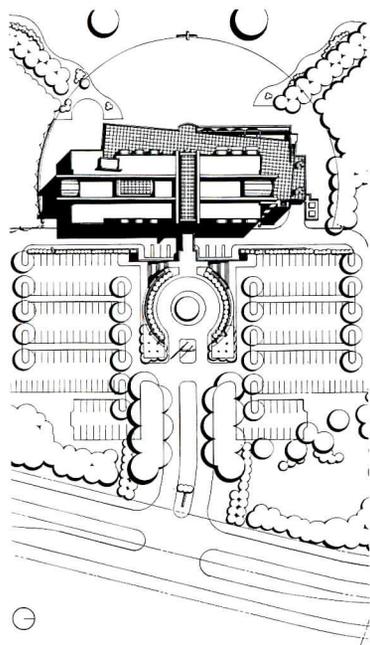
**ABOVE RIGHT:** Ethospace, designed by William Stumpf for Herman Miller, exemplifies mid-1980s modular approach to workstations and wiring.

**DRAWING:** Typical 1980s workstation incorporates a VDT, ergonomic chair, phone, shelving plus enclosed storage, filing, and task lighting.



EZRA STOLLER/ESTO

# MACHINE IN A GARDEN



SITE PLAN

**SITE PLAN:** Machinists and Aerospace Workers headquarters is located on a 10-acre tract within a suburban business park outside Washington, D.C. Building mediates between landscaped parking lot and manicured garden.

**FACING PAGE, TOP:** Steel-framed building is clad in flamed and polished granite and factory-finished steel panels, overlaid with tubular steel sunscreens.

**FACING PAGE, BOTTOM:** Barrel-vaulted volume signals main entrance.

When leaders of the nation's largest union of machinists decided to sell their 1956 headquarters in downtown Washington, D.C., and build a new one in the suburbs, they wanted a building that not only would be constructed entirely by union members but also would showcase their skills. Joseph Boggs, design principal of the local firm AI/Boggs, responded with a highly sophisticated structure that is descended from the machine-in-the-garden esthetic pioneered by Le Corbusier, with a decidedly 21st-century twist. A veritable collage of machine images—from a jetliner's fuselage to rocket-launching gantries at Cape Canaveral—the metal and granite Robo-building strongly evokes space-age machinery; from various angles, the \$19.5 million machinists union headquarters looks as if it is about to fire up and take off.

Members of the International Association of Machinists and Aerospace Workers (IAM) "take disorder every day and make order out of it," Boggs explains. "They take raw shards of metal, scraps of steel and turn them into beautiful, refined pieces of machinery. This building is a metaphor of what they do." By extension, the IAM headquarters is designed so that union members actually inhabit one of their machines. But unlike the dark, Chaplinesque world of *Modern Times*, the silent film in which the future was presented as a nightmare of overindustrialization and workers literally got caught in the gears of bureaucracy, the machinists' building offers a far brighter interpretation.

Located on a 10-acre tract in the Presidential Corporate Center, a new business park off the Capital Beltway, the 125,000-square-foot IAM headquarters comprises four levels containing offices for the union's different departments—education, legal, executive, and administrative—as well as ancillary spaces such as a computer center, auditorium, cafeteria, and fully equipped television studio.

Aided by design associate Michael Patton, Boggs clad the building's three upper levels

in a mixture of granite and factory-finished steel honeycomb panels that recall the jets that fly in and out of nearby Andrews Air Force Base—jets that are made by IAM members. But he set the four-level building on an all-granite base—a concession to the clients who wanted the 368-foot-long headquarters firmly anchored in the landscape.

Perforated-metal sunscreens and vertical trusses shaped like '60s-era launching pad gantries help give the building a more three-dimensional quality while further evoking objects associated with the aerospace industry. So do the end facades, whose barrel-vaulted roofs and louvered grilles recall the exhaust vents of a giant turbine.

The machine motif is continued on the inside of the structure, where four L-shaped granite walls frame the central lobby. The interior atrium evokes the inside of a precision-engineered machine housing. On one side of this atrium, a three-story staircase appears to bore down through the building like an oversized worm gear. The soaring interior spaces are articulated by precisely detailed materials, signs that this organization appreciates fine workmanship. "It's almost as if you've microed yourself so you're small enough to fit inside the crankcase of an engine, and you're walking around all the parts," Boggs notes.

Every inch of the building was constructed by union members, including the lacquered wood and granite reception desk, and the brushed stainless steel and chrome elevator cabs. One of the headquarters' most engaging spaces is the executive council room, a museumlike chamber with a curved metal ceiling that resembles the underside of a 747's wing. Lining the mahogany-paneled walls are glass cases filled with scale models of products the union members make—tractors, rockets, Trident submarines.

As might be expected, this is a building where copiers, fax machines, and computer terminals look right at home, rather than sticking out like alien creatures. Given the proliferation of office machines today and the



difficulty of incorporating them into the workplace, that integration is no small feat.

If it were merely a melange of machine images, the IAM headquarters would be an architectural one-liner. But AI/Boggs enriched the design with moves that call attention to another important aspect of the building—the people inside. For example, the architect superimposed the orthogonal grid that organizes the building over a second, “space-creating” grid that is shifted 5 degrees off the first. The colliding geometries add an element of surprise, opening up views in some directions and forcing the perspective in others. Besides producing visual effects that would not have been possible had all the walls been built at 90 degree angles, the shifting grids indicate that this machinelike building is not so predictable after all, and that a human hand was clearly behind the design.

The AI/Boggs team also departed from the expected by carving out multistory interior spaces with balconies that overlook the central atrium. From the center, “you’re always looking into architectural volumes and then out to greenery,” Boggs explains. “In most offices, people long to be outside. Here, there’s an interplay between outside and inside, light and shadow, that makes the three-dimensional spaces exciting to be in.”

These unexpected elements provide a reminder that for all of its precision, the building ultimately serves and celebrates the people who create the machines, and not the machines themselves. From any vantage

point, one can see a continual parade of passersby—union members on the stairs, in the atrium, one flight below in another part of the building. They are the fuel that runs the motor, the oil that lubricates and keeps the gears turning, the soul of the new machine. With them, the metaphor is complete.

For all its futuristic allusions, however, this building breaks no new ground in the spatial organization of offices or the incorporation of technology into the workplace. Nor does it attempt to do so. There are the predictable private offices, open-plan offices, work areas with systems furniture, impromptu gathering spots—settings that have functioned well in the past, successfully adapted for this organization. “Morale is up. Tension is down. Absenteeism is down tremendously. People are staying at work 15 minutes later in the evening,” notes IAM General Vice President R. Thomas Buffenbarger. “The whole work environment took a giant leap forward for all employees.”

Appropriately, for a group that produces beautiful objects with machinelike precision, the union headquarters symbolizes what its members can achieve in their working lives, rather than a place that revolutionizes the way its occupants work. Technology, Boggs believes, is a means to an end, and not an end in itself. Technological elements, when selected, must be applied appropriately for the users. Ultimately, he contends, “the responsibility is still on the architect to create a magical space.”

—Edward Gums



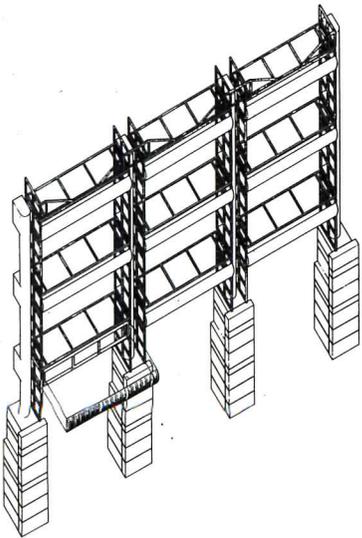
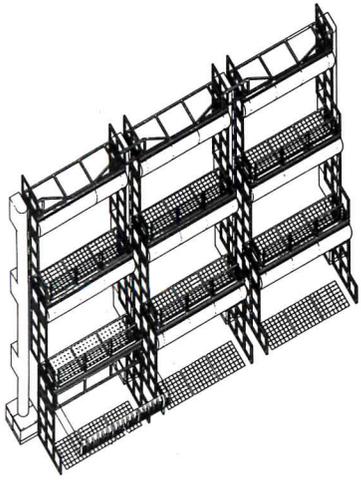
**DRAWING:** Daylight entering executive offices on west side is filtered by perforated-metal sunscreens. Below-grade cafeteria opens to outdoor terrace.

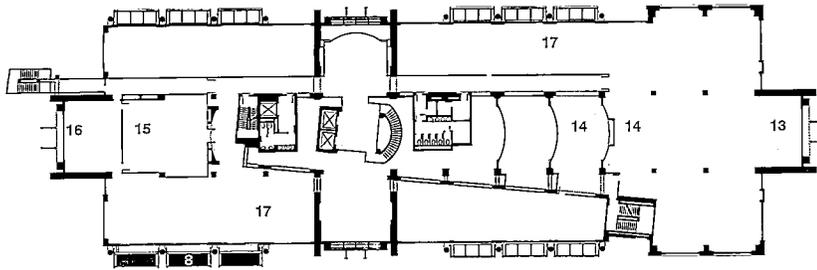
**RIGHT:** Tubular metal balconies step down the northwest side of the building, growing progressively deeper as they reach the granite-clad platform that shelters below-grade cafeteria.

**FACING PAGE:** North facade is dominated by barrel-vaulted roof with louvered grilles. Vertical trusses resemble rocket-launching gantries.

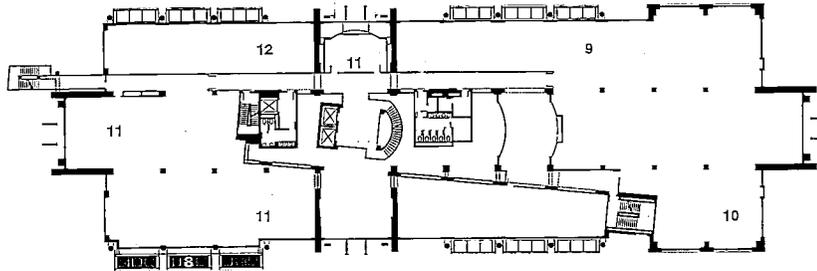




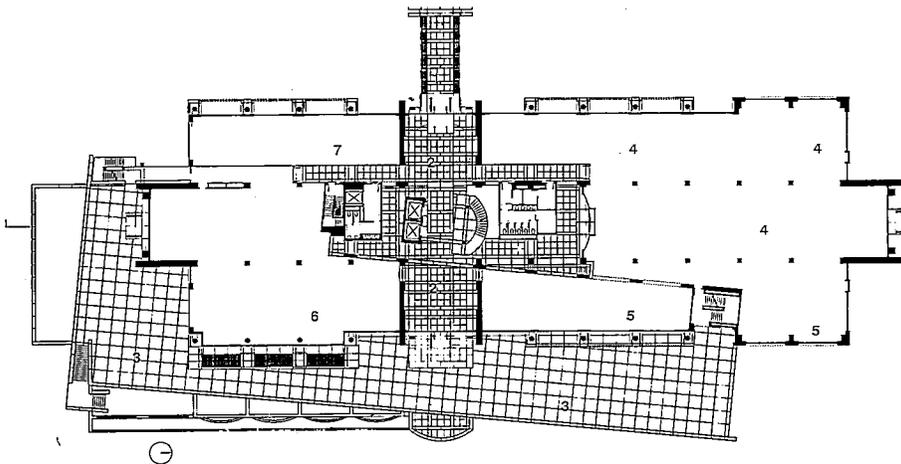




THIRD FLOOR PLAN

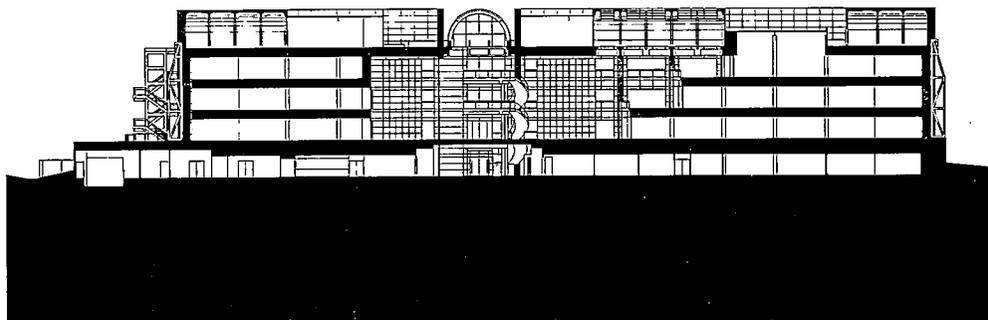


SECOND FLOOR PLAN



FIRST FLOOR PLAN

- |                             |                                     |
|-----------------------------|-------------------------------------|
| 1 ENTRANCE BRIDGE           | 10 LEGAL DEPARTMENT                 |
| 2 LOBBY                     | 11 SECRETARY/TREASURER'S DEPARTMENT |
| 3 PLAZA                     | 12 ACCOUNTING DEPARTMENT            |
| 4 COMPUTER DEPARTMENT       | 13 COMMUNICATIONS DEPARTMENT        |
| 5 REPORTS DEPARTMENT        | 14 TELEVISION STUDIO                |
| 6 TRANSPORTATION DEPARTMENT | 15 COUNCIL ROOM                     |
| 7 ORGANIZING DEPARTMENT     | 16 EXECUTIVE DINING ROOM            |
| 8 TERRACE                   | 17 PRESIDENT'S DEPARTMENT           |
| 9 RESEARCH DEPARTMENT       |                                     |



NORTH-SOUTH SECTION

**FACING PAGE, DRAWINGS:** Sunscreens on west (top) and east elevations (bottom) evince meticulous detailing. Northwest sunscreen doubles as a series of balconies, with precast concrete floors and glass-block inserts.

**FACING PAGE, TOP:** Tubular steel grid-work supports metal screens and railings made of steel and vinyl-coated aircraft cable. Structural column in foreground is clad in curved steel panels.

**FACING PAGE, BOTTOM:** Cantilevered fire stairwell at north end is composed of poured-in-place concrete with steel panel cladding and handrails.

**PLANS:** Shifted grid is superimposed on orthogonal bays, creating unexpected interior views. Executive offices and TV studio occupy top floor; various departments are on the other levels.

**SECTION:** Central atrium with balconies serves to divide office spaces.

**INTERNATIONAL ASSOCIATION OF  
MACHINISTS AND AEROSPACE WORKERS  
UPPER MARLBORO, MARYLAND**

**ARCHITECT:** AI/Boggs, Washington, D.C.—Joseph Boggs (design principal); Michael Patton (design associate/project architect); Frank Kaye (interiors); Henry Berben, Michael Callison, Anthony Dicamillo, Byron Durham, Suzanne Harness, Madeline Kennedy, Charles Moore, Barry Weiner, Al Wisor (design team)

**LANDSCAPE ARCHITECT:** Graham Landscape/Architecture

**ENGINEERS:** Tadjer-Cohen-Edelson Associates (structural); Bansal & Associates (mechanical/electrical/plumbing); Botts & Associates (civil); Stehle Engineering (fire protection)

**CONSULTANTS:** Peter Barna (lighting); Savage-Fogarty (construction management); Warner Construction (construction)

**GENERAL CONTRACTOR:** James G. Davis Construction

**COST:** \$19.5 million

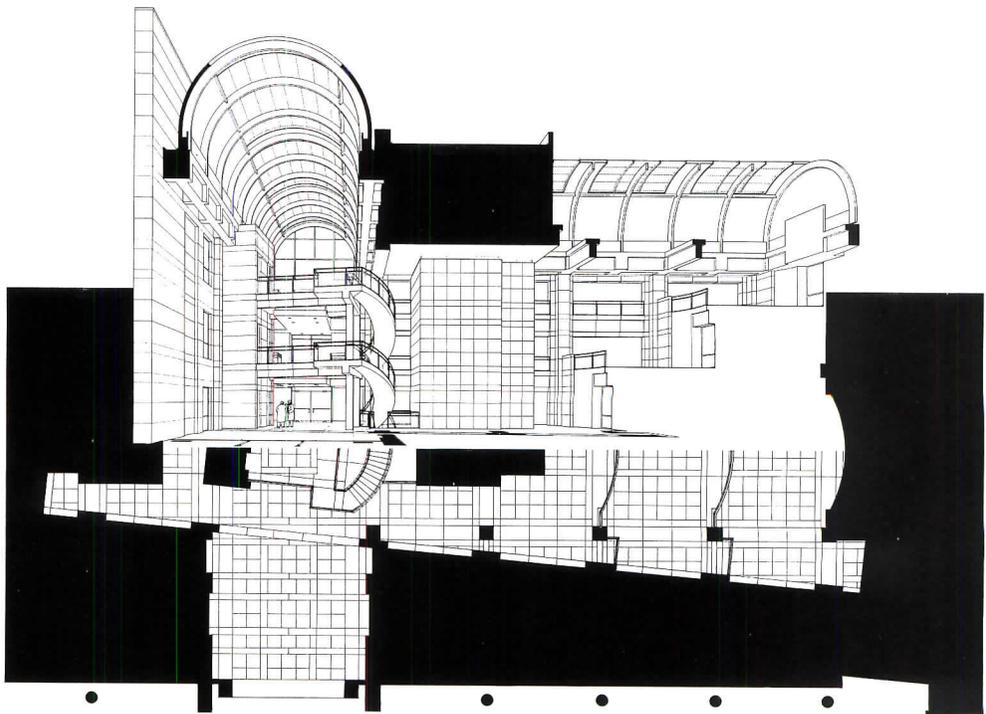
**PHOTOGRAPHER:** Maxwell MacKenzie



**ABOVE RIGHT:** Third-level reception area is skylit and features lacquered wood and granite reception desk, with stainless steel division bars and hex bolts.

**DRAWING:** Staircase and elevators in atrium are shifted off orthogonal geometry. North-south and east-west skylit barrel vaults boost daylight in entry and work areas.

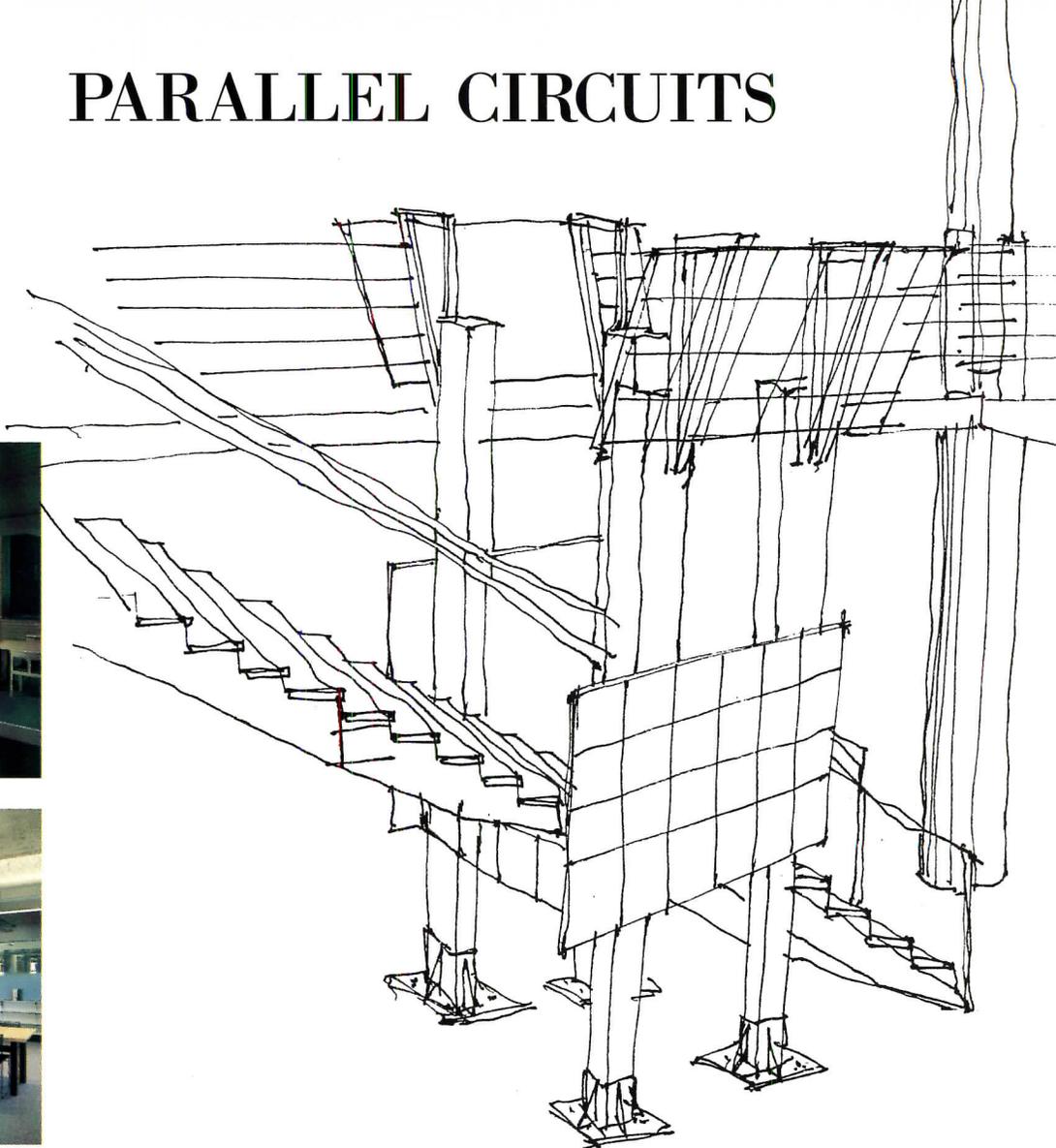
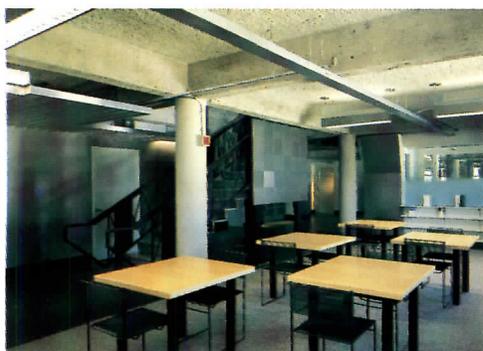
**FACING PAGE:** Three-story staircase spirals down central atrium. Terrazzo floor pattern provides a Cartesian ordering device while expressing the building's shifting geometries.





Advent Software Headquarters  
San Francisco, California  
MacCracken Architects

# PARALLEL CIRCUITS

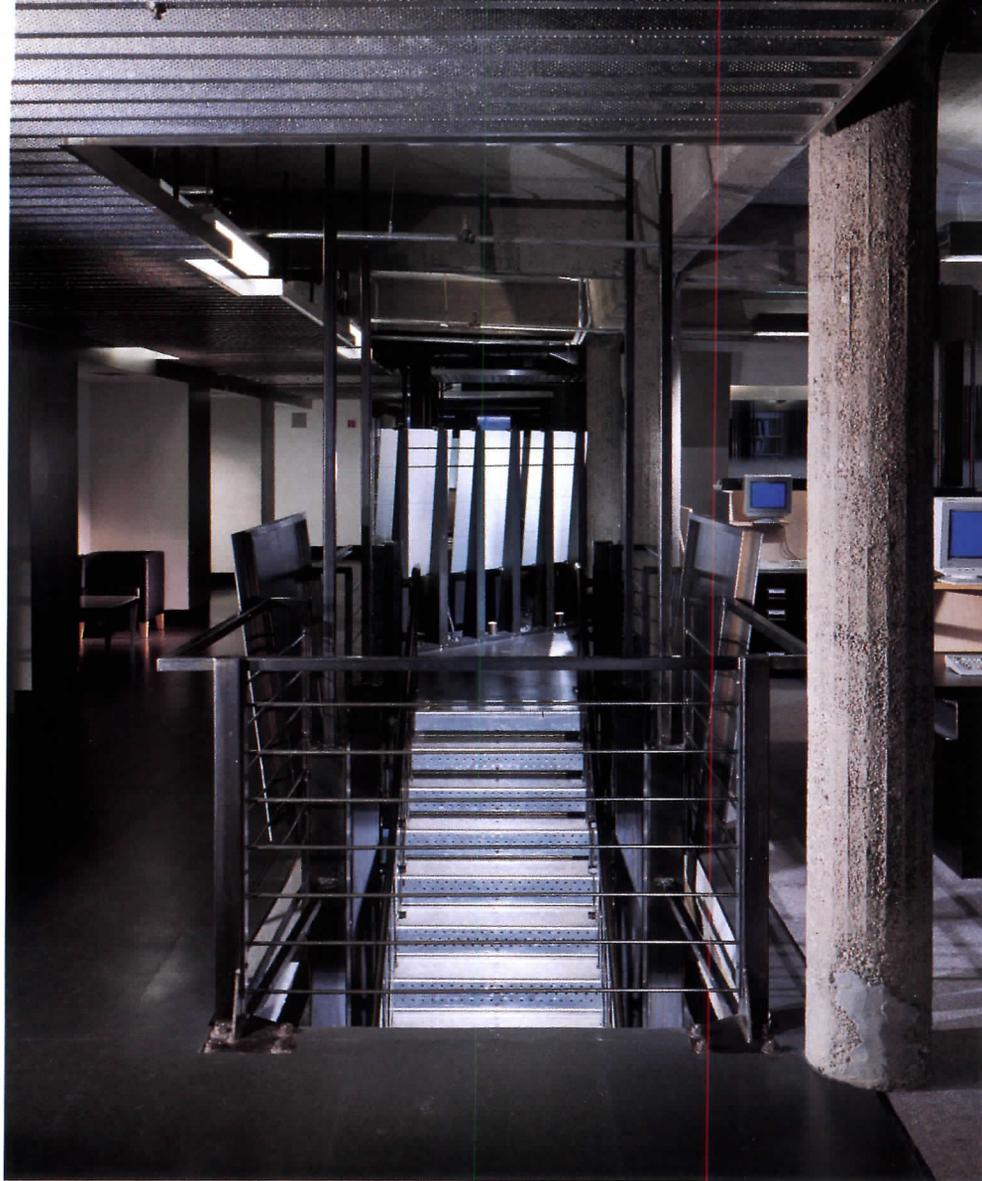


The atmosphere is casual, hip, and upwardly mobile. The location is San Francisco's gentrified South of Market Street district. The client is a software company that manages stock portfolios for money managers and huge corporations. The offices could be mistaken for a set from "thirtysomething," except that there's no music, and the TV show has been cancelled.

The new headquarters of Advent Software, designed by MacCracken Architects, is the result of a long-standing relationship between client and architect. Steve MacCracken and Advent President and CEO Stephanie Di Marco are friends who both founded their respective firms in 1984, initially in shared office space. Advent grew enough to need its own headquarters in 1987 and commissioned MacCracken to renovate another space in the same light industrial building in the South of Market district (ARCHITECTURE, June 1990, pages 68-69). By 1992, the software company needed to expand again, to accommo-

date around 110 employees on two floors in a nearby building, and MacCracken was given his largest commercial interior to date. The architect credits the quality of the 23,000-square-foot offices to his client's "sensitivity and sensibility" in allowing him to interpret functional requirements.

MacCracken values developing good, and continuing, relationships with clients and contractors. He points out that it makes "all the difference in the world to feel like there's a collaborative process." This attitude extends to his practice, where associates Chris Laing and Michael Saltzman worked closely with MacCracken on the tightly scheduled, eight-month commission. In the firm, every project is organized around a central concept, usually a metaphor, derived from diverse sources, including the client and site. MacCracken's single-family houses and small commercial spaces vary stylistically, from fairly abstract to more representational; a central stair, often topped by a skylight, appears frequently;



and materials, while carefully detailed, are left largely in their natural state. As influences, MacCracken cites the work of Steven Holl, the careful detailing of Carlo Scarpa and Louis Kahn, and the experimental use of materials in Rudolph Schindler's work.

For Advent, MacCracken translated the dynamism of his client's company into architectural elements that flare upward. The formal and functional elements of the interiors, mostly constructed of steel and plywood, contrast sharply with the existing sandblasted concrete frame and brick shell. They appear clearly as new insertions in the existing building, a converted 1909 warehouse.

The two-story office space, located on the fifth and sixth floors, is entered on the upper level from an elevator lobby customized with downlighted glass panels. The floors are conventionally organized around a central service core, with most of the perimeter area occupied by custom-designed, open workstations. Corner offices and other interspersed, en-

closed rooms provide aural and visual privacy and accommodate special functions, such as training in the use of Advent's software.

"Served" and "service" spaces are distinguished by a change in materials: Plywood surfaces predominate in the work areas, where the floor is carpeted, while the core is clad with 1-foot-square steel panels and edged by politically correct rubber flooring made of recycled materials. Overhead, the mechanical ducts and electrical wiring project from the steel-clad core, shielded by a perforated-metal horizontal screen, which, MacCracken says, "calms them down a little bit." Ringing the core, the screened services extend into the offices and conference rooms and then branch into smaller channels that feed the workstations through vertical towers. Thus, these overhead systems mirror the hierarchy of the firm's organization, branching from executive offices and group spaces out to individual work areas. Their treatment, states MacCracken, gives recognition

**FACING PAGE, TOP LEFT:** Entrance opens to angled plywood reception desk clamped to new steel column and shielded by sandblasted glass screen.

**FACING PAGE, BOTTOM LEFT:** Lunchroom is located at perimeter windows and is screened by open stair and steel panels.

**FACING PAGE, DRAWING:** MacCracken's sketch shows initial design of staircase, supported on steel columns.

**ABOVE LEFT:** Perforated-aluminum stair connects Advent Software's two office floors between open steel railings and angled steel-clad panels.

**ABOVE:** Stair's handrail and balusters are formed from a steel truss that supports aluminum risers and treads.



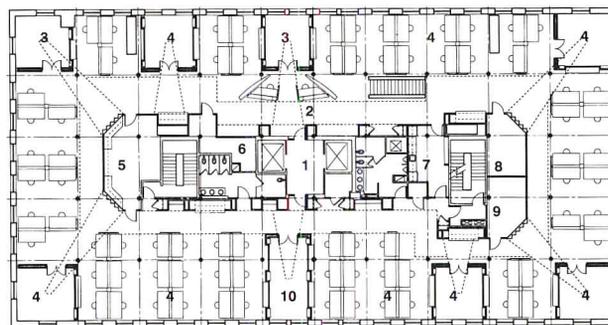
**ABOVE:** Corners of steel-clad core step in even setbacks to open up circulation; each setback is separately down-lighted to create a visual focus.

**ABOVE RIGHT:** Horizontal perforated-metal screen both organizes and shields overhead mechanical and electrical services. Angled plywood panels provide privacy at workstations.

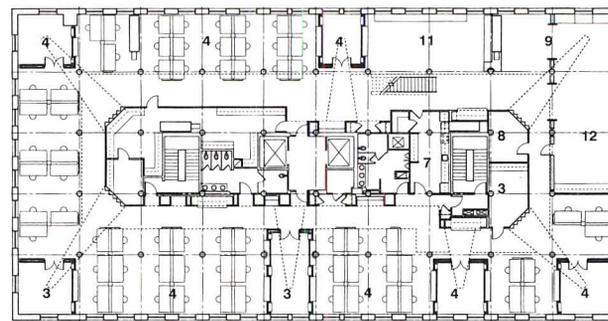
**PLANS:** Office floors comprise a central core ringed by open workstations alternated with enclosed rooms at the perimeter. Advent headquarters is entered from upper floor.

**FACING PAGE, DRAWING:** Office and conference "pods" are constructed of tempered glass over plywood and metal shelves between steel-clad piers. Services are shielded by slotted screen.

**FACING PAGE, RIGHT:** Glazing inside enclosed spaces is sandblasted at base for privacy and transparent at top to provide visual continuity.

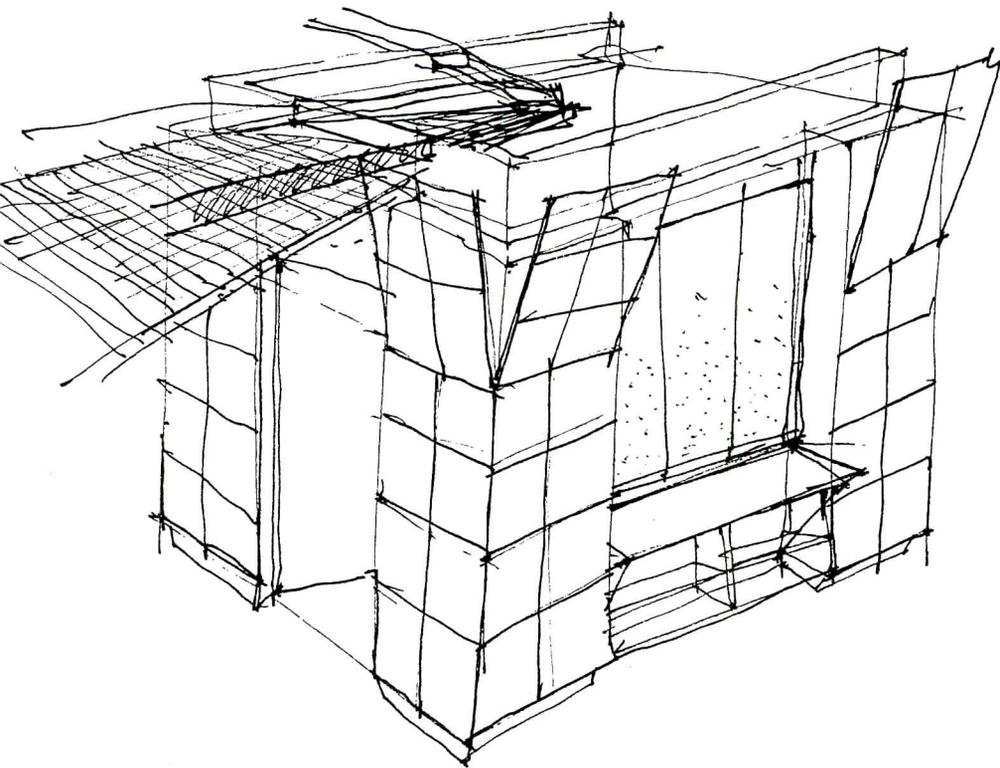


UPPER LEVEL PLAN



LOWER LEVEL PLAN

- 1 ELEVATOR LOBBY
- 2 RECEPTION
- 3 CONFERENCE ROOM
- 4 OFFICE
- 5 OPERATIONS
- 6 SUPPLY ROOM
- 7 KITCHEN
- 8 EQUIPMENT ROOM
- 9 LOUNGE
- 10 LIBRARY
- 11 CAFE
- 12 TRAINING ROOM



to the fact that "Advent is dependent on electronic equipment." Not only does Advent's success stem from the new software produced in the company's research and development department, but also from responsiveness to client questions and concerns; sales and marketing communications skills; and, as the headquarters has rapidly expanded, increasingly sophisticated interoffice communications, all highly dependent on computers and their attendant electronics.

Advent's new headquarters improves on its former offices in ways other than the rationalization of electronic services. In the company's previous space, private offices were enclosed by translucent sliding panels, which, when closed for aural privacy, boxed them in. The enclosed offices and conference rooms in the new space are glazed, but the lower areas of the glass panels are sandblasted, affording privacy while a group is seated. The upper portions remain transparent for visual openness when people are standing. The open

workstations feature the same spatial properties as the offices. Angled panels of naturally finished maple veneer plywood screen the desks at seated height and allow easy communication while standing. The teamwork employed in all of the firm's divisions is facilitated by the interaction made possible by this open-plan arrangement.

MacCracken carefully designed the workstations to accommodate the range of Advent's divisions, from research and development employees, who have a lot of equipment and hence longer desks, to the support division, which requires only a telephone and a computer. Because everyone at Advent needs a computer, the workstations are supported by steel "towers" that accept and organize electrical services, support custom-designed lighting fixtures, and partially support built-in surfaces. Angled plywood panels at the back of each desk incorporate a slot for computer wiring and allow terminals to nest within them. Shelves for files, books,

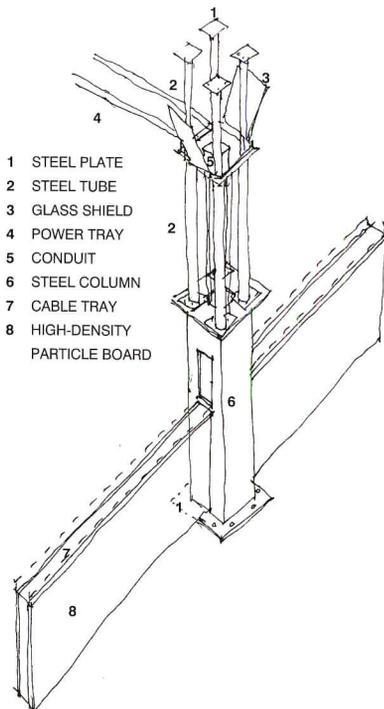
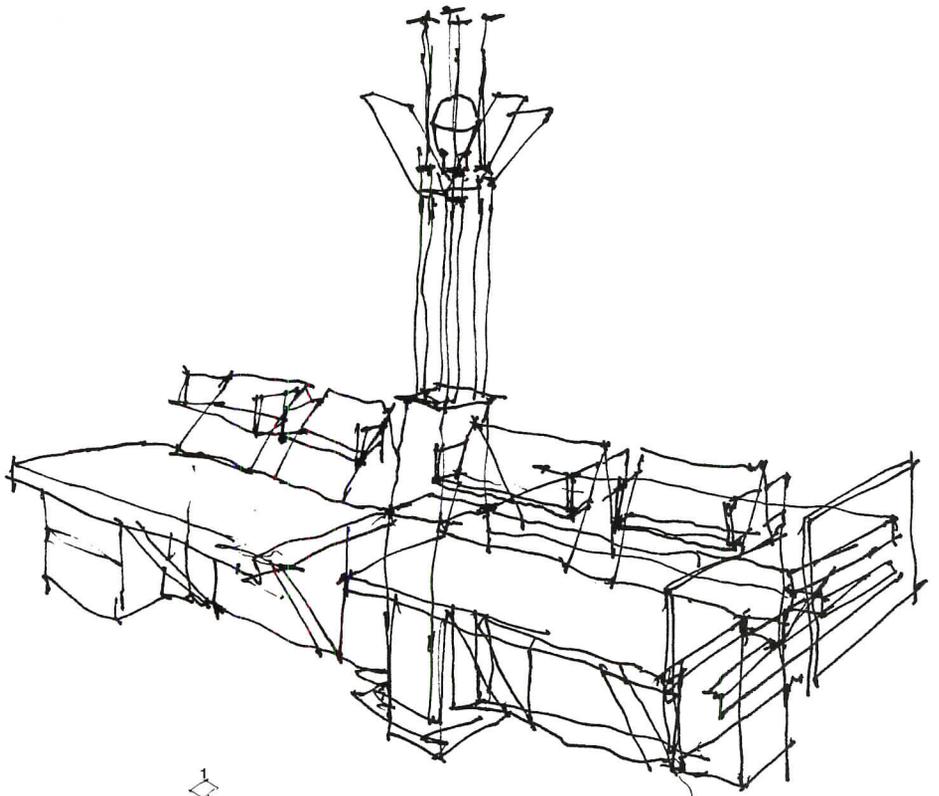


**ABOVE:** Steel towers support light fixtures, accept overhead services, and partially support workstation. Computer monitors are housed within angled plywood panels.

**TOP DRAWING:** Sketch reveals workstation assemblies with steel tower and desks mounted with angled panels.

**RIGHT DRAWING:** Detail reveals how steel utility tower is bolted to floor and ceiling and supports spine of workstation.

**FACING PAGE:** Conference rooms and workstations are designed so that each floor feels like one open space. Steel-clad corners echo sloping plywood panels of workstations.



- 1 STEEL PLATE
- 2 STEEL TUBE
- 3 GLASS SHIELD
- 4 POWER TRAY
- 5 CONDUIT
- 6 STEEL COLUMN
- 7 CABLE TRAY
- 8 HIGH-DENSITY PARTICLE BOARD



and photographs further frame the ubiquitous monitors. The custom lighting held by the towers provides ambient lighting, with individual quartz task lighting at each desk. Tinted windows were inherited with the building shell, but they help to cut down on glare, as do adjustable nylon screens that were added by the architect.

Formally, the workstations act as “alien” objects whose steel structure is clamped to the existing shell. The reception area and the open stair connecting the fifth and sixth floors are similarly treated, offering a degree of spatial enclosure while opening to adjacent spaces. At the entrance, sandblasted glass panels mounted on steel supports are angled to screen the work areas. Adjacent to this reception area, the stair is only attached to nearby columns for lateral loads and thus appears as another independent insertion. Its handrail is a steel truss that supports the stair itself, with treads and risers of folded aluminum plate hung from the truss. The perforations in the aluminum allow the stair to act

as a screen: While standing behind it, only the outline of someone walking up or down can be seen. While on the stair, steel-clad panels at either side again provide spatial definition without complete enclosure.

Feedback from Advent employees has been positive, and CEO Stephanie Di Marco is clearly pleased. As she explains, “A lot of business people don’t think about the environment, but it makes a big difference in the enterprise,” contributing to both employee satisfaction and client relations. At Advent’s new headquarters, Di Marco adds, “no one comes to visit who doesn’t remark on the space. It makes a big impact.” The success of the company’s headquarters can be attributed to a productive collaboration and a disciplined approach to functional and esthetic considerations. The Advent/MacCracken business relationship has blossomed into a beautiful friendship, one that should boost the growth of both firms. —*Judith Sheine*

**ADVENT SOFTWARE HEADQUARTERS  
SAN FRANCISCO, CALIFORNIA**

**ARCHITECT:** MacCracken Architects, San Francisco, California—Stephen MacCracken (principal); Christine Laing (project architect); Michael Saltzman, Marc Held, Kathleen Dooley (design team)

**ENGINEERS:** Stephen Tipping (structural); Western Allied (mechanical); Sliverman & Light (electrical)

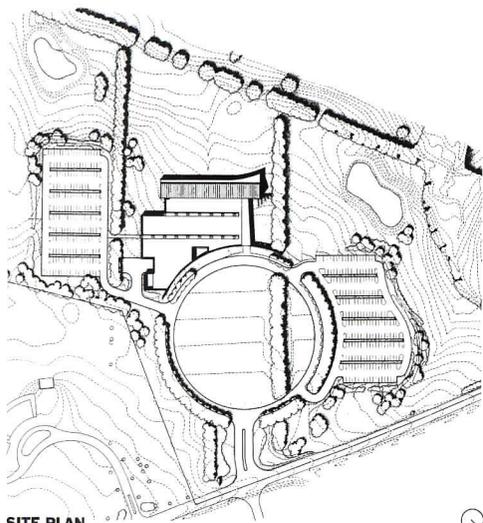
**CONSULTANTS:** South Park Fabricators (stair/railing); DM Custom (furniture); North American Stijl Life (CAD)

**GENERAL CONTRACTOR:** Plant Construction Company

**COST:** Withheld at owner’s request

**PHOTOGRAPHER:** Richard Barnes

# REAR WINDOW



SITE PLAN

From the road, the monolithic facade of Arrow International conveys neither the pomposity nor the banality that usually characterizes a suburban corporate headquarters. No fountains, no flags, no strip windows, and, incredibly, no vast parking lots surround it. For a company that makes and sells medical supplies, the building looks appropriately stark and stripped, though more abstract than one would expect from Boston-based Kallmann McKinnell & Wood Architects. Unlike the sprawling corporate villa the firm designed for Becton Dickinson and Company in Franklin Lakes, New Jersey, Arrow's headquarters in Reading, Pennsylvania, resonates the clarity of vision that generated the firm's first building, Boston City Hall, and the best work of Louis Kahn.

At Arrow, architecture defers to landscape, which comprises 125 acres of fields divided by linear hedgerows, and a backdrop of mountains to the west. "We sought to engage, rather than dominate, the site," avers

Principal Michael McKinnell. The entry facade, a 26-foot-high, red-brick arc, reaches north beyond the mass of the building to intersect an existing hedgerow; a line of pear trees continues the curve of the wall, along the edge of the driveway, to enclose a circular forecourt. This interaction of building and nature culminates in a fluid procession from the road to the western hills. Visitors enter the forecourt, pass through the loggia-like space of the entry hall, and arrive on a middle-level landing, facing a reception desk; beyond, a rear window transforms the view of the bucolic frontier into a living painting.

The building contains 168,000 square feet on three floors, organized in an unconventional sequence. Arrow's manufacturing and research laboratories are layered behind the front facade, a band of development offices flanks the rear, and an atrium is compressed between. Visitors and office employees enter on the middle level from the front, before the site drops off toward the mountains; manu-





**FACING PAGE, SITE PLAN:** Arrow's new headquarters stands between two existing hedgerows, one of which intersects the circular forecourt. Parking lots on each side of building are sunken from view.

**FACING PAGE, BOTTOM:** Entrance facade is articulated by glazed, blind, and open windows. Center of piers along the curve correspond to an orthogonal 13-foot, 4-inch building module.

**ABOVE:** Circular field of wildflowers blooms in sequence. Atrium clerestories jut above curved east facade.

**ABOVE LEFT:** Offices extend along west-facing rear facade. Windows increase in size from the ground to the roof.

**LEFT:** Overhanging cornice protects upper level offices from midday sun.

facturing and research employees, who occupy the building at all hours, park to the south and enter on the same level from the side, into long, skylit corridors.

To accommodate the company's ever-changing needs, the plan of the industrial areas can be modified according to a standard module, which allows the client to move walls, interchange supply ducts and return ducts, and reconnect electrical systems without tearing out huge areas of partitions and acoustical-tile ceiling and redesigning the whole layout. By necessity, these rooms have no openings to the exterior, though Kallmann McKinnell & Wood mitigate the psychological effect with interior windows that look into sun-drenched hallways and, from the engineering labs, into the office atrium.

The atrium within Arrow International's headquarters functions as a vital circulation and work area, a 240-foot-long shed bounded by thick walls that enclose the building's heat pump and mechanical systems. Its two upper

floors are supported by steel columns that hang from the roof. Light pours in through 26-foot-high, east-facing clerestories, reflects the subtle shade of sky blue painted on the ceiling, and filters into the open-plan offices below. This is a communal space, not merely a void to look into, as at Becton Dickinson, but an airy workroom, like the tall cavern of Frank Lloyd Wright's Larkin Building or the giant concrete forest of Wright's Johnson Wax Building. In each case, the architects forge a corporate identity from the inside out, based upon the distribution of employees within a great machine for working.

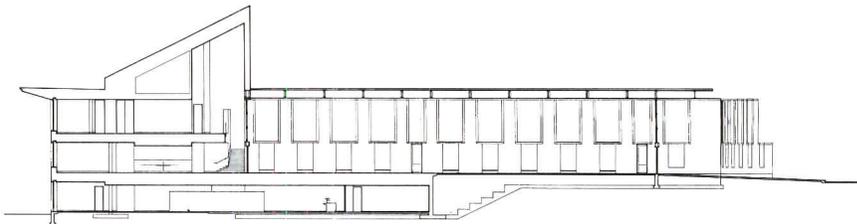
Arrow's atrium is hardly as grand as those of its predecessors, and certainly more "self-consciously frugal," as McKinnell notes. Yet at Arrow, a similar aura of calm prevails. The architects manifest this intention in the details. Glass doors separate the perimeter offices from the atrium to "bring everyone in contact with the view out back," explains McKinnell. He adds that large rear windows,

**RIGHT:** Employees enter manufacturing areas from the south into glass-roofed corridors. In the future, headquarters will be expanded from this side.

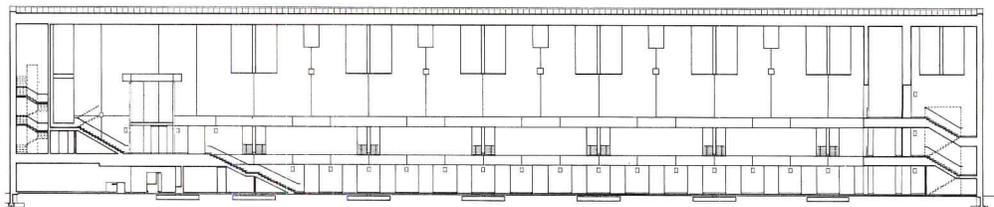
**FACING PAGE:** Copper-paneled soffit extends grid of ceiling tiles and lights inside. Brick wall steps back to frame windows and reduce mass of wall.





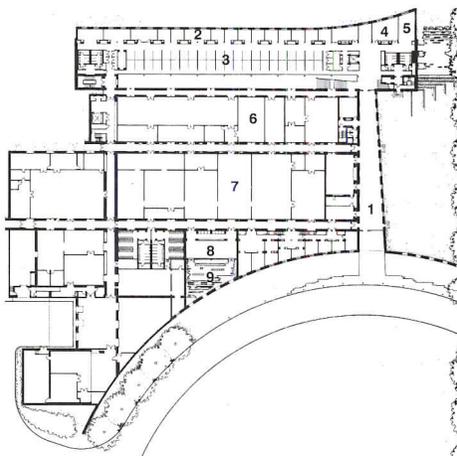


EAST-WEST SECTION

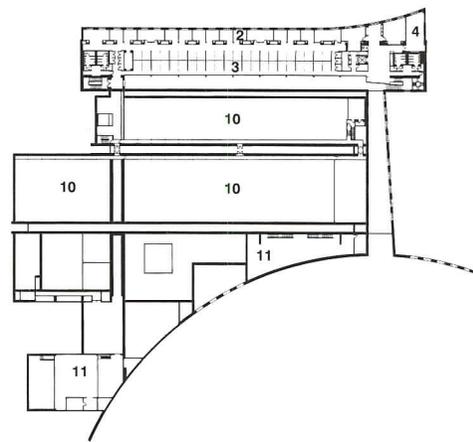


NORTH-SOUTH SECTION

- 1 ENTRY HALL
- 2 OFFICE
- 3 ATRIUM
- 4 BOARDROOM
- 5 LIBRARY
- 6 LABORATORY
- 7 MANUFACTURING
- 8 CAFETERIA
- 9 GARDEN COURT
- 10 MECHANICAL
- 11 MEZZANINE



MAIN FLOOR PLAN



UPPER FLOOR PLAN

**SECTIONS:** Slate-floored entrance hall leads from the eastern forecourt (top right) to the atrium. North-south section shows the open stairs that flank the entry (left). Windows in midlevel engineering labs overlook atrium.

**PLANS:** Kallmann McKinnell & Wood organized the building in layers, with manufacturing in the front, atrium in the center, and offices at the rear.

**RIGHT:** Walls in entry hall converge in a forced perspective toward reception area. A steel girder braces horizontal beams that support the roof and marks central axis of forecourt.

**FACING PAGE:** Steel columns hang from the roof to support open-plan office floors. Visitors enter the reception area from a midlevel stair landing at the far end of the atrium.





**ARROW INTERNATIONAL HEADQUARTERS  
READING, PENNSYLVANIA**

**ARCHITECT:** Kallmann McKinnell & Wood Architects, Boston—Gerhard Kallmann, Michael McKinnell, Henry Wood (principals); Bruce Wood (project architect/project manager); Ed Alshut, Pete Bacot, Alicia Crothers, Stephen Dadagian, Kenneth Hartfiel, Leta Wong Sherman, Ron Steffek, Judith Strayer (design team)

**LANDSCAPE ARCHITECT:** KMW/Morgan Wheelock

**ENGINEERS:** Weidlinger Associates (structural); Consentini Associates (mechanical/electrical/plumbing)

**CONSULTANTS:** Stephanie Mallis (interior design); Jerry Kugler Associates (lighting); Lewis S. Goodfriend Associates (acoustics); Todisco Associates (specifications); Rolf Jensen and Associates (building codes)

**GENERAL CONTRACTOR:** Hayes Construction Company

**COST:** Withheld at owner's request

**PHOTOGRAPHER:** Steve Rosenthal

**RIGHT:** Offices off the atrium conform to a single or double 13-foot, 4-inch module. Windows are framed flush to wall. Lines in carpet and ceiling direct the eye toward the view.

**FACING PAGE:** Thirty-six sales and marketing employees work on the atrium's upper level. Glass doors (right) open into private offices at perimeter. The architects chose pendant fixtures over linear fluorescents to avoid the suggestion of a secondary ceiling plane.

single sheets of glass framed flush to the wall, "put less architecture between the viewer and the landscape." These openings conspire with the unified lines of the structure, lighting systems, carpeting, and even the cladding on the rear overhang to direct the eye westward over the magnificent sweep of the fields.

On the exterior, the architects less compulsively resolve the massing, particularly in the front. Here, the east wall of the atrium clerestory juts above the roof of the laboratories and compromises the unity of the main facade. Seen from the south, where most employees enter, the volumes appear pure but severe, a clear diagram of the building's section. The west-facing rear facade is more elegant and forceful. Atop the length of the wall, an overhanging cornice casts a deep shadow at midday; its lead-coated copper sheathing picks up the grid of the ceiling inside and reflects the brick's red hue. A slight curve at the end of the wall activates the mass with noble restraint, and though the ac-

tual corner remains solid and stable, the effect is one of transparency when the last windows of the adjoining walls line up to frame views of the north lawn.

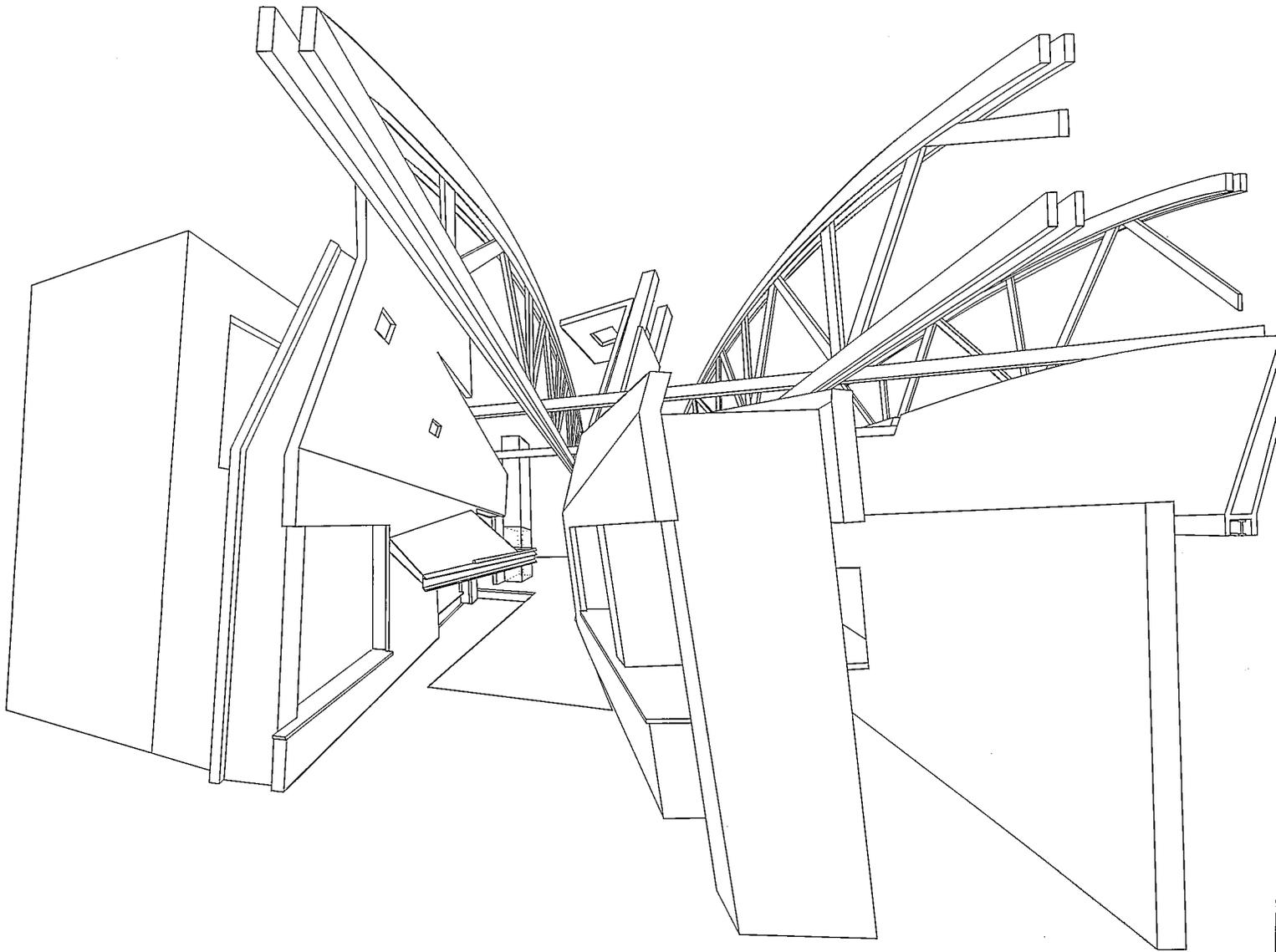
To promote the good health of Arrow's employees, the company installed a jogging trail, which begins at the back door, winds down through the grass to a creek, and continues in either direction for a 14-mile rural stretch. According to project architect Bruce Wood, those who run on the paths think of the rear facade as the front of the building. The architects, nonetheless, clearly distinguish between back and front. From the trail, the building stands out as a plastic form; it commands a broad lawn which looks best when mowed in the same direction as the stripes of the green-hued carpet it inspired inside. Approaching from the road, however, the building respectfully recedes into the landscape, where in time, the hedgerows of the old fields and the pear trees around the forecourt will prevail. —*M. Lindsay Bierman*





Ove Arup & Partners California  
Los Angeles, California  
Morphosis, Architect

# ART OF ENGINEERING





**FACING PAGE:** Morphosis studied the relationship of new additions to the existing structure in a series of computer-generated perspectives, such as the view from the main entrance into the reception area.

**ABOVE:** Perforated-metal panels absorb sound, reflect light, and define the space of the entry hall.

**RIGHT:** Sculptural wall in Ove Arup & Partners' reception area captures daylight through an opening that corresponds to new skylight in roof.



The new, rawboned Los Angeles office of Ove Arup & Partners dispels the stereotype of engineers as pencil-pushing, number-crunching structural determinists who frown upon the theoretical bent of late-20th-century architects. The studio is one of 50 offices of the international firm that devised all the technical bravura of Piano & Rogers' Centre Pompidou in Paris; Richard Rogers' Lloyd's of London; and Norman Foster's Hong Kong and Shanghai Banking Corporation. Arup's work is as integral to the art of building as the compositional skill of the architects with whom they collaborate. In Los Angeles, the engineers further their technically creative methods in a 14,000-square-foot loft designed by Santa Monica-based Morphosis, a firm that had previously sought Arup's help on unbuilt projects in Japan.

The Los Angeles engineers embrace the ideals of Danish-born visionary Ove Arup, who launched the firm in London in 1946. His concept of a "total architecture," rooted in the art of engineering, has inspired the firm's work ever since. To combine global intelligence with regional expertise, Arup set up an American practice in San Francisco in 1985; the next year, the partnership opened a Los Angeles office designed by local architects Charles and Elizabeth Lee. It was artfully crafted, but located in a drab speculative building that countered the firm's creativity. According to Arup Principal Alan Locke, the new office is the engineers' American showpiece, an example of "innovative technology



**ABOVE:** Sculptural walls and exposed glass duct dominate view toward entrance from studio. Two conference rooms, one enclosed in plywood and the other in glass, flank threshold to reception area.

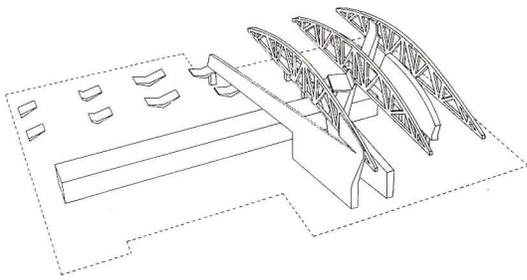
**NEAR RIGHT:** Morphosis enclosed central conference room with glass walls and unfinished plywood panels.

**FAR RIGHT:** Detail of glass duct reveals fan impellers, which rotate to show the movement of air.

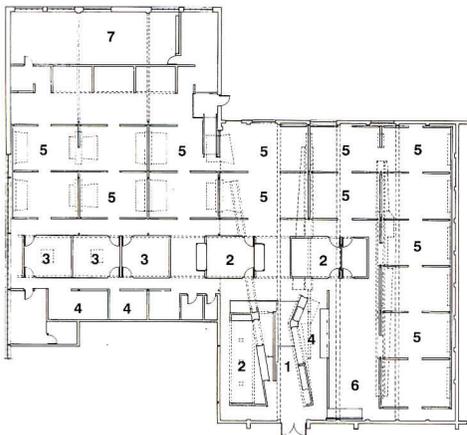
**FACING PAGE:** Interior additions are treated as structurally independent objects within the existing space. Perspective shows massive I-beam support at left and glass duct at center. Zone of offices and conference rooms runs beneath new walls and old trusses.







**SPATIAL DIAGRAM**



**FIRST FLOOR PLAN**

- 1 RECEPTION
- 2 CONFERENCE ROOM
- 3 OFFICE
- 4 SUPPORT STAFF
- 5 WORKSTATIONS
- 6 LIBRARY
- 7 STORAGE

as it applies to architecture: exciting, alive, good to live in—like engineering should be.”

The loft comprises two shifted, independent volumes within a 45-year-old warehouse. Bowstring trusses span load-bearing brick walls in the taller bay; steel columns and wood beams support the shorter; and clerestories extend from the top of the wall that adjoins the two. Since Arup’s employees work in project teams, the office looks like a design studio, with clusters of desks and common meeting areas engulfed in piles of drawings.

Surprisingly, Morphosis principal Thom Mayne chose to resolve the spatial duality of the interior rather than exaggerate it. A continuous, glass-walled band of rooms extends across both bays, enclosing three offices, a kitchen, and two conference rooms. Designed as a structurally independent object within the existing space, this box-within-a-box establishes strong visual continuity between the two volumes and acoustically separates engineers from support staff. Arup’s partners work between its transparent walls, immediately accessible to everyone. Each of the rooms is finished like a small crate, with low plywood ceilings and bolted steel furniture, rough and raw, like the building itself.

To modulate open workspace, reflect natural light, and control acoustics, Morphosis collaborated with Arup on a combination of sculptural forms and bent planes that sharply contrast with the existing structure. In the taller bay, three sculpted, parallel walls dominate the studio. These are not obsessively ar-

ticulated, like most of Mayne’s work, but built as a stage set—twisted, warped, wrinkled like paper, and clad in perforated metal that allows the penetration of sound. Staff and visitors enter between two of the walls, into the forced perspective of the reception hall. Viewed from the opposite end, the partitions project into the space of the studio, seemingly afloat. Massive steel I-beams anchor the forms to the floor.

To impress Arup’s ingenuity upon potential clients, Mayne worked with the engineers to reveal parts of the mechanical system. At the entrance, the floor plenum is exposed to show the ducts, cables, and conduits concealed beneath concrete tiles raised on metal supports. More engaging are transparent-glass vertical ducts that flank the central conference room. Each duct describes the flow of air between clerestory returns and floor diffusers with visible fan impellers that resemble wheels, or even hamster cages.

Morphosis employed such devices on a low budget, though the visual complexity of the project belies an economy of means. Neither the architecture of the new construction nor that of the old warehouse prevails, but rather the simultaneous perception of both. Given this balance, Arup should expand into the vacant office next door, and not onto a mezzanine, as proposed. The insertion of a second floor amidst Mayne’s aggressive forms would destroy the interplay of solid and void that Morphosis and Arup have so convincingly developed.

—*M. Lindsay Bierman*



**OVE ARUP & PARTNERS CALIFORNIA  
LOS ANGELES, CALIFORNIA**

**ARCHITECT:** Morphosis, Santa Monica, California—Thom Mayne (principal-in-charge); Kim Groves, John Enright, Steve Chen, Steve Sinclair (design team)

**ENGINEER:** Ove Arup & Partners California—Peter Budd, Alan Locke (principals-in-charge); Rob Bolin, John Gantry (mechanical); Jacob Chan, Vahik Davodui (electrical); Bruce Gibbons, Atila Zekloglu (structural); Dan Ursea (plumbing)

**CONSULTANTS:** Tate Access Floors (access floors); Richard Russell (acoustics)

**GENERAL CONTRACTOR:** Limbrick A/A Construction

**COST:** \$607,000

**PHOTOGRAPHER:** Tom Bonner



**FACING PAGE, DIAGRAM:** Morphosis interpenetrated sound-absorbing planes and existing bowstring trusses. Rectangular zone of offices and conference rooms unifies the two-bay studio.

**FACING PAGE, PLAN:** Entrance zone (bottom bay) is treated as a sculptural insertion. Open studio is designed with workstations for 60 engineers, who collaborate in project teams.

**ABOVE:** V-shaped baffles hang from ceiling in lower bay to absorb sound and reflect daylight.

**LEFT:** Engineers' desks hang from plywood partitions. Lighting is suspended from existing structure.

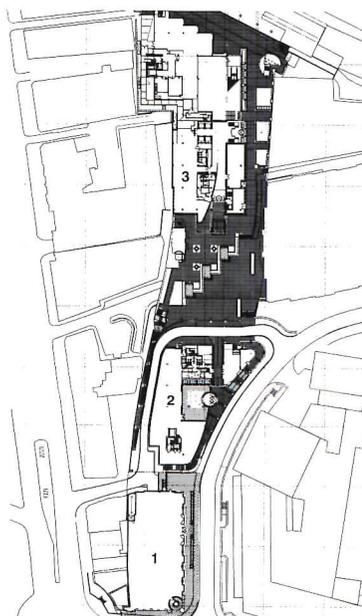
# INDUSTRIAL GOTHIC



**ABOVE:** North facade of 10 Ludgate Place faces a new pedestrian plaza.

**SITE PLAN:** 10 Ludgate Place is one of three buildings designed by SOM for an 18-acre development.

**FACING PAGE:** Viewed along Sea Coal Lane, the facade becomes a solid mass of black granite. 100 Ludgate Hill (foreground) is also designed by SOM.



**SITE PLAN**

- 1 100 LUDGATE HILL
- 2 10 LUDGATE PLACE
- 3 1 LUDGATE

The square-mile district in the center of London known as The City is not an easy place to build a large-scale office development. Its street plan has the constriction and congestion that only 2,000 years of history can produce, and nobody wants to change the congestion because that's what everybody likes about it. Sir Christopher Wren would have sorted out the plan after the fire of 1666, but he wasn't given the chance and had to be content with the rebuilding of St. Paul's Cathedral. Now, of course, St. Paul's is just one more restriction for architects designing new buildings in The City; tradition dictates that the cathedral should continue to dominate the skyline. But tradition also dictates that The City should remain a financial quarter, resulting in a tension between the demand for modern offices and the powerful forces of historic preservation.

Preservation has not always taken priority in The City. Victorian railway engineers, for example, built an ugly steel bridge over the street called Ludgate Hill, cutting across the main approach to St. Paul's and ruining the view of its grand western facade. This bridge, however, enabled the recent redevelopment of a strip of land east of Ludgate Circus, just inside the line of the old Roman wall. For once, developers and preservationists shared a common interest. If the railway could be pushed underground, the bridge could be removed and the air rights over the tracks and adjacent land made available for construction. The resulting Broadgate development (ARCHITECTURE, September 1990, pages 68-69) was hailed as a leap forward in the technological progress of the British building industry, with American architect Skidmore, Owings & Merrill (SOM) playing an important role in realizing its design.

Ludgate Hill divides the site of a new development, about a mile west of Broadgate, into north and south sections. The south section was allocated to two British firms: RHWL, a large commercial practice, and John Outram, a darling of the British architectural

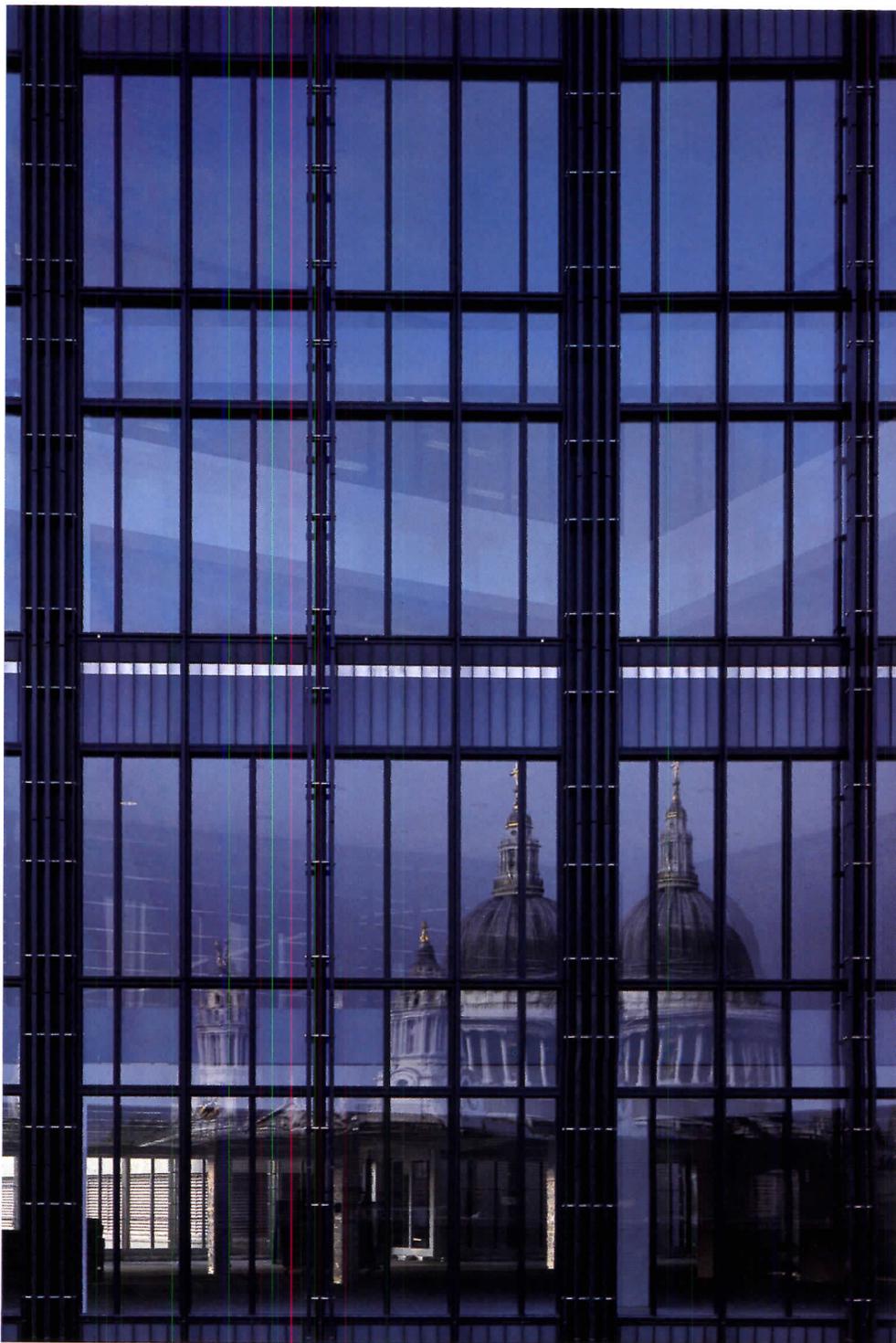




**ABOVE RIGHT:** Glass and aluminum curtain wall is overlaid by black granite fins attached to the columns and braced by raking steel tension rods.

**RIGHT:** The dome of St. Paul's Cathedral is reflected in the curved facade, which follows the line of Sea Coal Lane, an ancient thoroughfare.

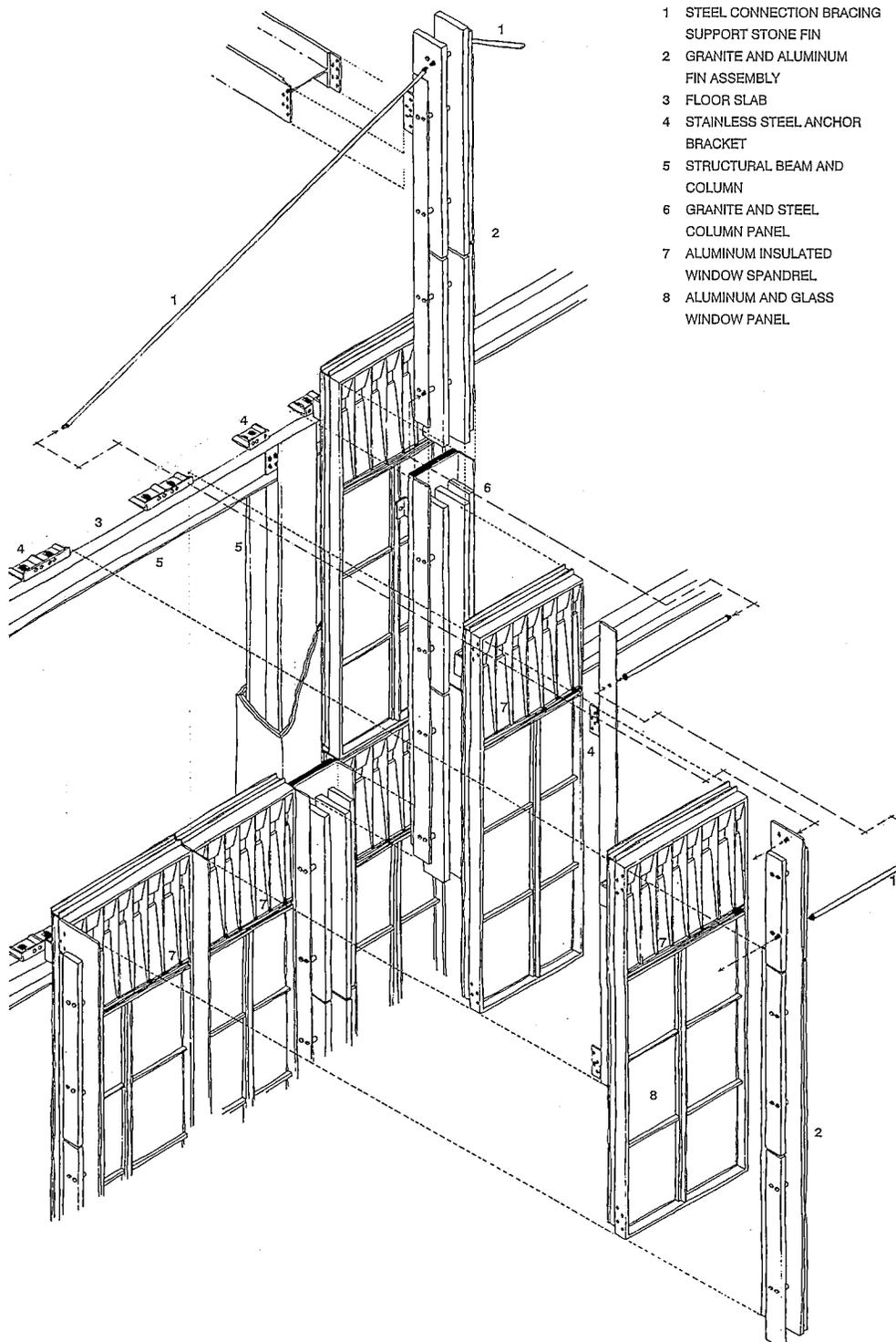
**FACING PAGE, DRAWING:** Granite fins of Italian-manufactured cladding system project above the roof line like flying buttresses, giving visual character.



establishment but inexperienced in large-scale office developments. The more constricted north section was allocated to SOM. The Chicago firm's first scheme, designed by Bruce Graham, envisaged a unified linear development based on an abstract grid. The overall plan was submitted for approval to city planners and the Royal Fine Arts Commission, which advises on the development of sensitive sites; RHWL's and Outram's designs met with approval. SOM, however, was asked to consider dividing its plan into three buildings. At this point, Design Partner Adrian Smith took over the project and adopted a more deliberately contextual approach.

The result is three SOM-designed buildings so different from one another that it is hard to believe they come from the same stable. At the south end of the site, Number 100 Ludgate Hill is an historicist exercise clad in white limestone with Classical details. At the north end, 1 Ludgate Place, a remnant of Graham's plan, is an abstract, rectilinear composition with an exposed steel frame. In between lies 10 Ludgate Place, the most interesting of the three because it combines abstraction and representation, advanced building technology, and traditional materials.

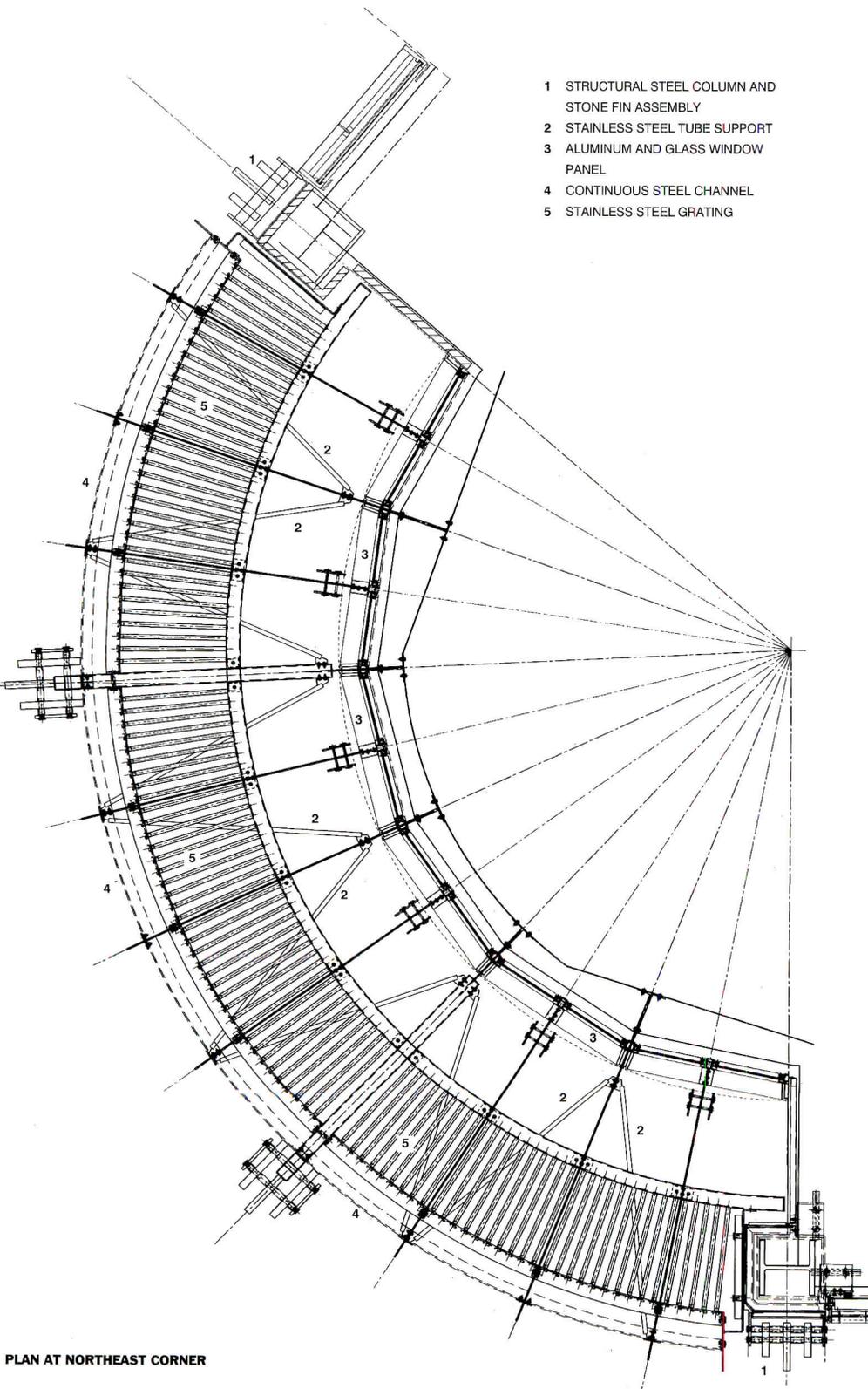
Every aspect of 10 Ludgate Place is derived from its urban context. The roughly triangular form hugs the boundary of the site, with a gently curved facade, following the line of Sea Coal Lane and terminated by rounded turretlike corners, reminiscent of Victorian London architecture. On the north side, where the building faces a new pedestrian plaza, the facade is straight and formal. A passageway cuts through the building to provide a pedestrian short-cut from Ludgate Hill to the new plaza; a flight of steps under the south side of the building connects to New Fleet Lane; and the new access road required by the planners is incorporated within the footprint of the building. The slope of Sea Coal Lane is neatly accommodated by the raised ground floor, supported by deep steel beams over the railway tracks.



- 1 STEEL CONNECTION BRACING SUPPORT STONE FIN
- 2 GRANITE AND ALUMINUM FIN ASSEMBLY
- 3 FLOOR SLAB
- 4 STAINLESS STEEL ANCHOR BRACKET
- 5 STRUCTURAL BEAM AND COLUMN
- 6 GRANITE AND STEEL COLUMN PANEL
- 7 ALUMINUM INSULATED WINDOW SPANDREL
- 8 ALUMINUM AND GLASS WINDOW PANEL

TYPICAL CURTAIN WALL CONSTRUCTION

- 1 STRUCTURAL STEEL COLUMN AND STONE FIN ASSEMBLY
- 2 STAINLESS STEEL TUBE SUPPORT
- 3 ALUMINUM AND GLASS WINDOW PANEL
- 4 CONTINUOUS STEEL CHANNEL
- 5 STAINLESS STEEL GRATING



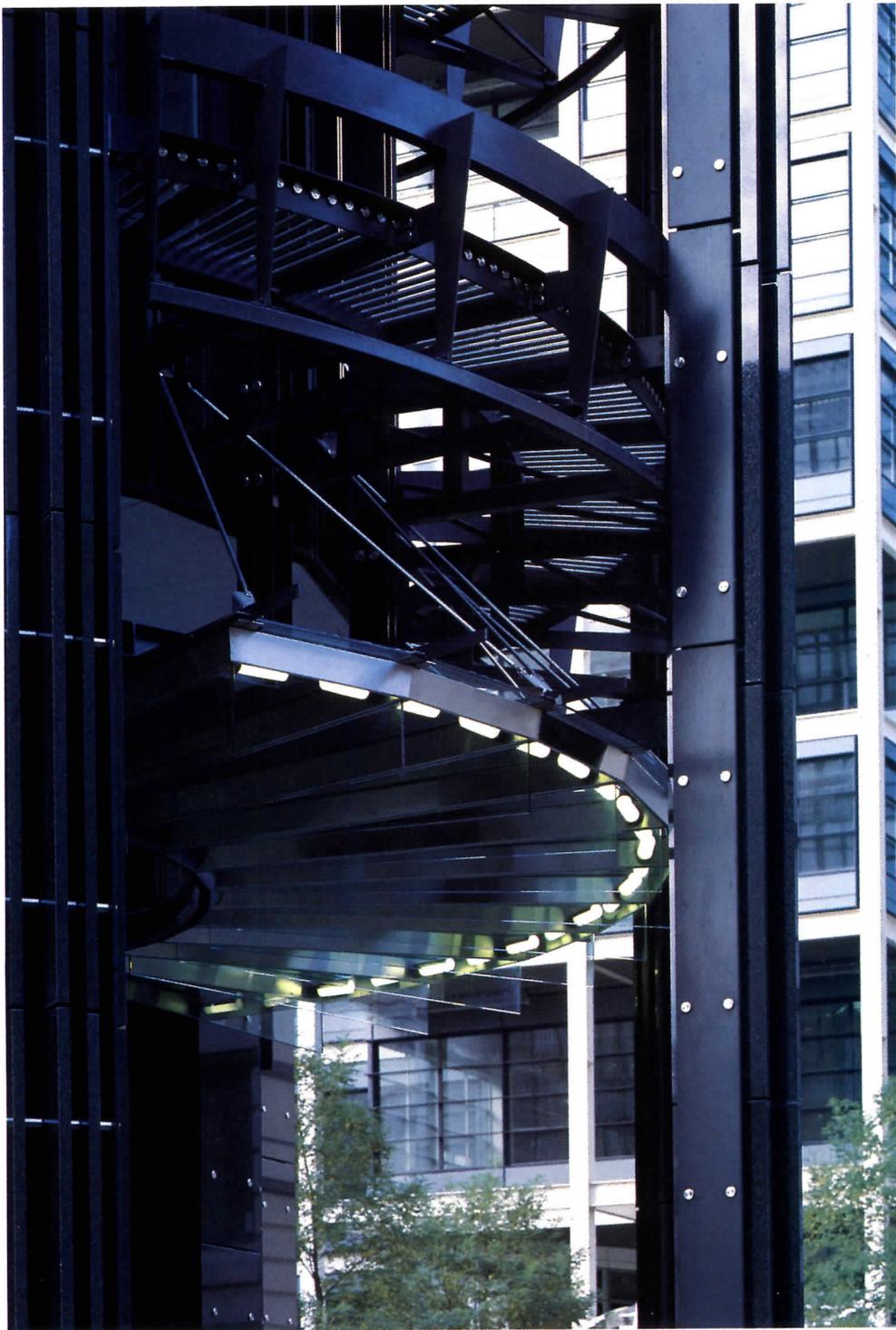
PLAN AT NORTHEAST CORNER

The most interesting aspect of Smith's design is the building's expensive, elaborate cladding. Manufactured in Italy, it combines glass, aluminum, and black granite in a complex, layered elevation with vertical emphasis. The external wall combines a square grid of glazing bars with profiled aluminum spandrel panels, stiffened by vertical fins. But what gives the facade its Gothic character are 50-millimeter-thick black granite fins, suspended in sets of three between the flanges of channel-shaped column covers by visible stainless steel pins. These project above the roof line like flying buttresses, stabilized by raking steel tension rods. They have no practical function other than to give the facade a dynamic visual character. Viewed obliquely along the narrow street, the facade appears as a solid wall of granite; viewed head on, its complicated linear pattern is revealed.

Ironically, while this is an unconventional use of a solid, heavy material like granite, the facade displays a typically English concern for the honest expression of materials. Smith has accepted the planners' requirement for stone, but has refused to pretend that 10 Ludgate Place is a traditional stone structure. "Industrial Gothic" is how he characterizes the building, noting an historical rationale. The somber but mechanistic aspect is a deliberate recollection of the sooty Victorian railway structures that previously occupied the site.

In an atmosphere of critical hostility to American architects working in London, Smith demonstrates that a Chicago-based firm can produce a true London building of real quality. It is a measure of his success that an uninformed critic might well have attributed this building to a London practice like Arup Associates or even Michael Hopkins. Indeed, in comparison, RHWL's 100 New Bridge Street is an ungainly, lumpish affair, designed with nothing like SOM's contextual sensitivity and care for detail. —Colin Davies

Colin Davies is author of *High Tech Architecture* (Rizzoli, New York, 1988).



**FACING PAGE, DRAWING:** Turret on northeast corner incorporates external walkways at each floor for maintenance.

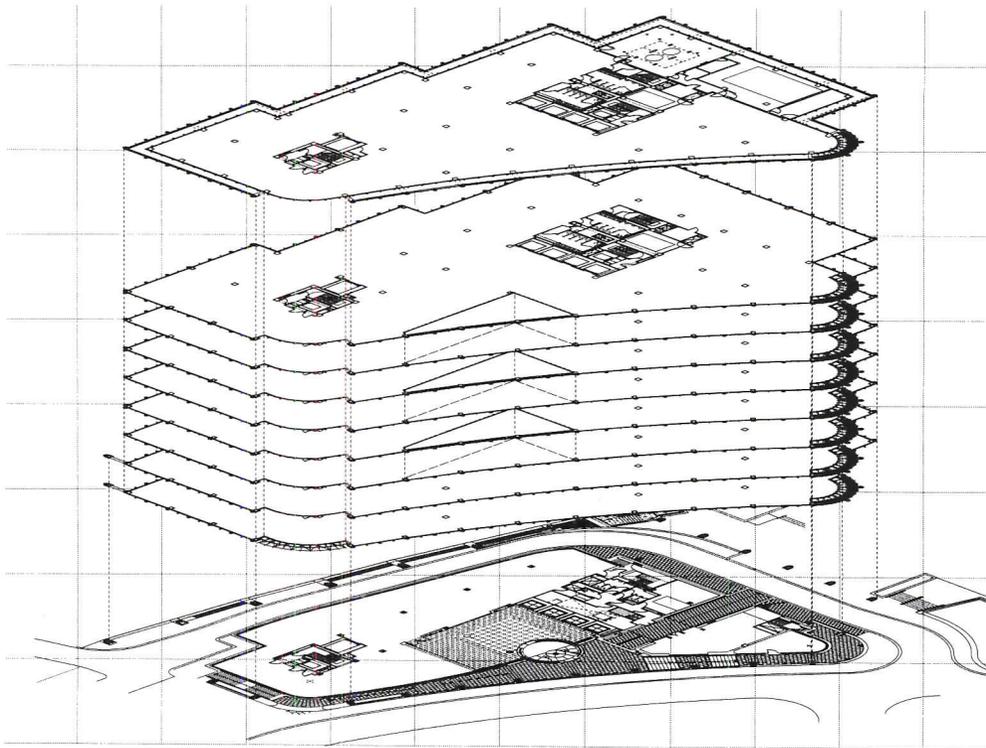
**ABOVE LEFT:** Northeast turret neatly turns the corner at the junction of Sea Coal Lane and new pedestrian plaza.

**LEFT:** Detail of northeast turret, with SOM's 1 Ludgate Place in background. Stainless steel pins support 50-millimeter-thick black granite fins.

**RIGHT, DRAWING:** On the east side of the building, alternate floors are cut back to create two-story mini-atriums.

**BELOW RIGHT:** Main entrance opens to ground floor, which is raised to accommodate slope of the site and depth of structure over buried railway lines.

**FACING PAGE:** Rich in texture and detail, facade of 10 Ludgate Place changes constantly, according to viewpoint.



**10 LUDGATE PLACE  
LONDON, ENGLAND**

**ARCHITECT:** Skidmore, Owings & Merrill, Chicago—Adrian D. Smith (design partner); Thomas K. Fridstein, Alan D. Hinklin (project partners); Srinivasa Iyengar (structural partner); Raymond J. Clark (mechanical/electrical/plumbing partner); M. Karlovitz (senior designer); T. Scheckelhoff, N. Scotty (project managers); T. Janezich, J. Zamorski (technical coordinators); R. Whiteman, J.M. Strabala, D. Prekas, D. Davis, C. Savoie, S. Dahdah, F. Karpowicz, P. Cartwright, B. Therenote, J. Barkley (design team)

**LANDSCAPE ARCHITECT:** Hanna Olin

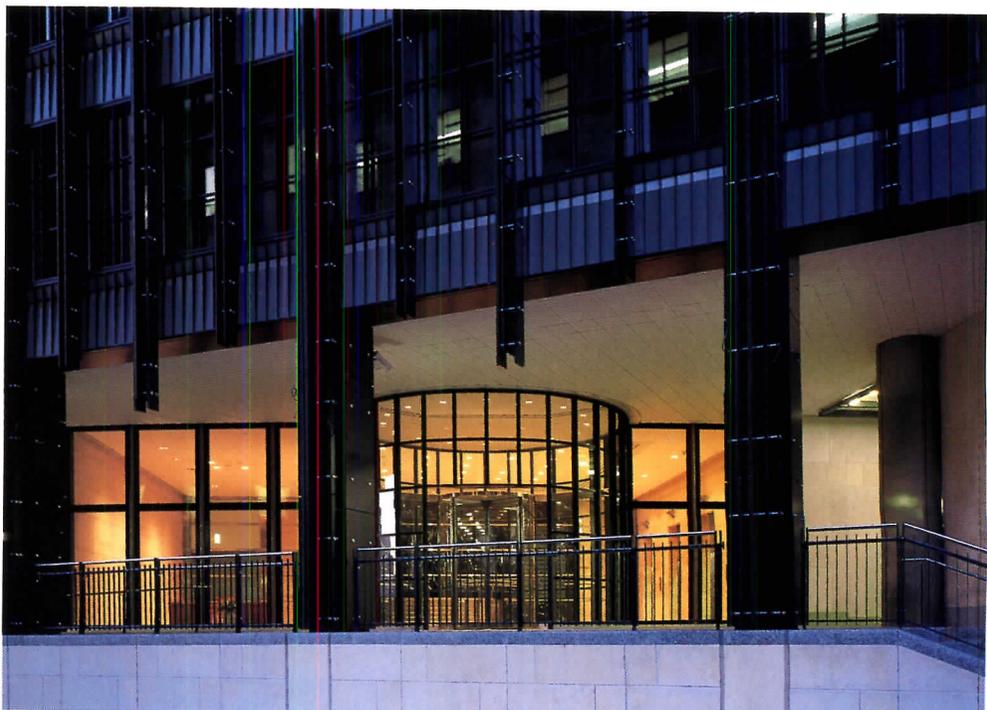
**ENGINEER:** Skidmore, Owings & Merrill (structural/mechanical/electrical)

**CONSULTANTS:** Gardiner & Theobald (cost); Mott Green & Wall (service cost); Fisher Marantz (lighting)

**GENERAL CONTRACTOR:** Bovis Construction Limited

**COST:** Withheld at owner's request

**PHOTOGRAPHER:** James H. Morris







# Technology & Practice

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Continuing our focus on the corporate workplace, this month's Technology & Practice section addresses the changes within architects' own offices. Computers are the greatest catalyst of this change, affecting not only the physical layout of the design studio, but also the ways in which architects work. A survey of six firms across the country reveals how CAD is transforming the open drafting rooms of old into new enclaves of individualized workstations. A second article on computers outlines developments in management software, programs tailored to architects—not accountants—for profit analysis and bookkeeping; analytical tools for calculating stair heights; and checklists for complying with new ADA codes. These advances in CAD and other computer technology won't entirely eliminate the need for blueprints and catalogs. But such developments have already minimized architects' reliance on conventional documentation and changed the appearance and operation of firms everywhere.

Meanwhile, architects are employing new approaches to solving problems that arise during construction. A feature on a project management strategy called partnering highlights the new spirit of cooperation that is reshaping architects' relationships with clients, contractors, engineers, and other affiliated professionals. Teamwork and open communication throughout the building process can reduce construction delays and minimize litigation, while improving efficiency and rapport. An update on professional liability also reveals the benefits of careful planning and cooperation between architects and their insurance brokers and clients. Legal headaches can be minimized by risk management strategies, which also help reduce construction time and costs. Another article examines the growing clout of facility management (FM) as a discipline, its effect on office design and operation, and how architects can tap into this expanding FM market.

Clearly, architectural practice is changing with advances in sophisticated technology and simple human communication. These far-reaching developments should send a strong signal to architects designing the workplaces of the 21st century: The office of the future has already arrived—in their own firms.

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## Automated Process Speeds Concrete Pours

A Florida company has patented a new technology for erecting five-sided concrete structures in two days, a process that shows promise for affordable housing. International Form Corporation (IFC) of Jacksonville has developed an automated concrete forming machine, called TechnoForm, that produces half a house with a single pour. IFC introduced the process at the International Congress of the Manufactured Concrete Products Industry, held last month in Washington, D.C.

This is how the TechnoForm process works: A rebar cage is placed on the pallet of the forming machine with window and door frames in place. Once the structure is set, a hydraulic control pump moves the rolling jacket of the form tightly against the base, enclosing the steel elements in preparation for the concrete pour. After the concrete has cured, the shrinking inner core of the forming machine automatically strips away from the corners of the newly formed structure.

Using cables, the concrete shell is lifted out of its mold and set on a frame to harden. The module then can be moved to the foundation of the house it will enclose. It takes two modules to build a 1,200-square-foot house. A precast concrete roof is placed between the modules, and because the roof's size is adjustable, so are the dimensions of the house. Floor plans, according to IFC, are not limited by the technology.

Based on IFC's estimates, a 1,200-square-foot house can be finished for \$25 to \$30 per square foot, or a total cost of about \$30,000. In addition, the main structure of the house can be completed in 48 hours, thus saving between 700 and 1,000 hours of labor—the time it would take to create a concrete shell through more conventional methods. "The best application is high volume," says TechnoForm's creator, Arthur Sherrer, Jr., president and CEO of IFC.

IFC took nine months to research and develop the process; Sherrer began investigating concrete technology in the wake of Hurricane Andrew, which destroyed 78,000 houses in South Florida. Much of the damage was blamed on shoddy construction. A concrete shell made with IFC's process can withstand pressures up to 8,000 pounds per square inch.—Bradford McKee



**FORMING MACHINE:** Jackets secure concrete.



**SHELL:** Finished in 48 hours.



**FINISHED MODULE:** Two halves of concrete house are joined by precast roof.

## Architects Form Practice Alliance

To enter new markets and extend their geographical reach, nine architecture and engineering firms have formed a consortium called the Strategic Team of Allied Resources, or STAR. Moving beyond joint ventures, the group hopes to bring together a critical mass of expertise in diverse specialties, ranging from acoustics to urban planning.

Members include architects Haines Lundberg Waehler in New York City; Odell Associates in Charlotte, North Carolina; The KPS Group in Birmingham, Alabama; Morris Architects in Houston; and Aiken Wreglesworth in Vancouver. STAR's member engineering firms are David Evans and Associates in Portland, Oregon; Paoletti Associates and EQE International, both in San Francisco; and The Earth Technology in Long Beach, California.

The alliance is the brainchild of Louis Marines, former chief executive officer of the AIA, who currently directs the Advanced Management Institute for Architecture and Engi-

neering in San Francisco. Strategic alliances in business are not new, and STAR members aim to improve the way architects and engineers serve clients by collaborating on projects and sharing expertise.

A typical STAR collaboration would work something like this: A client in Birmingham contracts local architects at The KPS Group to oversee a project requiring acoustic and seismic engineering. KPS would pass along the referral to STAR's resident acoustics experts at Paoletti Associates and to the seismic engineers at STAR member firm EQE. KPS would act as the client's project manager and as the local contact for the San Francisco firms.

STAR allows firms to operate in greater territory, as members have access to jobs nationwide. The client benefits from the established working relationships between members of the consortium, their expertise, and the flexibility of the STAR arrangement. And the firms benefit from more work in an expanded market, which may turn global if STAR succeeds with its plan to add overseas members.—Barry Abrams

*Automating concrete pours and a strategic alliance of firms simplify construction.*



# AND THE WINNERS ARE:

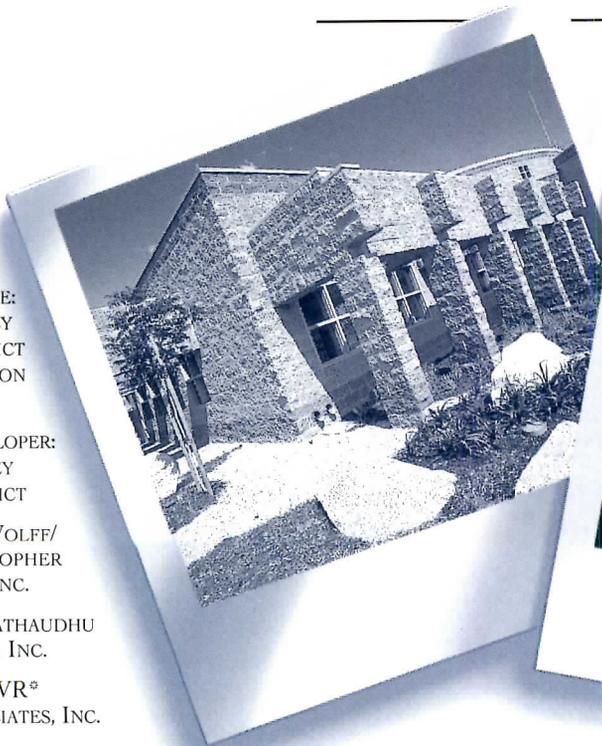
PROJECT NAME:  
VICTOR VALLEY  
WATER DISTRICT  
ADMINISTRATION  
FACILITY

OWNER/DEVELOPER:  
VICTOR VALLEY  
WATER DISTRICT

ARCHITECT: WOLFF/  
LANG/ CHRISTOPHER  
ARCHITECTS, INC.

ENGINEER: MATHAUDHU  
ENGINEERING, INC.

ENGINEER: RWR\*  
PASCOE ASSOCIATES, INC.



PROJECT NAME:  
CLA BUILDING  
AT CALIFORNIA  
STATE POLYTECHNIC  
UNIVERSITY, POMONA

OWNER/DEVELOPER:  
CALIFORNIA STATE  
UNIVERSITY

ARCHITECT: ANTON  
PREDOCK ARCHITECTS

ENGINEER: TIMMERMAN  
EVANS, SCHREIBER

ENGINEER: ENERGY  
SIMULATION  
SPECIALISTS, INC.



## Paperless Practices

*A survey of six architecture offices reveals how computers are changing design studio layout and operation.*

**RIGHT:** Anschuetz, Christidis & Lauster in New York designs on Apple Quadra 950s and a Macintosh IIfx.



MICHAEL MORAN

Most architecture firms continue to employ traditional drafting techniques, but increasing reliance on CAD and CAD-related software has opened the utopian possibility of the “paperless” office. According to the 1991 AIA firm survey report, 60 percent of small architecture firms and 85 percent of practices employing 10 or more on staff work on CAD systems. In addition to design software, 97 percent of all firms take advantage of word-processing programs, and over 60 percent use spreadsheets and specifications software.

As a result, firms are reorienting their staff, office space, and work loads to capitalize on the potentials of new hardware and software. To assess the impact of CAD, the following pages feature profiles of six highly computer-driven firms, representing a cross section of the profession in terms of firm size and degree of specialization.

Barriers to “paperless” offices arise less from organization than from external demand. Clients, building departments, consultants, and contractors all demand hard copy. The legal obstacles to a totally computerized office are also formidable. To protect themselves from lawsuits arising from altered software, architects must date and seal prints of building documents and return to these “originals” in case of dispute.

In the past, most architectural offices were organized as an open expanse of drafting tables, surrounded by principals’ private offices. In the studio, personal interaction was guar-

anteed. On the one hand, openness engendered the cross-pollination of ideas, but often left individual employees distracted, unable to concentrate. Private offices, on the other hand, fostered concentration, but discouraged a sense of community. With the advent of CAD, the polarization between open studios and closed offices is disappearing.

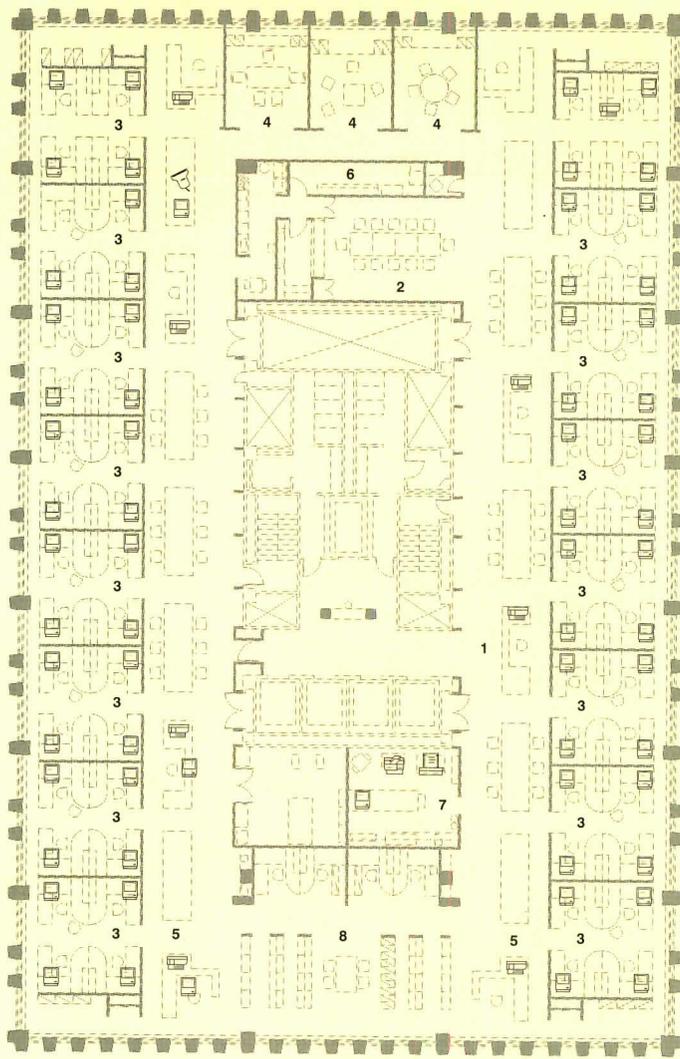
Though larger firms still tend to shape their environments around CAD systems, many smaller offices choose to clear existing table space and make do. Now, even at larger organizations, regimented office furniture is giving way to freestanding work tables and lightly supported workstations.

Of the six firms surveyed, a forward-looking principal at each one secured funding for the computer systems and oversaw their implementation. Office layout has been freed from many of the restraints imposed by traditional drafting and redrafting, because designers now work on a single set of master plans in the office network. In fact, CAD integration often leads to a more diversified portfolio for a firm, as expertise in one aspect of design carries over into others.

At Anshen + Allen, Computer Systems Manager Tony Rinella points out that the last boundaries of the paperless office are those that separate one firm’s projects from another’s. “I can call up our past design solutions on network, razor-out examples, and see how they tick,” observes Rinella, “but I wish I could call up a project by Louis Kahn on screen for lighting advice.”—*Joe Day*



JONATHAN HILLIER PHOTOS



- 1 RECEPTION
- 2 CONFERENCE
- 3 STUDIO
- 4 OFFICE
- 5 ADMINISTRATION
- 6 COMPUTER ROOM
- 7 PRINT ROOM
- 8 LIBRARY

-  COMPUTER
-  SCANNER
-  LASER PRINTER
-  PLOTTER
-  COLOR PRINTER

**FLOOR PLAN**

**TOP:** Cantilevered tables support a series of PCs that run Intergraph MicroStation at Lord, Aeck & Sargent.

**ABOVE:** Teams of architects “brainstorm” on trace and in model.

**PLAN:** Lord, Aeck & Sargent’s new offices are organized along wide, “public” walkways on either side of the service core. Design teams work in partitioned modules along the corridor; workstations line the perimeter.

### Lord, Aeck & Sargent Atlanta, Georgia

Spurred by a recent move from a 1904 structure in downtown Atlanta in a speculative office building, Terrance Sargent of Lord, Aeck & Sargent saw the shift in the architecture firm’s headquarters as a catalyst for changing to a new style of management and design. The new space opened up possibilities for staff interaction that had not been feasible before and cleared the slate for computerized workstations, rather than traditional drafting boards.

All of Lord, Aeck & Sargent’s design work is now produced in model and on computer. This combination allows teams of designers to move back and forth between collaborative model-making and discussions, and private, reflective work performed at integrated desks and workstations. In this way, a project

is first “brainstormed,” on trace and in model, and then the basics are immediately transferred to the office computer network, where drawing and documentation will continue as the design evolves in model.

Groups of four to eight designers work within partitioned cubicles at wide, cantilevered tables surrounding models in progress. These subdivisions open onto a wide central walkway through the office, terminated by the model shop.

Moving from easy public interaction along the core walkway to extreme privacy at the perimeter, architects at Lord, Aeck & Sargent perform in an environment without corporate division, one that is evenly graded from the open-floor workspaces to the personal offices.

Jean Wineman, professor of architecture at Georgia Institute of Technology, conducted a postoccupancy evaluation of Lord, Aeck & Sargent’s “loose-tight” office organi-

zation in 1992. In Wineman’s view, the subtle shifts from public circulation to group and private workspaces guarantees the cross-pollination of ideas within the design teams and within the firm.

As architects move around the office, and especially back and forth from the model shop at one end of the walkways, they are almost inevitably exposed to the work of other design teams. This generalized knowledge of the designs in progress at Lord, Aeck & Sargent has led to a healthy level of in-house competition among the various design teams as well as a greater sense of continuity in the firm’s design work.

Though the introduction of computer systems often threatens to replace human interaction in high-tech offices, Lord, Aeck & Sargent has capitalized on its Intergraph MicroStation network to bring designers together, untethered to traditional drafting procedures.



FLOOR PLAN



HEDRICH BLESSING PHOTOS

## Gensler and Associates Los Angeles, California

"It will mean the difference between a hose and a sewer pipe," speculates Bruce Bartoff of Gensler and Associates in Los Angeles, as he explains the anticipated growth of digital and fiber-optic information exchange capabilities over the next 10 years. Gensler is one of few architecture firms planning for such linkage among its eight offices in the future.

Unlike most large practices that underscore the autonomy of their regional offices, such as Kohn Pedersen Fox or Skidmore, Owings & Merrill, Gensler regularly moves its associates from one office to another. Such interaction among designers helps to ensure quality and continuity for multiple-site clients, such as the Gap clothing stores. These wide-area networks reflect a willingness to communicate, as well as document, design from one locale to the next.

With offices in San Francisco, Los Angeles, Irvine, New York City, Washington, D.C., Denver, Houston, and London, Gensler and Associates has laid the groundwork for "real-time" information exchange, as soon as those technologies become affordable. Either by a much-heralded "information superhighway," cellular linkage, or even radio airwaves, communication among office locations is less a matter of how, than of when and how much.

Until a recent foray into AutoCAD (the San Francisco office has leased four workstations), Gensler has run all design work on Intergraph software, a system first installed in 1984. By standardizing the design systems, Gensler can quickly shift projects and architects from one office to another.

Inverting the pattern of organization at Lord, Aeck & Sargent, Gensler offices move from dense to diffuse. Reception areas, large con-

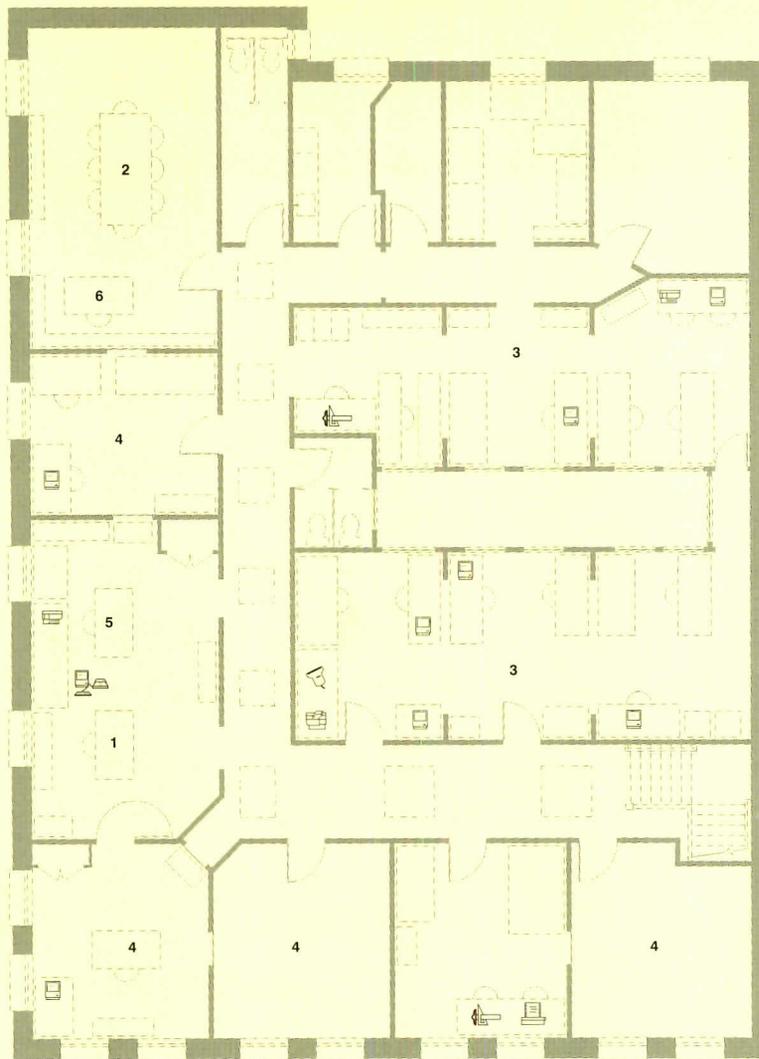
ference rooms, and executive offices are concentrated near the entrance or elevator core of each office. These more public, central spaces are designed to unify the Gensler offices for clients and to focus administrative needs. Partitioned studio spaces loosely surround the core, incorporating small meeting areas and conference rooms for architects as each floor plan will allow. Each office weaves studios, offices, libraries, and conference spaces together differently, but all share similar furniture and partitioning systems.

Gensler tailors its services to client needs rather than to regional differences, centralizing business operations in San Francisco, while replicating corporate organization in its various offices. Through this approach, the firm has created a flexible web of design centers that allows both clients and architects greater freedom of movement between the various branch offices.

**TOP:** At its seven U.S. offices and in London, Gensler arranges workstations in a linear sequence.

**ABOVE:** Small conference rooms and offices punctuate partitioned workspaces at the San Francisco office.

**PLAN:** Gensler and Associates in Los Angeles places reception, conference rooms, and offices near the core; studio spaces, linked by a wide-area network, are located at the perimeter.



- 1 RECEPTION
- 2 CONFERENCE
- 3 STUDIO
- 4 OFFICE
- 5 ADMINISTRATION
- 6 LIBRARY

- COMPUTER
- SCANNER
- LASER PRINTER
- PLOTTER
- COLOR PRINTER
- CADD STATION
- MODEM

FLOOR PLAN

**TOP:** Historic American Buildings Survey (HABS) drawings are rendered on screen at Page & Turnbull.

**ABOVE:** Macintosh units are integrated into traditional design studio.

**PLAN:** Page & Turnbull divides its office into small studios and private offices along a single, skylit corridor. Two central studios open onto a light court.

### Page & Turnbull San Francisco, California

For a 12-person practice specializing in historic preservation, San Francisco-based Page & Turnbull lets CAD systems play an unusually large role in documentation and design. Most of the firm's large-scale restoration work has been performed in collaboration with larger firms, an arrangement that led quickly to "CAD awareness," which is rare for specialists in preservation.

Preservation projects often begin with a wealth of eccentric structural and ornamental details, and seldom with construction documents previously entered into CAD. When available, the original documents provide a restoration model, but to enter those specs into CAD often is both time consuming and redundant. As a result, many historic preservation firms have been slow to embrace computer simulation.

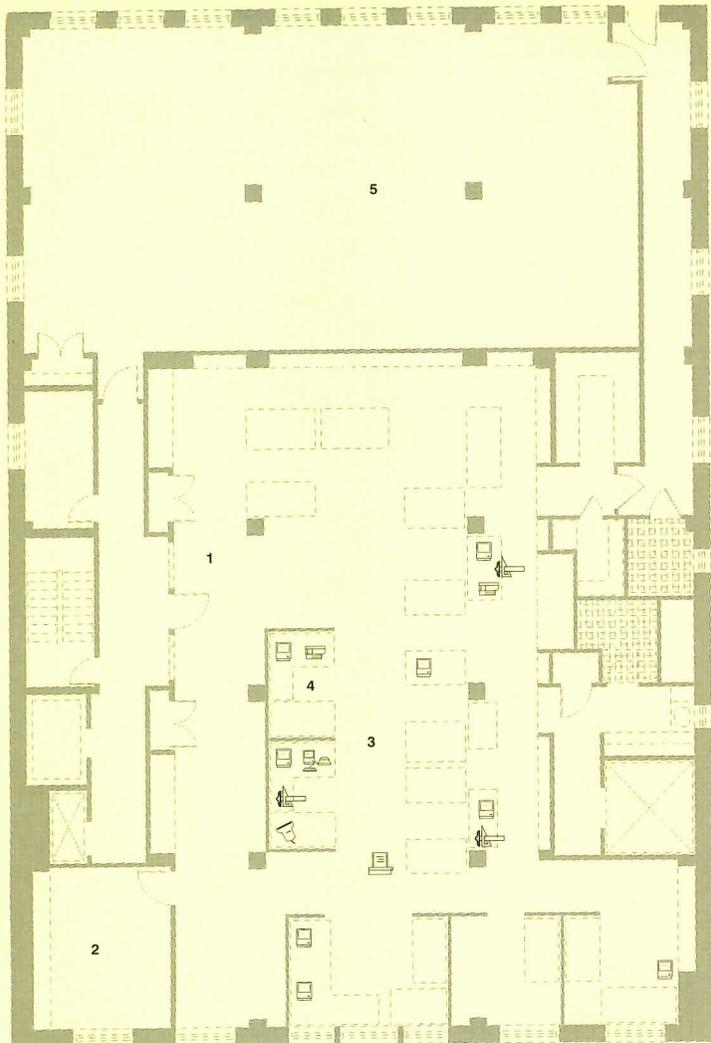
However, small preservation firms such as Page & Turnbull often collaborate with larger firms that serve as the architects of record for civic preservation projects. Page & Turnbull, for example, is currently working with Kendall Heaton Associates of Houston on the Pacific Gas & Electric Company headquarters, and with Skidmore, Owings & Merrill on the renovation of the U.S. Court of Appeals, both in San Francisco. Because the larger firms work exclusively on CAD, a collaborator such as Page & Turnbull must produce documents in the same format. In addition, contracts with government offices routinely specify final product submissions in MS-DOS.

DXF formatting bridges the gap between the DOS-based and Macintosh-based design software, allowing smaller practices to communicate with larger business systems. As Partner Jay Turnbull notes, "The one technical boon to our practice

has been the ability to trade files, produced on other CAD systems in other offices, in DXF format."

Page & Turnbull has found some unexpected advantages in moving historical documentation onto computer. Traditionally, the drawings undertaken by the Historic American Buildings Survey (HABS) of historic buildings around the United States are drawn by hand in ink, on linen or mylar. Page & Turnbull now produces accepted, cost-effective HABS renderings of existing conditions on Architron, the firm's CAD program on Macintosh.

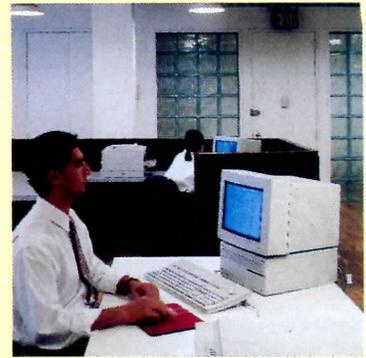
Without the smudges and correction marks of older HABS drawings, but with equally precise detail and thoughtful line-weight variation, the HABS work of Page & Turnbull is disarmingly clear. A different kind of "life" animates these drawings: no longer the handedness of the draftsman, but a charged synthesis of human and digital vision.



10TH FLOOR PLAN

- 1 RECEPTION
- 2 CONFERENCE
- 3 STUDIO
- 4 ADMINISTRATION
- 5 TENANT SPACE

-  COMPUTER
-  SCANNER
-  LASER PRINTER
-  PLOTTER
-  CADD STATION
-  MODEM



MICHAEL MORAN

### Anshuetz, Christidis & Lauster New York City

The 10-year-old firm of Anshuetz, Christidis & Lauster in New York City approaches CAD with demanding skepticism. Through the mid-1980s, the fledgling office enjoyed residential and commercial commissions in New York City, Boston, and Washington, D.C., producing documents by hand and using a single Macintosh for both bookkeeping and word processing.

Well on the way to a diversified, if conventional, success story, Anshuetz, Christidis & Lauster ran up against the recession in 1987. "Just when business was collapsing, we started spending money, buying machines," remembers Principal Charles Lauster. But upgrading the architecture firm's hardware and software was far easier than redirecting the methodology of the designers. "The hardest transition came in

moving from what we called an analog office, where you draw with pencils, to a digital office, where everything happens on screen," Lauster explains. "It really changes the way you do architecture."

Working on three Apple Quadra 950s and a Macintosh IIci, the eight architects generate design documents and site-specific imagery exclusively on screen. Despite state-of-the-art workstations, the office remains spartan, with two Apple printers shared by the designers and a pen plotter rolled from desk to desk. The exposed mechanics of their operation and the private alcoves of the designers suggest a process closer to monastic illumination than architectural illustration.

Of the firms surveyed on these pages, the work of Anshuetz, Christidis & Lauster comes the closest to photorealistic simulation. CAD-generated perspectives are directly transposed on contextual pho-

tographs scanned into a Microtek 600ZS scanner. The "site" is then further developed and modified through a number of specialized computer software programs: Dynaware's DynaPerspective for 3D modeling, Ray Dream's Ray Dream Designer for rendering, Adobe Systems' Adobe Photoshop for image editing, and finally Quark's QuarkXPress for page formatting.

For small offices that are planning to integrate computers gradually into their practice, Anshuetz, Christidis & Lauster provides a telling example. Initially, computers were to replace one drafting board at a time in the office, but as soon as a couple of the firm's designers understood the software, they all wanted workstations. According to Lauster, the work couldn't be split easily: "Projects couldn't be partially analog and partially digital, so we went in pell-mell, buying as many machines as we could."

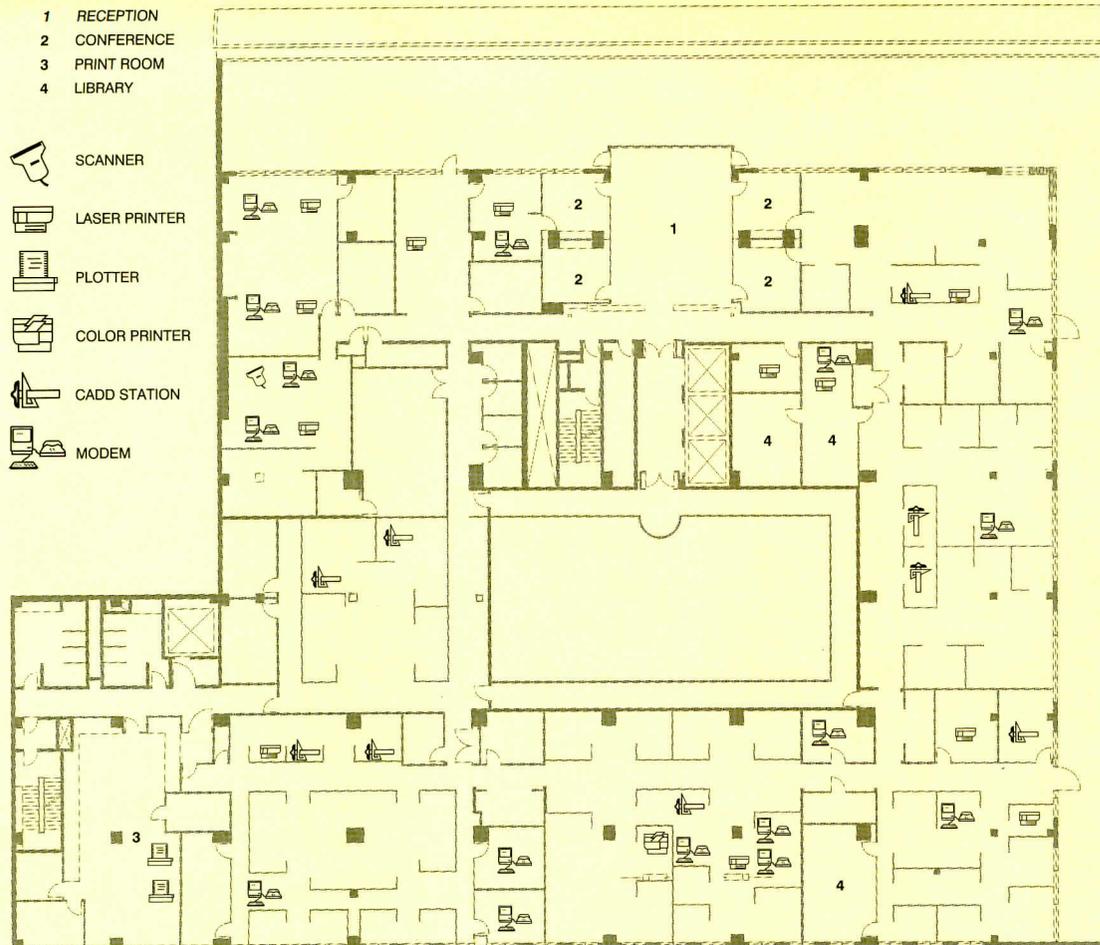
**TOP:** Daniel Turkewitz augments CAD data on DynaPerspective for 3D modeling as well as on QuarkXPress for modifying graphic design.

**PLAN:** The 10th floor office of Anshuetz, Christidis & Lauster is an open studio lined by services and conference rooms. Though originally only a few desks were slated for computers, almost every drafting board in the office has been replaced by an Apple Quadra 950 or Macintosh.

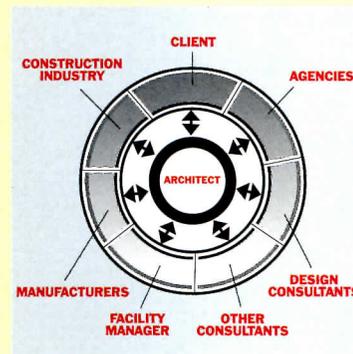
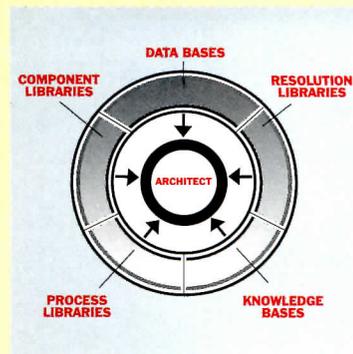


- 1 RECEPTION
- 2 CONFERENCE
- 3 PRINT ROOM
- 4 LIBRARY

- SCANNER
- LASER PRINTER
- PLOTTER
- COLOR PRINTER
- CADD STATION
- MODEM



FLOOR PLAN



**Anshen + Allen Architects  
San Francisco, California**

“Information management” and “building publication” are two ways to describe the approach to architectural production at Anshen + Allen Architects, an early pioneer of computer-aided design in the United States. Using Graphic Design Systems (GDS) developed in Cambridge, England, President Jack MacAllister opened a completely computerized office in Los Angeles in 1984, expanding from Anshen + Allen’s base in San Francisco.

At the time, total integration was an enormous risk in terms of both quality and cost. In the early 1980s, Anshen + Allen in San Francisco was making the most of under-powered equipment, once forcing a single hospital floor plate out of 16 individual CAD units. Coordinating the output of that particular floor plan fell to Tony Rinella, who is now

Computer Systems Manager for the firm’s three offices. This task quickly convinced Rinella of the need to upgrade Anshen + Allen’s systems at every opportunity. With leadership as enthusiastic as MacAllister’s, the firm has raced to absorb every new technological advance, often taking software from other disciplines and tailoring it to their own needs.

Though a few ongoing projects in the Los Angeles office are still supported by GDS, almost all of the firm’s work is now performed on AutoCAD. MacAllister regrets giving up a system that he believes was more sensitive to architects’ needs, but GDS could not integrate the majority of support software, which is tailored to AutoCAD and critical to an architecture firm specializing in research and medical facilities.

All design work and almost all data entry at Anshen + Allen is performed by licensed architects, who work strictly on the office networks.

“No operators nor CAD-entry draftspersons are employed,” states Anshen + Allen’s MacAllister. “We need the expertise of a ‘smart office.’”

Systems Manager Rinella explains that the complexity and urgency of medical design demand the integration of building systems and ever-changing equipment that must serve patients, families, and medical practitioners. While other firms may be lured by the cost savings or graphic possibilities of “paperless” design, Anshen + Allen had little choice but to invest in more powerful computer systems as soon as they became available, in order to factor in all of the programmatic variables of healthcare facilities.

As the firm broadens its interests into medical data bank creation, design libraries, and facility monitoring and management, MacAllister’s opposition to paper remains firm: “One [hand-written] note, and the set of project documents is poisoned.”

**TOP:** At Anshen + Allen, the role of the architect is expanded into related fields through CAD, as shown in diagrams.

**PLAN:** Anshen + Allen’s office in San Francisco surrounds a large, central atrium. Small design studios are separated by libraries, reprographics areas, and a gallery. A wide-area network in each office allows architects access to other libraries and data banks on IBM 486s and Sun SPARCstations.



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### Liability Premiums and Deductibles by Firm Size

Firm Size	Premium	1990 Coverage	Deductible	Premium	1989 Coverage	Deductible
All firms	\$21,400	\$612,300	\$13,800	\$23,500	\$602,200	\$13,800
1	5,200	358,800	4,700	5,600	336,100	5,200
2-4	7,900	406,100	6,000	8,500	377,900	6,100
5-9	15,000	549,900	10,700	16,100	533,800	10,100
10-19	29,200	718,800	16,100	29,800	684,800	15,800
20+	99,300	1,651,800	57,800	101,000	1,601,600	53,200

Source: AIA

## Liability on a Leash

*Keeping risk within reach takes more than insurance.*

David Castro-Blanco, president of AIA's New York City chapter and founder and CEO of Castro-Blanco, Piscioneri and Associates, Architects, fought a liability claim for six years that, in a less-litigious world, might have been resolved with one or two phone calls.

In 1984, a construction worker fell down an elevator shaft in a rehabilitated apartment building on West 107th Street in Manhattan. The worker's attorney filed a lawsuit against Castro-Blanco's firm because the elevator shop drawings listed Castro-Blanco, Piscioneri in the title block. But the elevator had not been specified by Castro-Blanco. It wasn't his project. The renovation had been designed by Rothzeit Kaiserman Thomson & Bee (RKTB), which had specified an elevator identical to one Castro-Blanco employed in a separate retrofit project. When the attorney requested shop drawings for the architect of record, the elevator manufacturer, unfortunately, sent the wrong ones.

Despite the voucher of RKTB itself—which was never found liable for the elevator accident, either—Castro-Blanco, Piscioneri worked until 1990 to have the firm's name dismissed from the suit. The effort cost his firm several thousand dollars, Castro-Blanco calculates, but luckily, the defense costs were covered by the firm's liability insurance.

### Rates are down

Even the most diligent of architects—those with no cost overruns or late deliveries; no leaky windows or too-slick brick sidewalks—cannot shield their firms from externalities gone awry. Castro-Blanco, Piscioneri's experience shows why firms of all sizes should contemplate liability coverage. Yet the 1991 AIA firm surveys show that about half of American architecture firms operate without any liability insurance. Large firms usually have it; small ones usually don't. Ninety-six percent of practices with 20 or more employees carry liability insurance, compared to only 25 percent of sole practitioners.

Cost is the main obstacle to buying and keeping up liability insurance, but such insurance is more affordable now than it's been in years, maintains John M. Laping, vice chair of the AIA's Risk Management Committee. "The market right now is very soft, and rates are down," Laping asserts. Such a buyer's advantage represents an improvement from the market of 1983 to 1985, when few insurers sold liability coverage and few architects could buy it: As late as 1987, there were only two major carriers—Victor O. Schinnerer & Company and Design Professionals Insurance Company—offering liability insurance to architecture firms, notes Christopher R. Clark, AIA's director of practice management programs.

### Risk management pays

Much of the 1980s liability crisis can be traced to the high number of claims rolling in from projects completed in the 1970s, when "risk management wasn't two words put together," recalls Connie McFarland, a Tulsa, Oklahoma, architect who chairs the AIA's Risk Management Committee. Architects since have grown more familiar with managing risk, McFarland explains, which makes a soft market even softer.

Proof of the payoff came during the latest recession. Since the liability insurance market's nadir of 1985, the frequency of claims has dropped 38 percent. Analysts expected the number of claims to increase during the economic downturn of 1990 to 1992, as displeased clients turned more testy: 59 percent of liability claims begin with the building owner. But the claims volume held steady. "You would have thought with the recession, clients would do anything to make money," such as suing their architects more, observes McFarland. "The statistics I've seen say it didn't happen." It may not happen again, industry analysts report, if architects treat liability insurance as just one facet of a broad-based strategy to guard risk—and become more savvy insurance shoppers.

## The Liability Insurance Market Sampler

Insurer Underwriter	A.M. Best Rating (A++ to F)	Coverage Limits	Minimum Deductible	Minimum Premium	Comments
<b>CNA Insurance Companies</b> Victor O. Schinnerer & Company, Inc. Chevy Chase, Maryland (301) 961-9800	A	\$100,000 to \$15 million	\$2,000	\$1,000	Commended program of the AIA. Broad range of limits and deductibles. Offers project insurance.
<b>Evanston Insurance Company</b> Shand Morahan & Company Evanston, Illinois (708) 866-2800	A-	\$100,000 to \$5 million; negotiable for specific projects	\$5,000	\$3,500	Provides up to 15 percent premium credit for firms managing risk. Offers project coverage.
<b>National Union Fire Insurance Company</b> Architects and Engineers Insurance Company (AEIC) Greenville, Delaware (302) 674-2342	A++	\$1 million to \$5 million	\$25,000	\$38,500	AEIC is wholly owned by its insureds and fully discloses its premium rate tables and underwriting criteria.
<b>Alpine Insurance Company</b> TCO Insurance Services Chicago (312) 922-8800	A	\$100,000 to \$2 million	\$5,000	\$1,000	Pricing determined by strict selection of risks. Credits given for preventive measures.
<b>Associated International Insurance Company and Calvert Insurance Company</b> RA&MCO Insurance Concord, California (510) 685-1600	A	\$250,000 to \$2 million; higher limit available	\$5,000	\$5,000	Stresses loss prevention through contract review, preclaim counseling, and seminars.
<b>Reliance Insurance Companies</b> Reliance National New York City (212) 858-3641	A-	\$100,000 to \$10 million	\$10,000	\$20,000	Seventh year insuring in architecture/ engineering liability coverage.
<b>Tudor Insurance Company</b> Professional Managers Chicago (312) 559-0101	A+	\$100,000 to \$2 million	\$2,500	\$3,000 for \$100,000 limit—same limit runs \$10,000 for design/build	Has insured architects and engineers since 1981. Covers firms of all sizes.
<b>DPIC Companies</b> DPIC Companies Monterey, California (800) 227-4284	A-	\$250,000 to \$5 million	\$2,500	\$2,500	Second-largest insurer of design professionals; has covered such firms since 1971.
<b>Lexington Insurance Company</b> Lexington Insurance Company Boston (617) 330-8319	A++	\$100,000 to \$25 million	\$5,000	\$3,000 for \$100,000 limit—same limit runs \$10,000 for design/build	Has covered firms of all sizes since 1975.
<b>Lloyd's of London</b> AVRECO Chicago (312) 346-6161	N/A	\$2 million; higher limit negotiable	\$5,000	\$2,000	Writes policies in all states but California, New Jersey, and Texas.

N/A: Not applicable

Source: AIA and individual firms listed.

### Containing coverage costs

Selecting a liability policy begins with choosing a broker. The best references come from asking colleagues, or the local or state AIA chapter. Another option is to call A/E ProNet (704-521-8878), a nationwide network of independent liability underwriters. Architects can control their costs by negotiating the premiums against the deductible. A lower premium buys a higher deductible.

The last major AIA firm survey of liability trends, in 1991, showed that premiums averaged 6 percent—about \$5,200—of gross billings for sole practitioners, and averaged 2 percent—about \$99,300—for firms with 20 or more staff. Deductibles are tantamount to self-insurance; the average firm self-insures at about 3 percent of total coverage.

Liability policy buyers should look for the longevity and the strength of the insurance company. A reliable index of a carrier's soundness is its A.M. Best Company rating, which evaluates insurers' performance, financial strength, and customer fulfillment. Ratings range from A++ to F; A.M. Best does not rate younger insurance firms or foreign carriers, such as Lloyd's of London.

### Practice-plus-project policies

Competitive insurers offer counseling and credits to encourage loss prevention. Some sell pollution-liability coverage; others offer flexible design/build insurance. Increasingly popular is project insurance to augment architects' practice coverage. Project insurance applies to a specific job and can be tailored to a specific design team. The architect buys a project policy for an amount over and above the firm's practice policy, commonly at the client's behest. The architect can pass on all or part of the policy cost to the client as overhead and avoid the extra expense.

Ward/Hall Associates, an architecture firm in Fairfax, Virginia, for example, has a three-year, \$4 million project policy to supplement its \$1 million practice policy. The firm recently realized the value of having a \$5 million project policy when an excavation collapse killed a worker at one of its construction sites. Ward/Hall was released from the case, as it looked like a contractor error, but "the lawyers drag in everybody at first," laments Principal G. Truman Ward.

Such project policies aren't the rule, but there has been a significant increase in their number, notes the AIA's Clark. Project policies are bought mostly for complex projects, he says, and almost no firm relies solely on a project policy. A continuing practice policy is

the only hedge against constant liability exposure. Most liability policies must be active both when the claim's cause occurred and when the claimant takes action.

### Rein in risk

Risk reduction starts with selecting clients and signing contracts. Traditionally it is the client's call whether or not to hire the architect, but the architect ultimately needs to exercise as much scrutiny toward the client. Liability experts urge architects to be wary of clients with overly speculative projects, and those demanding shortcuts for the sake of cost-effectiveness. If the client proves desirable, the qualification question returns to the architect: Is the firm capable of completing this particular type of project?

The other area to watch at the outset of a project is the contract. Brokers should review contracts before architects sign them, to spot potential coverage problems. Liability law analysts cite outright guarantees or warranties of service as major problems in contracts. Also alarming are strict provisions for financial liability for cost overruns; provisions that indemnify the owner, consultants, or contractors at the greater risk of the architect; and rigid deadlines for performance.

The insurer may give advice on the contract, but final decisions belong to the architect. "You don't want anyone saying, 'It's too risky; don't do it,' because life is risky," maintains Ava Abramowitz, vice president for program services at Victor O. Schinnerer & Company, based in Chevy Chase, Maryland. "Besides, if there's a problem, the contract is not the issue. The contract is the signal."

Equally important to vetting clients and contracts is keeping the client informed, especially of any changes to a project that fall outside of the agreed-upon scope of work. Those changes should be brought to the client's attention immediately and put in writing once the client provides consent.

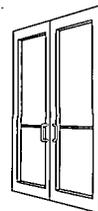
Like most insured architects, David Castro-Blanco reexamines his coverage options each year, as that is the typical term for a policy. Castro-Blanco insists that after his recent debacle, he will never go uninsured against liability losses. Each time his firm renegotiates a new policy, it may have to adjust the premium and the deductible to maintain affordable costs. But just in case he ever meets another claim against his firm, Castro-Blanco always gains assurances that the selected carrier accepts all the terms of his previous policies—"so we don't leave anything uncovered."—Bradford McKee

*Architects should treat liability insurance as one facet of a broad-based strategy to guard risk.*

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The Mark of Responsibility

**design**

15 percent: interior designer, architect

**construction**

20 percent: engineer

**other management**

53 percent: non-FM department administrator

**all other**

12 percent: vendor, student, military, clerical

## Facility Managers' Growing Clout

*As facility management gains wider recognition, architects seize new opportunities.*

In more extravagant times, facility managers stood by while an out-of-house architect sculpted a bold image for a corporate headquarters. After the new building was occupied, the managers quietly cleaned up the areas of the interiors that didn't work.

Today, facility managers have gained a stronghold in all types of organizations, as postrecession CEOs discover that space ranks second only to personnel as their leading expense. In a recent issue of the *Harvard Business Review*, consultant Mahlon Apgar IV notes that the typical service business in the 1980s "saw its ratio of occupancy costs to revenues more than double, its real rents increase by 50 percent, and its space use per employee grow by 80 percent." Everywhere, the cost of headquartering an organization soared out of proportion to people or productivity.

Slamming the brakes on construction has not necessarily remedied the situation. Computers, reorganization, regulation, competition, growth cycles, and firings have all motivated top executives to find smart, qualified people who can handle the costs of housing their operations on a continuing basis.

### Evolution of facility management

The 107-chapter, 12,000-member International Facility Management Association (IFMA) was founded in 1980 in response to the growth of office automation and more complex furniture systems. Today, the focus on controlling operating expenses and the

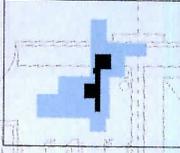
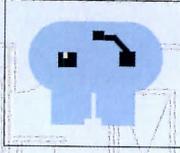
bottom line is propelling facility management (FM) far beyond furniture. Facility managers' various titles—from vice president of real estate to manager of facilities engineering—reflect diverse credentials. In response to the discipline's growing clout, IFMA has taken steps to define FM as a distinct profession.

### Education and certification

Twenty-six universities, from Cornell to Grand Valley State, already offer FM degrees or associate programs. Despite resistance from several of these schools, IFMA is seeking U.S. Department of Education recognition for its own authority to set accreditation standards for all FM programs. Meanwhile, last fall, IFMA launched a national certification program, comprising education and experience requirements plus a written exam.

This Certified Facility Manager program admits professionals who hold degrees in architecture, engineering, construction, business, property management, and institutional or hotel management, and have at least four years of experience. The exam includes parts on operations and maintenance, real estate, human and environmental factors, planning and project management, facility function, communications, finance, and quality assessment and innovation. Personal and educational accreditation actions follow recommendations from IFMA's study of the field, beginning with a 1988 survey of members' roles and a 1991 education survey.

## Building Comparison Matrix

Core			
Building Shape			
Criteria		<b>A</b>	<b>B</b>
10-year net present value		15	25
Operation disruptions		4	20
Location		16	10
Space availability		13	12
Employee turnover		8	16
Quality of space		13	20
Building systems		12	21
Space efficiency		21	11
Space flexibility		9	12
Parking		22	20
Building amenities		11	17
<b>Total</b>		<b>144</b>	<b>184</b>

**ABOVE:** Taking a facility management approach to long-range planning, a client can compare occupancy factors in this hypothetical matrix. Reviewing a number of weighted criteria in buildings A, B, and C helps to evaluate the long-term potential of each proposed corporate location and select the most suitable, cost-effective space.

While the International Facility Management Association insists certification is not meant to exclude architects, its exam favors those with hands-on experience gained at the operations level. "It aims to set a baseline of competence" among members with diverse backgrounds, explains IFMA President Diane MacKnight, director of facility operations for Gannett/*USA Today*. A liberal arts major, MacKnight credits her ability to read floor plans to a course in cartography.

Chris Nims, vice president of Gensler and Associates and a leader in the firm's nationwide FM practice, is one IFMA member who supports certification, but notes that he has no immediate plans to become certified himself: "I don't discount the possibility that it will be useful in the future, but it's not essential to my practice now. I already have a profession as an architect."

### Defining FM's practitioners

The Library of Congress defines facility management as "the practice of coordinating the physical workplace with the people and work of the organization; integrates the principles of business administration, architecture, and the behavioral and engineering sciences." For IFMA President MacKnight, it is this support of a particular organization that sets facility managers apart, philosophically if not always functionally, from the property managers represented by the Building Owners and Managers Association International. Asserts

MacKnight, "We see ourselves as a helping profession, like teaching or social work."

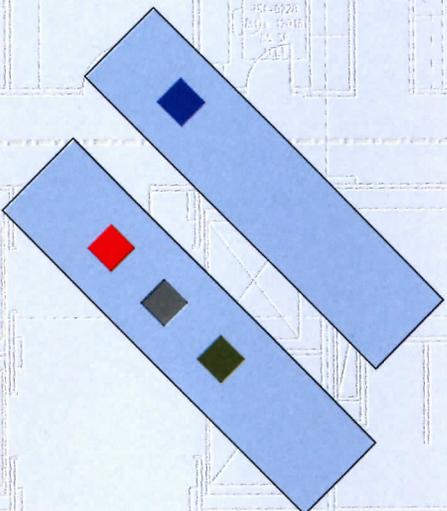
According to IFMA's most recent survey, conducted in 1988, the typical IFMA member is a "generalist manager," who supervises two tiers of specialists plus outside consultants. Over half of IFMA members claim general management backgrounds, compared with 20 percent from the fields of engineering and construction, and only 15 percent from architecture and interior design combined.

In contrast, a 1991 AIA Practice Management survey of 633 AIA firms found that at least 25 percent claimed to offer facility management services. The same poll found that 12 percent planned to add FM within three years, making it by far the most popular market choice for expanded services. More evidence is the AIA's recently created Facility Management Professional Interest Area (PIA). This AIA group already claims 400 members, despite overlapping Corporate Architects and Interior Design PIAs. It appears that IFMA and AIA see the same turf from different points of view, a situation further confused by the fast-changing nature of FM itself.

### Crossing boundaries

Computers have often led architects to facility management, but too many firms that have taken this approach to FM view it only as territory to be colonized. To be sure, architects' computer-aided facility management (CAFM) has often served "frequent construc-

*In today's rapidly changing workplace, companies are striving to consolidate operations, take advantage of advances in technology, and improve the productivity of their workers and their environments. An initial, strategic analysis of departmental interrelationships helps companies plan for such changes.*



**Operations**

- New business
- Reinsurance actuarial claims
- Deferred annuities
- Life operations

**Financial Services**

- Finance and accounting
- Agency service
- Agency compensation commission
- Treasury
- Audit
- Taxes

**Corporate Services**

- Reception
- Office services
- Training rooms
- Human resources
- Word processing
- Corporate communication
- Mail room and reproduction
- Records management
- Supply and facilities storage

**Information Services**

- New business
- Telecom staff
- Data center

tion” clients well. The Hillier Group’s systems, for example, now store and retrieve graphic and alphanumeric data for dozens of university, corporate, and high-tech clients. Another oft-cited CAFM success is Boston, Massachusetts-based Jung/Brannen’s research and development subsidiary, directed by Bruce Kenneth Forbes, author of the firm’s widely marketed ARCHIBUS software.

But a more fundamental change in facility management has seemed to elude most design professionals. While architects were honing specialized FM tools, a new generation of FM guerrillas was positioning itself to embrace a much larger whole: location, finance, productivity, and operations, with construction as a low priority. In the flexible, organization-integrated discipline, architecture would be the add-on service.

“The ability of architects to adjust and work with facility managers in the future will have a significant effect on their marketing effort,” claims former IFMA President David G. Cotts. “But I sense that major design firms would much rather deal directly with the CEO of a company.”

One firm that fits this description is Hellmuth, Obata & Kassabaum (HOK). In 1978, HOK assembled a line of consulting services it called “Program Management.” Recently reorganized as the Facilities Consulting Group (FCG), this unit includes finance, computer, and behavioral science specialists, but retains a majority of people with architectural cre-

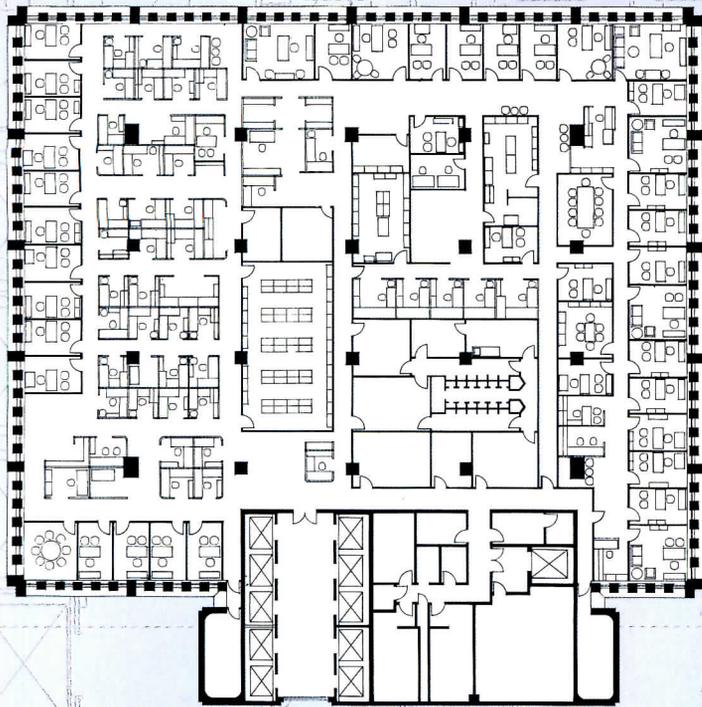
dentials. FCG units are located in five of HOK’s eight U.S. offices: Washington, D.C.; New York City; St. Louis, Missouri; and San Francisco and Los Angeles, California. As a self-styled think tank that claims to help control occupancy costs and enhance productivity, the FCG targets the facility managers’ bosses. Significantly, its scope of services does not parallel IFMA’s. HOK’s Facilities Consulting Group confines what it calls “facility management” services to operations and training, while offering broader consulting services under “workplace improvement” or “accommodation strategy.”

**Architects’ FM advantages**

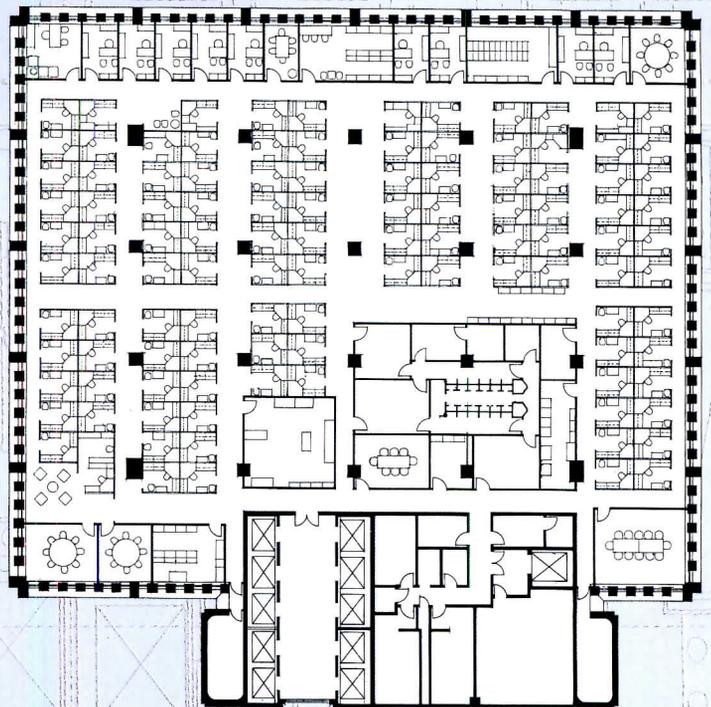
Where do architects really fit in, given this new wave of facility managers? Although architects may be handicapped by association with ’80s glitz, their generalist understanding—ranging from building codes to broad social and cultural concerns—and training as business-to-business communicators suggest they can become a strong, positive competitor in this market, whether as an in-house FM specialist or on a consulting basis.

As a discipline, facility management spans three main areas of expertise: building operations, long-range planning, and special projects. These broad areas encompass such functions as controlling daily and yearly energy, labor, materials, and other costs; avoiding real estate, tax, labor, and government regulatory pitfalls; guarding against building

**ABOVE:** Plotting a departmental diagram helps to design workplaces that encourage maximum staff productivity and operational efficiency.



FLOOR PLAN, BEFORE



FLOOR PLAN, AFTER

**ABOVE:** With a computer-aided facility management program, Gensler reconfigured a typical floor (left) into a universal plan (right), improving building efficiency by 30 percent and decreasing move costs by 150 percent.

obsolescence; and minimizing the need for more and different spaces and systems.

Beyond knowing how to build, architects can bring special strengths to each of these areas. For example, the computer database itself is no longer the marketing master key to FM. More essential is what the database may represent—a long-standing, empathetic relationship with a client organization. Swanke Hayden Connell Architects' (SHCA's) recent work for a reorganizing and downsizing IBM, for instance, has included consolidating, on short notice, a variety of the company's world trade operations in space originally built for a single, expanding Latin American division. Rapport between SHCA's project manager, Richard L. Sewell, and IBM's in-house advisory architectural designer, Joseph A. Rossi, proved just as important during the project as SHCA's on-line access to client data.

#### Architect as consultant

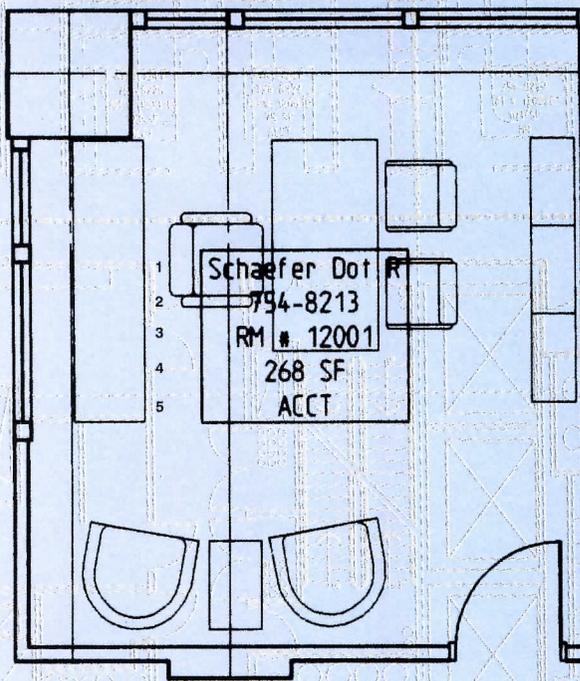
A trend to "outsourcing" gives consultant services new fiscal respectability. Some FM departments have shrunk, and architecture firms can propose filling in. "The pendulum swings back and forth on this," says Gensler's Nims. "Right now, facility management is more critical than ever, but at the same time, in-house departments are downsizing: fewer people with more responsibilities." Architects should prepare to compete with credentialed FM consultants, however. The Hillier Group Chairman J. Robert Hillier foresees archi-

itects' role as an "implant." Architecture firm staff will be farmed out to an organization's FM department at minimum cost to the client, giving the firm an inside edge when large, new construction projects come up.

Architects also bring specifying and problem-solving skills to short-term operations. "Architects need to understand that facility management is very much of a short-order, fast-response business," counsels Hillier. Again, drawing on wide-ranging experience and education covering many kinds of buildings, the architect can propose legitimate quick fixes that can yield long-term savings and lead to more substantive commissions.

Today's consultative management style is not necessarily at odds with the traditional architect's role. Concepts such as value engineering, TQM, and partnering have often been pioneered or anticipated by architectural firms. In the mid-1950s, for example, Eero Saarinen and SOM convinced corporate clients to listen to employees, build full-scale prototypes to be tested and modified, and work intensively in teams.

Sustainable design principles promise architects an important FM "product." As embodied in a project like the Croxton Collaborative's National Audubon Society headquarters (ARCHITECTURE, June 1993, pages 62-69), these tenets overlap much of FM's cost-cutting, productivity-raising repertoire in a sophisticated and socially conscious package. An added dimension is today's



OFFICE DETAIL

- 1 OCCUPANT'S NAME
- 2 TELEPHONE NUMBER
- 3 ROOM NUMBER
- 4 ROOM/WORKSTATION SIZE
- 5 EMPLOYEE DEPARTMENT

“green” approach to urban design, applicable from office parks to college campuses. The pluses range from bottom-line savings to environmental benefits, better employee health to reduced regulatory hassles.

Although the building industry as a whole underfunds research and development, it is often design professionals’ research (and not, for the present, IFMA’s) that is developing better data on occupant needs, energy use, and improved technologies and materials.

### FM’s new frontiers

Finally, while the “virtual office” represents the glamorous frontier of FM, surveys show that acceptance remains limited. In theory, automated companies can already dispense with office walls and street addresses and turn employees (and consultants) loose to work at a shared table, on the road, at the customer’s place, or at home. The hope is that rethinking the workplace as virtual reality will enable freer and more creative use of space, give workers more control, and improve productivity. The fear is that too much open-endedness can become a trendy excuse for mean, cheap buildings.

For now, however, architects are discovering ad hoc markets in programming or designing for a changing corporate culture. Increasingly, they are developing new areas for shared and shifting workstations; “hoteling,” time-share private offices reserved like hotel rooms; flextime schedules; and portable com-

munications tools that can be taken home or on the road. The Hillier Group, for example, claims to be cutting space 40 percent by a “strategic deployment” of carrels, worktables, and lounge chairs, inspired by the cushy but compact executive work environment of a first-class airport lounge.

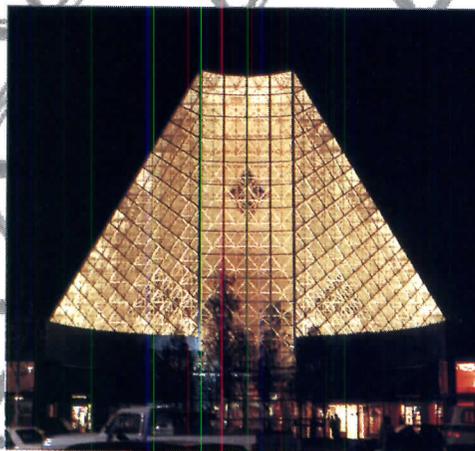
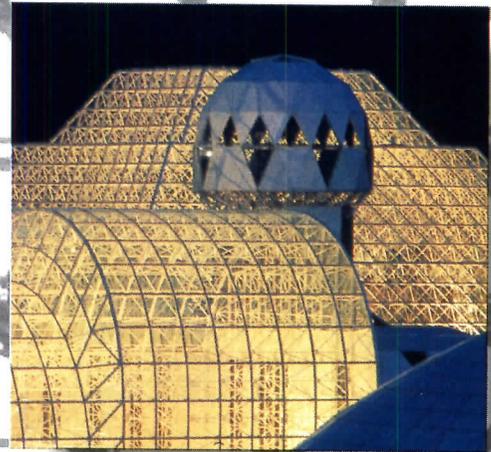
In the past, a major weakness for the architectural profession in understanding and profiting from facility management’s growth was the fear and condescension directed at in-house corporate architects by architects in private practice. The in-house subordinate expected to clean up after the “name” architect’s expression of corporate image was, too often, another architect. Thanks to economic realities, such attitudes seem to be waning.

In this light, a current study, titled “Future Beginnings: Directions in Officing,” involving the AIA’s Corporate Architects and Public Architects Professional Interest Areas, is encouraging as much for its format as for its content. Although its conclusions are tentative, the first report of this group is worth ordering from the AIA (800-365-2724). In addition, IFMA principals have been invited to Facility Management PIA focus groups at the AIA regional conventions in Illinois and Boston this fall. Maybe if architects are more congenial, IFMA will invite us to one of their conventions.—*Robert L. Miller*

*Robert L. Miller, AIA, is an advisor to the AIA’s Facility Management Professional Interest Area.*

**LEFT:** For rapidly changing organizations in the 1990s, HOK’s flexible “alternative officing” designs employ a standard module with a kit of parts customized to the particular user’s functions and work patterns.

**DRAWING:** By combining graphic and alphanumeric information, The Hillier Group answers questions about occupant, department, furniture, and other details for any location.



“Our space frame system provides maximum design flexibility. Any geometry or grid pattern. Any grid size, equal or unequal. Any configuration, flat or curved. Any depth or depth variation. Any member size or section. Any support condition. Any span. Any color.” Any questions? Call 1-800-760-4444

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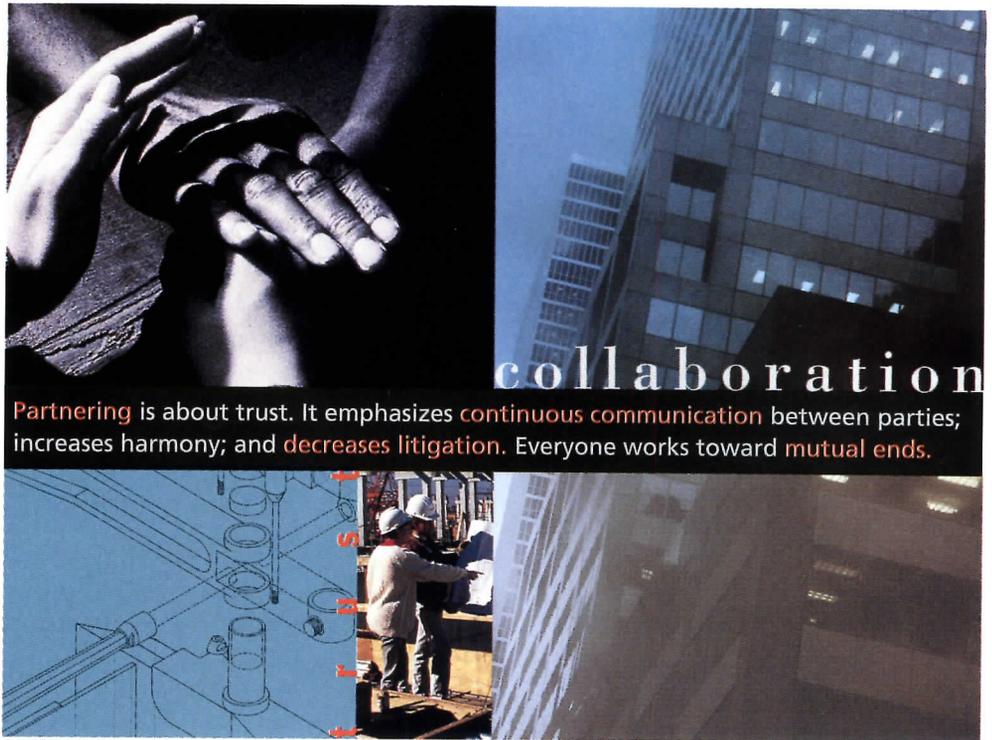
SPECIALISTS IN SPACE ENCLOSURE SYSTEMS DESIGN, ENGINEERING AND MANUFACTURE

(top l.) BC Pavilion, Expo '86, Vancouver, Canada. (top, r.) © 1991, Space Biospheres Ventures, C. Allen Morgan. (bottom) Southland Gardens Food Court, Detroit, Michigan.

Circle 171 on information card

## Project Partnering

*A new management strategy based upon old-fashioned cooperation streamlines the construction process.*



Partnering is about trust. It emphasizes continuous communication between parties; increases harmony; and decreases litigation. Everyone works toward mutual ends.

Once upon a time, an architect, a client, and a contractor built a project based on a verbal agreement and a firm handshake. As project costs became more pressing, members of the trio began to distrust one another and attempted to resolve their differences through lawsuits. Realizing that they were wasting money and time, these disciplines eventually adopted a management strategy to help them solve problems as they arose. Called partnering, the technique allowed architect, client, and contractor to finish projects on time and within budget and to build together happily ever after.

### Trust and teamwork

For many architects accustomed to the adversarial relationships that often develop during building projects, partnering's promise of increased harmony and decreased litigation sounds too good to be true. Many architects involved in recent partnering projects maintain that the organizational strategy can foster a smoother running, higher quality job. "We promote it because it is in our best interest," explains Scott Simpson, president of Flad & Associates, a Madison, Wisconsin-based firm that has been involved in several informal partnering arrangements. "We have a happy client who saves money, and a happy contractor, so we don't get sued."

Partnering describes a management method that breaks down traditional barriers between building team members, enabling them to work toward common goals. Based

on trust and teamwork, partnering emphasizes continuous, open communication between parties that might otherwise safeguard proprietary information and carefully document every action in case of a claim. Partnering's success requires all parties to put aside individual objectives and to work to resolve problems for the good of the project.

To some, partnering is a temporary, formal relationship created to manage a single project. To others, partnering refers to an ongoing, long-term business relationship between clients, architects, contractors, and suppliers that spans many projects. Both types of partnering are a component of total quality management, a strategy that promotes communication, worker participation, and statistical analysis to improve production (ARCHITECTURE, May 1992, pages 103-106).

### Setting project goals

Formal, one-project partnering was first launched by the Army Corps of Engineers' Portland, Oregon, district in the late 1980s to reduce litigation and its associated costs on several civil engineering projects. The one-project partnering process can be initiated by any member of a project team, but is usually adopted at the instigation of the client. The process is begun by inviting all involved parties—architect, engineer, contractor, subcontractors, suppliers, and client—to participate in a workshop. On small jobs, this workshop may consist of just one morning-long meeting at the owner's office; on a large job, a profes-

sional facilitator may be hired to conduct a two-day retreat held at a remote location.

The workshop enables participants to get to know one another and to share project concerns and agendas. Participants discuss their goals to ensure that everyone is working for mutual ends. Often this process involves reaching agreements about priorities that everyone can live with, says William Crockett, a project manager at Kansas City, Missouri-based Ellerbe Becket, who has worked within several partnering arrangements.

To illustrate, a partnering session was held for the \$190 million Oregon Arena complex designed by Ellerbe Becket and now under construction in Portland. During the workshop, the arena's two owners, the Oregon Arena Corporation and the city, resolved that meeting the completion date of October 1995, in time for the start of the basketball season, was more important than finishing the project within budget. What could have become a contentious issue was resolved in advance of a dispute through partnering.

#### **Open communication**

Key to the entire partnering process is the establishment of a system that opens communication and resolves conflicts at the lowest possible management level. Participants also establish a system to rapidly move the dispute to a higher management level, if necessary. "It's the nature of the construction process: On any given project there is going to be conflict," explains William E. Heitz, vice president and regional manager of Atlanta-based Heery International. "What partnering communicates is that the participants are all rational people and that conflicts can be solved in a rational manner."

The most tangible result of a partnering workshop is usually a written charter or mission statement that reiterates all agreed-upon goals and objectives and is signed by all participants at the close of the session. Usually, regular follow-up meetings are scheduled to monitor the partnering relationship.

One concern many architects voice about single-project partnering focuses on the timing of the first partnering session. On many projects, the initial partnering meeting is not held until just before the start of construction, after the architect has completed design documents. As a result, the architect is required to attend extra meetings at late stages of the project, sometimes without additional compensation, but does not gain the benefit of early interaction with other team members. The American Institute of Architects

advocates starting the partnering process earlier. "The architect and contractor can create a better project prior to design because they don't have to worry about late value engineering and changes after the design is finished," points out Christopher R. Clark, AIA's director of practice management programs and co-author of *A Design Professional Partnering Guide*, published this fall by AIA and the American Consulting Engineers Council.

One example of partnering early in the design process is the \$124 million addition to the Portland International Airport, designed by Zimmer Gunsul Frasca Partnership (ZGF). Although formal goals were not written down until the project team had been working together for two years, project participants credit partnering with allowing the complex job to be constructed with a minimum of difficulty. A three-day partnering workshop that included the contractor, construction manager, and airport officials "helped set up a good project chemistry," says ZGF Managing Partner Robert G. Packard. The participants worked on a fast track, with far less fighting and disagreement than could be expected on a project of this complexity. At a follow-up session last winter, team members developed a strategy to lop 10 months off the construction schedule to appease the airlines and cut costs.

But even on projects where a collaborative process does not begin until the start of construction, partnering can provide an opportunity for the architect to assume a greater leadership role. "The professional facilitator has a role to play for two days every three months, but during construction, someone has to play that role day-to-day," explains Heery's Heitz. "The architect or program manager can lead the group's cooperative efforts, helping to keep the lines of communication open and resolve disputes."

#### **Strategic partnering**

While single-project partnering holds out the promise of better, more cooperative and efficient working relationships, long-term or *strategic partnering* offers even greater potential, according to its advocates. Under strategic partnering, two or more parties commit to work together to achieve business goals. They agree to share information without regard to organizational boundaries over a series of projects, says Donn E. Hancher, chairman of the Construction Engineering and Management Department at the University of Kentucky and author of *In Search of Partnering Excellence*, published in 1991 by

the Construction Industry Institute, a consortium of major U.S. owners and contractors. These long-term relationships have their roots in the process and manufacturing industries. DuPont and Shell Oil, for example, employ strategic partnering on an ongoing basis with engineers and contractors.

Under strategic partnering, two parties integrate their individual skills and cultures for their mutual benefit, with all of the employees, from the CEO on down, committing to the agreement. Although the companies remain separate entities, they may share computer systems, telephone systems, and office space and often develop common business plans, practices, and strategies. Like single-project partnerships, strategic partnerships are based on trust, openness, and early problem-solving. They seek solutions that benefit all participants. "With a long-term working relationship, there is no need for everyone to get in their corners and buy lots of insurance and [hire] lawyers," says Hancher. Individual parties benefit from the ability to constantly improve their product, applying what they learn from one job to the next, he explains.

BSW International, a Tulsa, Oklahoma-based practice, is a very strong proponent of strategic partnering. The firm has established many long-term working relationships with its clients, with other professional disciplines, and with suppliers. According to Principal Robert C. Workman, BSW seeks out clients that will commit to hire the firm for several projects. Its major clients include Wal-Mart, which commissioned hundreds of projects. Workman explains that the process of long-term partnering between BSW and Wal-Mart mirrors single-project partnering but is more intense. BSW and Wal-Mart employees meet regularly to assess goals, objectives, and results and to suggest refinements to process and product. Employees work in each others' offices and attend joint training sessions in interpersonal relationships, project management, and other subjects.

BSW also maintains key partnering relationships with a structural engineering, a mechanical and electrical, plus a civil engineering firm, as well as with its printing supplier and its overnight airmail delivery service. Workman brushes aside conventional wisdom that lower prices are possible by allowing suppliers to continuously compete for business. He claims BSW gets better prices and service by establishing an ongoing relationship with one source because that commitment lets the supplier devote its total resources to perfecting the relationship.

Despite these successes, partnering is not a panacea. "If you think this is a quick fix, you're wrong," maintains Hancher. "It really has to be a cultural change. It only takes one weak link and the whole thing falls apart." Indeed, if all participants do not wholly subscribe to partnering's tenets, tensions can develop. Some architects say they feel that an everyone-for-himself spirit remains just below the surface of some partnering agreements. Others fear that the agreement will be used as a club by the contractor who wants changes approved or hopes the architect will overlook minor problems at the job site.

### **Legal ramifications**

Many believe partnering is more difficult to implement in a recession, when architects and contractors have lowered their fees to get work. Partnering can not occur if all parties are not willing to enter into the spirit of the agreement, with the owner willing to pay a fair price for services and the building team members willing to work to let all participants come out ahead.

Ironically, some professionals are quite concerned that the partnering charter could become a tool used against architects in lawsuits. Although the charter is generally not thought to establish or replace a legal or contractual relationship between parties, and has not yet been tested in court, Frank Musica, a lawyer with insurer Victor O. Schinnerer & Company, warns that the partnering charter may be perceived to be a modification of the owner/architect contract that creates a higher standard of care for the architect. The charter also establishes for the first time a contractual relationship between the contractor and the architect that the contractor might use in court. The contractor might claim delays, for example, because the architect agreed to resolve disputes in a timely manner and then failed to resolve them as quickly as the contractor wanted, explains Musica.

Problems like these have kept many architects from sharing the same enthusiasm for the practice as already shown by contractors and owners. But many believe that as more value-conscious owners begin to adopt partnering, an increasing number of architects will become familiar with this management process and take advantage of the opportunities it provides. "Partnering is really going back to the way architects, clients, and contractors used to work," maintains RTKL's Chairman Harold L. Adams. "It fosters a more relaxed, friendly feeling; more respect; and a better rapport."—*Virginia Kent Dorris*



# BELDEN BRICK IN 116 OF YOUR FAVORITE COLORS\*

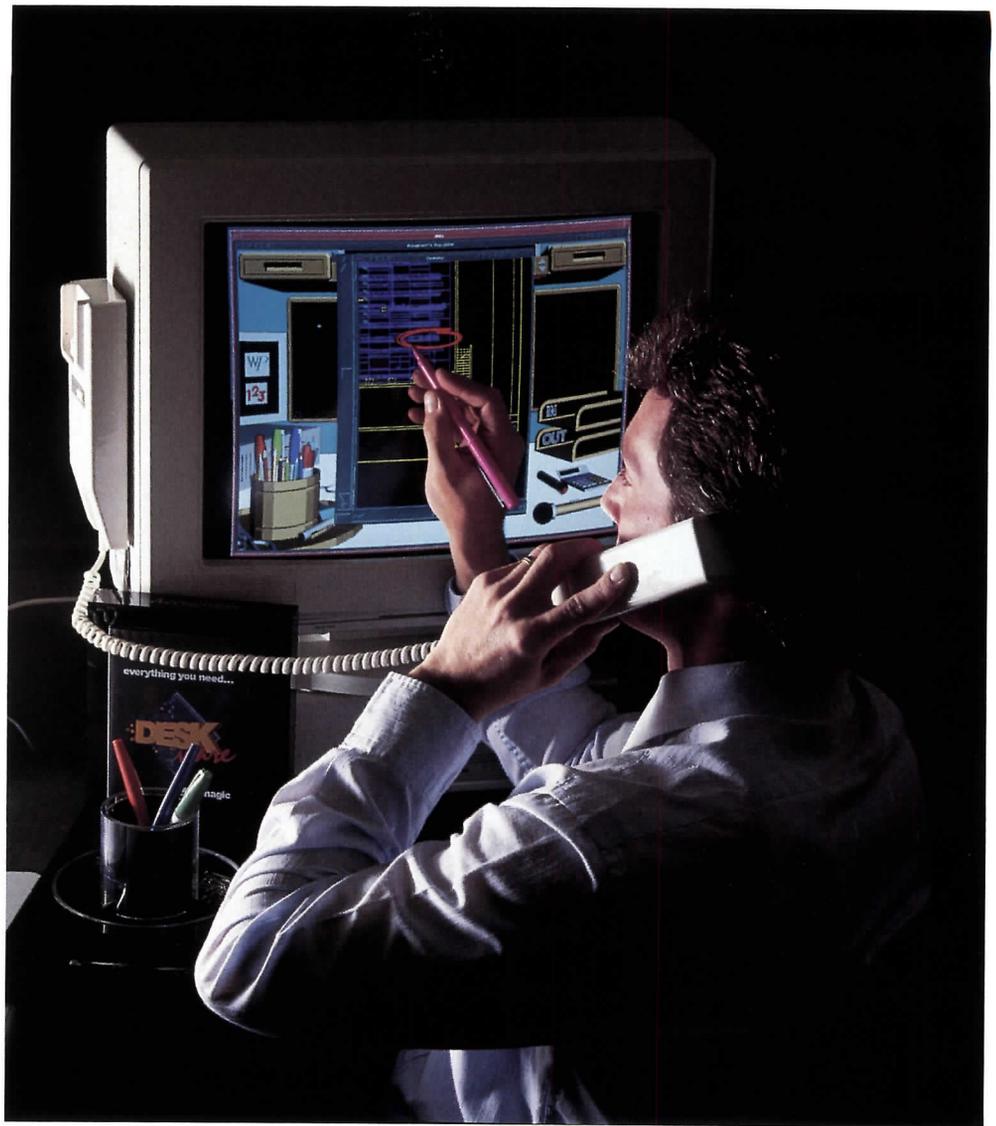
- \* 2 Choices in black
- 28 Choices in brown
- 7 Choices in tan
- 8 Choices in buff
- 3 Choices in cream
- 18 Choices in gray
- 16 Choices in pink
- 26 Choices in red
- 8 Choices in white

Whatever color of brick is your favorite, the 116 colors we're currently making for stock will quite likely include the one chromatically in tune with your composition. If not, let us know. We're capable of many others. □ You can also choose from 7 standard sizes and 11 textures, although not all colors are available in all sizes or all textures. □ Further, we offer a wide selection of special shapes (over 200 at last count) plus the ability to custom-make ones of your design. □ In one area we do limit choice – quality. If it isn't the best, it isn't from Belden.



## Desktop Tools for Architects

*New software eases proposal writing, accounting, and construction administration.*



**ABOVE RIGHT:** Accugraph introduces the MagicDesk interface to improve communications within design teams.

The phrase “architectural software” commonly evokes images of sleek renderings or precise production drawings. But the day-to-day work of an architect includes much more than design and drawing. There are phone calls to make, consultants to meet, calculations to perform, proposals to write. Software to support these disparate functions makes architects more productive in small but important ways. The programs described on the following pages are merely a sampling of the thousands of tools that ease an architect’s daily activities.

### Managing projects and costs

Powerful project management software (ARCHITECTURE, October 1991, pages 103-106) can be daunting to professionals without special expertise. However, one new, low-cost program from Concord Business Tools, QuickGantt, caters to senior partners who need fast answers but who may not be computer experts. QuickGantt accepts input

in a spreadsheet format and produces Gantt charts indicating the sequence of project activities, who is to perform them, how long they will take, and how much they will cost. Thus, architects can easily estimate time and cost for proposals or determine staff capacity.

A software proposal system from A/E Management Services, RFP, is one of several available programs to help with generating 254/255 forms for government proposals. This software maintains and organizes a firm’s data about projects, consultants, employees, and prospects. Reports can be printed as 254/255 forms, or they can be customized for private-sector proposals.

Financial management is another important yet often neglected aspect of architectural practice. MacArchitect is a new program by Beedee Corporation that helps practitioners assess the firm’s financial health; track project performance and cash flow; calculate efficiency ratios, multipliers, and profit margins; and perform job costing, billing, and



**TOP:** Total Information Management System (TIMS) brings the power of geographic information systems to architects and facility managers.

**ABOVE:** With TIMS, plans and isometric views can be displayed with color for spatial and numerical data.

other accounting procedures. Springfield, Oregon-based architect Don Lutes, who practiced for 30 years without the benefit of such tools, now introduces MacArchitect to students at the University of Oregon. According to Lutes, "This software speaks the language of architects, not accountants. It tells you where you are in a project so you can organize the remaining work to stay within your time and dollar target." He believes that fee management is a basic health, safety, and welfare issue because it affects the quality of work. "When architects don't know where they are on a project," Lutes explains, "they run short of time and dollars toward the end of construction document preparation. This lack of preparation results in a short time period for checking and coordination, leading to expensive change orders and a reputation for not being very precise."

### Organizing the office

The Macintosh computer made the "desktop" metaphor popular, with graphic icons representing programs, drawings, folders of information, and so on. This visual environment, now also found on other computers, offers accessibility to nonexperts. Frank Mascia of Tuscon, Arizona-based CDG Architects has extended the metaphor by creating the Architect's Office, a set of HyperCard stacks equivalent to a Rolodex, client files, CSI specifications, a datebook, field report forms, and other organizational tools. His firm also offers a series of checklists in an electronic format.

Now, Accugraph, a manufacturer of high-end CAD software, has introduced MagicDesk, which carries the desktop metaphor still further. MagicDesk's interface looks like a real desk, complete with familiar accessories. For example, to start redlining a drawing, the user clicks on a red pen in an image of a cup of pens and pencils. Notes can be written on slips of yellow "paper" and attached to any document. Any combination of drawings, specifications, spreadsheets, faxes, recorded speech, or photographs can be linked together and sent electronically to a receiver who can review and respond without necessarily knowing how to run the programs that generated the information.

Heizer Software offers several architectural templates, accessible to anyone who knows Excel. The Solar Calculator, as one example, plots a sun position chart for any North American location. Unlike conventional solar charts, these templates are adjustable for local longitude and latitude. Another Heizer program is the Architect's Fee Estimator, to

aid in preparing client contracts. The architect provides information about salary rates, estimated time per person per design phase, office multiplier, and consultant and contingency costs. The software then calculates a fee, which can be fine-tuned by manipulating the project variables. At the end of a job, actual costs can be entered to form a database for future reference. Also available from Heizer are Beam Analysis, Stair Calculator, and general-purpose accounting templates.

### Linking CAD to data

Many architects have failed to achieve productivity gains with CAD because they have not yet adjusted their old work habits to the new high-tech design environment. According to Orinda, California-based architect Fred Stitt, whose company, Guidelines, offers standard CAD details and checklists for planning and managing drawings, "What's needed is a drawing management system, a set of procedures and standards that will put an end to the chaos of errors and inconsistencies." The Guidelines Master Detail System includes building components that can be recombined for custom detailing, notes Stitt.

Most of the major CAD systems have added productivity features in recent years. These features make the systems' power more accessible to inexperienced users and allow data sharing between different kinds of software. For example, Autodesk's latest version of AutoCAD and ISICAD's CADvance feature object linking and embedding plus dynamic data exchange. They allow, for example, CAD graphics to be exported to a desktop publishing program for illustrating marketing brochures. Intergraph's MicroStation now sports links between CAD and spreadsheets or relational databases that allow the graphics to be "driven" by the data. MicroStation also provides a choice of interfaces, depending on a user's discipline and prior CAD experience.

The Productivity Tools module from Autodesk ASG offers a spreadsheet and word processor that share data with CAD. Within CAD, the module helps architects manage defaults and drawing revisions and develop renderings. One Productivity Tools user is David Morgareidge, the CADD team leader of the Haskell Company in Jacksonville, Florida. He particularly likes the software's ability to make "slides," or AutoCAD images, of standard detail drawings for use with symbol libraries. "Normally building a slide is a tedious process," Morgareidge explains, "but this facility makes it easy. And the graphical representation lets you distinguish between

details as you insert them in a drawing." A design and construction firm, the Haskell Company is also experimenting with the Productivity Tools' bill of materials capability as a means of communicating between the firm's design and construction groups.

Architectural drawings often communicate a clearer sense of scale and realism when populated by human characters. But in many computer drawings, people are just pasted-in images, and there is no guarantee that real people would fit into the space the way the images do. The Mannequin software, from Biomechanics Corporation of America, in Melville, New York, creates ergonomically accurate human forms, in both 2D and 3D, for testing the human scale of designs. The forms can be specified by age, gender, size, and ethnic origin. Within Mannequin, the models can be moved to a variety of positions, and their movements are automatically constrained according to the limits of human reaching, grasping, and walking. The models can be shaped to assume any position and can be made to "walk" in animations.

The power of geographic information systems is starting to be felt in the design and facility management arenas. For years, these systems have been more suitable for regional-scale planners than for building-scale designers. Recently, however, because of their links to familiar architectural CAD systems, they have grown in their utility to architects. Object Graphics has developed several such programs. The Total Information Management System, for use with AutoCAD Release 12 (TIMS R12), links drawings with databases. Beyond the capabilities of most CAD systems, which provide a one-to-one link between a graphic entity and a database entry, TIMS R12 allows data searches by spatial criteria. Object Graphics' new software, Seamless Mapper, allows the user to query a virtually unlimited number of drawings at once and "see" them as a single drawing. The program works on both 2D and 3D files, so graphic output can consist of color-coded plans or even 3D projections, which can be exported to rendering or animation software.

New programs are available to assist in compliance with the Americans With Disabilities Act (ADA). ADA Survey, from Caolo and Bieniek Associates, provides a graphic format to the ADA Checklist developed by Adaptive Environments Center and Barrier-Free Environments. Architects load in a scanned or CAD-generated plan and place symbols representing the particular kind of barriers found in a facility. Built-in symbols

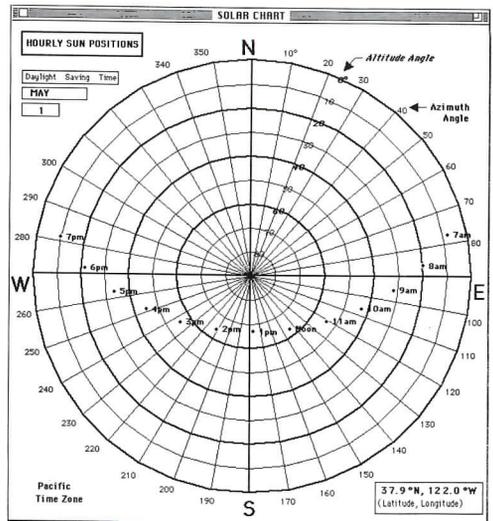
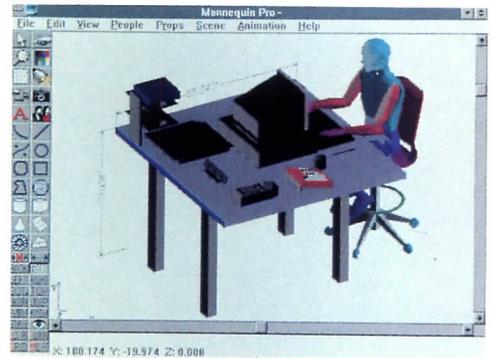
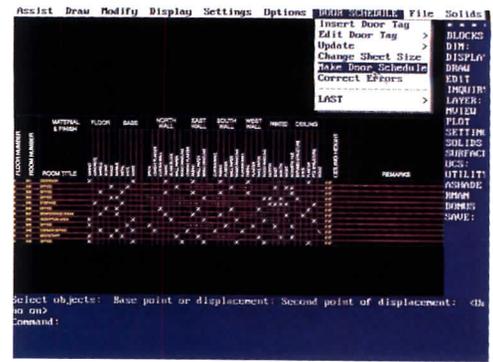
include those for entrance accessibility, parking areas, door controls, and restrooms, among other barriers. Add-ons to the software count the occurrence of each barrier type and estimate the cost of removing it. The software also has electronic links to the ADA Searchware (ARCHITECTURE, February 1993, pages 111-113), available from the AIA.

### Construction administration

Numerous construction administration tasks lend themselves to automation. When planning work on the four-building Suffolk County Courthouse project, MGA Partners of Philadelphia worked with Mark Aseltine, a computer consultant and University of Pennsylvania professor, to create the Punch List Database to organize their construction review notes. The system allows architects, clients, and consultants to make comments on construction problems and degree of completion for each room. A predefined list of problem categories ensures that the reviewer doesn't overlook anything. The data can be input in any order, then sorted in a variety of ways, such as by items not yet corrected. Although the database was designed specifically for one project, a similar database could be customized for any building.

BeneLog is Windows-based software, from Okoh, Gurevich & Co., that tracks shop drawings and other documents as they travel between architects, consultants, and contractors. Tied into a database system, the software allows drawings or other documents to be organized by specification section, consultant, contractor, or date. Architects can track who has which documents and for how long, identify bottlenecks in the process, and generate statistics about who is responsible for delays. Dennis Dambreville, an architect with James Stewart Polshek and Partners, in New York, uses it to maintain shop drawing submissions. He appreciates that BeneLog makes it easy to move between spec sections and to track the number of days the submissions are in-house or with a contractor or consultant. "We have found this software makes submittal procedures go faster," notes Dambreville, "and we have fewer problems with subcontractors."

James Stewart Polshek and Partners and other New York architects were instrumental in the design of the software, which was based on their lists of common problems in construction administration. The architects' participation in software development pays off in the programs' utility and close fit with architectural work.—*B.J. Novitski*



**TOP:** The Architectural Schedule Generator, from L.E. CADD Corporation, compiles AutoCAD plan data into door, finish, and color schedules.

**CENTER:** The Mannequin software creates ergonomically accurate human forms, in both 2D and 3D, for testing the human scale of designs.

**ABOVE:** The Solar Calculator Excel template plots a sun position chart for any North American location.



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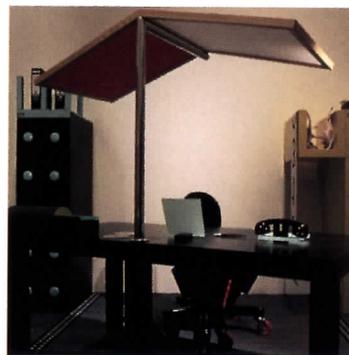
## Products

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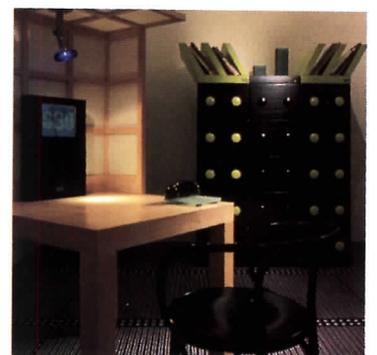
**TOP:** Interlübke, a German-based manufacturer of system furniture, addresses the 1990s collaborative workspace with interconnecting modular workstations, shelving, and storage components. Peter Maly, a Hamburg-based designer for Interlübke, combines a circular pedestal table and the company's Cockpit desk to form Duo Cockpit, an executive workstation and conference table that measures 235 cm long. The adjoining work surface features a roll-out drawer unit for storage and a modesty panel. Coupled with a 120-cm circular attachment, it provides a four-person conference table, finished in wood or lacquer. *Circle 401 on information card.*

**ABOVE:** Evanson Studios introduces High Rise, a collection of furniture for the home or office designed by James Evanson, a New York designer. The suite incorporates maple, natural, and cherry finishes or black lacquered oak, interconnected with industrial powder-coated tubular steel. The collection



comprises a desk with optional elevated circular stand and side drawer; a console available with storage cabinets or shelving; low or high side tables or cabinets available in various sizes and numbers of drawers; a stacking chair finished in lacquered wood or upholstered. Custom finishes include hand-rubbed graphite and plastic laminate. *Circle 402 on information card.*

**ABOVE:** Milan-based designer Ettore Sottsass most recently contributed to "Citizen Office: Ideas and Notes for a New Office World," an exhibit staged this summer by the Vitra Design Museum in Weil am Rhein, Germany. One piece in the show was his executive workstation, Desk with Small Roof. It comprises a table of black lacquered ash, with gold-plated metal applied around the base of the table's legs. Rising from the table's surface is a chrome-plated steel post supporting a bent, rectangular ash frame supporting panels of red and white taut linen. This canopy forms a roof over the desk



to indicate executive status; according to Sottsass, the red and white panels symbolize life and prosperity. His chair, called Caddy, is designed with high back support and two side pockets for cellular telephone, notepad, and pencil storage. Sottsass's four-drawer metal filing cabinets with wooden knobs, handles, and locks are available with slanted dividers, or topped with a cantilevered storage unit. *Circle 403 on information card.*

**ABOVE:** Vitra's Concentration Desk by Ettore Sottsass is naturally finished ash with gold-plated metal at the base of each leg. An ash grid infilled with a thin opaque plastic forms the desk's roof and privacy wall. Sottsass's metal filing cabinets can stand alone or be joined as units. Artos 3, manufactured by Zumtobel and designed by Sottsass, is an adjustable lamp with a cobalt-blue glass shade enveloping the bulb. The gridded carpet is designed by Sottsass for Vorwerk. *Circle 404 on information card.*



## REFLECTIONS

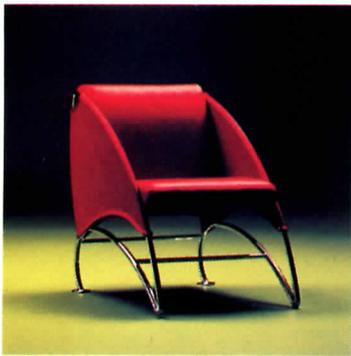
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Circle 177 on information card



### Dynamic chair

Stephen Preisig of Tribeca Design in London is inspired by movement, which he incorporates in his designs. Preisig's Ascari (above), named after an early-1950s race car driver, is scaled for small offices, plus waiting and lounge areas. Ascari's frame is bent tubular stainless steel enveloped in leather or fabric. *Circle 405 on information card.*

### Dutch chairs

European manufacturer Montis offers Charly and Chaplin designed by Amsterdam-based designer Gerard Van den berg. The Dutch desk and lounge chairs are designed and man-

ufactured in Dongen, Holland. The Chaplin desk and dining chair measures 24 inches long by 24 inches wide and 39 inches tall. The lounge chair, Charly, is longer and slightly wider, measuring 29 1/2 inches long by 25 1/2 inches wide and 39 inches tall. The slip cover rests on a metal frame with foam cushions; the slip-covered seats are available in Montis' line of velvets and leathers or in designer-specified fabrics.

*Circle 406 on information card.*

### Molded chair

American Seating's new sled-base office chair is designed in collaboration with designer Don Chadwick and Du Pont. The Evo side chair flexes and conforms to human dimensions with the aid of Du Pont's Zytel nylon, an advanced glass-reinforced copolymer resin. Du Pont's innovative material forms the seat, spine, and back of the chair as one continuous body and molds to the curvature of the user's movements. The waterfall edge design of Evo's seat cushion alleviates pressure points that can restrict circulation. The cushion's deep contours also aid posture alignment. *Circle 407 on information card.*



### Modular seating

The Futu Modular Lounge seating (above) is designed by Fuss Design of Germany for the Brayton International Collection. Futu's basic component in its lounge system is a single seat, with or without arms, available in several powder-coat finish colors or stainless steel chrome. Intermediate tables are attached to the chairs, which can be arranged with the seating to form a variety of different configurations, ranging from circular to serpentine designs. Futu adjoins or enhances its seating with rectangular or elliptical free-standing tables. *Circle 408 on information card.*

### Teamwork casegoods

Teamwork, offered by Metropolitan Furniture, was developed by the Metro Design Team and Brian Kenneth Graham in association with the Gensler Product Design Group for shared workspaces. Teamwork accommodates mobile equipment with a wheel-based utility cart, a lectern/overhead projection cart, and mobile presentation easel. Conference and meeting tables are available with pedestal or leg base options. Stacking tables provide personal workspace during conferences and workshops. The Fifth Wall, a free-standing storage unit, may house presentation equipment, a television, videocassette recorder, slide projector, erasable presentation board, and display rail. The Teamwork collection is available in Metro's metal, wood, and laminate finishes. *Circle 409 on information card.*

### Storage system

Jean Beirise, who has designed furniture for Herman Miller since 1986, has developed the Liaison cabinet system that frees the work surface of clutter. The cabinets can be outfitted with shelving, vertical or lateral fil-

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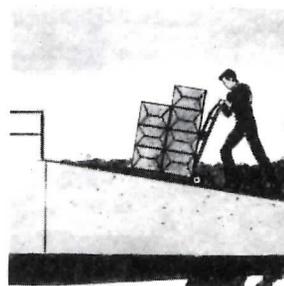
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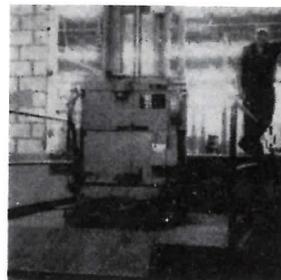
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ing slots, storage with flip doors and locking mechanisms, and spaces for phones and fax machines.

Circle 410 on information card.

### System enhancements

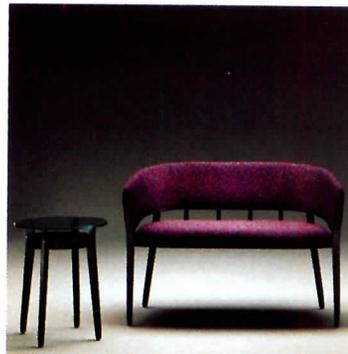
Series 9000 (above), a furniture system manufactured by Steelcase, was introduced in 1973 to address the changes in the workplace. Series 9000 continues to fulfill current office demands with new field-replacement panel surfaces that are compatible with the older panel series. The panel surfaces are easily replaced for esthetic or functional changes, without disrupting office employees. Pull-up receptacles help

control surface clutter while providing electrical power and data outlets at work surface height. Series 9000 binder bins and shelving now offer recessed task lighting: Eclipse II, is a variable-intensity task light; and Nimbus, is a new high-intensity light with a special diffusing lens that dramatically cuts glare and improves light distribution. The Valencia collection has also been integrated into the Series 9000 for complete freestanding wood furniture and components.

Circle 411 on information card.

### Affordable filing

LogicFile, a new, low-cost lateral-file series produced by Allsteel, is priced 20 percent less than the company's premium lateral files. The file is constructed of multifomed 16-gauge-steel front and rear posts for stability. The heavy-duty safety-interlock mechanism allows access to one drawer at a time. This feature prevents the file cabinet from tipping. LogicFile stores letter and legal documents in side-to-side or front-to-back filing. The cabinets are offered in 12-inch-high roll-out drawers and 13-inch-high roll-out shelves with



receding doors. LogicFiles are available in two- to five-level versions; 30-, 36-, or 42-inch widths and six color finishes are available.

Circle 412 on information card.

### Tables and chairs

Charlotte offers Citrus (above), a group of chairs and tables designed by David Ritch of Los Angeles-based 5D Design Studio. The Citrus group comprises chairs with or without arms; a settee; a round-end and coffee table; and oval-shaped table. Table bases are visible through a 1/2-inch thick, clear, polished, and seamed-edged glass top.

Circle 413 on information card.

### Midmanagement casegoods

Lunstead, a Haworth company, offers its Marlowe Series casegoods for middle management and private offices. Marlowe's contemporary designs are carried through the desks, credenzas, and storage units. The signature feature of the line is a tapered leg, detailed and fashioned from hardwood solids. Reversed bevel edges and angular pulls appear throughout for continuity. Marlowe is available in cherry and maple. Enhancements include bow-front tops; an ebonized inlaid reveal on case-good tops; and etched metal tops.

Circle 414 on information card.

### Pen plotter

CalComp adds a new plotter to its DesignMate series. Model 3036 is an E-size plotter that costs less than \$3,000 with the capacity to plot eight colors with pen sizes A through E. The plotter system comprises a set of four liquid-ball color pens; a standard floor stand; an RS-232 serial cable; a driver for Microsoft Windows; and an enhanced Autodesk driver for AutoCAD releases 10, 11, and 12.

Circle 415 on information card.

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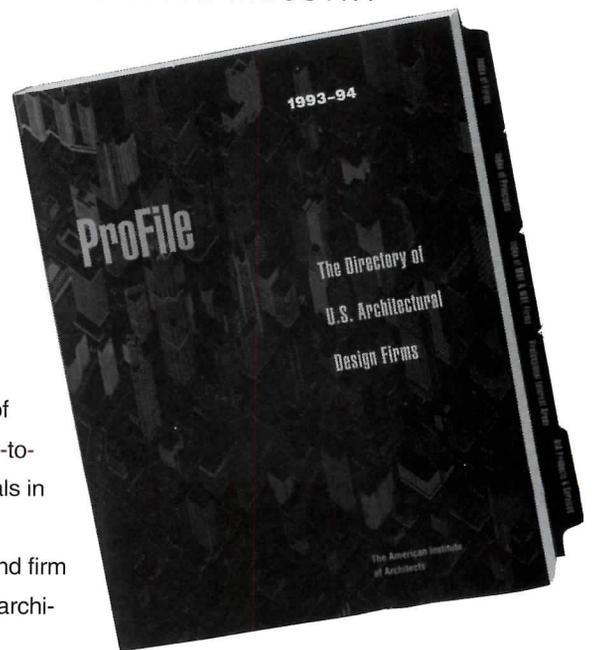
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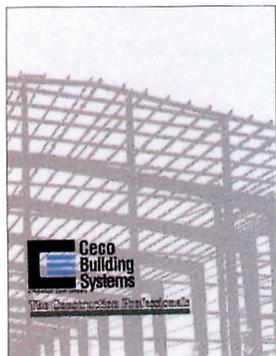
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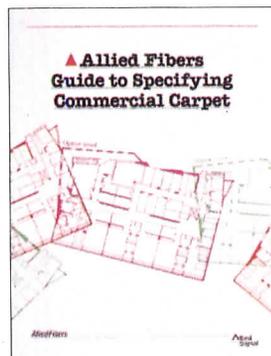
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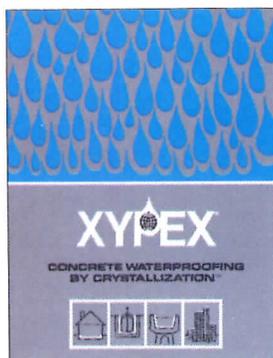
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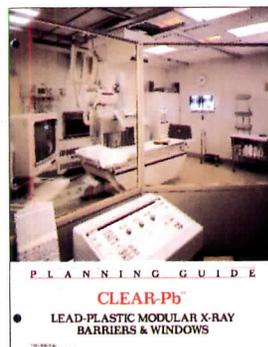
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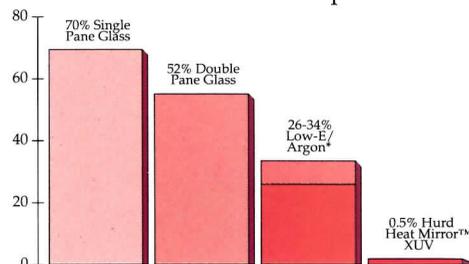
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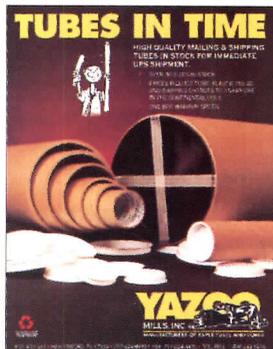
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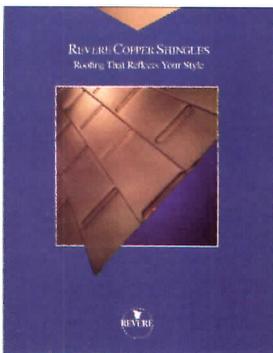
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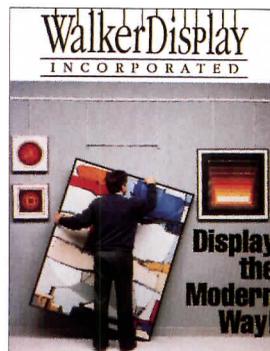
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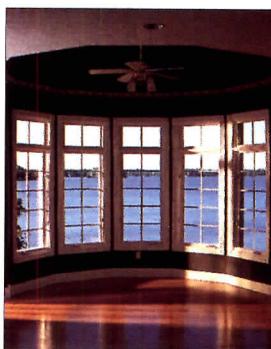
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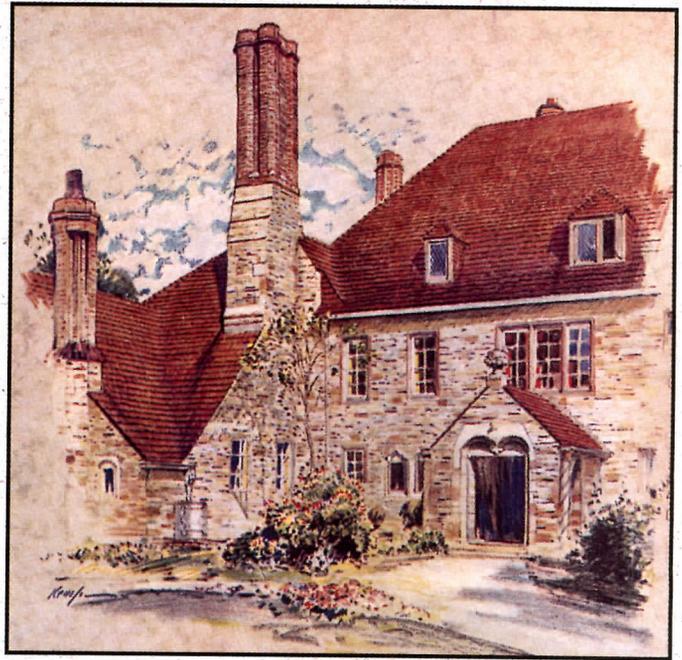
*Architect Richard Powers based his 1926 design on the timeless look of a*

# ALL UNDER ONE ROOF

*16th century English country house. He specified a durable, beautiful version of Ludowici's Provincial tile to match the enduring beauty of the design.*

*In the years since, this majestic structure has been the residence of a prominent Chicago businessman, the national headquarters of a fraternity, and, today, the Evanston Art Center.*

*All under one roof.*



The Ludowici roof as proud owner's art investment and architect's trophy component.

1926



1993 The very same work of art as cost-efficient, workhorse tile. The Ludowici roof is the lowest-cost roofing material over a structure's life cycle, in this case flourishing through sixty-seven Chicago winters.

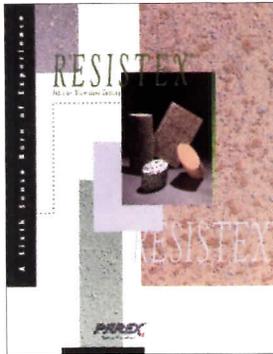


**LUDOWICI-CELADON, INC.**

*Specifying the beautiful durability of Ludowici-Celadon for any project assures it a place in history. Our fired-clay roofing tiles come in an endless variety of styles and colors, and offer the added assurance of a half-century limited warranty. Call us for more information.*

A CertainTeed Company • 4757 Tile Plant Road • New Lexington, Ohio 45764 • 1-800-945-8455  
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## Parex Inc.



**Resistex®** - Durable interior decorative wall coating for heavy traffic areas where durability and design are necessary. Resistex is the ideal wall coating for heavy traffic areas such as lobbies, hotel and hospital rooms, schools, etc. It is available in any desired custom color and various Finish coat textures. Resistex is mildew resistant, vapor permeable and scrubbable. It can be sprayed or troweled onto a variety of substrates for retrofit as well as new projects. To receive Resistex literature, call 1-800-LEP-AREX (537-2739).

Circle 31.

## 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 35 on information card or phone (416) 730-9090.

Circle 35.

## Louisiana-Pacific



Nature Guard insulation costs less than fiberglass and has a 3.8 R-value per inch - higher than rockwool or fiberglass. 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 39.

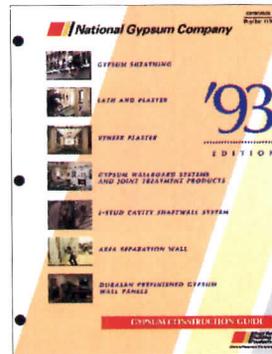
## Truebro



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

Circle 43.

## National Gypsum Company



**New Gypsum Wallboard Construction Guide.** National Gypsum's 140-page Gypsum Wallboard Construction Guide is a complete reference library designed to meet the needs of architects, specifiers and contractors. Written in the CSI/Master Format System, each section is color coded and contains technical data, detailed drawings, specifications and recommendations for installation. For technical information call 1-800-National.

Circle 33.

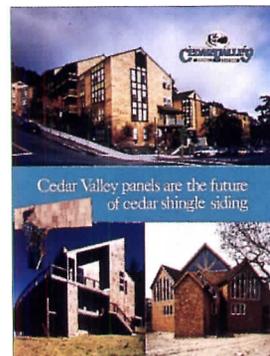
## WireCrafters Inc.



**MESSARAIL 420 RAIL SYSTEM.** Attractive rail system for mezzanines, aisle ways, and loading docks, combines rail and wire panel into one unit. Better than multi-rail systems because it prevents objects from passing between rails. Fast setup, just two bolts fasten panel sections to posts. Deck or face mounting options. Meets OSHA and BOCA guardrail load requirements. Send for free brochure. WireCrafters, Inc., 6208 Strawberry Lane, Louisville, KY 40214, 800/626-1816.

Circle 37.

## Cedar Valley Shingle Systems



The future of cedar shingle siding is the theme of Cedar Valley's new 8-page 4-color brochure detailing the panelized exterior siding system. Included are specifications, product descriptions and illustrations, finishing and application information, and nearly four pages of color photos of significant projects by leading architects throughout the U.S. who used conventional and Decorator shingle panels. Cedar Valley Shingle Systems. Phone 800-521-9523. FAX 408-636-9035 or

Circle 41.

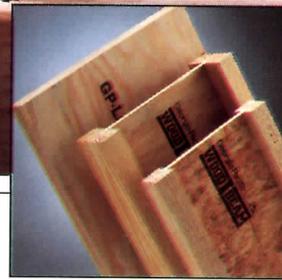
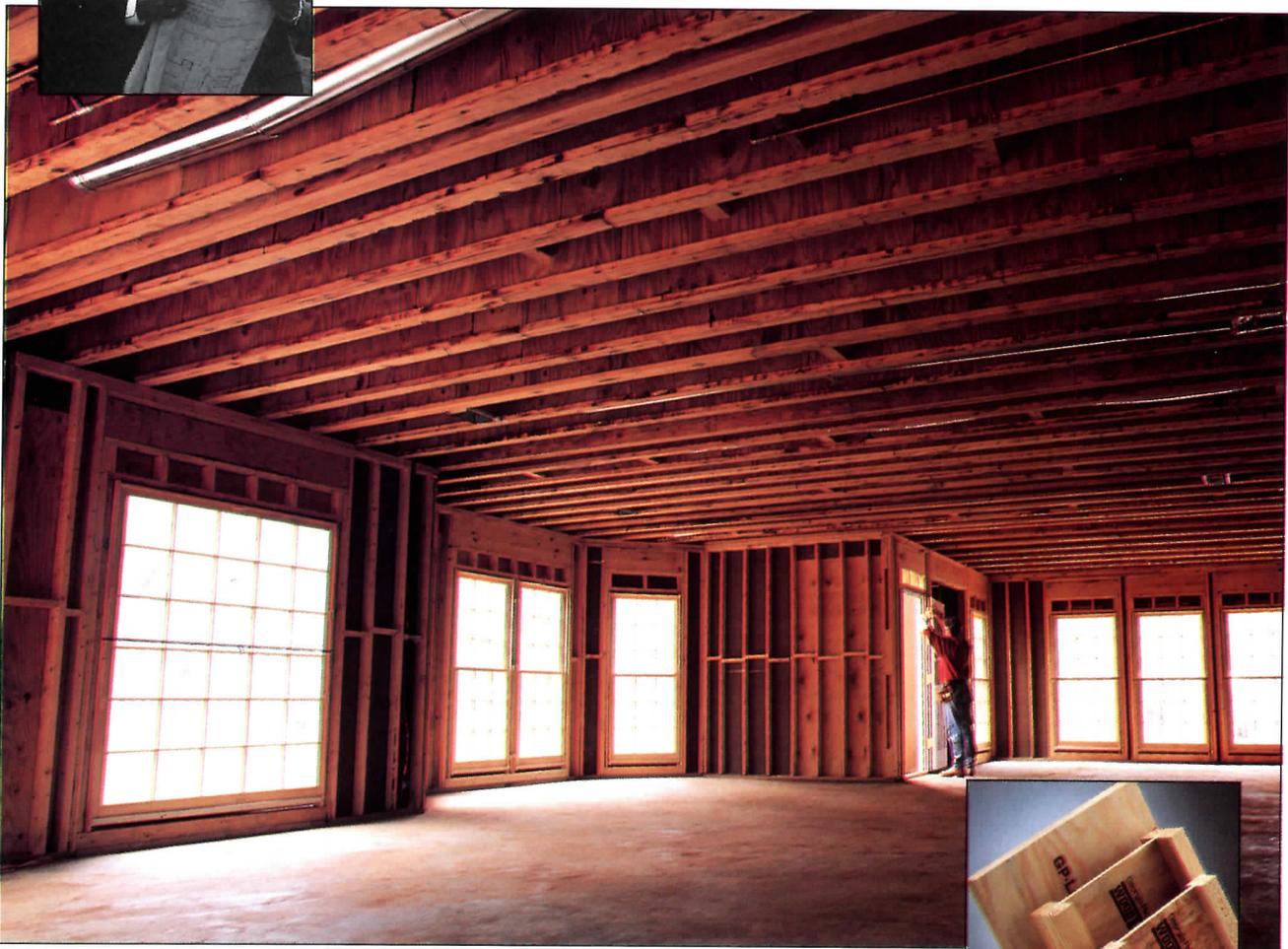
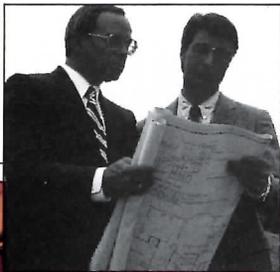
## Georgia-Pacific



**Dens-Glass® Gold**—Extensive overview on unique Dens-Glass® Gold exterior sheathing by Georgia-Pacific. Covers application diagrams, installation procedures, warranty details, architectural specifications, recommendations for framing, fastening and joint treatment along with product comparison charts. For your FREE copy, call 1-800-BUILD-GP and ask for Literature Item Number 102250.

Circle 45.

*"Your Wood I Beam™ is going to allow me unsupported spans up to how many feet?"*



**G-P:** Wood I Beam joists have more load-bearing and spanning capabilities than dimensional lumber, so you can design with up to 48' spans\*.

**YOU:** ...without cluttering up open space with support columns. It'd be ideal for a great room, a bonus room over a garage, a finished basement.

**G-P:** Speaking of basements, Wood I Beams allow higher ceilings because you can pass utilities and duct work through the beams.

**YOU:** What about floors? Does it help avoid squeaks?

**G-P:** Absolutely. G-P Wood I Beams are built to resist the warping and twisting that create those squeaks.

**YOU:** Will I be able to use Wood I Beams if I spec conventional lumber in the flooring system too?

**G-P:** Yes—G-P Wood I Beams are compatible with standard dimensional lumber sizes. And you can get long lengths, even up to 60', for just about any design you can dream up.

**YOU:** Of course, I wouldn't know how to design with it

*after using dimensional lumber for 15 years...*

**G-P:** We'll help with that, and we can do take-offs for you.

**YOU:** Well, anything that expands my design options solves some big problems for me.

**G-P:** So—no more questions? Come on, I'm just getting warmed up...

For more information about G-P Wood I Beam joists and headers, call 1-800-BUILD G-P (284-5347), Operator 730. (Ask about G-P Lam® laminated veneer lumber, too.) Or check Sweets Section 06190/GEO.

Solve it with G-P.™



Georgia-Pacific

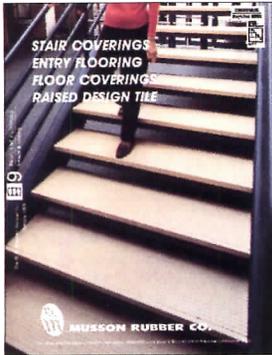
OFFICIAL SPONSOR OF THE 1992 U.S. OLYMPIC TEAM

\*Depending on space, loading and beam size.

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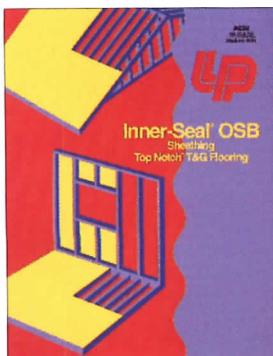
## Musson Rubber Company



**FLOOR and STAIR SAFETY**—Learn more about VI (Visually Impaired), Fire Safety and other rubber floor and stair tread systems featuring marbled or plain, raised and surface designs in new popular colors. Also included is the latest entry flooring such as Disco, Low Disc, Square, Diamond, Fluff Cord and Traffic Tiles along with colorful illustrations and helpful specifications. Write Musson Rubber Co., P.O. Box 7038, Akron, OH 44306; Phone 216-773-7651, Fax 1-216-773-3254.

Circle 47.

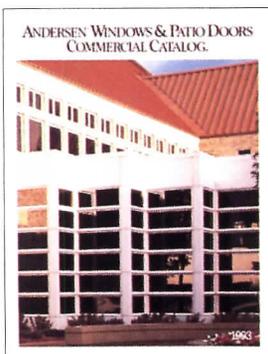
## Louisiana-Pacific



Long after construction, L-P's Inner-Seal Top Notch™ T&G flooring stays flat. With vertical notches in the tongue and panel ends, water on the job site drains and damage to the panel surface is prevented. Our moisture-resistant sheathing offers consistently trouble-free performance. On side-walls, swelling around windows is kept to a minimum. The panel is sound on both sides, edge-sealed, and easy to cut and nail.

Circle 51.

## Andersen Commercial Group



**1993 Andersen Commercial Product Catalog.** This 92-page catalog comes complete with detail drawings, color photographs and descriptions of all Andersen windows and patio doors for non-residential applications. Added to this are detailed specifications, product size tables and technical data. The catalog also offers comprehensive information on Andersen Reinforced Joining Material for proper reinforcement when combining Andersen windows and patio doors to create larger Andersen Feature Windows for non-residential applications.

Circle 55.

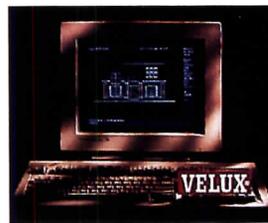
## ROBERTSON



Robertson, A United Dominion Company, can help make your curtain wall designs become reality. Formawall® Metal Spandrel Panels feature vertical and horizontal joinery designs. The two-inch thick panel is available with either honeycomb or insulating foam core. Formavue® Windows provide a complementary addition to the spandrel panels for a truly integrated system. **Robertson, A United Dominion Company.**

Circle 59.

## Velux-America Inc.



**NEW VELCAD SOFTWARE** — Velux introduces first CAD software designed exclusively for roof windows and skylights. Designed in Microsoft Windows™ 3.0 Operable within or out of AutoCAD®. Accommodates two levels of user experience. Can generate and receive DXF files. Allows printing of detail drawings and specs and, with AutoCAD, manipulation of elevations, drawings and schedules. Contains a drawing viewer for printing and viewing head, jamb and sill details. **VELUX AMERICA INC.**

Circle 49.

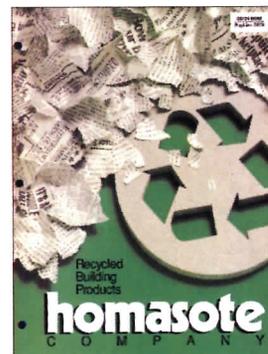
## LUDOWICI ROOF TILE



Beautiful Ludowici roof tiles have the lowest lifecycle cost in the industry. Other roofing materials have to be replaced roughly four times by the time Ludowici's industry-leading seventy-five year limited warranty expires. A wide variety of standard styles and colors and complete customization services are available. Call Ludowici-Celadon at 1-800-945-8453.

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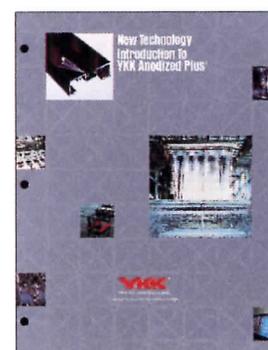
## Homasote Company



**Homasote Company's 1993 Sweet's Brochure of Recycled Building Products**—This easy to read brochure provides a comprehensive description of the Homasote Company's full line of recycled building products. Included are detailed specifications, general application data, a variety of test results, sizes, codes and other relevant information. The Homasote Company has produced top quality building materials from recycled newsprint for over 83 years. For more information contact Homasote at 1-800-257-9491.

Circle 57.

## YKK AP America, Inc.



YKK AP now offers a brochure revealing important new test results gauging the performance of Anodized Plus versus other surface treatments. As the literature illustrates, Anodized Plus provides a unique protective coating on anodized finishes that present four major benefits: finish consistency, enhanced protection of aluminum substrate, superior color and gloss retention, and resistance to chemical corrosion. To obtain this brochure, or information on other YKK AP products, call YKK in Atlanta at 404-344-2981.

Circle 61.

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GO WILD WITH COLOR!  
ENOUGH OPTIONS TO  
CONFOUND A CHAMELEON.



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Go wild with  
**FORBO VINYL  
FLOORING.**

The new standard in vinyl.  
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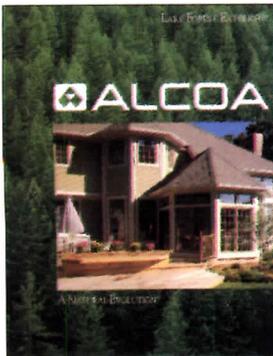
## Georgia-Pacific



**Wood I Beam™ Joists**—Complete reference guide for using Wood I Beam™ Joists by Georgia-Pacific in a variety of applications. Includes step-by-step information on installation, hole, load bearing cantilever and maximum span charts, along with architectural specifications, and pitched roof conversion charts. For your FREE copy, call 1-800-BUILD-GP and ask for Literature Item Number 123000.

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**Durable Lake Forest Exteriors Give Beauty of Cedar Without High Cost or Maintenance.** Lake Forest Exteriors capture the texture, character and natural beauty of cedar in a product designed to last a lifetime. A unique multi-layer thermal bonding process combines high-tech polymers and resins with a super-tough Kynar 500® finish that is resistant to UV rays, harsh weather and man-made pollutants. Available in a variety of exterior colors that further duplicate the look of cedar.

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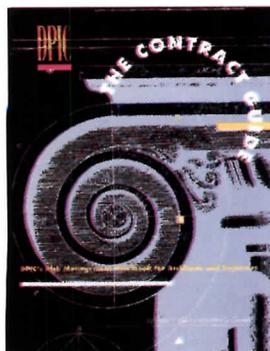
## American Olean Tile Company



**THE LOOKS YOU WANT**—Find hundreds of ideas easily with American Olean's new 50-page residential tile catalog. Over 35 products including glazed wall and floor tile, liners, quarry tile, ceramic mosaics and porcelain pavers. Arranged by usage, shows room scenes/color palettes of floor tile, wall and bath floor tile and wall tile. Circle reader service number for free copy.

Circle 71.

## DPIC Companies



**THE CONTRACT GUIDE: DPIC's Risk Management Handbook for Architects and Engineers.** Shows design professionals how to draft or revise contracts to minimize their liability exposure. 77 key risk management issues addressed. Each section defines liability issue, proposes solutions and offers sample contract clauses. Topics include ADA, asbestos, site assessments, dispute resolution, condominiums, indemnities, fast track projects. \$49.95 from DPIC Companies; 800/227-4284.

Circle 75.

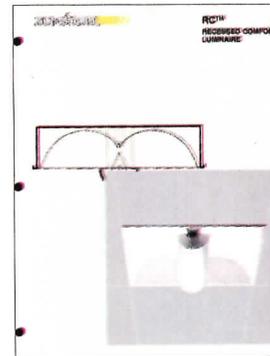
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**Disabled Accessible/Lead-Free Haws Drinking Fountain Brochure** features new indoor and outdoor drinking fountains and electric water coolers designed to meet the Americans With Disabilities Act (ADA) requirements. Includes "Hi-Lo" designs and "Hands-Off" electronic sensors. All are 0.0% lead-free, exceeding the Standards of the Safe Drinking Water Act and Lead Contamination Control Act. Contact: Haws Drinking Faucet Company; Phone (510) 525-5801, Fax: (510) 528-2812.

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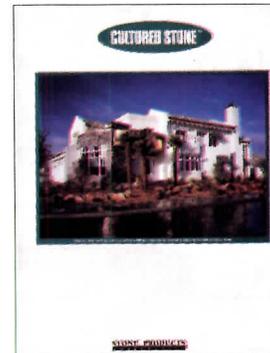
## Zumtobel Lighting, Inc.



**The RC™ Luminaire by Zumtobel**—The RC™ Luminaire, by Zumtobel Lighting, Inc. was designed as a revolutionary alternative to the standard recessed fixture. A semi-recessed fixture, measuring 2x2, and 2x4, the RC™ achieves the highest quality Indirect/direct light.

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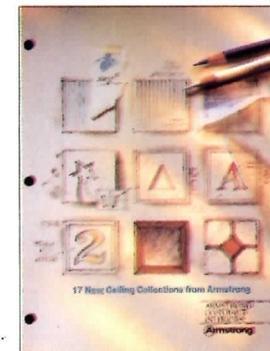
## Stone Products Corporation



**The Beauty of Natural Stone at a Fraction of the Cost.** Cultured Stone® is the lightweight alternative to full thickness stone. Easy to install—requires no additional footings or wall ties; over 50 colors/textures for interior or exterior applications; complementary Terra Craft® paving and landscape products; new brochure features an array of ideas and possibilities. Stone Products Corporation, P.O. Box 270, Napa, CA 94559, Phone: (800) 255-1727, Fax (707) 255-5672.

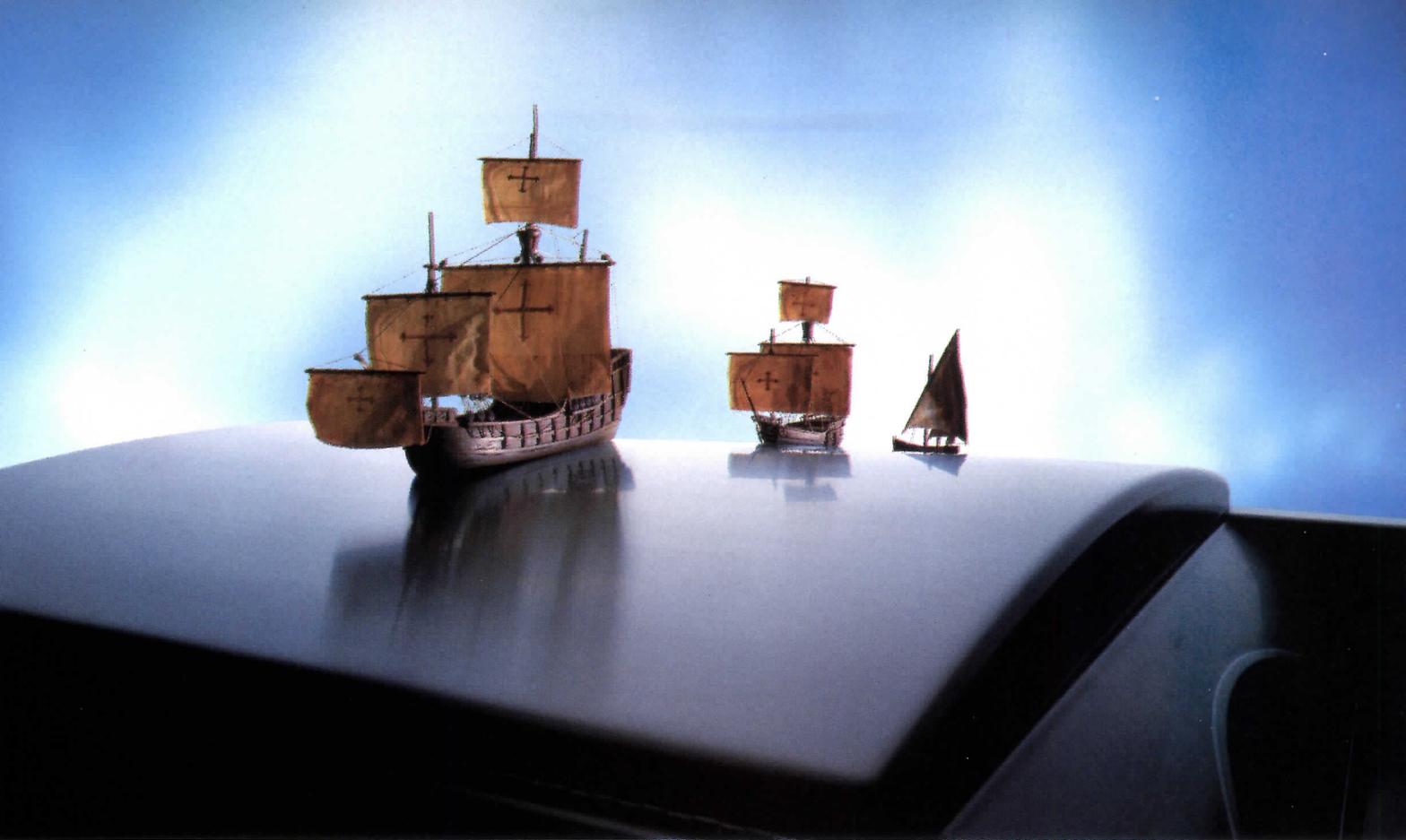
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## Armstrong World Industries



**New for 1993!** Over 17 new contract ceiling collections are illustrated in this 44-page, full-color catalog. Choose from revolutionary new acoustical metal and wood systems, intricately carved panel designs as well as a special new family of Cirrus Themes for kids called Cirrus Themes. This catalog contains all the information you need to specify these exciting new systems.

Circle 77.



# LEAVING THE FLAT EARTH SOCIETY GAVE US A WHOLE NEW DESIGN PERSPECTIVE.

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Contura washroom accessories are a family of



design-integrated paper towel dispensers and waste receptacles, toilet tissue and seat cover dispensers, soap dispensers, and sanitary napkin/tampon vendors and disposals.

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So, turn in your membership in the flat earth society and specify Bobrick's new Contura Series.

For a catalog and personal presentation, call or write Bobrick, 11611 Hart Street, North Hollywood, CA 91605.

Telephone 800/553-1600, in CA call 818/503-1630.

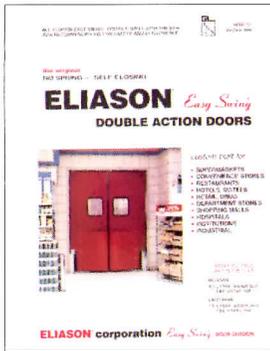
© 1993 Bobrick Washroom Equipment, Inc. Contura and the distinctive arc design are trademarks of Bobrick Washroom Equipment, Inc.

## BOBRICK Contura™ Series

New York Los Angeles Jackson, TN Toronto

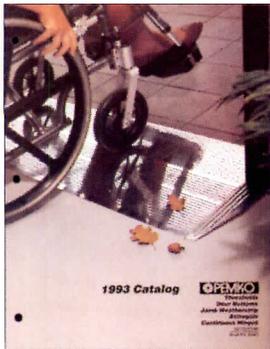
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## ELIASON CORPORATION



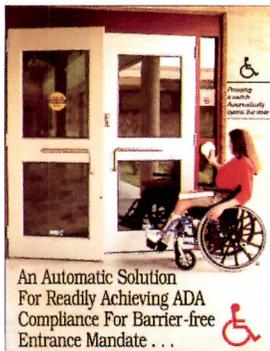
Complete specifications and four color illustrations of Eliason Easy Swing double action doors are presented in a bound Price/Spec catalog. Doors are sold direct and custom built to your specifications. Many sizes, styles and decor options. All doors comply with the new ADA recommendations for safety and convenience. Catalog is sent no charge.  
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**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 83.**

## Horton Automatics



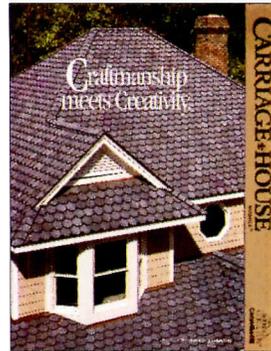
**Pushing a Switch Automatically Opens the Door.** EasyAccess™ Series 7000 swing door operator makes complying with ADA 1990 barrier-free entrance mandate "readily achievable" and "easily accomplishable....without much difficulty or expense." EasyAccess turns most ordinary doors into affordably priced, automatic, barrier-free entrances for the physically disabled. Horton Automatics, 4242 Baldwin Blvd, Corpus Christi, TX 78405, 1-800-531-3111.  
**Circle 87.**

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Pearce Systems International, Inc. provides highly sophisticated architectural design, engineering and manufacturing of state-of-the-art space enclosure systems. Pearce offers a full line of products, including architectural space frames as well as integrated glazing or cladding systems. Pearce's patented space frame technology is the basis of extraordinary high performance, cost-effective and highly efficient building systems. Projects include Biosphere 2, MCA/Universal "CityWalk," BC Pavillon/86 Expo, American Airlines DFW and Six Flags Magic Mountain/LA.  
**Circle 91.**

## CertainTeed Corporation



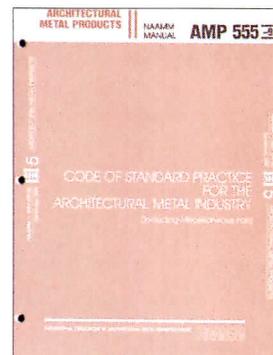
**Carriage House Shingle™** Product Brochure. This 8-page product brochure features CertainTeed's Carriage House Shingle™, its newest designer asphalt shingle with a unique chamfered cut to provide the look of hand-crafted slate roofs. This free brochure includes color photos of Carriage House along with product specifications and warranty information.  
**Circle 81.**

## Real-Tool Inc.



Real-Tool is proud to present a non-penetrating, non-marring Snow Guard which will not compromise integrity or finish of metal roofs. It securely clamps to standing seams without restricting thermal movement, and is available in cast aluminum and bronze. Aluminum model is pretreated and finished with electrostatically applied baked-on epoxy; custom colors possible to match prefinished metal. Real-Tool, Inc, P.O. Box 370, Purcellville, Virginia 22132, Phone (703) 338-4544, Fax (703) 338-4654.  
**Circle 85.**

## National Assoc. of Architectural Metal Manufacturers



Code of Standard Practice for the Architectural Metal Industry (Including Miscellaneous Iron.) NAAMM/AMP 555-92, discusses current industry practices regarding estimating, detailing, manufacturing, fabricating, assembling and erecting of industry products. Commonly accepted standards of the industry are covered in 19 pages plus a 13 page commentary section. Available from NAAMM for \$5.00 plus handling.  
**Circle 89.**

## W&W Sales, Ltd.

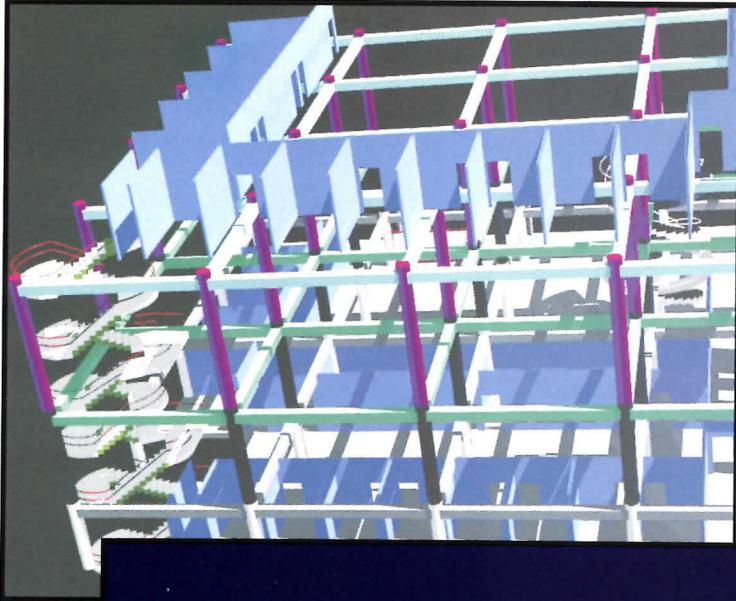


W&W announces its *exclusive* representation of NT Norbau Nylon Railing and Balustrade Systems throughout the US, Canada and Mexico. A new and improved nylon formulation has removed all cadmium from the product and features a stabilizer that has been added to the nylon, significantly increasing its resistance to UV light. Several new and exciting colors have also been introduced.  
**Circle 93.**

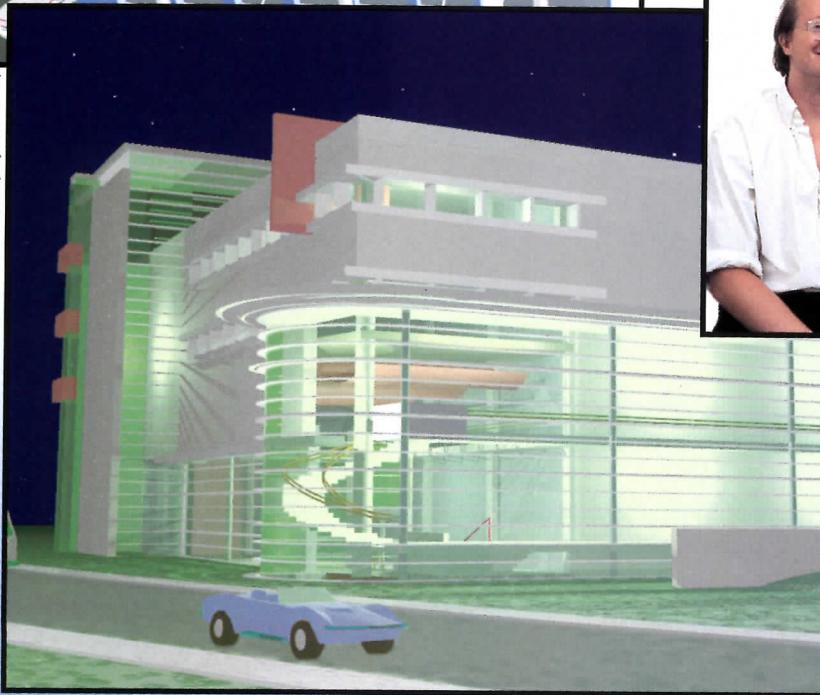
“What sells clients is 3D modeling. With DesignWorks, I can automatically generate 3D models from floor plans.”

— David Bader, president  
neubau imaging

To complement MicroStation's powerful production capabilities, architects and designers are turning to DesignWorks. For designers at Neubau Imaging, MicroStation and DesignWorks are the perfect 3D tools. “Once the plan is made, only a few steps are needed to transform the work into a 3D model. This brings life to any space-planning concept, and provides a vivid spatial understanding for our clients.” — Curt Dilger, designer



Combining MicroStation and DesignWorks, Curt Dilger, David Bader, and Steven Johns enjoy increased productivity at Neubau Imaging.



Art museum rendered using Intergraph's ModelView software.

**INTERGRAPH**

*Solutions for the Technical Desktop*

Circle 197 on information card

*DesignWorks and MicroStation — giving you the designing edge.*

 **MicroStation**



Have a look at MicroStation and DesignWorks on Intergraph's Technical Desktop Series personal workstations.

**Call 800-345-4856 for free brochures and demo disks on MicroStation and DesignWorks.**

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In today's designs, it's the brand that helps architects take value to new heights.

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### Bobrick Washroom Equipment

Find out about the only complete line of washroom accessories that meets ADA guidelines. *Circle No. 68*

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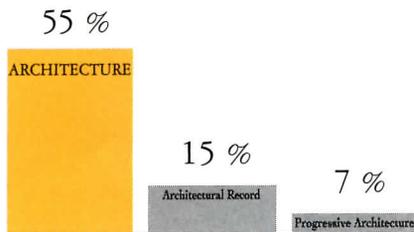
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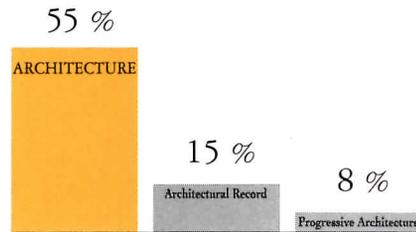
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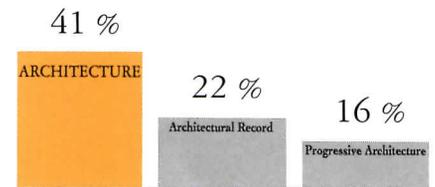
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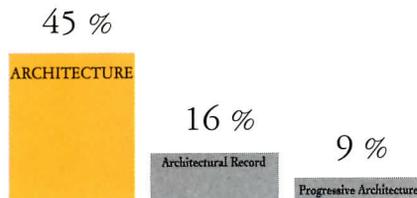
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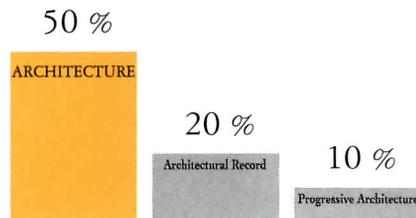
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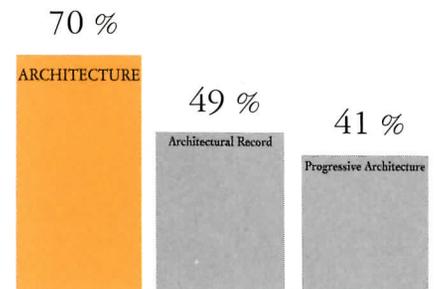
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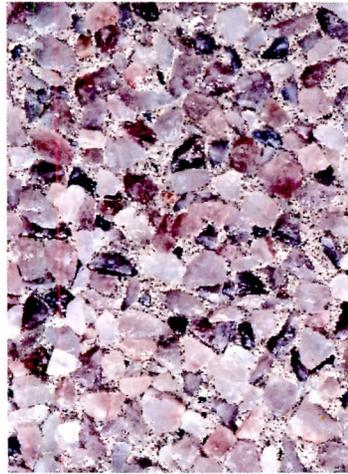
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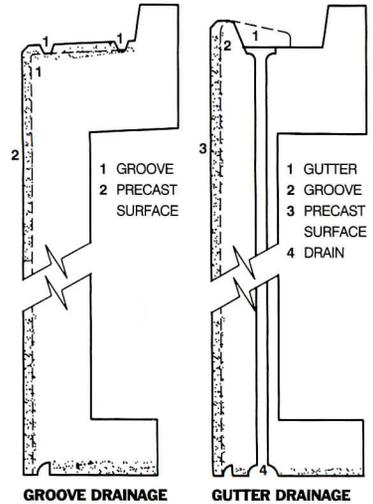
No excuses after this information exchange



**SANDBLASTED:** Uniform appearance.



**EXPOSED AGGREGATE:** Matrix recedes.



## Architectural Precast Concrete

CSI Section 03450

### Finish considerations

Architectural precast concrete is almost as versatile in its finish treatment as it is in its configuration. The choice of finish, however, is often neglected during the specifications phase of a project, and consequently, inappropriate finishes get worked into construction bids.

A smooth form finish is the cheapest to manufacture precast, but has limited application. This finish receives little or no surface treatment once the piece is removed from the form. Its quality relies solely on the form's accuracy and craftsmanship. The glassy smooth finish reveals the slightest defect in the form, and air pockets at the surface of horizontal rails will be obvious. This finish is best used as a substrate for paint or cementitious coatings.

A sandblasted finish (top left) is an economical way to remove surface blemishes. The depth of the cut can be varied for different textures, from smooth sandstone finishes to deeply cut exposed aggregate surfaces. Sandblasting removes weaker areas of the concrete mix first and will cloud the surface of any exposed aggregate. Air pockets and voids are blended by sandblasting, resulting in a generally uniform appearance.

An acid-etched finish is slightly more expensive than sandblasting, but can achieve a smoother surface and is therefore best at simulating limestone. Air pockets and voids are filled with a rub mixture subsequent to applying acid, resulting in a uniform appearance. This finish can be repaired reasonably well in the field.

A machine-honed finish is about 25 percent more expensive to produce than the acid-etched finish, but offers many advantages. After a piece is poured, its surface is honed, rubbed, and polished. This process can be repeated to produce a granite-like surface. This finish is best at resisting water penetration, and it repairs well in the field.

An exposed aggregate finish (above) is usually less expensive to produce than a machine-honed finish. The architect carefully specifies the type of aggregate to assure comparable bids. An exposed aggregate finish is produced by applying a chemical retarder to the form before pouring the concrete. The retarder slows the settling of the concrete at the surface so that the matrix can be washed away shortly after the piece is removed from the form. The depth of the cut can be controlled by the retarder. The finish poorly resists water absorption, but can be excellently repaired in the field.

Form liners used in conjunction with these five basic surface treatments can simulate stone or brick. Employing combinations of surface treatments can also result in a variety of effects within the same panel.

*Kevin L. Bertolf, AIA  
Architectural Concrete Products  
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### Surface quality

Building with precast concrete in the United Kingdom presents a number of special problems. Although temperate, the climate in the U.K. is constantly cloudy and damp. In winter, below freezing temperatures occur at night, while warmer daytime temperatures quickly thaw frozen areas. The problem of urban air pol-

lution is augmented by the moist weather. Pollution is absorbed into the pores of concrete, forming a gray or charcoal-colored coating, characteristic of U.K. buildings.

To combat this premature aging and discoloration, a precast concrete surface must be as nonabsorbent as possible. A concrete mix contains stone, cement, sand, and water. The stone or coarse aggregate can be a very dense material such as granite or quartz. The denser the material, the less likely it is to absorb moisture or pollutants. A smaller stone size increases the exposed surface area of this denser material. A stone size of  $\frac{3}{8}$  inch, rather than a larger aggregate, allows less matrix to show on the surface. Vibrating the concrete mix during the casting process minimizes the exposed area of the stone on the surface, forming a dense, nonporous shield. As an added benefit, the all-stone surface projects a high-quality image of permanence.

Unnoticed damage to precast concrete from water marks and stains can be alleviated by designing the exposed surfaces with horizontal and vertical grooves to channel the flow of water runoff (details above). Internal drainage should be used where a large horizontal area is exposed to the elements.

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Philadelphia, Pennsylvania*

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