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### Bridging

I am embarrassed that I have not let you know how delighted we have been by your coverage of "Bridging" ["Project Delivery by Bridging," RECORD, March 1992, pages 38-39]. Also, we credit your publication with initiating a minor groundswell of interest in bridging that we are starting to see.

*George T. Heery, Architect  
Atlanta*

Proposals such as this are one of the reasons our profession is perceived as it is by the general public. Our continual abdication of responsibility has taken us from being the "master builder" to the "unnecessary-to-the-system dreamer" that would result if we proposed that all projects be delivered in the manner described. Thank goodness it is not yet the norm, or small firms such as mine would die tomorrow. I'm surprised that the AIA didn't have more comment.

*Richard L. Lundahl, Architect  
Minnetonka, Minnesota*

### Minority architects

This is a response to your editorial of November 1991 ["A Time for Basics," RECORD, page 9] on African-American architects. As an African-American architect, I would like to say there were several common truths therein. Any professional practicing architect is adept at survival skills. Stereotypes in all professions are difficult to eradicate, but persistently, African-American firms are viewed as not having the talent to be designated as design firms. I doubt seriously if you can find one African-American working with any majority firm who is a partner, and working as a designer. Many firms would not entrust this area of work to an African-American but persist with the notion that somehow an

African-American would damage the relationship with the client.

*Philip Craig Johnson,  
Architect  
Chicago*

### Sick at Salick

Apropos of your January 1992 editorial on judging architecture as a whole and not on narrow criteria, I was embarrassed to see the article on the Salick Health Care building ["Judging Architecture," RECORD, page 9; "Morphosis Metamorphosis," pages 130-137]. It is an egregious example of mindless "fashion" reporting. Nowhere in the article could I find a cogent rationale for the extensive nature of the project. The writer leaves one to surmise that the client simply had a ton of money and wanted to build a monument to himself. There is certainly no law against this, though at a crisis-time for health-care funding in America it is disgusting to see such an obscene display of tax-deductible wealth gained by treating seriously ill patients.

So, can a building be beautiful if it is paid for by a service and fee structure that is becoming a national scandal? Of course, but a *journalist* would at least briefly deal with that issue. I am constantly amazed at the emphasis on "product" in the glossy magazines, at the expense of economic and social context.

*David R. Weaver, Architect  
Los Angeles*

### Correction

Credits for the Opus One Winery ["Rare Vintage," RECORD, May 1992, pages 94-101] should have listed Johnson Fain Pereira as the interior architect of record, with assistance by Daniel Kiener.

### June 8-July 3

"Industrial Elegance," exhibit sponsored by the Steelcase Design Partnership. Gallery I, Chicago Athenaeum, 515 N. State Street, Chicago. 312/829-9650.

### June 14-August 18

"Louis I. Kahn: In the Realm of Architecture," Museum of Modern Art, 11 West 53rd Street, New York City. 212/708-9480.

### June 19-22

"Explorations '92: Engaging Society in Vital Ways," 124th annual AIA convention. Hynes Convention Center, Boston. 202/626-7395.

### June 26-28

Construction Specifications Institute's 36th annual convention and exhibit. Georgia World Congress Center, the Conference Center, Atlanta. 703/684-1300.

### Through July 17

"José Antonio Coderch: Casa Ugalde (1951)," National Institute for Architectural Education, 30 West 22nd Street, New York City. 212/924-7000.

### July 27-September 17

"Dream House: Designed and Crafted Objects," Peninsula Fine Arts Center, 101 Museum Drive, Newport News, Virginia. 804/596-8175.

### National Building Museum

"Interface Berlin: Images of a City," (through July 5). "Choosing Futures," exhibit marking 75th anniversary of its sponsors, the American Institute of Certified Planners (through August 30). National Building Museum, 401 F Street N. W., Washington, D. C. 202/272-2448.

### September 11-November 8

"The Wright State: Frank Lloyd Wright in Wisconsin," Journal/Lubar Galleries, Milwaukee Art Museum, 750 N. Lincoln Memorial Drive, Milwaukee, Wisconsin. 414/224-3200.

## L. A. Aftermath

If nothing else emerges from the tragedy of the Los Angeles riots, at least it focuses the nation's thinking on some fundamental issues too long neglected. At the risk of oversimplifying what is clearly a far more complex issue, I think it's safe to make this conclusion: that the whole process of civic calm, progress, and prosperity comes down to a single subject, work—its substance, objectives, training, performance, compensation, management, physical setting, and the resulting impact of all of this on personal self-respect and the family, corporate profits and investment, and public revenues.

This month's special theme of *The New Workplace* must be seen in that wider context. The architect's direct influence, and that of the planner and urban designer is, to be realistic, limited largely to physical setting, but even at that it is a hefty mandate. The very nature of work is changing before our eyes. Yet we are so much in the midst of the change that it is difficult to see the whole for the details. Blue-collar work has for years been losing ground to office labor, creating the very tinderbox of demoralized under- and unemployed workers that was the underlying cause of Los Angeles. Many of those blue-collar jobs are lost forever. Retraining those whose jobs are gone for good, and those who are unemployable because they are untrained (many of them dropped out of school as there was no real incentive to finish), must be at the heart of any public and private reconstruction initiatives.

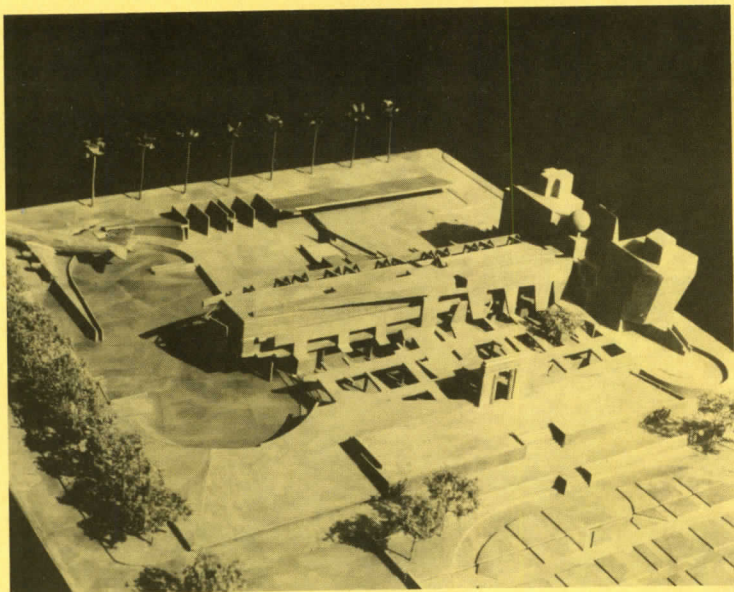
The white-collar workplace, then, is one of the great stages on which the progress of this and other nations will be played out. This stage will prove (and, as the section beginning on page 69 shows, already is doing so) the extent to which computers will, or will not, make for more efficient work output. It will test new ways to organize and manage work. It will (and indeed must) learn to satisfy the higher amenity levels demanded by the highly educated workforces that already dominate such countries as Sweden and Germany, where workers conditioned by a combination of labor shortages and short work weeks demand high standards of comfort and control. It will be the place where new technology in lighting, heating and air conditioning, communications, ergonomics, and personal discretion over one's immediate work space will be tried and solved. It is here that we'll see the outcome of some important conflicts. For example, will the champions of the all-under-one-roof "chance-physical-contacts-for-better-performance" triumph? Or will the workplace follow the techies who believe the world of work functions best by reverting to the old cottage-industry scenario, but with all the parts connected by computers and video? It is also in the workplace that energy-consciousness and ecological concerns will be translated into viable systems. And last but not least, the workplace will be the testing ground for the incipient globalization of work and markets.

So work, and the workplace, is the fulcrum of the immense effort needed to head off another explosion, an effort that must also include community planning and design, investment incentives, and attention to the nation's infrastructure. And, as Seattle Mayor Norman Rice said last month, the reason that so many well-intended efforts of the past failed is that they weren't given the time to succeed. Short-term planning, public as well as corporate, is the bane of our economy. By staying the course, our public officials and corporate managers can assure that work, the basic motivator, becomes the focus of our effort and the generator of our progress to come. *Stephen A. Kliment*



**Los Angeles**

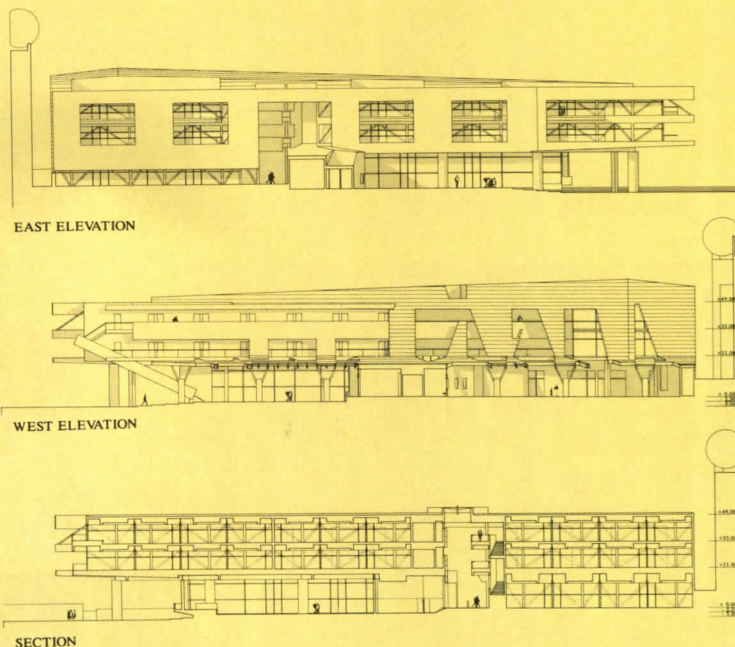
**Morphosis Wins Competition for \$30-Million Science School**



A simply diagrammed design by Morphosis Architects has won a competition for the \$30-million Science Museum School, a grade school adjacent to Frank Gehry's Aerospace Museum in Exposition Park in Los Angeles. The "space saver" facility functions as the

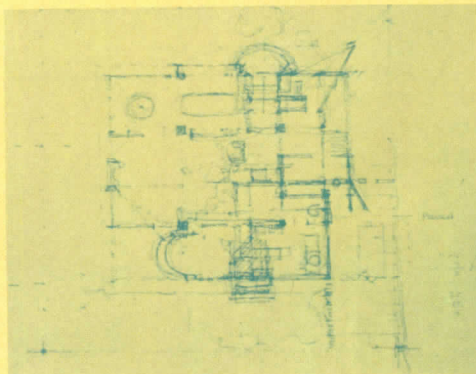
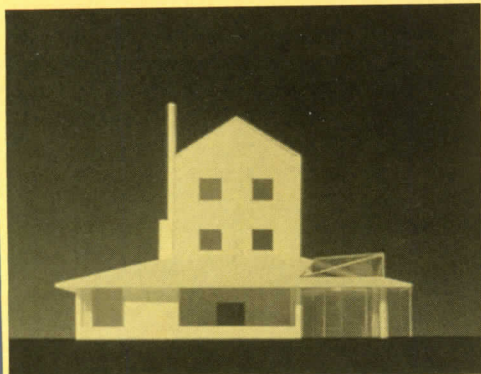
neighborhood school and serves as an educational extension to the nearby California Museum of Science and Industry and USC. Built around a media-center hub, the design draws heavily on electronic communication. Morphosis's straightforward plan, a three-

story bar rising out of a trellised trench, cuts through and weaves together structural elements to create flexible, wedge-shaped classroom modules. The scheme was chosen over entries by Siegel/Diamond and Arthur Golding. *Aaron Betsky*



**Poland**

**Children's Village Includes Maki House**



Tokyo-based Fumihiko Maki has designed one of 11 houses planned by various architects for a Children's Village in Oswiecim, Poland. The village honors Janusz Korczak, who dedicated his life to orphans of the Nazi occupation, and died in Treblinka. Maki's 2,000-sq-ft masonry and wood house provides living space for six children up to 18 years old, with room for a foster teacher. The complex, with shared recreation space and community center, reflects Korczak's belief in integrating family and community life in childrearing. *Naomi R. Pollock*

## Business as Usual at Furniture Fair



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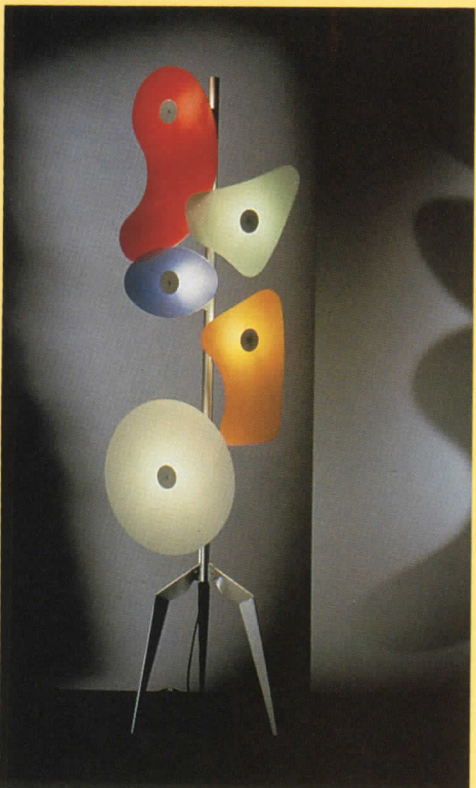


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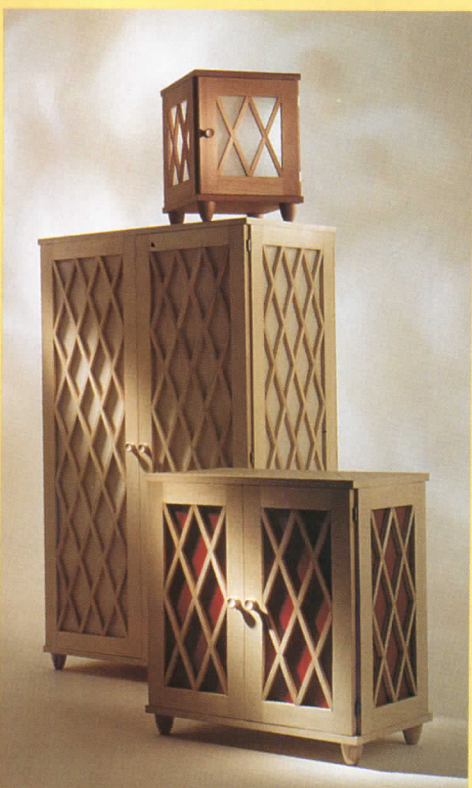


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Although rumors of its declining international status circulated the hallways of the Milan fairground's campus of sprawling industrial sheds along with crowds of furniture manufacturers, dealers, designers, and trend-watchers, it was business as usual at the 1992 Salone del Mobile, on view April 10-15. This year the Furniture Fair coincided with Euroluce, the biannual lighting exhibition, broadening the already varied spectrum of new product introductions. Shown here is a sampling of the wares. K. D. S.

1. Artemide's Onidia table lamp, designed by Santiago Calatrava
2. Zero.one wall-mounted lamp, designed by Ingo Maurer and produced by his Munich-based company
3. B&B Italia's Compagnia delle Filippine chair, designed by Antonio Citterio
4. Pallucco's Big Bottom chair, designed by Lynn Godley and Lloyd Schwan
5. Foscari's Orbital Terra floor lamp, designed by Ferruccio Laviani
6. Standard's System X storage units, designed by Aldo Cibic

## Briefs

### Retooling for retail

Sony Corp., new owners of Philip Johnson's AT&T Building on New York's Madison Avenue, wants to enclose the tall, dark, and generally vacant public arcade at the base of the building to create new retail space. Gwathmey Siegel has done initial design work on the project, which must undergo a series of public approvals.

### Olympic competition

Ellerbe Becket, Howard Needles Tammen & Bergendoff, and Hellmuth, Obata & Kassabaum are finalists in a competition to design an Olympic Stadium for the 1996 Atlanta Games.

### Academy honors

At a May ceremony, Norman Foster received the Brunner Prize from the American Academy-Institute of Arts and Letters; also honored were Morphosis founders Thom Mayne and Michael Rotondi, who received the Academy-Institute's Award in Architecture. Jury for the prizes was chaired by Henry Cobb and included Frank Gehry, Ada Louise Huxtable, Kevin Roche, and Paul Rudolph.

### Competitions

- Western Red Cedar Lumber Association Architectural Awards. Deadline July 1. 503/224-3930.
- Precast/Prestressed Concrete Institute Awards. Deadline June 30. 312/786-0300.
- Concrete Reinforcing Steel Institute Software Development Competition. Deadline October 31. 708/517-1200.

### Tile city

Thirty kinds of Italian ceramic tile make up this Chicago-inspired mosaic, designed by Tigerman McCurry for Assopiastrelle at the International Tile Exposition, to be held in Chicago in June. ■





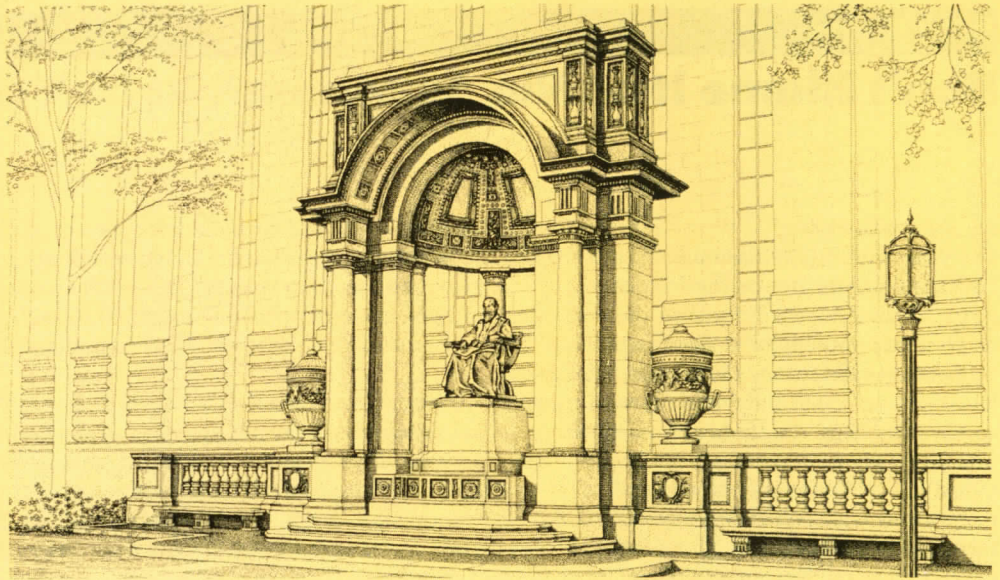
## Carpenter Designs for the Home

© James Carpenter



James Carpenter, a glass artist known for his collaborations with architects and specialty fabricators [RECORD, November 1990, pages 108-111], has turned to furniture design. An exhibit at New York's Peter Joseph Gallery (closes June 20) showcases, for example, an oval glass-topped table supported by lovingly hand-finished wood and slick tension cables (above). Carpenter uses heat-shielding dichroic glass in a curving screen of glass panels and as planar connecting chords in a faceted 10-foot-diameter sphere. *J. S. R.*

## Memorial Caps Bryant Park Restoration



Dedicated in 1912, the arch by Thomas Hastings and statue by Herbert Adams that make up the William Cullen Bryant Memorial at the head of Bryant Park, behind Carrère and Hastings' 1894 New York Public Library, were last cleaned up during a large-scale renovation of the park in 1934 by Robert Moses. Now badly deteriorated, the memorial, of soft Tennessee marble, is one of the last pieces in a restoration puzzle coordinated by the Bryant Park Restoration Corp., a private-public partnership. Architects for the project are Robert Kupiec and

Nicholas Koutsomitis, who have also restored two Carrère & Hastings Park Houses as public bathrooms. The park itself, a three-acre square with a full one-acre lawn, was reclaimed from a thriving drug trade and opened in April following restoration led by Hanna/Olin. The Josephine Lowell Fountain, an Italianate pink granite structure designed by Charles Platt, has also been restored. Already open are two new refreshment kiosks by Hardy Holzman Pfeiffer, which is also at work on a new restaurant overlooking the park. *P. D. S.*

## New Staging Center for Arboretum



Founded in 1922 as a privately endowed public institution, the 1,500-acre Morton Arboretum in Lisle, Illinois, is a "great outdoor museum," devoted to research into what architect Bill Latoza calls "woody plants and trees." Latoza's firm, Bauer Latoza of Chicago, has designed a 22-foot-high, colonnaded staging center for the arboretum, to be completed this fall. Latoza sees the 3,200-sq-ft center, which may be enclosed in the future, as a manmade tree canopy for the groups of schoolchildren entering the arboretum on field trips. ■

## Sustainable Design

### Conference Sounds Environmental Wake-Up Call

At a recent conference sponsored by the Northeast Sustainable Energy Association (NESEA), about 300 builders, architects, and engineers gathered to explore the recession-influenced theme of "Waking Up the Residential Building Market: Affordability and Sustainability Are Good Business." The three-day meeting, held in central Massachusetts, examined issues that are shaping this latest cycle of environmentalism.

- *Comprehensive energy costs.* Today, energy-conservation efforts have expanded beyond operating costs to include the concept of embodied energy—that which is required to extract, process, manufacture, and transport building materials, plus energy needed for construction. Architect Ray Cole, director of the Environmental Research Group at the University of British Columbia, described efforts to develop easy-to-use indices of embodied energy, proposing that such measures may be available soon.

- *Renewability and recyclability.* At the heart of the concept of sustainable design is concern that even renewable natural resources (old-growth forests) are endangered. At a session titled "Material Choices for Sustainability," Montana builder Steve Loken, a founder of the Missoula-based Center for Resourceful Building Technology, outlined efforts to evaluate dozens of recycled materials in a demonstration house. Cataloged in the Center's "Guide to Resource Efficient Building Elements," these include autoclaved-concrete foundation blocks (made of fly ash from coal-burning plants), sheathing and insulation (newsprint), aluminum shingles (soda cans), and carpet underlayment (tire rubber).

- *Solar energy.* In "Solar Design Makes Good Cents," engineer Mark Kelley, designer of Acorn Structures' popular solar houses, pointed out that passive-gain techniques can be economically incorporated into most residential construction. Given drama-

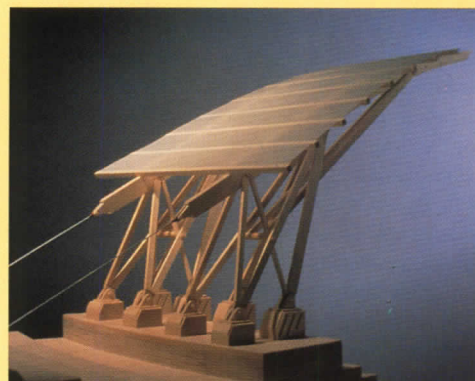
tic improvements in glazing and insulation, Kelley suggested that most houses could be partially "solarized" by careful placement of windows and mass. In a rousing talk on the potential of decentralized photovoltaic power, solar designer Steve Strong cited an ongoing, utility-sponsored demonstration project in Gardner, Massachusetts. There, 30 houses and several institutional and commercial buildings (including City Hall and a Burger King) have been retrofitted with rooftop PV panels. Engineer John Bzura, manager of the project for New England Electric, says these panels do more than supplement the buildings' grid-supplied power. On bright summer days, peak-demand time for utilities, they feed energy *into* the grid. Although PVs remain expensive—the Gardner retrofits cost about \$20,000 each—Bzura predicts that prices will become more affordable within 10 years.

- *Lending efficiency.* Ottawa engineer Donald E. Buchan, a former president of the Wisconsin-based Energy Builders Association, described a U. S. Department of Energy program, just released in draft form, called Energy-Rated Mortgages. If the DOE's proposal is to succeed, says Buchan, the building industry must devise a simple, consistent way to rate energy efficiency and lenders must use this rating for their guidelines. "It makes economic sense," he says. "With the exception of interest," energy costs are a homebuyer's highest carrying expense.

- *Buildings and health.* California architect Carol Venolia, the author of *Healing Environments: Your Guide to Indoor Well-Being*, presented a series of "affordable healthy houses." Venolia likened people who develop intolerances to synthetic materials, chemical vapors, and the like to the canary in the mineshaft. "Few of us respond so extremely to our surroundings," says Venolia, "but it's likely that we'll all benefit if architects pay attention to the health effects of building materials." *Nancy Levinson*

## Structural Design

### Amphitheater Takes Wing



When you consider the old saw, "form follows function," you're not necessarily thinking of hawks and eagles as the form. At the Minnesota Zoological Garden, though, the task facing Hammel Green and Abrahamson was to design a series of roofs to shade patrons observing demonstrations by curators using birds of prey. The design, nearing completion, embraces avian allusion (top): Teflon-coated-fiberglass roofs resemble wings; the tubular-steel supports are tendonlike; the raised concrete piers suggest talons. (Tension cables restrain the roof's cantilever.) The enclosures shade patrons within an amphitheater of limestone steps carved out of a hillside (above). It faces a pond and a grass stage where demonstrations are performed. Heavily planted rough-cut stone walls provide a backdrop and disguise animal holding areas. ■

## Technology

# Briefs

### Asbestos orphans

With release of the Health Effects Institute report titled, "Asbestos in Public and Commercial Buildings: A Literature Review and Synthesis of Current Knowledge," the strengthening consensus among experts is that intact asbestos-containing materials within buildings do not pose a health risk to workers and general occupants [RECORD, October 1990, pages 110-111]. Consistent with other research, the report does warn that maintenance and renovation workers *could* be exposed to threatening levels of asbestos particles. The report did not propose a regulatory response. A new asbestos threat looms in the commercial sector, however. In the current space glut, owners and tenants are shunning buildings where asbestos remains. Without incentives for control or abatement, these "orphans" may become "wards" of bankruptcy courts and local governments.

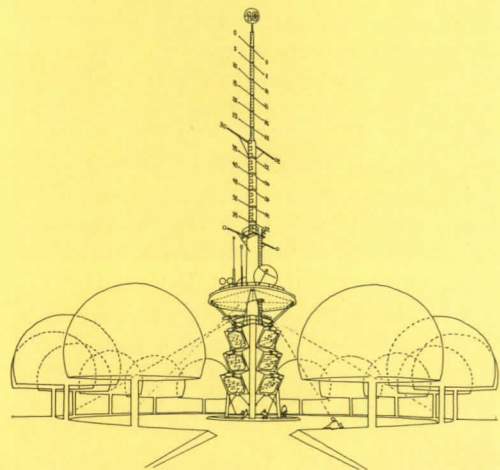
### Improved monitors reduce magnetic-field emissions

Though computer-monitor makers dispute contentions that magnetic-field emissions are harmful to health [RECORD, February 1991, page 113], manufacturers for both Apple and IBM computers have nevertheless taken steps to reduce emissions. This typically involves a different arrangement of the deflection coil in relationship to the monitor's cathode-ray tube. Improved monitors cost more and some argue that performance is compromised. Emissions standards have not been adopted in the U. S., so makers state compliance with Swedish guidelines (MPR-2) or those under development by the Institute of Electrical and Electronic Engineers (IEEE) for emission of Extremely Low Magnetic Fields (ELMF—considered by some experts the most harmful—and Very Low Magnetic Fields, VLMF). Shielding older models can be difficult. Producers of glare screens, which are mounted in front of the screen, claim magnetic-field reductions, but only a few products reduce ELMF fields. ■

## Telecommunications

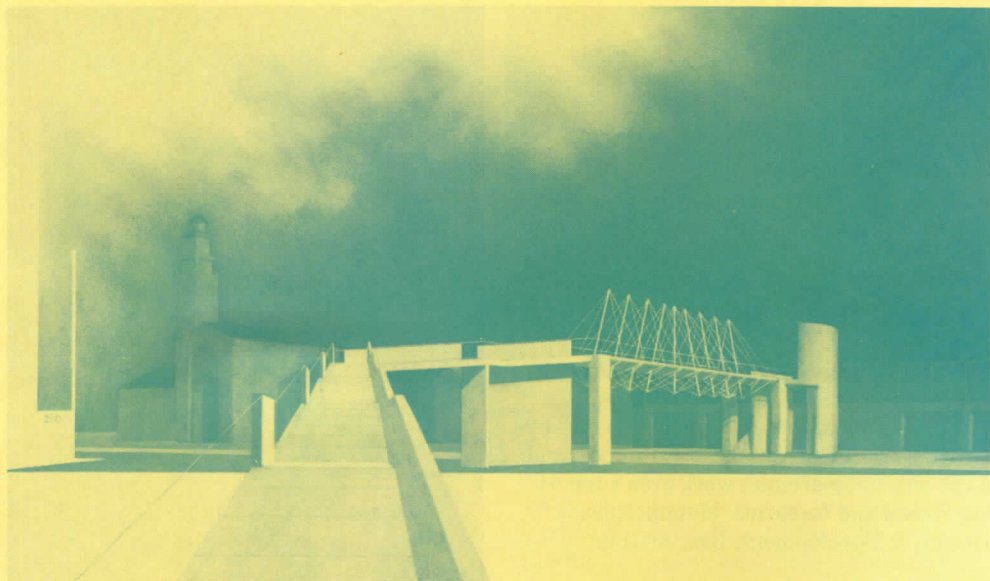
# Architecture School Goes Global

Considering recent contributions by Norman Foster and Santiago Calatrava, the design of towers containing radio antennae and telecommunications equipment has been honed to a fine art in Europe. (In the U. S., we bury such devices in skyscrapers or build eyesores on hilltops.) Avery Associates' Tower in Portsmouth, England, is both substance and symbol of the Portsmouth Polytechnic School of Architecture's initiative to link architecture schools worldwide via satellite. Updating the clocktowers of yore, an array of lasers and strobe lights marks the hour. ■



## Bridge

# Pedestrian Tensegrity



To connect a park and parking structure at the border between Los Angeles and Beverly Hills, Wolf+ has proposed a clear-span pedestrian bridge, using rigid tubes and tension cables, that is based on Buckminster Fuller's "tensegrity" principles. Ove Arup &

Partners engineered the structure of rigid tubes that rise from below the center of the deck and tilt toward the bridge's center. They are restrained by outboard-rigged tension cables. Deck deflection is calibrated to put a little spring in joggers' steps. ■

# Light and Power

Moog Advertising, Inc.

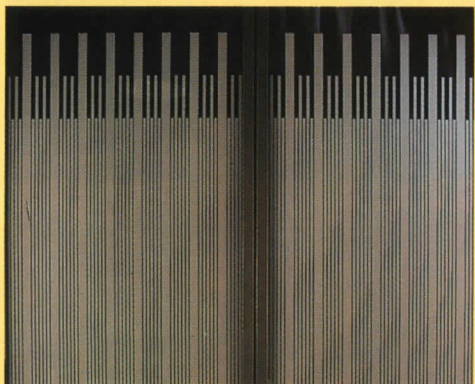


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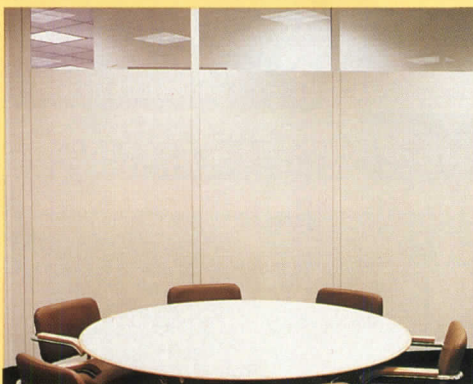
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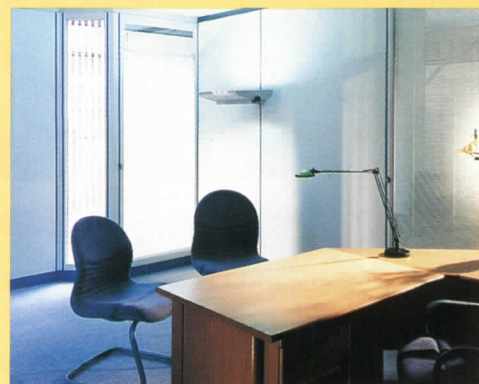
306b



307a



307b



308

**306. Crystal gazing.** When Chrysler Corporation decided to replace old automotive-engineering offices, a warren of pre-World War I brick-walled fiefdoms, they asked Architects Harley Ellington Pierce Yee Associates for a facility that would encourage teamwork and communication, provide privacy, and give all employees a view. The light-filled space of the new Technology Center has miles of movable glass walls, a special-size version of the Academic wall system with a horizontal power raceway in the base. Managerial offices were placed along the perimeter of the atrium, with open-plan clerical workstations and corridors nearer the outside walls. The installation met BOCA atrium conditions with sprinklers on both sides of the atrium walls, which are fronted by a 6-ft-wide corridor on all but the top floor. There, the steel muntins were

reinforced to create an integral, to-code handrail. Cost savings were realized by doing wall fabrication off-site, and from using a single almost-10-ft-high glass light instead of three individually glazed sections. Dowcraft, Inc., Falconer, N. Y.

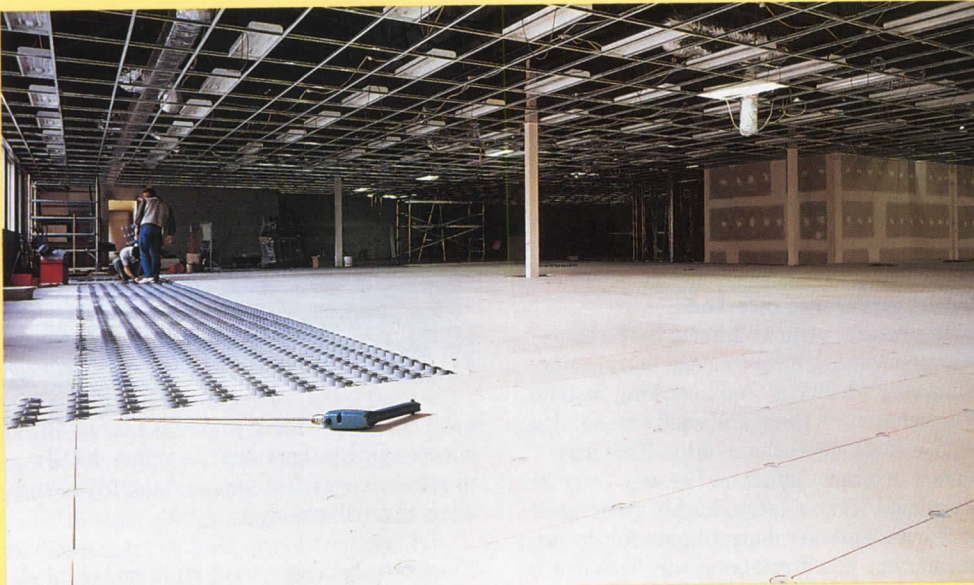
**307. Patterned.** Project architect Steve Mendelsohn and designer John Mack of KPF Interior Architects created a custom ceramic-frit glass motif for 17 floors worth of movable office walls (307a). The silk-screened design, which echoes the massing of the Cesar Pelli-designed NationsBank Tower, was a custom-design option available with Silhouette Series walls. The glass lets light from the exterior offices into the interior of the work floor. A conference-room installation demonstrates the FineLine joint offered by the system (307b). Co-extruded

vinyl gaskets maintain an almost-invisible connection while blocking sound transmission between solid panels. Virginia Metal Industries, Orange, Va.

**308. Easy up.** The Ultramovable wall is intended to be especially useful for installations that reconfigure space constantly (and there *are* firms with churn rates of over 50 percent a year). The walls are unitized, each complete section independently movable without debris or waste. The partition system is rated to perform without compromise of the when-new fire, acoustic, or other characteristics of the wall over the life of the building. Finish options include paint on smooth or textured steel, fabric, and wood veneers, as well as patterned, textured, or custom architectural glass lights. Clestra Hauserman, Cleveland.

*Movable partition walls with large areas of glass borrow natural light and provide privacy without isolation. Space-saving low-height access floor systems distribute CVD cables.*

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



309a



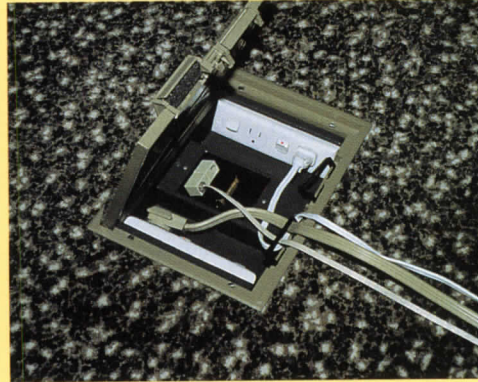
309b



310

The increased use of unshielded twisted pair/IBM standard wiring for communications, voice, and data means less depth is needed for raised, access-floor distribution systems. New lower pedestals make access-floor installations possible even in buildings with minimal ceiling heights.

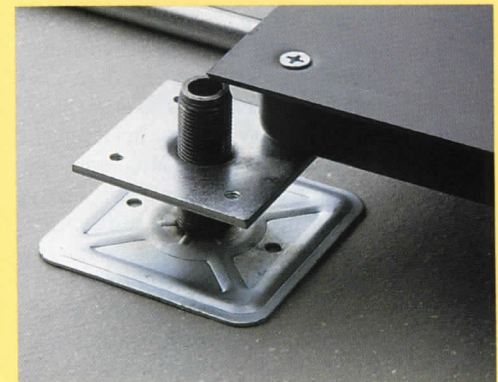
**309. Cost effective.** An Australian system manufactured under license in the U. S. and distributed by Allsteel, Inc., the Cablefloor is described as very easy to install. Fire-rated polypropylene pedestals are supplied as snap-together grids (309b), with cable tie-downs and bridges. Floor panels, either Duraflake particleboard (309a) or Pyrok fiber-cement, can be cut on-site to fit curves and perimeter conditions. Corners of panels are rabbetted to receive positioning discs; a metal screw holds the disc to the pedestals.



309c

A webbed flange under the disc separates panel edges to prevent shift and squeak. Supported 6-in. o.c., the floor meets most distributed and concentrated load requirements, with reticulation spaces 3 1/8-in. wide and 1 1/2-in. deep feeding wiring to floor boxes (309c). CoDesign, Atlanta.

**310. Variable height.** The Bravo access floor system allows for a range of pedestal heights, a finished-floor height of from 4 to 30 in., and cable-cavity depths as shallow as 1 1/2 in. Understructure options include corner-fastened, rigid grid, stringers, and freestanding, for different churn and cavity-volume requirements. To meet Washington, D. C.'s severe floor-height restrictions in a spec-built building leased by NASA, consultant Susan J. Wittmack, AIA, recommended 450,000 sq ft of access floor



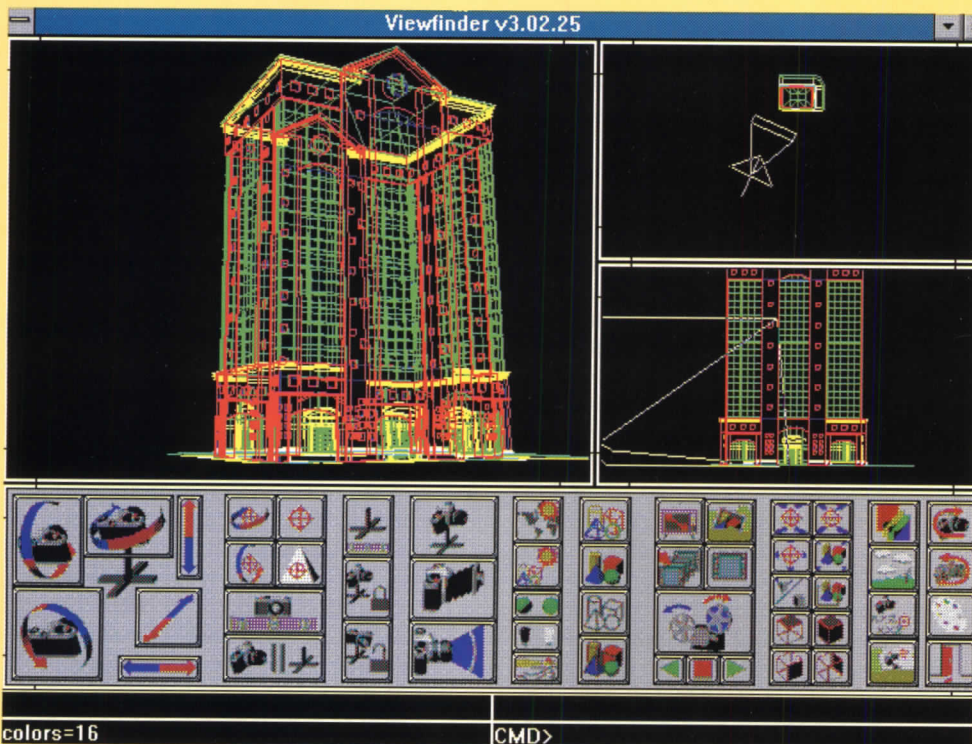
311

with a 4-in. finished height. To keep data transmission clear, power was brought into the floor from pods placed 20-ft o.c. under the deck, above the ceiling of the floor below, and distributed by whips to outlet boxes. Bravo International, Ltd., Baltimore.

**311. Low profile.** The Donn system offers a wide range of panel types, including all-steel, cementitious-core SolidFeel, and wood-composites, to meet a number of budget and loading requirements, including heavy rolling carts. A new Low-Loc pedestal option available with steel and cementitious panels can create an access floor with a finished height of only 3 in., fitting into the very tight floor-to-ceiling dimensions found in many office renovation projects while retaining an ability to adjust to out-of-level slabs. USG Interiors, Chicago. ■

## ModelView PC, Version 3.0

For more information circle item numbers on Reader Service Cards.



ModelView-rendered and displayed image took 10 minutes to create on an 80486 CPU computer running at 33 MHz, with enough memory to keep everything in RAM.

By Steven S. Ross

Intergraph's modeling program brings workstation photorealistic sophistication—although not necessarily workstation speed—to personal computers running Windows. It can be used to render 3-D computer (DGN) drawings created with either Intergraph MicroStation or UNIX workstation software on any platform. The capacity to render DXF files will be added soon.

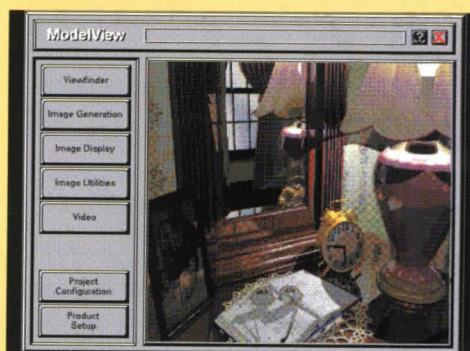
The software's chief limitation will almost certainly be the exactness with which the original 3-D model was drawn. "Fudges" that plot out fine, but are really out-of-place in true 3-D, will give you fits. This may be the first commercial modeling package for personal computers with the sophistication to expose such subtle flaws.

To use ModelView, you import the 3-D drawing into ModelView using the "ViewFinder" module. This displays the drawing in a large window that shows it in perspective, and in two smaller windows that show top and front or side views. You use ViewFinder to set up

lights and eye (camera) positions. It is perhaps the most versatile program in this regard available on a personal computer. The number of light sources is unlimited. Cameras cannot only zoom in and out (change the "focal length" of the "lens") but also dolly (move the entire camera) and tilt the projection plane (simulating the bellows on a view camera). You can even turn on a "haze" that lets images in the background slowly fade away.

You can save specific "key" frames and string them together later in fully shaded animations. The software will add extra frames you specify between the key frames to keep things moving smoothly. Doing an animation script through the interactive on-screen control panel is fun. There are fades and other tricks. The animations can be viewed on-screen, or sent through a video capture board (they cost as little as \$500 these days) to videotape.

That's often preferable to viewing on the computer screen anyway, unless you have a very fancy multicolor graphics card in-

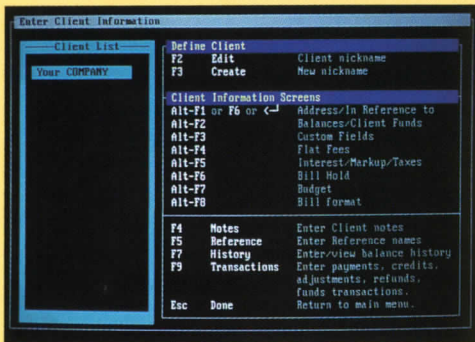


Office tower (top) is on screen at lowest possible VGA resolution; RayTrace adds realistic surfaces and textures (above).

stalled—able to display 256 colors from a palette of 16 million, at 1024 by 768 resolution. The 3-D stereo effect—gained by creating two different-color renderings slightly out of registration on-screen, and viewing through tinted glasses (supplied) is startlingly real on a computer monitor, however.

To help you decide what views to pick, you can quickly render an image in the View-Finder itself. The next level of rendering sophistication is QuickTrace, which allows you to add surface textures and reflections. The results are outstanding. But if you want true photorealism, there's RayTrace, a tracing process that takes a long time.

Patterns and colors—even scanned photos—can be applied to images created with either QuickTrace or RayTrace. The effects can be viewed quickly. Misalignments between the model and imported images can be aligned on-screen. If the overall effect is too dark, it can be quickly lightened without retracing. **Circle number 312**



Entering client information into Timeslips.

Any organization that bills clients by the hour can use Timeslips to keep track of things. The software itself is simple to use, and will run on the smallest of computers that use MS-DOS or PC-DOS. You can use it to keep track of associates' activities by client, billing rate, and amount of time used. It will handle adjustments and credits. And it will export data to spreadsheets and word processors, or use in general accounting programs.

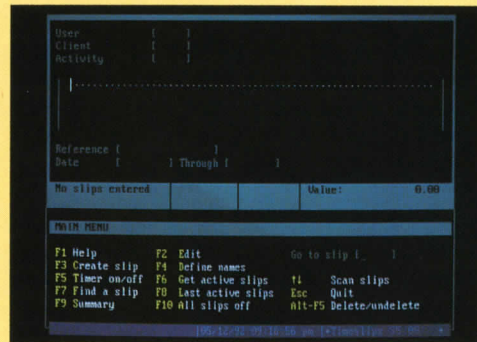
## ModelView summary

**Equipment required:** IBM PC or compatible running Windows and having a CPU with at least the power of an 80386SX (80486DX strongly recommended); separate math coprocessor (80387 series or equivalent) required for 80386SX and 80386DX CPUs. Four MB random-access memory (8 MB strongly recommended), VGA monitor or better, mouse or digitizer tablet, 40 MB free space on your fixed disk. A faster version is available for Intergraph Clipper workstations.

**Vendor:** Intergraph Corp., Huntsville, Alabama 35894-0001. Phone 205/730-2000; fax 205/730-2461. \$2,500.

**Manual:** A large loose-leaf with tabs, covering a good reference and including good tutorial examples. The overall organization, layout, and writing is terrific.

**Ease-of-use:** This is a huge program; some operations such as raytracing of a complex model can take hours. Editing images is almost interactive, however—extremely



Creating a Timeslip—a record of an associate's activity on behalf of a client.

Compared to earlier versions, Release 5 allows up to six billing rates per employee and up to 15 fields per client database. It also allows easy reporting of receivables, and of clients' payment histories. You can also set billings to an agreed-upon maximum with a client, but continue to track time spent on the project—for future reference and analysis of your internal costs.

Circle number **313**

comfortable on a fast 486 machine. The hardware copy protection "lock" on the parallel port can trigger antivirus software. Once you invoke the software from Windows, the look-and-feel is decidedly not Windows; it handles like UNIX instead. The menus are chock full of icons you can click on, once you learn what they mean (it will take a few hours). Intergraph has been standardizing on this "X-Windows" look.

**Error-trapping:** Good; on-screen error messages are informative.

## Timeslips summary

**Equipment required:** IBM PC or compatible, fixed disk, 640K (as little as 512K for DOS 3.0 through 3.3).

**Vendor:** Timeslips Corp., 239 Western Ave., Essex, MA 01929. Phone 508/768-6100, fax 508/768-7600. \$299.95 for single-user version (tracks up to eight employees, 250 clients per employee); multiuser versions available for tracking activities for up to 250 employees. Price includes 30 days free support; \$10 minimum charge, \$60/hour

This latest upgrade of what is supposedly a low-end 2-D drawing package from Autodesk is far from low-end. To Version 5.0 (reviewed April 1991), the following items have been added:

- Direct loading of 2-D AutoCAD DWG files, without having to go through DXF translation.
- A built-in DXF converter (instead of the \$99.95 add-on available for Version 5.0).
- Better support for AutoCAD hatch patterns and fonts.
- A better macro language, and support for attaching up to 48 macros to command-key combinations, a digitizer menu, or an on-screen point-and-shoot menu.
- Import and export of Lotus 1-2-3 WK1 files for use by the built-in bill-of-materials processor.
- Better on-line help.
- Support for extended memory.

All in all, this is a terrific package for 2-D production in a small office.

Circle number **314**

thereafter for single user products.

**Manual:** A large paperback book, well illustrated.

**Ease-of-use:** The software is fine; get a bookkeeper or accountant to help you set up the billing system itself, however.

**Error-trapping:** Good.

## Generic CADD summary

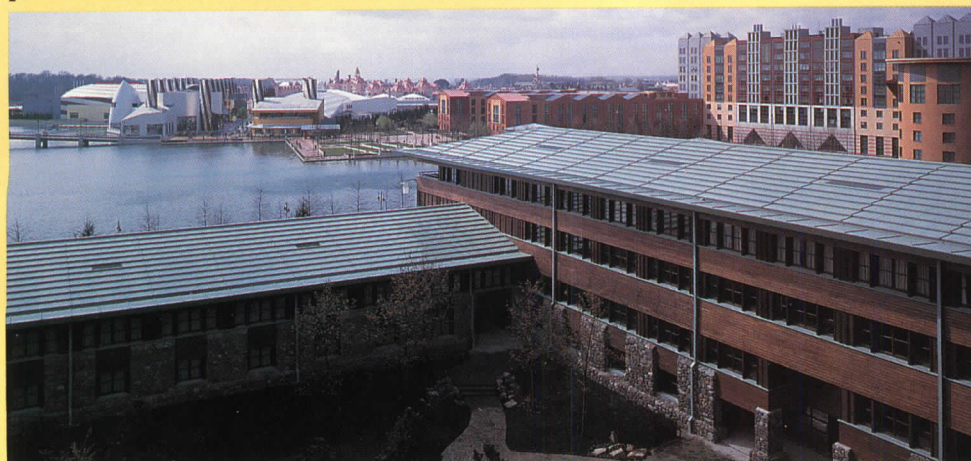
**Equipment required:** IBM PC with fixed disk and 640K of random-access memory; 80386SX and 2MB of RAM recommended.

**Vendor:** Autodesk, 11911 North Creek Parkway South, Bothell, WA 98011. Phone 206/487-2233, fax 206/483-6969. \$495. Upgrade from Version 5.0 if purchased after November 30, 1991 is \$50.

**Manifest Disney**

*Critic Suzanne Stephens assesses Disney's eastward expansion—Euro Disney—which opened outside Paris in April.*

© Stéphane Couturier/ARCHIPRESS photos



Euro Disneyland opened on April 12 with explosive fanfare from the popular media and a barrage of criticism from French intellectuals. In essence it was both praised for being fun, and criticized for being fake. Although only 20 miles east of Paris, the 4,800-acre American implant of make-believe castles and mountains with Main Street, Mickey, Donald Duck, and Goofy could be anywhere. Plopped down in the green pastures of Marne-la-Vallée, this colony appears self-sufficient. The inclusion of 5,200 hotel rooms and a restaurant/nightclub complex next to the amusement park is key to Disney's success: With the hotels easy to see and easy to walk to, there is no need to stay in Paris. After all, as Disney CEO Michael Eisner points out, "Research shows that Paris is an adult attraction."

To help make the Euro Disney Resort more delectable as a tourist destination to adults and children alike, the Disney Company, led by Eisner, hired high-profile American architects Frank Gehry, Michael Graves, Antoine Predock, and Robert Stern, along with respected French architect Antoine Grumbach, to design five hotels and an entertainment complex [RECORD, August 1990, pages 72-79]. The concept, already initiated at Disney World in Orlando, Florida, presumably would instill in the buildings an element of sophistication appealing to grown-ups, while still accounting for Disney's reputation for being CG-13—anyone over 13 should be accompanied by a child.

Clearly "entertainment architecture," the epithet for the output of these architects, comes with a different set of requirements and expectations than "regular architecture." The question then is what are those expectations and how well does this group of high-design architects live up to them? More importantly, what implications does this type of architectural effort have for architecture in general? With the architects feeling figuratively pushed to the edges of the built world these days, some could hope that entertainment architecture is a way of finally convincing the public of its need for

*Suzanne Stephens writes for Architectural Digest and The New York Times and is editor of Oculus.*



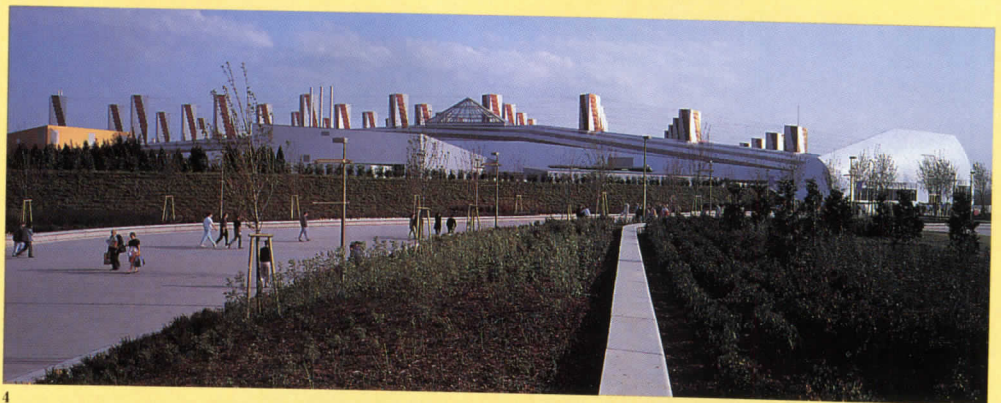
1. View of amusement park  
 2. Disneyland Hotel by the Imagineers and  
 Wimberly, Allison, Tong and Goo

3. Overview of Euro Disney Resort  
 4-7. Festival Disney by Frank O. Gehry &  
 Associates

the real thing. As in Disney's box-office hit *Beauty and the Beast*, a happy ending would be in store when the public, drawn into entertainment architecture, learns to love architecture for its soul and accepts it in all its outward, even ugly, guises.

The hotels by Graves, Grumbach, Predock, and Stern, along with the entertainment complex by Gehry, are clustered in their own compound around a lake and an adjoining creek. While separated from the amusement park itself by the rapid transit and high-speed railroad stations that link Euro Disney to Paris and (eventually) southern Europe, they are only a short stroll from the heart of the action. One hotel, however, is not part of this cluster. The Disneyland Hotel is the gateway entrance to the amusement park, a high-Victorian-style confection with rabbit-eye pink wood siding and lobster-red turreted and mansarded roofs. Its foofaraws, frills, and furbelows go the whole nine yards of entertainment architecture. Indeed, compared to the hotels designed by the "name" architects, the Disneyland Hotel establishes a strong sense of Other. Because it was designed by the in-house Disney Imagineers (in association with Newport Beach, California, firm Wimberly, Allison, Tong and Goo) it's entertainment architecture without architects. Ironically, this 500-room hotel is the only one given a Disney "five-star" rating at Euro Disney—which means a higher construction budget along with larger rooms, more staff, and, of course, higher room rates.

The designer-collection architects got to do the hotels that would charge less and therefore had smaller budgets, smaller rooms, but higher densities. In a way this was a stroke of genius on Disney's part. When the Imagineers and associated architects have designed lower-budget accommodations, the result is often a watered-down mock-theme-of-the-moment-look. Why not have inventive architects beat their brains out to elevate the program with their own architectural imprimatur? The high-design architects still had to "theme," of course, and those themes had to tell a story that could be understood and loved by its audience. Herein was the challenge, for such themes would need to captivate the fantasies of the public (ro-



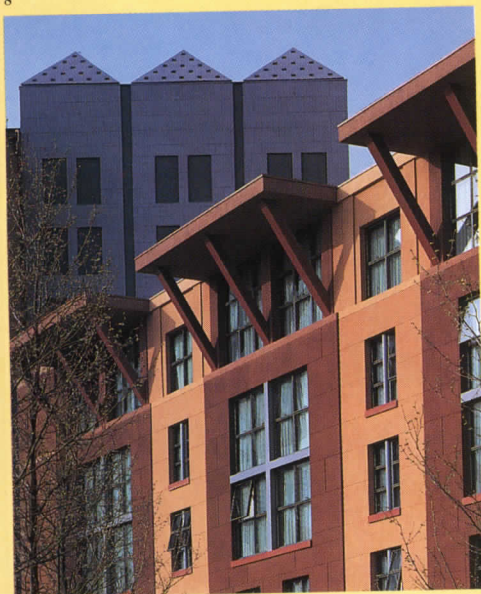
**Observations**

8. Lakeside view of Hotel New York by Michael Graves Architect  
9, 10. Exterior details

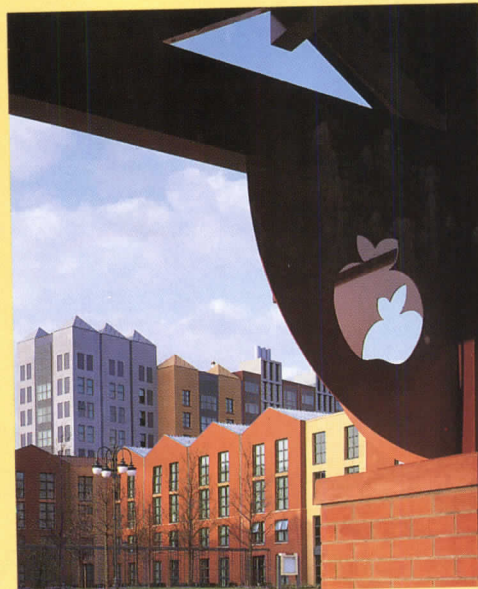
11. Lobby by Michael Graves Architect  
12. Rainbow Room restaurant by Michael Graves Architect



8



9



10



11



12

mance, glamor, perpetual youth), if entertainment architecture were to work. But in many cases, the architects' own fantasies proved more about the artistic act of creation, more about creating Architecture with a capital A.

The overall theme seems perfectly reasonable: each hotel was to re-create the ambience of a particular American region or city. Thus Graves's Hotel New York is meant to conjure up different parts of Manhattan, from brownstones to skyscrapers. It works extremely well inside, where take-offs on Rockefeller Center's Rainbow Room, Art Deco bars, a diner, lobby, and guest rooms allude to the city in the 1930s, while New York tourist-type iconography adds additional whimsy. Instead of the exterior evoking the venerable Waldorf-Astoria Hotel, however, its terra-cotta, and earth-colored stucco and brick surfaces and chunky vernacular-classical forms remind one more of recent IBA urban-renewal housing in Berlin [RECORD, July 1989, pages 82-95]. The Waldorf it ain't.

The Hotel New York, with 574 rooms and a four-star rating, occupies a prominent location at the end of the large basin of water around which the major hotels are arranged. Opposite is Stern's Newport Bay Club. Newport Bay, like his Yacht and Beach Club hotels at Disneyworld in Orlando, is intent on evoking the kind of hotel that might be found along the Northeastern seaboard at the turn of the century. Except this one is a tad larger. What Disneyites claim is the largest hotel in Europe, the Newport clearly has a problem fitting all of its 1,100 rooms into a domestically derived imagery. It all gets too stretched. The proportional play between small windows and large roofs is thrown out of kilter through sheer numbers. While the pressed-fiberboard siding painted pale yellow, gray, and white may warm the building on a gloomy day, its complexion looks consumptive next to its floridly robust Victorian cousin, the Disneyland Hotel. Since the Newport is three-star, the rooms are by formula small, although Design Continuum of Atlanta made them cheery.

Grumbach's three-star Sequoia Lodge, located between the New York and the

13. Newport Bay Club by Robert A. M. Stern Architects

14. Newport Bay Club lobby by Robert

Newport hotels, is surprisingly successful because of a relaxed attitude toward theming. The mixture of redwood planks and real stone (mounted in prefabricated panels), plus the long, horizontal lines of the hotel, its deep, overhanging roofs, and bands of fenestration, show a link to Frank Lloyd Wright's prairie houses and to Far West retreats. While the plan, the exterior detailing, and the composition of the masses are stiffer than those predecessors, the lush landscaping should soon soften features. Inside, Grumbach has managed to alternate intimate spaces with grand ones in a manner that conjures up what Wright might have done if he had designed a 1,000-room lodge at Yellowstone. The Arts and Crafts-style interior by Wilson & Associates upholds the general image.

Down river from the Sequoia is Predock's two-star Hotel Santa Fe. The Santa Fe consists of 42 integrally painted stucco guestroom "pueblos." On a sunny day, the gradation of pastel earth to sky hues of the low-rise structures looks quite luminous. But it is hard to say whether the muted colors will soften the austerity of the masses in gloomy weather, or how much maintenance this stucco will require in a cold, rainy climate.

A large drive-in movie screen with the likeness of Clint Eastwood enlivens the entrance, but it shows that Predock lost the battle to leave the screen (poignantly) blank. However Predock did win the battle of the Trails. His predilection toward the abstract and arty, instead of the themey, called for different circulation paths weaving through the grounds: the Trail of Monuments, Trail of Water, Trail of Infinite Space, and so on. The trails are called out by such markers as rusted pick-up trucks, a water trough, a yellow line on a road that supposedly continues forever. You get the picture, and if you don't, you're not alone: some "cast members" (staff) sound confused when retelling the hotel's storyline. Unfortunately interiors, by the normally upbeat Dallas-based Wilson & Associates, seem to indicate that a standoff took place between interior designer and architect. The lobby and restaurants areas are as sparsely decked out as a parking garage, including dreary lighting.

A. M. Stern Architects and Design Continuum

15, 16. Hotel Cheyenne by Robert A. M. Stern Architects



13

17. Hotel Cheyenne's Chuck Wagon Café by Robert A. M. Stern Architects and Wilson & Associates



14



15



16



17

## The Black Architect's Experience

By J. Max Bond Jr.

Jack Travis, the editor of *African-American Architects in Current Practice* (Princeton Architectural Press, 1991) wrote in the book's foreword that "This report will not be a historical, critical, or complete account of the contributions of black American architects. My efforts here are primarily meant to profile a few significant individuals and their firms in current practice, and to present people of color in architecture as positive role models and architecture as an alternative profession to black youth." From that and other statements, it is clear that this book is meant to reveal and affirm the presence of African-American architects. As Harry Robinson points out: "We practice . . . We exist."

To understand this drive to affirm the work of black architects, it might be useful to discuss the context and history that have influenced Travis's publication as well as the "Directory of African-American Registered Architects," prepared by Bradford C. Grant and Dennis Alan Mann. (Although this article will focus on Travis's book, the *Directory* is a wonderful project—a valuable networking tool that architects and clients can use to find out just who is out there. It lists some 880 architects and is available from the Center for the Study of the Practice of Architecture, the University of Cincinnati, Ohio 45221.)

### A historical context

Opportunities for African-American architects have been linked to the fortunes of the black community in general and to the evolution of laws affecting race relations. Richard Dozier's essay "The Black American Architectural Experience in America" traces the role of blacks to builders during slavery, the decline in building activity during reconstruction, and the gradual but extremely limited increase in the number of black architects during the early years of this century.

The Civil Rights struggle in the U. S., liberation movements throughout the world, and post-World War II prosperity focused more

*J. Max Bond Jr. is a partner with Davis, Brody & Associates in New York City.*

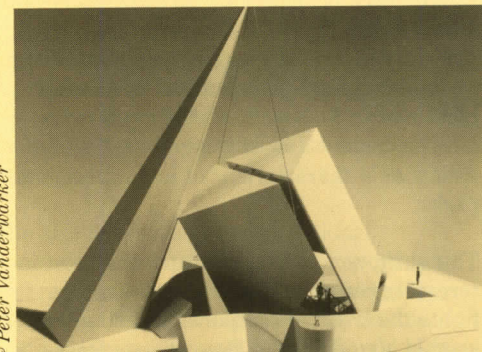
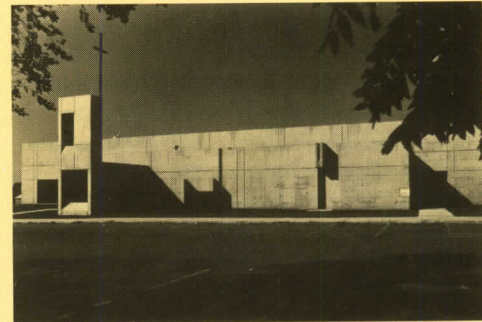
attention on blacks. Increases in power and opportunity were reflected in a sudden surge (still miniscule in real numbers) of blacks opening offices and studying architecture. Sharon Sutton describes this phenomenon in her statement in Travis's book. She entered Columbia School of Architecture in 1968 along with 25 other black students, an unprecedented number. That group included several now-successful architects such as Stan Britt, whose firm is not featured in Travis's book.

With the Reagan era, the country backed away from earlier progress toward equal rights and opportunity. The withdrawal of federal support to the cities and social programs, coupled with increased spending on the military and decreased spending on the public realm, had a negative impact on poor people and their communities. This situation was immediately reflected in the circumstances of black architects. Black enrollments at schools of architecture decreased as did the impetus to hire black architects.

The branch of the architectural profession with access to the media adopted interests that fitted neatly into the Reagan agenda. Sharon Sutton quotes a student who described architecture as "a profession erasing itself with its own elitism." She also characterizes the "architectural trend-setters . . . as practitioners who place "their professional identities above all else [and are] making architecture quite irrelevant to the pressing environmental needs of the nation."

In response to the not-so-benign neglect of recent years and to the changes in Europe, various elements of our society have begun to reassert an interest in the public realm and in the socioeconomic welfare of the nation. Following the usual pattern there has been renewed expression of concern for the fate of black citizens and architects (no doubt encouraged by the recent violence in Los Angeles). Robert Coles's speech on "Black Architects: an Endangered Species," Richard Dozier's research and lectures, Harry Robinson's implementation of an archive at Howard University, and Harry Overstreet's energizing term as president of the National Organization of Minority Archi-

*Although blacks have made recent progress, a new book suggests that more needs to be done to encourage African Americans to enter the field.*



© Peter Vandervarker

Top: Calvary Baptist Church, Wichita, Kansas; Charles F. McAfee, architect  
Bottom: Middle Passage Memorial (model); Stull and Lee, architects

itects have been critical elements in creating a climate that supported discussions of blacks in architecture. Grant and Mann's directory is a natural outcome of the desire to discover what skills exist in the black community.

### The media's image of black architects

Spike Lee's film *Jungle Fever*, in which the male lead happens to be a black architect, presented an opportunity that Jack Travis seized as Lee's consultant. Despite the usual obstacles, Travis in time found a publisher for his research on some, though not all, practicing black architects; hence the publication of *African-American Architects*.

It seems clear that historical context shaped the character of Travis's book as much as the editor's own point of view, the work shown, or even the individual concerns of the architects. It was important that someone chronicle our existence. It was also obvious that even the architectural critics who profess some social concern still do not see blacks as important contributors to the

nation's culture. How else can one explain the exhibit and catalog prepared by the normally enlightened Architects, Designers, Planners for Social Responsibility, which virtually ignored the existence of African-American architects? Travis's book should be seen as an important first step. Because there is so much ground to cover, however, the book is not always clearly focused. The book opens with a series of essays followed by a profile, including photographs and a short general statement, on each of several firms. Given that some significant work is not included, the book is not quite a catalog; what's more, it offers little critical commentary on the individual buildings shown. Beyond the fact, often stated in the essays and personal statements, that the architects represented have seen hard times and are "survivors," one gets little sense of what motivates them. What choices do they make? What unites or distinguishes them?

I have heard Wendell Campbell, Roberta Washington, and Charles McAfee talk about their work. In each case they presented a unique point of view and described the circumstances of their practice eloquently. In listening to Campbell one sensed his passion for informing his clients of his intentions, and for increasing their awareness of the potential ideas that can be represented in building. He is dedicated to meeting their needs and aspirations. Roberta Washington works on many renovations in Harlem. Such projects are not glamorous and provide little opportunity for great architectural statements. Yet she brings to that work a care for details and a broad view of the social issues involved in the creation of each design. Others have struggled to balance the economic situation of African-American communities with their desire to express particular attitudes toward culture and one's place in the community.

My own experience has revealed a vast number of questions to be addressed if one only postulates a change in the relationship between the architect to his community. Sharon Sutton's essay deals with how the role of an African-American female architect may be quite different from the image taught in architecture schools and advocated in the highly polished trade publications.

Thus, the position of these architects offers great opportunity for re-evaluating architectural norms; for developing, if not a new style, then a close interconnection among the reality of building, social needs, and architectural history.

#### **Combining architecture and urban design**

Stull and Lee's statement does express the joy one feels on finally completing a building. But what is not represented is David Lee's insightful argument for combining urban design and architecture in one practice. He argues that the problems of our cities cannot be addressed through an individual building opportunity but need broader approaches if we hope to restore the social, economic, and architectural vibrancy of our urban neighborhoods.

In short, much of the work shown is informed by more than can be represented in photos and brief statements. Perhaps the format of an architecture book, which this is, is an inadequate means of presenting the work of those who represent an American reality rarely presented in the artificial fantasies and frequently political images of what Sutton calls the "glossies." In an era that ceaselessly hypes the new, there is too much emphasis on objects, superficial success, formal excitement, and rich and powerful people using architecture to reinforce their economic and cultural hegemony.

It would have been wonderful if this first attempt had broken from the "picture book" format of presenting architecture not just as individual objects but as a complicated creative process—a process, incidentally, that begins before an architect designs and continues beyond the construction of a building to include revisions by its inhabitants. Travis might have shifted his emphasis away from presenting so many pictures without their surroundings to more analysis. Statements relating specifically to the work shown might have helped give a clearer sense of who these architects are, of their concerns, of how they produce work, and of the work's relationship to its environment.

The method used—general essays followed by statements and photographs of the individual architects' work—does not permit

Travis to develop themes or groupings that would place the work in a critical context. Various categories would have been possible depending on the editor's sense of the work. Alternatively, an analysis of the projects themselves might have suggested categories. Not only would this have helped to clarify the selections of work; it might also have revealed how architectural production is shaped by circumstances, intention, teamwork, or other processes.

#### **A first step**

To summarize, Travis's book is an important first step and deserves great credit for imagination, insight, and perseverance. We all owe him a debt. His book represents not only an individual effort but also the interaction of many forces and people. Architecture is a social art and it responds to social forces. Yet it has its own language and dynamic. Black architects, their work, and their history can only be understood through some analysis of our society and of the role of architecture within that society.

African-Americans, like most oppressed people, are not simply victims. We have created a rich social and cultural life expressed in all art forms. Black architects share not only the disadvantages but also the rich cultural heritage of African-America. Forthcoming books and articles will perhaps begin to present the variety, skill, interpretation, and controversy—matters that blacks share with other artists, writers, musicians, and social analysts. Harvey Gantt's grandson will not only be as skilled and talented as his grandfather, he will also have the luxury of being judged by the quality of his art and its relevance to people and place. ■

## Briefly Noted

**Harwell Hamilton Harris**, by Lisa Germany. Austin: University of Texas Press, 1992, 252 pages, \$65.

A long-overdue study of this important but often neglected Modern regionalist, *Harwell Hamilton Harris* places the architect where he belongs: in the center of 20th-century American design. An apprentice to Richard Neutra and Rudolph Schindler and a disciple of Frank Lloyd Wright, Harris carried the torch of "organic" architecture from the 1930s until his death in 1990. As a practitioner, he designed beautifully crafted houses (such as the 1939 Blair residence and the 1941 Weston Havens residence) that respond intimately to their settings. What is more, as director of the new School of Architecture at the University of Texas in the early 1950s, he helped shape a generation of educators—John Hejduk, Colin Rowe, and Robert Slutzky, among others—all of whom eventually rose to prominence. Essays by Kenneth Frampton and Bruno Zevi, along with a solid biographical text by author Lisa Germany, underscore the significance of Harris's work.

**Design with Climate: A Bioclimatic Approach to Architectural Regionalism**, by Victor Olgyay. New York: Van Nostrand Reinhold, 1992, 190 pages, \$30 (paper).

First published in 1962, this book makes even more sense today. Offering a general climatic approach and specific applications, the text combines research from various sciences (including biology, meteorology, and engineering). Unfortunately, the text has not been updated in 30 years and lacks any new introductory material.

**Macfarlane's Cast Iron Catalogue**. Salt Lake City: Historical Arts and Casting, 1992, 696 pages, \$70.

A reprint of a Scottish cast-iron manufacturer's catalogue from 1882, this two-volume set is a rich trove of Victorian design. From spire terminals to rain-water pipes and elaborate railings, this facsimile publication includes hundreds of selections. An introduction by Margot Gayle, president of the Friends of Cast Iron Architecture, provides background history on manufacturer Walter Macfarlane and cast-iron production.

**Richard Meier Architect**, preface by Richard Meier, essays by Kenneth Frampton and Joseph Rykwert. New York: Rizzoli, 1992, 432 pages, \$60 (cloth), \$40 (paper).

The sequel to a 1984 monograph on Meier, this book presents recent buildings and projects, including the Frankfurt Museum for the Decorative Arts, the Canal + Headquarters in Paris, and the Getty Center under construction in Los Angeles. Divided into private buildings, public buildings, and object designs (everything from clocks to china), the book offers an in-depth look at continuity and change in Meier's work as it has become grander in size and more international in scope.

**Design for Effective Selling Space**, by Joseph Weishar. New York: McGraw-Hill, 1992, 176 pages, \$57.

Combining psychology and merchandising with design, this book explains the basics of retail architecture. The author, a founding principal of New Vision Studios, covers topics ranging from establishing images to graphics and traffic patterns. ■

Drawn for ARCHITECTURAL RECORD by Sidney Harris



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Circle 26 on inquiry card

Apple Macintosh and Architects **A9**

## ORCUTT/WINSLOW PARTNERSHIP

PHOENIX, AZ

When the pace of things feels dizzying in the extreme, it's often valuable to step back and review just how rapidly one's world has changed in a given time span. With any luck, the exercise eases that urgent desire to stop the universe and head for the closest exit ramp. And nowhere is this more true than in the razzle-dazzle world of computers. A simple anecdote from Mark Patterson, AIA, System Administrator and Project Manager at Orcutt/Winslow Partnership, speaks to the issue:

*"We purchased our first computer in 1980. It was a miniframe dedicated CAD system — state-of-the-art hardware for the time, with a 40 megabyte hard disk — which took up an entire temperature-controlled room and had but a single workstation. Today, we have Apple Macintoshes throughout our office, accessible to everyone for CAD or any other function a computer might be asked to do. The office is on Ethernet with a Macintosh SE/30 and a 600 megabyte hard disk running AppleShare as the files server."*

Orcutt/Winslow first moved to the Macintosh platform in 1986 for specifications, correspondence, transmittals, spreadsheets, cost estimates, database information management, etc. Then, in 1989, they determined that

they had to move away from the miniframe-based CAD system. They began a rigorous, year-long process to evaluate CAD systems on all platforms. After looking at all systems that met their criteria, they selected ArchiCAD. "We felt it was the most accessible of all the systems we explored," notes Mark, "and it even had a few features that went beyond our expectations. It exceeded what we felt was necessary for a CAD package and, as a bonus, it had the benefit of being Macintosh-based, so it fit in with the rest of the office."

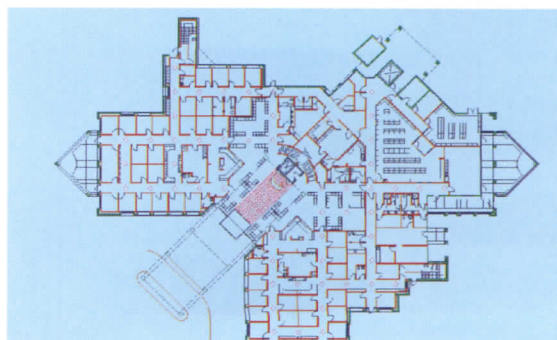
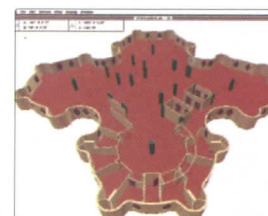
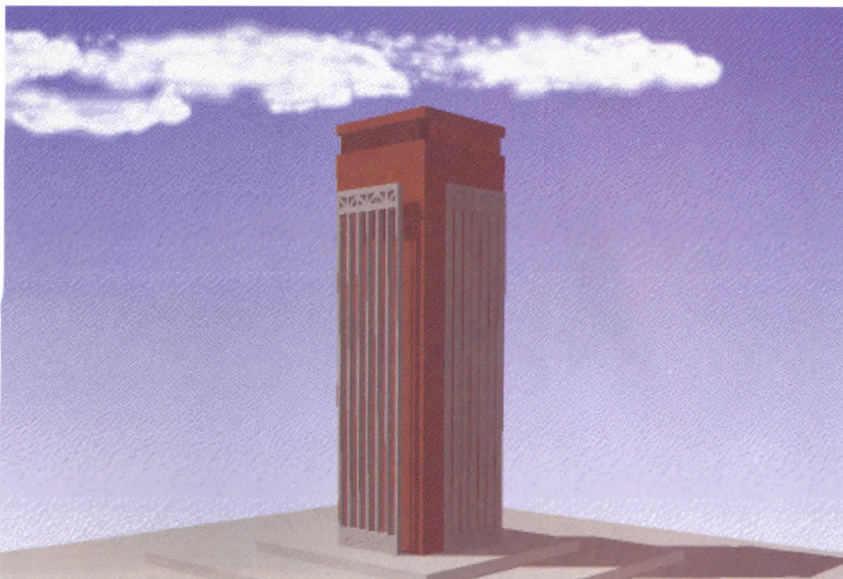
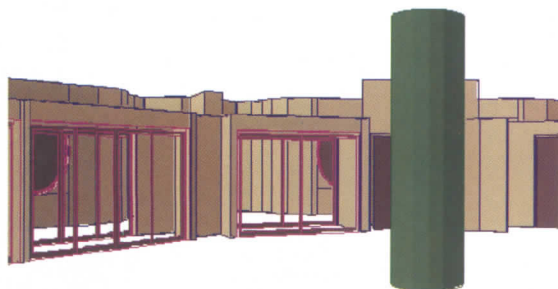
The firm uses ArchiCAD throughout the design and production process. Almost immediately, concepts lead to 3D models for which there are several alternative output formats, including animation and recording to video tape with music. They routinely bring clients in and show them different views of the project on the Mac. For other presentations, they create 3D wire-frame models, plot them out, and hand-render over the computer drawings to give them a personal touch.

Proposals are prepared on PageMaker, and the project managers employ MacProject II to establish timelines and assignments. Number-crunching — as well as the preparation of cost estimates, shop drawing logs, and project tracking — is done on Excel. "And," Mark adds, "we are starting to take advantage of a network FAX modem to send office correspondence as well as CAD drawings to clients and consultants. There are great advantages to this method including clarity of the transmission, immediacy of response, and ease of use."

In summary, Mark says, "Our office philosophy is based on accessibility of information. The Macintosh fits in perfectly. What's more, we encourage everyone in the office to experiment with the entire Mac system to find new uses and applications. And rather than pay for outside training, we formed our own in-house training classes to get everyone up to speed. We're serious Macintosh devotees."

*"Our office philosophy is based on accessibility of information. The Macintosh fits in perfectly."*

MARK PATTERSON, AIA



### PROFILE

In Business Since - 1972

Number of Employees - 39

Using Computers Since - 1980

Using Macs Since - 1986

Number of Macs in Use - 20

Primary Software Applications -  
Apple File Exchange, ArchiCAD,  
Excel, MacProject II,  
PageMaker



**MEDIA FIVE DESIGN GROUP**

HONOLULU, HI

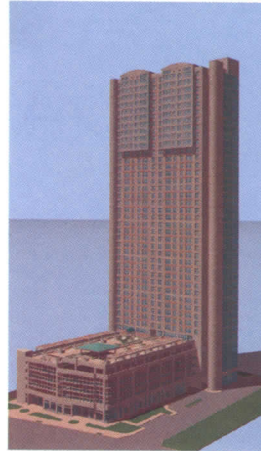
**M**aximally Mac-ified is not a phrase that has found its way into everyday jargon. But it fits this Honolulu-based firm that specializes in very large projects (like resort hotels) that cost over one hundred million dollars. With a staff of 100, they utilize 80 Apple Macintosh computers for land-use design, conceptual and interior design, graphics displays, marketing presentations, and administration. Heavily-traveled partners work on the road and communicate with the office using Apple PowerBook 170s.

New employees can be instantly introduced to the Mac with little or no formal training. Peer "veterans" help them with occasional problems, and soon the newcomers themselves are tutoring the next batch of "rookies." In one instance, a complex forty-two-story building was designed and rendered by a "computer illiterate" designer in two and one-half weeks ... while learning the software. Although the designer

didn't need a computer to visualize his concepts, he used the Mac and ArchiCAD to communicate his ideas to colleagues, and to explore alternatives of color, elements, scale, etc. And along the way, he and the senior designer studied details of the building that otherwise could not have been seen until an expensive and complicated model had been constructed.

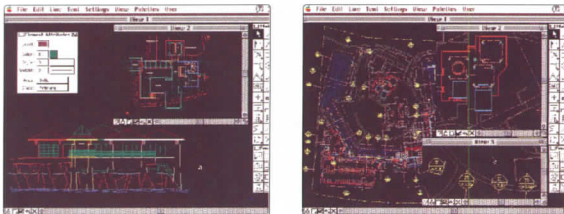
Recently, Joe Burke, Media Five's CAD manager, worked on a major project proposal with six outside consultants who were each operating on different platforms and running different software. Joe translated all outside drawings into the Macintosh and then, using DXF, imported them into MicroStation Mac, producing eighty sheets of drawings for the design development phase.

Thanks to the Macintosh's short learning curve, Media Five is able to concentrate on hiring experienced architectural designers, not computer jockeys.



*"A complex forty-two-story building was designed and rendered by a 'computer illiterate' designer in two and one-half weeks ... while learning the software."*

JOE BURKE, CAD MANAGER



**PROFILE**  
**In Business Since - 1973**  
**Number of Employees - 100**  
**Using Computers Since - 1983**  
**Using Macs Since - 1984**  
**Number of Macs in Use - 80**  
**Primary Software Applications - ArchiCAD, Excel, FileMaker Pro, MacProject II, MicroStation Mac, PowerDraw, Word**

**VERISTAR, INCORPORATED**

HOUSTON, TX

**A**vivid example of the Apple Macintosh's awesome versatility is provided by Veristar, a corporation involved in: CAD-based space planning and interior architecture; furniture procurement, moving and installation; facilities management contract services, and software development/technical manual publishing.

Networking thirty-three Macintoshes distributed among eight departmental entities — some in Houston, Texas, some in Austin — Veristar achieves 24-hour-a-day connectivity for electronic mail, order processing and file sharing. "The primary benefit we derive from the system,"

says Robert Anderson, AIA, "goes beyond 'pretty' drawings or nicely integrated graphics and text, or ease of use across standard office productivity applications, or greatly facilitated communications — or even the ability for a company our size to

achieve all of this without having to hire expensive consultants. Rather, it is the combination and integration of all these advantages that make us strong advocates of the Macintosh system."

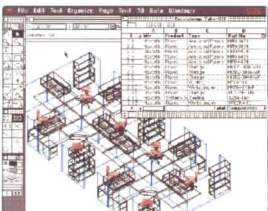
Veristar, Inc. makes heavy use of MiniCad+ for architectural plans and elevations. "We feel its biggest strength is its ability to handle non-graphic data linked to graphic CAD data on screen," says Mr. Anderson. "We use this data extraction capability for instantaneous parts takeoffs, cost estimating, and departmental area reports."

Using Word, Veristar has created merge templates which allow an account manager to turn around a complete proposal, including detailed scope of services and costing for turnkey projects, in as little as one-half hour on the Mac. Further, all project time usage information for designers and architects is collected by real-time entry into an on-line FileMaker Pro database used for time and billing. Linked to this database are in-house-developed tools for producing quick, sophisticated project estimates.

What else can you ask of a computer? You can bet Veristar's Robert Anderson is working on it.

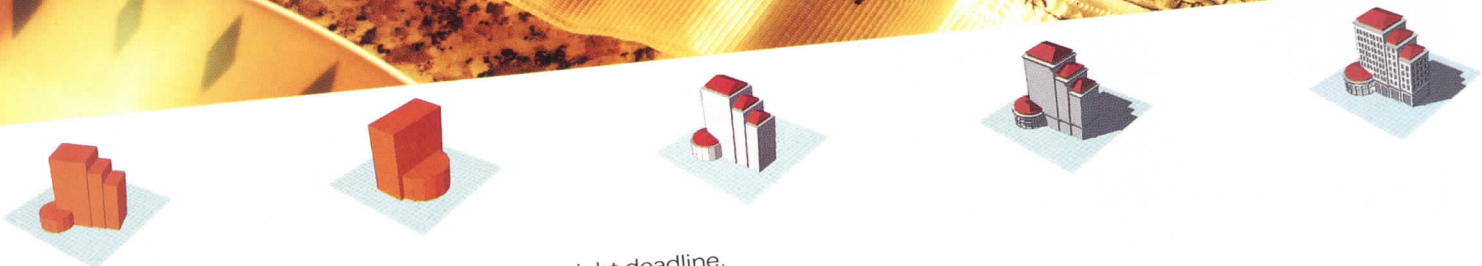
*"The primary benefit we derive from the system goes beyond 'pretty' drawings."*

ROBERT ANDERSON, AIA



**PROFILE**  
**In Business Since - 1981**  
**Number of Employees - 200**  
**Using Computers Since - 1984**  
**Using Macs Since - 1984**  
**Number of Macs in Use - 33**  
**Primary Software Applications - Excel, FileMaker Pro, MiniCad+, QuickMail, Word**

On paper it's just an idea.



Last night was a dead end. You're up against a tight deadline. The waitress has just poured you a cup of coffee. Black. Suddenly an idea strikes. You start to draw as if possessed. It's very conceptual. No pressure. Ideas flow, mix and transform. Throughout history, napkins have been one of the great creative surfaces to rough out and present an idea. They're convenient and easy to use, but a napkin can't easily show three dimensions, different angles, or full color and real shadows.

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# THE AMERICAN INSTITUTE OF ARCHITECTS

WASHINGTON, DC

As one of its many services to the profession, The American Institute of Architects publishes and distributes large numbers of newsletters, white papers, meeting notices and other important documents each year — much of them based directly on materials submitted by the members. And that's where the problems begin.

They receive both 5 1/4" and 3 1/2" floppies, in a variety of formats. On occasion, they receive "mystery disks" from unidentified platforms. And they still receive typed manuscripts, sometimes 20 or 30 pages in length. Christopher R. Clark, AIA, Director of Design Practice, is responsible for receiving and processing these diverse materials. Chris has requested that members submit their materials in electronic format, since disks are used to input text to The Institute's computerized printing process. But he isn't always successful ... which is not altogether surprising, given a membership of over 55,000 independent-minded individualists.

The solution?

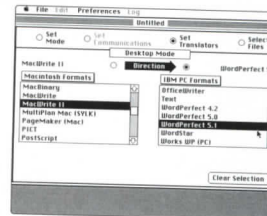
According to Chris, "The Apple Macintosh has proven to be a vital tool in processing the volumes of floppy disks and written text that arrive each month. In addition to reading Macintosh disks, the Mac can easily format, read and write to DOS disks. Using DOS Mounter, they show up on the screen

just like Macintosh disks, and I can work with them in the same convenient way."

Because of its extensive array of built-in translators for both Mac and DOS-based word processing programs, Chris uses MacWrite II to review the incoming disks. After opening a file, he runs it through a spell checker, corrects punctuation, and saves it. Then he uses MacLink Plus to translate it from MacWrite II to a DOS word processing file format — usually WordPerfect — that is compatible with the layout system used to create The Institute's printed publications.

For typewritten manuscripts, Chris scans them into his Mac with an Apple Scanner using OmniPage, an optical character recognition (OCR) program. OmniPage automatically converts the scanned document to a text file that can be edited and saved. "Here again," says Chris, "I just open the scanned document, perform spelling and punctuation checks, then translate it to DOS format."

"With either process, I'm able to deliver text on 3 1/2" disks to the Institute group responsible for producing the finished publications."



*"The Apple Macintosh has proven to be a vital tool in processing the volumes of floppy disks and written text that arrive each month."*

CHRISTOPHER R. CLARK,  
AIA, DIRECTOR OF  
DESIGN PRACTICE

**PROFILE**

In Operation Since - 1856  
Number of Employees - 200+  
Using Computers Since - 1970  
Using Macs Since - 1990  
Number of Macs in Use - 5  
Primary Software Applications -  
DOS Mounter, MacLink Plus,  
MacWrite II, OmniPage

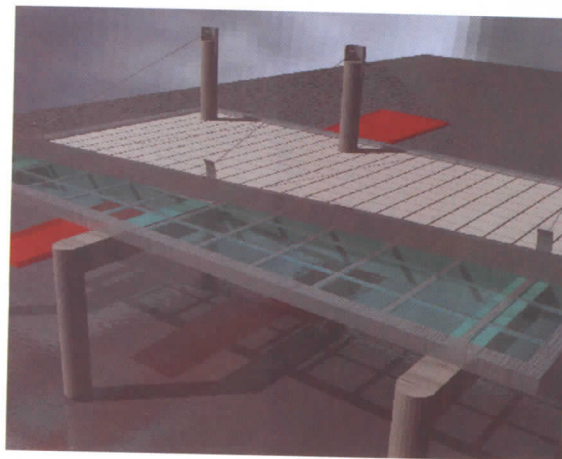
# HEERY INTERNATIONAL

ATLANTA, GA

An all-too-common admonition laid on new employees these days is, "... And don't bring stuff from home into the office." Yet outright delinquency in this area is exactly what led Alan Brown, Architect, to make extraordinary changes in his approach to architectural design. In 1989 when he joined Heery International, a firm specializing in industrial and commercial architectural design for large corporations, he promptly did the unthinkable: he packed up his Apple Macintosh computer ("stuff from home") and plopped it down on his office desk — just like his other tools.

The Macintosh had been used widely in the Facility Management and Graphics Departments at Heery International. And now, partially due to Alan's use of the Mac in his design work, the company is purchasing Macintosh Quadras for use throughout the Design Department.

Alan is a regular user of Ashlar Vellum for 2D work. And he regularly exports files to form•Z (his 3D program of choice) to create solid models "that I can punch holes in for windows and doors, and gradually evolve the form and the design." He then exports that model in a DXF format



to StrataVision 3d to render the image in high resolution, to print out slides and, in some instances, to create animations. Alan saves the animations in a QuickTime movie format and then opens them in Adobe Premiere for editing

*"I want to use the technology, not be overwhelmed by it."*

ALAN BROWN, ARCHITECT

**PROFILE**

In Business Since - 1952  
Number of Employees - 250  
Using Computers Since - 1984  
Using Macs Since - 1987  
Number of Macs in Use - 30  
Primary Software Applications -  
Adobe Premiere, Ashlar Vellum,  
Canvas, form•Z, QuickTime,  
StrataVision 3d



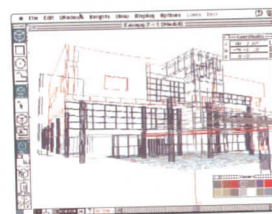
and the addition of special effects, graphics, overlays and sounds. Recently, his firm wanted to send a video tape to a client instead of hard copy, so they used a NuVista board at a video production company to output the QuickTime animation to video tape. Alan says, "The client absolutely loved it. Our next step is to use the technology to output directly to video tape right here in the office — including images and sound."

Alan favors Canvas for all of his graphics work. "To me it is the 'Grand Central Station' of graphics. And I need that, because I bring many different formats together from a wide variety of sources. Canvas is not used as a CAD pro-

gram in our office but it has a lot of the same features with an easy-to-use interface and very broad applications."

"Even so, I consider the Macintosh just another 'tool' to do my work," adds Alan. "I still use straight edges, parallel blades, triangles, pencils, etc., but the Mac enhances everything I'm capable of doing. However, I don't get involved in 'computerese,' I just use the tools available to me. I want to use the technology, not be overwhelmed by it. Other platforms require a tremendous investment of time and learning, but the Mac allows me to move among programs with ease."

"For graphically oriented people," Alan concludes, "the Macintosh is a natural tool. It does what I need."



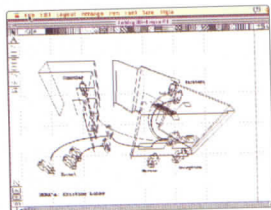
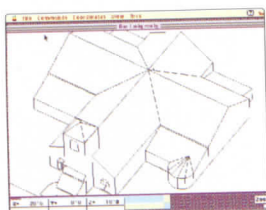
## CLOVIS HEIMSATH ARCHITECTS

AUSTIN, TX

Clovis Heimsath, FAIA, was dragged kicking and screaming into the computer age. But his saga provides vivid testimony to the over-50 segment in the architectural profession that the payoffs are more than worth the modest amount of unease that accompanies adoption of any new technology. "I hoped against hope that I could get through my career without retraining," Mr. Heimsath says, "particularly since I was pretty good with traditional drafting and illustrating tools. Let my son's generation be computer literate! Leave me out of it! But computers just wouldn't go away."

Today Mr. Heimsath is a vociferous Apple Macintosh convert. "The Macintosh has given me the opportunity to express what I've wanted to do for thirty years. It has been an altogether liberating influence. It has set free my imagination."

Clovis Heimsath Architects specializes in religious architecture. "The major issue between the architect and the client in this field," Mr. Heimsath says, "can be summed up in the simple question, 'What will it look like?' A church/temple/mosque lives two lives simultaneously: it is a supportive environment for the faithful inside; and, it is a symbol of faith to the larger community outside."



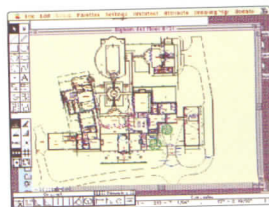
Mr. Heimsath compares the Macintosh way with the traditional method of producing documents. No more the hours, even days, spent preparing longhand perspective layouts. In developing St. Mary's Episcopal Church in Richmond, Virginia, rapid perspective layout was essential, for it was necessary to show how the complex of buildings would look from every side. "Before Macintosh," Mr. Heimsath says, "I would have produced a half dozen 'thumb-nail' sketches from various views, or I would have laid out laboriously (4-5 hours minimum) an axonometric. Using MacPerspective, I constructed a wire-frame 3D image of St. Mary's in approximately three hours, which I could then view from every side, at any height (from eye-level to thousands of feet overhead) in seconds. And, in less than an hour's additional work, I produced a second 3D interior perspective layout which was visually accurate in every detail."

Recently, Mr. Heimsath had an opportunity to compare work done on an early project in which CAD was combined with longhand drawings, and two later projects which were drawn completely on the Macintosh. "We asked ourselves: 'Which is better?' The answer became emphatically clear: not only are CAD-generated drawings more accurate (and coordinated), they are quicker to produce."

The Heimsath firm also uses the Macintosh for presentations, marketing, and many administrative tasks. Every desk has been replaced by a Mac workstation.

A favorite Macintosh story of Mr. Heimsath's involves the Mac's extraordinary connectivity. An important client demanded that all files on his project be usable on his DOS platform. Clovis Heimsath Architects created drawings on their Macintoshes, copied the drawings onto a DOS disk, and at one very dramatic meeting put the disk into the client's DOS portable and asked him to take a look. "The client was amazed," says Mr. Heimsath.

"A big problem, as any architect knows, is the time and cost involved in producing the communicating documents. I've waited twenty-five years for the tool to make this process rapid and inexpensive. The Macintosh is it."

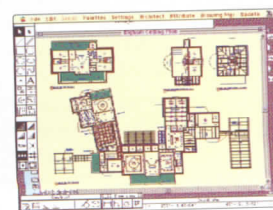


*"The Macintosh has given me the opportunity to express what I've wanted to do for thirty years. It has been an altogether liberating influence. It has set free my imagination."*

CLOVIS HEIMSATH, FAIA

### PROFILE

In Business Since - 1967  
 Number of Employees - 8  
 Using Computers Since - 1987  
 Using Macs Since - 1988  
 Number of Macs in Use - 8  
 Primary Software Applications -  
 Apple File Exchange,  
 DynaPerspective, Excel,  
 MacDraw II, MacPerspective,  
 PageMaker, SuperPaint,  
 VersaCAD, Virtus WalkThrough,  
 Word



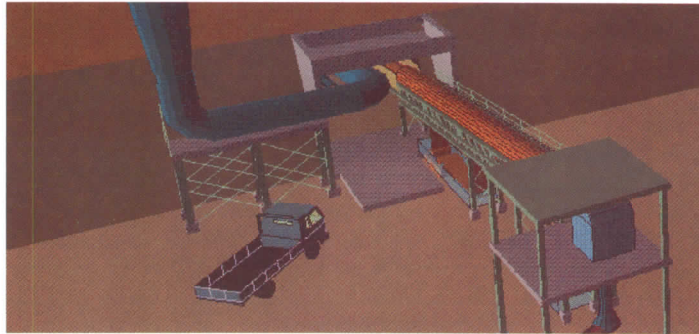
**NORDQUIST ASSOCIATES**

SAN DIEGO, CA

**H**ow does a leader of an organization, persuaded that a new technology will profit not only the firm but individual staff members as well, get his employees to at least give the approach a look? Niles Nordquist, ASLA has an answer, one that has paid off handsomely for all concerned. Niles offers everyone in his office an interest-free loan to cover the cost of purchasing a new Apple Macintosh system for home use. Then, when someone takes him up on the offer, he sets about encouraging them to explore new ways of using this versatile machine. His philosophy is simple: "If the principal doesn't support the technology — really get behind it — the office doesn't support it. We have a great ability to train new employees because everyone in the office pitches in and brings them along at their own pace." Today, there's a Macintosh on every desk, all of them networked via AppleTalk. Everyone does their own typing of correspondence, transmittals, meeting minutes, etc. The company does not have secretaries.

But use of the Macintosh is not confined to routine administrative chores at this landscape architecture office. Nordquist Associates have been working with VALE and SightPlan to digitize contour maps, and LANDview for 3D design. They employ DynaPerspective and ModelShop to perform 3D visualizations, animations and fly-throughs of their ideas. "After we design a project," says Niles, "we typi-

cally put together a series of animated 'clips' that describe our solution. Then we export them to an outside production studio for editing. What we end up with is a presentation format that can really reach an audience. Most clients can't read plans, so we communicate in a medium they are familiar with — VHS tape and the TV screen. Generally they prefer this to a physical model because it's so easy to



change, and they can look at our solution from many different realistic viewpoints."

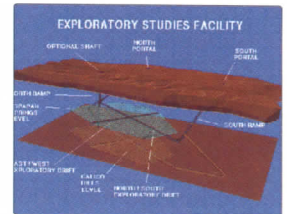
Despite his respect and affection for the Macintosh, and his efforts to instill those sentiments in his employees, Niles is not so blinded by the new technology that he ignores the fact that there is still a time and place for traditional ways. "It is much easier for us to do our conceptual work by hand. We will continue to combine this sort of work with the computer applications."

*"If the principal doesn't support the technology — really get behind it — the office doesn't support it."*

NILES NORDQUIST, ASLA

**PROFILE**

**In Business Since - 1982**  
**Number of Employees - 6**  
**Using Computers Since - 1982**  
**Using Macs Since - 1984**  
**Number of Macs in Use - 7**  
**Primary Software Applications - DynaPerspective, Excel, FileMaker Pro, LANDview, ModelShop, SightPlan, VALE, Word**



**LENNON ASSOCIATES**

DEL MAR, CA

**I**t is doubtful that one could find a case anywhere in which the Apple Macintosh computer is more completely integrated into an architectural project than in a recent design from the offices of Lennon Associates. Not only was the Macintosh used in preparing the design, administering the project, and communicating with the client — it also became a key element in the actual operation of the project itself.

Lennon Associates works extensively in the health care industry. "Health care architecture is information-intensive," says Jim Lennon, AIA. "And the biggest problem one has is tracking information flow and finding out where information is being lost." With FileMaker Pro, Jim says his firm can keep tight control of what they are doing.

Recently, the firm was contracted to design a 55-bed Emergency Department for a large hospital. "Before the Macintosh, we'd have responded to this job like a pharmacist

— we'd have just 'filled the order' and given the results to the client," comments Jim. "But in this case we decided to develop various simulations of how the Emergency Department (ED) might operate. For the purpose, we used Extend, a general purpose simulation language." Among the discoveries: eighty percent of recognized problems in the ED were due to administrative procedures; only twenty percent could be attributed directly to the architectural layout of the spaces used. That meant that an analysis of activities — from the moment of admission, through taking of patient histories, lab testing, processing of lab data, diagnosing, treatment, physician visits, record-keeping, etc. and finally release of the patient — could yield many opportunities for increasing the flow of patients through the ED without affecting quality of care. And that could mean reducing the number of beds needed in the final design.

"We presented the simulation to the hospital staff, and to-

*"Before the Macintosh, we'd have responded to this job like a pharmacist ..."*

JIM LENNON, AIA

**PROFILE**

**In Business Since - 1985**  
**Number of Employees - 7**  
**Using Computers Since - 1985**  
**Using Macs Since - 1985**  
**Number of Macs in Use - 7**  
**Primary Software Applications - AutoCAD, Extend, FileMaker Pro, form\*Z, StrataVision 3d**

gether played 'What if?' scenarios with them. We could all see the consequences of, for instance, reducing by one minute the time a patient occupies a bed from the moment a lab test is taken until the results are received and acted upon. A direct result of the simulations carried out on the Mac was a new design for the ED based on podiums, instead of the traditional 'ball-room' layout. But more important, we also designed a Mac-based tracking system for each patient. At the time of admission, the intake professional is cued by a screen display to ask vital questions, and the responses are entered in the computer. From that point on, all vital information is placed in a Macintosh file bearing the patient's name. In ED hallways, monitors show the name of each patient, color-coded to indicate status and other information. The data-collection and monitoring systems on the Mac are so integrated into the design of the building that the ED could not operate without them."



"We would have been unable to do this design work on any other platform," Jim believes. "In addition, the presentations we do for clients aren't achievable on anything but a Macintosh. We're able to put together renderings and animations plus sophisticated simulations to explain complexities, details and to show movements through spaces in a visual way that conveys vast amounts of information very easily."

## BIG TIMBERWORKS, INC.

GALLATIN GATEWAY, MT

The familiar television slogan, "We do things the old-fashioned way," could well have been invented for Big Timberworks. Specializing in heavy timber-framed residential and commercial structures, they design all connections between their massive members in the fashion of traditional wood joinery: mortise-and-tenon and wooden pins (instead of nails) to join the pieces together.

"Occasionally we may have to use a steel strap to satisfy code, but we hide it well so it doesn't interfere with the aesthetics of the design," says Michael ("Call me Bake — never call me Mike") Riebeek, head of the firm's computer design department. Recently, Big Timberworks even began using recycled douglas fir lumber from old buildings to reduce the shrinkage that normally takes place. They have a saw mill on site with which they can resurface veteran timbers, catalog them and hold them for a future job. As Bake put it, "We prefer to be called 'manufacturers and carpenters' rather than 'designer/builders.'"

Until about 1990, the staff at Big Timberworks were — by their own admission — "computer phobics." It was a big leap for them to even look at computers. But look they did. And, after evaluating all their choices, they decided on the Apple Macintosh platform because of its ease of use. They then reviewed several CAD applications and chose Ashlar Vellum 3D. "The Macintosh has changed the way we do business," says Bake. "We used to draw all the details, and calculate the beam lengths and joints by hand — which led to a lot of error. Now all our drawings are done on a Mac.

And what used to take weeks now only takes a couple of days. We start with a wire-frame stick version of a design, for client review and approval, then export it through DXF to Multiframe3D for structural analysis. We calculate all loads, shear, bending, moments and stresses on the frames and members, and then take that information back to Vellum to do complete drawings."

Big Timberworks' project managers use Excel spreadsheets to track timber lists, parts sizes and quantities, and they use a macro that calculates compound angles for hip-and-valley joinery. These spreadsheet data are integrated with Vellum to check calculations and to make sure the details coincide with each other.

On second thought, a better Big Timberworks slogan is, "We do things the old-fashioned way — with new-fangled gear, Macintosh."

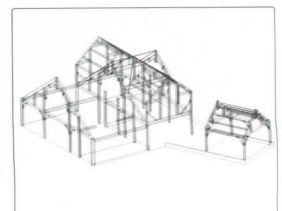


"Now all our drawings are done on a Mac. And what used to take weeks now only takes a couple of days."

MICHAEL RIEBEEK

### PROFILE

In Business Since - 1982  
 Number of Employees - 18  
 Using Computers Since - 1990  
 Using Macs Since - 1990  
 Number of Macs in Use - 4  
 Primary Software Applications -  
 Ashlar Vellum 3D, Excel,  
 Multiframe3D



**GROUP 70 INTERNATIONAL, INC.**

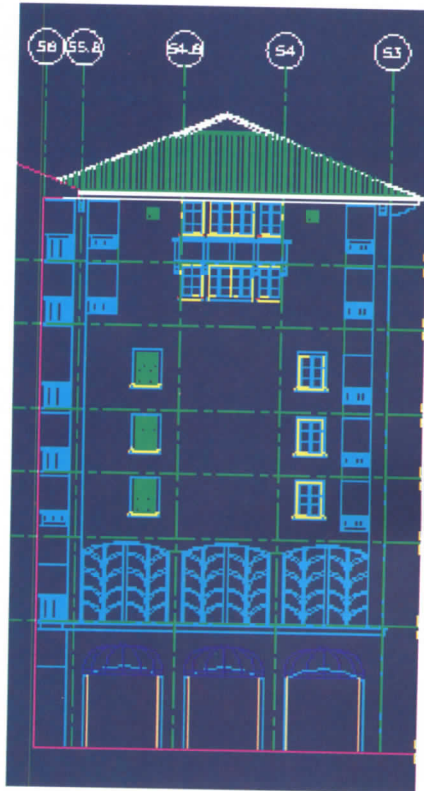
HONOLULU, HI

**W**hen the management of this successful architecture, planning and interior design firm first decided to purchase a computer, they had little idea how quickly it would enable them to realize their objective of becoming a progressive, automated firm. Today, all their project management, administration, accounting, graphics and CAD operations are fully computerized and integrated in a networked environment.

Group 70 specializes in worldwide resorts and multi-use developments, and the task of selecting an ideal primary system was not an easy one — given a staff of seventy-six and a demand for a very wide range of computer applications. Group 70 chose the Apple Macintosh for several reasons.

A major consideration was the Mac's user-friendliness. The ease of access has generated a large user group among members of the firm — many of whom were reluctant to give up the old ways. Another factor was the Mac's simple network environment, which has enabled Group 70 to integrate many of its interoffice disciplines. And, the final issue was the extensive array of graphic and business software available for the Mac, which they now use to ...

- Draw CAD images that reflect innovative designs and provide more accurate renderings,
- Schedule projects to facilitate management,
- Develop spreadsheets for the preparation of estimates, feasibility studies, charts and schedules for doors, room finish and FF&E,



- Produce graphics for presentations and marketing materials,
- Provide word processing for creating reports, proposals and interiors specifications,
- Handle administrative forms, such as FAX transmittals and memos, as well as maintain consistency and ensure simultaneous filing,

- Translate English into Japanese for correspondence with Japanese clients, and for targeted marketing efforts,
- Reformat computer files for convenient sharing of documents with consultants, clients and others, and
- Create and sustain an electronic mail system for documenting daily communications.

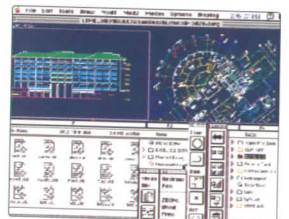
Group 70's computerized applications currently share three operating systems, Macintosh System 7, Unix and DOS. Significantly, 47 of the 60 computers in their offices are Macs.

"Our goal is to remain competitive while promoting excellence in design and productivity," say Group 70's CAD managers, Ms. Teresa Davidson, AIA, and Linda Chung. "Macintosh has responded to these needs beautifully."

*"The nature and size of a firm's projects often mandate the use of computers to remain competitive."*

TERESA DAVIDSON, AIA  
LINDA CHUNG

**PROFILE**  
**In Business Since - 1971**  
**Number of Employees - 76**  
**Using Computers Since - 1982**  
**Using Macs Since - 1986**  
**Number of Macs in Use - 47**  
**Primary Software Applications - 146 Different Applications**



**TULLOCH CONSTRUCTION**

OAKLAND, CA

**A** picture is worth a thousand numbers. So reasons Edward Ong, ASCE, ACI, PE, Chief Structural Engineer with Tulloch Construction, an architectural engineering and building firm. Using the Apple Macintosh and software programs like FRAMEMac and Multiframe3D, Ed is able to view graphic portrayals of crucial engineering calculations ... instead of pages and pages of digits, which often make interpretation of such data a brain-fatiguing chore. Ed finds the Mac a dramatic improvement.

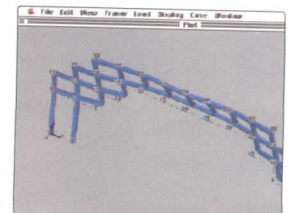
When Ed first joined Tulloch in 1986 and brought his

personal Macintosh to work, his was the only computer in the office. Today, everyone on the staff is "Mac-literate." "I like the Mac for its flexibility and for the way it does things," Ed says. "For instance, structural engineering often involves entering a great many numerical values. By using the Macintosh, we can substantially reduce the number of errors typically made from keyboard entry in structural engineering analysis programs on other platforms."

And Ed makes inventive use of a variety of programs. For instance, with Excel, he sets up a series of customized structural calculation templates for such components as tilt-

*"A picture is worth a thousand numbers."*

EDWARD ONG, PE, ASCE, ACI

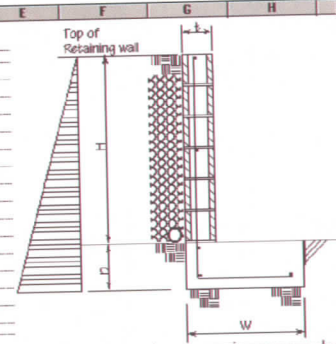


up and retaining walls, then locks them for continuous use in project after project. All construction documents are prepared on the Macintosh. Symbols taken from standard detail libraries are stored for placement whenever needed, and are easily modified to fit unique situations.

In 1987, Tulloch began using FRAMEMac for 2D analysis of loading calculations on structural elements. Two years later they acquired Multiframe3D for 3D interpretation of the same data, as well as for out-of-frame loading calculations. Ed comments, "Both of these programs allow us to visually see the loads being imposed on beams, trusses, structures and nodes. We input values graphically, on the screen, not as a list of numbers. And we can instantly see if we've made any obvious errors by simply looking at the loads graphically."

"It's also easy to select the nodes and key-in the values on the Macintosh, versus keyboard entry of X, Y, and Z coordinates and the loads, which can lead to errors. Modifying the structure is as easy as selecting a node point with the mouse, dragging the node point to a new location, and entering new

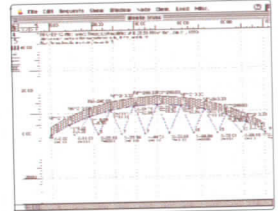
	A	B	C	D	E	F	G	H
8	<b>CANTILEVER RETAINING WALL DESIGN:</b>							
9								
10	<b>DESIGN DATA:</b>							
11	Wall and loading dimensions and material information:							
12	H:	Wall Height =	2.67	ft				
13	W:	Footing Width =	1.67	ft				
14	D:	Footing Depth =	1.00	ft				
15	t:	Wall thickness =	8.00	in				
16	Type of Wall: Masonry, Uninspected							
17	Fm for masonry = 1500 psi							
18	Unit weight of mas. wall = 84 psf							
19	fc: Concrete Strength of Footing = 2000 psi							
20	Reinforcing Steel Strength, Fy = 60000 psi							
21	Soil information:							
22	EFP: Equivalent Fluid Pressure = 35 pcf							
23	PF: Passive Pressure = 250 psf							
24	Fs: Max Allowable Soil Pressure = 1500 psf							
25								
26	<b>CHECK WALL STABILITY:</b>							
27	Overturning Moment : ((D+H)/3)*EFP*(H+D)/2) = 287.546 B-ft							
28	Resisting Moment :							
29		Wall:	223.99	1.33	238.56	B-ft		
30		Footing:	250.00	0.83	208.33	B-ft		
31					Total Resisting Moment =	506.99	B-ft	



load values. Printouts of the calculation results can be filtered so that you get only the calculations you want to see. The shear, moment, bending and load graphs can all be printed out, or exported to another application for enhancement and inclusion in a report."

Ed sums it up: "With the Macintosh, you can always see the results of your work."

**PROFILE**  
 In Business Since - 1933  
 Number of Employees - 10  
 Using Computers Since - 1986  
 Using Macs Since - 1986  
 Number of Macs in Use - 4  
 Primary Software Applications -  
 Claris Graphics Translator,  
 ClarisCAD, Excel, FlexiCAD,  
 FRAMEMac, Multiframe3D



**HOWARD F. THOMPSON ASSOCIATES, INC.**  
 NEWPORT BEACH, CA

"I use Voice Navigator to control most of the functions of my CAD program."

THOMAS KENNEDY, AIA

Imagine your computer as a highly competent design assistant ... one that will listen to and obey your every word. Sound impossible?

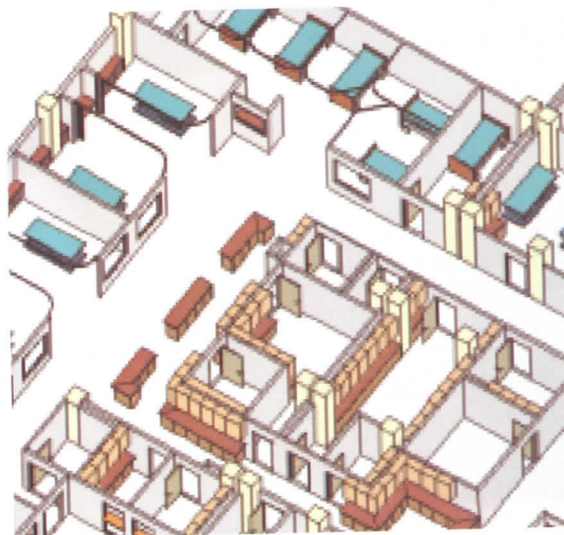
Well, it's not. In fact, the Apple Macintosh computer Thomas Kennedy, AIA, works on does it all the time. He issues voice commands and his Mac dutifully does exactly what he tells it. Tom, an architect with Howard F. Thompson Associates, uses Voice Navigator from Articulate Systems to control most of the functions of his CAD program, as well as other applications he runs.

Voice Navigator captures computer commands from an application's menus and dialog boxes and then associates a voice command with each. By creating a series of separate files, it can easily be 'trained' to respond to different individuals' voices. Normally, all a new user has to do is repeat a command three times and the software remembers the voice and the command. Voice Navigator is successful at ignoring most background noises in the office.

Macintosh users often move through more than one application in the course of a single workday ... and Voice Navigator moves along with them. Because of the consistency of the Macintosh platform's user interface, once you train it to recognize and perform a command — "Open," for instance — it will remember what "Open" means in any Mac application you are using. Voice Navigator is best for commands that are repeated over and over, like filling-in and answering dialog boxes.

You can also train it to recognize phrases like "Launch Excel" and it will start up the application. If it comes across a

command it doesn't recognize, the program will hesitate until it is trained for that command (or you can use the mouse or keyboard). The ability to switch between applications is particularly useful on CAD programs and when using large screen monitors. Voice Navigator doesn't replace other input devices — like the mouse, keyboard or a tablet — it's meant to work in conjunction with and to augment them. Tom has found that his efficiency has increased substantially: "It helps you do your work."



**PROFILE**  
 In Business Since - 1967  
 Number of Employees - 15  
 Using Computers Since - 1987  
 Using Macs Since - 1989  
 Number of Macs in Use - 2  
 Primary Software Applications -  
 Archtition II, Voice Navigator





**OLDHAM & SELTZ**

WASHINGTON, D.C.

**Y**ou've heard sports play-by-play broadcasters praise a team for having a "deep bench." Oldham and Seltz, an architecture and interior design firm, is such a team, thanks to the presence of networked Apple Macintosh computers on every desk. And, a unique philosophy about staff utilization.

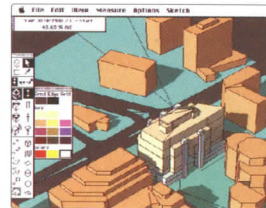
"We're not split into rigid teams," says Jan Simmon, Director of Computer Services. "People and assignments flex as jobs come in, so individuals have different, rotating roles during the course of a project. Using the reference file capability of Intergraph's MicroStation Mac, several people can contribute to a drawing at the same time. If a certain project suddenly requires more manpower, we can draw from resources within the office to fill the need." Everyone in the office has been trained on MicroStation Mac, including the firm principals, so they're all knowledgeable about the power and capabilities of the hardware and software and what can be expected from them.

And these are no small projects. For instance, Oldham and Seltz is currently designing an 800,000 square foot building for a federal agency. "We think MicroStation Mac is great," says Ms. Simmon. "We can completely customize our

screens, write menus, and produce files which are compatible with any platform our consultants or clients might have." Among the many MicroStation Mac features they like, a favorite is its ability to zoom in on portions of a drawing (done in 1/8 scale) and have it displayed on the same page as the overall drawing, much like a picture within a picture. If they choose to edit any aspect of the exploded portion, the changes are automatically changed in the 1/8 scale drawing.

The firm also uses Macintoshes for word processing, spreadsheets, databases, preparation of marketing brochures, accounting, job estimating, and supply control. They have one DOS machine in the corner which they use when they are desperate, or need a specific translation.

At Oldham and Seltz, when it's time to "send in the reserves" for any of these tasks, Macintosh is there to make it all possible with minimum effort and maximum payoff.



*"...several people can contribute to a drawing at the same time."*

JANET SIMMON,  
DIRECTOR OF COMPUTER SERVICES

**PROFILE**

**In Business Since - 1982**  
**Number of Employees - 42**  
**Using Computers Since - 1982**  
**Using Macs Since - 1984**  
**Number of Macs in Use - 45**  
**Primary Software Application - MicroStation Mac, Upfront**



**KOHN PEDERSON FOX ASSOCIATES, PC**

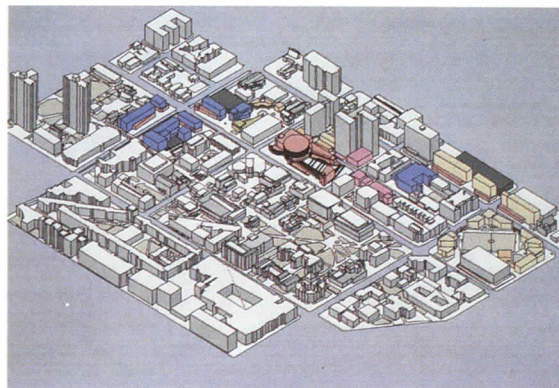
NEW YORK, NY

**H**ow does a large, prestigious architectural firm, involved in projects on many continents, incorporate computers into their practice? Kohn Pederson Fox takes an eclectic approach. At the main office in New York, a staff of more than one hundred uses Apple Macintosh computers for master planning, scheduling, art work, illustrations, modeling and image processing. And a Mac CAD system — used for creation of construction documents, modeling, and animation — runs MicroStation Mac on a mixed platform NFS network of Unix workstations and PCs. The network is attached to a Versatec electrostatic plotter and color printer.

Tomas Hernandez, AIA, Director of Computer Services, says, "The Macintosh is by far the most popular machine, and it is the easiest to support because program installations, updates and training are relatively simple. It also lends an air of friendliness that helps encourage its productive use. Most of the architects use the Mac as their prime machine."

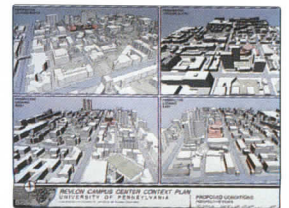
"Even architects who are only casual users produce incredible work. There's a buddy system in the office through which an experienced user in one application can share his knowledge with someone else. Those who want to learn more are given the opportunity to experiment and be creative with the technology. No other computer can offer the clean, reliable user interface and consistency from program

to program that makes people want to use Macs. They can run AutoCAD and MicroStation Mac on the Macintosh at the same time — without having to create hooks to cut and paste from one to the other. On our DOS machines, we had to create 'autoexec.bat' files and then reboot each time we wanted to switch. Very soon, FAX transmissions, E-mail, voice-mail, animation, modeling, project scheduling and database access on the Mac will be the norm for everyone. We'll continue to enjoy the benefits that the Mac offers, including better looking products and time savings."



*"Even architects who are only casual users produce incredible work."*

TOMAS HERNANDEZ, AIA



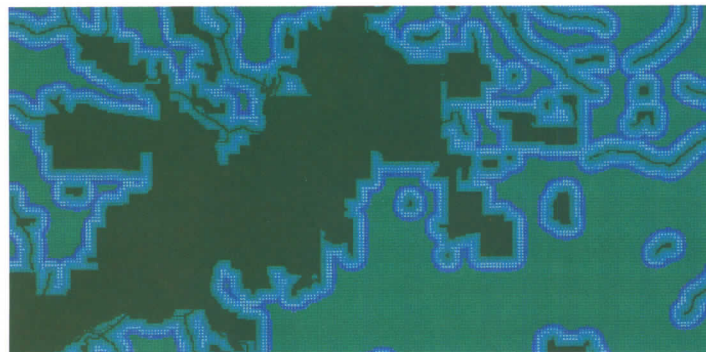
**PROFILE**

**In Business Since - 1976**  
**Number of Employees - 130**  
**Using Computers Since - 1982**  
**Using Macs Since - 1987**  
**Number of Macs in Use - 20**  
**Primary Software Applications - AutoCAD, Excel, FileMaker Pro, form•Z, Freehand, Mac Kanji, MicroStation Mac, ModelShop II, PageMaker, Persuasion, PhotoShop, Project, SuperPaint, Word**

# UNIVERSITY OF MINNESOTA

SCHOOL OF ARCHITECTURE, MINNEAPOLIS, MN

For an intriguing peek at how the next generation of architects is already using computers, the School of Architecture and Landscape Architecture at the University of Minnesota is the place to go. Their Microcomputer Lab features thirty-four Apple Macintosh computers, including twelve Macintosh Quadras. All the Macs are on an AppleTalk network (using Appleshare 3.0) and are bridged to a campus-wide network, which includes mainframes — one of them a Cray supercomputer — as well as a library search system, electronic mail, and thousands of other Macintoshes and PCs. Overall, the University of



Minnesota has the fifth largest installation of Macintoshes in the world according to Lee Anderson, Assistant Professor and Director of the University's Computer Aided Design Center.

"Ease of networking is critical to our future plans," Lee says. "Within a few years we expect most, if not all, of our students to have their own notebook computers. At that time, the Micro Lab will extend networked services to students anywhere throughout our building, including specialized services such as high-end rendering, color printing and access to video and animation libraries."

The Micro Lab has a large-screen color video projector and sound system that faculty members use when giving demonstrations to large groups. A single instructor at a Macintosh can guide a group of students through exercises they do at their individual Macs. In addition, these demonstrations are videotaped and played back in the lab for review, and a student can place a portable TV/VCR unit next to any Mac in the lab and work along with the instructor on the tape. "We have also purchased videotaped instructions for software like Canvas, so that students can learn a program in depth on their own," Lee adds. "The projector and sound system are also excellent for multimedia presentations of student work. Students use applications which support QuickTime for presentations that involve animation and sound. They will increasingly be using multimedia tools for both design and presentation, and they'll be working closely with the Department's Built Environment Communications Center, which has produced a number of videos on architectural topics, to develop their video capabilities."

The Micro Lab supports student work in a variety of other ways:

- Students use word processing and desktop publishing software such as MacWrite II, Word 5.0 and PageMaker to prepare papers, proposals and thesis documents. The department's annual publication of student work is produced entirely with Word and PageMaker.

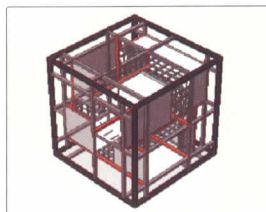
- Three courses are offered dealing with the use of computers in architecture and landscape architecture. Topics include word processing, Pascal programming, spreadsheet, database, hypermedia, land-use analysis, GIS, project management, facilities management, CAD, 3D modeling and graphics, animation, multimedia, and expert systems. Every topic requires that students use the Macintosh to complete weekly assignments. "The ability of the Macintosh to share information between these applications is critical to us," says Lee.

- A Landscape Architecture studio employs Map II software for GIS site analysis. Building site information is then passed on for use in an Architectural Design studio. Lee comments, "We are enthusiastic about this potential of the Micro Lab for increasing the interaction between the Architecture and Landscape Architecture classes and studios."

- Studio classes are supported by seminars covering use of hardware and software provided by the lab, such as Canvas, PixelPaint, Upfront, Alias Sketch!, and other new products as they become available.

- Students use the Micro Lab extensively for design work. They have created 3D models of downtown Minneapolis and St. Paul for use by the Urban Design Center to evaluate the impact of proposed changes. The Daylighting center used Upfront to study sunlight penetration for various configurations of a new museum being built on campus.

And, the next time you roll up a set of blueprints, think about this: In addition to the Micro Lab, Lee teaches a studio which concentrates exclusively on computer methods for design, modeling and presentation using Upfront and Canvas. Students are using a beta version of Upfront 2.0 on the Macintosh to create QuickTime animations which are then combined with other animations captured with VideoSpigot and manipulated with Premiere. "QuickTime gives us the capability of 'inhabiting' our computer graphics with 'real' moving 'videoed' people. We output Upfront models to the VPL Virtual Reality equipment at the University's Human Factors Research lab which allows students in the studio to move about and interact with the environment they have designed."

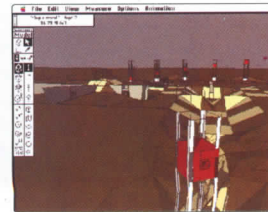
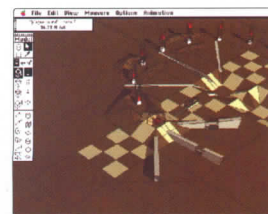


"QuickTime gives us the capability of 'inhabiting' our computer graphics with 'real' moving 'videoed' people."

LEE ANDERSON,  
ASSISTANT PROFESSOR  
AND DIRECTOR OF  
THE COMPUTER AIDED  
DESIGN CENTER

#### PROFILE

**Number of Macs in Use - 34**  
**Primary Software Applications - Alias Sketch!, Canvas, MacWrite II, Map II, PageMaker, PixelPaint, Premiere, QuickTime, Upfront, VideoSpigot, Word**



**CITY OF SACRAMENTO**

GENERAL SERVICES DEPT./FACILITY MANAGEMENT DIV.

**T**he Facility Management Division of the City of Sacramento bears responsibility for overseeing the development and management of all the city's facilities. At any given moment, they might have ninety construction projects on their agenda, for which they are obliged to guide all pre-design, design, bidding and negotiation, construction, and post-construction activities. Gary Szydelko, AIA Supervising Architect, and his colleagues find Apple Macintosh computers indispensable in carrying out this formidable task.

The Division first works with client departments of the city, helping them define their needs, wants, desires and goals. With these guidelines in mind, they then hire an architect and work with him or her throughout the project. They keep information about all their projects — sometimes totaling over \$130 million — on AEC Information Manager, using it to perform budget tracking, to track the work of consultants and contractors, to publish monthly status reports, and to compile composite schedules of all work to be done. They depend on MacProject II to do all of the micro-management of their projects. All project-related forms, contracts, transmittals, and correspondence are kept on the computer.

"Everything that goes through the office goes through the Macintosh," says Gary. "And we often transfer text files between the Mac and DOS machines used by our consultants and contractors."

Charts from MacProject II are printed out in standard 8 1/2" x 11" format, then enlarged to 3' x 5' wall charts for use in meetings ... which typically involve from fifteen to twenty-five individuals. MacProject Gantt charts are exported to MacDraw II where they are enhanced for use in graphic presentations.

"At the completion of construction," Gary says, "we walk the client department representatives through the building, and our Interiors Group comes in with their space planning, ordering of furniture, and facility management — all on the Macintosh. We remain involved through the one-year warrantee period to make sure everything is performing properly, at which time the building is turned over to the Maintenance Division for ongoing maintenance."

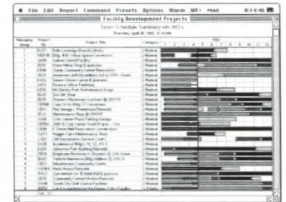
"All thirty staff members in the Division are essentially self-taught on the Macintosh with little formal training," says Gary, "and they quickly learned a wide variety of software applications ranging from word processing to project management."

*"Everything that goes through the office goes through the Macintosh."*

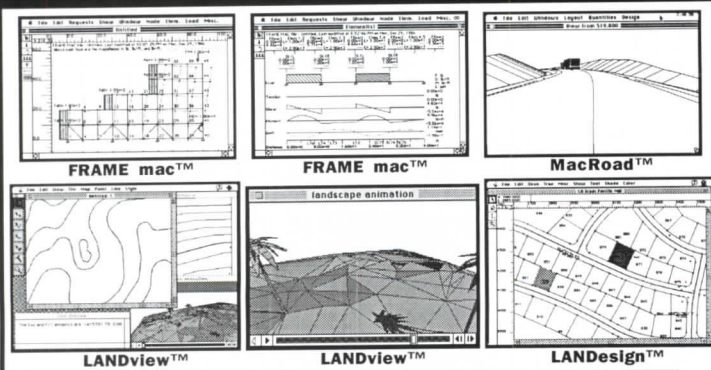
GARY SZYDELKO, AIA

**PROFILE**

- In Operation Since - 1977**
- Number of Employees - 30**
- Using Computers Since - 1986**
- Using Macs Since - 1986**
- Number of Macs in Use - 16**
- Primary Software Applications - AEC Information Manager, Apple File Exchange, ClarisCAD, Excel, FileMaker Pro, MacDraw II, MacProject II, Word**



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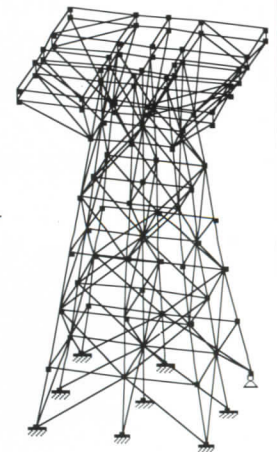
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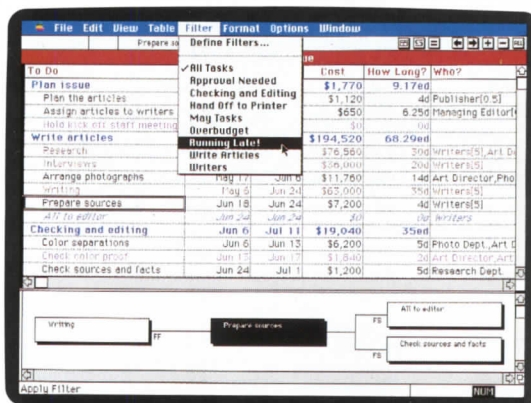
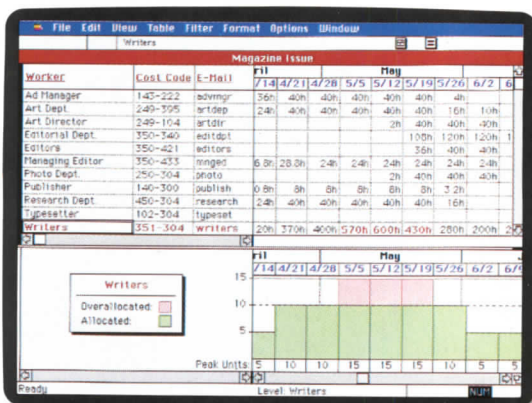
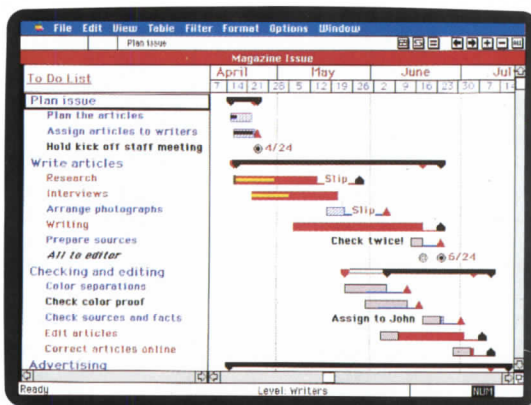
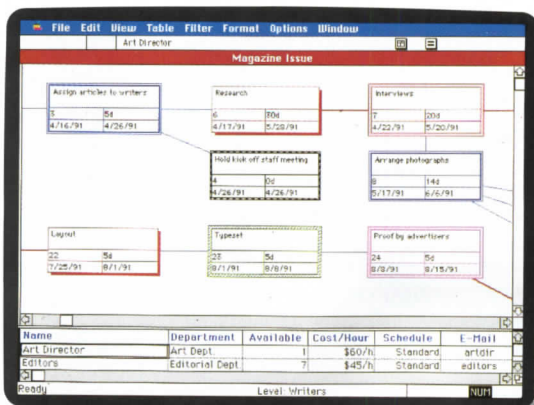


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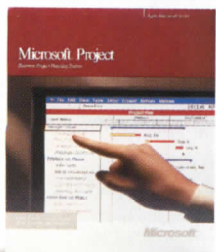
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## COMPUTER VISUALIZATION

With the introduction of some very powerful applications on the Macintosh, new techniques are being explored to communicate and present accurately depicted designs to clients, government officials and others.

2D CAD, 3D visualization and high end paint, illustration and rendering applications have created a new avenue for architects to present their designs and offer the ability to quickly explore alternatives that were previously unavailable.

For example, Alan Oyakawa creates 3D models of his work using DynaPerspective. After producing several views that illustrate his design, he saves the perspective view and uses Aldus Gallery Effects to apply textured screens or filters over the original image to soften it and give it a more hand-rendered, artistic look.

Harlan Hambricht of InSite takes advantage of his years as a photographer and combines the experience with computer modeling techniques to produce photo-realistic images of proposed projects convincingly placed into existing contexts, a process he calls "contextual perception." He begins by photographing the site from an angle chosen by the client and scans it into his Macintosh for use in ColorStudio. From dimensioned drawings he creates a 3D wire-frame model of the proposed structure using MacPerspective, and matches the perspective view of the model to that of the photograph. In



ColorStudio, he adds textures, materials and colors to the 3D model and then places the rendered image onto the scanned photograph and blends clouds, sky, trees, textures, people and cars onto the image. He makes it more realistic by matching shadow angles, lighting angles, lighting conditions and even reflections in windows.

Entasis Computer Modeling and Visualization is a service bureau that produces accurate computer generated models produced entirely on the Macintosh. They use ArchiCAD to create the model and define a series of still images along a fly-through path of the model. Instead of rendering each of the still images by hand, Entasis goes through a process of assigning textures and materials to surfaces and objects in the model and gives the computer the task of generating the finished render-

ing. Each of these rendered images can be printed to a high quality photographic format or combined in an animation sequence with titles and graphics to produce a video tape of the fly-through.

Arcathexis creates photo-realistic visualizations of architectural and interior designs. They take advantage of the Macintosh as a tool for the production of computer generated renderings by starting with working drawings, sketches or CAD files from an architect, and creating a 3D model in Sculpt 4D. Within the application, they can control lighting, textures and surface behavior that allow their clients to receive images that precisely simulate the appearances of a given environment. Sculpt 4D also gives them the capability to produce animations with highly rendered images for presentations.

View by View is a Macintosh-based architectural modeling and visualization service bureau that created the cover of this section. View by View can begin to create 3D models from preliminary sketches, design development or working drawings, or from a client's CAD file. They use Architrion II, form•Z and, for very high end work, they rely on Turbo 3D to create accurate, highly detailed 3D models that are rendered with Electric Image Animation System for textures, lighting effects, shadowing attributes and reflections, to achieve photo-realistic images. The images they produce can be output to a variety of formats like 35mm slides, continuous tone photographic prints and transparencies up to 11" x 11", electronic images you can use in your Macintosh presentations, and even 42" wide near photo quality color electrostatic prints. View by View also produces animations and fly-throughs of their clients' projects, transferring the animations to digital tape, Betacam or VHS video tape formats with graphic overlays, sound and narration.

These kinds of quality presentation techniques can be very effective when used at the right time. Bear in mind that a photo-realistic image is not necessarily a more desirable or useful medium all of the time. One service bureau was actually asked by a



client to tone-down the quality of one image during the design phase of the project because it was "too realistic."

## COMMUNICATION

The right communication utility, used the right way, can give you the biggest bang for your buck of any piece of software in the office. These utilities — accessible by anyone in the office — can save you time and effort by getting you through the "busy work" that you have to do on a daily basis.

### Electronic Mail

Are you playing telephone tag with another member of the office? Or with outside consultants? Consider putting all of them on an electronic mail system, like QuickMail or Microsoft Mail. Everyone in the office, as well as consultants and others you need to contact on a regular basis, can participate in an E-Mail setup. The sending and receiving of messages and files can be set up to function automatically. And you'll have a written record of all transactions, just like a phone log.



### "Electronic Rolodex"

One of the key areas for automation is setting up an "electronic Rolodex" for use throughout the office. Either HyperCard or any of the Personal Information Managers (PIMs) available will automatically dial your telephone — after it looks up a name and number — as well as transmit FAXes and address envelopes and letters. Some include a telephone log that keeps track of the time and length of the call, to whom it was made and the subject, and then holds the information so you can print out a copy, FAX it to the other party, or retain it in a database.

Address Card: Creighton Nolte & Associates, Architect, 744 "G" Street #209, San Diego, CA 92101. Contact info includes phone (619) 234-1008 and fax (619) 232-4029. The card also shows fields for Name (Creighton Nolte), Title (Architect), Company (Creighton Nolte & Associates), and Address (744 "G" Street #209, San Diego, CA 92101).

### Time Management Tools

Networked utilities, like Now Up-to-Date from Now Software or the In•Out messaging center from CE Software, provide a common office calendar so everyone can see everyone else's schedule. They can broadcast or display meetings, and show who is doing what, and when. And scheduling meetings is much easier with the use of products like Meeting Maker. This type of system can also help you keep a record of where you were, projects you have been working on, and can often function as a personal or networkable scheduling system.

### Personal Information Managers

Nobody knows better than you exactly what has to be said in your letters. Which is why you should be typing them.

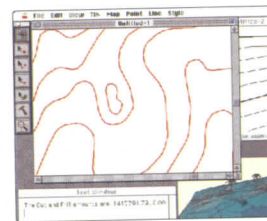
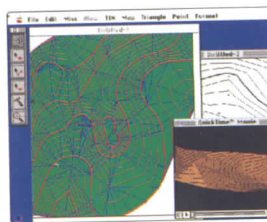
With the use of Personal Information Manager from Architectonica, for example, you can search an entire database of thousands of entries in a fraction of a second (or select someone from a pop-up list of frequently-called people), click on a button that indicates you want to send them a letter, and immediately you're switched to your word processor with the person's name, company, address, date, salutation and your signature already in the letter. Now all you have to do is type the body of your letter and print a hard copy (or FAX it out from your Mac).

### Word Processors

Practically every function in your office hinges around written communication, whether correspondence, FAXes, memos, or

other documents. As a result, automating the written communication process by using the power of the Macintosh and a good word processor is the biggest productivity gain any firm can make. One of the fastest ways to improve efficiency in the office, a word processor improves the speed, legibility and accuracy of written communications. In fact, a word processor is probably one of the most basic pieces of software that should be used on every Mac.

The Macintosh is an incredibly powerful and diverse tool. Use its full capabilities firm-wide, from top to bottom to help you communicate more efficiently.



the Mac to create accurate 2D and 3D topographic information. This data can then be used in most CAD and 3D visualization applications. SightPlan can also register digitized information to a desired coordinate system, which is essential for site planning, GIS applications and professional drawing production.

Landscape architects, civil engineers and site planners may want the added features of another digitizing application called VALE.

VALE provides the same digitizing, 2D and 3D features as SightPlan, but with the added capabilities of estimating volume, area, length of contours, earthwork quantities and costs.

SightPlan or VALE data can be imported into LANDview to create a 3D terrain model on which the contour lines are automatically calculated and displayed. The model can be manipulated and embellished by many 3D visualization programs, such as Upfront 2.0. Upfront can shade, as well as add trees and structures onto the terrain, and then animate a fly-through of the model. The fly-through can be saved as a QuickTime movie on the Macintosh and incorporated into presentations or exported out to videotape.

Ever need to know what kind of light bulb to specify to achieve certain conditions? Data Light 3 is a unique HyperCard stack that can help you with the design and specification of lighting systems. It analyzes General Electric light bulbs and can calculate illuminance values in either foot-candles or lux, and in metric or English units. Plan and section drawings of a room are used to locate the light source and direct the center of the light beam. Analysis charts are presented graphically in similar views to give you an idea of how the light

## PIECES OF THE ENGINEERING PIE

In the practice of architecture, critical information from many different specialized fields must be brought together to complete any project. The Macintosh can be used to address this need.

For example, one area that impacts most projects is topography. We usually get a contour map describing the terrain of a site. But a blueprint made from the original drawings can stretch and distort the scale. A 30" x 42" blueprint may be off from the original drawing by a significant amount, depending on the original scale.

Using SightPlan from Earthware, a blueprint of a contour map can be digitized into



placement will impact the room.

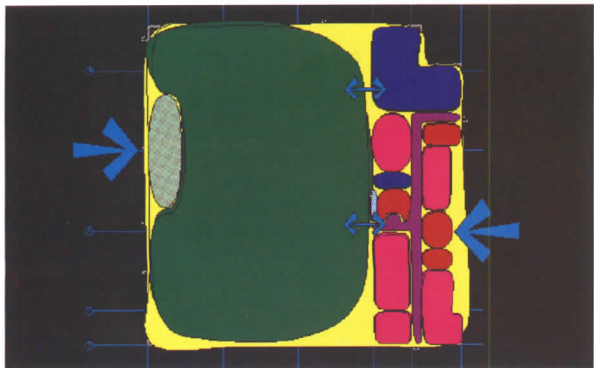
And there are other practical utilities you may want to consider. Using a product such as Building Code Analyst can make searches of the Uniform Building Code much easier and more comprehensive. And symbol libraries for specialized uses — like civil and structural engineering, architecture and landscape architecture — are available from several sources.

## OUTPUT HINTS

To present more of an "architectural" image to a client, don't show computer printouts of perspective views of your 3D model. Instead, find the angles and views from which you want to show the building. Print out wire-frame or hidden line drawings from those angles. You can use this technique at 8 1/2" x 11" from a laser printer or plot them out at any scale and size. Once you have the originals, use them as templates or guides to do hand rendering or coloring of the perspectives or images. Pin those up on the wall, and it will be more impressive than the same number of computer line drawings.

Here's another technique. Import or paste your perspective views into an illustration or general graphics application. Fill the areas with textures, gray tones or dot patterns. Save the drawings in a file format that a high quality graphics printer can handle, and make an 8 1/2" x 11", 2,540 Dot Per Inch (DPI) high resolution print from an imagesetter on resin coated paper. Take the original to your local printer and have him enlarge it on a Shacoh or Xerox printer to 11" x 17" for inclusion in reports as a fold out, or to 30" x 42" for presentations. This will enlarge the original about 350% and give you an original with a resolution at around 750 DPI.

The Option button in the Page Setup dialog box on the Macintosh for LaserWriter printers allows you to do some important things with your output. For example, click



on "Flip Horizontal," and the image that comes out of your printer will have backwards-reading copy. Big deal? Yes! Take the printout and run it through your photocopier onto stickyback film (or run the stickyback through your LaserWriter if it is intended for that purpose). If you paste this onto the back side of your drawing sheet, details or notes or schedules, you can draw over this on the front side. This Options feature can be used for detail drawings for paste ups, for notes or specifications from word processors on CAD drawings, for schedules created in spreadsheets, or any other use that you can come up with.

A great output method for any colored work on your Mac is to print the file out to slide format. Many graphic service bureaus can provide slide output from Mac applications, and you can then get hard copy color prints or inexpensive color photocopies from the slides. You can cheat on this one when you're in a rush by taking a slide directly from your computer screen. A 13" RGB monitor works best because the proportions most closely match the proportions of the 35mm slide. Always use a tripod with a cable release. And it's best to shoot in a dark room illuminated by only the monitor. You'll get different results from different film speeds and types, but try Ektachrome 100 Plus. Use a telephoto zoom lens for the ease of framing the shot, and set your shutter speed way down to 1/4 or even 1/8 of a second to get good image colors.

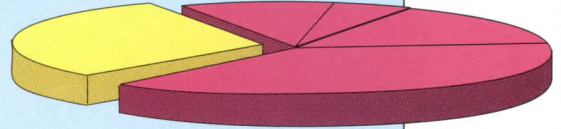
Several service bureaus are also now able to provide you with color 8 1/2" x 11", 11" x 17" and poster-size color electrostatic prints up to 42" wide. These can be from CAD drawings, 3D models, computer renderings, plotter output or illustrations, or from your word processor or spreadsheet.

## OFFICE PRODUCTIVITY

The frequency of articles about computers and CAD software in some professional publications would lead the uninitiated to believe that the primary function of an architect is drafting. However, it has been estimated that only 25% to 30% of a typical architect's work has anything to do with drafting or CAD. The rest of the time is spent on scheduling, contracts, transmittals, telephone calls, meeting agendas, correspondence, meeting min-

### THE 70% SOLUTION

An unfortunate reality for many architects today is that they're too busy "running a business" to devote their attentions to the practice of architecture. One solution is to automate. But, when considering the Macintosh, too many architects focus on its 3D modeling, CAD, rendering and presentation capabilities ... and step right over up to 70% of the needs of their practice.



Thus, if you only use the Mac to automate this 25% to 30% (CAD/design-related portion) of your business, you are ignoring the lion's share of your automation opportunities throughout the office. And you don't want your computer investment sitting idle two-thirds of the time, do you — while you're on the telephone, writing letters, preparing transmittals, or doing other "office work"?

- CAD/Design-Related
- Administration, Marketing, Management, Construction Administration

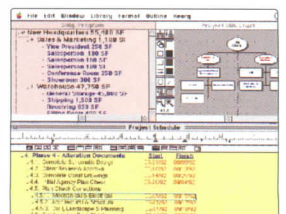
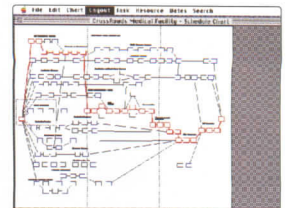
utes, and so on. Architectural firms should look to the computer to assist in meeting these needs.

MORE, for example, is an outliner or thought processor and a presentation program. It can be used to brainstorm ideas and organize them later, or to keep track of a building program, organize a project team or initiate a preliminary project schedule. Project schedule information can be exported and moved into a Gantt scheduling program such as FastTrack Schedule. It lets you see the schedule in a graphic format.

To view the same information displayed in a CPM chart, export the data from FastTrack Schedule and import it into MacProject II or other CPM project management application. The critical path to complete the project is clearly displayed and you can begin to enter more information, like resources and associated costs, into the application.

The flow of information from one document to another is practically endless. General notes or specifications created, stored and modified in a word processor can be pasted into a CAD program. Office multipliers, overhead rates and fee calculations and analysis charts from a spreadsheet can be used in a word processed client proposal, and then moved to a page layout application. Using a feature called "Publish and Subscribe", you can set up just about all of these actions to be performed automatically in all of the copies, every time the original is modified.

Spreadsheets like Excel, Lotus 1-2-3 Mac and Claris Resolve are incredibly useful applications that can be used





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*"Vellum, with its elegant and easy-to-use interface, is ideal for architects and engineers..."*

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in every phase of a project — including overhead and multiplier calculations, fee proposals, facility programming, building program analysis, life-cycle costing, budgeting project resources, construction cost estimates, engineering analysis, financial feasibility analysis ... anything to do with numbers and calculating the results.

Architects don't make money from their proposals and marketing efforts unless they get the job, so making the best impression — right away — is very important. With the Macintosh, 2D and 3D CAD drawings and 3D conceptual models can be copied and used in page layout programs for proposals and marketing materials. Text from a word processor, images from scanned photographs, floor plans or bubble diagrams from a CAD program and perspectives from a 3D visualization program can be easily and effectively combined for professional looking publications.

Database applications can also share information, whether graphic or text, with other applications. Aside from keeping records of clients, consultants, past projects and general information, architects are also using Macintosh databases for furniture inventories, time sheets, job costing and billing, automatically completing SF 254 & 255, submittal tracking, tracking proposals, and creating form letters for marketing needs.

To be competitive, you have to use the technology. And in more and more cases, clients *expect* that you will be using the technology of computers in your practice.

## A CONTRACTOR'S POINT-OF-VIEW

*This article was written by Craig Savage, a contractor and writer who lives and works in Carpinteria, California.*

I have been a building contractor for 25 years. Very early on I learned that the contracting business involved a lot more than the "hammer and nails" issues of how to put a building together. To be successful I had to be more than a builder. I had to assume the role, sometimes unwillingly, of salesman, accountant, marketing manager, planner, secretary, designer, and draftsman, to mention just a few. Then, about seven years ago, a Macintosh computer — with a mouse attached — found its way into my office. It changed the way I thought about and conducted my business.

Every aspect of my construction business has been touched to some degree by the intro-

duction of that computer. Yet when I talk to other contractors about this new tool, most are puzzled. Lots of them have computers and they know about the uses for payroll or scheduling. And some even acknowledge its ability to integrate bidding and job costing into accounting. But few are aware of the many new roads that graphic computers [read Macintosh] have allowed contractors to travel.

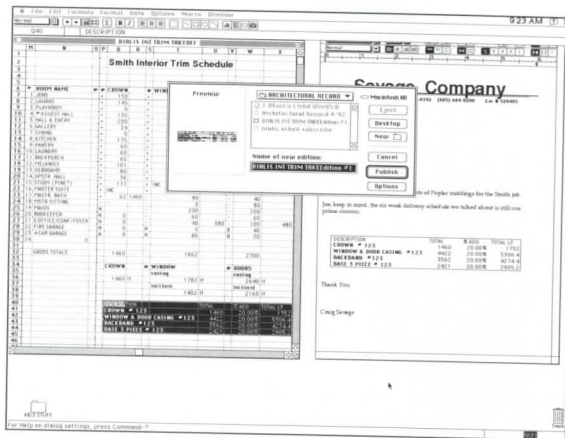
In my company, the Macintosh is viewed as a tool to help run our entire construction business. I want to stress the word "tool" because my construction background is of the "hands on" variety and I view computers like I view a skill saw. It is a tool to be turned on, used for a specific purpose, and turned off. A good tool shouldn't require a Ph.D. to understand and it should do the job better than previously existing tools. And that's the point: the Mac is so simple to learn that to *not* use one is just bad business.

From my perspective there are two compelling reasons for contractors to use Macintosh computers instead of IBM compatibles. The primary one is that learning to use a Macintosh is far simpler than learning to use a "compatible" PC. That's a fact. And the shorter learning curve translates to money spent on productivity gains, not wasteful training. When the computer system is friendly, everyone in the office will use it because the information is readily available.

The other reason Macs are finding their way into construction offices is that all the data created in any Mac program is instantly available to any other Mac program. The common data format that Mac programs share is a powerful attribute that should not be taken lightly. File transfer between Mac applications allows offices to integrate operations that until recently had to be carried out individually or with massive (and expensive) "integrated" programs.

In regard to certain basic office functions, all businesses, not just construction businesses, have a "commonality-of-need" that applies to their day-to-day business operations. Macintosh computer systems are designed to automate and simplify these functions. Other, more construction-specific functions, such as estimating, job costing, project management and design, are also easier on the Mac. In fact, with a Mac and a laser printer, your business — and your image — will take on a new dimension.

Computers are a relatively new tool for the contractor and, as such, they need to be



viewed with healthy skepticism. The computer you buy needs to be as simple to use as a screwdriver or it just won't be used. Horror stories are everywhere. Thousands of PCs sit collecting dust, a zero return on their buyers' investments. The key to getting a good return on the investment for a tool, obviously, is to use it to its fullest capability. You wouldn't consider spending thousands of dollars on a back hoe and then feel nonplused while it sat idle day after day. The same holds true with your computer.

Many contractors only consider the computer an "accounting box." And while it may function well as such, it isn't returning to you all it can unless it is used for more than bookkeeping. That doesn't mean "doing the payroll" or writing letters with a word processing machine isn't productive. It just means that if the tool is only doing those functions it is being under utilized.

The computer can function as many tools. At its simplest it can be a word processor, or a payroll box. However as you begin to realize the power of information storage and retrieval based on the simple "point-and-click" philosophy, you realize that you have at you finger tips a marketing tool, a communication tool, a scheduling tool, a charting tool, a forms generator, and cost control tool.

From my experience, the strategy to adopt when computerizing is to model your existing business systems in an electronic fashion. Most contractors have already evolved systems, on paper, that serve them reasonably well. So the first thing they *don't* want to do is to change what is already working. Therefore, the initial step is to try to put current paper systems on the computer, organized so that they function essentially the way they do now, only better.

Once you are up and running and your office is comfortable with the Macintosh, you can begin to combine applications into integrated systems to handle everything from estimating and project management to communicating documents and marketing materials.

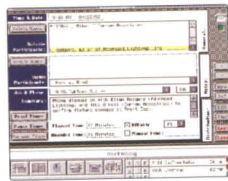
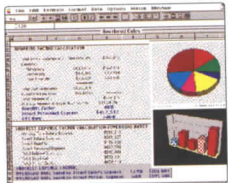
## ACCOUNTING

It's a terrible fact, but most of us have no idea what we're doing when it comes to accounting, job costing, financial project management and fee proposals.

With a Macintosh it's simple.

Use a set of spreadsheet templates like Fee Simple to organize and calculate all of your office expenses, overhead rates, benefits factor and multiplier. Then, work up your fee proposal using the calculated overhead rate — based on your direct salary expenses — and include an adequate amount for profit.

Now that you have your fee set, use MacArchitect, a new financial project management application written by Arne Bystrom, FAIA, to track time and money for all of your projects, and to maintain a database of past work so you can compare your past performance with current conditions. It gives you the kind of information that you need to control and keep tabs on the finances of a project in your office.



Another new product, Reckoning, is a time and information management application that integrates time-billing, scheduling, and contract management within a comprehensive client and project database. Reckoning integrates an electronic desktop with a project management module. The electronic desktop includes a calendar, E-mail, address book, telephone log, time sheet and more, covering most of the activities performed during the course of a day. The project management module handles project tracking and billing functions, and can pass the data on to a third-party accounting application to control the general ledger, accounts payable, accounts receivable, checkbook, etc.

Some of the really basic accounting programs available for the Macintosh can help the single proprietor and the small design firm move into the automated accounting arena. Basic applications like Quicken, M.Y.O.B. and Business Sense will get you started and take you a long way, depending on your specific needs.

The more complicated and detailed your needs, the more you will have to look at higher-priced, dedicated accounting programs like Job Costing/Time Billing from Satori, and Great Plains accounting modules including General Ledger, AP, AR, and payroll. Clerk of the Works is written exclusively for architects using the Macintosh and fol-

lows The American Institute of Architects' accounting guidelines and AIA chart of accounts.

Many professionals have chosen to use spreadsheet templates or sophisticated database programs written especially for them. Others have stayed with manual methods and incorporated word processors to produce the billing statements. Whatever your needs, the Macintosh — with appropriate software — can greatly assist you.

## TRANSFERRING

Point and click. That's all it takes to transfer or translate text, graphics and CAD drawing files and data between the Apple Macintosh and other platforms — if you have the right tools.

The transfer of data between applications on the Macintosh can take place through the Cut, Copy and Paste functions. You can copy data from a spreadsheet and paste it into a word processor. Or copy a detail from a CAD drawing and paste it into a letter to an engineer.

In addition, most applications allow you to save an entire file in another format so

# Easy, Powerful Plotting for the Mac

## “a must for engineers and architects.”

from summary of comparative review, MacWEEK, January 8, 1991

**PLOTTERgeist™** is a chooser level driver for the Mac that allows you to produce presentation quality plots from almost any CAD, engineering or graphics package. In giving it an editors' choice award, MacWEEK said “**PLOTTERgeist** comes out on top with a superb interface, great flexibility, and your choice of fast or fine plotting.”

Here are just a few of the features that put **PLOTTERgeist** on top:

- Background spooling - lets you work while your plotter does
- LaserWriter quality fonts - use any Adobe Type Manager or TrueType font style
- Plot preview - see the layout before you waste valuable media
- No gaps output - use your roll plotter's long axis capabilities
- Networking - compatible with Shiva products
- System 7 compatible
- Software controlable pen speed
- Complete with cable - fits most standard plotters
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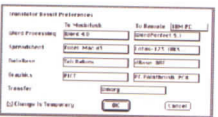
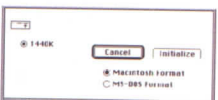
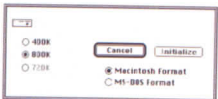
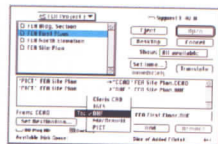
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that it can be read by another application. Microsoft Excel, for example, can save a file as tab delimited text, or as a Lotus 1-2-3 .WKS file that can be read on a DOS machine. Most CAD and 3D visualization programs can save files in the PICT file format, which can be placed in page layout documents like brochures, proposals and reports.

Transferring and translating files between the Macintosh and other platforms is just as easy. Excel, Word, MacWrite II and WordPerfect, to name a few, all have the capability of exporting their files out to a DOS file format. Macintosh PC Exchange allows you to open a DOS file from a floppy disk simply by double-clicking. There are also several specific applications that translate not only the text but also the formatting of the original document. These translations can go in any direction: Mac to Mac, Mac to DOS, or DOS to Mac. Apple File Exchange, included free with all Macintosh computers, provides basic translation capabilities.

MacLinkPlus/PC, LapLink Mac, and Software Bridge offer more extensive translators.



All Macintosh computers sold today (with the exception of the PowerBook 100) are equipped with an internal disk drive called a SuperDrive, aptly named for what it can do. It can, of course, read and write any Macintosh disk format. Additionally, it can format, read and write to 3 1/2" DOS disks. If you use the free Apple File Exchange software from Apple, you can insert a DOS disk into the SuperDrive and transfer your files onto the DOS disk. To have a DOS disk appear on the Macintosh desktop and be able to access the files on it, you can use Macintosh PC Exchange, or other third-party utilities like DOS Mounter or AccessPC. All are tremendous time savers if you need to work with Mac and DOS files at the same time.

A common network with both Macintosh and DOS computers is obviously the easiest method of transferring files, but the disk method is available to everyone.

CADMOVER, Claris Graphics Translator, SNAP! translators, PowerDraw Translator, VersaLink and others provide

translations of CAD file formats. (Nothing, however, is foolproof in the area of CAD translations and it takes a little trial and error to perfect the technique.)

The ultimate in translation may be emulation. If you need to run a DOS program on your Mac, you can use a DOS emulation application such as SoftAT and SoftPC from Insignia Solutions. They will allow you to run just about any DOS program on your Mac, and be able to Cut and Paste to transfer data from the DOS program to a Mac application.

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In 1991, a major revision to the operating system was introduced: System 7. It brought with it some radical new concepts to make the Macintosh more accessible to the user ... while still allowing users of previous versions

Continued on page 38

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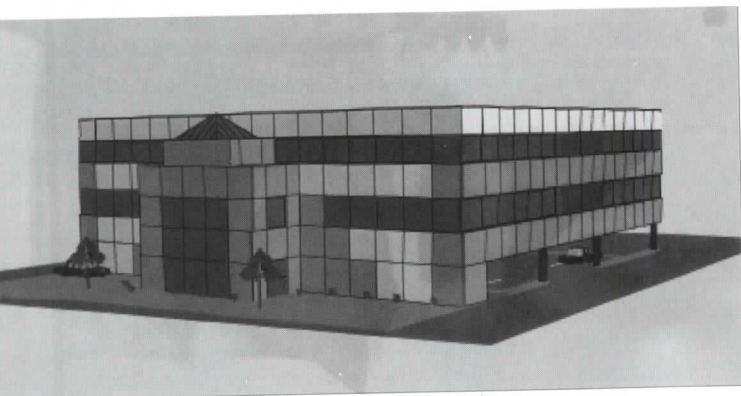
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# What if....?

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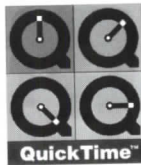
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Continued from page 35

to run their existing software. What's in System 7 for you? Let's look at a few of the features.

### Network File Sharing

The Macintosh has always had built-in networking capabilities; it's as simple as plugging in a cable. Network File Sharing now allows you to share selected files with any other Mac on a network, with password security if you need it.

A simple network can consist of two Macintoshes that are connected to a LaserWriter. This means that the same wire that lets you print also allows you to access files on the other Mac.

### Aliases

To open a document or start an application, you have to find the icon that represents the document and either double-click on it or use the "Open" command under the "File" menu.

But these icons may be organized in several layers of folders ... and well hidden. Aliases simplify the search by making copies of the icons which point the computer to the original — no matter where it is located on your Mac, or elsewhere on your network.

You can make Aliases of frequently-used documents and applications and store them in a convenient, easy-to-get-at location for quick access. You can even create an Alias that will automatically connect you to a network and retrieve a file from another computer for your use.

### AppleTalk Remote Access

If you're in a meeting or out on the road and need something that's in your Macintosh back at the office, what do you do?

With AppleTalk Remote Access you can, for example, connect your Macintosh PowerBook to a local telephone line, call your office network over the built-in modem, connect to your Mac at the office, see the entire contents of the hard disk, and copy the needed information into your PowerBook — no matter where you are.

### Publish and Subscribe

The Macintosh has always allowed the user to cut, copy and paste data and graphics between applications. But, until System 7, each time the original information was updated, the process had to be repeated to update the documents where it had been pasted. "Publish and Subscribe" now automatically updates all copies of the information — no matter where

they are, every time the original is changed.

### TrueType

Technically a system-level outline font technology, TrueType allows you to have a smooth font style displayed on the screen, and be able to print it out on a LaserWriter, imagesetter or film recorder at just about any point size. TrueType gives you great-looking type at any size.

### Extensions

Extensions add functionality to your Macintosh system software without having to go through major system upgrades. They allow you to interface with different printers, plotters, FAX machines, VCRs, CD-ROM players and slide printers among others. And they can also enhance the tools that you use on the Mac.

QuickTime is a revolutionary extension to Macintosh system software that provides exciting new capabilities to all your Macintosh applications. It is an architecture for the integration of dynamic data types, such as sound, video and animation. QuickTime lets you create and play back animations or movies from within applications such as CAD programs, word processors, presentations and databases. An example might be creating a 3D model in Alias Upfront, Virtus WalkThrough, ArchiCAD or form•Z, and moving or flying through it on a defined path. The animation can be saved as a QuickTime movie which may be edited with Adobe Premiere or DiVA VideoShop, adding special effects, sound, graphics, titles, etc. Now you have several options. It can be output to videotape, played back on the Mac, included in a presentation of your project, or pasted into another application and played back with a simple click of the mouse. QuickTime has opened up a completely new area for presentations and the communication of ideas.

There are many other features built into System 7, all designed to provide easy access to the technology and to allow you to use it in any way you want.

The technological evolution of office-building design, the way these buildings affect our increasingly fragile urban and nonurban environment, the growing concern for white-collar worker happiness and productivity, and the value of group contact within a building: these are some of the global issues that RECORD examines in this month's focus on The New Workplace. As senior editor James Russell notes in referring to the wave of new buildings in Frankfurt, Germany, the challenge for architects is "to balance the efficiency and prestige of a tall building with technical solutions that set new resource-conservation standards and provide workers a more attractive and sustainable environment." The stylistically diverse buildings featured on the following pages suggest that Europe and Japan are ahead of the United States in attaining these goals. Germany, Holland, and the Scandinavian countries, in particular, have long recognized the benefits of natural light (often via a large atrium) and fresh air (through operable windows). Though efficient from an interior-planning point of view, the typical postwar American office tower, with its enormous floor plates and hermetically sealed windows, is becoming obsolete, replaced by more user-friendly structures that save money, promote productivity, conserve natural resources, and allow employees some control over their environment. The change is good news, especially for those who spend so many of their waking hours behind word processors and desks. *P. M. S.*

# The New Workplace

We're in a period of enormous change in the nature of work—not all of which is yet evident. Technology is evolving; researchers are questioning assumptions about both the quality of the work environment and the way people work together (indeed, their need to); even the place of work within the city is debated. With so-called knowledge work ascendant, this evolution will most affect the white-collar workplace. This month's U. N. Conference on Environment and Development in Rio de Janeiro, as one example, may have a profound impact on the places and ways in which we work, simply because the opportunity for improvement is vast.

An era of intense social and technological change often begets landmark architectural solutions: historians credit a nascent service sector and the development of the elevator for making skyscrapers possible. Yet many of today's changes don't at first glance suggest an architectural expression. Take computers. As they become smaller, more powerful, and more versatile, they become a physical leveler, obviating the need for a variety of dedicated spaces. We videoconference and telecommunicate; the great glass-roofed bourse of yore is now the low-ceilinged, mechanically cooled trading room. On a larger scale, electronic "streets" have rendered the real street obsolete, say experts. Those public places William H. Whyte admires because of the "unplanned, informal encounters" they foster may be replaced by electronic bulletin boards—the computerized agora.

Just because such novelties as voice-and-data transmission lines are essentially nonphysical manifestations of work, however, doesn't mean that the only reality workers require is "virtual" reality. (The latter, though, testifies to the fascination with science fiction made fact.) Architecture is often at its best when creating new forms or

types suggested by altered social and technological circumstances—literally making *visible* what before seemed amorphous. With such an era upon us, this issue of RECORD assembles some ambitious solutions—some as yet unbuilt—for this focus on white-collar office work. There are many issues that are shaping the way work is done; the purpose of this essay is to relate the projects shown to those issues most likely to affect the physical form of the workplace.

## Toward a new sense of urban place and space

The dream promised by the increasingly portable computer is that one could work anywhere—in a rural farmhouse as easily as a highrise office building, at dozens of locations instead of one. Many experts now argue that the virtues of location are steadily eroding, that increasing numbers of people will work at home (they'll "telecommute" instead of fighting traffic), and that high-cost downtown locations, which place a premium on face-to-face contact, are no longer justified. A truer reading may be that the places where people work are becoming more specialized. The big, monolithic corporate headquarters, for example, seems a thing of the past. Today, executives may be downtown, sales managers in highway-oriented suburbs, while clerical and data-entry personnel occupy low-cost edge-city locations. They're linked by phone lines and electronic databases rather than elevators and stairs.

Yet, the success of the American downtown in the 1980s, against considerable odds, should renew interest in the value of proximity. While modems and phone lines can put us through to previously undreamed-of resources, the increasing complexity of commerce suggests that the traditional attributes of cities—density of specialized businesses and civic institutions; concentrations of universities,

## Precursors

*There is a sinking feeling among many architects that current changes in the workplace—computers, mechanical systems—are really invisible and don't have much impact on design. This no doubt seemed true historically until architecture developed new types, giving form to change. The projects shown on these pages are milestones in rethinking the workplace. Though not all were considered successful, some of their groundbreaking concepts have found new life in projects featured elsewhere in this issue.*



*The light court of Frank Lloyd Wright's (sadly) demolished Larkin Building prefigures today's atrium structures in its use of both daylight and ventilation (1, 2). Today atriums can reduce air-conditioning costs; the Larkin's innovative heating and cooling system was*





## *RECORD looks at the issues that are shaping the new white-collar workplace—and some innovative architectural responses.*

hospitals, and transportation facilities—may be more important than ever. Take research universities, which are spinning off new businesses all over the country. The biotechnology belt has as its fulcrum Philadelphia's five medical colleges. Research Triangle Park would not exist but for nearby Duke University, the University of North Carolina, and North Carolina State.

Then there is today's urban flavor-of-the-month, the edge city. Touted as "the new frontier" replacing the obsolete big-city downtown, edge cities replicate downtown in every aspect but density (though the most recent are the most dense). And the edges these places attach to are America's biggest and most economically successful cities. Rather than replacing big cities, such places, economically speaking, simply extend them. And their future is anything but assured. Most are less than 10 years old, and many (Stamford, Connecticut, and Manchester, New Hampshire, most prominently) have stratospheric vacancy rates. Finally, the flight to rural America, a subject of endless speculation in the 1970s and supposedly made possible by computers, never happened. Rather, movement to rural areas has reversed, and most small towns are more distressed than ever before.

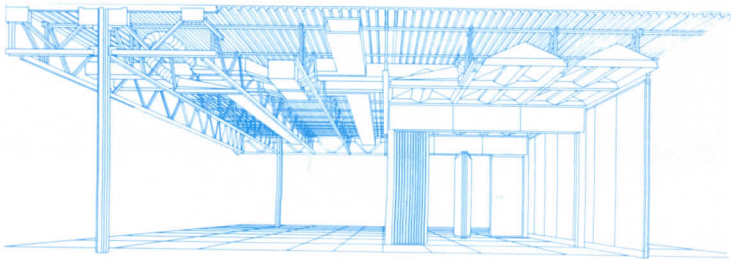
The form of the city is changing nevertheless. A globalizing economy means that cities must reconsider their traditional mercantile role. This is nowhere more evident than in Europe, where trade barriers are dropping in favor of economic unification, and formerly captive "native" markets are disappearing. Frankfurt, seeking to become united Europe's financial capital, is developing a new vision of downtown. Not only has it built an unprecedented number of cultural facilities, new structures for its many banks are redefining the

skyscraper, trying to balance the efficiency and prestige of a tall building with technical solutions that set new resource-conservation standards and provide workers a more attractive and sustainable environment (pages 80-89).

### **Rethinking the way people work together**

The logical extension of the wired-together workplace is that we don't need to come to the office at all. Current wisdom is that we can talk via E-mail; call up databases instead of going to the library; teleconference and video-conference. Those who actually analyze the way products and services are successfully delivered these days, however, are reaching different conclusions. "Work is a social activity," asserts industrial designer William Stumpf. "The first complaint of computer operators who work under high pressure is about the lack of sociability. They can't see anyone." Flad Associates, an architectural firm in Madison, Wisconsin, is among those researching the way groups of people work together and the kinds of physical support they need. "The reconsideration of group space comes about primarily for two reasons," explains Bill Bula, a principal at Flad. "The first is speed, the second is to build some level of communication where you wouldn't otherwise have it." Competitive pressures in fields like consumer products and biotechnology are forcing companies to bring products and services to market more quickly. To accomplish this, Bula explains, businesses are experimenting with different ways of structuring groups for more effective interaction. They are also studying the physical environment to discover what kinds of spaces best support group work.

Companies and institutions recognize that the structure of interaction isn't always important as long as it happens. "For people who



3  
needed to filter Buffalo's polluted air. The School Construction Systems Development program (SCSD), pioneered by Ezra Ehrenkrantz and the Educational Facilities Laboratories in the early '60s (3), sought a means to economically integrate components into a flexible, widely

applicable construction process to meet rapidly changing school needs and tight budgets. The Ford Foundation's 1965 New York City headquarters, designed by Kevin Roche and John Dinkeloo (4), rethought the light court as air-conditioned atrium and plant-filled garden of repose.



Kevin Roche John Dinkeloo and Associates

don't see an obvious need to get together," explains Bula, "they probably won't unless something in the physical environment encourages it, such as pleasant lounges and circulation spaces." At Nike's corporate headquarters, near Portland, Oregon, the one place where the entire corporation gets together is its luxurious health club—not surprising for a maker of athletic shoes. On a more modest scale, offices for D. E. Shaw, designed by Steven Holl, contrast a dense layout of desks piled high with monitors and printouts to a nearly empty, ethereal and mysterious central gathering space (pages 114-119). Though not motivated specifically by a new vision of group work, Century Tower, in Tokyo, provides the opportunity, through its unique suspended mezzanines, to support interaction and group identity among two floors of workers (pages 100-109).

Finessing group interaction has a longer history in northern Europe. At Centraal Beheer, a 1974 insurance company headquarters built in Apeldoorn, Holland, Herman Hertzberger designed clusters of 24-foot-square work platforms irregularly suspended within a toplit envelope. Though the clusters themselves were uniform and circulation was rigidly zoned, each platform could be divided by users into many combinations of private offices and group work spaces. In much the same way, his recently completed Ministry of Social Welfare and Employment (page 120) uses interlocking yet repetitive geometries to provide a wide variety of work spaces.

In Scandinavia, the headquarters designed by Niels Torp for SAS is seen as the prototype for a new generation of offices-as-small-city (page 75). The idea is that courtyards filled with greenery and overlooked by coffee bars, lounges, and other informal meeting spaces lower the barriers to communication. This is also key to the

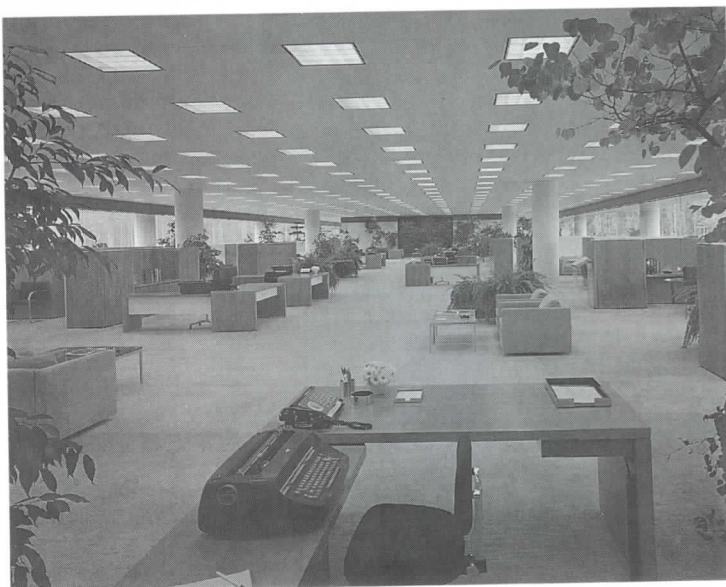
Kombi-Büro concept, which is catching on in Germany (pages 89 and 124). This arrangement bridges the need to do some work in private offices and some in groups of varying levels of formality. An office structured along Kombi-Büro lines may cluster glass-enclosed private offices around an unassigned, living-roomlike arrangement of furniture that is intended to lure users into casual conversations with colleagues. At Gruner & Jahr, a Hamburg publishing house, editors exchange ideas in long skylit corridors connected to adjacent floors by many convenience stairs (page 124). By recognizing that useful work does not always take place in settings with fixed functions, these new concepts challenge an important American notion of office space: that you get maximum efficiency by minimizing circulation. In an age of knowledge-based work, the cliché "corridors of power" takes on new meaning.

Still, we can't ignore the spatial consequences of new technology, particularly shrinking computers. Nathan Myrsvold, vice-president of advanced technology and business development at Microsoft Corporation, argues that we'll soon be seeing the "virtual office"—we'll just carry everything around in our laptop or palmtop computer. Bill Gay and Tammy Peiper, at Sverdrup Architecture in Washington, D. C., talk about "hoteling," a concept developed with Michael Brill of BOSTI for Ernst & Young International in Chicago. Since the firm's tax, accounting, and professional consultants increasingly work in clients' offices, employees only occasionally need a "home" at headquarters. Rather than permanently setting aside space, Ernst & Young simply plugs in the analyst's telephone (including the number), computer, and related electronic resources into whatever available space suits that person's current project or group. Though the installation and maintenance costs of its electronic infra-



5  
*Skidmore, Owings & Merrill's headquarters for Weyerhaeuser, near Tacoma, Washington, used a long-span concrete structure and vast horizontal stretches of glass, broken only by silicone butt-glazing joints (5). Daylight pours into the floors. Nearly*

*all occupants can take advantage of landscape views over low partitions, since this project, completed in 1971, was one of the earliest to realize the full potential of open-office furnishing systems (6). Today, designers are rethinking office arrangements to better exploit*



6

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*“The reconsideration of group space comes about for reasons of speed and to build some level of communication where you wouldn’t otherwise have it.”—Bill Bula, Flad Associates*

structure are higher, Ernst & Young balances them by requiring substantially less space to accomplish the same tasks.

#### **The workplace and quality of life**

Only a few years ago U. S. white-collar workers enjoyed the best working conditions in the world. Space standards were generous, air-conditioning universal, lighting levels were high. Much of this began to change with the advent of microcomputers and related devices. These machines take up space, generate heat and noise, and some emit possibly toxic compounds into the air. Desks, chairs, and lighting designed for typewriters and pens are not well-matched to computer monitors and keyboards. At the same time, energy conservation began to trigger simplistic solutions: seal up buildings; reduce building perimeters and glazing areas; tint glass deeply.

It’s not surprising that the combination of inappropriate furnishings; inadequate power and cooling; reduced access to outdoor light, air, and views created widespread dissatisfaction—often expressed by “sick building” symptoms. Ed Arens, a professor at the University of California, Berkeley, has been surveying satisfaction with the office environment. He reports, “The amount of discomfort is disturbing, even in offices maintained within the accepted comfort zone.” The nature of this unhappiness is quantified by a survey Louis Harris and Associates conducted for Steelcase, called the Worldwide Office Environment Index. Though American workers express a higher level of job satisfaction than their counterparts in Canada, Europe, or Japan, many more American workers feel the quality of work life has declined in the last 10 years. Only 12 percent felt this way in 1978; in 1991, 26 percent did. More workers cite eyestrain, air quality, VDT hazards, and hazardous building materials

as serious concerns than did in a similar survey conducted only two years previously. This decline can’t help but impact productivity.

In Europe, which has skilled labor shortages and a highly educated workforce, quality-of-the-workplace concerns have a different twist. In countries such as Germany, Holland, and Sweden, workers regard access to light and views a birthright, and the ability to control ventilation through operable windows a high priority. In Germany, most workstations are no more than 25 feet from a window. In recent years, American development practice has actually been going the other way. Developers have moved away from the rectangular slab-type buildings of the ’60s to squarer plans with deeper floor plates that place workers as much as 60 feet from exterior walls. (Views are likely to be blocked by private executive offices anyway.) Such buildings are cheaper to build (fewer square feet of expensive curtain wall), cheaper to cool in the hotter parts of the U. S., and highly efficient in terms of workstation density. But they offer few amenities to the workforce, and some companies are looking at whether these early-term savings compromise productivity.

Projects that provide every worker with access to a window have layouts dramatically different from the deep floor plate favored in America. The plans of low-rise buildings tend to be long, narrow slabs or short with many fingerlike wings. Taller buildings need to be extremely slender (such as those proposed for Frankfurt and the recently completed 712 Fifth Avenue, in New York, pages 90-95). Such structures have a very high proportion of perimeter wall to floor area, which costs more to build and may cost more to heat and cool. The answer, increasingly, is to have offices face light courts or atriums, which act as climatic mediating devices. These are used in

*daylighting and encourage greater interaction among work groups. An office building for Hooker Chemical (now Occidental Chemical), completed to designs of the Cannon Group in 1982, marked an early use of a ventilated double curtain wall. Without compromising transparency (7), the design offers extraordinary thermal efficiency and shading in the form of internal blinds (8). This concept’s higher initial expense has been hard to justify in an era of low fuel costs, but today’s designers are looking at it again as a naturally ventilated alternative to mechanical cooling.*



7



8

government ministries in Marseilles (pages 96-99) and The Hague (page 122), and for Epson, in California (page 124). The Green Building, proposed for the City of London, seeks to improve the quality of the workplace by giving individuals wide control over ventilation and lighting without compromising a strict energy-conservation regime (pages 110-113). Not only does this research project use a central atrium for natural ventilation and daylighting, but users can open windows to a sealed ventilation layer, which serves as both building insulation and temperature-relief valve. Updating the energy-saving double-glass wall scheme is already more widely accepted, and is proposed for three of the Frankfurt towers. A variant is being studied for NTT's headquarters (pages 76-79). High-quality workplaces don't have to be expensive. Ian Ritchie's building B8 is a budget building at Stockley Park that boasts an atrium, upgraded glazing, and sunshades (page 122).

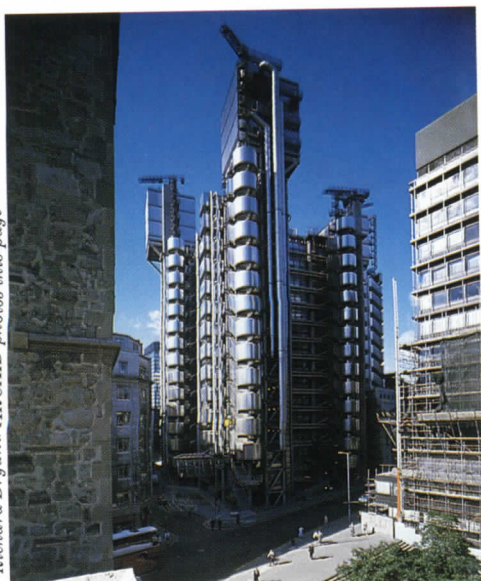
### The office driven by technology

We may be entering one of the most fertile periods for development of building technology. And, because of the enormous potential benefits, most of this effort is going into energy-conservation and other "green" building strategies. Experts now see the white-collar workplace as the energy-conservation frontier likely to deliver the greatest short-term benefits. Already, utility companies are putting incentives into place that reward the installation of a variety of technologies [RECORD, February 1992, pages 34-35]. Research is paying off, too, as better conservation products come on the market. Take lighting: dimmable fluorescents, parabolic lenses, and improved indirect-lighting fixtures combined with better controls and ballasts mean that office lighting alone can reduce electric bills substantially. The use of sunshades, daylighting, and advanced lighting

devices earned Epson's U. S. headquarters a Design for Excellence award from Southern California Edison. We've seen staggering improvements in glass: low-E and other coatings now selectively admit light and reject heat. With improved insulating units, energy-saving suspended films, and new laminated-glass interlayers, windows can now save more energy than walls. Now that clear glass with selective coatings can be used without energy penalty even in warm locations [RECORD, January 1992, pages 130-137], architects can make better use of daylight, not only for its psychological benefits, but as another weapon in the conservation arsenal.

The intense use of microelectronic technologies is affecting architecture in unexpected ways. The value of equipment, systems, and data can be so high that the structures that house them must be designed to resist extraordinary catastrophes. The cost of telecommunications and computer equipment in Tokyo's NTT building will be much higher than the building itself—even considering the expense of redundant base-building systems to protect the contents and a frame engineered to ride out the worst earthquakes.

We'll also be seeing many changes in mechanical equipment. CFC refrigerants will have to go; some experts propose a large-scale shift to gas-fired chillers that don't require freonlike refrigerants. Alan Hedges, an associate professor of ergonomics at Cornell University, sees a return to dual-duct air-conditioning systems because they are more responsive to the varying loads of today's office than variable air-volume systems now commonly specified. The Rocky Mountain Institute, through its Competitek subsidiary, is looking more closely at heat generated and power used by microcomputers and peripherals, which are now so significant that they strain even



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Richard Rogers's 1985 headquarters for Lloyd's is a 14-story glass shed that is hardly visible within a network of service pods containing stairs, elevators, and the vast mechanical infrastructure required by computer-intensive financial trading (9). It still ranks among the most sophisticated projects ever built in the way it integrates mechanical and other services into ceiling, raised access floor, and workstation. The sun-drenched 240-ft-high atrium (10) is oddly reminiscent of Wright's Larkin Building. With lush plantings, lounges, and eateries, Niels Torp's 1976 headquarters for

## *In countries such as Germany, Holland, and Sweden, workers regard access to light and views a birthright.*

heavily serviced recently built buildings. Air-conditioning costs, too, rise as computer use intensifies. Already manufacturers are responding with more-efficient units.

Complex designs can today be more readily analyzed thanks to faster and more powerful computers. The tall and slender structures in Frankfurt echo those constructed in the U. S., including 712 Fifth Avenue. But it is extremely powerful computer analysis that has found the least expensive ways to build such buildings, which may be too expensive otherwise [RECORD, October 1990, pages 105-109]. Computers can now readily be used to analyze, design, and verify the performance of shading devices, highly insulated wall systems, natural ventilation, glass-covered courtyards, and other resource-conserving solutions [RECORD, April 1992, pages 40-43].

### **Putting it all together**

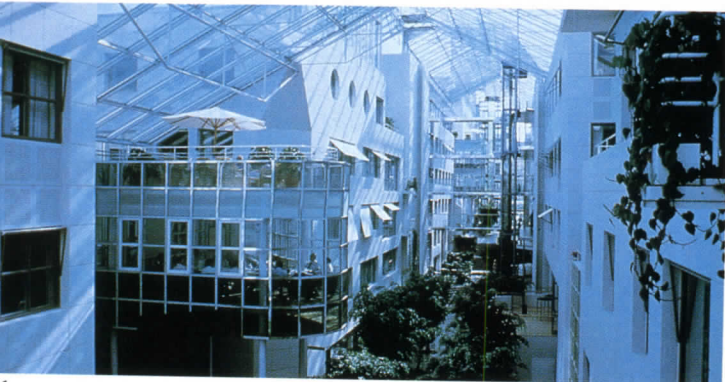
That most of the projects in this issue are outside the U. S. suggests that other industrialized countries are taking new developments more seriously than Americans are. Complacency in the U. S. could divert the nation from its intent to be competitive worldwide or even within its borders. This is not to say that there is little innovation in America. Projects do, however, tend to be less ambitious. Some of the best recently published examples include: Becton-Dickinson's headquarters, designed by Kallmann McKinnell & Wood [RECORD, January 1988, pages 62-73], where nearly every worker has access to light and views to internal courtyards or open landscape. A subsequent phase, nearing completion, puts even greater emphasis on the design of the individual workstation. IBM's Advanced Business Institute [RECORD, September 1989, pages 84-91] encourages informal exchanges of ideas by making coffee-break areas among the most

attractive in the entire complex (Mitchell/Giurgola Architects). Offices for the Natural Resources Defense Council [RECORD, October 1989, pages 128-133] and the Audubon Society [RECORD, June 1991, page 38], by the Croxton Collaborative, explore resource-conserving techniques using off-the-shelf solutions.

This is hardly an exhaustive list. Indeed, there is an enormous role for architects in creating workplaces that are more pleasant, efficient, and environmentally responsive. But the decisions are not entirely up to architects. Much is up to government, which can either encourage or discourage innovation. Many of the dramatic improvements in glazing, for example, were commercialized through federally funded research by the Windows and Daylighting Group at the University of California's Lawrence Berkeley Laboratory. It runs on a shoestring. By contrast, Japan's government lavishly supports photovoltaic research. Aside from funding for basic research, the European community is supporting energy-conserving design through grants totaling some \$200 million annually.

If you consider (according to J. D. Wineman, *Behavioral Issues in Office Design*) that the salaries paid to workers within a building are anywhere from 8 to 11 times the costs to build and operate it, even modest productivity gains can justify considerably higher building costs. If real conservation or productivity advantages can be shown, the reworking of America's stock of outdated commercial structures may prove to be a potent way to move the vast amounts of spec space currently on the market. It's up to architects to recognize the opportunities in the changing nature of work, to analyze the implications and, above all, to propose responsive *and* intriguing designs.

*James S. Russell*



1  
Scandinavian Air Services encourages chance encounters among building occupants (11). Becton-Dickinson's headquarters, designed by Kallman, McKinnell & Wood and com-

pleted in 1987, offers its workers views to a bucolic suburban landscape or to climate-controlled interior atriums enlivened by gardens and art (12).

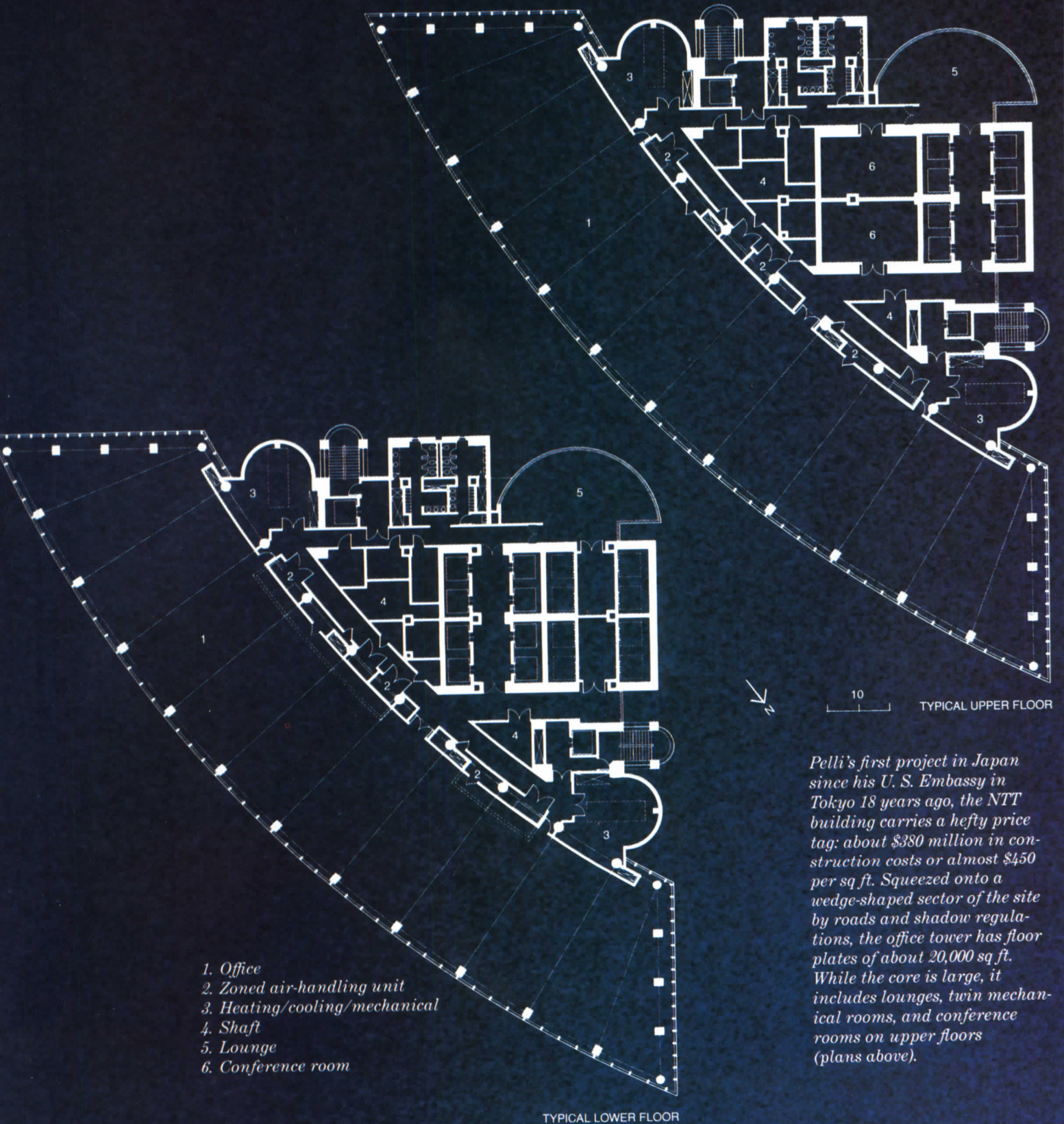


12

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# High-Wired Act

NTT Shinjuku Headquarters Building  
Tokyo, Japan  
Cesar Pelli & Associates,  
Design Architect  
Yamashita Sekkei, Inc.,  
Architect of Record



*Pelli's first project in Japan since his U. S. Embassy in Tokyo 18 years ago, the NTT building carries a hefty price tag: about \$380 million in construction costs or almost \$450 per sq. ft. Squeezed onto a wedge-shaped sector of the site by roads and shadow regulations, the office tower has floor plates of about 20,000 sq. ft. While the core is large, it includes lounges, twin mechanical rooms, and conference rooms on upper floors (plans above).*

located in one of the fastest-changing areas of a city notorious for its dizzying transformations, Nippon Telephone and Telegraph's new headquarters building will be an appropriate symbol of the Japanese people's faith in technology and innovation when it is completed in 1995. Not only will the 30-story steel-frame tower house some of the world's most sophisticated (and expensive) telecommunications equipment, but it will showcase an impressive array of advanced indoor-environment controls and electronic networking. It will also reflect a more generous relationship between a large Japanese corporation and its employees.

While the amorphous character of the Shinjuku area of Tokyo freed the architects from stylistic constraints, a complex web of urban infrastructure—existing and planned—has strongly influenced the shape and siting of the building. With an elevated highway running along one edge, plans to turn a second road into an elevated thoroughfare, and a proposed below-grade road curving around the site's third border, the architects had very little wiggle room in placing the office tower and the accompanying three-story museum and showroom building. Further complicating the design task were strict guidelines limiting the amount of shadow the new structure could cast on an adjacent residential neighborhood, and the need to avoid blocking microwave transmission paths cutting through the area's airspace. The resulting design features a wedge-shaped tower and a crescentlike showroom building enclosing an outdoor garden.

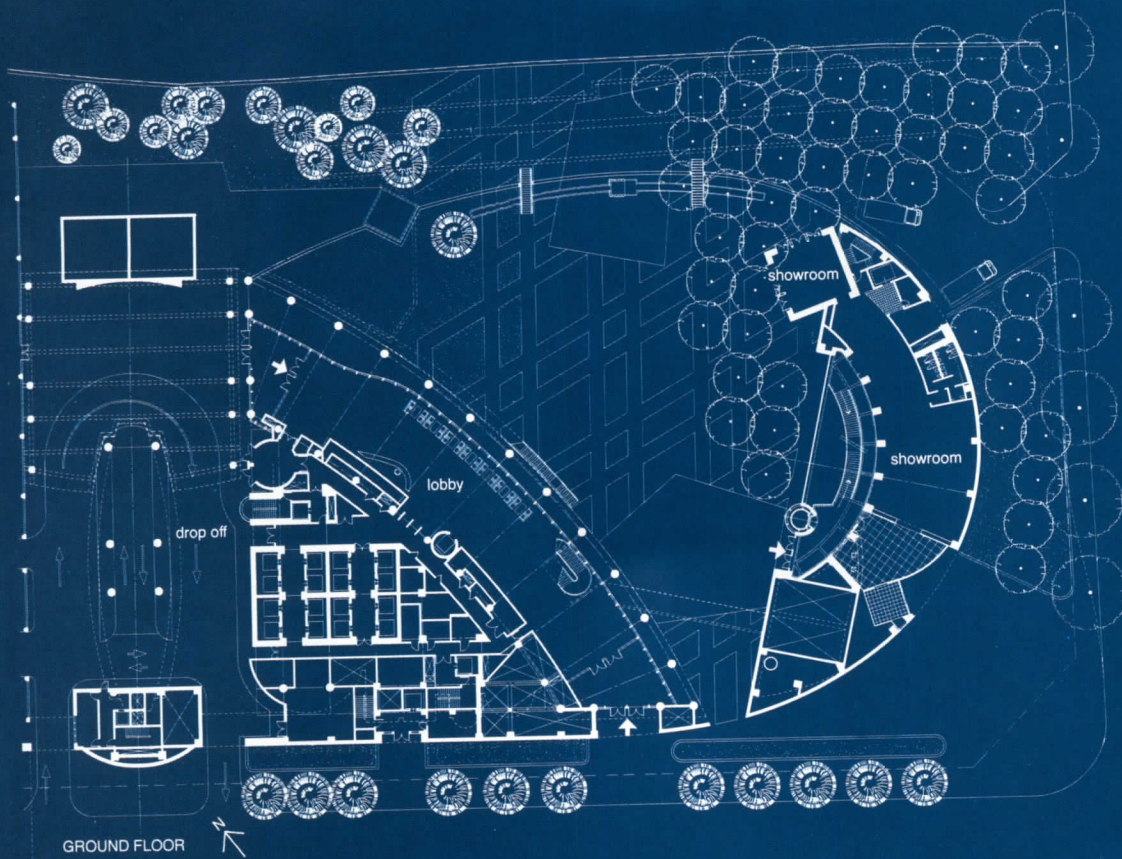
Compared to buildings in the United States, the NTT tower will have a larger proportion of core area to office space. In part, this is due to stricter codes requiring a second emergency stair reserved for firefighters and heavier structural members for seismic reinforcing. But it also reflects the client's decision to include huge fiber-optic cables (up to five feet in diameter), several *billion* dollars worth of telecommunications equipment requiring extensive cooling cells, and extra hvac capacity for a future addition. The core includes a spacious "refresh" room or employee lounge on each floor, an amenity seldom found in Western buildings. Because the core is so large, it wouldn't fit in the center of the building. Instead it is pushed to one corner of the plan.

Office space—open on most floors and partitioned on floors with top executives—spreads out in a great curve oriented to views of the Imperial gardens, the Meiji shrine, and Shinjuku. Reflecting a gentler and kinder corporate attitude, the NTT building offers more space per employee than is typical in Japan and more individual control of the internal environment. Not only is each floor broken down into several air-handling zones, but each workstation is equipped with air vents controlled by the individual employee. Raised flooring (6 inches deep) allows desks to be wired for the latest electronic equipment. Although the technology used is also available in the United States, "the question is how much can you afford?" explains Cesar Pelli. Clearly, NTT decided it must afford much more than the typical American corporation.

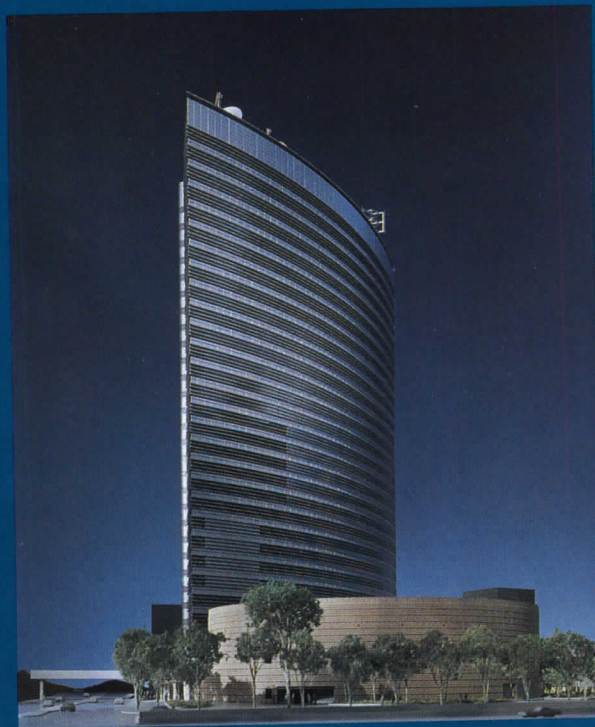
The building's aluminum curtain wall features a fluoropolymer finish that sets it apart from most other office towers in Japan. "It will be darker and warmer and less shiny" than the typical metal panels found on other office towers in Japan, says Pelli. Although the architects didn't design the building's skin as a metaphor for the high-tech equipment mostly hidden within, says David Chen, the senior designer on the Pelli team, mechanical systems placed along the perimeter of the building are clearly expressed on the exterior.

Clifford A. Pearson





Although indoor atriums are common in Japan, outdoor gardens—such as the one between the NTT office tower and its showroom building—are seen as extravagant uses of land (site plan left). Multi-billion-dollar electronic equipment occupies five floors below grade and parts of several tower floors (section right). A fluoropolymer finish gives the building a rich appearance (model photos below). Instead of insulated glazing, which is rare in Japan, the building uses a motorized venetian-blind system recessed 18 inches from the curtain wall that can let in hot or cold air, depending on the season (far right).



Kenneth Champlin photos



**Credits**

*NTT Shinjuku Headquarters  
Tokyo, Japan*

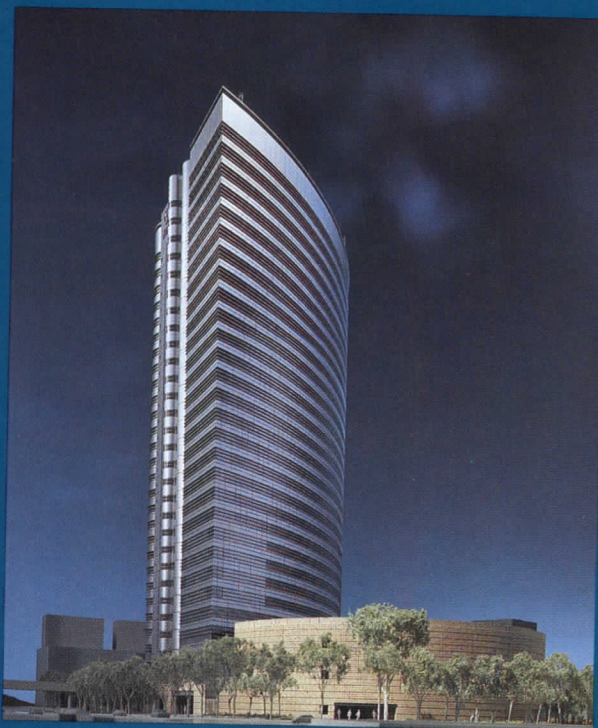
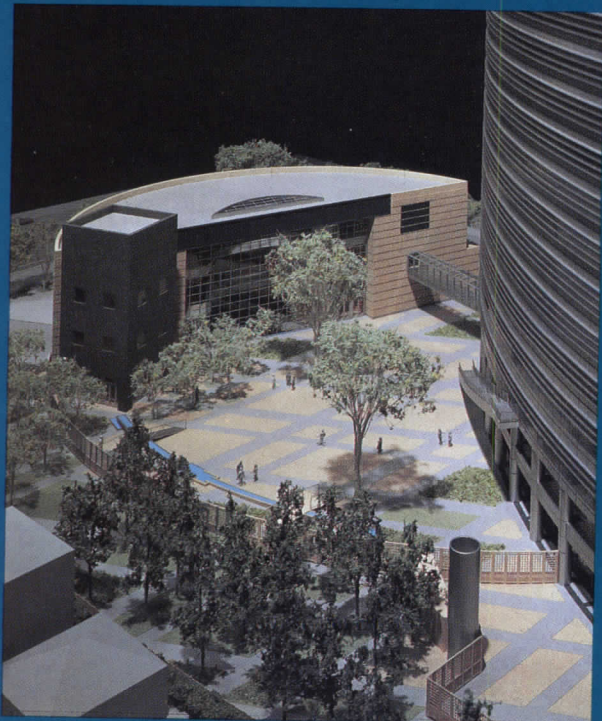
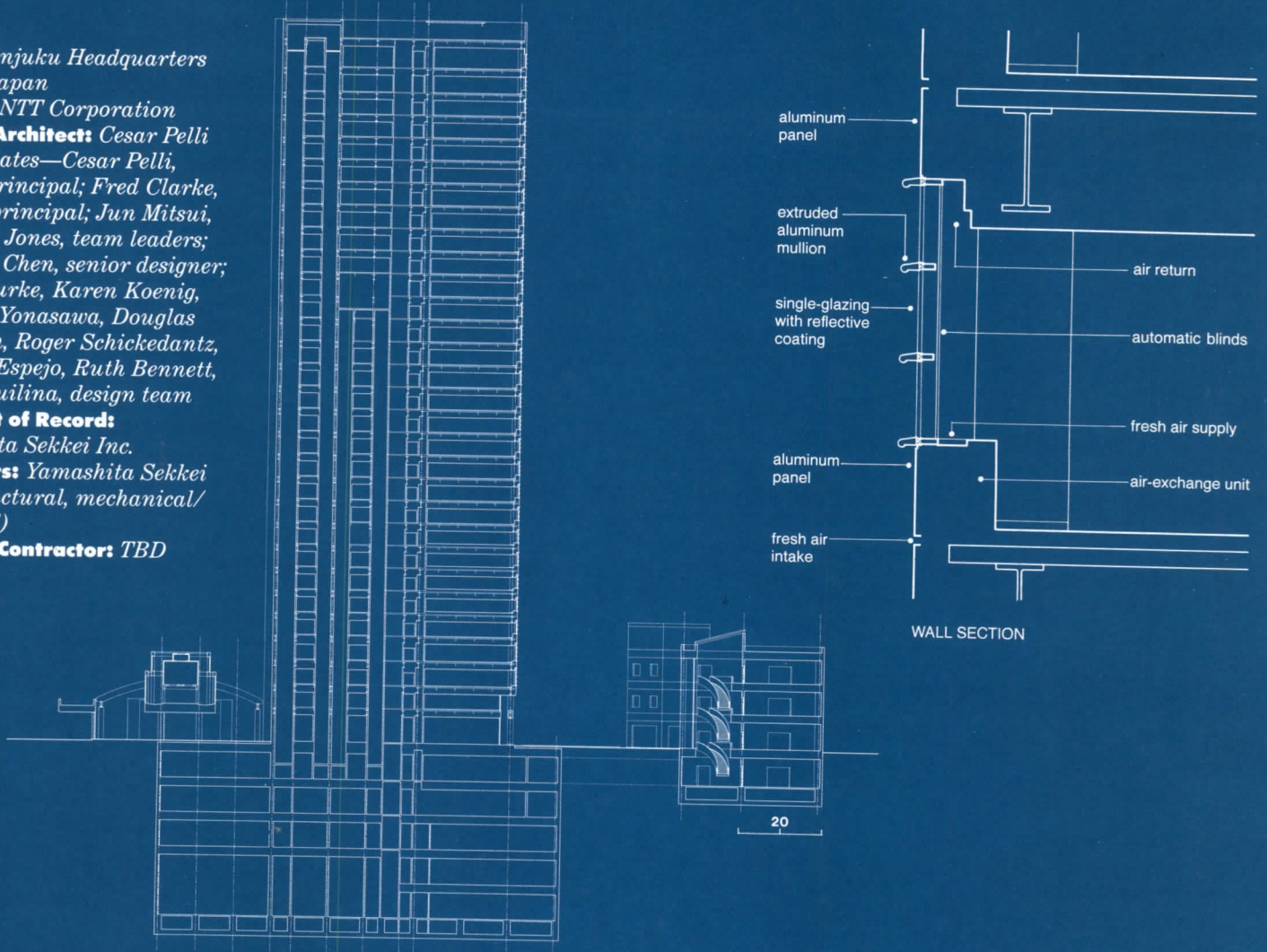
**Owner:** *NTT Corporation*

**Design Architect:** *Cesar Pelli & Associates—Cesar Pelli, design principal; Fred Clarke, project principal; Jun Mitsui, Gregg E. Jones, team leaders; David P. Chen, senior designer; Kevin Burke, Karen Koenig, Masami Yonasawa, Douglas McIntosh, Roger Schickedantz, Roberto Espejo, Ruth Bennett, Scott Aquilina, design team*

**Architect of Record:**  
*Yamashita Sekkei Inc.*

**Engineers:** *Yamashita Sekkei Inc. (structural, mechanical/electrical)*

**General Contractor:** *TBD*



# The New Downtown

*With the city of Frankfurt, Germany, aspiring to be Europe's new financial capital, architects are proposing "socially acceptable" skyscrapers.*

In the postwar wave of prosperity known as the *Wirtschaftswunder*, Frankfurt am Main's unconditional devotion to the interests of business resulted in an incoherent streetscape. Now, as Europe moves toward economic unification, Frankfurt is seeking new means to becoming a world-class financial capital. The past years have seen major investments in a spate of cultural facilities such as the string of museums lining the Main River. Since a coalition of the Socialist Party and the Greens was voted into municipal power in 1989, however, politicians, planners, and architects have looked askance at this century's symbol of progress and prosperity, the skyscraper (though the skyline's most striking addition is Helmut Jahn's Messeturm, at 750 feet the tallest building in Europe). Heights up to about 650 feet are now only permitted around the Messe fairground and in the centrally located banking area. In other office areas the limit is 330 to 400 feet, and residential zones retain Frankfurt's traditional six to eight stories.

Martin Wentz, the Socialist politician responsible for urban planning, describes the city's present policies as "differentiation." "We want to give each quarter its own architectural identity. For that reason we prefer to group buildings, especially the tall ones, in clusters rather than along long axes. Frankfurt is the only city in Europe where you can identify the banking area by its architecture." To improve Frankfurt's architectural quality, local government has made competitions for high-rise buildings mandatory. "Investors here have realized that in the long run, competitions yield both more corporate identity and better buildings," Wentz explains. Responding to municipal mandates, several new towers break ground in technology that improves the quality of the workplace and benefits the city as a whole.

Norman Foster's 690-foot-tall headquarters for Commerzbank (1 opposite and pages 82-83) is arguably the most ambitious of such new "green" skyscrapers. Here he hopes to realize the "garden in the sky" he had envisioned for the HongKong Bank. Foster's competition-winning design uses the analogy of a flower: the rounded triangular floors are the "petals" grouped around a stemlike central atrium. Each petal is supported by an internal and external *Vierendeel* truss spanning between the primary columns located at the apex of the plan form, freeing the offices from obstructions and opening views either to the outside or into the gardens. Natural ventilation through the atrium and a ventilated double-wall construction is expected to meet comfort needs on eight out of ten days. (Supplementary mechanical cooling is also proposed.)

With its design for an extension to the Hessische Landesbank—its location in the bank quarter justified a height averaging 650 feet—the Hamburg firm of Schweger & Partners aims for no less than "a

new European type of highrise." Schweger's concrete-framed tower (3), scheduled to be completed in 1997, also provides a double-layer curtain wall (*Klimafassade*) onto which the operable windows in the inner facade open (pages 86-87). The building's shape, an intersecting circle and square, was determined by two factors: the desire for strong geometric forms that would hold their own among the neighboring towers, and the need to create the required amount of office space without sacrificing daylight. The architects expect that the greater initial investment—the facade, for example, is expected to cost 15 per cent more than a traditional one—will be offset by savings on heating, cooling, and artificial light. "We have wanted to try out our ideas about a 'green' skyscraper for a long time," says project architect Heino Latteman. "Finally we have found a principal willing to try."

When the Cologne-based architect Oswald Mathias Ungers designed an urban plan for the western side of Frankfurt in the mid 1980s, he envisioned two tall towers straddling the expressway and marking a gateway to the city. He himself won the architectural competition with his design for two *Stadtportalhäuser* (4), one for Bosch and one for the organization that operates the Messe. They are limited to 330 feet high due to Frankfurt's newfound phobia for height, according to Ungers (pages 88-89). Ungers describes his double-wall scheme as akin to a glass envelope (*Klimahülle*). On one tower Ungers sets the inner layer at varying distances from the outer layer, creating the appearance of an open scaffolding and permitting protected gardens within the interstitial space. In two neat rows next to the Bosch tower stand five clones, connected by gardens. These stand 115 feet high and match the cladding and footprint of the ten lower stories of the Bosch tower.

Before the new height policies went into effect, Kohn Pedersen Fox obtained approval for its 750,000-square-foot development at Westendstrasse 1, including a 650-foot-high commercial office tower. The slender tower, its fan shape allowing daylight to penetrate deep into the workspaces, is placed at the corner of the traffic artery Mainzer Landstrasse, casting the least possible shadow over the residential Westendstrasse and KPF's 300-room hotel, apartments, and winter garden. Such respect for the street wall alone sets it apart from the majority of Frankfurt's uninspired postwar commercial buildings. The tower terminates in a two-story loggia beneath a cantilevered crown, the project's "signature on the skyline."

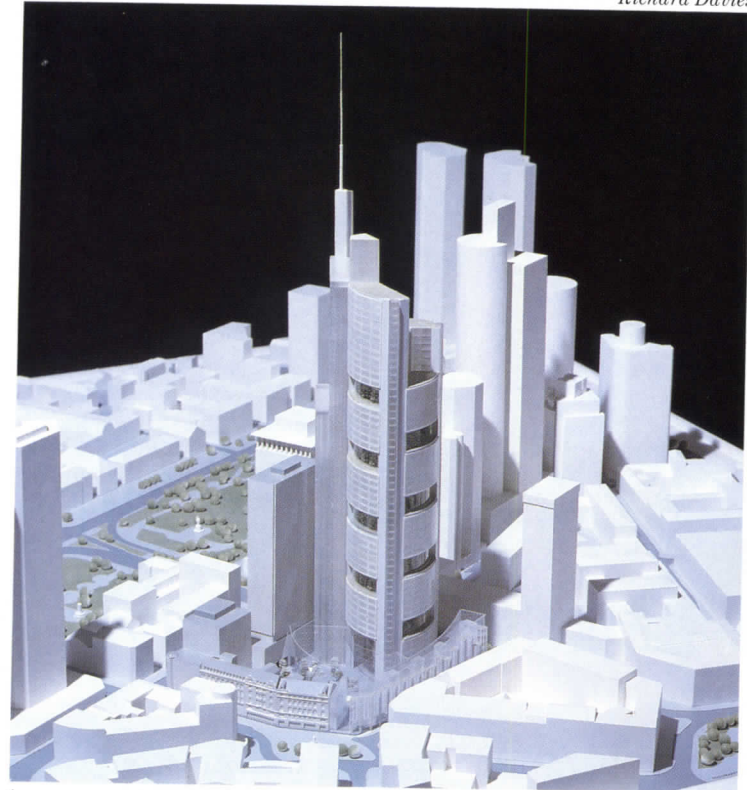
Ungers, a vocal advocate of tall buildings, sums up the dilemma of the new downtown: "Consumers and workers are becoming more sensitive to issues of urbanism, the environment, and the quality of the workplace. If tall buildings are to remain socially acceptable, we must find a solution to their high energy consumption." Tracy Metz

Frankfurt is raising its profile as the financial capital of Germany and possibly of Europe. The banking area is now the only part of the city to permit buildings over 650 feet, and city government requires investors to hold competitions for these. Norman Foster's Commerzbank (1) and Schweger & Partner's extension to the Hessische Landesbank (3) were winning competition entries;

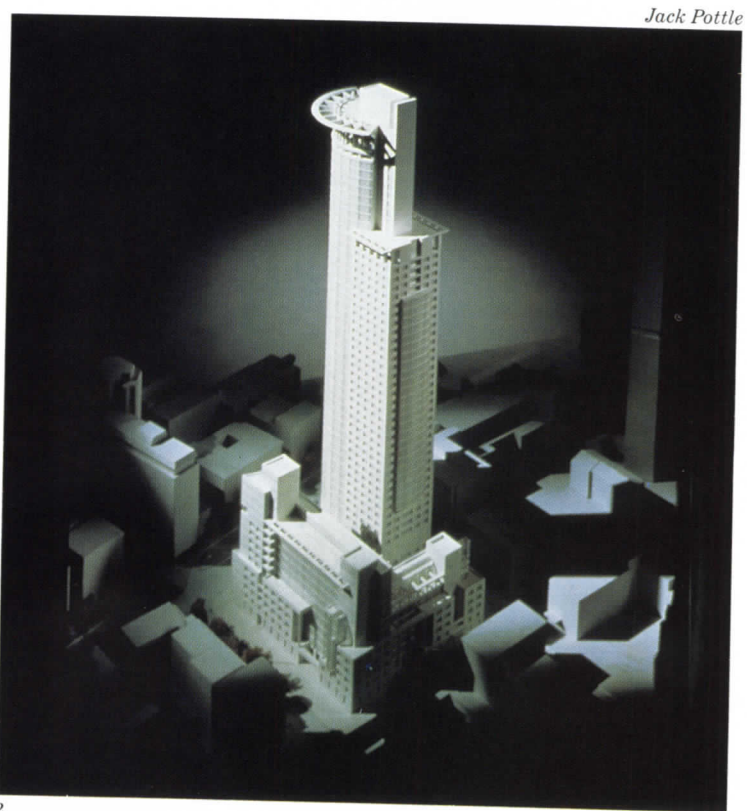
the Kohn Pedersen Fox project (2) was approved before the new guidelines went into effect. The new guidelines limited O. M. Ungers's two-tower gateway near the Messe fairground to half its planned height (4). These projects provide daylight and windows for nearly every worker, and the later projects more and more deal with environmental issues, particularly natural ventilation.

Richard Davies

Jack Pottle



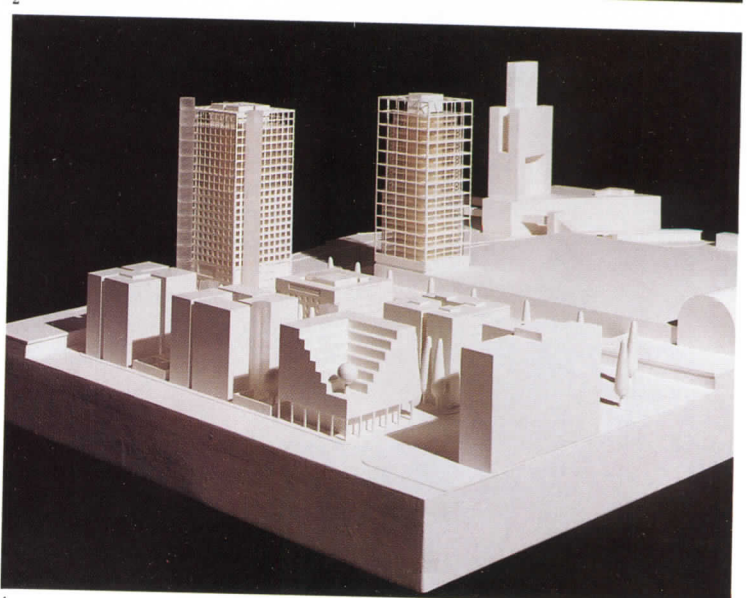
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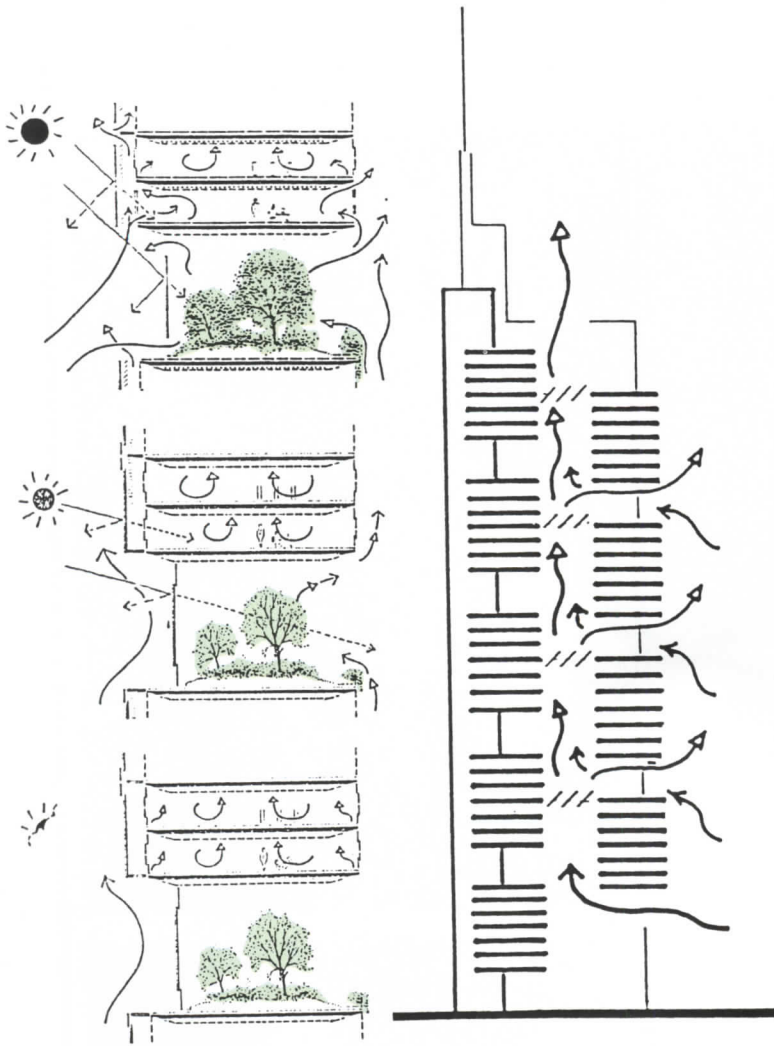
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Foto-Studio Luenen

# Commerzbank Headquarters

Taking to heart Frankfurt's architectural image for its banking center, Norman Foster has designed the 690-foot-tall Commerzbank Headquarters to be a strong presence on the skyline (view from Main River, below). In this project, his closest yet to a "green" skyscraper, roughly triangular floors are stacked around a central atrium like

petals around a stem. At every third floor, and rotating to different "petals," the architect has designed open-air gardens (below and opposite). Each rotating petal of the Commerzbank is supported by internal and external Vierendeel trusses spanning between the primary columns located at the apex of the plan segments, freeing the office spaces from columns and other



Natural ventilation is provided through the atrium by fan-assisted natural buoyancy and through operable windows opening onto a 16-in.-wide zone between the inner and outer glass skins. This curtain wall entails three glass layers, an inner skin consisting of operable double-glazed units and an outer skin forming a windscreen.



Richard Daines

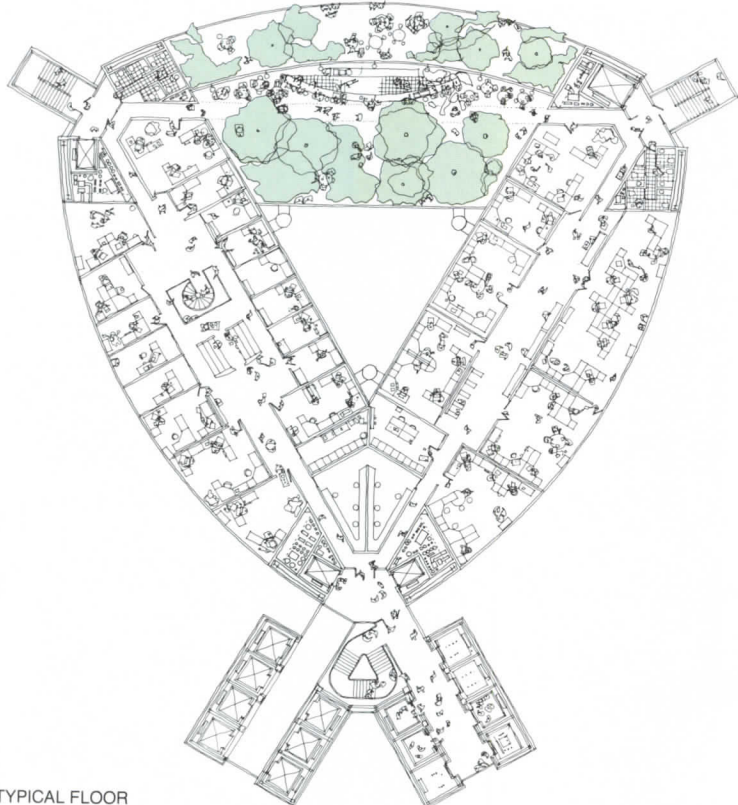


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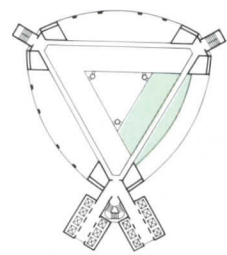
obstructions. All have views either to the outside or into the gardens (bottom). The architects propose natural ventilation (opposite) with radiant cooling provided by cold-water pipes embedded in the concrete floor slabs. Under consideration are a skip-stop elevator scheme to reduce the number of shafts required, a recycling chute system, and use of gray water for cooling.

**Credits**  
 Commerzbank Headquarters  
 Frankfurt am Main, Germany  
**Architect:** Sir Norman Foster & Partners—Sir Norman Foster, Spencer de Gray, John Silver, Chris Eisner, Tom Politowicz, Giles Robinson, Simon Bowden, Nadi Jahangiri, Alan Martin, Eckhard Buerling, Joachim Kappeler, team

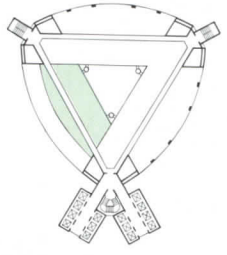
**Engineers:** Ove Arup & Partners (structural); J. Roger Preston & Partners (mechanical and electrical)  
**Management Contractor:** Bovis Lohmeyer



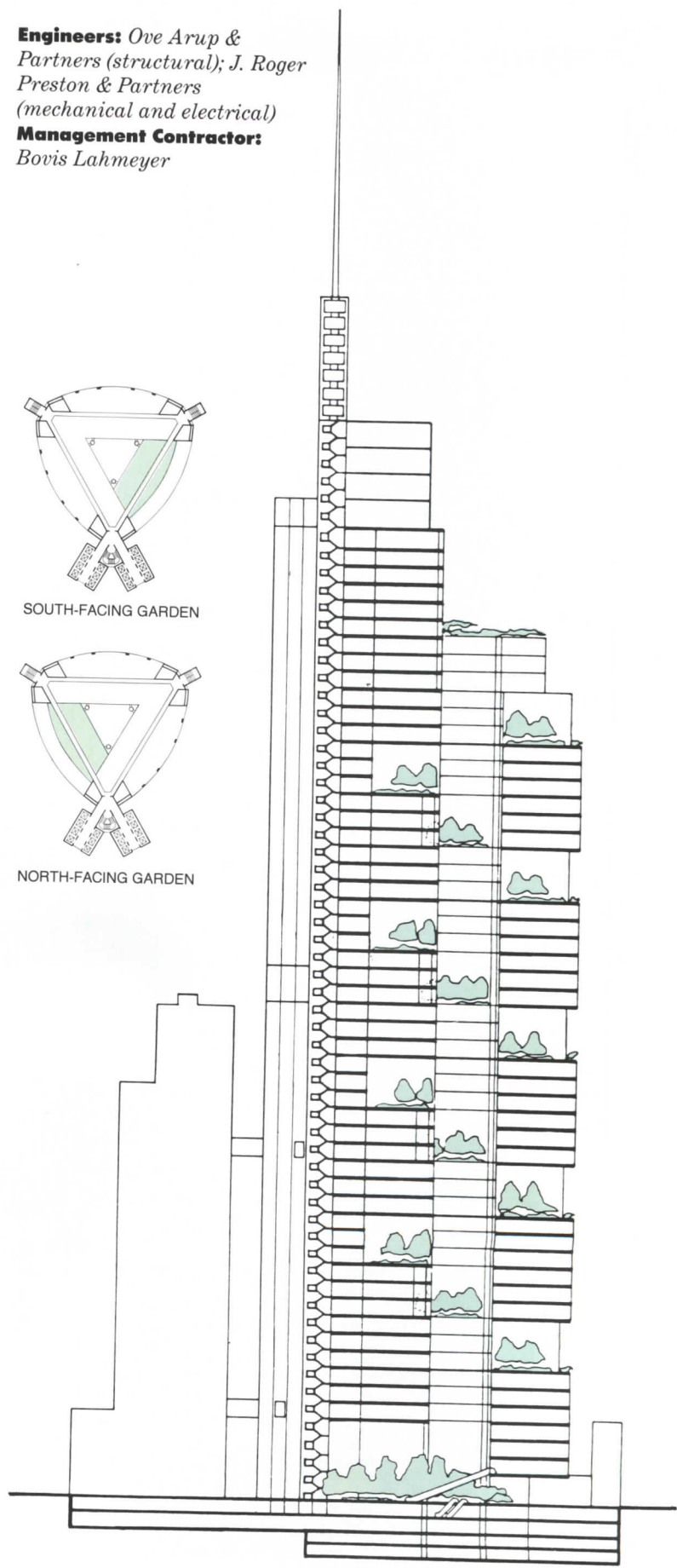
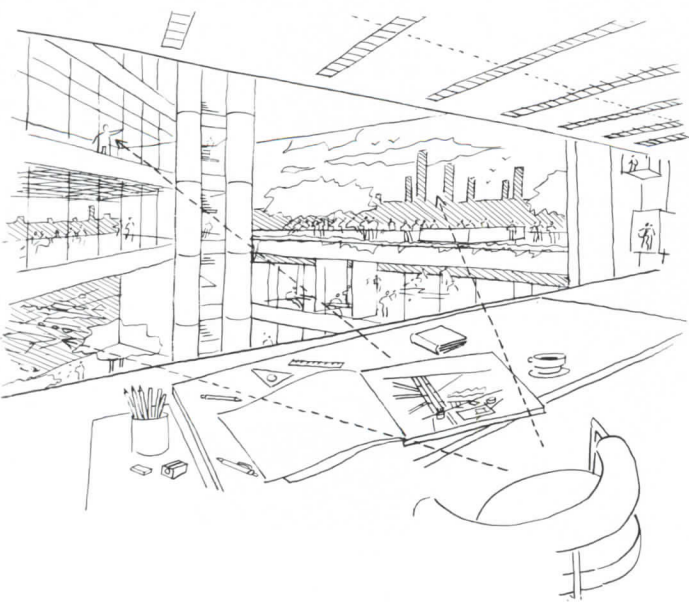
TYPICAL FLOOR



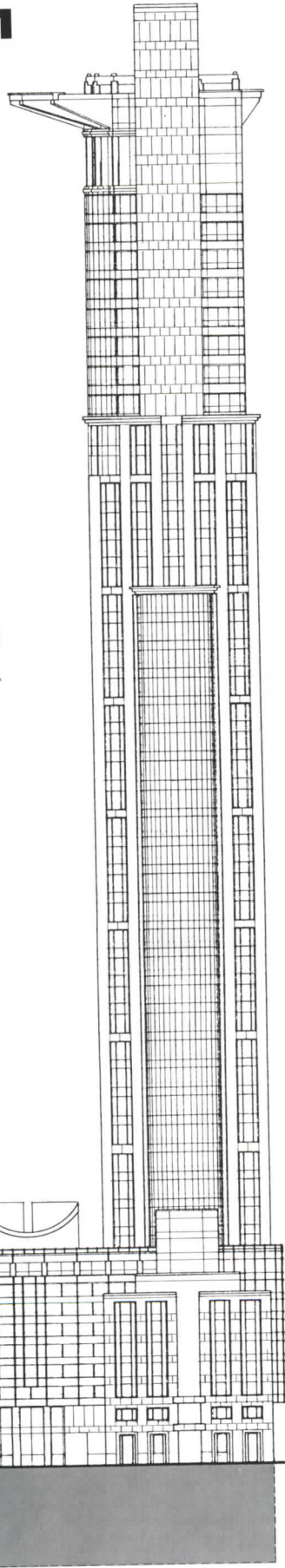
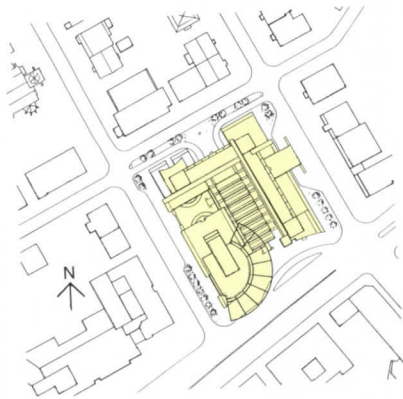
SOUTH-FACING GARDEN



NORTH-FACING GARDEN



# Westendstrasse 1



Designed in 1987 and nearing completion, Kohn Pedersen Fox's Westendstrasse 1 development is a 650-foot-high mixed-use project located on the Mainzer Landstrasse, a busy traffic artery. Though the project predates both the new zoning rules and the new focus on environmental technologies, it is notable both for its sensitivity to urban scale and the quality of the workspace

within. The office tower's slim profile doesn't block light to its lower-scaled neighbors. Behind the office spire, with its cantilevered crown, and more in scale with the residential Westendstrasse neighborhood, are a winter garden, hotel, and apartments. The plan of the office floors reflects an American-style focus on efficient floor use, with tightly packed services in a central core. Re-

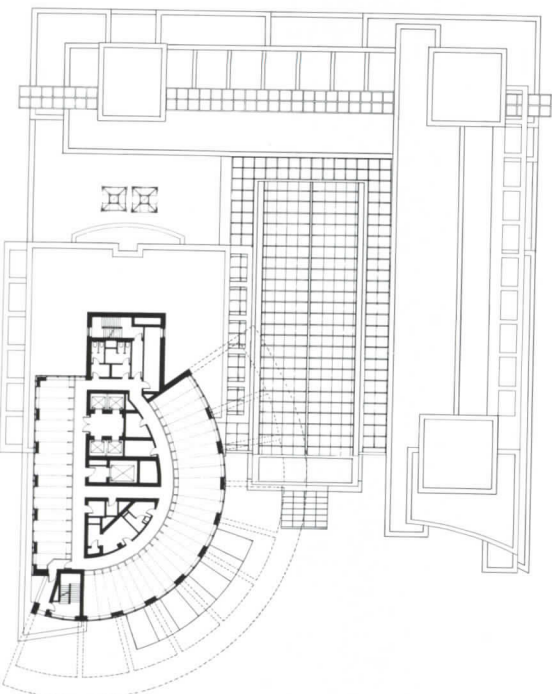


M. Frank

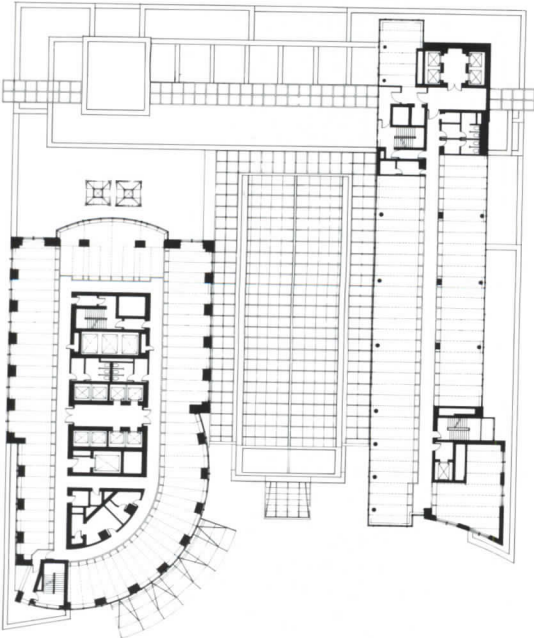
sponding to a longstanding German practice of giving workers access to windows, the core is wrapped by a single layer of offices which average 20 feet deep. (Contrast this to typical American downtown towers in which three or four workstations might be located between core and exterior wall.)

**Credits:**  
 Westendstrasse 1  
 Frankfurt am Main, Germany  
**Owner:** DG Immobilien  
 Anlagegesellschaft GmbH  
**Architect:** Kohn Pedersen Fox  
 Associates—A. Eugene Kohn,  
 partner-in-charge; William  
 Pedersen, partner-in-charge  
 (design); Lee Polisano, partner-  
 in-charge (management); Paul  
 King, senior designer; Andreas  
 Hausler, project manager;

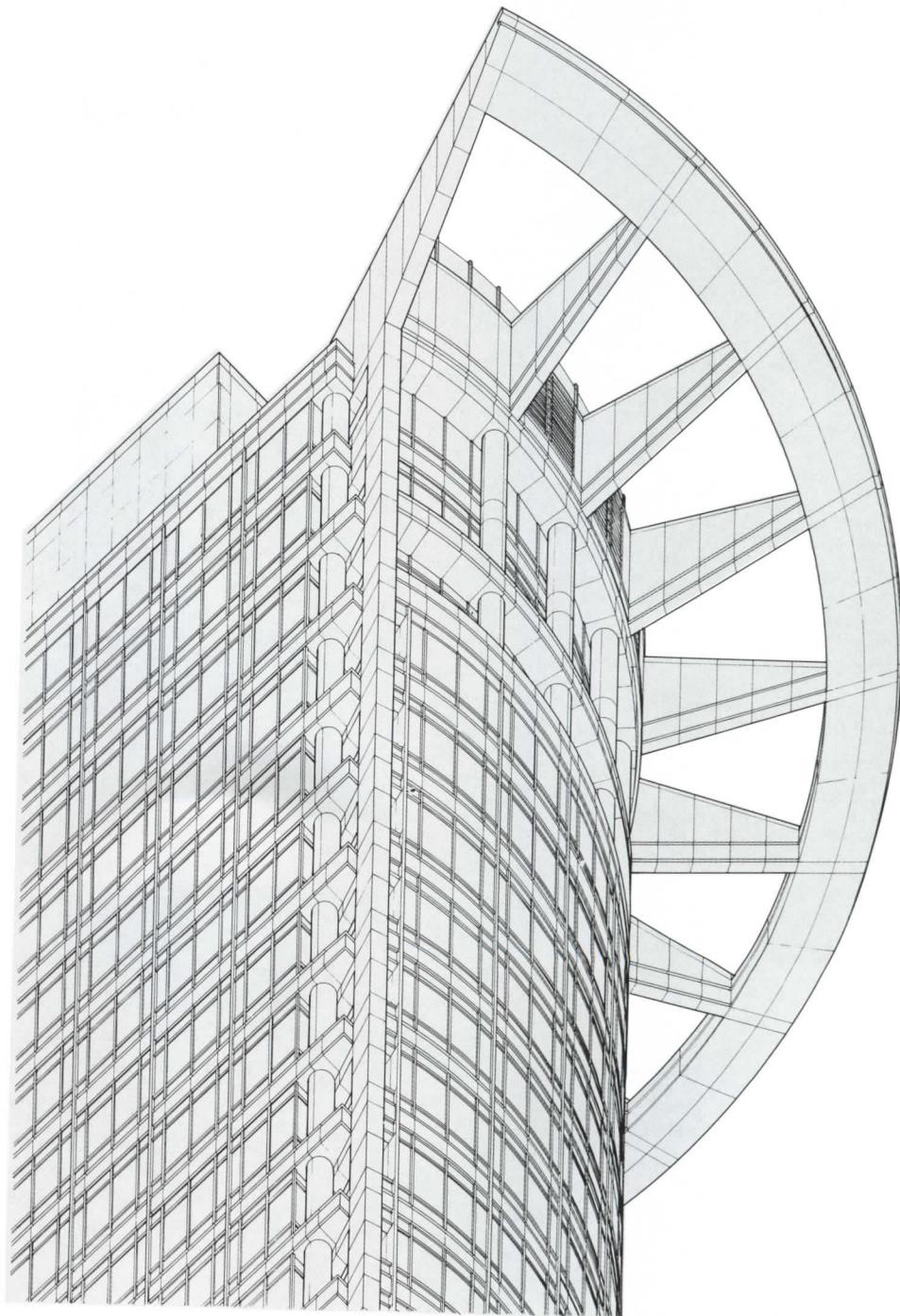
J. William Davis, Robert  
 Demel, Armando Gutierrez,  
 George Hauner, Nicole Mronz,  
 Jane Murphy, Evelyn  
 Neumann, Beth Niemi,  
 Wolfgang Neumüller, James  
 Papoutsis, Klaus Zahn, Brigit  
 Zwankhuizen, project team  
**Structural Engineer:**  
 Ingenieursozietät BGS



TOWER FLOOR PLAN



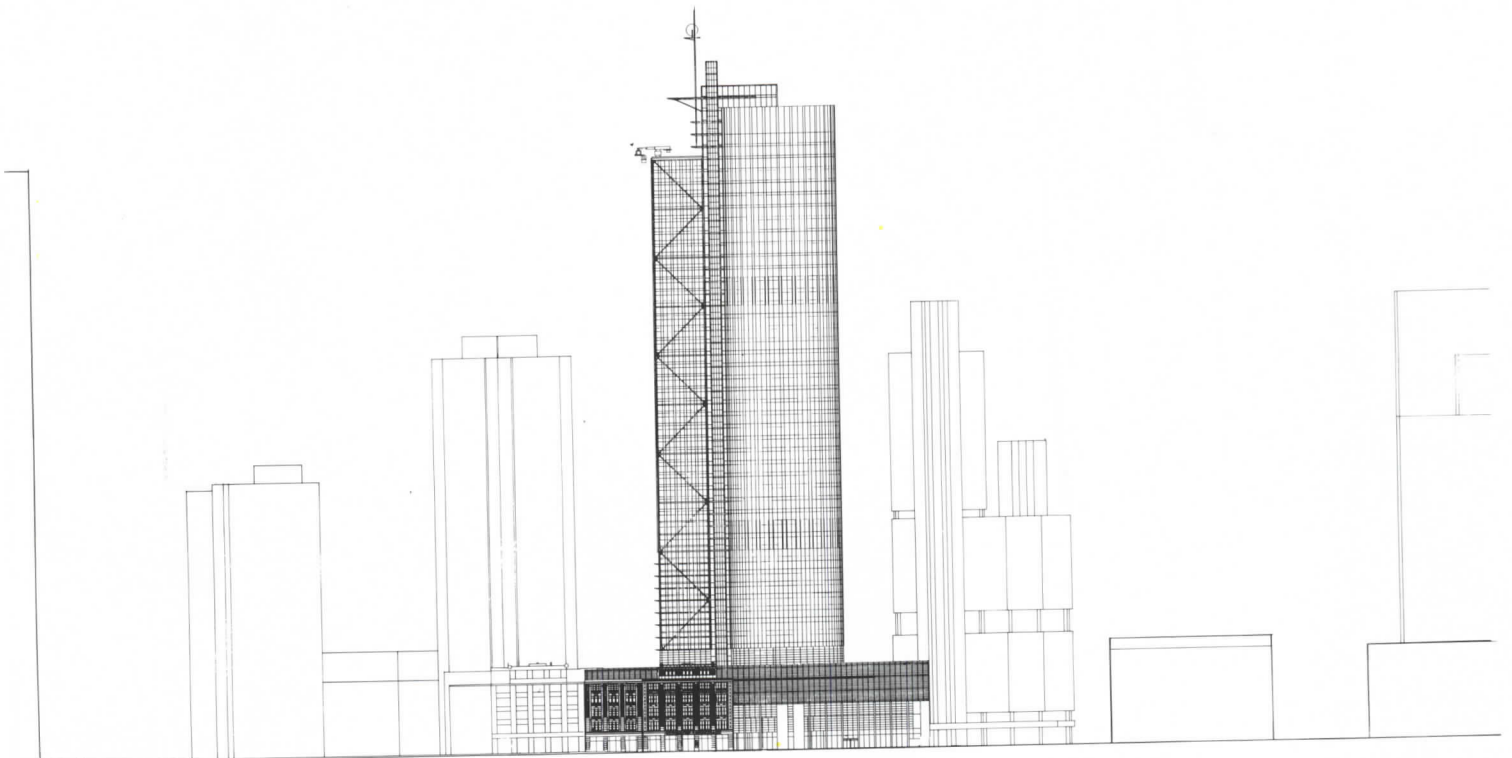
PLAN OF OFFICE, WINTER GARDEN, AND HOTEL



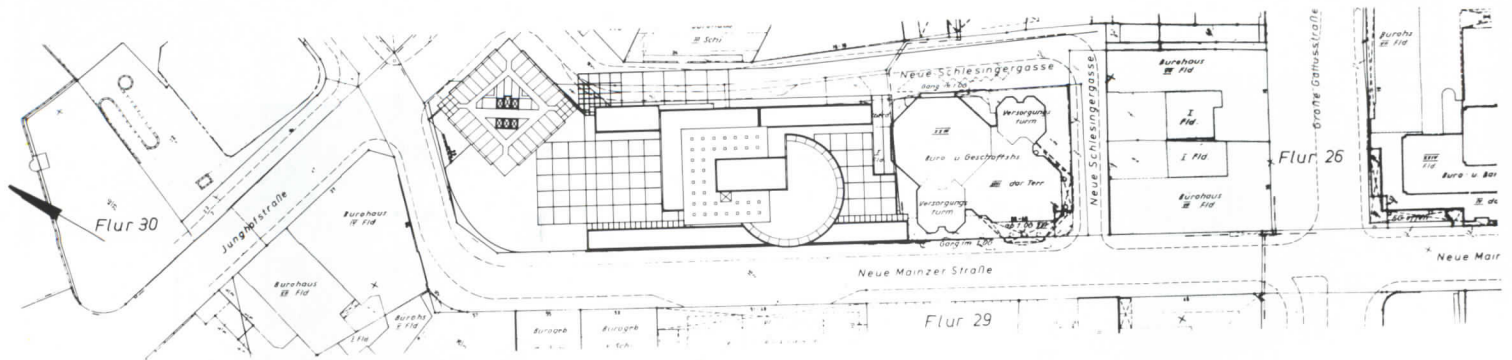
# Hessische Landesbank

For its winning design of an extension to the headquarters of the Hessische Landesbank, the Hamburg firm of Schweger & Partner chose strong forms that would hold their own among the tall and dense development in Frankfurt's banking area. The architects took Frankfurt's need for better-defined street walls into account by giving the tower a broad six-story base with res-

taurants, meeting rooms, an auditorium, and a shopping arcade set at an angle (site plan below). The landmark facade of the existing bank building will stay in place while new construction goes on both behind and 65 feet beneath it. By joining a square and a circle Schweger & Partner were able to more than meet the office-space needs within the height limit while creating a



ELEVATION



SITE PLAN

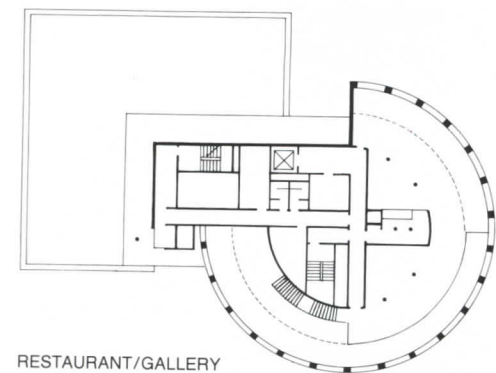


flexible floor plan giving a high percentage of window offices and daylight in virtually all the work spaces. The architects prepared alternative typical floor plans to suggest the variety of arrangements possible (plans below). One elevator whisks passengers directly to a restaurant on the 51st floor.

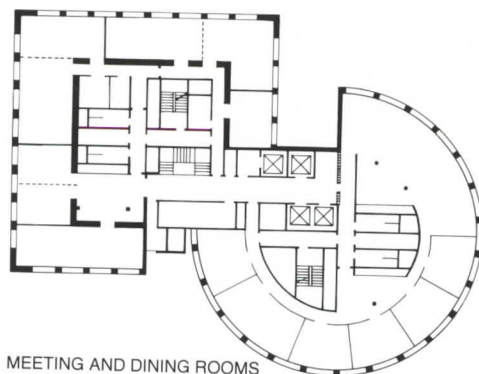
Thanks to a Klimafassade, a system of double glazing, workers will be able to open their windows over the full height of the tower onto a ventilation zone 16 to 20 inches wide (drawing below right).

**Credits:**  
Hessische Landesbank  
Frankfurt am Main, Germany

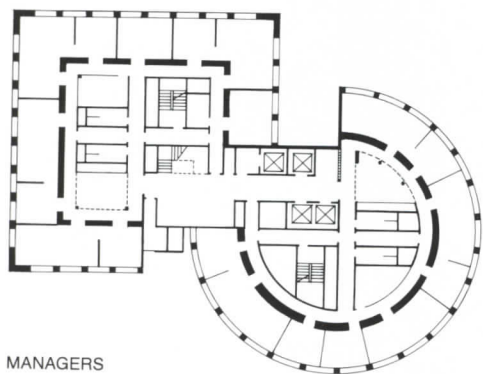
**Architect:** Architekten  
Schweger & Partner  
**Technical planning:**  
HL-Technik AG  
**Engineer:** BGS Frankfurt  
(structural)  
**Organization:** Schuster  
Unternehmensberatung  
**Consultant:** Dipl.-Ing.  
P. Jordan (facade,



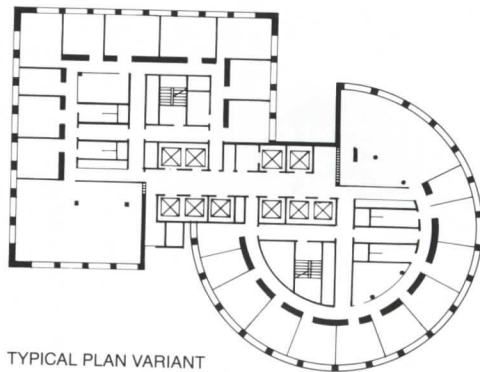
RESTAURANT/GALLERY



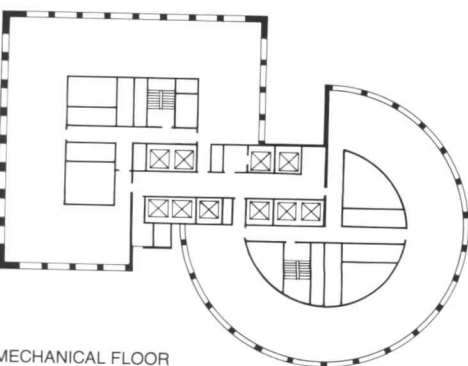
MEETING AND DINING ROOMS



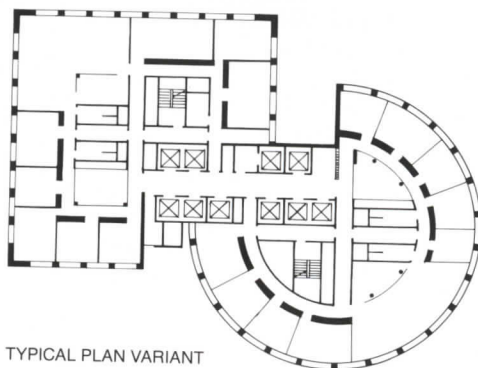
MANAGERS



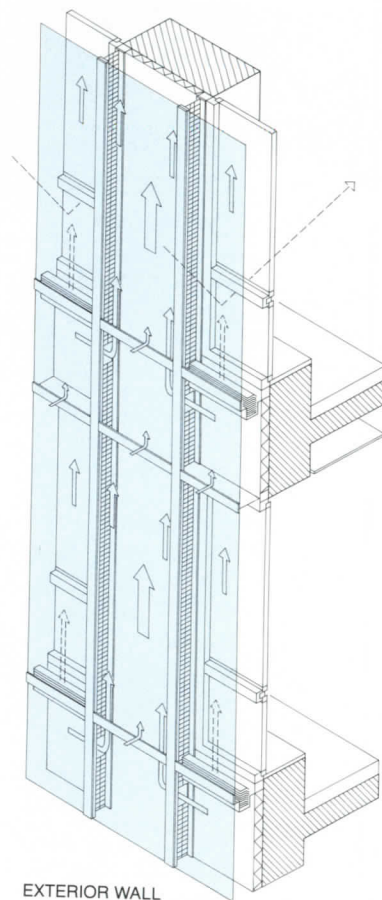
TYPICAL PLAN VARIANT



MECHANICAL FLOOR



TYPICAL PLAN VARIANT



EXTERIOR WALL

*On cool days, the Hessische Landesbank's double-wall acts as an insulator. At other times gaps between the glass panels of the outer skin bring fresh air in at the bottom and exhaust stale air at the top. (Though shown in drawing above as continuous from floor to floor, the current design envisions single-floor zones.)*

# Messe and Bosch Towers

In his competition entry for the Messe and Bosch speculative towers at a corner of the Messe fairground in western Frankfurt, the Cologne-based architect Oswald Mathias Ungers conceived of this project as city gates (or Stradtportalhäuser) straddling the expressway. The city's new building policies, however, restricted their height to 330 feet. The square, southern Messe

tower (below and left in photo) changes in plan on the top 10 floors to an octagon, creating two-story triangular gardens (plans opposite). Ungers, too, has proposed a double-layer facade—a "climatized envelope" Ungers calls it, that provides workers with operable windows and greenery in the ventilation zone between the inner and outer glazing. The Messe tower is, however, also

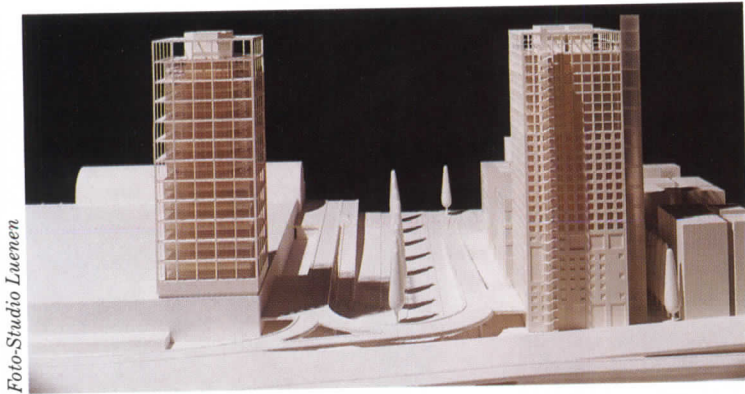
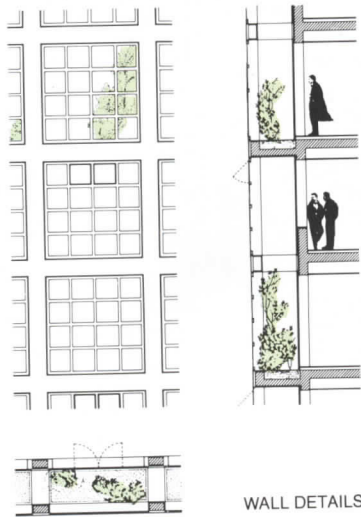


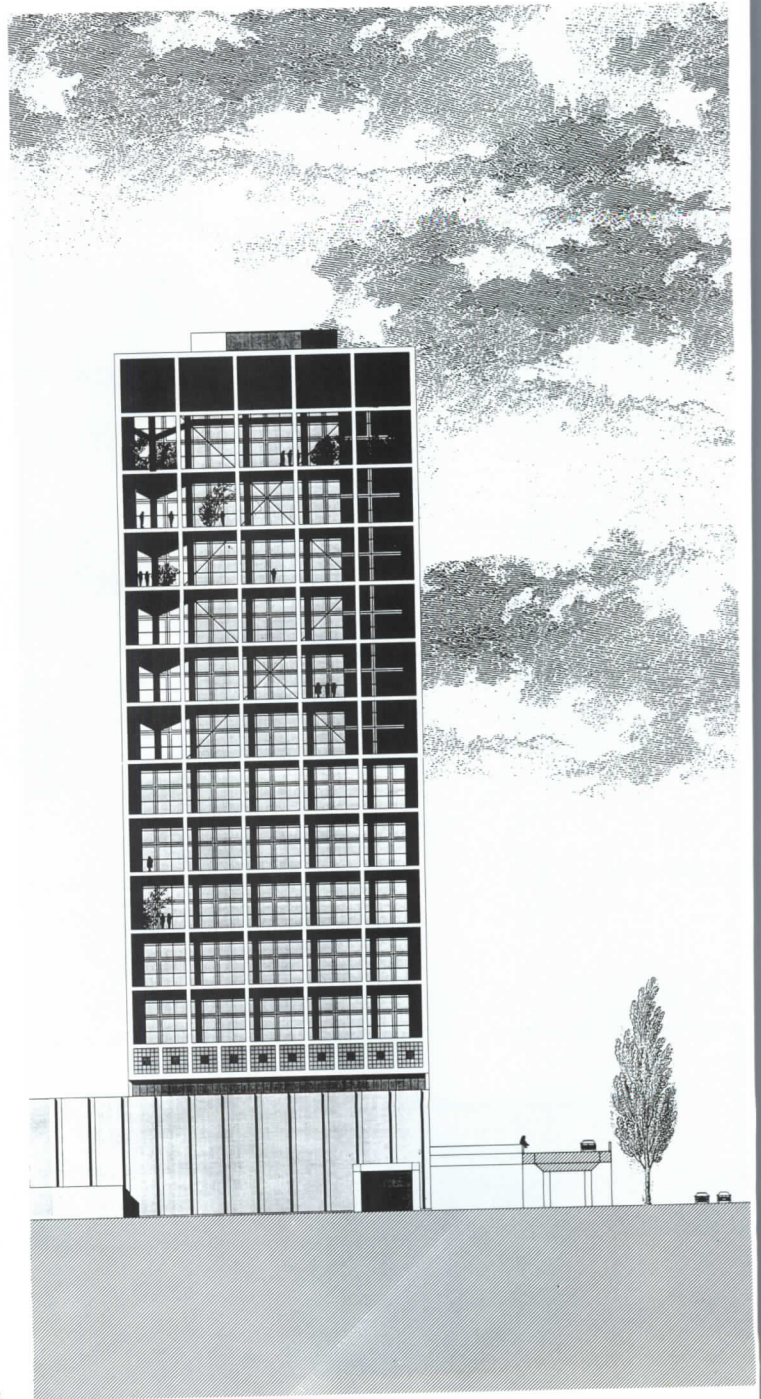
Foto-Studio Luenen

View looking east.



WALL DETAILS

The outer glass envelope of the Messe tower (right) is set within the building's gridded frame. The inner layer is set far enough back to allow planting. The octagonal form of the occupied area of upper floors permits generous triangular gardens (plans opposite).



Messe tower, east elevation

equipped with supplementary air conditioning.

The northern tower, for Bosch, contains offices and a hotel, and is divided into three equal sections, which Ungers calls "stone," "grid," and "scaffolding." Each section has its own ventilation system. With external exit stairs, its center is more open than the Messe tower, which has a conventional central core. Adjoining

the Bosch tower are five 10-story blocks with the same footprint and cladding as the lower third of the tower. The two towers are linked across the expressway by a raised walkway, freeing the ground floor for deliveries.

**Credits**

Messe and Bosch Towers  
Frankfurt am Main, Germany

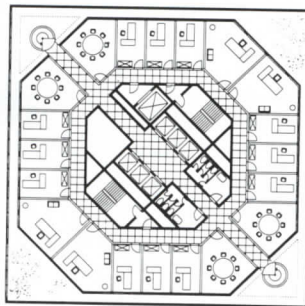
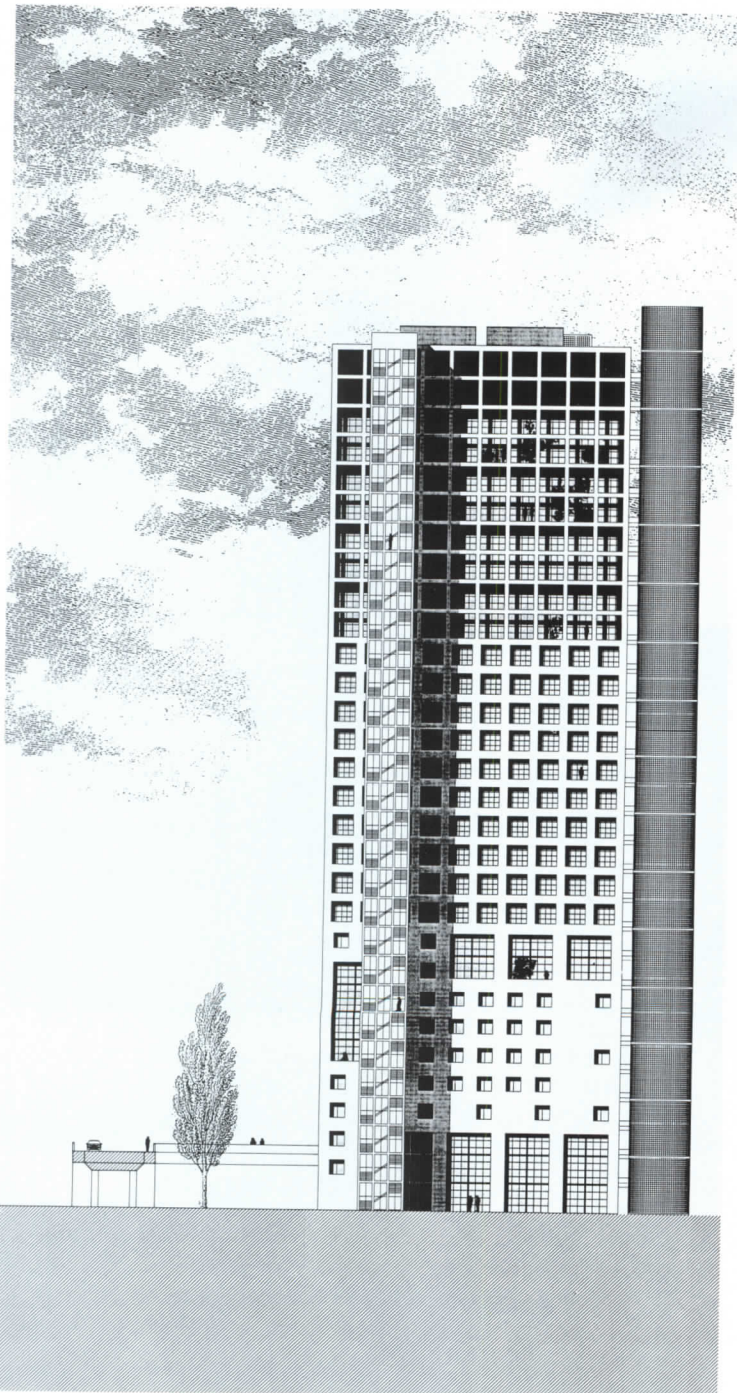
**Owner:** Messe Frankfurt GmbH and Robert Bosch AG

**Architect:** Prof. O.M. Ungers—Stefan Viehls, Benedikt Baumewerd, Lukas Baumewerd, Kai-Uwe Lompa, Markus Müller, Axel Steudel.

**Engineer:** BGS Frankfurt (structural and traffic)

*Messe tower*

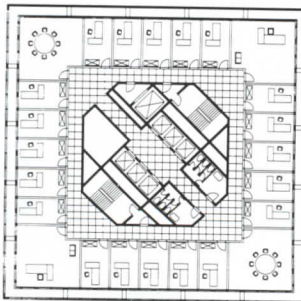
*Bosch tower*



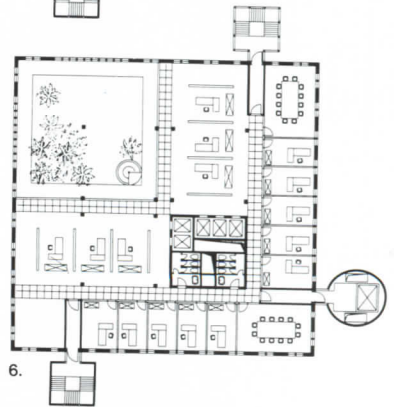
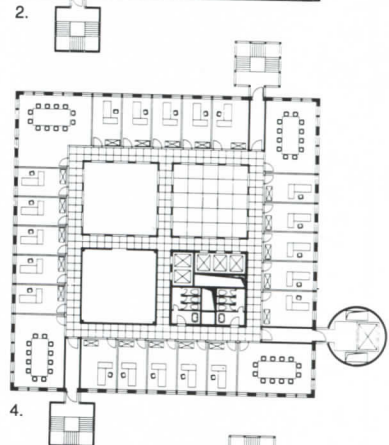
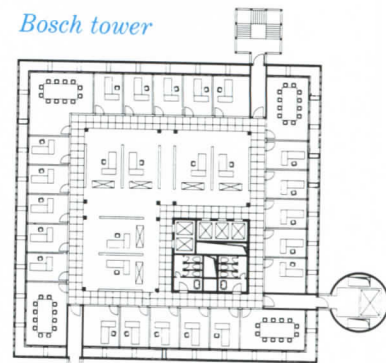
- 1.
- 1. CHAMFERED CORNERS OPEN
- 2. CENTRAL WORKSTATIONS



- 3.
- 3. CORNER GARDENS
- 4. CENTRAL MEETING ROOMS



- 5.
- 5. FULL FLOOR PLAN
- 6. CORNER GARDEN



*Bosch tower, east elevation*

# Double Play





© Cerwin Robinson, photos except as noted

**A** hold-out corner property, a protected historic district, and an eleventh-hour landmark designation combined to elbow a New York office tower into a slim envelope that brings dividends of light and space to both its occupants and its neighborhood.

In the mid-1980s the block between 55th and 56th streets presented one of the most distinguished building ensembles remaining on Fifth Avenue, incorporating the fashionable Fifth Avenue Presbyterian Church on the south corner and Harry Winston's well-known jewelry emporium on the north. Between lay two handsome Parisian-inspired *fin de siècle* townhouses known for their previous tenants, the Rizzoli bookstore and the much earlier Coty perfumery, along with a nondescript infill store. When the two were included in an L-shaped parcel (excluding Winston's corner) being assembled for a high-rise tower, local preservationists greeted the development with predictable cries of dismay. In response, architect Kohn Pedersen Fox proposed a tower with modest setbacks above a five-story retail galleria that would preserve both the Fifth Avenue facades and the side-street brownstones of the historic district.

The issue was shortly made moot, however, by the discovery that the grimy three-story window across the Coty Building's white marble street front was of frosted-relief glass fashioned by the renowned René Lalique in 1912. Within weeks both buildings was landmarked, and the architects and New York's Landmarks Preservation Commission began consultations through which, says KPF partner William Pedersen, "Everybody ended up winning."

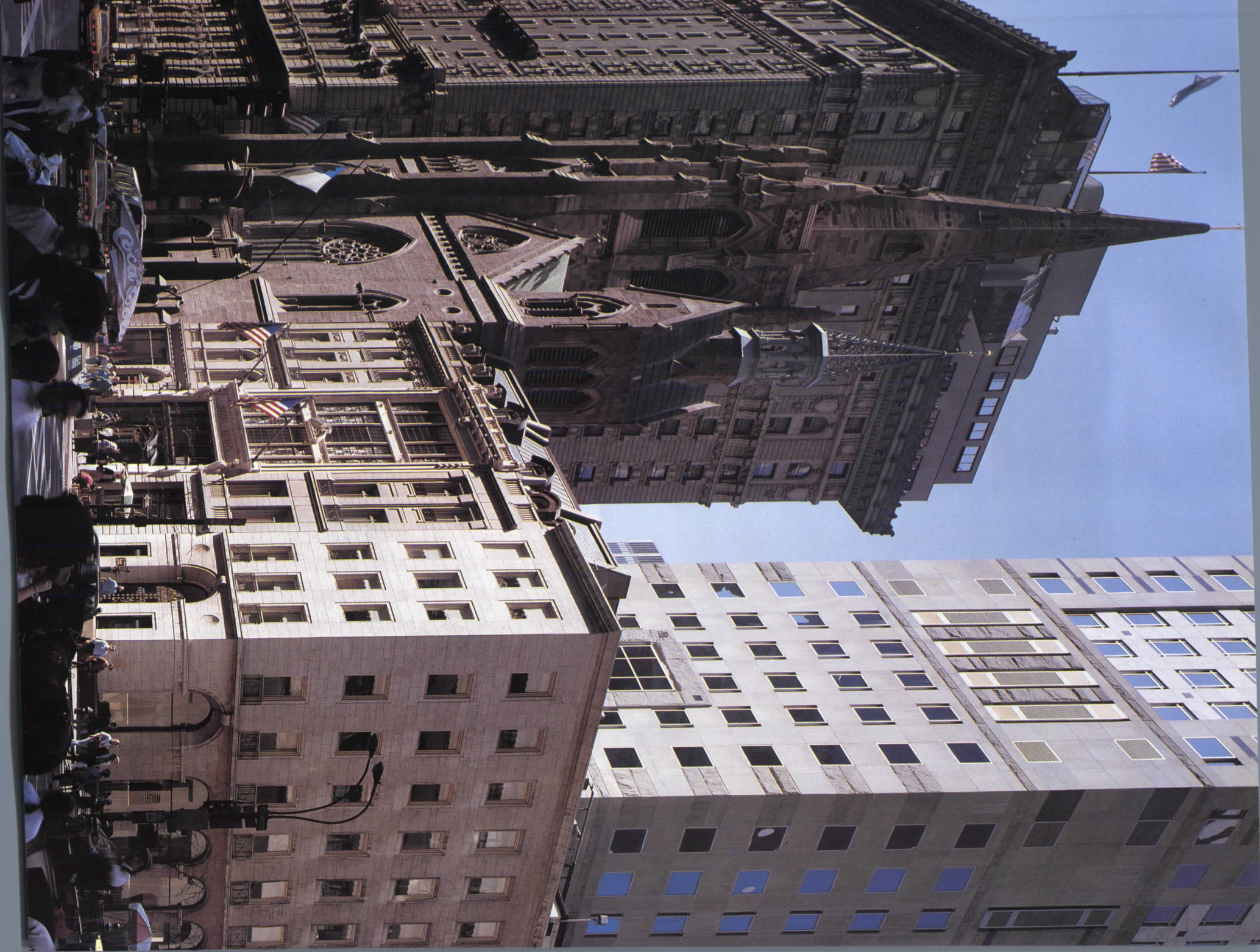
To assert the autonomy of the landmarks, the concrete-framed tower was pulled back to a depth of 50 feet from the lot line, retaining not only the townhouse facades but their intimately scaled interiors, which were well-suited to the "boutique" merchandising concept favored by Henri Bendel, the upscale women's specialty store that occupies the building's 79,000-square-foot retail base. Bendel's architect, Beyer Blinder Belle, assumed the task of renovating and restoring the townhouses, with special emphasis on the Lalique glass front, now showcased by a skylit atrium. The firm also substituted for the infill shop a new limestone and granite structure that echoes the scale and detailing of the adjacent landmarks.

Although the deeper setback further diminished the floor plate of the 53-story tower, Pedersen welcomed the inherent grace of proportion that resulted, as well as the more emphatic divorce from the townhouse "podium" at street level. Classically composed, the slender limestone shaft with its square punched windows respects immediate neighbors but its restraint recalls more forcefully the nearby buildings of Rockefeller Center. At the 15th and 16th floors, mechanical areas are marked by "rusticated" bands of cleft limestone. Above, the shaft is visually lightened by central inset panels of white marble in contrast to the denser limestone at the building corners. To increase the apparent depth of the stone veneer curtain wall, the windows feature slim recessed sidelights that emphasize the play of shadows.

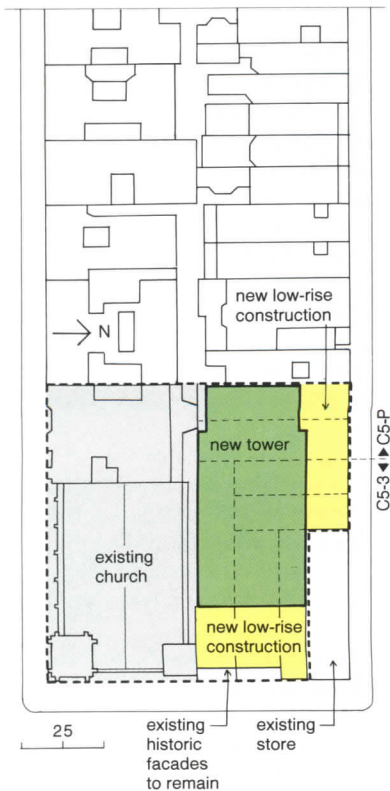
Reduction of the office floors to 7,500 square feet also brought unexpected amenities to the tenant spaces. Relegating the service core to the inmost corner of the building, for example, allows for flexible and efficient floor layouts, while daylight from the large windows readily penetrates to the 75-foot-wide interiors. Not least, the tower's linkage with retail use benefits the city, which has recaptured a segment of its history, recovered an art treasure, and gained in Bendel's atrium an elegant public "salon." *Margaret Gaskie*

712 Fifth Avenue/Henri Bendel  
New York City  
Kohn Pedersen Fox,  
Design Architect  
Schuman, Claman,  
Lichtenstein & Efron,  
Executive Architect  
Beyer Blinder Belle,  
Bendel/Preservation Architect

Above: Fifth Avenue facade  
Opposite: 55th Street facade



*In addition to the 50-foot setback from the Fifth Avenue facade (opposite and lower right) the tower takes a shallower step at the side street, preserving the continuity of the base as it rounds the corner to join a row of brownstones that comprise a historic preservation district. At sidewalk level, the new 55th Street facade (upper right) encompasses the tower lobby, which includes an entrance to the Bendel store. The upper floors, occupied by Bendel's, reprise the detailing of the shaft above with accents of marble, granite, and cleft limestone against a background plane of gray limestone; polished stainless steel replaces bronze hardware and fittings. Above the lobby, a two-story window of etched glass, designed by Thierry Bruet and etched by Amy Rassindorf, depicts the signs of the zodiac.*

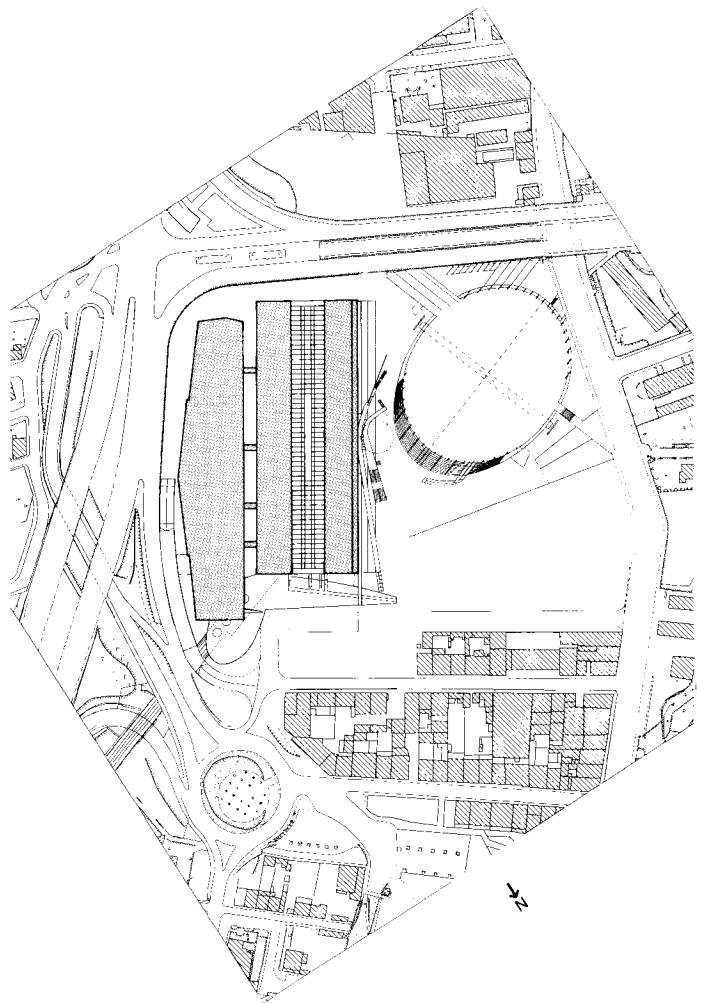


# Streamlined Government

Upon completing the Unité d'Habitation at Marseilles in 1952, Le Corbusier said, "Luckily we have no money"—referring to the impossibility of correcting "faults" in the finishes of his new building. Perhaps British architect Will Alsop, of Alsop & Störmer Architects, will find cause to make a similar utterance when his own 1.2 million-square-foot project for the city is completed in 1994. Alsop and Störmer won the job for the seat of local government in this industrial part of southern France against French architects and prominent foreign entries in an open competition. Their proposal, developed with engineers Ove Arup & Partners, combines formal invention with an environmental regime dubbed "active natural servicing." Though key to the project's selection by the jury, several of these innovations (some admittedly wild) have been jettisoned as officials slashed the budget from around \$240 million to \$150 million.

The site lies in a rundown area of this rather unattractive city, surrounded by a mix of houses and industrial buildings and cut up by busy commuter highways. Placing 1,700 of its own workers here represented the local government's commitment to regeneration of the neighborhood. The scheme is divided into three main blocks grouped over a two-story basement. Two long rectangular slabs containing administrative offices lie roughly northeast to southwest across the site. To reduce the perimeter exposed to weather, the architects joined the slabs by a large, glazed atrium. The roof and walls have operable "helioscreens"—fabric panels that react to changes in the Mediterranean climate. A giant pivoting paddle with blades of glass-reinforced plastic (GRP) film is suspended from the atrium's space-frame roof structure (page 99). Activated by a programmed timer, it deflects the harshest summer sun and admits light in the winter.

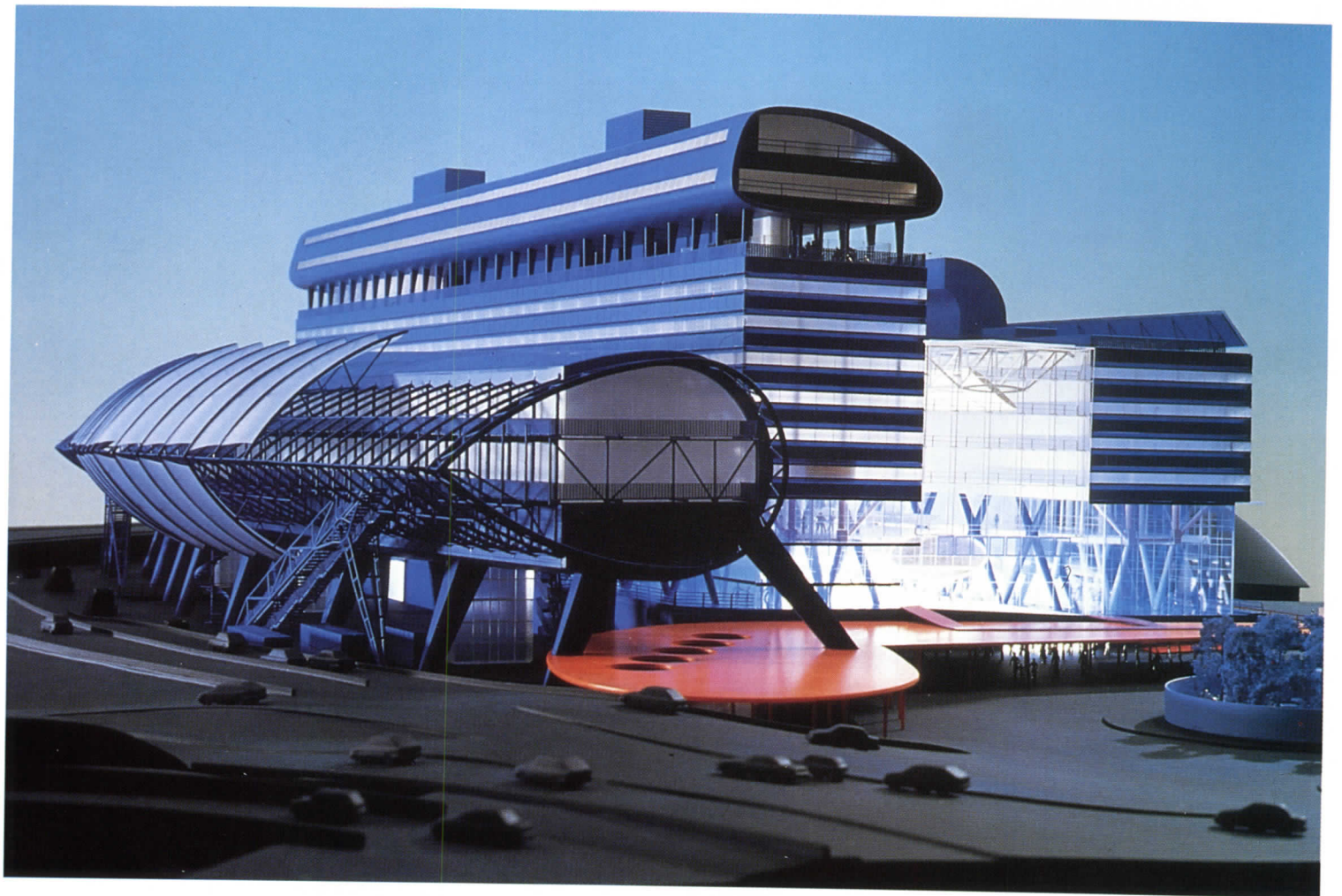
The architects inserted a number of "organic" objects in the atrium to counterpoint its rectilinear form. At each end two raised ovoid tubes contain public records offices. Between them hangs a massive





*The designers of a government ministry combine environmental concerns and formal invention on a budget that keeps getting tighter.*

*Hôtel du Département  
des Bouches-du-Rhône  
Marseille, France  
Alsop and Störmer Architects*



*Adjoining busy roads, the Hôtel and an adjacent new concert hall (opposite) signal the Département's commitment to regenerating an undistinguished area of Marseille. The insectlike Deliberatif (left in photo above) creates a striking image for passing motorists. Behind it lie the more conventional slabs of the Administratif, the taller of the two topped by a two-story ovoid containing*

*presidential suites complete with balconies for viewing the Mediterranean and wells for roof gardens. The overall shape of the building was dictated in part by the Mistral wind while the aluminum cladding of the curved surfaces is designed to resist the salty air. The vermilion leg-of-mutton platform in the foreground above shelters a bus terminal, its hue one of the palette of hot colors employed.*

red Arp-shaped cloud serving doubly as meeting point and sound baffle. The three-dimensional sense of these objects will be enhanced by the 4-degree slope of the floor across the atrium, suggesting in its total effect a giant sculpture gallery.

Notwithstanding the much larger ovoid extrusion that lies along the roof of the taller block (containing presidential suites), the administrative slabs are a neutral foil for the third building element, the *Deliberatif*, which contains council chambers and other meeting areas. Raised on massive pilotis and entered by means of steel stairways resembling those lowered from the sides of ships, the *Deliberatif* looks almost animal, a langoustine perhaps, with "scales" of aluminum. From this larval form citizens will witness—after long periods of apparent inactivity—the emergence of mature butterflies of civic policy.

The rationale for the airfoil forms stems from the Mistral, the hot wind that blows down the Rhône valley during the summer. The roof shapes assure negative pressure at the atrium, drawing out ventilating air or smoke in the case of fire. These elements are among several inevitable nods to Le Corbusier's *Unité* (which occupies a similar site). There are also references to British high-tech. The elevations and sections in particular have the feel of such landmarks as the Pompidou Museum, Foster's unbuilt Hammersmith project, even Ron Herron's *Walking City*.

These resonances are even more evident in Alsop & Störmer's competition-winning version. The original had three slabs with two narrow atriums sandwiched between them. Each block had its asymmetric rooftop ovoid, and these were complemented by further airfoil forms on the long windward and leeward sides. One of the earliest design's features was a blimp that would rise and fall, acting as a giant valve to control the flow of air through the atriums. Sadly, nothing could persuade the client that a balloon would remain tethered once the Mistral blew. More practical was the proposal to use glass-enclosed, naturally ventilated perimeter corridors as an insulating barrier between mechanically cooled offices and the exterior. The tightened budget demanded minimized floor areas, leading to a reversion to external offices, internal corridors, and a more conventional service core. The revised program also asked that the office space be highly flexible, increasing the floor area needing mechanical servicing. For all this, Alsop and Störmer's *Hôtel* is a brave attempt to devise a language of form appropriate to the mediation between the office and the outside world. *Hugh Aldersey-Williams*

*Hugh Aldersey-Williams is a London-based writer on architecture and design.*

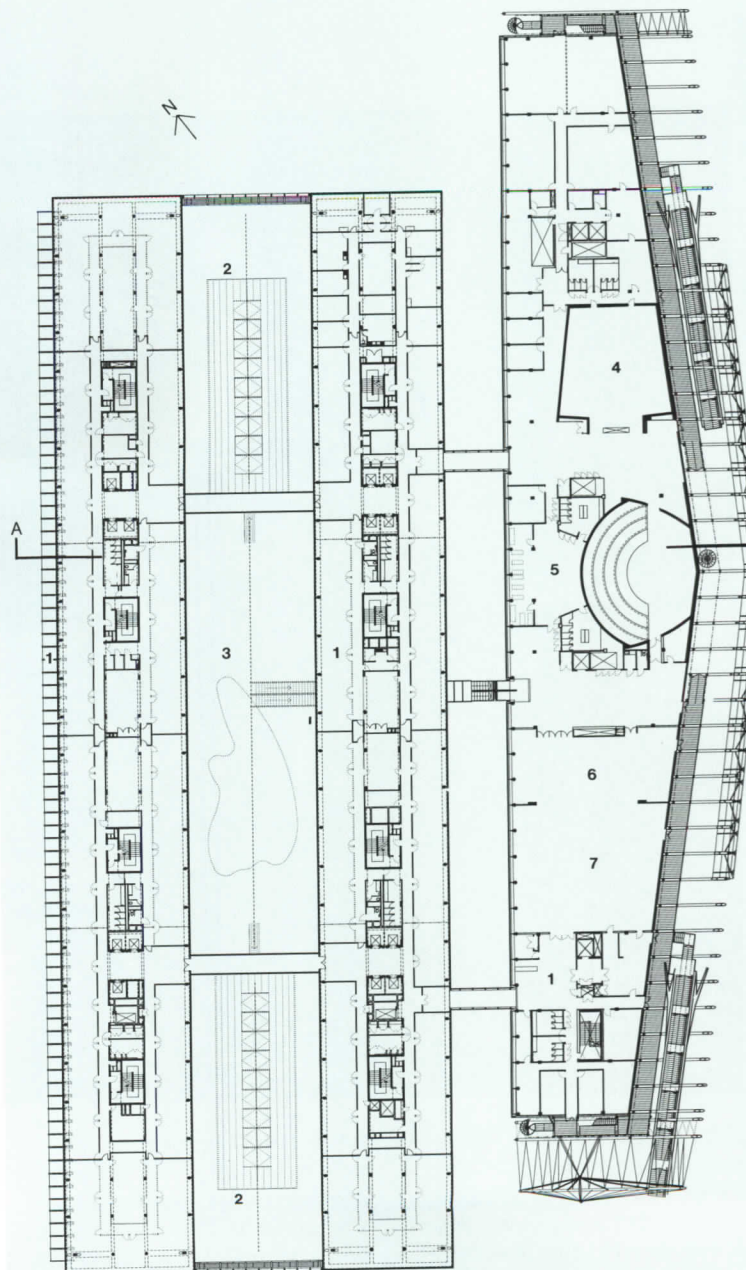
#### Credits

*Hôtel du Département des Bouches-du-Rhône*  
Marseilles, France

**Owner:** Conseil General

**Architect:** Alsop & Störmer Architects—William Alsop, Gary Taylor, Francis Graves, Laurence York Moore, Peter Strudwick, Johnnie Kember, George Tsoutsos, Jason Dickenson, Geoffrey Powis, John Pevc, David Knill-Samuel, Harvey Male, Peter Angrave, Stephen Bedford, Xavier D'Alenson, Robert Evans, Roger Farrow, Colin Foster, Stephen James, Paul Mathews, Roger Minost, Stephen Pimbley, Mathew Priestman, Niki Van Oosten, Jonathon Adams, design team

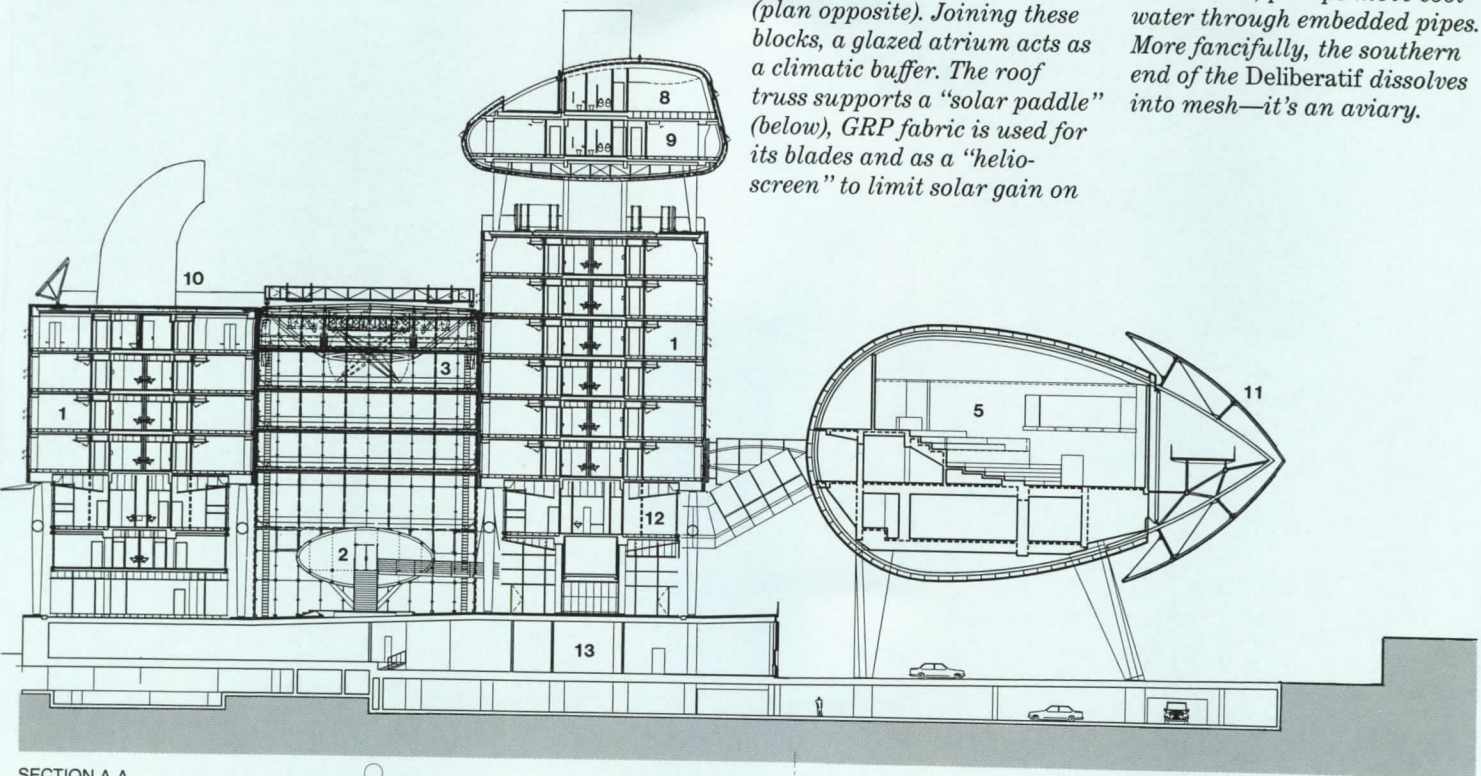
**Engineer:** Ove Arup & Partners (structural, mechanical, electrical, acoustics)



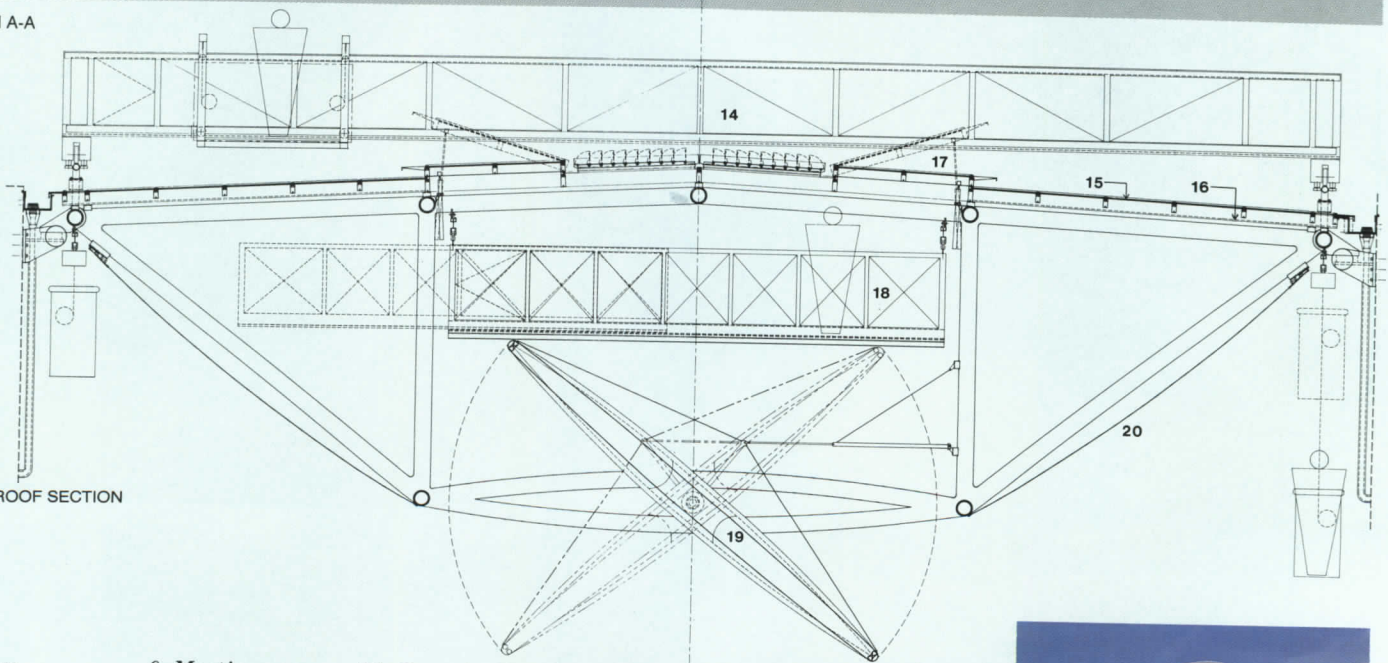
TYPICAL PLAN

The linear configuration of the office blocks provides daylighting and an operable window for each occupant (plan opposite). Joining these blocks, a glazed atrium acts as a climatic buffer. The roof truss supports a "solar paddle" (below), GRP fabric is used for its blades and as a "helio-screen" to limit solar gain on

the atrium's southern wall. Its thick floor absorbs incident sunlight during winter days. In summer, pumps move cool water through embedded pipes. More fancifully, the southern end of the Deliberatif dissolves into mesh—it's an aviary.



SECTION A-A



ATRIUM ROOF SECTION

- |                     |                           |                               |                           |
|---------------------|---------------------------|-------------------------------|---------------------------|
| 1. Offices          | 6. Meeting                | 10. Running track and terrace | 15. Roof glazing          |
| 2. Ovoid            | 7. Salon                  | 11. Tensile screen            | 16. Tensile fabric screen |
| 3. Atrium           | 8. Presidential suite     | 12. Restaurant                | 17. Hydraulic roof vents  |
| 4. Plenary chambers | 9. Restaurant and terrace | 13. Parking                   | 18. Cleaning cradle       |
| 5. Council chambers |                           | 14. Cleaning gantry           | 19. Solar paddle          |
|                     |                           |                               | 20. Roof truss            |



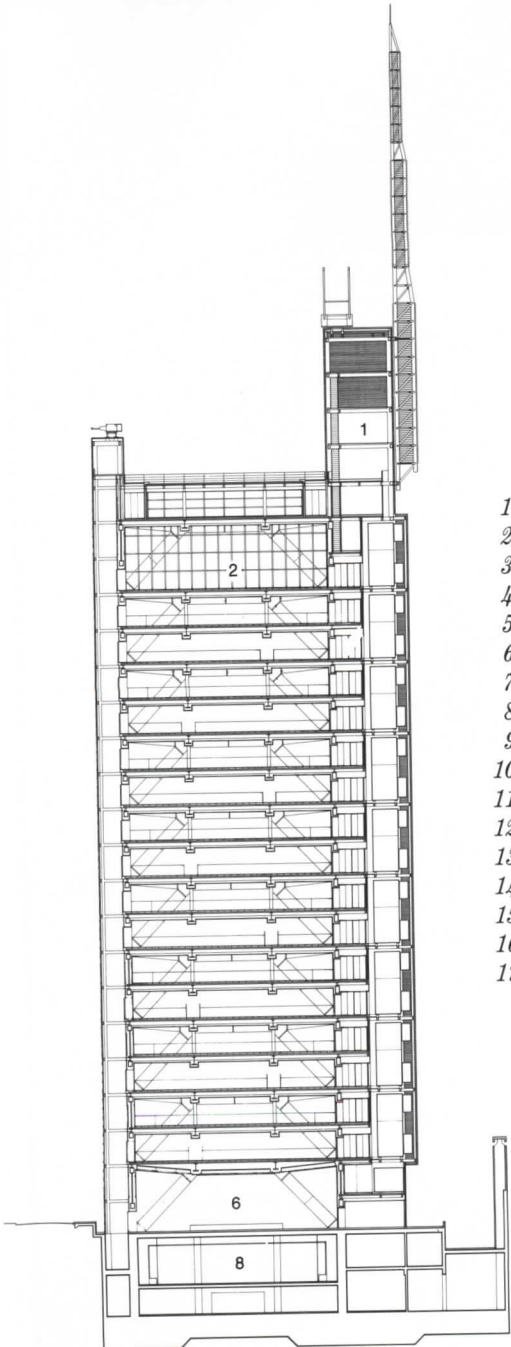
# Brains and Brawn



*Using mezzanines and a dramatic atrium, Foster Associates has created a new kind of office environment.*

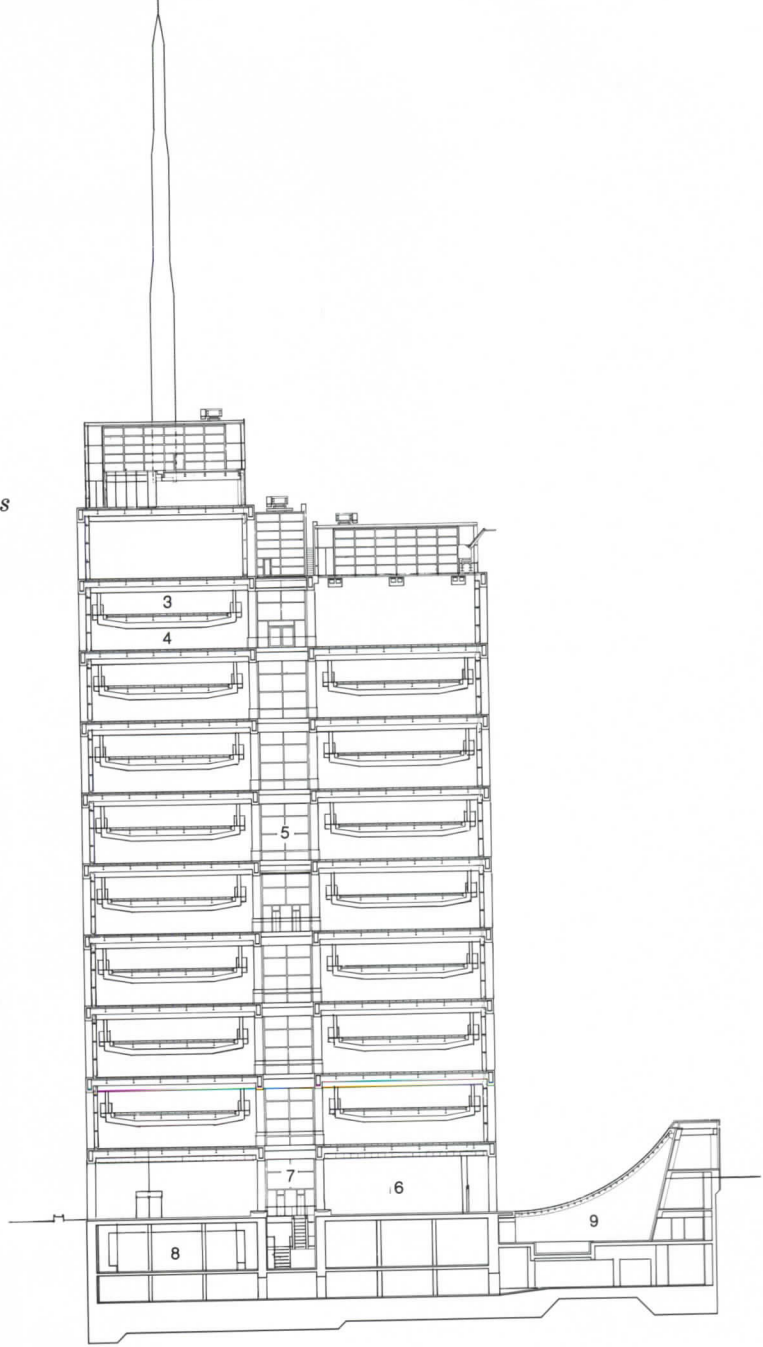
*Century Tower  
Tokyo, Japan  
Foster Associates, Architects*



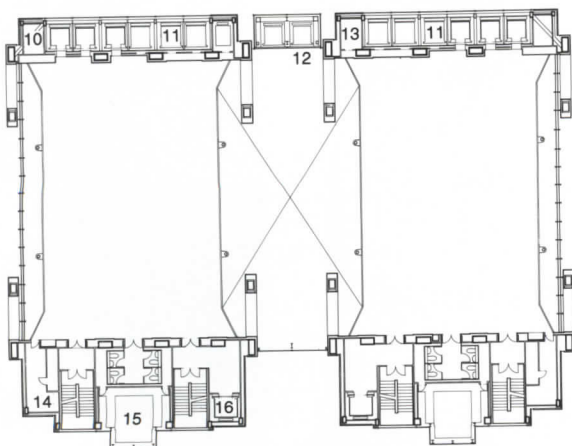


EAST-WEST SECTION

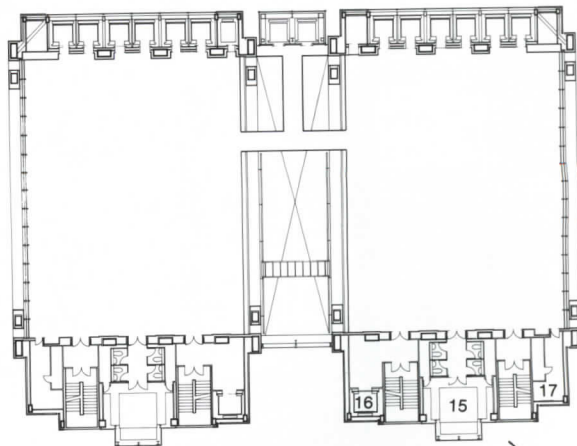
1. Telecommunications
2. Apartment
3. Office mezzanine
4. Office
5. Atrium
6. Lobby
7. Gallery entrance
8. Art gallery
9. Health club
10. Smoke extraction
11. Tenant elevators
12. Express elevators
13. Tenant riser
14. Electrical riser
15. Air-handling unit
16. Service elevator
17. Supplementary mechanical riser



NORTH-SOUTH SECTION



MEZZANINE FLOOR PLAN

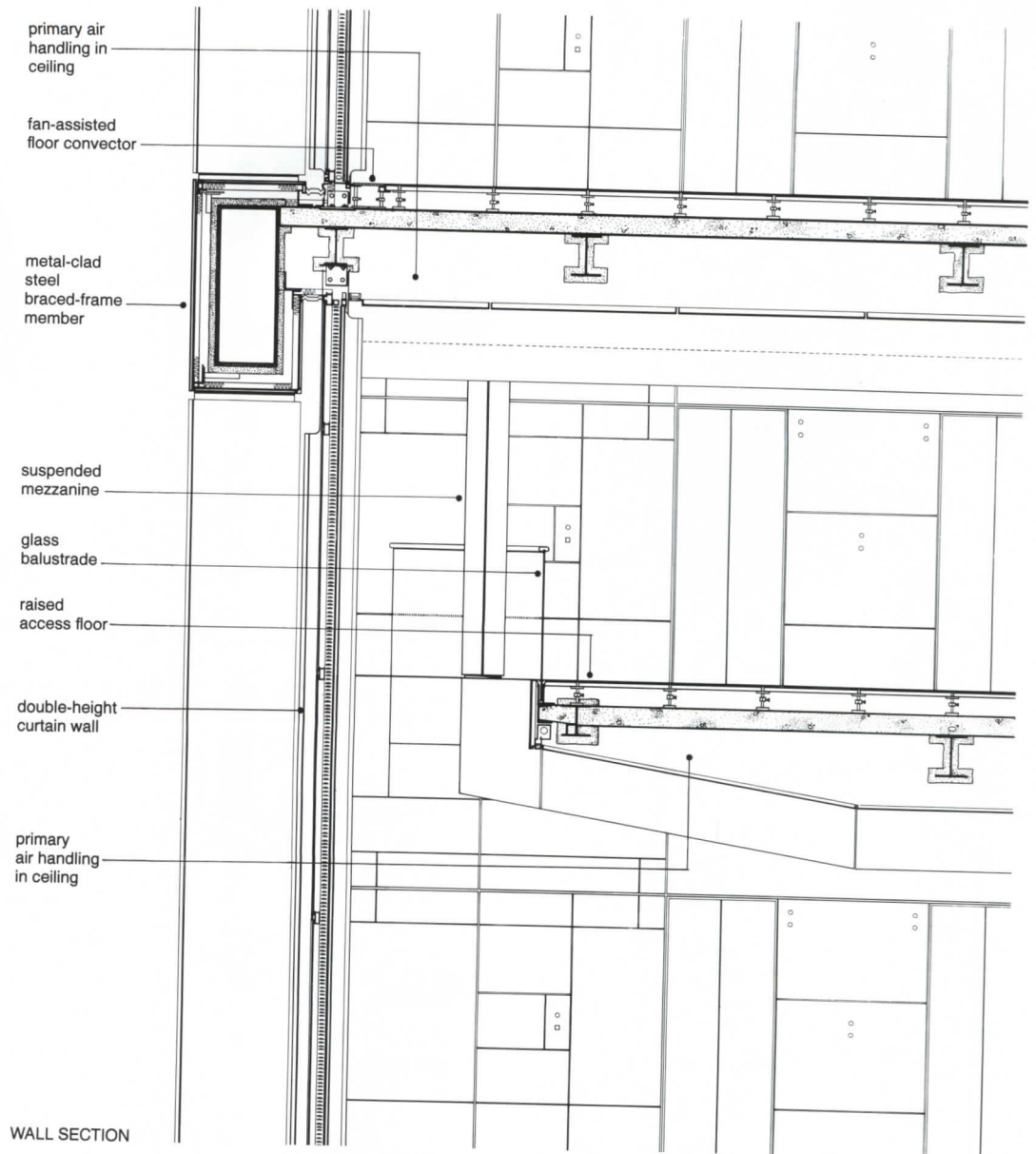


TYPICAL FLOOR PLAN



By pulling services to the building's perimeter, Foster kept office areas entirely free of fixed impediments (plans opposite). Suspended from the double-height framing system, the edges of mezzanines are held away from the exterior (detail right) and the 18- to 37-foot-wide atrium (following pages). A novelty in earthquake-prone Japan, this atrium required innovative fire-protection measures. To prevent smoke from entering, the atrium is maintained under positive pressure. When a fire occurs, pressurization from nonfire floors is stepped up, while smoke extraction fans exhaust air from the fire floor. This protection is backed up by fabric smoke shutters that drop automatically (to within five feet of the floor) and a drenching system at the face of the atrium. The Obayashi Research Institute (a subsidiary of the general contractor) together with Foster prototyped and tested the systems to satisfy local officials.

The health club and restaurant share a sweep of catenary-shaped glass roof (bottom right). The rigidity of box-beam framing met seismic needs better than a tension structure. Fixed louvers limit heat and light (below).





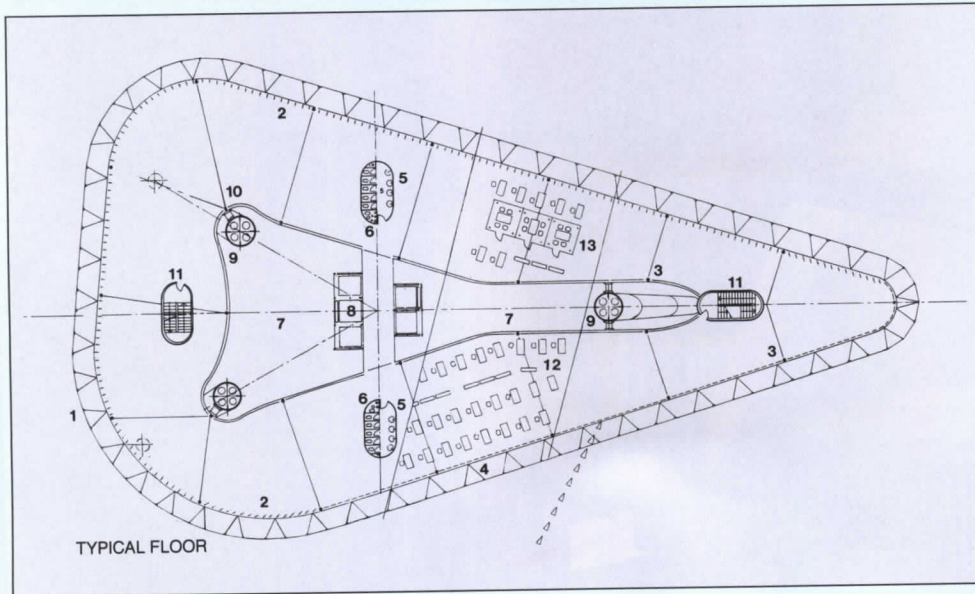
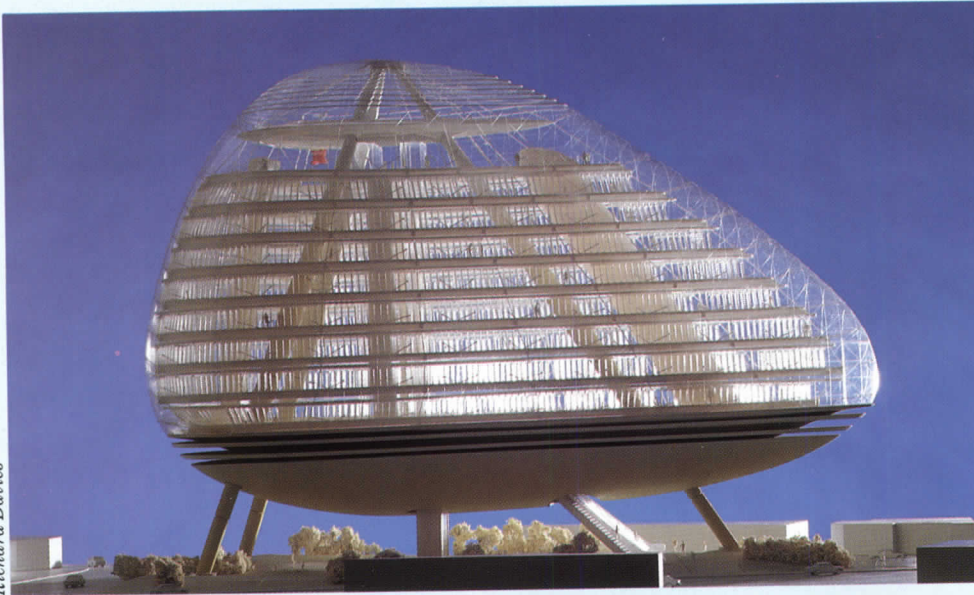




# Green Machine

*The Green Building  
London, England  
Future Systems with  
Ove Arup & Partners,  
Architects and Engineers*

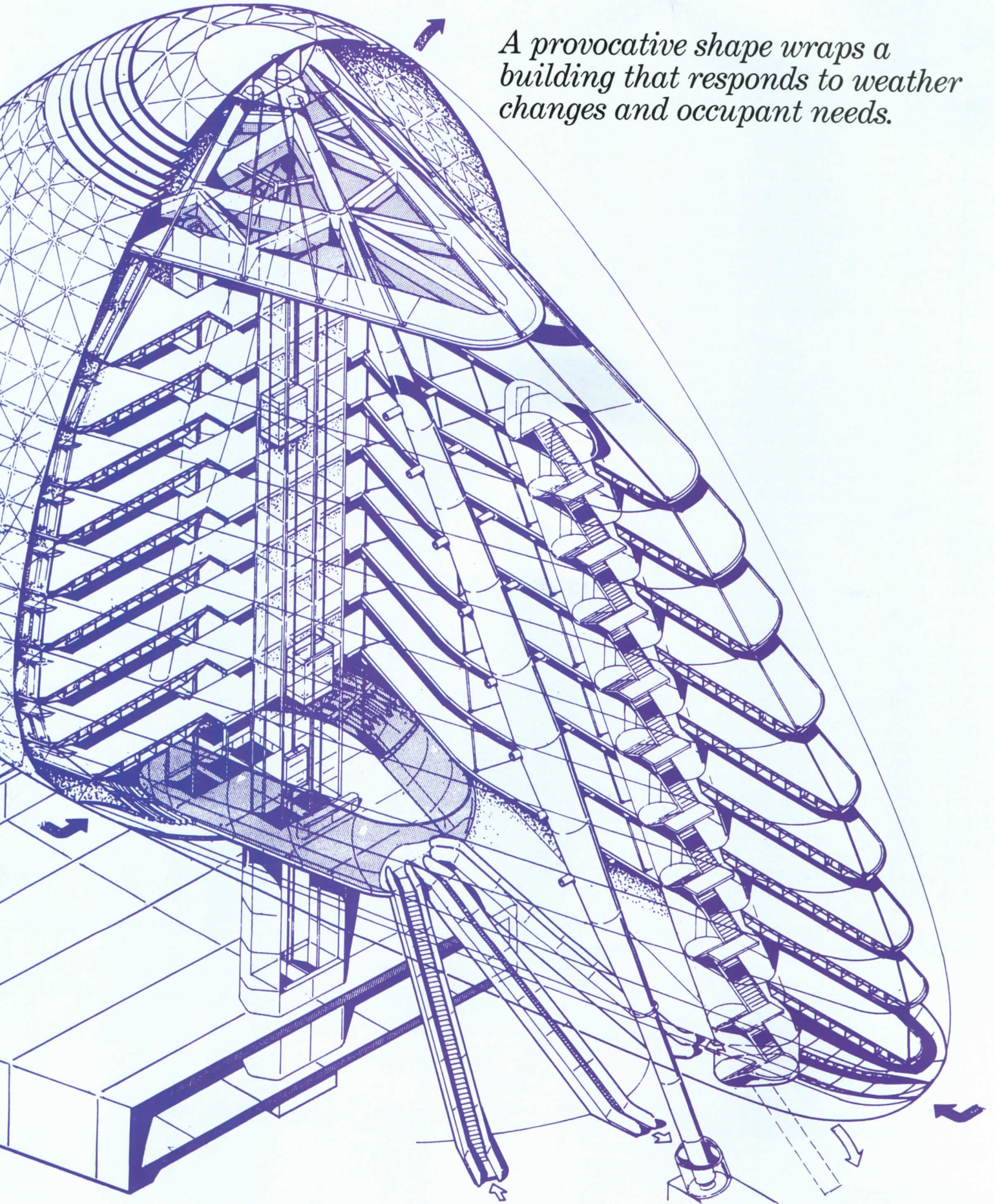
Richard Davies



- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| 1. Glazed outer skin                | 9. Steel tripod leg               |
| 2. Adjustable glass fins            | 10. Horizontal floor bracing      |
| 3. Floor suspension hanger          | 11. Fire stairs                   |
| 4. Bracing supporting outer skin    | 12. Open-plan office layout       |
| 5. Toilets                          | 13. Open plan and private offices |
| 6. Main vertical riser              |                                   |
| 7. Atrium                           |                                   |
| 8. Linear-induction motor elevators |                                   |



*A provocative shape wraps a building that responds to weather changes and occupant needs.*



At first glance, this project looks like another example of what British critic Rowan Moore has called “the egg-motif explosion.” Dubbed the Green Building by its collaborative design team—Future Systems, architects, and Ove Arup & Partners, engineers—it is anything but an exercise in style. The team took on the Green Building as a research project (though there is a real site, in the City of London, there’s no client and a generic office-space program). They sought a resource-conserving alternative to what they see as the status quo: “the deep-plan office space with year-round air-conditioning and minimal access to natural light.” It’s not the earth-bermed, solar-collecting “green” structure built of used tires we’ve been primed to see. Instead, its architectural form is at the service of daylighting and natural ventilation. Further, the project recognizes the nature of office work (it doesn’t require you to change your life) and gives occupants far more control over their own environment.

**Why the shape?** Though London’s mild climate would seem to make natural ventilation easy, opening windows lets in noise and pollution as well as air. The curved base of the building, set well above the street, permits the dilution of noise and pollutants and creates a sunlit garden at grade. By sealing the outer layer of the building and providing fresh air from intakes set 55 feet high, natural ventilation can be acceptably controlled. While intake scoops capture the breeze for use in the interior, air flowing over the structure’s streamlined form draws exhaust out of the building’s top.

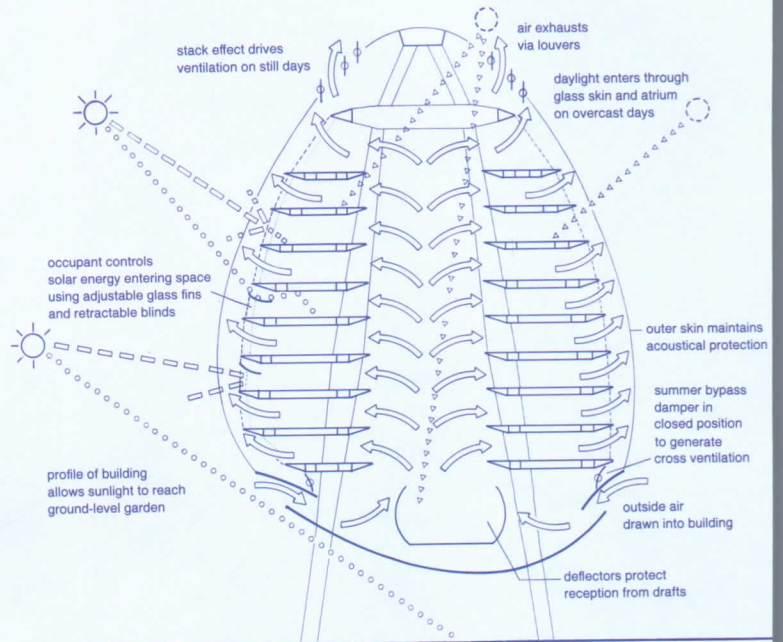
**A naturally ventilated egg?** The structure uses the “stack” effect of heat rising. Within this egg’s shell is an inner layer with openings that occupants can open or close, like windows. The separating air space, warmed by sunlight through the glass and heat from office activities, rises, and is exhausted through rooftop louvers. The process draws in fresh, cool makeup air from the building’s base through the atrium and occupied spaces.

**How is the building supported?** The floors are hung by tension members from a tripod structure. The two-layer exterior wall acts like the chords of a truss, resisting wind loads and conveying gravity loads back to the legs through the floors by compression.

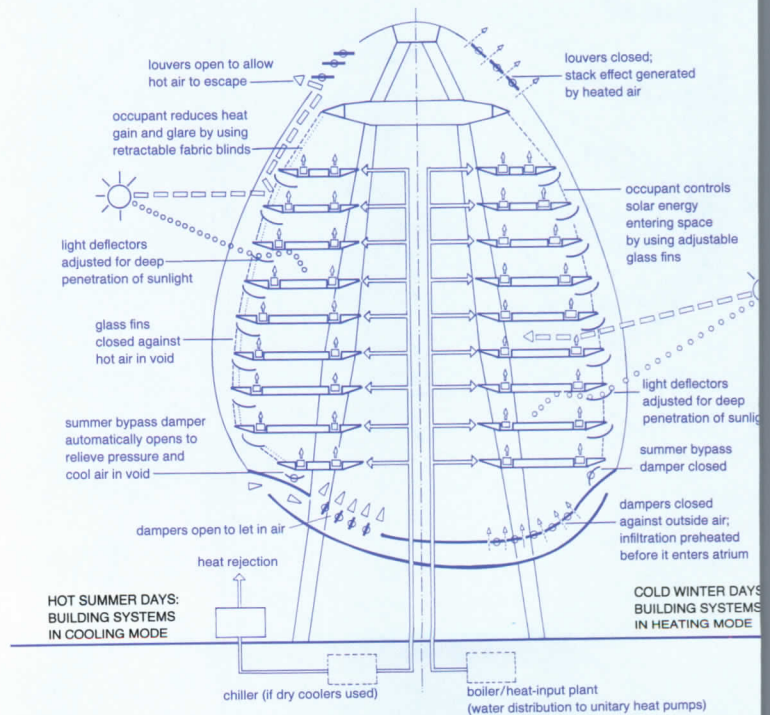
**How do occupants control light and heat?** The floor layout (page 110) permits nearly every worker access to daylight and views. Light scoops coated with mirrorlike Mylar film deflect light deep into the floors (opposite), obviating the need for electric lighting on most days. Blinds are incorporated into the inner glass layer to reduce glare when needed. Occupants can closely control temperature and air movement by operating the louvered-glass “windows.”

“It’s a very rare case that someone like Arups will take on a project of this sort,” says Future System’s Jan Kaplicky. His firm is, after all, small with little built work on its résumé. “We sat down with Tom Barker [of Arups] and came to a mutual accommodation about the need to study a building of this nature. That was enough.” The Green Building happened because, as the team explains, there isn’t the kind of research in the building industry that in other industries is undertaken as a matter of course.

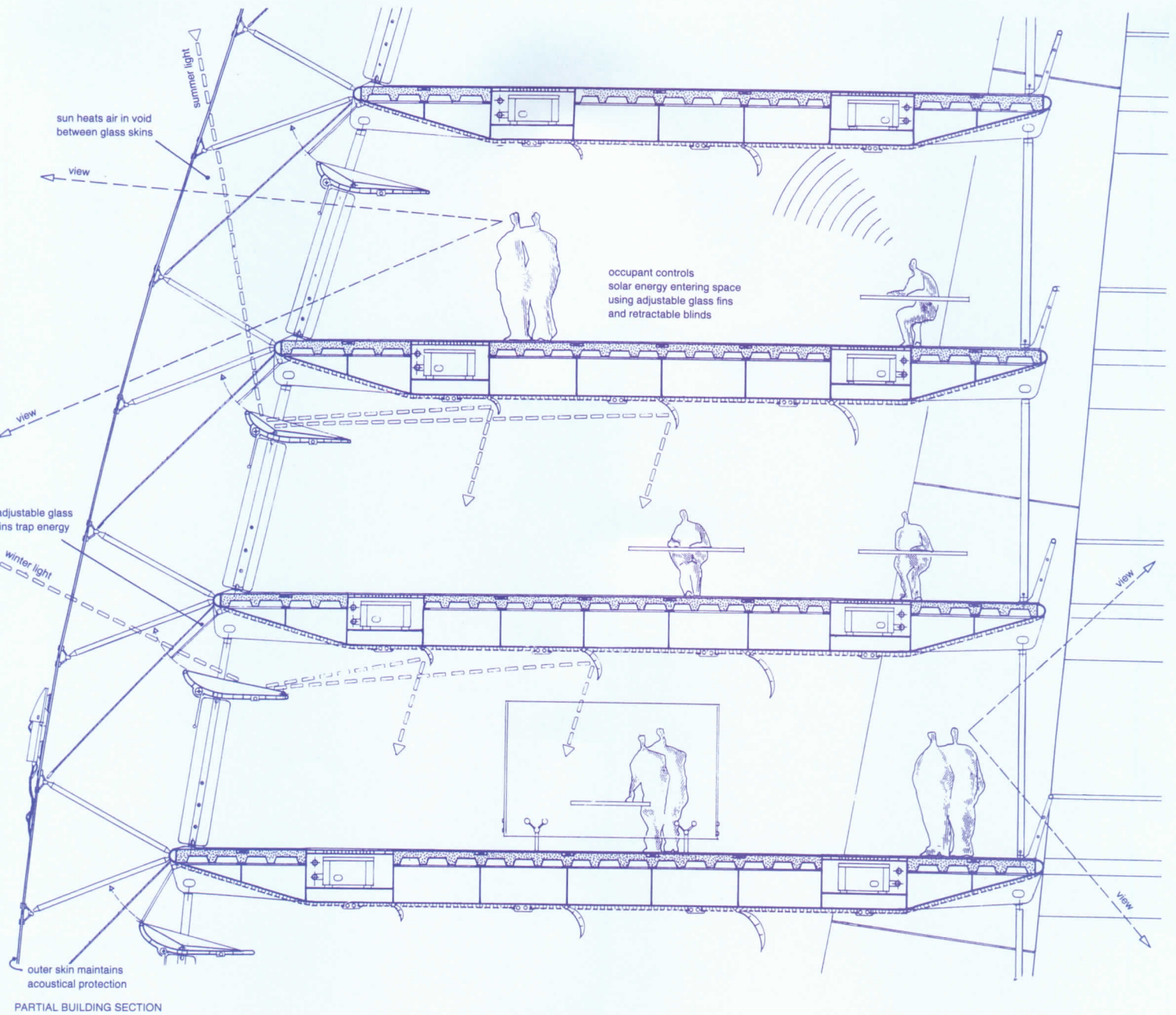
Future Systems and Arups designed the building together: “The first model was done by the engineers,” explains Kaplicky. “Some people have a problem with this because its not an architectural creation—it’s not a Beaux Arts way of thinking.” The project does represent a number of ideas that Arups had been hoping to put into practice, and they are seeping into a variety of new projects (pages 82-83 and 96-99, for example). The egg look is a beginning. The architects’ and engineers’ preferred metaphor is of a building “that knows how to change clothes to suit the weather.” *James S. Russell*



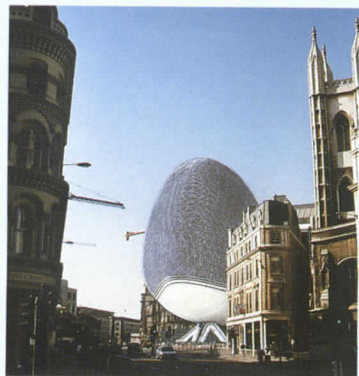
DAYLIGHT AND VENTILATION-NORMAL CONDITIONS



DAYLIGHT AND VENTILATION-EXTREME CONDITIONS



PARTIAL BUILDING SECTION



Though *The Green Building* may evoke 1950s sci-fi (left), its purpose is anything but frivolous. In the natural-ventilation scheme, fresh air enters the atrium at its base, drawn through the occupied floors by a "thermal flue" created by the double-wall construction of the exterior (opposite). On cool days, the air space acts as an insulating layer (and warmth from exhausted air is recovered

for preheating cold fresh air). On warm days, the air rises more rapidly, drawing in more fresh air. Localized heat pumps and a tepid-water loop would be called upon during climatic extremes. Above: The combination of atrium and exterior wall gives nearly all occupants access and control over daylight and views.

#### Credits

*The Green Building*  
London, England

**Architect:** Future Systems—  
Jan Kaplicky, Amanda Levete

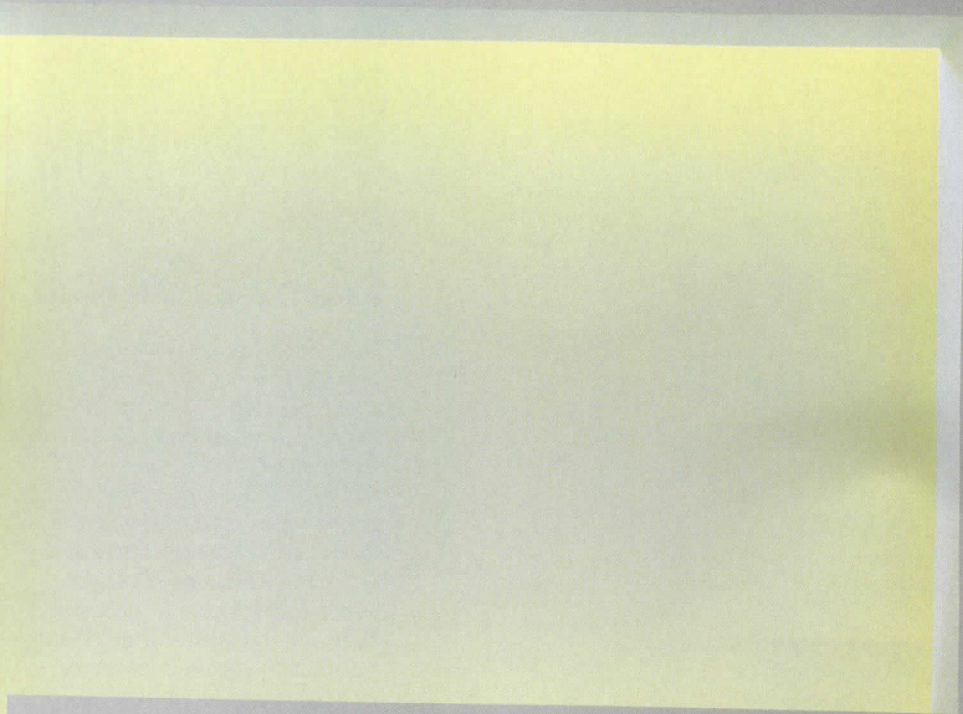
**Engineer:** Ove Arup &  
Partners—Alistair Lenczner,  
Peter Rice (structural); Tom  
Barker, Mike Beavan, Andy  
Sedgwick (mechanical)

# Virtual Reality

*Steven Holl gives a round-the-clock financial trading firm a serene center.*



*D. E. Shaw & Company  
New York City  
Steven Holl Architects*



What do you do if a new client asks you to design his 11,000-square-foot office in minimal time (six months from date of commission to move-in) and on a spartan budget (roughly equal to the \$50 per square foot "work letter" provided by the landlord)? If you're Steven Holl, you begin as with any other project by studying the client (in this case, a small, heavily computer-driven financial services company) and the space (the top two floors of a 40-story tower in midtown Manhattan). Holl hoped to capture something of the ephemeral nature of trading that relies on memory chips and satellites—"it's reaching out to the unknown," he says. Conscious that his patented palette of tinted plaster, cast-glass, and terrazzo would cost far too much, Holl was leaving his apartment one morning when he noticed a rosy glow on a whitewashed wall across the street. Realizing it was the result of sun reflecting off a red car parked nearby, Holl conceived a design born of space and light—"the only free materials."

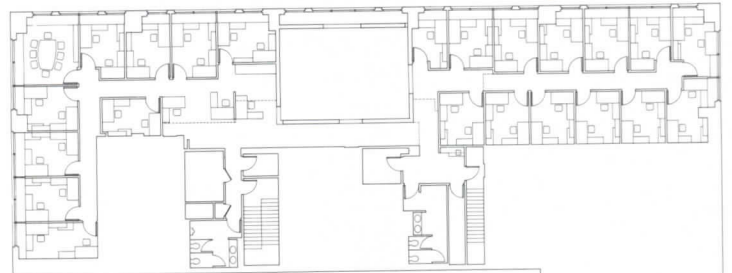
D. E. Shaw & Company considers itself a maverick in the financial world. Founded in 1988 by David Shaw, a former professor of computer science who did a brief stint at the investment bank Morgan Stanley, the company's 65-person team uses some 300 computers to execute transactions 22 1/2 hours a day. (The company rests only between the close of American markets and the opening of the Tokyo exchange.) To make profits on decimal-point price shifts, Shaw has assembled a staff dominated by computer scientists and mathematicians, who devise strategies for four to six full-time traders. "We're an unusual group," explains Shaw, "so I wanted something unlike the typical Wall Street office."

Holl derived his central theme from the company's total reliance on computers and telecommunications, or what the architect refers to as the "invisible technology of electricity." (The technology proved to be not completely invisible: roughly 30 percent of the final \$700,000 budget was devoted to electrical equipment, which includes two-tons' worth of emergency generators now stored in closets on the 40th floor.) Shaw's program requirements were simple: a series of private offices and semiprivate workstations, a conference room, and a compact trading room (plans right); no need to impress visitors with outward signs of prosperity, since as a proprietary trader, D. E. Shaw & Company's only client is itself. As a result, the plan is, according to Holl, "unexceptional." In contrast to the desks piled high with monitors, a double-height reception room is a serene central gathering place (previous pages and right).

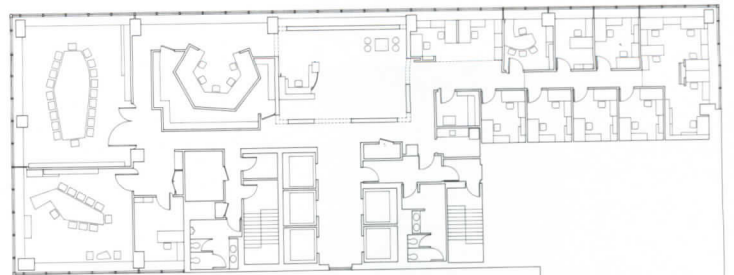
This cubic reception area is surrounded by a thick wall. Cut-outs in side walls, lit by colored artificial light and reflected sunlight, evoke electricity as energy pulsating between the walls and provide abstract elliptical views to spaces beyond. Holl and project architect Thomas Jenkinson produced the eerie greenish tint using paint developed in the 1950s for outdoor billboards. At night, concealed fluorescent fixtures replicate the effect of daylight. The overall luminescence is intensified by the sheen of waxed black vinyl-tile floors. Whereas the reception area's layered north wall mostly blocks skyline vistas, small glass side panels tightly crop portions of adjacent towers, making their gridded stone and steel skins look, appropriately, like pieces of giant computer chips. Holl was able, however, to exploit skyline views in perimeter offices along the east and west sides. Even the traditionally insular trading room has large windows behind its computer-laden desk. This feature may be at odds with the need to minimize glare on display monitors (the architects plan to install polarized glass), but not with the company's own expansive image of what a workplace should be. *Karen D. Stein*



*D. E. Shaw & Company occupies the top two floors of a 40-story midtown Manhattan tower. The reception area is 21 feet wide, 28 feet long, and 30 feet high (above and opposite). A two-layer stud and gypsum board wall faces the entrance, eclipsing northern views. The inner layer has cutouts whose backs are coated in fluorescent paint, allowing incoming sunlight (by day) or concealed fluorescent fixtures (by night) to project colored shadows on the white outer layer.*



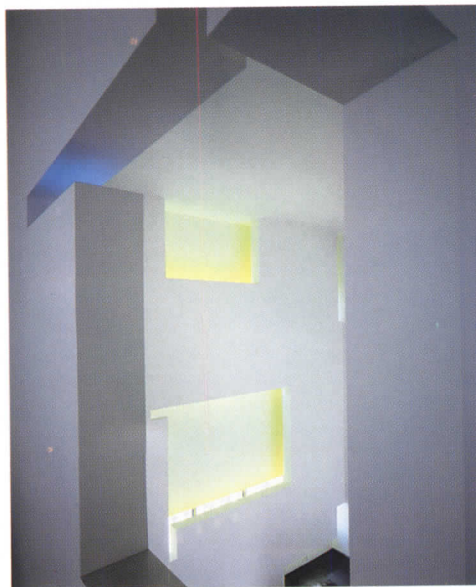
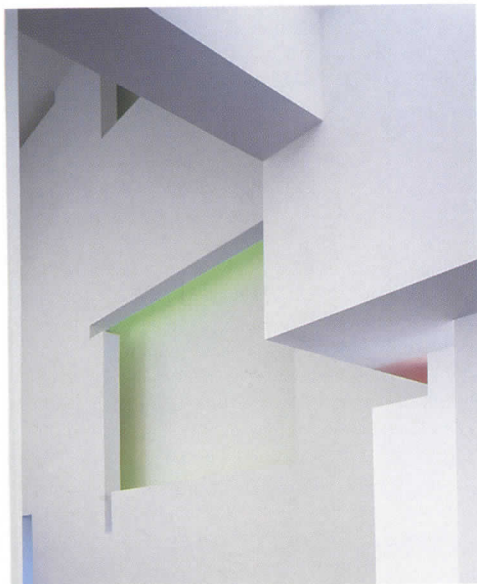
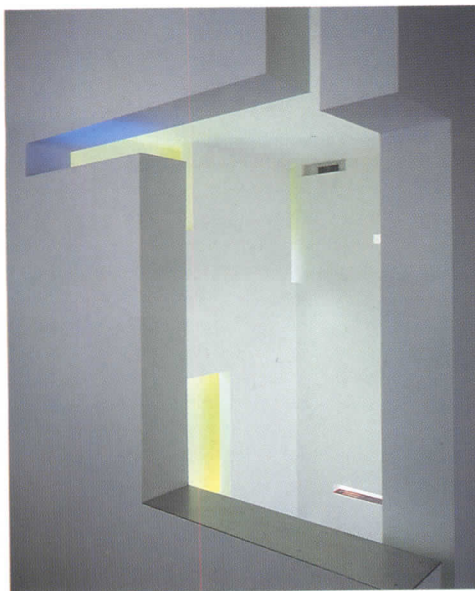
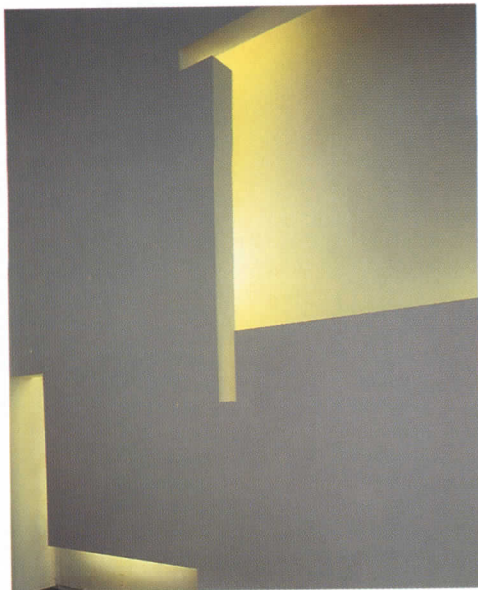
UPPER LEVEL



LOWER LEVEL







A wall section (below) reveals how sunlight enters the north wall of the D. E. Shaw reception room and reflects fluorescent-painted surfaces (left). At night, fluorescent fixtures concealed between the double-layered wall reproduce the ethereal glow. The building's hvac system is supplemented in the trading room where some 200 computers are active nearly 24 hours a day. Sandblasted heat-resistant glass cylinders in varying diameters act as diffusers for halogen bulbs suspended from low-voltage wires over the desk/conference table in David Shaw's office (opposite).

**Credits**

*D. E. Shaw & Company  
New York City*

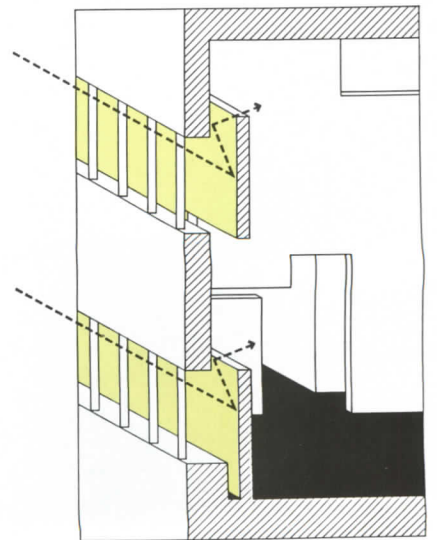
**Owner:** *D. E. Shaw & Company, Holdings, L. P.*

**Architect:** *Steven Holl Architects—Steven Holl, principal-in-charge; Thomas Jenkinson, project architect; Scott Enge, Todd Fouser, Hideaki Ariizumi, Adam Yarinsky, Annette Goderbauer, team*

**Engineer:** *Robert Derector Associates (mechanical, electrical)*

**Consultant:** *Scott Fenton (technologies)*

**General Contractor:** *Clark Construction*



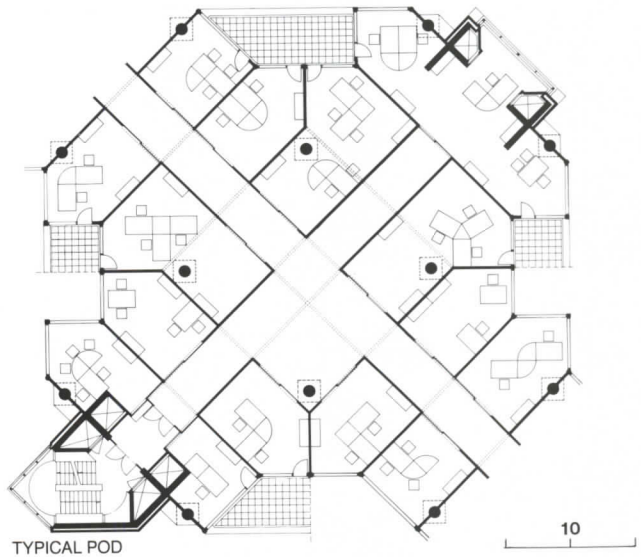
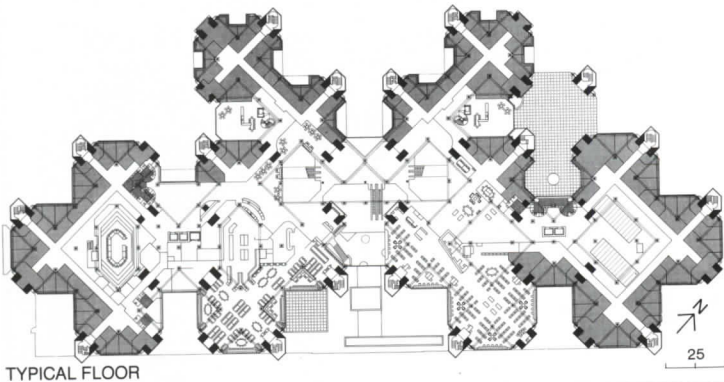


# Focus on The Workplace

*The eight projects featured on the following pages are examples of how changes in technology, concern for the environment, and new ideas about the way people work are affecting design. Not surprisingly, five of the projects are located in northern Europe (two in Holland, two in Germany, and one in England), where some countries have passed legislation requiring*

## Ministry of Social Welfare and Employment

*The Hague, The Netherlands*



## Moore Business Forms

*Lake Forest, Illinois*



*operable windows, individually controlled heating and cooling for each employee, and a maximum allowable distance from desk to window. Though aimed primarily at worker satisfaction and productivity, these mandates also produce environmental benefits that would be impossible in a typical sealed, mechanically air-conditioned postwar office building.*



Robert Oerlemans, Joop van Keeken Studio

### **A friendly castle**

Architect Herman Hertzberger has dubbed this precast-concrete building the Friendly Castle, a reference to the project's turretlike clusters of office blocks and its combination of private office space and interactive public amenities. The building houses 2,000 workers and is located outside The Hague's historic old town. The basic plan module for each of the complex's green-glass and concrete-block towers is the octagon, a shape that forms squares when locked together. The octagons offer optimal perimeter for offices with outside views, along with interior views across communal spaces and galleries (which encourage casual interaction, left). Depending on the occupants' need for privacy, individual office modules (opposite) can be laid out with fixed walls or movable partitions. The result is an unusually sensitive government building and a lively contrast to an adjacent group of dull postwar office structures. *P. M. S.*

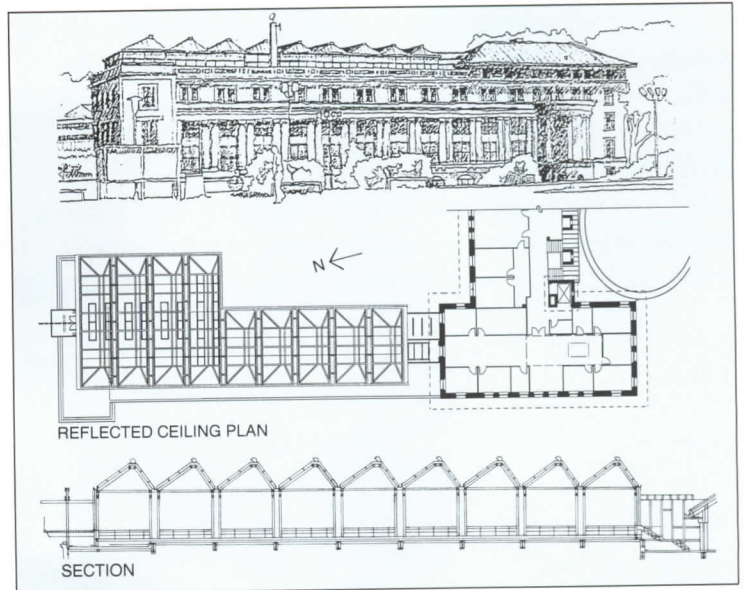
### **Corporate communications**

American corporations have been slower than their European counterparts to recognize the benefits of natural light and employee interaction on worker happiness and productivity. Even so, things are changing here: witness Hellmuth Obata & Kassabaum's new corporate headquarters for Moore Business Forms' U. S. Division. Located near Chicago, this 230,000-square-foot complex responds in part to the client's desire to convey a "progressive" corporate image, reflecting the company's ongoing transition from manufacturing to information services. Toward that end HOK designed the building as two loftlike wings around a central atrium. Along with bridges, stairs, and escalators that cross through the atrium, open-plan offices (from the president on down) and 22 shared conference facilities encourage communication among the building's 710 employees. Light wells on each office floor allow natural illumination to enter the building's innermost office areas. *P. M. S.*



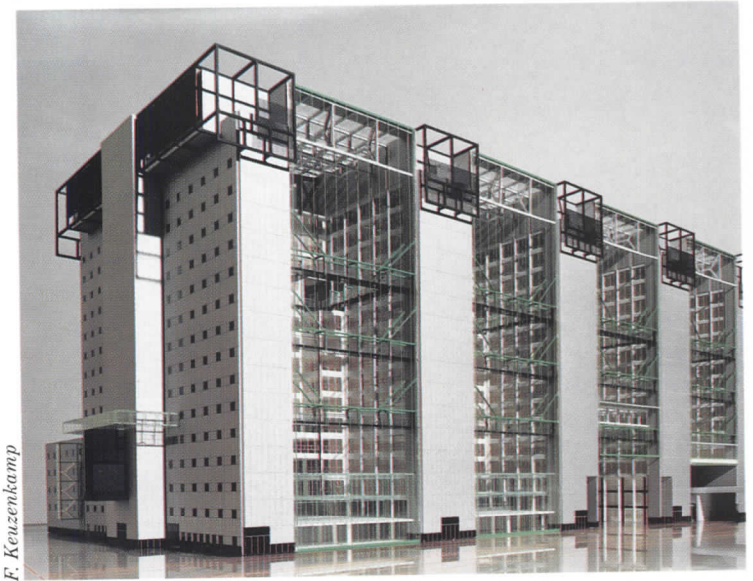
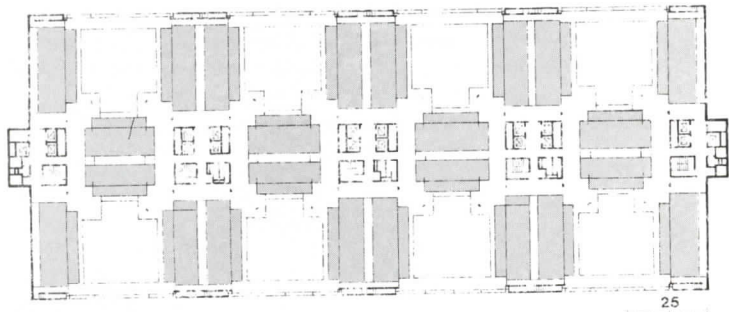
# The Intelligent Penthouse

Carnegie-Mellon University  
Pittsburgh, Pennsylvania



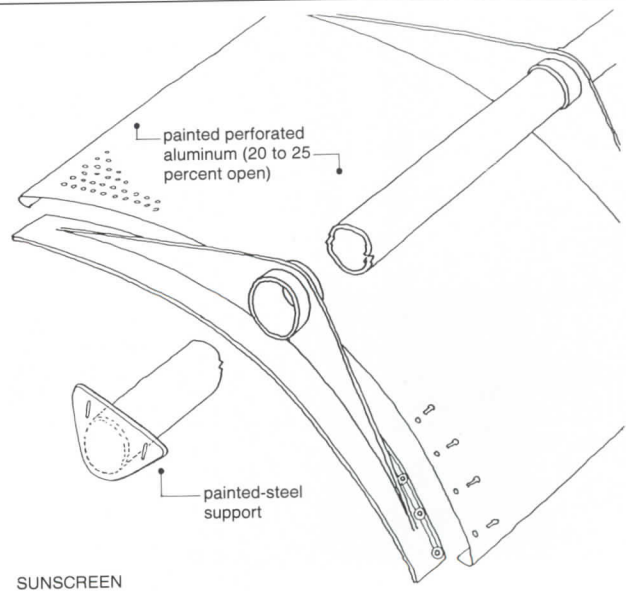
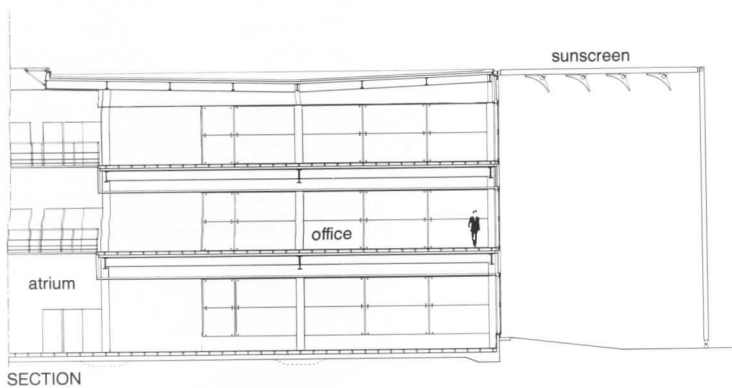
# Ministry of Housing, Planning, and the Environment

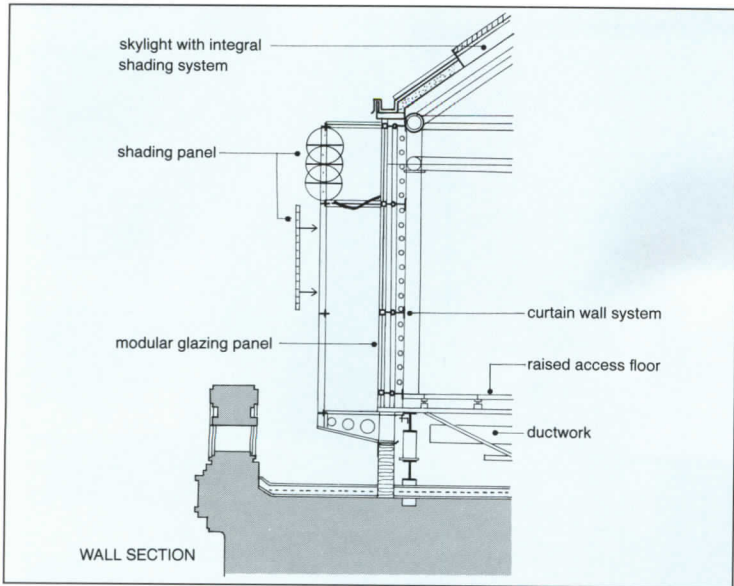
The Hague, The Netherlands



# Building B8, Stockley Park

London, England





### Workplace laboratory

Not a luxury apartment for scholars, the Intelligent Penthouse is a demonstration project at Carnegie-Mellon University aimed at creating a workplace attuned to encouraging peak productivity, measured by building-systems performance. The Center for Building Performance and Diagnostics-Intelligent Penthouse (CBPD-IP) is overseen by the Advanced Building Systems Integration Consortium, a university-industry partnership at Carnegie-Mellon's Department of Architecture. Rather than expend all its environmental problem-solving efforts in one system, the planned CBPD-IP, a 6,000-square-foot educational laboratory atop an existing 1916 building, proposes integrated systems that together provide an optimum work environment. An energy-efficient envelope, for example, permits testing of daylighting, variable shading devices, and operable windows. It works with two independent hvac systems that provide individual-workstation controls. By setting parameters for everything from air quality and acoustics to structural performance, as well as establishing a viable means to monitor and evaluate ideas in practice, the CBPD-IP (on completion in fall 1993) could become a valuable proving ground for alternative building systems. *P. D. S.*

### Environmental responsibility

"Spring comes a little sooner, summer stays on a little longer, and winter never comes at all." With these words Rotterdam architect Jan Hoogstad sums up his intentions for a major annex to a Dutch ministry in the heart of The Hague. The 950,000-square-foot structure comprises five precast-concrete sections arranged around a central core. A 16-story-high skeleton supports steel suspension bridges, which span an existing tram line and street.

Each ministry office overlooks one of eight atriums, which are enclosed to shield occupants from pollution and noise. The atriums allow natural light into the building core and enable building employees to enjoy operable windows at all times of the year. Given that one of the ministry's main areas of responsibility is the environment, the architect deliberately avoided unsound materials—e. g., tropical hardwood, asbestos, PVCs—and chose energy-efficient interior lighting and "environmentally friendly" wood veneers for the building facade and rooftop. *P. M. S.*

### Glass action

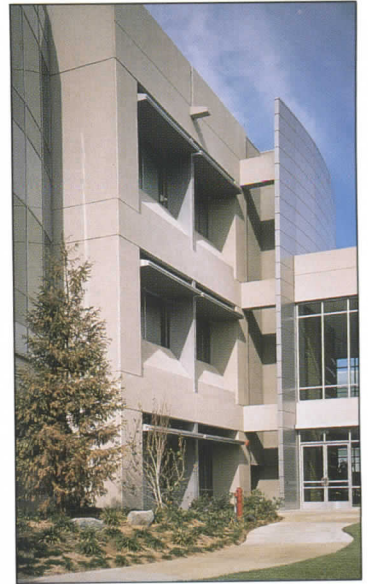
Glass and a simple system of sunshades are the tools British architect Ian Ritchie chose to control energy in Building B8. It was constructed for a typical suburban-office budget at Stockley Park, a development outside London. Clear-glass panel assemblies use ceramic-frit patterns to deliver 70-percent opacity while leaving vision areas largely transparent. The fritting, on the inner face of outer 12-mm sheets, combined with a low-emissivity coating on the outer face of the inner 6-mm layer, helps control thermal flow within the 82,000-square-foot building. The glass layers are separated by a 16-mm air gap; the unusually large air space provides additional acoustical insulation to deaden noise from a nearby helicopter pad. Stainless-steel pins hold the glass panels to inner aluminum mullions, providing a flush-glazed appearance. The sunshades reduce solar gain and provide a technologic image to appeal to research-and-development tenants. Ritchie has designed a similar project for another research park that goes one step farther: its design will permit natural ventilation. *P. D. S.*



# Epson Corporate Headquarters

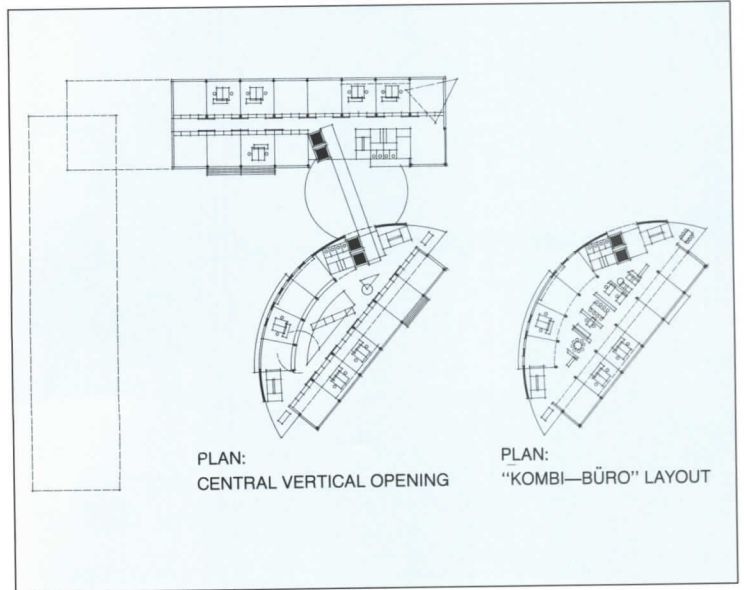
Torrance, California

© Marco Lorenzetti/Hedrich-Blessing



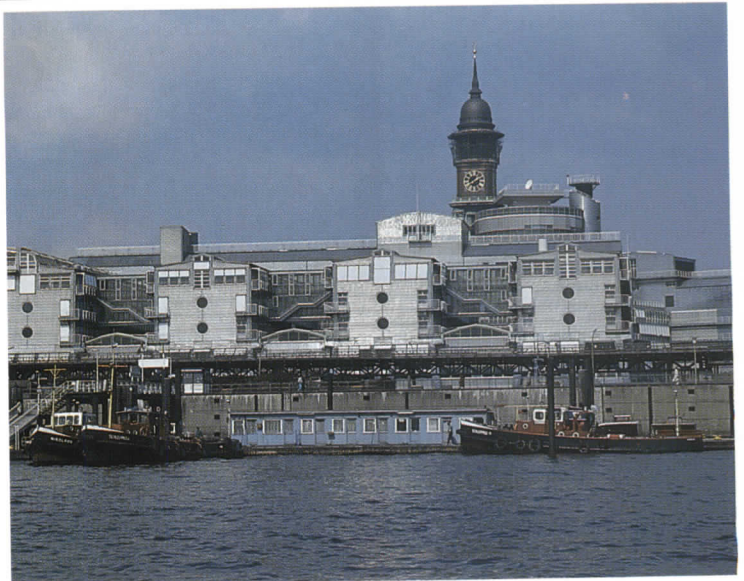
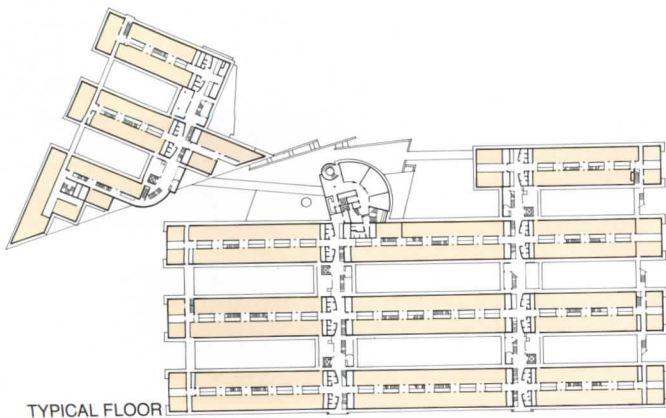
# Goethering Büro

Offenbach, Germany



# Gruner + Jahr Headquarters

Hamburg, Germany







### Off the shelf

Allowing maximum sunlight penetration while keeping solar-heat gain to a minimum were prerequisites for conserving energy at Gensler and Associates' 285,000-square-foot, four-building headquarters complex for Epson America, completed in 1990. Ten-foot ceilings with flexible, open-plan offices helped, but the key component to enhancing available light while simultaneously reducing solar heat and minimizing the need for artificial illumination and its radiant heat can be found just outside the buildings' deeply recessed (3.5 feet) windows. Here, the architects attached 4.5-foot-deep aluminum shelves that project one foot beyond the precast building skin; these are mounted on struts to hang eight feet above and parallel to the floor level. As the shelves and the recesses protect the interior from gathering direct sunlight on the floor, daylight is still reflected off the high-gloss top of the shelves onto the ceiling, where it is diffused deep within the building. Mechanical and electrical engineers Syska & Hennessy received the 1990 Design for Excellence Award from the California Energy Commission and Southern California Edison for the energy-saving system. P. D. S.



### Private offices, team settings

In the German city of Offenbach, the Frankfurt firm of Albert Speer & Partners is completing plans for a speculative office building that conforms to a philosophy called the *Kombi-Büro*. The guiding principles of this office-building system address the way people work: i. e., how to give the individual privacy while promoting teamwork and an easy exchange of ideas. Because of advancing technology in offices, task changes demand a flexible interior that combines employees' need to work without disturbance with the ability to meet informally in group settings. The two plans shown (opposite) illustrate a pair of different alternatives for the Offenbach project: one scheme (far left) has an escalator running obliquely through the atrium, with offices around the building perimeter; a second layout has a core of public meeting areas with offices along the edge. P. M. S.



### Hospitable giant

At nearly a million square feet, a building that emphasizes creativity and humanism for its 2,000 workers while meeting environmental concerns head-on might seem a contradiction in terms. But by embracing these challenges in tandem with a commitment to technology in their design for the \$200-million Hamburg headquarters of German publishing giant Gruner + Jahr, architects Uwe Kiessler and Otto Steidle of Munich created an efficient, productive, and bustling microcity overlooking the Elbe. The architects tapped a nearby power station for waste heat and provided access to daylight and operable windows for the workers. With internal staircases, apparently purposeless spaces, and intersections placed where people might bump into each other for a productive chat, the interiors are designed to promote serendipitous encounters among the staff. Flow is also directed into the complex's own streets, cafes, and squares, giving the headquarters a life of its own and adding weight to Kiessler's vision of it as a university setting, separate from but very much part of the surrounding city. P. D. S.

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*Jim Scalise*  
**Jim Scalise**  
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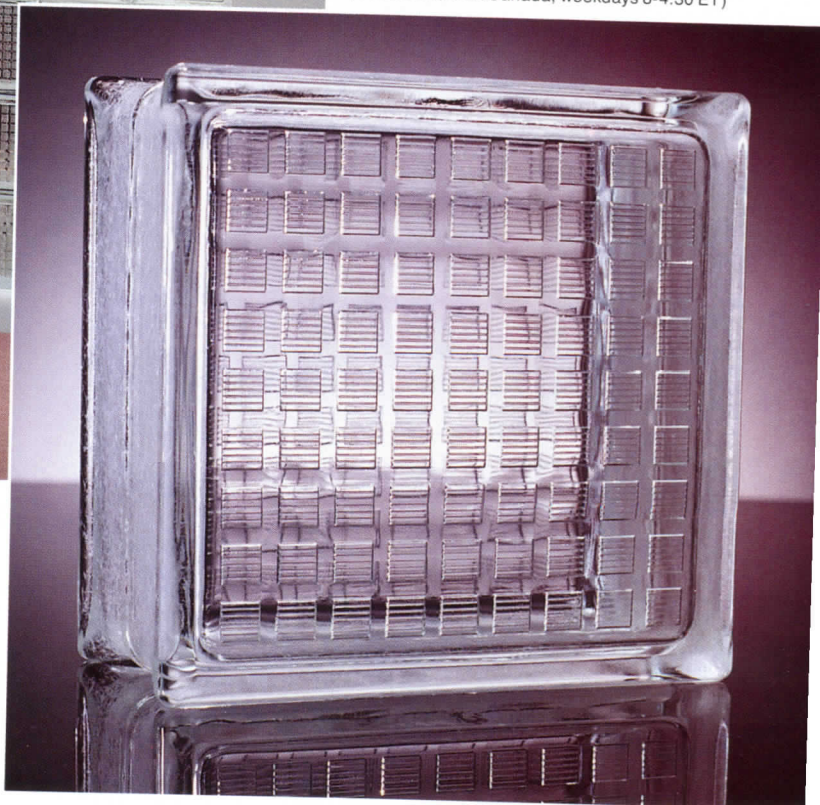
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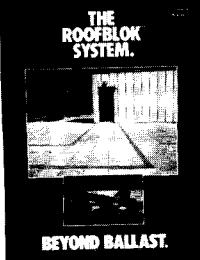


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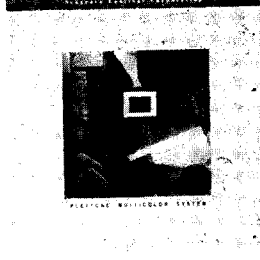
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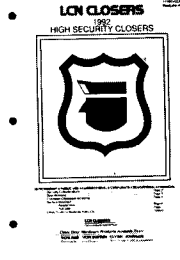
#### 400. Roof ballast/pavers

The Roofblok system of interlocking cementitious tiles protects single-ply roofing membranes from wind, punctures, and UV degradation, while also providing a decorative traffic-bearing surface. Roofblok Ltd., Fitchburg, Mass.



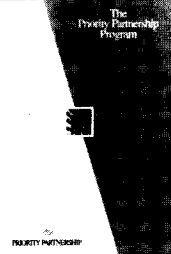
#### 401. Textured paint system

Design guide highlights the color and texture options offered by Plexitone finishes for interior walls. This architectural coating creates a seamless multicolor surface with a single-spray application that is rugged enough for schools and hospitals. Meets all new EPA regulations. Seagrave Coatings Corp., Inc., Carlstadt, N. J.



#### 402. Security door closers

Specification sheets detail jam- and tamper-resistant hydraulic operators built for high-abuse installations such as prisons. Overhead-concealed, parallel-arm, and side-mounted closers featured. LCN Closers, Princeton, Ill.



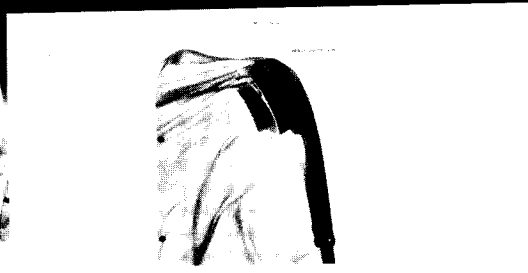
#### 403. Single-source resource

Pamphlet explains the Priority Partnership, a marketing program for architects and contractors that coordinates building-product information, pre-spec reviews, and design services from all Masco companies, including Baldwin hardware, Steelcraft and Acme doors, and Eagle windows. Masco Industries, Inc., Taylor, Mich.



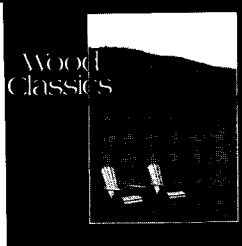
#### 404. Coated-clay masonry

A colorful brochure follows architectural applications of glazed-, coated-, and matte-surface exterior masonry from initial sketch to finished building, illustrating urban and collegiate projects. Wall sections and bonding patterns detailed. Stark Ceramics, Inc., Canton, Ohio.



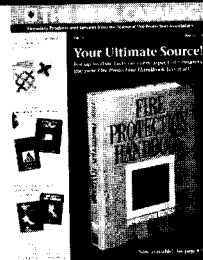
#### 405. Pulsating showers

A six-page brochure describes all Shower Massage bathing products, including multifunction wall-mount and hand-held showers and pressure-proof hose connections. Water-action features provided at a low-flow 2.5 gpm; "pause" settings offer additional water savings. Teledyne Water Pik, Fort Collins, Colo.



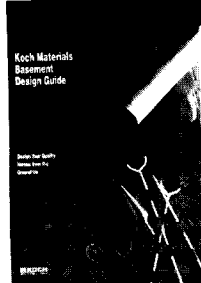
#### 406. Outdoor furniture

Chairs, tables, benches, and other site furniture, made in New York State of plantation-grown teak and mahogany, are offered in different weights for either residential or public-space use. Color catalog includes special designs such as a curved-back Adirondack chair and Southwestern-motif benches. Wood Classics, Inc., Gardiner, N. Y.



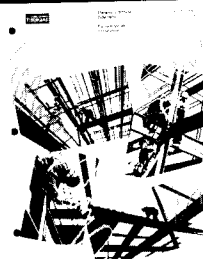
#### 407. Fire codes/standards

An 82-page catalog describes handbooks, manuals, videos, and other publications dealing with fire-resistant design, fire-protection codes and services, and fire-safety education. Text summaries, prices, and ordering information given for all materials. National Fire Protection Association, Quincy, Mass.



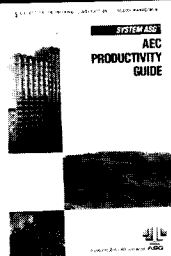
#### 408. Basement design

Design and construction tips that should insure a dry basement are covered in a guide from the makers of Tuff-N-Dri foundation waterproofing. Photographs illustrate suggested interior-finish and lighting options. Koch Materials Co., Heath, Ohio.



#### 409. Commercial insulation

A 30-page products and design guide covers features, benefits, and installation techniques for a complete line of board and batt commercial insulation products. Includes thermal-rated and acoustic materials for curtain-wall, ceiling, and frame constructions. Owens-Corning Fiberglas Corp., Toledo, Ohio.\*



#### 410. CAD software

An illustrated 56-page booklet, the *AEC Productivity Guide* explains the benefits offered by System ASG's integrated AutoCAD applications, Electronic CADalogs, AEC industry interfaces, and Vertex Division detail groups. ASG, Sausalito, Calif.\*



#### 411. Window films

Optically clear Protekt safety film can be applied to glass lights of any size to protect against personal injury from glass broken by storms, impact, earthquakes, or explosion, as well as provide security against smash and grab theft. Tinted and reflective films can offer solar control. Madico, Inc., Woburn, Mass.

\* Product data on CAD disk



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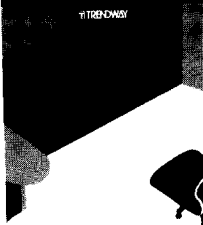
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Circle 53 on inquiry card

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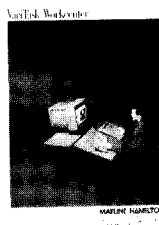
#### 412. Task-support options

Program brochure highlights the standard features offered in the Choices office line, including panels with high acoustical ratings (.85 NRC), a universal hinge that connects panels of different heights, curved worksurfaces, and a selection of over 45 panel fabrics. Trendway Corp., Holland, Mich.



#### 413. Easy-in storage

Designed by Robert Reuter, a new overhead-mount storage option for many open-plan workstations has a curvilinear front with a pneumatic-action door that lifts up at the touch of a finger. The compartment can be configured vertically or horizontally, and has a built-in wiring trough. The Knoll Group, New York City.



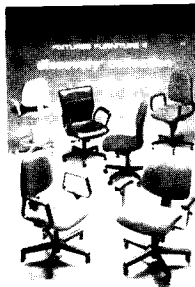
#### 414. Computer workstation

A multifunction computer-support desk, the VariTask incorporates ergonomic features that improve productivity, including independent height and tilt adjustment of both front and rear work surfaces to provide ideal viewing of monitors. The Mayline Co., Inc., Sheboygan, Wis.

#### WYSE

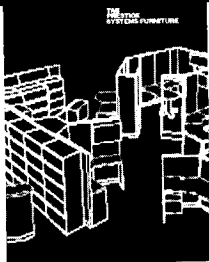
#### 415. Low EMI VDT

Brochure addresses the monitor, workstation, and keyboard-design factors that can improve visual and physical comfort and reduce electromagnetic emissions. The material also describes a line of terminals that conform to stringent Swedish emissions standards. Wyse Technology, San Jose, Calif.



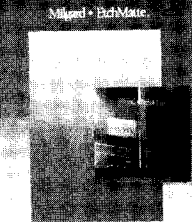
#### 416. Multiple-shift seating

The Discovery line offers seating with passive ergonomic features, as well as a range of active-function chairs particularly suitable for use by different workers in multiple-shift operations. Easy-read permanent graphics replace often-lost paper use instructions. Fixtures Furniture, Kansas City, Mo.



#### 417. Cockpit clusters

Brochure explains how space-sensitive workstations allow for adjustable individual air flow, task lighting, sound control, and ergonomic keyboard trays, with a variety of panel heights and fabric options that provide design flexibility. TAB Products Co., Palo Alto, Calif.



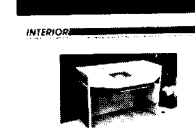
#### 418. Translucent

An architectural catalog illustrates office partitions, entrances, and signage made with EtchMatte silkscreened glass. The process involves fusing a ceramic slurry, in precise designs, onto glass at 1200F, with no distortion or loss of optical quality. Milgard Tempering, Tacoma, Wash.



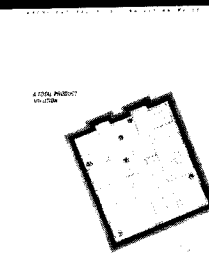
#### 419. Computer intensive

The Command Center features adjustable keyboard arms and angled shelves to accommodate multiple computer-terminal installations, such as those in utility or building-management applications. Also offered is a 10-page guide to the human factors of ergonomic office design. Hamilton Sorter Co., Inc., Fairfield, Ohio.



#### 420. Recessed monitor

The Workstation Down-Under places the VDT under the worksurface in a tilted housing. This is said to offer a more natural viewing angle, minimizing operator fatigue and freeing up desk space. Interior Specialists Corp., Spring Lake, Mich.



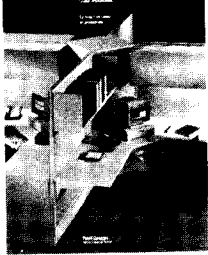
#### 421. EMI-shielded spaces

An Architectural Shielding Design Guide clearly explains the difficulties caused by electromagnetic interference, pinpoints problem sources, and discusses readily available shielding products such as gaskets and conductive copper coatings. Tecknit, Cranford, N. J.



#### 422. Special-use seating

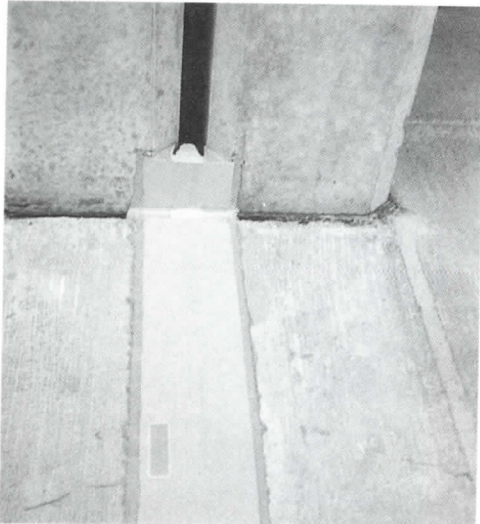
Colorful brochure shows how the industrial, educational, or healthcare user can design a task-specific chair or stool from a number of function and finish options. Configurations include molded plastic, plywood, and extra-wide (26-in.) upholstered seats. Ajusto Equipment Co., Bowling Green, Ohio.



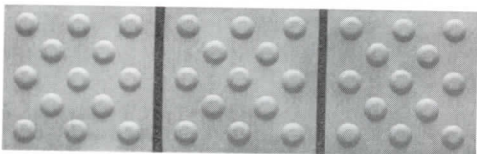
#### 423. Clustered workstations

A planning guide suggests cluster configurations of from two to six stations that are said to combine open-plan appearance and finish options with the space efficiencies of circular work areas linked to a central core. Panel Concepts, L.P., Santa Ana, Calif.

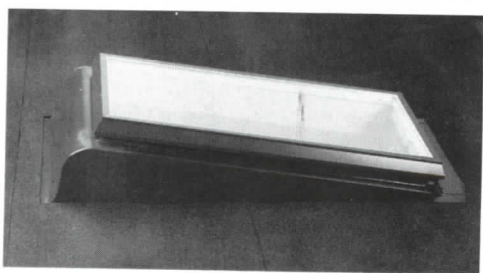
## New Products



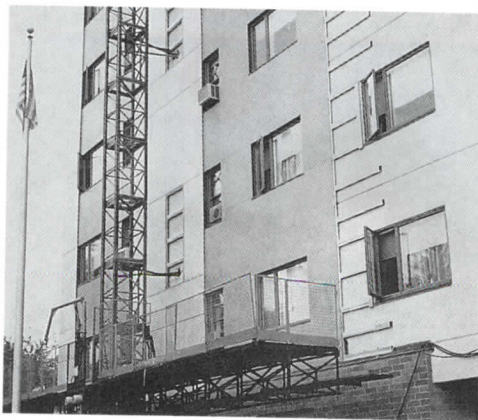
**316. Epoxy expansion joint.** Developed in Scandinavia, the Interspan concrete-deck joint is a epoxy/urethane system with a flexible, Kevlar-reinforced nosing. Epoxied-in-place on both horizontal and vertical surfaces, it responds to the design movement of the joint without bulging or cupping, and prevents moisture penetration. Larsen Products Corp., Feasterville, Pa.



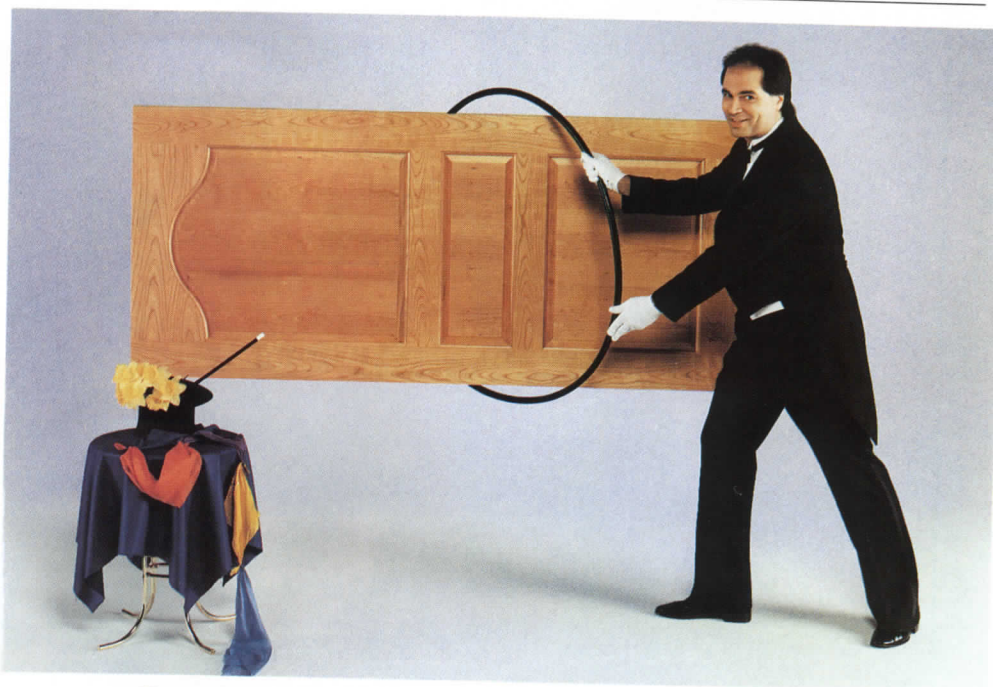
**317. Detectable-warning tile.** A bright integrally colored quarry tile, yellow Transit-Tile provides both a visual and a tactile hazardous-location warning that meets new ADA guidelines. Tiles are 6 13/16-in. square, and require a 3/8-in. grout joint. American Olean Tile Co., Lansdale, Pa.



**318. Sloped skylight flashing.** For low-slope applications, the Roto roof window can be specified with a structural aluminum flashing that automatically pitches the sash at an angle sufficient to improve water runoff. Flashing is supplied painted to match the skylight frame. Roto Frank of America, Inc., Chester, Conn.



**319. Recladding option.** Deteriorating lightweight wall systems can be reclad using an economical, site-assembled secondary frame. The project pictured has fiber-reinforced Glasweld panels placed over a damaged EIFS wall. Aluminum bearing plates fasten to an adjustable steel frame tied back through the existing wall finish directly to the original steel-stud framing, and to the concrete deck on alternate floors. The Glasweld panels are adhered to the plates with structural silicone, and caulked with a urethane sealant. Eternit, Inc., Blandon, Pa. *continued on page 139*



## Greg performs stile and rail magic!

Greg Shavlik is our Customer Service Coordinator for stile and rail doors. His 16 years experience at Eggers can make many of your stile and rail design problems disappear!

"Our rep and I frequently consult with the architect or designer during the design phase," said Greg. "The rep then works with the customer for quotations and to implement the order."

"Two very critical factors in design are the hardware type and location. This can affect both the aesthetics and structural soundness of the door.

"I can help the designer by supplying dimensional tolerances. This is particularly important if the door has to meet B or C label requirements. We do manufacture stile and rail doors for the 20 minute label and we are autho-

rized to do hardware prep. Not all stile and rail manufacturers can do that.

"Where 45 or 90 minute doors are required we'll do a sketch face or simulated style and rail to match the other doors.

"Stile and rail doors produce an elegant and complex design statement. I think we can help the designer make the most of that opportunity by showing how veneers, panel design and finish influence that statement."

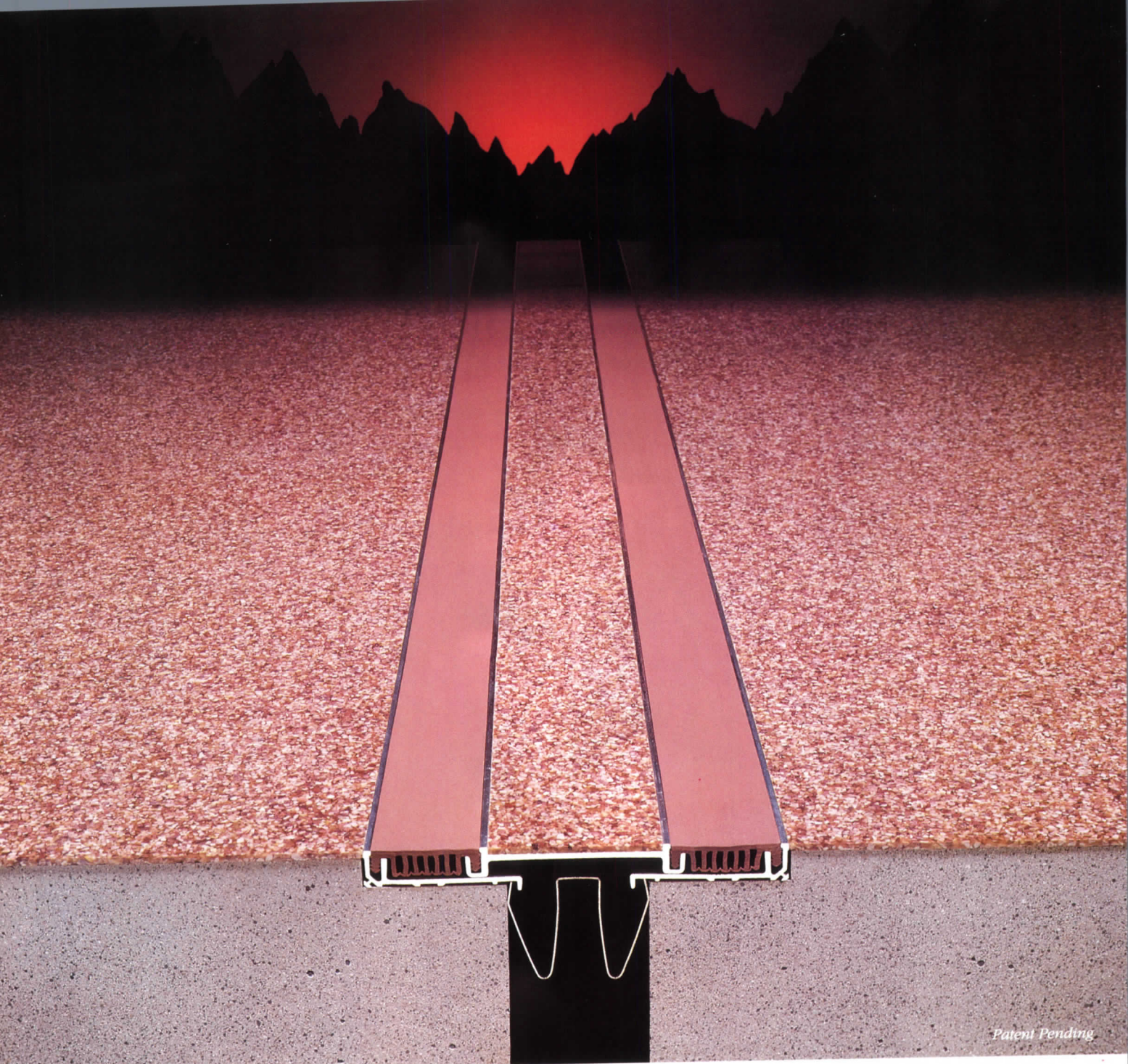
**Eggers has a booklet about understanding and designing with stile and rail doors. Send for it or call (414) 793-1351 and ask for Greg.**



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Patent Pending

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Unsightly floor joints with missing gaskets and dirt collecting voids have been a serious maintenance problem, tripping hazard and visual disgrace for years.

But now there's a solution! C/S has developed a flush expansion joint cover system with clean, simple lines. It provides for multi-directional movement — up to 50% — *without loss of seal* and is available for 1" through 16" openings.

The design features rugged aluminum components and gaskets of a co-extruded thermoplastic material

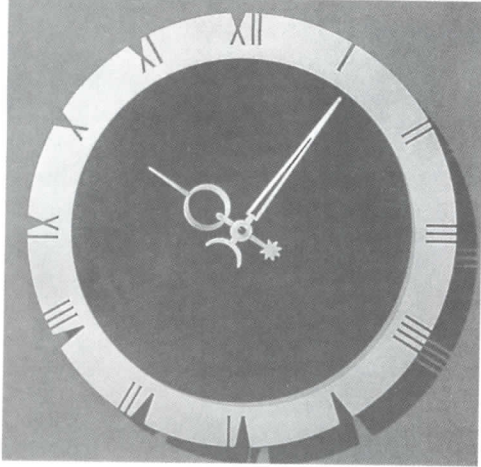
to smoothly accommodate both pedestrians and wheeled equipment. Gaskets may be custom colored for larger projects and the center plate recessed to accept tile or carpet for the ultimate unobtrusive look. Best of all, C/S Flush Seals cost no more than conventional joint systems.

A new age in expansion joint technology is now here — even for seismic applications! Call 800-233-8493, our technical staff is ready to assist you.

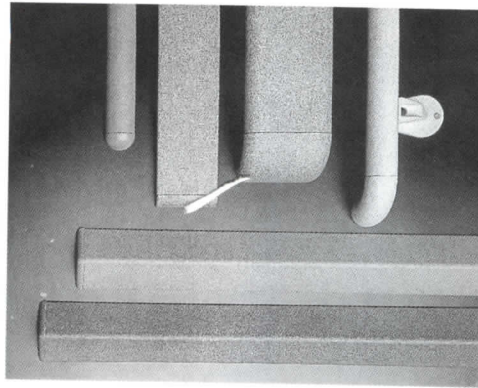
**THECSGROUP**



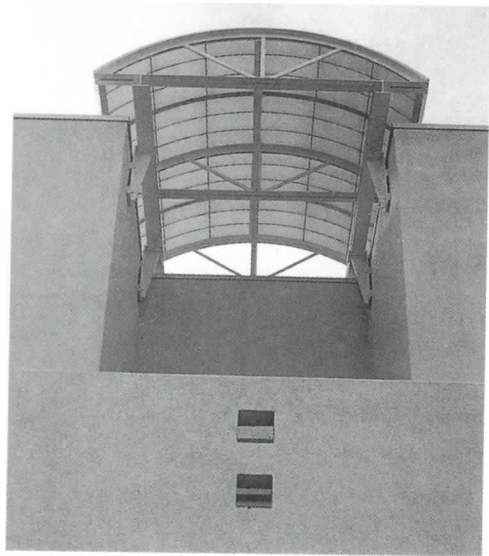
**New Products** continued from page 137



**320. Wall clock.** Created by architect/industrial designer Timothy Techler for Umbra, the Copernicus Clock has time-telling hands of brushed metal in shapes symbolic of the sun, moon, and stars. The 12-in.-diameter steel dial projects slightly over the birch-wood face, so that cut-out Roman numerals cast a shadow on the wall behind. Retail price: about \$50. Techler Design Group, Inc., Boston.



**322. Decorative rails.** A new design option for all Acrovyn handrails, bumper guards, corner guards, and other wall-protection elements offers realistic stone, wood, and other natural patterns, applied on every exposed surface. Patterns are produced by special inks that integrally bond to the vinyl/acrylic material, and are available in 53 colorways. The C/S Group of Companies, Muncy, Pa. continued on page 141



**321. Translucent vault.** A new curved structural system for light-diffusing, insulating reinforced plastic panels, the SkyCurve translucent skylight can be configured in barrel-vault, arched, and low-profile shapes, and can work as a canopy. The pre-assembled system offers a choice of U factors, shading coefficients, and light-transmission values. Exterior face sheets are laminated with Tedlar film to prevent weather degradation and fiberbloom. Skywall, Inc., Chattanooga, Tenn.

## HOW TO LIGHT AMERICA

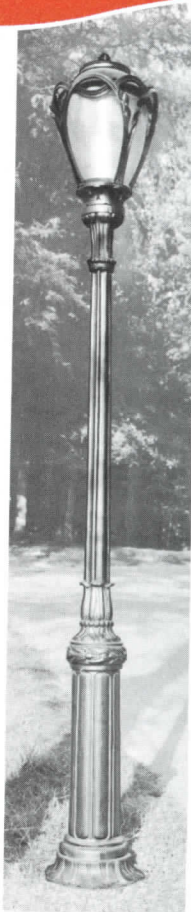
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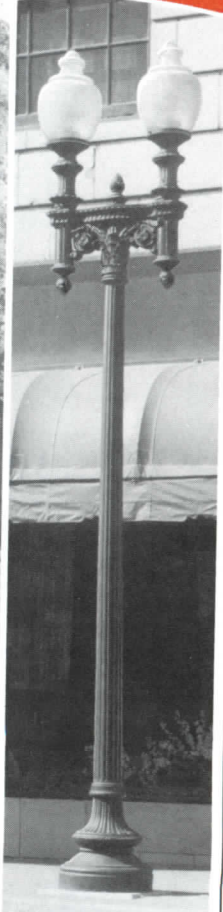
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**MADISON POST**  
Shown in New York City's Public Park System. Heights vary from 6'3" to 12'6" (excluding luminaire + adapter), 1 1/2" O.D. base. Available with twin arms for 2 luminaires and as a bollard.



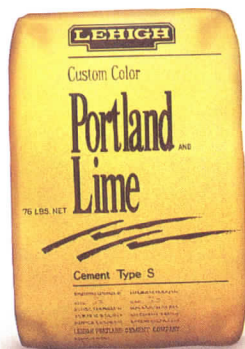
**WASHINGTON POST**  
Shown at the Peabody Hotel in Memphis, Tenn. 12' to 16'10" heights (excluding luminaire) 21" and 24" O.D. bases. Available as 4 or 5 luminaire unit.

# Don't Leave the Consistency of Your Color Mortar to the Accuracy of This Site Blending Tool



## Rely on Lehigh Preblended Custom Color Portland/Lime Cement

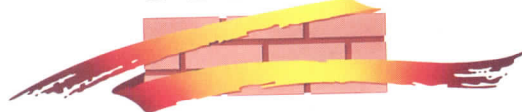
There are certain elements that you can control on a job site. The color of your mortar should be one. When you work with Lehigh's preblended Custom Color Portland/Lime Cement you know the pigment, lime and cement are already properly proportioned and preblended. Available for immediate delivery in the most popular architectural colors, Lehigh Custom Color Portland/Lime Cement gives you more control of the blend and greater color consistency when you need it most.



Considering a masonry wall is 20% mortar, it's important to know exactly what color your finished wall will be. In addition to Custom Color Portland/Lime, Lehigh manufactures Custom Color Masonry and Custom Color Portland Cements. So, the next time you need that special color, ask your local building materials supplier to show you the selection of Lehigh preblended Custom Color Cements, or call Lehigh's Custom Color Development Service to discuss color matches to meet your needs.

**LEHIGH**

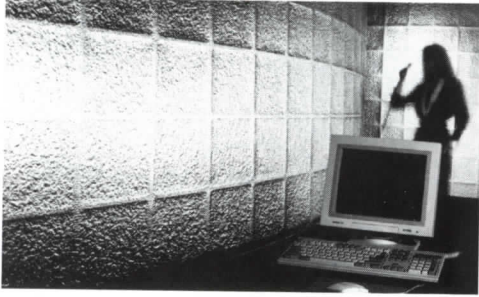
LEHIGH



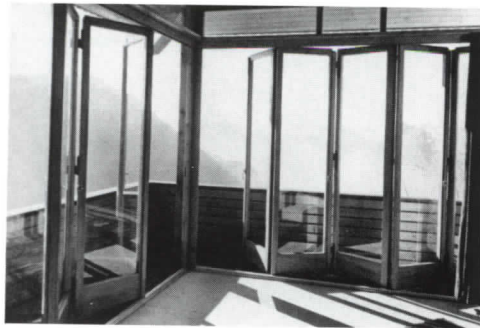
CUSTOM COLOR MASONRY CEMENT  
CUSTOM COLOR PORTLAND CEMENT  
CUSTOM COLOR PORTLAND/LIME CEMENT

## New Products

Continued from page 139



**323. Block-look panels.** A new pattern in fiberglass-reinforced acrylic-polyester Krinklglas sheet, Pan-L-Blok sheet comes in sizes from 4- by 8- to 5- by 10-ft. Impact- and UV-resistant, panels are an approved Class A material, and can be used indoors or out. Dimensional Plastics Corp., Hialeah, Fla.



**324. Folding-door system.** Hawa Fold-away 10 hardware can carry glazed panels up to 35 1/2 in. wide and 176 lb. each, to make a folding patio door that slides almost completely aside, with minimal stack dimensions. Operation can be inward or outward. Häfele America Co., Archdale, N. C. ■

## Manufacturer Sources

### Pages 90-95

712 Fifth Avenue  
Kohn Pedersen Fox Associates, Architect  
Indiana Limestone: Miller Druck Co. Curtain wall and windows: Wausau Windows. Glazing: PPG Industries (Solarban Clear). Roofing: American Hydrotech; RPM. Stainless-steel entrances: Melto Metal Work. Locksets: Schlage Lock Co. Hinges: Bommer Industries, Inc. Closers: Rixson-Firemark. Exits: Von Duprin. Elevators: Otis Elevators.

### Pages 100-109

Century Tower  
Foster Associates, Architect  
Curtain wall and windows: Cupples Products, Div. H. H. Robertson Co.; Shin Nikkei; Fujisash. Glass: Asahi Glass (Sunlux). Elevators: Mitsubishi. Carpeting: Interface Flooring Systems, Inc.

### Pages 114-119

D. E. Shaw and Company  
Steven Holl Architect  
Resilient tile: Azrock, Inc. Drywall: USG Corp. Paints: Benjamin Moore & Co. Custom entrance doors, reception desk, and conference tables: Progressive. Locksets: Schlage Lock Co. Closers: Rixson-Firemark. Ceilings: Armstrong World Industries. Fluorescent paint in light covers: Ron-Glo. Pendant lighting in conference room: custom by architects, fabricated by Tom Hand. Shades: F. J. Grey Glass. Window treatment: Carey-McFall Corp. Conference seating: Montis. Task chairs: Herman Miller. HQI uplighting: Osram Corp.

### Pages 120-121

Moore Business Forms

Hellmuth, Obata & Kassabaum, Inc., Architects  
Atrium glazing: Active Industries. Curtain wall and windows: Marmet. Glass: Interpane Coatings. Bridge lighting: Halo; LSI. Roofing: Firestone.

### Pages 122-123

Stockley Park, Building B8  
Ian Ritchie Architects  
Double-glazed wall system; clear, frit, and low-E glass: Pilkington Glass, Ltd. (Planar Wall).

### Pages 124-125

Epson Corporate Headquarters  
Gensler and Associates, Architect  
Tinted glass: PPG Industries (Solex). Storefronts, metal cladding, and custom light shelf: Carmel Architectural Products. ■



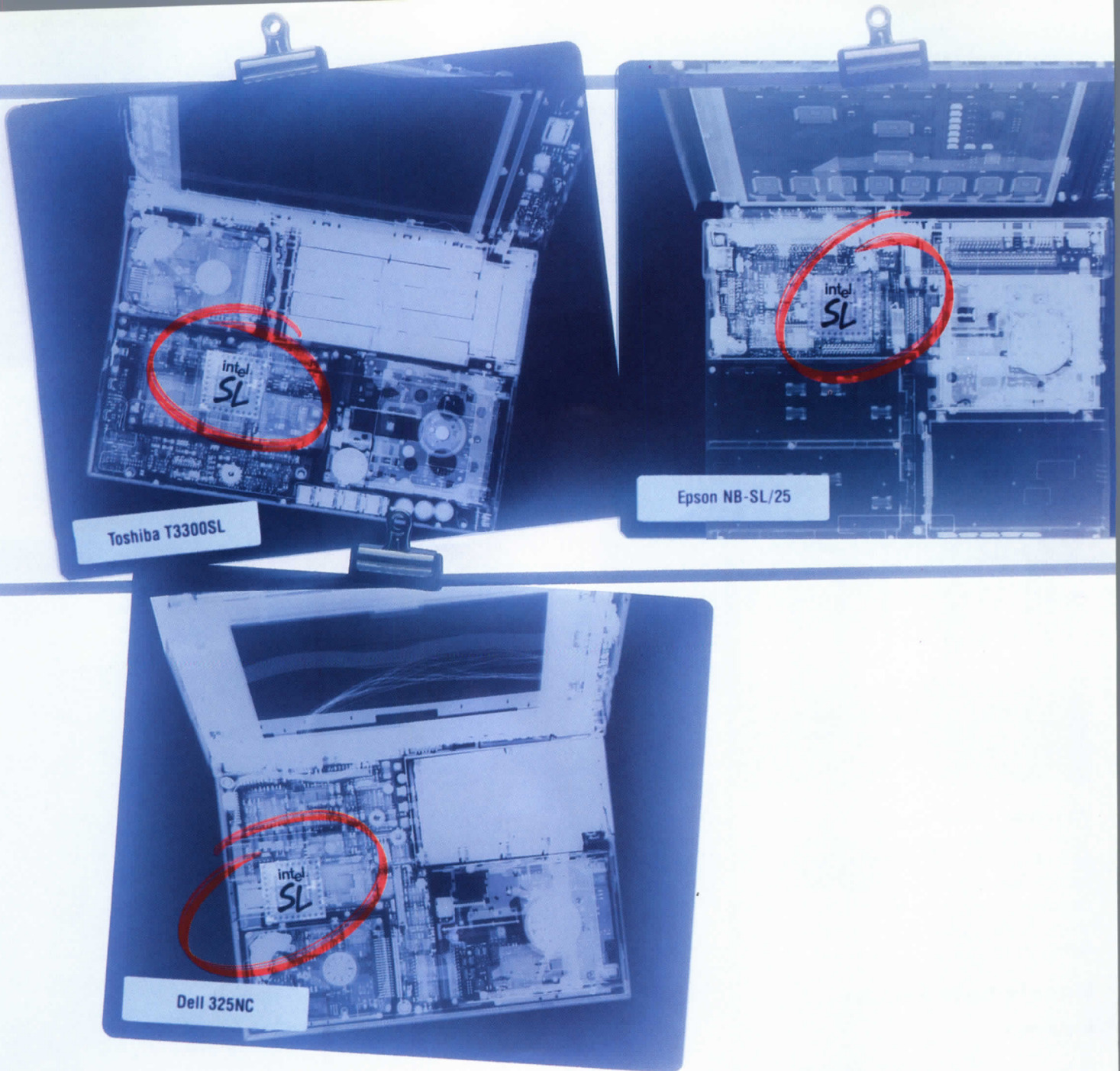
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30 tons of bananas (seven tarantulas),  
25 tons of squash,  
two tons of squashed squash,  
one Raynor Rolling Steel Door,  
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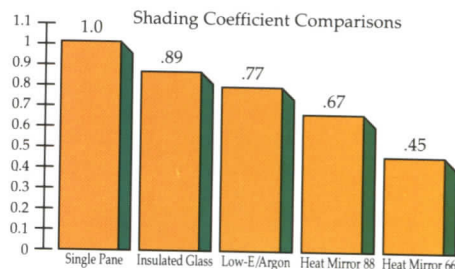
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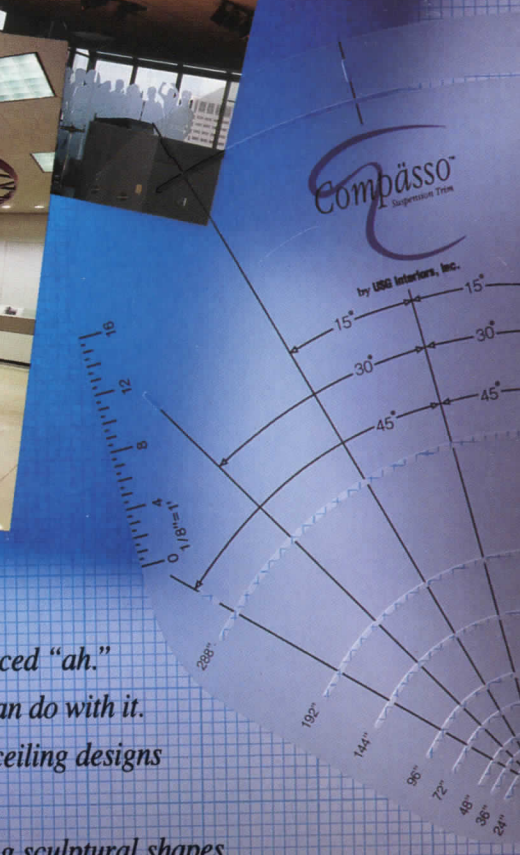


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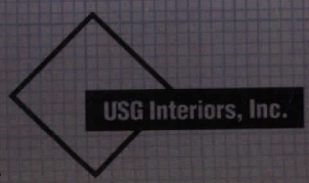
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