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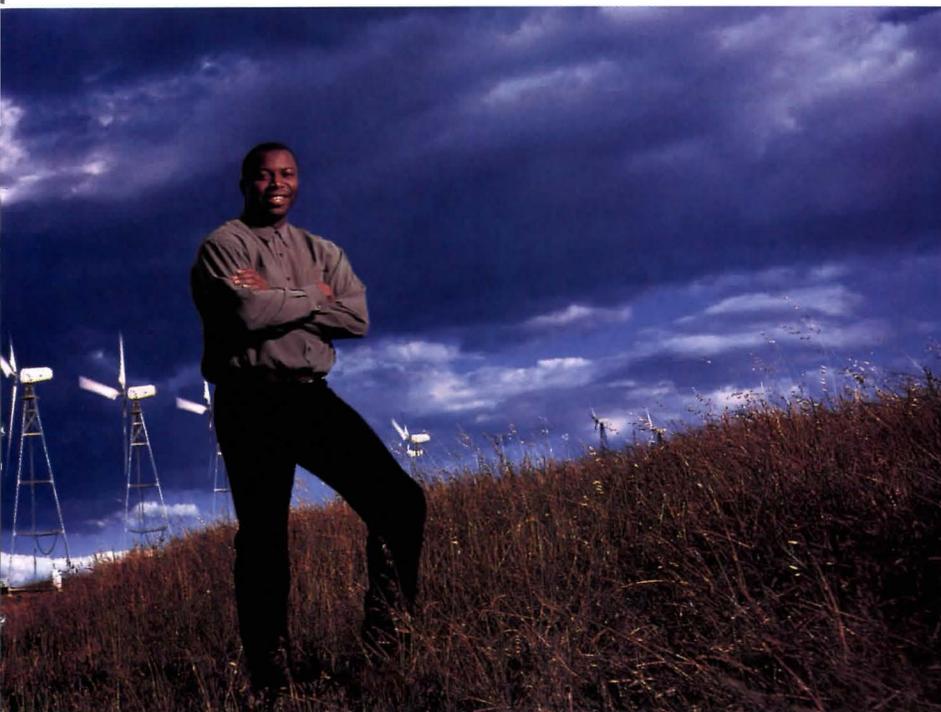
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**Minorities in Architecture**

I was impressed by the article in the July 1995 RECORD ["Why Architecture Still Fails to Attract Minorities," pages 32 to 33] discussing the plight of almost every non-white professional in this field. I still have a tremendous degree of difficulty explaining my frustration as an African-born architect, having been successful gaining employment in a large corporate firm, yet not able to rise to leadership positions within the company. It is assumed that my face and my presence may turn away new business—a white or Asian client may not feel "comfortable" charging a black man with a \$100 million project. Since the black community in America has not recovered from the disenfranchisement of their forefathers, it is not conceivable that projects of such impact will come from that community anytime soon.

Therefore, promoting or appointing a black man to a partnership position, for instance, promises no immediate returns. So, why bother? This mentality is prevalent in this profession. It is shameful, and is clearly a reason why I believe that the American Institute of Architects needs to establish guidelines to deal with this issue of race. Otherwise, it cannot claim not to be a "white man's country club."

Name Withheld on Request

The above letter was transmitted by e-mail. Readers are encouraged to contact RECORD editors by e-mail at: JSRRecord@aol.com.

**Client Delight**

I enjoyed reading your editorial, "Delighting That Customer," in the July issue of RECORD, [page 9] and I believe that you are 100 percent on point.

In my experience, consulting with design professionals in virtually every aspect of the service process from the viewpoint of the design marketplace, I've found several factors that almost always seem to block the path toward client "delight."

1. Crisis thinking invariably overcomes any ability to think and act strategically. It drastically erodes relationships with exciting clients and virtually negates the process for—successfully—obtaining new clients. Clients can smell the fear.

2. Aside from the few genuine successes in our profession, the buzz around the management "epiphanies" of TQM, re-engineering teams, and partnering haven't built enough evidence pro-change. Mid-to small-sized firms are still not convinced that TQM really works. And some may never be convinced.

The literature and general hype driving the wave to implement these programs has created an overload of factual and anecdotal information that leaves design professionals unable to focus on the process to turn their business around.

Expecting a "bolt-on" quick fix for what's wrong with their practice, many architects still embark upon a TQM or re-engineering program only to find that it is an all or nothing evolutionary process that never really ends. Disillusioned and bitter, the architect abandons the program in favor of the previous "crisis-focused" business style.

3. Networking experiential knowledge. Architects can network one another and share in the "moral" successes of learning  
*continued on page 117*

**September 12**

Philip Johnson will introduce the television biography on him, "A Self-Portrait," at the Museum of Television & Radio, New York City (\$10 fee). 212/621-6600.

**Through September 17**

"Contemporary British Architecture" exhibition of 80 drawings, models, sketches, by Rogers, Foster—80 architects in all; National Academy of Design, New York City, 212/369-4880.

**September 17-20**

World Workplace '95, sponsored by the AIA and other groups; Miami Beach; 713/629-6753.

**September 18-20**

"Transgressions Through Time," First International Congress of Architecture, Monterrey (Mexico) Institute of Technology; 52-83/358-2000, ext. 5406.

**Through September 26**

"The United Nations in Perspective," a 50th-anniversary showing of drawings and photos by the architects of the UN; MOMA, New York City; 212/708-9400.

**October 1-29**

"White Chimneys" exhibition in a Philadelphia Victorian Gothic home showcases the work of more than 30 interior and landscape designers; 215/248-8811.

**November 1-3**

Interplan 1995 (formerly Designer's Saturday) moves this year to the New York Coliseum, where 550 exhibitors will display interiors products for 10,000 attendees. Call 800/950-1314 for details.

**Competitions**

- Williamsburg (Va.) design competitions for a new town plan and new court house; \$154,000 cash prizes. Registration closes Oct. 2; call 414/963-0868 for information.
- New York Society of Architects' annual design-awards-program entries due Oct. 3. Call 212/675-6646 for details.
- American Wood Council design-awards entries due Oct. 5. Call Ron Ingram, 202/463-2769. ■



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## Inside Out: Why Architects Should Worry About Interiors

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It wasn't until Stanley Abercrombie wrote "A Philosophy of Interior Design" (Harper & Row, 1990) that I became truly aware of the pitfalls in trying to separate architecture from interiors. In my review at the time, I wrote "...one is left with the feeling that coming up with a philosophy of interior design separate from architecture cannot be done, [simply because] interior design cannot really be separated from architecture."

Still, the thorny issue keeps coming up, because both architects and interior designers see it as one of artistic integrity and professional turf, and the client sees it as another case of fragmented responsibility.

One underlying cause of the polemic is the great discrepancy in the shelf lives of box versus content. In the lifetime of one building, the interior can change 50 times; it lives and breathes, and is subject to fads and fashion. But the box lives on (though it too is subject to renovation or recycling); still, that, as they say in hurricane forecasting circles, is a 100-year event.

When the owner grants the architect a free hand with the interior, there are degrees of intervention. At one end, the architect does it all. At the other, as Charles Gwathmey points out in Suzanne Stephens' essay in this issue, the architect relies less on "additive decoration" and more on providing "natural light, textures, and materiality." The "decorator" deals with the curtains, furniture, and the rest of the fashion-responsive infill that allows generations of users to shape their surroundings to their own tastes, which range from high-tech to stuffy Victorian.

So much for residential work. Commercial or contract interiors are kept in line by the demands of function, productivity, wiring for information systems and, increasingly, code-directed provisions for workers' well-being in their place of business. Not only is the engagement of an architect far more common than it is on the residential side, but the interior designer, when there is one, is more likely to be professionally trained and certified. There's a growing role for the so-called *space planner*, who typically takes into account, or should, the long-term facilities-management implications of design decisions. This need is accentuated, as the latest article in RECORD's series of workplace features points out (page 32), by the business re-engineering fervor of the '90s, which demands of the designer and the owner a sharp focus on flexibility. Thus flexibility is to the commercial sector what fashion is to the residential sector.

The basic fact is that any misalliance between exterior and interior—of form, color, texture, and above all, scale—can be catastrophic. Therefore the architect should be, if not commissioned to do the entire design, at least a consultant to the interior designer or decorator to ensure the visual and functional integrity of the work. But sadly there's little in most architects' traditional training that qualifies them to handle the finer details of such work, let alone its taxing management complexities.

The architect's intervention in interiors can go too far, particularly with a timid client. The story is told of Marcel Breuer, a man of strong beliefs and personality, who designed a house for a client family down to the very last detail, such as placement of the ashtrays. On visiting his clients one year later, he was dismayed to find every item in its original place, including the ashtrays. *Stephen A. Kliment*



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**Boston**

## Funds Raised by Preservationists Save Gropius Archives After TAC's Demise

The swift and difficult demise of The Architects Collaborative last April, which occurred when a local bank foreclosed on its loan and took possession of the once thriving office, shocked and dismayed Boston's architectural community. According to Kimberly Shilland, Curator of Architectural Collections at the Massachusetts Institute of Technology, the concern was that the bank would sell or auction the large collection of construction drawings, renderings, sketches, models, photographs, slides, and books.

TAC, a unique Cambridge, Mass., firm founded in 1945 by Walter Gropius and six young colleagues from Harvard, epitomized mid-century optimism about architecture and its role in post-war America.

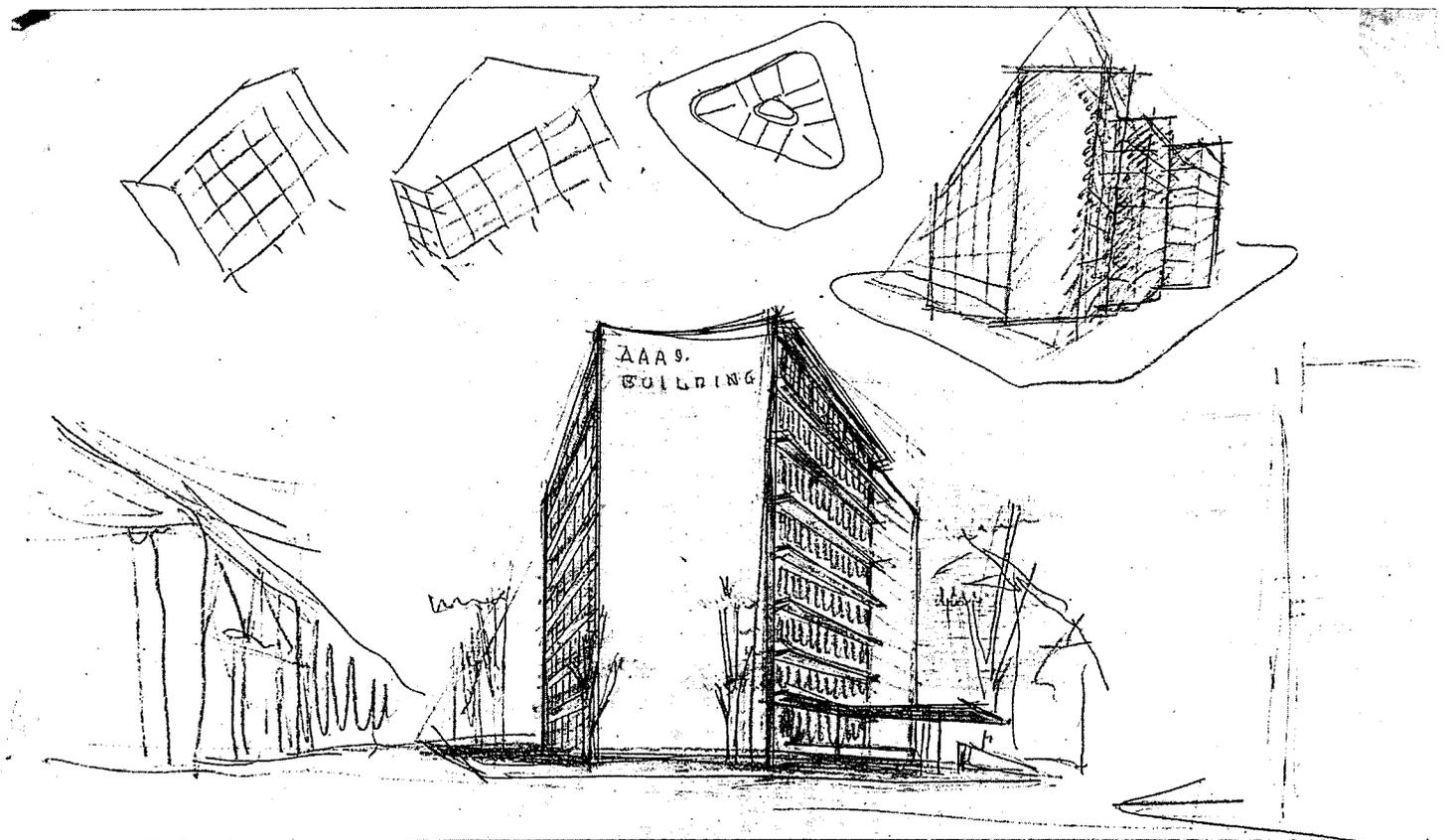
Several Boston-area institutions, alarmed that TAC's archives might leave New England forever, formed a consortium to keep them intact. After several busy weeks of fund-raising and negotiating, their efforts were rewarded: this past July they bought the archives for \$7,000.

"Under the circumstances, this is very good news for the architectural community," says Shilland, who notes the material, most of which was stored in a Cambridge warehouse. The material includes project documents and drawings (see an original Gropius sketch below) that will become part of MIT's collection of architectural drawings.

Currently, the school is seeking funds to

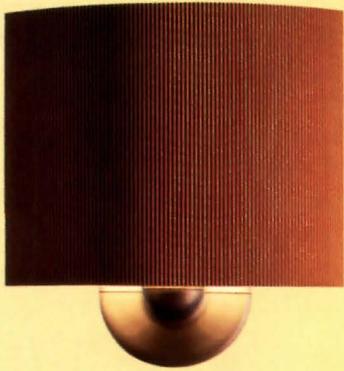
catalog the material—Shilland estimates there are at least 10,000 documents. Long-range plans include an exhibition, perhaps in 1997, the 60th anniversary of Gropius's arrival in the U.S. Other portions of the archives are elsewhere—its slide collection is at Harvard's Loeb Library; its books and periodicals at the Boston Architectural Center.

John C. Harkness, one of TAC's founders who has started a new Boston-based office with another TAC founder, Norman Fletcher, is pleased that an important record of the firm's work will be carefully preserved and widely accessible. "I think the material will help future generations better understand the work of Gropius and of the firm," he says.  
*Nancy Levinson*



© Gropius drawings courtesy of The Architects Collaborative and MIT

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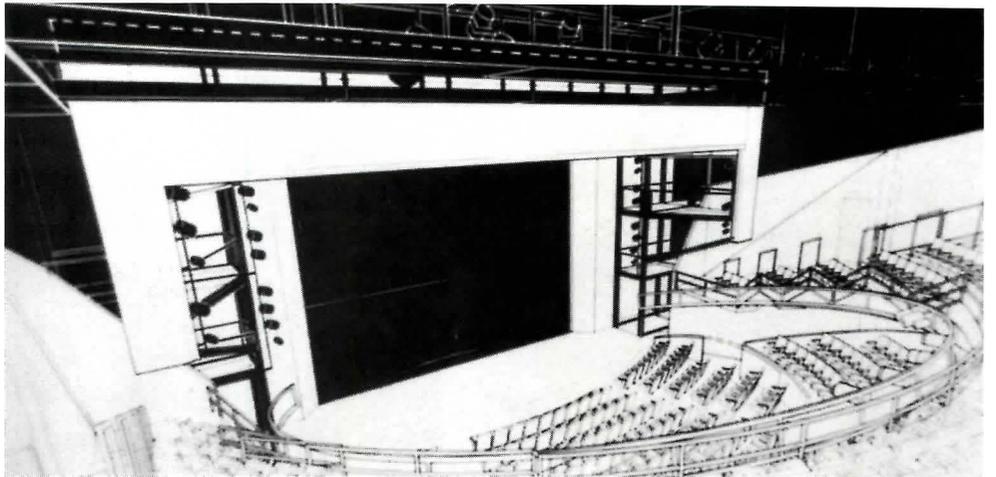
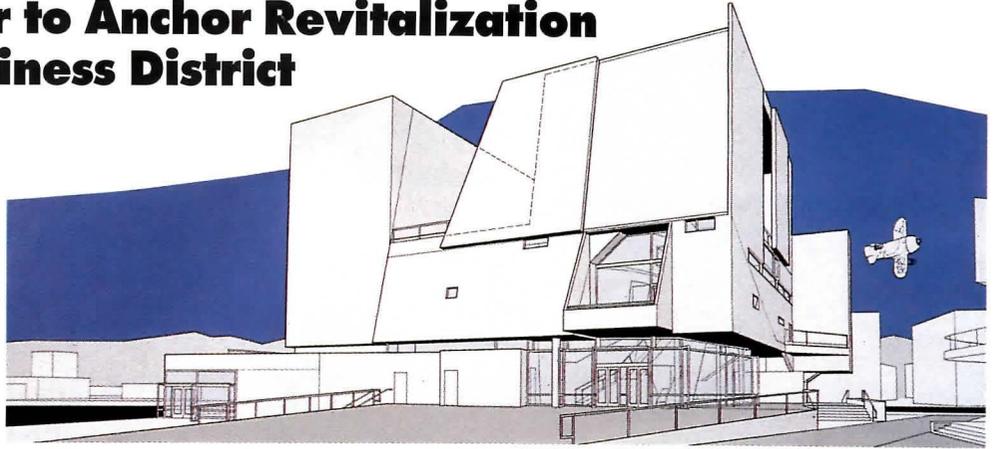
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## San Jose Rep Theater to Anchor Revitalization Of Ailing Central Business District

When it opens in 1997, the elaborate San Jose Repertory Theater will be the focus of the redevelopment of San Jose's dilapidated downtown. The \$15-million project by Holt Hinshaw Jones was handled by two principal designers—Wes Jones, before he left the firm a year and a half ago, and Paul Holt, who saw it through to completion.

The final version will sit in the path of San Jose's paseo—the downtown pedestrian walk—forming a sort of public forum where the paseo wraps around the building and continues towards San Jose University. In the design, a vast cube, rotated on a 12-deg. angle, sits on top of a plinth of retail space. The metal-clad cube encloses a series of interconnected volumes, including the 625-seat theater, a rehearsal hall, and flyloft. The rehearsal hall is tucked above the lobby, and a company terrace is carved out between the hall and the flyloft, facing back down over the paseo. Below, the lobby and additional retail space will also open up generously towards a plaza and the paseo. Construction is expected to begin this fall.

*Nicolai Ouroussoff*



## Washington, D.C.

### Historic-Homes Tax Credits Pending?

Preservationists, take note. A U.S. Senate bill due on the floor this fall, would give tax credits to owners of historic homes. A spinoff of the 1978 historic-preservation law that was severely weakened by the 1986 Congress, the S. 1002 bill (another one has been introduced in the House) would give a 20 percent tax incentive to owner-occupied homes that have been landmarked or nationally registered, or are in a designated historic district.

Harry Schwartz, formerly with the National Trust for Historic Preservation and now an advisor to the National Park Service, urged a New York City audience of preservationists to lobby for the Senate bill, since it is more likely to be acted on before the House bill. "Write your Senators," he pleaded. "This will help low-income people buy a home and allow towns to hold onto a tax base." *C.D.K.*

## Ohio

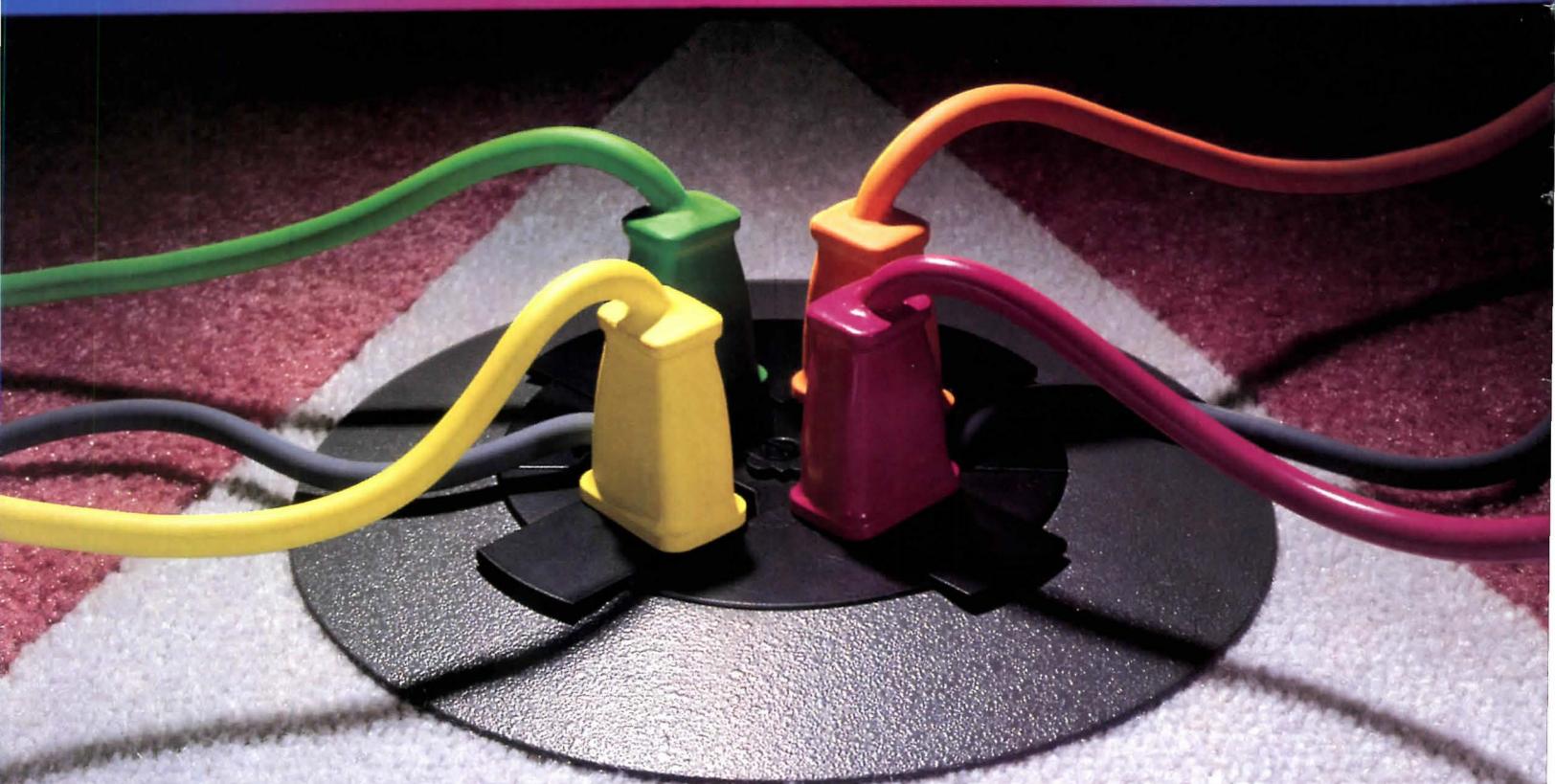
### Design Chosen for \$75-Million Ohio State Arena



In Moody/Nolan Ltd.'s arena for Ohio State University at Columbus, a giant hockey and basketball stadium oval is nestled within a more traditional frame. The 20,000-seat arena is encased in a brick facade, which establishes a more formal secondary entrance to the university campus and houses athletic offices. Visitors can enter the arena

at each of three corners from the main campus via a pedestrian bridge or from nearby parking lots. The structure's remaining corner locks into a small-scale auxiliary gym. (Sink Comb Dethleths were arena design consultants, Sasaki & Associates were master-plan and landscape architects.) Construction begins this fall. ■

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## Briefs

### Awards

• The Grand Central Partnership and the 34th Street Partnership have jointly received the American Institute of Architects' 1995 Merit Award for fostering "an environment where retail businesses can flourish." The partnerships offer merchants free advice on signage and store-front design at no charge through a Retail Improvement Program.

• Francis Xavier Leadon, Gainesville, Fla., a 1994 graduate of Yale University's School of Architecture, has won the biennial Royal Oak Architectural Design Competition. He will receive \$15,000 plus expenses to pursue independent study in Great Britain with the help of National Trust experts.

### Opening

*Robert Moses and the Shaping of New York* opens at New York City's PaineWebber Art Gallery (212/713-2000) Sept. 27 to Dec. 8. The show will include pictures and plans of projects ranging from the 1939 World's Fair to Moses's gargantuan public-works projects.

### InterPlan now on the Internet

The New York-based InterPlan contract-furnishings trade fair will have a "home page" on the Net, including previews of its scheduled November 1-3 show, location and travel information, and information on the fair's gala at the Metropolitan Museum of Art. InterPlan '95 will be held at the New York Coliseum. Its home page address is: <http://www.mfi.com/interplan>.

### Awards Directory

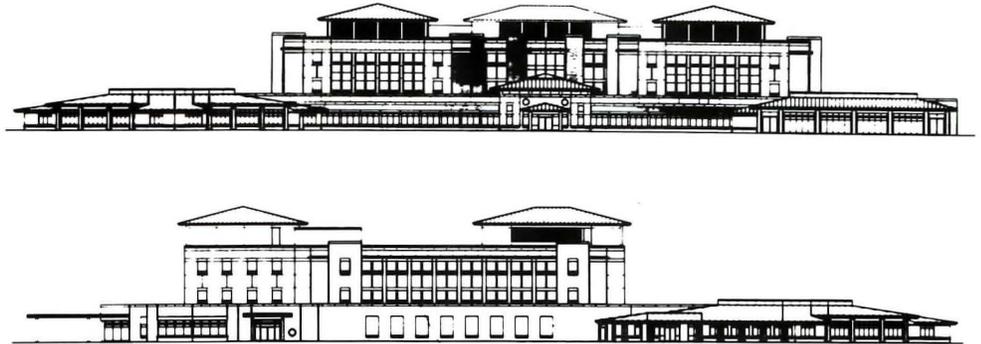
Britain's Cheerman Limited is putting together a directory of annual architectural and building-design awards. Any regular awards for finished projects can be included by faxing 0171/730-7178. Include name of award and name, address, telephone, and fax numbers of organizer.

### Remembered

• George A. Christie, familiar to readers of RECORD for his incisive Construction Outlook columns, died Aug. 21 at age 67. Christie retired as chief economist of The McGraw-Hill Companies' Dodge Division in 1992.

• The Modernist architect Abraham W. Geller, 83, died in July in New York City. The designer of numerous office buildings and city projects during his career, he was awarded the New York Chapter of the American Institute of Architects' Medal of Honor in 1985. Geller was best known as an articulate defender of Modernism's social mission. ■

## Two Hospitals Become One in Carolina Medical-Center Design



Earl Eason and Associates' design for the Marion County Medical Center in South Carolina combines two hospitals into one and aims at providing a more humane, campus-like setting. Replacing two existing hospitals that are less than eight miles from one another, planners expect to save at least \$2 million a year by ending duplicated costs.

In the design, a 215,000-sq-ft central building, with two additional doctor's office buildings locked into its corners, will sit on a 48-acre site. The brick-clad main building is

dominated by a two-story skylit pavilion. A smaller, existing doctors' office building will be connected to it by a covered walkway. The focus here is out-patient care: the first floor houses a food court (with an outdoor terrace), out-patient surgery, and doctors' offices, while all in-patient areas are on the upper stories. The smaller doctors' buildings will be used for elective care and rehabilitation.

Construction of the \$27-million project—which is funded by a private developer—begins this month. ■

### New Publisher

## Elaine Shusterman Takes Helm as RECORD Publisher



C. Linn photo

Elaine Shusterman takes over this month as publisher of ARCHITECTURAL RECORD. Ms. Shusterman (left) comes to RECORD with an extensive publishing background that includes magazines and directories, most recently at Reed Elsevier Publications. Ms. Shusterman's goal consists, in her words, of providing, through ARCHITECTURAL RECORD, "the most innovative, vibrant, and useful publication in the architectural marketplace." "We're committed," she adds, "to building on RECORD's 104-year-old history and enhancing the magazine's leadership position through a high level of service to the reader and advertiser."

She succeeds Howard Mager, who was made vice president, strategic alliances and industry programs, in The McGraw-Hill Companies' Construction Information Group. ■



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## Of Howard Roark and Clients

**The Fountainheadache: The Politics of Architect-Client Relations**, by Andy Pressman. New York: John Wiley, 1995, 234 pages \$30 (paper).

Reviewed by Elizabeth S. Padjen

Can't live with 'em, can't live without 'em. The often uneasy relationship of architects and clients is an underexplored aspect of practice, one that is usually discussed in terms of legal and financial arrangements.

In *The Fountainheadache*, architect Andy Pressman looks instead at a truth that is recognized by most architects: Good design, good documents, and high professionalism aren't much help when the chemistry is wrong. Pressman is interested in the personal aspects of the relationship. The "politics" of the subtitle suggests a scholarly analysis, but Pressman has provided something far more entertaining—an anthology of war stories and ruminations contributed by architects with a range of experience and renown.

It's a bit like a cocktail party, with some amusing tales that effervesce into nothing, and some nuggets of wisdom that deserve further thought. The story of a residential client in need more of a marriage counselor than of an architect will surely sound familiar to many readers, and suggests that some architect-client relationships are doomed from the beginning. A young architect relates with good humor the story of winning a commission because the client thought he was the son of a prominent local philanthropist, a case of mistaken identity that neither discovered until after the contract was signed.

But there is much that is useful, even provocative. One chapter opens with this almost cynical comment: "Race and gender appear to be increasingly appreciated as mediators of the relationship between architects and clients." A chapter on working with client committees contains this contrarian advice from contributor Kent Larson: "Large committees are often more manageable. It is true that a committee of more than five can

*Elizabeth S. Padjen is president of Padjen Architects, Inc. in Topsfield, Mass., and is president of the Boston Society of Architects.*

© Courtesy of Harry Weese Associates



*Model of a Washington, D.C. subway station was used by lighting consultant William Lam to communicate well with the client.*

do little work. Design committees, however, are not formed to do any work... A smaller committee often begins to micromanage the design process." And a contribution by Charles Moore, whom Pressman rightly describes as the antithesis of Howard Roark, is a wonderful description of a collaborative process with a church group that could serve as a model for other practitioners.

*The Fountainheadache* provides architects with a bonding experience of sorts, because it uncovers the essential democracy of the profession—clients afflict architects both great and small equally. This narrative thread of the problem client runs through many accounts in the book, but is not countered by stories of problem architects, except in a few heroic accounts of fixing the mistakes of others. Pressman's guest list has been limited to architects, and the omission of the client's point of view soon becomes obvious.

The reader begins to wonder about the war stories that clients might share, and even about the other side of some of the stories here—like the thoughts of the client who began to cry when presented with a study model.

*The Fountainheadache* isn't all horror stories. Stanley Tigerman, a fan of the Ayn Rand novel, contributes some up-beat tales, noting, "these 30-plus years that I've been in my own practice have not been a 'Fountainheadache.'" Charles Gwathmey recounts the

behind-the-scenes story of Gwathmey Siegel's addition to the Guggenheim Museum, where he enjoyed the support of the client while fighting what he dubs the "counter-client"—the opposing preservation lobby. Carol Ross Barney describes how tackling bureaucracy head-on led to the award-winning Glendale Heights Post Office. Others have contributed essays, like William Kirby Lockard's discussion of architectural communication.

Despite occasional outbursts of advice by some of the contributors, *The Fountainheadache* is more of a casebook than a how-to guide to improved architect-client relations. Perhaps hindered by the anthology format, Pressman draws relatively few conclusions. Chapters are structured around specific issues, but occasionally fail to provide enough content. Others include submissions that are off the topic, such as the otherwise delightful Tigerman tales about his experiences in the Midwest that Pressman places in a section on foreign clients, blithely dubbing the stories "sufficiently exotic."

Pressman tends to fawn over his writers in his introductions, and his apparent gratitude to them has perhaps made it difficult to pull consistency from them. Some pieces are candid and engaging, others are bland and self-serving, as though passed through the sieve of big-firm marketing departments. Shifts in format, point-of-view, and tone may work on MTV, but here they are often jarring and sometimes confusing.

Still, one of the most intriguing contributions to the discussion is made at the very end by Pressman himself as he describes the results of a small, admittedly flawed, survey of architects, lawyers, and doctors. Doctors and lawyers, he discovered, derive their greatest professional satisfaction from interaction with their patients and clients; a successful outcome is considered "icing on the cake." Noting that architects may even take pride in estranged client relationships, he found that architects derive satisfaction from outcome, not from the process; client give-and-take is frequently something that is only tolerated. If this is true, then the chances of finding a cure for the "Fountainheadache" are probably very slim indeed. ■



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**The Architecture of the Jumping Universe**, by Charles Jencks. London: Academy Editions, 1995, 176 pages, \$20 (paper).

*Reviewed by Hugh Aldersey-Williams*

The town crier of new architectural movements is on the march again. This time, Charles Jencks tries to inject new life into architecture by turning to contemporary science—or rather, the non-scientist's idea of contemporary science, which is pretty much everything that has happened in the 20th century from the General Theory of Relativity to Heisenberg's Uncertainty Principle.

Jencks's exercise is potentially rewarding as a brave attempt to find a logic in some of today's boldest architecture, from Gehry, Libeskind, and Hadid, to Calatrava, Piano, and Grimshaw. However, it fails because of its

*Hugh Aldersey-Williams writes on architecture from London. His latest book, The Most Beautiful Molecule, describes the discovery of the "buckyball."*

fatuity. Formerly revealing in his categorization, Jencks now stuffs the pick of today's novel buildings into a box bearing the ludicrous label "complexitist" and then spends a book trying to hold the lid shut on it.

Jencks is smitten with what he calls "the new sciences:" chaos, complexity, fractals, Gaia. We are, he marvels, the first generation to know the age and origin of the universe. Know? Hardly. Estimates vary by billions of years. We are just the latest generation to know a bit more than the last and to think we know it all. So Jencks is wrong to deduce that this "discovery" will "change every area of life." All it shows is that Jencks has caught up on his science reading.

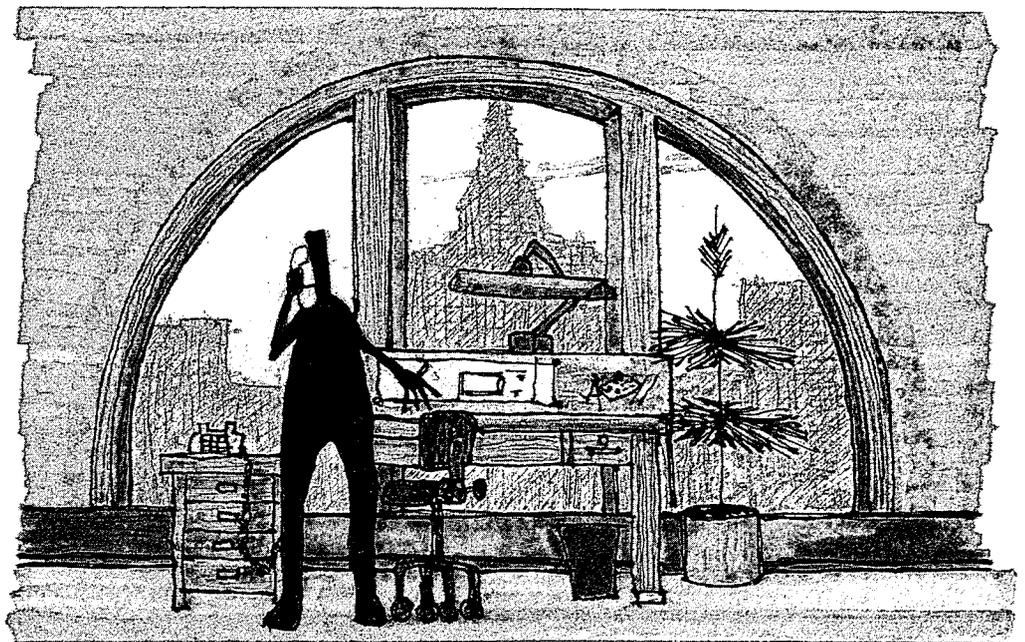
The finer points of science count for little in this book. For Jencks sees in science no more than the ingredients of a new style, or, as he puts it, a "new Post-Modern paradigm." One can only agree that, if all we are doing is looking for a new style, then science seems as good a starting point as any. Certainly, science in its broadest sense is more inspiring than the tired credo that technology dictates

form, a notion Jencks deftly dispels with reference to Frank Gehry's Disney Concert Hall in Los Angeles, whose vast swaths of curved limestone were sized by computer but nevertheless dreamed up and sketched by human mind and hand.

But in revealing how arbitrary is his germ for a new style, Jencks merely hastens its descent into meaninglessness. In his taxonomy, any building with curves appears to be "biomorphic." Some are "cosmic," others "cosmogenic." Before long, any architecture that resists "easy interpretation" finds itself eligible. That's the beauty of a label like "complexitist." And yet despite this relaxation of the usual stylistic codes, there are, in fact, rather few buildings to illustrate the points that Jencks wants to make. To compensate, he often illustrates his argument with his own designs for furniture and follies.

Jencks makes brilliant connections across vast disciplinary chasms, but to what end? At bottom, there is in all this "new"-ness more a desperate journalistic attempt to manufacture novelty than original polemic. ■

*Drawn for ARCHITECTURAL RECORD  
by Charles Linn*



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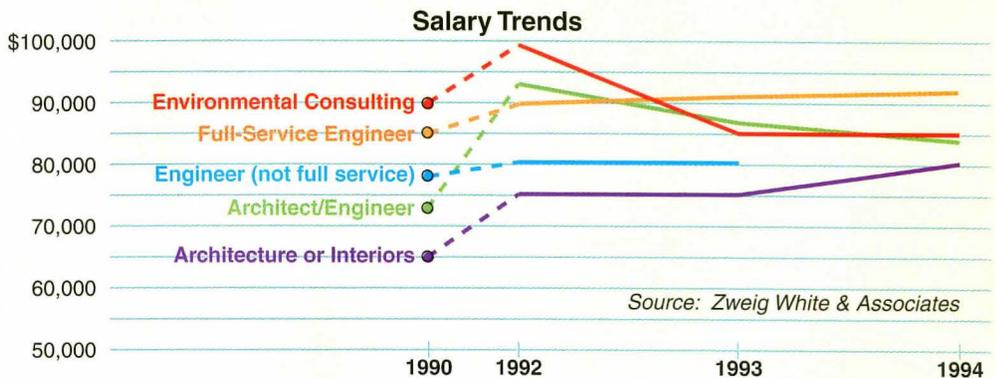
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Indicators

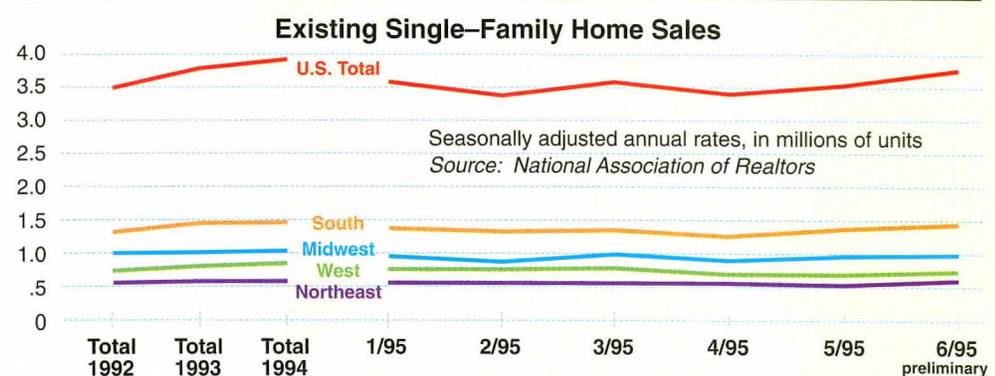
**Principals' salaries up**

Though they remain below those of related disciplines, salaries of principals in architecture-only firms have moved up smartly, according to Zweig White & Associates' annual *Principal's Survey of A/E/P & Environmental Consulting Firms*. Since 1990, architects have seen salaries rise 23 percent, compared to 15 percent for A/E's. Environmental consultants, facing an uncertain market, actually saw compensation slip. (Data not collected in 1991; engineers were regrouped in 1995.) Info: 800/466-6275. ■



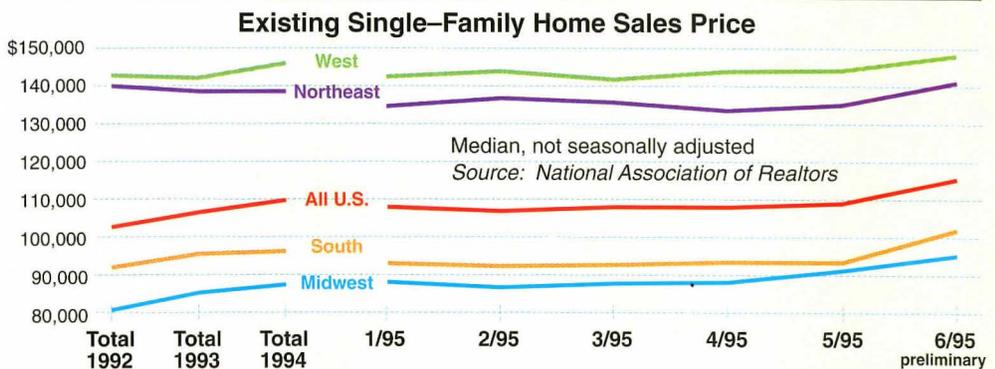
**Home sales turn up . . .**

A decline in early 1995 interest rates has arrested the home-sales and home-building slide that began last summer. The Federal Home Loan Mortgage Corp. reported 30-year, fixed-rate mortgages at 7.53 percent, down from 8.43 percent a year earlier. Analysts expect further rate declines. These trends should bode well for the remodeling as well as the new-construction market. Since such building types as schools and retail are also partly tied to housing, some optimism for these types is also in order. ■



**. . . but prices are still soft in some areas**

The national median existing-home price rose 2.3 percent in June compared to a year earlier. National Association of Realtors' Chief Economist John A. Tuccillo sees the modest increase as reflecting continued price softness in high-cost northeastern and western markets. The Midwest showed the strongest price increases, while the South barely improved. In much of the country, though, prices were steady through much of late 1994 and the first months of 1995. ■



**Short Takes**

• **OSB Litigation:** Directors of Louisiana-Pacific Corp. ousted president Harry A. Merlo, due to L-P's "current litigation situation," according to *The Wall Street Journal*. The company has paid \$46 million in claims related to alleged defects in its oriented-strandboard (OSB) products—a line that has become increasingly popular as a substitute for plywood. (See wood report this issue.)

• **New design/build guidelines:** The Associated General Contractors of America and the AIA have jointly published guidelines for design/build procurement in the public

sector. They address such oft-criticized aspects of the process as the non-payment of stipends for losing teams. It also looks at concerns related to "bridging," in which a conceptual-design team's work is conveyed to a design/build firm ["Architects Out of the Loop?" *RECORD*, March 1995, pages 30-35].

• **Residential and commercial pace June volume gains:** Single-family, multi-family, industrial, and retail construction rose in June, according to *F.W. Dodge* data, while office buildings fell back and institutional types remained level. ■

## Designing the Ever-Changing Workplace

Whether it's called restructuring, re-engineering, Total Quality Management (TQM), or "getting close to the customer," business after business today is going through a process of questioning and fundamentally reorganizing the way it works. The Facility Performance Group, Inc. (FPG) has been analyzing these new work patterns and how companies cope with the related space-planning and design issues. FPG's research shows that new ways of working are so different that they open uncharted design territory—where there's ample opportunity for a creative design team to completely rethink what the workplace is.

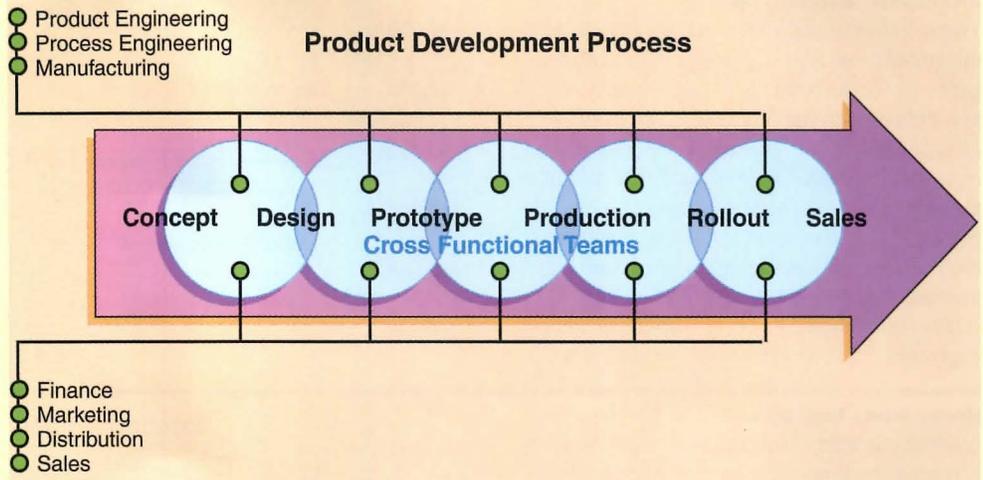
This story condenses two "Best Practice Planning" reports by FPG president Jon Ryburg, "Emerging Work Patterns," and "Strategic Planning." (Though it typically refers to in-house facilities staff, conclusions apply equally to private-practice architects and other consultants.) The full reports are available from the Facility Performance Group, 1000 Victors Way, Suite 300, Ann Arbor, MI 48108 (313/930-9955).

The sea change in the way many companies work is driven by competitive pressures that force businesses to get products and services to market faster and to continuously improve them. Emerging work patterns often conform to some broad categories.

- **Continuous innovation:** A goal of Total Quality Management (TQM), companies seek this in two ways. They continuously improve products or services being developed, and they continuously improve the structure and organization of the process by which products are developed or updated. All the companies studied in the research had experienced several waves of restructuring. Organizations found they couldn't do it right the first, second, or even the third time.

Executives admitted that the TQM goal of continuous improvement meant that restructuring was also continuous, a new fact of life in their organizations. Companies that had

*Related articles recently published in RECORD include: September 1994, pages 88-91; "The New Workplace" (theme issue), June 1992; September 1991, pages 100-105.*



The chart shows an example of a cross-functional team approach to developing a new product or service. By soliciting input from

all affected units throughout the process, companies hope to save time and improve quality by avoiding costly late-stage rework.

included real-estate and facilities departments as TQM partners understood the implications for facility planning and management. Those that did not thought—inaccurately—that facility churn rates of 150 percent and higher would end after an initial restructuring. They didn't.

- **Concurrent vs. linear workflow:** Prior to restructuring, as many companies describe it, one department would "throw" its finished part of a project "over the fence" to the next department, which performed its task, and so on, until the new product or service was completed. The departments rarely communicated with one another, which often meant products had to be returned to earlier phases for re-work or Band-Aid-type fixes.

The result was products of substandard quality that got to market late. Now companies are vertically integrating tasks and people into cross-functional teams (diagram above).

Companies have always used teams, but traditionally as part of a linear process. Individuals would prepare on their own, then meet to present and defend ideas. Afterward they would return to their separate offices to get "real" work done. Today, participants use the word *collaboration* to describe team interactions, rather than simply *communica-*

*tion*, because it conveys a truer sense of what is needed to work together effectively.

Working in such teams is intense, and it turns conventional notions of staff deployment upside down. In the linear, mass-production approach, the number of staff involved in a project steadily increases as rollout approaches. In Japan, the number of staff involved is highest at the beginning of projects, tapering off as problems are ironed out. Recent U.S. experience has involved its greatest human resources toward the middle of a team project. In general, companies are still shifting in the direction of Japan's model. The impact on facilities is that the space required to support teams and meetings increases dramatically. Ninety percent of analyzed companies found that meeting space had to be at least doubled.

### Emerging work patterns

Many companies that undertake restructuring see profound cultural change in their workplace. Cultural anthropologists call this a shift from a "low-context" (i.e., individualistic) culture to one that is high-context (more interdependent, similar to cultural patterns in Japan, France, and Italy). Managers who understand the fundamental nature of these changes also tend to recognize the critical facility implications well.

- **Convergent work patterns** support the for-

*Companies are recognizing that facility design can either help or hobble corporate re-engineering. To succeed in this emerging area, designers must work with clients in an entirely different way.*

mation of cross-functional teams. For teams to operate effectively, members, and the functions that critically support them, must be as close together as possible. As many as 10 to 20 company units, located in several different states, might be brought together on a single site within a single building or campus of buildings.

The most effective convergent sites turn out to be either extensively renovated existing buildings (often underutilized factory space) or totally new construction consisting of three or four donut-shaped floors wrapped around atrium cores and linked by expansive open stairways. (See following pages for one example.)

The least effective and most difficult convergent-pattern sites were those where companies tried to use current buildings that were not suited to, or easily adaptable to, team use. For example, it has proved difficult to integrate the culture of groups of units when they are on separate floors of standard office buildings, linked only by elevators. Indeed, most standard office-building configurations tended to maintain a separation of functions, reducing rather than encouraging communication among units.

A secondary benefit is that such consolidation often generates large reductions in real estate costs, as unused sites are either sold, leased, or retained for other company uses.

• *Divergent patterns* support another important TQM goal—to get key functions related to marketing, sales, and customer support as close to customers as possible. As a result, centralized offices have been consolidated or abandoned. Some consultants even work at customer locations.

Divergent work patterns also require new kinds of teams, but ones with a less formal structure. Team members come together informally to pool resources. These teams differ from cross-functional teams in that individual units or members do not work together in lock-step to accomplish a defined task from beginning to end. Team members may brainstorm to crack a new market, find new ways to sign clients, and so on. To support informal meetings, these groups

need space that permits and invites collaboration as circumstances dictate. As companies move to divergent work patterns, they typically find they can reduce office space used—even eliminate entire locations. Seventy percent of analyzed companies found that regional, field, and local office spaces could be reduced between 50 and 100 percent. But these companies found that they had to analyze their space needs much more carefully. They had to give up a “one size fits all” mentality, replacing it with a spectrum of spatial solutions.

Indeed, companies now need to view office-space configurations as a set of tools critical to meeting TQM objectives. Prior to restructuring, much of the office space in the analyzed companies was mindlessly identical, and had largely lost any effective relationship to the real work of people or larger organizational goals. Convergent and divergent work patterns, however, require specific types of “alternative” office configurations.

#### **The convergent-work space**

• *Traditional Offices:* Traditional private offices were still used by more than half the analyzed companies, but they have been made much smaller. The freed-up space is reallocated for team meetings. Open-plan spaces were still used by nearly 70 percent of the analyzed companies in more than half of their locations. Since restructuring, the size of these spaces has also decreased by as much as 25 to 50 percent, to provide more team-meeting and project rooms.

• *Home Base and Shared Spaces:* This approach is a more sophisticated variant of restructured traditional office space. Home base/shared offices (or “cave and commons”) encourage team interaction by providing even smaller private offices for individual work requiring concentration, combined with more shared spaces. The latter are large and inviting. They may incorporate work tools (computers, white boards, A/V support), amenities such as coffee bars, and comfortable, informal furniture. They support greater variations in team size, project cycles, and duration. Management has appointed these spaces well to encourage team members to spend time together.

• *Multi-site (Flexplace):* This type of space

eliminates the dedicated private offices and separate team spaces by combining both into a single workplace. This approach has been found to be feasible when team members are assigned primarily to a single project (other companies might assign individuals to several different teams at once), and when a team member reports to his or her team rather than to a functional department. Flexplace offices contain dedicated (assigned) spaces, which may be shared, along with team-meeting areas. About 20 percent of the analyzed companies use this approach.

#### **The divergent-work space**

Since these types represent the greatest departure from standard office layouts, companies often move from one type to another as they come to understand their new work processes.

• *Shared/Assigned:* This is the most common divergent-work configuration. Such office space is filled with small, individual cubicles, each typically about 16 sq. ft. Each cubicle may be pre-assigned to as many as three users. Adequate, convenient, and lockable storage for users is provided either within the cubicle or close by. The most successful shared/assigned offices include at least some open space for meetings of up to six individuals. This is the least flexible divergent arrangement, but works well if matched carefully to the needs of users.

The biggest problems include the minimal size of the work area (typically only 4-ft-wide), and the fact that it is fixed. Conflicts also arise because no user is ever sure that the workstation is not already occupied. (Hiring a person to coordinate scheduling is typically viewed as too expensive.)

• *Just-In-Time Spaces:* JIT spaces were most frequently found in locations used by sales, marketing, and customer- or product-support personnel, although a few companies use them for cross-functional teams. JIT offices were the second most frequently used divergent-work layout. Basically, they are shared office spaces (of a wide variety of configurations) that are usually scheduled for use as individuals or teams need them. (“Hoteling” is a widely known form of JIT space.) Small lockers are assigned to individuals, who carry

their work materials to an available office space, then store them when finished. The simplest layout is a string of rooms along a corridor. The more elaborate versions can be completely fitted out on request by facilities-support staff with walls, furniture, computer hardware and software, telephones, and supplies.

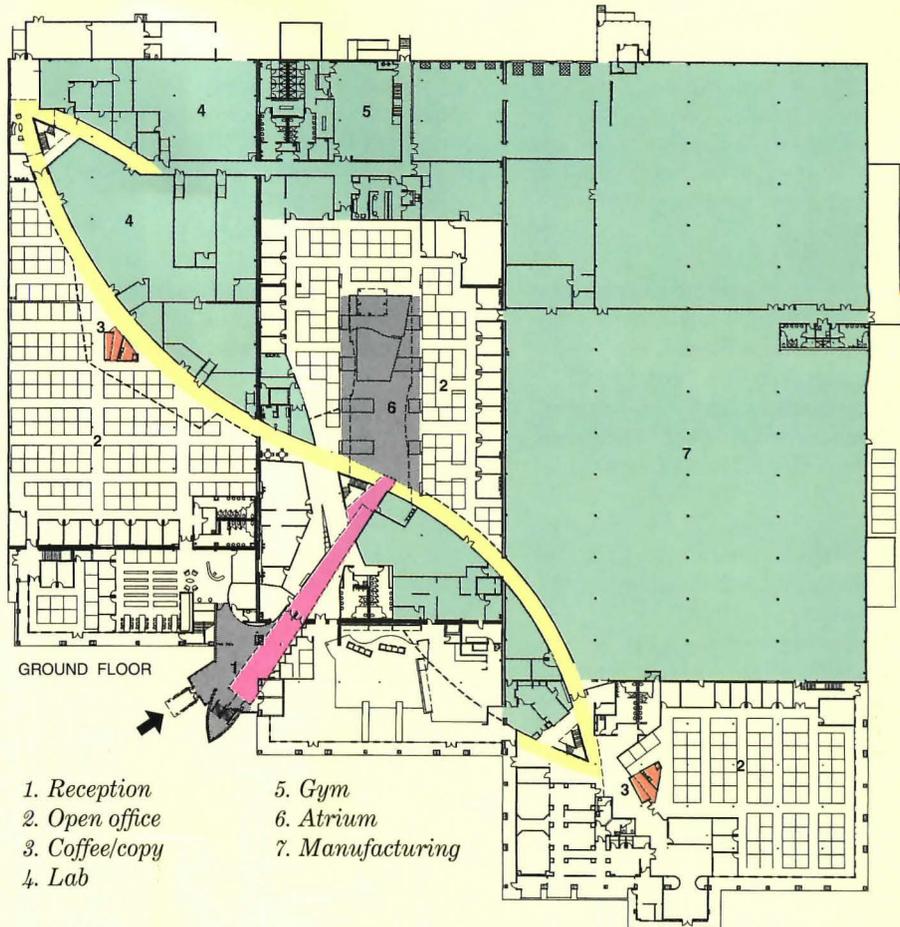
Users of these spaces often find assigned storage space insufficient. The most basic layout—standard-sized private offices lining a common corridor—did not readily accommodate informal pooling of ideas and market intelligence. Hoteling spaces were often too small to accommodate meetings of as few as four to six. The most successful hoteling schemes provide an option for more storage (in carts) and one or two larger spaces to support meetings for up to eight people.

• *Non-Territorial (Free-Address)*: Those companies with the most experience in JIT/hoteling and shared/assigned office spaces often found themselves moving some functions to non-territorial/free-address solutions. Generally, these locations are planned to include a mix of private and open-plan offices as well as team and retreat areas.

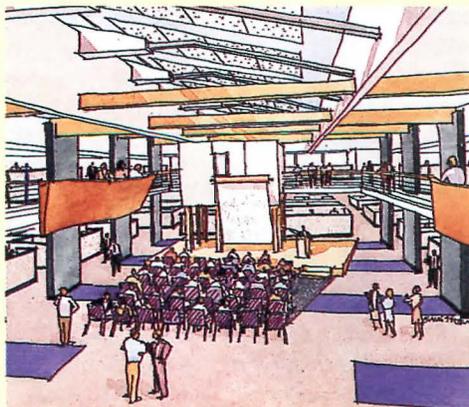
The idea is that employees move to the space best fitted out to perform a task, whether that be a meeting room, archive, or private-work area. Storage is most often provided in pre-assigned mobile storage carts (or “little red wagons” as one company put it), which personnel use to trundle work materials to appropriate settings. Employees pick up cordless telephones when entering the location, and take them wherever they go.

Because such an arrangement does not fit standard formulas for allocating space, a company must carefully analyze its process before embarking on a non-territorial solution. It must research the work process, and its privacy, storage, teaming-technology, ergonomic, and utility needs. The frequency and duration of use of each area must be understood.

In the majority of cases, non-territorial offices have been used only to support divergent-work patterns. However, companies are experimenting with non-territorial solutions



- 1. Reception
- 2. Open office
- 3. Coffee/copy
- 4. Lab
- 5. Gym
- 6. Atrium
- 7. Manufacturing



*To support concurrent engineering of new products, Northern Telecom plans to divide an existing factory in Santa Clara, Calif. (left) into a facility that permits engineering, manufacturing, and other functions to work together. Because the groups were separated 35 years ago, there was staff resistance to the new approach. During the programming phase, the company and STUDIOS architects solicited ideas and needs from the involved groups. To forge a more attractive environment, STUDIOS carved a curving spine, a new atrium (bottom left), and a new common entrance, encouraging planned and spontaneous interaction (plan).*

*Companies see profound cultural change in their workplace . . . from a "low-context" (i.e., individualistic) culture to a high-context one (more interdependent, akin to that of Japan, France, and Italy).*

for convergent, cross-functional teams. A small number of analyzed companies (and others we have spoken to) were either using or considering a free-address approach throughout their organizations.

• **Floating Office/Home Office:** Nearly 10 percent of the analyzed companies eliminated their divergent-pattern offices altogether. These companies gave their people powerful mobile computing and telecom technologies to enable communications on the road, access to data, ability to send and receive e-mail and faxes, and collaboration with team members in far-flung locations. You can see the "office" as being wherever the worker is—car, plane, home, or customer location. As of 1994, floating-office solutions were confined to field sales and selected technical staff.

#### **What work pattern fits best?**

For facilities to support a company's actual work patterns, the company must itself examine how each component fits on the convergent-to-divergent spectrum. Research, styling, design, and engineering are typical candidates for convergent, team-based organization. Production and distribution may be more demanding in terms of technically specialized facilities, which may mean that other relevant functions must cluster nearby.

Administrative functions, such as legal, finance, and planning, may be organized in either type of pattern, while customer-service, sales, technical-support, and marketing functions might best be accommodated in divergent patterns.

#### **Allowing for collaboration**

High-involvement, team-oriented organizations and teams must be supported by facilities that enable a much higher level of interaction. Nearly all of the companies analyzed by FPG found that at least three types of collaboration required facilities support.

• **Planned Communications:** These take place in scheduled meetings, the need for which increases by as much as three or four times, compared to traditional work patterns. Companies need to add at least twice the number of meeting rooms, and often as many as three or four times.

Japanese auto companies in the U.S. recognized this need earlier than American companies. The average Japanese firm provided between 30 and 32.5 sq ft of space per person for scheduled meetings, while American firms provided only 6 to 17 sq ft per person. Though American companies understood the productivity benefits of cross-functional teams, they didn't realize it would lead to such a big shift in the amount of time that individuals would spend working together. Nearly all of the American companies used their prior space standards in restructuring, only to find that space had to be modified and reallocated to support team-meeting and communication needs.

• **Spontaneous Communication:** Each of the analyzed companies experienced a three- to four-fold increase in "communication events" among team members outside formal meetings. Successful teaming occurred in both the convergent and divergent work patterns when members could readily keep one another updated on new information and insights. In a traditional layout of shoulder-high cubicles, employees typically stand up and look around to see if the desired colleague is "in," but they often can't tell unless that person is standing up and looking around too. Teamed staff asked that panels be lowered, or complained that a maze of private offices kept members too isolated. Telephones haven't proved "spontaneous" enough (due to "telephone tag"). E-mail has not been considered adequate to the information-sharing task or didn't support the need for immediate response.

Many companies thought they needed to create places for spontaneous meetings. Most learned, however, that planning the total environment to support new ways of working proved more effective than the allocation of specific "spontaneous-communication" places.

As companies learned from these complaints, they made workstations more open, and located the team's home base or their dedicated offices closer together. Two companies were installing a closed-circuit television system in key buildings so that individuals could quickly scan areas to find roving colleagues. Three other companies were using mobile telecom products (beepers, cellular

phones, and small cordless telephones) to keep team members in touch.

• **Chance Communication:** In the past, even individuals within the same functional department often didn't know one another—it wasn't considered productive. Now companies encourage chance encounters because team members never know who might have special knowledge or expertise that could be applied to the project at hand or in the future. Individuals are increasingly expected to meet and know something about their colleagues.

This type of communication is often enhanced through architectural amenities (plantings, windows, informal gathering spaces, coffee bars) and upgrading utilitarian spaces (entrances, corridors, cafeterias), to reinforce unplanned encounters. Even reserved executive parking, once a perk, has been discontinued, so that early-arrivers are rewarded, and more unplanned encounters can occur. In 10 percent of analyzed companies, dress codes were relaxed, making executives more approachable, and removing the stigma of uniforms for support staff. Some companies permit coffee breaks only if they are taken outside the "home" area. Five companies were experimenting with full-motion, two-way video to link break areas on different floors and in different buildings.

The "high-involvement" culture of restructured companies means a different use of technology. Instead of working alone using only a fixed, desktop computer, staff at nearly all of the analyzed companies use portable computers at team-meeting sites. Several companies were beginning to use what they described as mobile "shirt-sleeve" teleconferencing technologies. These permitted nearly full-motion video, excellent audio, and some computing tools that could be used by team members located at different sites.

#### **Dealing with the desire for privacy**

Prior to restructuring, most employees saw more privacy as a perk. Most said they wanted greater privacy, not less. Studies even associated privacy with increased productivity and satisfaction (primarily by giving the employee greater control of the number and kind of outside contacts). Yet restruc-

*Continued on page 62*

## Framing Techniques Change to Match Resource Quality

*An update on coping with limited amounts of high-quality lumber. A separate report compares environmental aspects of metal and wood.*

By Dana Holbrook

Turner Brooks is in the kind of quandary many architects face these days. A principal at Brooks and Carey Architects in Burlington, Vt., Brooks is in the early design phases on two projects for which he'd like to specify wood framing. But the quality of the wood he's seeing is poor. "It's soft and rots so quickly. The old window casings hold up better than the modern equivalent of the same species," he says.

One alternative is to specify steel. Including materials and labor, the costs of wood and steel are about equal for both projects. Still, Brooks is reluctant to go with metal—most contractors are uneasy with it; it's not as readily available as wood; and, unless it's fire-insulated, the thickness of steel commonly used in light framing buckles and deforms quickly in fires. That leaves engineered lumber, which is too expensive to use for the whole building, or masonry, which brings its own set of design limitations.

Everyone, from lumber-industry experts to carpenters, seems to agree that the quality of wood just isn't what it used to be. For example, a recent survey conducted by the National Association of Home Builders (NAHB) found poor lumber quality among the biggest problems builders face. Their complaints included framing lumber that's prone to twisting, splitting, and warping.

### Coping with what's available

Declining quality [first reported in RECORD, December 1990, pages 39-45] remains a valid concern, says William Dost, a wood-technology consultant in Berkeley, Calif. Within the past 10 years, the lumber resource base shifted from the large, old-growth trees of the Pacific Northwest to smaller, younger trees from a variety of sources. "The fact is all the old-growth timber is either gone or in preserves," he says. "You can blame the environmentalists for locking it up, but even if we cut the last of the old-growth trees, the supply would see us through only a few more years. The switch to different lumbering practices was inevitable."

*Dana Holbrook is a writer in Westport, Conn., who specializes in technical and construction issues.*

Much of the structural timber available today, regardless of species, is milled from trees that average 40 to 60 years in age. The products tend to be smaller because the trees are smaller. Solid 6 by 16s, for example, are harder to find. Logs from young trees yield a higher percentage of boards that contain softer, less dense, juvenile wood, with less vertical grain and more knotholes. That means more shrinkage along and across the grain and a greater propensity for cupping and twisting.

Smaller trees also mean that more boards will have wane (natural edge chamfers on pieces that come from the tree's outermost layer). While the amount of wane that's allowable is limited by industry standards, a greater percentage of boards come closer to meeting the maximum.

There are some advantages to wood cut from juvenile logs, Dost says. Knotholes are smaller and of less structural or esthetic concern. The slope of the grain can add to the strength of the member. "What we're seeing is more wood in the middle grades," says Timm Locke, spokesman for the Western Wood Products Association. "There is a greater likelihood of dimensional instability, but that can be compensated for by selecting kiln-dried lumber, which reduces warping and cupping."

Another alternative is to switch to structural glued lumber, including finger-jointed studs and face-glued members. They combine smaller pieces that don't have knots and other defects, and yield a stronger member. These are graded like normal lumber. Face-glued pieces can be ordered with clear, vertical-grain face veneers where appearance is important.

Some mills are marketing a premium-stud grade. It's more expensive but it's higher quality and, for clients who are concerned about the appearance of their framing lumber and the lack of supply in conventional appearance grades, premium studs look better than structurally graded ones.

### Addressing structural performance

The lumber industry's In-Grade program, which was instituted in 1992 but is showing

up in code books this year, was developed to assure that the changing composition of the wood supply would not compromise structural performance. Wood researchers and engineers developed new design values based on the performance of timber that's actually available, rather than on theoretical values. Load tables based on In-Grade values have regrouped species, and permit reduced maximum spans for some species and grades.

To maintain quality and performance without sacrificing environmental values, more architects are mixing lumber, engineered wood, and steel. Richard Fernau, a principal at Fernau and Hartman Architects in Berkeley, Calif., says finding contractors who can deal with these hybrids requires effort. But the results are worthwhile. "I save good wood for important places—where it will be seen or relied upon structurally. But I won't bury it in stud walls anymore," he says.

### Varying views of the forest

Even if an agreement brokered by the Clinton Administration between Pacific Northwest environmentalists and logging interests is scuttled (as some in Congress seek) or the Endangered Species Act repealed (the proximate cause of old-growth harvesting restrictions), more lumber companies are trying new techniques to manage for sustainability—if for no other reason than to improve production, provide for future harvests and, in some cases, decrease production costs.

In the broad sense, harvesting for sustainability means looking at the long term and taking into account the forest's ecological role when evaluating future supply needs. More specifically, sustainability includes prompt reforestation (within three years of harvest) and limited clear cutting.

"This sort of planning and stewardship has been going on for a decade, according to the wood industry," says Jim Pissot, director of the state of Washington State's National Audubon Society. "But in reality, aside from a few companies that try to take a balanced approach to forestry, we're still seeing a lot of reckless practices." Regional clear cutting, for example, persists, he says. And while six trees are planted for every one that's cut, by

the time those trees are ready to harvest, only one has survived.

The American Forest and Paper Association (AFPA), meanwhile, recently launched a sustainable-forestry initiative that's endorsed by a number of environmental groups, including The Conservation Fund. The initiative gives members specific steps to follow that contribute to biodiversity, protect special sites, minimize the visual impact of harvesting, and improve wood utilization.

"I don't think the tension between our members and the environmentalists is as strong as it was a few years ago," says Cinda Jones, AFPA's director of marketing. "I think they [environmentalists] realize how much we are doing to protect the forest—how much we've always done. Our members' livelihood depends on perpetuating the forests."

#### Management versus sustainability

Forest management is related to sustainability but focuses more on improving production and keeping costs down. Management practices vary somewhat regionally. Southern pine, for instance, is grown on tree plantations and harvested in 30- to 40-year cycles. In other parts of the country, tracts of land are planted with seedlings, usually of the same species. The land may be fertilized and cultivated. But more often, the trees are simply thinned as they grow to maximize access to sunlight.

Economically speaking, trees grow fastest in their first 30 to 60 years. Waiting beyond that rapid growth period to harvest them yields little additional wood. But environmentalists are opposed to such rapid cycles because it doesn't give the habitat a chance to stabilize.

What's worse, according to such groups as Save America's Forests, in Washington, and the Rainforest Action Network, in San Francisco, is the agricultural approach to forestry that such management practices foster. "These are industrial forests, not ecosystems. A walk through the woods is more like a walk through a cornfield—no variation in species, no diversity," says a spokesman for Save America's Forests. Pissot agrees. "[Agricultural-style] management is unnat-

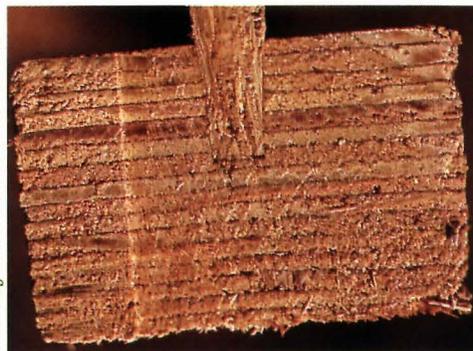
APA/Engineered Wood Association

Courtesy Arizona Public Service Co.

Courtesy Arizona Public Service Co.

Courtesy Arizona Public Service Co.

## An Engineered-Wood Primer



### Glued-Laminated Timber

Made from pieces of lumber no greater than 2-in. thick that are face- and end-bonded with melamine or pheno-resorcinol adhesive. The grain in all laminations is parallel. The grade of the individual layers varies through the depth of the member; highest grades are located in maximum-stress zones.

**Uses:** Primarily for beams and headers; available in various appearance grades.

**Species sources:** Southern pine, Douglas fir, hemlock, red maple, yellow poplar.

### Laminated-Veneer Lumber

Made from thin veneers of wood (much like plywood), bonded with pheno-resorcinol adhesive. Veneers are positioned with the grains running parallel.

**Uses:** Substitute for dimension lumber in beams and headers. Also used as flanges for wood I-joists (see bottom item).

**Species sources:** Southern pine and Douglas fir.

### Parallel-Strand Lumber

Made from long veneer strands (typically smaller and narrower than those used in laminated-veneer lumber) bonded together in a parallel configuration with pheno-resorcinol adhesive.

**Uses:** Substitute for dimension lumber in beams and headers.

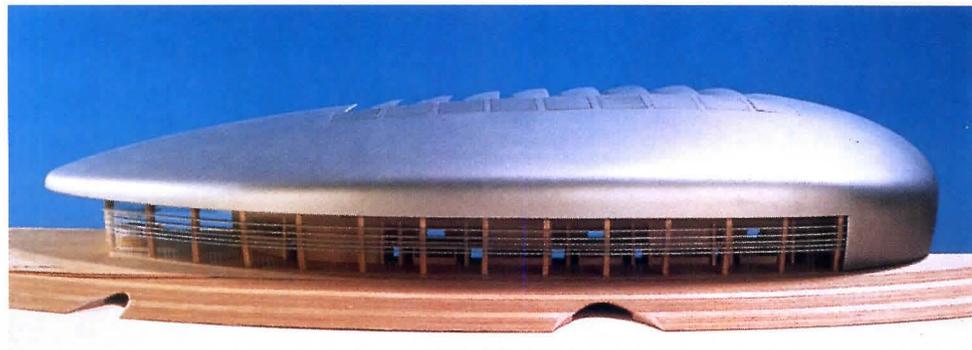
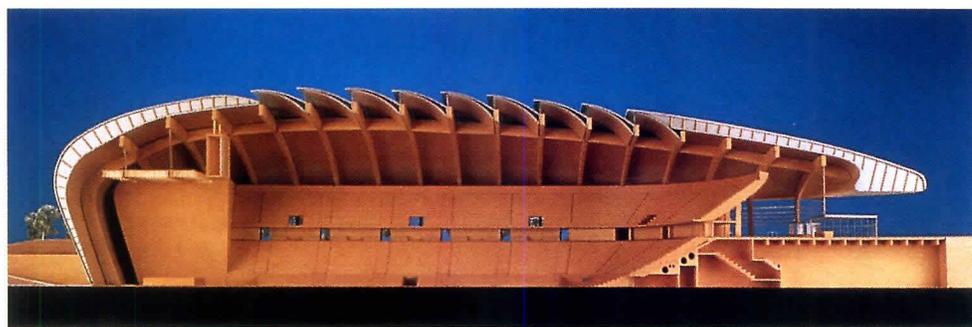
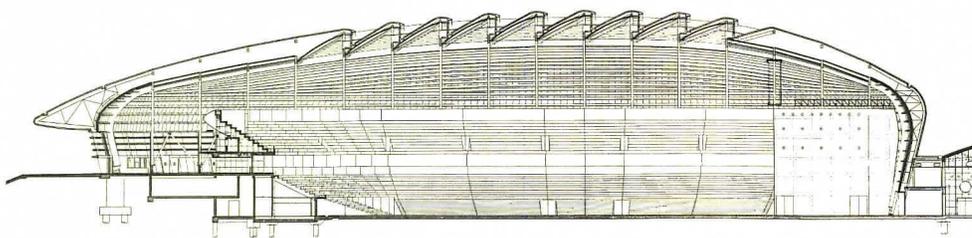
**Species sources:** Southern pine, Douglas fir, yellow poplar, hemlock.

### Wood I-Joists

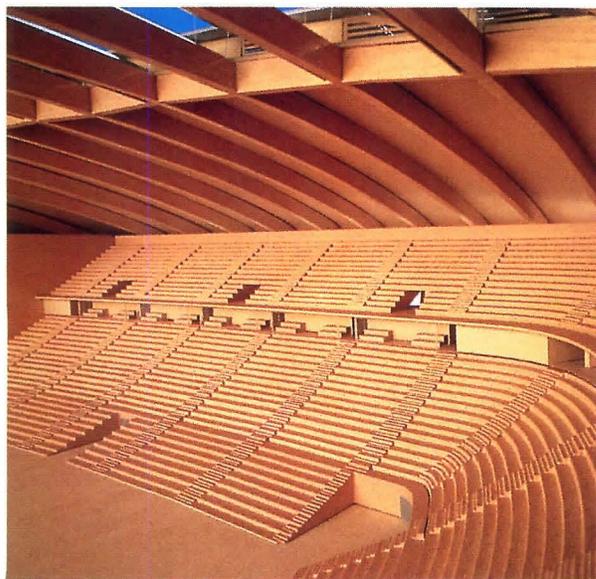
Flanges are typically made from dimension lumber or laminated-veneer lumber. Web is made from oriented-strand board (photo) or plywood. Components are joined with pheno-resorcinol adhesive. May be purchased in standard sizes or fabricated to suit.

**Uses:** Floor joists, rafters.

**Species sources:** Southern pine, Douglas fir, aspen.



**Wood-Framed Arena:** *The London office of Skidmore, Owings & Merrill is working with Regino Cruz on a glu-lam framed arena for Lisbon's Expo '98. While an existing dome in Tacoma, Wash. is structured similarly, the Lisbon project may require beams as deep as 4m (about 13 ft). Principal Robert Turner says the design's boat-like imagery evokes the city's maritime traditions. The metal-clad roof will be supported by wood purlins that span the gaps between the deep beams. Ventilation will be supplied from under seats, allowing the architects to keep the elegant ceiling clear of ductwork.*



© Andrew Putler photos

ural and over-simplified." A better approach is that used by some small timber companies, including Murray Pacific Corp., based in Tacoma, Wash. They've surveyed their lands for endangered species, set aside 10 percent in reserves that will never be cut, and practice what Pissot calls "gentle harvesting" instead of clear cutting.

**An end to volatile pricing?**

As conservationists and foresters wrangle, land remains tied up in legal battles, slowing logging production. The result is reduced lumber supply and fluctuating wood prices. Worries about pricing make a reliable bid difficult. While mill-direct prices are holding at about \$300 per 1,000 bd. ft. for dimension lumber, they were as high as \$500 per 1,000 bd. ft. less than two years ago.

Deborah Berke, an architect in New York City, explains, "Contractors are skittish about committing to a price unless there's a very short lead time. Prices have stabilized somewhat, but I think everyone feels it's just a matter of time till they start climbing again."

Prices are down now because demand is slack, says Jay Shackford, vice president of public affairs for the NAHB. But when the housing market improves, there will be greater demand, and lumber prices are likely to jump once again. "Builders and architects must look increasingly to wood substitutes or hybrid framing to protect themselves from cyclical lumber prices," he says. Adding further complexity, it's unclear whether consumers will pay more for lumber from forests managed for sustainability.

**Framing alternatives**

Despite all the talk about steel framing as a viable framing alternative, less than 3 percent of all new homes incorporate it, according to the NAHB. "This industry is slow to change. Carpenters don't like steel; they can't use a saw on it, and they can't run down to the lumberyard and pick up a steel I-beam," Berke says.

There are other problems with steel as well, including a lack of standards and coordination among the manufacturers and some performance problems. "From what we've seen, architects are most likely to do parti-

## Is Wood or Metal "Greener"?

tion walls with nailable steel studs or to save steel for big spans," Shackford says.

Meanwhile, the use of engineered lumber, particularly wood I-beams, has increased tremendously in the past five years and is expected to double within the next five years, says Tom Williamson, executive vice president of American Wood Systems, part of APA-The Engineered Wood Association, a trade group in Tacoma, Wash. Advocates promote engineered lumber's environmental advantages. It incorporates parts of trees previously discarded and species not used for structural lumber before, including yellow poplar and aspen, says Williamson.

### Has quality been engineered in?

Because engineered wood is a manufactured product, it can be designed for strength and reliability. However, apart from structural panels, there's no industry-wide standard to control the quality of engineered lumber. There's an industry consensus on glued-laminated members and a standard is being developed for wood I-beams.

"The more you re-form wood, the more dependent you become on the manufacturing process," Dost says. "So the manufacturing process needs to be regulated somehow so you can be sure of what you're getting." As the industry stands now, it's best to specify a manufacturer and to have some experience with their products, he adds. "Not all engineered wood is wonderful."

Another problem is that while all types of engineered lumber can be fire-retardant treated, it's not done routinely. "After all the problems with fire-retardant treated plywood [in which treatment accelerated deterioration], the specter of litigation looms large over the manufacturers," Dost says. As a result, fire-retardant members must be custom-ordered.

Many architects are willing to spec engineered wood but, like Deborah Berke, they consult with an engineer to make sure of the design values and the quality of the product. Berke also looks for contractors who are comfortable with engineered wood. "Many contractors aren't what I'd call 'fluent' with it yet," she says. ■

By Nadav Malin

The disappearance of America's primeval forests, an issue forced into prominence by the controversy over protecting the spotted owl, has received enormous attention in recent years. Out of this debate, many designers have begun seeking alternatives to wood—such as steel—on the assumption that any material that doesn't deplete forest resources is environmentally preferable.

But a dispassionate comparison from an environmental perspective must look at the broad picture. Focusing only on where materials come from—the forestry issues—omits many other important factors. One should also look at pollution from manufacturing processes, impacts on building energy efficiency, and disposal or recycling options. Such an analysis may help us choose *the* most appropriate material for light framing, or it may suggest how materials can be used to best advantage.

### Many kinds of forestry

Beyond the fact that wood comes from trees, there are no universal truths about lumber harvesting. Trees may be cut from pristine, old-growth forests, regenerated forests (also known as second-growth), or plantations. They may be harvested selectively, or in large clear-cut swaths, and the cutting may be planned for short-term financial gain or long-term, stable income.

Even carefully replanted forests may lose many of the qualities that make forests so valuable environmentally. Increasingly, diversity is recognized as a key element in the resilience and value of ecosystems, and healthy forests are home to a range of plant and animal species, as well as trees of varying ages. Industrial-scale forestry, however, prefers uniform stands of trees, all of the same species and age. In effect, replanting after a clear-cut may be the same as replacing a forest with a monocultural plantation that is no more diverse than a farm field.

Ultimately, how forests are managed depends largely on what they are being managed for.

*Nadav Malin is managing editor of Brattleboro, Vt.-based Environmental Building News.*

For a forest to be recognized as environmentally sustainable, the values of habitat and wildlife protection, esthetics, and recreation must be balanced with the goals of optimum timber yield. Environmentalists believe that ultimately ecological and economic interests do coincide, as only healthy, diverse forests will continue to produce timber indefinitely, while single-species plantations will eventually succumb to erosion, nutrient depletion, and disease. Forest operations such as that of the Menominee Native American tribe in northern Wisconsin have demonstrated that ongoing harvest can be compatible with other forest values. Their 220,000 acres are just as healthy and diverse as they were in 1854, when logging operations—and comprehensive forest management—began.

The Menominee forest is one of a handful in the U.S. that have been certified by independent agencies as "well-managed" forests. Many certification organizations have recently cooperated to create the Forest Stewardship Council (FSC), an international oversight body working to ensure common minimum environmental certification standards.

The American Forest and Paper Association (AFPA), representing 80 percent of the U.S. forest-products industry, this year announced its own "Sustainable Forestry Guidelines." These guidelines move the industry closer to FSC criteria, but FSC-member organizations still feel that they fall short. Most significantly, the AFPA guidelines contain no provision for independent inspection or documentation of forestry practices, leaving all reporting up to the companies themselves. Because the AFPA represents so much of the industry, however, its guidelines may lead to widespread, if incremental, improvements in the forests.

### The limits of man-made lumber

Engineered wood products, including wood I-joists, laminated-veneer lumber, and parallel-strand lumber, may be made from smaller-dimension trees. In some cases, tree species are used that otherwise have little commercial value—an important diversification in the use of the forest resource. Engineered wood also requires binders. All are currently produced from natural gas and

petroleum. Both the limited quantity of these fossil fuels and the serious environmental impacts associated with their extraction and processing detract from engineered wood's environmental advantages. Whether or not the specifier should choose it over standard lumber may ultimately depend more on the specific application.

Thermally, products such as wood I-joists are better than solid-wood joists because the section that spans the cavity is thinner, conducting less heat. Batt insulation manufactured to fit between standard wood members will not work with narrow engineered-wood sections. Wider batts that fill

*"A knee-jerk reaction to avoid wood products may be misguided. Alternative technologies [such as engineered wood or metal] can have significant environmental disadvantages."*

the cavities completely must be specified in order to avoid gaps.

#### **Steel: advantages overstated?**

In contrast to the large land areas potentially spoiled by forestry, the raw materials for steel come from mines that are much more geographically contained. While there are certainly some downstream impacts from mines, including possibly toxic runoff from tailings and site erosion, it is the energy-intensive manufacturing process that may be more environmentally significant. Large quantities of metallurgical coal are refined into coke which is used to make iron from iron ore. These coking and iron-making operations release various air and water pollutants, though the industry has drastically reduced emissions and improved efficiency in the last decade.

Zinc-smelting—required for galvanizing steel—is also environmentally problematic, to the point where many U.S. facilities have shut down and some have been listed as Superfund cleanup sites. Once an exporter of processed zinc, the U.S. now imports about two-thirds of the zinc it uses, and we may be

exporting the associated environmental problems to countries with less strict controls. The zinc (galvanizing) coating on light-gauge steel framing accounts for 3 percent to 5 percent of the material by weight.

The high levels of recycled content commonly ascribed to steel don't generally apply to the sheet steel from which most light framing is made. While the electric-arc furnaces that turn scrap steel into new use up to 95 percent recycled material, these plants don't have the enormous facilities required to "cold roll" steel into sheets. Almost all sheet steel is made instead at larger mills that make both iron and steel in the same plant. These mills

use basic-oxygen furnaces to refine the iron into steel, using 25 percent to 30 percent scrap steel in the process. Some of this scrap is manufacturing waste, however, which is not usually considered recycled material. Steel made in a basic-oxygen furnace is roughly 20 percent recycled material. As nearly all light-gauge framing is made from such steel, the average recycled content is between 20 percent and 25 percent. This percentage may increase significantly, however, as electric-arc furnace operations develop the process of casting molten steel directly into thin sheets.

#### **Steel's problem: thermal performance**

A product is only manufactured once (even if, as hopefully is the case, the material is later recycled into a new product). After it is installed in a building, however, it will serve for decades. For this reason, it's a significant, ongoing liability that steel framing conducts 10 times more heat than wood framing. If a building envelope is insulated only in the cavities between the framing members, the steel framing will reduce the insulation's performance by more than 50 percent (compared with 10 percent to 15 percent for wood framing—table opposite). These figures are

for simple wall sections, without openings or junctions. When the extra framing required for these details is taken into account, the thermal performance drops another 20 to 40 percent, according to researchers at the Oak Ridge National Laboratory.

Those seeking to reduce steel's energy penalty suggest applying insulating sheathing (typically extruded or expanded polystyrene boards), over the outside of the framing. Tests done on actual wall sections produced the surprising result that adding insulation in this way actually improves a wall's performance by up to 20 percent more than the insulating value contributed by the sheathing alone. Apparently, by reducing the temperature differential between outside and inside of the steel studs, the added insulation reduces thermal bridging within the wall. The American Iron and Steel Institute has published recommended insulation levels for various regions of the U.S. Unfortunately, the recommendations are based on heat-loss data only. No added insulation is recommended in climates with high cooling loads, perhaps because the calculations used did not take into account potential energy use for cooling.

An outer layer of foam insulation adds to both the cost and environmental impact of a framing system, however, so other solutions are still being pursued. Several designs have emerged for steel studs that conduct less heat, but so far none of these has a documented performance improvement of more than 10 to 15 percent. Another approach reduces the number of thermal bridges through the envelope. Simply changing from 16-in. on-center framing to 24-in.-on-center improves a wall's performance by about 20 percent. Researchers at Oak Ridge and other institutions are designing proprietary framing systems using steel in more efficient configurations. Techbuilt Systems, Inc., of Cleveland, is also trying new a new system. It has installed Thermotech 21 in over 200 structures. Only four bolts penetrate the thermal break that separates 1-in.-by-2-in. steel tubes at the exterior and interior of the wall (opposite bottom).

Rather than switch to steel throughout, many builders are using metal only for interior partitions, as in commercial construction, which

avoids the thermal-bridging problem. The lighter-gauge steel available for use in non-load-bearing applications is also less expensive than load-bearing steel and easier to work with. Engineered-wood products offer many of the advantages of steel, including dimensional stability and consistent quality, without its thermal disadvantage.

### Treating wood for durability

In circumstances where moisture or insect pests are a concern, wood framing is often treated with preservatives to ensure its longevity. When the wood will be protected from weather, relatively benign borate-based treatments can be effective. Much more common, however, are preservatives based on arsenic and heavy metals, such as cromated copper arsenate (CCA).

Properly fixed in the wood, these chemicals are not generally thought to pose a significant threat to building occupants. The preservatives are manufactured and transported in a form 50 to 100 times more concentrated than they are applied. The environmental and health risks posed by the chemicals at this stage are much more severe. Preservative-treated wood also poses a disposal problem, both from scraps and off-cuts during construction, and from demolition. Burning the material releases highly toxic fumes. In landfills, it resists decomposition. Should the wood finally deteriorate, the toxic preservatives can be released. For all these reasons, treatment with arsenic preservatives adds significantly to the negative environmental impact of wood. When steel framing offers an alternative to the use of treated wood, it may well be environmentally preferable. Steel, however, has proved troublesome in consistently moist or marine environments. Even painted or galvanized steel studs have deteriorated when water accumulates at base plates and at screw penetrations.

### What's recyclable?

Used-steel framing and scraps left over from new construction are readily recycled. Many electric-arc furnaces even have equipment to reclaim zinc from the coatings on galvanized steel. Clean wood scraps from construction sites can also be recycled, though, unlike steel, they have little economic value. Recy-

cling them only pays off if significant disposal fees can be avoided. Except in the case of large timbers, wood waste cannot usually be recycled back into structural material. Instead, it is typically ground into mulch or fibers. In a landfill, clean wood waste will eventually biodegrade back into soil. Used wood from demolition or remodeling projects is difficult to recycle, due to contamination from fasteners and coatings.

### What's best?

Environmental factors should certainly be considered when choosing building materials, but it is important to put the issues in perspective. A knee-jerk reaction to avoid wood products may be misguided if the alternatives have more significant environmental disadvantages. If wood is available from verifiably well-managed forests, it may not be an environmental liability at all. When the only alternative is conventionally harvested wood, however, steel is worth considering—but only if thermal and other performance considerations will not be compromised as a result.

### Further information:

*The Environmental Resource Guide*, from The American Institute of Architects, 1735 New York Ave. N.W., Washington, DC 20006-5292, 202/626-7300

*Environmental Building News*, a bimonthly newsletter on environmentally sustainable design and construction, RR 1, Box 161, Brattleboro, VT 05301; 802/257-7300, 802/257-7304 (fax) ebn@sover.net (e-mail).

*The Thermal Performance Guide for Exterior Walls* (Publication RG-9405) is available by sending \$5 to: American Iron and Steel Institute, 1101 17th Street, N.W., Washington, DC 20036-4700 or by calling the Steel Framing Hotline at: 800/797-8335. ■

## Framing and Wall R-values

Framing & spacing	Nominal cavity insulation	Wood framed <sup>3</sup>	Steel framed <sup>4</sup>
2x4 16" o.c. <sup>1</sup>	R-11	R-9.0	R-5.5
	R-13	R-10.1	R-6.0
	R-15	R-11.2	R-6.4
2x4 24" o.c. <sup>2</sup>	R-11	R-9.4	R-6.6
	R-13	R-10.7	R-7.2
	R-15	R-11.9	R-7.8
2x6 16" o.c. <sup>1</sup>	R-19	R-15.1	R-7.1
	R-21	R-16.2	R-7.4
2x6 24" o.c. <sup>2</sup>	R-19	R-16.0	R-8.6
	R-21	R-17.2	R-9.0
2x8 16" o.c. <sup>1</sup>	R-25	R-20.1	R-7.8
2x8 24" o.c. <sup>2</sup>	R-25	R-21.2	R-9.6

Notes: C-channel metal studs are 16 gauge or thinner. Wall R-values are without sheathing or air films.

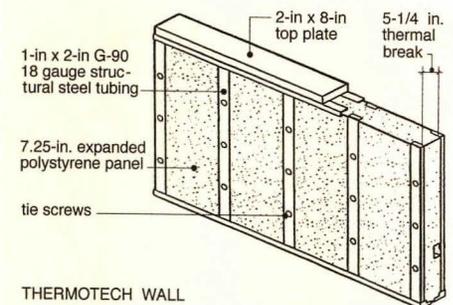
<sup>1</sup> Assumes 11.9% of wall area is framing.

<sup>2</sup> Assumes 8.9% of wall area is framing.

<sup>3</sup> Values for wood calculated using parallel path method.

<sup>4</sup> Values for steel from ASHRAE Standard 90.1.

Source: *Environmental Building News* Volume 3, Number 4



The chart (top) illustrates the significant energy penalty exacted by conventional metal-stud framing. An external layer of insulating sheathing improves performance considerably. The Thermotech wall (above) is one of a number of alternatives that use a thermal break to reduce energy loss.

## VOC Regulations: Change is in the Air

*An industry source explains why architects need to have a thorough understanding of VOC regulations and their impact on paints and other coatings.*

By Lane Blackburn

By now, the rumor that traditional solvent-based paints will disappear sometime in 1996 has most likely infiltrated the architectural community. And most likely, it's more than a rumor. Rising environmental consciousness and clean-air standards are changing the formulations of many solvent-based paints and stains to reduce airborne emissions of volatile organic compounds, better known as VOCs.

VOCs, which are emitted from such solvent chemicals as mineral spirits, xylene, and naphtha during spray application or curing of (primarily) oil-based paints, contribute to ground-level ozone, a major component of smog. [Besides ozone, another big contribu-

*“VOC regulations are causing sweeping changes in the paint industry—from the way paints and stains are formulated to the way architectural specifications will be written...and guidelines targeting VOC content take non-compliance seriously.”*

tor to smog are the oxides of nitrogen produced by the combustion of coal and other fossil fuels.—Ed.] VOCs help create smog when they react with other chemical compounds in the presence of heat and ultra-violet radiation. While the paint industry makes up only between 3 and 6 percent of total VOC emissions (automobile exhaust is the largest component), laws and standards are being created to regulate such emissions—which are highest in solvent-based architectural coatings.

So what exactly do such measures mean to the future performance and availability of architectural coatings? VOC regulations are causing sweeping changes in the paint industry—from the way paints and stains are formulated to the way specs will be written.

*Lane Blackburn is the Director of Architectural Marketing for The Sherwin-Williams Company, Cleveland.*

### Increasing regulations

Until recently, most architects and specifiers have not had to consider VOC limits when specifying or contracting a project. As environmental concerns and congressional mandates have increased, VOC regulations have been introduced on a state and local level. Several regions have had such regulations since the 1980s, including metropolitan New York, specific counties in Arizona and Texas, and the entire states of New Jersey and California. Projects located in these regulated areas require specification of VOC-compliant coatings.

The 1990 amendments to the Clean Air Act of 1970 mandated that the federal Environmen-

tal Protection Agency study and regulate VOC emissions from consumer products. Architectural coatings (including flats, non-flats, primers and undercoaters, stains, varnishes, and lacquers) are one of the first product groups to be affected.

Negotiations on a national rule limiting VOCs in architectural coatings began several years ago, and included coating manufacturers and painting contractors as well as environmental scientists. Although several years of meetings and exchanges of ideas failed to produce an agreement, the federal EPA was provided with an abundance of information concerning the performance requirements of architectural coatings and the relationship of such properties to VOC content

Over the entire architectural-coating industry, the federal rule is expected to reduce VOC emissions by 15 percent when compared to 1990 total emissions. States will be able to develop and adopt individual rules which are

more restrictive than the federal rule, but they cannot promulgate rules more lax than those set by the EPA. It appears a national standard probably won't become effective until at least September 1996. But if Congress permits air-quality legislation to be adopted on a state-by-state basis, VOC-content restrictions could also differ, making it virtually impossible to write consistent specs that can be used nationwide, such as the MASTERSPEC program offered by the AIA.

While it remains to be seen on which level guidelines will be enacted, architects and specifiers should start thinking about how products they are now using will change—or disappear. For example, specs are being written for jobs today when product application might be a year or two down the road. If solvent-borne coatings are in these specs, chances are that what is written will be outmoded by the time the project reaches the painting stage.

### VOC levels will be enforced

Guidelines targeting VOC content take non-compliance seriously. Contractors may be required to keep stringent records of products specified for a job, but they aren't the only ones to carry the burden. Use of non-compliant products could result in stiff fines, criminal charges—and in some cases even jail time—for the building owner, general contractor, painting contractor, paint supplier, and architect/specifier, depending on the specific regulations that are ultimately adopted.

### New paints, new formulas

Each major category of architectural coatings will change as solvent-based coatings are eliminated, so it's important to know what to expect from the new low-VOC coatings.

Take interior enamels, for example. While existing latex interior enamels do have their positive attributes, solvent-borne products have been the popular choice in this category for years, due in most part to their hardness, block resistance (which keeps the paint from feeling tacky after drying), feel, flow, adhesion, build (the paint's richness and fullness), and their tolerance of minimal surface preparation. These features of solvent-borne coatings will be compromised or eliminated

**Expected VOC Content Reduction  
for Selected Categories**  
(Grams per liter<sup>1</sup>)

Coating Category	Existing <sup>2</sup>	July 1, 1996	Jan. 1, 2000
<b>Flat</b>			
Interior	425	200	150
Exterior	380	200	200
<b>Non-Flat</b>			
Interior	430-455	350	250
Exterior	360-420	250	250
<b>Primers/ Undercoaters</b>	410-475	350	250
<b>Stains</b>			
Clear & Semi-Transparent	675	550	400
Opaque	500	350	250
<b>Concrete Protective Coatings</b>	420-735	400	350
<b>Floor Coatings</b>	420-550	400	350

**Notes:**

<sup>1</sup> Excluding water & exempt compounds at the maximum thinning by the manufacturer.

<sup>2</sup> Approximate gram/liter count, based on existing, non-compliant solvent-based products.

Source: EPA

*Anticipated changes in federal clean-air regulations will affect all categories of solvent-based coatings that emit VOCs.*

under the VOC reductions suggested in the federal guidelines. Right now, the average alkyd gloss interior enamel has a VOC content of 450 grams per liter. Based on the initial draft by the EPA, these new regulations would require that it drop to 350 grams per liter, which would drastically degrade the performance and application features of such products.

But in fact, manufacturers have already replaced close to 80 percent of solvent-based architectural coatings with water-borne products that are more durable than latex paints of the past. In many cases, advanced resin technology has allowed coating developers to produce water-borne systems that match solvent-borne properties while offering environmentally safer performance. And even newer high-performance, water-borne interior enamels currently under testing are proving to combine the fast dry times, low-odor, and non-yellowing properties of latex combined with the hardness, build, flow, and adhesion of oil-based varieties.

In addition to interior paint, other coating categories will undergo similar revisions under the expected EPA guidelines (chart). For instance, the VOC content of opaque solid-color stains must decrease from nearly 500 grams per liter to 350 grams per liter. Clear and semi-transparent stains, at roughly 650 and 675 grams per liter, respectively, will need to reduce VOC levels to only 550 grams per liter. Flat alkyd interior wall paints will need to drop from roughly 425 grams per liter to 200 grams per liter, while flat exterior building finishes will need to decrease to 200 grams per liter from roughly 365.

The predictions that low VOC paints would not perform as well, would cost more, and might not apply as easily as their solvent-based predecessors should prove untrue in the long run. This new generation of coatings will offer easy, uniform application, fast dry times, and durability. However, there are some differences in coating thickness. While new, low-VOC coatings should not require any special treatment beyond traditional surface-preparation considerations, some coatings, particularly compliant solvent-borne coatings, may undergo changes in mils thickness due to higher volume of solids. For example, a traditional alkyd may have been applied at 4 mils wet, and dried to 1.6 mils. A new compliant solvent-borne coating with a VOC content of 350 grams per liter could still apply at 4 mils wet, but most likely would dry at 2.3 mils. Architects and specifiers should consider this potential shift in coating thickness when specifying square footage. A higher mil thickness means the paint will cover less surface area; however, it also means a thickness comparable to about one-and-a-half coats could be applied in a single application.

**Paints in the near future**

Yes, products will change. Yes, some paints as we know them will disappear. But emerging technologies can provide even better products than "before VOC" regulations. And product selection most likely will increase rather than decrease, without the sharp increase in costs some critics predict.

Now is the time to start preparing specs that ultimately would comply with the new guide-

lines should they come into effect, as seems likely. Paint and coating manufacturers are highly knowledgeable about this legislation, particularly in light of the fact it directly affects their business. Their representatives are happy to work with architects and specifiers to recommend compliant coating systems for any job. Also, these companies have regulatory-affairs specialists who are available for consultation on VOC requirements and difficult compliance problems.

Preparing paint specifications is not an easy task, and it's likely the federal guidelines will do more to complicate this effort than simplify it, but uniform federal regulations are vastly preferable to a hodge-podge of state standards. ■

**Sources of additional information**

*National Paint & Coatings Association (NPCA)*

1500 Rhode Island Ave., NW  
Washington, DC 20005  
202/462-6272

*Steel Structures Painting Council (SSPC)*  
4516 Henry Street  
Pittsburgh, PA 15213  
412/687-1113

*Construction Specifications Institute (CSI)*  
601 Madison Street  
Alexandria, VA 22314-1791  
703/684-0300

*Federation of Societies for Coatings Technology*  
492 Norristown Road  
Blue Bell, PA 19422-2350  
610/940-0777

*Painting and Decorating Contractors of America (PDCA)*  
3913 Old Lee Highway, Suite 33B  
Fairfax, VA 22030  
703/359-0826

Literature from manufacturers of low-VOC paints and coatings appears on page 119. ■

## A Meaningful Upgrade and Worthy Successor to VersaCAD

By Steven S. Ross

**VersaCAD, Objectively:** Nothing is forever in the software business. VersaCAD was the very first fully functional drafting package for a personal computer—and the platform was the Macintosh. It was, in the early 1980s, the most widely used high-end CAD package. But it was eventually eclipsed by AutoCAD, which has been most popular in its DOS and workstation versions.

VersaCAD (the company) was eventually absorbed into Prime Computer, moved from California to Massachusetts, then spun out to Computervision. The package was always a leader in built-in “parametric” tools. This made it easy for third-party vendors to develop smallish, custom add-ons (we know offices that keep it around only to design striping for garage parking stalls—and to design custom kitchens).

That strength has led naturally to object-oriented programming. Clearly, as of this month DesignPost Drafting offers more functionality than its competitors at giving collections of lines some “intelligence” (that is, treating them as objects), using work of the (mainly European) Standard for Exchange of Product Model Data—the STEP initiative. But the real payoff will come when those objects are standardized. That’s still a year away for the most part (although some standards are due in October, thanks to Autodesk). Also, Autodesk and Bentley seem to be aiming higher in the level of object “intelligence” they expect to add to drawings. Nevertheless, Computervision is here first.

We note, though, that this successor to VersaCAD is not available on the Macintosh. Neither is AutoCAD. Only Bentley, among the providers of high-end production-oriented CAD products, has introduced updated Macintosh versions of its software.

[For more information on objects in drawings, see the August issue of RECORD, pages 32-37.]

### DesignPost Drafting 1.0

**Vendor:** Computervision Corp., 100 Cosby Drive, Bedford, MA 01730-9607, 617-275-1800, fax 617-275-2670, 800-786-2231.

**Equipment required:** Windows-capable computer, 16MB of RAM. A Unix version is promised as well. File sizes reproduced by this software are quite large compared to equivalent drawings in AutoCAD or MicroStation, requiring large hard drives.

**Price:** \$2,995. Upgrade from VersaCAD, \$895 (multi-seat discounts are quite steep). Includes toll-free support for 60 days. Can be set up for automatic link with Computervision technical support, through modem.

VersaCAD users have had a long wait for a meaningful upgrade—too long for what was once the most widely used CAD package. DesignPost Drafting has been positioned by Computervision to be that replacement (and an adjunct for its Personal Designer as well). It has a significantly different look and feel, but the changes are for the better. DesignPost Drafting is being sold mainly for 2D drafting (it has 3D wireframe) on stand-alone CAD seats, but offers good file compatibility with AutoCAD and (soon) higher-end Computervision products in networks. For architects, this isn’t much of an advantage; Computervision’s high-end CADDS and MEDUSA drafting software are mainly tools for industrial engineering and tool design.

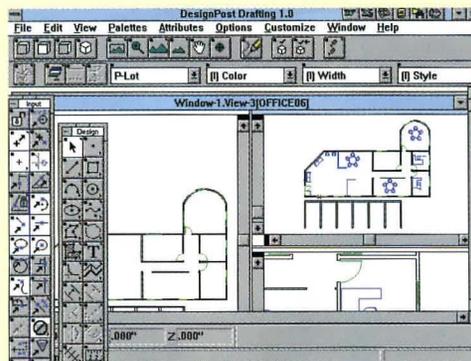
We reviewed DesignPost Drafting on a

75MHz Pentium with 8MB of RAM, a 90MHz Pentium with 16MB (both running Windows 3.11) and a 100MHz 486-based computer with 16MB running Windows 95. It ran well on all three with small drawings in 2D, and ran comfortably on the 90MHz machine, even with our larger files (10MB DXF and up).

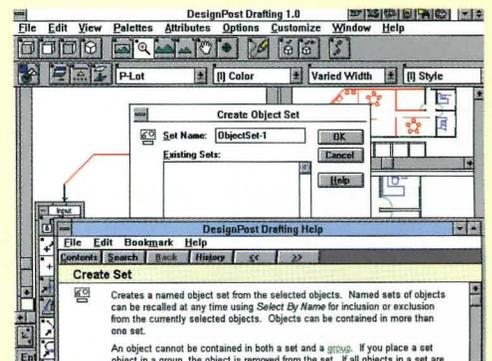
DesignPost Drafting has a nice interface in its own right, with features that make it easy to draw with. It is the first large CAD package with built-in support for object-oriented drawings. Computervision calls its object technology PELORUS; it is aimed at compatibility with STEP (see opening comments).

As this review goes to press, there are no generally accepted, standard objects to plug into DesignPost Drafting. But it is easy to see how it works. You can bring an external “reference model” into your drawing. Changing the reference model changes all its instances in the drawing itself. You need a separate reference model for each style (as well as type) of an object like a door, but add-on vendors working with STEP are likely to improve on that over the next year. First, the basics:

- The interface is standard Windows. You can open multiple drawings at the same time, and cut and paste among them (bitmaps cannot be pasted into drawings, and pasted objects from multiple layers end up in the active layer of the target drawing if you try to paste all layers at once). The interface can also be customized. It supports scalable



*Basic setup for drafting. Notice that the overall “window” scrolls on a low-resolution (640 by 480) screen, as do the individual windows. This allows everything to overhang the screen area.*



*You can select objects easily (and write routines for doing so) by layer; color; type, etc. The underlying database is tightly linked to the drawing.*

*If you are using VersaCAD or Personal Designer now, you will want to consider DesignPost Drafting as a good upgrade path.*

TrueType fonts and other Windows niceties.

- It has translators for DXF, DWG, Personal Designer and VersaCAD. IGES is optional.
- The drawing tools are first-rate—not as good as the latest from Bentley [PowerDraft; see RECORD May 1995, page 44], but sure to provide big productivity improvements if you are using earlier products from Computervision. You get “smart” object snapping and alignment, nice constraint management and efficient dimensioning.
- The file structure tightly links the drawing with the data model; when one is changed, the other reflects the change. Parametric calculations are built in. The programming language for the Windows version is based on Microsoft's Visual Basic programming language. That means there are built-in “hooks” for a wide range of “helper” programs (DLLs in Windows). The equivalent to a DLL in Unix is called a shared library. Visual Basic itself is not included in the package, but everything you need to run it and to automate simple tasks is included.
- Operations are event-driven. In plain English, you can interrupt an operation—say, inserting a window in a wall—to plot something, zoom in, even open a second drawing. When you go back to the original operation, you can resume where you left off. This also makes it easy for vendors of add-on software to integrate seamlessly. The built-in language lets you “stack” tasks and come back to them. Computervision spokespeople say most of the add-ons that worked with older Computervision CAD software work with DesignPost Drafting.

Modeling is not yet entirely ready. You get editable region boundaries for shading and boolean operations. But you don't yet get full solids or surface modeling.

- Printing is through standard Windows drivers, but you can pull files together in “paper space” and arrange them for printing within DesignPost Drafting.

All of this is impressive. You do, however, get about the same functionality (and a similar interface) with Bentley PowerDraft, at a

higher price. Our users have generally found PowerDraft to be better (fewer commands and mouse movements) at 2D production drafting work, but some preferred DesignPost Drafting in that respect. It really depends on what you draw, and on what your compatibility needs are. Object-oriented software is quickly moving beyond what DesignPost Drafting offers—but DesignPost has objects now, a year ahead of the competition and for \$1,000 a seat less.

If you are using VersaCAD or Personal Designer now, you will want to consider DesignPost Drafting as a good upgrade path, especially if you require (and already own) custom parametric add-ons that will run with the new software but not with AutoCAD or Bentley's line. The price is attractive, even with the necessary machine upgrade.

Machine size is an issue. Computervision claims 16MB of random-access memory as a minimum. That's not quite true—we got it to run in 8MB. (Its memory footprint in RAM is 14MB, but some can be sloughed off to “virtual memory” on disk.) But drawing files can grow very large, very fast. Thus, even 16MB isn't truly comfortable if you want to take full advantage of all the features. But you can certainly carry it around on an 8MB laptop for client presentations.

*Manuals:* Tutorial and “getting started” guide, AutoCAD/VersaCAD command translation guide, and installation booklet. Printed user references for commands, and for Visual Basic programming, are not included in software package. The on-line command reference is excellent, however.

*Ease of use:* Easy things are easy to do. Hard things are hard to do, at least the first time. It is easy to customize the palettes and move from window to window (you can have any number of windows open at the same time).

*Error-trapping:* Excellent recovery from system upsets. There's also a multi-level undo. Tools for keeping the drawing in sync with external references are fine, but (as with its competition) don't try to move files around outside of DesignPost Drafting itself (with Windows File Manager, for instance); your main drawing file won't be able to find the references.

**332** on Reader Service Card

## ClickFlick for AutoCAD

**Vendor:** MiraTech, 3517 Alma Street, Palo Alto, CA 94306-3539, 415-842-7133.

**Equipment required:** Computer running a Windows version of AutoCAD 12, 13, or LT. It uses about 250K of memory.

**Price:** \$229.95.

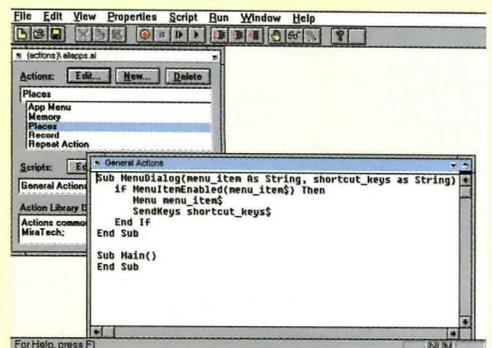
Here's a nifty utility that puts a “popbox” tool palette under your mouse cursor, simply by invoking a mouse or keyboard command such as SHIFT-right mouse button. You can use different key combos to invoke different popboxes for a given application. The AutoCAD version puts as many as 175 commands at your cursor-tip, in four boxes. You can also design popboxes for other Windows software, or customize your AutoCAD interface.

The easiest way to do that is to record an action using the Windows Macro recorder, and then assign an icon to it. The icon will be placed in your popbox. You can also write little programs for specific actions. One icon can call others (similar to the “flyout” icons on many CAD palettes).

*Manual:* A bit wordy if you only want to use the product as-is out of the box, but a good reference if you want to customize.

*Ease-of-use:* Simple. You install it under Windows, then invoke it with a mouse or keyboard command from inside AutoCAD (or other software). Different commands invoke different boxes.

**333** on Reader Service Card



*ClickFlick comes with prefabricated popup palettes for AutoCAD. Here, however, we've used the popup designer to make command icons of our own.*

## Windows 95 Casts Long Shadow

By Steven S. Ross

With this issue, we wrap up coverage of A/E/C Systems 95 that we started last month [RECORD August 1995, pages 32 to 37] just before Windows 95 was released. Just as the Unix operating system made early architectural software possible and shaped its development, Windows shapes things today.

At the show, we were struck by how easy computing is becoming—easy, at least, compared to the recent past:

- Geographical Information System (GIS) files can now be handled at your desktop, in part because computers are more powerful and in part because the Windows-based software interfaces are easier to use.
- Digitizer tablets are not merely cheaper and more capable—they are easier to set up, thanks to the software.
- Color output is dazzling and easy to implement because developers only need to write a single printer/plotter driver for Windows, not for each individual CAD or GIS or project-planning package.
- Architects are finally being served by a growing list of facilities-management, specification, and financial-management packages. The resulting software is more flexible than ever before. It is also easier to move files from one application to another.
- Relative ease in installing Windows software has helped lead to cheaper software, even clever utilities costing \$200 or less. The low price is possible because vendors do not have to invest as heavily in customer support.

Despite all that, architects have been slow to install Windows-based software in many circumstances. Why? Windows itself has been slow—slower than corresponding DOS- or Unix-based software.

Now vendors' stakes in Windows are being vindicated. Windows 95 runs Windows 3.1 software faster, and is easier to network (we've been working with pre-release versions for almost a year). There are advances in areas that architects rarely follow—better compilers, for instance, to create faster soft-

ware. But, most important, vendors are learning to create more efficient user interfaces with Windows. It takes fewer mouse movements to complete a task.

### Geographical Information Systems

ESRI, the Environmental Systems Research Institute, showed version 2 of its ArcView, which accepts AutoCAD drawings and links them to GIS data. ArcView can handle almost all data structures simultaneously—SQL, DBMS, ASCII, dBase as well as Arc/Info. Its ArcCAD add-on for AutoCAD Release 13 was not yet shipping at show time, however.

**300 on Reader Service Card**

Hitachi Software showed V/Image Plus, a low-cost viewing package that works inside AutoCAD. You can use it to view ortho photos, apply CAD applications directly over a raster image, connect land-based photos to a database, and handle other tasks to create development proposals. There's also Tracer 2 for viewing, editing, and converting AutoCAD files, and for archiving edited versions.

**301 on Reader Service Card**

Plus 3 Software showed Contour for ArcView in its Terramodel series. You select points from an ArcView table, ASCII points file, or DBF file, select contour interval and smoothness, and let the software calculate your contours for you.

**302 on Reader Service Card**

Vidar Systems Corp. showed its TruScan 800 large-document scanner, with a direct software link to Arc/Info Version 7. ESRI offers the 36-in.-wide scanner as part of its midrange solution.

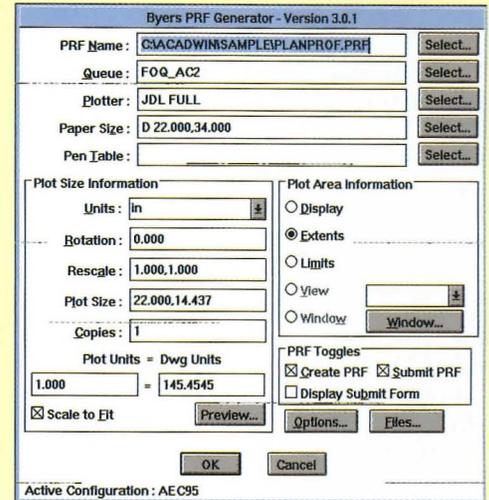
**303 on Reader Service Card**

### Facilities Management

Many of the old-line facilities-management-software providers showed or announced new versions of their wares, as did newer vendors.

Archibus showed the latest version of its facilities-management system, Archibus/FM 10 for Windows. The reporting tools, always a strong point, are easier for novices to use. Three modules were shipping by showtime—space management, furniture and equipment management, and building operations. AutoCAD overlays for all modules are in the

*If Unix wrote the book for architectural software, Windows 95 has written the screen version, taking it at super speed into the 21st century.*



works as well. **304 on Reader Service Card**

GDS (Graphic Data Systems Corp.) showed upgrades to its MicroGDS line of CAD and facilities-management software. Data exchange between Windows-based and workstation-based GDS has been enhanced. There's also read-only software at a lower price, and LightWorks rendering tools.

**305 on Reader Service Card**

Among the new entries into the field, Innovative Technology showed its Span-FM for Windows. Various modules include typical asset management, maintenance handling, and lease management. There's also a two-way link to CAD; you can modify either the drawing or the Span-FM file, do takeoffs from the drawing into the database, and so forth. Other modules do cable tracking and project management.

**306 on Reader Service Card**

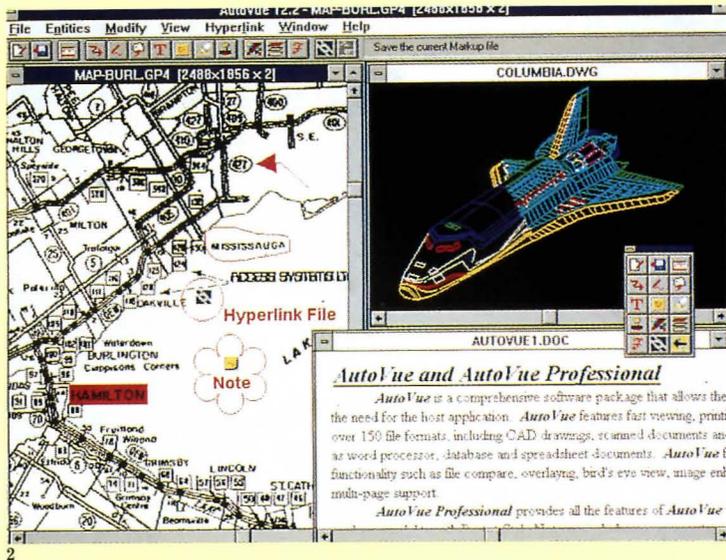
### Document Handling

There is a cloud on the compatibility horizon here, with Microsoft allied with Wang. Wang's desktop-imaging and object-control software will eventually end up in Windows 95 and Windows NT. Most of the rest of the industry is aligned in DMA, the Document Management Alliance, whose sparkplugs are IBM, Novell, Xerox, and Saros Corp. Novell was scheduled to introduce a free NetWare add-on for DMA work soon after the show.

1. Byers Plot Manager for Windows generates PRFs (plot request forms) and imports them into AutoCAD's WorkCenter.

2. Cimmetry's AutoVue Professional for markups (redlining) allows hyperlinking—coupling one drawing with another or with text data.

3. Rasterex RxViewCenter by Expert Graphics is an add-on to WorkCenter for redlining, viewing, and linking drawings to other documents.



Because DMA is not tied to a single operating system—many of its partners are, in fact, wedded to Unix—the lack of focus may slightly restrict interoperability between the Windows and Unix worlds.

For those offices that use only one specific operating system—and most do—document management has begun to catch up with modern CAD software's ability to scatter files across networks and reference them to one another. Good software in this class must allow users to view different file formats interchangeably, keep track of revisions, redline, and link various files being updated at various times.

Autodesk's WorkCenter is in some ways the "gold standard" of such software. But its ability to work with non-AutoCAD files is weak, and it cannot control output devices except through Windows or third-party add-ons. Thus, developers showed many packages that work on top of or alongside WorkCenter, or provide much of the same functionality at a cheaper price.

**307** on Reader Service Card

Byers Plot Manager for Windows, from Byers CADNET, comes with many plotter and printer vendors' solutions. It ties WorkCenter to Byers Plot Station (which does the actual plotting) by generating PRFs (plot request forms) and importing them into

WorkCenter; users submit plot jobs, monitor plot status, even scale, rotate, and control line weights and layer appearance outside AutoCAD. There's also a new PRF Builder from Byers for MicroStation and the Byers Plot Station server.

**308** on Reader Service Card

Cimmetry Systems, Inc., (CSI) showed its AutoVue Professional 12.2 for markups (redlining). It allows "hyperlinking"—setting up hot spots on one drawing that link to another, or to text. CSI also offers VCET for file viewing, document management, plotting (including converting a vector image to raster for speed), and attaching e-mail. Its EDAT link provides programmers with the tools to create their own versions in Windows, DOS, or Unix. The tools handle AutoCAD DWG files through version 13 and MicroStation DGN through version 5.0.

**309** on Reader Service Card

Cyco International showed the new version 4 of its AutoManager WorkFlow. It manages drawings, spreadsheets, change orders, and memos. There's even a report generator. The interface has changed significantly. We'll be reviewing version 4 soon.

**310** on Reader Service Card

Informative Graphics announced integration of its Myriad file-viewing software with Autodesk WorkCenter. Myriad supports

more than 100 file formats and has links to database packages. Most important for architects, it handles many AutoCAD third-party image formats such as GTXRasterCAD, CAD Overlay ESP, and Intergraph IRAS. There are Myriad versions for DOS, Unix, and Macintosh as well as Windows.

**311** on Reader Service Card

Expert Graphics announced its new Rasterex RxViewCenter, also as an add-on to WorkCenter; it joins earlier products for highlighting and viewing. The programs can work together to redline, view, and link drawings to other documents (Word files or Excel files showing a bill of materials, for instance). A five-license pack costs under \$1,000 for RxViewCenter; the other products, with less functionality, sell for considerably less. There's also RxAutoImage, which allows loading and filing almost any image from within AutoCAD.

**312** on Reader Service Card

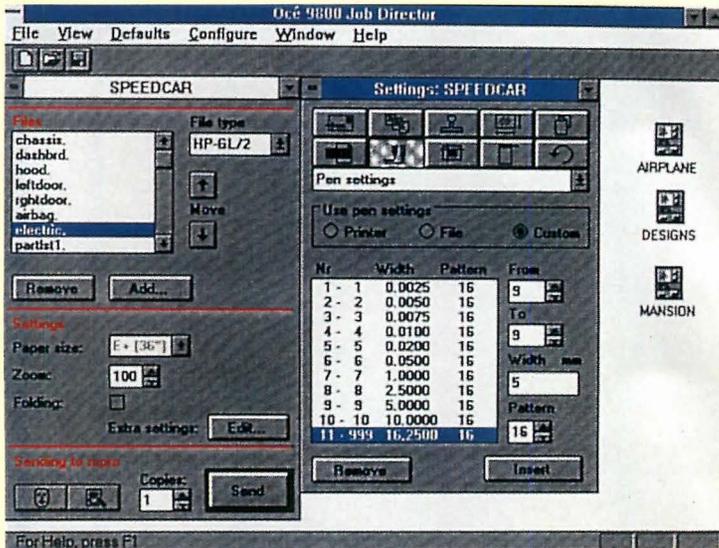
Océ-Bruning showed the latest version of its Repro Station document-distribution system, tied to the Océ 7700 digital copier/plotter/scanner. It allows users to set criteria for plotting, such as user or media type, or the printing of specific pages for specific users.

**313** on Reader Service Card

TSA/ADVET and Bentley Systems announced that MicroStation TeamMate, for

4. *Océ-Brüning's Repro Station software organizes and controls document distribution by automating the plot-order process.*

5. *CalComp's new E-size TechJet color inkjet printer costs under \$6,000, while its now-discontinued electrostatic version was more than \$50,000.*



4



5

technical document management, will be incorporated into the next version of TSA/ADVET Falcon/DMS, a high-end document manager capable of handling large installations.

**314** on Reader Service Card

Zeh Graphic Systems announced agreement with Bentley Systems to use Bentley plotting software with Zeh Plot Express for enhanced plotting capabilities, particularly over a network.

**315** on Reader Service Card

**Output Devices**

This is clearly the year of the inkjet. Even Hewlett-Packard, which in many ways epitomized the highest level of pen-plotter development (its plotting languages, HPGL and HPGL/2, are as close as we get to an industry-wide standard) no longer makes pen plotters; inkjets have replaced them.

HP announced two low-cost, large-format inkjet plotters at the show—the DesignJet 250C color (\$2,995 for the D-size, \$3,995 for E-size) and 230 monochrome (\$2,395 for D, \$3,195 for E). These units are meant for small architectural offices that produce about 10 plots a day.

**316** on Reader Service Card

Likewise, CalComp no longer accepts orders for its electrostatic plotters; the monochrome

models were discontinued in December and color models in May. Price is the main reason; CalComp's new E-size TechJET color inkjet sells for under \$6,000 while the color electrostatic of that size was more than \$50,000. If you need the electrostatic throughput, try an LED xerographic; the new E-size Solus comes in at under \$35,000.

**317** on Reader Service Card

Encad, which started the large-format color inkjet craze with its Novajet, was also showing its lower-priced Cadjet D- and E-size color units. These units come with Mac and Windows interfaces and drivers.

**318** on Reader Service Card

Mutoh America, perhaps best known for its pencil plotters, jumped on the inkjet bandwagon with two monochrome and two color models in D and E sizes. The AccuJet series offers dual, refillable ink cartridges to cut per-plot cost. Prices range from \$2,995 for the D-size monochrome to \$4,195 for the E-size color. The firm, which recently merged with Kurta, also offered improved pen/pencil plotters in its new XP-300 series; you can mix pen and pencil in the same plot.

**319** on Reader Service Card

Summagraphics reduced prices on its SummaJet 2 large-format color and monochrome inkjets. The D-size mono now lists at \$2,299; the E-size is \$2,899. The D-size color is \$2,599

and E-size color is \$3,199. All come with a bundle of media or ink.

**320** on Reader Service Card

Xerox Engineering Systems introduced its digital reprographics system to the U.S.; it's been available in Germany since March. It combines scanning, image processing and distribution (printing, on-screen viewing, and so forth), and a straightforward user interface; you can use a touch-screen monitor to control the operations. The Unix-based system is meant for large practices; it comes with a price-tag of over \$150,000. There's also "virtual printroom" systems that can be configured for a few to several hundred operators.

**321** on Reader Service Card

**Graphics Aids**

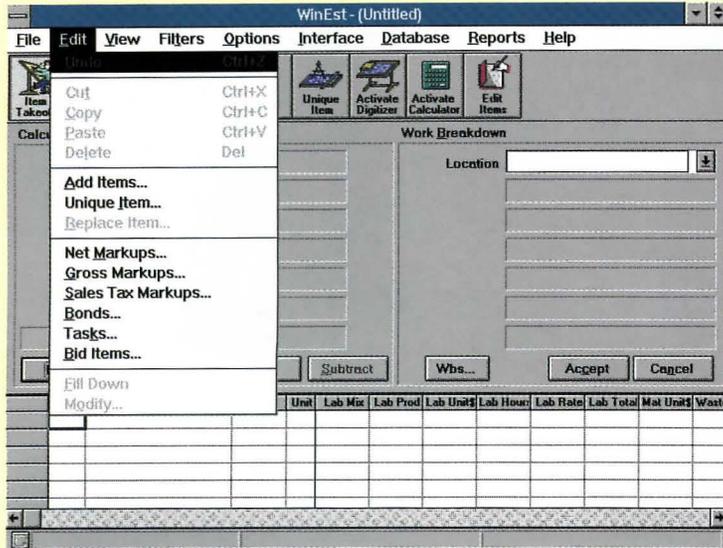
For easy drawing and sketching, Summagraphics introduced two new Summa Expert pressure-sensitive digitizer tablets, a 12- by-12 and a 12- by-18-in., with easy-to-use software (Windows, DOS, Macintosh, SGI, Sun) for customizing their surfaces. They come with a choice of pressure-sensitive pen, a clever cursor puck with movable crosshairs, or a 16-button cursor. The list price is \$499 for the smaller tablet, \$899 for the 12- by-18.

**322** on Reader Service Card

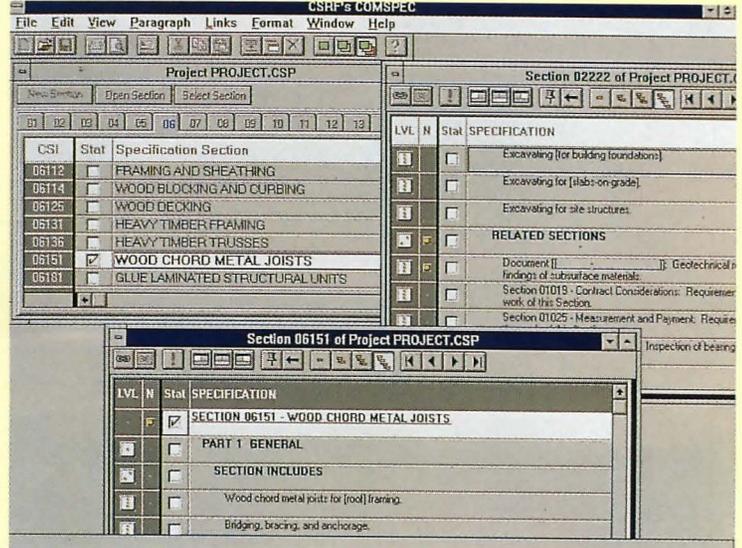
TRF Systems showed Lynx, a digital-photo project-documentation system built around

6. The WinCost Pro 3.0, by Win-Estimator, is a professional cost-accounting software package for Windows.

7. Comspec not only copies text from a master document and pastes it into a new one, it also pulls in relevant data when specific specs are written.



6



7

the Kodak Digital Color Camera. **323** on Reader Service Card

### Financial Management

There has long been a lack of good financial-management software for architectural practices. This year, a few new entrants to the field are trying for the business with some new or updated packages.

BEEDEE Corp. showed version 2.0 of its Financial-Management Package for the architectural practice. The software, available for the PowerMac, is a standout among the few Mac-compatible office and project bookkeeping programs. Due this year are add-ons for generating change orders and certificates of payment, a project scheduler, and a networkable timesheet.

**324** on Reader Service Card

Harper and Shuman, almost certainly the largest provider of project-based financial-management systems, introduced its first Windows-based client-server application—purchase-order tracking—and automated timekeeping and reporting.

**325** on Reader Service Card

Meridian Project Systems showed its Super Prolog Plus jobsite documentation software for Windows. It handles word processing, database access, forms, and so forth for everything from crew tracking to change

orders. **326** on Reader Service Card

Smith, Dennis & Gaylord showed its SDG Project Controller, an accounting system tuned to A/E/C needs, but based on the Solomon IV for Windows accounting system for middle-size businesses. Up to now, the systems have been sold mainly on the Tandem and HP3000 platforms.

**327** on Reader Service Card

WinEstimator, Inc., showed its new WinCost Pro 3.0, professional cost accounting for Windows. Modules include job cost, general ledger, accounts payable, accounts receivable, purchase orders, payroll, inventory, and sales. There are also take-off modules.

**328** on Reader Service Card

### Specification Writing

Building Systems Design, Inc., of Atlanta, and Construction Sciences Research Foundation (CSRF), of Baltimore, showed Comspec, a Windows-based package producing and managing construction specifications. Like other systems, it offers the ability to grab text from master documents and place it in a new spec. But Comspec offers something new—links that pull in relevant data such as installation instructions or new cost data when specific specs are given. Comspec won't be ready until early 1996, however.

**329** on Reader Service Card

CSRF also offers—on 20 to 40 disks or on CD-ROM—SPECTEXT, organized in MasterFormat, the CSI/CSC master list. It is updated quarterly. The distributor is Construction Data Services.

**330** on Reader Service Card

Sweet's introduced a fax-on-demand service. Product vendors get an 800 line and an automated fax system to distribute product information to callers. Product updates can get into the system within a day. Vendors can also turn their product literature into an interactive CD-ROM using Sweet's. Sweet's celebrated its 90th anniversary with a reproduction of its first one-volume catalog.

**331** on Reader Service Card ■

## The Zen of Furniture Design



1



2



3



4

### 334. Nicely tailored.

In a marketplace where architects create teapots, it seems natural for a designer of menswear to invent furniture.

New York-based Jhane Barnes has captured numerous prizes from the fashion industry, including Coty awards, for her creative take on clothing for men. A graduate of the Fashion Institute of Technology, she has also developed textiles for the contract market, winning Gold Awards from the Institute of Business Designers and the American Society of Interior Designers in the process. And her marriage to Japanese businessman Katsuhiko Kawasaki and extensive travel in the Far East broadened her affinity for the clean, spare lines of Japanese design. In 1993, Bernhardt Furniture approached her to consider still another career opportunity: the

design of furniture that would be rugged enough—and cost-competitive enough—for the contract market, yet comfortable in use and adaptable to a contemporary-style home.

After several intensive sessions in wood-construction techniques, production realities, and the economics of furniture manufacture, and after spending time learning the intricacies of three-dimensional CAD programs, Barnes completed the design of a collection of seating and tables that Bernhardt introduced at Neocon this June.

Main components of the group are shown above. The Tatami Lounge (1) consists of an upholstered seat and back placed on a solid-maple platform raised to Occidental seating height on cylindrical legs with a brushed-nickel finish. The platform itself, surfaced in

wood or tatami matting, functions as an integral end table. Barnes calls the dining/conference table (2) Otera, for its borrowed structural elements and scale from Japanese temple buildings. The top is attached to the tapering cherry-wood legs by a Simpson Strong-Tie connector in nickel or black. Shown here with a plate-glass top, Otera can also be specified with an inlaid-pattern cherry-veneer top.

Wabi (3), pictured in its generously proportioned, single-seat configuration, also comes as a sofa or two-seat settee. The Kasane chair (4) is suitable for several office or residential uses: a dining chair, guest pull-up, or a group-seating stacking chair. 704/758-9811.

Bernhardt Furniture Co., Lenoir, N.C. ■

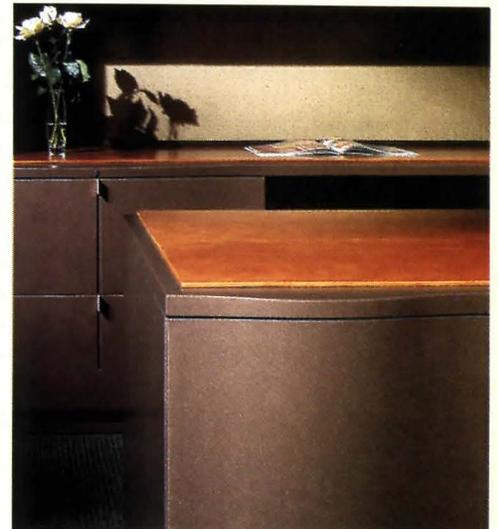
## Grid System Holds Marbles in Place



### 335. Through a glass brightly.

The Lightscreen takes advantage of the fact that most people like glass marbles. They enjoy holding them in their fingers and looking up at the sky through them. So David Howell designed a neat aluminum grid to hold lots of them up to the light, a system that can be configured as freestanding or framed-in partitions for dividing space or providing privacy indoors or out. The Hanson Group, Denver (Laurel Quint, designer), used the light-catching panels as decoration on a pair of office doors (above). Separate framed sections were bolted directly to the sand-blasted glass doors using holes drilled before the glass was tempered. Priced about \$40 psf, standard screens hold as many as 12 marble colors in 22 different arrangements; marbles can also be placed in custom designs. 800/639-4351. David Howell & Co., Bedford Hills, N.Y. ■

## Innovative Finish on Wood



### 336. A desk of a different color.

To increase the custom-order appeal of the bowed-front Cadence casegoods John Thiele and Brian Graham designed for Halcon, the company asked color consultants Beverly Thome and Laura Guido-Clark to develop a totally new range of decorative options. Called Chemcolor, the subtle finish is a catalyzed polyester enamel, with a discrete pearlescent effect supplied by mica and other organic particles. The Chemcolor cures to create a hard, chip-resistant surface that coordinates with any of the applied wood-veneer tops offered in the line. The suite includes desks and returns, credenzas, and vertical storage units; a binder and sample-chip program assists in product selection. Introduced this June, Cadence won top prize as best new casegoods at Neocon. 507/533-4235. Halcon, Stewartville, Minn. ■





### 337. Wired conference

Assuming that conference spaces are the new activity hubs of today's team-work-based offices, Lisa Bottom and John Duvivier designed their Courant tables to be able to accept—and hide—wiring for computers, projectors, and teleconferencing equipment. Tables come in a range of size and wood-finish options, with casegoods to match. 704/328-2064. HBF, Hickory, N.C.



### 338. Deep-toned vinyl

A new commercial-flooring pattern, Tapestry is said to offer a "softer" look in a stain-resistant vinyl-sheet product. Flooring comes in a 14-color palette that includes deep green, blue, and burgundy tones intended to give a carpet-like, residential ambience to hospitals and long-term-care facilities. Architectural sample program. 800/292-6308. Armstrong World Industries, Inc., Lancaster, Pa.



### 339. Enameled tea kettle

Michael Graves returns to the kitchen with his enameled-metal Ferris kettle. The plastic-wrapped handle is balanced over the wide, easy-to-fill lid; the spoked wheel on the spout both whistles and spins. Available in colors shown; list price: \$50. 800/8MOLLER. Möller Design, Newport Beach, Calif.



### 340. Decorative laminate

One of more than a dozen new patterns introduced so far in 1995, Inclusion meets NEMA performance and application specs. The design features colorful particles randomly embedded at different levels within the paper surface that catch the light, imparting a sense of depth and movement. 800/526-4627. Laminart, Elk Grove Village, Ill.



### 341. Easy-install vaulted ceiling

The Aluma-Vault is described as an affordable curved acoustical ceiling with a freeformed, non-modular aesthetic. The aluminum-sheet infill panels, trimmed with extruded moldings, can be plain or perforated. Ceiling can be arched to any radius as a partial or full barrel vault; snap-on covers hide the fasteners. CAD design and detail help. 800/747-8954. Gordon, Inc., Shreveport, La.



### 342. Tile-coordination tools

A new resource for designing tile walls and floors in commercial spaces, the Contract Colorways diskette (Macintosh or Windows) coordinates Olean tile and grout colors with appropriate Formica laminates, Metpar partitions, American-Standard plumbing fixtures, and other products. Free; includes all 1995 colors and CSI specs. 215/393-2828. American Olean Tile, Lansdale, Pa.



### 343. Stackable outdoor chair

Made of natural mahogany and designed by Wilson Associates to suit the specific site and program requirements of a resort in Santa Fe, N. M., a new stacking chair exemplifies the custom capabilities of this maker of durable outdoor furniture. Finish options include Awlgrip enamel and colored and natural-tone stains. 800/456-6483. Weatherend Estate Furniture, Rockland, Me.



### 344. Flat-panel monitor

Only 3-in. deep, the 460 active-matrix LCD panel provides an easy-on-the-eye large-screen (14 1/2-in.) display while saving significant space in VDT-intensive applications such as trading desks. Its small size and adaptable mounting permits use of information-display screens in the tightest of spaces. Touch-screen interface an option. 508/264-9443. PixelVision, Acton, Mass. ■

## Short takes

**Specification guide helps reduce construction waste, boosts reuse.** A three-ring, 114-page binder helps architects insert waste-reduction, reuse, and recycling specifications into building projects before construction begins. Called WasteSpec, the manual provides model language addressing all phases of a project; symbols indicate whether or not each suggested provision is likely to add cost to a project. Funded by the U.S. Environmental Protection

Agency, the specifications (in various word-processing formats) are available for \$20 from the Triangle J Council of Governments, PO Box 12276, Research Triangle Park, NC 27709; 919/549-0551.

**Restroom design.** Free guides address different aspects of restroom construction and renovation, including how to size and place accessories, how to design an esthetic, clean, safe, and cost-effective

restroom, and how to comply with access standards. 800/472-6881. Scott Paper Co., Philadelphia.

**Celebrating Masonry.** The 1995 Masonry Craft Fair takes place Oct. 4-8 in Chicago. Exhibitions will showcase bricklaying, ornamental plastering, mosaic assembly, stone carving, tilesetting, terrazzo, and masonry restoration. Seminars will cover seismic design of loadbearing masonry walls. 202/783-3921. ■



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**Workplace** continued from page 35

tured companies need to increase mutual access, which means less privacy. Needless to say, the transition to a more-open office is always difficult. In most cases, change was done in stages, starting with those managers most eager to adopt new work methods.

Companies in the second to the fourth year of the restructuring process found that attitudes changed—from the expectation of maximum achievable privacy to seeing the traditional levels of acoustic and visual privacy as a barrier to efficient team-based communication and work. Research conducted at reorganizing companies found that satisfaction and performance increasingly correlates with access (to resources and technology) and choice (in terms of location, adjacency, and degree of privacy). This was also true in companies that had reached more mature phases of restructuring.

The need for privacy does not disappear. Managers still require acoustically private offices in most cases. Glass is often added to improve visual access. Individuals working in open-plan offices still need places that offer high levels of acoustic and visual privacy, but they're needed for shorter durations. (Com-

panies provide special semi-isolated shared retreat spaces.) Acoustic privacy is maintained through high-performance sound-absorbing ceiling systems, addition of background sound, and use of sound-absorption treatment.

**Design process and restructuring process**

All of the analyzed companies used either a five-stage or three-stage internal-planning model to achieve their objectives. The first stage, Strategic Business Planning, produces a long-range business plan (3- to 10-year horizon), which is updated at least once each year. In the Near-Term Operations phase, financial, organizational, and technological requirements are refined for a one- to two-year horizon. The Detailed Planning stage, with a horizon of 12 to 18 months, is conducted at department levels. The fourth phase is implementation, and the fifth stage is ongoing management.

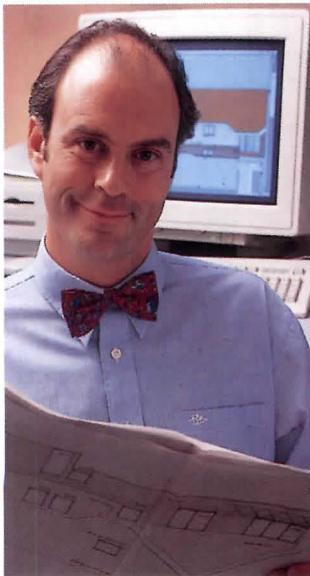
Prior to restructuring, fewer than 5 percent of the analyzed companies had a facility-planning process that supported the strategic-planning phase; 40 percent had limited facilities-planning support for Near-Term Operations; most provided major facilities-

planning input in the third phase. All of the companies strongly supported implementation and management.

Companies that did not include facility personnel as full participants in the re-engineering of their businesses found that restructuring was hobbled by inappropriate work-spaces. Facilities considerations came too late in the process, forcing reactive solutions. Planners and designers were ill-informed and couldn't get input early enough in the process to produce the well-conceived designs needed to enable change in cost-effective ways. Assumptions underlying both the number of people allocated to a unit or team and the amount of space each person needs rarely conform to current practice. Thus, inaccurate forecasting of staff allocation and space needs has been common.

Increasingly, senior management recognizes that facility planners and designers must participate much earlier in the strategic- and business-planning process. These companies have created new long-range facility-planning teams charged with supporting strategic business planning, and new near-term facility-planning teams charged with supporting

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operations planning. Other facilities staff or consultants carry out detailed planning and design, and support project implementation.

### Strategic long-range planning

Providing a truly strategic long-range facility-planning entity proved to be the most difficult task for the analyzed companies. To obtain the support of senior management, the financial and organizational benefits needed to be clearly identified, communicated, understood, and agreed to. This process alone often took two or three years. Secondly, the strategic nature of corporate business planning always produces scenarios that are controversial or politically sensitive. They might cost jobs or require disruptive relocations, for example. Facility planners or outside designers have typically not been given much sensitive information.

By recognizing the importance of input by facilities designers, companies learn to grant facilities staff access to critical information when necessary as part of strategic planning. Planners and designers must take a broader view and understand that strategic planning is never completed. Staff who excel at detailed planning and design often prove

not to be good at a strategic approach.

Even gross space needs cannot be forecast until the strategic business and facility-planning teams agree on suitable work patterns. (Convergent teams may need downtown space; divergent-work groups may need space near airports or major customers.) Once a location is identified, the mix of, say, workstations, meeting rooms, and technology-support space, usually can't be planned using traditional blocking and stacking assumptions. And company goals always include reducing costs and improving innovation and quality, so traditional multipliers for space are often drastically scaled down. Space allocated to staff, for example, is often reduced from 250 to 200 gross sq. ft. per person to no more than 150 sq. ft. Space consumed by technology may increase by 15 to 20 percent, and so on.

### Short-term facility master planning

Providing master-planning support for operations-level managers has also proved to be difficult. In preparing master plans intended to meet new business objectives, planners are typically ordered to make the best short-term use of existing assets. In essence, the

planner is told to move toward the future, using existing (and often inadequate) spaces to accomplish objectives.

To succeed under such circumstances, the planner must seek the closest possible fit between user needs, given the kind of space available. To maintain an appropriate "customer" relationship with operations-level management, while making the most of existing facility assets and keeping costs under control, requires a more systematic "service-response" process than may have been needed prior to restructuring.

While the first requirement of a facility-planning and design process is to deliver useful and efficient work places, analyzed companies with appropriate facility-design input often realized major hard-cost savings, including huge reductions in the number of square feet replanned annually (the churn rate), with related reductions in the cost of reworking space. ■

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*Building Types Study 730/Interiors*

Interior design has long been a step-child to architects—its status unclear. Where’s the confusion? Is interior design a totally integrated perceptual experience of space, to paraphrase Charles Gwathmey, or an afterthought that may or may not bear some relation to the shell? Is it intrinsic to the discipline of architecture or outside it? In her essay, “Thinking Like a Decorator,” Suzanne Stephens maintains that whatever your opinion, attention to every detail in residential design can be handsomely rewarding (pages 90-93). The residential projects shown in this issue represent the visions of two architectural firms, Hanrahan Meyers (pages 74-79) and Valerio Dewalt Train (pages 104-109). In each case, the scheme was fortified by the input of an interior designer (Tse-Yun Chu and Nancy Willert, respectively). The concept of a total perceptual experience also rings true for the non-residential projects shown here. A canted partition sweeps from the front of the law office by Venning Atwood Kean to its center, squeezing space, while a stair wrapped around a tower of books spirals through the space (pages 80-85). ROTO Architects’ Gemini Learning Center (pages 94-99) and Anderson Schwartz’s SMA Video (pages 100-103) are both laid out off the grid to convey the unconventional nature of the enterprises. Ron Arad and Alison Brooks inserted sculptural objects into another architect’s building (pages 110-113). Canadian firm Kuwabara Payne McKenna Blumberg remade the historic Toronto Exchange and an adjacent space in a new tower into The Design Exchange (pages 86-89), a place intended, much like this issue, to encourage design innovation.

*Karen D. Stein*



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Some of the architects whose work is featured on the following pages:  
 1. (left to right) Bruce Kuwabara, Shirley Blumberg, Marianne McKenna, and Thomas Payne of Kuwabara Payne McKenna Blumberg Architects.  
 2. Clark Stevens of ROTO Architects.  
 3. Michael Rotondi of ROTO Architects.  
 4. Lee Anne Kean of Venning Atwood Kean Design.  
 5. Jeff Atwood of Venning Atwood Kean Design.  
 6. Frank Venning of Venning Atwood Kean Design.  
 7. Thomas Hanrahan, Victoria Meyers of Hanrahan Meyers Architects.  
 8. Ross Anderson of Anderson Schwartz Architects.  
 9. Joe Valerio of Valerio Dewalt Train.

*Manufacturers’ Sources listed on page 125*



# Off the Wall

When this story began, nearly three years ago, Thomas Hanrahan and Victoria Meyers were at a professional crossroads. In architectural circles they were known for sleek, cerebral designs that won awards and competitions but, in the public eye, the work getting built was, by Hanrahan's own admission, "marginal." "A lot of Neoclassic apartment renovations," shudders Meyers. "There was a schism in what we were publishing [in design journals] and the opportunities we were given to build," explains Hanrahan. As with many younger architects, theory and practice didn't jibe. Then along came Steven Holley, who in an initial meeting with the architects managed to meet their new, self-imposed criteria for accepting clients: an interest in Modernism. "The tipoff was he mentioned the Bauhaus," remembers Meyers. An attorney, Holley proved to be as methodical in his architect-selection process as in preparing a court case, ultimately choosing Hanrahan and Meyers not only because he "didn't want a lot of stuff" in his new apartment, but also because they could comfortably "engage in a discussion" about design issues.

To further his research, Holley moved into his new second-floor space—a former industrial loft near Union Square in New York City—for nearly a year prior to the start of construction to understand the play of light through east- and west-facing windows and the effects of street noise. While Holley was getting to know his apartment, his architects were continually refining their scheme. Time proved to be a critical editor for both sides. Holley was increasingly convinced of the need for openness—a dramatic contrast to the former tenant, who had subdivided the loft into a rabbit warren of rooms and elevated platforms with hidden doors. The architects were able to transform an ambiguous notion of furniture-as-walls into a series of overlapping areas that borrowed views and daylight from

each other. "Often you have to hide spatial complexities from clients," says Meyers. "But not in this case. The more complex the space became, the happier Steve was with the project."

The result is planes of clear and sandblasted glass and steel that alternately provide transparency and privacy. The architects replastered the four structural columns that form a center line through the loft, locating the kitchen and dining room on one side and the master bedroom suite on the other. A new mechanical system along the 13-foot ceiling plane subtly suggests the outline of rooms that can be further defined by wood partitions, which pivot to enclose a study/guest room (opposite). A curved cabinet wall along the central gallery relieves the overall linearity, suggesting a more intimate space beyond. The perimeter is purposely left untouched, as if some centripetal force moved everything but the plumbing encasement in from the edges. Throughout, maple floors reinforce the effect of expansive, uninterrupted space, while maple cabinetry gives the effect, says Meyers, of "walls that grow out of the ground." *Karen D. Stein*

## Credits

*Holley Loft*

*New York City*

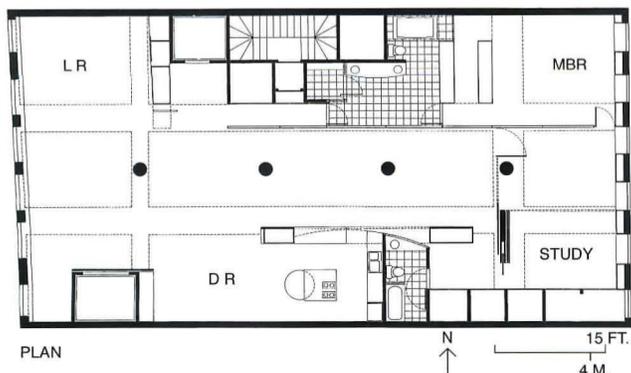
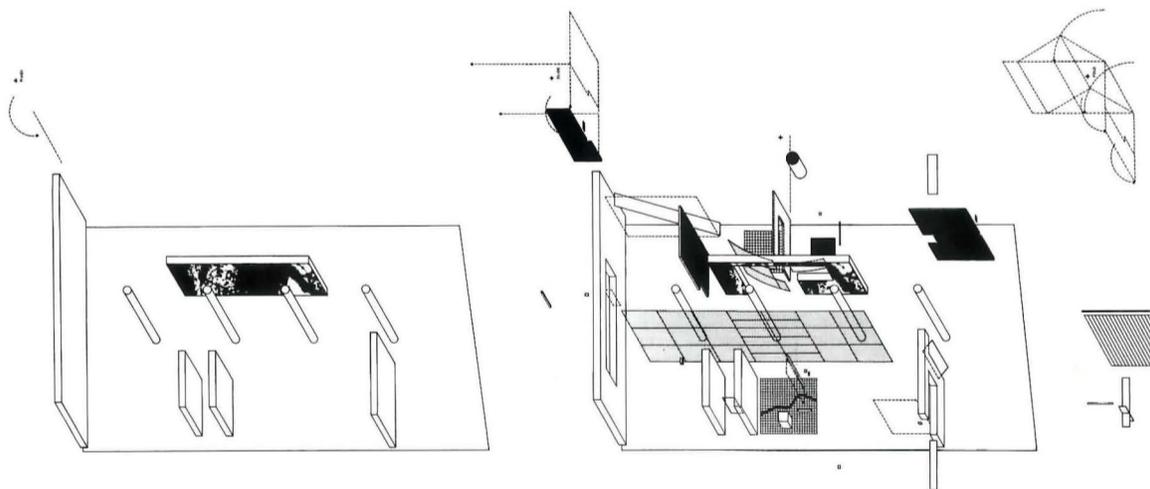
**Owner:** *Steven Holley*

**Architect:** *Hanrahan & Meyers Architects—Thomas Hanrahan, Victoria Meyers, principals-in-charge; Martha Coleman, project assistant*

**Engineers:** *M.A. Rubiano (mechanical)*

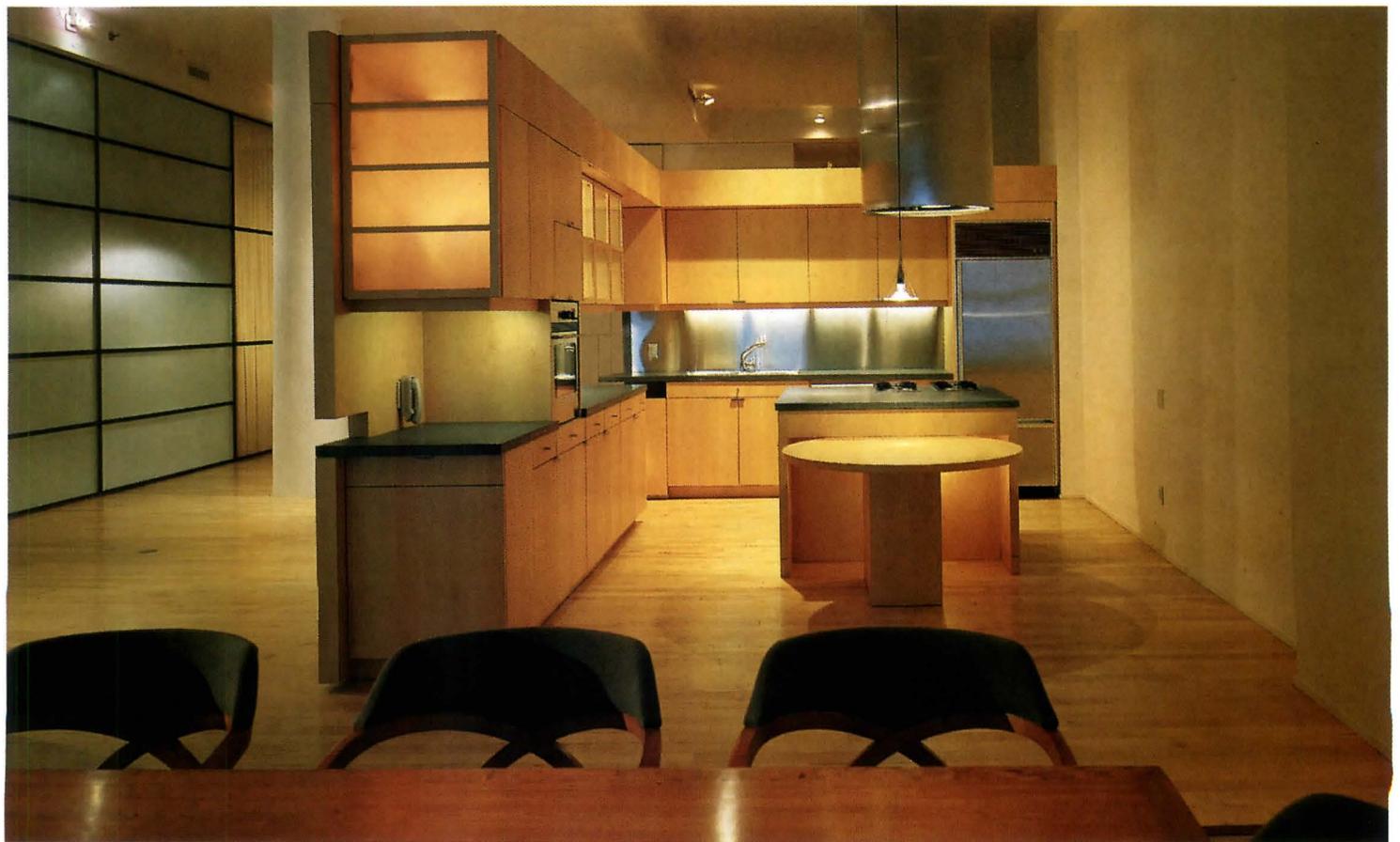
**Consultant:** *Tse-Yun Chu Interior Design (furnishings/fabric selection)*

**General Contractor:** *J. Lauda Co., Inc.*



*The axonometric drawing above shows how movable partitions and built-ins divide the 3,800-square-foot space into discrete rooms. The study can be closed off from the center gallery (opposite). Following pages, clockwise from top left: foyer; looking east; view of dining room from entry; master bedroom; view of kitchen from dining room.*







# Legal Motion

*Law Offices of Bruce S. Harvey  
Atlanta, Georgia  
Venning Atwood Kean Design,  
Architects*



**T**ake an old industrial building in a neighborhood encompassing railroad tracks, a Baptist Tabernacle, and a nude-modeling studio, then add a client with a reputation as a renegade in a stodgy profession. Strip away layers of ersatz Georgian detailing, reveal several overlapping street grids, and have fun with rugged materials. That's what Venning Atwood Kean Design did with the 3,000-square-foot offices of Bruce Harvey, the pony-tailed, richly tattooed lawyer who has built a reputation in Georgia for taking nasty cases shunned by most of his colleagues. "Defender of the damned" is the way *Atlanta* magazine describes him.

Playing it safe was not what Harvey or his architects had in mind when they started converting a two-story printer's building into offices for himself, two associates, an administrative assistant, and two lawyers who would rent space. Located in a part of downtown Atlanta where streets follow the city's original grid, the trapezoidal building dating from 1924 stands at a 45-degree angle to the modern towers a few blocks away. By overlaying these grids and the lines of the nearby railroad and highway, the architects created a complex geometry for the offices—one that is dynamic, but grounded in the history of Atlanta. "At the center of all these force lines was Bruce's office," says Lee Anne Kean. "He liked that idea a lot."

Echoing the client's personality, which combines the rough and the sophisticated, the project emphasizes contrasts between old and new, natural and manufactured. To do this, the building was stripped to its original shell, leaving exposed brick walls, concrete floors on the first level, and wood floors on the second level. At the front of the building, a covered entry space was created by inserting a new metal-and-glass wall at an angle to the street. Inside, a slice of the second floor was cut away to form a narrow two-story entry foyer leading to the center of the offices. Some ghosts remain. For example, indentations in a brick wall recall floor joists now removed. And the imprint of vanished stairs clings to a wall in one of the leased offices on the first floor. (1, following page) "There's as much complexity in taking away as there is in adding," notes Frank Venning.

Because they wanted to juxtapose old and new—rather than merge the two—the architects brought together elements from different eras without letting them quite touch. The most dramatic example of this is the new canted partition that sweeps from the front of the offices to the center, pushing closer and closer to one of the building's old masonry walls (2, following page). The result is a remarkable compression of space and time periods. This big squeeze is followed by an explosion of space and light around the main stair. Topped by a skylight, the stair is a Constructivist creation made of yellow-pine timber and hung with angled planes of translucent-white acrylic. Wrapping around a tower of books that serves as the library, the stair is the main social space in the building—offering views up and down, sunlight from above, and a place to grab a legal tome or bump into associates.

The first floor provides leased space for two lawyers and a reception area for Harvey's firm, but the second floor is all Harvey's. His own office sits at one end of the floor, sheathed in black-iron sheet metal, while a conference room, wrapped in corrugated translucent fiber-glass, anchors the other end. "The bunker and the ice cube," says Kean, describing the two rooms. Doors to these spaces and most others slide back and forth, enhancing a sense of layering begun with overlapping geometries and materials. Having asked for a design that would set him apart from other lawyers, Harvey says the offices help convince clients that "That's my man!" *Clifford A. Pearson*

©Timothy Hursley photos



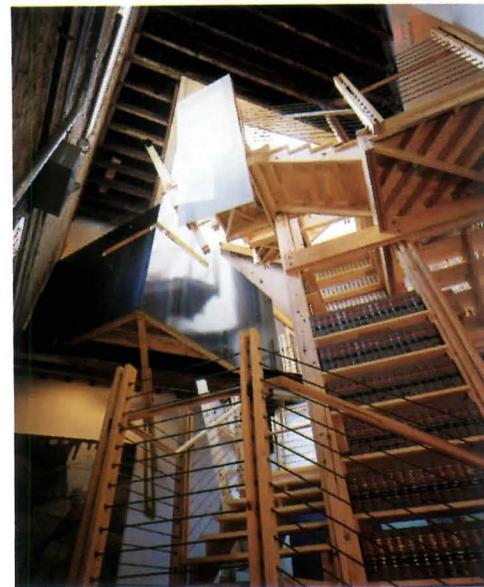
*Located in a mixed-use neighborhood, the 3,000-sq-ft building retains an industrial esthetic. Its simple masonry shell (top) serves as a foil for a dynamic interior. An angled glass wall recessed within the building's mass creates a covered entry space that can be closed from the street by a chain-metal curtain (above). The main staircase is assembled from yellow-pine 2x10s and 2x12s (opposite).*



1



2



3



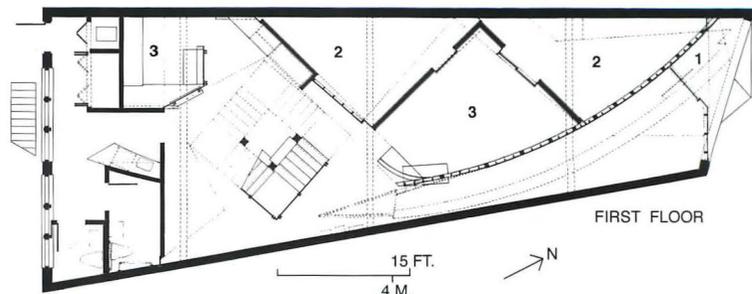
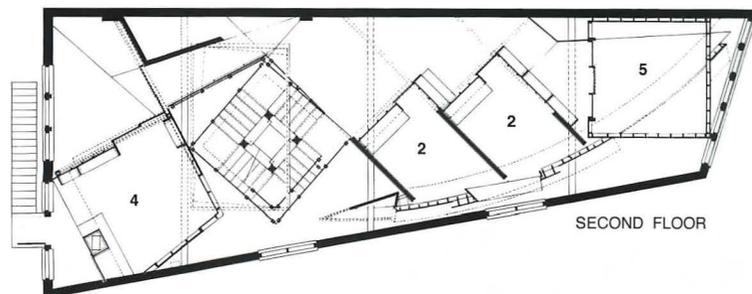
4

*In the front office on the ground floor, the imprint of an old stair remains on the wall (1). By bringing old and new close together without touching, the architects created a sense of dynamic tension in the long entry foyer (2). Peeling away part of the curving wall opened views to the foyer, while maintaining a sense of enclosure in the staff area (opposite).*

*Asked by the client to design something "dramatic but cheap," Venning Atwood Kean Design used inexpensive materials such as gypsum board, corrugated fiberglass, and simple timber throughout the offices. By exposing metal studs, piping, ducts, and electrical conduits, the project uses construction itself as an important part of its architectural expression.*

*A feeling of motion is emphasized on the main stair by attaching translucent acrylic panels at various angles (3 and 4). The effect is similar to that created by Russian Constructivist designers in the 1920s. Although rotated 45 degrees from the building's straight north wall, the stair is aligned with the street grid of most of modern Atlanta.*

1. Entry
2. Lawyer's office
3. Staff
4. Harvey's office
5. Conference room







Harvey's own office is entered through large sliding doors sheathed in black-iron sheet metal (left top). Sliding doors and peeled surfaces help reinforce a complex layering that is also seen in overlapping grids, exposed studs, and multiple planes. While Harvey's office is affectionately referred to as "the bunker," the translucent conference room is called "the ice cube" (left bottom). Corrugated fiberglass with exposed metal studs frame the conference room.

A giant piece of sculpture made of wood, plexiglass, and metal cables, the main stair serves a variety of functions—from housing bookshelves to providing access to the roof and the building's two floors (left middle). Sunlight coming from above also helps animate the stair and the spaces around it (opposite). Harvey says that on sunny days he has little need for interior light sources. He also appreciates the changing quality of light as the day passes. "When a cloud comes by, you know it," he says.

#### **Credits**

*Law Offices of Bruce S. Harvey  
Atlanta, Georgia*

**Architects:** *Venning Atwood  
Kean Design—Frank F. Venning,  
Jeff Atwood, Lee Anne Kean,  
partners; Roderick Cloud,  
presentation drawings; Steve  
Ellis, newel-post design; Mike  
Nash, furniture design*

**Engineer:** *Pruitt Eberly, Inc.  
(structural)—Robert M. Stone,  
principal*

**General Contractor:** *Lusk and  
Associates—Bill Lusk, owner;  
Vince Ometz, superintendent;  
Shawn Evans, project manager*



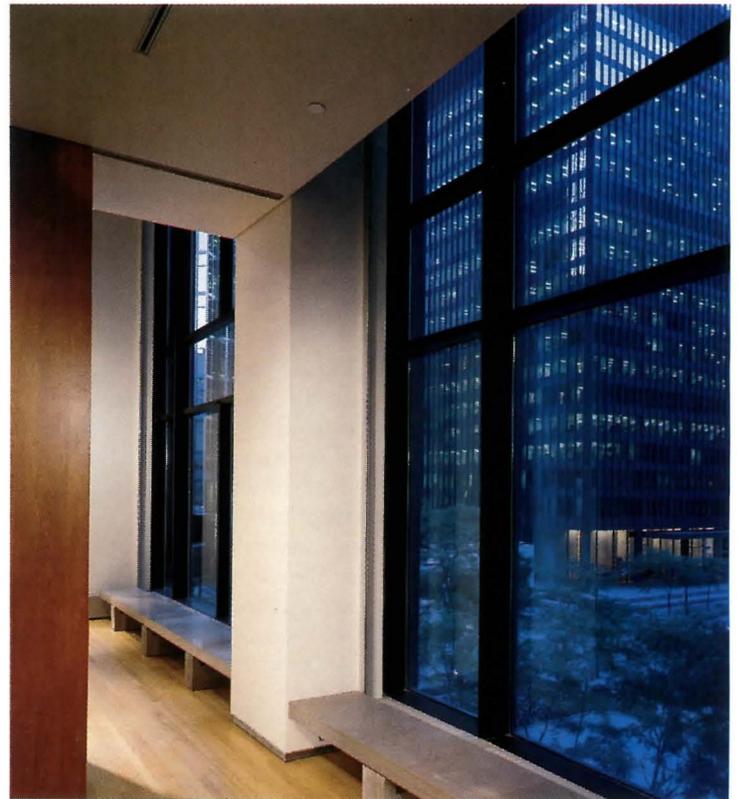
the entrance to determine a design language the architects would carry throughout the project. They introduced new materials: polished concrete, integrally colored plaster, and white-oak flooring, which, in the trading room, replaces cigarette-pocked cork. Some materials carry through those found in the trading room: etched glass, stainless steel, and cherry woodwork. The team used all materials to create surfaces and forms meant to seem independent of their surroundings. For instance, ceilings in all-new spaces stop short of walls and appear to float below the exposed structure—just as the new bridge and stair in the trading room seem to float above the floor. Lighting is indirect or narrowly focused away from walls and ceilings, further reducing their confining effect.

The third-floor bridge and fourth-floor corridors snaked through roof trusses unite isolated areas. But the greatest problem came in 1992, when the architects completed a first set of working drawings. Funding from private corporations and government greatly shrank. The budget for the 40,000-square-foot facility went from \$6.5 million to \$4.5 million, and a new program called for flexible spaces that could be converted for rentals (to corporations and individuals) for events varying from intimate cocktail parties and meetings to large-scale fashion and video shows, as well as weddings. Suddenly, there were unanticipated needs for kitchens, equipment storage, extra hvac and security. The resolution is to confine large-scale events to the trading floor. Low walls, projecting from former recesses, conceal such ancillary

*Unexpected economies did not prevent a high level of new finishes throughout, including in the 1937 trading room (above and opposite). "We used real materials and stretched them to the limit," says partner-in-charge Shirley Blumberg. Large sheets of etched glass along the bridge, stainless-steel handrails, and oak flooring carry through the design intent of the original room—executed with marble-like fiberboard walls and cork floors.*



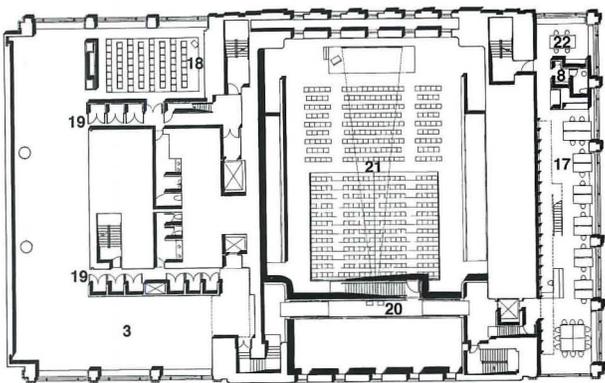
© Steven Evans photos this page.



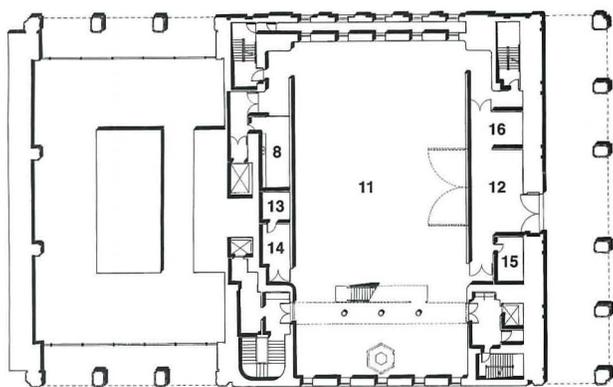
4

The resource center (1) was conceived before computers reduced the need for bulky book collections. Now it serves small social functions and is reached by stairs directly from the major rental space in the trading room. Graphite paint on the inside of the curtain-wall framing in the

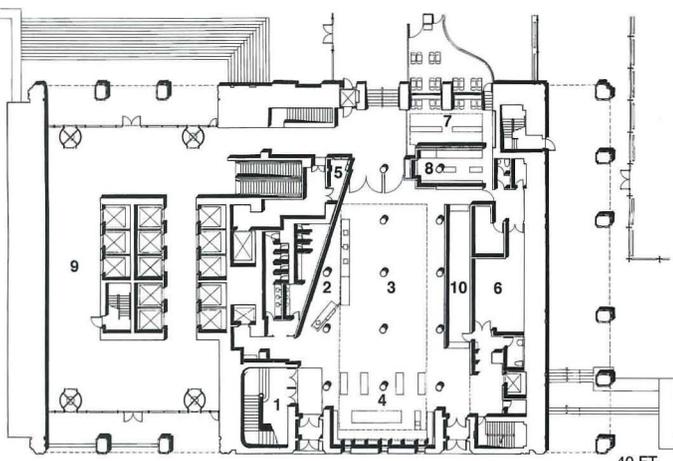
skinny support columns in the ground-floor entrance hall (2, 5, and 6), but holds away from the ceiling to reveal the true structure. In turn, the ceiling stops short of the walls as it does in all of the originally unfinished spaces to reveal the varying structure. Another original 1937



THIRD FLOOR



SECOND FLOOR



GROUND FLOOR

- 1. Historic lobby
- 2. Information
- 3. Exhibit
- 4. Store
- 5. Maintenance
- 6. Exhibit prep
- 7. Cafe
- 8. Kitchen
- 9. Office building
- 10. AV projection
- 11. Seating storage
- 12. Mechanical
- 13. Lighting storage
- 14. Electrical/ AV
- 15. Exhibit storage
- 16. Resource center
- 17. Meeting/lecture
- 18. Storage
- 19. AV projection
- 20. AV projection



2



3



5

**Credits**

*The Design Exchange  
Toronto, Ontario*

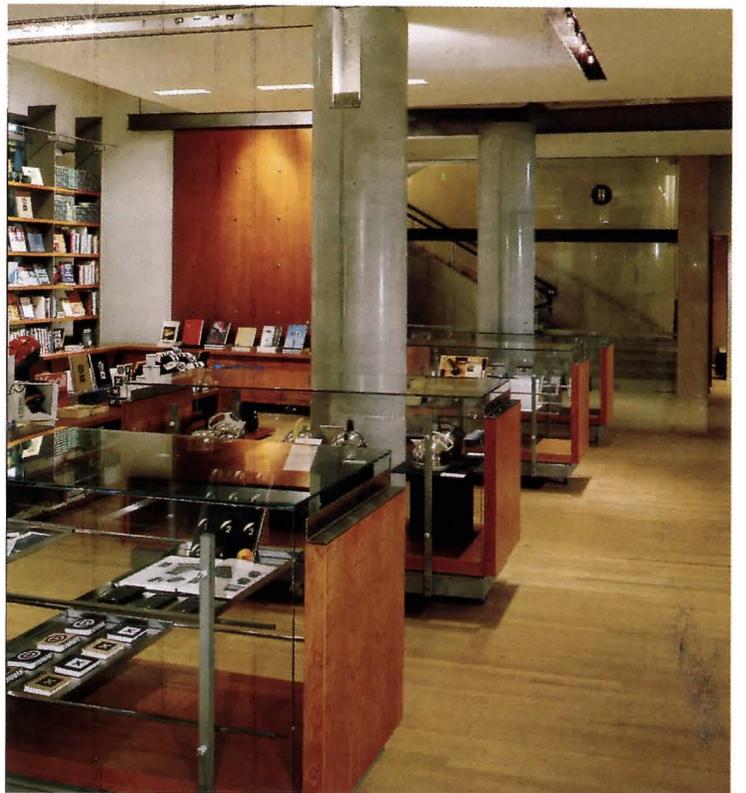
**Owner:** *The Design Exchange*

**Architect:** *Kuwabara Payne McKenna Blumberg Architects—Shirley Blumberg, partner-in-charge; Bruce Kuwabara, associated partner; Siamak Hariri, associate-in-charge; Todd Macyk, project architect; David Jesson, Kelly Lem, Mike Poitras, Anthony Provenzano, project*

*team; Karen Petrachenko, interior designer*

**Engineers:** *Yolles Partnership Ltd. (structural) Merber Corporation (mechanical); Carinci Burt Rogers Engineering (electrical)*

**Consultants:** *James F. Vermeulen Cost Consultant Ltd. (costs); Brian Arnott (audio-visual); Morrison Hershfield (fire and safety); Donald Kaufman (color); Gottshalk+*



6

*Ash (signage); Valcoustics Canada Ltd. (acoustics); Howarth Design Inc. (food)*  
**General Contractor:** *Jackson-Lewis Company, Inc.*

# Thinking Like a Decorator

By Suzanne Stephens

Many architects like to shrug off the residential work that interior designers and decorators may win away from them. After all, it's usually only about appliqué—pelmet, passementerie, and other furbelows that cover up the architecture instead of enhancing it. And, the residential interiors market seems too small in scale to worry about the financial aspect. High-rise towers with repetitive floors are, says this argument, a more efficient way to go. Still, architects have no doubt noticed that few towers are being commissioned right now, while clients for residential interiors do not seem to go away. Furthermore, those interior designers and decorators seem to live as well as their rich clients, with lavish houses in Southampton, apartments on Manhattan's Sutton Place, and cars with drivers. Fabrics, finishes, and furniture can be lucrative.

## Why architects bother with interiors

The architects who are known for their residential interiors bring up higher-minded reasons for doing so than simply money. Charles Gwathmey of Gwathmey Siegel Architects, Robert A.M. Stern, Peter Marino, and B Five Studio (formerly known as Bentley LaRosa Salasky) have been involved with interiors from the start of their practices, which in some cases go back 30 years. They ascribe their motives to principles inherent in the architectural discipline itself. As Gwathmey, who frequently has designed the interiors of his houses, maintains: "Our effort begins with the entire structuring of space into which every aspect of the perceptual experience is integrated. When an architect does the interiors, all the elements, including the lighting and mechanical systems, become part of an overall design strategy. We are thinking holistically. I really mean that." This strategy obviously affects the look of the place. As Gwathmey puts it, "Our work does not rely on a sort of additive decoration, but on natural light, textures, and materiality." In other words, forget about curtains.

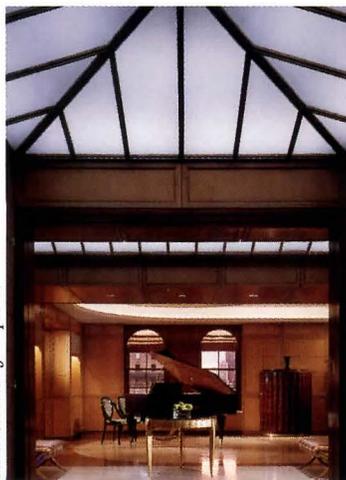
*Suzanne Stephens is a contributing writer to Architectural Digest and is pursuing graduate studies at Cornell University.*

## Gwathmey Siegel & Associates

*Gwathmey Apartment, New York City, (below left).*



© Paul Warchal photo



© Durston Saylor photo

Curtains, those "additive" artifacts, usually offer a telling clue about whether a room is designed by an architect or interior designer. Architects view curtains as not "integral" to the architecture and, worse, they cover up window details that are. Still, Marino, the architect who has designed some very serious curtains in his sumptuous interiors, argues, "There are architectural reasons for making curtains one way and not another." Marino, who studied architecture at Cornell University and later worked in the offices of Skidmore, Owings, & Merrill and George Nelson, explains, "I founded a business on the idea that architecture and interior design are all part of one continuum. Nobody was taking interior design seriously at the time. Architecture was shifting into engineering, and interior designers were becoming fabric pickers."

Stern invokes historical reasons for wanting to do residential interiors. "Robert Adam, John Soane, and Ogden Codman," he points out, "all combined an eclectic sensibility in architecture and furniture." While Stern says, "I like decorating because it is fun," he also argues that he has a basic predisposition for interior design since, as the architect he would know the size, scale, color, and texture of the elements that work best with his rooms. At the same time, Stern clarifies that his intent is "to complement the architecture while also offering an antiphonal reading of it."

## If you have a good architect, who needs a decorator?

In spite of having heavy-duty reputations for interiors work, both Gwathmey and Stern have acquiesced to clients who prefer bringing in an interior designer or decorator to finish up the houses they have executed. "Special relationships develop between the decorators and the clients," Stern says, adding diplomatically that "I have worked with several decorators whose work I respect, like Mark Hampton, Mariette Gomez, Albert Hadley, and [the firm] McMillen." Gwathmey cuts to the heart of the matter when he says: "There is a preconception that architects do not accommodate creature comforts, and that

*Koppleman Apartment, New York City; Bennett and Judie Weinstock, consultants on*

*furnishings (below middle and right).*



© Durston Saylor photo

*Many architects think of decorators as second best. But as Suzanne Stephens reports, when it comes to residential interiors, thinking like a decorator pays off in more ways than just money.*

they are too rigorous and inflexible.” He calls it “a myth inculcated into the psyche that decorators equal ‘soft’ and architects equal ‘hard.’” There are, however, interior designers with whom Gwathmey feels a rapport. One is Naomi Leff, who has now worked with him on houses for Jeffrey Katzenberg and Steven Spielberg. “Naomi has a sensibility for our work,” says Gwathmey. “We have developed good communication, with a set of constraints that she is willing to accept and support. She appreciates the refinement of the architecture, the reductiveness of the whole, and the fact that every object selected has to have a legitimate presence in the ethic of the total design.”

This could be a heavy load to bear. Leff, who took architecture courses at Pratt while she was getting a master’s degree in environmental design, seems to have the right amount of empathy. “With architects like Gwathmey,” she says, “you want to respect, not weaken, their vision.” The reason she believes she is often called in, however, is that “The client feels the need for another voice to be heard, someone freer of agendas about form—so that the lifestyle issues get the proper attention.”

Clients soon recognize that the architect is guided by a strong vision—the “concept.” But when the architectural concept means that closets have to be smaller than clients would like in order to keep the module of the design intact, there may be a problem. As Sal LaRosa, of B Five Studio, puts it, “The clientele is wealthy. They expect you to provide an order to their lives. No one wants to have to rummage around on the floor of a closet to look for shoes because the architect didn’t provide closets just for shoe racks.”

Interior designers often have many tales to tell about architects’ shortcomings, including those who design such unusually shaped windows for the bedroom that no shade or curtain can be devised to shield the occupant from the early morning sun. Or the architects who

don’t know how to combine differently scaled pieces of furniture (especially antiques) in a room, or who think all colors have to be white, beige and grey, or who have no idea why some people prefer lamp light to downlighting. Leff remarks she has worked on projects with architects (“Not Charlie,” she qualifies), where there was no place for the bed in the master bedroom. “We always include the furniture in the plans we show the client,” says Stern.

**The decorating mentality**

Many clients also have tastes and preferences that may not be part of the architect’s “design strategy.” They may view “integration” as promoting a deadening homogeneity, and look at the adherence to one design approach as being too rigid. Here, again, interior designers are perceived as being more flexible. For example, Leff says, “I’m interested in the style appropriate to the client’s own tastes, as well as to the architecture. We work with contemporary, country, and traditional looks, and I hope we bring to them a level of quality and rationality.”

Naturally architects are more single-minded about formal issues. To them, designing in different styles reveals a lack of resolve or commitment to a set of principles they have developed during their architectural training. It is the basis of their educational ethos. Nevertheless, Marino argues, “Our firm believes in the appropriate architecture for the site—on an all-encompassing view for architecture.” The same goes for the interiors. “We do everything from A to Z,” he says, adding, “Or you could say, from Armani to Valentino. I did Armani’s villa in Milan in an uncluttered, clean look in which the sensuousness comes from textures and colors of materials. Then I did Valentino’s place in New York. Valentino likes objects and is a great connoisseur,” Marino explains.

To bring off interiors of this nature, Marino has to get involved with specifics, and he prides himself on his expertise in textiles as well as

**B Five Studio**

*Park Avenue Apartment,  
New York City.*



©Michael Muncy photos

*"It is a given that clients never mind paying decorators retail, or even a percentage above retail," says Charles Gwathmey, "but they scream when an architect tries to get a legitimate fee."*

antiques. He can thus challenge interior-design firms, which, as Leff explains, "know resources, furniture, patterns of furniture, and can bring a certain reassurance to the client that the furniture is going to fit. How much can the architect do" she asks, "if the client doesn't want all the furniture built in?" Leff further notes, "Some architects don't want to involve themselves with lighting, or the way the draperies hang."

#### **Architects aren't always trained to decorate**

While Marino studied fine arts in architecture school, he had to pick up the knowledge of furniture and textiles on his own. "Architecture schools stress the need to know structures of buildings," he says, "but not how to build furniture, or how a sofa is made, including the distance between the frame and the upholstery." Moreover, he contends, "There is a whole education in interior design and furniture history that architects should have along with architectural history."

Stern agrees. "Most architects don't know how to decorate," he says. "They are not taught in the schools, and they think it's frou-frou. There are architects designing 80-story buildings who haven't designed a single room for one person," he adds. "Talk about alienation." While Stern, who studied architecture at Yale, didn't have courses in the decorative arts, he says he has taught himself about it, reading books and catalogs and going to antique stores.

While LaRosa was getting his master's of architecture at Columbia University, he took a decorative-arts course in the preservation program that he felt was "great." Others don't do this. "The way architects place furniture," he says, "is a joke. They aren't trained about how the scale of the furniture works with the size of the room, and the scale of the people occupying that space."

Considering the general lack of such training, convincing the client the architect knows how to "decorate" clearly can be tough. Marino

maintains that if the client wants only architecture from him, he just says no. He also claims he hasn't worked with an interior designer since he established his own firm in 1976. If the client wants only interiors, the answer may be modified "depending on how penitent the client is about having made another choice for the architecture."

#### **Financial benefits**

In spite of the highly principled reasons that architects offer for their interest in designing residential interiors, they are aware of the financial benefits. As LaRosa puts it, "Usually our interiors work pays for the architectural work in the office." Since the firm has recently been restructured, expanding both the architecture component by adding Charles Capaldi, an architect with much institutional-design experience, and bringing in Victoria Borus, an interior designer, LaRosa's equation could change. In the meantime, he points to an intriguing situation. "Architects often shy away from designing houses because they lose money," LaRosa says, adding "but it works if you design a house *and* the interiors."

The advantage occurs in the mark-up on fabrics, antiques, furnishings, and finishes. Since many interior designers charge retail prices for furniture, antiques, and the rest while paying only net prices to the dealer or manufacturer, they are indeed able to realize a handsome profit. Their way of pricing their services has psychological advantages as well. "It is a given that clients never mind paying decorators retail, or even a percentage above retail," says Gwathmey, "but they scream when an architect tries to get a legitimate fee." Leff adds, "If a client hates to pay fees, charging retail evaporates the [fee] issue."

Designers also may charge hourly rates, depending on the nature of the services. In addition, they often charge a "preliminary conceptual fee" at the start for developing the design scheme and making a presentation to the client. Gwathmey varies his form of billing. "If we

#### **Peter Marino + Associates Architects/Peter Marino, Ltd.**

*Armani Residence  
Milan (below left).*

*Valentino Residence  
New York City (below right).*



©Oberto Gili photo

©Michael Mundy photo

buy a \$150,000 antique for the client, we don't charge the percentage we are charging for the architecture," says Gwathmey. "We charge by the hour as consultants, or set a prearranged percentage of the price of the object we purchase. The same goes for fabrics and other furniture we buy at net. It's a negotiation."

Franklin Salasky, of B Five Studio, explains that his firm prefers hybrid fees, both hourly rates and percentages, although, "When doing decorating, we are likely to charge on a retail basis." For bookkeeping purposes Marino has two companies, Peter Marino and Associates, Architects, and Peter Marino, Ltd. for interiors work. His clients hire both at the same time so that the interiors people are involved in the meetings from the start. Regarding his fees, he says only, "In general, it is a percentage contract with certain peculiarities, depending on the project." For his part, Stern says that his firm establishes a budget for the architecture and interiors, and sets fixed fees on the interiors based on the time and the scope of responsibility. These too can be adjusted for unforeseen circumstances. "We don't like to mark up or charge retail," he says. "Often we go to auctions with the client, and the bid determines the cost. We're not trying to get the client to buy a more expensive item than necessary. Yet we may have a couple of people working one year on the interiors, and we have to provide for that."

#### When is a project over?

The range of services provided by architects acting as interior designers can include stocking the whole house with bed, bath, and table linens, silverware and, yes, candles. Some clients just don't have the time to shop. Furthermore, many interior designers will do an "installation." This ritual also takes time. As Leff explains, "The installation is the moment when all the furniture has been moved in, all the issues resolved, the beds are made, the kitchen has been used, the candles are lit, the flowers are in place, and the clients arrive for a dinner prepared by their staff." During the last month of the design process

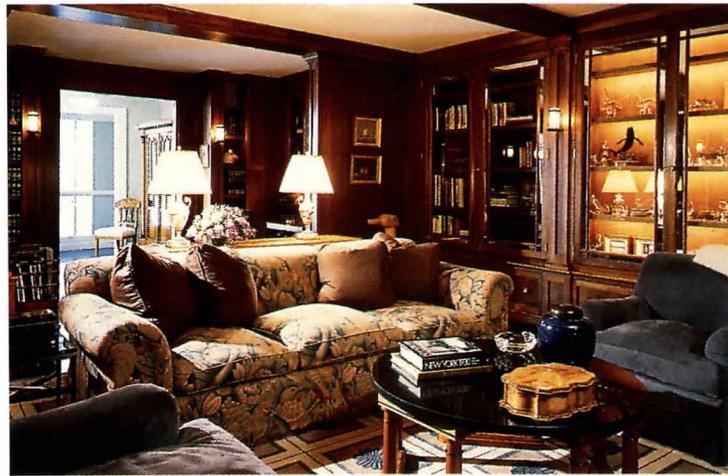
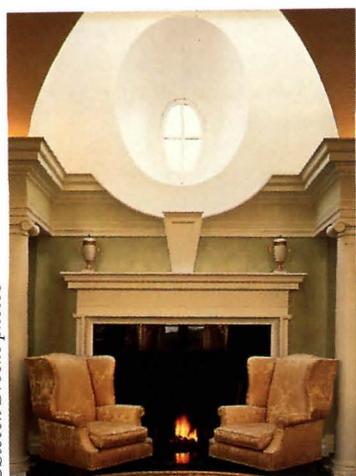
when the "installation" (also included in the designers' fees) is taking place, the clients are asked to stay away from the house or apartment. "Often we install three weeks before the final date," Leff says, "Then we go away for a week, and come back to do the final tweaking with the owner's staff."

Clearly, no matter how much "fun" it may be, or how high the profit margin, interior design and decorating are labor intensive. "Just purchasing all this stuff is a nightmare. There is so much paperwork," adds Stern. There are other detractions. "Architects who decorate are pigeonholed," says LaRosa. "You get to be known as a great decorator who happens to be an architect, rather than the other way around." The reason? "Decorators are still considered second class," LaRosa continues. "The distinction between decorating to cover up the architecture and decorating to enhance the architecture is still not clear in many people's minds."

Nevertheless, with architects showing more of an interest in designing interiors, and taking a connoisseur-like interest in furniture and the decorative arts, there is a possibility that such prejudices will slowly break down. It will take, however, more than a small group of architects pointing the way. Certain implications are apparent for those interested in this market. First, architects would have to come to terms with their belief system and the clients' focus on comfort, function, and whatever they define as sensuous and appealing. Architects also would have to convincingly demonstrate they know as much about the fabrics and furniture, color and lighting, as interior designers. They have to prove they can "pull a room together" without depending only on Mies van der Rohe chairs or custom built-ins. And they might even have to design curtains. While not all clients have the budgets this group is used to, there are enough who do have the money to pay for this kind of design. But it is their call. ■

### Robert A.M. Stern Architects

*Hewlett Harbor Residence  
Hewlett Harbor, New York.*

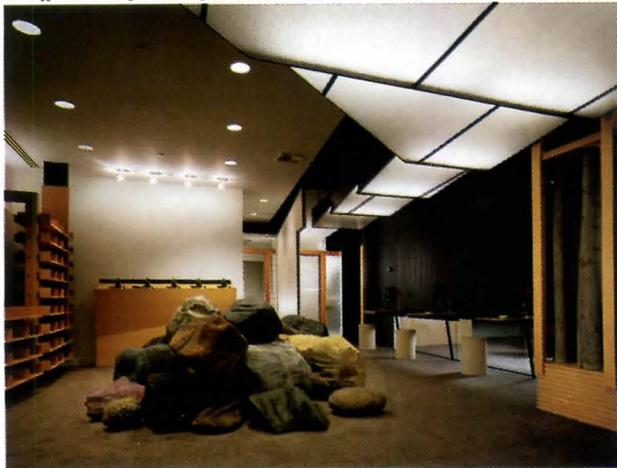


©Steven Brooker photos

Gemini Learning Center  
Morristown, New Jersey  
ROTO Architects

# Breaking the Grid With 3-D Thinking

© Jeff Goldberg/ESTO photos



*With most of its planes askew, the Gemini Learning Center looks like it was built by a crew of carpenters that lost its levels. Not so. This is ROTO Architects' model of the multiple forces that are at work in a complex business organization, pushing and pulling on one another in an organic growth process. The center's architecture helps managers learn to think about business transformation in several dimensions.*

Change comes barreling down on executives and corporate managers in the form of globalization, re-engineering, restructuring, downsizing, mergers, buyouts, and more. Staying in business is all about coping with change. Unfortunately, the multi-layered implications of these metamorphoses are not always understood by number-crunchers who easily comprehend the two-dimensional, gridded-off world of the spreadsheet. Gemini Consulting, a 450-person firm, uses its Gemini Learning Center to train business people to make and rapidly implement plans for coping with such multi-dimensional change.

"The objective was to come up with an environment that would encourage people to think in terms of the third dimension," says Michael Rotondi of ROTO Architects. "We began to talk with our client about how a complex, hierarchical organization translates itself into a business, and about the paradigms out of which companies are transformed. If you looked at a company's social, political, and economic forces, and were to model them on a computer, you would have all of those parts moving in relation to other parts to make a whole.

"What we talked about for this interior was making a space that abstractly represented a constantly moving, three-dimensional diagram of a complex organization—at some point you would sort of hit the 'pause button' and build it. But when people walk through this space, they don't say, 'Gee, this is like an organization,' but rather it is as if all of a sudden everything begins to move along with them in the new way in which they begin to think—in three dimensions. It was supposed to be a dynamic organization of a plan, but the same dynamic order occurs in section."

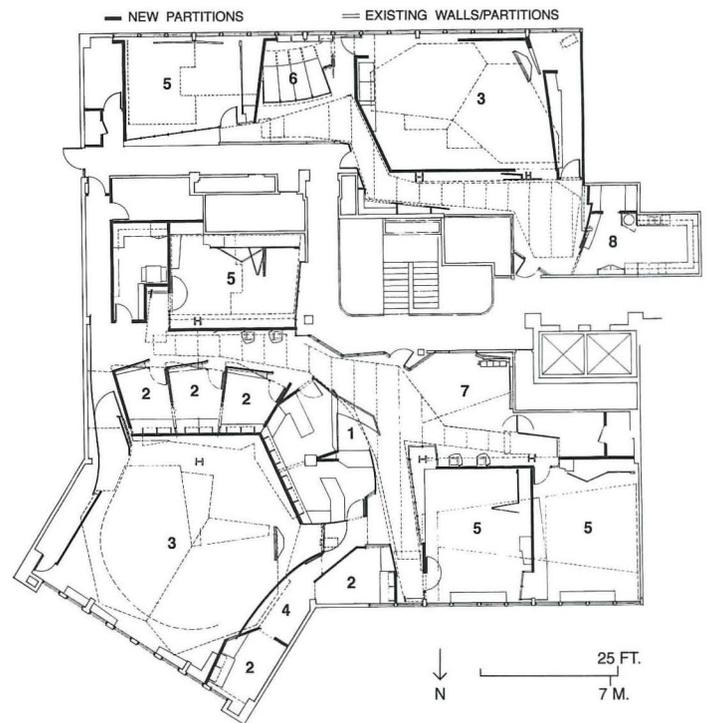
"The floor plate wasn't ideal," says partner Clark Stevens of the center's location in a 1960s spec-office building next door to Gemini's headquarters. "But they wanted to keep this near the main office, so they had to live with the floor plate and a space that was split by public spaces. That was one of the problems—how to get these parts to work as one." But these spaces were not isolated entirely because, while privacy was desirable, the sense that work was going on "behind closed doors" was not. One of the devices used to allow a fleeting glimpse of the training rooms to passersby were screens made of dried tree trunks, part of an organic "growth" theme carried on by the use of vertical-grain fir panels and found in the gray-green wool carpet the color of a forest's floor used throughout the center. Custom deep-purple chalkboards are placed in breakout rooms for making quick notes about material developed in training.

Training rooms were intentionally laid out so there was no preferred seat in the room, and no one would be behind anyone else. "The theory," says Clark, "is that no one can hide, everyone's got to get up and participate—if they have a thought, they're right there. The little tables in these rooms, designed in conjunction with Krohn Design, needed to be mobile, fun, and not seen as a barrier; this is why they're made of glass." Each can be moved like a wheelbarrow, and has a port so a laptop can be linked to the building's central data system. Additional ports are located in the floor. The desks also connect back-to-back to allow four people at one desk to work on a small-group project. *Charles Linn*

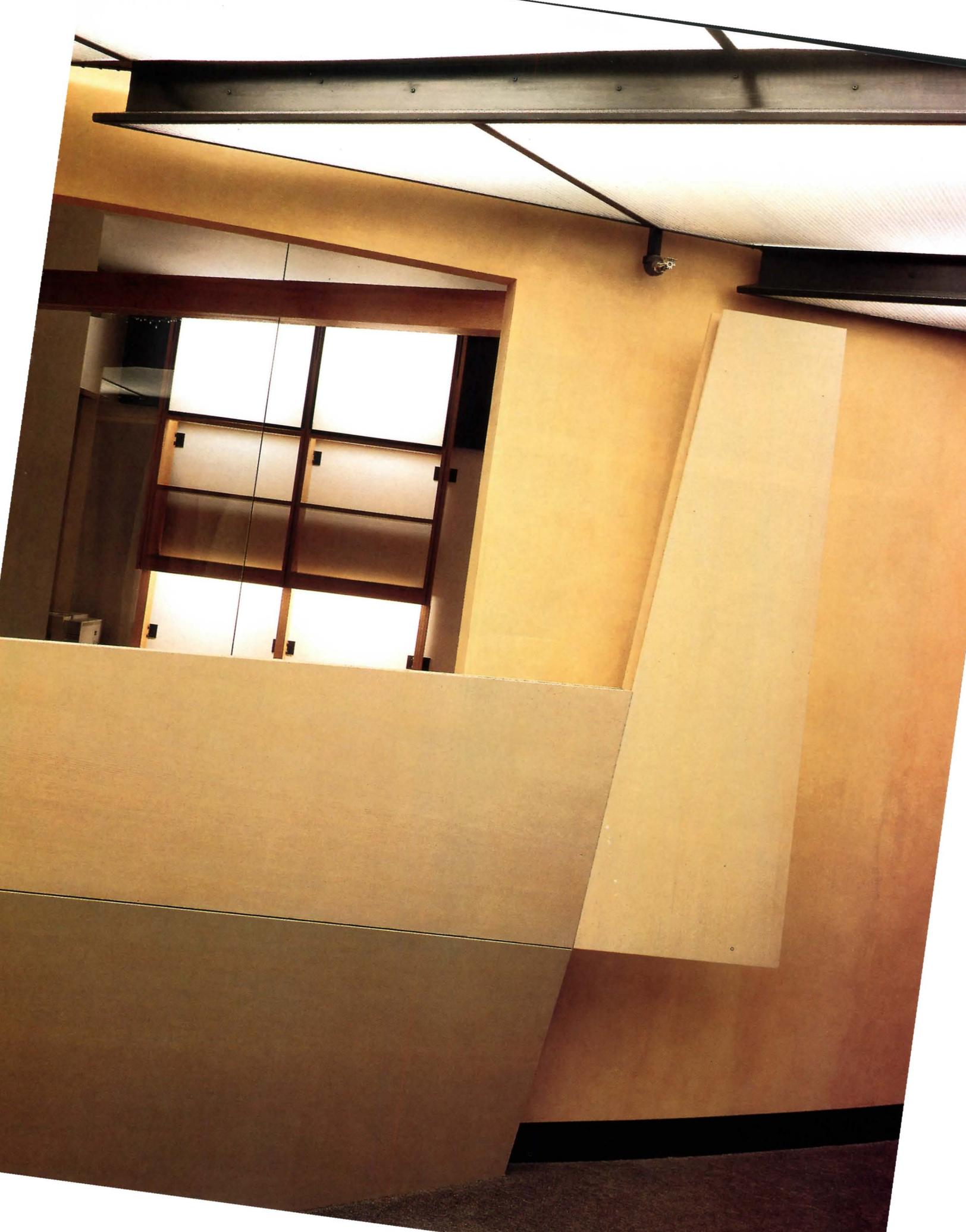


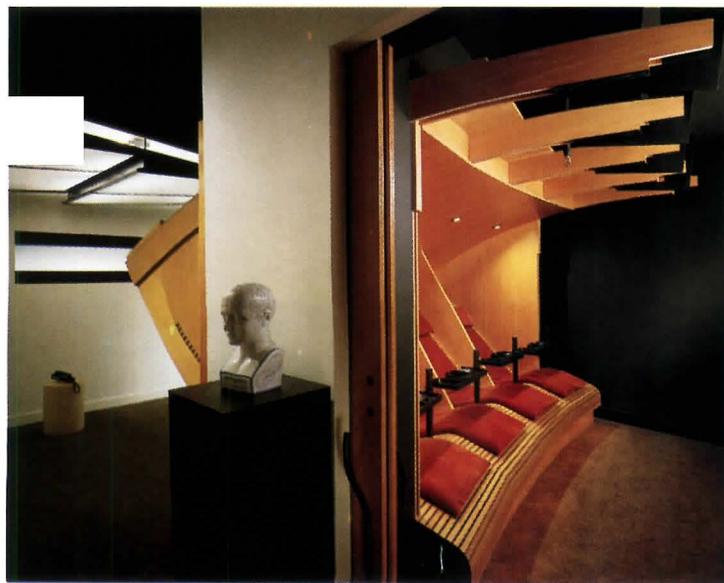


The reception area of the Gemini Learning Center establishes the center's theme of metamorphosis, change, and three-dimensional thinking using "organic" surfaces. The "folded walls" (this page and opposite) developed by ROTO are lightweight and thin in profile, but extremely stiff. They consist of 5/8-inch plywood fastened to welded tubular-steel frames with plugged screws. A screen made of a row of tree trunks (below left) allows private sessions to go on in the training room, without creating a sense of isolation.



1. Reception
2. Office
3. Training room
4. Waiting room
5. Breakout room
6. "Mind gym"
7. Lounge
8. Kitchen





A breakout room (top left) has all of the amenities necessary to continue the intense discussions that go on in training rooms (center left). The training rooms have movable tables equipped with a bit of wheeled whimsy—wheel-barrow tires that allow them to be quickly reconfigured, and custom-made, deep-purple chalkboards. The “mind gym” (bottom left) is an area dedicated to relaxation, and comes with comfortable built-in chairs and high-tech gear that de-stresses the user and provides deep relaxation. A screen (detail opposite) constructed of tree trunks provides privacy without isolation.

**Credits**

*Gemini Learning Center  
Morristown, New Jersey*  
**Owner:** Gemini Consulting  
**Architect:** ROTO Architects—  
Michael Rotondi, Clark Stevens,  
principals; Tracy Loeffler, Brian  
Reiff, Craig Scott, collaborators;  
Jim Bassett, Michael Brandes,  
Max Massie, team; Richard  
Kasemsarn, Jason King, Milana  
Kosovic, Yusuki Obuchi,  
assistants.

**Consultants:** Kay Kollar Design  
(finishes, furniture); Krohn  
Design (furniture);  
MB & A (mechanical);  
Chermayeff & Geismar  
(graphics); WGFS Lighting  
(lighting); Johnson  
Schwinghammer  
(lighting)

**Contractor:** Clearcut  
Construction



# Soho Video

SMA Video, Inc.  
Production Facilities  
New York City  
Anderson/Schwartz Architects,  
Architect

**S**MA Video, according to president Michael Morrissey, is the first high-end, full-service, on-line, film-to-digital-tape post-production house to settle in Soho, an area located south of New York City's Houston Street that's fast becoming a national center for high-tech media production. Artists, lured by relatively low rents, vast uncluttered loft spaces, and easy access by public transit, led the way years ago, followed now by a new wave of electronic media teams.

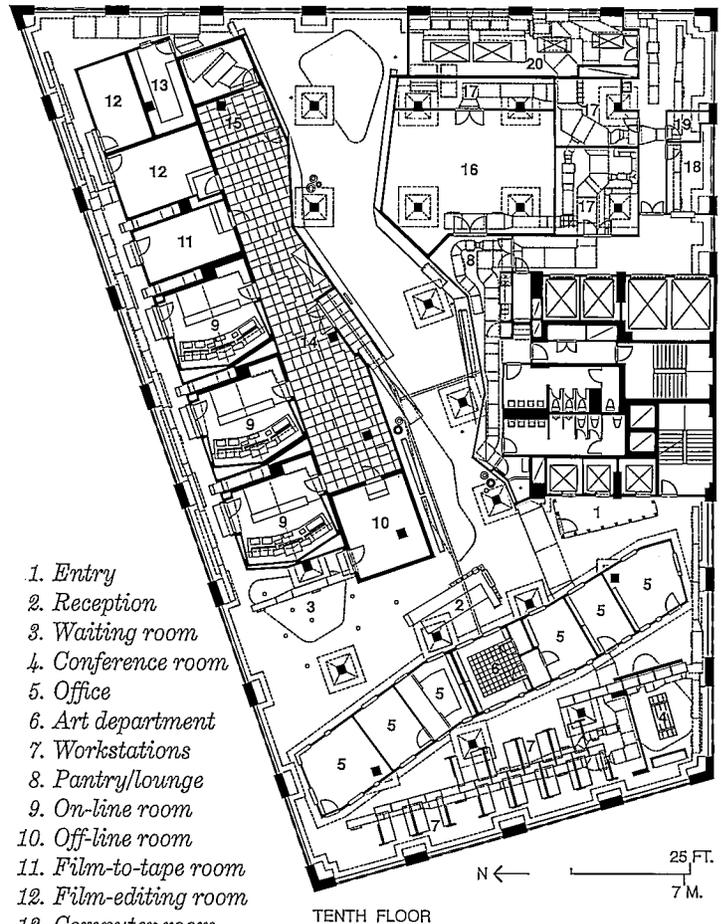
The client's charge to Anderson/Schwartz was to design a facility that would attract, and be sympathetic to, the hip culture of the feature-film makers, TV show producers, and makers of commercials who come, story-boards in hand, to tap SMA's electronic production savvy. These clients often call for grandiose settings ("We want to recreate the Entebbe raid") but lack the budget to hire a fleet of helicopters, rent the Javits Convention Center, or engage a great ship for the shoot.

The resulting space is a funky, intricate blending of cool internal landscape and closely managed wiring, air-conditioning, and acoustic controls. Mentally, says principal-in-charge Ross Anderson, "it's a place where people can walk through and feel some sense of dislocation. 'Where are we?' And we're making a connection with the larger landscape as well, so you don't feel you're locked in."

In fact, the existing grid of mushroom-capped concrete columns echoes the city's street grid, a similarity underscored by setting the enclosed interior spaces back from the windows (floor plan, right). This has the critical added virtues of acoustically isolating spaces from outside noise and gently filtering the light from this "fourth wall." The result is a sense of perpetual twilight once you leave the windows: light levels are low so staff isn't momentarily blinded moving in and out of dimly lit studios. These irregular, non-specific spaces (opposite) have extra uses as backgrounds for shoots (especially long dolly shots), for equipment, and to serve as gathering places for staff—areas denoted on the ceiling by yellow painted "puddles."

The former printing plant's concrete floor was left untouched—pits, pockmarks, and all. The architects like the contrast with the smooth dark walls, although the owners fear trip-ups by espadrilles-shod summer staff. As for the furniture, this was outside the architects' control, and doesn't always bear out the dynamic message of the design—with the possible exception of an electric chair that's no longer used for its original purpose.

Perhaps the greatest challenge was to control the great array of cables and raceways demanded by a facility of this caliber, along with the heat and noise generated by the equipment. Allowing the machines to access wires efficiently was the work of SMA engineering director (and executive vice president) David Satin. In the project's early stages, Satin designed a master system that spelled out how the machines would work with one another, then worked closely with the electricians in laying the sheaves of cables—all color-coded by Satin, some exposed (see tray, opposite bottom), some buried under the floor, some in the ceiling. The result is an adroit meld of function and form. *Stephen A. Kliment*



1. Entry
2. Reception
3. Waiting room
4. Conference room
5. Office
6. Art department
7. Workstations
8. Pantry/lounge
9. On-line room
10. Off-line room
11. Film-to-tape room
12. Film-editing room
13. Computer room
14. Machine room
15. Electric shop
16. Sound stage
17. Storage
18. Shipping
19. Dark room
20. Mechanical

*The view towards the entrance of this 24-hour facility (opposite top, rear) shows a security cage at the elevators made of mining mesh supported by heavy timber posts, and to its right a stunning reception "box" of birch, poplar, and fiberglass sheet (see detail overleaf). A section of internal landscape (opposite below) reveals an exposed tray of cables and a painted ceiling "puddle." Walls are galvanized sheet steel.*





*From top to bottom (this page) is a view of the entry area with reception cage; a typical digital editing room, with a counter for client viewing—the equipment is served by cables via a long machine room; and the setback from Soho's streetscape, which is intended as wallpaper forming the fourth wall of the "landscape."*

*Splayed walls (opposite top) give a planned sense of dislocation, in contrast to the more structured open work area (below).*

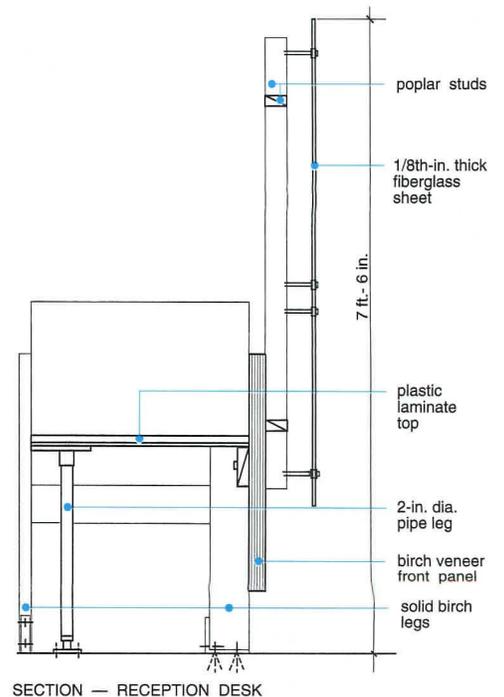
**Credits**

*SMA Video, Inc. Production Facilities, New York City*

**Architect:** *Anderson/Schwartz Architects—Ross Anderson, partner-in-charge; Stephen O'Dell, project architect; Aaron Bentley, M. J. Sagan, Caroline Otto, Paul Cali, project team*

**Consultants:** *I. P. Group Consulting Engineers (mechanical); Shen, Milsom & Wilkie, Inc. (acoustical)*

**General Contractor:** *Clark Construction*





# Breaking the Mold



*Nearly 60 floors in the air, Joe Valerio has created an idealized world of metal and wood.*

*Gardner Residence  
Chicago  
Valerio Dewalt Train Associates,  
Architect*





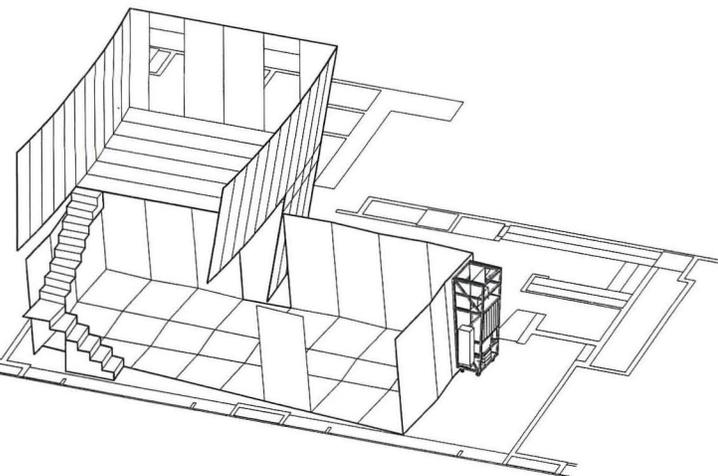
© Barbara Karant photos

Joe Valerio still can't believe his good luck. In fact, whenever he tries to describe how Tracy Gardner first came to see him about designing his apartment and, on a subsequent visit, brought photographs of work he liked, the usually loquacious Valerio just stammers. After many false starts, the most coherent statement he can muster is: "It's great. He's great. I mean, come on." After all, he asks, how many prospective clients would present you with images of Le Corbusier's La Tourette monastery and Villa Savoye and Frank Gehry's Schnabel House in Los Angeles as the work they most admire? Contrary to Valerio's momentary loss-for-words, he's a story-teller. While this is partly a tale of a client with a unique appreciation for sculptural architecture, the apartment itself has a lot to say.

While its location—the 58th and 59th floors of a Skidmore, Owings, and Merrill-designed building overlooking Chicago's North Michigan Avenue and the nearby lake—is irrefutably lofty, its size—1,000 square feet—is diminutive. Valerio looked to the building envelope's proportional system for design clues. Instead of geometric order, he found confusion. Says the architect: "Nothing [about the position of services or window module] makes any sense." So the lack of organizational clarity became the opener to his story. Within this "mess," he decided to insert a more perfect world, comprising two interlocking boxes—one horizontal to enclose the first-floor living room and one vertical to carve out a second-floor study—each materially distinct and flawlessly detailed (axonometric left). The area between the boxes is reserved for more basic human functions: eating, sleeping, and bathing.

Straddling the mundane and the other-worldly are the series of panels that align like an aluminum wrapper around the central space, or pivot open to reveal the kitchen, bedroom, or bathroom. Floors in this area are also aluminum as are ceiling panels, which have corners that are folded back to reveal light fixtures (previous pages). Connecting the two boxes is a seemingly paper-thin aluminum stair cantilevered from the east wood wall, which enhances the dramatic sweep of the second box. Slicing through the lower volume, it creates an angled opening—the first view upon entry to the apartment (following pages).

While Valerio deliberately chose to delay the panoramic skyline until one passes through the foyer, he channeled all initial views on another SOM building, the John Hancock Center, three blocks away. The chamfered tower became a touchstone of sorts, providing the angle for aluminum panels and a hypothetical geometric counterpoint to the curved wood sections of the study. In his storyline, Valerio likens the Chicago landmark to "a supernova that exerts tremendous pressure on the interior [of the apartment] and warps it." This outer-space analogy has particular resonance for Gardner's doorman, who has nicknamed the place "the Star Trek apartment." *Karen D. Stein*



When aluminum panels are pivoted open, bathroom mirrors reflect furniture and views (above). The "media center" is a metal unit attached to an aluminum panel that pivots on rollers between the bedroom and living room (outlined in drawing above).





*Leaning maple walls telescope the view at the entrance (top left). On the first floor, aluminum panels cut at the same angle as the black John Hancock building that dominates the skyline pivot when there is a need for privacy (top right and bottom left). Valerio replaced the mechanical system on the ceiling with one concealed behind wood cabinets and designed a more porous balustrade of aluminum members, opening up north-facing views from the second-floor loft (opposite). Open slots between wood panels accommodate lighting and sprinklers.*



**Credits**

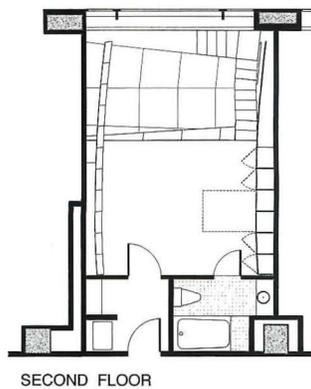
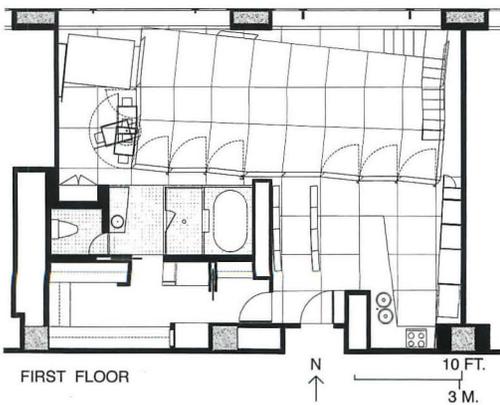
*Gardner Residence  
Chicago*

**Owner:** Tracy Gardner

**Architect:** Valerio Dewalt Train Associates—Joseph Valerio, principal-in-charge; Michael Cygan, Randall Mattheis, Shawn Trentlage, Sarah Morie, Nancy Willert, project team

**Engineers:** Robert Darvas Associates (structural); WMA, Inc. (M/E/P)

**General Contractor:** Turner Construction, special projects division





# World Apart

Tel Aviv Performing Arts Center Foyer  
Tel Aviv, Israel  
Ron Arad and Alison Brooks, Architects

Architectural competitions can make strange bedfellows, but when London-based Ron Arad Associates was selected to design the foyer of Yacov Rechter's Tel Aviv opera house, there was little question of trying to fit in. Instead, Arad, known for his ingenious heavy-metal furniture [RECORD, Mid-September 1988, pages 64-71], and partner Alison Brooks, chose to insert a different and independent landscape into Rechter's rational concrete frame (below right). Their concept was to design a place to pass the time between performances, and in that passage unite two disparate architectural vocabularies. Also, they hoped to create an oasis of visual and tactile relief within the sprawling performing-arts and office complex.

The four-story lobby is, in fact, transformed by their insertion of a white spiraling island that contains the box office, bars, a cafe, a catering kitchen, and an amphitheater (following pages). Openings in it could only be designed on-site, since their shape was determined by constantly changing wall thicknesses. The blue-black underside of the auditorium, pierced by Ingo Maurer's light fixtures, is treated as a second independent element in the space. At its base, an undulating bronze wall alternately acts as enclosure, bench, and screen. Pre-made in Italy, it's curved form is made from stacked bronze rods welded together. One cannot help but be in awe of the hands-on attention such inventive irregularity requires, not to mention the number of working drawings (over 200 were done). Luckily, the adventurous spirit of the project's designers extended to the contractor, a marine biologist who, he says, builds for fun. *Claire Downey*

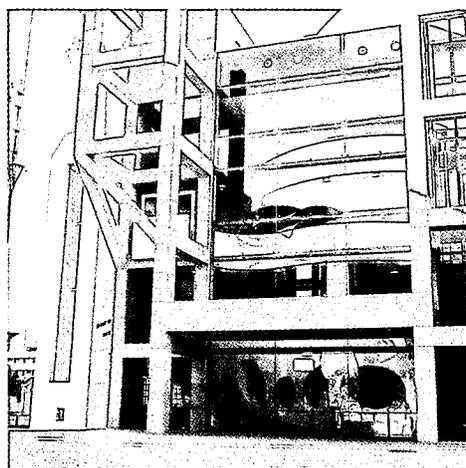
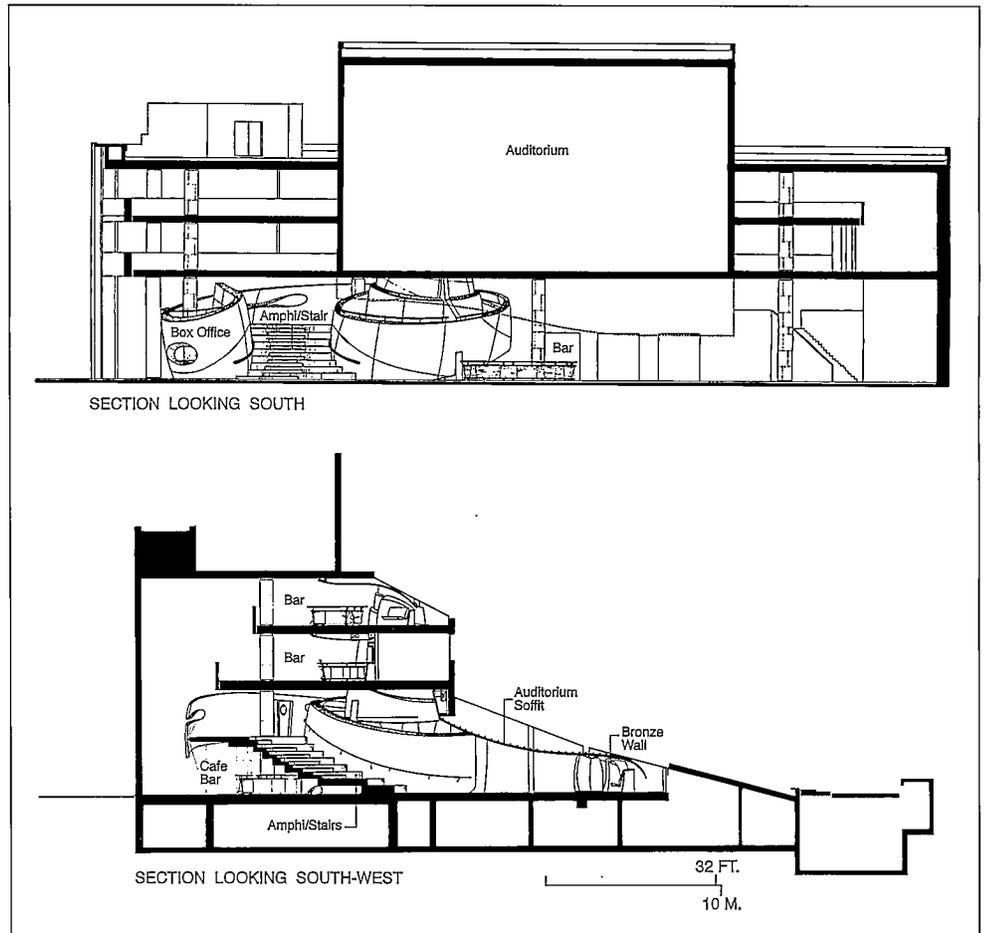
## Credits

Tel Aviv Performing Arts Center Foyer  
Tel Aviv, Israel

**Architect:** Ron Arad and Alison Brooks, Architects—Ron Arad, Alison Brooks, Monique van den Hurk, Vincent Chang, Charles Walker, Oliver Salway, Sophie Bruere, Graham Goymour, Christophe Egret, project team

**Building Architect:** Yacov Rechter

**Contractor:** Ramir Construction and Israel Freyssinet Co., Marzorati Ronchetti (metal work)



Amphitheater steps spill out between spiral-shaped forms (opposite and following pages, 4). Arad and Brooks's white island curves through the four floors of the lobby, containing the box office (1, 5), bars of aluminum and stainless steel, and a cafe (2, 3, 8, 9, 10). The soffit of the waiting room beneath the cantilever of the auditorium is punctured by egg-shaped openings, which contain lighting and TV monitors (?). A bronze wall defines the circulation route and encloses a bookstore (6, 11, 12).

© G. Dagon photos except as noted





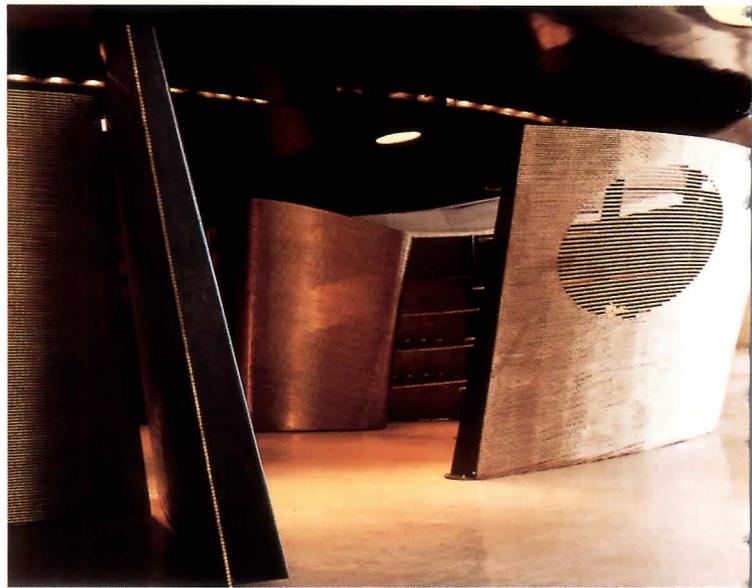
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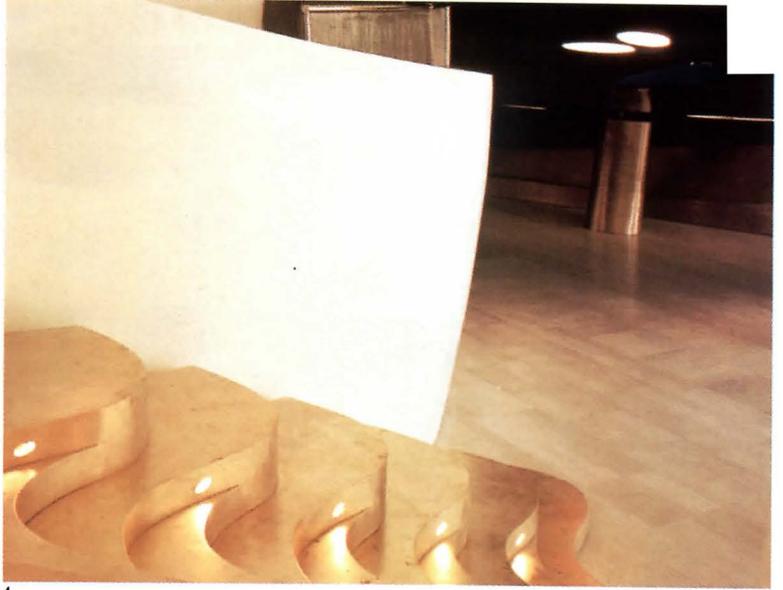
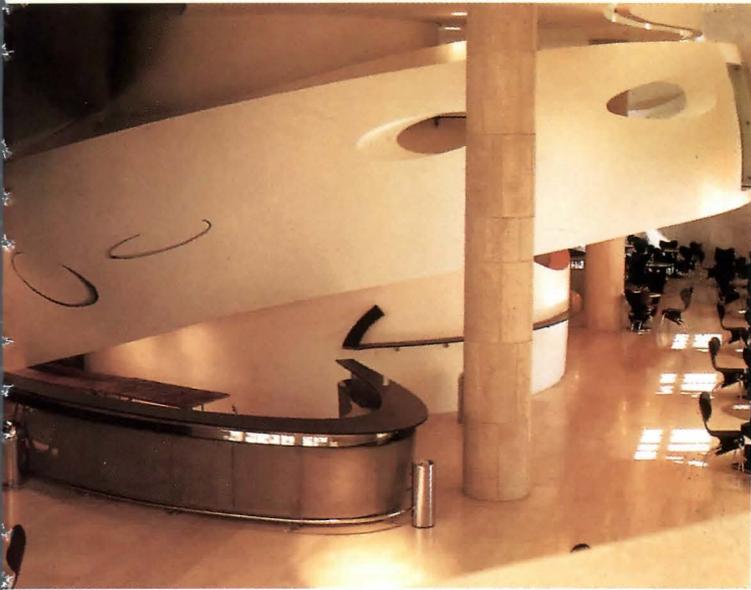


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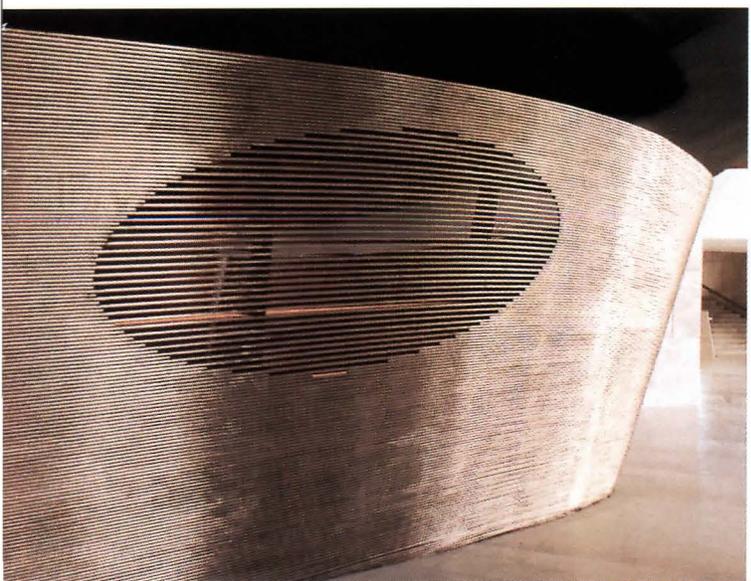
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4



8



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12

**CALL FOR ENTRIES**

# **RECORD HOUSES 1996**

The editors of ARCHITECTURAL RECORD announce the 41st annual RECORD HOUSES awards program. This program is open to any registered architect; work previously published in other national design magazines is disqualified. Of particular interest are projects that incorporate innovative programs, building technologies, and use of materials. There is an entry fee of \$15 per submission; please make checks payable to ARCHITECTURAL RECORD. Submissions must also include plan(s), photographs (transparencies, slides, or prints), and a brief project description bound firmly in an 8-1/2 by 11-in. folder—and be postmarked no later than October 31, 1995. Winning entries will be featured in the 1996 RECORD HOUSES. Other submissions will either be returned or scheduled for a future issue. If you would like your entry returned, please include a self-addressed envelope with appropriate postage.

Submissions should be mailed to:

**Karen D. Stein**  
**RECORD HOUSES**  
**ARCHITECTURAL RECORD**  
1221 Avenue of the Americas  
New York, New York 10020

**LETTERS** *continued from page 4*

from each other, but most choose to be highly protective—even when their practice is on the verge of failure.

I encourage smaller firms to create informal networks with other practices that share similar challenges and desires, to “nurture” each other with proven knowledge in every aspect of practice. This “safety net” of support allows independent, and competitive, practice with a much broader knowledge base. Support sessions within these groups can be frequent—and teleconferenced.

4. Fear of criticism—or hearing the truth—is the primary reason that most architects avoid the post-service interview with clients. And, as you allude in your editorial, this is an opportunity lost. We *can* learn invaluable lessons from our clients—if we listen. I don’t know of any client that wouldn’t respect a request from an architect to participate in a frank discussion on serving them better in the future. It’s *professional*, it demonstrates an understanding of our business and an important willingness to better understand the business of our clients.

5. Next to learning from our clients, learning

the lessons of successful customer service from other businesses also eludes us. Many believe that what “delights” the buyers of Saturns, Xerox copiers, checking accounts, or lawn care smacks just a little too much of “selling” and has nothing whatever to do with professional design services. The winning performance in other business sectors has everything to do with quality and client service but, apparently, we feel that effective use of similar “borrowed” customer-service strategies demeans our professional image.

Your editorial certainly helps to move the importance of emphasizing client relationships higher on the architect’s list of priorities. I would, however, like to take that thought one step further: For firms expecting to do business into the next century, innovative, high-quality design services that create lifetime clients need to become the *only* priority.

*Robert O. MaGaw*  
President/CEO  
Visiongroup  
Carle Place, N.Y.

Thank you for your editorial “Delighting That Customer.” It is a marvelous reaffirma-

tion of the most important tenets of marketing: that the design profession is a service business based on relationships nurtured over time through communication, empathy, and trust.

*Dianne Ludman Frank, FMP*  
Birmingham, Mich.

**Clarification**

I just finished reading the article in your July issue on the Perry Community Education Village. I would like to congratulate you on an excellent and wonderfully presented article on this project. As one of the prime contractors for the East Campus we were proud to see it recognized in RECORD.

In reviewing the manufacturers’ resources you listed for the project, I wanted to point out an error for the supplier of the curtain-wall and entrances. Ajay Glass Company provided its own custom systems for the East Campus (middle and elementary schools). Tubelite’s materials were provided for the West Campus only.

*Demetrios G. Stathopoulos, P.E.*  
Vice President  
Ajay Glass & Mirror Co., Inc.  
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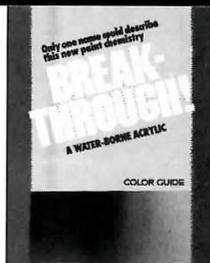
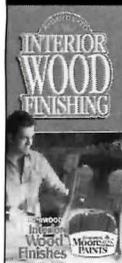


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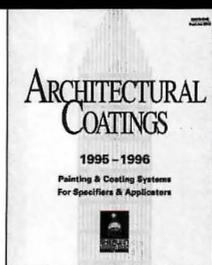
**400. Wood-finishing products**  
A pocket-size brochure describes new Benwood Interior Wood Finishes, developed for both professional and do-it-yourself use. Products include 13 colors of penetrating stain, polyurethane stains, fillers, sealers, and several types of clear finish. Shows correct prep and application for trim, furniture, paneling, and floors. Benjamin Moore & Co., Montvale, N.J. \*

**401. Chemical-resistant paint**  
Product sheets explain how site-applied Break-Through water-borne acrylics are as hard as baked enamel and two-part epoxies, yet meet the most stringent clean-air standards. Easy to apply, paints come in over 20 colors as well as clear formulations; two gloss levels. Data kit includes color chart and spec sheets. 800/851-7390. Vanex, Inc., Mt. Vernon, Ill.



**402. Low-maintenance walls**  
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**403. Multicolor finish system**  
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**404. Primer primer**  
Specification and technical-data sheets detail four types of stain-killing primer-sealers, explaining how they can solve substrate problems such as knots in new wood, cedar bleed, and pre-existing graffiti, as well as insure better performance from paints in no-problem applications. Covers correct surface prep. 908/469-4367. Zinsser, Somerset, N.J.

**405. Electronic paint specs**  
DataBank Computerized Painting Schedule 09900 runs on Macintosh and ASCII platforms as well as a number of word-processing systems. Drafted in CSI Masterformat language, software selects paints and coatings by substrate for exterior and interior exposures. 800/321-8194. The Sherwin-Williams Co., Cleveland. \*

\* Product Data on CAD disk

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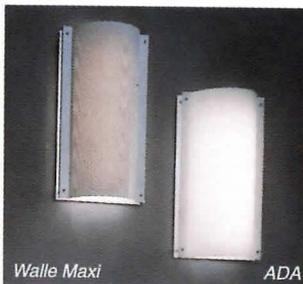
Continued on page 121

Borens

# Northern Lights

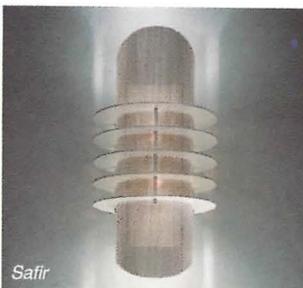


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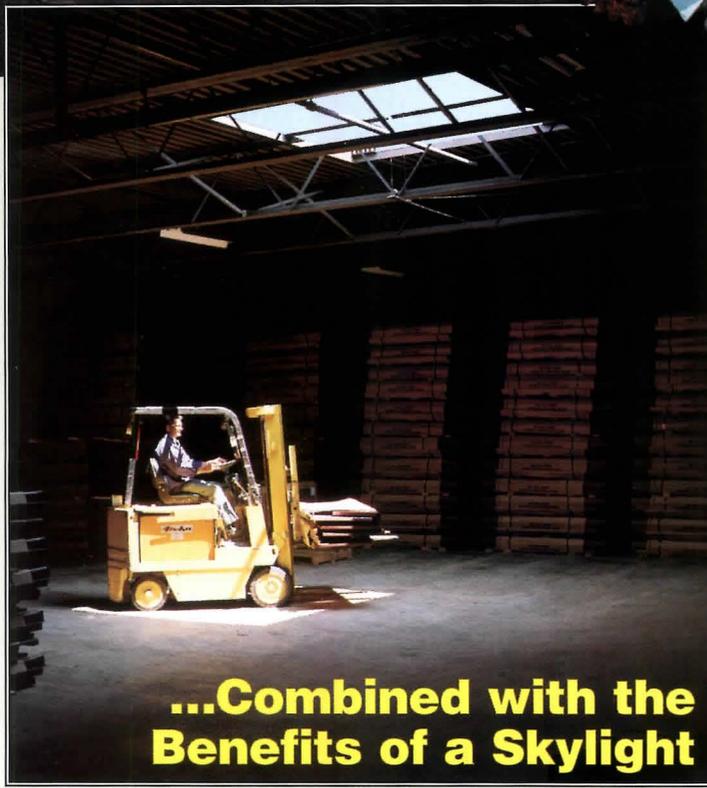
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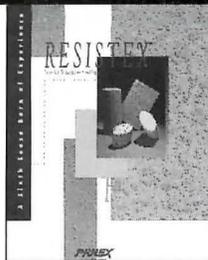
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**Product Literature/Paints and Coatings**

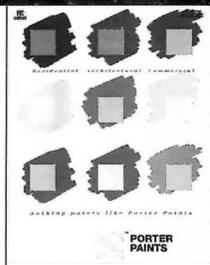


**406. Architectural paints**

A 12-page Sweet's catalog describes this manufacturer's color-matching services, advanced coatings technology, and substrate-specific systems. Explains how AccuDesign software automates coatings selection and specs, color matching, and color visualizing using PC-based CAD. 800/441-9695. PPG Architectural Finishes, Inc., Pittsburgh. \*

**407. Textured wall treatments**

Design brochures illustrate two durable, scrubbable wall decorations: Resistex, an integrally colored, mildew-resistant primer/skim coat/texture system for spray or trowel application, and Cerastone, a three-dimensional, quartz-aggregate finish for exterior as well as interior use. Flexible and vapor permeable. 404/482-7872. Parex, Inc., Redan, Ga.

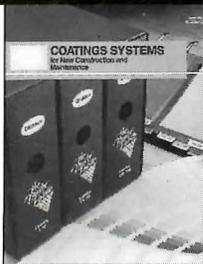


**408. Water-based multicolor**

Decora is described as a multicolored finish that has low odor, is reasonably priced, and can be applied with either a roller or a spray gun. Flecks are suspended in a clear gel that meets all VOC regulations; for application over a base coat of any color or brand of paint on walls, furniture, and accessories. 800/225-8543. Parks Corp., Fall River, Mass.

**409. High-performance coatings**

A 44-page catalog describes Porter architectural finishes, available in formulations for all interior and exterior substrates, from concrete masonry to reflecting pools. Each application is matched with the appropriate products, with VOC data supplied for each. Includes stains and clear finishes. 800/332-6270. Porter Paints, Div. Courtaulds Coatings, Louisville, Ky.\*



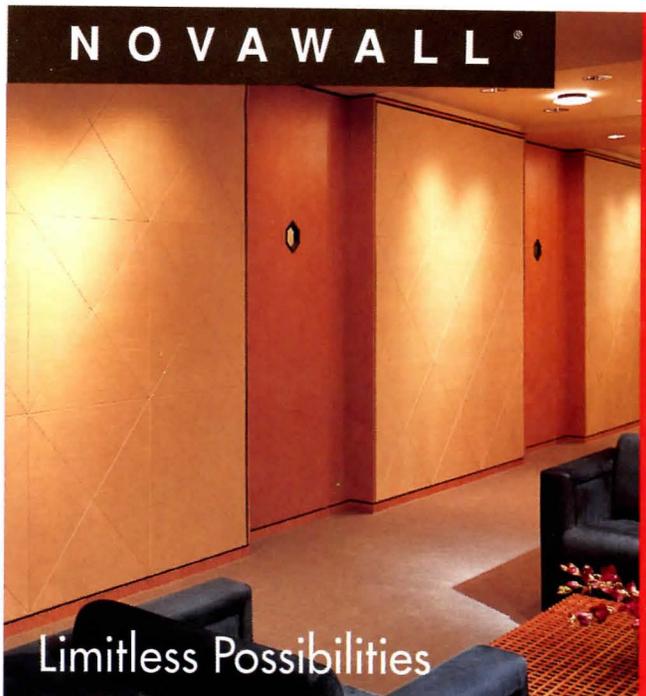
**410. Stains for wood**

A flyer highlights systems for new or reconditioned exterior wood, such as shingle and shake siding and decking. Includes clear, semi-solid, semi-transparent, solid-color, and weathering stains, with a selection guide that matches individual products to various substrates. Model specs available on disk. 800/US-STAIN. Samuel Cabot, Inc., Newburyport, Mass. \*

**411. Color-matching help**

A 24-page architectural catalog describes the Master Palette color system, which places each of 6,134 unique colors within a "three-dimensional" spectrum. Paint choice is supported by an album, a 1,600-color deck, and a three-volume, clippable sample book. Includes VOC-free paints. The Glidden Co., Cleveland. ■

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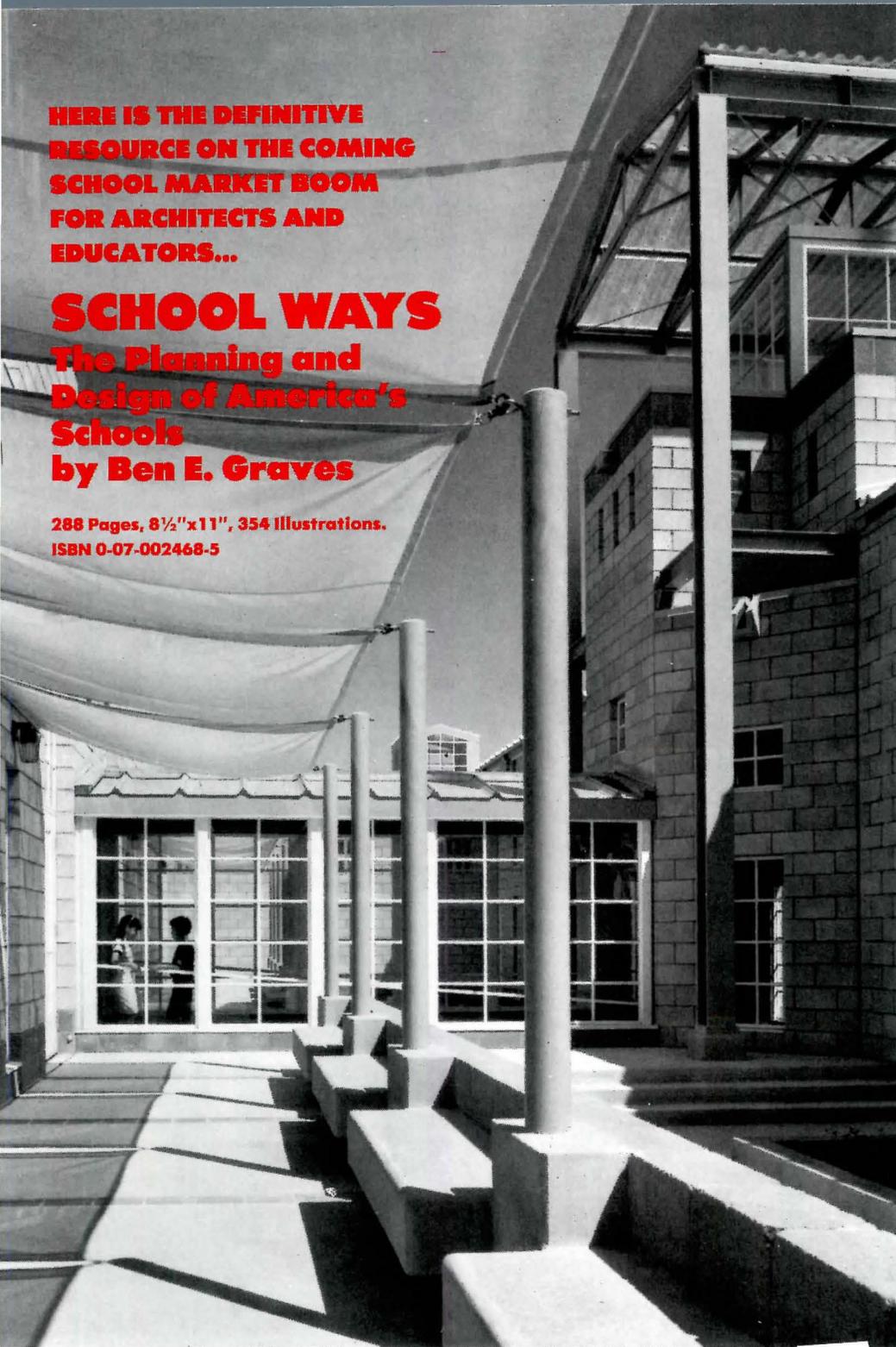
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The number of school-age children is booming. From top to bottom, the existing educational plant in most urban areas is in shambles. **And 30 percent more space is needed per pupil.** There's an explosion in special programs that targets the needs of students with learning disabilities or outstanding talents. Computers are now *basic* tools of education . . . and they require lots of extra footage. And most classes will be made up of 20 pupils — instead of 30 or more, requiring additional classrooms. . . . **And That Means More Schools Have To Be Built!**

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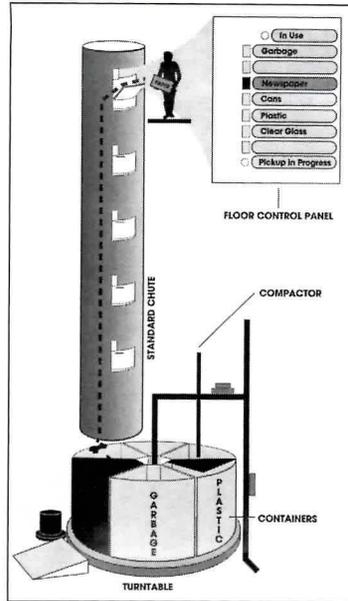


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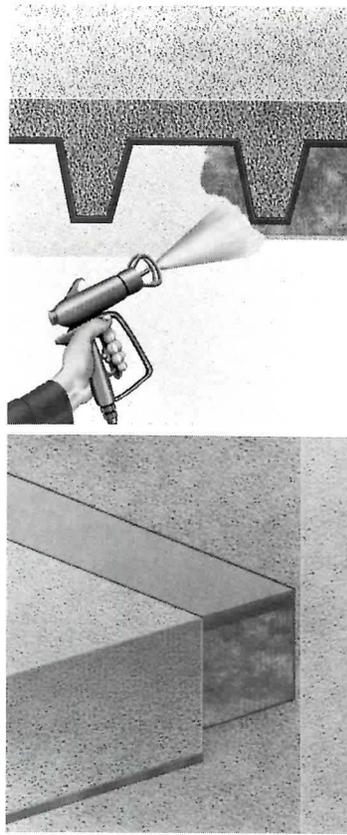
## New Products



**345. Apartment/office recycling**  
The Hi-Rise Recycling System, suitable for retrofit as well as new construction, lets the tenants of multi-story buildings drop their garbage and source-separated recyclables—clear and colored glass, plastics, metal, and paper—directly down a single trash chute. An automated

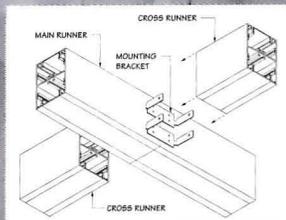


turntable positions the appropriate wedge-shaped bin directly under the chute in response to the user's push-button command. A compactor handles all of the mobile bins, which can be unloaded and replaced by one person. Compatible with all types of chutes, interlocks, and garbage trucks. 305/624-9222. HRS, Miami.

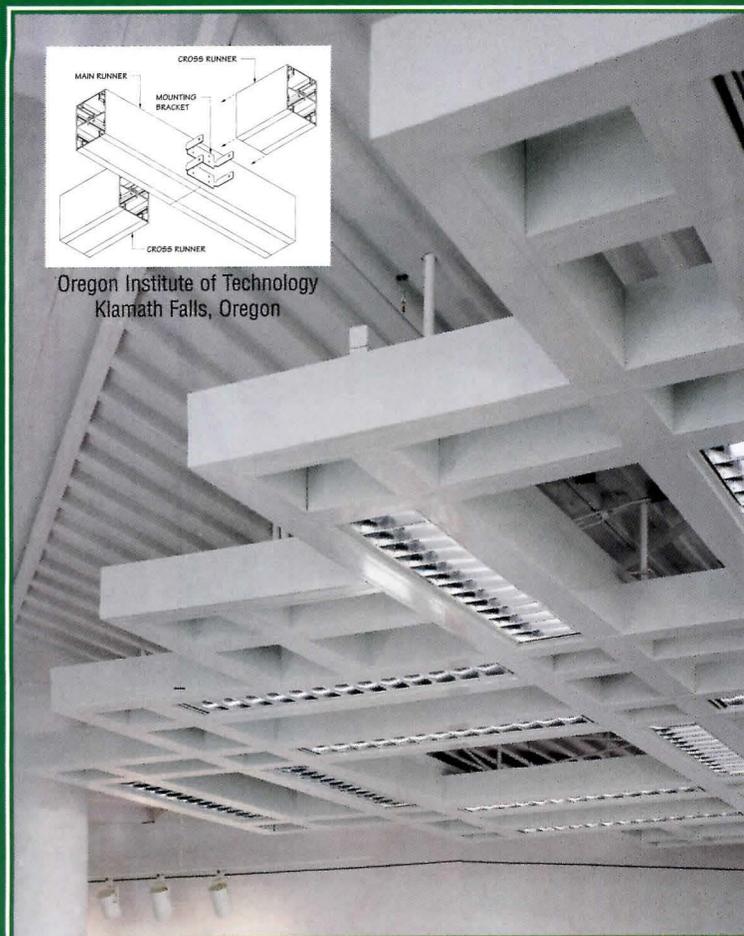


**346. Perimeter-joint firestops**  
New CAFCO TPS spray-on and caulk-type firestops meet building-movement requirements in a two-hour-label product for top-track and edge-of-slab/curtain-wall construction gaps. Water-based acrylics, they contain no solvents, halogens, or combustible materials. [Fire-stops have been tested with mineral-wool insulation.] Type CT (top) is a heavy-duty sprayable firestop coating for static joints that is said to withstand building deflection of up to 15 percent. Impervious to moisture, Type CT can also be used in exterior exposures.

A flexible, intumescent caulk, Type I (below) is said to exhibit excellent elastomeric and adhesive properties, making it especially suitable for assemblies subject to vibration, deflection, or possible seismic movement. Type I meets the requirements of UL 2079, the new safety standard for building-joint systems, which becomes effective in May 1996. Capable of a 10-times intumescent expansion, Type I can be used for plastic pipe and other non-metallic penetrants. Both products are made to be used without thinning or pre-mixing, reducing the chance for application error. 201/347-1200. Iso-latek International, Stanhope, N.J. ■



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## Manufacturer Sources

For your convenience in locating building materials and other products shown in this month's feature articles, RECORD has asked the architects to identify the products specified.

### Pages 74-79

Holley Loft

Thomas Hanrahan Victoria Meyers Architects  
Pivot hinges: Rixon. Door track: Dejonge. Paint:  
Benjamin Moore & Co. Sandblasted glass: Exquis-  
ite Glass & Stone. Steel-framed glass walls: Scott  
Enge, E Fabrication. Wood panels: hand-finished  
on site by Bruce Pearson. Counters: Verde Ardesia.  
Cabinet pulls: Colonial Brass. Dining chairs:  
Geiger International (Ward Bennet), fabricated by  
and cabinetry: custom by architects, fabricated by  
Europa Woodworking. Shoji and window blinds:  
Tse-Yun Chu. Lounge chair: Zographos Design.  
Lamp: Herbert Schults (Orbis). Pin-spot pendants:  
Modulightor, Inc. Carpet: V'Soske. Bedroom  
chaise: Gabriela Mucci. Table: Eileen Gray. Bed  
and spread: Chu/Charity. Spot lights: Reggiani.  
Lever-handle locksets: Omnia.

### Pages 80-85

Office of Bruce S. Harvey

Architect

panels: Resolite. Glass table: Domus (Stark).  
Pendant: custom by architect; fabricated by Hadley  
Robbins, CMS Electric. Downlight: Lithonia.

### Pages 86-89

Toronto Design Center

Kuwabara Payne McKenna Blumberg, Architects  
Red-oak floor: Barwood Hardwood Floors. Ltd.  
Finish: Durase Ltd. Folded steel-plate stairs and  
cabinet hardware: custom by architects, fabricated  
by Modern Rags and Metalcraft, Ltd. Graphite  
paint on metal spar, Inc. Theatrical spots:  
Colourtran Caa, Inc. Linear-track spots and  
lobby downlight: Capri Lighting Co. Sand-blasted  
balustrade and room paneling: PPG Indus-  
tries, Glass Gr (Starphire). Railings, lobby  
doors, and pulstom by architects, fabricated  
by Rovico Archural Products, Ltd. Carpeting:  
Crossley Canac. Blue-plaster wall: Edile  
Importing, Ltd. Motion system: Teknion Furni-  
ture Systems. Entry and tables: Fabricated by  
Amati Ltd. Closers: E. H. Price Ltd. Reglets:  
Gor-Don Metals. Boardroom chairs:  
Brayton Interi (BCN Chair). Table: Vecta  
(Ballet). Case: reaction Baumann.

### Pages 94-99

Gemini Consulting Center

ROTO Archite

Light-diffusing GE Plastics (Lexan). Light-

with Krohn Design. Window screens: Mary Bright  
Originals. Recessed downlights: Lightolier, Inc.  
(incandescent); Edison Price (fluorescent). Wiring  
devices and dimming: Lutron. Adjustable accents:  
Prescolite. Red "warning" light, cove-mounted fix-  
tures: Norbert Belfer. Low-voltage track fixtures:  
Halo. Pin spots (Mind Gym): Lucifer Lighting.  
Pocket door: Clear Cut Construction. Conference  
table: Vecta. Door pulls and steel flipcharts: Red  
Hook Fabricators. Architectural woodwork and  
custom doors: Castle Woodcraft. Chalkboard panel-  
ing (at phone desks): custom by Greensteel.

### Pages 100-103

SMA Video Inc.

Anderson/Schwartz, Architect  
Acoustic doors: Overly. Locksets: Schlage. Closers:  
LCN. Ceiling: Tectum. Paints: Benjamin Moore.  
Resilient: Forbo (Marmoleum). Raised floor: C-Tec.  
Sound-dampening floor: Kinetics Noise Control.

### Pages 104-109

Chicago Apartment

Valerio Dewalt Train Architects  
Aluminum partitions, railings, and other metal  
components fabricated by P.I.W., Inc. Armchair:  
ICF (Aalto). Terrazzo: Roman & Michi. Cable-  
lights: Ingo Maurer (YaYaHo). Sofa and ottoman:  
Palazzetti (Noguchi). Upholstery: Roger Arling  
Paints: Benjamin Moore & Co. Bath: American  
Standard (Sensotum). Basin: Elkay. Faucets:



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