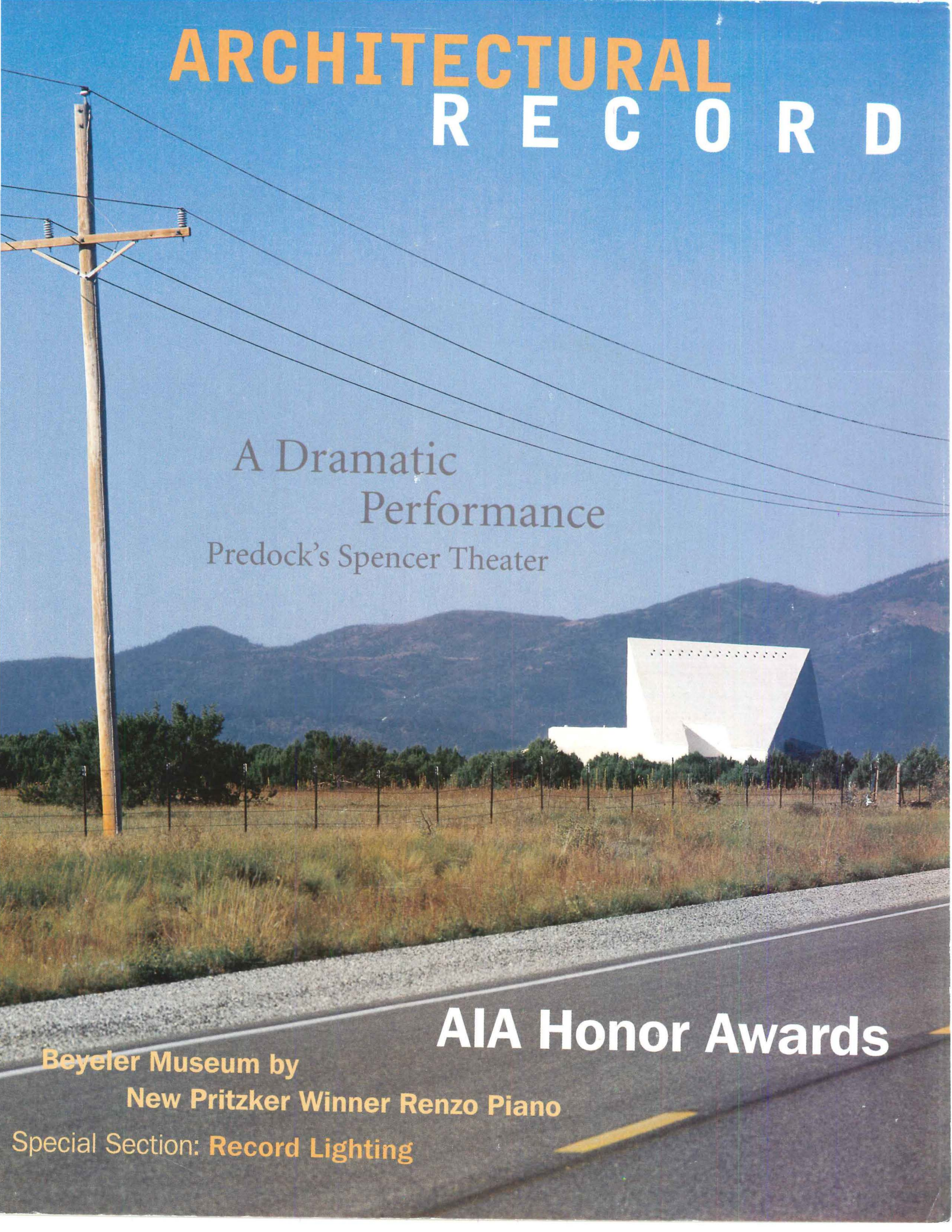
ARCHITECTURAL RECORD



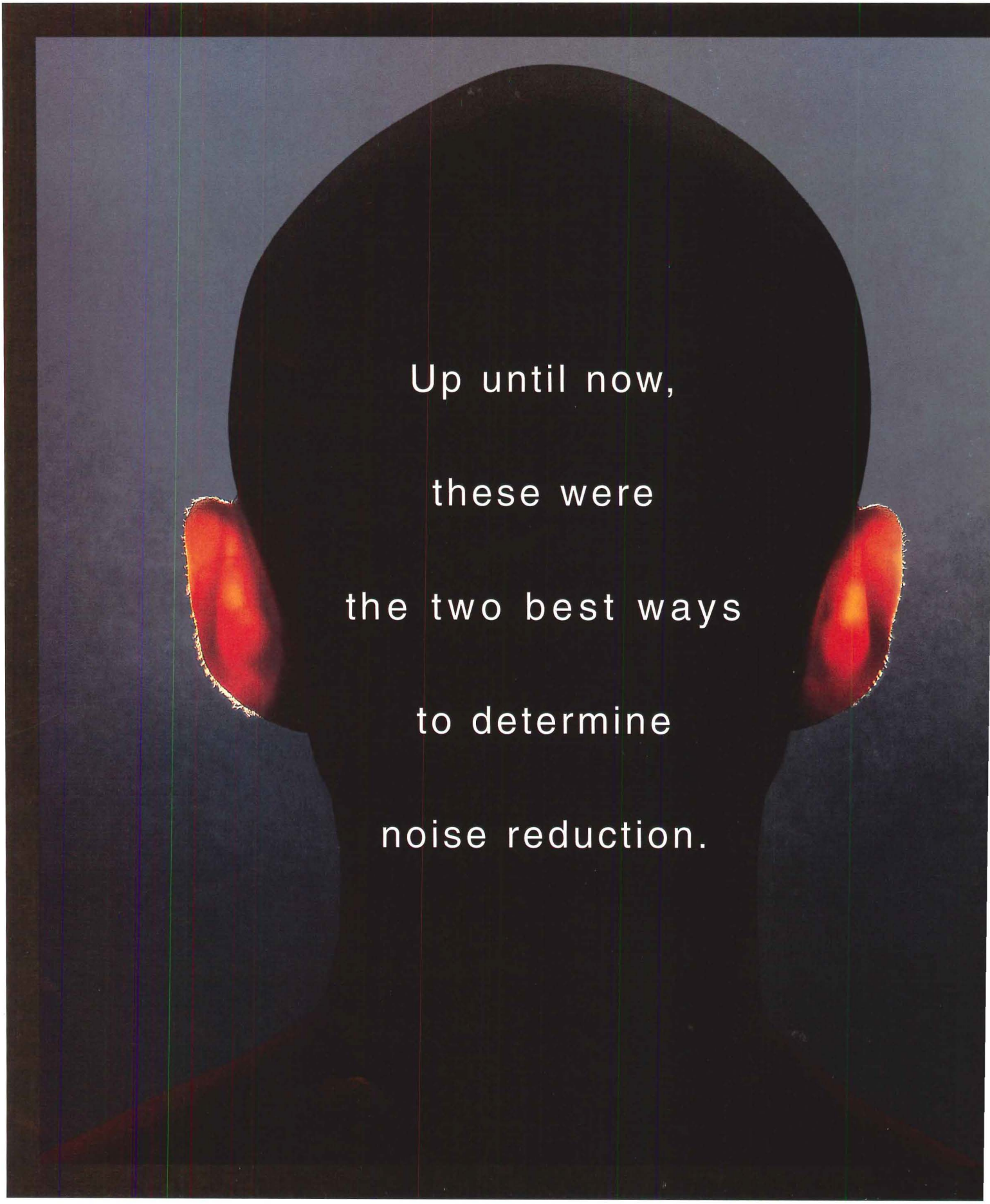
A Dramatic Performance

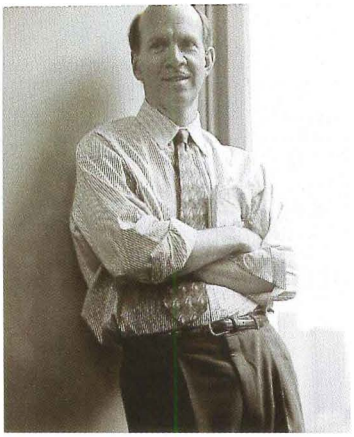
Predock's Spencer Theater

AIA Honor Awards

Beyeler Museum by New Pritzker Winner Renzo Piano

Special Section: **Record Lighting**


Up until now,
these were
the two best ways
to determine
noise reduction.



EDITORIAL

The iconic American building

BY ROBERT A. IVY, FAIA

It has been a spring of violent storms. As television cameras have panned across the country, exposing mud slides, scoured houses, and twisted trees—the detritus of clashing weather fronts—a singular building crops up in scene after scene: the public school. In the aftermath of torrential California rains or Alabama tornadoes, it is the school building that often serves as backdrop for the interview with survivors, since it continues to serve a central role as physical shelter and community center. The traditional anchor for the development of our citizens, the public school is arguably the fundamental, iconic American building type.

President Clinton has suggested a fund with billions of dollars to assist with school construction. His program is sane, balanced, and necessary: he proposes assisting 5,000 schools over a five-year period by paying the interest on bonds issued to states and municipalities. The anticipated law rises above partisanship and intrastate squabbling by allowing local initiative and encouraging local construction where it is needed most. Every architect should be able to support this model legislation.

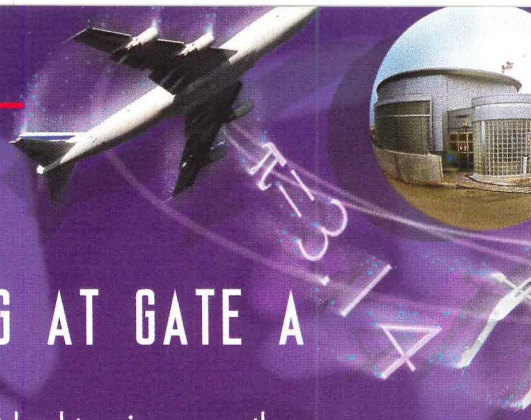
Why? Elementary and secondary schools comprise a bedrock component of architectural practice. Schools constitute a healthy sector of the construction economy, accounting for over $12 billion of completed work in 1997, involving all our skills for planning, new construction, additions, and renovations. What architect, what firm has not participated in their advancement?

When critics accuse architects of being apolitical, concerned only with the niceties of design, they fail to recognize how school work is inevitably politicized, a fractious arena where architects find themselves at the center of clashing points of view. When architects gather, as they are convening this month in San Francisco, war stories from school board meetings abound. Parent meetings and bond-issue gatherings sometimes turn into passionate forums of debate as taxpayers argue vehemently the merits and costs of architects' proposals. Architects are often on the firing line, called on to build consensus to achieve approved plans: since we are so vitally involved, we cannot help but care about the outcome.

Despite national economic health, architects know from experience that too many school districts are clinging to poor facilities because of inadequate resources. While bad buildings can come from incomplete maintenance programs, inept or corrupt management, the culprit is often property taxes, which undergird the system and can perpetuate inequity. Too often we observe significant disparity between facilities. We inspect older buildings with leaking roofs and worn floors, with uninspired double-loaded corridors that stretch toward no horizon; we visit playgrounds with trampled earth and broken equipment that suggest anything but play. Rich districts inevitably build and maintain better schools; dirt-poor districts, whether urban or rural, sometimes fail to provide the minimum standard of care. They cannot afford the basics.

Building schools is something architects know how to do. Given the resources, we can help provide sheltering, creative, cost-effective learning environments: resource centers and classrooms that stimulate the mind; buildings that instill pride, self-worth, and a sense of ownership for students, teachers, and administrators; and whole campuses that bolster community development and declare the centrality of education in our democracy.

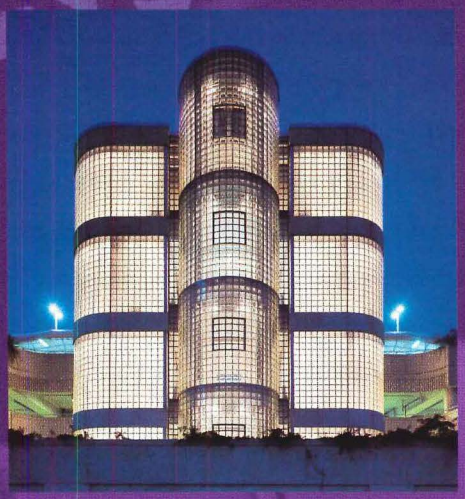
The president is calling for infrastructure building of a high order. Regardless of your political affiliation, as an architect you understand the need to create proper foundations of buildings and of people. You have the skills and contacts and a vested interest in the outcome. Exercise your considerable influence for our collective future. This is a moment and a chance for the architect's voice to be heard. The skies are continuing to rumble.



INSPIRED DESIGNS NOW ARRIVING AT GATE A

Contemporary yet historical. Beautiful yet secure. And it had to give more than three million parking patrons a well-marked path to their flight. From the beginning, the new garage at National Airport was a study in contrasts.

The finished project is a shining example of steel and glass block. Pittsburgh Corning Glass Block. "We started with the vertical elements of the garages — the elevator towers — and using the VUE® pattern, turned it into a virtual wayfinder system. Then, we continued that theme with small wayfinder devices — information pylons using ESSEX® AA — throughout the interior of the garages."
– Graham Davidson, architect



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CONTINUING EDUCATION AIA

CIRCLE 11 ON INQUIRY CARD

Terminal A parking garage at
National Airport in Washington, D.C.
Architect of record: HNTB Corporation
Design architects: Hartman-Cox Architects
Graham Davidson, FAIA

PITTSBURGH CORNING
GLASS BLOCK

LETTERS

Mixed-use Main Street

I was somewhat dismayed to see that the three projects featured in your otherwise stimulating article "Main Street Goes Suburban" [March, page 123] all lacked the key ingredient that makes Main Street so appealing, namely mixed use. Dismayed but not surprised, since increasing specialization today within both the profession and the development community makes mixed-use projects the exception rather than the rule.

Main Street is retail driven, and all too often retail tenants (specifically larger national tenants who need to be wooed by developers to ensure that a project can go ahead) end up calling the shots. Unless real estate prices or specific land-use requirements dictate otherwise, you will be hard pressed to find either a retail tenant or a developer willing to consider putting offices or apartments above a new store, given the ensuing lack of flexibility and the perceived added competition for parking.

Changing entrenched mentalities is a long and arduous task and requires a combination of favorable market forces, a local jurisdiction with a clear vision of what they want their community to be, an enlightened developer, and a committed architect capable of maneuvering through the complex politics of such an endeavor. Until this happens more regularly, I fear that we will see many more articles like yours: an encouraging premise but disappointing results.

—Yann E. Taylor, AIA
Field Paoli Architects
San Francisco

Interior design and safety

After reading your editorial in the February issue of RECORD ["A Building Lasts a Lifetime," page 13], I felt I had to respond. By asserting that only architects are in a position to have a synergistic view of building safety, you are showing your inexperience with the entire design profession. As an interior designer for more than 20 years, I can assure you that it is our business to manage life-safety issues on a daily basis.

Knowledgeable and experienced architects who have the opportunity to observe the successful results of the work of interior designers can and will prove you incorrect.

—Marla Bommarito-Crouch, ASID, IIDA
Graeber, Simmons & Cowan
Austin, Tex.

Soul provider

I gave your article "Listening to Interior Designers" [April, page 66] to a recent residential client of mine to get his opinion about his experience with me versus his interior designer. His reaction was "Well, she [the interior designer] did design a place for our underwear to go, but you designed a place for our souls. And that is the most wonderful thing of all about the house."

—Dennis Michael Findley
McLean, Va.

Accessible? Yes. Easy? No.

Your news item "Wheelchair Ramp Drives Renovation of New School Courtyard" [March, page 46] shows a stunning plan view of a ramp that "flows down from the deck" in a "radical curve" around a fountain.

While a curving ramp may tickle the fancy of the designers, most wheelchair users have great difficulty negotiating a narrow, curving pathway because it requires the wheels of the chair to be rotated at different speeds. Driving a chair up a ramp is difficult enough, but adding the requirement that you must simultaneously turn your left side wheel 30 percent faster than your right side wheel is asking a lot. Perhaps the designers should have "embraced the access requirement" a little tighter and spent a little of the project's $2.6 million budget on research.

—Carl Mezoff, AIA
Stamford, Conn.

Architects and contractors

"Listening to Contractors" in your February issue [page 54] was very timely, informative, and stimulating for this architect who has worked the past 14 years as a consultant on complex and costly construction litigation. It is relatively easy to identify problems—few can doubt that the architect's construction documents have declined in quality and completeness—but solutions are difficult.

I am troubled that so many people—the GSA, developers, contractors, and especially architects—have opted for design-build without recognizing the limitations of this approach to construction. Andrea Oppenheimer Dean's article only reinforces my conviction that design-build deserves far more skepticism and analysis than its proponents appear to grant.

—Ellis Kaplan
Kaplan McLaughlin Diaz
Bolinas, Calif.

Practicing prudence

Your March editorial, "Prudence in Good Times" [page 15], makes some excellent points, especially regarding "valuable strategic planning" for architects. However, your premise that "our collective economic life in the construction universe follows a sine curve like a powerful wave" does not have to apply to architecture firms.

In our management consulting experience, design firms that organize themselves around select client types gain a superior understanding of their clients' needs and issues. This makes them more responsive and more cost-effective, which translates into being more competitive and more profitable. Also, their focused knowledge allows them to advise their clients, rather than take orders from clients who think *they* know best. The best client-driven architecture firms are paid for their knowledge, not their CADD systems.

—Raymond F. Kogan, AIA
Zweig White & Associates, Inc.
Washington, D.C.

AIA award for adaptive reuse?

The adaptive reuse award as proposed by Malcolm Holzman [February, page 18] is worthy of serious consideration by the AIA. These projects must overcome significant economic handicaps while meeting unique contextual guidelines. They must serve the present and respect the past. These buildings frequently impart a special sense of place to a community, a sense that is often ignored in favor of "progress."

Our roots do not have to be our relics…or our endangered species.

—Henry Eng, AICP
Honolulu

I would like to suggest another category in the AIA Awards program: details. Awarding outstanding design detailing on buildings would send the correct message to the general public that architecture is a complex and highly technical field. Good design is also the result of good detailing. Witness the detailing of I. M. Pei's Louvre addition. Let's see a contractor detail that.

—Howard L. Filiere Jr., NCARB
The Architects Incorporated
Cleveland

More on VSBA

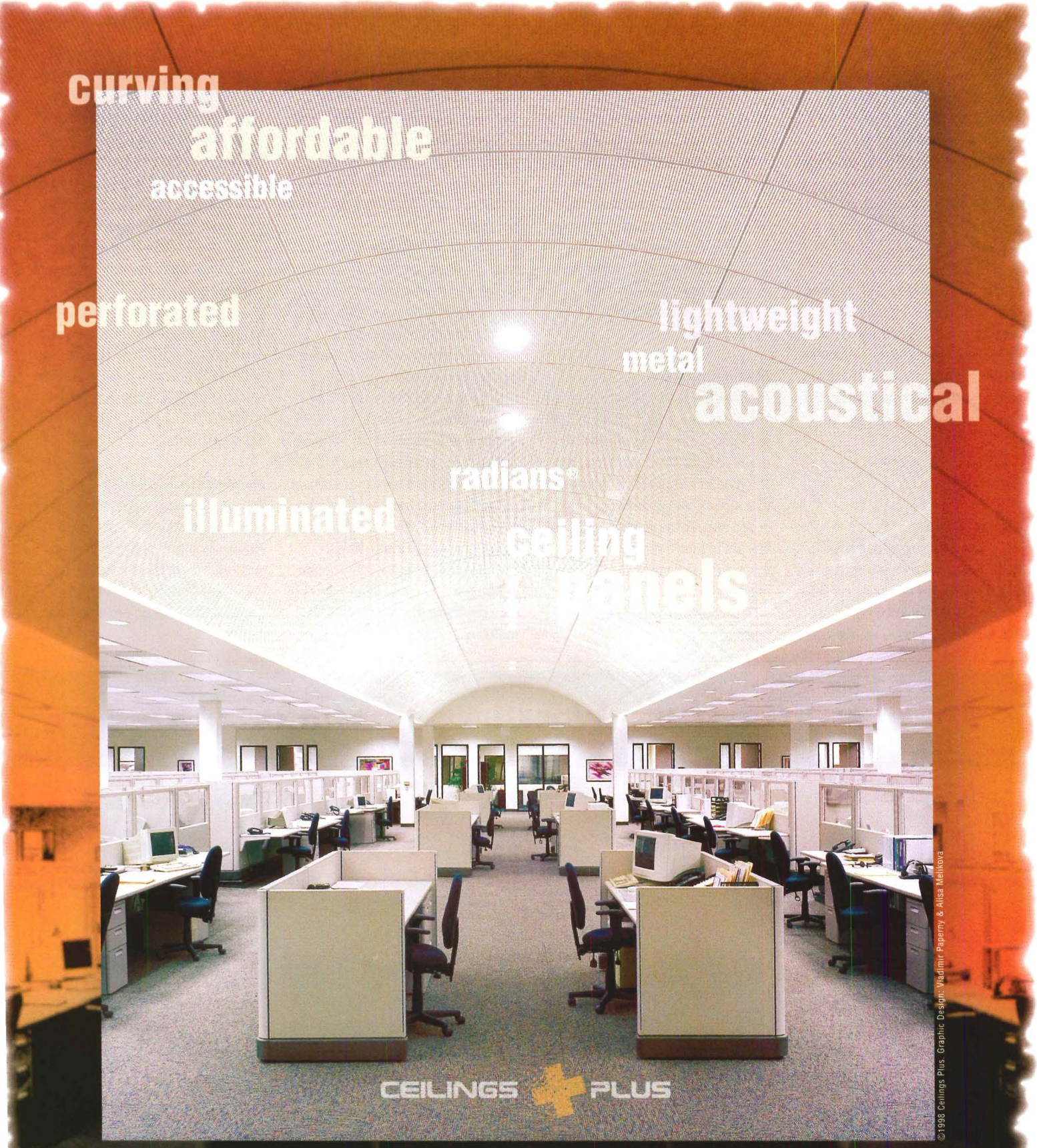
Venturi Scott Brown and Associates ["VSBA Today," February, page 58] is almost alone in continuing the project of Modernism—engaging in an artistically unpreconceived way the real conditions of contemporary society, construction, and culture.

That they have found Rome, art history, and unmodern moderns such as Lutyens helpful has confused even admirers. In some ways it would have been better if they hadn't written about it. They might never have been credited with unleashing Postmodernism, a charge comparable to calling Thomas Edison the father of disco.

—Robert L. Miller, AIA
Washington, D.C.

It may interest you to learn that there were many of us here in Staten Island who supported both

(continued on page 22)



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CIRCLE 12 ON INQUIRY CARD

(continued from page 20)
of VSBA's designs for the Whitehall Terminal, but we never had the chance to make our support known. I myself—a lifelong resident of Staten Island and a daily commuter by ferry to Manhattan—wrote more than 50 letters to various government officials and civic groups, and handed out leaflets in the St. George Terminal. The silence of members of the New York architecture community—for example, I asked, in vain, members of Columbia University's architecture and art history faculties to write letters of support—was pathetically noticeable and would make a story in itself.
—Richard William Hayes, RA
Staten Island, N.Y.

Koolhaas at IIT
Rem Koolhaas suggests the inclusion of Mies's Commons Building under the roof of his campus center [March, page 37]. Such chutzpah! This is almost as nutty as the idea, of a few years back, to enclose the Parthenon.

Architecture, by definition, must embrace the real world of change over time such as the effects of climate and weather, the physical context, and vandalism. At best, a work of architecture might become, at some future date, a fine ruin. Alas, such a romantic notion pretty much evaporated with the demise of stone construction.
—James A. Gresham, FAIA
Tucson, Ariz.

Slavery museum
Creating a national slavery museum is a great idea [March, page 20]. It would be a natural companion to the Holocaust Memorial Museum. The museums help us to remember that slavery and genocide are part of our past. By remembering these horrors of the past, we can keep them from being part of the present and future.
—Susan Greenwald, FAIA
Chicago

Marketing expanded services
"America's Best-Managed Firms: How to Succeed with Expanded Services" [January, page 50] points out the benefits of architects offering clients a wide array of services but provides little advice about how to identify and sell these services.

Apart from reorganizing how services are presented, the new Owner/Architect Agreement (B141-1997) offers two major opportunities for identifying and selling expanded services. First, it requires owners and architects to identify major project objectives and parameters (physical constraints, schedule and financial parameters, program requirements, etc.). From an active discussion of these issues, architects can segue into discussing how their expertise can help owners tackle each of their objectives.

Second, article 2.8.3 prompts a dialogue about possible expanded services. While not exhaustive, the matrix of services invites both owners and architects to discuss their capacity and willingness to provide the myriad administrative and technical tasks required. Architects can expand this matrix to include their full range of capabilities, from project definition to facility move-in and management. This not only broadens the architect's thinking, it also shows owners how architects can help navigate the labyrinth of project tasks and decisions.

Now that the B141 has evolved to a point where it can be used as a marketing tool, the architect's ability to broaden his project role has been considerably strengthened.
—Michael Strogoff
Mill Valley, Calif.

Modernist spec house
The lesson learned from "Making a Spec House Special" [April, page 70] was not that high design is an option for speculative housing, as the article implies. It's that high design *costs*. Hire an architect, lose money.

The most important programmatic requirement for a spec house is to make a profit for the client/builder, to add value that can be perceived and appreciated in an open market. If there's no market for Postmodernism in the land of the colonial, then don't build it!

Is it any wonder that architects have been shut out of the spec housing arena?

—Todd Hotchkiss, AIA
Des Moines

Criticism crit

This is simply an enthusiastic fan letter about "Assessing the State of Architectural Criticism in Today's Press" [March, page 64]. What a thoughtful, comprehensive, interesting, lively, well-written, accurate piece!

I was particularly affected by the last sentence: "The next step should be trying to place architecture…in the larger social and political picture." This gets directly at the chief frustration of existing written understandings of architecture, that they are so hermetic and hence make architecture out to be something ultimately so unimportant.

—Paul Spencer Byard, FAIA
Platt Byard Dovell
New York City

The vast majority of practicing architects are (as forced by the market) producing more inclusive work, yet the magazines obsess about a few projects that are, on the surface, modern looking even if not especially relevant or responsive.

A certain amount of this is to be expected from journals that cater to the young and the easily influenced. But where does it lead? Do you really want to see a Bilbao sprouting up next to a gas station in Lincoln, Illinois? Will this help the average American get through his or her day? Will this contribute to the bettering of our world, country, town?

Eye-candy projects produced on lavish Hollywood budgets are not relevant to the usual business of architecture.

—Ethan Anthony
HDB Architects
Boston

Credits/corrections

The review of a new Fumihiko Maki monograph in the March issue (page 27) incorrectly identified the book's graphic designer; it was Kijuro Yahagi. Ricardo Legorreta's name was misspelled in the review of his monograph.

Lawrence Weschler's and Miriam Gusevich's names were spelled incorrectly in "Assessing the State of Architectural Criticism in Today's Press" (March, page 64).

The March article on the Rocky Ridge Town Center (page 134) should have identified Kalwall, one of the materials used in the project, as translucent fiberglass reinforced composite glazing.

On page 159 of the March New Products section, Kaswell Flooring Systems' FibreBlock was misidentified as FireBlock.

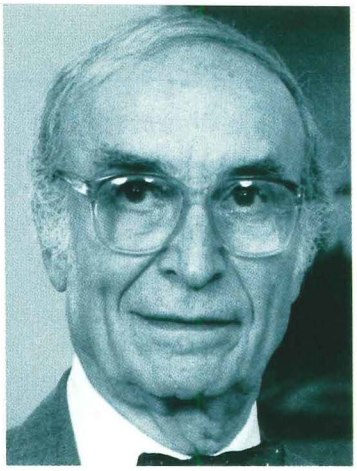
In "VSBA Today" (February, page 58), the New York firm of Anderson/Schwartz should have been credited as a partner with Venturi Scott Brown and Associates in the design of the Whitehall Ferry Terminal. The firm has continued with the project since VSBA's resignation.

In a February story on Salt Lake Hardware (page 126), John Williams was identified as the developer of the Metropolitan restaurant. Although Mr. Williams once owned the property, the developer of the Metropolitan was Christophe Olson.

Letters may be E-mailed by visiting our Web site at www.archrecord.com and clicking on News/Features/Dialogue. RECORD may edit letters for grammar, style, and length, taking care not to change the meaning.

SPEAK OUT It's time we recognize the unique contributions of the executive architect.

GEORGE M. WHITE, FAIA



George M. White, FAIA, vice chairman of Leo A. Daly, is a registered architect, a professional engineer, and a member of the bar. A graduate of Harvard's business school, he is the former Architect of the Capitol.

One of the primary goals of architecture is to bring beauty into the environment. Architects harness the power of form to enhance the human experience through structures. But if giving a building its identity—designing—is a job only architects can do, it is just one of many that they perform.

The architect's task used to be simple: design all aspects of a house or building. But about 100 years ago, technological innovations began to increase the rate of change in the construction industry. The advent of hot-water heating systems, elevators, and electric lighting, for example, meant that the engineering of even simple construction projects became increasingly complicated.

Suddenly, installing plumbing was no longer a matter of digging a pit in the backyard. As the scope of architecture expanded, its practitioners had to become increasingly specialized—to master one aspect of construction—a development that led to the formalization of the engineering professions.

In recent years, as clients have built ever larger projects with complex systems, the practice of architecture has evolved even further. Large firms, especially, are called on for services that would boggle the gentleman architect's mind, like financial feasibility studies, construction and program management, and design-build.

"One-stop shopping," or purchasing a broad range of services from one firm (whether the firm provides them all itself or farms out selected jobs), has pushed architecture in new directions, and industry's ethics and standards are evolving with it.

Architects are the only professionals whose interests and expertise encompass the entire spectrum of design and construction issues. In addition to being creative designers, they are synthesizers, coordinators, financial analysts, business executives, cost controllers, and managers of other professionals and of construction projects. But in response to the increasingly complex demands of their medium, architects too have become specialized within their field.

The executive architect, who is ultimately responsible for making a project happen, must be on top of every aspect of its design and construction. Consider the awesome responsibility of realizing Dulles Airport, for example. Then consider that designer Eero Saarinen's name is the only one linked to it in the public record.

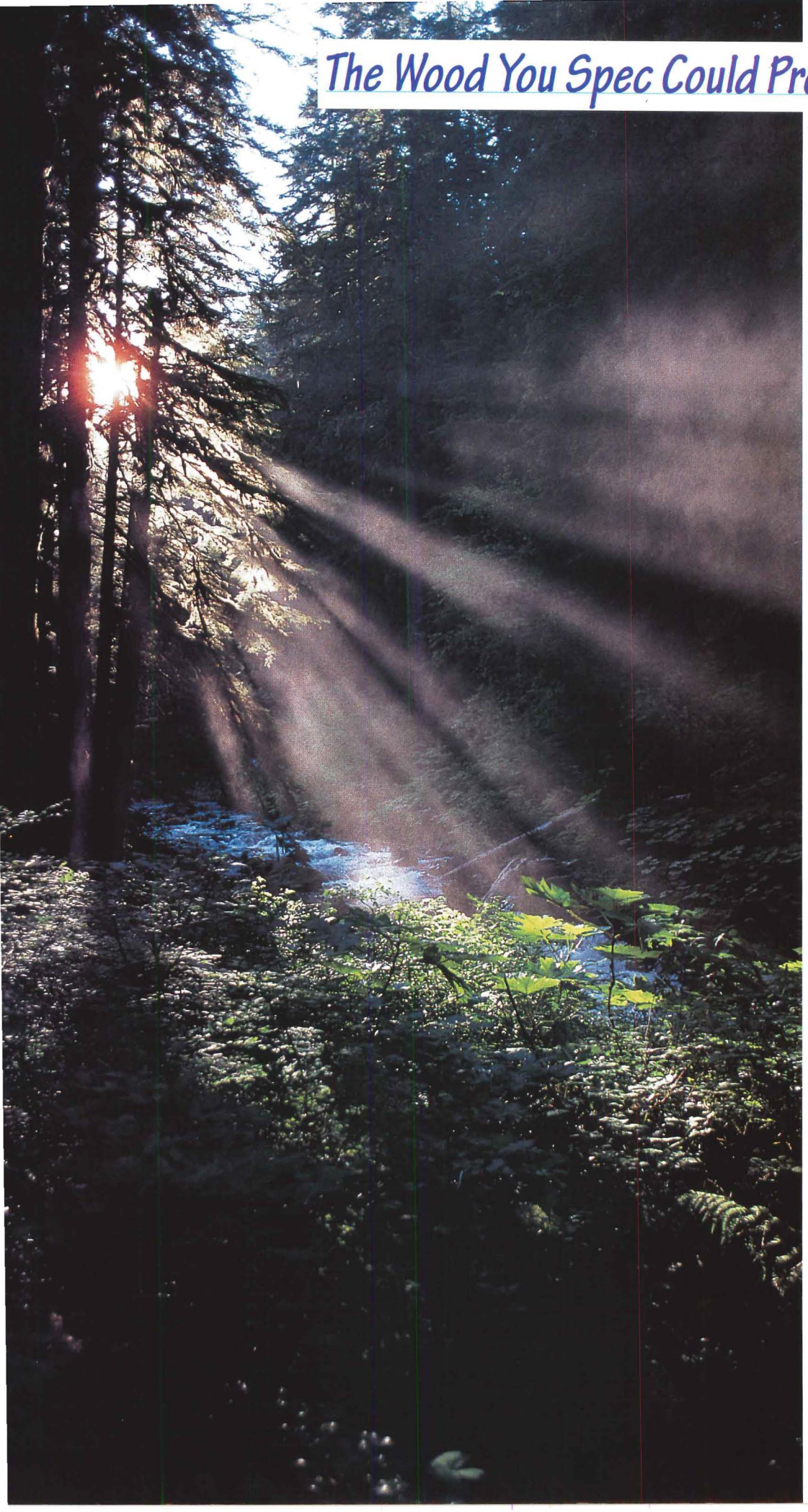
Because the executive architect's work is managerial in nature, there's no "beauty" in a job well done. Unlike the design of a facade or tower, which makes an instant impact, the essential contribution of executive architects—who are by far the vast majority of practicing professionals—is unlikely to garner attention.

The profession itself—and the architectural press—has been slow to recognize that design expertise has its counterparts in the other aspects of practice. The Gold Medal, the American Institute of Architects' highest individual award, is given to a "signature" architect each year for excellence in design. But where is the recognition of executive architects? The AIA board of directors' recent democratization of the selection process for the Gold Medal and the Firm Award may offer an opportunity to honor them.

In addition to awards, the executive architect could benefit from more press. A picture of a building is the graphical equivalent of a 20-second sound bite, which necessarily leaves out much more than it reveals. What we need to know, especially in the case of technical marvels like Frank O. Gehry's Guggenheim Bilbao, is the rest of the story.

Without in any way diminishing the work of celebrated designers, why not recognize the architect who delivers a project—whose talents are as valuable and as difficult to come across as those of a first-rate designer? Thousands of architects are solving the myriad problems associated with the design and construction of society's shelter every day. Let's sing the praises of these as yet unsung heroes, as well as for those at the forefront of design. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk, if possible) to Speak Out, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to soren_larson@mcgraw-hill.com. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive final text approval.*



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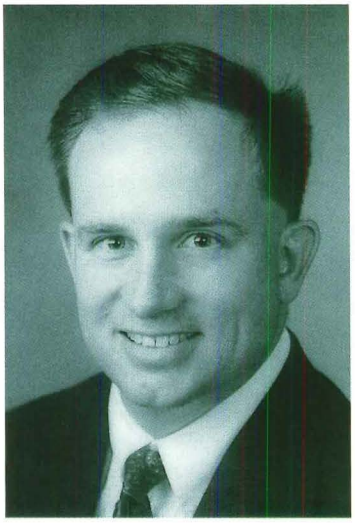
AR 4/98 **CIRCLE 14 ON INQUIRY CARD**

MENTORS One engineer discusses the new discipline of building commissioning, and another offers a primer for new project architects.

David Houghton, P.E., is president of the consulting engineering firm Resource Engineering Group, in Boulder, Colorado.

Andy Covington, P.E., is an electrical engineer with CRS, a consulting engineering firm with offices in Jackson, Mississippi, and Birmingham and Mobile, Alabama.



ARCHITECTURAL RECORD asked David Houghton, P.E., to discuss a new trend, building commissioning, which helps ensure that new buildings work as intended.

There's a lot of talk these days about building commissioning. What is it? Like evaluating a ship's seaworthiness before it sails, the commissioning process thoroughly inspects and aggressively tests commercial and institutional buildings to see that their systems are functioning well. Commissioning ensures that buyers get buildings that actually work—a feat that grows more difficult each year as increasingly complex systems seem to invite error into every phase of project development.

Systems that benefit from commissioning include HVAC, lighting, building automation, energy management, fire protection, security, and communications. Although saving energy isn't always the primary goal of commissioning, it is often a very tangible benefit.

New buildings are not always commissioned. In many cases, the owner and the design team rely on contractors to determine that they've met the specifications for system operation. But this method doesn't always produce the desired results. Construction managers tend to pay more attention to budgets, schedules, and materials than the intricacies of building controls; inspectors are mostly concerned with life-safety issues; and designers are usually knee-deep in their next projects by the time final punch lists are being tackled.

Who does commissioning, and how much does it cost? A new breed of specialists, known as commissioning coordinators, is helping bring major construction projects to successful completion. These people, often former facility operators or controls contractors, tend to be good communicators with a broad knowledge of building systems. Rather than cast blame, they try to improve everyone's understanding of how things are supposed to work and who is responsible for what. (Getting people to work together can be as challenging as getting equipment to work together.) Over the past several years, building commissioning has become a small but established industry with its own annual conferences and an emerging professional association.

Commissioning coordinators begin their work in the design phase, verifying that the design team's intent is clearly communicated to the builders. They develop tests to put the building through its paces and make sure contractors know that final payments depend on passing them. They oversee the tests and certify that everything works—or help solve the problems that arise. Finally, commissioning coordinators help prepare accurate operation and maintenance documents and train building operators.

Commissioning costs upwards of $1 per square foot, depending on a building's size and complexity. Energy savings often quickly recover the cost, and there are the added benefits of happy occupants, reduced maintenance costs, and averted haggling and finger-pointing.

In a recently constructed commercial building, the mechanical engineer specified a variable-speed drive for a large supply fan. The owner paid several thousand dollars for the device, which performs better and costs less to operate than constant-speed fans. The contractor installed it and claimed it was working properly—after all, the fan blew air, and the LEDs on the drive panel blinked convincingly.

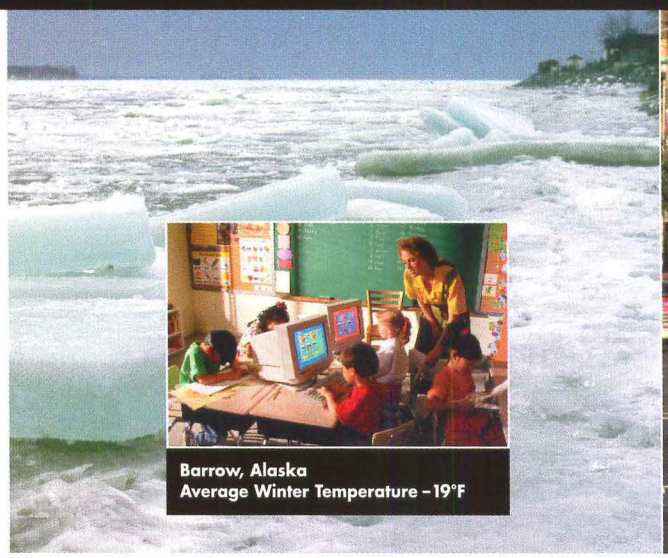
However, when commissioning agents measured the fan's input and output, they discovered that it was running 24 hours a day. They looked into the problem and found a simple programming error. A quick fix enabled the drive to do its job, but without the scrutiny of commissioning, the problem might have gone undetected for years and wasted the owner's investment.

Can existing buildings be commissioned? Yes, although it's harder to investigate systems that have been modified over the years. Even so, a recent study of 44 buildings showed that commissioning existing buildings cost 5 to 40 cents per square foot and usually resulted in energy savings that repaid the commissioning costs in less than a year.

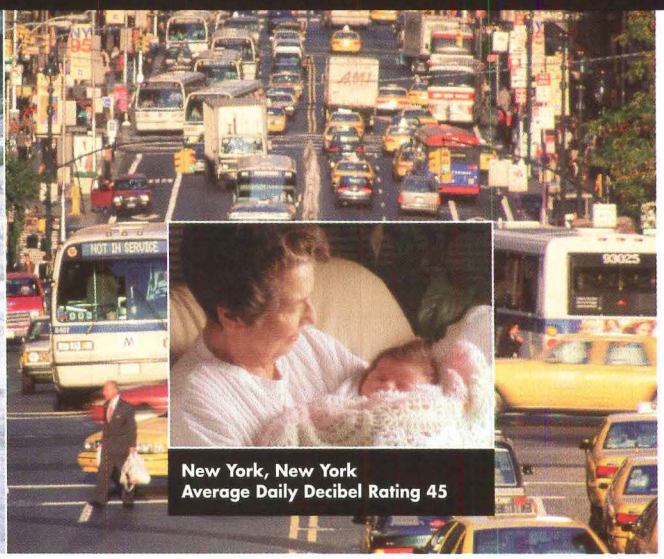
Although the intricacies of mechanical, electrical, and communications systems are the domain of engineering specialists, the architect has overall responsibility for the owner's interests in a successful project. In a world where projects are ever more complex and flawless operation is the exception rather than the rule, commissioning is a welcome antidote for Murphy's law.

(continued on page 354)

When The Great Outdoors Makes Life Challenging...



Barrow, Alaska
Average Winter Temperature – 19°F



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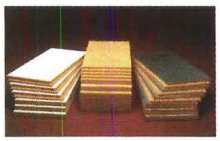

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CIRCLE 15 ON INQUIRY CARD

PULSE RECORD readers were asked: Does the increasing concentration of architectural services within large firms benefit architects and their clients?

No: Because of their size, it's a matter of fact that large architecture firms can provide many more services than smaller ones. But no extra resources can make up for the lack of innovation that tends to characterize the designs of large firms. And perhaps the greatest thing a firm can offer—a principal's involvement with projects and clients—is another service that the heavy hitters often can't provide.
—Tammy Goldberg
Cisneros Design Studio
Houston, Tex.

No: Difficulties with services are encountered at both ends of the scale. However, with smaller firms, the client is usually dealing directly with a principal, which tends to improve the quality of service and the client's confidence level. There is unquestionably a "critical mass" with regard to numbers and diversity that will ensure the highest quality of service; but when a firm gets so large that important decisions regarding service are made by accountants or lawyers or both, there is no doubt that the client suffers. We have witnessed many incidents of the latter.
—Gordon H. Rutherford, AIA
Director of Facilities Planning
University of North Carolina at Chapel Hill
Chapel Hill, N.C.

No: Large firms may have plenty of the resources, but they don't often have the appropriate experience to perform well on small-scale projects and still provide their clients with personal service and good value.
—Miles Yanick
Bainbridge Island, Wash.

No: Architecture practices are following the same trend as most other sectors of the American economy. The result will be the same: less diversity in the marketplace and therefore less choice for the client.
—Richard Clarke, AIA
Leo A Daly
Washington, D.C.

No: There is no inherent advantage in being a big firm. Clients are still discriminating enough to want the very best from the architects they hire. No matter how many services a firm provides, they have to be *good* services. What's more, providing more services doesn't translate to real savings for the client.
—Robert G. Packard III, AIA
Managing Partner
Zimmer Gunsul Frasca Partnership
Portland, Oreg.

Yes: Absolutely, if the firms are integrated and coordinated, and offer a single point of contact for the client.
—James M. Stevenson, FAIA
Perkins & Will
Chicago

Yes: Having so many services under one umbrella rescues the client from the headache and expense of coordinating a flock of consultants.
—Lynne Barnard
Associate V.P., Entertainment
RTKL Associates
Baltimore

Yes: Because we're a big firm, there is collaboration, not a dictatorship of one famous person. We benefit by picking up cues from each other.
—Peter Pran, AIA
Design Principal, NBBJ
Seattle

This Month's Question

Should interior designers be licensed?

Interior designers are currently attempting to achieve licensure at the state level through their associations. Title laws for certification are now in effect in 15 states, but licensure implies practice regulation. Only two states—Florida and Nevada—currently have existing practice laws. It is the stated policy of the American Institute of Architects that interior designers should not be licensed and that licensing is not the appropriate form of state regulation.

Should interior designers be licensed? ☐ Yes ☐ No

Copy and fax this form to 212/512-4256; or to respond by E-mail, visit our Web site at www.archrecord.com and click on News/Features/Dialogue.

Note: The Pulse poll reflects a tabulation of individual responses to each month's question and is not intended to be construed as formal research.

Let us know your opinion:

_____

_____

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May an editor contact you for comments?
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BOOKS A spring roundup of recent publications includes topics ranging from architecture and destruction to Louis Kahn's love life.

Radical Reconstruction, *by Lebbeus Woods. New York: Princeton Architectural Press, 1997, 168 pages, $45.*

Sarajevo, Havana, and San Francisco are ground zero for Lebbeus Woods's latest assault on architecture-as-usual. Grouping these places together sets off creative sparks in the book's three essays. Additional light and heat are provided by the author's provocative drawings—obsessively detailed, aggressively executed renderings of worlds torn apart and then stitched back together in fantastical ways. Morbid yet vibrant, these startling images are like an adrenaline rush to the reader's architectural imagination.

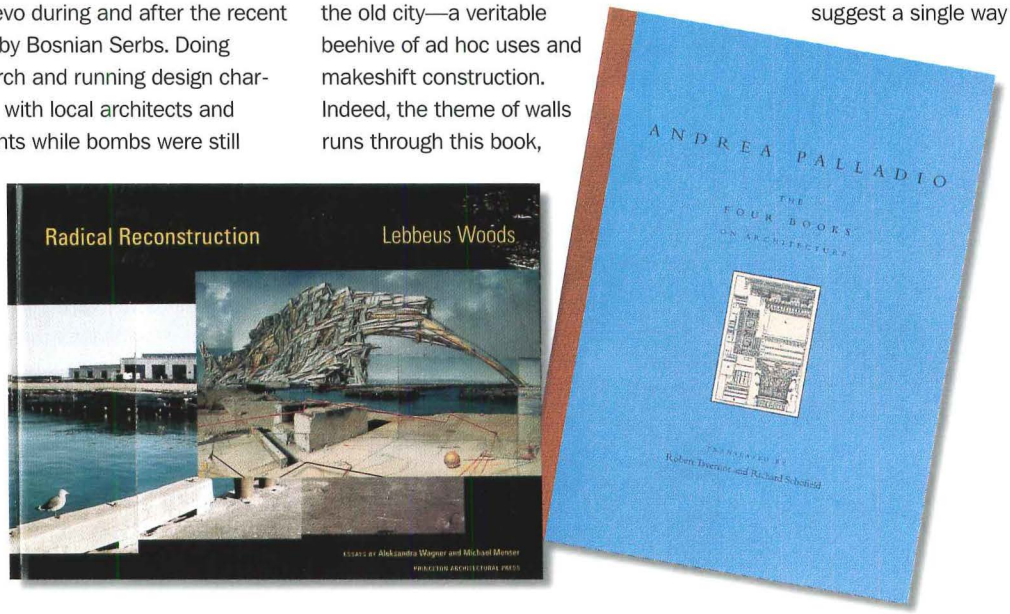
Drawn to "peripheries and edges," which "are always to some degree neglected or at the limits of control from centers of authority," Woods made numerous trips to Sarajevo during and after the recent siege by Bosnian Serbs. Doing research and running design charrettes with local architects and students while bombs were still falling, Woods developed several approaches for rebuilding pieces of the shattered city. These approaches, which Woods dubs "injection," "scab," "scar," and "new tissue," add layers of new construction and meaning to the remnants of the damaged past, ensuring that Sarajevo's tortured history is not forgotten or lost.

In Havana, Woods was attracted to another kind of destruction—that caused by neglect and decay in the wake of the U.S. embargo of Cuba and the failed economic policies of the Castro regime. Having participated in a conference in Havana sponsored by MAK (Austria Museum of Applied Arts) in 1995, Woods drew up a proposal for building an artificial terrace/seawall that would be a new urban edge for the Malecón, the six-kilometer-long boulevard that runs along Havana's waterfront. He also proposed a new "urban wall" for the edge of the old city—a veritable beehive of ad hoc uses and makeshift construction. Indeed, the theme of walls runs through this book, connected to the author's fascination with borders and edges.

In San Francisco, Woods examined radical responses to the ever-present threat of earthquakes. Instead of seismically reinforcing existing buildings that rely mostly on orthogonal frames, he investigated new kinds of structures that might actually trigger "microquakes in order that 'the big one' is defused." The result is, according to the author, "an architecture that inhabits earthquakes, existing in *their* space and time."

While Woods's powerful drawings grab the reader's eye first, his provocative text deserves attention too. Dense but clearly structured, the essay is a call to arms, a plea for architects to get involved in the world around them. Explaining the work shown in the book, he writes, "this does not mean to establish a new architectural style, or to aestheticize violence, and even less to suggest a single way of approaching the problems at hand, but rather to link the highest level of formal concerns in architecture with the most difficult social conditions."

Woods also explains why architects who are not lured to places of destruction might pick up this book. "By confronting the extreme conditions brought about by willful destruction, particularly as it affects urban life and its structures, architects will learn much about the practice of architecture within stable conditions, which they will never learn by unquestioningly accepting the often illusory appearances and assumptions of stability." *Clifford Pearson*



Andrea Palladio: The Four Books on Architecture, *translated by Robert Tavernor and Richard Schofield. Cambridge, Mass.: MIT Press, 1997, 436 pages, $50.*

Andrea Palladio's *I quattro libri dell'architettura* (The Four Books on Architecture) is an important Renaissance treatise, conjuring classical images from the Tuscan order and ancient Roman basilicas. First published in Italian in 1570, the work was translated into English by Isaac Ware in 1738. For 250 years Ware's translation was the only English version available.

Now British professors Robert Tavernor and Richard Schofield have translated the original text into modern English and provided an introduction with information on Palladio's life and his writings. Also included are a glossary of technical terms and a bibliography of recent

Palladio research. The result is a much more accessible Palladio. *Elana Frankel*

Contemporary Native American Architecture: Cultural Regeneration and Creativity, *by Carol Herselle Krinsky. New York: Oxford University Press, 1997, 277 pages, $45, $30 (paper).*

Krinsky's book records contemporary Native American architecture, from ceremonial roundhouses to pueblo-style schools to adobe stuccoed homes, as it relates to the Native American cultural regeneration that started in the 1960s and continues to this day. The text, illustrated by black-and-white photographs, places the architecture in its historical, social, political, and economic context. Krinsky covers both governmental efforts to help formulate a modern architectural movement as well as some rare private attempts to do so. Most of the buildings are small and located off the beaten path on remote reservations, and most have been neglected by the architectural press …until now. *E.F.*

Architects and the City: Holabird & Roche of Chicago, 1880–1918, *by Robert Bruegmann. Chicago: University of Chicago Press, 1997, 560 pages, $65.*

Over the past 15 years, Robert Bruegmann, with help from many other individuals and institutions, has been painstakingly documenting the work of the Chicago architectural firm Holabird & Roche. In this first volume, Bruegmann, a professor of architectural history at the University of Illinois in Chicago, has not only successfully catalogued the architects' various commercial buildings and houses but has also proved that in researching architecture, urban history must also be considered. The firm's remarkable impact on the city's architecture and the surrounding areas, the fabric that makes up an urban landscape, should be of great interest to historians, no matter what their title or field. *E.F.*

Chairman: Rolf Fehlbaum, *by Tibor Kalman. New York: Princeton Architectural Press, 1997, 592 pages, $35.*

Rolf Fehlbaum is obsessed with chairs; indeed, he's crazy for them. So says a new book by Tibor Kalman. In a whimsical, poetic, and primarily pictorial chronology (the text is children's-book spare and basic enough to be read without translation by people around the world), Kalman presents a global history of chairs—from humble milking stools to the electric chair—that reaches nearly mythic proportions.

Simultaneously, we learn the story of how Fehlbaum, chairman of Vitra, the internationally renowned Swiss furniture company, developed his collaborations with leading architects like Tadao Ando, Zaha Hadid, and Charles and Ray Eames, who designed the first chairs produced by Vitra.

Along with co-designer Kim Maley, Kalman filled this thick little book with 650 images of Fehlbaum's favorite people and things, including, of course, Vitra's famous chair collection, which is contained in its museum in Weil am Rhein, Germany, designed by Frank Gehry. Kalman, who was the founding editor of *Colors* magazine and head of his own multidisciplinary design group M&Co. in New York City, has created a book evocative of jazz and Jim Jarmusch films, which Fehlbaum apparently loves. *Christine Liotta*

Toward a Simpler Way of Life: The Arts & Crafts Architects of California, *edited by Robert Winter. Berkeley: University of California Press, 1997, 310 pages, $45.*

In a spirit similar to that of the pre-Raphaelite artists of the mid-19th century, who deplored the current state of painting and sought to evoke the sincerity of a previous era, the architects of the California Arts and Crafts movement drew on the decorative themes of English Tudor, Swiss chalet, Japanese temple, and Spanish mission. Their houses were designed to complement rather than compete with nature, as evidenced, for instance, by the copious use of their favorite building material: wood.

Summoning an earlier time, before modern industry and technology transformed the practice and style of architecture, the movement, which flourished between 1890 and 1930, represented a conscious retreat from the overt materialism and commercialism of American culture. Featuring works by the movement's most notable architects, including Charles and Henry Greene, Bernard Maybeck, and Julia Morgan, this book also reveals the influence that the Arts and Crafts aesthetic continues to exert on architects working today. *C.L.*

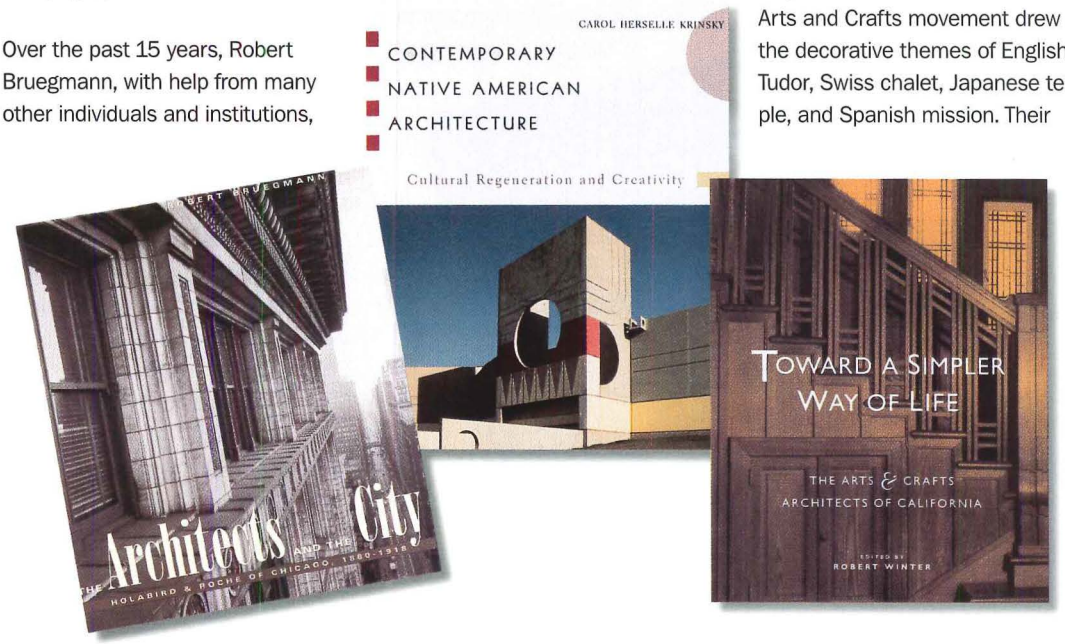
Civic Realism, *by Peter G. Rowe. Cambridge, Mass.: MIT Press, 1997, 241 pages, $30.*

Peter G. Rowe, who is a professor of architecture and urban design as well as dean of the faculty of design at Harvard, is a true urbanist. In this book, he closely examines the form, appearance, and value of civic places and the cultural, political, and social forces that create them.

Rowe analyzes the circumstances that paved the way for suburbia as we know it (single-family houses, shopping centers, workplaces, and highways) and balances this with observations on some great civic places that have stood the test of time, such as the Piazza de Campo in Siena, Italy.

Most of his examples are more modern: recent public spaces in Barcelona, several of the *grand projets* in Paris, and New York's Central Park as well as other transformations of the Manhattan grid. Ultimately, Rowe is fascinated with the question of what makes a civic space, which belongs to everyone yet no one in particular, great.

What the places described in his book have in common is not so much their architectural features, but the activities that take place



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inside them. Not just for architects and urban planners, this book should interest all citizens concerned with developing a cohesive, feasible vision of a sustainable civic future. *C.L.*

Polychromie architecturale: Le Corbusier's Color Keyboards from 1931 and 1959. *Basel: Birkhäuser, 1997, 173 pages, plus two color charts, $180 (3 volumes in slipcase).*

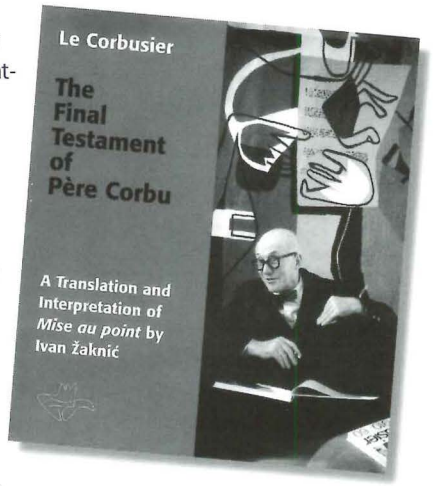
White is probably the "color" most commonly associated with the work of Le Corbusier. Think of the chapel of Notre-Dame-du-Haut in Ronchamp or the Villa Savoye or the monastery of La Tourette, and color is probably the last thing that comes to mind. Indeed, Le Corbusier's most famous text, *Towards a New Architecture* (1923), contains not a single reference to color in architecture.

But as this set of books reminds us, Corb, who was also a painter, was a master colorist. And his use of color could be as powerful as his floor plans or his palette of materials. Since his work has been primarily reproduced in black and white, it comes as a shock to see how liberally he used color, as on the facade of the Unité d'Habitation in Marseilles.

The first volume of this three-part set features full-color photos and an accessible text (in English, German, and French) by Arthur Rüegg, a Corbusier specialist who teaches in Switzerland at the ETH Zurich.

The second presents fabrications of colored wallpaper that Corbusier designed. Each page is a lush field of color, ranging from pale earth tones to acidic greens to vibrant ultramarine.

A third volume presents Corb's "color keyboard," a system he invented for the application of color. Each page represents a "color mood" and contains pattern cards with shades of color arranged in sequences for clients to choose for walls, woodwork, doors, and other details. This beautifully slipcased edition is a fascinating study in the architect's little-known purist color theory. *C.L.*

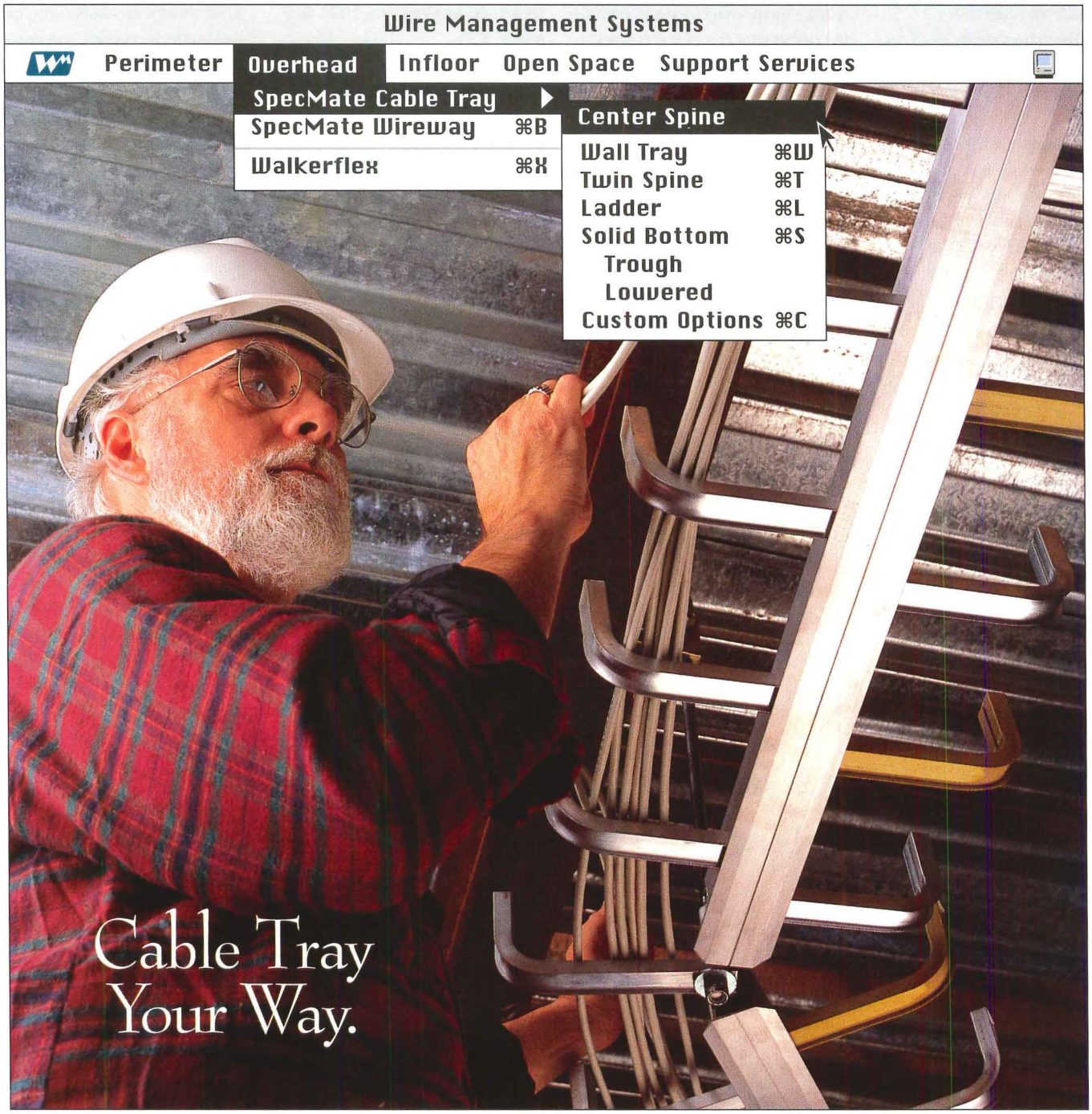


Le Corbusier: The Final Testament of Père Corbu, *a translation and interpretation of* Mise au point *by Ivan Zaknic. New Haven: Yale University Press, 1997, 192 pages, $25.*

More than a translation, this homage to Le Corbusier by Lehigh University architecture professor Ivan Zaknic is a strange piece of work. Zaknic provides the original text to Le Corbusier's autobiographical reflections, *Mise au point*, and aptly renders it into English.

However, the author provides some strange background information for understanding the text. For example, is it necessary to cite (in painful detail) the exact coordinates of the two men swimming nearby when Le Corbusier had a seizure and died in 1965? And the exact steps they took to drag his body out of the water? And must readers see the view of the Mediterranean from the Cap-Martin cemetery where Le Corbusier and his wife Yvonne are buried, with an arrow pointing to the location where the architect took his final swim? I think not. *E.F.*

(continued on page 38)



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CIRCLE 21 ON INQUIRY CARD

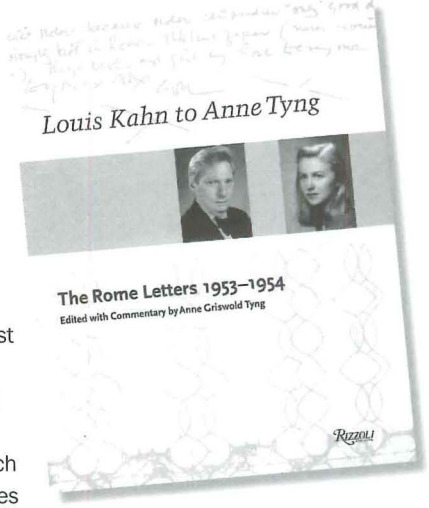
(continued from page 36)
Herman Hertzberger, *by Herman van Bergeijk. Basel: Birkhäuser, 1997, 216 pages, $35 (paperback).*

Born in Amsterdam in 1932, Herman Hertzberger is one of Europe's most influential contemporary architects but is not as well known in America. The majority of his progressive designs, which include schools, theaters, and housing for the elderly, have been built in the Netherlands, and nearly all invite a great deal of social participation from the people who use them.

The only book devoted exclusively to Hertzberger, this paperback volume offers a concise and complete presentation of the architect's work to date. It includes all his important buildings and projects, from his earliest works in the 1960s to his most recent, like the Chassi Theater in Breda, Holland. This theater's dynamic undulating roofline, which Hertzberger split in two, resembles rolling ocean waves and serves as the primary facade of the building.

The book's text is presented in both English and German, and its clear and simple language should satisfy both lay and professional readers. *C.L.*

The Illustrated Room: 20th Century Interior Design Rendering, *by Vilma Barr and Dani Antman. New York: McGraw-Hill, 1997, 272 pages, $70.*



Focusing on interior and architectural rendering as a unique and evolving 20th-century art form, this book presents a comprehensive survey of styles, media, and projects—from vibrant pen-and-ink sketches of interiors to computer-generated elevations.

Organized by decade and, further, by type of interior within each chapter, the book examines Art Deco, Art Nouveau, Arts and Crafts, and other movements as they pertain to interior rendering. Highlighted are drawings by Wright, Mies, Le Corbusier, and Hugh Ferriss, one of the century's greatest architectural delineators.

Representing the most up-to-date collection of information and illustrations in the trade, and with a special section that is devoted to the future of the renderer's art in the computer age, this book promises to be an invaluable reference tool for architects, interior designers, renderers, and design students. *C.L.*

Louis Kahn to Anne Tyng: The Rome Letters 1953–1954, *edited with commentary by Anne Griswold Tyng. New York: Rizzoli, 1998, 224 pages, $45, $30 (paper).*

There is little doubt that Anne Tyng was Louis Kahn's professional muse and lover for almost a decade. But when she left for Rome in 1953, alone and pregnant, there was much question as to her own future.

The recent publication of 53 of Kahn's never-before-seen letters to Tyng in 1953–54, the time she spent in Rome, proves that in addition to their romance there was a mutual professional respect. The informal correspondence reflects a dual passion for architecture and design and bears witness to one woman's pioneering effort in a male-dominated architectural world. *E.F.*

EXHIBITIONS Two exhibitions—a Shiro Kuramata retrospective and a survey of recent public buildings—focus on innovative Japanese design.

Shiro Kuramata, 1934–1991
Grey Art Gallery and Study Center, New York University, New York. *Through May 2.* Musée des Arts Décoratifs, Montreal. *June 3–September 7.*

Japan 2000: Architecture for the Japanese Public
Art Institute of Chicago. *Through May 3.*

Shiro Kuramata, 1934–1991

The Japanese furniture and interior designer Shiro Kuramata is revered for having pushed the experimental envelope to create original forms, materials, and environments—or combinations of all three. During his 28-year career, this metaphysical magician's best stunts included glow-in-the-dark tables, draped fabric solidified into walls, and feathers frozen in acrylic, beyond the reach of gravity. He also worked extensively with fashion designer Issey Miyake, designing his boutiques all over the world. Kuramata's furniture and interiors have had a tremendous influence on a generation of designers in Japan, although his work is less well known here.

Incorporating the defining themes of Kuramata's career was the challenge faced by architects Michael Morris and Yoshiko Sato in their installation for the exhibition "Shiro Kuramata, 1934–1991," which was on view at New York University's Grey Art Gallery. Sato worked with Kuramata as a student intern in 1987, and she drew on that experience in her design for the retrospective.

Kuramata's unique vision was an unapologetic hybrid of cultural contradictions. In many respects, he was very Japanese. He insisted on precise craftsmanship; he was fascinated with duality, which can be seen as an extension of *wabi-sabi* aesthetic and moral values (the beauty of things imperfect, impermanent, incomplete, unconventional); and in his work he seemed to be striving for a kind of Buddhist nothingness.

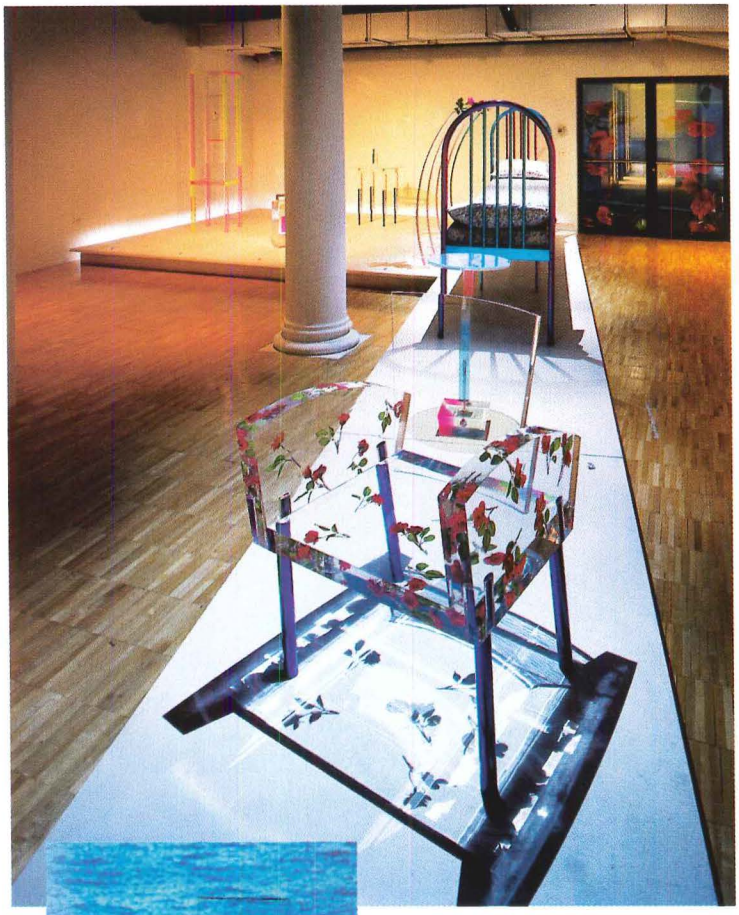
Installation view of "Shiro Kuramata, 1934–1991," with Lamp (Oba-Q), 1972, in the foreground and 01 Chair, 1979, at left.

However, Kuramata grew up in postwar Japan, where the United States' invasion never ended, culturally speaking. While he may have felt some ambivalence toward America, he embraced the culture's big-band music, its emphasis on planned obsolescence, its casual irreverence, and its slick pop imagery. Kuramata adored Western magazines and Surrealist art, especially Duchamp's work. American films and music provided him with evocative titles for many of his furniture pieces: Miss Blanche, Blue Champagne, How High the Moon.

For Kuramata, functionality and practicality were not the only priorities. "The ideal is to have things float in the air without any support," he said in 1973, "like the chairs and musical instruments floating in the blue sky in Magritte's paintings.

Victoria C. Rowan is a writer based in New York City.

Cheryl Kent writes about architecture and urban affairs from Chicago.



Overhead fiber-optic lighting heightens the effect of Miss Blanche, 1988 (above). The Glass Chair, 1976, dissolves into projected waves (left).

That is the best. From there, design begins to evolve." This concept became a major design departure point for Morris and Sato's installation. Most of the display platforms were constructed with deep reveals, the supports hidden from view so they appear to hover just above the floor.

Morris and Sato took advantage of the Grey's large, free-flowing loft space. Visitors could determine their own traffic patterns through the exhibition, viewing objects in whatever order they chose. Because the architects knew that Kuramata created his furniture for sculptural punctuation within his dramatic commercial interiors, and that he preferred to photograph his pieces outside on highways or standing in water (again illustrating walk-on-water buoyancy), Morris and Sato chose to present the works as icons-in-the-round. For the main platform in the gallery, they simulated a reflecting pool, covering the surface with a glass laminate that has stainless-steel film sandwiched within it.

Kuramata was also preoccupied with light, shadow, and the evocative quality of materials. Recognizing that Kuramata's negatives (shadows) were just as important as the positives (the furniture), Morris and Sato generated stark shadows on many of the pieces with powerful cones of light emanating from the ceiling. The result is a spectacular flattened abstract image, an effect that is particularly striking with such chairs as Begin the Beguine—a steel armature in the shape of a bent-wood Josef Hoffman chair, which Kuramata ceremonially burnt out from within—and the Miss Blanche chair, with its kitschy plastic roses suspended in acrylic.

Morris and Sato also realized, however, that some pieces would look best lit from lightboxes below. At the gallery's entrance, visitors are greeted by the ghostly apparition of How High the Moon, a metal-mesh club chair that appears to be upholstered with an intricate weave of shadows. The same treatment is used with Pyramid Furniture, a tall Plexiglass chest whose seams carry the light like a visible electric current and whose black plastic drawers seem to have given gravity the slip.

Kuramata examined aspects of translucency and transparency throughout his career, whether working with acrylic, glass, or wire mesh. Morris and Sato take advantage of Kuramata's tweaking of preconceived notions in pieces like the Glass Chair, which has been described as a see-through Rietveld. In the exhibition the chair is displayed against a video projection of an oceanscape. The transparent chair panels tease the eyes into doubting what they're seeing as the furniture dissolves into the rhythmic waves.

The predominant tone of Morris and Sato's design is one of sympathetic respect for Kuramata's work. The gallery's preexisting spatial conditions are deliberately minimal, and the installation's white walls, colorless lighting, and metallic glass laminate create an environment that allows Kuramata's pieces to stand out.

At the Montreal Musée des Arts Décoratifs, where the exhibition opens on June 3, Morris and Sato will be designing the installation in a space that comes prepackaged with Frank O. Gehry's distinct imprint. Instead of creating a frame, they will be working within one: here, double-height ceilings with permanent marine-grade natural-finish plywood columns erupt in helter-skelter clusters that create silhouettes and shadows. The space in Montreal will engage in a more active dialogue with Kuramata's furniture. Instead of the ethereal, contemplative quality of the Grey installation, the meeting of Gehry and Kuramata will almost certainly be characterized by playfulness verging on the apocalyptic. *Victoria C. Rowan*

Japan 2000

In the past 50 years, the character of Japanese architecture has gone through a remarkable evolution, from desperate utilitarianism, as cities devastated by war were rebuilt, to the flashy, heedless commercialism of the 1980s' speculative economy, to the adventurous public-minded projects of today.

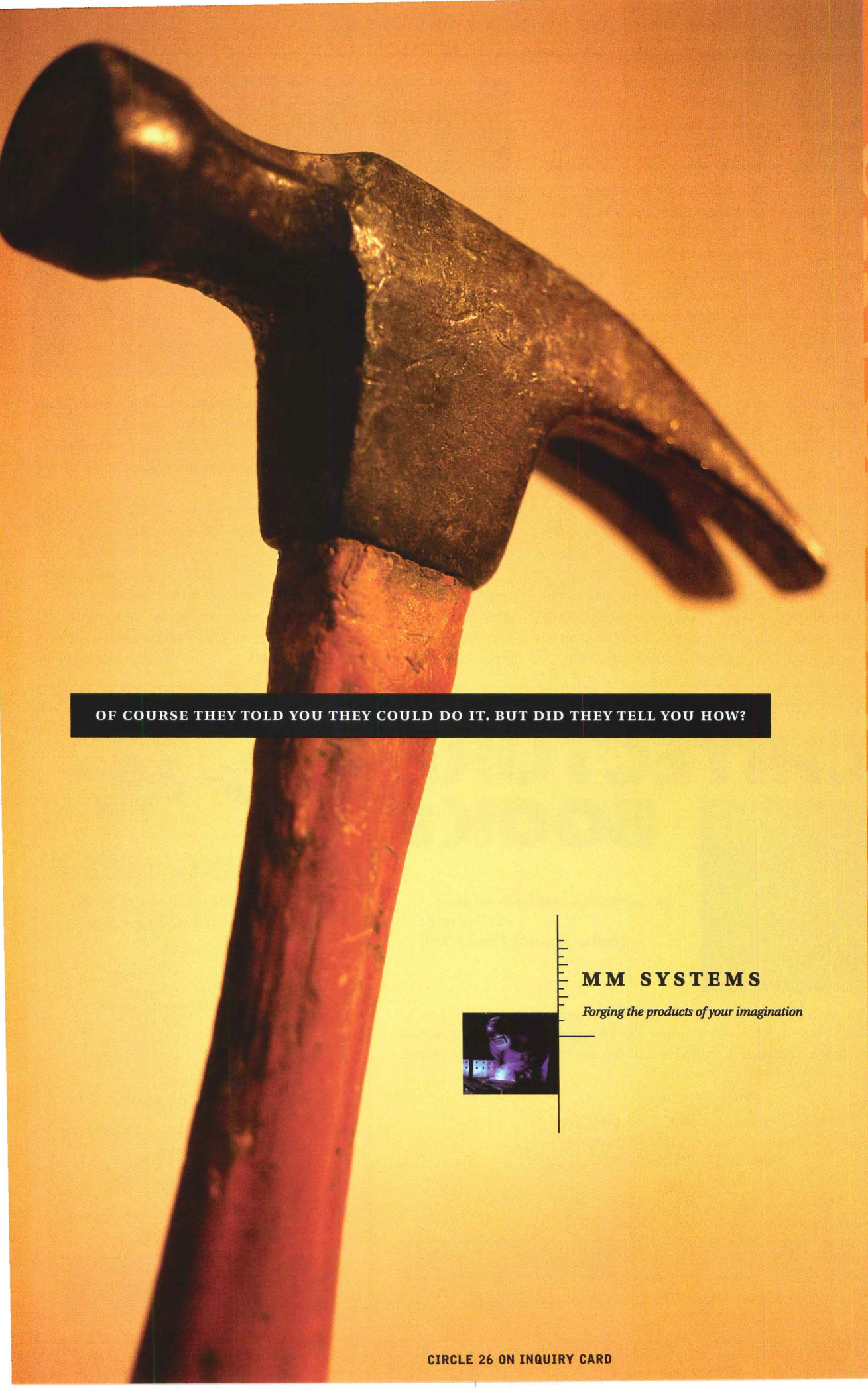
In the 1990s much of Japan's best architecture is in the public rather than the commercial realm, and it is being funded by government sources. Furthermore, many of these projects were designed by internationally known designers like Fumihiko Maki and Arata Isozaki and by virtually unknown younger architects, instead of the architecture-construction behemoths that have typically dominated public building in Japan.

Giving this new public architecture an audience and putting it in a social perspective was the intention of "Japan 2000: Architecture for the Japanese Public," an exhibition at the Art Institute of Chicago. Guest-curated by Naomi Pollock, an American architect who lives and works in Japan, the exhibition was the first in a series of three that will explore the role of the Japanese

(continued on page 46)

The Noh Stage in the Forest, by Kengo Kuma & Associates, blends structure and landscape.

PHOTOGRAPHS: COURTESY OF THE ART INSTITUTE OF CHICAGO (ALL JAPAN 2000 PHOTOS)



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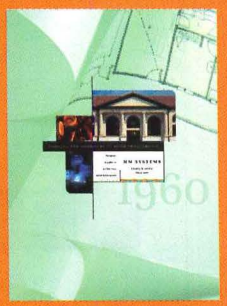

CIRCLE 26 ON INQUIRY CARD

(continued from page 44)
government in fostering innovative architecture and industrial design. (It will also be shown in the San Francisco airport later this year and two locations in Berlin in 1999.)

The 17 projects Pollock has chosen are wonderfully varied in program and expression: a traditional Noh theater, a resort, a conceptually complex bridge, a school and community center, several sports facilities, a museum, a police station, and a crematorium are among the featured projects. Scattered across the country, many of these public facilities enrich small communities that have not enjoyed such amenities before.

Pollock's catalogue essay traces the beginnings of these projects to 1988, when Arata Isozaki was appointed to Kumamoto Prefecture's new Artpolis program. With the sanction of Governor Morihiro Hosokawa, Isozaki would circumvent the government bureaucracy (which inevitably commissioned large, politically connected firms) to select architects directly for public works projects. Isozaki chose young, talented, independent architects for the first phase, which consisted of 40 projects of differing scale. "Artpolis succeeded brilliantly in turning a sleepy agricultural region into an architectural mecca of international repute," Pollock writes. It was not long before other prefectures sought to emulate this success with their own projects and architects.

The exhibition offers a look at a soon-to-be-completed gallery for the Tokyo National Museum by Yoshio Taniguchi (who won the commission to expand the Museum of Modern Art in New York). The freestanding gallery, which will house the Horyuji temple treasures, is distinguished by a remarkable delicacy in scaling and detailing. Two sides of the building are glazed, with a steel screen in front and a canopy above, and the brightly lit interior contains the lobby and lounge areas. The other two sides, clad in stone, house the exhibition and preservation areas. The transparency demonstrates the public ownership and accessibility of the objects; the opaqueness shows the government's responsibility in protecting and caring for the treasures.

Norihiko Dan's community center will serve as a public amenity for those forced to abandon their homes for the building of Hiyoshi Dam.

The show includes two stadiums, a building type that has had great significance in Japan since Kenzo Tange's National Olympics Stadium was built for the 1964 Tokyo games. Architectural historian Reyner Banham said the games marked the end of the postwar reconstruction and the beginning of Japan's economic ascent. Tange's design remains as extraordinary as ever. In looking at these two new

(continued on page 48)

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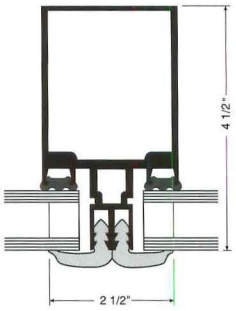

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(continued from page 46)
stadium designs, one can almost feel the architects tensing like athletes running toward the high hurdle: can they match Tange?

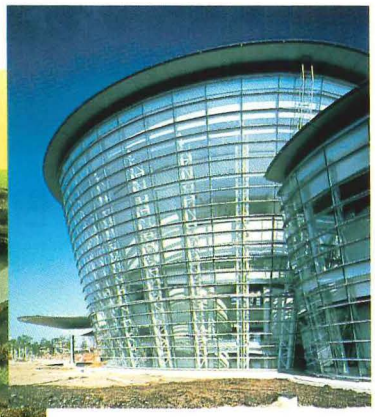
The Miyagi Stadium, by Haryu & Abe Cooperative Atelier, will not be built until 2000, but the model, showing arcing, overlapping crescents enveloping the oblong field, looks promising. The recently completed Kumamoto Stadium, or Buoyant Cloud, by Teiichi Takahashi of Daiichi Kobo Associates, is intriguing. Ingenious engineering will permit the ceiling membrane to be opened to the sky. And the building form is softer, less overwhelmingly monumental than most stadiums, with a billowing skirt draping away from the glass-and-steel cylinder that encloses the playing field.

Another exceptional example from the exhibition is the Noh Stage in the Forest, in Miyagi Prefecture, designed by Kengo Kuma & Associates. In a poetic return to traditional Japanese construction, the natural wooded environment and the building blend into one another.

With the Mamihara Bridge, architects Jun Aoki & Associates commemorate the community's past as a stopover for travelers on the old post roads. Cars travel over the upper deck, and an inverted lower deck for pedestrians serves as a gathering place.

The catalogue essay illuminates the conditions peculiar to Japan, explaining, for example, the circumstances that have led to the dominance of large construction-architecture conglomerates in obtaining most commissions in the country. Pollock's insights into Japanese architecture and her knowledge of the subject (which she also writes about as a RECORD correspondent) make the text well worth reading.

Because no labels or interpretation are provided in the exhibition, the catalogue serves as a useful accompaniment for viewers who are unfamiliar with architectural drawings and models. The work in "Japan 2000," much of which is marvelous and inventive, deserves to be made accessible to as wide an audience as possible. *Cheryl Kent*



Toyo Ito's Ota-ku hotel/school complex in Nagano (left), and Kisho Kurokawa's Fukui City Museum of Art (above).

CORRESPONDENT'S FILE As a once forlorn San Francisco area gains cachet, artists are squeezed out of affordable housing.

BY ERIC C.Y. FANG

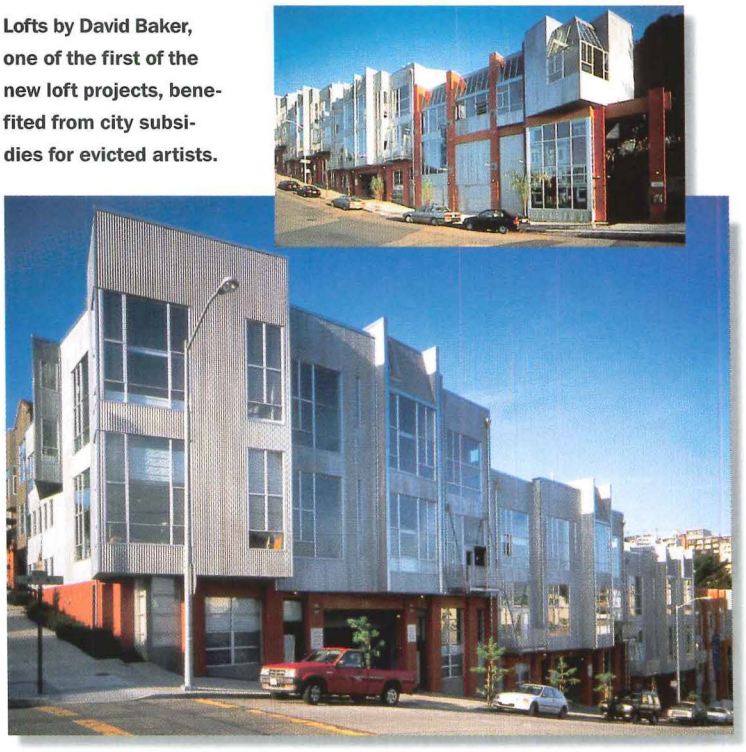
Eric C. Y. Fang, AIA, is an architect and urban designer with Skidmore, Owings & Merrill in San Francisco.

San Francisco's 80-block neighborhood south of Market Street looks much as it has for years. To be sure, the signs that gentrification is taking place along SoMa's broad one-way streets—spruced-up storefronts and warehouses converted into trendy bars and nightclubs—are obvious. The essential physical framework, though, remains the same. SoMa is a jumbled mix of two- and three-story brick warehouses, hulking metal industrial buildings, and four-story wood-framed SROs that once housed shipbuilders.

But turn into alleys like Zoe or Clementina, named after the wives and daughters of the area's early settlers, and you see signs of something new. Here, taut new five-story stucco buildings with metal balconies stand side by side with jewelry manufacturers, auto-body shops, and Victorian-era triple decker houses. Sleek volumes of corrugated metal with large expanses of glass hover over the sidewalk. In the past five years scores of these buildings have gone up in a boom that has not only breathed new life into the city's residential architecture but also sparked San Francisco's most heated land-use conflict in years.

Unintended consequences

Originally, city planners intended to create affordable housing in SoMa for artists. Instead, they spurred a rapid gentrification that forced real estate prices out of the reach of the very people it was supposed to benefit. Artists had been using the area's large, cheap warehouses for studios since the early 1970s. By the end of the decade the city had revised its housing code to allow for live-work occupancy, but it proved limited in addressing the artists' needs. Within a few years artists started agitating for action.



Lofts by David Baker, one of the first of the new loft projects, benefited from city subsidies for evicted artists.

In 1989 the Planning Department responded by creating special zones south of Market Street in which live-work spaces could be built under commercial zoning regulations. As a practical matter, this meant that all such units would have no lot-coverage or side- or rear-yard requirements but higher height limits, and could avoid design review. Because the Planning Department's main objective was to preserve existing housing and encourage new housing for artists, a key stipulation in most of these zones was that the "work" component be limited to "arts activities."

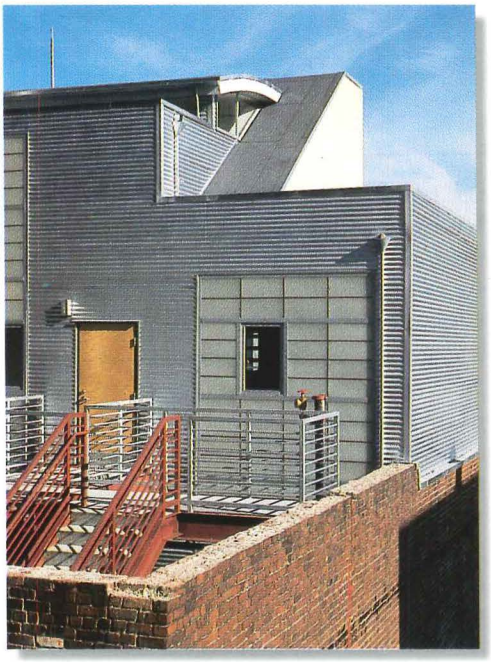
Loft conversions, of course, had been going on for decades in cities like New York, Chicago, and Philadelphia. But several factors prevented the trend from catching on here: stringent seismic regulations and San Franciscans' insistence on living with their cars. The first to match the implications of the new ordinance with the demographic and market trends of the late 1980s was developer Rick Holliday. He and architect David Baker addressed these problems beginning in 1990 with a series of warehouse conversions in an area zoned for professionals' as well as

artists' live-work use, with parking in adjacent buildings.

Because they were conversions, the design of these projects was minimal. Looking to New York City's SoHo for inspiration and drawing on findings from focus groups conducted by Holliday, Baker developed a strategy that capitalized on the character of the old loft buildings and deployed new architectural elements only at select locations. Holliday gives Baker particular credit for employing his contacts among local artisans to create such interventions as the twisting timber and aluminum staircase at the Clocktower lofts and the hand-wrought metal gates at 355 Bryant Street—quirky elements that make a powerful statement. With these conversions, Holliday and Baker identified an emerging market niche for live-work: designers, entrepreneurs, and other knowledge workers. What's more, they made the notion of living in SoMa chic.

The most surprising impact on the SoMa streetscape has been made by small-scale builders in the area and the new live-work lofts that began appearing in the alleys around 1992. Residential building at this end of the market—15 units or less—had long been dominated in the city by "Irish builders," the first-generation Irish immigrants who developed and built much of the neighborhoods, such as Richmond and Sunset, in the western part of the city in the 1960s and '70s.

In the early '90s, as downzoning, a scarcity of vacant sites, and NIMBYism slowed construction in these neighborhoods to a near standstill, the Irish builders set their sights on the cheaper land and more relaxed development climate south of Market. Their first buildings, small infill projects in alleys zoned for artists' lofts, were enabled in part by the increased densities allowed by the '89 ordinance. Their success, fueled by the emergence of multimedia businesses around South Park (in eastern SoMa), and skyrocketing housing costs throughout the city, attracted other builders. By 1996 new lofts accounted for more than 20 percent of the city's annual housing construction.



Capehorn Lofts, a 16-unit high-end conversion by Pfau Architects, makes generous use of Kalwall and corrugated steel.

A new housing type emerges

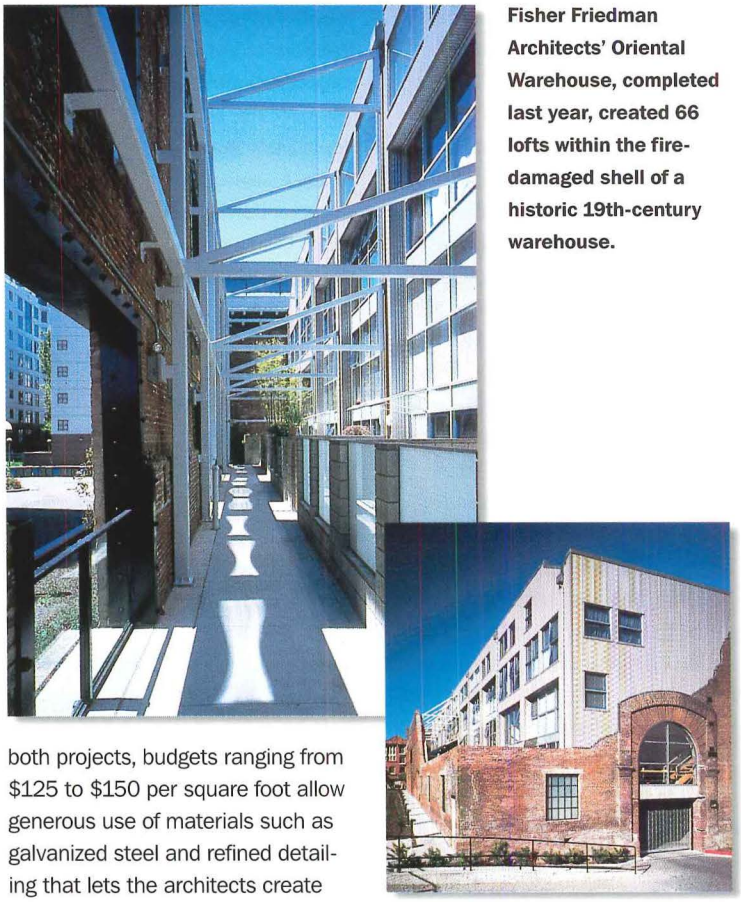
But these buildings were different from the projects by the same builders in western neighborhoods—homely brick and stucco numbers locals call Richmond Specials. The salient characteristics of the emergent type—two floors of double-height lofts with partial mezzanines above a ground-floor garage—can partially be explained by the '89 zoning ordinance, new building code regulations on live-work spaces, and of course economics: although the building type

contains five floors, it qualifies as three floors according to code and thus can be framed in wood.

The design sensibility of these buildings reflects the builders' savvy about the new market attracted to SoMa and their alliance with younger, more design-oriented architects. One of the most active of these is Sternberg Benjamin Architects (SBA), who have become perhaps the city's most prolific designers of live-work projects by providing "builders' sets"—documents that set the basic form, organization, and exterior materials but cede the detailing to the builder.

SBA's projects, like most of the new live-work projects, typically draw from the industrial palette of the area—corrugated metal siding, Kalwall, and lots of stucco. They also incorporate many of the elements introduced by Baker that are now de rigueur for live-work spaces, like artisan-designed metal entry gates. The risks of builders' sets are seen in their uneven execution, manifested in the occasional extraneous polystyrene molding or saccharine color scheme. SBA's best buildings, like their 12-unit project at 50 Lucerne Street, tend to be their "dumbest"—simply detailed and well-proportioned, with innovations like bay windows and ground-floor work spaces that provide separate street-level business entrances for second-level units.

The new loft construction boom has not only provided work for younger designers, but it has also provided opportunities for more established architects to explore different aspects of the type. On the high end of the market are rehabilitations like Fisher Friedman's Oriental Warehouse and Capehorn Lofts by Pfau Architects, located on either end of Delancey Street. Called life-style lofts by some, these projects take more of a "custom spec house approach" by providing more extensive interior finish packages, explains the Capehorn's project architect, Dwight Long. In both projects, budgets ranging from $125 to $150 per square foot allow generous use of materials such as galvanized steel and refined detailing that lets the architects create

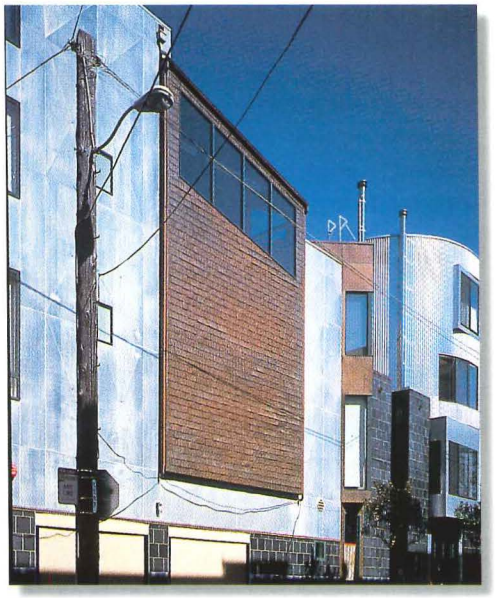


Fisher Friedman Architects' Oriental Warehouse, completed last year, created 66 lofts within the fire-damaged shell of a historic 19th-century warehouse.

sophisticated dialogues between the new lofts and their existing brick shells.

Other architects have investigated construction and tectonic issues. Toby Levy's mixed-use project in South Park, which houses her office on street level and family above, explored the implications of incorporating nontoxic materials such as structural Homasote. Stanley Saitowitz's pursuit of maximum flexibility and transparency in his Natoma Street and more recent Tennessee Street projects has returned the aesthetic expression of the type back to its industrial origins. The street facades of both buildings bring the steel moment frame to the exterior, reflecting the structural system rather than more conventional interpretations of traditional San Francisco residential architecture.

The still evolving balance between "live" and "work" has also suggested ways in which new collective forms may develop from the



Toby Levy Design Partners' mixed-use project in South Park, the epicenter of San Francisco's Multimedia Gulch, houses the architect's office on street level and her living quarters above.

type. At the Clocktower Lofts, Baker carved large courtyards out of the deep floor plates of three old industrial buildings. They combine California informality with a level of finish and control that bespeaks a place of business. Baker, who works in a Clocktower loft, likens the building to an "urban district," where people commute within the building.

SoMa's growing status as the regional center for multimedia businesses has injected an additional element into the live-work market. The Bluxom Street lofts by Mark Horton Architects, a 102-unit project still in construction, have been targeted for technology and multimedia workers. Plans call for a digital concierge to provide 24-hour computer support and Cat-5 and T-1 lines wired into each unit. Architect Peter Pfau predicts that devising a new type of corporate environment for businesses that eschew conventional class-A office space may be the next wave in the area as more firms seek to establish a presence in SoMa's Multimedia Gulch.

The interesting thing about this particular moment is that SoMa's architecture does not yet have a "style." While there is something vaguely defined as "industrial" (per the planning code) that underlies all of the new construction, that term has, happily, been left uncodified. Corrugated metal is put up horizontally in some projects, and vertically in others. Some projects explore a more residential expression through increased facade articulation, while others suppress residential character, stressing instead flatness and simplicity. But SoMa's new architects are not preoccupied with matters of appearance; the continual tinkering with the type is a sign that they are focusing as much on what the housing does as on what it is.

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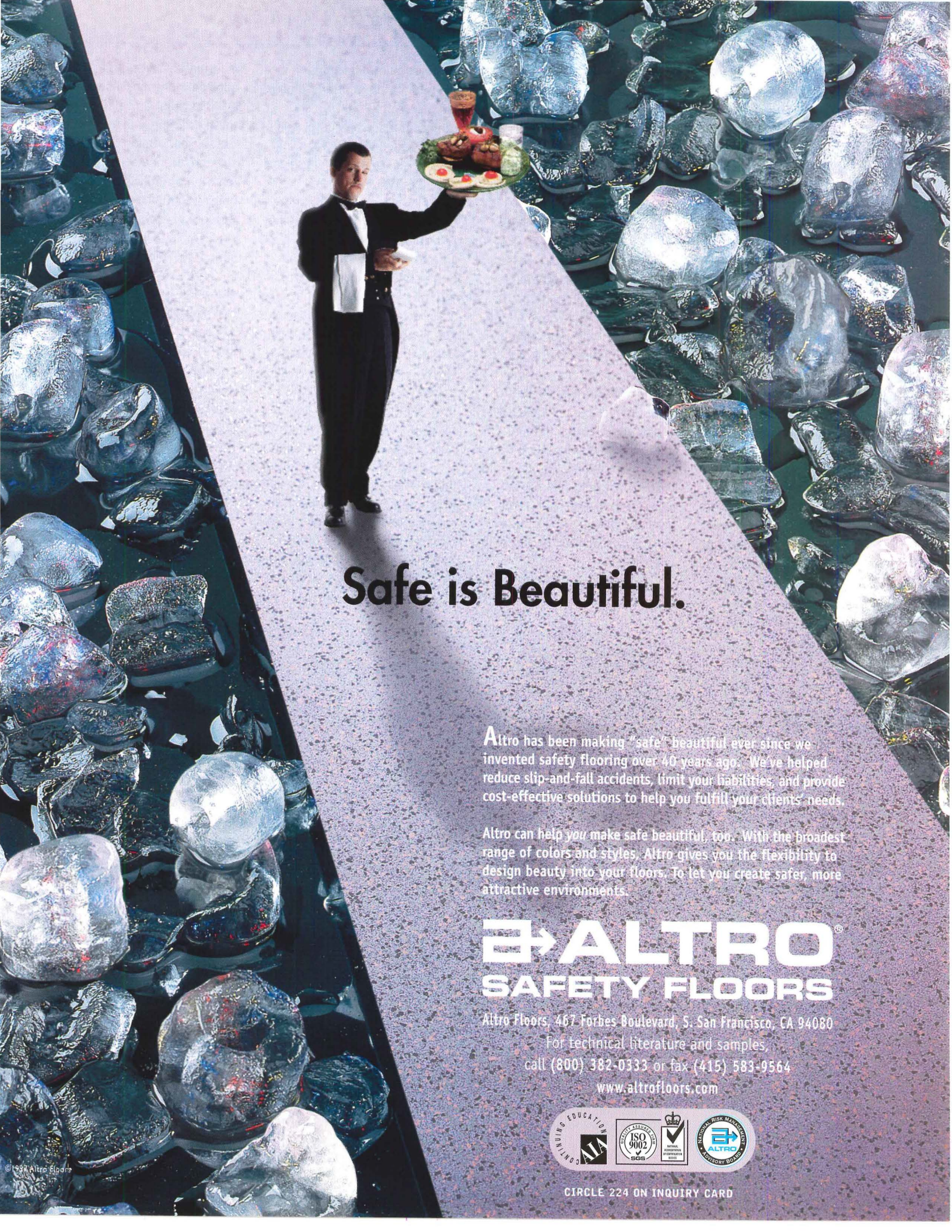

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CIRCLE 224 ON INQUIRY CARD

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Planning sparks controversy

The new housing raises several larger issues. Urbanistically, the incremental nature of the infill projects has allowed SoMa's distinctive scale and grain—especially in the alleys—to remain intact. But the question of whether the new live-work housing will add up to something more and contribute to the public realm has yet to be answered. With street-level facades occupied largely by garage doors and double-height windows floating above the street, the live-work buildings tend to stand aloof from their still-gritty urban surroundings. This perhaps reflects the new lofts' status as favorites of tech workers reverse commuting to Silicon Valley. But SoMa's five-lane one-way streets, narrow sidewalks, and block-long warehouse walls have never made it a particularly pedestrian-friendly part of town. The influx of new residents has produced a clamoring for more amenities like grocery stores and dry cleaners. A reevaluation of the area's urban design and open space needs should not be far behind if it is to evolve as a living quarter of the city, and not just become what architect Daniel Solomon calls an "inner-city bedroom community."

The influx of new residents, and the conspicuous absence of artists among their ranks, is also forcing the city to reckon with larger, more painful land-use issues, including the future of industry here. With recent lofts selling for an average of $250 to $260 per square foot, and many artists moving across the bay to Hunter's Point and Emeryville, it would seem that the battle for affordable artists' housing is over. But the '89 ordinance brought into the open a conflict that has embroiled artists, owners of SoMa industrial businesses, architects, the Irish builders, and neighborhood associations.

Earlier this year the Planning Commission held hearings on the live-work controversies. Testimony ran well into the night. Artists charged that the new development has worsened their own housing situation; longtime SoMa residents and industry owners feared that their new neighbors would drive them out. Architects and builders pointed out that in a city with a 1 percent vacancy rate and the country's highest housing costs, the new lofts' contribution to the housing inventory can only be seen as positive. San Francisco's Planning Department acknowledged the value of the new housing but ultimately enacted new remedial restrictions that will most likely make live-work developments in SoMa more difficult to develop.

But the cat's out of the bag. As recent sales figures attest, the new lofts, with their flexibility, expansive volumes, and large windows, have captured the imagination of both longtime residents and people wanting to move back into the city. The industrial aesthetic has also been adopted by the multimedia crowd.

For people in other cities, these developments may not seem extraordinary. But for those familiar with the recent architectural climate in San Francisco, they are nothing short of remarkable. Because of a trying approvals process, a strong sentimental streak, and a touch of complacency, the environment here has been far less conducive to progressive architecture than, say, Los Angeles, or even the San Francisco of the 1960s. The new wave of housing signals that San Francisco may at last be moving beyond the Victorian "painted ladies," Mission-style stucco boxes, and Shingle Style houses that have long defined its residential vernacular. Historian Kevin Starr recently said, "San Francisco needs a new story to tell about itself." If so, then SoMa's current development boom may be architecture's contribution to that story. ■

Calendar

Arquitectonica: The Times Square Project
New York City
Through May 10
The first solo exhibition in New York of work by the Miami-based firm focuses on the architects' design of a mixed-use complex combining a hotel with entertainment and retail components, to be built at 42nd Street and Eighth Avenue. Cooper-Hewitt National Design Museum. 212/849-8300.

Civics Lessons: Recent New York Public Architecture
Washington, D.C.
Through May 11
Projects in New York initiated by public agencies working with architects from 1985 to 1995. Organized by AIA/New York and the New York Foundation for Architecture, the show emphasizes the link between public investment in architecture and the economic, social, and aesthetic quality of the city. National Building Museum. 202/272-2448.

Alvar Aalto: Between Humanism and Materialism
New York City
Through May 19
Marking the 100th anniversary of Aalto's birth, this large-scale retrospective is the first in the United States to present original drawings and models of work by the renowned Finnish architect, designer, and town planner. Video walk-throughs of several of his most important buildings are included. Museum of Modern Art. 212/708-9400.

Position/Paradox
New York City
Through May 19
An exhibition of work by the six winners of the Architectural League's annual competition for young architects and designers, accompanied by a lecture series. Urban Center. 212/753-1722.

Lightforms '98
New York City
Through May 31
Three monumental, site-specific, interactive light sculptures—winners in the Lightforms competition—are on display. New York Hall of Science. 718/816-9796.

Kisho Kurokawa Retrospective
London
Through June 13
"From the Age of the Machine to the Age of Life," a major retrospective of the work of Japanese architect Kisho Kurokawa, from his early projects with the Metabolist Group through his current addition to the Van Gogh Museum in Amsterdam. RIBA Architecture Centre. 011/01-1-580-5533.

Finnish Modern Design: Utopian Ideals and Everyday Realities
New York City
Through June 28
Featured in the exhibition are glass, ceramics, furniture, textiles, metalwork, and industrial design. Organized by the Bard Graduate Center for Studies in Decorative Arts in New York and the Museum of Art and Design in Helsinki. Bard Graduate Center. 212/501-3000.

Titanium!
New York City
Through June 30
An exhibition demonstrating the range and diversity of titanium, including its recent architectural applications in the Guggenheim Bilbao and elsewhere. Material ConneXion Gallery. 212/445-8950.

Architecture in Perspective
Washington, D.C.
Through July 5
This juried exhibition, organized by the American Society of Architectural Perspectivists, features 55 renderings, including the six winners of the Hugh Ferriss Memorial Prize. The Octagon. 202/879-7764.

Changing Places: Looking at Southampton
Southampton, New York
Through July 12
An exhibition of paintings, maps, plans, and photographs documenting Southampton sites and how they have changed over time. The show explores issues of village planning, land use, and demographic change. On May 15 and 16, a forum on architecture and planning in Southampton will be held. Parrish Art Museum. 516/283-2118.

Architecture of Independence: Making of Modern South Asia
Pittsburgh
Through July 19
The work of four South Asian architects—Charles Correa, Achyut Kanvinde, Balkrishna Doshi, and Muzharul Islam—is included in this traveling exhibition. Heinz Architectural Center, Carnegie Museum of Art. 412/622-3131.

Landmarks of New York
New York City
Through August 23
An exhibition of historical photographs celebrating New York's centennial, accompanied by a symposium, walking tours, and panel discussions. New-York Historical Society. 212/861-4641.

National Design Triennial
New York City
Through September 12
A survey of developments in contemporary design, investigating how issues and ideas drive design practices in America. Cooper-Hewitt National Design Museum. 212/849-8300.

Completing the Federal Triangle
Washington, D.C.
Through September 27
An exhibit documenting the development of the Ronald Reagan Building and International Trade Center on Pennsylvania Avenue, from a design competition in 1989 to the building's recent completion. The winning design was by Pei Cobb Freed & Partners in association with Ellerbe Becket. National Building Museum. 202/272-2448.

New Ways of Revitalizing the American City
Washington, D.C.
May 2–January 3, 1999
An exhibition illustrating how new cultural facilities have brought life back to tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

Design ADAC '98
Atlanta
May 6–7
The annual marketplace for design professionals. This year's theme: Stars of Design. Seminars, product previews, and networking opportunities are the featured fare. Atlanta Decorative Arts Center. 404/231-1720.

Move into the Open
Hamburg, Germany
May 7–9
A series of debates and conferences, including architects, artists, writers, and scientists, inspired by the work of architecture theorist Henri Lefebvre and examining the concept of "open topologies." Academy for Fine Arts. Fax 011/49-40-37-22-22 for ticket information.

Maya Color: The Painted Villages of Mesoamerica
Washington, D.C.
May 8–June 26
Paintings and photographs by Jeffrey Becom and Sally Jean Aberg explore the symbolism of color in ancient and modern Mayan architecture. AIA Headquarters Gallery. 202/638-3221.

Federation for Housing and Planning Conference
Lelystad, The Netherlands
May 10–13
This year's conference, which takes place in a region that was entirely reclaimed from under water during

(continued on page 69)

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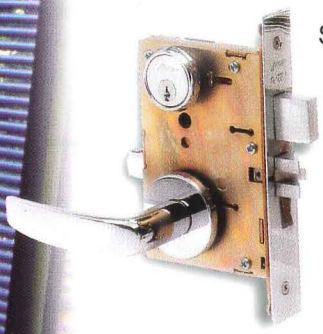

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(continued from page 67)
the 30 years after World War II, focuses on "problems and solutions in sustainable water management." Flevoland Province House. 011/31-70-328-2085.

1998 AIA National Convention and Expo
San Francisco
May 14–17
Twelve thousand industry professionals are expected to attend this year's convention at the Moscone Convention Center. Apart from the usual array of products and services on exhibit, representatives of federal agencies will discuss design-contract opportunities. An AIA/Rizzoli bookstore will also be in operation. In addition, there will be opportunities to earn continuing education credits. This year, for the first time, registration for the convention will be free for all members of the AIA. For information about exhibiting, call 617/859-4483. For other information, call the AIA at 202/626-7395 or check the convention Web site at www.aia98.org.

International Contemporary Furniture Fair
New York City
May 16–19
Includes more than 400 exhibits by manufacturers and designers of contemporary furniture, lighting, floor and wall coverings, textiles, and decorative accessories. Jacob Javits Center. 212/879-5776.

Women in Architecture Film Festival
Washington, D.C.
May 20 and 23
The Northern Virginia chapter of the AIA, with the support of the National Museum of Women in the Arts, is sponsoring this series of documentaries on architects such as Charlotte Perriand, Eileen Gray, Mary Jane Colter, and Maya Lin. Panel discussions featuring local women architects will follow. National Museum of Women in the Arts. For information call 703/549-9747.

ACSA International Conference
Rio de Janeiro
May 23–27
The first international conference of the Association of Collegiate Schools of Architecture to be held outside Europe. Architectural educators, scholars, and professional architects will be in attendance. Exhibits of publications, computer programs, and services are also featured. Universidade Federale. For information call the ACSA in Washington, D.C., at 202/785-2324.

Lightfair International
Las Vegas
May 26–29
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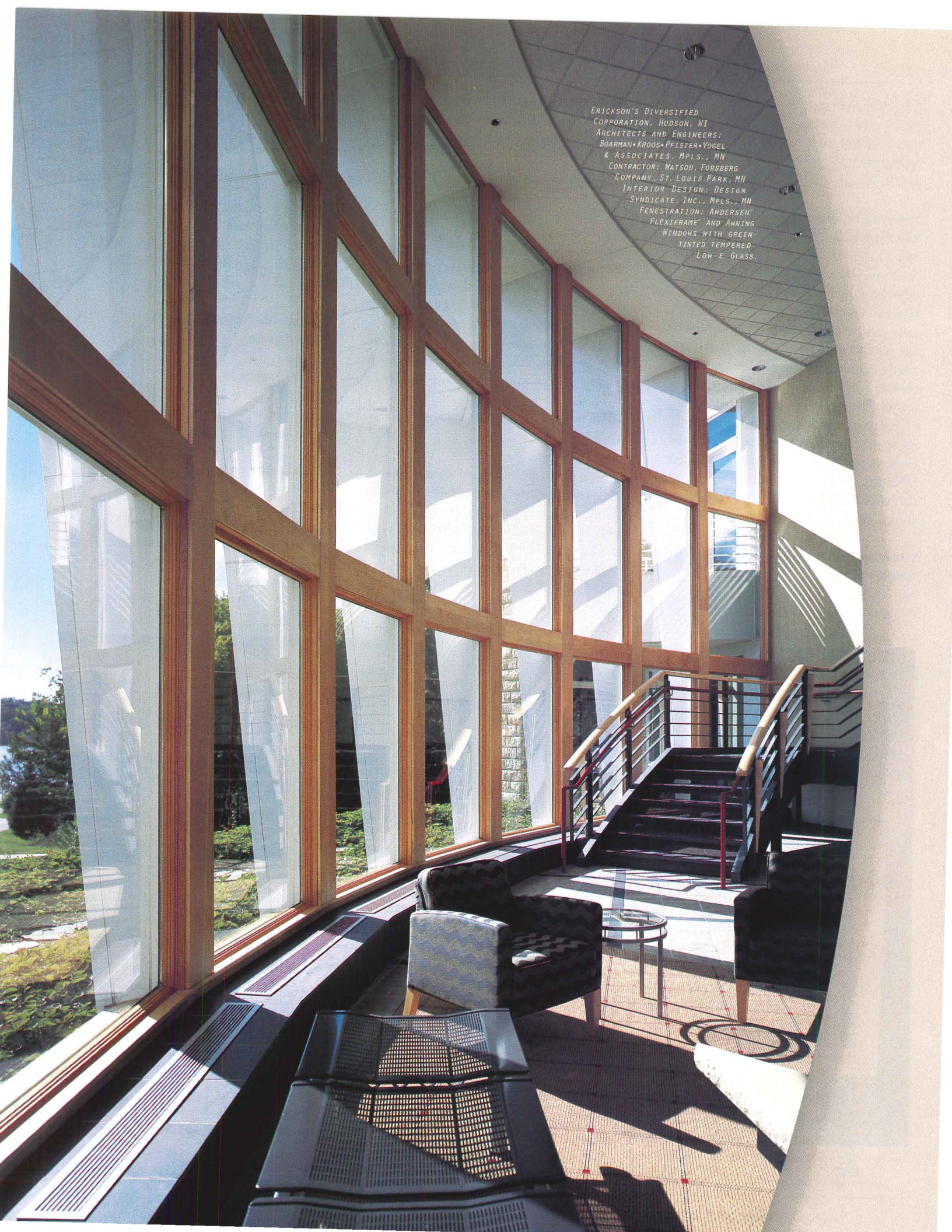
(continued on page 360)



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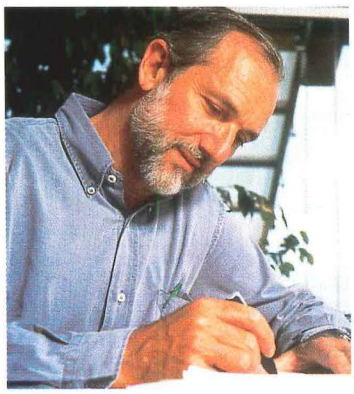
PRITZKER WINNER RENZO PIANO PLAYS MUSIC ON AN URBAN STAGE



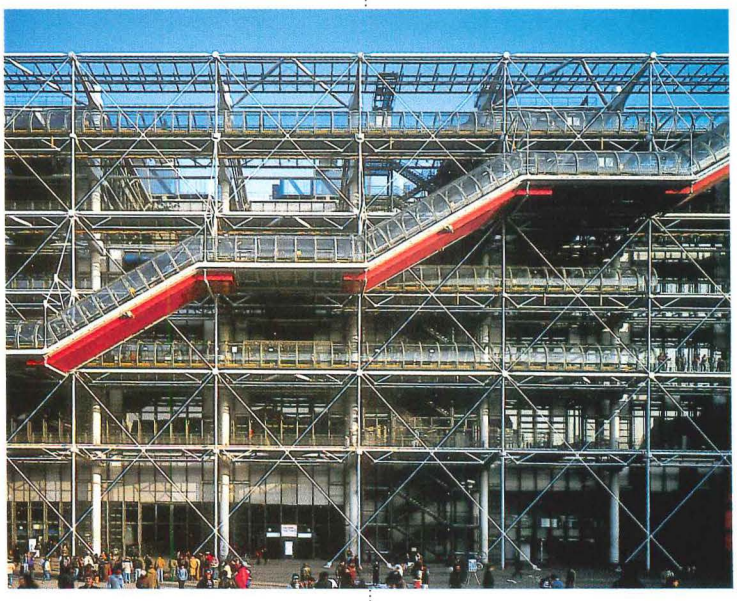
Renzo Piano, this year's winner of the Pritzker Architectural Prize, leaped to notoriety in 1976 with the opening of the Centre Georges Pompidou in Paris (below). Since then, the 60-year-old Italian has forged his reputation with complex efforts in cities around the world, many of them described as futuristic. Nevertheless, as he states in the following interview, Piano—who grew up in Genoa and now has offices there and in Paris and Berlin—doesn't feel he's that technologically oriented.

RECORD: The Pritzker committee described your work as a "rare melding of art, architecture and engineering." Do you consciously try to achieve that synthesis?

Piano: Even more than that, it's also about the pleasure of construction, not just engineering. As you may know, I was born into a family of builders, so I grew up with this sort of instinctive pleasure for construction. Then in the late '60s my work was mainly about experimenting; it was very naive, very innocent in some way. Of course, as you grow up you realize architecture is much more than that: architecture is history, it's geography, it's about topography, its about sociology. But I have stayed sensitive to everything on the other side—engineering, construction, and of course process as well.

RECORD: Did any particular architects have an early influence?

Piano: Certainly one was Franco Albini. He was a great architect in Milan—he made nice things—maybe not so famous but great. And when I was in school, I wasn't really in school because I was working with Franco Albini and going to school maybe twice a week. Then there is Pierluigi Nervi, and I have a great respect for Jean Prouvé, and of course Buckminster Fuller, who was a sort of philosopher. All those people. Charles Eames on the West Coast. At that age, you build up a number of masters.



RECORD: Looking back, what are some of your favorite projects?

Piano: This is a difficult answer to give, because you tend to love most the scheme you are making or are about to finish, and you tend to forget about what you finished a long time ago. I'm about to open a cultural center [in New Caledonia]—this is a very interesting project, made of wood. But of course the Potsdamer Platz [redevelopment], which is an immense scheme, is absorbing a lot of energy. The headquarters for Daimler-Benz [right] is practically finished and we are about to finish another four or five buildings. And this is a very complex scheme, because it's not about making buildings; it's about making a piece of a city.

RECORD: What do you think of the Pompidou now?

Piano: I think it was a great building, I do. I think it was very important for [Paris] at that time. Also, it helped to change the way museums have been seen. The perception of museums has been changing a lot. Pompidou was a good example of that changing moment. I think for some time I've been seen as a high-tech architect, and this is [because of] the Centre Pompidou, which is seen as high-tech. People love to put on labels, you know.

RECORD: And that particular label is inaccurate?

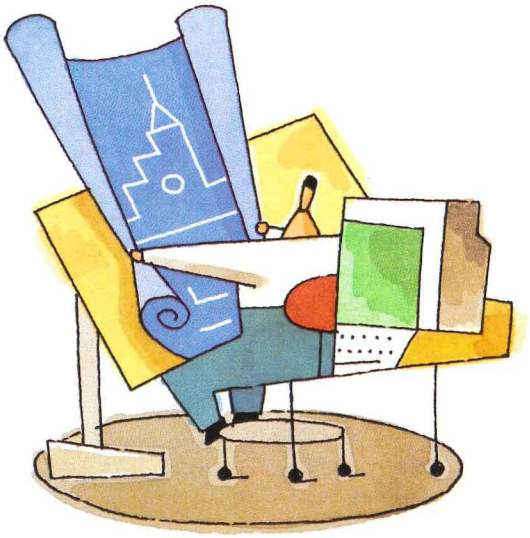
Piano: Yes, I think so. I would say it's more a bit like piano playing. As a piano player, even if you're the most poetic one, you must know the technique—otherwise you are lost. My idea is that you have to learn technique enough so that you are able to forget about it. And then you just play. *Soren Larson*

AIA NAMES JURY FOR BW/AR AWARDS The AIA has selected a jury for the second annual Business Week/Architectural Record Awards, which honor organizations that integrate creative design with enterprise: "good design is good business." The panel represents a range of fields, from the automotive industry to leading architectural firms.

Among the architects on the panel are Bernardo Fort-Brescia, FAIA, principal of Arquitectonica International in Miami; Charles Gwathmey, FAIA, principal of Gwathmey Siegel & Associates in New York; Wendy Evans Joseph, AIA, principal of her own firm in New York; Rodolfo Machado, Assoc. AIA, principal of Machado & Silvetti Associates in Boston; and Charles B. Rose, AIA, principal of Thompson and Rose Architects in Cambridge, Massachusetts.

Filling out the list are Michael Bassermann, chairman and CEO of Mercedes Benz North America; Sherri Geldin, director of the Wexner Center for the Arts in Columbus, Ohio; Olli-Pekka Kallasvuo, executive vice president of Nokia Telecommunications; John O. Norquist, mayor of Milwaukee, and Ian Schrager, owner of Ian Schrager Hotels.

The awards will be conferred in the fall; over 300 submissions have been received. *S.L.*



The architect had big plans-but his client's wallet had other ideas.

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CIRCLE 36 ON INQUIRY CARD

WITH MONEY MATTERS A MEMORY, BOSTON GETS A NEW COURTHOUSE

Boston's new Federal Courthouse, after withstanding a struggle over its design budget, is nearing completion at the edge of the harbor.

Before its opening, the building's concave glass wall, facing downtown Boston across Fort Point Channel, had already made the courthouse a highly visible landmark—and finances had made it a subject of heated debate. Early on, the project was attacked as too expensive, too grand. But on a per-square-foot basis, the final budget of a little over $200 is remarkably low, notes Henry D. Cobb, FAIA, of Pei Cobb Freed & Partners, who designed the building (associated architects were Jung/Brannen Associates Inc. of Boston).

The courthouse has been made to look conspicuous and even rich in order to celebrate its civic function, Cobb says. But it achieves its effects through detailing and monumental shapes, not luxury finishes. The $162 million, 765,000-square-foot building contains 27 courtrooms (about three times the average number), as well as extensive public facilities. The courtrooms are grouped on three levels around a glazed, multistory common space that opens onto a public garden and a new Harborpark. The latter was designed as an integral part of the whole by the Olin Partnership and Carole R. Johnson & Associates.

The building design is intended to reveal itself gradually as one walks through it; a processional sequence of the public spaces leads from street to courtrooms. Surrounding the three-story core is a six-story "jacket" of support space, whose exterior walls form the building's street facades. While a feeling of openness is created on the side facing the water, the street side has a more severe appearance, a perception increased by the building's isolation amid relatively vacant surroundings.

However, the detailed granite-trimmed red brick, which provides a relatively inexpensive material, says Cobb, also refers to 19th-century commercial structures a few blocks away. In addition, the city plans for the area to become a new business, commercial, and residential center, and a new subway line will stop at the courthouse. *Jonathan Hale*

THE SMITHSONIAN'S INDIAN MUSEUM: MULTIPLE AGENDAS, MULTIPLE PROBLEMS

Upon receiving the commission to design the Smithsonian Institution's new National Museum of the American Indian, Canadian architect Douglas Cardinal moved to Washington, set up shop, and prepared to construct the consensus required to get something built on the Mall.

Instead, he became mired in the agendas of multiple agencies which, he contends, threaten to compromise the integrity of his design and drive his office into bankruptcy. His only recourse, he was advised, was to withhold the drawings while negotiating for a larger fee and the right to continue his role in the building process. As a result of his actions, he has been fired.

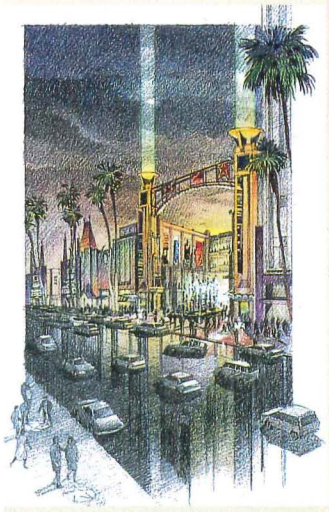
The Smithsonian, in a statement, maintained that Cardinal "failed repeatedly to meet contractual performance requirements" and that he was unlikely to be able to "meet those requirements in the future." The agency has retained New York architect James Stewart Polshek to complete working drawings and to oversee construction.

Cardinal, who cites Bruce Goff and native culture as major influences on his work, asserts that he must remain involved throughout construction. "It's like painting half a painting," he said, "and then they come along and say someone else is going to finish it, but don't worry, we'll still give you credit for it." The drawings are completed and stored in his firm's computers.

The Smithsonian, however, argued that "the creative phase of the design process…is finished," and what remains is the administration of contract documents, which is separate from design.

Cardinal remains hopeful that the rift can be repaired and that he will be allowed to continue with the project. "I hope," he said, "that the design and our technical expertise will be honored and that we will be reimbursed." The resolution, observers note, may set a new precedent for the design and execution relationship between architects and public clients. *Ellen Sands*

AND THE OSCARS GO TO: THE ROCKWELL GROUP **After two decades of shuttling between the Shrine Auditorium (near USC) and the Dorothy Chandler Pavilion (in downtown Los Angeles), the Academy Awards are going back to Hollywood. Starting in 2001, the statuettes will be doled out in a new auditorium on Hollywood Boulevard built just for that purpose.**



New York's Rockwell Group is designing the theater, a flexible construction that will host up to 3,300 people on Oscar night—with a high-tech "media cockpit" situated in the orchestra—and seat 2,000 for other performances during the year.

In a situation that has been likened to Times Square, Hollywood has fallen on hard times of late, with corrosion replacing glamour. However, as is the case in New York, the city is boosting redevelopment and touts $1 billion worth of planned projects. The Oscars theater is part of a $350 million development project by the TrizecHahn Corporation that will also include restaurants and retail outlets. ***S.L.***

Designing the Peace Dividend **Converting from a wartime mentality does have its challenges. A huge number of military bases—from 19th-century outposts to Cold War relics—are closing around the U.S. and in Europe, with the Pentagon decommissioning 200 in the last 10 years. Communities are now looking at adaptive reuse; here, three solutions. *S.L.***

WATERTOWN ARSENAL TRADES WEAPONS FOR OFFICES AND A PUBLIC PARK

A design team has been put together to adapt the historic Watertown Arsenal, near Boston, for reuse. As a result, the 19th-century complex will soon become offices, community facilities, and a public park. Construction is scheduled to begin in October and be completed the following fall.

The architects are Bruner/Cott & Associates of Cambridge, Massachusetts; Thomas E. Hall & Associates of Wayne, Pennsylvania, are the consulting architects; and the developer is O'Neill Properties of Philadelphia. Dan Kiley, the landscape architect, plans to preserve the turn-of-the-century landscaping by the Olmsted Brothers.

For almost 200 years the arsenal has practically been an island, housing the workings of a secretive industry that was off-limits to the nearby village. The reuse plan changes that by opening the site to the public; plans include a new theater and arts center in one of the 19th-century buildings, as well as the renovation of an 1850s Italianate commander's house.

Total redevelopment cost for the project is estimated at $90 million. In addition, the revamping of the site required a $100 million environmental cleanup by the Army, including the demolition of a small nuclear reactor.

The 37-acre site borders the Charles River, across from Boston. Its most prominent building is the 900-foot-long Erecting Shop (below), constructed in two 450-foot phases for World War I and World War II.

Bruner/Cott—who are working on two other large-scale adaptation projects in Massachusetts—see their task as preserving the history of the complex while making it attractive to modern businesses. The architects must also mediate the tension between the military toughness of the buildings and the pastoral site.

Another area of the arsenal was converted in the early 1980s, when several structures and the surrounding land were turned into a shopping mall, health center, housing, and public park. *Jonathan Hale*

A LITTLE SOMETHING FOR THE KIDS: OLD HANGAR IS NOW A MUSEUM

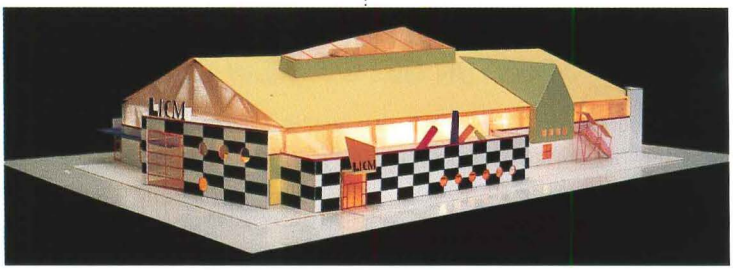
An abandoned World War II airplane hangar on Long Island's Mitchell Field has finally found a peacetime occupation as a children's museum. New York City–based Gran Sultan Architects is handling the renovation and expansion of the structure, near Garden City, which will house 12 galleries, a 150-seat theater, a store, a classroom, and 3,000 square feet dedicated to toddlers when it opens in 2000.

The privately funded Long Island Children's Museum is the first museum for principal Joe Sultan, whose municipal projects have often packed innovative design into tight budgets—in this case, $100 a square foot.

Sultan views the financial constraints as a way to keep focused on the mission of the museum rather than the details of the design. "We're working to develop a clear, dynamic circulation system enhanced by two-story volumes, daylighting, and exposure of the existing structural system," he says.

The exterior (below) will present a traditional scale to those approaching from the outlying complex but a kid's scale up close.

The Long Island Children's Museum is one of three under development at the Museums at Mitchell Center. Also planned are aerospace and firefighter museums. *Julie Moline*



ADAPTING U.S. AND SOVIET BASES IS TRICKY BUSINESS IN GERMANY

The two sites could not be more different: one is a sturdy, well-maintained industrial complex, the other an assortment of stripped and decrepit buildings. Situated several miles apart on either side of the Berlin Wall, they once housed soldiers trained to kill each other. Now they are destined to house the legions marching from Bonn to Berlin as Germany shifts its capital.

Germany is densely populated, and absorbing huge swaths of land has been a weighty political issue. The fates of the former McNair Barracks—once headquarters for U.S. troops—and the abandoned Soviet army barracks in Karlshorst are typical of the tedious process of redeveloping the installations used by Germany's former occupiers.

Both sides left environmental messes, but the problem is critical in the east. Surface areas of the former Karlshorst base have been cleared of fuel and munitions, according to a redevelopment spokesman, and underground contamination will be treated during construction. A recent competition resulted in a plan for about 1,000 housing units, mostly apartments, with supporting retail, but bids have not been taken from developers.

Whether and how to preserve elements of the Nazi and Communist eras are also issues that plague planners. Most of the Karlshorst barracks will be razed, but other parts, including a Lenin monument, will be saved.

At McNair, much of the industrial complex, designed in the 1930s by Hans Hertlein, will be renovated, though entirely new housing will be built. *Chuck Twardy*

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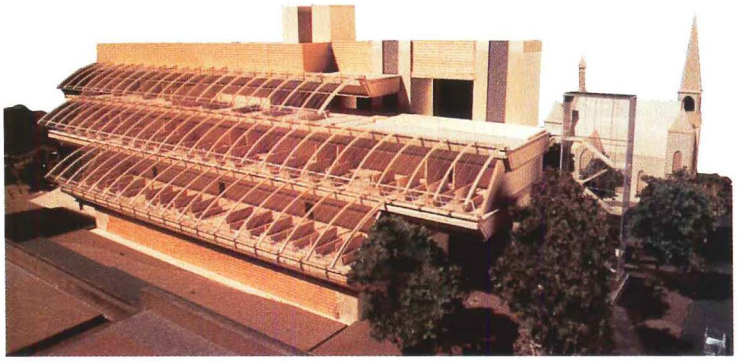


VINOLY'S LABORATORY DESIGN IDEA: KEEP THE RESEARCHERS HAPPY

With a goal of expanding the frontiers of medical research, the Van Andel Institute is creating a new $200 million headquarters at its base in Grand Rapids, Michigan. The institute has four Nobel laureates as scientific advisers, so it's not surprising that it searched worldwide for an architect who would push beyond traditional research lab design. The choice turned out to be Rafael Viñoly Architects of New York City.

Construction began in March on phase one: a 150,000-square-foot space that includes research labs, conference rooms, and a 350-seat auditorium.

The area will open by 2000, and work will then begin on phase two, which expands the research space and conference facilities and adds a cafeteria and parking. The completed institute will be 400,000 square feet.

Architects at Viñoly inspected many other labs and found that most had too few windows. As a result, daylight is an important part of the new design, with a five-story, vaulted glass roof over the research space as one of the most prominent elements.

"The challenge was to make the most flexible building possible," says Jay Bargmann, AIA, project director at Viñoly. As an example he cites the research space: the lab furniture is on wheels and has built-in lights so it can be easily rearranged for group or individual projects.

An informal gathering space and a cafeteria are included in the atrium, which Bargmann calls "the civic space at the heart of the building." The idea: simply to encourage researchers to talk to one another. *Susan R. Bleznick*

DRAMATIC ARCHES ON THE RISE IN BARREN OUTSKIRTS OF MEXICO CITY

The Los Arcos Bosques complex, now rising next to a highway outside Mexico City, is Latin America's most ambitious real estate project in terms of space, according to its developers, with more than 5 million square feet of residences and offices under construction.

The mammoth buildings—two 525-foot arches within three inhabited walls—are a statement that the Mexico City–based architect, Teodoro González de León, along with architects Francisco Serrano and Carlos Tejada, hopes will carve a dramatic urban niche in what is now a dreary area.

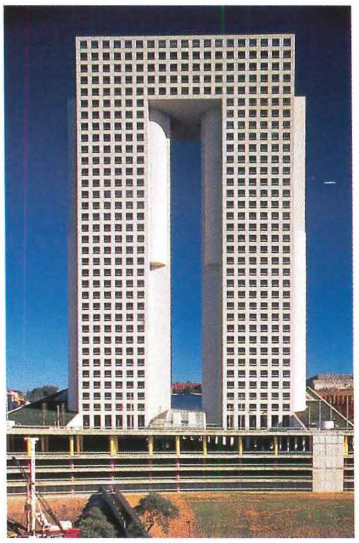
Each arch has two towers with thirty 10,000-square-foot floors; four 30,000-square-foot upper floors connect the towers at the top.

The floors are built in a free-plan design, with service and circulation cores running along the building's exterior. The windows, three meter squares, form a pattern of stamps across the white chiseled concrete.The forms are meant to be simple and autonomous, according to the architects, and invoke gravity and solidity.

The slope on which the buildings rest—a man-made inclined plane reminiscent of pre-Columbian temples—anchors the complex to the terrain.

González de León, who also designed the upcoming Mexican Embassy in Berlin, brings extensive experience in public building to this privately funded project.

As a result, Los Arcos has common spaces, like waiting areas and plazas, that "monumentalize" the mundane architecture typical of most corporate headquarters.



The arches will serve as a new reference point as the city grows outward, the only context in an otherwise barren landscape. The first arch is now complete and the second will be constructed by 2001. *Miquel Adría*

THE FRENCH STROLL IN A NEW PARK **The newest green space in Paris, le Parc de Bercy, is nearly complete. Designed by FFL architects along with Bernard Huet and landscape architect Ian de Caisne, the park is roughly the size of the renowned Tuileries—but very different in design scale.**

The 33-acre space is also the focal point of the redevelopment of Bercy, which was the center of the French wine trade for several centuries. Only a small section of the original warehouses remain, and Frank Gehry's American Center, built in 1994, is closed, depriving the new neighborhood of a cultural magnet. Still, Bercy is largely considered a success, and the government-subsidized apartments are filling up quickly.

The designers of the park preserved the stone crossroads embedded with rails (for transporting wine) and used them for an organizing grid. They then created a succession of garden environments, moving from the westernmost green "prairie" to nine themed squares, which include vegetable and herb gardens and an orchard. Four other gardens evoke the seasons, while waterfalls, a canal, and a grotto complete the eastern zone.

To see the Seine, park visitors climb a monumental stairway up a wall that buffers the park from a busy riverside expressway. The wall, harboring maintenance facilities and parking, serves to cut sound levels from 100 decibels down to 60 inside the park. *Claire Downey*

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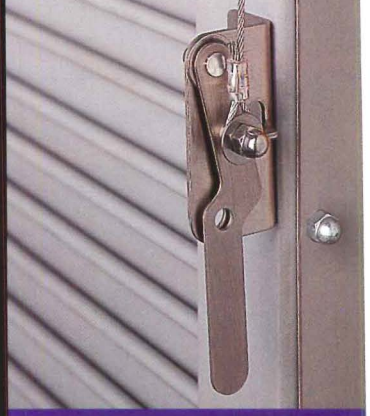

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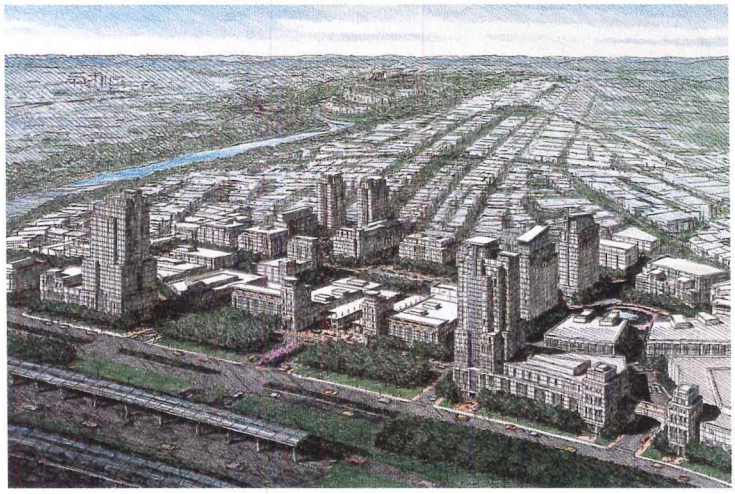

TURKEY GETS DOSE OF NEW URBANISM WITH AMBITIOUS SITES NEAR ISTANBUL

By applying what is an essentially American small-town ideal to the planning of affordable, high-density communities in Turkey, Maryland-based CHK Architects and Planners is testing the limits of New Urbanism.

The conditions that inspired the New Urbanism movement in the United States—suburban sprawl and severe apartment slabs—also exist in Turkey, especially in Istanbul. Unlike the experience of American cities, however, Istanbul is also burdened by a prolonged housing shortage.

Housing construction in the past 40 years has never met demand, while the population of the city has grown from 1 million to 12 million. Around 30 percent of new housing starts are *gecekondu*, squatter-built homes that, despite violating safety codes, are allowed to stand if they are built in one night.

CHK's first New Urbanist experiment in Turkey was a small resort community in Istanbul, which didn't allay the frequently voiced criticism that connectivity, a strong public realm, the integration of mixed uses, and an emphasis on traditional styles are luxuries.

Nevertheless, CHK wanted to prove that its approach was a sensible solution to Istanbul's urban woes. There are no phobias about density there or about living over a restaurant, says CHK president John Torti, suggesting that his firm's ideas may make even more sense in Turkey than in American cities.

The architects have done master planning and designed 2,300 units at Bahcesehir, a hillside town outside Istanbul. Commercial and civic functions are concentrated at the bottom of the hill, and parks, fountains, and vistas abound throughout.

The homes were built in the Ottoman vernacular, but the architects resorted to a new housing type to deal with the difficult slope of the site. A three-story house entered at the bottom of a hill is topped by a three-story house entered farther up, an arrangement inspired by the wood-framed houses that abut the wall of Istanbul's Topkapi Palace. This system, combined with the double loading of streets, allowed for a heavy concentration of units.

There was also a wide range in size and pricing, as dictated by the client, a government-owned bank interested in quality housing choices for a growing middle class.

Ispartakule, an even larger town planned by CHK (above), will break ground near Bahcesehir by the end of the year. It will eventually house 65,000 people, including the residents of a *gecekondu* neighborhood that will be integrated into the town and its infrastructure.
David Simon Morton

DEVELOPERS MAKING THEIR PLAY FOR GIGANTIC INFILL IN DENVER

When Denver International Airport opened in 1995, Stapleton, the city's old airport, became the nation's largest urban-infill site. City officials were thrilled at the prospect of developing such a large parcel of land relatively close to downtown.

Denver Mayor Wellington Webb created the nonprofit Stapleton Development Corporation to devise a comprehensive plan for the site, which covers 4,700 acres on the prairie just east of town. The resulting design—produced by New York–based Cooper, Robertson & Partners and five other firms—has already won several awards, including the 1996 President's Award for Planning from the American Society of Landscape Architects.

But other than a few commercial buildings, Stapleton remains largely undeveloped.

That's about to change. Later this year, SDC will begin selling off sections of the property to private developers. If all goes according to plan, the former airport will be transformed into a mixed-use extension of the city (partial view below) containing thousands of New Urbanist–style homes, schools, and businesses, as well as 1,700 acres of parks, trails, and open space. One interesting feature will be 365 acres of restored prairie sand dunes.

When the development is completed in 30 years, it will be home to 25,000 new residents.

"This is a unique opportunity for Denver," says Tom Gleason, SDC's director of community and government relations. "Not only is it a large site, but it's also right in the heart of the metropolitan area."

Steven Walsh, AIA, an associate with RNL Design, says he and others are watching the project closely to make sure the city and private developers don't stray too far from the plan. "We don't want to see the whole process subverted by shortsightedness," notes Walsh.

Meanwhile, several other infill projects are taking shape. The closed Lowry Air Force Base is being redeveloped into a mixed-use community, and on the other side of town developer Chuck Perry wants to turn Elitch Gardens, former site of an amusement park, into 38 acres of traditional-style housing.

Perry has hired Calthorpe Associates of Berkeley, California, to design an "urban village" that would blend in with the surrounding neighborhood, which contains mostly 60- and 70-year-old brick bungalows.

Perry promises to incorporate the landmark Elitch Gardens Theatre, built in 1890, into the development. "We've really let the historic and natural features of the site guide the design," Perry says.

On March 17, the city council voted 12 to 1 in favor of the plan to redevelop Elitch Gardens.
David Hill

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CIRCLE 39 ON INQUIRY CARD

AT THE CROSSROADS OF THE WORLD, A FACELIFT IS IN FULL SWING

It's been 15 years since the vision of Times Square as a corporate office park was proclaimed, and almost a decade since that vision became mired in recession and battles to preserve the area's historical character as an entertainment mecca.

Now, design and construction are moving ahead on a dizzying number of projects—thanks to a stronger economy, risks taken by early investors, and optimism about Times Square's potential.

In the latest news, the rights to the last two sites among the planned quartet of office towers have been sold by the Prudential Insurance Co. A partnership of Boston Properties, the Blackstone Group, and Park Tower Realty will break ground in 1999 on these two buildings, although architects have not been selected.

Meanwhile, the much-discussed 48-story Condé Nast building is rising at Broadway and 42nd Street, while its architects, Fox & Fowle, ready their plans for the Reuters building, to be built across the street on Seventh Avenue. With the Rudin Organization as the developer and Swanke, Hayden, Connell Architects designing the interior, the 855,000-square-foot tower (right) is due for completion in 2001.

Fox & Fowle's idea was to link the building with the revitalized entertainment row along 42nd Street. The 30-story east facade presents a corporate face, with its sleek glazing curving west onto 42nd and into a seven-story, drum-shaped rotunda to draw pedestrians around the corner.

The terra-cotta and carved-stone facades of the drum, a low-rise retail space, and the 20-story north side retain some of the character of nearby buildings, including renovated theaters.

The design is an intentional "pastiche," says partner Bruce Fowle. "Times Square has always been about layering, not about architecture."

Signage integrated into the architecture includes a wedge-shaped rooftop finial identifying Reuters, news zippers that flow from within the lobby out around the exterior, and a three-story video monitor. A 14-story cylindrical "spectacular"—a large-scale electronic display—at the northeast corner announces the building to traffic entering Times Square.

Meanwhile, under construction a block away at 42nd Street and Eighth Avenue is Tishman Urban Development's E Walk, a retail, entertainment, and hotel complex. The hotels, designed by the Miami firm Arquitectonica and costing $230 million, include an 800-room, 45-story tower and a more intimate 100-unit establishment that provides a formal transition between the tower and the retail base.

With only a half block on which to fit 650,000 square feet, the designers avoided a potential monolith by slicing a curving, vertical ribbon of light through the length of the tower and vertically shifting the resulting sections. *Andrea Truppin*

NEW FACE OF NICOLLET MALL HAS TWIN CITIES IN TURMOIL

Amid the latest development boom that finds construction cranes dotting the downtown Minneapolis skyline, some preservationists and critics are alarmed that three recently announced large-scale projects along the historic Nicollet Mall shopping district are threatening the low-scale, pedestrian-friendly character of the mall's south half (right).

Under construction is a 14-story corporate headquarters for discount retailer Target, designed by Minneapolis-based Ellerbe Becket as the first of a proposed two-phase project that will include an entire block. To the north, Minneapolis-based Ryan Companies has proposed building a Target store to fulfill the city's goal of bringing more moderately priced retailers downtown.

In addition, demolition teams have imploded a failed 10-year-old retail mall, The Conservatory on Nicollet, to make way for a 30-story, 910,000-square-foot headquarters—also designed by Ellerbe Becket—for the investment firm Piper Jaffray Companies Inc.

The north end of the mall succumbed long ago to large-scale development, but the south has retained many of its older, low-rise buildings—and their demolition could quicken the loss of the area's vanishing human-scale character.

Robert Roscoe, head of a preservation-design firm and a member of the Minneapolis Heritage Preservation Commission, calls the razed structures on the south mall "background" buildings that gave people pleasure and comfort. "Their demise is a great loss to the city," he says. "They had a tactile, close-to-the-eye relationship to people on the sidewalk. Downtown Minneapolis, unfortunately, has an insatiable appetite for retooling itself and erasing its architectural history."

Martha Frey, an independent preservation consultant from Minneapolis, notes, "What makes the mall interesting is the diversity of old and new. These smaller buildings are often seen as a kind of stumbling block [to developers] rather than as an opportunity to do something creative."

Ellerbe Becket did design the two new office buildings with Nicollet Mall's retail heritage in mind. The Piper Jaffray Center, sheathed in light-color stone panels and glass, will include two levels of retail outlets when it opens in June 2000, while the Target headquarters, clad in stone and glass at the base with precast and glass above, promises retail on the first level when it opens this fall. *Eric Kudalis*

NEWS BRIEFS

Thompson, Western pioneer Elisabeth Kendall Thompson, who worked for over 30 years at ARCHITECTURAL RECORD and was a major figure in Californian architecture, died late in March at age 87. After two years apiece at Tulane and the University of California studying architecture, Thompson began her career at RECORD in 1937 in the New York office. She took time off for motherhood before resurfacing in Berkeley in 1947 to start the magazine's Western edition. Thompson retired in 1975 as Senior Editor, but she maintained a steady schedule of serving on local and national AIA committees along with juries and boards. A crowning achievement was being named a Fellow of the AIA, only the ninth woman to be bestowed that honor.

Favorable response To gauge whether architects support the expansion of its multimedia advertising campaign, the AIA has been conducting an on-line survey. At last count, 72 percent of respondents favored the proposal, which the AIA says would produce greater public appreciation of the profession. The expanded campaign would include television and additional radio ads.

Lobbying effort The Albany Institute of History and Art is set to build a connecting lobby that will also serve as its new main entrance. Construction is scheduled to begin this summer on the glass, aluminum, and limestone lobby, which will bridge two existing Beaux Arts structures, built in 1894 and 1908. Architects for the project are Solomon + Bauer Architects Inc. of Watertown, Massachusetts, who emphasized the primacy of the new portal by creating a new diagonal axis from the street to the entry. Two parallel walls clad in limestone define the new circulation spine, while a monumental staircase connects the building's three levels,

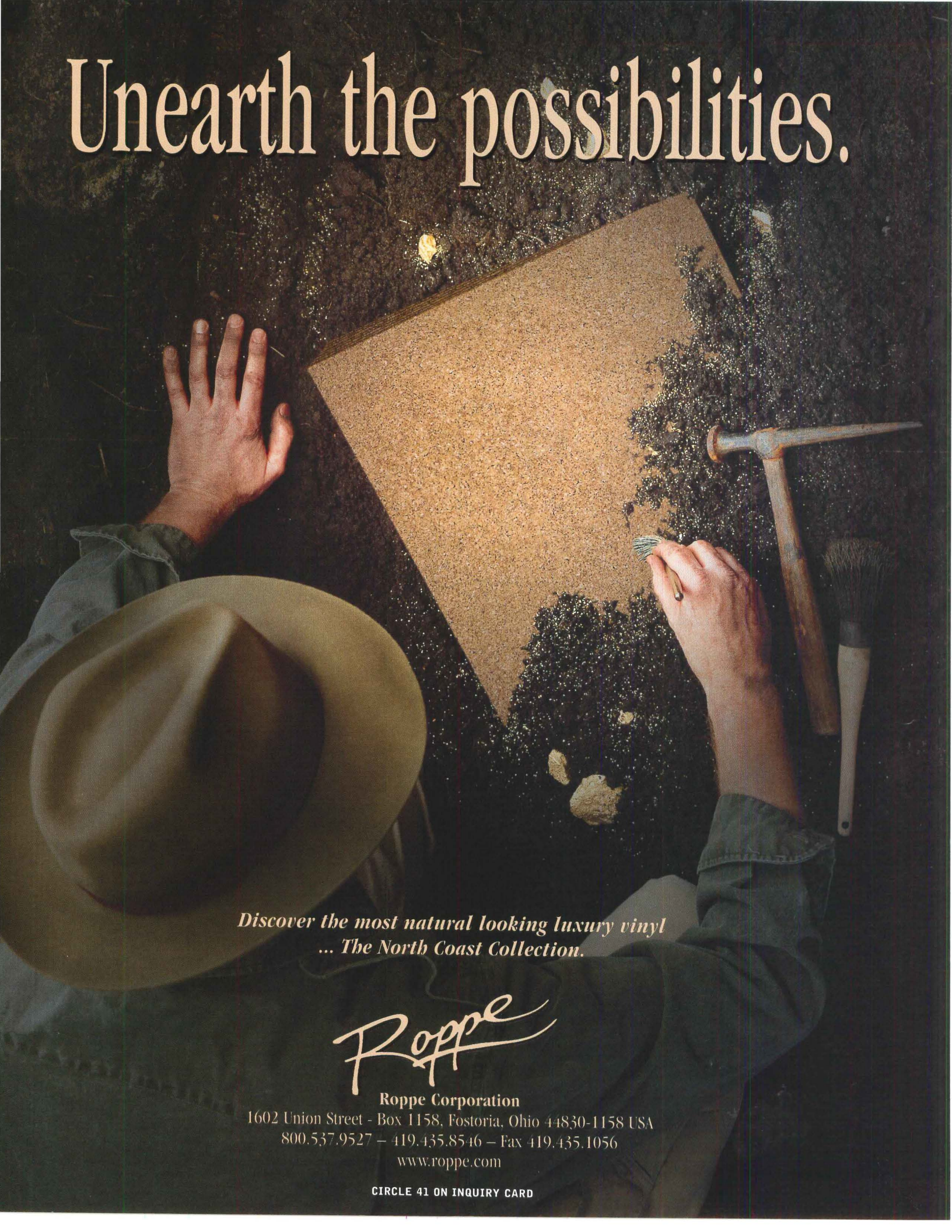
Albany's Modernist addition.

where a collection of primarily American painting and sculpture is housed. The new lobby is part of a $9.5 million restoration that will also include a second new structure to house mechanical equipment, along with conservation facilities and a loading area.

Health matters As the population gets older and health care demands change, innovative facilities are needed to treat specific lifestyle requirements. The Pratt Planning and Architectural Collective kept that in mind in designing the Housing Works Adult Day Health Care Facility, which opened in Brooklyn in March. The residential facility—which received funding from HUD and the New York Department of Social Services—includes efficiency apartments, a

(continued on page 88)

PHOTOGRAPHY: © STEVE ROSENTHAL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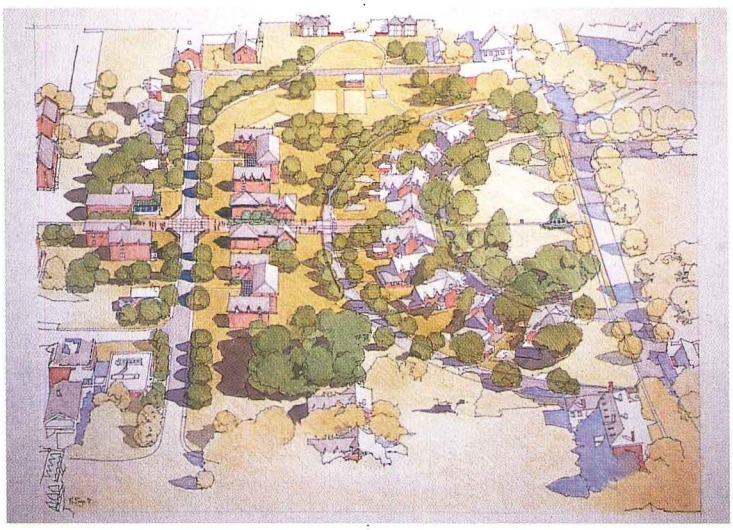
CIRCLE 41 ON INQUIRY CARD

(continued from page 86)
clinic, and a café, using materials that are typically found in affordable housing rather than hospitals.

It takes a village The athletes' village for the 2002 Winter Olympics in Salt Lake City, Utah, presents a challenge, as it must meet multiple design criteria. In addition to being sensitive to the needs of 2,400 international athletes, the architects must keep in mind that the site is eventually intended to be converted to a learning environment for the University of Utah. Another significant challenge is the need to integrate the construction with the fabric of Fort Douglas, an Army post built in 1862. The Norfolk, Virginia, firm Hanbury Evans Newill Vlattas is in the design phase (working with Architectural Design West, a Salt Lake City firm). The village's 27 buildings—totaling about 910,000 square feet—will include residential, dining, academic, and community-support facilities in two-, three-, and four-story units, interspersed along an elliptical green space with intersecting walkways.



HENV's Olympic vision.

School days The University of Texas has rechristened its art collection the Jack S. Blanton Museum of Art, raised $35.5 million in an endowment campaign, and initiated an international search for an architect to design a major new building, slated to be built by 2002. In other news from academia, Douglas S. Kelbaugh has been named dean of the University of Michigan's College of Architecture and Urban Planning.

Priming the Pentagon In the first significant change to its exterior since it was built 55 years ago, the Pentagon will renovate the core and shell portions of what it calls wedges 2 through 5. Hayes, Seay, Mattern & Mattern has the design contract for the 5.4 million-square-foot project, which will be completed over the next three years and will cost a hefty $1.1 billion.

Clean living One of London's priorities has been to reduce congestion. To wit, a new residential development in Soho, designed by CGHP architects, will be the first car-free housing scheme in the city. The project comprises 29 homes with gardens on the ground and on a communal rooftop.

Honor roll At its annual convention this month, the AIA is conferring three Institute Honors, which reward achievements that benefit the built environment and the architectural profession. The recipients are Lian Hurst Mann, AIA, Ph.D.; William N. Morgan, FAIA; and the Skidmore, Owings & Merrill Foundation. ■

RENDERING: HENV

architecture
interiors
urban design
firm award
25-year award

American Institute of Architects 1998 Honors & Awards

Architectural awards programs are like snapshots, offering intriguing views of the profession and design culture at a particular time. And, like photographs, they can be both misleading and remarkably true, catching architecture at awkward moments or at its most appealing. To offer some perspective on this year's family portrait, ARCHITECTURAL RECORD *asked a distinguished foreign critic and architectural historian, William J.R. Curtis, to look at the 1998 AIA Honor Awards winners and analyze what they say about American architecture today. Curtis brought to the assignment an interesting background, having finished the demanding job of updating his landmark 1982 book* Modern Architecture Since 1900, *essentially rewriting his own version of modern architectural history.*

Curtis delineates interesting differences in approach and style between American architects and their counterparts in developed countries in Europe and Asia. The most important of these relate to designs for the public realm and the situations in which American architects will (and will not) use Modernist forms. He also examines American designers' relationship with history, technology, consumerism, and the concept of nature.
—Clifford Pearson

WILLIAM CURTIS compares design in other nations with this year's AIA AWARD WINNERS to gain perspective on American architecture.

by William J.R. Curtis

It is hard to know if the 1998 AIA Honor Awards offer a representative cross section of recent tendencies in North American architecture. But if they do, they reveal a curious state of affairs, in which Modernist abstraction is apparently reserved for exclusive penthouses, woodland retreats, and spiritually uplifting environments (whether religious or artistic), while more traditionalist schemes of representation and historical models are to be found in the street, the urban institution, the university, and the realm of affordable housing.

It is not certain what this says about contemporary American society, but it clearly reveals a different set of priorities than those in, for example, France, Finland, Spain, Holland, Switzerland, and Japan, where diverse cultures of modernity have a much wider social basis and a relative degree of support from the state. In fact, a cross section of recent European awards (such as the Spanish Biennale of 1997 or the Finland Builds exhibition, which takes place every five years) would reveal how Modernisms or neo-Modernisms of various kinds have functioned in the public realm for a broad range of building types, from schools, gymnasiums, churches, and museums to subsidized housing. At the same time, there have been subtle accommodations to place, history, and topography, but without an agonized pastiche of past models.

Ellen Wilson Neighborhood by Weinstein Associates

In the United States today there is an apparent caution and lack of experimentation in the civic domain, which perhaps reveals both cultural conservatism and a lingering dismay at the disastrous impact of urban renewal 30 or more years ago. I do not know if it is by chance, but of the institutional works given awards in 1998, many are renovations or restorations. Even with new buildings there is an evident desire to make them look (sort of) old. Especially in cultural precincts like universities, contextualist pieties continue to hold sway. The desire to fit in sometimes results in tired imitation of historical neighbors.

Where urban housing is concerned, there seems to be an implicit belief that the old pattern languages are the safest ones to follow. The terms of the debate were fixed in caricature long ago: anything resembling a freestanding slab is bad; anything resembling a traditional street with facades and front doors is good. A whole range of intermediary research into modern reinterpretations of the enclave, the court, the cluster, and other types of aggregation is largely ignored. As for the sort of avant-gardist experimentation that one finds in the housing sector in the Netherlands, for example, there seems to be no equivalent in the recent honor awards, or in U.S. production generally. In fact, the American avant-garde (such as it is) has retreated into the arms of one of its traditional enemies, academia. Here it spends much of its energy avoiding social realities and withdrawing into arcane theoretical discourses.

There is nothing new in raising the problem of the consumerism of images, but in the United States, commercialism and populism have enjoyed a free exchange in the marketplace for some time. It is noticeable that when architects are addressing less-well-off sectors of the community they resort to architectural "signs" and recognizable imagery. By now the Postmodernist clichés of yesteryear have gone full circle to become a common currency in the main street from which they were supposed to have sprung. While sentimental urban designers and academics cling to some cherished notions of "civic values" through an updated version of "realism," the actual street of the American downtown gradually transforms itself into a species of suburban mall without a roof, or else a theme park of historical clichés.

No tech, please; we're American

It is fascinating to see how different societies deal with images of technology. Recent American work, even in the commercial sector, is squeamish about "high-tech" expression. It is curious too how absent skyscrapers are from the current scene. Fifteen years ago the tall building stood at the center of a boom, and much of the critical chatter had to do with the look of the skyscraper (though very little with its substance or anatomy). In the 1990s one sees more rehabs of old buildings and more out-of-town office parks with pastoral pavilions decked out with romantic, overhanging roofs.

As for Nature, that great abstraction tied to North American notions of the ideal life in suburbia and beyond, it seems to have been recast as a great consumable for the uprooted inhabitants of the "information city." Nature has become a sort of New Age generalization, combining a vague spirituality with soothing sensations of landscape and materiality and a well-wired escapism into the "wild." Nature for the rich may mean the flood of light onto silent abstract surfaces in apartments suspended above the mess of the city (inner landscapes of a kind), or else it may mean lyrical scenarios deep in the woods, with echoes of vernacular archetypes. The public space between the penthouse and the rural retreat exists, increasingly, in the virtual space of electronic communications from car to airport to portable phone and

William J.R. Curtis is a British architectural historian and critic based in France. The third edition of his book Modern Architecture Since 1900 *was published by Phaidon Press in 1996. He writes for a number of international design journals.*

Manhattan Rooftop Residence by Shelton, Mindel & Associates

computer. Tokyo is on the line, but the bombed-out park near the freeway is scarcely noticed.

These are some of the signs and symptoms of a technological society in which electronic gadgets and networks are redefining the very notions of public and private, urban and rural, cosmopolitan and regional. Similar things are happening in other postindustrial societies, but take different forms and represent different styles of modernization. In France, for example, modernity is virtually an affair of the state, which has tried to articulate a progressive vision through statements of technocratic monumentality (as in the *grands projets*). In the United States, a building like Dominique Perrault's "*très grande bibliothèque*" in Paris is unthinkable. In North America the state does not get much involved in modern architecture of any kind; glass skyscrapers contain private and commercial activities (if they are built at all); and bold statements of technocratic rhetoric are, for the moment, regarded with suspicion.

A gradual assimilation of early Modernism

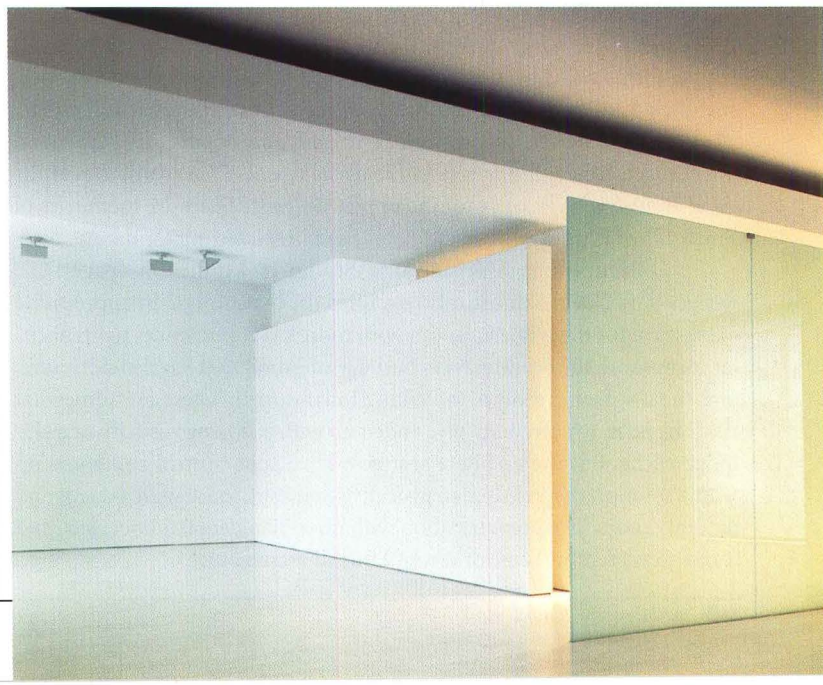
I have no intention of turning this essay into a diatribe on the evils of privatization and free-market capitalism. But one does need to be aware of the forces at work, including the largely unconscious hold of architectural tradition. American architectural culture undergoes constant disjunctions and jolts of fashion, but there are also continuities and realignments as new paradigms are taken into account, absorbed, or rejected. Despite the ruptures of Postmodernism (much less drastic than some thought at the time), and despite the claims of radical innovation in the avant-garde, the actual buildings bear witness to a much more gradual assimilation of earlier phases in the history of modern architecture than is usually admitted.

Take those minimalist penthouses bathed in white paint. In one there are echoes of Mies, in another references to Le Corbusier, in another analogies with Tadao Ando. By coincidence, I happened to go to a party in one of this year's honored apartments the same day that I saw Richard Serra's amazing *Torqued Ellipses* at the Dia Foundation in New York City. This competition would be overwhelming for virtually any living architect, but the comparison prompted a reflection on the reemergence of interest in abstraction in recent American architecture. Indeed, the minimalist apartment seems to have joined ranks with Modernist furniture and modern art as a sort of collector's item. For example, the Park Avenue Apartment by Frank Lupo and Daniel Rowen (page 121) is characterized by the architects as "a meditative landscape, radically separated from the city around it, in which the occupant can explore the senses without encumbrance, a place to listen to the light, see the silence, and dream." Even the client's "intended art collection" was not included as he "determined that the play of light against the composition of planes of walls, floors, and ceilings satisfied his aesthetic agenda."

To the observer accustomed to acres of drywall on interiors and skin-deep veneer on facades in American buildings, it is gratifying to see a number of selected projects dedicated to an exploration of the tectonic presence of material and the expression of construction. One of the most subtle is the renovation of MIT's School of Architecture and Planning by Leers Weinzapfel Associates, with its inserted layers of transparency relying on a reductivist language of steel-framed glazing (page 123). A different example is the Becton Dickinson corporate villa in suburban New Jersey, for which Kallmann, McKinnell & Wood developed a palette of "brickwork and copper carefully fitted to the forest and topography of the site" (page 109).

Near Boston's Logan Airport, there is a remarkable work that contradicts some of my earlier generalizations, since it is technologically adventurous, aesthetically convincing, monumental, and in the public sector: Ventilation Building No. 7 (page 112), designed by Stull & Lee; Wallace, Floyd, Associates; and TAMS Consultants. Here engineering serves as a springboard for powerful architectural expression, but without the pictorial excesses of much recent high-tech design.

Private Apartment by Frank Lupo/Daniel Rowen, Architects



Atlantic Center for the Arts by Thompson and Rose Architects

Given the American tendency to rely simplistically on traditionalist schemes in housing, I must single out the Orange Place Cooperative in Escondido, California, by Studio E Architects (page 114); here an attempt has been made to reinterpret a local design tradition—that of Southern Californian bungalow courts. Like its predecessors, Orange Place takes advantage of a benign climate and mixes together buildings and outdoor spaces to create an affordable neighborhood. The formal expression is modest, while the spatial disposition reminds one of the underexploited wisdom lying latent in the patio tradition, running back to Rudolph Schindler's Pueblo Ribera Courts of 1924 and Irving Gill's work in the early decades of the 20th century.

Adjusting to regional and international sources

Some 15 years ago regionalisms (critical and otherwise) were much discussed. While some of the most engaging of this year's projects deal with the problems of adjustment to particular landscapes and climates, it would be pointless to bracket them with any *ism*. Whatever their local inspirations and regional responses, they also draw on a wide range of cosmopolitan and international sources, in turn employing abstraction to effect a transformation. The Type/Variant House in Wisconsin by Vincent James Associates is a case in point (page 108). Aptly described as "an assembly of copper forms veiled by the forest," the project is made up of wood-framed, metal-clad volumes, each a variation on a basic geometrical theme. Abstraction is used to intensify the experience of a sequence and the mood of the place. Here minimalism and materiality evoke the geometries of the rural-industrial vernacular of the upper Midwest. There are memories of Frank Lloyd Wright in plan and detail, and in the feeling for nature.

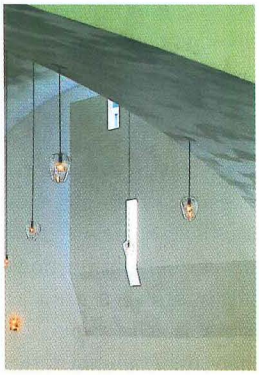
Brandenburg's Ravenwood Studio in Minnesota (page 113), designed by David Salmela, also explores the question of an appropriate expression for the wilderness but with more overt references to vernacular form (both the Scandinavian heritage of immigrant rural architecture, and the original prototype of Viking longhouses). These are somewhat risky agendas, which could have ended up with a cloying rusticity or a ski-lodge cliché. But the architect seems to have kept control and come up with a solution that releases an evocative domestic space with ancient and natural echoes. The preoccupation with quotidian detail, timber slats, and forest views reminds one of recent Finnish architecture.

This theme of combining local and general finds yet another form in the dramatically contrasting setting of the semitropical coastline of Florida. The Atlantic Center for the Arts at New Smyrna Beach, by Thompson and Rose Architects, is arranged as a scattered sequence of timber structures along a boardwalk that meanders through the jungle as a raised social street (page 112). The individual buildings are angled to frame views, include or exclude light, respond to breezes or the rain. The vocabulary draws from the screens and perforated transparencies of tropical vernaculars, transforming the idea of a filter for light and air into a vocabulary of inflected fragments. There is a preoccupation with "intensified experience" through perceptual adjustments of surface, volume, plane, space, and material. The Atlantic Center for the Arts is a reminder that fragmentation (so often discussed as an expression of uprootedness) may also be used to ground a building in natural and topographical conditions. Although there are no direct references to Frank Gehry or Alvaro Siza, lessons from some of their work seem to have been absorbed.

One of Steven Holl's recurrent and guiding themes is the primacy of experience: the impact of phenomena on all of the senses through basic architectural means. Thus while Holl did not give way to the temptations of Postmodernism, he wasn't lured by the quick tricks of neo-Modernism either, preferring to explore a single-minded route grounded in his direct perceptions of architecture, art, and the natural world. Despite these commitments to a "poetics of space" and of "the thing itself," his results have sometimes seemed overintellectualized, though in recent years a distinct language and approach have crystallized.

The Chapel of St. Ignatius at Seattle University (page 110) explores both the sensations and the possible meanings of light in a spiritual center. The generating sketches of the scheme suggest a spatial idea unfolding around interpenetrating layers of natural illumination and filtered or reflected color. Holl reacts to the sacral function by reinterpreting some of the traditional means for handling ritual: procession, gathering, and the evocation of mood through overlapping, perceptual "veils." The building serves as spiritual center for the Jesuit community, and the architect has also explored the notion of "unity of differences gathered in one." But these metaphors are not stuck on; they are integral to the ideas of the work and communicate without being fully spelled out. One senses that Holl has drawn his lessons from Le Corbusier, Aalto, Kahn, and even Richard Serra, but the result is not a beguiling formalism: it is, rather, a transformation to fit a new social interpretation expressed in terms of space, light, weight, weightlessness, and material.

Holl's building is a fitting place to close because it is also a reminder that the formulation of an authentic architectural language is a long business of testing and reflection in which many sources within and beyond architecture are gradually absorbed into a system of expression. The surrounding culture is obsessed with transience and change, and sometimes resorts to the quick fix of instant history. But modern architecture at its most ambitious keeps coming back to the same old things, rethinking and transforming them in unexpected new ways. Since Louis Kahn is also being honored by the AIA in 1998 with the 25-Year Award for the Kimbell Art Museum (page 130), perhaps we should leave the final statement to him: "If I were to define architecture in a word I would say that architecture is a thoughtful making of spaces." ■



Chapel of St. Ignatius by Steven Holl Architects

Winners

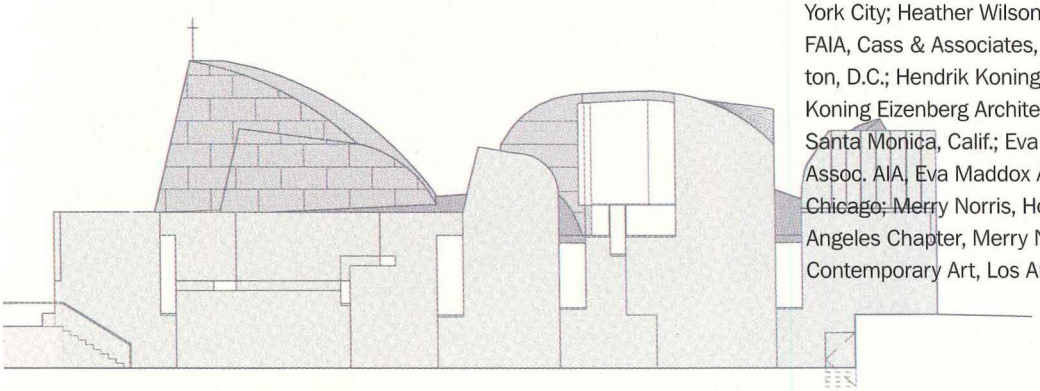
Architecture *(page 108)*
Type/Variant House, Vincent James Associates; James/Snow Architects. *Becton Dickinson and Co., Building 2,* Kallmann, McKinnell & Wood Architects. *Chapel of St. Ignatius at Seattle University,* Steven Holl Architects; Olson Sundberg Architects. *St. Andrew Presbyterian Church,* Turnbull Griffin Haesloop. *Ventilation Building No. 7,* TAMS Consultants; Stull & Lee, Inc.; Wallace, Floyd, Associates. *Atlantic Center for the Arts,* Thompson and Rose Architects. *Brandenburg's Ravenwood Studio,* Salmela Architect. *Orange Place Cooperative,* Studio E Architects. *Powell Library Renovation,* Moore Ruble Yudell Architects & Planners. *U.S. Court of Appeals Renovation,* Skidmore, Owings & Merrill, San Francisco.

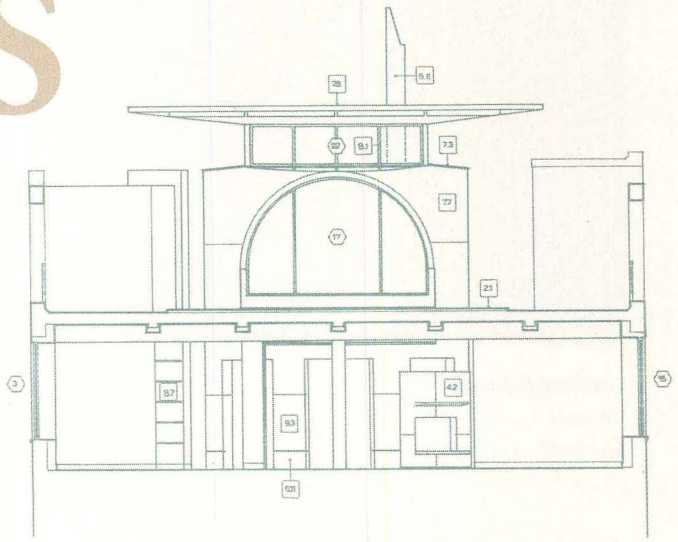
Interiors *(page 118)*
Manhattan Rooftop Residence, Shelton, Mindel & Associates; Reed Morrison, Architect. *Neisser Residence,* Tigerman McCurry Architects. *101 CityFood Cafe,* Westfourth Architecture. *New Hearth Showroom,* Mark Simon of Centerbrook Architects and Planners. *The Salad Bowl,* Hugh A. Boyd, Architects. *New Amsterdam Theater,* Hardy Holzman Pfeiffer Associates. *Private Apartment,* Frank Lupo/Daniel Rowen, Architects. *Wilkhahn North America Showroom,* Skidmore, Owings & Merrill, Chicago. *The Helen & Harry Gray Court at the Wadsworth Atheneum,* Tai Soo Kim Partners. *Civic Opera House Renovation,* Skidmore, Owings & Merrill, Chicago. *MIT School of Architecture and Planning,* Leers Weinzapfel Associates.

Urban Design *(page 124)*
Beursplein Rotterdam, The Jerde Partnership International; De Architekten Cie; T+T Design. *Jamaica Market,* James McCullar & Associates. *Robert F. Wagner, Jr., Park,* Machado and Silvetti Associates; Olin Partnership; Lynden B. Miller Gaden Design. *City Campus of the Savannah College of Art and Design,* Lee Meyer & Co., Architects. *Ellen Wilson Neighborhood Redevelopment,* Weinstein Associates Achitects. *State Street Renovation,* Skidmore, Owings & Merrill, Chicago.

Firm Award *(page 128)*
Centerbrook Architects and Planners.

25-Year Award *(page 130)*
Kimbell Art Museum, Louis I. Kahn, FAIA.





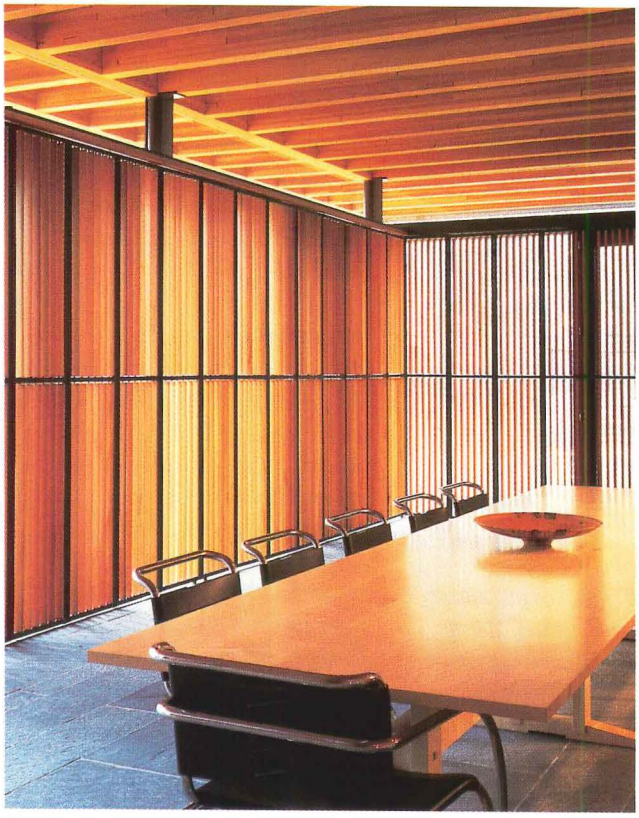
Jurors

Architecture/25-Year Award
Mark Simon, FAIA (chair), Centerbrook Architects and Planners, Essex, Conn.; Walter F. Chatham, FAIA, Walter F. Chatham Architect, New York City; Bruce A. Eckfeldt, Assoc. AIA, BWBR Architects, St. Paul, Minn.; Michael L. Quinn, FAIA, Quinn/Evans Architects, Washington, D.C.; Adele Naude Santos, FAIA, Adele Naude Santos & Associates, Philadelphia; Peter L. Schaudt, FAAR ASLA, Peter Lindsay Schaudt Landscapes, Chicago; Scott A. Welch, University Park, Md.; Allison G. Williams, FAIA, Ai San Francisco, San Francisco; Robert L. Ziegelman, FAIA, Luckenbach/Ziegelman & Partners, Birmingham, Mich.

Interiors
Steven M. Goldberg, FAIA (chair), Mitchell/Giurgola Architects, New York City; Heather Wilson Cass, FAIA, Cass & Associates, Washington, D.C.; Hendrik Koning, FAIA, Koning Eizenberg Architecture, Santa Monica, Calif.; Eva Maddox, Assoc. AIA, Eva Maddox Associates, Chicago; Merry Norris, Hon. AIA Los Angeles Chapter, Merry Norris Contemporary Art, Los Angeles

Urban Design
William Rawn, FAIA (chair), William Rawn Associates, Boston; Rebecca G. Barnes, AIA, Frederic R. Harris, Inc., Boston; Steve Dragos, Somerset Alliance, Somerville, N.J.; Robert Geddes, FAIA, Princeton, N.J.; Michael Southworth, FAIA, University of California at Berkeley.

Firm Award
Cynthia Weese, FAIA (chair), Washington University School of Architecture, St. Louis, Mo.; Frederick Bland, FAIA, Beyer Blinder Belle, New York City; Michael Convertino, Assoc. AIA, Mallin Mendel & Associates Architects, Albany; John Morris Dixon, FAIA, Old Greenwich, Conn.; Daniel Gregory, *Sunset* Magazine, Menlo Park, Calif.; Charles W. "Duke" Oakley, FAIA, Pacific Palisades, Calif.; The Honorable Douglas Woodlock, Boston.

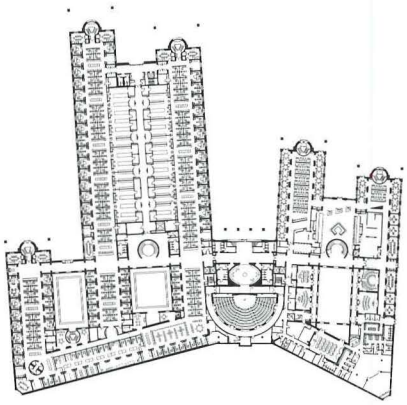


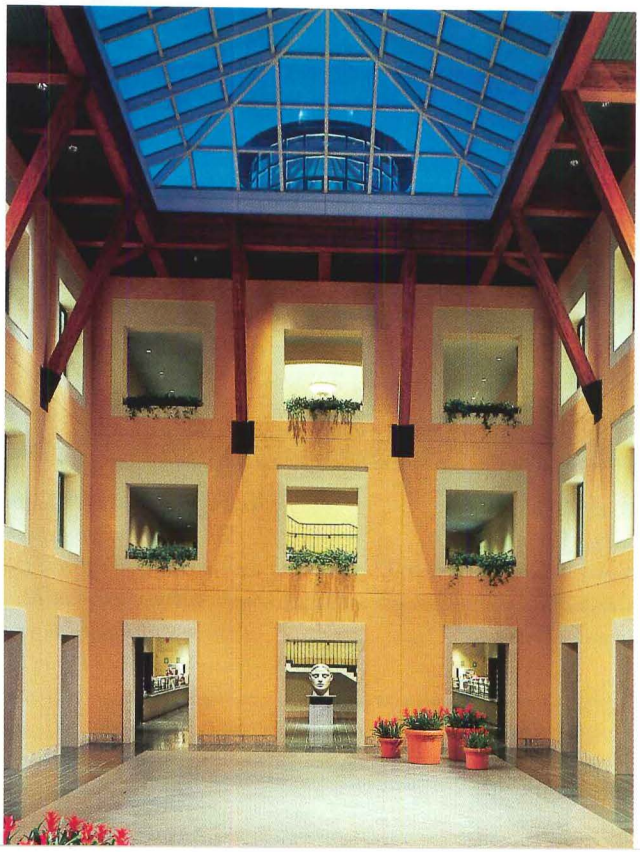
Type/Variant House
Northern Wisconsin
Architect: *Vincent James Associates (begun by James/Snow Architects)*

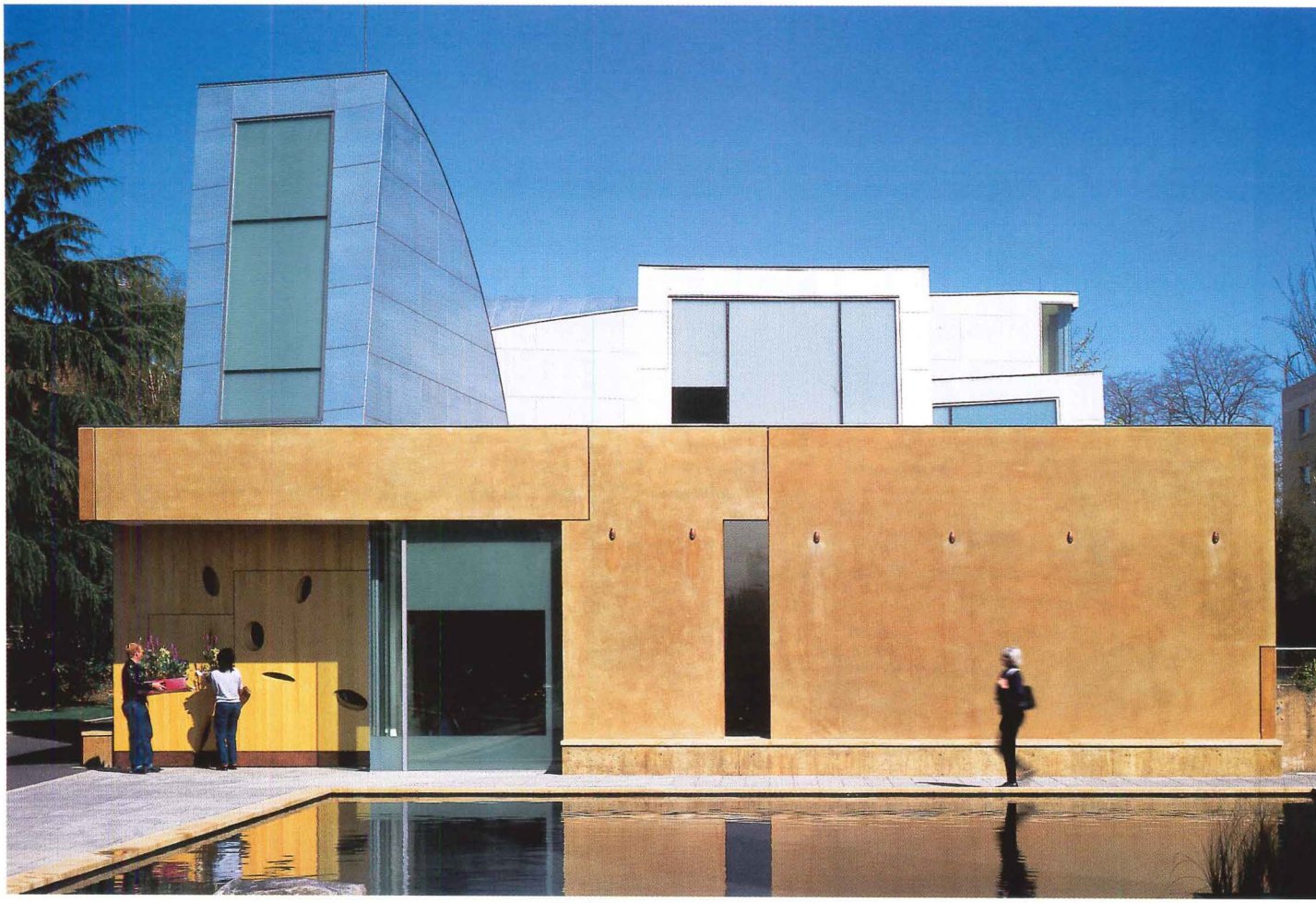
Built for a family of seven, this 8,000-square-foot house plays on the idea of "type/variant" used by collectors to note similarities and differences among pieces. The wood-frame, copper-clad volumes are of one type of form, but they vary in orientation and proportions. Materials that weather naturally knit the house to its woodlands setting.

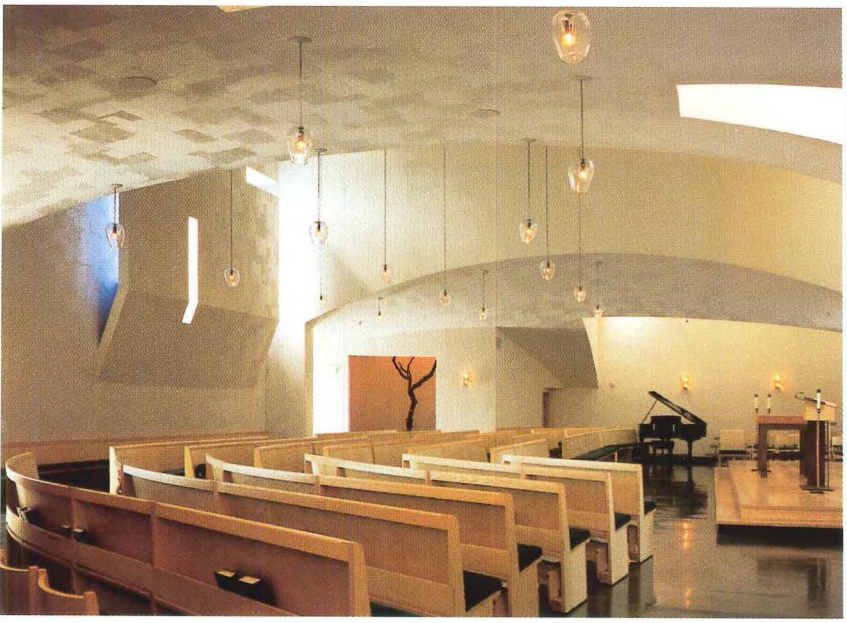
Becton Dickinson and Co., Building 2
Franklin Lakes, New Jersey
Owner: *Becton Dickinson and Co.*
Architect: *Kallmann, McKinnell & Wood Architects*

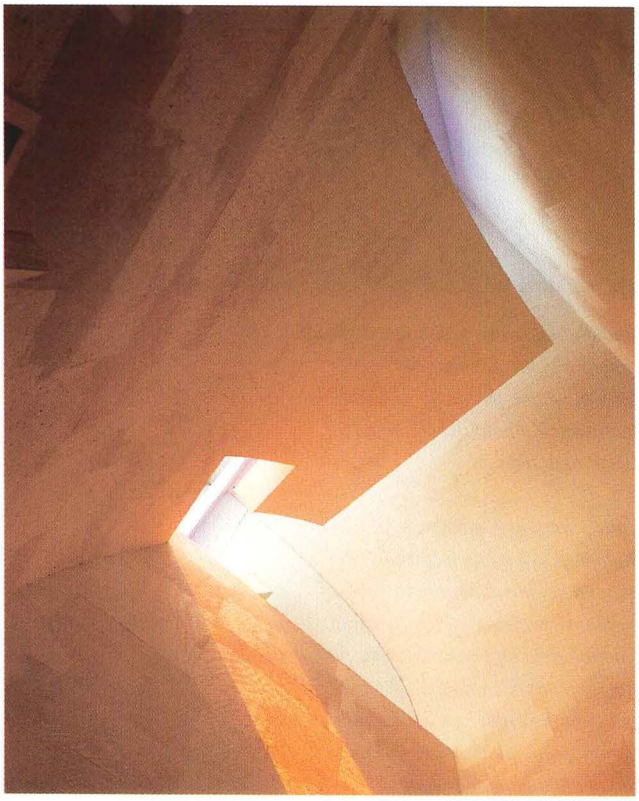
Offices wrap around laboratories in this 450,000-square-foot facility, whose plan makes it read more as a series of pavilions than as one large building. Interior atria topped by skylights function as covered courtyards. To make the space more flexible, a modular system for office partitions and services was incorporated into the design.









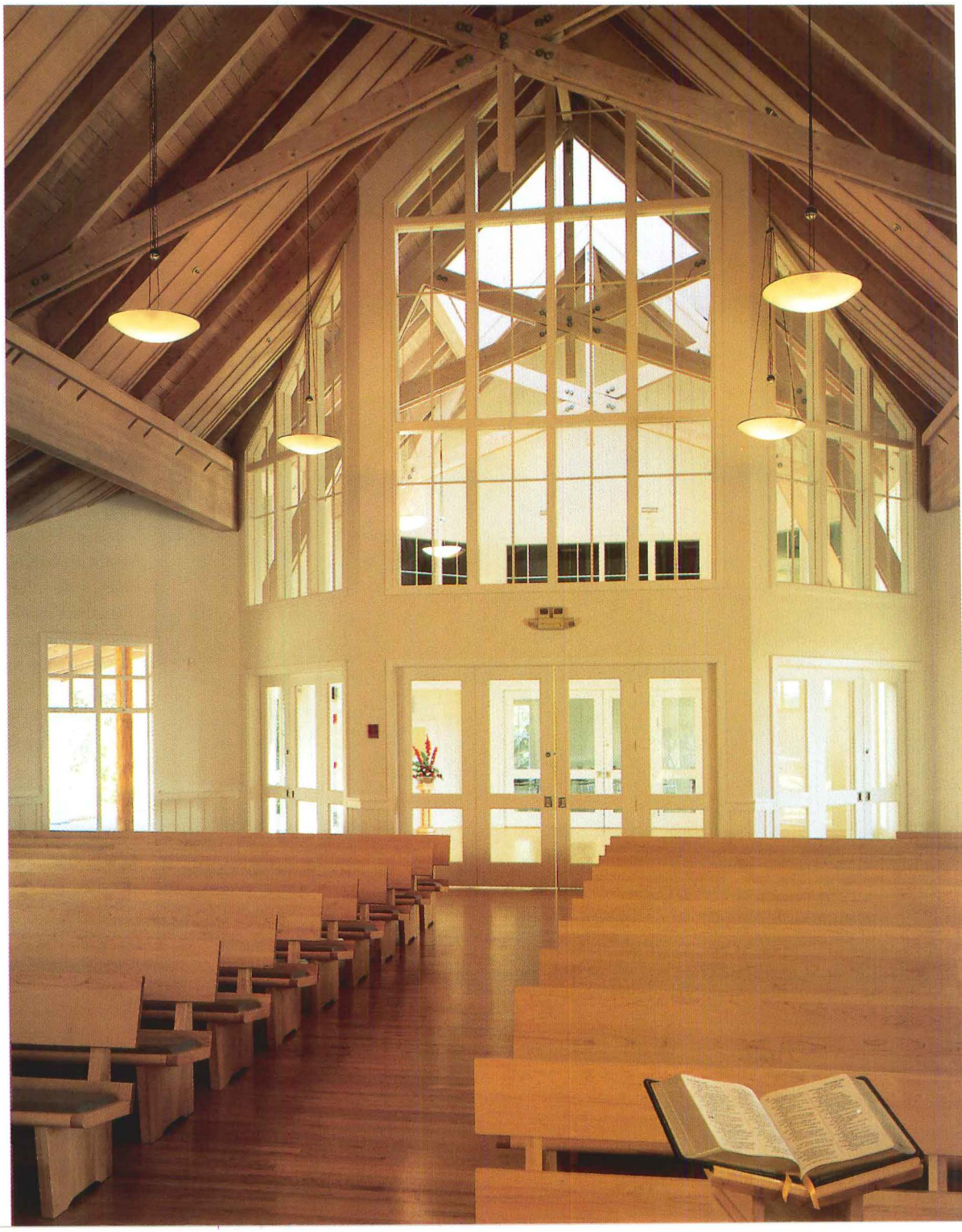


Chapel of St. Ignatius
Seattle, Washington
Owner: *Seattle University*
Architect: *Steven Holl Architects; Olson Sundberg Architects*

Light as a metaphor and as an ever-changing, often surprising presence is at the heart of this 6,100-square-foot chapel. Roof monitors bring light in from above, then reflect it off interior surfaces, which are painted in a range of colors. Structurally, the chapel is remarkably simple, relying mostly on steel and tilt-up concrete panels. [RECORD, July 1997, page 40]

St. Andrew Presbyterian Church
Sonoma, California
Owner: *St. Andrew Presbyterian Church*
Architect: *Turnbull Griffin Haesloop*

One of the last projects designed by the late William Turnbull, FAIA, the 12,000-square-foot St. Andrew church evokes rural barns in its forms and simple detailing while featuring an inventive floor plan that brings together a sanctuary, a fellowship hall, offices, and classrooms. A high cupola anchors the composition, bringing light into an octagonal narthex with the sanctuary and fellowship hall on either side. The wood-frame and plywood building replaces an old carriage house that had been converted to a church but burned down in 1989.

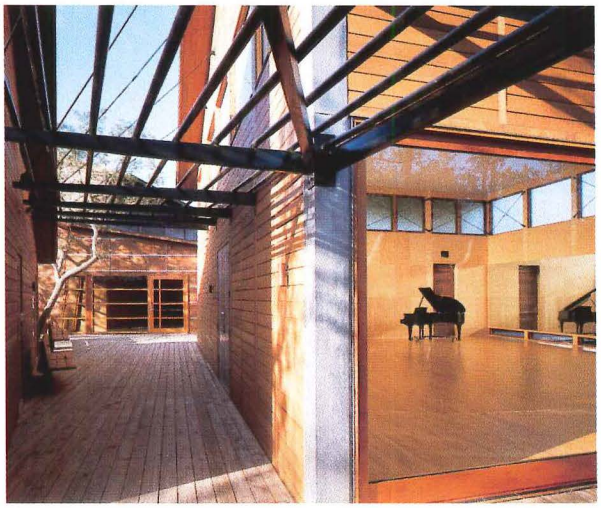


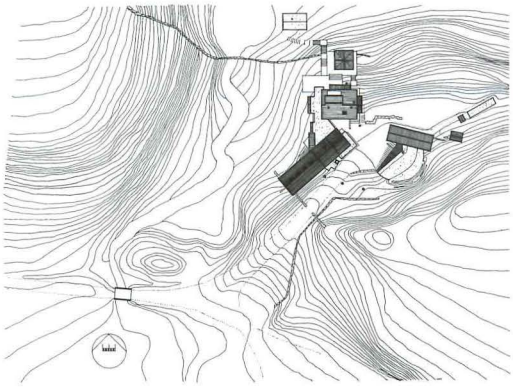
Ventilation Building No. 7
Logan Airport, Boston
Owner: *Massachusetts Highway Department*
Architects: *TAMS Consultants; Stull & Lee, Inc.; Wallace, Floyd, Associates*

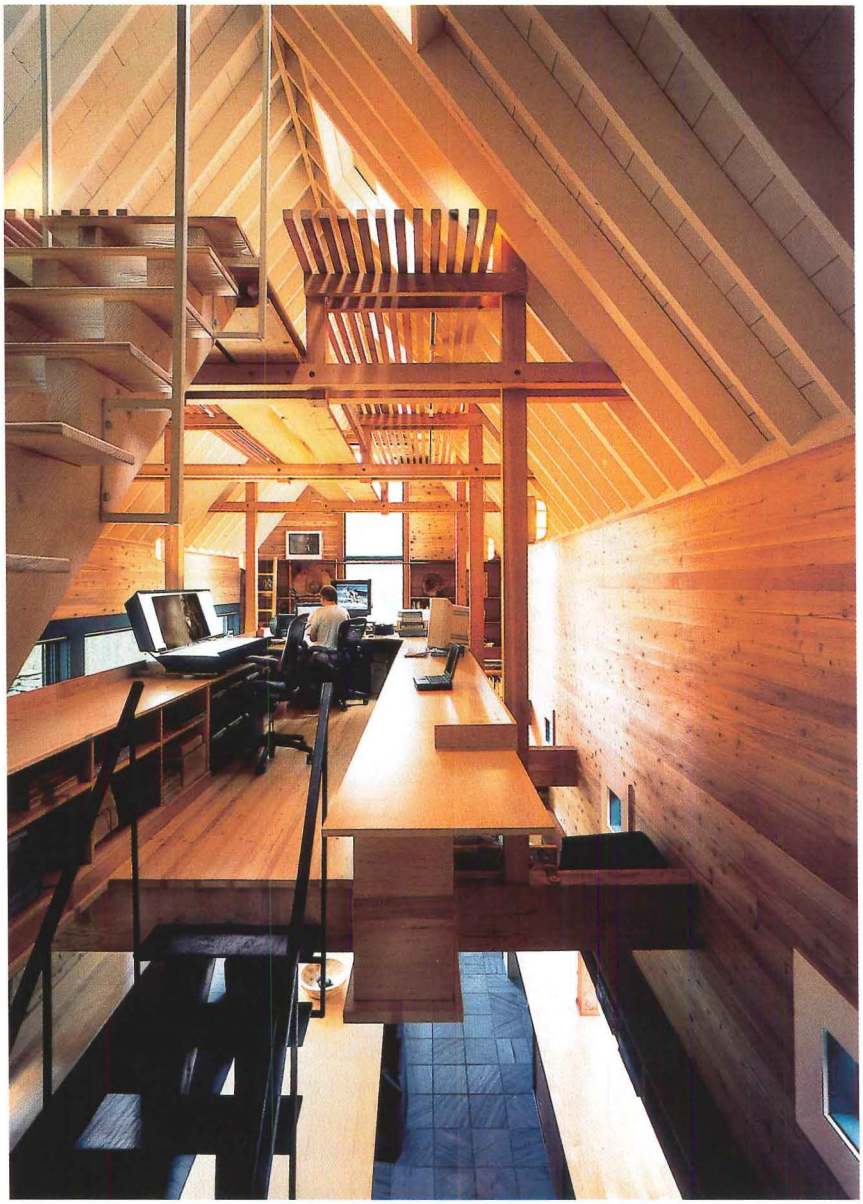
Built for the new Ted Williams Tunnel linking Logan Airport to Boston, this ventilation building has two primary parts: an intake section sheathed with aluminum louvers, and an exhaust section with 14 towers of concrete and stainless steel. The building houses room-size exhaust and supply fans that direct tunnel fumes above the roof and dispense fresh air to the tunnel. [RECORD, February 1998, page 100]

Atlantic Center for the Arts
New Smyrna Beach, Florida
Owner: *Atlantic Center for the Arts*
Architect: *Thompson and Rose Architects*

Sensitively inserted onto a site thick with palmetto shrubs and twisted scrub oak, this artists' retreat is a series of pavilions dedicated to individual art forms: dance, sculpture, painting, music. A winding boardwalk connects the various buildings and serves as auxiliary open space. Building materials include mahogany panels, lead-coated copper roofs, concrete walls, fixed louvers, and sliding-glass doors. [RECORD, June 1997, page 98]

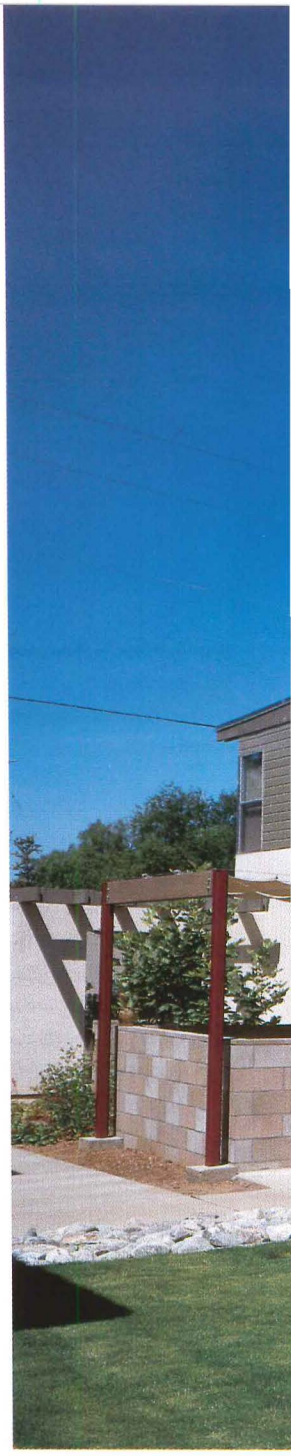






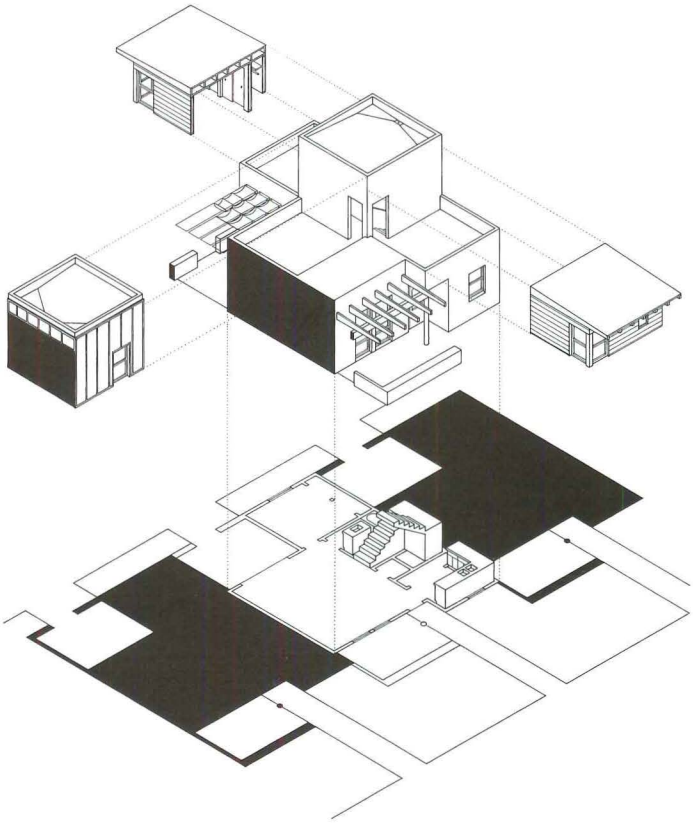
Brandenburg's Ravenwood Studio
Ely, Minnesota
Owner: *Jim and Judy Brandenburg*
Architect: *Salmela Architect*

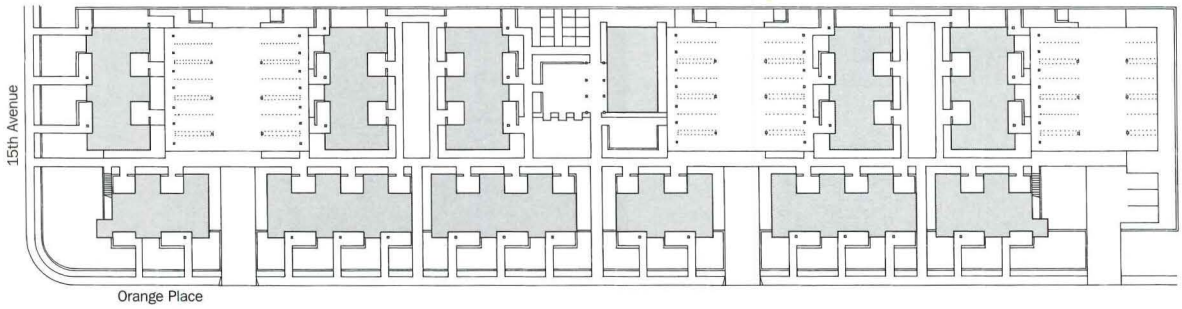
Set on the edge of a 3 million-acre wilderness park, this residence and studio for a National Geographic *photographer and his wife unfolds as a series of gabled wood structures in the forest. The architectural forms are reminiscent of Scandinavian immigrant farm buildings, but they are detailed with a contemporary sensibility.*



Orange Place Cooperative
Escondido, California
Owner: *Community Housing of North County*
Architect: *Studio E Architects*

Modeled after Southern California bungalow courts, this 32-unit affordable housing cooperative puts parking behind the buildings to leave the street elevations free for small porches, lawns, and retaining walls perfect for sitting. Most apartments are two-story units with three or four bedrooms, but there are a few flats and small units. All have their own outdoor space and access to shared courts and a community building. Tax credits, local grants, and private money covered the project's $2.2 million construction budget.

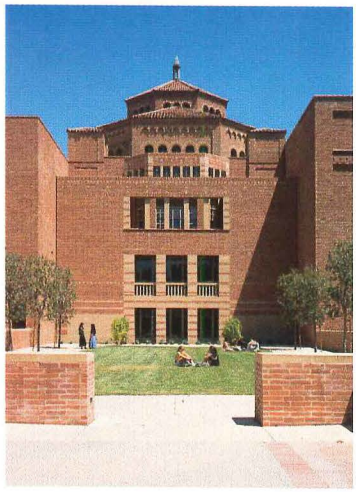


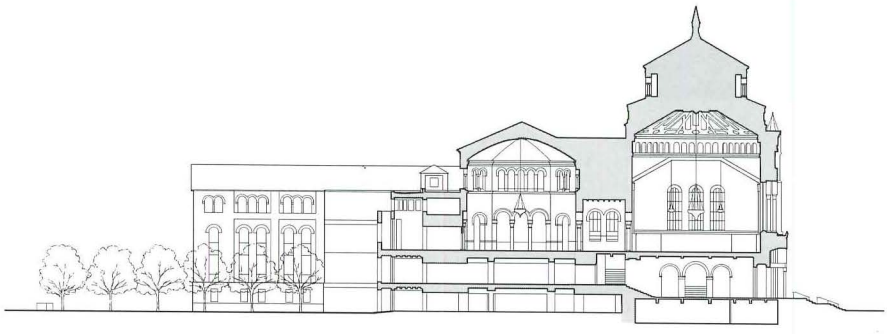


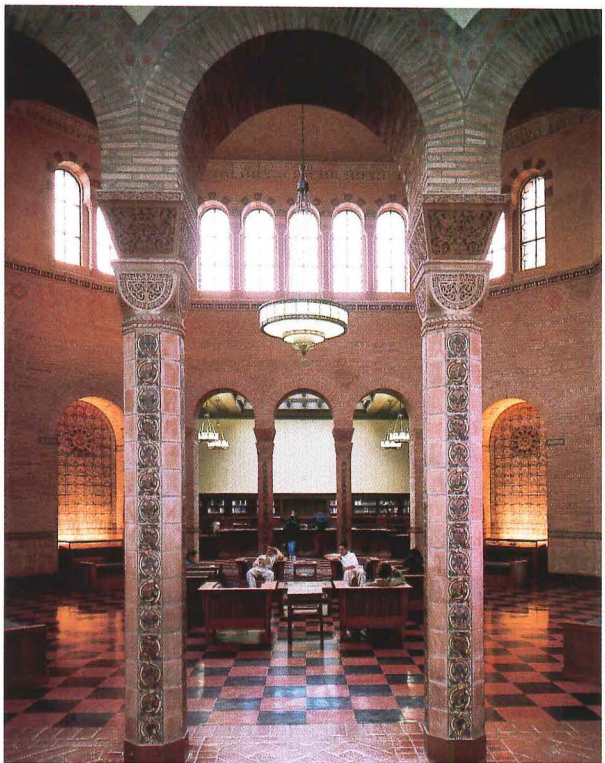
An interior path and a series of common outdoor spaces create a sense of community (above and opposite top). The front facade (opposite bottom) engages the street.

Powell Library Renovation
University of California, Los Angeles
Owner: *University of California*
Architect: *Moore Ruble Yudell Architects & Planners*

Hired to design seismic, life-safety, and accessibility improvements for this 1929 neo-Romanesque building, the architects accomplished these goals while adding a new south loggia and garden. Oriented to new campus growth, the modifications create reading and study areas of different character. In making all parts of the library accessible, the architects removed large handicapped ramps and restored the building's original identity by eliminating awkward changes done over the years.



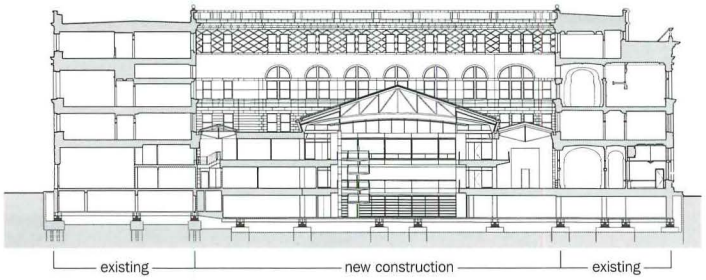




PHOTOGRAPHY: © TIMOTHY HURSLEY (POWELL); ABBY SADIN (COURT)

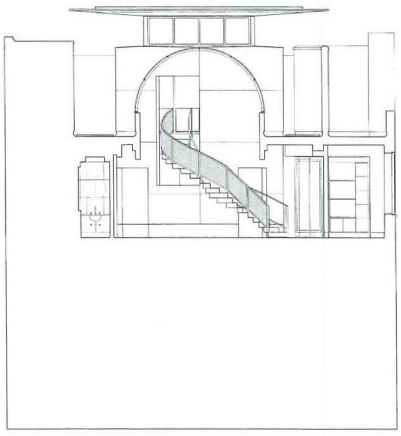
U.S. Court of Appeals Renovation
San Francisco, California
Client: *General Services Administration*
Architect: *Skidmore, Owings & Merrill, San Francisco*

Damaged by the 1989 Loma Prieta earthquake, the 1905 courthouse received a major renovation that included restoring and modernizing its opulent hearing rooms, and creating a new skylit atrium in what had been a dark interior area. The key to the seismic retrofit is a friction pendulum system of base isolation, among the first and largest uses of this new technology.



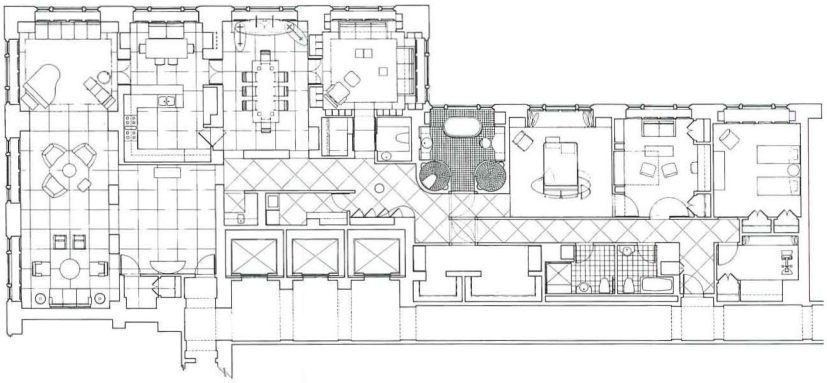
Manhattan Rooftop Residence
New York City
Architect: *Shelton, Mindel & Associates*
Associate Architect: *Reed Morrison, Architect*

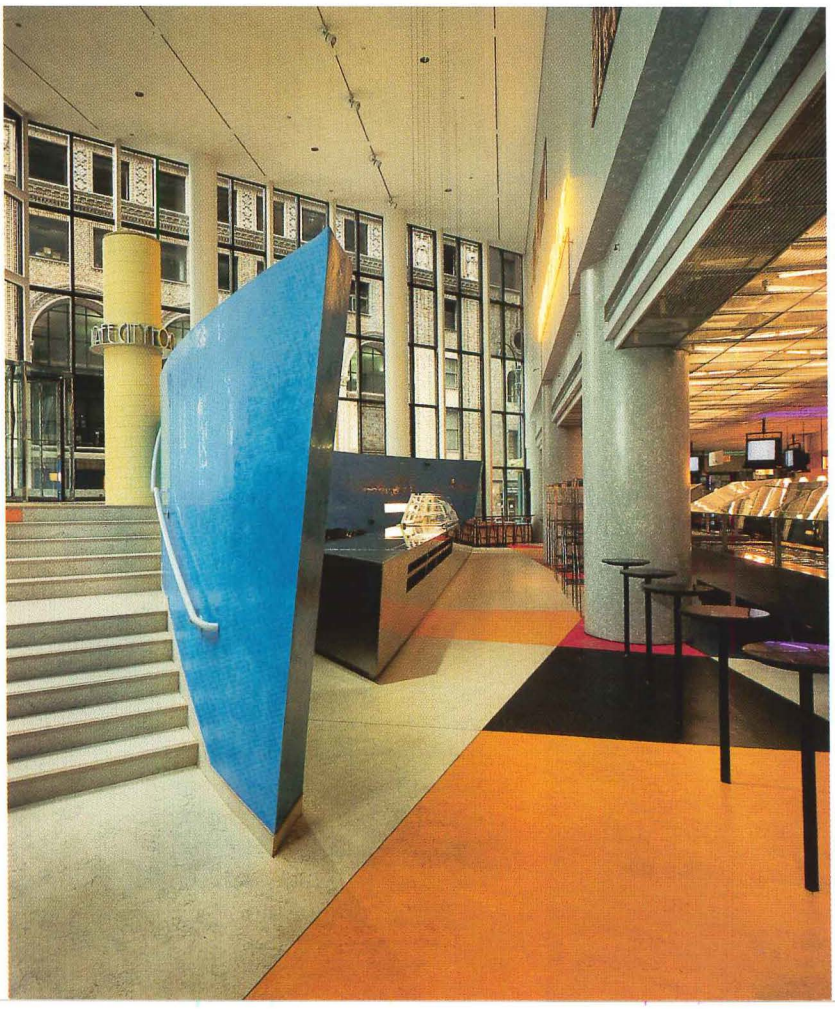
Inspired by the water tanks that dot the city's roofscapes, the architects designed a modern addition that rises from the 12th story of a former manufacturing building. Geometric forms such as a rotunda, a curved glass vault, and a double-helix stair establish the character of the apartment, while generous glazing offers views in four directions.



Neisser Residence
Chicago
Owner: *Judith Neisser*
Architect: *Tigerman McCurry Architects*

The architects reduced the surfaces and detailing of this 4,400-square-foot apartment to their essence, creating an "absent presence." The plan unfolds as a series of chambers en suite, *a strategy that underscores the restrained elegance of the apartment. Accommodating an art collection, guest rooms for two adult children, and space for entertaining was also part of the design challenge.*



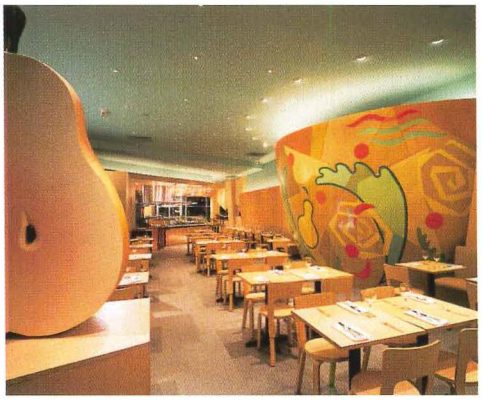


101 Cityfood Cafe
New York City
Owner: *Cafe Sonata, Inc.*
Architect: *Westfourth Architecture*

A difficult 7,000-square-foot triangular space on the ground floor of an office tower was turned into an energetic food court and take-out café. To break down the space and identify each type of food served, the architects designed five separate counters, including a sushi bar made of cherry wood and others made of millwork wrapped in stainless steel. Bright colors and a sense of layering enliven the space.

New Hearth Showroom
New York City
Owner: *D'Elia Associates*
Architect: *Mark Simon of Centerbrook*

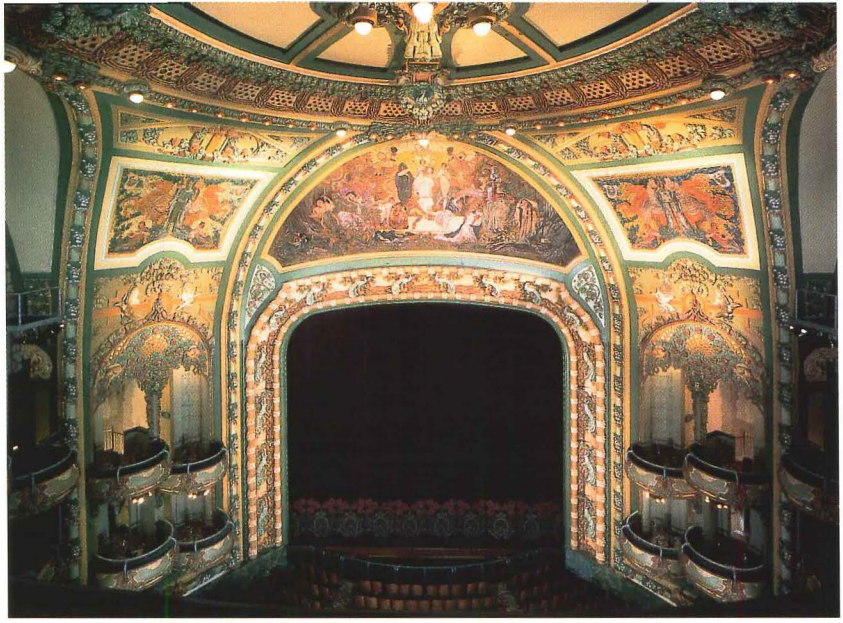
For a showroom where the products change periodically, Centerbrook designed a theatrical space with the flexibility of a stage set. Cross-hatched floor tracks allow the kitchen appliances and other items for sale to be moved around, while overhead track lighting provides enough illumination to turn the showroom into a small studio for demonstrations and videotapings.



The Salad Bowl
New York City
Architect: *Hugh A. Boyd, Architects*

Set within a dark, 24-by-100-foot envelope, this take-out and self-service café uses bold graphics, a few colorfully decorated elements, and good lighting to create an appetizing setting. Display counters and the open kitchen are located up front to provide maximum product exposure, and a perforated, backlit, serpentine piece of fabric above the open kitchen catches the eye. All this for $83 a square foot.

PHOTOGRAPHY: © JEFF GOLDBERG/ESTO (NEW HEARTH); DUB ROGERS (SALAD BOWL); WHITNEY COX (THEATER);



New Amsterdam Theater
New York City
Owner: *Walt Disney Imagineering*
Architect: *Hardy Holzman Pfeiffer Associates*

This "interpretive" restoration of one of Times Square's great old theaters involved preserving and re-creating elements from different periods in the building's history, as well as unobtrusively inserting new lobby spaces, mechanical systems, and elevators. [RECORD, June 1997, page 112]

Wilkhahn North America Showroom
New York City
Owner: *Wilkhahn, Inc.*
Architect: *Skidmore, Owings & Merrill, Chicago*

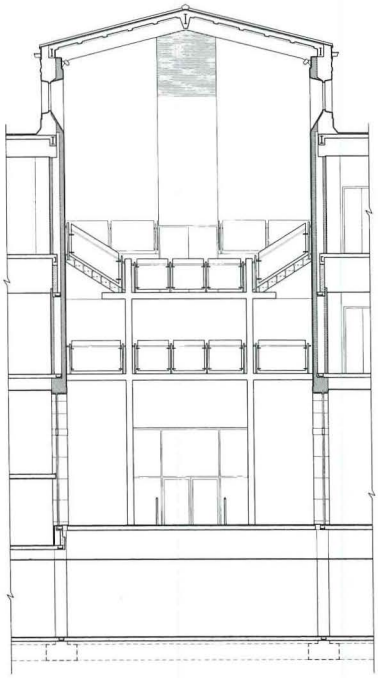
For a German furniture company, SOM designed spaces on two floors connected by a shot-blasted steel staircase that seems to hover between floors. An inclined plane of stainless-steel mesh bisects the lower floor, separating new items from those under development. Offices and more displays are upstairs.

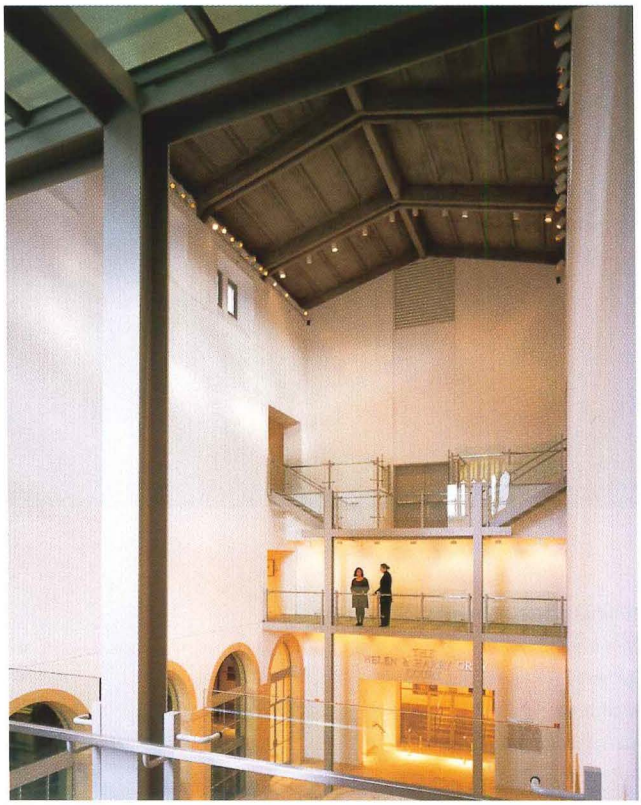
Private Apartment
New York City
Architect: *Frank Lupo/Daniel Rowen, Architects*

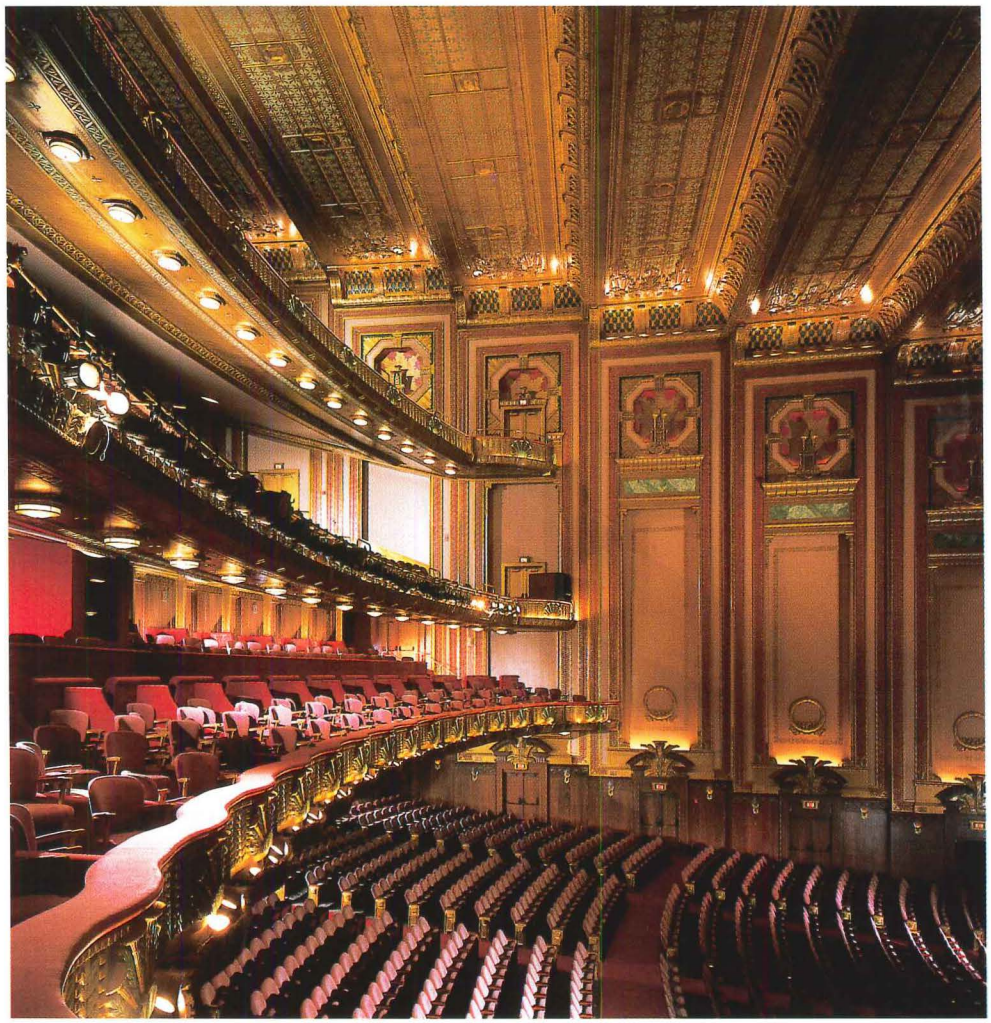
The architects took two apartments and turned them into a single 2,500-square-foot pied-à-terre, in the process creating a minimalist environment in which the play of light against the walls, floors, and ceilings provides most of the visual stimulation. By eliminating almost all furniture and forgoing even the client's art collection, the design heightens a sense of separation from a hectic world.

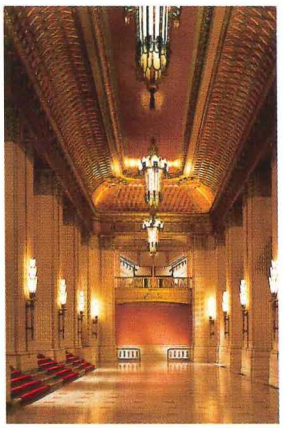
The Helen & Harry Gray Court at the Wadsworth Atheneum
Hartford, Connecticut
Owner: *Wadsworth Atheneum*
Architect: *Tai Soo Kim Partners*

The architects transformed the main lobby of this museum by removing part of the third floor of its 1842 neo-Gothic building and creating a soaring 50-foot-high entry space. The court is animated with light from glass-and-steel windows set in limestone arches and translucent-glass bridges connecting galleries on the second and third floors.







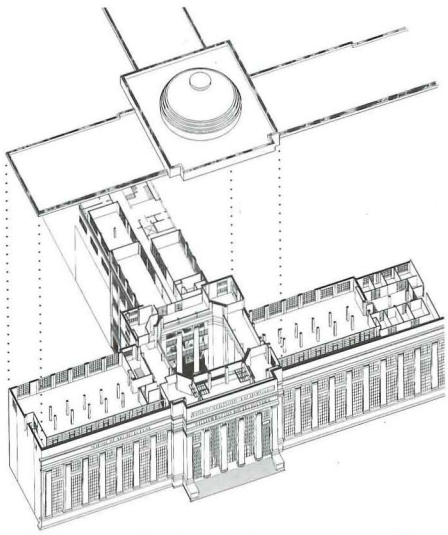


Civic Opera House Renovation
Chicago
Owner: *Lyric Opera of Chicago*
Architect: *Skidmore, Owings & Merrill, Chicago*

Restoring this 1928 extravaganza involved design solutions for four different zones. The back-of-the-house was demolished and replaced with new scenery-handling and rehearsal spaces; the stage was equipped with new lighting and electrical systems; new seats were installed; and the exterior was refurbished with new lighting.

MIT School of Architecture and Planning
Cambridge, Massachusetts
Owner: *MIT*
Architect: *Leers Weinzapfel Associates*

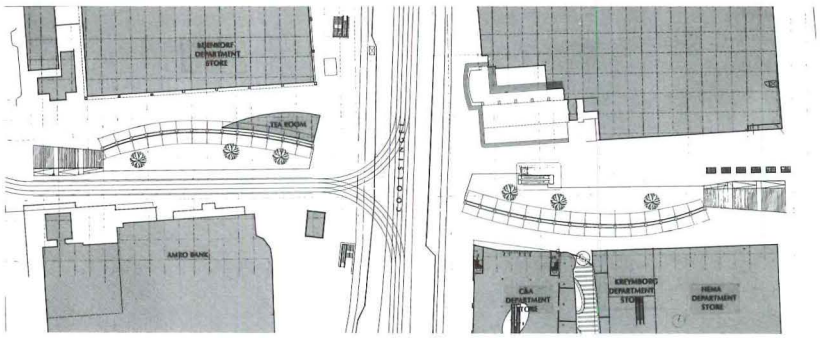
The architects transformed what had been virtually abandoned space in the attic of MIT's "main group" of buildings into studio and review spaces, academic offices, and galleries. The project involved moving corridors, reconfiguring space around the dome, creating windowed studios, and wiring studios for computers.

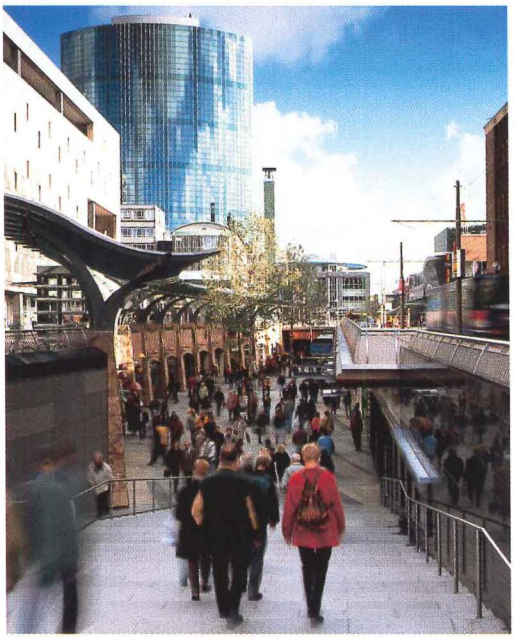


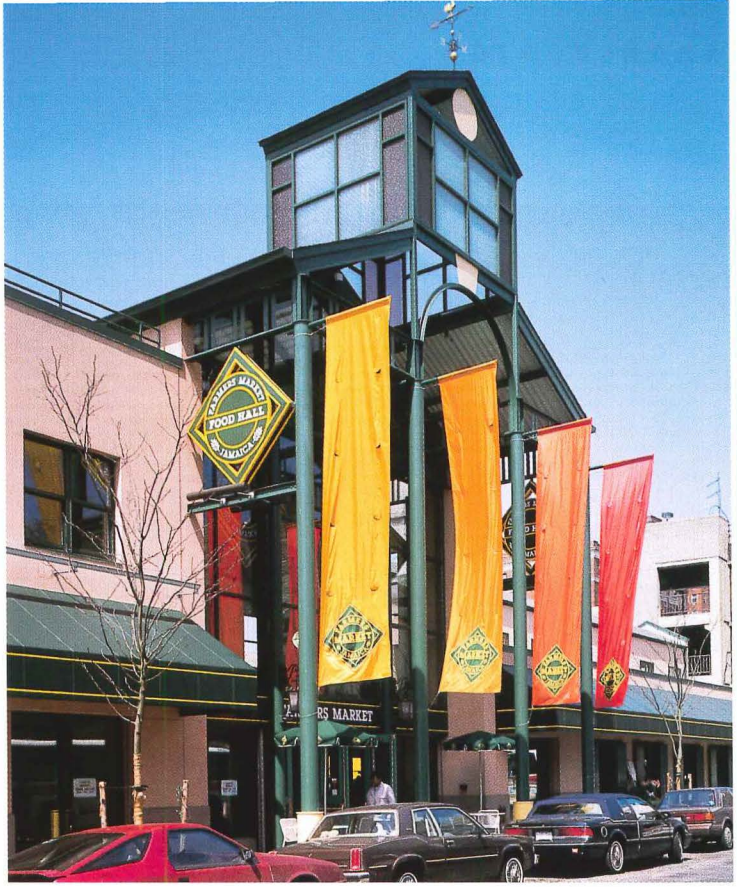
PHOTOGRAPHY: © ROBERT BENSON (ATHENEUM); JON MILLER/HEDRICH BLESSING (OPERA); CHUCK CHOI (MIT)

Beursplein, Rotterdam
Rotterdam, The Netherlands
Client: *Multi Vastgoed b.v.*
Architect: *The Jerde Partnership International; De Architekten Cie.; T+T Design*

This mixed-use project creates a more unified downtown by connecting two market districts that were divided by a major traffic artery, Coolsingel Boulevard. Using energetic architecture, new retail, and entertainment features, the development takes pedestrians along a lively route that snakes underneath Coolsingel. The project includes Beursplein Promenade, a 1,000-foot-long shopping street that is covered by curving glass canopies and connects two outdoor plazas on either side of Coolsingel; Beurspassage, a three-level shopping gallery; four new department stores; a 30-floor apartment building; a parking garage; and the renovation and expansion of the busiest metro station in Rotterdam. Completed in August 1996, the project has been successful both financially and urbanistically, helping to revitalize a downtown that

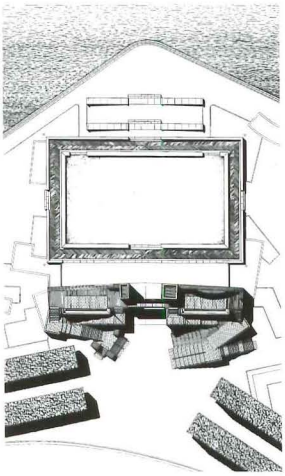


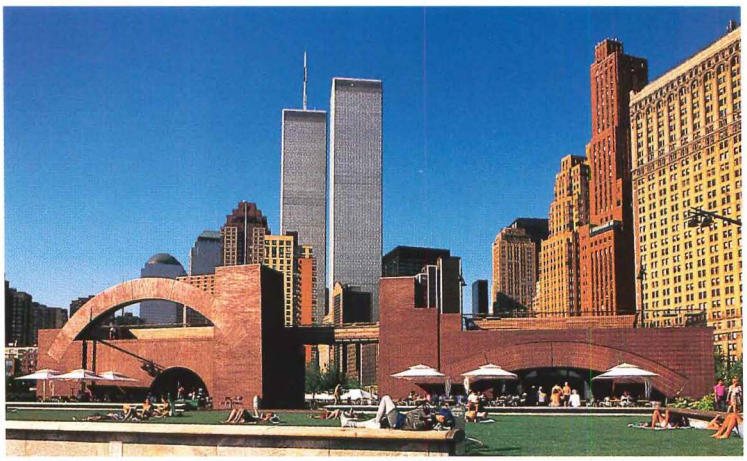


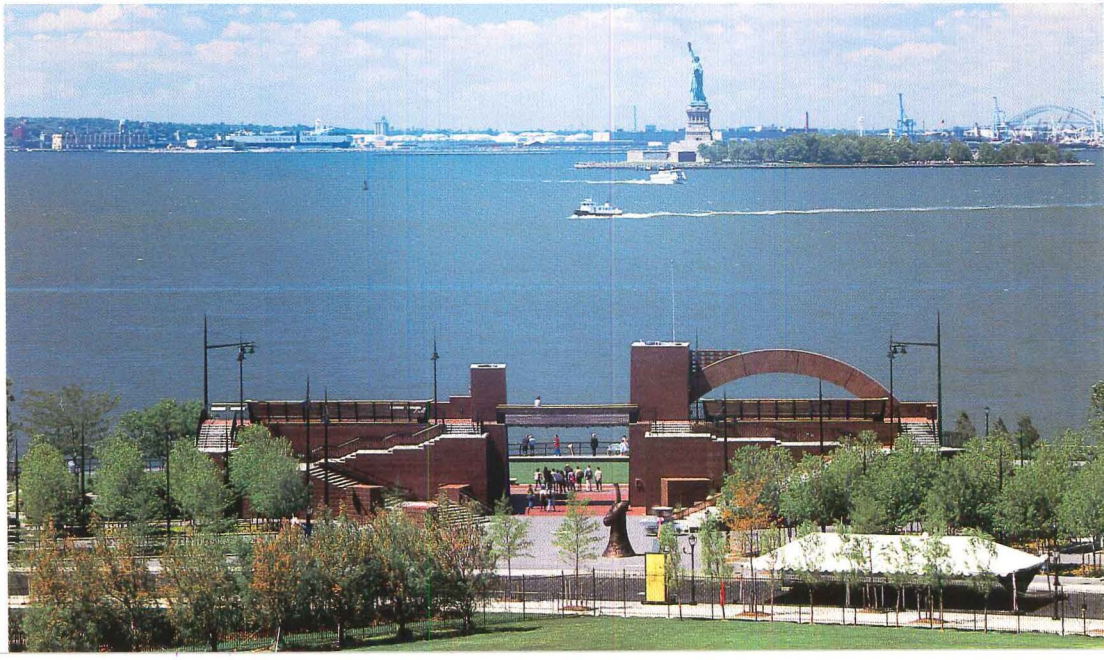


Jamaica Market
Queens, New York
Owner: *Greater Jamaica Development Corporation*
Architect: *James McCullar & Associates*

A combination of new construction and adaptive reuse was employed to create a colorful marketplace that is revitalizing a blighted city block. The market includes a retail center for fresh and prepared foods, dining areas for a growing population of office workers, and community meeting rooms and offices. Developed by a local nonprofit corporation, the project has a distinct Caribbean-American flavor and now serves as an unofficial town center where festivals, seasonal events, and street fairs take place.

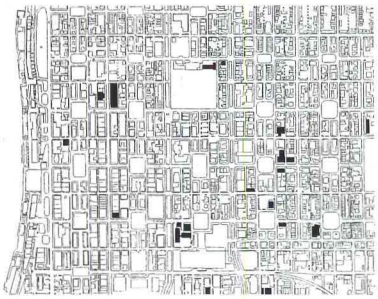






Robert F. Wagner, Jr., Park
Battery Park City, New York
Client: *Battery Park City Authority*
Designers: *Machado and Silvetti Associates (architecture); Olin Partnership (landscape); Lynden B. Miller (garden)*

Set at the southern tip of Manhattan with the Hudson River in front and the island's famous skyline behind, this 3.5-acre park straddles the city edge where towers meet water. Formal garden elements (such as a stone-edged lawn and maple allées) complement a pair of brick-clad pavilions. [RECORD, February 1997, page 64]



Project: *City Campus of the Savannah College of Art and Design, Savannah, Georgia*
Owner: *Savannah College of Art and Design*
Architect: *Lee Meyer & Co., Architects*

Encompassing nearly 50 buildings throughout the downtown historic district, the Savannah College of Art and Design has made the city its campus. Over a 20-year period, the school has rescued abandoned buildings and renovated historic structures, injecting much-needed economic activity into a downtown that had experienced difficult times. The multidisciplinary emphasis of the college reinforces a diverse urban fabric and is a natural complement to a city that has a rich history dating back several centuries.

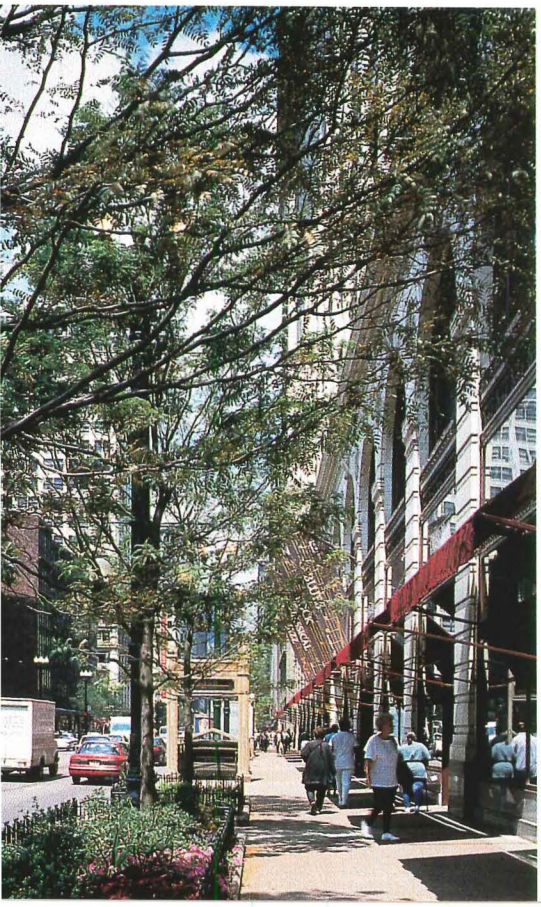
Ellen Wilson Neighborhood Redevelopment
Washington, D.C.
Owners: *Ellen Wilson Redevelopment Corporation; Telesis Corporation; McHenry Tag, Inc.; District of Columbia Housing Authority*
Architect: *Weinstein Associates*

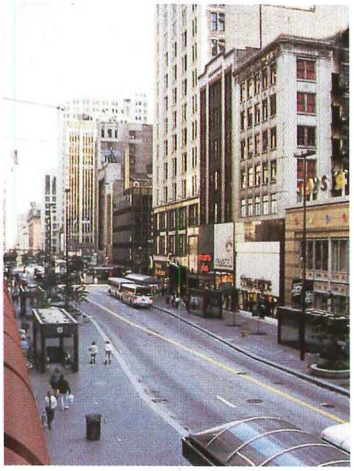
Now under construction, this project replaces abandoned public housing on a 5.3-acre site adjacent to the Capitol Hill Historic District. Funded by HUD's Hope VI program, the plan reintegrates the site into the surrounding community, both physically and socially. The 154 living units are modeled after nearby Victorian streetscapes.

PHOTOGRAPHY: © WAYNE C. MOORE/SAVANNAH COLLEGE; STEINKAMP/BALLOGG (STATE STREET, TOP AND LEFT);

State Street Renovation
Chicago
Client: *City of Chicago, Department of Transportation*
Architect: *Skidmore, Owings & Merrill, Chicago*

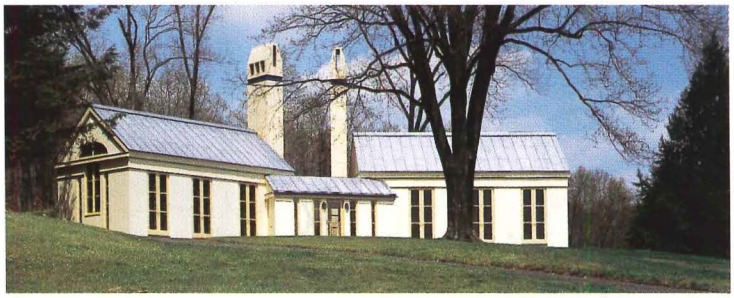
The primary challenge of this project was to rectify the unsuccessful 1979 conversion of State Street into a pedestrian mall. SOM's plan weaves State Street back into a resurgent downtown, returning it to its place as an economically and architecturally important part of Chicago's downtown Loop—home to Louis Sullivan's Carson Pirie Scott store and other modern landmarks. The $23 million renovation included bringing car traffic back to the street, returning sidewalks to their original width, and building new sidewalks with light-colored concrete to give the street a brighter look. In addition, sidewalk planters were installed near the curb line to create a "green street." New streetlights combine recastings of the original Graham, Anderson, Probst & White fixtures that graced State Street from 1926 to 1958 with new globe lighting and armatures that bring light closer to pedestrians. The project also included new subway entrances that fit in with the historic nature of the street.





CENTERBROOK NAMED FIRM OF THE YEAR FOR ECLECTIC BODY OF WORK

The five partners of Centerbrook Architects and Planners, in Essex, Connecticut, have blazed individual design trails for 23 years, all the while collaborating in a unified firm. Self-described "American pragmatic" architects, William Grover, FAIA, Jefferson Riley, FAIA, Mark Simon, FAIA, Chad Floyd, FAIA, and James Childress, AIA, "solve problems one at a time," says Grover. The partners and recent principal James Coan, AIA, are respected not only for their designs but also for their willingness to involve clients and users in the design process—a trait learned from their mentor, Charles Moore. One result has been long-term clients; indeed, more than 80 percent of the firm's work is from repeat customers. As Ray Gindroz, AIA, a principal with UDA Architects, states in his nomination of Centerbrook, the firm has "consistently create[d] beautiful architecture which responds to local contexts with human-scale spaces filled with delight."



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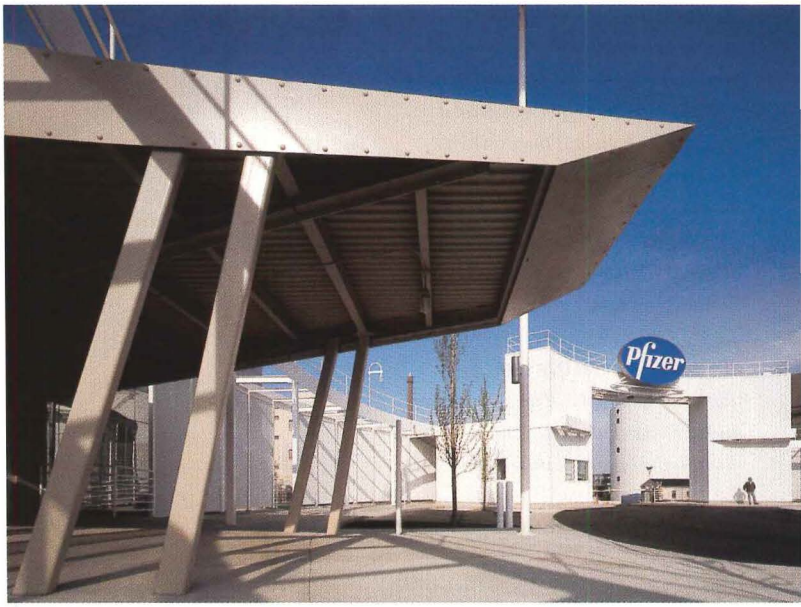

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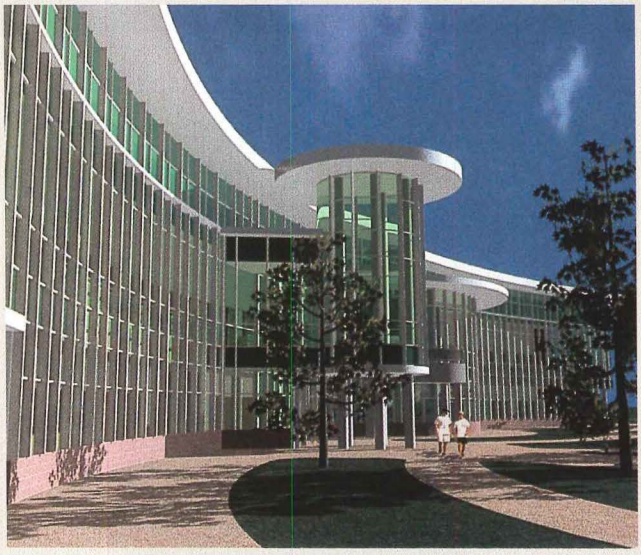
ABOVE, LEFT TO RIGHT: *Chad Floyd, Jefferson Riley, Mark Simon, William Grover, James Coan, James Childress.* RIGHT AND OPPOSITE: *1. House in the Connecticut Hills. 2. Pfizer, Inc. main gate. 3. Pond House, New England coast. 4. Lender School of Business, Quinnipiac College. 5. Neuroscience Center, Cold Spring Harbor.*

On the boards at Centerbrook:
1. Learning Resource Center, Manchester Community-Technical College, Manchester, Connecticut. 2. Chemistry Building, University of Connecticut, Storrs. 3. Stepping Stones Museum for Children, Norwalk, Connecticut. 4. Campus Center, University of Colorado Health Sciences Center, Denver.



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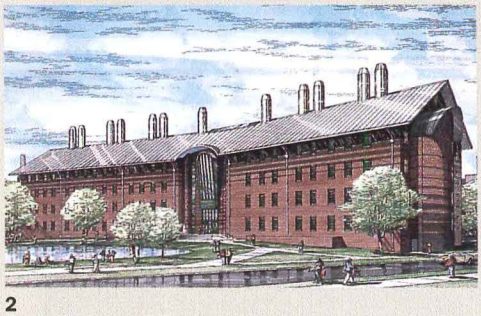

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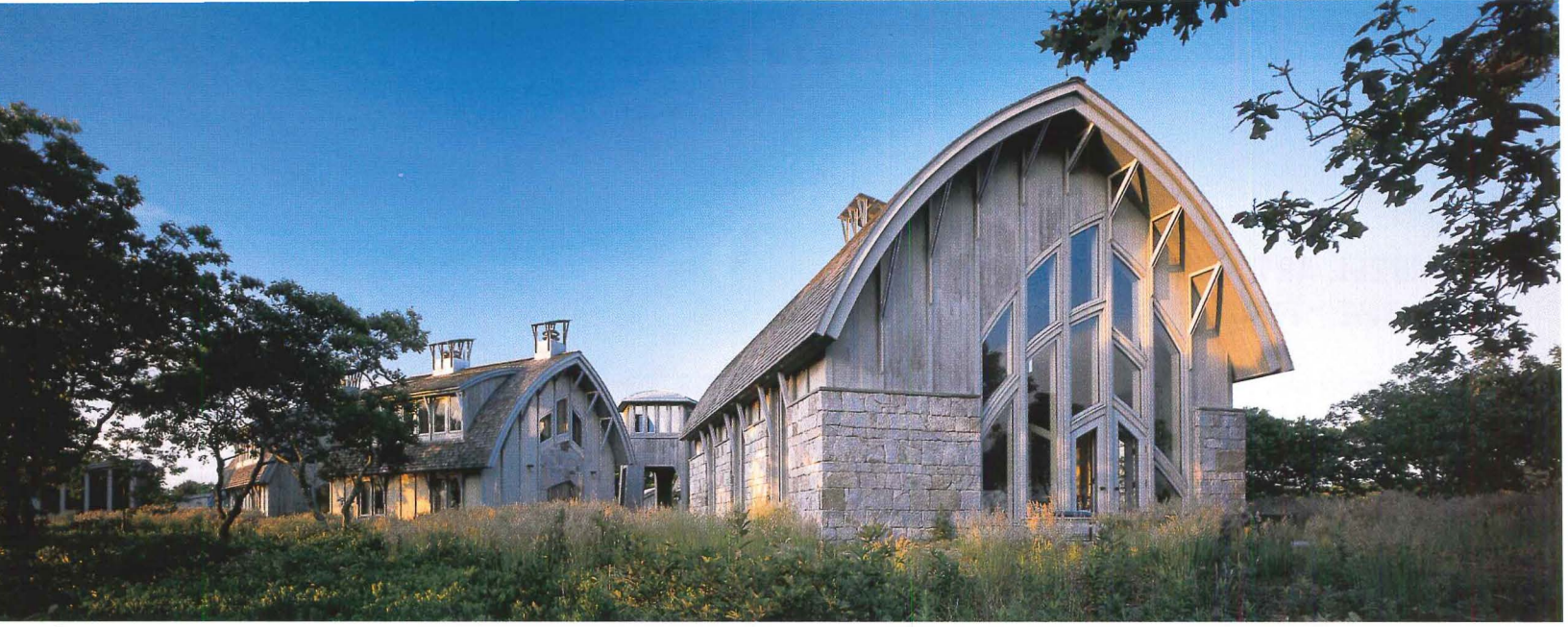
PHOTOGRAPHY: © TIMOTHY HURSLEY (1,5 TOP); JEFF GOLDBERG/ESTO (2–4 TOP);



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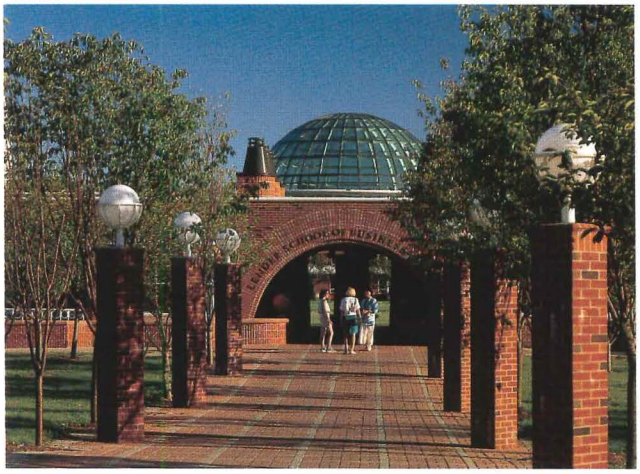

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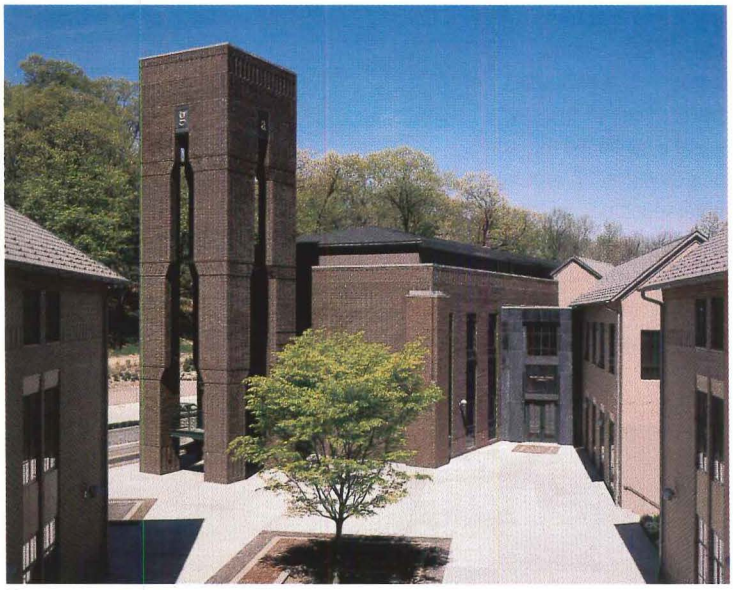

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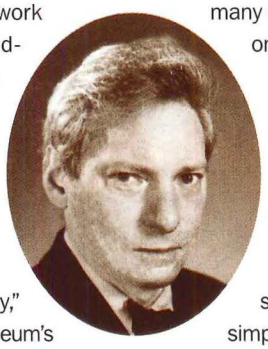
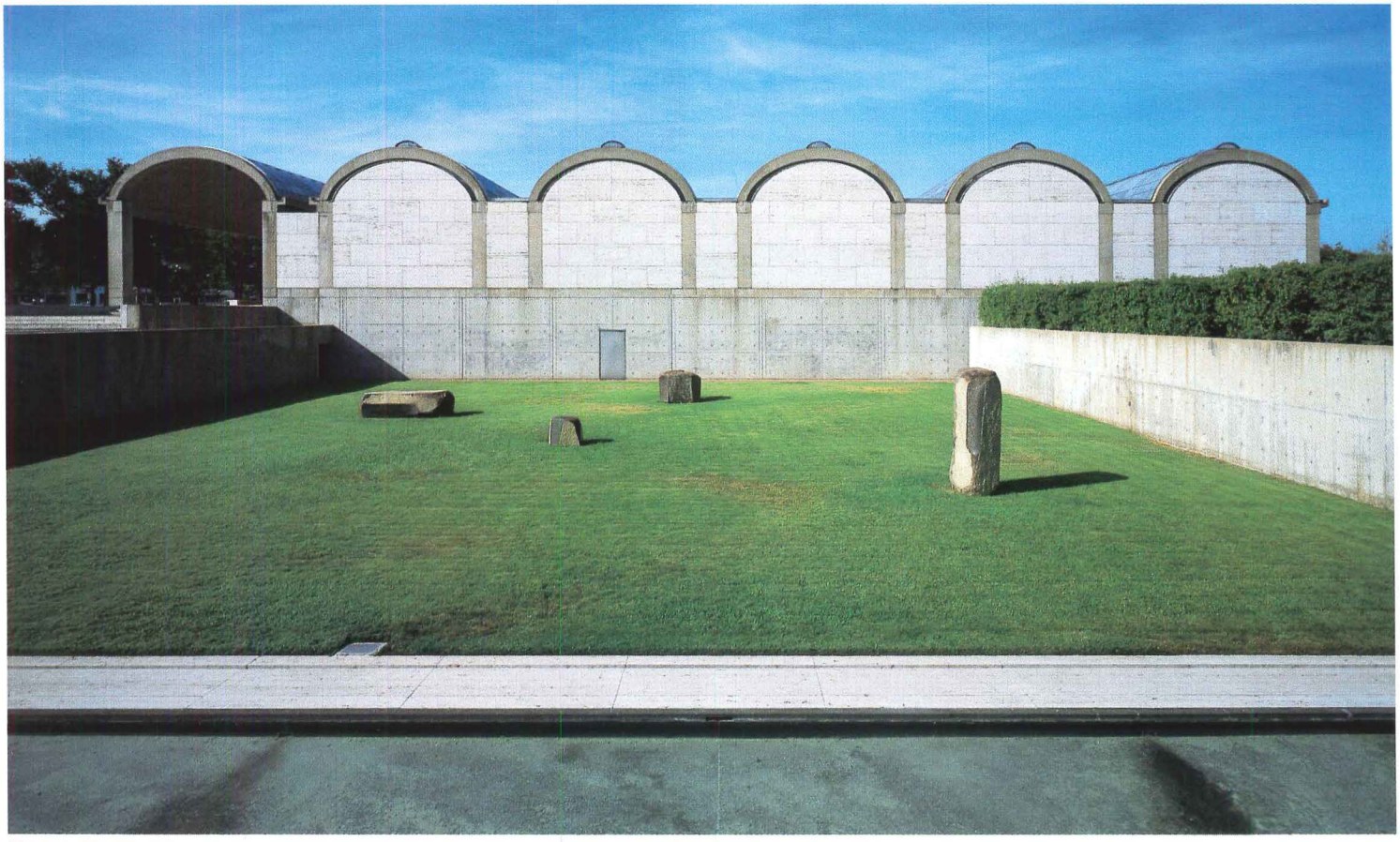
KIMBELL ART MUSEUM IS HONORED AS THE "TIMELESS" WORK OF A MASTER

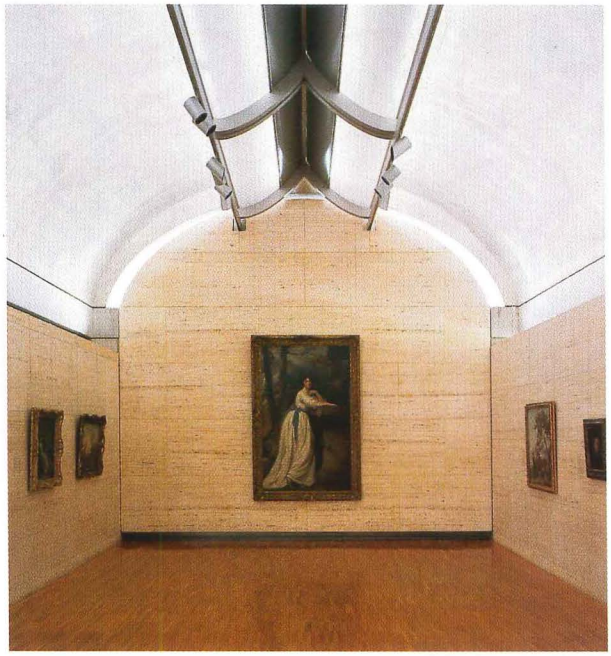
One of the indisputable masterpieces of 20th-century architecture, the Kimbell Art Museum in Fort Worth exemplifies many of the key ideas behind the work of Louis Kahn. The building's simple, powerful forms—curving vaults that work equally well as gallery space, library, and auditorium—linger in one's memory. The famous "narrow slits to the sky," as Kahn called the museum's long skylights, direct sunlight to metal reflectors, which then bounce light off the underside of the vaults. Straightforward volumes, a clear expression of materials, and a knack for using light to articulate form, all hallmarks of Kahn's work, are present in the Kimbell. "The Kimbell Art Museum is the work of a master allowed to apply all of his many extraordinary skills to one building," says Mark Simon, FAIA, the chair of the jury that selected the building for the AIA's 25-Year Award. "The museum shows layers and layers of richness and care, while simultaneously seeming simple, inevitable, and timeless." The 120,000-square-foot museum opened in October 1972 and sits in a 9.5-acre park. Kahn, who died in 1974, envisioned the Kimbell as having "the luminosity of silver."



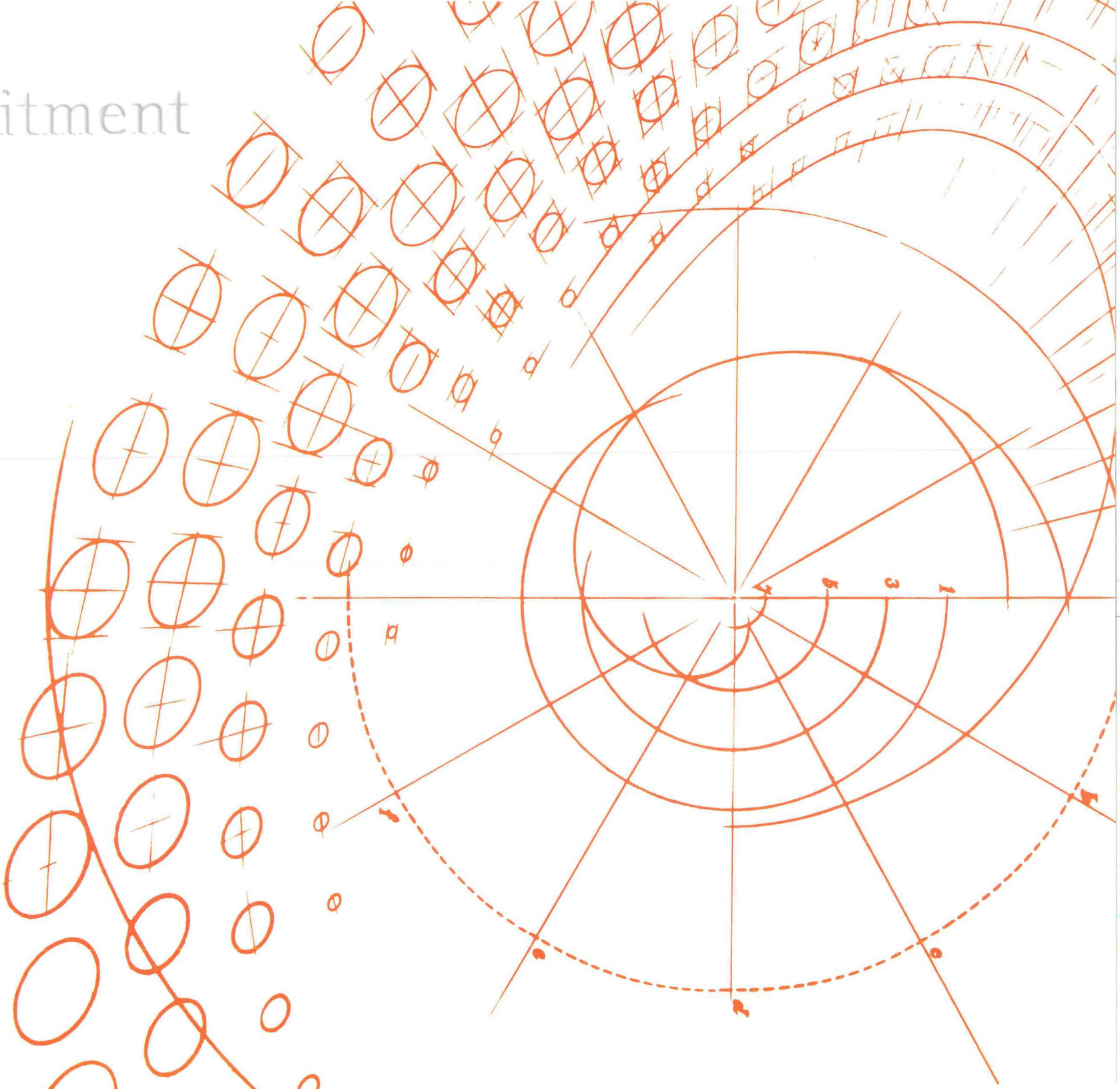


PHOTOGRAPHY: © GRANT MUDFORD

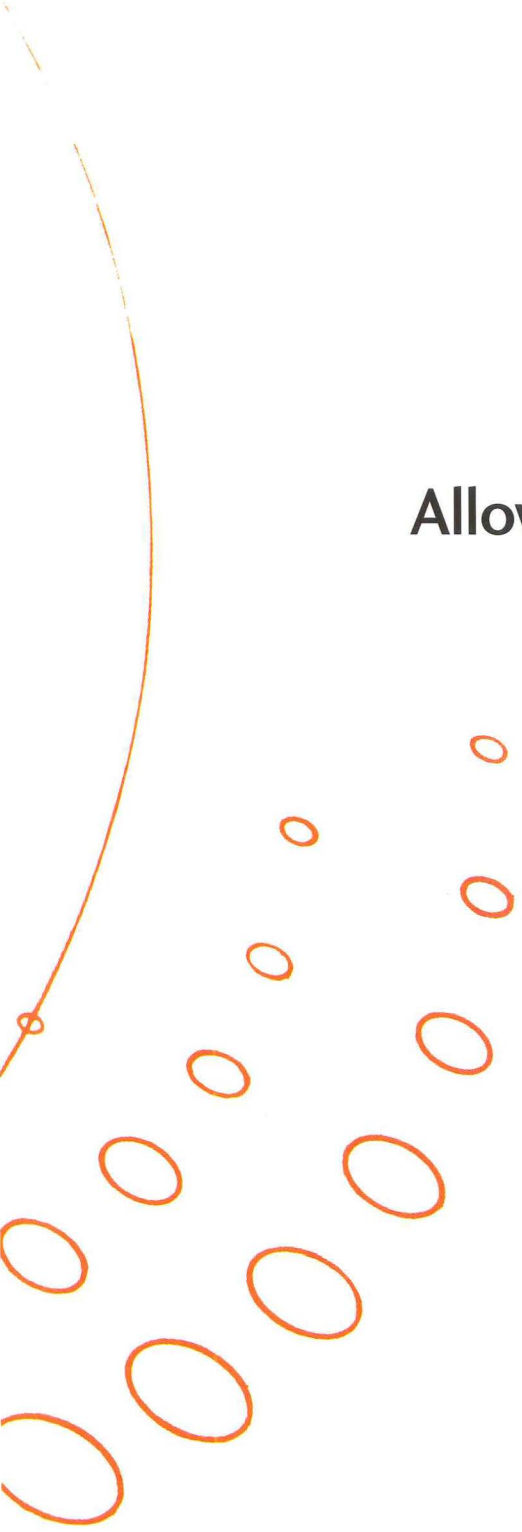
The Kimbell includes gallery spaces (below), courtyards (opposite, top and bottom), a restaurant, an auditorium (right), a bookshop, a library, and space for operations and offices. While serving art, the building itself is also a work of art.



Commitment



Allow us to illustrate why we should be a part of your plans.



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Young Architects Profiles

SIX WHO WEATHERED THE NATIONAL RECESSION OF THE EARLY 1990s ARE FARING VERY WELL IN THE CURRENT ECONOMIC CLIMATE.

by Lee D. Mitgang

For many architecture firms, the first half of the 1990s was awash in red ink. As recently as two years ago, the air was thick with talk of too many architects and "downsizing the profession." Architecture students were bailing out of graduate school in droves. Of the 3,500 to 4,000 who did graduate each year with professional degrees, as many as half were heeding the advice of older architects and seeking jobs outside traditional practice—making custom furniture, perhaps, managing facilities, opening hip restaurants in Sante Fe, or turning CAD skills into big bucks in a Silicon Valley technology firm or in Hollywood animation studios.

Today the picture is, in a number of respects, dramatically different. Architecture firms across the country are drowning in work. And young architects—those in their late 20s to mid 30s, who earned their degrees or licenses during a national recession that hit architecture especially hard—are suddenly among the profession's hottest properties, ardently courted because of both their skills and their scarcity.

The national downturn that began in the late 1980s lasted longer and left more scars in the architecture profession than on many other fields. Layoffs dropped total U.S. architectural employment from 157,000 in 1989 to 138,000 in 1992, according to U.S. Bureau of Labor Statistics (BLS) data. No one felt the pain more than young architects, almost invariably the first to be let go at recession-racked firms. Whereas the architectural workforce as a whole declined by 5 percent between 1988 and 1991, the number of intern-architects employed by AIA member–owned firms dropped by 20 percent, a loss of roughly 3,600 positions for young architects.

Lee D. Mitgang, a contributing editor, was co-author of the 1996 Carnegie Foundation Report Building Community: A New Future for Architecture Education and Practice. *He was a senior fellow at Carnegie from 1992 to 1997.*

The recession has left a residue of wariness. Unquestionably, the job picture is dramatically brighter for young architects—certainly for those whose résumés convey talent, energy, versatility, and a modicum of seasoning. Still, many employers seeking to avoid repeating past sins of overhiring are focusing on those prospects who seem most able to hit the ground running and assume the largest share of the project load. Meanwhile, the growing financial crisis in Asian countries is clouding the picture at some firms with heavy dealings in those markets. And despite the more promising job outlook in traditional practice, young architecture graduates have continued to look in large numbers beyond building and design firms for better pay and more security.

"Students used to ask me if there were architecture firms hiring in New York or Philadelphia. Now they ask who I know in Hollywood," says Robert Gutman of Princeton University, an expert in the economics of architecture who estimates that at least one-third of Princeton's architecture graduates are seeking work outside traditional practice.

AVERAGE SALARIES FOR YOUNG LICENSED ARCHITECTS

	1990	1993	1996
ARCHITECT I (RECENTLY LICENSED, 3-5 YEARS EXPERIENCE	30,000	30,000	33,200 (+11%)
ARCHITECT II (LICENSED, 6-8 YEARS EXPERIENCE)	33,800	34,300 (+1%)	38,900 (+13%)
ARCHITECT III (LICENSED, 8-10 YEARS EXPERIENCE)	38,000	38,600 (+2%)	45,400 (+18%)
MANAGER (MORE THAN 10 YEARS EXPERIENCE; PROJECT RESPONSIBILITY)	43,400	45,300 (+4%)	53,100 (+17%)

SOURCE: COMPENSATION AT U.S. ARCHITECTURAL FIRMS, A SURVEY BY THE AMERICAN INSTITUTE OF ARCHITECTS, 1996

Nonetheless, with unaccustomed prosperity suddenly pushing many design firms beyond their limits during the last year or two, U.S. architectural employment has rebounded smartly from recessionary lows, to 169,000 by December 1997, according to the most recent BLS data. And the outlook seems especially bright for young architects who graduated from school five to a dozen years ago.

"All of these enormous old projects that had been asleep for years are now coming alive," says Frances Halsband, a partner in the medium-size New York City firm of R. M. Kliment and Frances Halsband Architects, which in the last year added four young, experienced architects to boost its staff to 33.

In the eyes of many such employers, these experienced but not veteran architects are highly prized because they can take on a wide range of tasks but don't yet command peak salaries. Yet they are the very architects now in shortest supply, because so many were scared off earlier in the decade by the seemingly dim prospects of traditional practice or were enticed into more stable, better-paying fields. The result for young architects: red-hot competition and even bidding wars of an intensity rarely if ever seen in this field.

In numerous interviews, we learned that the salary hold-downs and layoff threats of just a few years ago have been replaced at many design firms with hefty Christmas and merit bonuses, lunches and dinners with bosses eager to let young employees know how much they are appreciated, and headhunters on the prowl. Most incredibly, one even hears the occasional story of signing bonuses—de rigueur, perhaps, for top law or business grads or college basketball prospects, but a stunning change in fortunes for aspiring architects.

"We're writing offers to potential young employees and getting replies from maybe one out of five," says Denis Henmi, a partner of the San Francisco–based Kwan Henmi Architects, which finds itself bidding not only against larger Bay Area architectural firms but also against high-paying Silicon Valley computer concerns hungry for the design skills and technical savvy of young architects.

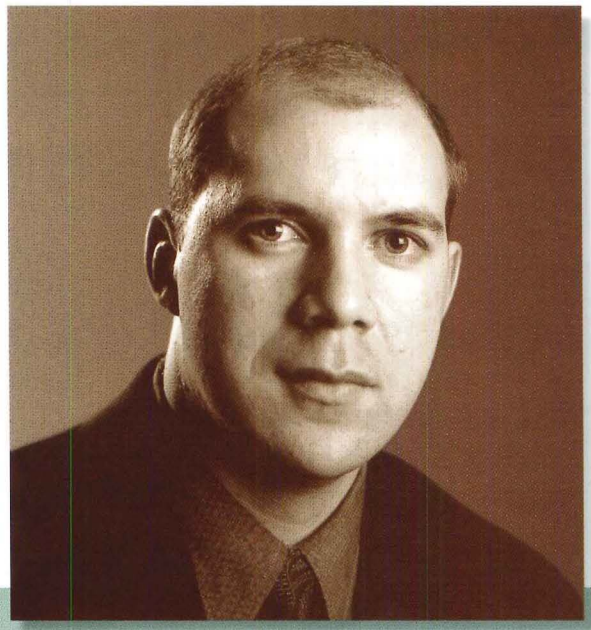
To shed some light on how these younger members of the profession are doing, we asked six—several of whom have already had a lifetime's worth of career ups and downs—to describe their adventures in the now-flourishing job market. Here are their stories:

Gordon Gill

Gordon Gill entered architecture—or tried to—in 1989, as the field was sinking into recession. He searched in vain for a job after graduating with his first professional degree from the University of Texas, Arlington. Despairing of finding anything in the United States, Gill briefly took a job in Canada before deciding to return to school to ride out the bad times. For his second degree, he entered Harvard University's Graduate School of Design. Even with that Ivy League pedigree, he found his prospects weren't a great deal better in 1992 as he prepared to take his next shot at entering the workforce.

"The number of firms coming to recruit at Harvard had dwindled to a handful. Certainly, none of the big firms came," Gill recalls. A year earlier, in 1991, he had landed a summer job at Skidmore, Owings & Merrill in Chicago, but was paid so little in his pregraduation internship that he wasn't breaking even. Gill's fortunes began to improve as graduation approached. He called back SOM in 1992 for a permanent position, and the firm hired him straight out of school. Gill spent the next five years at the giant firm, quite content.

Then, in the summer of 1997, Gill's telephone started to ring. "I got a lot of calls from people I didn't even know, asking if I would be interested in a new job." One caller, who had been a a colleague of Gill's at SOM, piqued his interest: it was Ricardo Fernandez, a design director of SHG, a large Detroit firm whose specialties include health care, education, corporate construction, and prearchitectural services.



Gordon Gill, *a senior design architect at SHG, in Detroit, sat out most of the recession at Harvard's Graduate School of Design.*

"The offer he made was very generous from both a professional and financial standpoint," says Gill. He began work at SHG in late February of this year as a senior design architect. At age 34, with barely six years of job experience, he believes he has a good shot at becoming a design principal within a year.

As part of the deal, the firm also hired Gill's wife, Wendy, an architect from Perkins & Will who also had her share of job offers. "Much of my professional background is in educational building, and since SHG had an education group like Perkins & Will, it seemed like a good fit," she says. Such husband-and-wife hiring agreements have traditionally been rarities at large firms, and SHG's agreeing to it is one more sign of how far firms will go to land young talent. "We're building up quite a good team of young architects," says SHG's Fernandez. "We're recruiting quite broadly, and we have the extra challenge of bringing people to Detroit. There is a lot of work in this city, and our firm has many of the choicest projects."

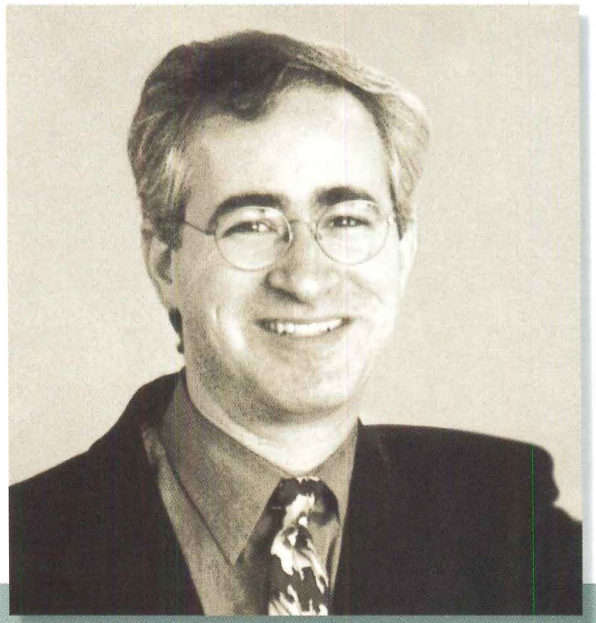
For Gill, one of the biggest inducements was the prospect of involvement in all phases of the firm's operations and its apparent openness to new directions and ideas. Says Gill: "That's something most young architects would like."

David Must

As an architecture student at Yale in the late 1980s, while recessionary clouds were gathering, the talk David Must heard from professors was of alternative career paths. It proved prophetic. When he graduated with his master's in 1988, Must had a peripatetic existence. His career consisted of diverse design tasks and marathon job searches spanning two continents.

Hoping to escape the U.S. recession, Must first headed for London and landed a two-year job with a firm building the new British Library. With his British work permit running out in 1990 and the U.S.

TWO YEARS AGO, THE AIR WAS THICK WITH TALK OF TOO MANY ARCHITECTS. ROUGHLY HALF OF THE GRADUATES IN THE EARLY 1990s LEFT TRADITIONAL PRACTICE.



David Must *worked abroad for four years before landing a job at the San Francisco firm Anshen+Allen.*

slump showing every sign of worsening, Must spent the next two years in Italy helping construct a cruise ship.

He returned to the United States in September 1992 as the job market in architecture was hitting bottom. Must took to the road and began a five-month-long, cross-country odyssey, papering scores of architecture firms in Pittsburgh, Chicago, Minneapolis, Seattle, and San Francisco with his résumé. "I found that architects never seem to know what their staffing needs are two months out. You just have to show up at the door and hope. If they don't have work, you ask if they'll refer you elsewhere," Must now recalls.

In the winter of 1993, he finally found work in San Francisco at Anshen+Allen Architects and spent the next three years working on hospital design. By 1996 the economic outlook was brightening and Must was hired by the New York City firm R. H. Kliment and Frances Halsband Architects. "The attraction was the firm's very strong design philosophy, competitive salaries, and the chance to see jobs through, from beginning to end," says Must. One of his current assignments is designing a New York City elementary school.

In the last several months, Must says, job offers, with higher salaries, have started to come his way. So far, however, he's staying put. "I now have options. It's quite clear that firms are looking for people of my age and experience, but why not stay where I am happy?"

His boss, Frances Halsband, is well aware of the hot market for employees like Must. The firm recently found itself in a bidding war for another young architect but pulled back when the salary grew exorbitant. "As for keeping such architects," Halsband says, "because things are looking very good, it's not unheard of to give midyear bonuses or promote more teamwork on all phases of projects. Does that make people want to stay? I hope so."

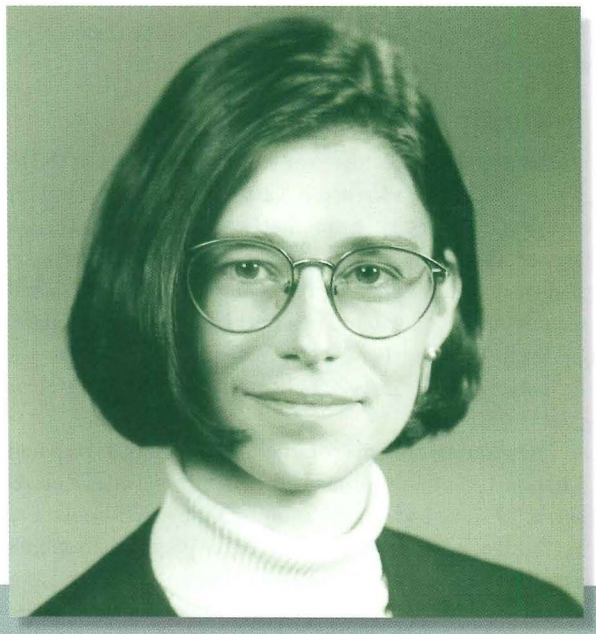
Jana Gooden Silsby

Jana Gooden Silsby remembers the depressing arithmetic lesson she received while earning her professional degree at Ball State University in Muncie, Indiana. Young architects earn their age—their age, in other words, multiplied by $1,000. "Nobody painted a glamorous picture then," she says.

Even before graduating in 1990, Silsby got a taste of things to come. She spent her internship at Terrien Architects, in Portland, Maine, in the summer of 1988. "Things were very bad," Silsby says. "The firm downsized by 30 percent, and I was laid off. A few weeks later they hired me back for a month because I came the cheapest. It was a big dose of reality."

Silsby sent out hundreds of résumés after she graduated in the summer of 1990. "I couldn't have graduated at a worse time," she recalls. "Nobody was hiring. I was second in my class, and I could only deal with 10 rejection calls a day."

It was Silsby's final thesis that opened the doors to her first job. Her subject was rehabilitation facilities for the blind, and it happened that Graham, Meus, a Boston firm specializing in psychiatric institutions, was looking for a young architect with experience designing health care facilities. The firm hired Silsby that fall as an intern, and, as forecasted, she "earned her age," even a bit less: $20,000. There was worse ahead. In 1992,



Jana Gooden Silsby, *a graduate of Ball State University, was laid off twice in less than two years.*

everyone at the firm took a 10 percent cut and, along with five others, Silsby was laid off for the second time in her fledgling career.

Jobless again, she decided that her best bet was to look for work at firms concentrating in the health care sector, her area of budding expertise and one of the few sectors of continued economic strength in the Boston area during the recession. The strategy paid off. Silsby was hired later that year by SBA/Steffian Bradley Associates, a firm noted for its work with advanced computer design programs, which has about 55 staff members and is growing.

Expanding beyond reliance on health care work, business at SBA is now thriving on several fronts, from specialty housing for the deaf and aging to hotels and high-end luxury housing. The firm, which had frozen most salaries during the recession, began handing out raises a couple years ago. And for the younger staff especially, the outside job offers have begun to pour in.

"There has been a lot of active recruiting here because of CAD. Our staff is a commodity because we're real proficient," Silsby says. She adds that as she has moved up the firm's ladder, she is no longer pursued as much by recruiters, since she is perceived more as a manager than a production person.

To keep young staff from straying, Silsby says, the firm began passing out merit bonuses. It also started having the younger professionals present their projects to the rest of the firm. Says Silsby: "It's to recognize good work, a chance to show off a little."

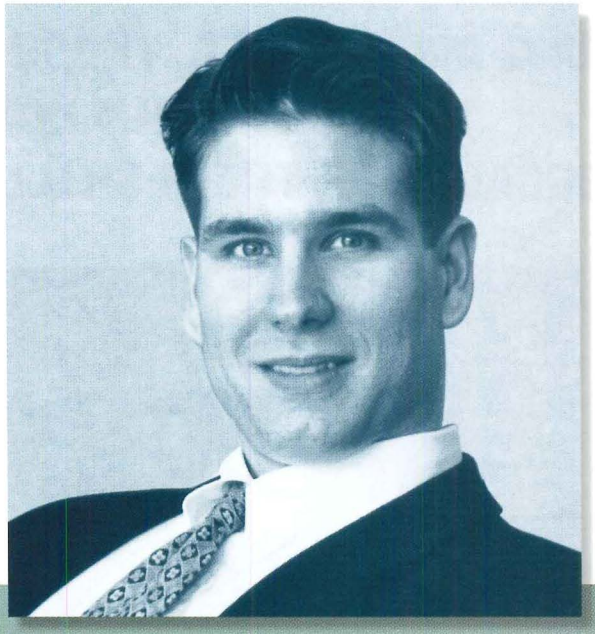
Vince Hunter

Vince Hunter, a 28-year-old architect at Weihe Design Group in Washington, D.C., can see the change in his profession's newly burnished, more affluent image when he visits his favorite watering holes. "Word gets around," says Hunter, who is unmarried. "Not long ago, when you were trying to meet someone, it was always better to have a line like, 'I'm in real estate.'" Now, he says, "being an architect, purely from a social point of view, is no longer bad at all."

That's quite a change from what he heard as an architecture student at Syracuse University in the early 1990s, where many of the faculty were from New York City and the messages reaching fledgling architects were uniformly bleak. With even the dean delivering jeremiads about the job picture, Hunter recalls, his classmates were leaving school for other fields.

When he graduated in 1993, no one was hiring. "You couldn't get jobs in design. Everyone just wanted to throw you in front of a computer," he says. After months of cold-calling prospective employers, Hunter found a job with a small firm in Norwich, Connecticut. He was barely scraping by on the salary and had to move in with his parents. Casting around for other opportunities, he decided Washington was promising turf and landed his current job at Weihe.

In the last six months, Hunter's experience has differed radically from his previous hat-in-hand job hunt: he's had five offers as well as frequent calls from headhunters. "Headhunters never used to call architects!" he says. The salary offers have been generous, upwards of $40,000, even though Hunter is still unlicensed. Another sign of the times: his firm matched the offers to keep him from leaving. So things are looking up for Hunter these days, in the studio—and at the local bar.



Vince Hunter *barely scraped by after graduating; now, though not yet licensed, he routinely receives salary offers of $40,000.*

Veronica West

At 38, Veronica West is already a veteran of two recessions. She graduated during the first of the slumps in 1982 with her professional degree from California Polytechnic State University in San Luis Obispo. With little help from her school in job placement, it took months of interviews for West to find her first position. Finally, she was hired at Miralles Associates, a small firm in Altadena, California. West rose through the ranks, became a principal, and stayed on for 13 years.

The next recession didn't hit Miralles until the mid-'90s—several years later than most firms—because funds were still flowing into public works, Miralles's specialty. When the downturn hit, however, it hit hard. Despite her senior status, West found herself jobless in midcareer, in the winter of 1996.

If she had to be laid off, 1996 turned out to be a good year for it to happen. In less than a week, West had found a new job at the small but growing Pasadena-based La Canada Design Group, which specializes in higher-education and high-tech structures.

La Canada's open philosophy, in which everyone in the office sees contracts and responsibility is there for the taking, had a special appeal for West as a young architect—along with the firm's scenic location in Pasadena. The firm's recent upsurge in profitability has also meant staff bonuses: "We're all very excited about that," West says.

TODAY THE PICTURE IS, IN A NUMBER OF RESPECTS, DRAMATICALLY DIFFERENT. ARCHITECTURAL FIRMS ACROSS THE COUNTRY ARE DROWNING IN WORK.

YOUNG ARCHITECTS, THOSE IN THEIR LATE 20S TO MID 30S, ARE SUDDENLY HOT PROPERTIES, ARDENTLY COURTED BECAUSE OF THEIR SKILLS AND THEIR SCARCITY.

Veronica West, *now 38, was laid off in 1996 after spending 13 years with one firm. She got a new job in less than a week.*

The staff has grown from 11 to 17 since she arrived two years ago, and they are now in the process of searching for more young architects. "We're finding that it's difficult to find qualified people. Just a year ago, job applications were raining down on us. Now we've been advertising for project architects, and we've had only five or ten replies," West says.

Sharon Ferguson Brittain

In 1984 Sharon Ferguson Brittain became the first female African American to graduate from Ball State's architecture school. The nation and the architecture field were both on the way to recovering from the early-'80s economic slump. Still, Brittain was greeted by an obstacle of a different, more intractable sort as she set out on her first job search in her native Indianapolis.

While many of her friends at school easily slipped into jobs days or weeks after graduation, Brittain's job hunt lasted all summer, with rejection after rejection. "In school," she recalls, "I was told not to expect to make a lot of money, and they were right. I didn't. I tried to find a job in Indianapolis first. Indianapolis didn't have black architects back then. I went on job interviews and got these surprised looks from potential employers."

Reluctant to expand her job search beyond her hometown, Brittain sent applications to three dozen medium and large firms in other cities, but still came up with nothing. Brittain finally received a warm reception in Atlanta, where business was booming and at least some firms were progressive about ethnic diversity as well as women on their staffs. In September 1984 she was hired by Cooper Carry & Associates, an award-winning firm with a large number of interns and a broad range of specialties and projects.

At Cooper Carry, Brittain spent three happy apprenticeship years working on speculative office buildings and on Underground Atlanta, a massive complex of retail shops. Brittain then joined Nix, Mann & Associates—now part of Perkins & Will—where she would stay for six years. She tackled larger projects, including a Veterans Administration hospital, and began to master computer design. Even then, she recalls, she was a rarity in the field as an African American woman.

Personal life forced professional changes in the early '90s: Brittain married, had a baby, and began looking for a job with fewer hours. While on maternity leave, she learned that the state Board of Regents was looking for architects to manage construction and renovation projects on Georgia's two- and four-year college campuses. "It meant leaving the drafting board behind," Brittain says. "But I've been program manager for the last four years, and the experience is just incredible."

Lately, with Georgia's economy relatively flush and an education-minded governor pouring money into new construction, Brittain has had her hands full. Her office is managing 150 campus projects, and she says Governor Zell Miller is asking the legislature for nearly $200 million to fund new projects. Now that she's empowered to help select architects for those projects, Brittain is a champion of smaller firms, especially those owned by females or minorities.

Having made the transition from employee to employer, Brittain is finding such architects in scarce supply: "We advertised two positions for program managers," she says, "and we didn't get any responses." ■

Sharon Ferguson Brittain *had to leave her hometown of Indianapolis for Atlanta to get her first job in architecture.*

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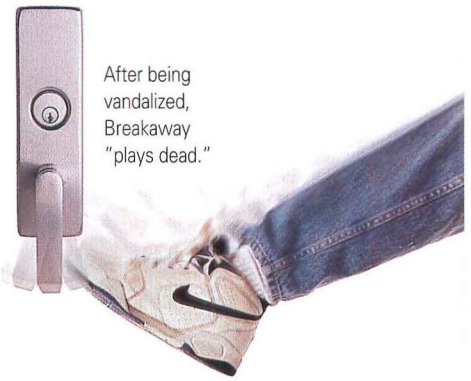
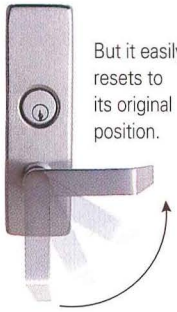
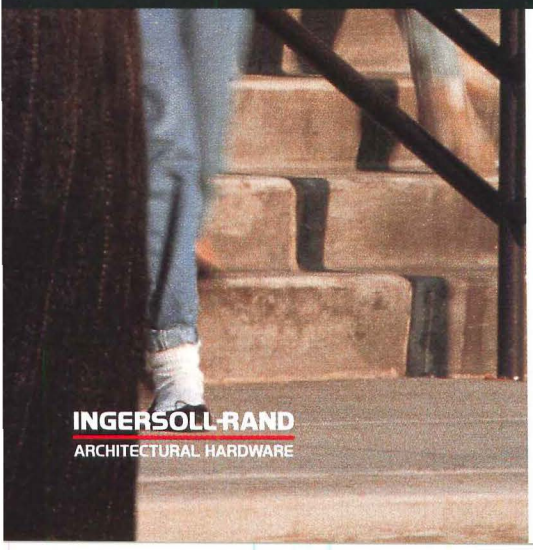


After being vandalized, Breakaway "plays dead."



But it easily resets to its original position.

F SHAPE. SO WHY ISN'T HE?



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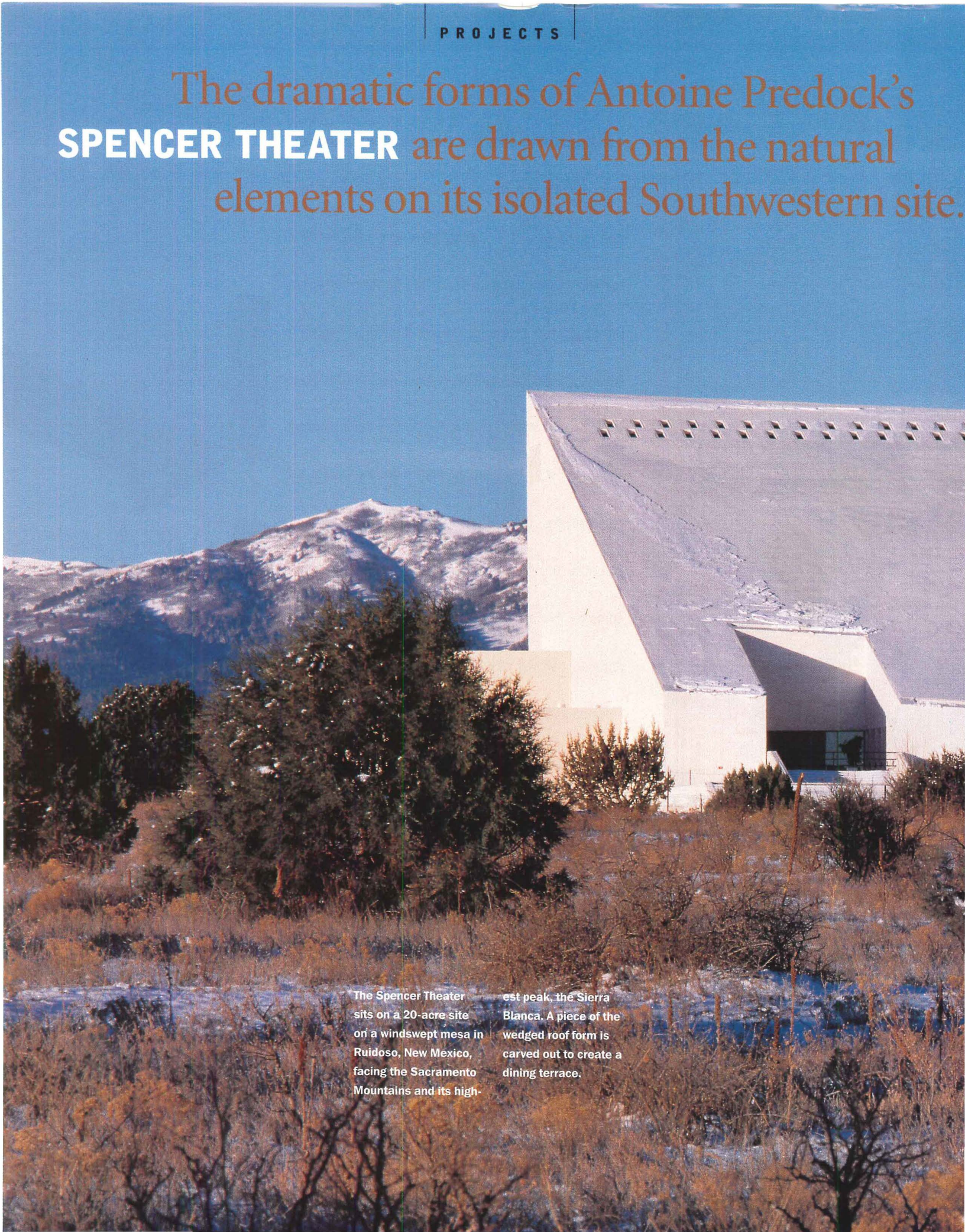
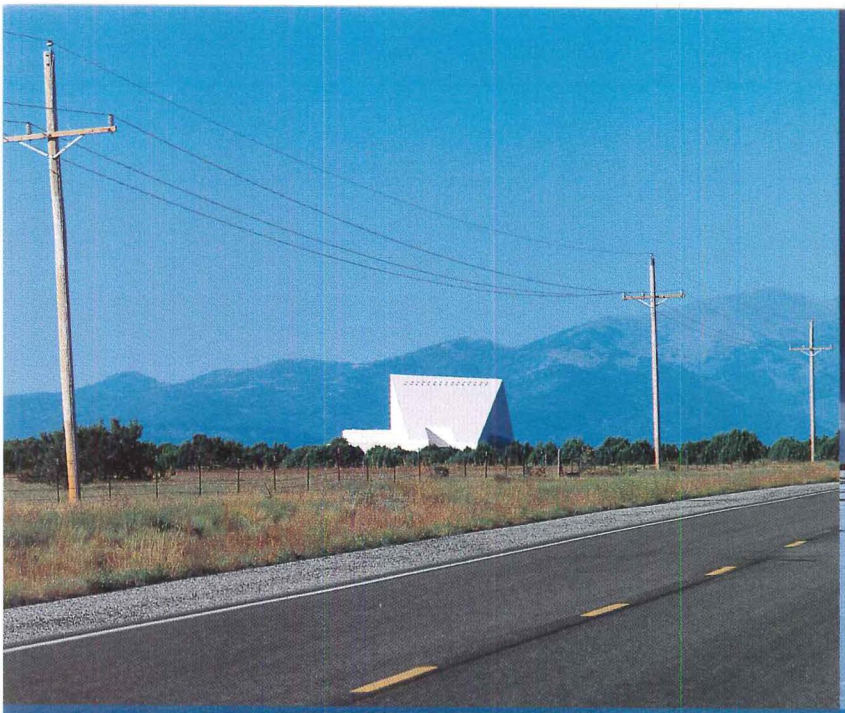
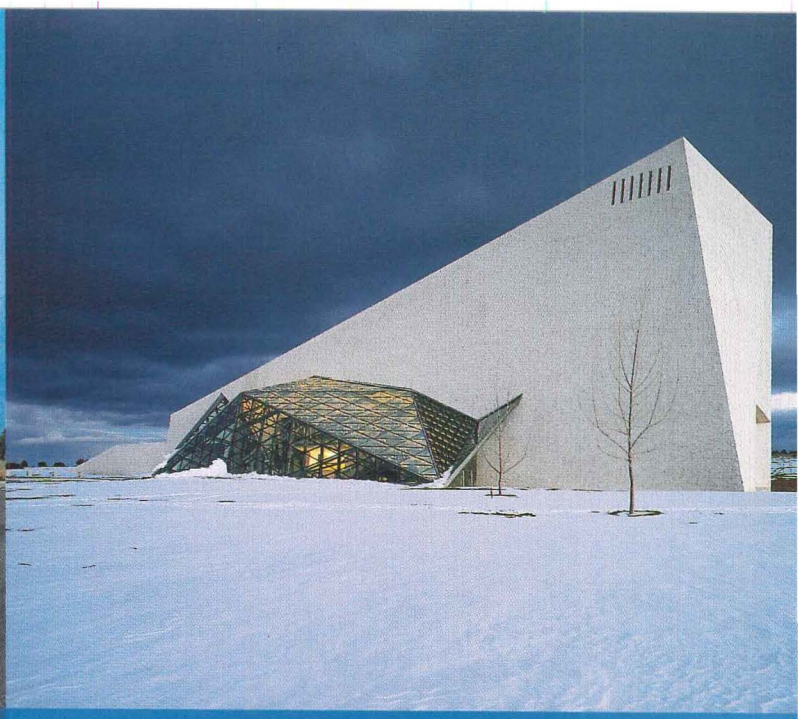
SPENCER THEATER

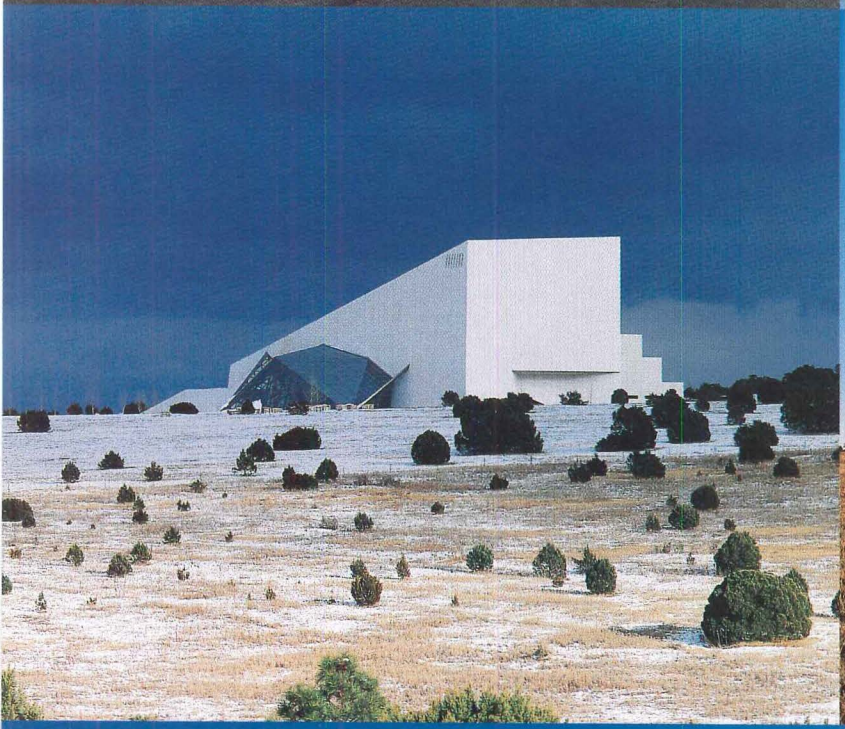
The dramatic forms of Antoine Predock's are drawn from the natural elements on its isolated Southwestern site.

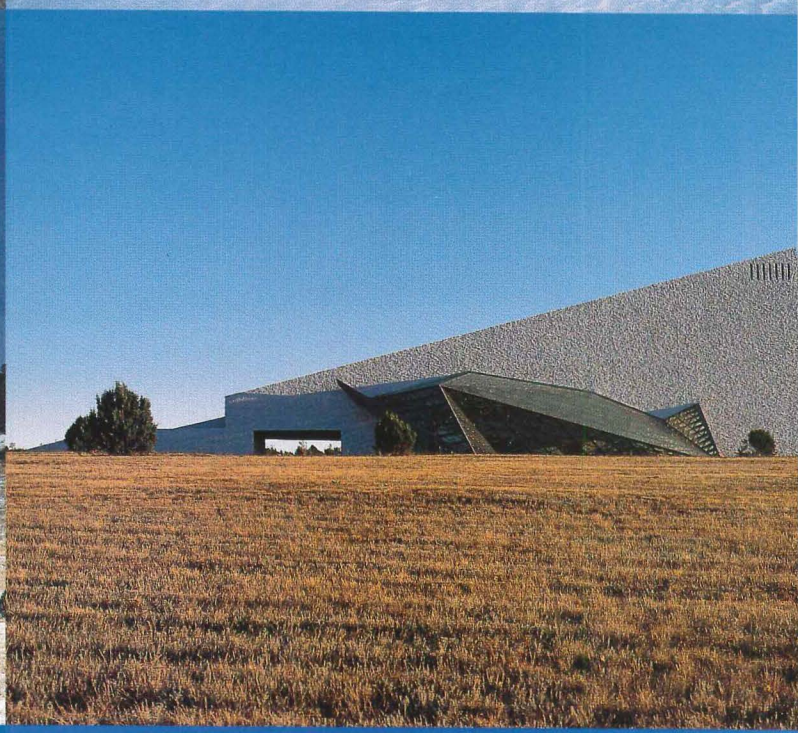


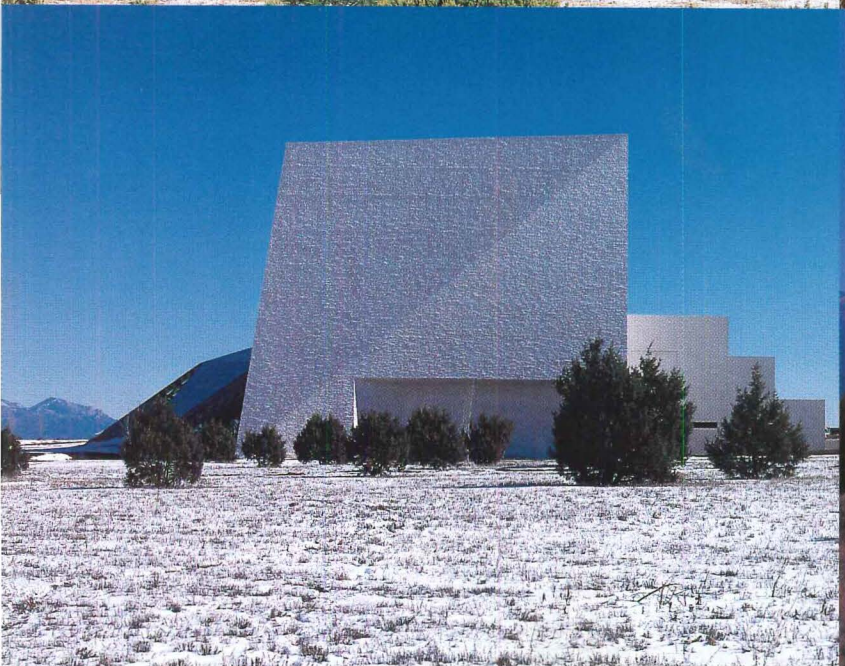
The Spencer Theater sits on a 20-acre site on a windswept mesa in Ruidoso, New Mexico, facing the Sacramento Mountains and its highest peak, the Sierra Blanca. A piece of the wedged roof form is carved out to create a dining terrace.

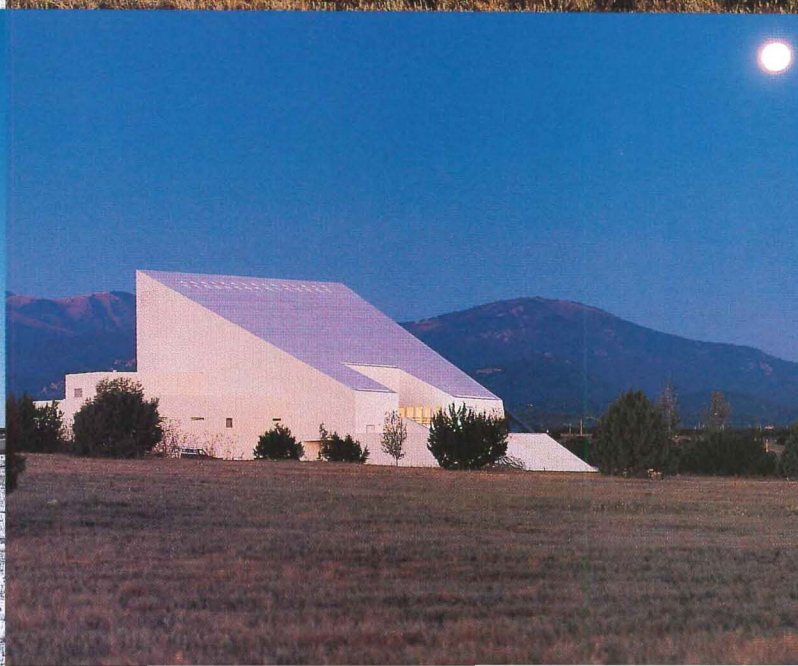












by Karen D. Stein

Located in the foothills of the Sacramento Mountains near the Texas border, the remote New Mexico town of Ruidoso is an unlikely place for a performing arts theater, particularly one with world-class aspirations. With a year-round population of 7,000 people that swells to about 28,000 during summer months, the area has long been a hub of outdoor activity: skiing, hiking, quarter-horse racing. But longtime local resident Jackie Spencer, a fan of musical and dramatic performances, longed for other forms of entertainment and decided to do something about it.

Spencer had moved to the area in 1948 when she married A. N. Spencer, a prominent New Mexico cattle rancher. During a trip to Boston to visit her college-age daughter in the early 1970s, Jackie Spencer attended an outdoor concert that proved to be inspirational, though not in the expected way. She recalls sitting on the banks of the Charles River and listening to the William Tell Overture, all the while thinking that if such a pleasurable performance was possible in such an unlikely venue (at least to her mind), then surely the more majestic backdrop of her own backyard had something to offer. Spencer, who has suffered from asthma her entire life, "doesn't do well in cities." Instead, she wanted city culture to come to her.

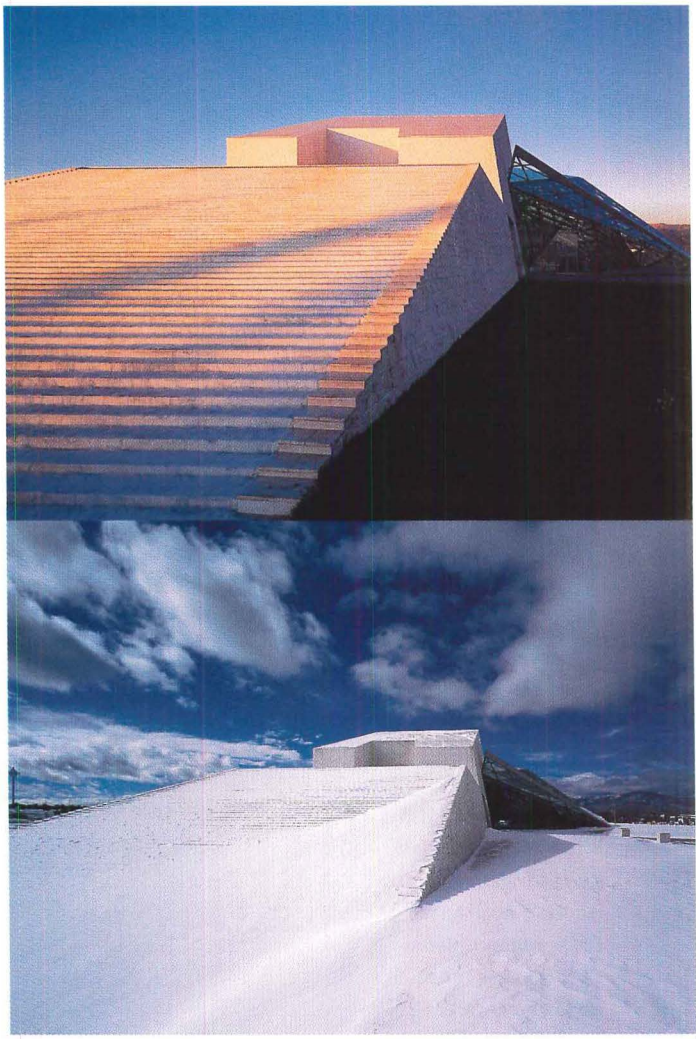
Upon her return, Spencer gradually went about putting her plan into action with the quiet support and advice of her husband. "It took me 15 years to put together enough money," Spencer explains of the $20 million she amassed to build the theater. After examining possible sites in Ruidoso, which she dismissed as "too crowded," she eventually purchased a 20-acre parcel on a mesa between downtown and the even smaller enclave of Alto, New Mexico. "I wanted nothing around it," she says, describing the site's splendid isolation.

She began working with one unnamed architect—"We dreamt up something awful," Spencer admits of their ill-fated collaboration—before setting her sights on someone with an international reputation. She canvassed her contacts, and a friend recommended Antoine Predock, who in addition to having completed performing-arts facilities at Arizona State University in Tempe and the University of California, San Diego, lives in Albuquerque, some 250 miles from Ruidoso—relatively close by New Mexico standards. "I called him out of the clear blue sky," chuckles Spencer.

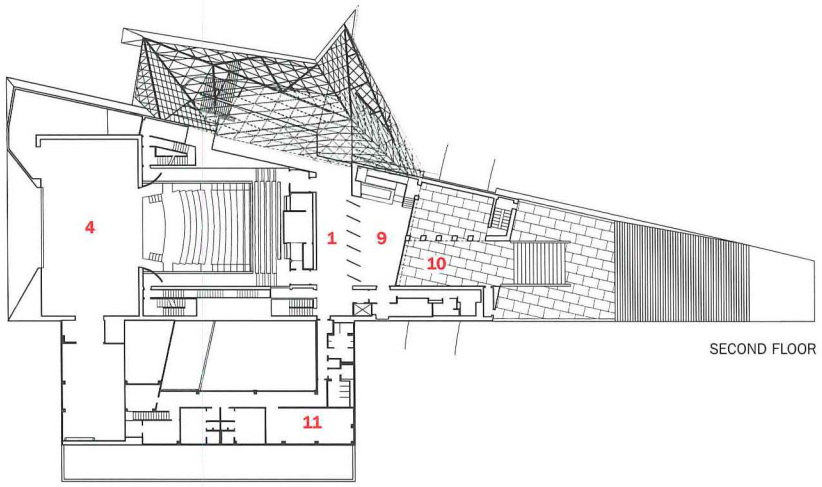
Predock confirms her description. "It came out of nowhere," he says of the commission, which he found striking not only for its dreamlike setting on the barren, windswept mesa but for its private patron with the resources and agenda of a civic institution. "It's the kind of story you hear about: a person of vision who wants to bring something special to an unlikely area. But these stories don't always happen," says the architect,

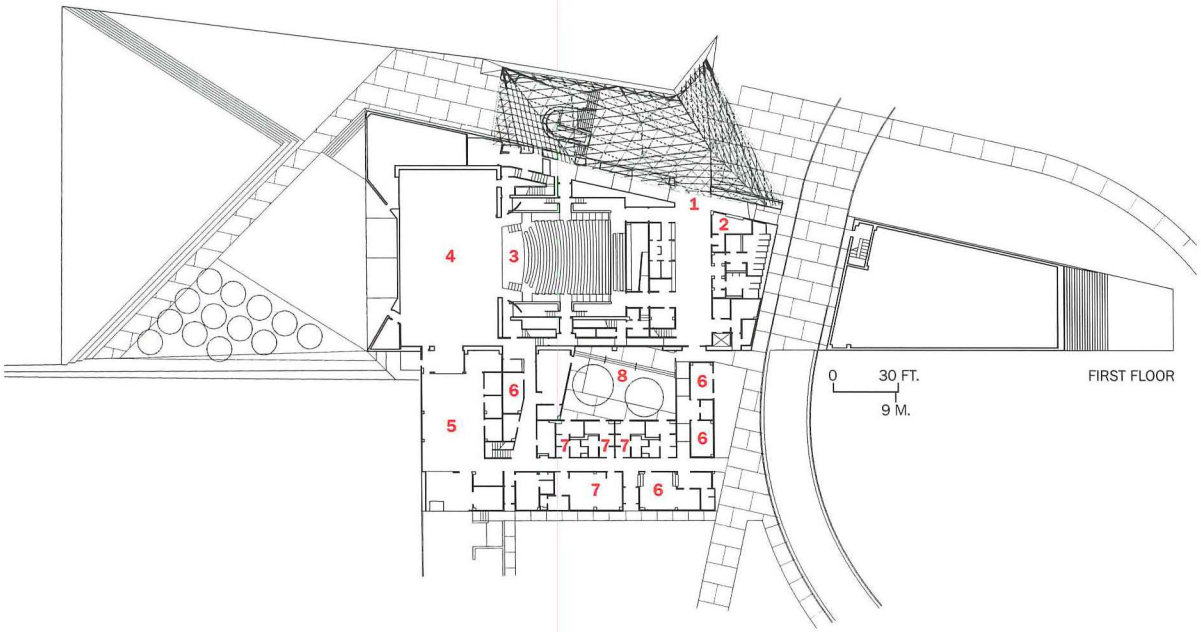
Project: *Spencer Theater for the Performing Arts, Ruidoso, New Mexico*
Architect: *Antoine Predock Architect—Antoine Predock, FAIA, principal-in-charge; Geoffrey Beebe, AIA, and Douglas Friend, AIA, senior associates-in-charge; Jorge Burbano, Devendra Contractor, AIA, Mark Donahue, AIA, W. Anthony Evanko, AIA, Paul Gonzales, Thea Hahn, Georgina Kish, Jennifer Lein, Robert McElheney, Lawrence Mead, John Morrow, George Newlands, Hadrian Predock, AIA, Kira Sowanick, Michele Cohen, Deborah Waldrip, project team*
Engineers: *Paragon Structural Design (structural); P2RS Group, Inc. (mechanical/plumbing); Telcon Engineering (electrical)*
Consultants: *Fisher Dachs (theater); McKay Conant Brook (acoustical); Lighting Design Alliance—Alexis Friend (lobby lighting)*
General Contractor: *PCL Construction Services*

The 54,000-square-foot theater takes on a variety of guises at different times of day and night, and in different weather conditions (opposite). During warmer months, water trickles down the roof's 68 steps (below), which evoke the Casa Malaparte in Capri, Italy, and is recirculated to the top.



1. *Lobby*
2. *Box office*
3. *Auditorium*
4. *Stage house*
5. *Shop*
6. *Office*
7. *Dressing room*
8. *Courtyard*
9. *Theater club*
10. *Terrace*
11. *Boardroom*





At an altitude of 7,200 feet, the theater's café terrace (right) remains relatively cool in the summertime. Colored-glass "Onions" on the ceiling are by artist Dale Chihuly (far right).

Some 700 halogen fixtures suspended from wire grids illuminate the underside of the faceted glass and steel canopy of the foyer.

noting his client's fierce determination to provide something unusual in program and form for her hometown.

Like his client, Predock is a transplanted Midwesterner, and after more than 30 years of living in Albuquerque, his buildings still express a newfound awe of the terrain, vistas, and light of his adopted home. His buildings have often been described as thresholds between the dramatic Southwestern landscapes they occupy and the more prosaic worlds of the parking lots and traffic arteries that service them. But they are also attempts to re-create the area's natural elements—mountain peaks, deep ravines, and stark, rocky outcroppings—in architectural form. Predock's strategy of making buildings virtual landscapes served him well for the Spencer Theater. "During one of our first discussions, Jackie and I agreed that we didn't want a blunt, fly-tower building," explains Predock, describing the typical method of accommodating behind-the-scenes theater space. "She also said that she wanted the building to be elegant, rather than some rugged Southwest number."

The architect's solution for fitting the big back-of-house into a streamlined form came directly from the surrounding Sacramento Mountains and the range's highest peak, the Sierra Blanca. In fact, White Mountain became an apt nickname for the design he developed for the Spencer Theater, a wedge of bleached Spanish limestone that rises up toward the snow-capped Sacramentos, enclosing a ticket lobby, a single-story suite of offices, and a fly tower with a 70-foot-high gridiron, all in one sweeping monumental form. A view from the side exposes a cutout

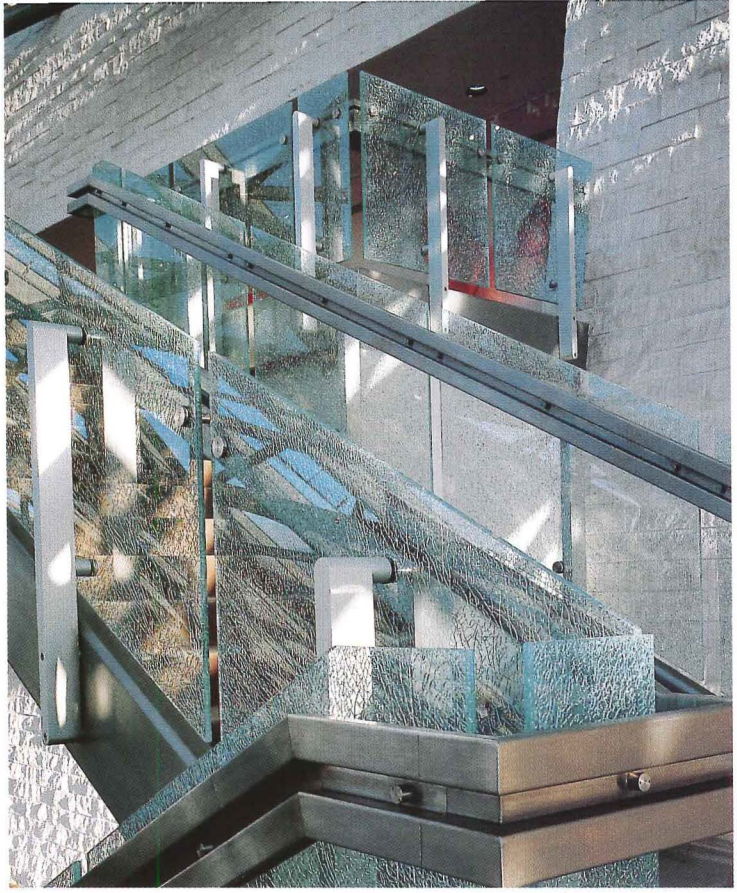
HERE, AS ELSEWHERE, PREDOCK MAKES THE BUILDING A VIRTUAL LANDSCAPE.

where a driveway slices through, creating a covered drop-off area to protect arriving theatergoers from bad weather.

To create a dramatic entrance for this man-made mountain, Predock affixed a crystalline lobby to the exterior, resulting in a form he likens to a fragment of a Stealth bomber that has crashed into the building. Elaborate wood and computer models were made by Predock's office to

The theater is equipped with state-of-the-art lighting equipment, according to Ed Spurr, director of operations and production, who says he has 1.6 million selections of lighting color to choose from.

For acoustic flexibility, curtains behind the stage can be adjusted according to the type of performance. A generous unloading dock and set-staging area also make large-scale productions possible.



Glass panels, which have a layer of fractured glass sandwiched between two unbroken layers, reinforce the shimmering effect of daylight streaming through the crystalline structure of the lobby (left and above).

depict to the fabricator the intricate arrangement of the nine panels of specially cut glass. The faceted glass forms are lined by hundreds of halogen bulbs, making the building a particularly dramatic apparition at night.

The size of the theater was a matter of debate. "An 800-seat theater was Jackie's initial idea," explains Predock. Working with theater and acoustical consultants Fisher Dachs and McKay Conant Brook, the architect determined that with untested audience demand and Spencer's desire for an intimate-feeling space, a hall of 500 seats was a more plausible goal.

"FROM 10 MILES AWAY YOU CAN SEE THIS INCREDIBLE CREATURE, THIS APPARITION, THAT JUST SITS THERE ON THE MESA."

The design was developed with 356 seats on the orchestra level and "finger balconies" wrapping around the space above, for a total of 514 seats. "In this type of theater we try to pull the audience as close to the stage as possible, within the restrictions of building codes," explains Joe Mobilia of Fisher Dachs. The backstage area was configured to hold a series of drapes and partitions that can be adjusted to acoustically alter the space, making it suitable for a variety of performances. Ed Spurr, director of operations and production for the theater, claims there is hardly a performer or troupe he can't accommodate.

Spencer Theater opened last October with performances by jazz musician Dave Brubeck and violinist Nadja Salerno-Sonnenberg. Tickets to the event were gone eight hours after they went on sale. Since then, the theater's twice-weekly program of events, which range from Brazilian classical guitar to the monologues of Spalding Gray, have frequently been sold out, sometimes months in advance. "We projected 70 percent capacity for many of our performances," explains executive director Theta Smith. "But our audience participation has been consistently in the 90 to 95 percent range." School groups are using the theater for children's workshops. And the building is the new tourist attraction of the area. "From 10 miles away you can see this incredible creature, this apparition, that just sits there on the mesa," says Smith. "We have 150 people on any given weekend who just show up and wander through," she reports, adding that she has hired security guards just to monitor all the traffic.

The response to the theater has surprised even its benefactor. "It turned out better than even *I* thought it would," admits Jackie Spencer. Her current plan is to attract as many top performers as possible. The generous dressing rooms arranged around a private courtyard should aid in that effort, says Predock. Spencer also plans to seek financial support in the local community for the theater's $2 million annual operating budget, which, in addition to the entire land acquisition and construction costs, the Spencers have shouldered so far. How often does one person envision and then endow an entire civic facility? "It's very, very, very rare," claims Smith. "I built it for myself," jokes Spencer, explaining her near-perfect attendance record. But the real truth, and the story that all those she worked with on this project are quick to point out, is that she's eager to share it with the world. ■

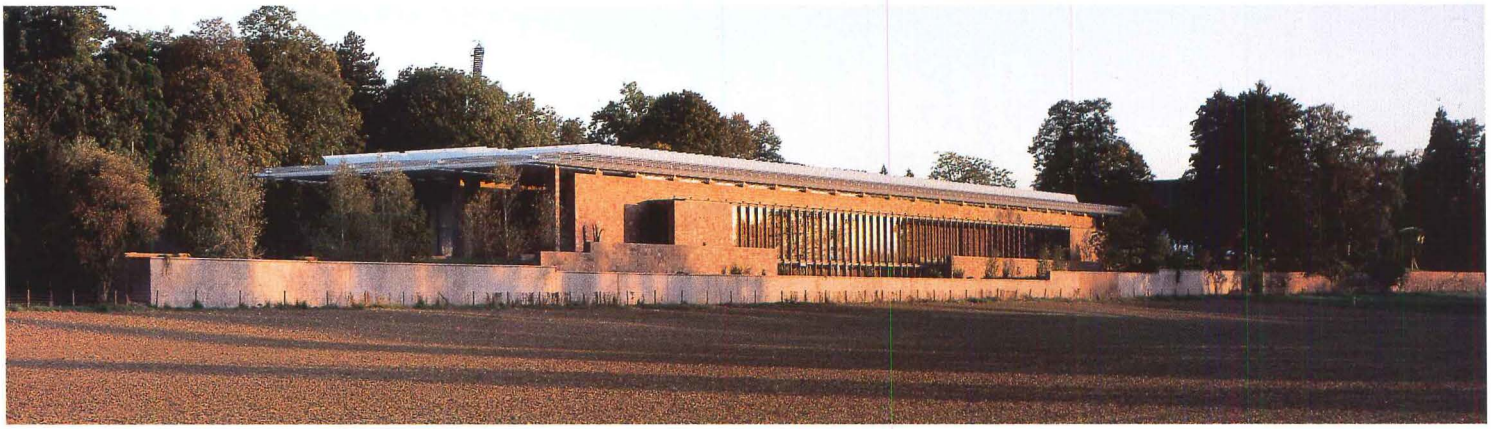
Sources

Elastomeric roofing: *Carlisle White EPDM*
Aluminum fixed, operable windows: *Western Glass & Panel*
Skylights: *Super Sky, Inc.*
Doors: *Preferred Door Company, Specialty Door, Inc.*
Locksets: *Schlage*
Hinges: *Hagen*
Closers: *LCM*
Exit, security devices: *Von Duprin*
Door pulls: *G. Johnson*
Acoustical ceilings, resilient flooring: *Armstrong*
Carpet: *Burlington*
Paints: *Sherwin-Williams*
Cabinetwork: *Precision Interiors*
Furniture: *Palazetti, Knoll*
Interior ambient lighting: *Schroeder Sales, Inc.*
Water feature: *Roman Fountains*

The north end of the museum opens onto a protected agrarian landscape. Mesh panels suspended under the cantilevered glass-panel roof provide shade for the galleries.

The BEYELER MUSEUM, by Pritzker Prize winner Renzo Piano, engages in a discreet dialogue between architecture and art.

by James S. Russell, AIA

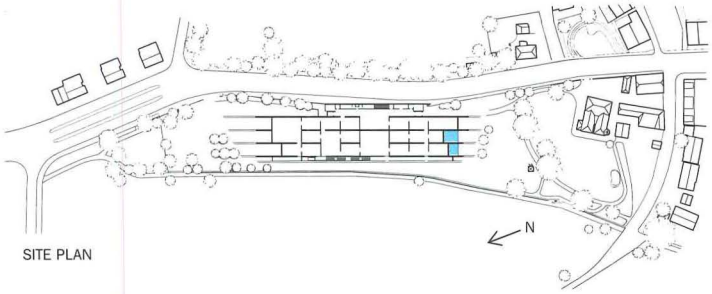


Does the Beyeler Museum belong to some bygone era of modern art museums? It's just a series of parallel walls—admittedly unusually handsome walls, constructed of red Argentine porphyry stone—with a plane of glass and white-painted metal hovering over them. Is this simplicity enough when architecture's biggest names are enclosing galleries with great blocks of hewn stone, surmounting museum atria with voluptuously soaring forms, or shrouding sculpture courts with shimmering glass membranes?

Certainly, Beyeler officials must have asked themselves these questions last year when they learned that their opening would fall in the same week in October as the inauguration of the Guggenheim Museum in Bilbao, Spain. Before Ernst Beyeler and his wife, Hildy, decided to build a museum to house their collection of paintings, drawings, and sculptures by artists ranging from Claude Monet to Anselm Kiefer, it was coveted by major institutions. But such was the avalanche of attention accorded Gehry's masterpiece of sculptural form [RECORD, October 1997, page 74] that the Beyeler resorted to chartering its own plane to bring guests from the Bilbao revels to Basel, Switzerland, for its ribbon-cutting.

Luckily the Beyeler's strategy for asserting its place among important European museums does not depend on an initial blast of publicity, since it received little by the standards of 1997 museum openings. Instead it will rely on the ability of the design by Renzo Piano—who has just been announced as this year's Pritzker Prize winner—to display the collection to best advantage. The Beyelers specifically directed Piano to make a museum whose architecture, according to Markus Brüderlin, chief curator, "serves the art and not just itself." Piano nevertheless found his own way to develop an architectural dialogue with the art.

The patrons, who have been art dealers since the 1940s, had originally intended to donate their collection to a major institution, and museum directors in several European and American cities courted them. The Beyelers' holdings include multiple examples of important late



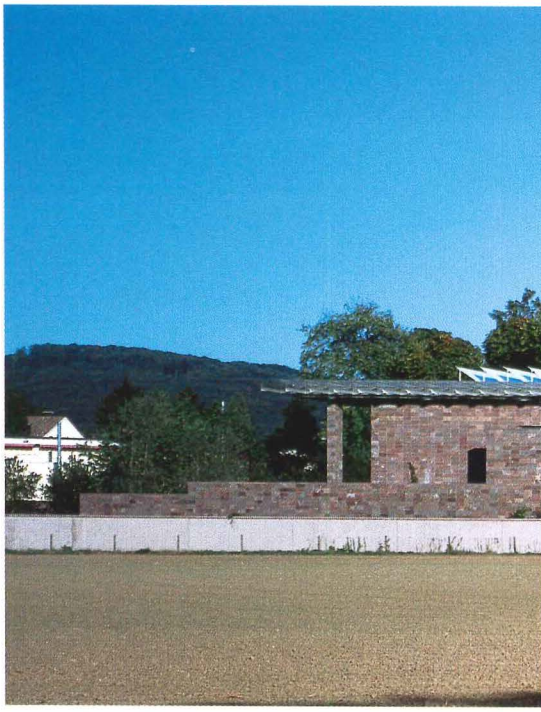
SITE PLAN

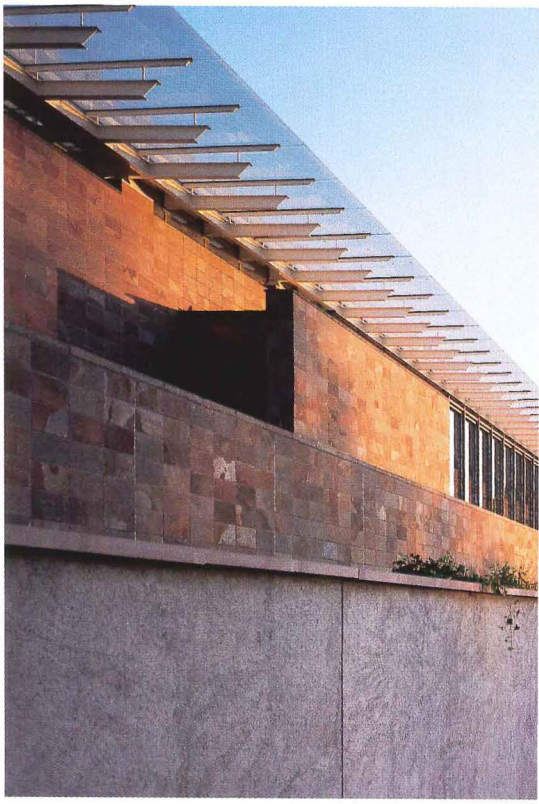
Impressionist paintings by Cézanne, Van Gogh, Monet, and Degas, which, according to Brüderlin, "show the direction toward abstract art." Twentieth-century works in the collection range from Mondrian, Kandinsky, Giacometti, and Picasso to American paintings of the postwar era by Warhol, Lichtenstein, and Rothko to 1980s Expressionist work by Georg Baselitz and Anselm Kiefer.

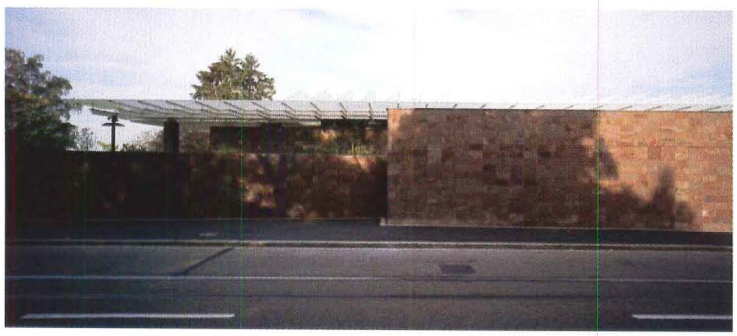
In short, it is a blue-chip collection of modern art that local officials and the Beyelers sought to keep in the collectors' home city of Basel. Once a suitable site was found in Riehen, a close-in suburb with the character of a village, the government arranged its purchase. *(text continues)*

Project: *Beyeler Museum, Basel, Switzerland*
Owner: *Fondation Beyeler*
Architect: *Renzo Piano Building Workshop/J. Bürkhardt+Partner AG—Renzo Piano, B. Plattner, associate-in-charge; L. Couton, J. Berger, E. Belik, W. Wassal, A. Schultz, P. Darmer, P. Hendier, W. Mathews, L. Epprecht, J. P. Allain, project team*
Engineers: *Ove Arup & Partners (structural, daylighting); Cyrill Burger & Partner (civil); Elektrizitäts (electrical); Forrer (HVAC); Bogenschütz (plumbing)*
Consultants: *Bogner & Lord (museum planning); Arge f. Grünplanung Schönholzer+Stauffer (landscape)*

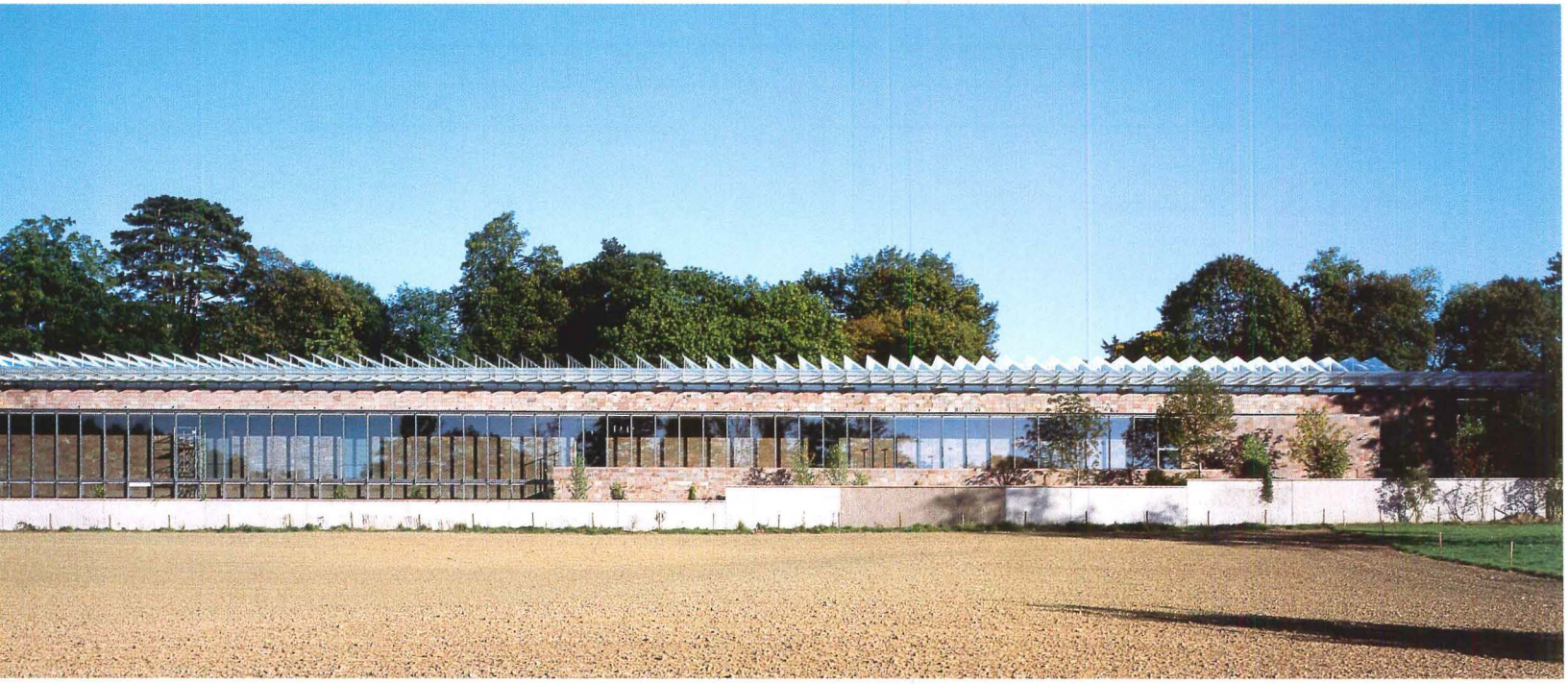
Piano developed the museum's expressive power through the visual contrast of the weighty stone piers and walls, the hovering glass-and-metal roof, and the diaphanous veil of the curtain wall. This southern elevation, with the main museum entrance at right, "explains" the building to the visitor.







Above: The top of the curtain wall at the winter garden is held well beneath the cantilevered glass roof panels. Left: Layered stone walls enclosing service spaces buffer the museum from the street. Top right: The bulk of the building appears to emerge from the agricultural landscape. Bottom right: Layered walls anchor the west elevation.



(The Beyelers built the museum; the Fondation Beyeler operates it with assistance from the local government.) At the south end of the site was a much-altered villa and outbuildings within an English-style garden landscape. The villa was remodeled to house administrative offices and a restaurant. The rest of the site rolls downward from the street to the north and west. Farm fields and a tree-dotted swale beyond the site are part of a protected agrarian landscape at the Swiss-German frontier.

Ernst Beyeler explained that he chose Piano as his architect based on the strength and calm he felt the architect had created for the Menil Collection, in Houston, built in 1986. But he also liked the brash urban spectacle of the Centre Georges Pompidou, in Paris, which Piano had designed early in his career, with Richard Rogers (and which he is now helping to overhaul). "We thought the truth might lie somewhere in between," explains Beyeler.

THE SERENITY OF THE DESIGN DRAWS THE EYE TO THE SMALL-SCALE BALLET OF CONNECTIONS AND DETAILS.

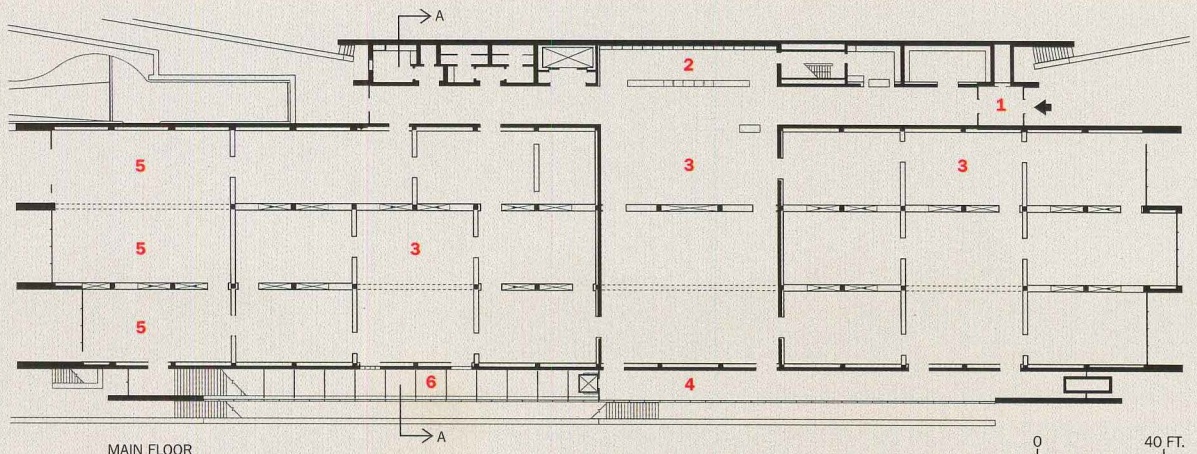
But the truth, in museum terms, can be slippery. Museums have gradually become an important expressive outlet for architects and the chief way architecture tells its story in the cultural realm. When museum architecture is dramatic or assertive, however, it can raise the hackles of curators and artists who find their own endeavors upstaged by the grand gesture. On the other hand, the museum that is too hushed, too carefully proportioned or tailored may fail to attract the audience necessary to justify the public support most museums require.

The work of Piano is sufficiently diverse that the design lineage of the Beyeler cannot be clearly traced. One antecedent is the Menil Collection's neutral Miesian box, topped by an assembly of light-refracting lightweight-concrete leaves. Another is the 1995 Cy Twombly Gallery, an addition to the same collection [RECORD, May 1995, page 78], in which heavy masonry walls are roofed with a layered, light-filtering system both more refined and more discreet than the earlier building. But Piano's career over the years has zigged into glitzy expressionism, at the truncated Columbus International Exhibition in his hometown of Genoa, Italy, and zagged to the sculpturally dramatic Kansai Airport in Osaka, Japan [RECORD Pacific Rim, July 1994, page 26].

Piano himself describes his approach as circular, indirect, and intuitive. As he explains in the *Renzo Piano Logbook* (Monacelli Press, 1997), experimenting means "you narrow the circle, like a hawk closing in on its prey." Piano sees much of what he has done as a kind of balancing act between architecture that takes "refuge in pure form" and work that derives from an approach where technology is "an instrument of art." His middle road is to "use technique [i.e., the materials and means of building] to create artistic emotion," and he strives to be like a classical musician in whom skill is so ingrained through practice that it becomes second nature.

The early schemes for the Beyeler resembled Mies van der Rohe's Barcelona Pavilion in their alignment of four walls. Piano intended to step the suites of galleries between the walls down the site's slope, but the level changes were nixed by Ernst Beyeler, who thought the resultant stairs and ramps would make navigating the museum too difficult. Instead, Piano settled the building lower in the landscape so that it would appear to emerge from the slope on the farm-field side, without being sunk too deep on the entrance side. He buffered the galleries by placing a narrow entry bay and services within a thick layer aligned to the street and adding another narrow buffer of winter garden, outdoor stairs, and services along the western elevation.

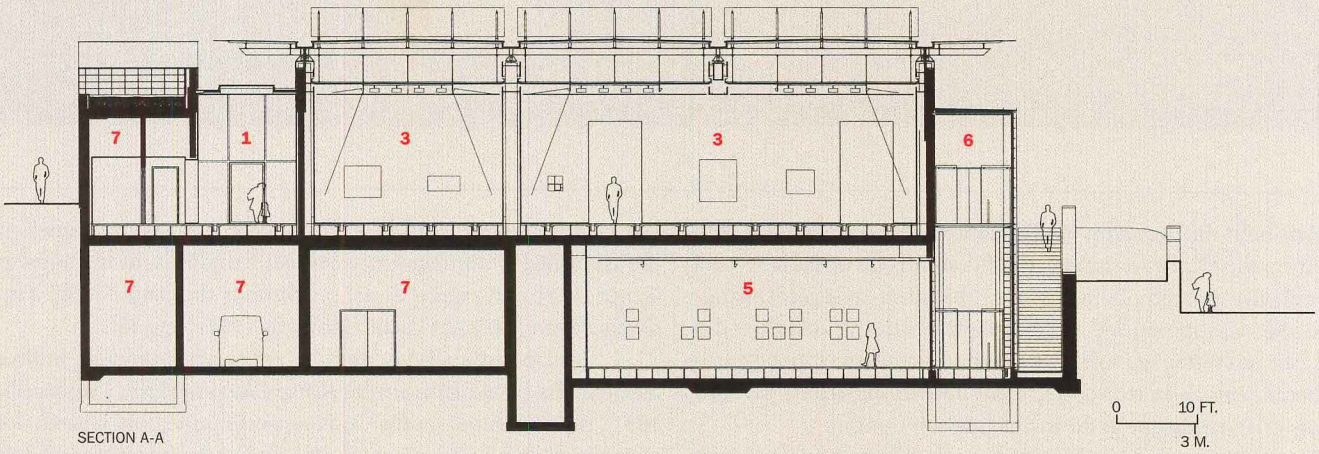
It was in the Twombly Gallery that Piano's Building Workshop first developed the aesthetic contrast between the handmade solidity of the masonry walls and the precision of the multilayered glass-panel roof system, but now it seems timid compared with the layering of stone walls



MAIN FLOOR

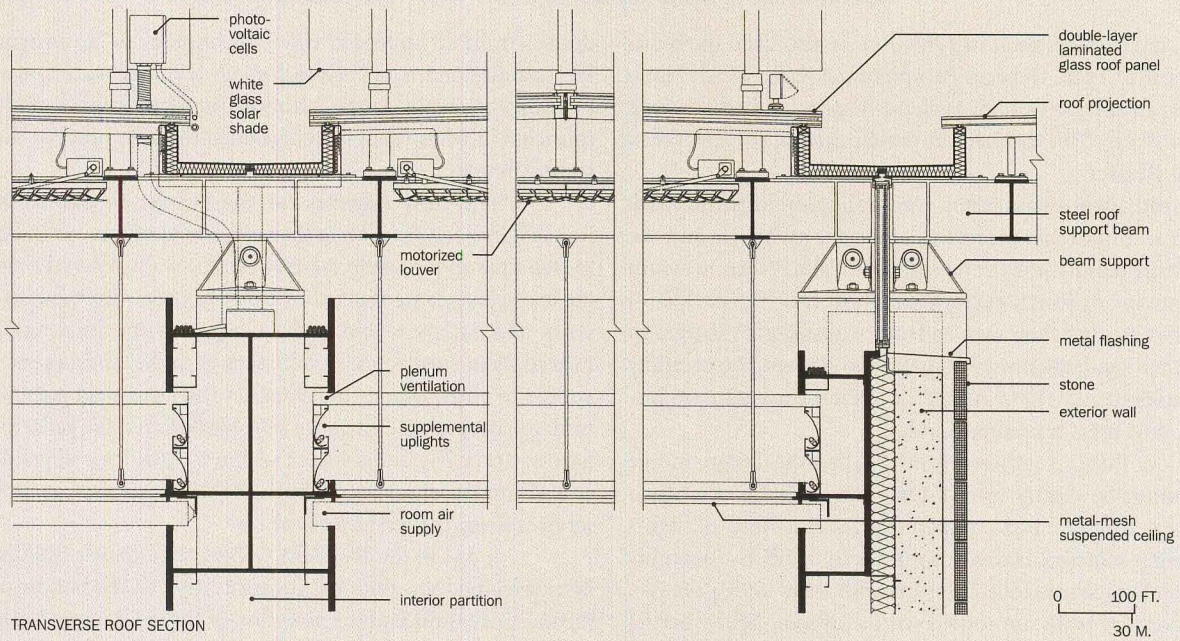
0 40 FT.
12 M.

1. *Entrance*
2. *Bookstore*
3. *Gallery*
4. *Winter garden*
5. *Temporary exhibitions*
6. *Open to gallery below*
7. *Support*



SECTION A-A

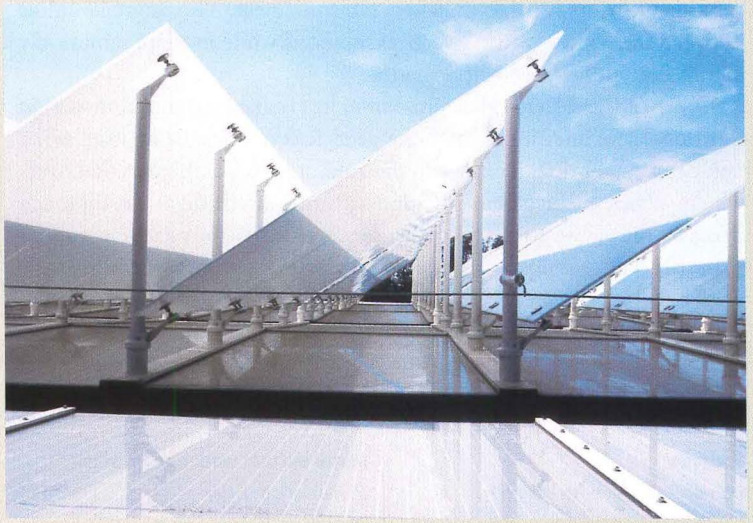
0 10 FT.
3 M.

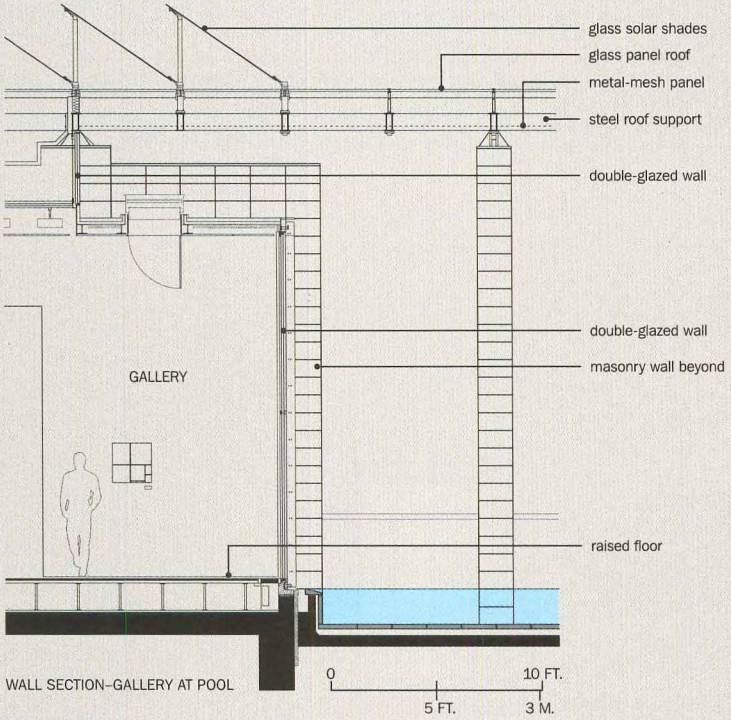


TRANSVERSE ROOF SECTION

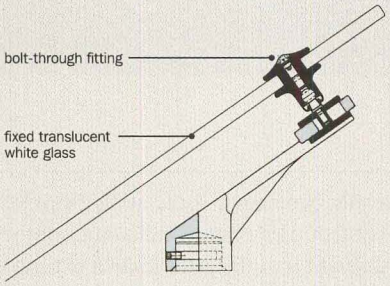
0 100 FT.
30 M.

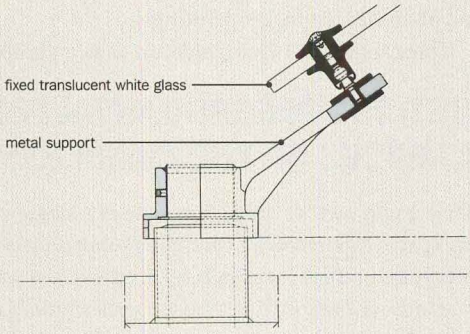
The hovering roof (below) and the limpid interior light create an ethereal effect. The angled translucent glass panels (bottom) permit 30 percent of visible light to pass. Light is further modified in the deep plenum under the glass-panel roof by computer-controlled, motorized louvers triggered by photovoltaic sensors (section details opposite). Metal mesh not only forms a ceiling plane but also diffuses light within the galleries. The section through the south elevation (right) shows the separation between infill curtain wall and structural stone walls.



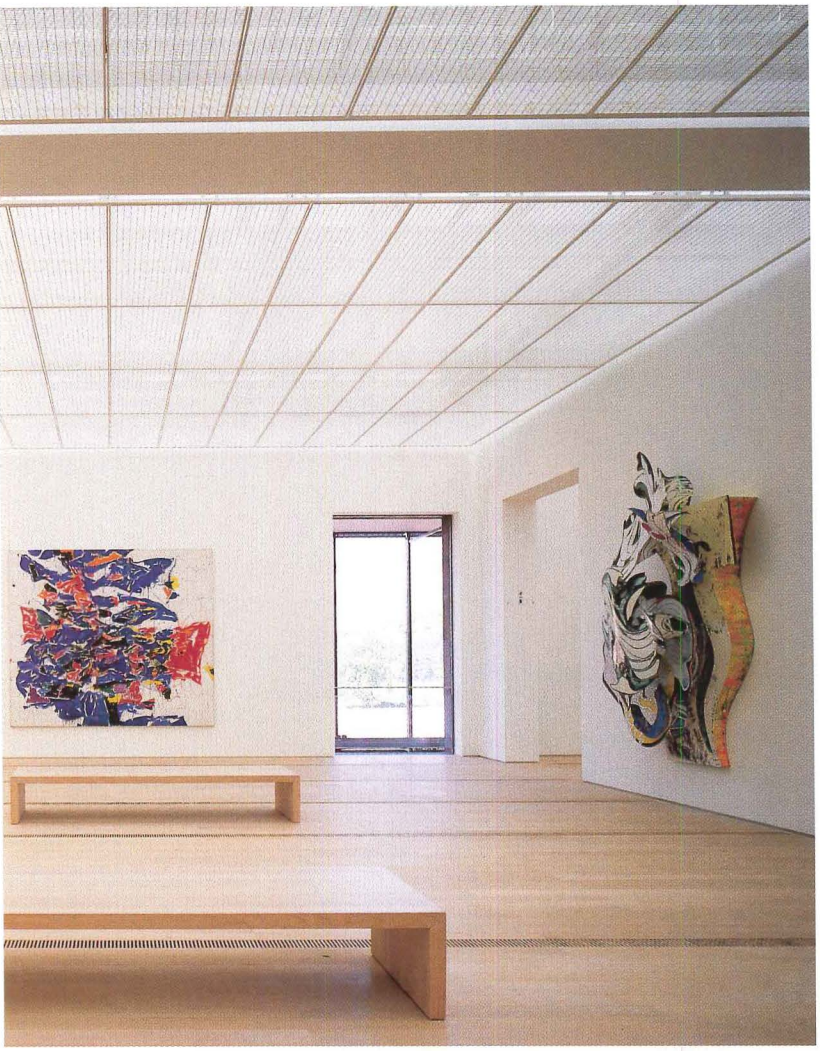


WALL SECTION–GALLERY AT POOL

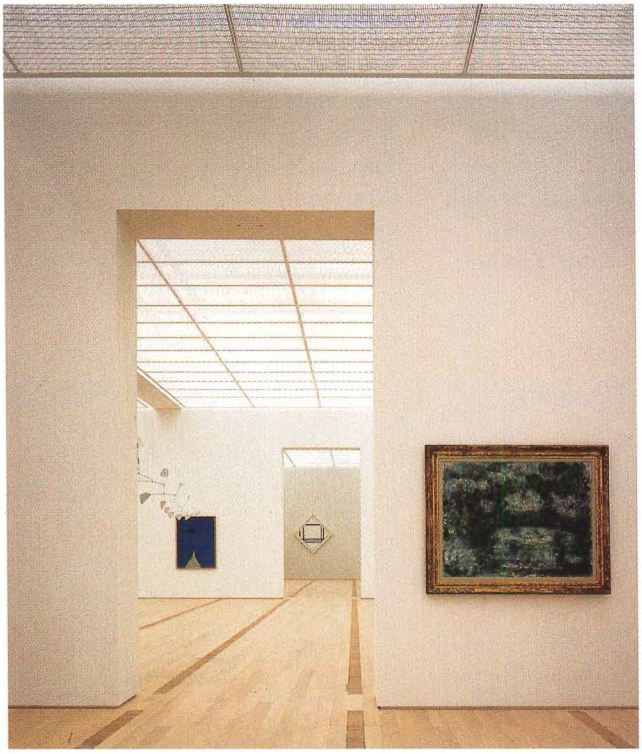




SOLAR SHADE DETAILS



The visual permeability of the metal-mesh ceiling makes for a livelier experience than that offered by the windowless "white cube" spaces the Beyeler's galleries resemble. Opposite: A grouping of Giacometti sculptures stands before the garden and reflecting pool.



and the dramatically projecting roofs at the Beyeler. The transparent glass-panel roof system uses photovoltaics and motor-driven louvers to guide overhead daylight into the galleries in a natural way while keeping light levels within strict curatorial criteria (targets of 80 lux for works on paper and 50 to 200 lux for oil paintings).

There are about 145 artworks on view, a number the Beyelers felt most people could comfortably appreciate in a single visit. Only a few of the gallery spaces depart from a carefully proportioned neutrality, though the counterpoint of thick long walls versus thin cross walls discreetly adds variety and aids navigation: one tends to walk south to north, though the galleries can be toured in any order. The thick walls also incorporate mechanical-ventilation ductwork and lighting. A key departure from most gallery design is a subtle one: the metal-mesh suspended ceiling offers tantalizing glimpses of the technical complexity above, but it is just scrimlike enough to keep the attention focused primarily on the artworks.

THE CEILING OFFERS TANTALIZING GLIMPSES OF THE COMPLEXITY ABOVE.

At a smaller scale, the architecture engages in a lively dialogue with the art. In a gallery facing the reflecting pool the visitor can compare one of Monet's *Water Lilies* with the real thing. The lush garden outside another room helps the viewer appreciate a Rousseau jungle. The expansiveness of the winter garden, a narrow band of glazed space that faces west toward vistas of the agricultural landscape, is intended as a restful pause. The Miesian module stretches for hundreds of feet (an elevator to a lower-level gallery is clad in glass to further extend the vista), but it feels infinite. Close up, hairline-thickness cables delineate a horizontal module between the winter garden's vertical mullions while more pragmatically acting as guides for protective shades.

At the Beyeler Museum, Piano has walked the museum-design tightrope. The building is neither a generic container for neutral, white cubic spaces nor does it engage in the kind of spatial acrobatics that overwhelm all but the biggest and boldest artworks. It's based on an approach that asks the viewer to use his or her senses to assess the relative weight of materials. The serenity of the design is meant to draw the eye to the small-scale ballet of connections and details. According to Ernst Beyeler, the approach works. Unknowingly restating Piano's intention, one visitor told him that it's the only museum she has ever visited that affected her as deeply as music does. ■

Sources

Stone: *Red Argentine porphyry*
Glass roof and facade system: *Vegla, Lanz*
Metal roof: *Jakem*
Metal curtain wall: *Gerber-Vogt, Preisswerk & Esser*
Bleached French oak floor: *Bauwerk Parkett*
Elevator: *Schindler*


Senate
Senado

A research-based restoration of the OLD STATE HOUSE in Hartford, Connecticut, results in rooms from different eras.

by John Morris Dixon, FAIA

The Old State House in Hartford, Connecticut, is one of those landmarks that have endured many alterations, not all of them terribly respectful. Occupied in 1796 as a rather austere shelter for the state legislature, the Old State House was clearly eclipsed by Richard Upjohn's exuberant Gothic Revival capitol, which opened in 1878. The latter was recently restored to its polychrome glory, a relatively easy operation since the building had been little altered, was well documented, and was still filling its original functions. Restoring the older, humbler structure presented a more interesting preservation challenge than that presented by its grand successor.

After the state government moved out, the Old State House had a second life as Hartford's city hall, from 1879 until a new city hall opened in 1915. Since then it has had a sporadic public role as a setting for meetings and exhibits. Altered repeatedly in the 19th century, the building underwent renovations in 1920 (aimed at making it correctly Georgian) and again in 1970 (when air-conditioning was installed and other systems were updated). The latest restoration was initiated more than 10 years ago by the nonprofit Old State House Association, which leases the structure from the city to use as a historical building museum.

In 1987 the association commissioned Smith Edwards Architects of Hartford to come up with a program for the project while it raised $12 million from private and public sources to carry out the work. Jared Edwards led research and design teams that included the association's executive director, Wilson H. Faude, and restoration consultants Abbott Lowell Cummings and J. Peter Spang. Relying on the research, the key players came up with a design strategy that is controversial among preservationists: to restore each part of the building to the period from which the most physical evidence remained in place.

Because of this basic decision, only the Senate Chamber, the least altered of the rooms, was returned to its original form. The House Chamber was returned to its 1880 configuration as the City Council Chamber. Other major public spaces retain the imprint of a 1920 restoration, as does the entire exterior. It would not have been possible to win approval for this piece-by-piece strategy, observes Edwards, without having done extremely thorough historical documentation before anything else. But since it was backed by methodical research and a convincing rationale, the proposal won the support of the association's board, the backing of the city, and the endorsement of the state historical preservation officer, which assured it of federal approval. When some of the donors bristled at historically correct colors or questioned preserving some of the 20th-century alterations, the approved statement of philosophy served as a bulwark. "When push came to shove," recalls Edwards, "the approved strategy assured us that scientific evidence, rather than personal taste, would be followed in all cases."

HISTORY—NOT PERSONAL TASTE—GUIDED RESTORATION DECISIONS.

The visitors' program revolves around costumed historical interpreters impersonating figures who used the building in the past.

John Morris Dixon, FAIA, edited Progressive Architecture *from 1972 to 1996.*

Project: *Old State House, Hartford, Connecticut*
Operating organization: *Old State House Association*
Architect and Interior Designer: *Smith Edwards Architects—Jared Edwards, FAIA, partner-in-charge; Kenton McCoy, AIA, design architect; Maria Watson, AIA, Antonio Matta, AIA, James Carlson, AIA, project architects*
Engineers: *Bounds-Kalberer (structural); BVH Engineers (mechanical) Haley and Aldrich (geotechnical)*
Consultants: *Rolland/Towers (landscape); System Design Associates (lighting)*
Restoration consultants: *Abbott Lowell Cummings, J. Peter Spang (architectural historians); Historic Resource Consultants (historic research); SPNEA Conservation Center (paint analysis); Robert Mussey Associates (furniture restoration)*

In 1920 the State Supreme Court room was turned into a conjectural Bulfinch interior with bold Doric columns. Its subtle, white-on-white paint treatment, spoiled by uniform white painting in the 1970s, was restored. Since it was impossible to re-create an earlier form of this room—or the first- and second-floor lobbies—it was returned to its 1920 state, serving as an example of 20th-century revivalism.

Faude sees historic buildings as the stage sets where history was played out, so he considers these performers, who double as guides and guards, logical extensions of the interior restoration. They tell visitors about their characters ("Hello, I am Daniel Wadsworth…."), the State House's spaces, and what took place there. Their occasional reenactments of pivotal events, such as the trial following the 1839 *Amistad* mutiny, draw enthusiastic audiences.

Bulfinch or Anonymous?

It is by no means certain who designed the Old State House in the first place. Although it has commonly been attributed to the revered Charles Bulfinch of Boston, definitive evidence is lacking. Bulfinch evidently submitted a "mail order" design, as Cummings puts it, but it has been lost, and many features seem to have been reconsidered during construction. The "marble edifice" initially promised by local politicians was quickly transformed into brick and brownstone as the legislature considered appropriations, and each step in the slow-moving construction process was scrutinized. In the 1820s, when the exterior walls were to be capped with a balustrade—a conventional feature at the time—it had be justified as a safety measure for firefighters on the roof. By 1827, when the central cupola was put in place, it was modeled after the one on Mangin and McComb's then recently completed New York City Hall. Nobody knows what Bulfinch proposed.

As originally built, the structure had an open central passage at the first floor, which was enclosed in various ways in later years. In the current restoration, facsimiles of the brick walls that went up in the 1920 renovation have replaced the storefront-type glazing of 1970. The windows and the wood trim are vintage 1920; the originals, which had been put in storage, were reinstalled.

A procession of periods

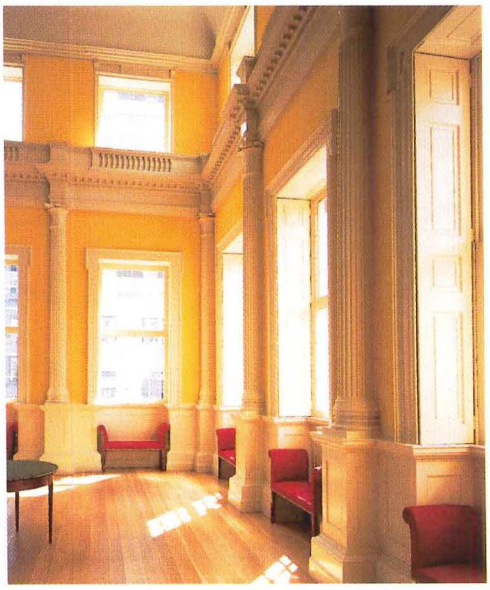
The only meeting room returned to its original form, the Senate Chamber, now represents the year 1818. Some of its furnishings were still on hand, though its central table and lamps had to be reconstructed based on indirect evidence. The room's vivid-yellow wall color was a surprise finding of the research and confirms the 18th-century taste for bold colors that has been revealed in other recent preservation efforts. After an effort to duplicate the color in modern paint resulted in a disturbing gaudiness, a re-creation of the distemper coating, using the original chrome-yellow pigment, yielded a richer effect and won the client's approval.

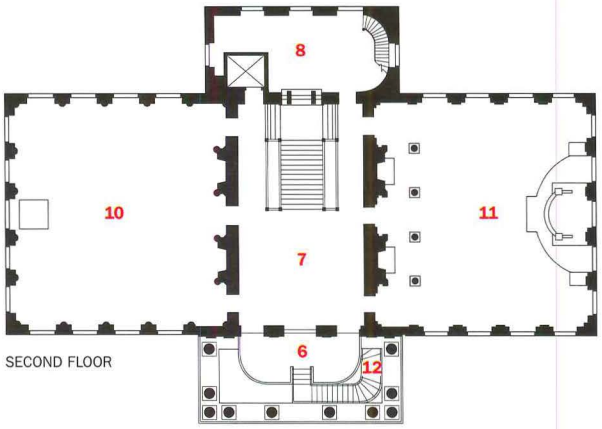
The original House Chamber had been radically altered in the 1870s for its new function as the City Council Chamber, which it was used for until 1915, when Hartford built an elegant Beaux Arts city hall. Good photographic records from the City Council period—and little documentation of its earlier configuration—supported the restoration of this chamber to its late-Victorian condition.

The one large room on the first floor, once used as the State Supreme Court, had been rather grandly remodeled in Georgian Revival mode in 1920. The insertion of several nonstructural Roman Doric columns modeled after those in Bulfinch's Boston State House gave the room a stronger link to its purported original architect. Since little is now known of the room's earlier appearance, it has been preserved as an early-20th-century celebration of the Revolutionary period. Across the first-floor lobby from the Supreme Court, changing exhibit galleries occupy an area that had always been carved up into offices.

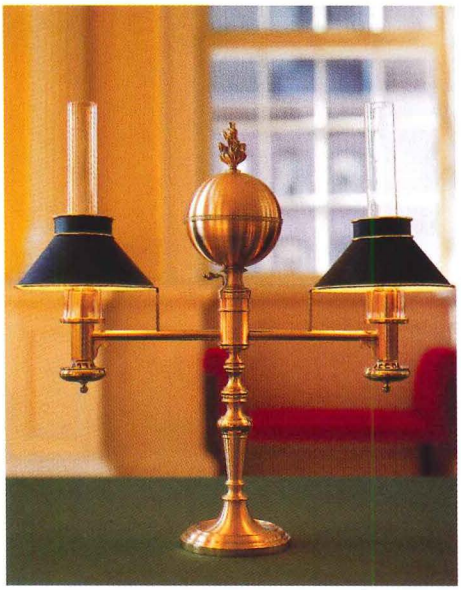
A major component of the project was the construction of a 7,300-square-foot underground exhibition gallery beneath the building's west plaza, accessible from the basement lobby. Unfortunately, the

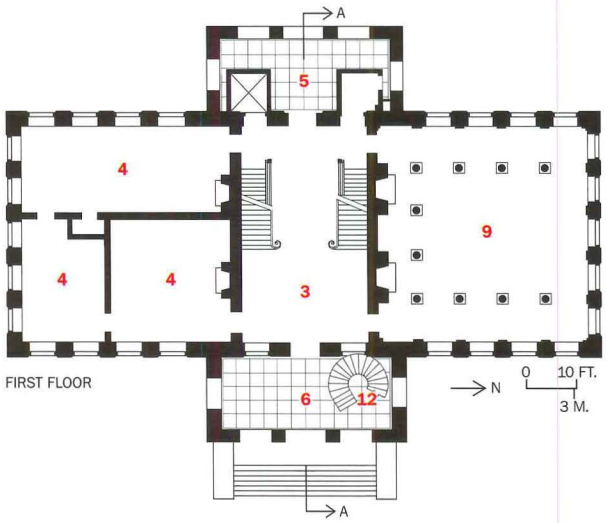
The Senate Chamber, the one room with original detail intact, has walls refinished with a "distemper," identified through paint-sample research. The acanthus leaves on the Corinthian columns were added in 1920, then stripped away in a 1970 restoration. A few of the chairs and benches are original; others are 1950s reproductions. The central table made at that time was later judged a historical misinterpretation and replaced by one that conforms to documentary evidence.

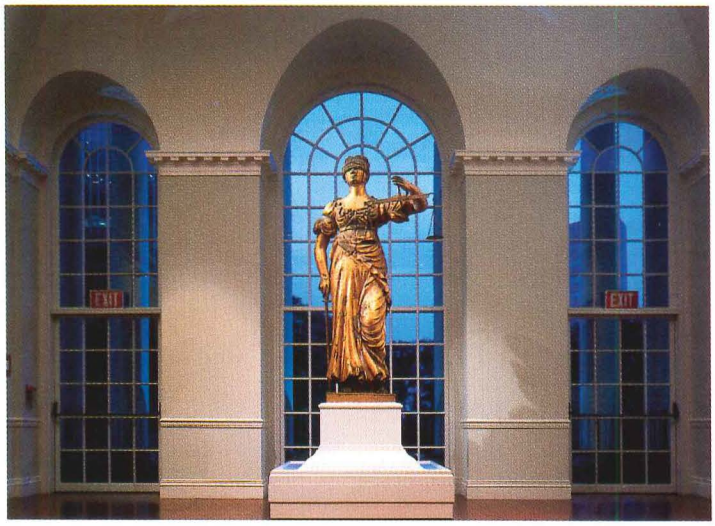


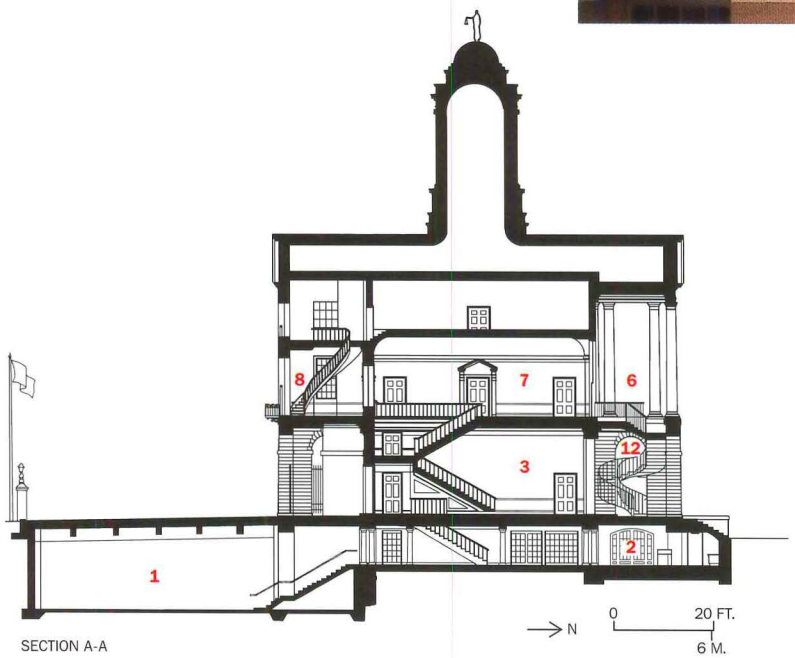


1. *New underground gallery*
2. *New entrance hall*
3. *Great Hall*
4. *Exhibits*
5. *West portico*
6. *East portico*
7. *Great Hall*
8. *Stewart's Museum*
9. *Supreme Court*
10. *Senate Chamber*
11. *City Council Chamber*
12. *New stairs*

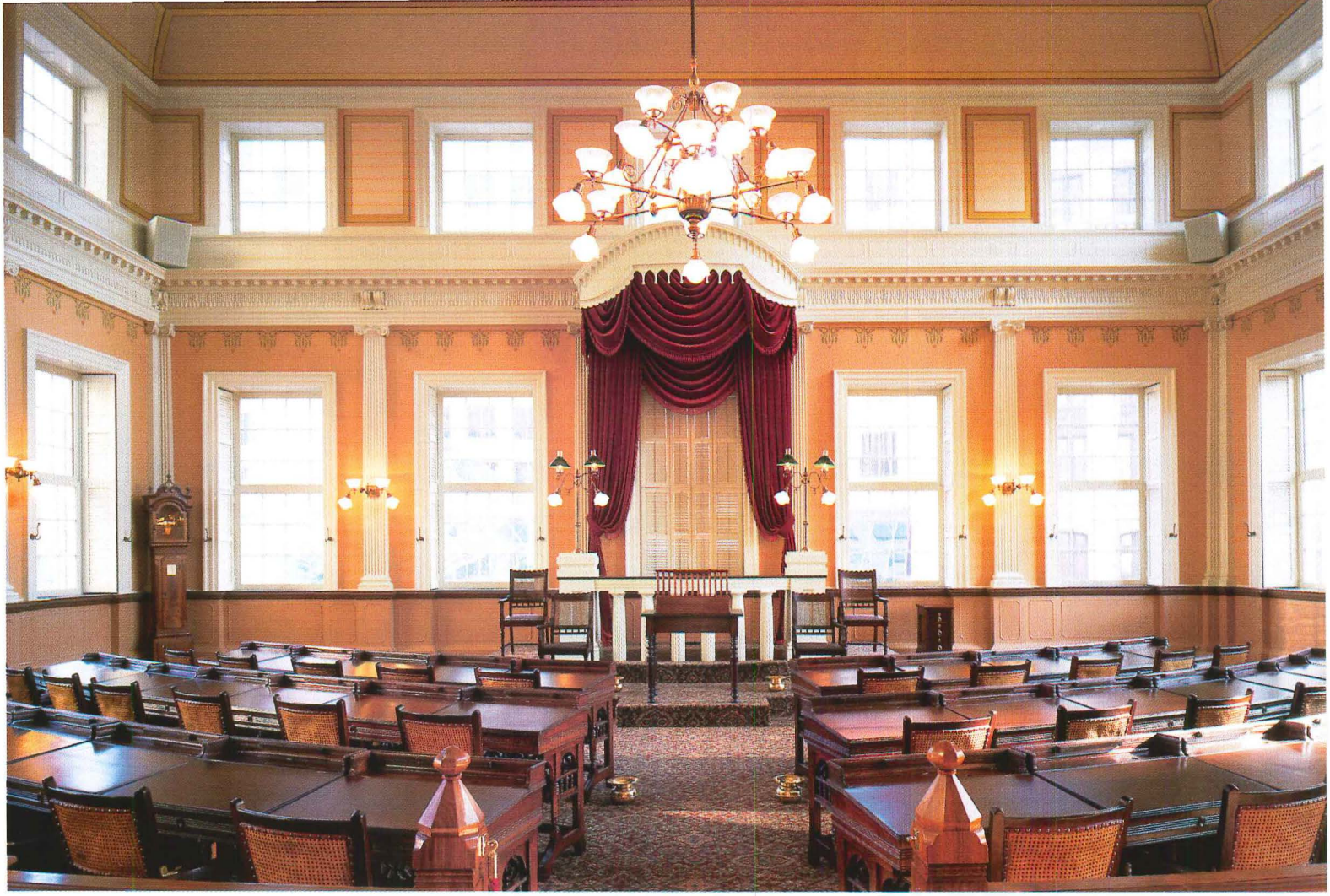








Task lighting (top) in the Senate Chamber was upgraded in the early 1800s with Argand lamps, the halogens of their day. The architects based the design of new Argand lamps on surviving examples and period ads. The gold-leafed wooden statue of Justice, mounted on top of the cupola in 1828 and removed in 1970, is now on display on the second floor.



Connecticut Historical Society, which is to move its exhibits on state history here from its present suburban location, has not yet done so, leaving this costly space unused.

The vicissitudes endured by the exterior of the building were comparable to those suffered by the interior. The brick walls were originally coated with a "rosy-colored" wash, later painted white, then exposed for the first time in 1920, when red brick fit the popular image of Revolutionary period design. This time the brick has been left exposed, maintaining the look familiar to the project's supporters. The wood trim, painted a historically correct ivory in the 1920 restoration, was repainted bright white in the 1940s. Returning it to a creamy shade was a decision in which research prevailed over popular sentiment.

Bringing the 18th century into the 21st

Even though the structure's original wood-framed floors had been replaced in the 1920s with a fireproof system (terra-cotta jack arches carried on steel beams), current codes for public assembly required steel reinforcement. And adding the underground gallery necessitated extensive underpinning of the foundations. One major, building-friendly decision was not to conform to the American Museum Association guidelines on climate control, even at the risk of missing out on some potential museum pieces. The interior humidity the AMA requires during the winter, Edwards maintains, would destroy the fabric of such a building, which was constructed with no vapor barriers. For the less demanding air-conditioning standards adopted, the ducts installed in the 1970s proved adequate, although new mechanical equipment has been installed.

Individual and corporate contributions, plus state bond moneys, covered most of the $8.5 million construction cost. An additional $3.5 million in federal grants made it possible to restore interior finishes and furnishings.

Association director Faude is particularly proud of the architects' adherence to ADA guidelines without creating a separate entryway for the handicapped. A new elevator, installed where it impinges on no historic rooms, serves all levels—from the basement gallery and lobby to a new storage facility in the original attic. One unconventional design strategy was to have Main Street, which runs along the building's western facade, regraded so that the principal public entry would have no steps. Making public buildings available for everyone to enjoy, including the elderly and the physically challenged, should be one of the main goals in saving landmarks, says Faude.

Restoring a building to more than one period is a good way to demonstrate what civic buildings meant in different eras and how the public's commitment to construction and renovation ebbs and flows. Visitors may even relish the irony—recurring all over the world today—that so many landmarks originally built on the cheap are now accorded well-funded, technologically sophisticated preservation efforts. ■

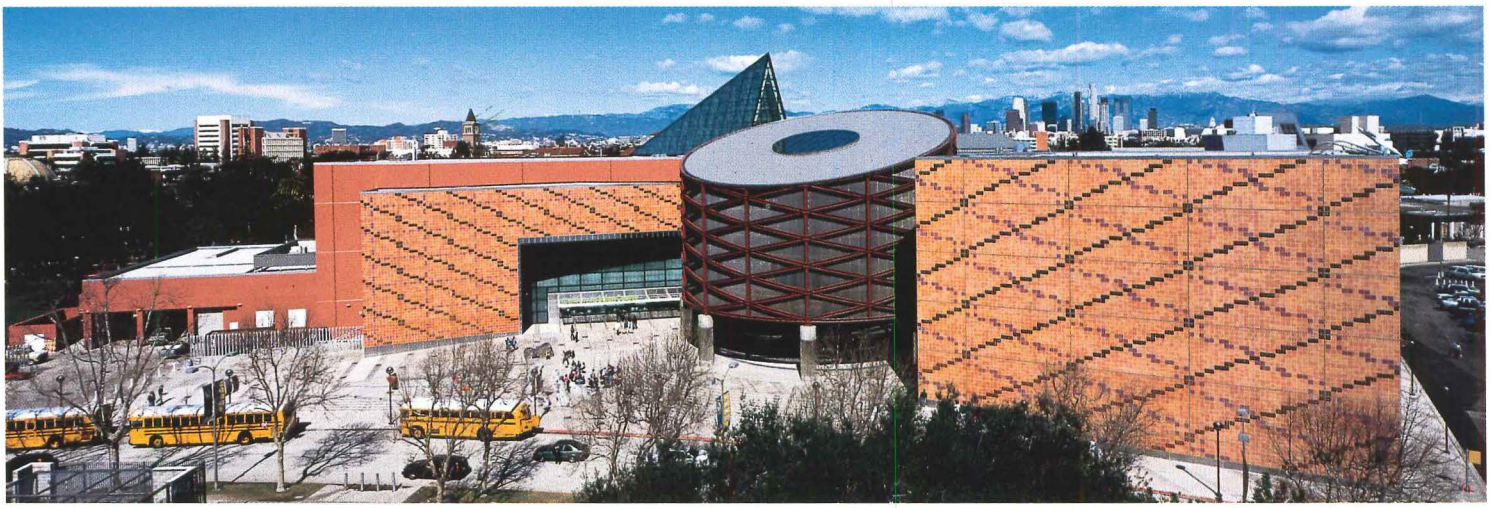
Sources

Tables: *Arnstein/Van Beckum*
Upholstery fabrics: *Scalamandre*
Reproduction task lighting: *Hugo Ramirez*
Elevators: *Otis Elevator*
Exterior cast-iron reproductions: *Cassidy Brothers Forge*
Historic decorative painting: *John Canning & Company*

Larry Kirkland's granite *DNA Bench*, part of the art program, represents a cross section of the genetic strand. The suspended spheres are from *Aerial*, a hanging sculpture, also by Kirkland.

A major redevelopment of the formerly dilapidated **CALIFORNIA SCIENCE CENTER** brings new energy to the institution and to 120-year-old Exposition Park.

by Karen D. Stein

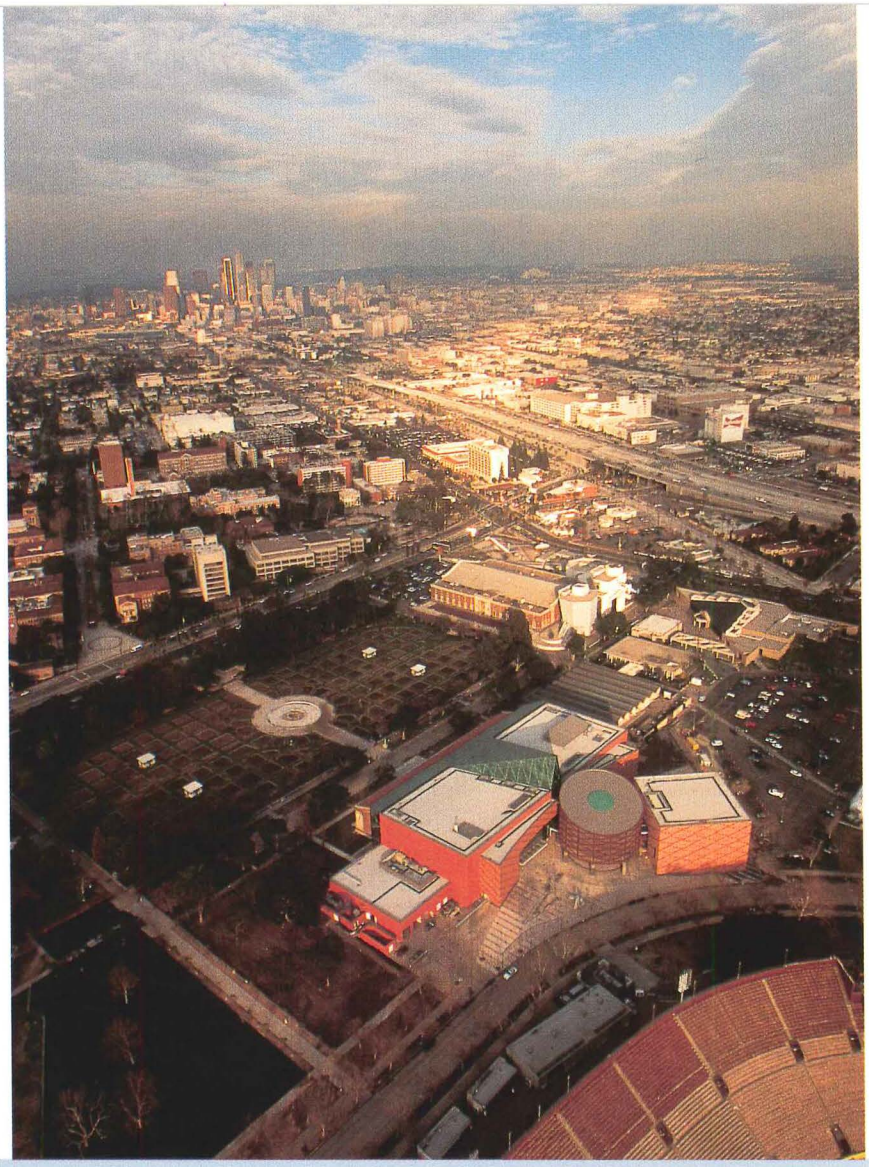


The giant rotunda is intended as a sheltered gathering space for groups. It connects the museum (left) and IMAX theater (right).

The centerpiece of Los Angeles's 160-acre Exposition Park is a sunken, seven-acre crisscross of formal pathways and well-tended flower beds called the Rose Garden. Surrounding it on three sides are the civic facilities intended to give life and meaning to this urban park: the Los Angeles County Natural History Museum, the California Aerospace Museum with adjacent armory, and the newly remade California Science Center, formerly known as the California Museum of Science and Industry. The Science Center has 245,000 square feet of brand new exhibition, retail, and restaurant space by the Los Angeles office of Zimmer Gunsul Frasca (ZGF). Nearly halfway through a two-decade-long, $300 million redevelopment that includes two additional wings, the building has been drawing record attendance since it opened last February—up to 15,000 people a day. As for the other institutions around the Rose Garden, the rambling 85-year-old Natural History Museum currently needs renovation. The Aerospace Museum, which was designed by Frank O. Gehry and Associates in time for the 1984 Summer Olympics [RECORD, January 1985, page 114], is soon to share its side of the garden with a school designed by Morphosis.

Located between two disparate worlds—the worn-out fringe of

Project: *California Science Center, Exposition Park, Los Angeles*
Owner: *State of California/California Science Center—Jeffrey Rudolph, executive director*
Architect: *Zimmer Gunsul Frasca Partnership—R. Doss Mabe, AIA, partner-in-charge; Robert J. Frasca, FAIA, design partner; Brooks Gunsul, FAIA, technical partner; Joseph Collins, AIA, project manager; Paul Engels, AIA, John Thompson, AIA, senior designers; Sharron Van Der Meulen, Susan Kerns, interior designers; Jan Willemse, Jeffrey Daiker, AIA, senior project architects; Lisa Fay Matthiessen, AIA, Errki Ojala, AIA, Bob Zimmerman, AIA, project architects; Steve Adams, AIA, Sandra Baik, Julie Cox, AIA, Bob Furusho, AIA, Brian Glover, AIA, Ted Hyman, AIA, Lee Kilbourn, FAIA, Doug Morris, AIA, project team*
Consulting Architects: *RAW International; Offenhauser/Mekeel Architects (historical)*
Consultants: *West Office Exhibition Design (exhibits); Melendréz & Associates (landscape); Horton-Lees Lighting Design (lighting); Joseph A. Wetzel Associates (exhibit master plan); Donovan & Green (institutional identity); McKay Conant Brook (acoustical); Debra Nichols Design (graphics); Hoberman Associates, Larry Kirkland Studio (artists)*
Engineers: *Englekirk & Sabol (structural); Tsuchiyama & Kaino (mechanical); Enteg, Inc. (electrical); CDC (curtain wall); Psomas & Associates (civil)*
General Contractor: *Keller Construction Co.*
Construction Manager: *Turner/Vanier CM*

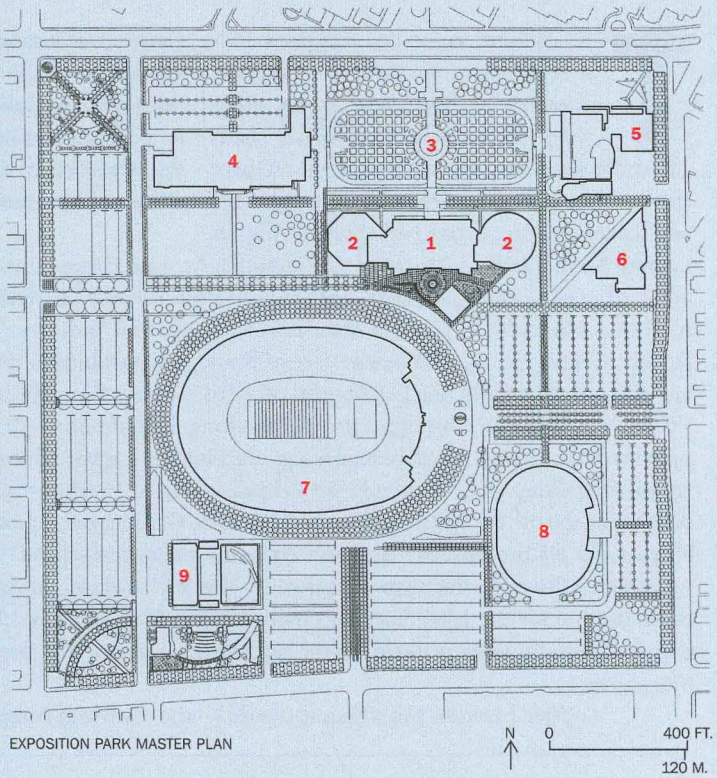


The center of the historic Ahmanson facade was rebuilt with salvaged brick (top) and integrated with the new building (above), which restored the north perimeter of the seven-acre 1928 Rose Garden (right).

MASTER PLAN

In April 1991, ZGF was commissioned to produce a master plan for Exposition Park. The results of the firm's planning process, shown at right, assume future changes, including the construction of a Morphosis-designed Science Center School on a site adjacent to Frank O. Gehry's existing California Aerospace Museum, which may be remodeled, and the renovation of the 1932 Olympic Swimming Stadium (currently derelict) into an aquatics center. With the departure of the city's pro football team, the long-term role of the Coliseum is unclear. The ZGF proposal calls for a new tree-lined promenade to encircle the park and the planting of grassy fields to be used for either recreation or parking.

1. *California Science Center*
2. *Future phase of California Science Center*
3. *Rose Garden*
4. *Natural History Museum of Los Angeles*
5. *Science Center School*
6. *African-American Museum*
7. *Los Angeles Memorial Coliseum*
8. *Los Angeles Sports Arena*
9. *Aquatics and Recreation Center*



EXPOSITION PARK MASTER PLAN

Accents in the terra-cotta and cementitious tile surfaces have a custom copper or orchid glaze and are meant to "change the scale of such big walls," according to architect Doss Mabe.

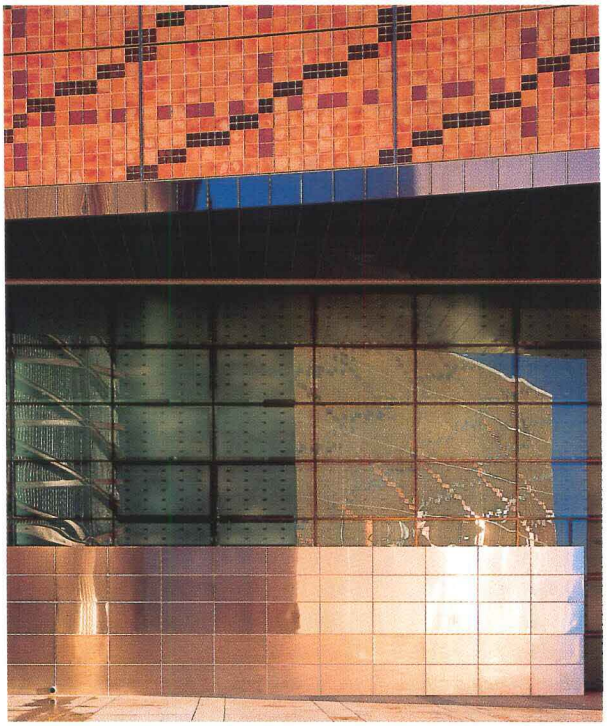
south central Los Angeles, an area made infamous by the 1992 riots following the Rodney King verdict, and the historic core of the University of Southern California campus—Exposition Park has sought to reconcile conflicting constituencies and demands since it opened in the 1870s. Originally intended for agricultural displays, it has been shaped as much by economics as by changing notions of the role of public parks. Debt forced its management association to sell off small parcels in the 1880s, and, following the turn of the century, the area experienced a gradual transformation from a place of contemplation and urban refuge to a center of activity. This shift resulted in the construction of a string of crowd-pleasers: a 75,000-seat sports stadium, the Los Angeles Memorial Coliseum, in 1923; a swimming stadium for the 1932 Los Angeles Olympic Games; and a basketball arena in 1959. While development brought more people to the park, the sports facilities and attendant parking lots guaranteed an erosion of its primary resource: open space.

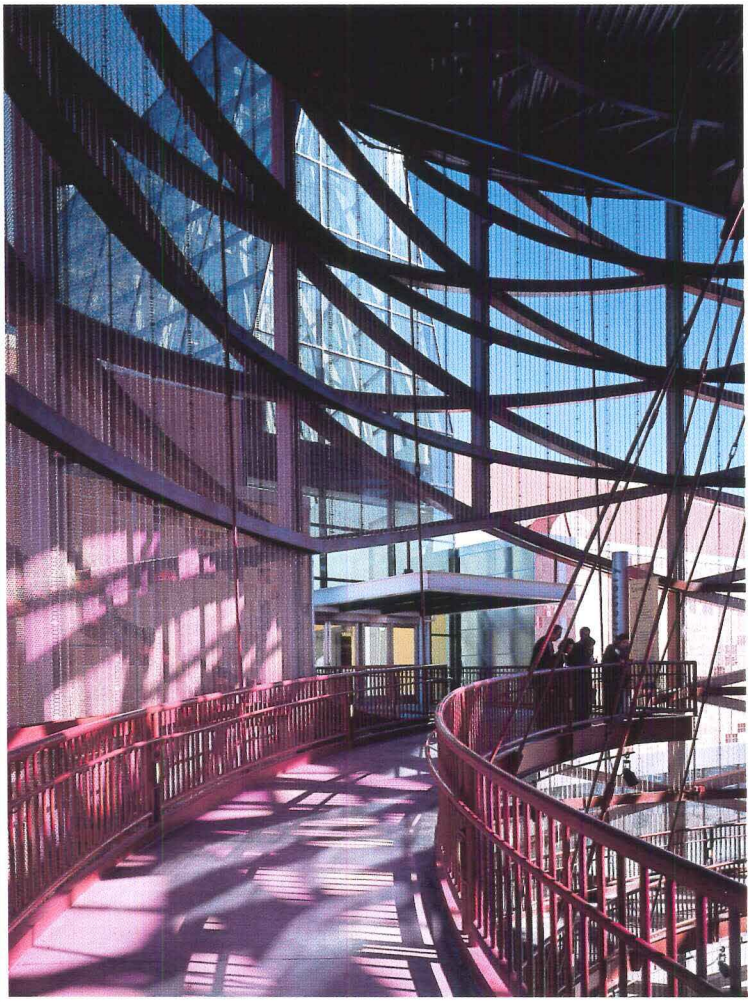
LOCATED BETWEEN TWO DISPARATE WORLDS, EXPOSITION PARK HAS SOUGHT TO RECONCILE CONFLICTING DEMANDS SINCE IT OPENED IN THE 1870S.

In 1992 ZGF was in the midst of putting together a regreening proposal for the entire park, a master plan commission awarded to the firm in April 1991, when the California Museum of Science and Industry (CMSI), the park's largest landholder, hired the firm to design its new building. The institution had already been forced to close two of its existing structures because of inadequate earthquake-safety protection. Provided with $47 million of State of California earthquake bond money earmarked for the repair or replacement of deficient structures, client and architect embarked on a public-private partnership that included not only the various institutions within the park but also representatives of the state, the county of Los Angeles, the community, and local preservation groups, which were adamant about maintaining significant portions of the CMSI's historic structures. To pay for the interior, CMSI initiated an ambitious capital campaign, ultimately raising some $120 million from a combination of public and private sources, several million dollars more than anticipated.

In its design of the California Science Center *(text continues)*

Dichroic glass in the oculus of the rotunda casts bright magenta and green shadows around the entrance pavilion, illuminating Larry Kirkland's hanging sculpture of gold- and palladium-leaf spheres. The IMAX theater (at left) is set at a 45-degree angle to the main California Science Center building to maintain alignment with an existing road through Exposition Park.





The open-air drum of the central rotunda is 100 feet in diameter and 88 feet high. Its steel exoskeleton is clad in panels of perforated stainless steel (opposite). Ramps attached to the inside of the rotunda (right) provide upper-floor connections between the IMAX theater and the exhibition spaces in the main building (above).

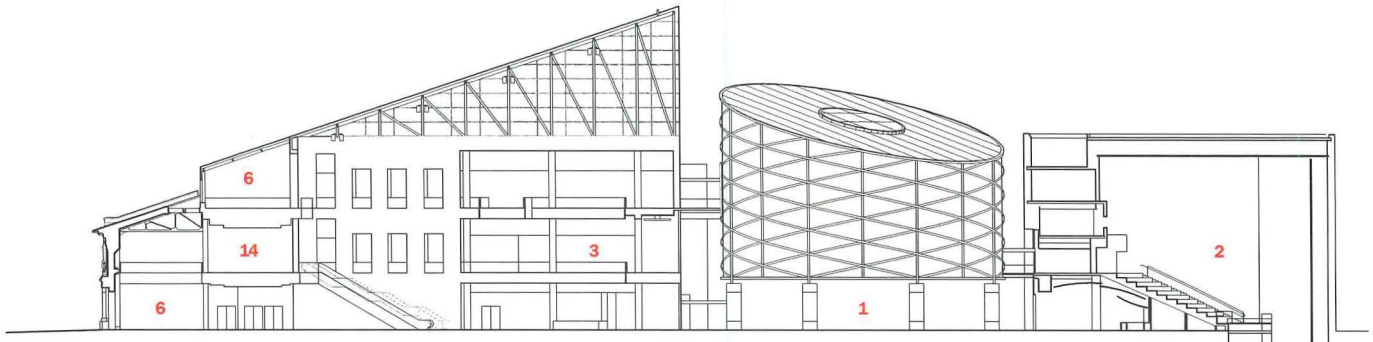
ZGF sought to accommodate all the seemingly conflicting demands of this heterogeneous client group in one design that would "envelop you in science from the minute you entered the space," according to the charge outlined by deputy director Ann Muscat and her colleagues. "We wanted the building to be an easy read for our visitors, so that it would be simple for them to figure out where they need to go. We wanted a building that would capture visitors' imaginations—grab their hearts—then we'd go after their minds."

For architect Robert Frasca, ZGF's design partner in charge of the project, an appropriate solution for the building was, like the process of defining an appropriate identity for the park, evolutionary. "We were packing everything in and it looked like Nordstrom's," recalls the Portland, Oregon–based architect in describing the early design solutions. "Then [partner] Doss [Mabe] and I came down to the site and we started to think about how to unpack the pieces. We knew we needed an icon and we knew we needed to respond to the symmetry of the Rose Garden. Also, we thought it was important to have a collection space, where kids could gather before they were ready to go inside. In Southern California it's possible for that to be a semi-enclosed space."

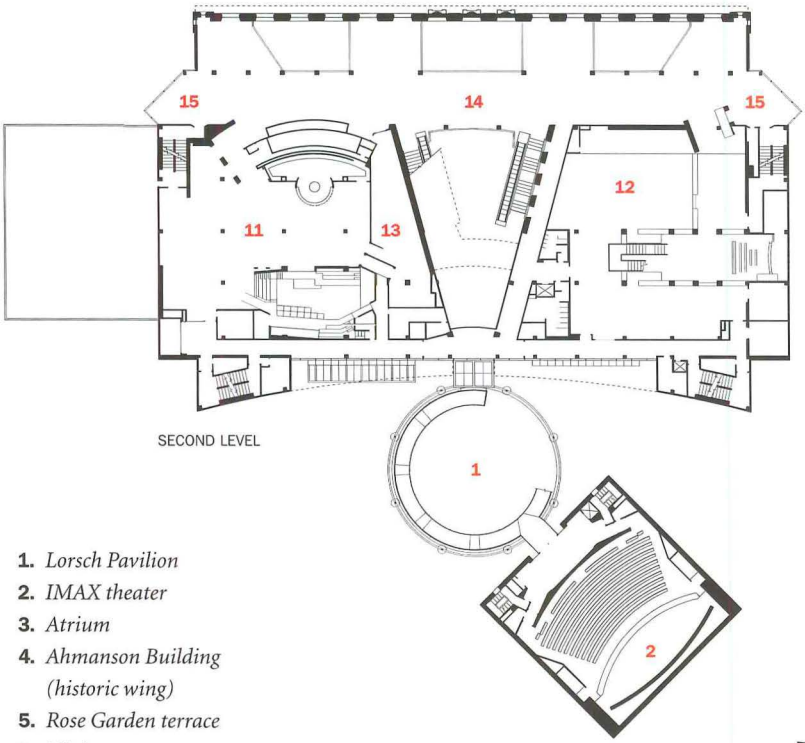
"WE WANTED THE BUILDING TO BE AN EASY READ FOR OUR VISITORS, SO THAT IT WOULD BE SIMPLE FOR THEM TO FIGURE OUT WHERE THEY NEED TO GO."

And so out of the dense box they had once envisioned, the architects extracted distinct programmatic pieces, pulling out, most notably, a three-story open-air rotunda as both building symbol and giant front porch. Called the Lorsch Family Pavilion, the space is 100 feet in diameter and 88 feet high. A skylight of dichroic glass casts colored reflections on the ground, on the tile walls, and on *Aerial*, an installation by Washington, D.C.–based artist Larry Kirkland that consists of some 1,600 gold- and palladium-leaf spheres suspended from the ceiling by cables. Beneath the cables, a granite bench, also designed by Kirkland, depicts a cross section of a DNA strand. Together, these parts of the overall art program for the science center are meant to introduce visitors to the major themes of the center: the origins of human life, from the microscopic to the cosmic.

The rotunda was also conceived as an easy, porous link between the exhibition space and the adjacent IMAX theater, with its seven-story-high screen. More difficult was incorporating the remaining north wing of the 1913 Howard F. Ahmanson Building with the new structure. The wing had been engulfed by additions in the 1950s and '60s, and only sections of the original brick and terra-cotta *(text continues)*



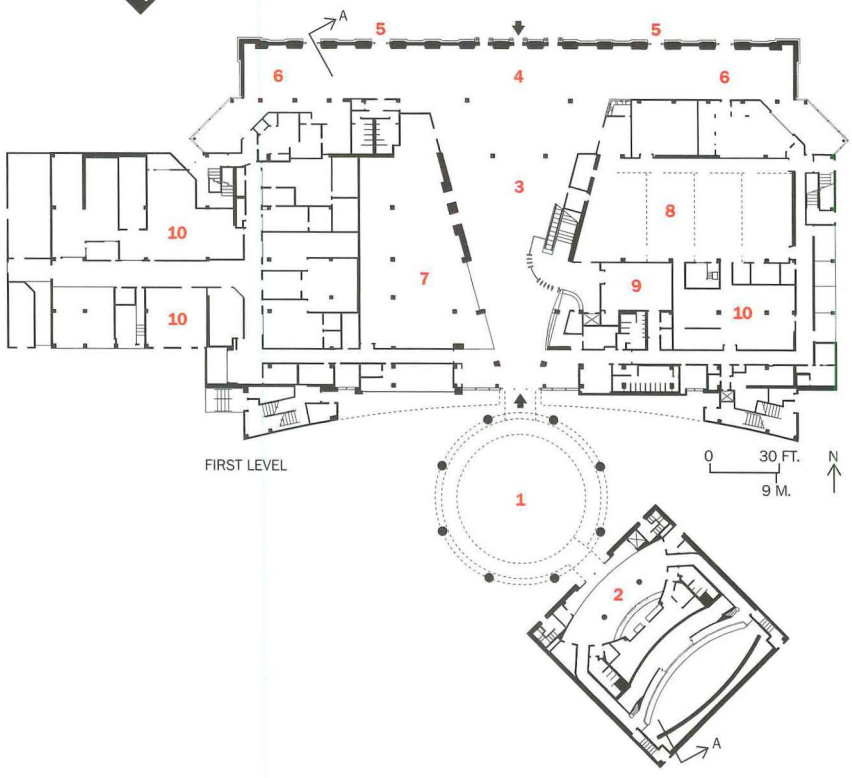
SECTION A-A



SECOND LEVEL

At the urging of preservation groups, ZGF incorporated a 1913 wall into the north perimeter of the complex. A giant skylit atrium ties the complex together (section above and photo opposite). Dominating the atrium is *Hypar*, a kinetic sculpture by Chuck Hoberman. Suspended some 40 feet above the floor, the six-sided, 5,000-pound structure is made of over 2,500 aluminum pieces that together expand from 15 to 50 feet.

1. *Lorsch Pavilion*
2. *IMAX theater*
3. *Atrium*
4. *Ahmanson Building (historic wing)*
5. *Rose Garden terrace*
6. *Dining*
7. *Retail*
8. *Conference center*
9. *Trustee room*
10. *Support*
11. *World of Life exhibits*
12. *Creative World exhibits*
13. *Discovery Room*
14. *Disney Science Court*
15. *Preview of future exhibit*



FIRST LEVEL


BICYCLE

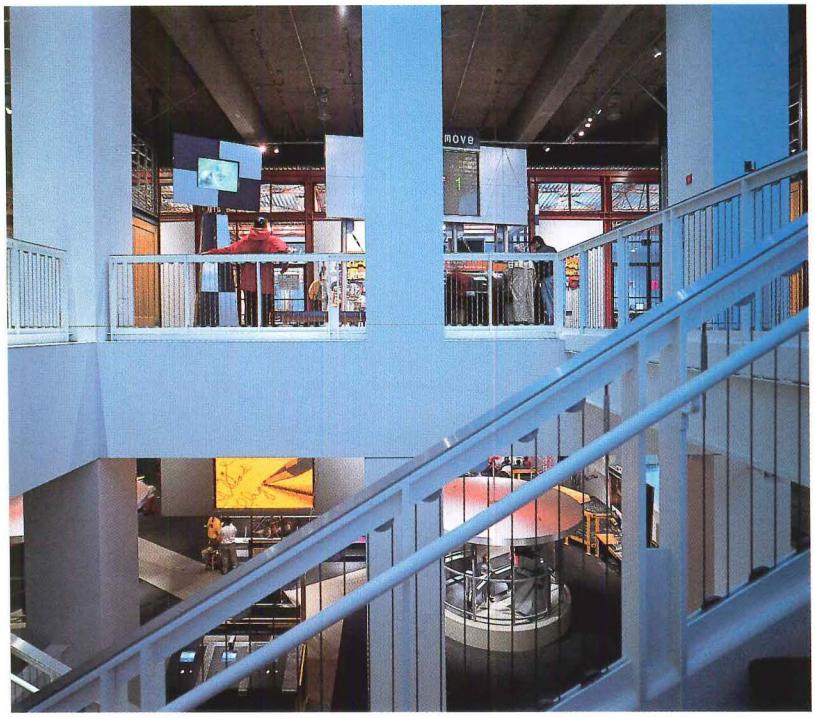
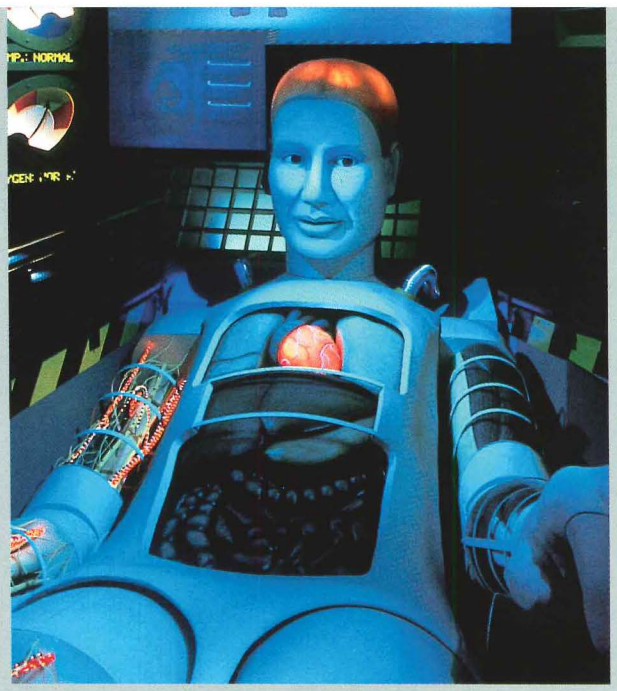
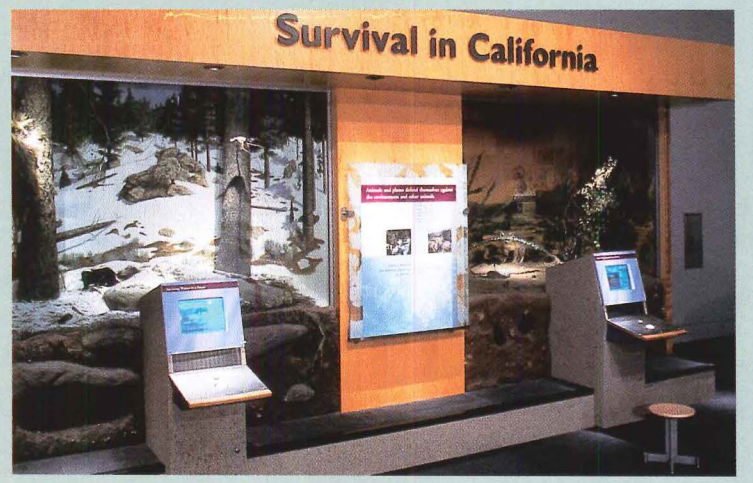


Exhibit spaces are grouped around the central atrium. Steel trusses, remnants of the 1913 structure, are now purely decorative elements (above). A café overlooks the heart of the USC campus (opposite).

EXHIBITS

The California Science Center's exhibition design, by West Office Exhibition Design under the direction of Andrew Kramer and Bill Smith, includes permanent installations gathered in two thematic environments. Creative World "examines the environments humans build to meet their needs for structures, transportation, and communications," according to Science Center officials. Subject matter ranges from computer technology to earthquake-resistant buildings. World of Life explores life from the small scale—the atom—to the large scale—the cosmos. Displays include Survival in California dioramas (below), the BodyWorks Theater (top right), and the Life Tunnel (bottom right). Between the themed environments is a discovery room, intended for parents and small children. It is staffed by volunteers who are participating in a community-outreach program.





facade remained intact. The centerpiece of the facade had to be rebuilt with salvaged bricks. Its design was based on old photographs and drawings—a task that combined archaeology, research, and input from the California Office of Historic Preservation and the Los Angeles Conservancy. "To put this piece back together is very gratifying," explains Mabe. "The Rose Garden is an outdoor room, and this is part of restoring that room." A glass-enclosed lobby with a pyramidal skylight that spans north to south ties the composition of old and new together.

THE ROTUNDA IS THE SCIENCE CENTER'S ICON AND GIANT PORCH.

Inside, the enormous lobby gives way on upper floors to loft-like spaces for the various exhibits, which are organized around two themes—World of Life, which explores the processes by which plants, animals, and people survive, and Creative World, which focuses on technologies. Future wings of the Science Center will include the World of the Pacific and Worlds Beyond.

"We try to get away from science factoids," says Muscat, explaining the Science Center's overall agenda. "It's important to create a context that puts people at ease with the subject matter and affects their attitude about science. It makes them more open to learn." Muscat reports that there was some anxiety among her colleagues about how grand the building should be because of its proximity to a poor neighborhood. Area residents dispelled those fears when they expressed a desire for a civic monument of their own. This input bolstered the architects' mission to provide a dramatic public presence for the center. "The institution had been invisible," says Frasca of its previous dilapidated state, "so it needed visibility." And now? "The glass roof can be seen from the freeway," reports Frasca. In Los Angeles, he says with a chuckle, that's high visibility. ■

Sources

Terra-cotta cladding: *Gladding McBean*
Stainless-steel panels: *Protean*
Tile: *Ann Sacks Tile & Stone*
EIFS: *Dryvit*
Roofing: *Johns-Manville, Custom Panel Industries*
Wood windows: *Eagles Restorations & Builders*
Curtain wall, swing doors: *U.S. Aluminum*
Laminated, insulated, fritted glass: *Viracon*
Acoustical ceilings, suspension grids: *Armstrong, Alpro Acoustic, Chicago Metallic*
Doors: *Roto-Swing, Horton Automatics, Algoma, Atlas doors*
Resilient flooring: *Azrock, Armstrong, Forbo*
Operable partitions: *Modernfold*
Carpet: *Prince Street, Mannington*
Terrazzo: *Coradini*
Paints: *Sherwin-Williams, Dunn-Edwards*
Wood paneling: *CMD, Inc.*
Wall coverings: *Lanark & Walcraft*
Interior ambient lighting: *Louis Poulsen, Kurt Versen, Elliptipar*
Downlights: *Prescolite*
Exterior lighting: *Hydrel, McPhilben*
Lighting controls: *Lutron, Strand, Intelligent Lighting Controls*

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UNGLORIFIED AND UTILITARIAN, THESE AMBITIOUS AND OFTEN INNOVATIVE BUILDINGS ARE THE UNSUNG HEROES OF THE AMERICAN ECONOMIC BASE.

by Grant Hildebrand

1

Flushing, New York

The New York Times *is printed in color now, thanks to the newspaper's new printing facility, designed by Polshek and Partners.*

2

Tuscaloosa County, Alabama

Albert Kahn Associates brings together the best automotive assembly practices of the United States, Germany, and Japan under one roof.

3

San Luis Potosi, Mexico

Davis Brody & Associates designed a building for an automotive components manufacturer that can be reconfigured for different products with ease.

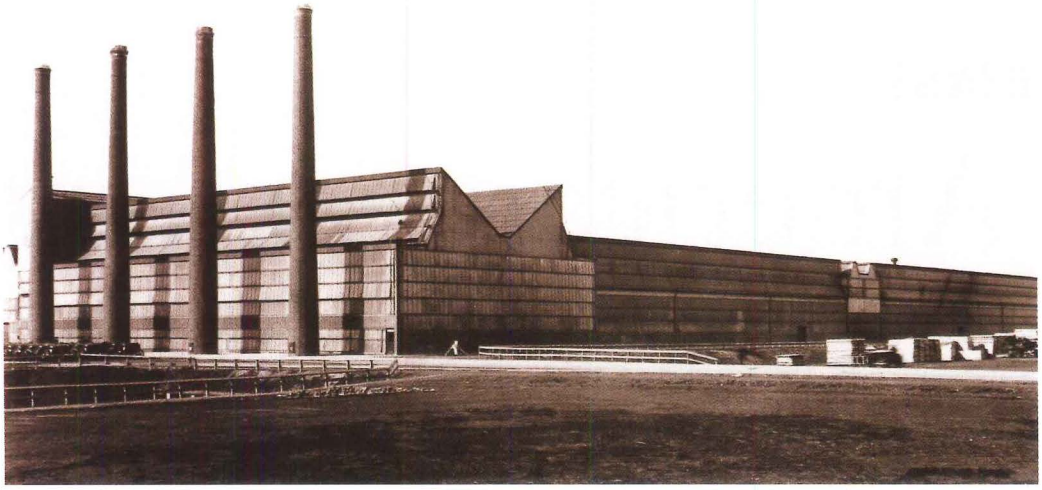
Industrial architecture, often overlooked in the mainstream press, has had a significant impact on the development of other building types, and American designers have been leaders in the field. In recognition of this, ARCHITECTURAL RECORD *commissioned Grant Hildebrand, a professor of architecture at the University of Washington, to examine the history of industrial buildings. Hildebrand looks with particular emphasis at one American firm that has influenced many others: Albert Kahn Associates.*

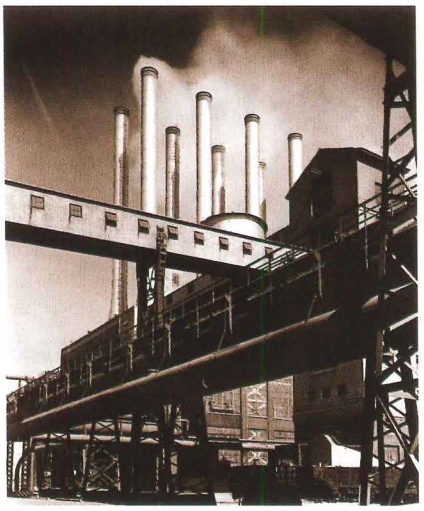
The appearance of architectural firms devoted to industrial buildings coincided with a change in the Industrial Revolution itself, a change of such a degree that it might be called a second industrial revolution. In the 19th century the Industrial Revolution represented a shift from home-based industry to production and manufacturing processes focused in a central location: the factory. Most of the early factories were grim places indeed. Little attention was devoted to finding ways to refine the assembly process, and what was lacking in organizational quality was made up for by the sheer volume of labor. At the same time, little thought was devoted to the working environment; no one cared much about whether workers had adequate lighting, comfortable seating, or a safe escape route in case of fire.

The second revolution came at the dawn of the 20th century, when industry began to address the importance of a factory carefully organized to foster maximum output. That affected not only the system by which tasks were assigned to workers and, to a lesser extent, the kinds of conditions in which employees did their work, but also how the production process itself was designed. Factories were no longer collections of laborers going about their individual tasks. Instead they evolved into methodical, systematic assembly operations, with each employee contributing in a specialized way to the manufacture of the product.

Architecture geared to the needs of organized industry emerged during that same period. This architecture became an entity unto itself, finding its own methodology, putting forward its own dramatic innovations. In the end, its emergence would become an international story. But the United States—its industrialists and its architects—played a vanguard role.

Grant Hildebrand is a professor at the University of Washington's School of Architecture and the author of Designing for Industry: The Architecture of Albert Kahn *(MIT Press). He is currently writing* Origins of Architectural Pleasure *(University of California Press).*





The 1922 plate-glass plant at the River Rouge was quick to build (left). The River Rouge site was 2,000 acres (right). Albert Kahn (below).

No architectural firm had a greater influence on the development of industrial architecture than Albert Kahn's. But there is evidence that the architect's work had a wider influence too, affecting the development of Modernism itself.

Many years ago architectural historian Reyner Banham traced the chain of events behind the design of Walter Gropius's 1911 Faguswerk in Alfeld, Germany, a building that's widely accepted as a cornerstone of Modernism. Faguswerk was partly owned by the United Shoe Machine Company of Beverly, Massachusetts, whose own reinforced-concrete factory of 1903 was the work of Ernest Ransome. Banham claims that in commissioning Gropius to design his building, Fagus put two photos on his desk: one of the Beverly factory and one of the newly opened Ford plant in Highland Park, Michigan, by Albert Kahn. There is evidence for Banham's claim that the clean frame of the Faguswerk building might have been inspired by these two American works, the Ford plant in particular. Furthermore, Gropius would later refer to Fagus as "an American factory."

That American industrial architecture was a source for European Modernism isn't news; it's well known that Gropius, and later Le Corbusier, published photos of American factories and grain silos, and Erich Mendelsohn made pilgrimages to such sites. Banham's research, however, brings some specificity to the story. And it brings Albert Kahn into the picture. However, if the photo Gropius saw was the one shown here (above left), he didn't see the factory's most important feature: the great central assembly hall.

Ford's Highland Park facility was much more than a four-story building. The carmaker intended to use gravity to assist in assembling the Model T, and he called on the building for help. At the center of the structure was a tall, open volume within which subassemblies of the automobile could be dropped one on top of the other—the body could be dropped on top of the chassis, for example. But at that same Highland Park plant, in March 1913, Ford tried building the magneto by moving the increasingly assembled unit past fixed work stations by means of a conveyor belt, or an assembly line. Such a manufacturing concept was best served by a single working floor long enough to contain the elements of the assembly process. This system, in turn, carried two other architectural implications.

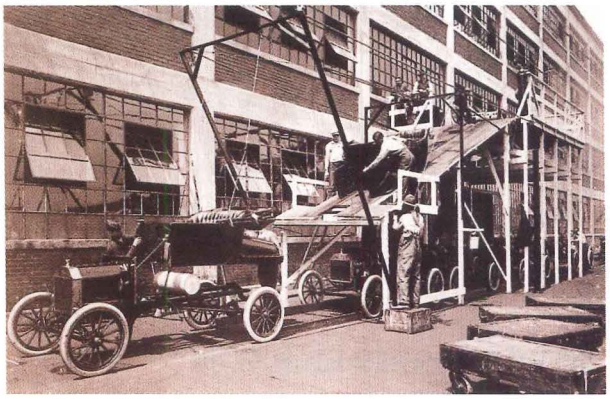
While previous factories had brought in light through wall windows, this wouldn't work in a one-level factory floor with broad dimensions. In 1906 Kahn, in concert with architects Lockwood, Greene and Company, built a single-story, broad-dimensioned factory for the George N. Pierce Company in Buffalo where unusually even lighting was accomplished by glazing the slanted surfaces of a sawtooth-shaped roof. Though the Pierce plant, which came seven years before Ford's experiments at Highland Park, wasn't intended for assembly-line production, it was ideally suited to the process.

The choice of building material was also driven by the invention of the single-floor assembly line. Concrete had advantages for multistory factories because it was fireproof and its considerable deadweight helped dampen vibrations. But in a one-story factory, equipment could rest on grade, and with no stairs to navigate, the threat of loss of human life by fire was radically reduced. In this type of building, the steel frame made sense, and it brought another advantage: speed of construction.

In 1917 Ford bought 2,000 acres on the River Rouge near Detroit (with a rail connection to Highland Park) to build a new industrial complex. Kahn was to be the primary architect of the buildings, which were to be one-story and steel-framed. The resulting 1922 plate-glass plant at the River Rouge is the epitome of American industrial architecture at the time. The plan is crisp and simple, with an economical footprint. The section is tailored to the various light and ventilation needs of the annealing, grinding, and polishing lines.

The plant was the prototype for the remaining River Rouge facilities and, eventually, for manufacturing buildings in much of the industrialized world. Its progeny at River Rouge alone, all by Kahn's firm, include the pressed steel, spring and upset, and open hearth buildings; the blast furnaces; the rolling mill; the coke ovens; and the power house.

How did this work stand in relation to other industrial architecture of the time? In 1914 Fiat began design of a new factory at Turin [see RECORD, March 1997, page 42]. A five-story version of the Ford plant at Highland Park, its only innovation was the banked, oval test track on the roof. Manufacturing began at grade, with final assembly on the fifth floor, closest to the track, reversing the gravity-assisted design of Highland Park's assembly hall. In the February 1933 issue of the *RIBA Journal*, which focused on industrial architecture, all of the examples cited were multistory, concrete-framed factories—11 years after the River Rouge glass plant. Clearly American industrial design was more advanced than that found in other countries.



Ford used gravity to help assemble the Model T (above) at the Highland Park Ford plant, a model for factories to come (right).

Kahn's later steel-framed factories of the 1930s demonstrate his unusual ability to create an architecture from uncompromised utilitarian demands. The Dodge half-ton truck plant at Warren, Michigan, completed in 1937, is a well-known example: it's crisp and elegant, spare and useful. Milton Brown, in *American Art,* chose a photograph of this building as the frontispiece for his section on American art between the wars.

Brown claims in this book that Mies's industrial style of steel, glass, and brick was anticipated by Albert Kahn Associates. Kahn's various factories of the 1930s, notably those for General Motors and the Chrysler Corporation, exhibit a precision of architectural detail that is remarkable for the period, Brown says, and is surely a source for the Miesian style.

Can Brown's claims be proven? There is some supporting evidence. Mies came to the United States in 1938. In 1939 George Nelson published *The Industrial Architecture of Albert Kahn,* and one of Mies's students, Myron Goldsmith, recalls his teacher poring over the book. Mies's work changed significantly at that time; he turned toward a greater interest in crisp revealed structure and, above all, steel structure.

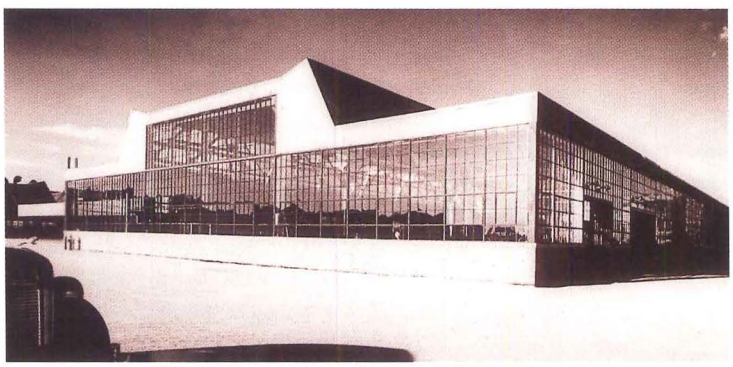
That the Kahn work had something to do with this is further supported by the history of Kahn's 1937 assembly building for Glenn Martin Aircraft, outside Baltimore, an elegant, column-free space. Mies's well-known proposal for a concert hall of 1942 is a collage of wall planes over a photo of Kahn's grand space. Such contemporaneous appropriation of one architect's work by another is rare and it's particularly important in light of how dominant Mies's influence was in American Modernism of the 1940s and 1950s. With the exception of Frank Lloyd Wright, almost every major American architect—including Paul Rudolph, Eero Saarinen, Minoru Yamasaki, Edward Stone—worked in a Miesian idiom. Thus, Kahn's late steel-framed factories may have contributed to the late and utterly pervasive phase of International Modernism, as his early work may have contributed to its early European phase.

Kahn was not alone in this story, of course. In its busiest period his firm designed hundreds of factories outside the United States and fully 19 percent of this country's industrial work. These are impressive numbers. But the obvious corollary is that firms other than Kahn's were designing more than 80 percent of this country's factories. Banham, in *A Concrete Atlantis,* made a case for Lockwood, Greene and Company, not Kahn, as the decisive architects for the Highland Park plant. Banham traced many other concrete industrial buildings by that firm, including striking examples for the Larkin Company of Buffalo (better known for its 1904 administration building by Wright). In later decades, the Austin Company, along with many other firms, played major roles in the development of the one-story, steel-framed factory. Yet Kahn was perhaps the key figure in the story.

Kahn's own death in December 1942 coincided with a change in industrial architecture. The last major factory with which he was involved was the Willow Run bomber plant, south of Detroit. Because of a perceived need to protect the plant from night attack, Willow Run was lit entirely by electrical fixtures, which became standard practice. Other changes have reshaped industrial architecture in the ensuing half-century, most profoundly new technological aids to assembly. These changes are often accommodated through revisions to the existing structure; most of Kahn's buildings of the 1920s and 1930s for Ford still exist.

What of the Kahn firm itself? It carries on a general practice of significant institutional and commercial work. And it continues its involvement with industry, with a clientele that includes names familiar to its founder, and some new clients too.

Is there larger significance to this story? Suppose we imagine a future archaeologist investigating our time. What structures would say the most about this American century? There is Disney World; there is Richard Meier's Getty; there is Henry Bacon's memorial to Lincoln and Maya Lin's to Vietnam veterans; there is Louis Kahn's Phillips Exeter Library; there is the vast treasure of Wright. There are quasi-architectural candidates: the Golden Gate Bridge and the Grand Coulee Dam. But one could also make a strong case for one of our great industrial complexes—perhaps Ford's River Rouge. For the future archaeologist, these might be the most informative of all, the most realistic evidence of who we were and what we did. ■



The crisp design of the 1937 Dodge half-ton truck plant in Warren, Michigan, symbolizes the industrial architecture in the 1930s.

1 New York Times Printing Plant Flushing, New York

PRINTING THE NEW YORK TIMES IN COLOR REQUIRES HIGH-TECH PRESSES AND A NEW FACILITY WHERE ROBOTS ROAM.

by Mildred Schmertz

Project: *The New York Times Printing Plant, Flushing, New York*
Owner: *The New York Times*
Design Architect: *Polshek and Partners Architects—James Stewart Polshek, FAIA, Richard M. Olcott, FAIA, design principals; Joseph L. Fleischer, FAIA, John Walsh, AIA, principals in charge; John Fernandez, David Wallance, AIA, senior designers; Jihyon Kim, AIA, technical designer; Kyle Yang, Lawrence Zeroth, Margaret Kundert, David Bushnell, Min Cho, Thomas Wong, Kevin McClurkan, AIA, Darius Sollohub, AIA, Francelle Lim, project team*
Architect of Record: *Parsons Main, Inc.*
Engineers: *Parsons Main, Inc. (mechanical, electrical, structural); Harnischfeger Engineers, Inc. (materials handling)*
Consultants: *Cline Bettridge Bernstein Lighting Design (lighting); DiDomenico + Partners (landscape); Premier Food Service Equipment Corp. (kitchen); Hertzfeld Design (furniture)*
General Contractor: *Lehrer McGovern Bovis*

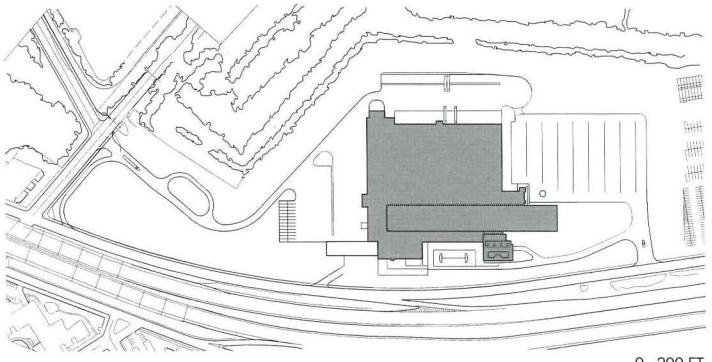
Size: *515,000 square feet on two levels*
Cost: *$350 million*

To those readers who are purists, the *New York Times* is not really the *Times* with color splashed all over its revered pages. But thanks, in part, to the five new high-tech presses at the *New York Times'* recently completed $350 million printing plant at College Point, in Flushing, New York, the esteemed international newspaper has joined the ranks of other dailies in producing its pages in color.

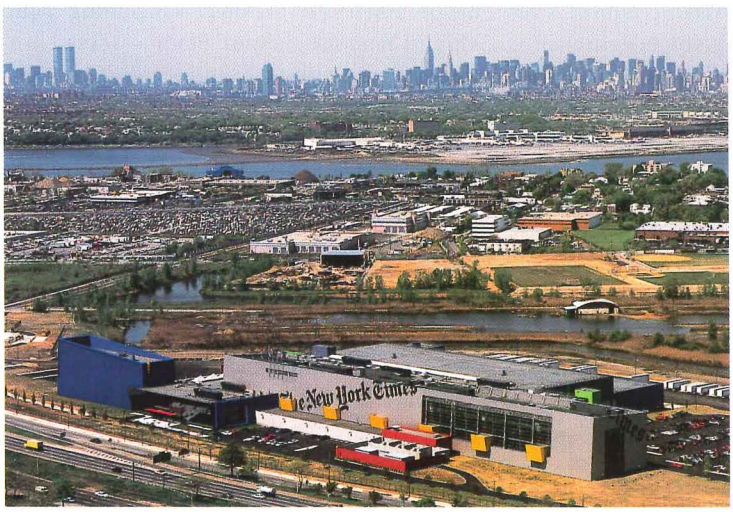
The College Point plant is one of ten around the country that print the paper in color. But it is the most technologically advanced of these, thanks to its use of robotics, computerization, and a skillfully arranged production sequence. The production process begins with trucked-in rolls of newsprint and ends with the shipping of the daily editions to newsstands and delivery services in the greater New York City area, Connecticut, and New Jersey. Advance sections of the Sunday *Times* are shipped nationwide—a process that's made simpler by the plant's proximity to LaGuardia Airport.

Located just 50 feet from the edge of the busy, six-lane Whitestone Expressway and just a few miles from LaGuardia, the new plant is designed as a highly visible, eye-catching, three-dimensional billboard. The 515,000-square-foot, three-story structure has a steel skin that's painted in vivid colors that resemble the palettes of Russian Constructivist posters. The familiar *New York Times* logo is emblazoned on the highway side in black-painted steel-mesh letters, leaving motorists with little doubt that this is where the daily newspaper comes from.

Using a design architect for printing plants is new to the *Times*. Says David A. Thurm, vice president for production, "This time we didn't want to house the newspaper printing process in an almost windowless

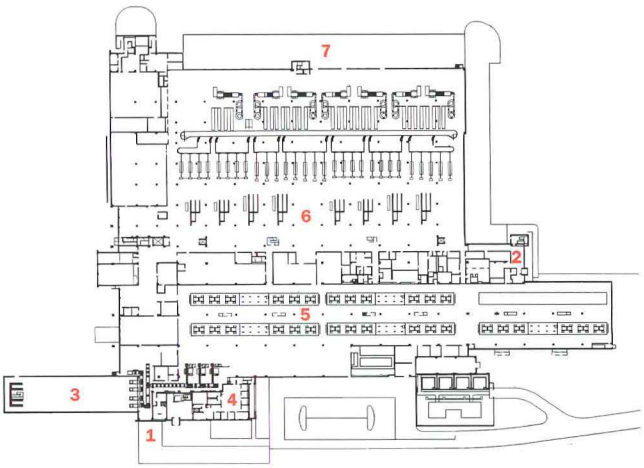


SITE PLAN

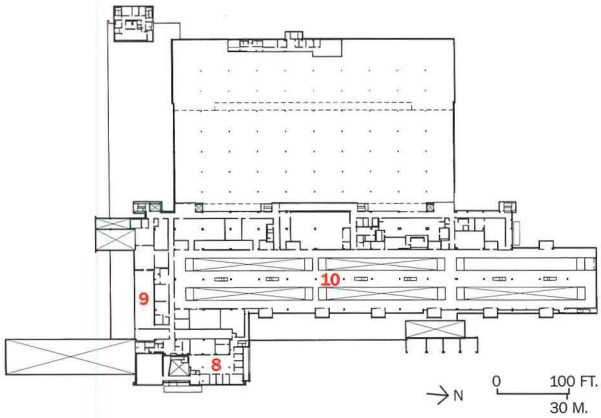


Mildred Schmertz, FAIA, is a former editor-in-chief of ARCHITECTURAL RECORD.

This printing plant, like the newspaper it produces, makes a strong statement. Passersby on the Whitestone Expressway can't miss its strong lines, logo, and strident colors.



FIRST FLOOR



SECOND FLOOR

1. *Entry*
2. *Employee entry*
3. *Paper roll storage*
4. *Administration*
5. *Press hall*
6. *Mail room*
7. *Loading docks*
8. *Administration*
9. *Cafeteria*
10. *Press hall*

A sloping wall of glass (above) brings natural light to the mail room and loading dock. The exterior is low-cost rolled industrial steel siding (left). Some areas are painted to announce their function—yellow boxes house the ink mist filters, for example.

factory-like box. We wanted our new plant to be a work of architecture that would clearly express from the exterior what goes on within." Thurm and his management team interviewed leading design firms to find one that could effectively organize the structural, foundation, electromechanical, automated printing, and employee support systems. Their goal from the outset was to minimize operations, maintenance, and capital costs. "Because we intended to use as much of the budget as possible for the very best printing equipment, we wanted a high-design building constructed with inexpensive but good-quality materials," Thurm reports.

Instead of rounding up the usual experts in industrial design, the team looked for architects with a broad range of experience. "We didn't care if the firm hadn't done industrial buildings before. We asked them to show us the big spaces they'd designed—the gymnasiums and the concert halls. We picked Polshek and Partners because they had the vocabulary and understood the equipment, the process, and the money constraints."

Designing for the printing process meant there were some specific parameters: the linear nature of the printing operation; the vastness, weight, and complexity of the machinery; and the need for large unobstructed floor areas for the state-of-the-art presses. It was also up to design principals James Stewart Polshek and Richard M. Olcott to develop an efficient pathway for storing, sorting, packaging, and sending out the printed product. Threaded through this system were the offices, workshops, lockers, and lounges for the employees.

The search for an appropriate site for the new plant presented its own set of challenges. The *Times* looked at a number of Rust Belt locations that were inexpensive but required extensive cleanup. Instead, they chose the 31.7-acre site in Queens, which was suitably low-priced, Thurm says, because of "its terrible, chocolate-pudding soil." The sogginess is due, in part, to the land's proximity to the Long Island Sound. This condition forced the architects to define the smallest possible footprint for the plant to minimize the expensive friction piles needed to stabilize it on the sopping soil. Every square foot suddenly became precious.

To keep the interior compact and efficient, Polshek, Olcott, and their team, in collaboration with

Money saved on building costs was invested in the computerized printing equipment located in the press hall (right and below). Robots carry and load the heavy paper rolls.

Parsons Main, Inc., an A/E firm that specializes in printing plants, organized the building into seven components.

Near the highway edge is a glass curtain-wall box enclosing the public entrance lobby and administrative space. At the far west of the site, a huge loft, painted blue, contains the automatic storage and retrieval system for approximately 2,230 rolls of newsprint (each weighing about 1.2 metric tons). The paper comes from mills in Canada to warehouses in the Bronx. From there, it's delivered by truck to loading docks at the west end of the plant. Employees remove the sturdy wrapping from the rolls, then robots carry the paper to the presses.

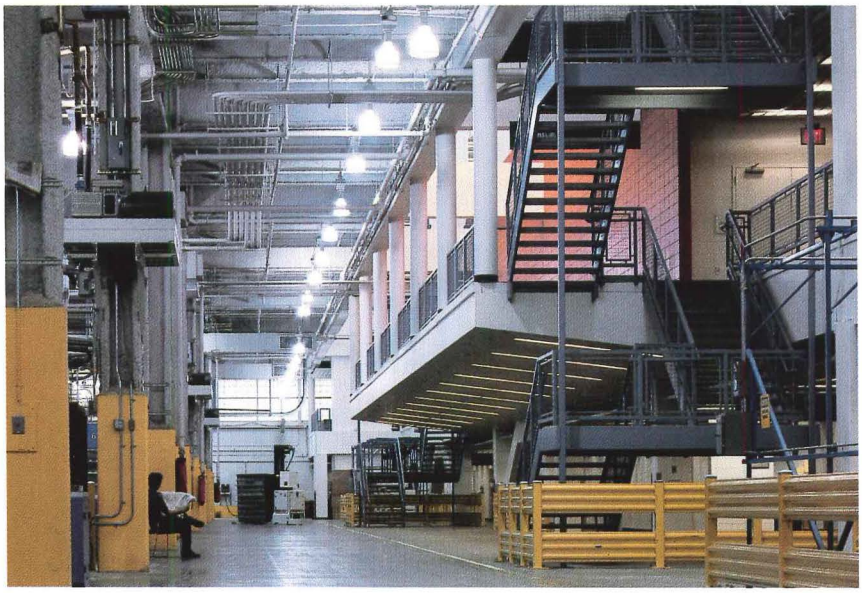
The 650-foot-long, three-story press hall has five 60-foot-high color presses and room for one more. The yellow-painted boxes that project from the building's facade contain filters that remove the fine ink mist generated during the printing process.

A three-story center spine contains the employee entrance, lockers, lounges, workshops, and computer control stations. The spine separates the press hall from the remainder of the plant, where the mail room, loading docks, and storage wheels for the printed sections are located. Interconnecting the two floors in this area are overhead paper conveyors, high-speed insert machines, sortation trays, palletizers, and other equipment used in the final stages of the production process.

Almost every kind of task traditionally performed by human beings was either reduced or eliminated in this plant. All of the heavy manual work is done by robots, whose position and status are tracked by sophisticated, integrated computer systems. Computers also indicate when a new roll of paper is loaded onto a press, how many copies are passing through a folding machine, and when an insert has failed to drop into place.

As a result of automation, the plant, which prints an average of 500,000 copies of the daily paper and 800,000 copies of the advance Sunday sections, has only 500 full-time employees. Workers transferred to the new facility from other plants in the area "see the robots doing the jobs their former colleagues used to do," Thurm says. It was up to the architects to find ways to create spaces that would heighten the sense of fellowship among the employees who work at the plant. That meant including plenty of windows for light and views. The cafeteria and lounge spaces are fresh and simple; and, thanks to careful acoustic treatments, they seem far from the pounding and rumbling of the printing presses.

Though the new equipment is engineered to be as quiet as possible, the printing and sorting processes are still noisy, demanding extensive soundproofing between the manufacturing and nonindustrial areas of the plant. For example, the interior wall surfaces of the press hall are lined with acoustic fiber-backed perforated metal, while window glazing is acoustical to cut down on the traffic noise entering



Printing presses are tall, long, and heavy. The architect had to provide enough unobstructed floor space and an adequate support system for six color presses (far left). Considering the volume of newspapers, there are surprisingly few employees—about 500 (left). Robots do much of the work. At the far west of the site, a huge blue loft holds about 2,230 rolls of newsprint (below).

from the Whitestone Expressway.

The architects produced 14 different structural schemes as input flowed from the design team, Olcott says. "At the beginning we thought it would be great to do a column-free structure with a tension-cable roof, but that proved expensive. So we built a structural steel grid with a flat roof and skylights. It turns out that columns belong in a printing plant anyway. They brace and support the equipment and help to order the vast spaces."

Olcott solved the problem of making the building, essentially a long box, sit gracefully on the site by adding what he refers to as "a few Deconstructivist tweaks." The front facade of the press hall tilts slightly and extends above the roof line to conceal the mechanical equipment. From the ground, a sliver of sky can be seen within a punched-out section of the facade above the five-bay-wide glass curtain wall. The diagonal supergraphic sign that faces the Whitestone Expressway resembles the diagonal signage of the *New York Times'* delivery trucks.

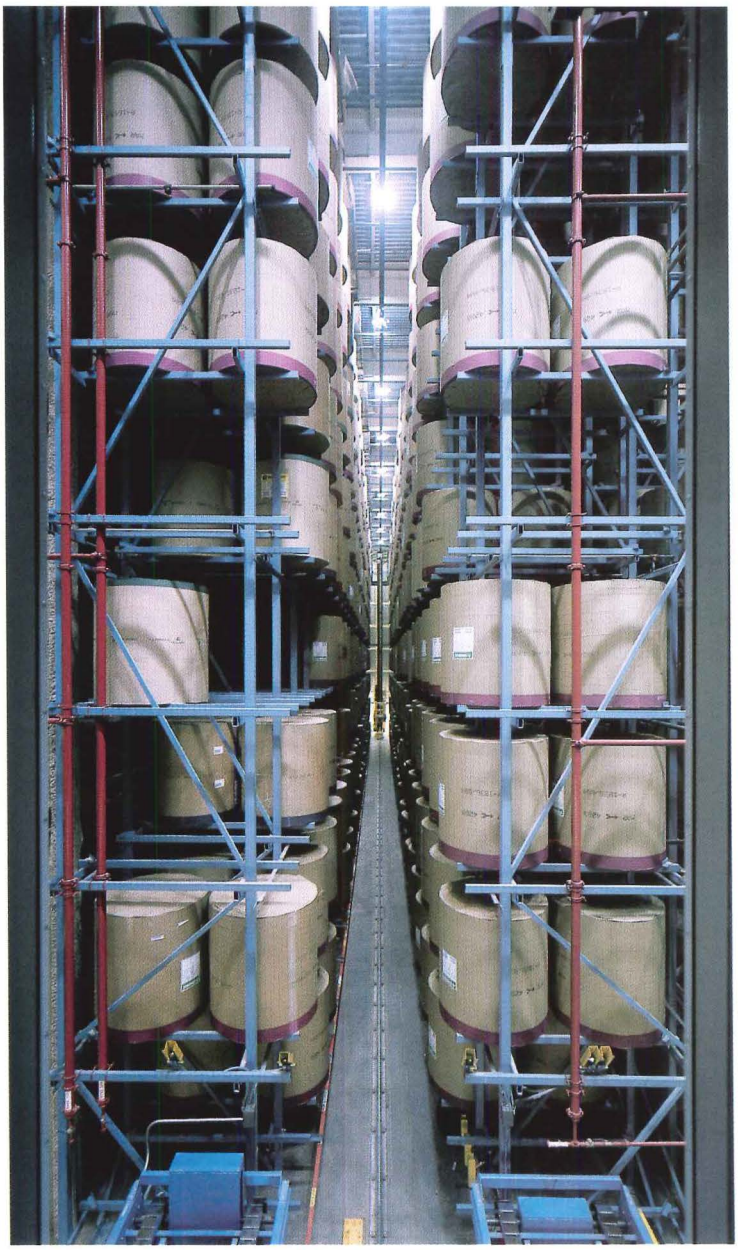
Thurm allowed the design process to get far along—about halfway through working drawings—before he brought in 40 people to the construction manager's office, including maintenance engineers, workers from the press room, and the architects and their consultants, for a three-day conference. He hoped to find ways to reduce costs before construction started, and to make sure that there would be minimal change orders.

On the first day of the conference, the group reviewed structural, electrical, mechanical, and site details. On day two, the group divided into four teams: architects; mechanical, electrical, and structural engineers; site consultants; and those involved in designing or running the printing process. Each group was given a preliminary estimate of what its share of the project would cost. On the third day, each team suggested cost-saving changes in its category of expertise. "We saved $4 million in those three days," Thurm says.

The result of this process is a lively, colorful building that's readily visible from the highway and brightens an otherwise dreary industrial area. ■

Sources

Structural system: *Interstate Iron Works Corp. (wide-flange material)*
Ground-faced CMU: *Plasticrete*
Interior glazed masonry unit: *Spectra Glaze*
Metal/glass curtain wall: *EFCO Corp.*
EPDM roofing: *Carlisle*
Skylights: *Skywall*
Paints and stains: *Sherwin-Williams*
Tile: *Dal Tile*



2 Mercedes-Benz M-Class Assembly Plant Tuscaloosa County, Ala.

GERMANY MEETS ALABAMA, AND 1,500 JOBS ARE CREATED IN A RURAL AREA BADLY IN NEED OF ECONOMIC DEVELOPMENT.

by Phillip Morris

Project: *Mercedes-Benz M-Class Assembly Plant, Tuscaloosa County, Alabama*
Owner: *Mercedes-Benz U.S. International*
Architect: *Albert Kahn Associates—George Barbu, project principal; Tony Grego, AIA, designer; Kenneth Chevrier, architect; Lawrence Bechard, project manager; Carol Kordich, interior designer; Peter Lynde, mechanical engineer; John Schuster, electrical engineer; John McClary, structural engineer*
Associate Architect: *Gresham, Smith and Partners*
Consultants: *Grover Harrison P.C. (landscape); E. F. Whitney (kitchen)*
General Contractor: *Fluor Daniel*

Size: *1 million square feet*
Cost: *$300 million*

Spread out amid the pine trees along Interstate 20/59 between Tuscaloosa and Birmingham, Alabama, the new $300 million Mercedes-Benz M-Class Assembly Plant is the product of a melting pot of corporate, ethnic, and regional cultures. The success of the building's design lies in the fact that these various groups were able to communicate, creating a commonality out of different backgrounds.

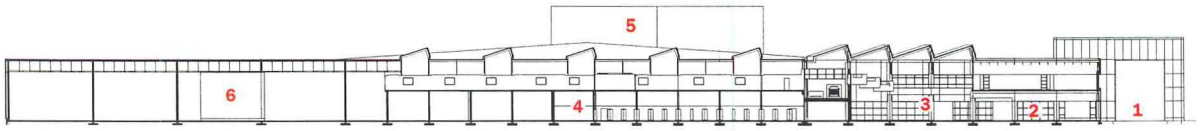
Employees setting up the production and manufacturing of the company's new, award-winning "all-activity" vehicle included key personnel recruited from GM, Chrysler, and the American operations of Toyota and Nissan; newly trained Alabama natives; and administrative and technical representatives from Mercedes headquarters in Stuttgart, Germany, as well as other German locations. It would have been simpler for the company to just import its way of doing things from Germany, the usual method Mercedes employs when conducting business in foreign countries. But the goal in Alabama was to plow new ground, both literally and conceptually.

"I remember one meeting of the team in Tuscaloosa where we debated until eleven p.m. whether to have an E-shaped plant, a T-shaped plant, or something else altogether," says Reiner Gors, project architect for Mercedes-Benz. "And this was before we even went to the architects." At the recommendation of general contractor Fluor Daniel, the decision was made to build a rectangular plant to facilitate communication and interaction among the body, paint, and assembly operations (typically located in separate wings), and to use the U.S. firm most experienced in automotive plant design, Albert Kahn Associates.

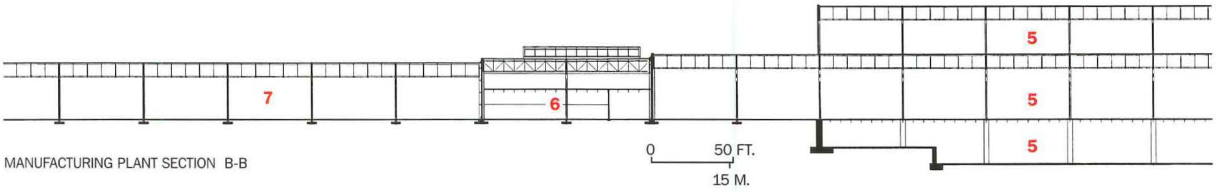
At 1 million square feet, the plant is not large compared to most assembly factories. Current capacity is lower than most, however, at 75,000 vehicles a year. A typical

Located on the site of a former tree farm, the Mercedes plant has its own exit off the nearby interstate. The State of Alabama invested more than $90 million in infrastructure.

Phillip Morris is an honorary member of the AIA and an editor-at-large for Southern Progress Magazines in Birmingham, Alabama.



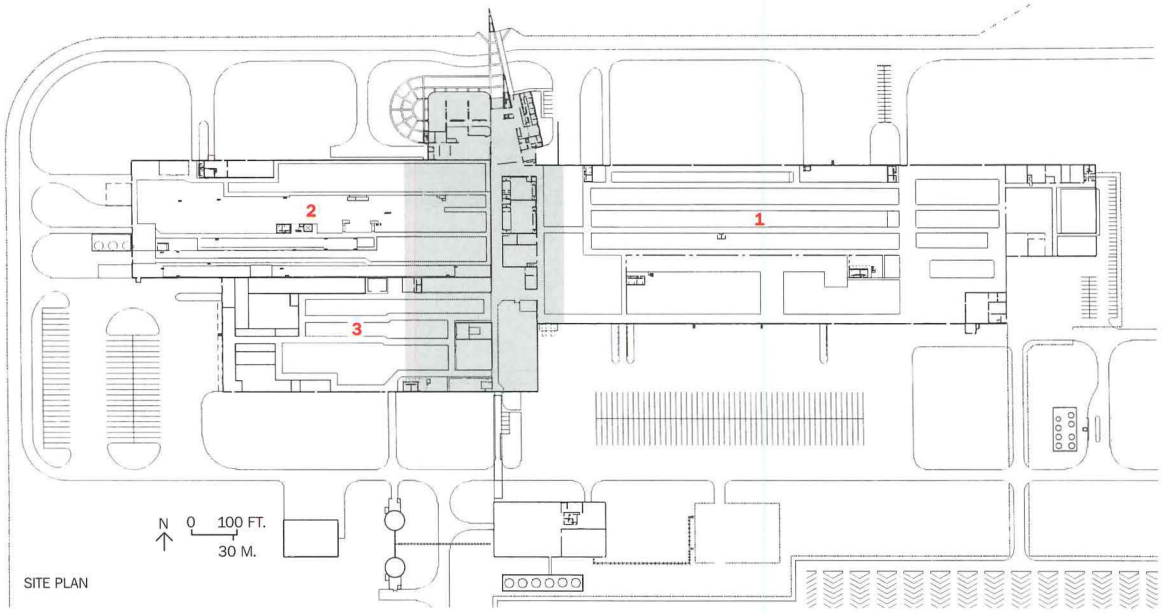
CENTRAL SERVICES SECTION A-A



MANUFACTURING PLANT SECTION B-B

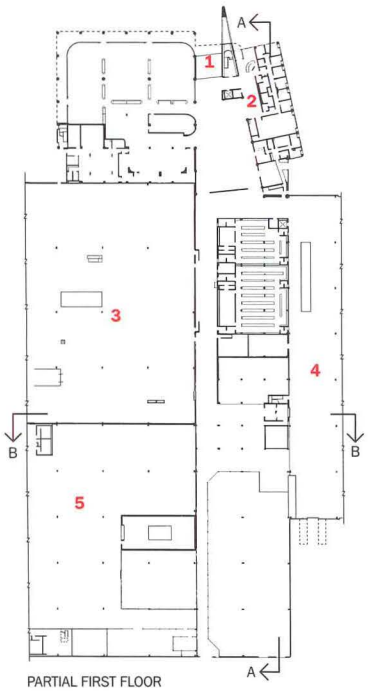
1. *Entry*
2. *Visitor area*
3. *Lobby*
4. *Production offices*
5. *Paint shop*
6. *Body shop*
7. *Assembly shop*

Rows of windows admit plenty of light. The strong, simple wedge marks the employee and visitor entries.

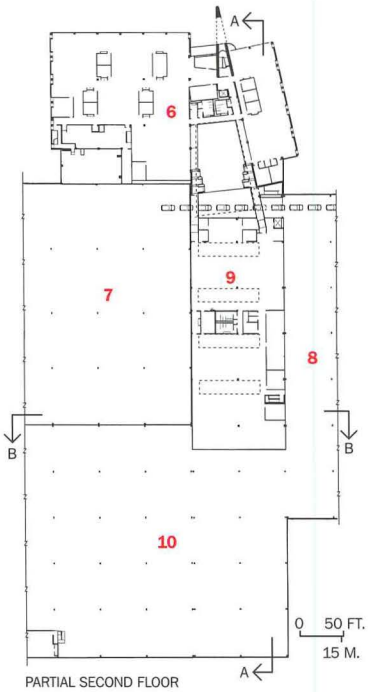


SITE PLAN

1. *Assembly*
2. *Paint*
3. *Body*



PARTIAL FIRST FLOOR



PARTIAL SECOND FLOOR

1. *Entry*
2. *Visitor area*
3. *Paint shop*
4. *Assembly*
5. *Body shop*
6. *Administrative offices*
7. *Upper paint shop*
8. *Upper assembly*
9. *Production offices*
10. *Upper body shop*

Employees, some of whom came to Alabama from Germany and Japan, eat lunch al fresco when the weather is nice. The cafeteria, at the north end of the building, seats 650 people.

U.S. plant produces about 250,000 vehicles. The 966-acre site affords room for expansion. Operations have been designed so that 80 percent of the M-Class parts come already assembled by suppliers, helping to reduce necessary plant size and personnel.

The State of Alabama put together a $253 million package to lure the foreign car manufacturer in hopes of putting the state on the global economic map. Alabama's growth rate is glacial compared to that of neighboring states. According to Mercedes, all 50 states sent site proposals to attract the automaker, but Alabama's was the most tempting. Among the incentives were $90 million for training, $15 million toward a new training center, direct payments for each job provided at the site, and more than $95 million in infrastructure and site work.

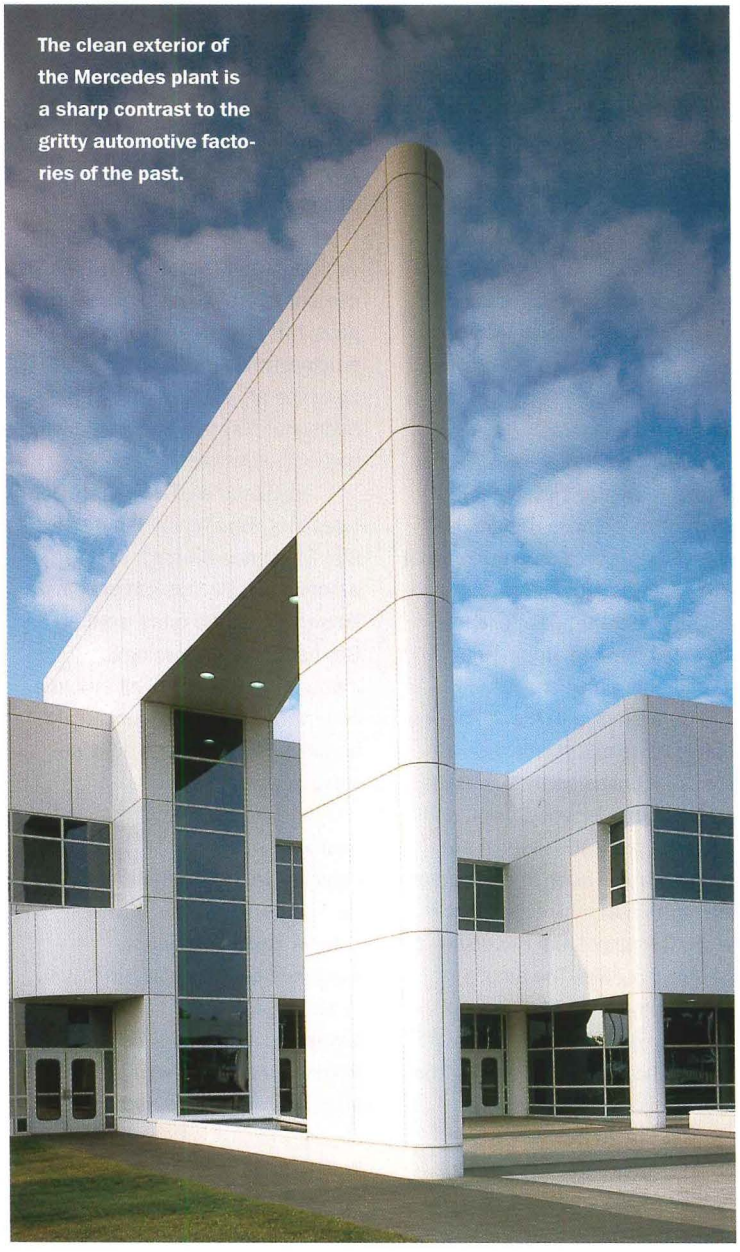
Mercedes-Benz's reputation for quality was combined here with a strong push for cost efficiency. The plant was begun in 1995 and finished on time and under budget. The fact that the site had been prepared for development by the state was helpful, as was the straightforward steel erection technique.

The plant's rectangular layout emphasizes the importance of teamwork and quality. By locating the body, paint, and assembly shops adjacent to each other and

PHOTOGRAPHY: © CARY KNIGHT (SIDEBAR)

Mercedes-Benz Institute and Visitor Center Zipping along I-20/59 in Tuscaloosa County, Alabama, it's impossible to miss the Mercedes-Benz logo atop a tall pylon and a roller coaster of a roof. Welcome to the Mercedes-Benz Institute and Visitor Center, designed by Gresham, Smith and Partners' Birmingham office and located about 600 feet away from the M-Class Assembly Plant. The 100,000-square-foot structure consists of three elements: a customer delivery space, a visitor's center with a Mercedes museum, and, the largest component, the plant's employee training center.

Using the same off-white exterior panels as the plant, the building is a complement to its neighbor. As in the plant, openness and communication are this building's major themes. Classrooms on a mezzanine overlook the shop training area below. Visitors view the training process through windows. "The client wanted a visual tour de force that could be read quickly from the interstate and make passersby curious," says Bill Jordan, AIA, project architect. An undulating roof of silver standing seam metal was inspired by the famous gull-wing sports coupe and evokes the kind of terrain the M-Class utility vehicle is intended to master. *P.M.*



The clean exterior of the Mercedes plant is a sharp contrast to the gritty automotive factories of the past.

connecting them with an administration and employee area, the layout makes it possible to see what's happening throughout the line, facilitating communication. It also reduces shop-to-shop conveyor links.

"We have worked with the Japanese and American auto manufacturers for many years, and with BMW on their new Spartanburg, South Carolina, facility," says Alan Cobb, AIA, who serves as director of architectural design for Albert Kahn Associates and worked with designer Tony Grego, AIA, to develop the plant's program. "The hallmark of the Mercedes approach is to look at the best practices in the United States, Germany, and Japan, and design to state of the art."

In plan, the plant is an irregular bar following an east-west alignment roughly paralleling the nearby interstate highway. Body and paint components are placed side by side to the west of a central service spine. The longer assembly component extends to the east. The site also features employee and visitor parking, truck marshalling yards for delivery and loading, an energy center, a hazardous-waste handling facility, a tank farm, and outbound-vehicle staging lanes. Placed several hundred feet to the northeast and within full view of the highway is the Mercedes-Benz Institute and Visitor Center (see sidebar), which also serves as an employee training facility.

The plant entrance is boldly marked by a full-height, open center wedge that thrusts out from the spine. The wedge and the spine's forward extension are clad in white powder-coated rectangular aluminum panels. The bulk of the plant is sheathed in vertically hung off-white metal siding. All employees, from administrators to assembly-line workers, enter here, as do visitors; the former go in to the right of the wedge and the latter angle off to the left.

"Communication was the most important aspect of the functional plan," Cobb says. "We needed to make sure people could come together easily, and the architecture of the entry and atrium space was intended to symbolize that emphasis on communication. Everyone passes through this space."

Opposite the visitor reception center, which is where factory tours begin, and beyond the two-story lobby, with its product and quality displays, is a spacious cafeteria. Employees look out through glass walls, over reflecting pools, to the pine trees and distant hills. There is also an outdoor dining terrace. This sequence of spaces flows together gracefully, striking a balance between precision and warmth with ceramic tile floors, maple paneling, and crisp metal trim.

Ready to roll, the new "all-activity" vehicles (far left) are examined in the service and test lot before being shipped out. About 70 percent of the product is destined for the American market. The cafeteria (left) was a necessity; there are no restaurants nearby. The space gives employees a place to socialize.

In melding German, Japanese, and American approaches to car manufacture, communication became the overarching design concern. Glass partitions and open spaces are used throughout. From the administration offices (above), employees can see over the lobby to the assembly areas.

Evidence of the plant's purpose is clearly visible in the 41-foot-high lobby: a glass-encased conveyor at the second level moves painted vehicle bodies from the body-and-paint side of the plant to the assembly side. This same moving line of glistening auto bodies can also be seen from the production offices and the administrative offices on the second level. The latter are located above the cafeteria and enjoy the same vistas of the Alabama countryside.

Sawtooth roof monitors with clerestory windows evoke early automotive factories designed by Albert Kahn, specifically the original Ford Model T plant in Highland Park, Michigan. Here they are used to bring light into the atrium and second-floor office spaces.

Consistent with the under-one-roof design and the emphasis on teamwork based on the Japanese model, offices for body, paint, and assembly-production teams are centralized and open to each other and to the assembly operations below. The paint shop is visible—but through glass. The area is sealed and pressurized to keep the fine, red clay dust that can sift through the smallest openings from ruining a good paint job.

The structural and exterior design of the Mercedes plant follows the internal agenda, with the exception of the wedge, the only decorative element. "The exterior is an envelope which may even be temporary," Cobb points out. "With Mercedes people, we decided on a husky rib siding without any horizontal girts to allow for flexibility and expansion."

The success of the M-Class vehicle in the U.S. market, where 70 percent of the plant's production goes, has brought the number of employees at the Alabama facility up to the projected 1,400, with an additional 100 jobs expected by the end of the decade.

Thanks to all the different cultures that were brought into the mix, Mercedes-Benz's first North American facility has emerged as its own hybrid. So much so that German visitors traveling to Alabama to visit the plant and test drive vehicles are disappointed in one thing: the cafeteria does not serve good beer. ■

Sources

Columns, trusses, purlins: *Qualico Steel Company*
Exterior cladding: *Centria*
Elastomeric roofing: *Stevens Roofing System*
Insulation: *Atlas Energy Products*
Glazing: *AFG Industries*
Aluminum entrance doors: *Special-Lite*
Hollow metal doors: *Mesker Door Company*
Wood doors: *Algoma Hardwoods*

3 Valeo Electrical Systems San Luis Potosi, Mexico

FLEXIBILITY, EASE OF EXPANSION, AND COMMUNICATION AMONG EMPLOYEES WERE TOP PRIORITIES IN THIS AUTOMOTIVE PARTS PLANT.

by Mildred Schmertz

Project: *Valeo Electrical Systems, San Luis Potosi, Mexico*
Owner: *Valeo*
Architect: *Davis, Brody & Associates, LLP—Steven Davis, FAIA, Chris Grabe, AIA*
Engineer: *Ove Arup & Partners*
Consultants: *Biaani Lighting Consultants (lighting)*
General Contractor: *Contreras & Associates*

Size: *100,000 square feet on one level*

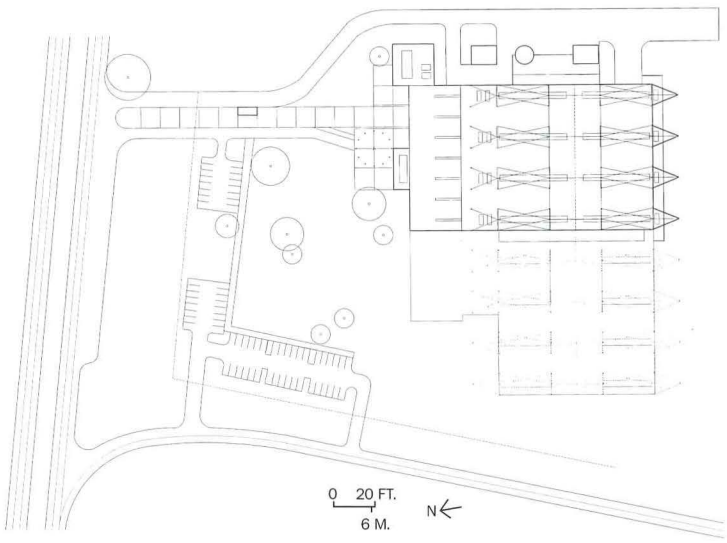
In the small city of San Luis Potosi in Mexico, there's an intriguing new factory building that houses the manufacture and assembly of a decidedly unintriguing product: electrical motor systems for automotive windshield wipers. The building was designed by Davis, Brody & Associates for Valeo, a French-owned automotive-components manufacturer that serves major truck- and carmakers worldwide. There are many automobile plants in San Luis Potosi, including Ford and Chrysler, Valeo's chief local customer.

The city, a four-hour drive south from Mexico City, once relied on nearby gold and silver mining for its economic base but now counts on the money generated by industrial development. Although the area is not particularly remote, it is in a part of the world in which Davis, Brody & Associates had no prior experience. To complete the building on time and within budget, the architects had to familiarize themselves with locally available materials and labor.

Valeo assisted in this process by hiring a liaison who worked with the contractor and the architect to assess the look, quality, and availability of various products. The team discovered a wealth of talented steelworkers in the area who could weld and assemble component pieces at a reasonable cost and more quickly than if premanufactured pieces were imported. They also discovered that because there are so many industrial buildings in the vicinity already, workers are well versed in this type of construction and can work quickly.

At the client's request, Davis, Brody completed the design work quickly—within two and a half months. Thanks to the highly skilled local labor force, the production line segment of the factory was up and running six months after construction began, says principal Steven Davis; the administration area was finished four months later. Moving at this fast pace was essential: Valeo had order commitments to fulfill and wanted to minimize downtime.

The flat, 16-acre site is bordered to the northeast by the major, four-lane highway linking San Luis Potosi and Mexico City. To the northwest and southwest are secondary roads, and to the southeast is another industrial property. The architects capitalized on the visibility of the site by making the facades that are visible from the highway as clean and attractive as possible. The impact of the service yard, with its truck dock, water tank, and mechanical and electrical equipment facilities, was minimized by placing it adjacent to the industrial plant. The facility's presence on the highway is enhanced by expanses of indigenous grasses, plantings, and trees.



SITE PLAN

The mostly glass entry and lobby area (left) faces a major highway running from San Luis Potosi to Mexico City. The custom-fabricated roof-support system (below) looks like a ship's riggings.

Broad eaves mitigate the effects of the hot Mexican sun, while expanses of glazing allow views of the hills that surround the site (above and right). Valeo located its operations here because of the concentration of automotive plants. An added benefit was the wealth of skilled steelworkers who could fabricate the complex trusses and fasteners.

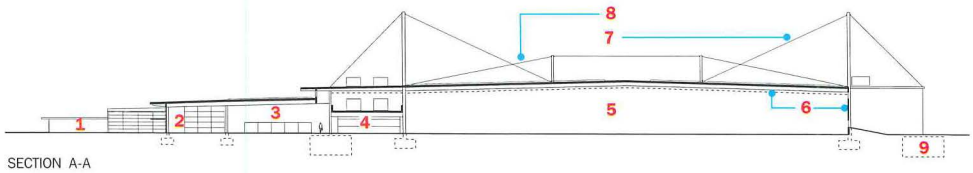
Spindly jointed trusses, along with abundant glass and broad eaves, make this otherwise simple, rectangular building noteworthy. Part of the rationale behind this presentation is Valeo's conviction that the architectural quality of a building is directly related to the quality of the products manufactured there. As the corporate reasoning goes, the precision that's evident in the trusses must also be evident in the components that are produced beneath them.

The main entry, administration, and common areas are located to the northeast, facing toward the arterial highway. The glass-enclosed facade of this public portion offers an open, attractive view of the activities taking place within and of the cactus-covered hills outside. To the northwest, sufficient land remains for the plant to eventually double in size. Little of the site is taken up by parking lots since most employees commute by bus or bicycle.

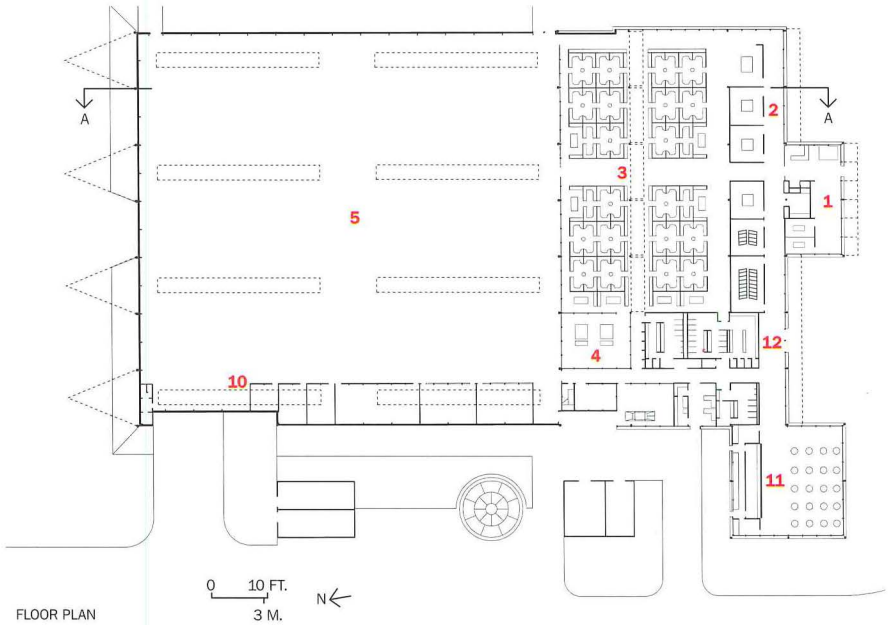
In planning the facility, Davis, Brody focused on three goals: the ability to expand in a manner that will allow production to continue during the process; flexibility in the arrangement of the manufacturing equipment and its services; and ease of visual as well as electronic communication among the departments. It was also important to the client that the building be adaptable to new and future production techniques. As architecture, the factory was to signify and embody the high level of technology and research that governs the manufacturing process within, as well as express the corporation's commitment to quality and innovation.

The program for the 100,000-square-foot, one-story facility required areas for fabrication, research laboratories, administration, and teleconferencing; a training center; a lobby with an exhibition space for visitors; a small infirmary; and a cafeteria serving local cuisine for employees.

Easy communication between the departments was possible in this factory mainly because the operation is not as noisy, dusty, and dangerous as other automotive-related industries. The first step was to place the administrative area directly adjacent to the fabrication floor. A row of research laboratories, all of which open onto and serve the fabrication space, defines the southeastern edge of the administrative area. Glass partitions, which block the relatively small amounts of dust and noise, were used to encourage visual contact among the departments. "The vice president can see straight through from his office to the laboratories and fabrication floor, and people working

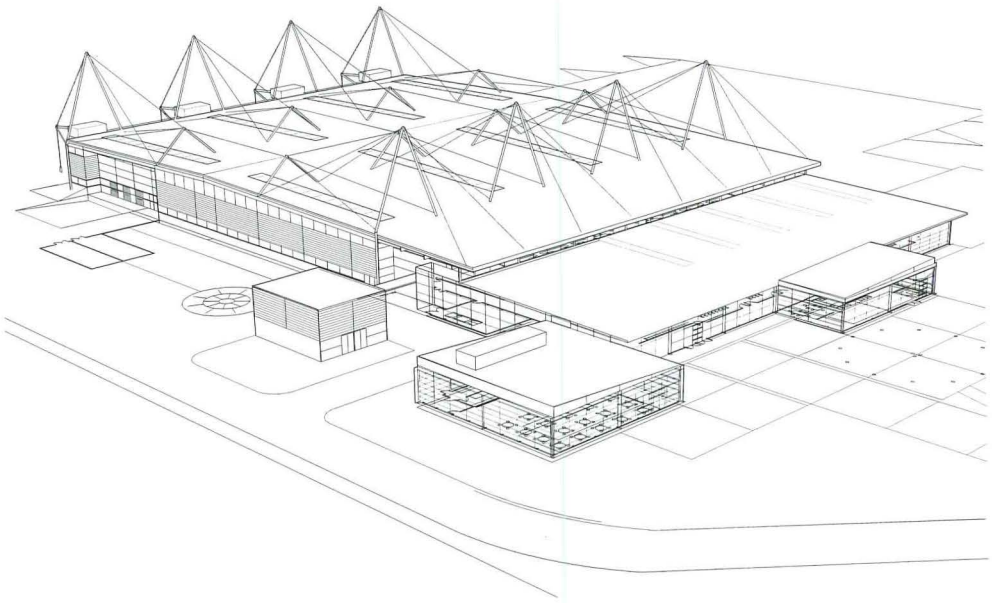


SECTION A-A



FLOOR PLAN

1. *Entry*
2. *Training/conference*
3. *Administration*
4. *Laboratories*
5. *Fabrication*
6. *Utility grid*
7. *Girder support rods*
8. *Wind uplift rods*
9. *Concrete counterweight*
10. *Incoming materials*
11. *Cafeteria*
12. *Employee entry*



Eliminating columns in the fabrication area made the space more flexible, but it also necessitated the dramatic fretwork of columns and tension rods that make the truss system so striking.

there can look back and see him," Davis says.

The administration offices are defined by low partitions that are demountable for flexibility. The open-landscape approach demonstrates Valeo's nonhierarchical standards for corporate space.

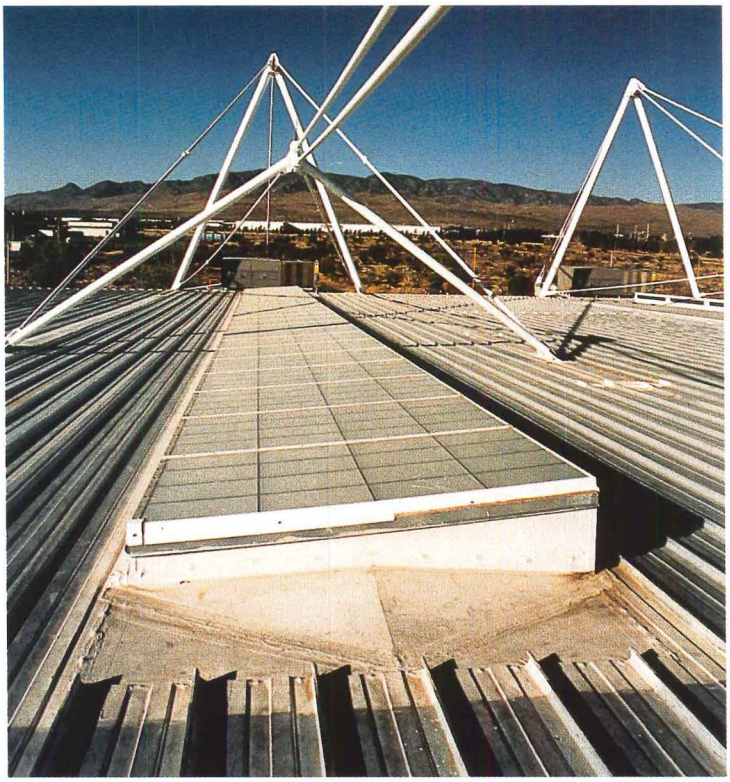
The areas allotted to fabrication, storage, laboratories, and administration are completely flexible. The building can be transformed from one that produces more than one million wiper systems per year to a manufacturing facility for automobile headlights, security systems, or several products at once. This allows Valeo to react quickly to the needs of the marketplace.

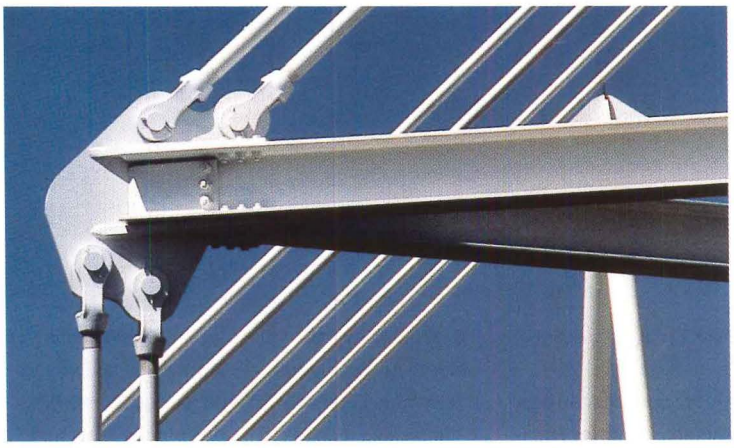
The column-free fabrication area shares the same grid-based proportions as the columnar system of the administrative wing. This repetitive module will allow the anticipated expansion to occur easily to accommodate the requirements of the client. In addition, the fabrication, laboratory, and administrative areas can grow in the same proportions as those of the original plan, or they can expand independently, based on need.

The mechanical and electrical services were also designed using a modular approach. In the fabrication area, there's an overhead utility grid of electric buss ducts, data lines, compressed air conductors, chilled water pipes, and exhaust ducts. Vertical utility drops are grouped together and then horizontally connected to individual pieces of equipment. This permits easy attachment to the production equipment, regardless of its layout, and leaves the fabrication floor, a concrete industrial slab, free of conduits, allowing equipment to be jockeyed around.

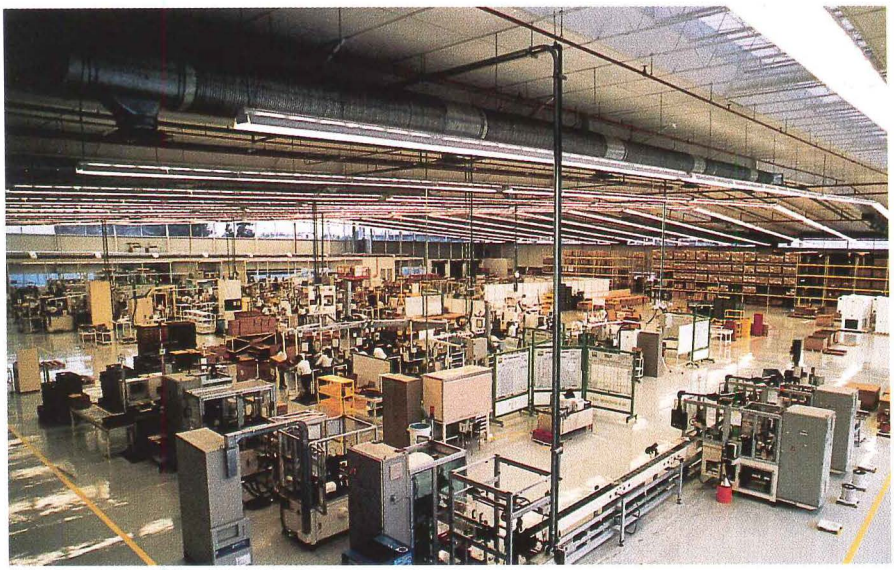
The building services in the administration and laboratory areas were designed to provide similar flexibility. Lighting, heat, and cooling systems are suspended from the ceiling to provide a uniform comfort and work level. Unlike the fabrication space, the administrative section has under-floor conduits through which data and electricity are fed to the furniture system and then carried through the furniture to the desktop.

The fabrication area is 56,500 square feet of open space. "If the client wants to be able to change the production line for innovations, it is inhibiting to have columns on a traditional rigid grid," Davis says. "Mapping the manufacturing sequence so that it missed columns would have inhibited flexibility and adaptability, and also cost space." To prove this theory, the architects asked Valeo's production people to lay out the fabrication process in a column-free sequence. Their investigation revealed that a column-free floor area could be 10 percent





An overhead utility grid in the fabrication section of the plant conducts electricity, water, compressed air, and whatever else is necessary to run the equipment on the production floor (right). Putting these supplies above meant the floor could be clear of hookups, allowing machinery to be moved around without hindrances. The space is also made safer for employees as a result.



Though Valeo's operation is set up to produce windshield wiper motors, the company can reconfigure the plant to produce other automotive supplies. Laboratories (above) are adjacent to the fabrication space, encouraging interaction among employees.

smaller than one with columns.

Calculations from consulting engineers Ove Arup & Partners bore similar results when it came to choosing the structural system. They compared the cost of steel for a standard, 82-square-foot rigid-bay factory structure with the cost for a long-span structure. The team determined that a factory with columns would require 110,000 square feet, but a column-free space would require only 100,000 square feet. On a dollar-per-kilo basis, the weight of the steel needed to build the larger plant was, naturally, greater than that needed for the smaller building. Though long-span systems are more complicated to build, the savings on the cost of materials more than offset construction costs.

The 245-foot-long roof is held in place by a system of trusses that resembles those used on suspension bridges. A-frame pipe column masts, rising 33 feet above the roof, provide the support for the tension-rod hangers. These carry 40-inch plate girders that divide the load of the building's long span into thirds. The rods then connect to back-span supports. The entire system is anchored vertically by reinforced-concrete, underground counterweights that are 27 feet square and 10 feet deep. To gauge the immensity of these weights, consider that each one weighs 310 tons—that's 13 cement mixers worth of concrete. The outriggers of the structure are used as dunnage for the air-conditioning chillers, which also serve as counterweights. Wind-uplift requirements are met by a less dramatic A-frame, tension-rod system, which ties down the roof in thirds along the long span.

Some of the components for this complex support system, including the rolled steel sections, aren't manufactured in Mexico. The mild-steel tension rods, for example, were imported from the United States. But local welders were able to fabricate the steel-plate girders and I-beams. "We wanted to take advantage of those skills and local products," Davis says. "We were bold enough to invent a sophisticated long-span structural system because we knew that the Mexican workers could build what they were presented with." ■

Sources
Joists and plate girders: *Capo Estructuras*
Curtain wall: *Argo Estructuras*
Concrete: *C&A*
Metal roofing: *Cano Estructuras*
Steel: *C&A*
Glazing: *Potosina de Aluminio*
Skylights: *Meda*
Plastic glazing: *Kalwall*
Entrance doors: *C&A*
Acoustical ceilings: *Armstrong*
Flooring: *Mannington*

NWWDA
NATIONAL WOOD WINDOW AND DOOR ASSOCIATION

IN ASSOCIATION WITH

AIA / ARCHITECTURAL RECORD
Continuing Education Series

PRESENTS

Specifying Wood Windows, Skylights and Doors: Beyond Aesthetics

Often the inclusion of wood windows, skylights, and doors in a building project is an obvious choice. For what could be more traditional, particularly in domestic architecture, than a piece of wood, sized to cover an opening in the façade and shaped to hold panes of glass or designed to allow entrance into and out of the building. Task accomplished!

Yet, today we ask much more of our wood windows, doors and skylights—in commercial as well as residential projects. Aesthetics are high on the list, for few materials can match wood's natural beauty, as revealed in its texture, grain, and color. But, also of great importance are other qualities and characteristics that wood windows, skylights, and doors offer—energy efficiency, ease of accessibility, acoustical buffering, fire control, and even a responsible use of our natural resources. In some cases, new wood window, skylight and door components are designed to comply with ever-changing codes and standards. In other instances, the products may be of cutting-edge technology, leading the architect to a design standard beyond that prescribed by codes.

When specifying wood windows, skylights, and doors, architects, therefore, need to look beyond the aesthetics—to understand how other critical aspects of the occupant's safety and welfare are addressed. With this in mind, the National Wood Window and Door Association (NWWDA), in association with the AIA/ARCHITECTURAL RECORD Continuing Education Series, offers a brief examination of the effect on wood windows, skylights and doors of changing requirements in several different areas of concern—acoustics, the environment (including energy efficiency), fire safety (including positive pressure testing), and accessibility. Often developments in one area overlap into another, as wood windows and doors are integrated products. Finally, this compendium offers a look at four instances in which the inclusion of wood windows, doors, and skylights go beyond aesthetics.

The NWWDA is comprised of the country's leading producers of wood sash, frames, window units, flush doors, stile and rail doors, sliding and swinging patio door units, and skylights, as well as producers of the numerous other materials required to manufacture this industry's products. As a professional trade organization, it formulates and promotes high standards of quality for the industry. More information on NWWDA, its standards, procedures, and literature can be obtained from NWWDA, 1400 E. Touhy Ave., Des Plaines, Ill. 60018. (847) 299-5200. Or visit NWWDA's website at http://www.nwwda.org.

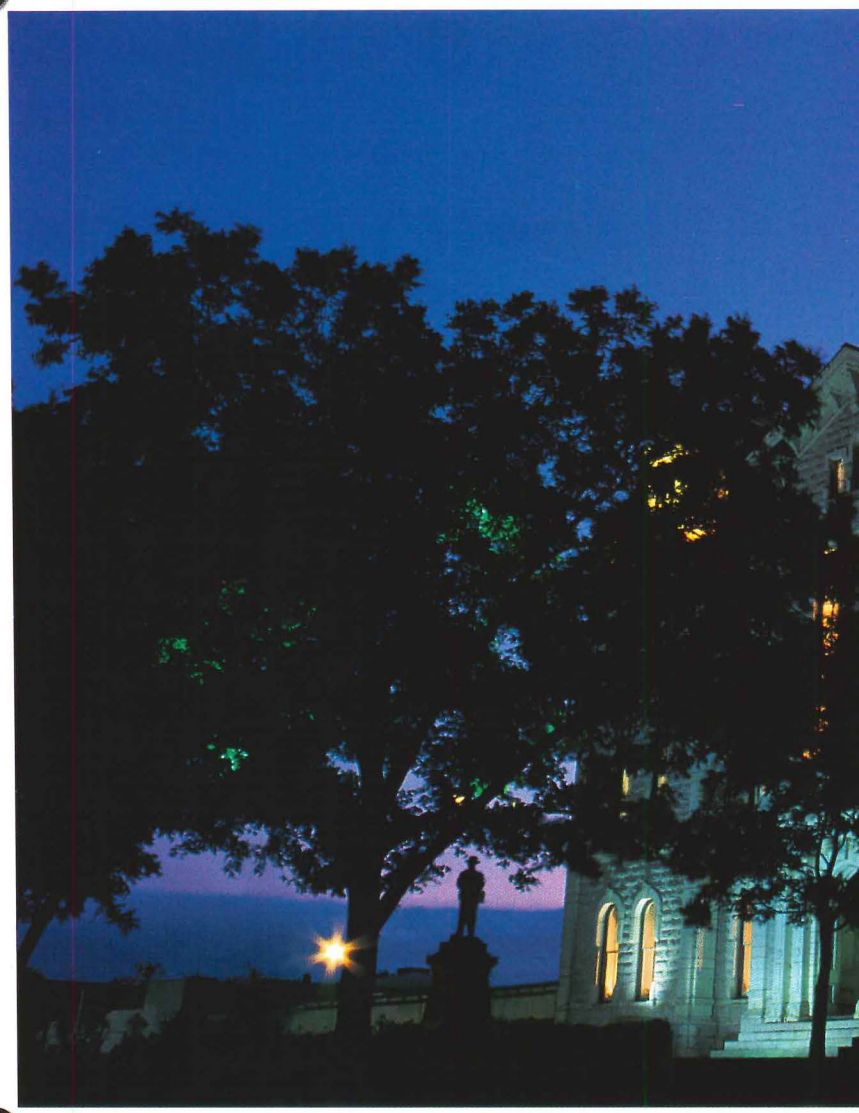
AIA / ARCHITECTURAL RECORD
Continuing Education Series

Use the following learning objectives to focus your study. After reading *Specifying Wood Windows, Skylights, and Doors: Beyond Aesthetics*, complete the questions (page 236) and check your answers (page 236). AIA members may fill out the self-report form (page 392) and send it in for two AIA Learning units that quality for Health, Safety, and Welfare credits.

Learning Objectives: After reading *Specifying Wood Windows and Doors: Beyond Aesthetics* and completing the exercises, you will be able to:

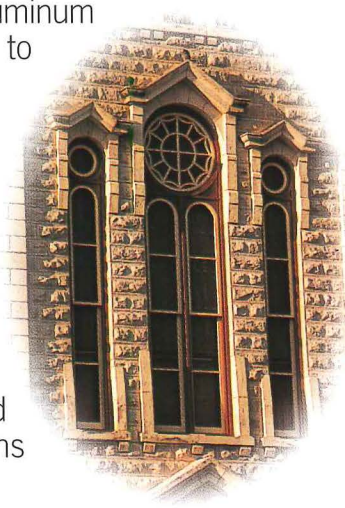
- Discuss at least two issues of concern in each of the following areas—acoustics, accessibility, environmental responsibility, and fire resistance.
- Discuss the theory behind acoustical, thermal, and fire performance tests and how to increase effectiveness in each area.
- Identify the nuances of specifying wood windows and doors in three different design applications.

WHEN IT CAME TO RENOVATING THIS HISTORIC COURTHOUSE, EVEN THE



In 1964, The Parker County Courthouse in Weatherford, Texas was designated a Texas Historic Landmark. And thus began the slow, methodical process of restoring it. First to receive attention was the structure's limestone stonework. Later, the roof was replaced. Then came the windows, which proved to be one of the most challenging aspects of the project.

The Historical Survey Committee mandates that if nothing remains of a historic building's original windows, the new ones must be faithful reproductions, right down to the last detail. Since the courthouse's original wood windows had been replaced by aluminum ones some years back, that meant that all 105 of the new windows had to be virtually identical to those made and installed over a century ago.

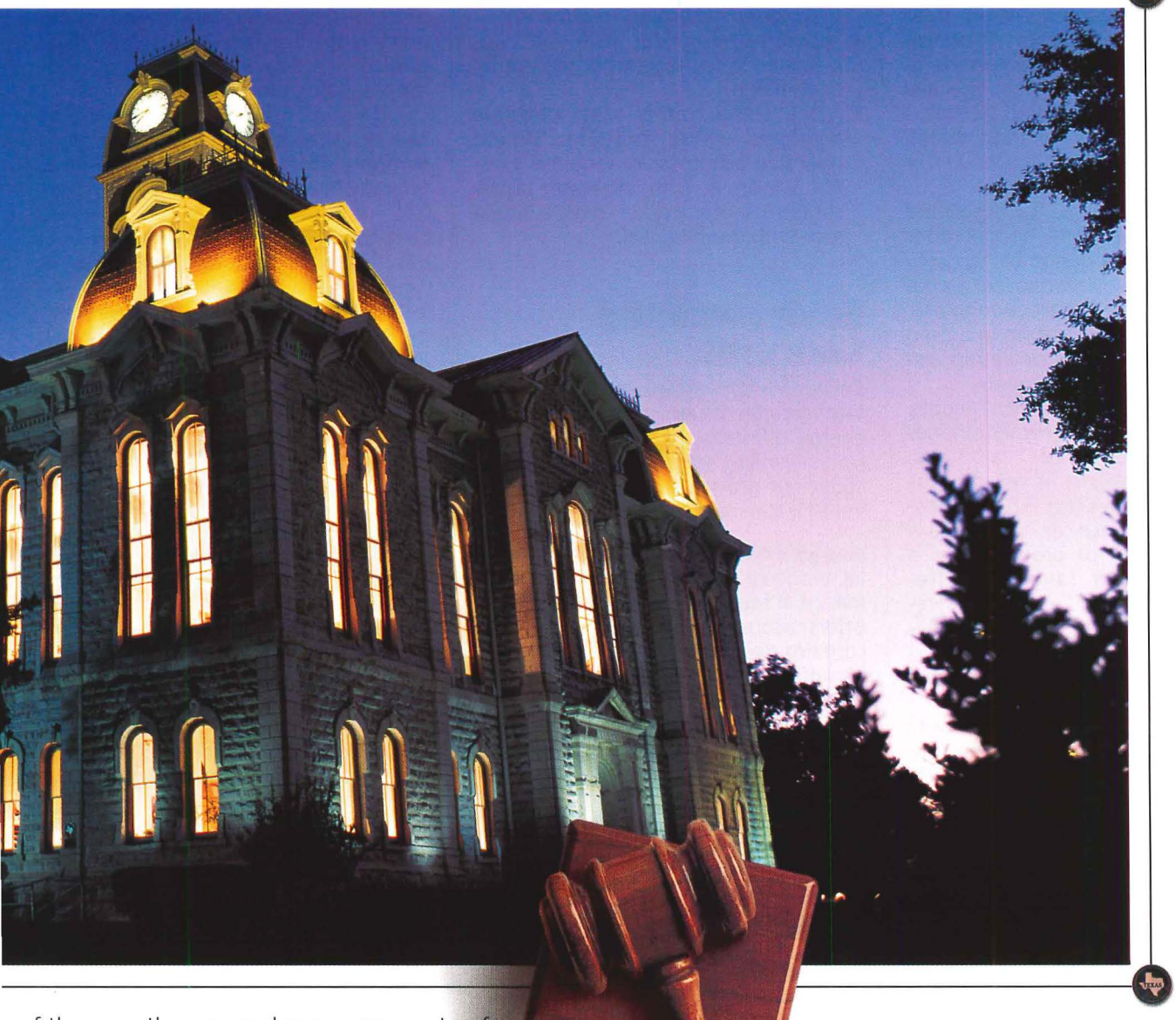


Bids were sought, but only two manufacturers felt qualified to respond. One of them, Marvin Windows & Doors, had actually been recommended by a company that was asked to bid but declined.

Though underbid by the other finalist, Marvin's figures were based on building the largest windows with structural muntin bars to withstand the winds that buffeted the building's hilltop site. Intrigued, the architect asked each company to build a sample window. One look at the prototypes and the job was immediately awarded to Marvin.

For the next several weeks, Marvin's architectural department busied itself recreating the past. Working from turn-of-the-century photographs

COMPETITION RULED IN OUR FAVOR.



of the courthouse and measurements of the actual openings, they designed the round tops, double hungs, circles and checkrail units that play such an integral role in the building's design. As for the largest of them, not only were they built to withstand the high wind requirements, Marvin delivered them factory-mulled to further simplify installation.

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Acoustics

As a natural material, wood ranks high in acoustical properties. Wood fiber contains many cells, each of which traps sound and decreases reverberation. The heavier the frame, the less sound transmission. Wood performs much better acoustically than metal, which provides a smooth avenue for sound transmission.

For wood products, further sound attenuation comes with special door construction. In the design of "acoustical" doors, wood veneer covers a core that has a damping construction to prevent the faces from vibrating in unison and also to meet special gasketing and automatic bottom requirements.

For wood windows and skylights, the glazing system primarily determines acoustical performance variations. Acoustical performance is rated by its Sound Transmission Class (STC), a measure of performance or transmission loss of a material or product over a standard frequency range. The frequency range is based on speech frequencies taken under laboratory conditions from 125 Hz to 4000 Hz and excludes both the lowest and highest frequencies.

Basically, greater mass generally results in less sound transmission. For example, a 13-mm (1/2-inch) thick piece of glass has a higher STC rating than 6-mm (1/4-inch) glass. Therefore, simple architectural applications might utilize single laminated glass with a polyvinyl butyral core 1.5 mm thick, which can provide an STC of up to 41. The highest possible STC level of 51 involves the use of 2 lites of 13-mm laminated glass or 6-mm laminated glass with a 100-mm air space between the lites.

It's important to note that the air space doesn't increase the mass. For example, is 2 lites of 6-mm glass with an air pocket of 100 mm better than 2 lites of 13-mm glass laminated together? The 2 lites of 13 mm would have greater mass.

The sound transmission loss of glazing can be improved by:

- Using insulated (double) glass with a minimum 13-mm air space, and with different glass thickness.
- Increasing the thickness of the glass (up to 13 mm).
- Using laminated glass, which can achieve higher STC ratings than monolithic glass of the same thickness.
- Avoiding lightweight frames. (Use separate frames where possible, and line the interior perimeter of frames with sound absorbing treatment.)
- Mounting glass lites with soft neoprene edge gaskets rather than putty or caulking.
- Using sealed rather than operable windows where possible. Where operable windows are required, double windows with separate sashes should be used rather than a single sash with double-glazing.

Environmental Concerns

Environmental concerns including important societal issues such as pollution, energy efficiency, and renewability are not normally addressed by building codes but are more likely addressed as industry standards.

Energy Efficiency. As a natural material, wood ranks high in thermal performance. It's the same natural design that offers acoustical buffers—wood fiber contains many cells, each of which traps air and creates natural insulating pockets throughout the whole mass of wood. The principle is the same one that is used in insulated glass systems. It's the trapped air, not the glass, that provides the energy benefits. Tests show that as an insulator, wood is 4,000 times more efficient than steel and 1,800 times more efficient than aluminum. Wood windows, doors, and skylights require less energy consumption in the production process than those manufactured from fiberglass, plastic, steel, or aluminum-and with less pollution.

In the manufacturing of wood windows and skylights, the development of low-E glass coatings and low conductivity gas-filled insulating glass units drastically changed the market, allowing for much more energy-efficient wood windows with greater glazed surfaces. The U-value of a wood window unit or skylight—the measure of its efficiency—is clearly stated on the unit's label. This allows easy specification of the proper thermal properties for a building's microclimate.

U-values measure the amount of heat transfer that results from a temperature difference across a window. Typically, U-values range from 1.15 to 0.15—the smaller the U-value, the less heat transfer between inside and outside due to temperature difference. A window with a U-value of 0.30, for instance, loses half the amount of energy as one with a U-value of 0.60 under the same temperature conditions. In other words, the lower the U-value, the more energy efficient the window (see chart below).

The National Fenestration Rating Council has established a single testing and rating system for U-values, based on the performance of the product—windows, doors, and frames.

Wood doors offer important energy savings as well. Unlike hollow-aluminum, steel or hollow-vinyl doors, wood doors react very little to heat and cold. Steel, particularly, rapidly transmits heat. Studies show that the air infiltration rate of steel doors virtually doubles between 100 and 130 degrees F, while that of wood actually declines

U-Values of Windows

Type of Glass	Wood window (80%) glass	Metal window (80% glass) nonthermal break	Metal window (80% glass) thermal break
Single glass	0.99	1.10	—
Insulating glass (1/4" air space)	0.55	0.70	0.58
Insulating glass (1/2" air space)	0.46	0.59	0.49
Single glass with snug storm window (1" to 4" air space)	0.45	0.60	0.50

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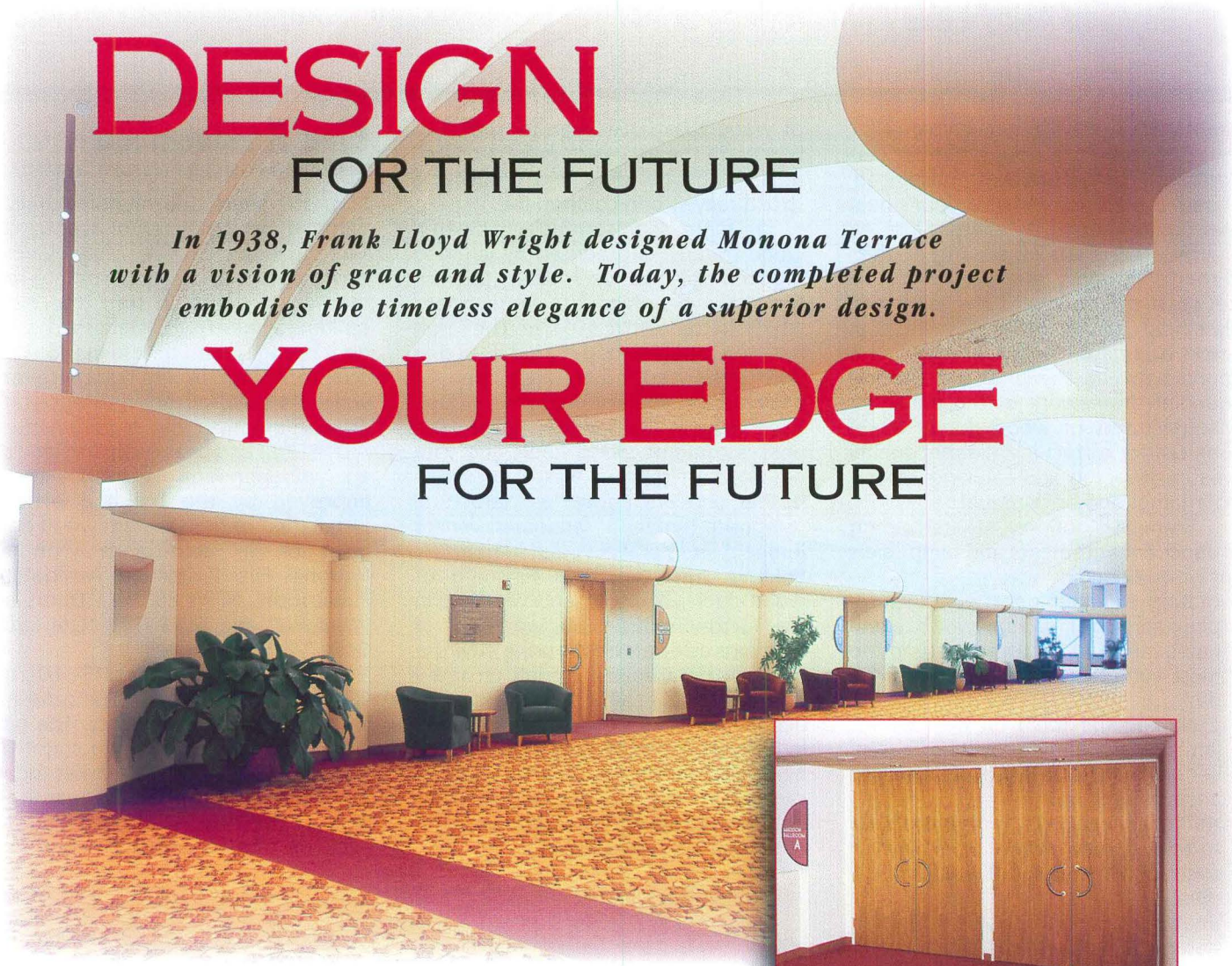

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CIRCLE 70 ON INQUIRY CARD

slightly because of its wood fiber cells.

Emphasis on a door's thermal performance is somewhat misplaced, though, as 75 percent of a door's heat loss occurs around its edges. Since air travels around an object rather than through it, most energy loss occurs between the door and the jamb and threshold as air infiltrates through cracks and gaps. Further energy loss is found between the jamb and the surrounding framework of the buildings. Manufacturers of wood doors, therefore, call for correct installation, quality weatherstripping and caulking around door jambs and brick moulds.

Examples of weatherstripping product enhancements and jamb liners for wood doors include:

- Mating together door weatherstripping and door sweep, which eliminates the need for corner pads in the most vulnerable sealing area of the door.
- Excluding the foam on the back of jamb liners, thus providing a seal between the side jamb of the door and the jamb line.
- Ability of weatherstripping products to take on new shapes or expand or contract, depending on weather conditions.
- Utilizing a multiple weatherstripping system that effectively minimizes air infiltration and energy loss. In this system, an adjustable jamb balance, made from extruded, impact resistant polyvinyl, is designed to resist conduction of warm air. A stepped gasket seal at the sill and side jambs virtually eliminates the possibility of water penetration.

Responsible use of natural resources. Wood can be considered an environmentally friendly resource in that it is renewable, recyclable, and ultimately biodegradable. Today's responsible forestry practices add to its environmentally friendly status. Most manufacturers utilize certified, well-managed forests for their raw materials. There, forestry experts ensure that the lumber supply is being replenished at a reasonable rate.

Recycling is also evident in the manufacturing of wood windows, skylights, and doors. For instance, many manufacturers use finger-jointed stock for components of frame and sash construction of windows, doors, and skylights that are hidden from view. Finger joining permits the use of smaller pieces of wood that have been discarded or burned in the past because of a defect, such as a large knot, and produces a structurally strong component.

A more sophisticated engineered wood product is produced by laminating multiple veneers with phenol-formaldehyde resins into large billets, which are then milled to size. The result is a structurally strong material used in door stiles and other large span or heavy load applications and hidden from view. In like fashion, wood composites combine wood fibers and various types of resin or plastic into composites and are known as "structural composite lumber," "laminated veneer lumber," or "parallel strand lumber."

Factory finishing. The finishing of wood doors, skylights, and windows in the factory reduces the potential of accidents associated with using environmentally hazardous materials on site—and may result in a better looking product. At the factory, conditions are ideal; in the field, job conditions often cannot be controlled. Factory finishing actually can prove less expensive and result in better finishes. And if a spill occurs, it can be better controlled.

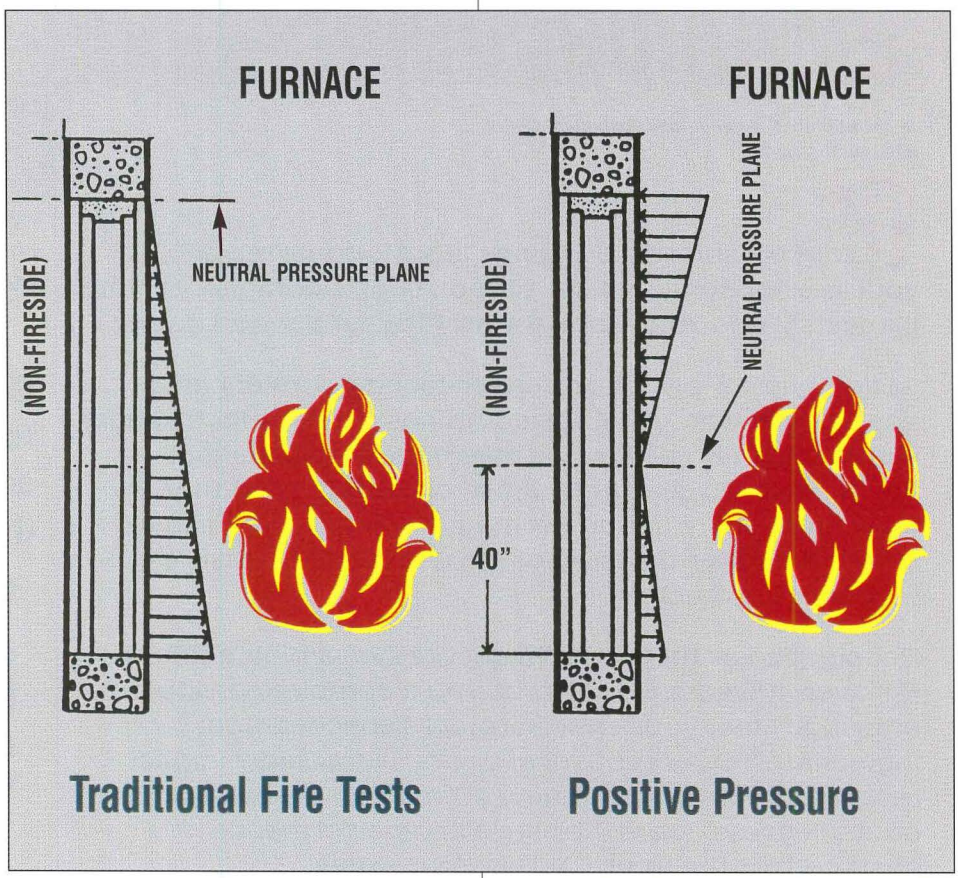
Fire Resistance

(Including Positive Pressure Testing)

Over the years, the manufacturers of wood doors have responded to consumer demand for fire safety by developing four classifications of fire-resistant wood doors. In turn, the model building codes have established a fire-door rating system for use in protecting door openings in fire-resistance-rated walls. As such, all fire-resistance-rated doors must meet the requirements of ASTM E152 and bear certifying labels of an independent testing agency approved by the building officials. Installation of fire-resistant wood doors must be in accordance with the National Fire Protection Association's Publications NFPA 80 "Fire Doors and Windows" and NFPA 101 "Life Safety Code."

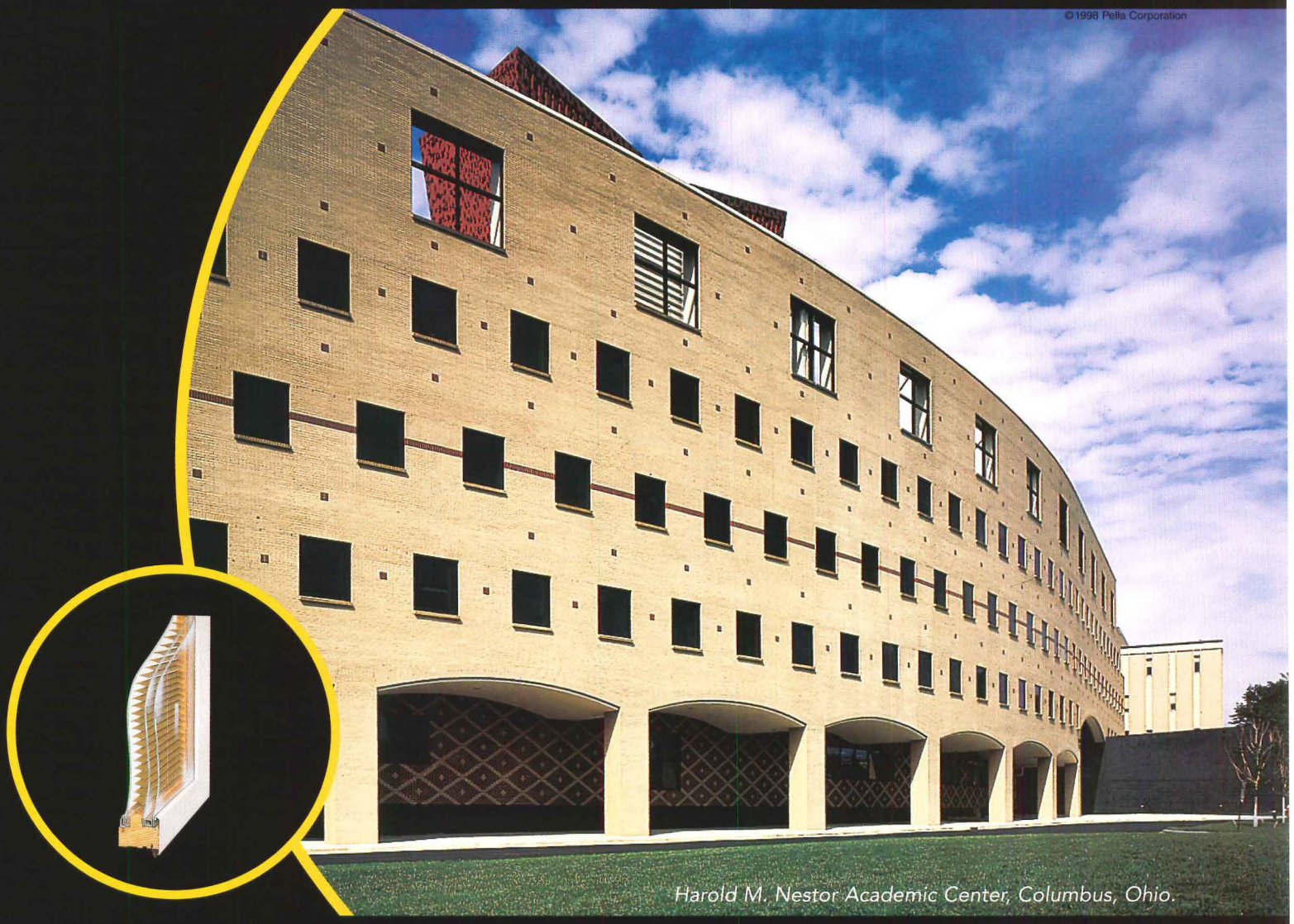
Core construction for 45-, 60-, and 90-minute doors is a mineral substance with a chalklike consistency. The basic 20-minute wood fire door accounts for about 90 percent of the market today.

Likely, controversial changes in fire door construction will result from the adoption of positive pressure testing by



COMMERCIAL SOLUTIONS

IF PELLA WINDOWS ARE ONLY FOR RESIDENTIAL USE, THEN THIS IS ONE REALLY, REALLY BIG HOUSE.



Harold M. Nestor Academic Center, Columbus, Ohio.

Architect: NBBJ, Columbus, Ohio, Friedl K. M. Böhm, FAIA, Principal-in-Charge
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one model code organization—ICBO. (This provision in the Uniform Building Code is a model for local jurisdictions that ultimately must adopt the language into its code.) Developed to more accurately reflect real-world situations, the new test specifies that "after five minutes into the test, the neutral pressure level in the furnace shall be established 40 inches above the sill. Such pressure shall be maintained during the entire test period."

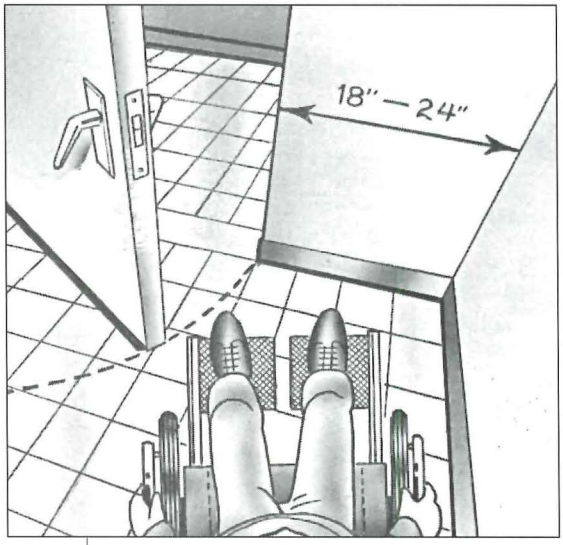
Previously, the neutral pressure plane was maintained at the top of the door for the entire test. The new test calls for hot air to be held against the top two-thirds of the door, while the lower one-third would have cooler air drawn into the furnace. The positive pressure tends to make the flames and hot gases want to push through the door, which is already weakened. The test is designed to reflect real situations based on the theory that heat expands the air, increasing the air pressure in the room or space where the fire is.

It is uncertain how wood door products will be affected by positive pressure testing, but industry experts suggest the new testing procedure will likely affect the design of the entire door system, including the frame and hardware design.

Tips on Hardware Selection

As mentioned above, in the aftermath of the ADA, there has been a major shift from doorknobs to levers and a slow movement toward electrified hardware, such as electric strikes or electromagnetic locks. Beyond accessibility, hardware selection is key to providing egress and security. Compatibility of the wood door, skylight, or window and hardware is important. Often overlooked and sometimes underrated, locksets, closers, and exit devices are integral components of wood windows and doors. Hardware has to work well with a wide range of windows, skylights, and doors in order to meet building codes. And, increasingly, form has to meld with function. The trend is to meet consumer demand for hardware that is stylish, or that is virtually invisible, such as concealed hinges and handles.

Accessibility



Adopted by the U.S. Congress in 1990, the Americans with Disabilities Act (ADA) has had far reaching consequences on building codes. The intent behind the law is that persons with disabilities have the right to receive the same public services and opportunities as nondisabled persons, including access to and through public buildings. For wood windows, skylights and doors, concerns center on the ease of mobility through doors and of operating both doors and windows.

The most basic requirement is that doors are wide enough for a wheelchair-bound person to swing the door open without hitting the chair and allow him or her to maneuver through the doorway. With standard construction and tolerances, a 36-inch width is the narrowest a door can be to comply if standard hardware is used.

When complying with accessibility standards and codes, though, much more than just the width of a wood door opening needs to be considered. For instance, door stops and thresholds can prove hazardous. Kickplates can also prevent the damage sometimes inflicted onto doors by wheelchairs.

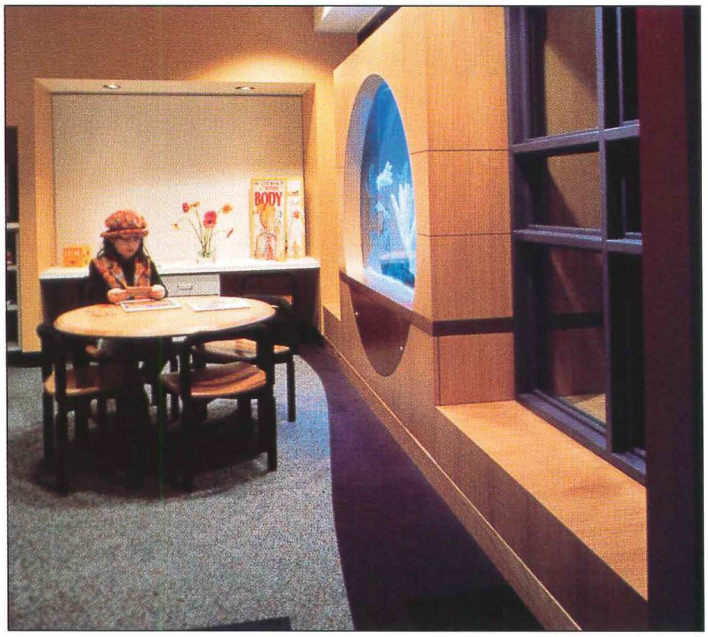
The type of door used for each building should be carefully considered. Wood sliding doors are often used, but may prove daunting to an older person. Special gliding tracks and other upgrades can make them easier to open. Some wood sliding doors have been newly designed to move without strong effort. Wood swinging doors are the most popular, but require landings on both sides (and these landings must have 18 to 24 inches of clearance beyond the strike jamb to allow enough room for a wheelchair user to easily open the door.) Wood pocket doors can be attractive when privacy is only occasionally wanted. Swinging wood patio doors are becoming popular as well, as they allow users to operate the somewhat larger units like a door, rather than having to slide them from one side to another. To enhance accessibility, automatic operators are now commonly used on exterior and vestibule doors.

For windows to be considered accessible, the ADA specifies that "windows requiring pushing, pulling, or lifting to open should require no more than five pounds of force to open or close." Wood tilt windows offer easy operation. Also highly useable by disabled persons are wood window systems that can be operated electrically. Motorized windows eliminate the difficulties associated with operating standard crank handles.

The American with Disabilities Act has also had a tremendous impact on what is currently available in door and window hardware. According to the ADA, handles, pulls, latches, and other operating devices on accessible doors "shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching or twisting of the wrist to operate." In other words, lever-operated mechanisms, push-type mechanisms and U-shaped handles are acceptable designs.

To be truly accessible, latches and locks need to be within reach of a person seated in a wheelchair or no higher than 48 inches above the floor. Since the hardware should be easy to operate, lever handles on latches and slide bolts instead of dead bolts are preferred. In fact, lever handles are considered the most easily used by the disabled. Concerning door locks, a concealed vertical rod design that attaches to the locking edge of a door and retracts the bolts into the core of the door is available. Swing-clear headings are also a good idea, since they effectively widen the door opening 1 1/3 inches by removing the door completely from the opening.

Joel/Shin Koyama



Peter Aaron @ Esto

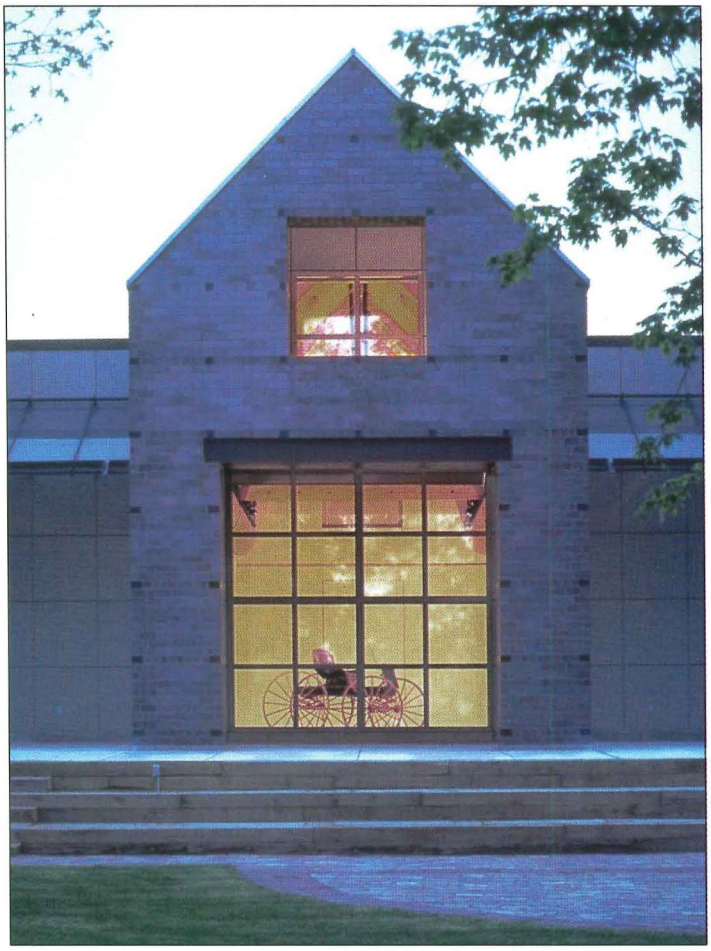
Joel/Shin Koyama

Wood Windows and Doors Heighten a Sense of Warmth and Accessibility in Health-Care Facilities

Ellerbe Becket uses wood windows and doors liberally in three health-care facilities to add a domestic quality to the institutional aesthetics (clockwise, starting top): WestHealth in Plymouth, Minn; and North Memorial Medical Center, Robinsdale, Minn.; and Memorial Deaconess Medical Center, Billings, Mont.

Concern for Energy Efficiency, Accessible Egress Prompts the Use of Wood Windows and Doors

Showcasing the historic artifacts of Northern Indiana, the 43,000-square-foot History Center of the Northern Indiana Historical Society in South Bend, Indiana, combines wood windows and doors to aesthetically contrast with masonry walls, while at the same time meeting energy efficiency and accessibility requirements. The center was designed by Holabird & Root.



Dare To Dream...

For 85 years, children with dreams of performing have attended the renowned Perry-Mansfield Performing Arts School and Camp. Now the oldest, continually-operated dance and theatre camp in the country, its distinguished alumni include; Doris Humphrey, Merce Cunningham, Agnes de Mille and Dustin Hoffman.

"The Pavilion", a focus of great pride for the school, was designed with wide, open-air spaces and symbolizes life's essentials: a person, the land, and the sky. Expansive walls of hinged patio and sliding doors frame the structure, and windows with small, divided-lite patterns represent trees and leaves.

EAGLE® windows and doors were chosen to showcase the project having intricate, hand-crafted patterns of Modern Divided Lights® and natural, warm wood interiors. EAGLE's willingness to customize products to exact design specifications contributed to making "The Pavilion" a success.

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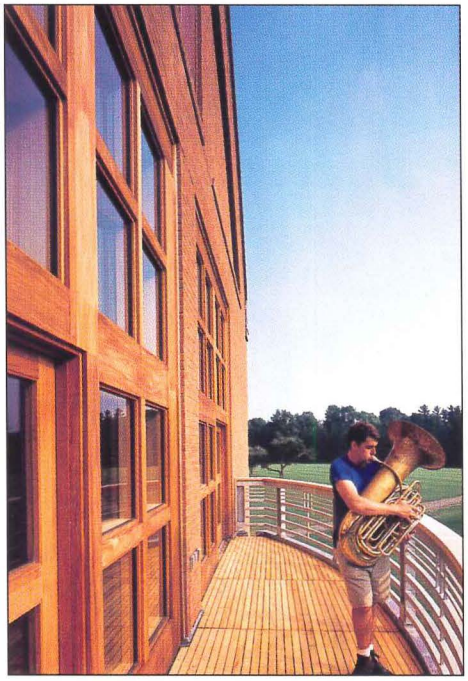


Paul Warchol Photography Inc.

Acoustics Are Perfected in a Heavily Wood-Appointed Music Hall in the Berkshire Mountains

At the Seiji Ozawa Concert Hall at Tanglewood, William Rawn and Associates used warmed-toned wood finishes to bring an intimacy to the 1,180 seat hall, while maintaining its acoustical excellence.

Building Over, Around, and Through

FOR BUILDINGS ON DIFFICULT SITES, WHERE THE LOGISTICS OF THE CONSTRUCTION PROCESS MAY DRIVE THE DESIGN, ARCHITECTS' SKILLS MAY BE PUT TO THE TEST.

by Virginia Kent Dorris

It is not unusual for an architect to be asked to build an addition to existing buildings on a dense, urban hospital campus. The tenor of the assignment changes, however, when making the connection means spanning a 100-foot-deep ravine with a critical access road at the bottom. The complex logistics of building on such sites are driving a widening variety of medical, research, academic, transportation, and other projects. In seriously circumscribed settings, planning for how the building will be built—including the phasing of construction, the coordination of trades, and the maintenance of existing building services during construction—starts early in the process and significantly affects the final design.

Where clients have a high investment in an existing location, moving to an open site that is easy to build on may be out of the question. While redoing a surgical wing can cost $100 million, replacing a major research hospital can run $1 billion; renovating an airport terminal may run $200 million; building a new major airport can easily run $10 billion. When owners must make the most of their current facilities, architects are called on to design structures—often complex, difficult, highly technical new buildings or additions to existing buildings—that fit over, under, between, or through existing facilities.

Coordination among the members of the building team is much more demanding than on conventional projects and demands management and communication skills that are not part of many architects' training. The design and construction team may be large, including architects, engineers, contractors, construction managers, subcontractors and specialized consultants, client representatives, and user groups.

But even when a project might legitimately be viewed as a logistical nightmare, architects caution, such concerns need not overshadow the pursuit of good design. "Logistical challenges are not an excuse for poor architecture," says Anthony T. Vacchione, Jr., AIA, director of airport planning and design at Skidmore, Owings & Merrill in New York City. He was project manager of the firm's extension of Dulles Airport's main terminal [RECORD, March 1997, page 62] and is currently designer of major additions at airports in New York City and Toronto. "The challenges cause you to think harder. You need to use the constraints to your advantage in shaping the building," he says. Gene McGovern, president of Crow/Jones Construction and a 25-year veteran of building international mega-projects, including Canary Wharf in London and the Petronas twin office towers in Kuala Lumpur, explains, "When you look at what drives logistically complex projects to success, it is getting the team together as early as possible, bringing together the architects' knowledge of planning and design and the contractors' knowledge of construction methods and sequencing."

Virginia Kent Dorris, based in Brooklyn, New York, writes on architecture and architectural technology.

Shepley Bulfinch Richardson and Abbott designed a neo-Gothic truss for a Yale library with an eye to installation logistics.

PHOTOGRAPHY: © WOODY FORD

The architect's communication and management skills may be put to the test during the execution of these difficult projects. When an owner hires a contractor or construction manager during the early phases of design to provide guidance on constructability and cost, the traditional architect/client relationship is altered. Because the contractor communicates directly with the owner regarding design decisions, the architect may feel his or her role diminished. The architect may also feel burdened by the need to continuously balance the requirements of various parties, with their sometimes competing interests, during design.

Conversely, the architect has much to gain from the arrange-

At the Doernbecher Childrens Hospital, Zimmer Gunsul Frasca's design spans a ravine over an active road and a parking structure that has remained in operation throughout construction. The photo sequence shows how the design minimized foundations and scaffolding on the steep, unstable hillside. The builder had to carefully place cranes around the busy roadway below. Steel framing speeded construction.

ment. Often the architect can tap into the contractor's vast knowledge of construction means and methods in a way that might not otherwise be possible. In addition, the need for late changes to the design can be minimized. The concrete, problem-solving knowledge gained by the architect may not only improve the project at hand but also give the architect an advantage in approaching future complex projects.

Hospital as highway bridge

When architect Zimmer Gunsul Frasca was hired by the Oregon Health Sciences University to design a new children's hospital on its medical campus in Portland, the exact site for the $61 million, acute-care facility had not been chosen. Few open sites remained on the hilly, 116-acre campus, shared by three hospital systems on a ridge above Portland's central business district. The hospital wanted an aesthetically unintimidating facility with easy access to an existing neonatal intensive-care unit and imaging facilities located near the center of campus. Cost was also important: the state-owned hospital system planned to finance the new building largely with private donations. After examining all options, the architect and client decided to locate the new Doernbecher Children's Hospital some 100 feet in the air, over a ravine. The decision created logistical challenges that influenced the form and materials of the new hospital building as well as how the architect worked with members of the building team.

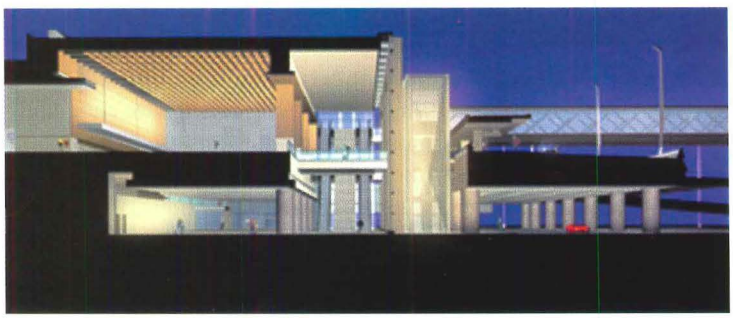
From the start, the Oregon Health Sciences University (OHSU) sought a team approach to the design and construction of Doernbecher, explains Gordon Ranta, director of special projects for OHSU. Rather than accept the traditional design-bid-build contractual relationship usually required for public projects, the hospital approached the state for permission to use a private-sector-style negotiated contract employing a construction manager/general contractor for the job. With timely sequencing and attention to accessibility critical during construction, the low-bidder procurement of the general contractor required by most public agencies would have precluded critical dialogue between builder, architect, and owner. And it may not have identified a contractor with the unusually high management skills needed. "We thought it was critical to get the construction manager in on the design in terms of constructability and cost," says Ranta. Lawmakers acceded; Portland-based Hoffman Construction was hired early (using a qualifications-based selection process), developed a guaranteed maximum price, and began working with Zimmer Gunsul Frasca during schematic design.

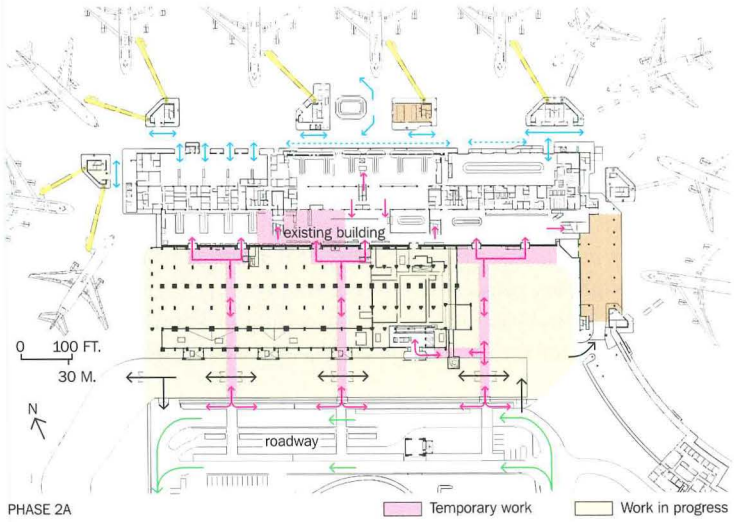
The logistical challenges associated with the project were not restricted to building 100 feet up. The site was also bisected by a road that had to remain open. Also located in the ravine was a parking garage that compounded the problem: the owner demanded that it operate throughout construction, even as contractors drove 96 piers through it to support one end of the new hospital building above.

Jan Willemse, project architect and Zimmer Gunsul Frasca associate partner, initially envisioned the building with unsupported spans of some 150 feet, literally bridging the ravine. He ultimately reduced the span length to an average of 70 feet when it became clear that the large structural members required to achieve the long spans could not be transported to the site over narrow, winding access roads. Fabrication of the members on site was also deemed undesirable. "Although we were hoping for long clean spans, it was a matter of aesthetics versus constructability," says Willemse. "In the end, we felt that the building form was strong enough to carry off the appearance of spanning the ravine, and that our choices didn't compromise the aesthetics in any significant way."

Likewise, design of the new hospital's structural system was constrained by the site. To avoid the extremely difficult job of mounting

The middle three of seven construction phases are shown for SOM's Logan Airport Terminal E (right). Computer files are layered so that toned areas denoting the scope of each phase can be changed throughout all plans. Phasing considerations had to include passenger comfort, security, and wayfinding as well as construction logistics. A section shows the roadway at right (below).





scaffolding on the steeply sloping site, the architect and contractor opted for a steel structural system that could be erected by crane. At first the team considered trusses, but successfully adapted the support system to steel-plate girders when Portland-based Oregon Steel Mills and American Steel, a distributor, offered the components as an in-kind donation. (The child of the president of American Steel had been successfully treated at Doernbecher.) Extruded, hollow-core, precast concrete planks were laid between the girders. Their undersides were left exposed, which permitted the elimination of a planned metal soffit, saving time and money.

In the final design, the building is supported at roughly mid-span by a poured-concrete elevator and utility core clad in stone and metal panel. Visitors and staff enter the core from the existing garage at a third-level lobby and travel by elevator to what is essentially a four-story hospital raised seven stories off the ravine floor. The new hospital connects to an existing building on the north edge of the canyon on levels eight and nine.

With much of the exterior hanging in the air, the design team selected the building's exterior cladding with an eye to maintenance. "If you have a problem with this building, it will be extremely difficult to go out onto the skin to correct it," Willemse explains. Though the medical campus consists mostly of masonry buildings, Willemse says he felt comfortable specifying metal panels because that system had already been introduced to the medical center in 1991 when the Casey Eye Institute was built nearby. ZGF specified a dry-joint, metal-panel curtain-wall system, which does not have exposed sealants that would eventually need repair or replacement. Another advantage of the metal-panel system was that it could be installed from a swing-stage platform suspended from the new structure itself, further reducing the need for scaffolding.

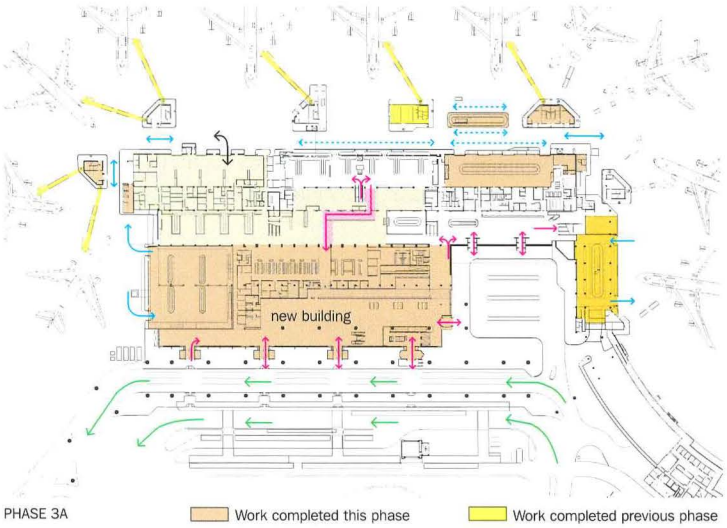
Bill Forsythe, project manager for Hoffman Construction, recalls that he and Willemse collaborated to write highly detailed sub-contractor bid documents. They defined limits of work with significant input from the architect and engineers to help ensure that construction would proceed smoothly. "It was a hand-in-hand approach to design and construction phasing," says Forsythe. The building is nearing completion, and will open this summer.

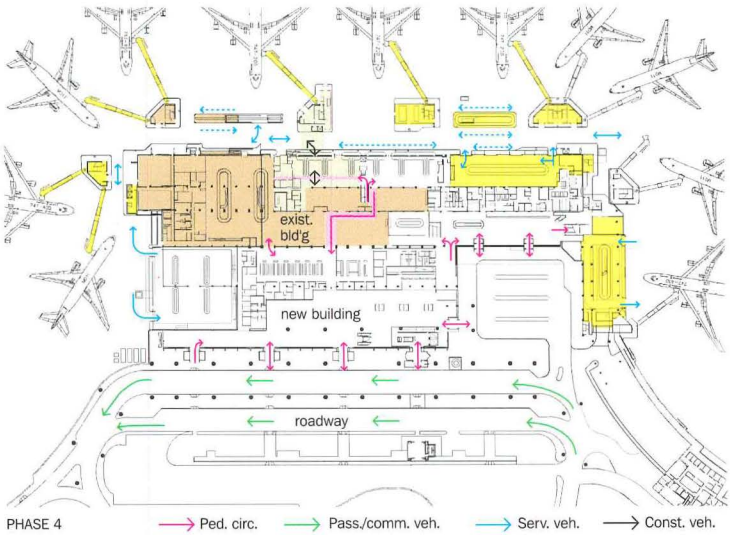
Traumatic construction

HDR Architecture, the Omaha, Nebraska–based designer of an $18 million addition to a trauma center at Methodist Medical Center in Dallas, is also dealing with constraints that influence both design and construction. The five-story addition, just beginning construction, will be built on an irregular site surrounded on almost all sides by existing hospital buildings of various heights and ages. The adjacent, existing emergency-room area must remain open and fully accessible throughout construction.

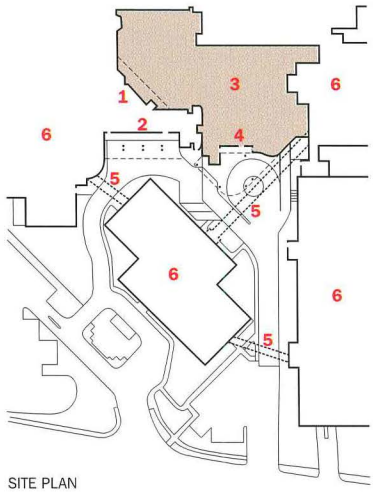
Careful phasing and planning will be required to build the addition without shutting down vital services, says Philip Wendling, AIA, HDR project principal. According to John Dalzell, director of construction for the privately owned Methodist Hospitals of Dallas, at the start of the project Jirousek & Jirousek—a specialized health care firm headed by architect and nurse partners James and Josephine Jirousek—was retained to help site the building functions in relationship to existing functions. Dalzell, who has a construction background, developed a preliminary project-phasing plan before hiring HDR. The architectural design process was about half finished when the contractor, Austin Commercial Inc., in Dallas, was hired to build the project under a negotiated contract for a guaranteed maximum price.

The extremely confined building site, and the lack of a nearby open area for storing building materials, posed the greatest coordination challenges. Trucks transporting materials can approach the site only one





No ambulance can be denied access during the construction of a new trauma center at the Methodist Medical Center of Dallas, designed by HDR.



SITE PLAN

1. *Existing entrance*
2. *Existing emergency*
3. *New addition*
4. *New entrance*
5. *Bridge overhead*
6. *Existing building*

at a time because of limited space, and they must back in. A one-level parking garage initially located under the new addition and extending beyond the new emergency room entrance to the south had be scaled back by about 10 percent because the space it would have occupied was needed for an access road. The building team is still examining the best way to maintain operations of two medical helipads located atop a 10-story building adjoining the addition because the pads may be affected by the proposed location of a major construction crane.

Planning the interior spaces of the first-floor trauma center and second-floor heart-treatment center were not affected significantly by site conditions, says Bernard Bortnick, FAIA, design director for HDR's Dallas office and project designer. But he regrets that the cramped site and budget considerations did not allow him to include additional amenities for patients, such as an outdoor garden or courtyard. Instead, Bortnick's design brings in light through a glass-block wall on the first floor and strategically placed windows on the second-floor patient rooms.

AT LOGAN, WHERE THE CONTRACTOR HAS YET TO BE SELECTED, SOM WORKS WITH 20 OF ITS OWN SUBCONSULTANTS AND WITH TWO OWNER ENTITIES.

Library within a library

Architect Shepley Bulfinch Richardson and Abbott faced a logistical challenge more or less of the firm's own making during the design of a new music library for Yale University. The facility, which is nearing completion, is being constructed within an enclosed, 50-by-80-foot light well inside the university's largest library, the 4-million-volume Sterling Memorial, a 1930 Gothic-style stone building designed by James Gamble Rogers.

Jonathan Ross, AIA, project manager and principal at Shepley Bulfinch, explains that his firm began working with Yale in 1991 to create a master plan for the renovation of Sterling Library, undertaking an analysis of its condition and developing strategies for improvement. The architect concluded that a large internal courtyard could be enclosed to provide more usable floor space. Meanwhile, the university had been looking for 20 years to find a better home for its inadequately housed music library. In 1994 Ross received a telephone call from a librarian who had read the architect's report and wondered if the music collection could find a home in the courtyard.

The courtyard did indeed become the best location for the music collection, and so began the design of a library within a library. Early in the process, Ross envisioned a grand space containing a reading room, echoing the grand reading rooms created more than half a century earlier by Rogers within Sterling. Ross developed the new facility on three levels, at the base of a space that soars 60 feet to a new roof, which is supported by custom-designed, Gothic-inspired steel trusses. Patrons enter the music library on its middle level, near the circulation desk of Sterling. From that main level, which accommodates most library services and a record-listening room, patrons have access to the mezzanine level that overlooks it, housing the reference and periodicals reading room. The music library's basement level contains the collections, as well as reading carrels.

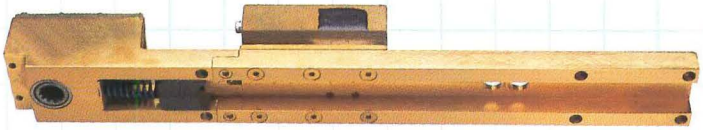
Since Sterling is Yale's main library, it had to remain open during construction, explains Alfred Dionne, executive vice president of Barr and Barr, the construction manager hired for the project. During construction, materials were brought in and out of the building through a window on a conveyor belt, raised on scaffolding, that hovered near the ceiling above an active library corridor. Concrete was lifted in buckets up and over the existing building by a 300-ton crawler crane. Erection of the 12-ton roof trusses posed a major challenge. Because the trusses were too large to be assembled outside the building and lifted into place, the team developed a plan to lift them in sections up and over the building, bolt them together on the new library's floor, then lift them into position.

The architect developed a plan that allowed the trusses to be fastened into the existing structural columns supporting what had been the exterior walls of the court. Operable windows, which formerly looked into the court, now look into the music library's reading room. Those windows still receive indirect light from the inserted structure but have been permanently sealed in compliance with fire regulations. Despite the logistical challenges of the project, Ross likens it to "putting a Swiss watch into a light well."

Building a new airport around an old one

Keeping a busy airport terminal at Logan International Airport in Boston operating during construction of a $250 million expansion that will nearly double its size is the challenge facing the New York City office of Skidmore, Owings & Merrill. "At the end of the project, the beauty of the airport will be in the architecture, but the beauty of what we do will be keeping the airport functioning throughout the construction," says Walter

Ellison's Balanced Door. Greater Than The Sum Of Its Parts.



Cast bronze check and door guide assembly

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Cast bronze top pivot with bearing

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Torsion bar closer spring

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Cast bronze bottom arm

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Cast bronze semi-automatic hold open device

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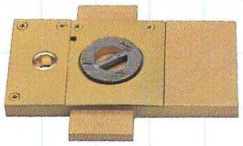

Cast bronze floor box

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Cast bronze door roller guide

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Cast bronze door bottom pivot

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Cast bronze top arm

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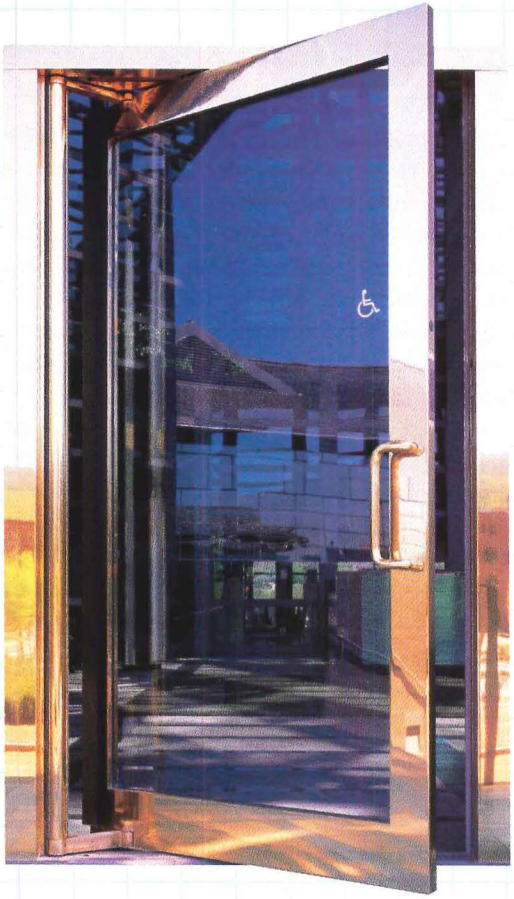

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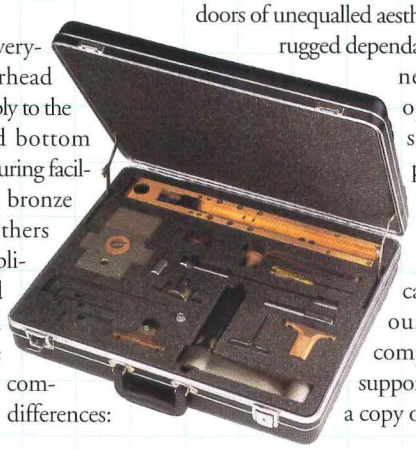

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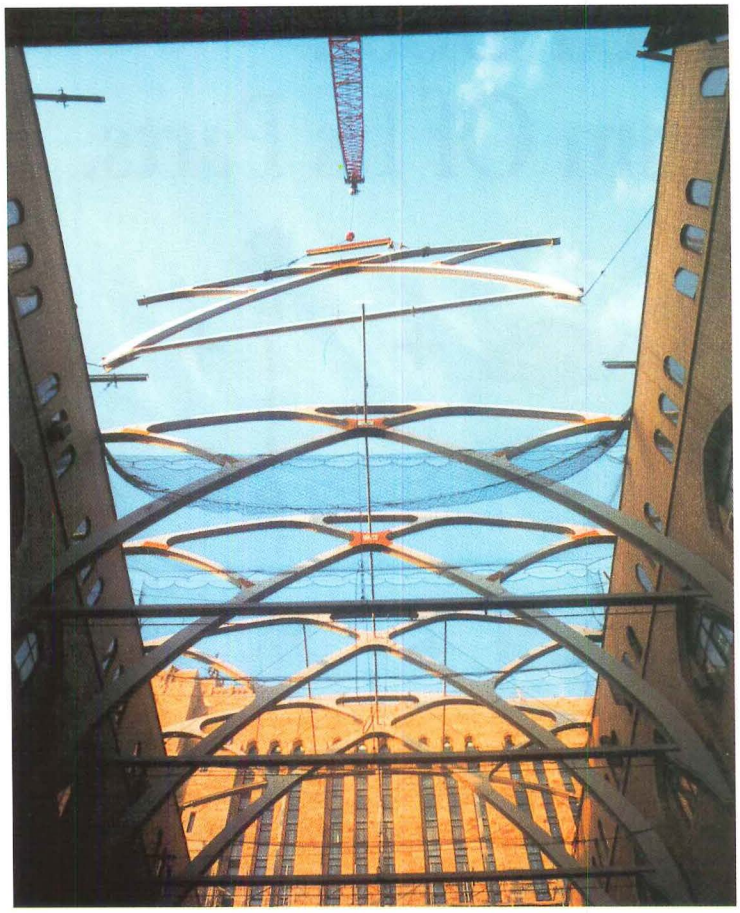
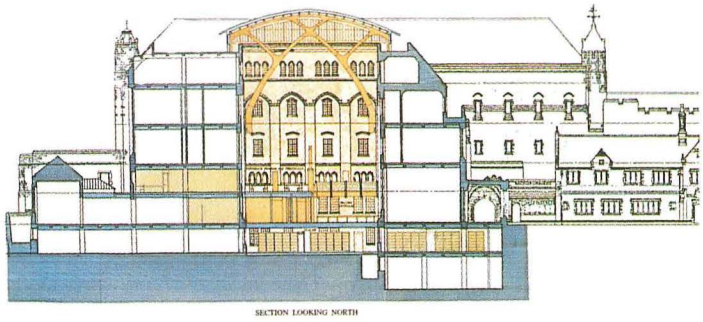
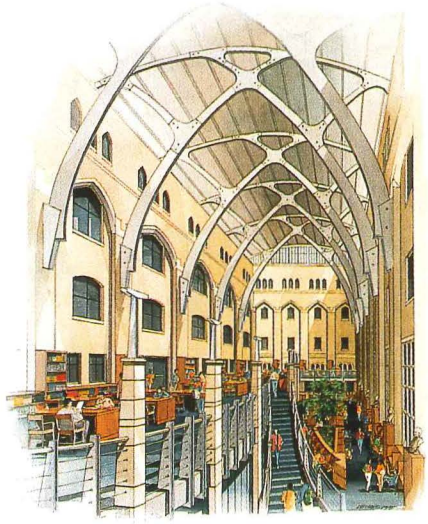




SECTION LOOKING NORTH



Yale University is filling a courtyard in the 1930 James Gamble Rogers Sterling Library with its music collection. Shepley Bulfinch Richardson and Abbott's design allows indirect light (above). The neo-Gothic trusses were designed in components that could be bolted together at the base of the court.

Smith, AIA, senior designer on the project. Coordinating existing operations was a concern from the very start, says SOM's Vacchione. He recalls a weekend-long charrette three years ago in Boston with the project's construction manager, a joint venture of Stone & Webster and Day & Zimmerman, where the team worked out a conceptual design and phasing plan together. "Work on the phasing started on day one," says Vacchione.

Expansion of the international terminal, known as Terminal E, is just one part of a $2 billion renovation of the entire airport. When originally designed by architect Kubitz and Pepsi in 1971, Terminal E was intended to handle just 600 passengers per hour during peak travel periods. The remodeled terminal will be designed to handle more than 3,000 passengers per peak hour after construction is complete in 2000. SOM is working closely with 20 subconsultants, ranging from the usual structural engineers to baggage-handling-equipment designers. The project construction manager works with Logan 2000, an entity merging Massport, the airport's owner, and O'Brien Kreitzberg, the terminal-area projects coordinator. Dan Coffee, a construction manager with Stone and Webster, says the team has worked to make the drawings as "ironclad" as possible because the contractor who will build the project is not yet on the job. The entire facility must be publicly bid, according to Massachusetts statute, and separate bid packages must be devised and bid for such subcontracts as glass and glazing; unit masonry; waterproofing and sealants; electrical; and mechanical. Communications, says SOM senior technical coordinator Mark Igou, AIA, "is a massive issue."

Available space for new construction is extremely limited on the congested airport site. SOM could not expand the building to the north, east, or west because it would impinge on existing aircraft taxiways and gate areas. As a result, it was necessary to expand the terminal to the south, essentially removing the building's landside facade, doubling the depth of the building, and turning a single-level facility into three levels, including a new two-level roadway to separate arriving and departing passengers. The terminal must provide a connection to a new pedestrian-bridge system that links all the terminals, a project under O'Brien Kreitzberg & Associates' direction, and prepare the way for a monorail-type people-mover system planned for the future.

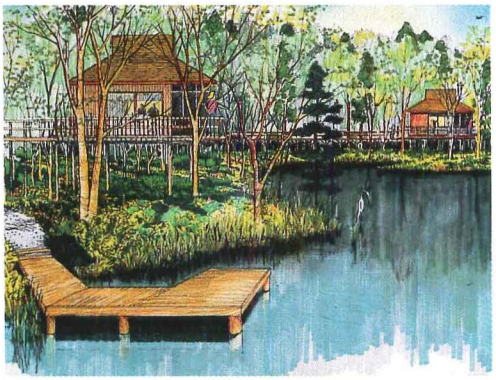
Seven primary construction phases were developed to allow passengers to move through the building during construction with minimal disruption and confusion. Construction of the expansion will take place around a series of temporary walkways that lead from a temporary dropoff to the existing building, Smith explains. As the new structure is completed, areas of the older building will be renovated. The architects worked out the phasing scheme with the construction manager, a job normally done by the contractor alone. But there was no other way to quantify the huge scope of temporary construction and facilities required. Also, much of the phasing had to be acceptable to users. One phase, for example, might envision two baggage carousels in use when three is the acceptable minimum, explains Igou. And defining any scope within a phase must take into account whether numerous services (existing, temporary, or new) would be available, such as HVAC, security, mechanical, or life-safety. Bidders may propose different phasing, says Igou, but he expects few proposals. "They have three months to bid the job; we've lived with it for years."

Although SOM is currently working on construction documents for the addition, construction is already under way on one of the faceted, fritted-glass entry vestibules at the southeast corner of the expansion because the pedestrian bridge will be completed before construction begins on Terminal E. It will stand as a lonely sentinel at the edge of the site, awaiting a whole new team to complete it. Smith shrugs that off: "The phasing is fundamental to making the whole project work." ■

Evaluating Hidden Site Conditions

UNDERSTANDING THE SITE—BOTH ABOVE GROUND AND BELOW—KEEPS DESIGN WORK MOVING FORWARD AND FORESTALLS LEGAL PROBLEMS.

by Wendy Talarico



During most of the year, the majority of land at Tickfaw State Park in Louisiana is under water (left). Instead of making the site a typical state park, the architect created an ecotourism center, where tourists and wetlands coexist (right).

High summer and the dense forests at the future site of Tickfaw State Park are still and quiet. The soil below feels dry, though it's black as coffee grounds. Vines hang from tree branches in soft ringlets, while gray-green ferns nose the mossy perimeters of the broad trunks. Small, algae-flecked pools, almost obscured by fallen logs, reflect the bits of sun that filter through the thick canopy of leaves.

To the untrained eye, Tickfaw in the middle of summer seems no different than any other southern forest. But to those schooled in the nuances of vegetation and soil, Tickfaw is a wetland just waiting to recur. Once the seasons change and the burning sun passes its zenith, the water will take over again, making paths that are navigable in the summer into impassable quagmires, the calm pools into swamps.

Kurt Soderberg, AIA, a principal with Chenevert, Songy, Rodi & Soderberg, was given a mandate by Louisiana's Office of State Parks to build pavilions, parking, a swimming pool, and all the other "garden-variety" state park accoutrements at Tickfaw. But partway through the design stages Soderberg and landscape architect Patrick Moore discovered that of the 750 acres that make up the site, all but 60 are wetlands. "We realized we had to completely alter the plans, and still placate our client," he says. As if things weren't complicated enough, Soderberg and Moore discovered that the small parcel of buildable ground at the Tickfaw site is precisely where the evidence of Native American relics can be found. Disturbing that ground is likely to trigger an archaeological excavation.

It's not enough to know the topography of a site anymore; you must also know the vegetation and what is beneath it. Endangered species, archaeological finds, brownfields, wetlands—these are the kinds of surprises that can devastate a project or, at the very least, stop work for a few hours, weeks, or months. Architects may be forced to alter their plans, resite buildings, or scrap the project altogether. It's not unusual for site problems to engender legal battles and community ill-will.

To some degree, what is discovered depends on the building's location. In the Southwest, Native American relics are common; in the Northeast, brownfields are. But wetlands are by far the most common site condition architects encounter. Look at the Tickfaw land in an historical context and it seems obvious that Native Americans would have camped on the dry ground and hunted, fished, and foraged in the fecund marshes. Look at the soil and the plants and it's obvious that the area is flooded most of the year. But this sort of site sensitivity takes experience and training of a different kind than architectural schools provide. "We may be taught how to relate the building to the site contextually, but coping with difficult site conditions is not something we learn formally," says R. Christian Schmitt, AIA, a principal at Schmitt Sampson Architects.

Site surprises used to be the developer's bailiwick. But as federal, state, and local control over these issues tightens, and as the role of the designer changes, architects are increasingly pulled into the debate and, in

Continuing Education *After reading this month's installment of the ARCHITECTURAL RECORD/AIA Continuing Education series, complete the questions (page 390) and check your answers (page 392). AIA members may fill out the self-report form (page 392) and send it in for two AIA Learning Units.*

Learning Objectives *After reading this article you will be able to:*

1. *Distinguish four types of hidden site conditions.*
2. *Describe steps to mitigate each of these four.*
3. *Appreciate the need for interdisciplinary teams to investigate hidden conditions.*

some cases, held responsible. For example, if an architect commissions a site analysis and finds nothing, he or she runs the risk of getting sued when toxic chemicals turn up later. There are also no clear standards for what constitutes a comprehensive site analysis or when it should be conducted. The federal government's requirements vary, depending on what's found on the site and what the government's jurisdiction is. Landscape architects, environmentalists, archaeologists, and other professionals who conduct analyses provide varying levels of thoroughness, according to how much is paid. And, as every architect knows, each dollar spent on the site is one less dollar devoted to the building.

Schmitt's firm designed a house at Brays Island, a residential development in South Carolina which requires that a highly detailed site analysis be approved by an architectural review board before drawings are submitted. It took Schmitt and a landscape architect close to four days to complete the analysis. The cost: about $5,000. But the results were worth it, he says. "You become so familiar with the site, with its history, its trees, the trails that the wildlife follow, the way the sun moves around it, and the soil, that you wind up with a design that couldn't work anywhere else," he says. Though the process is expensive, it yields a better building. Also, because the analysis is done early in the project, it greatly reduces the likelihood of a surprise later, when fixing it is costlier.

In the end, Soderberg and Moore converted Tickfaw into an ecotourism center, a place where tourists and wetlands coexist. Opening this summer, the redesigned park uses buildable land for interpretive centers, while the archaeological sites and wetlands are crisscrossed with trails and boardwalks. Instead of swimming pools, there are retention ponds to contain some of the water that floods the area.

Knowing the ground conditions at Tickfaw in advance would have saved time for Soderberg. The contract was awarded in 1992, but because of the wetlands issue, construction on the $5 million project didn't begin until 1997. Consulting fees for environmental and archaeological work and permits ran about $90,000. But this example proves that, though architects may be afraid of finding site problems, they are also adept at solving them. "We took something that was a real obstacle and turned it into something innovative," Soderberg says.

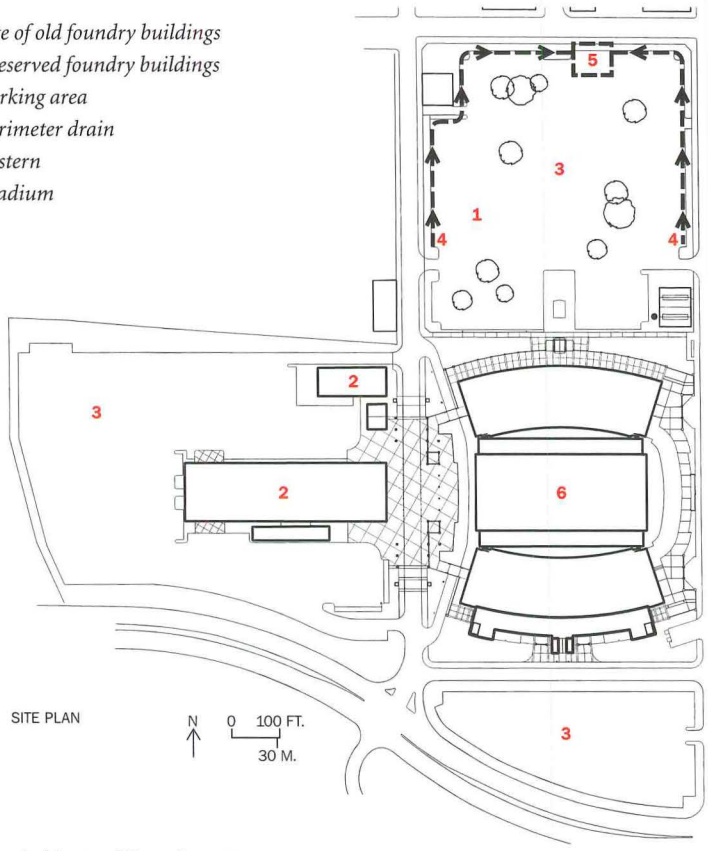
Brownfields

For almost two years, Bill Wilkerson, AIA, of Derthick, Henley & Wilkerson Architects, grappled with state and local officials to come up with a way to make a chemically polluted site in the industrial south side of Chattanooga, Tennessee, viable for a new stadium. Wilkerson is no expert in brownfield development. When it came to sorting out the tangle of government regulations, the architect admits that he "didn't have a clue." But the stadium project was a crash course for Wilkerson in how to deal with brownfields, a significant problem now that pristine sites in urban areas are rare and expensive. According to federal surveys, there are about 600,000 brownfield sites in the United States. Says Michael Pawlukiewicz, director of environmental research for the Urban Land Institute, "Just about every city site is a brownfield." Cleaning one up costs, in very general figures, at least $100,000 per acre, though there are federal programs that provide money to offset these costs.

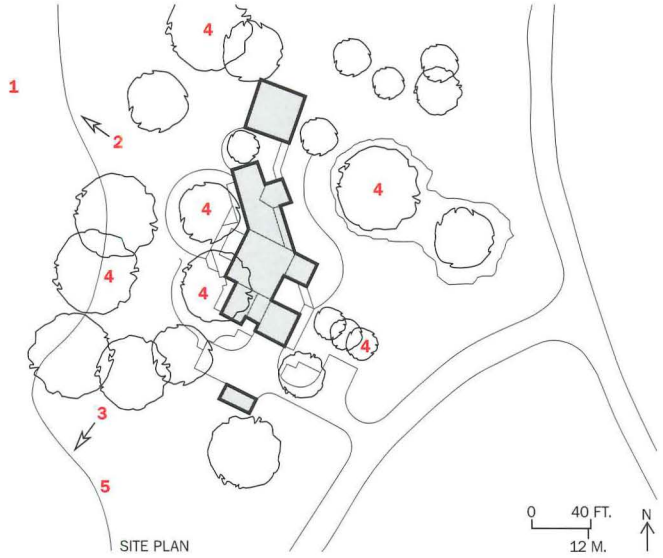
ARCHITECTS ARE ADEPT AT TURNING SITE OBSTACLES INTO ADVANTAGES.

In 1993 Wilkerson's firm was commissioned to design the football and soccer stadium on the site of an old foundry. The firm first encountered a hundred 55-gallon drums sitting on one edge of the property and oozing unidentified liquids. In addition, the 33-acre parcel was frosted with a four-foot-deep layer of sand contaminated with heavy metals and petrochemicals, through which surface water was percolating. State regulators required capping the site with a nonporous material, such

1. *Site of old foundry buildings*
2. *Preserved foundry buildings*
3. *Parking area*
4. *Perimeter drain*
5. *Cistern*
6. *Stadium*



Chattanooga's new football and soccer stadium (above) rests on the contaminated site of an old foundry. To mitigate the pollution, the architects capped the site with impervious clay that was unearthed while dishing the stadium into the ground. Perimeter drains and cisterns capture water for the trees planted in the clay (left).



1. *Marshes*
2. *Winter sunset*
3. *Summer sunset*
4. *Significant trees*
5. *Wetlands boundary*

The detailed site analysis for this house (above) in Brays Island, a community in South Carolina, included mapping significant oak, pine, and hickory trees, prevailing winds, views, the location of the sunrise and sunset, and wetlands (left).

as asphalt, to prevent the surface water from straining out contaminants and introducing them to the ground water.

"Initially this was a $29 million project," Wilkerson says. "Conducting a cleanup would have cost, based on the original estimate, at least $2 million. So we were in a position of finding a way to keep enough money for our project and still make the site usable. It was as if we were pouring our client's resources into the ground."

The first breakthrough came when the architects discovered, after testing every barrel, that the contents were mostly water. The other liquids were not dangerous and were easily disposed of. Next problem: the contaminated sand. Beneath that four-foot strata was a layer of impervious clay. Wilkerson and his team discovered that by dishing into the ground for part of the stadium they could scale back the mass of the complex and use the clay removed from the 16-foot-deep bowl to seal the site elsewhere. That would avoid the unappealing "asphalt sea" that state regulators had in mind, and the clay could support plantings and trees.

The stadium was completed last year and, thanks to creative problem solving, only $150,000 was spent on testing and abatement. But Wilkerson learned that working on this type of site requires close collaboration among engineers, bankers, environmental consultants, landscape architects, contractors, and lawyers; the problems encountered invariably cross interdisciplinary lines. He also worked with an environmental lawyer who served as his advocate in deciphering regulations and dealing with the state. Finally, while there are plenty of consultants willing to perform seemingly endless studies of contaminated sites, "you have to know when to end the studies and spend money on remediating the site instead," he says.

Investigation of a site's history and disclosure of contamination is a standard real estate practice that normally takes place before a parcel is sold. But that doesn't guarantee there won't be surprises. Robert Colangelo, the founder of *Brownfield News Magazine* and manager of a brownfield development company, says the first thing architects should ask for when they get involved in a commercial or industrial site is an ASTM phase-one site assessment. This document includes a site history and a sampling of the soil and groundwater, as well as analysis of any site structures. The cost to perform an assessment ranges from $6,000 to $200,000, depending on the size of the parcel and the type of contaminants. If contamination is uncovered mid-project, work should be stopped and the proper regulatory authorities contacted. Workers should stay away from the site until the problem is solved to avoid personal injury.

Digging up bones

Every Native American tribe is loath to disturb burial sites. The Tunica Biloxi tribe of central Louisiana is no exception. When construction on the reservation is planned, they send Bill Day, the tribe's director of cultural and historical preservation, to look for archaeological materials. Evidence of what's underground can usually be found by looking carefully on the surface. Flakes of rock may indicate arrowheads, bits of pigment may indicate pottery, and, in the palm-flat land in this part of Louisiana, swells in the ground may indicate a burial mound.

NEVER UNDERESTIMATE A COMMUNITY'S INVOLVEMENT WITH A GIVEN SITE.

Day was researching the site of the Tunica Biloxi Economic Development Corporation, a 6,000-square-foot office building designed by Yeager, Watson and Associates. Prodding a small mound of soil, he uncovered bones that appeared to be human. He examined them and found a flattened musket ball lodged in what he believed to be the chest cavity. Further research led Day to conclude this was the body of a well-known tribal chief shot in the mid-1800s.

As a result of the find, the architects had to move the parking lot to allow tribal representatives to heap a four-foot-high mound over the site. The architects were not happy about the change in plans, though it came about early enough to keep costs minimal. "We're just not convinced that it was necessary," says Perry Watson, AIA. "We're not even sure those bones were human." On the reservation, architects must follow the tribe's tenets. To the elders, Bill Day's word was enough to convince them to move the parking lot. But to architects used to a more formalized methodology, the Tunica Biloxi's system is casual and mystifying.

The building is now complete, but the case underscores one of the rules of dealing with site problems: Never underestimate the community's involvement with a site, especially one with human remains.

When burials are found, the coroner, an archaeologist, or the local university's anthropology department (of which archaeology is a part) should be contacted.

Other archaeological finds

Nothing can hold up site work longer and introduce more extra costs than an archaeological excavation. Rules governing finds vary according to the locality, the size of the site, and who is involved in the project. If the property is private, finds can be bulldozed, except where there's legislation that says otherwise. If there are ties to the federal government, even if the project is only partially funded by a federal agency, the site falls under the National Historic Preservation Act, administered by the Department of the Interior. The property must then undergo a phase-one archaeological analysis, during which test pits are dug. If anything of value is found, the act requires a more extensive phase-two dig. A phase-three dig is a full-blown excavation. Since the act was passed 20 years ago, the number of archaeologists employed by public agencies has leaped exponentially.

When Coke Florance, FAIA, at KCF/SHG first walked the Washington, D.C., block where the $200 million MCI Arena would be built, it was nothing more than a city parking lot. KCF/SHG, working with Ellerbe Becket, and Devrouax & Purnell, charged ahead with the project, never suspecting there was anything beneath that asphalt. The project was so politically complex, no one even thought about the site analysis. "It was lost in the shuffle," Florance says.

Just before excavation, the site was tested. Historical records showed nothing of significance, but plenty of interesting things turned up once the digging began. The project quickly moved to phase-three status. A 70-member crew worked seven days a week, 12 hours a day, for three months. Meanwhile, the construction crews waited. Ultimately, the project came in two months late, though there were other problems during construction. The cost of the site work was $600,000. However, the finds, now on display at the arena, were of historical value. Says Florance, "In the end, the finds became an asset."

Artifacts lurked below the MCI Arena (above), including items that once belonged to Frederick Douglass and Belle Lockwood.

WHAT TO DO WHEN A SITE PROBLEM IS FOUND

In all cases, notify the property owner and stop work until it is determined what must be done to comply with the law.

ENDANGERED SPECIES

Before work begins, check with the United States Fish and Wildlife Service to see if there are endangered species in the region. On private land, contact a local environmental consultant or a nonprofit conservation group, such as the Sierra Club.

ARCHAEOLOGICAL FIND

Before work begins, search historic literature to see if anything of significance was on the site. On lands with federal involvement, a phase-one study is required. For help, contact the United States Department of the Interior, the state archaeologist, the National Trust for Historic Preservation, or, in case of human remains, the coroner.

TOXIC WASTE

Before work begins, make sure an ASTM phase-one study was conducted. On private lands, check local maps and records to see if the site was ever industrial. For help, contact the United States Environmental Protection Agency, an environmental attorney, or an environmental engineer.

WETLANDS

If wetlands are suspected, have an environmental consultant, the regional department of environmental conservation, or the Army Corps of Engineers do a wetlands delineation. Findings are submitted to the Corps of Engineers. To develop in wetlands, a 404 permit is needed and compensatory wetlands must be created.

Saving endangered species

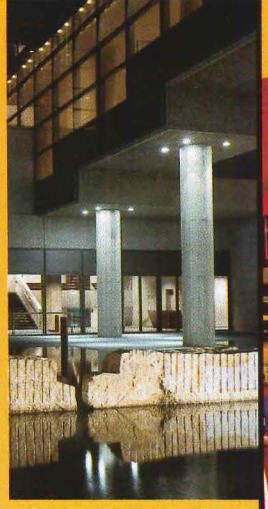
At Disney's Celebration, near Orlando, Florida, plans for a housing tract were altered when nesting eagles were found on the land. After negotiating with the Fish and Wildlife Service, the Florida Game and Freshwater Fish Department, and conservation groups, the Celebration Company, the site developer, had to give the eagles a 2,250-foot radius around the nest. This cost the company 12 acres of developable land.

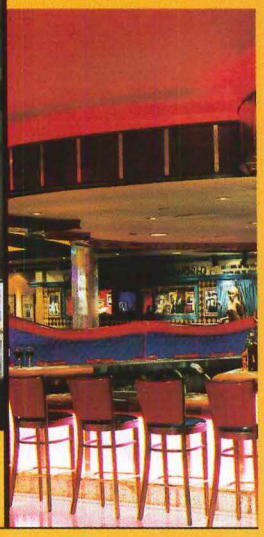
Jim Yawn, the environmental project manager, says there were plans to set aside much of the land in that radius as part of a greenbelt flanking the development. But because of the eagles, the plan was changed to include the residential area. Yawn's bitterness over the decision is clear. "Studies have proven that the eagle population is booming in Florida. These birds are nesting in suburban backyards and even urban areas."

Part of the problem with laws governing site work, especially endangered species legislation, is that they seem subjective. "Laws change. The species on the endangered list change. There are differences in the ways the various species are handled and these recommendations change. What the developer next door did is different than what you do," says John Fay, a biologist for the United States Fish and Wildlife Service.

The highest concentration of endangered species is in the southern United States, especially where pressure from development is strong. Fay advises checking with local agencies to find out what species are on the list in the vicinity of the site. In sensitive areas, a study will have to be done before a building permit is issued. An environmental consultant should review the site, even if the land is private.

Decisions about what to do once something is found on a site—whether it's an endangered species, toxic waste, wetlands, or an archaeological site—aren't normally as one-sided as in Celebration's case. Unless what's found is highly significant, officials are willing to compromise. Says landscape architect Patrick Moore: "The days of beating your head against the wall with agencies are over. Now you can go to them and say, 'We have a problem. Help us solve it.'" ■





LIGHTING...

Two of the projects featured in this month's lighting section are places people go to be entertained. The lighting of the New National Theatre of Japan, in Tokyo (above left), was designed by Paul Marantz and Charles Stone of Fisher Marantz Renfro Stone. It complements Japanese architect Takahiko Yanagisawa's modern design by illuminating its rich materials and establishing a sense of orientation and procession. It does so quietly, and I would say, masterfully. People go to the theater to hear an opera or see a play—to escape to other worlds. Yet the building that houses these other worlds stands apart from them, unto itself, and so does its lighting. It is the sort of project where the architecture and the lighting are so interrelated that one cannot exist without the other.

The Motown Café at the New York New York Hotel and Casino, in Las Vegas, stands in striking contrast, although people go there for theater as well. They want to visit a fantasy version of a Detroit nightclub where the Temptations once sang. The lighting, by architect Jay Haverson and lighting designer Joe Kaplan, is bold and vibrant; it inspires nostalgia for experiences people probably never even had. Lighting is so integral to this project that Haverson has said, "There are so many special effects in this place, you could take the walls down and it would still stand up."

Because the ultimate effects are so dramatically different at the National Theatre and the Motown Café, the approach to lighting in the two projects would seem to be very different too. But this isn't true. Both projects use wall washing to define or deepen the appearance of surfaces and objects. Both use downlighting for tasks like reading programs or menus and dining. Focal glow is created where needed in each scheme.

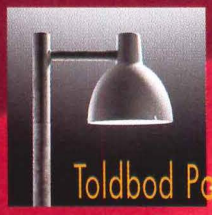
The lighting designers of each venue also used dimming to the same effect—to spark anticipation. When light levels go down in the theater, audience members know the curtain is about to rise. At the café, when light levels go down, people know that dinner's over and it's time for the party to begin. If you switched the locales of the buildings or the nationalities of the people inside, the patrons would still grasp the meaning of the lighting change.

Lighting makes a significant contribution to the success of both buildings. Whatever the goals of each architect were, the lighting designers' ability to understand those issues and to communicate them with light helped to create a successful space. And turning those goals into positive experiences for a building's users is what makes the difference between a truly awful place and a truly great one. Charles D. Linn, AIA

OUTDOOR


Kipp


Kinu

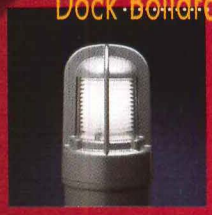

Toldbod Post

Satellit Mini

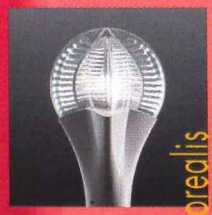

Orbiter Bollard

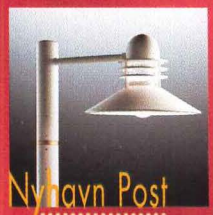

Parc

Dock Bollard




Dock Wall


Borealis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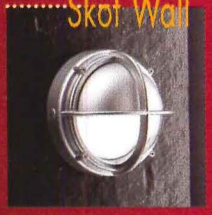
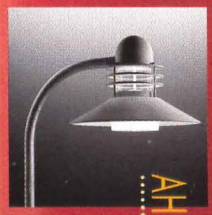
Saturn Bollard

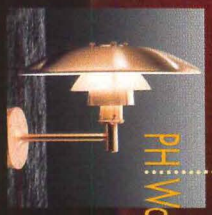
Skot Wall



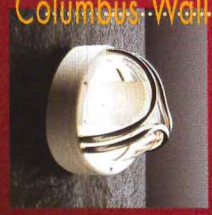

Magnum


Dipteros


AH Nyhavn Area Light


PH Wall

Columbus Wall



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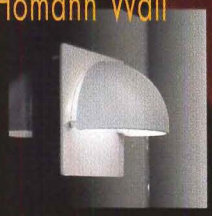


Orbiter Wall

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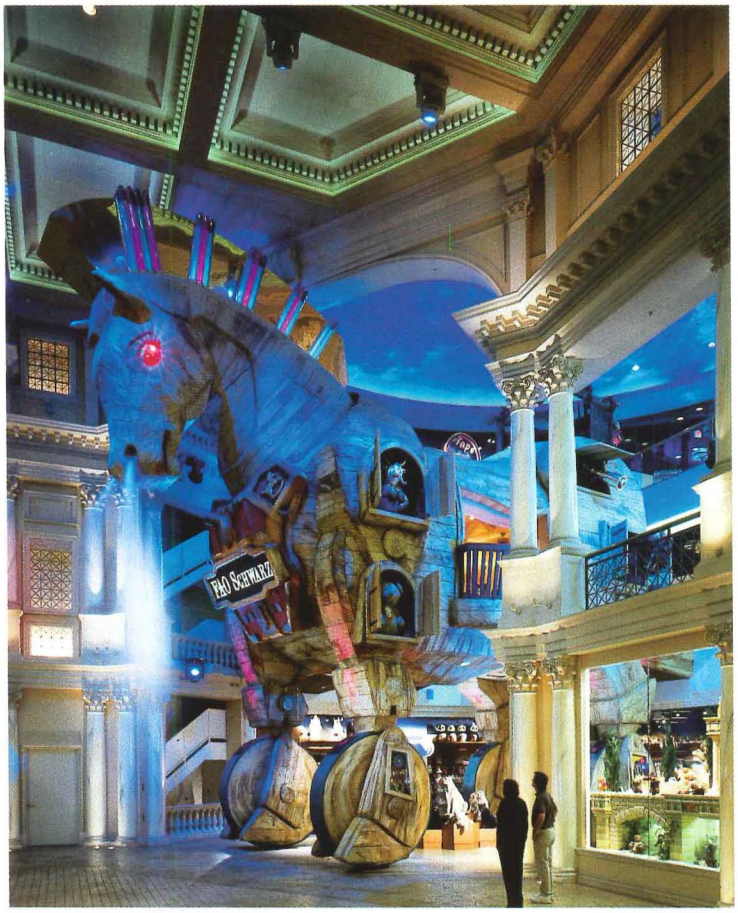
CIRCLE 87 ON INQUIRY CARD

CREATIVE USES



FAO SCHWARZ VEGAS NODS TO CLASSICS WITH A REALLY WILD TROJAN HORSE

In Las Vegas, FAO Schwarz's signature rocking horse has been reborn as a flashing, smoking, animated spectacle fit for this city of pure theater. The 48-foot-tall Trojan horse continues the classical theme of the shopping mall at Caesar's Palace where FAO Schwarz is located. It straddles the entrance of the three-story toy emporium and draws large crowds with a 15-minute animated performance. It nods its head while incandescent eyes pulsate, a strobe light flashes inside its mane, and smoke billows out of its nostrils.

A host of characters—such as Truffles the Teddy Bear, a chorus line of Barbies, a serenading cow, a swinging monkey, and a robotic arm that periodically dusts the horse—appear and disappear from behind trap doors on the animal's surface.

Lighting for the performance, and for the 56,000-square-foot store, was designed by the New York City–based firm Johnson Schwinghammer Lighting Consultants. Lighting designer and project manager Bill Schwinghammer used computer-controlled lights for the show, which starts every 30 minutes. Theatrical fixtures mounted on the high vaulted ceiling and on either side of the store entrance light the horse itself. The motor-driven lights can tilt and rotate a full 360 degrees and are programmed to change colors in synchronization with the music and action. *Nayana Currimbhoy*

VERSATILITY IS TODAY'S LESSON FOR BUSINESS SCHOOL CLASSROOMS

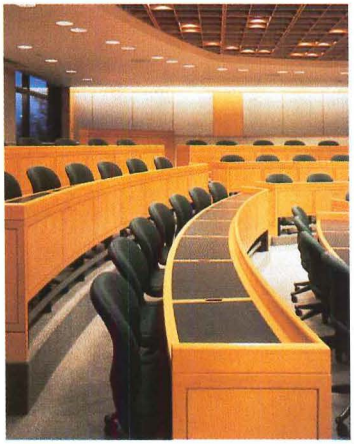
At Harvard Business School's McCollum Center, mid-career executives take classes in seminar rooms equipped with state-of-the-art video, audio, and data-processing equipment. Desks allow students to hook up their laptops to a network. And rooms are equipped for video conferencing as well as for videotaping classes.

With all the different kinds of tasks taking place in the rooms, the lighting plan had to be sophisticated enough to accommodate many disparate lighting requirements. The goal of the lighting designers, says architect Peter Kuttner, of Cambridge Seven Architects, was to make the fixtures invisible.

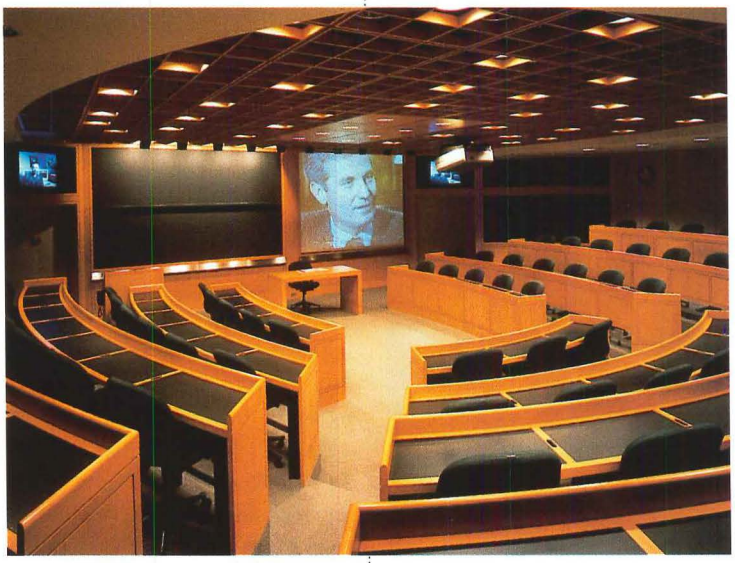
The lighting designers, Berg/Howland Associates, used recessed compact fluorescent wall washers and linear fluorescent lighting hidden in coves for perimeter lighting and to provide background illumination for videotaping.

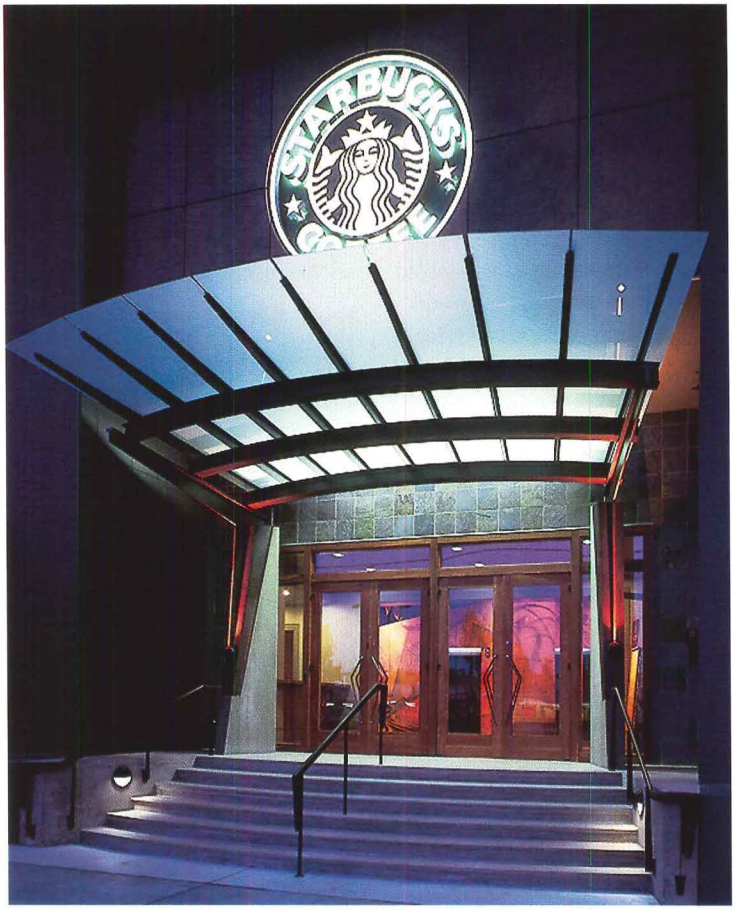
Lighting for the desktops comes from recessed downlights placed to follow the seating pattern. These are fitted with 100W halogen PAR lamps to ensure good color rendering for videotaping and let light be dimmed during screenings and video conferences. Parabolic reflectors minimize reflections in screens and provide even illumination for desktop tasks.

Flexibility and control were two other important considerations for the classrooms. All the light sources are dimmable, and the control system accommodates a range of preferences, like manipulating the audiovisual equipment and the projection screen from a touch panel on the lectern or with one of three one-button controls located at the chalk rail. Adept users can create custom settings at the touch screen for a wider range of control options. *N.C.*



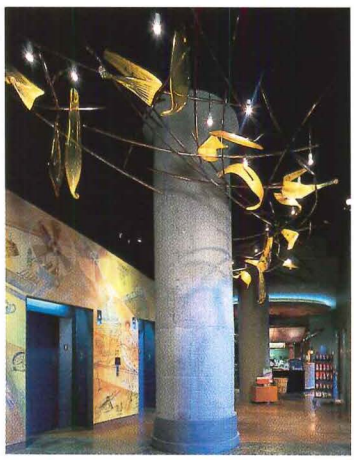
A classroom used for multimedia presentations must easily accommodate different kinds of tasks.





LIGHT SCULPTURE STIRS VISIONS OF FALLING LEAVES AND COFFEE PLANTS

The headquarters of the giant coffee chain Starbucks is located in a landmark building in downtown Seattle. A canopy of wood and diffusing glass over the entrance to the building is lit from above by a strip-fluorescent sign light, and low-voltage halogen uplights placed on the canopy supports provide supplementary lighting. Compact fluorescent steplights flank the stairs.



When remodeling the building's public areas, the architectural firm of Adams/Mohler was confronted with large column-filled volumes of space that received no daylight. "We decided to emphasize the immensity of the volume by carefully composing the objects within the space," says principal Rick Mohler.

A large column in the center of the space was turned into both a source of light and a work of art. Designed by local artisan Brent Markee, the sculpture, an abstract tree, is composed of blown-glass leaves, copper-tubing branches, and 75W spotlights suspended on pivoting arms. "The luminaires cast a pattern of light and shadow on the concrete floor, suggesting the dappled sunshine of coffee plantations," says Mohler. *N.C.*

NEW NASDAQ MARKETSITE DESIGN INSPIRED BY COMPUTER CHIP

Nasdaq's MarketSite headquarters in New York City is designed to show technology at work. A competitor of the New York Stock Exchange, Nasdaq is a securities market known for technology stocks such as Microsoft and Intel. Nasdaq's management wanted a physical environment that would help communicate the image of a company that has billed itself as "the stock market for the next 100 years."

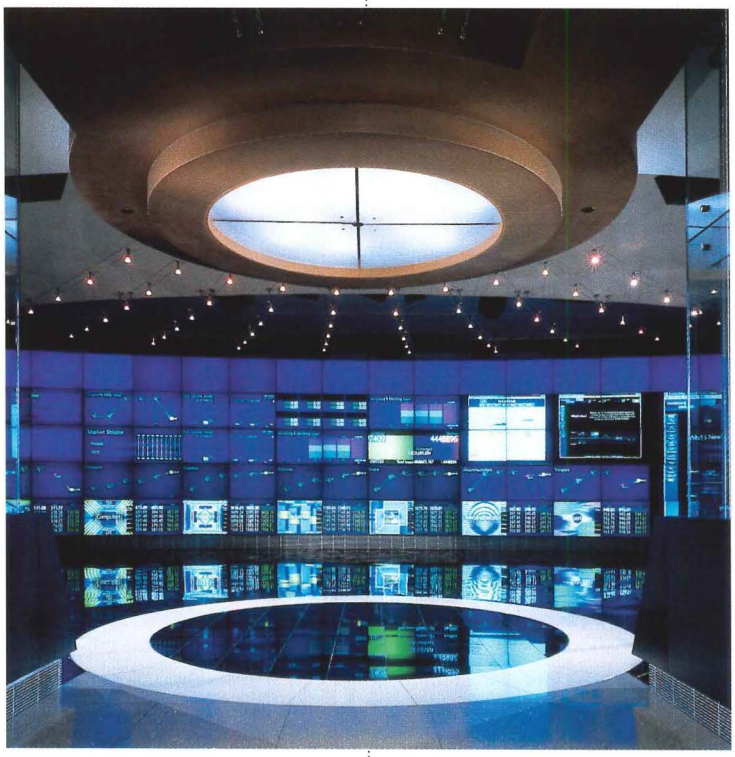
"The client wanted a space that would look as different as possible from the paper-strewn New York Stock Exchange—one that resembles the inside of a computer," says Harout Dedeyan, of C & J Partners, the Pasadena, California, design and marketing firm that won the job in a competition.

"We wanted to give visitors the experience of seeing information traveling through a network," adds lighting designer Robert White, who was with Illuminating Concepts when he designed his part of the project.

As visitors are ushered from the understated elevator lobby into the MarketSite facility, they are treated to a carefully choreographed light show, controlled from the receptionist's desk, which leads them through the space. MR16 halogen lights are strung on cables like microchips on a circuit board and fan outward from a central light source.

These lights are programmed to dim in a wave that draws attention first to a neon-lit, shimmering artwork of silk and metal fabric and then leads the eye through the space, which terminates at a curved 55-by-11-foot video wall comprising 100 video monitors. Continuously updated news, stock prices, and performance information are displayed at this state-of-the-art digital information system.

Circuitry for the space is covered by a raised, accessible-tile floor custom-designed in Italy. You can take a virtual tour of Nasdaq's MarketSite headquarters by visiting the firm's Web site at nasdaq.com. *N.C.*



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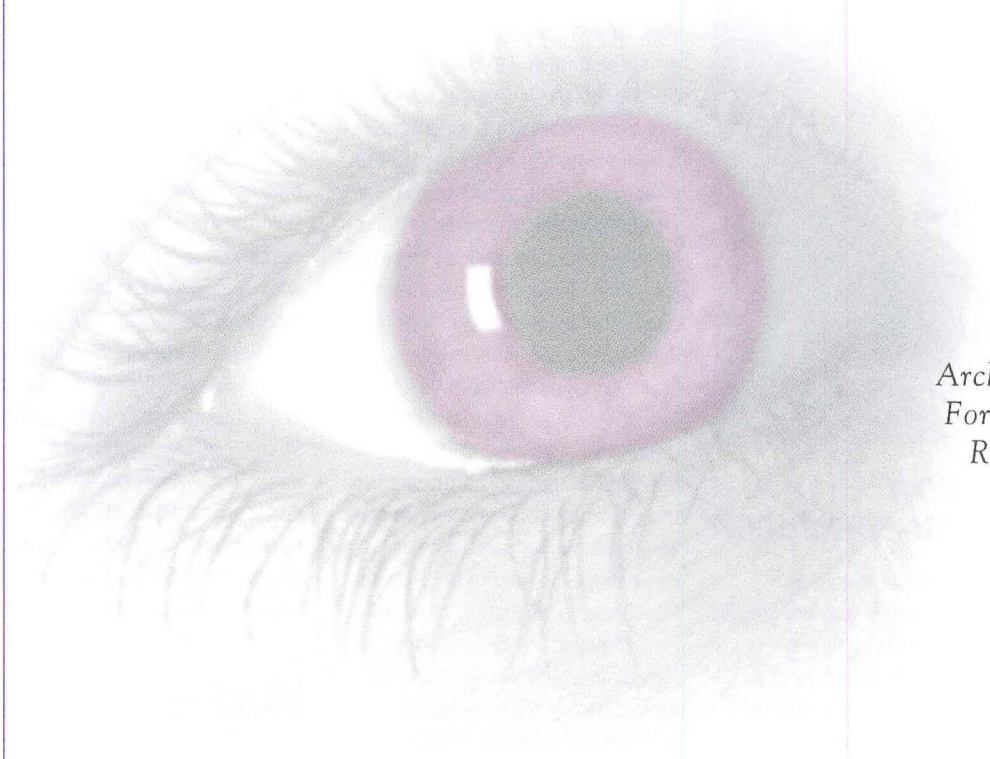

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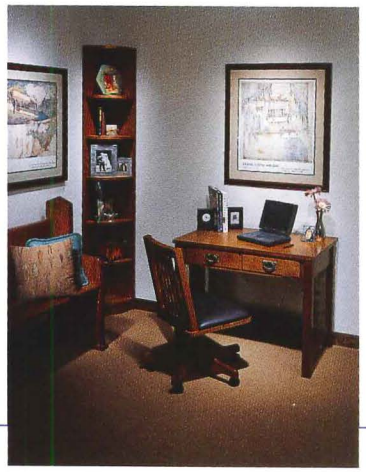

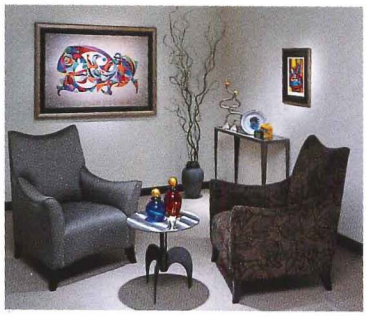

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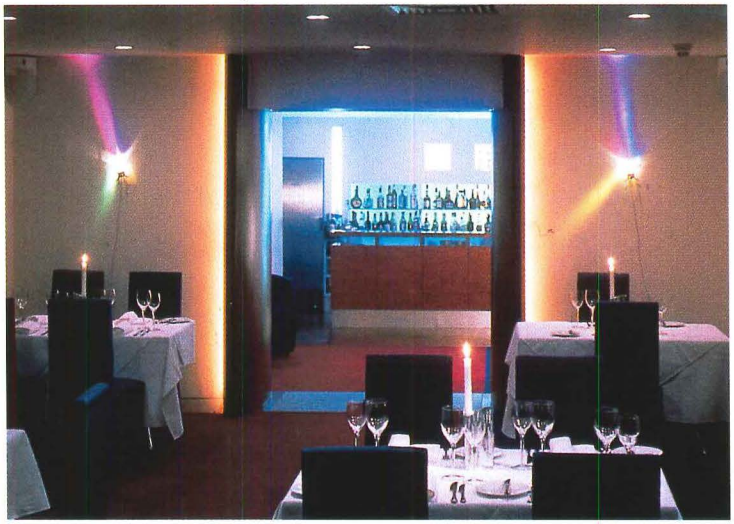
CIRCLE 238 ON INQUIRY CARD



SOMEWHERE OVER THE RAINBOW IS UNDERGROUND IN EDINBURGH

The client wanted to have the best restaurant in Scotland, and he wanted lighting to play a crucial role in the design. He approached Edinburgh-based lighting designer Jonathan Speirs to come up with a design concept for his basement venue, Restaurant 36, even before he hired an architect.

A whimsical fixture designed and studio-manufactured by German designer Gregory Prade is central to the lighting of the restaurant. Called 77 Moons, the wall-mounted luminaire casts light in colorful patterns. It consists of a pair of drilled glass marbles anchoring a short aluminum rod that holds a butterfly-shaped luminaire. The butterfly's wings are two adjustable dichroic filters with a low-voltage halogen capsule at the center. When the white light passes through the two semireflecting filters, it is broken up into all the colors of the rainbow; the colors change when the filters move. Speirs and Prade hung the fixtures as art on the otherwise bare walls, and patrons are encouraged to participate in the lighting design of the restaurant by adjusting the filters until the light suits their fancy.

A transitional space created by the change in levels between the bar and the dining room has been treated as an entryway. Fluorescent lamps sleeved in blue theater gel are set in a glass panel behind the riser of the step to light the way to the dining room.

Throughout the restaurant, colored fluorescent tubes are used to illuminate pockets set into walls, creating sharp silhouettes and shadows in a space with no natural light whatsoever. Spotlights on flowers and uplights placed in niches behind banquettes also help to add depth to the 50-seat restaurant.

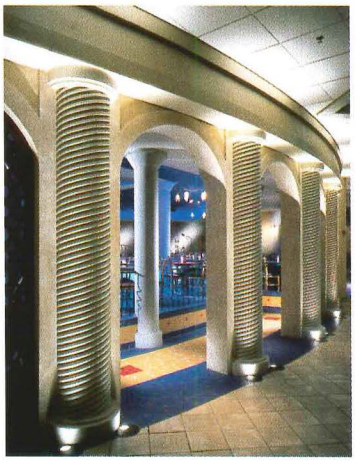
The exterior sign consists of the number 36 lying horizontally in a large bed of smooth pebbles and ringed in gas flames; the sign's bluish-yellow glow beckons visitors to descend the steps leading to Restaurant 36. *N.C.*

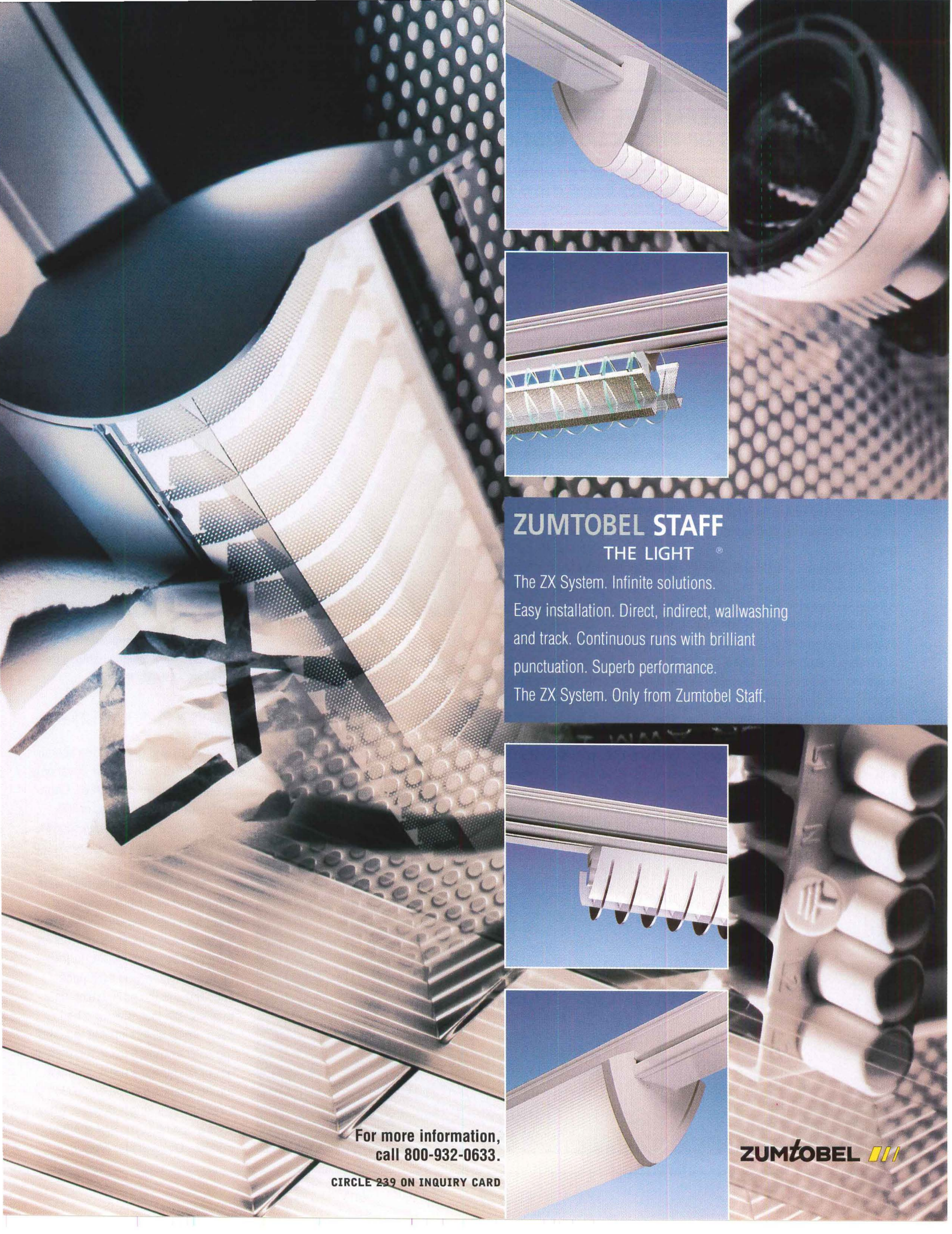
TERMINAL BUILDING TRANSPORTS MISSOURIANS TO MEDITERRANEAN

The Argosy Terminal Building is the on-shore gateway to the Argosy Casino, which, in keeping with Missouri gaming laws, is located on a boat in the Missouri River. Set on a 40-acre site adjacent to the highway in Riverside, the terminal building is designed to set the mood for a fling at the casino. A sumptuous entryway of sails and fountains leads to the two-story building, which contains restaurants, bars, and private party rooms. "The procession through the building is intended to transport patrons from the everyday world into a surrealistic fantasy world," says project designer David Reid of the Kansas City–based architecture firm WRS.

Designed by Bruce Yarnell Associates, the lighting in the terminal building works with the architecture to evoke a southern Mediterranean feeling. The 80,000-square-foot building is designed with brick walls, mosaic floors, and palm trees, set around a large skylight. At night, a circular arrangement of white sails suspended from the skylight is illuminated by MR16 track fixtures set in a cove at the skylight's perimeter. Fitted with dichroic filters of blue and green, and wired to three circuits that cross-fade between blue, green, and white light, the lights bathe the sails in a variety of changing colors. An uplit arcade of columns sculpted in a spiral pattern surrounds the skylight.

From the atrium, guests walk through a gallery to board the riverboat casino. Conceived as a village street, the gallery is articulated with massive stucco walls that are randomly punctured with deep openings. Here, MR16 uplights in the openings are designed to continue the effect of strong light and shade. Another highlight of the space is a heavenly light show of sorts: computer-controlled fiber-optic strands simulate the dawn-to-dark cycle of the skies over Kansas City, complete with the constellations. *N.C.*





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CIRCLE 239 ON INQUIRY CARD

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ANIMATED AND INTERACTIVE DESIGN LIGHTS UP FINANCIAL DISTRICT

Landscape architect Ken Smith and lighting designer Jim Conti were brought together this past winter by a local business alliance seeking a proposal for a holiday makeover of a small cement park in New York City's Financial District. The two were appalled by the ranks of '70s-era lollipop lights that interrupted the space. So they resolved to hide them.

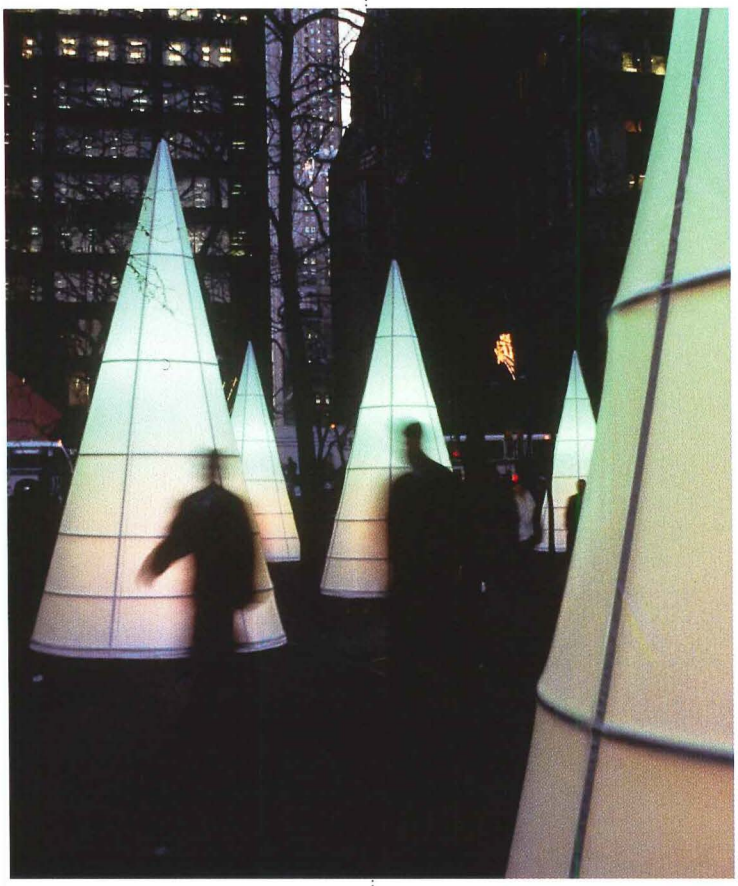
In their scheme, translucent cones covered the light poles. A larger cone in the center lent a strong sense of order to the arrangement. Liberty Plaza would, for the winter at least, become a hybrid Japanese garden and French topiary, with the cones functioning as both lanterns and abstracted trees.

The proposal was accepted by the business alliance and the project was budgeted at $125,000, with many support services provided free of charge by the owner of the site.

Frames for the cones were made from one-inch-diameter galvanized steel piping, and the vinyl sheathing was the same material used for pizzeria awnings. The 16 small cones were 16 feet high and 8 feet in diameter at the base, roomy enough to enclose the existing 10-foot-high lollipop lights as well as the bunches of lights that would be installed below them. The single big cone was 24 feet high and 12 feet in diameter at the base.

Clear globes replaced the 250W phosphor-coated mercury vapor globes at the top of the poles to create a greenish-white color at the apex of each cone. The rest of the color was provided by a tripod of three four-foot 40W T12 D835 tubes, each facing in a different direction. The southeastern face of each cone was lit with a saturated yellow filter, the northeastern face with a pale lavender, and the western face with a deep amber, corresponding to different qualities of sunlight. An opaque disk wrapped around the pole seven feet above the ground prevented the light of the three fixtures from interfering too much with the light of the globe above.

Inside the big cone, which had no lollipop light, a tripod of eight-foot fixtures contained six four-foot lamps filtered with reddish-purple gels. PAR lamps suspended from the tripod bounced light from crumpled silver Mylar on the floor of the cone to its tip. The resulting aquatic light softened the hard white light of Christmas bulbs stuffed inside Mylar-backed tubes and strung up near the cone's surface.

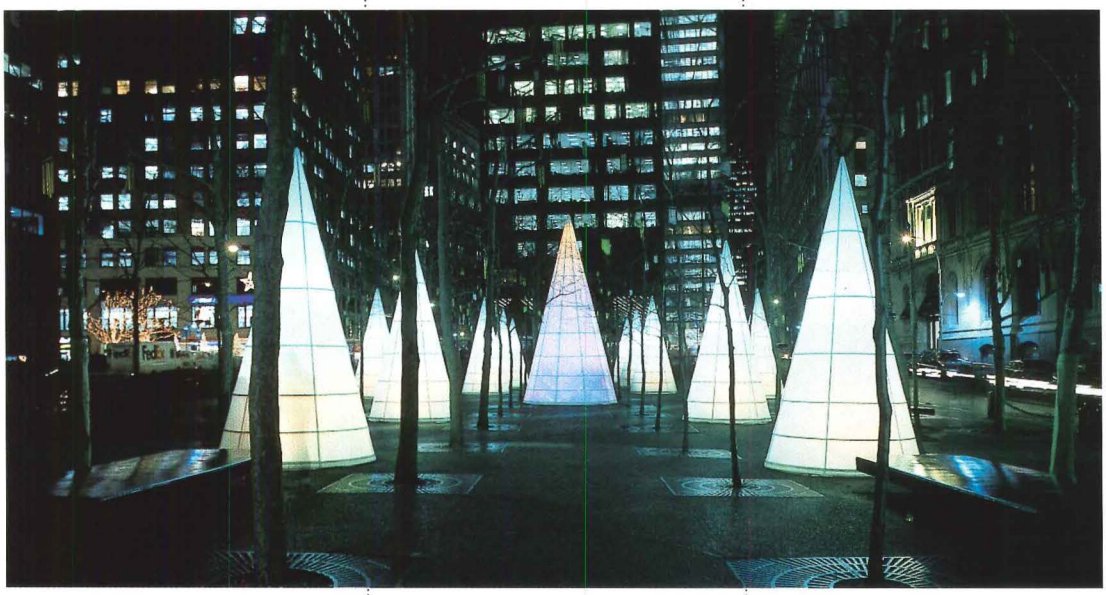


This winter, translucent cones covered 1970s-era lollipop lights in New York City's Liberty Plaza.

Since there were three colored faces for each cone except the center cone, the colors appeared to change as viewers walked through or past the park. "Animation isn't just flashing or dimming lights," says Conti. "It can come from perception too."

Smith and Conti added sound, hanging 200 wind chimes of varying size and pitch from the trees. Conti programmed 32 samples of "Oh Tannenbaum" using 32 bell sounds, set to play at varying intervals in the cones.

Some visitors to the park were disoriented by such a full engagement with light and sound. According to Conti, businesspeople rushing from Wall Street to the World Trade Center visibly slowed their pace once they hit the park, taking time to get a little lost. Kids who had been out all night clubbing took the trip downtown to relax in the park at dawn. For perhaps the first time in the 30 years since the demolition of Ernest Flagg's Singer Building, which once stood here, the site sparked wonder. *David Simon Morton*



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CIRCLE 90 ON INQUIRY CARD

STAFF

PARIS INSPIRES SISTER CITY CHICAGO TO LIGHTEN UP A LOT

Chicagoans have never been big on lighting. In fact, when Wrigley Field was finally illuminated for night play in 1988, fans mourned the passing of the Cubs' day-game-only tradition.

But now, with a new lighting master plan in the works, Chicago's Loop, considered one of the most vigorous downtown areas in the United States, is poised to take on a new glow. A number of its landmarks and streets are already impressively lit, but efforts by Mayor Richard A. Daley would take this urban area to even higher levels of brightness.

The Chicago Downtown Lighting Master Plan has been overseen by Skidmore, Owings & Merrill and the lighting design firm Schuler & Shook. It is outlined in a four-part report commissioned jointly by the City of Chicago's Departments of Planning and Development, Transportation, and Streets and Sanitation.

"This plan was a combination of a number of different projects that were all going on at the same time," says Robert Shook of Schuler & Shook. "First, there was a push to standardize all the streetlighting schemes downtown. That effort was coming from the department in charge of maintaining the equipment." Different groups in each area of the Loop were asking for their own special decorative lighting fixtures, making it extremely difficult for the city to maintain a complete inventory of lamps, decorative globes, and other parts. "And," adds Shook, "the street lighting didn't have a unified appearance."

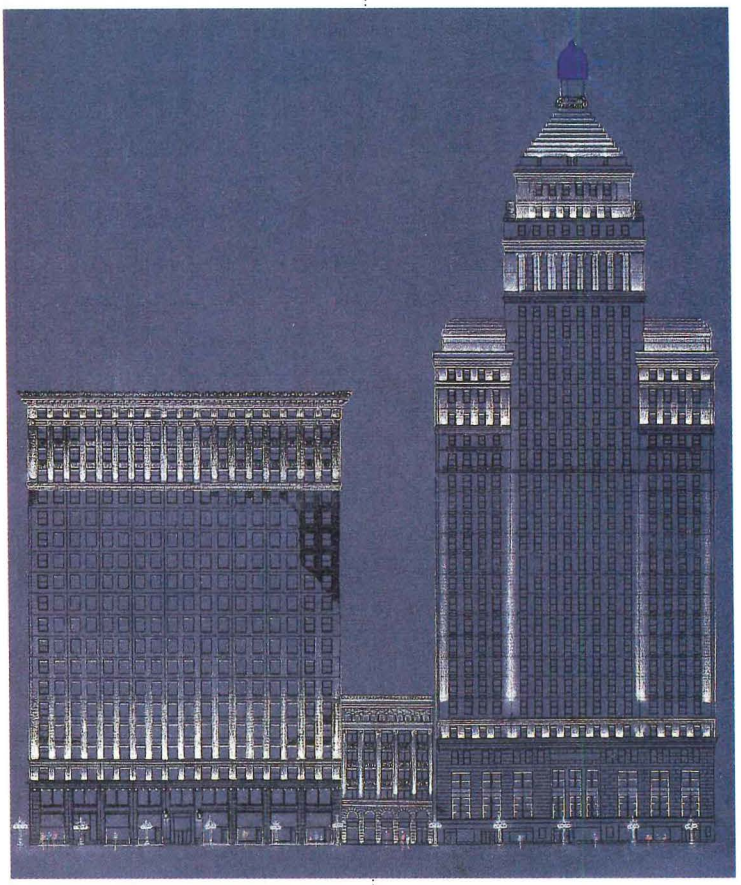
The report identifies four different types of street-lighting fixtures, which vary in height and style depending on their location. The tallest, fitted with two acorn-type globes, would be installed along Chicago's famed State Street. Michigan Avenue and Wacker Drive, which borders the Loop on the east, north, and west sides, would have shorter poles fitted with spherical globes. The plan also gives specifications for each proposed fixture, including style, type, finish, and cost.

It is easy to see the advantages of better street lighting, especially in terms of pedestrian safety and security. Understanding what can be gained by lighting the city's nightscape requires a little more imagination. The second part of the master plan was inspired by a visit Mayor Daley made to Paris, Chicago's sister city, two and a half years ago. He was smitten with the grandeur of the City of Light's illuminated buildings and charged some of his staff members with seeing how Chicago might light up its own skyline.

"Chicago's public buildings are the obvious targets. Many of them are wonderful historic buildings, and if the city wants to, it can light them. It's tougher to get the privately owned buildings lit," Shook points out. So the mayor asked the Department of Planning to create a presentation that he would make to civic organizations and building owners.

This eventually blossomed into a program called HighLight Chicago, which is operated by the city's Department of Cultural Affairs. Building owners who participate donate money to a not-for-profit corporation, which is used to finance design and construction services for their buildings. The idea is that the money they contribute to lighting buildings can be written off of federal and local income taxes. "The city wanted to give building owners an incentive to light the buildings without actually paying for them to be lighted," says Shook.

The organizers of HighLight Chicago put together a report that gives building owners a short course in the principles of lighting



Left to right: The Straus, Karpen, and McCormick buildings, on Michigan Avenue, are among the structures that Skidmore, Owings & Merrill and Schuler & Shook's lighting design master plan for Chicago has suggested should be illuminated. The rendering and an explanation of the lighting concepts were presented as part of the plan.

exteriors and outlines what kinds of buildings make good candidates for illumination. It also inventories which buildings have already been lit in the Loop, and others that might benefit from illumination. Case studies—with renderings and cost estimates of labor and materials for installation and operation—of notable buildings that have never been lit, such as the Straus, Karpen, and McCormick buildings (shown above), are included. A projection of annual costs and tax savings for a representative project is given too.

The last two sections of the lighting master plan are concerned with two features of the Loop that are landmarks of the Chicago streetscape: the elevated train stations downtown and the bridges at the edge of the Chicago River.

"The elevated stations are too big to ignore," says Shook. "So you may as well make something nice out of them." The key strategy proposed in the report was to use light to make it easier to identify stations at night, as well as to improve pedestrian safety.

The 16 bridges that span the Chicago River are important gateways into the Loop. The plan recommends that they be illuminated by sources mounted on or near bridge structures so that the light will emphasize key architectural details and the overall forms of the bridges.

Those interested in learning more about HighLight Chicago can contact the organization at 312/742-1175. *C.D.L.*

INTERVIEW: How Designers Applied Classical Lighting to a Modern Theater

by Charles Linn, AIA

When the competition for Japan's New National Theatre was held in 1986, multipurpose theaters, which could be adapted at will for opera, concerts, or drama, were the norm in Japan. The New National, designed by Takahiko Yanagisawa and completed in 1997, took Japanese theater design in a new direction: with three separate houses, it could play host to many different types of performance simultaneously.

Occupying an entire city block in the Shibuya section of Tokyo, the 741,000-square-foot New National has a forbidding presence—the massive, windowless concrete exterior walls suggest a bunker more than a center for the arts. But once you pass through the public space outside the lobby, the building's appearance changes sharply. An uplit wall of rough-hewn stone appears to float in a fragile black pool of water, reflecting the oak-paneled foyer of the opera house beyond it. These elements begin to express the shift in contrast between the coldness of the theater's exterior and the warmth of its interior.

Inside the facility, the opera house seats 1,810; an experimental theater, the Pit, holds 486 people; and the playhouse, which can be converted from a traditional proscenium theater to a thrust stage, has the capacity for 1,038. When the playhouse is in the latter configuration, opening the ceiling provides access to a second flytower.

For the New National, the architect based his design on the premise that the theater is a place where one can encounter firsthand the power of human creativity. He created a composition of spaces—beyond the stages themselves—that not only engage the visitors but put them on stage. A veteran designer of cultural facilities in Japan, Yanagisawa, principal of TAK Associated Architects, won the 1998 Architectural Institute of Japan Prize for the New National Theatre.

Lighting the New National Theatre

Lighting designers Paul Marantz and Charles Stone, principals of Fisher Marantz Renfro Stone of New York City, had collaborated with Yanagisawa on the recently completed New Tokyo Metropolitan Museum of Art. For the theater, their arrangement with Yanagisawa was atypical. In the United States, lighting designers work directly for the architect. In this case the lighting designers consulted for Yamagiwa Laboratories, the lighting manufacturer that furnished fixtures for the project. Yamagiwa normally offers design services as part of its package, much the way manufacturers offer design services in Europe. But even though Yanagisawa didn't employ Marantz and Stone's firm directly, the lighting designers worked intimately with him on the theater.

Long a presence on the international scene—the firm's résumé lists 55 projects beyond U.S. borders—Fisher Marantz Renfro Stone came up with a design for the New National that would be considered classical in any country: incandescent downlighting and wall washing define layers of space. The scheme emphasizes the architecture's complexity and shows off Yanagisawa's work as a series of geometric, cerebral compositions—an effect much easier to describe than to achieve.

The editors of ARCHITECTURAL RECORD talked to Paul Marantz and Charles Stone about how they worked with Yanagisawa and about the design process that ultimately yielded the lighting for the New National Theatre.

The New National Theatre in Tokyo, which occupies an entire city block, is the low-rise building in the foreground (right). Theatergoers enter through the plaza (above left).

Project: *New National Theatre, Shibuya-ku, Honmachi, Tokyo*
Client Organization: *Ministry of Construction, Kanto Regional Construction Bureau*
Managing Organization: *Japan Arts Council*
Architectural, Structural, and Services Design: *Takahiko Yanagisawa + TAK Associated Architects*
Associate Architect: *Harald Deilmann (co-architect)*
Consultants: *Adolf Zotzmann (theater technology); Kisaburo Kawakami (design); Fisher Marantz Renfro Stone with TL Yamagiwa Laboratories (lighting); Leo Beranek (acoustical design); Shozo Motosugi, Hiroyuki Suzuki (theater planning)*
Stage Equipment Design: *TAK Associated Architects, Theater Engineering Institute, Nagata Acoustics*
Stage Equipment Design Cooperative: *Hashinosuke Kotani, Sumio Yoshii (overall design); Yasuo Okuhata, Motoi Hattori, Ikuo Mirofushi, Mutsumi Isono (lighting)*

The public lobby (this page and opposite) is the point of transition between the cold concrete of the exterior and the warmly lighted wood of the interior.

RECORD: Go back to the beginning of this project. What happened when you first met Takahiko Yanagisawa?

Paul Marantz: The job started when he arrived here in New York about eight or nine years ago. We took him on a tour of Lincoln Center. The New National Theatre was intended to be *the* Lincoln Center of Tokyo, the first real Western-style theater complex built there, and they wanted it to be one of the best theaters possible. So that was a natural starting point.

Charles Stone: I remember being in the New York State Theater lobby talking with Yanagisawa about how lighting ideas had changed over the years. Even after Modernism and the International Style, some of the basic rules first articulated by Richard Kelly still apply: you have to put light on the curtains and task lighting on the seats, to put focal glow on architectural features and materials. And you need sparkle. These are things you assemble one piece at a time.

RECORD: So you still follow some simple rules of lighting space, and you also get a clear understanding of what the architect's idea is. In this case it was very restrained and modern—and they work together.

P.M.: Yes. The decoration was very restrained. It wasn't trying to be active. There are no chandeliers, for example.

RECORD: But one clear difference between the New National Theatre and Lincoln Center is that Lincoln Center is wide open—there is a plaza and you can see the whole thing at once—whereas the New National is very contained.

P.M.: That's true. It takes many steps to get from the public spaces to the theaters at the New National. And, whereas at Lincoln Center each theater building is distinct and stands out, the New National is just one extremely large public building. The first goal the lighting sought to achieve was to create a sense of the place. One of the most interesting design problems at the New National is in the main transitional public space, where you come in: there is a series of level changes, with some light boxes on the walls and three clerestories overhead. Yanagisawa's idea was that the sun would come through them and play in the space during the day, thus animating the area. We decided we should find an electric-lighting analogy to that. So we used the concrete beams that support the clerestories to hide very strong directional light sources. They nonuniformly light a set of stairs that moves you from the street up to the lobby.

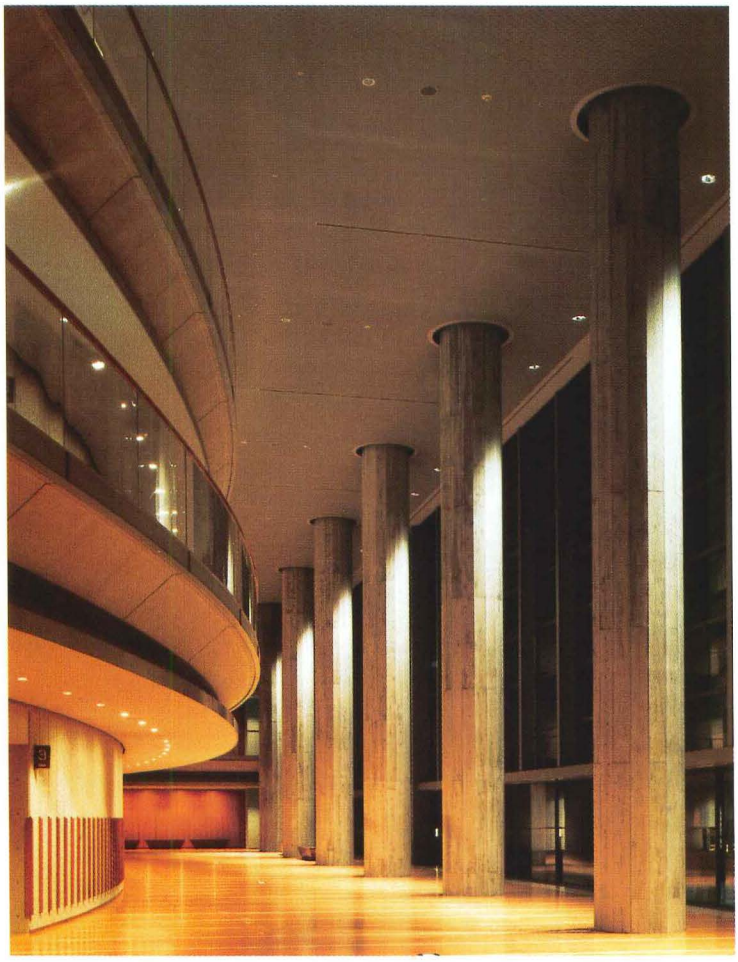
RECORD: What role does the pool play in the entry procession?

C.S.: At the New National, you pass an incredible reflecting pool on the

"EVEN AFTER MODERNISM AND THE INTERNATIONAL STYLE, SOME OF THE RULES FIRST ARTICULATED BY RICHARD KELLY STILL APPLY."

A view across the reflecting pool (opposite) to the foyer outside the opera house shows how different planes are lit to create numerous layers between the interior walls and the exterior of the building. A view from within the foyer (below) shows how the columns are washed to give them a greater sense of depth.

Severe uplighting of the white stone wall in the black reflecting pool puts it in sharp contrast with the smoother, rusticated concrete finishes around it (right).



way into the building. All the way around the pool, and on all three levels, there are places to stroll, so people are seeing and being seen. The pool is a calm, black mirror reflecting you and others. All the interior lighting and the rough stone forms sitting in the fountain are reflected and rereflected to create a composition. All the lights are on a dimmer, so the brightness can be adjusted to keep the glass transparent.

Inside, we decided that the columns looked good with a little bit of light, because it gave the whole space more depth. You really get a sense

"YOU LOOK FOR THE HOOKS IN THE ARCHITECTURE THAT BEGIN TO INFORM THE LIGHTING SCENARIO."

of that in the other lobby, where the light on the columns looks good, and there's a strong band of light on the curtain walls. It's very subtle. And then you get to the outside wall of the theater, which is washed in a very traditional, simple way.

RECORD: So this, again, is a strategy of revisiting some of the classical principles of lighting.

P.M.: Yes, but also you look for the hooks in the architecture that begin to inform what the lighting scenario will be. The architect has created this story through form—about procession from the exterior to the interior, and from rough to smooth. So you latch on to the architectural clues to help you develop a design.

Of course, each surface requires a different plan of attack by the designer to coax out its texture and color. Ideally, lighting designers would hold off on designing anything until they really understand what a building is all about. In my experience, when I really understand the building, and its qualities resonate with me, then the lighting pretty much designs itself.

Any good building tells you how to light it. Sometimes I get in trouble with my clients when I can't find a solution to a lighting problem: I tell them nothing is coming to me because their building isn't good enough [he laughs]. The more perspicacious of my clients have generally agreed with me!

RECORD: When you look at a completed project, how do you measure its success?

C.S.: At the New National, some of the results were intentional on our part. Others were just a product of our office's lighting-design process. I look at a building, and certain effects make me say, *Yes, I remember. That's exactly what we wanted.*

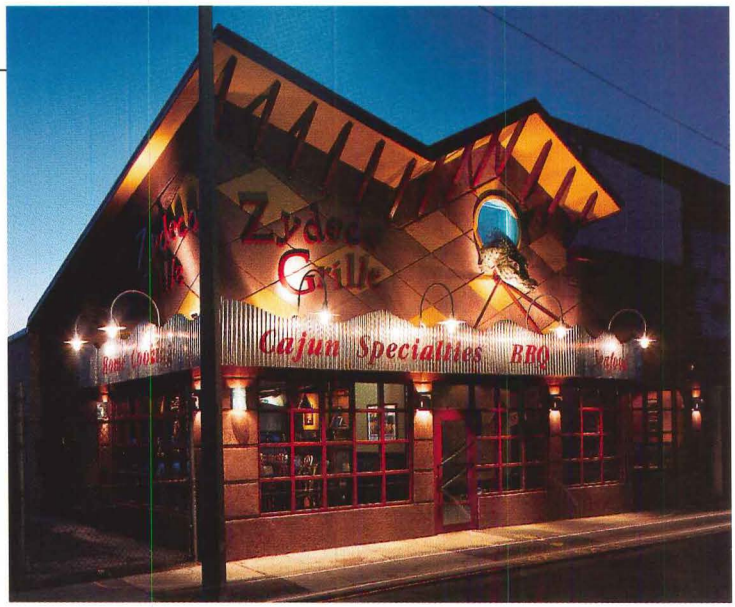
We pay attention to volumes of space—where the people will be and what and where the materials are. We use light like paint, to coat surfaces and objects. Generally speaking, we aim to highlight the expensive and, therefore, higher-quality materials. You find a lot of clues in the space just by looking at where the expensive materials are. And, we try to be sensitive to the structure's alignments.

In the case of the New National, lining up lights with the centers of panels and joints and columns was a torturous experience, because the building's systems are so complicated, but it was worth the effort. Once you've succeeded at that, you kick the light up and away from the surfaces and objects you want to miss and use it to coat the surfaces you want to hit. If you've kept the progression of spaces in mind throughout the project, that's when you get results like these. ■

The opera house's oak panels (above) have been given focal glow from wall washers. The playhouse (below) has wall washers hitting the balcony fronts; both houses' seating has task lighting.

Cajun Rhythms Inspire the Vibrant Lights of Zydeco Grille

by Charles Linn, AIA



The staccato of a rapidly pumped accordion and the slashing steel riff of a washboard are the elements of traditional Cajun music that inspired Doreen LeMay Madden's lighting design for the Zydeco Grille in South Boston. "I tried to create a rhythm and a sense of harmony with the lighting," she says. "I feel very strongly that lighting, like music, is a universal language. It has a certain psychology behind it, and it shows people how to respond to a space." The Zydeco Grille is intended to be as spirited as the Louisiana music that inspired it, and Madden's gaily layered illumination of the restaurant makes its message clear: *laissez les bons temps rouler!*

On the front and side of the building, PAR38 uplights and MR16 downlights are hidden behind a corrugated, galvanized-steel fascia. The uplights wash the upper portion of the facade and signage, the undersides of the eaves, and a menacing life-size wooden alligator that appears to be crawling out of a pool of blue neon. The MR16s wash the sidewalk below. Traditional gooseneck fixtures with wavy-rimmed

The message Doreen LeMay Madden wanted to communicate with the layers of light in this replica of a tacked-together bayou bar is the same as that of Zydeco music: have fun! The underside of the bar is lined with intense horizon-blue neon, and the bar has custom pendants overhead. The walls, which are decorated with Louisiana artifacts, are bathed in light by a track of MR16s over the back bar.

Project: *Zydeco Grille, South Boston*
Owner: *Jim Fagan*
Architect: *George Schnee Architects*
Lighting designer: *The Lighting Design Group, division of Standard Electric—Doreen LeMay Madden*

Sheet-metal pendants over tables have the letter Z cut into them. Clouds over the "alligator pond" are backlit by fluorescent tubes wrapped with blue gels. MR11s recessed into the clouds drop pools of starlight on the floor.

reflectors of galvanized steel bounce light onto the shiny fascia, and each column bears a custom-made sconce, with the letter Z cut out for the light to shine through.

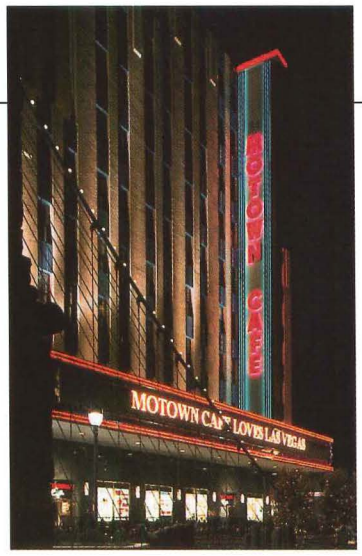
On the interior walls, artifacts like a New Orleans street sign and a giant crayfish evoke the Bayou State, as does the "alligator pond," an overscale floor mosaic of one of the reptiles. Drywall "clouds" float over the pond, concealing 4100K fluorescent lamps wrapped in blue theatrical-gel material, which cast a sky blue across the ceiling. Recessed, chrome-trimmed MR11 downlights drop pools of light from the clouds onto the alligator mosaic, and the blue fluorescents shine through a slot in the bottom of each cloud.

To light tables and wash the walls, Madden put 12V MR11s on tracks around the perimeter. Away from the perimeter, black stem-mounted MR16s and cone-shaped, sheet-metal pendants with frosted G lamps are used to provide ambient light for the tables and the half-height corrugated-steel partitions that divide the dining area. The Z cutouts that first appear in the sconces outside are repeated in the pendants. Madden responded to maintenance concerns by limiting the number of lamp types to seven, and dimming controls were used to lengthen lamp life and enable light levels to be easily altered. ■

Sources

Fluorescent strips: *Columbia Lighting*
MR11 downlights: *Europhase*
Interior Z pendants: *Avalanche*
Low-voltage MR11 track: *Seagull*
Exterior MR11s: *Seagull*
MR16 monopoints: *Lightolier*
Interior and exterior blue neon: *Neon Williams Co.*
Exterior floods: *RAB*
Recessed exterior MR16s: *Lightolier*
Wall-mounted goosenecks: *Abolite*
Exterior Z sconces: *Ultralights*
Exit lighting: *Surelights*

Radio City Meets Motown in Las Vegas Fantasy World

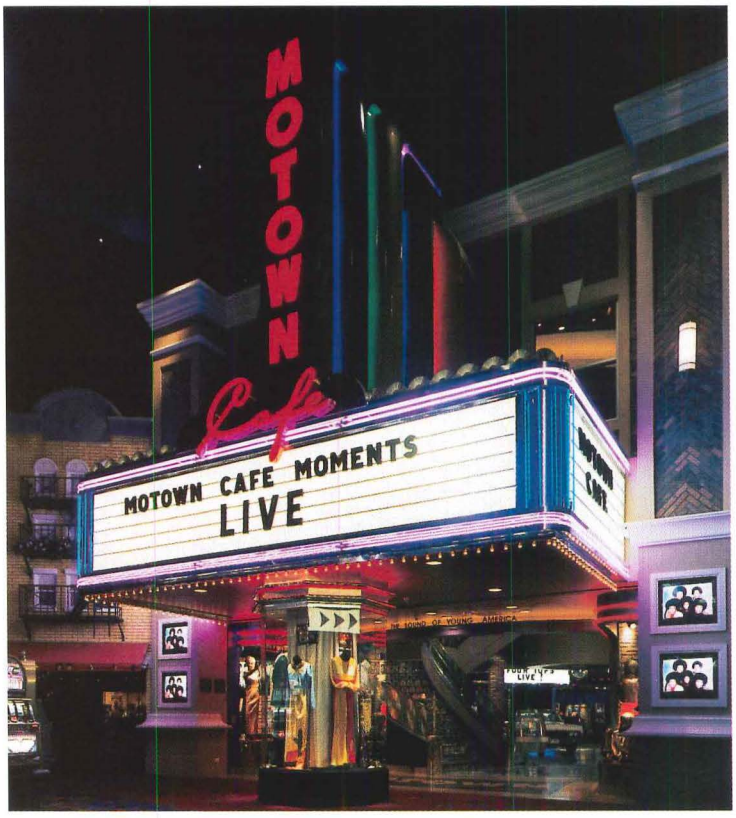


by Charles Linn, AIA

The popularity of themed architecture projects in recent years—especially those that present a carefully choreographed and sanitized rendition of the past—raises some intriguing questions about what, exactly, those who frequent them are looking for. How does an architect design for the person who would rather travel to Las Vegas to experience the Empire State Building and the Brooklyn Bridge than see the sights themselves in New York City?

To answer this question is to acknowledge that some of the experiences people really want cannot be had in New York City—or any other real place for that matter. Designers of themed restaurants and nightclubs combine evocative music, memorabilia, and food with other potent symbols and pack them into a box fashioned from architecture and lighting. What's inside is an idealized spin on the landmarks of Fantasy Land: all the wonders of Chinatown, for example, without the crowds and smells.

Founders of dream theme locales take eclectic license. The Motown Café at the New York New York Hotel and Casino sits behind a facade whose marquee and 50-foot-tall vertical sign bear an unmistakable likeness to those at Radio City Music Hall. Never mind that Motown is synonymous with Detroit. Visitors seem indifferent to whether or how the record label's identity and Radio City's appearance have been commandeered and conflated; they just come here to relive memories of the golden age of Motown or, in some cases, to have their first Motown experience—hold the reality.



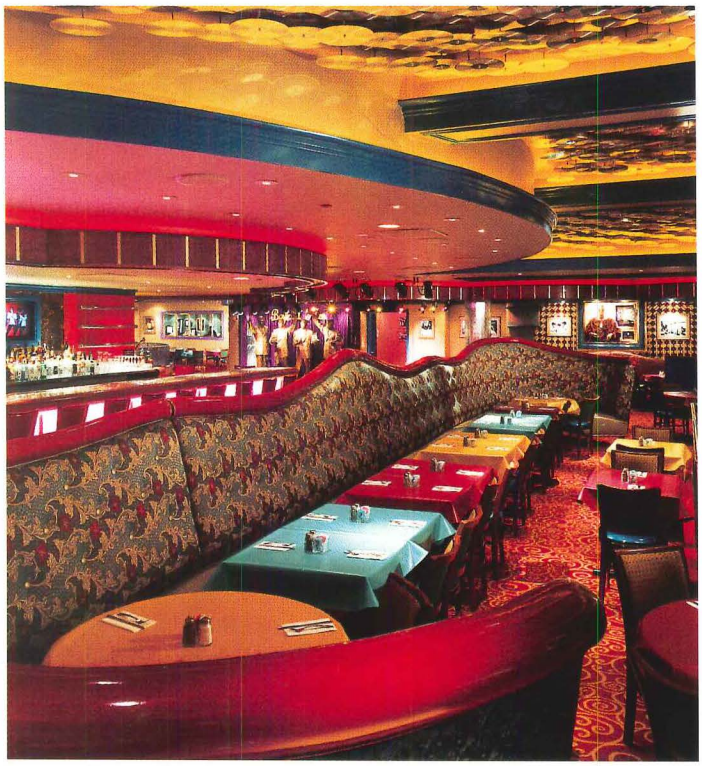
The Motown Café at New York New York Hotel and Casino in Las Vegas is behind a replica of Radio City Music Hall (above left). It is entered from the casino through a theater facade (above).

Evoking a mood, a time, and a place

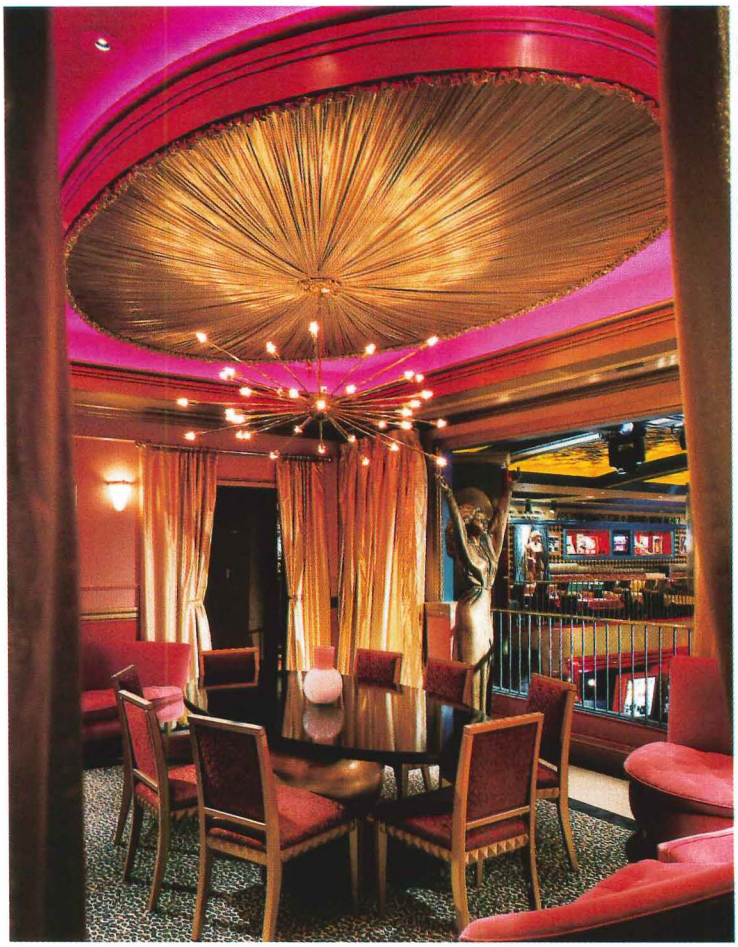
Jay Haverson, Motown Café's architect, says, "We wanted to evoke the colors—bright reds, yellows, purples, and pinks—and the styles of the early to mid-1960s, when the label was in its heyday. The message of the music was clean and wholesome, and the success of Motown signaled an exchange, when many white Americans first began accepting black culture. It was a powerful moment in time. This music said, 'Here's what we have in common: we all have tragedies, and we all get the blues.'"

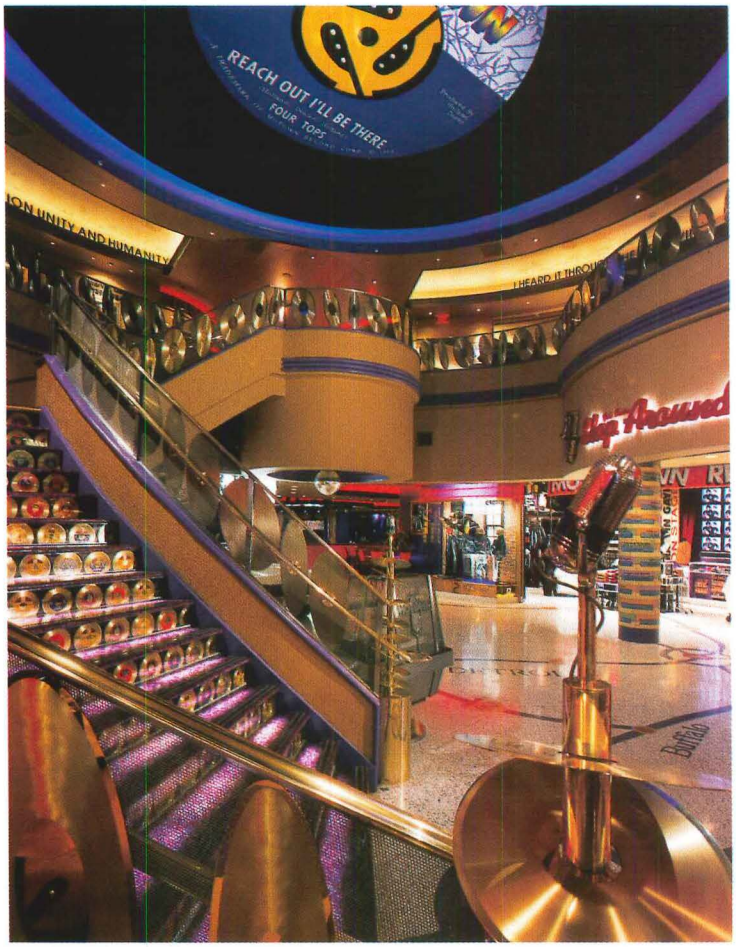
The lighting for the Motown Café was a substantial part of the project budget for one reason, says Haverson. "There is a lot of competition for people's money in Las Vegas, and people expect a restaurant to be over the top." Haverson divides the lighting he uses for themed architecture into three categories. The first is lighting that becomes a part of the event itself. To keep the Motown Café more like a stage show than a museum, people who work there wear costumes: hostesses in gowns reminiscent of those worn by performers of the 1960s direct patrons by way

Project: *Motown Café at the New York New York Hotel and Casino, Las Vegas*
Architect: *Haverson Architecture and Design—Jay Haverson, principal-in-charge; Carolyn Haverson; David Jablonka, project manager; Lisa Bianco, interior designer; Michael Gonzaga, Tim Koelle, Michael Kaufman, David Jimenez, Barbara Vazquez, Gina Librandi, Nick Lios, project team*
Consultants: *David Brewer (retail consultant); White Design (case design and memorabilia stylists)*
Construction Manager: *Peters Development*
Lighting Designer: *Joe Kaplan Architectural Lighting Design—Joe Kaplan, Michael Gehring, Guy Smith, project team*



The Twenty Grand Bar (above) and Main Bar (left and below) indicate the extent to which lighting has been employed to evoke a feeling of the 1960s. A focal point of the Diana Ross Room is a starburst pendant over the stairs (opposite left). 45-rpm records cover steplights on the Stairway to the Stars (opposite right).





of the Stairway to the Stars to the Twenty Grand Bar (the main dining room), to the Main Bar, or to mezzanine seating. The Motown Moments sing in various spots of the café, and their performance is also broadcast on video monitors. Theatrical light fixtures gelled in the classic stage colors of red, blue, and yellow are positioned to track the singers' choreographed routines—front- and backlighting them. "The experience is very three-dimensional," says Haverson. "The scenic lighting illuminates the show, and the actors and the guests are in a theatrical experience to begin with. That's part of what gives the space its richness."

WHEN SUCCESSFULLY DONE, THE LIGHTING BECOMES PART OF THE EVENT.

The function of Haverson's second category of lighting is to enhance the architectural form and objects in the space. This type of lighting abounds in the Motown Café: coved neon is layered in the brilliant shades of the '60s, which are reflected in plush pink-and-red banquettes, mint-green table linens, and golden draperies. Showcases containing memorabilia and statues of Motown artists, lit from above and below by incandescents, are the brightest objects in the restaurant.

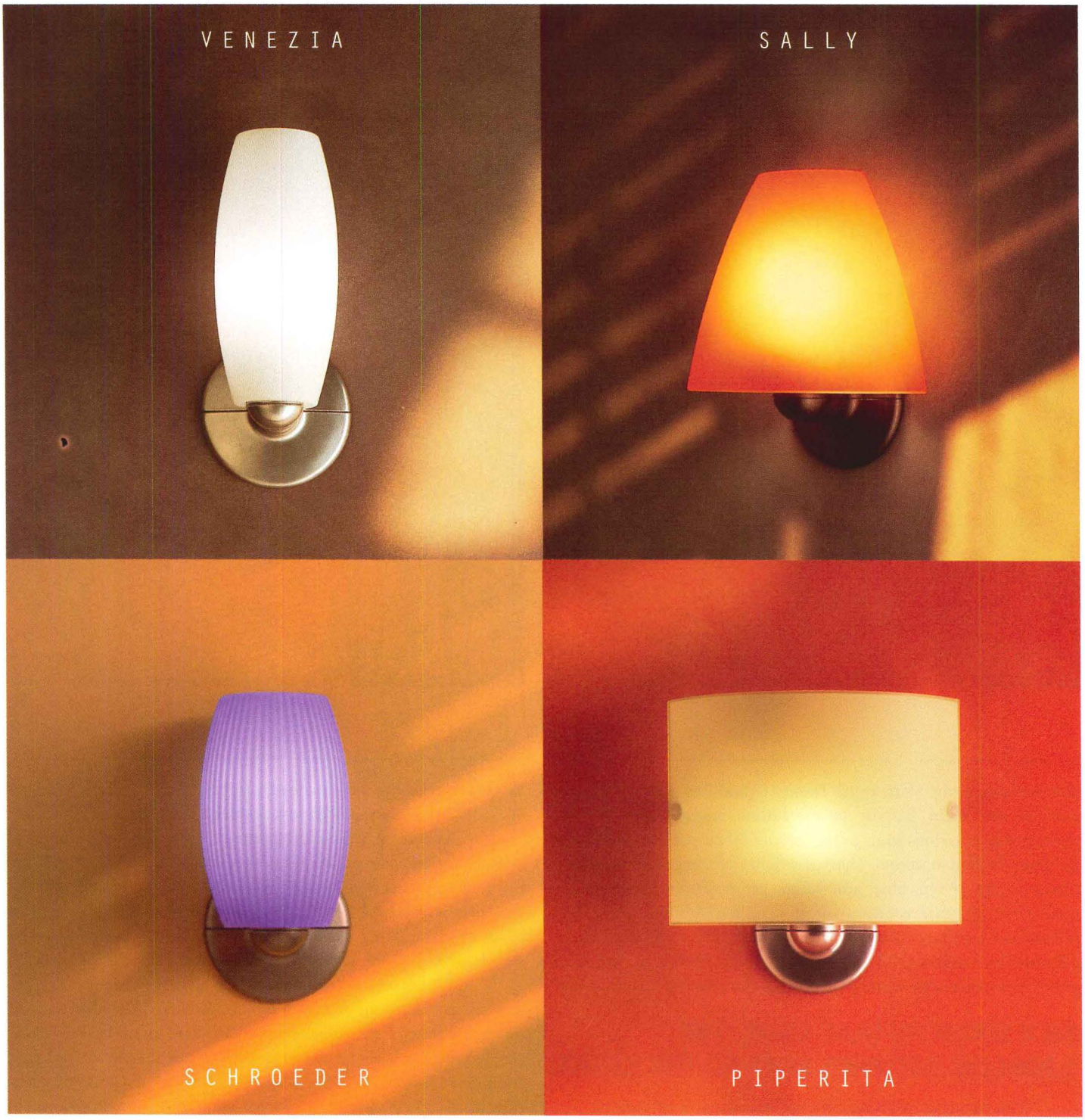
Other lighting that enhances the architectural form here is cleverly disguised. The MR16 pin-spots that illuminate dining tables, for example, are hidden inside gold record albums mounted on the vaulted ceiling; the albums are lit by uplights spaced around the mezzanine railing. Steplights illuminating the Stairway to the Stars are concealed behind golden discs that look like singles. Neon lights up the clear terrazzo footprints charting famed choreographer Cholly Atkins's "Temptation Walk," bringing the dance alive for patrons of the gift shop.

The third subset of lighting per Haverson is fixtures that become design elements in and of themselves, like sconces and chandeliers: "They do produce light, but they are really decorative objects." An exemplar of Haverson's third category—an ebullient starburst pendant of brass tubes radiating from a central point and terminating in globe-shaped lamps—is the key design element of the café's Diana Ross Room.

Whether those who dine at the Motown Café realize it or not, they are partaking not of history but of nostalgia. The Detroit nightclubs that the Motown Café has in part modeled itself on never really existed—yet their idealized versions are understood by all. Despite all the lights and equipment, however, this is not a time machine but a fantastic collage of cultural references. And the Motown Café does manage to take its visitors on a journey: a trip down Memory Lane. ■

Sources

Incandescent downlighting: *Lightolier, Halo*
Wallwashers: *Lightolier, CSL*
Track lighting, monopoints: *L.S.I.*
Low-voltage strip display lighting: *Ardee*
Exterior facade uplight: *Omegalux*
Fluorescent marquee backlight: *Lithonia*
Neon lighting: *YESCO*
Roving exterior searchlight: *Raztech*
Chasing striplights: *Celestial*
Exterior downlight: *Lithonia*
Decorative fixtures at casino entrance: *Lithonia*
Fluorescent light in dressing rooms: *Peerless*
Decorative pendants: *Sirmos*
Blue jelly jars: *Stoneco*



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CIRCLE 99 ON INQUIRY CARD

Lighting for New Eastman Chemical Offices Is Economical and Effective

by Charles D. Linn, AIA

It is not unusual for an architect to be asked to add to or renovate an office building. What Eastman Chemical asked of Mark Freeman, AIA, however, was unusual: the Kingsport, Tennessee, manufacturer of chemicals, fibers, and plastics challenged Freeman to devise a plan to renovate its existing 109,000-square-foot office concurrently with the construction of a 176,000-square-foot addition, and make it happen with no employee downtime. Another goal was to improve the energy efficiency of the office task lighting while keeping down equipment costs.

At the same time, Freeman wanted to specify lighting systems that would win approval from the 51 department heads representing the 1,600 employees who would be working in Eastman's new center of operations. So Freeman called in lighting designer James Benya. "It might seem a little extravagant to have a lighting designer on a project that doesn't require complicated things like custom fixtures," Benya says. "But architects and engineers can still make good use of lighting-design services while keeping project fees affordable."

Changing standards

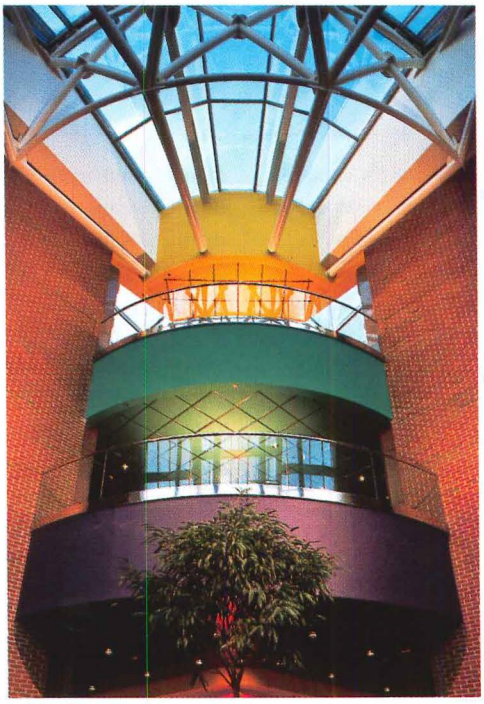
Benya showed the design team alternatives to the company's standard low-brightness lighting fixtures for offices with computers. "Eastman's standard," says Benya, "was a typical fluorescent troffer fitted with either a specular plastic or aluminum parabolic louver. Millions of them are in use because they are inexpensive."

Benya proposed that the company consider an indirect fluorescent uplight fixture. Because indirect lighting bounces light off the ceiling, distributing it over large areas rather than toward the floor (as troffers fitted with plastic lenses do), it minimizes the veiling computer-monitor reflections that plague office workers. Indirect uplights can also be spaced farther apart than fixtures that have louvers, which control glare by cutting light off at a steep angle to the floor and may create a cavelike feeling in offices.

Most indirect lighting systems are constructed of precision-extruded aluminum, which makes them too costly to compete with troffer systems. Benya recommended an indirect lighting product made of rolled steel, which he felt would create a better-lit environment than a troffer system at a competitive price.

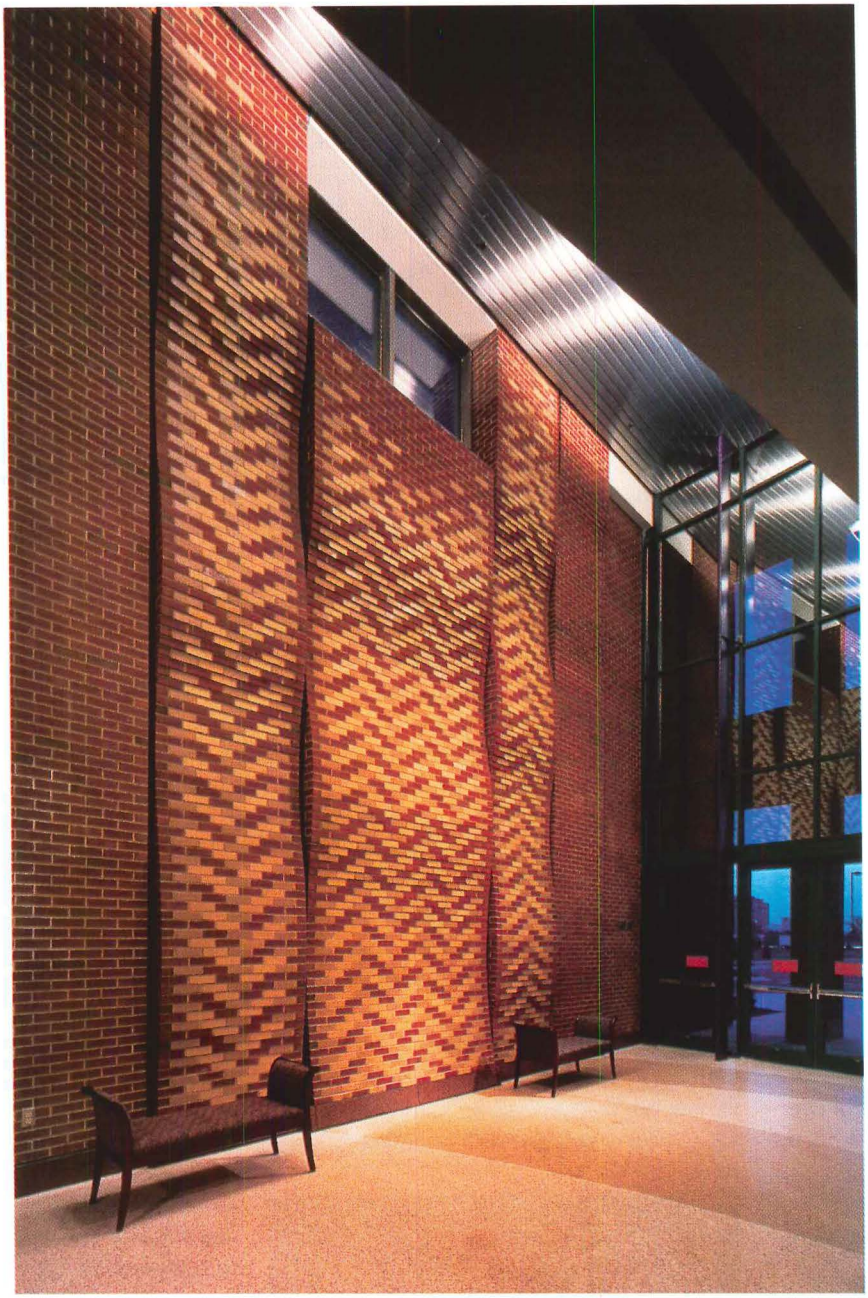
Before committing to any lighting-design scheme, representatives of Eastman decided to mock up a few sample work spaces, so employees could decide for themselves which system they liked best. They divided an entire floor of a nearby office building into thirds, and installed a different lighting system in each. One-third of the floor was outfitted with troffers, the second with an indirect system, and a third with a combination of the two. Employees were unanimous in their choice of the indirect system, which produced an average of 40 footcandles at the work surface.

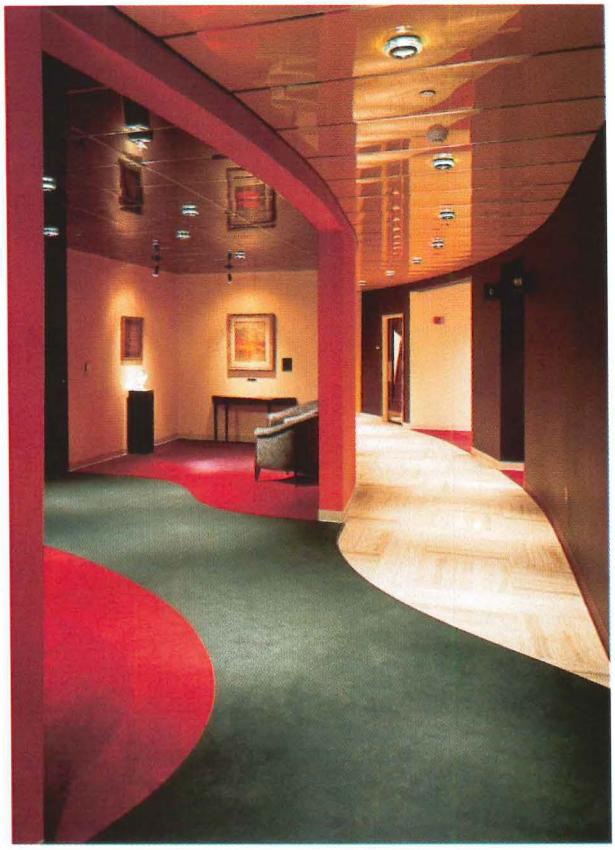
Because indirect lighting can leave perimeter walls in the dark, fluorescent wall washers are often used to light vertical surfaces. But these fixtures can be expensive, so Benya recommended less costly one-by-four-foot troffers equipped with asymmetric "kicker" reflectors to wash the



Eastman Chemical's new Business Center seamlessly combines an existing office building with a new one. The space between the old and new wings is flooded with daylight in a new atrium (left).

Project: *Eastman Chemical Business Center, Kingsport, Tennessee*
Project Manager: *Richard Russell (Eastman Chemical)*
Architect: *Mark Freeman Associates—Mark Freeman, AIA, principal-in-charge*
Lighting Designer: *Pacific Lightworks—James Benya, principal-in-charge*
Electrical Engineer: *West, Welch, and Read Engineers*
Electrical Contractor: *Tennessee Electric Company*





Track lighting floods a brick feature wall (above) and artwork in a waiting area (top right). The reception area is lit by halogen downlights with decorative trim rings. As part of the renovation and expansion, Eastman adopted indirect fluorescent (bottom right) as its new standard method for lighting office space.

walls where they meet the ceiling. "Possibly the most important work that the design team did," says Benya, "was to help change the company's office lighting standards. We took them from troffers to indirect fluorescent—that's a major change."

The design team went to a manufacturer's training facility to see fixtures in use before they chose luminaires for other parts of the building. They selected two-by-two-foot parabolic troffers for ambient illumination in conference rooms as well as circulation areas and other shared spaces. Architectural-grade compact fluorescent downlights and parabolic troffers were chosen for offices. In the public spaces, halogen downlights with decorative trim rings pick up the gleam of polished-metal ceiling panels, and incandescent track lighting is used to illuminate artwork.

An atrium of glass and specially commissioned bricks serves to link the new and old wings of the building visually as well as physically. As floors in each section were completed, 50 to 100 employees were moved in at a time, generally over weekends to minimize downtime.

Two years after the project began, 1,600 employees were ensconced in new work spaces, and Eastman Chemical's business operations had been consolidated from eight locations into one. The overall operating electric load for the lighting systems was reduced from 3.5W per square foot in the old facility to 1.2W per square foot in the new facility, with no loss in illumination at the work surface. ■

Sources
Indirect uplights: *Finelight*
Parabolic troffers: *Metalux*
Fluorescent downlights: *Halo*
Exit and emergency lighting: *Surelites*
Halogen downlights: *Halo*
Incandescent track: *Halo*
Parking lot lighting: *McGraw-Edison*

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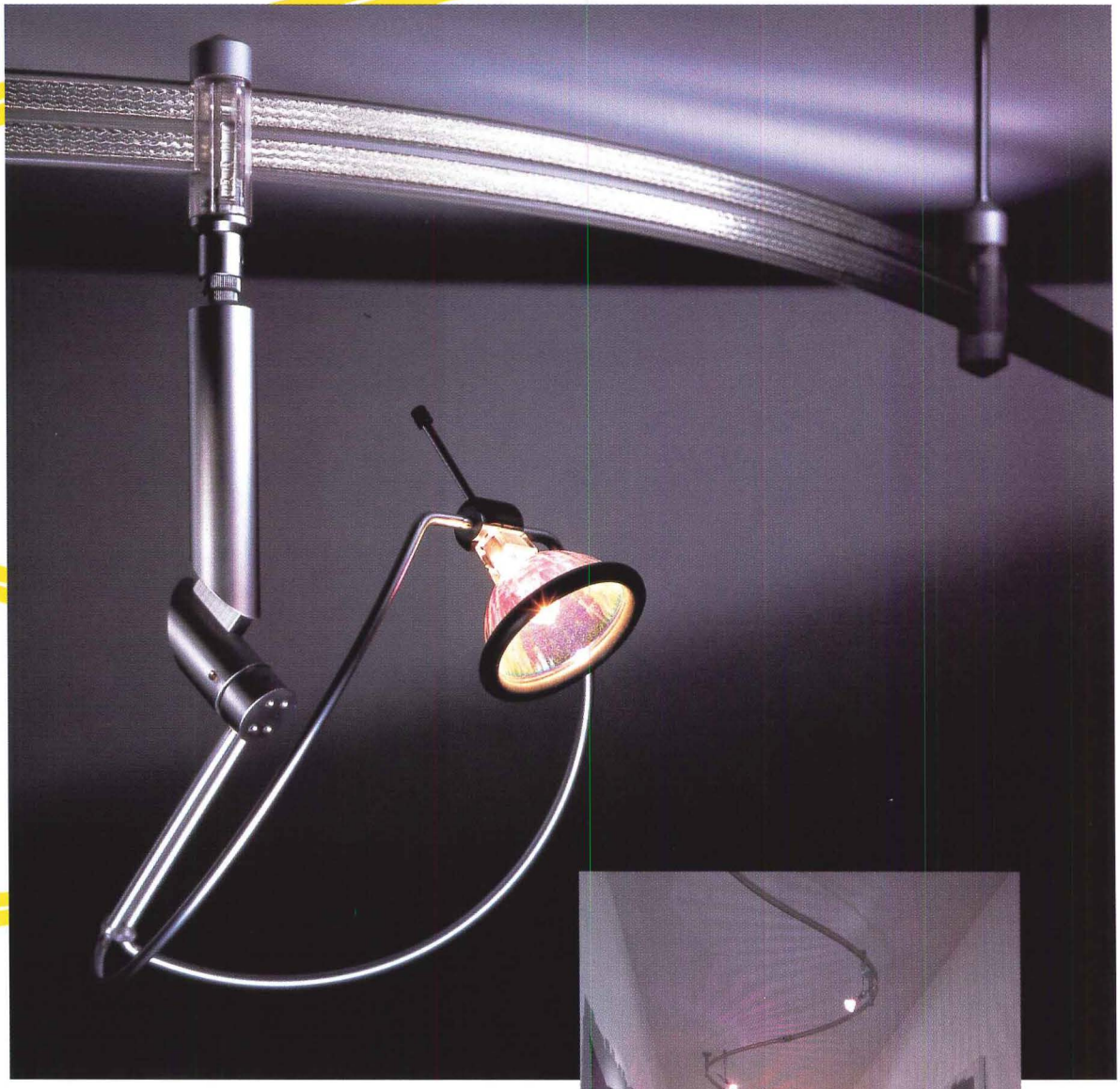

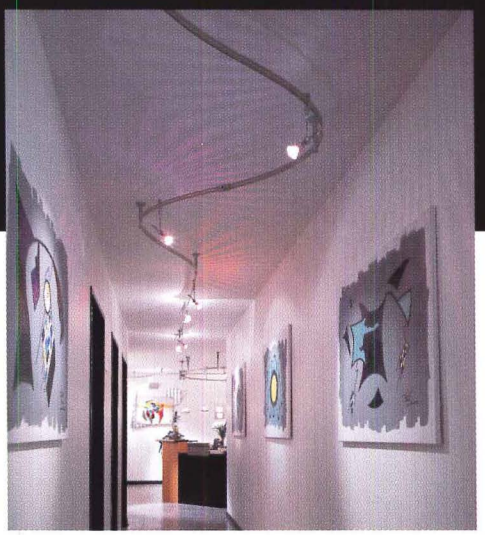

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CIRCLE 101 ON INQUIRY CARD

Reassessing the Value of the High-Pressure Sodium Lamp

by James Robert Benya

High-pressure sodium (HPS) lamps, the ubiquitous golden-white light source, are the darling of public works engineers, who have installed them in more than 90 percent of all roadway lighting fixtures in the United States. You can find them in the decorative acorn fixtures in almost every redeveloped downtown area as well as in warehouses, industrial work spaces, building and monument floodlighting, and airport terminals. They are everywhere.

From the moment they were introduced in the 1960s, HPS lamps became the light source of choice for applications requiring high-intensity discharge lighting. Heavily advertised as the replacement for mercury vapor in applications where color quality was apparently of no concern, HPS lamps quickly became recognized as the most energy-efficient, long-life light source available.

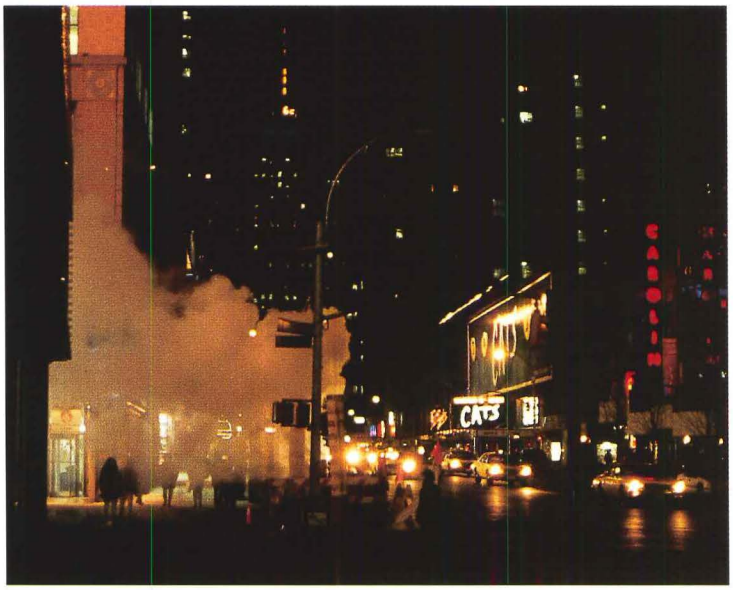
During the energy crisis of the 1970s, HPS's popularity soared. The technology was rapidly applied—and misapplied—across the nation. In the mid-1970s, newspaper reports began to appear linking the HPS lamps installed in grade-school classrooms to save energy with instances of headache and nausea in children. While there was no explanation for the phenomenon, the specialty fluorescent lamp industry took advantage of it to promote "full-spectrum" lighting. Many HPS installations were changed back to fluorescent systems, and the children's symptoms disappeared.

In the 1980s similar problems showed up in industrial applications as mercury vapor or fluorescent systems were changed to HPS. In one case, a major automobile manufacturer's workers complained that under HPS light they had trouble reading fine print and doing detail work; in spaces with mercury vapor light, they said, even at lower levels they could see well enough to perform the same tasks easily. In another case, a manufacturer had to remove an HPS retrofit and replace it with a high-output fluorescent system to prevent a union walkout after workers complained of nausea and disorientation.

What's wrong with HPS?

Much of the explanation rests in the human eye's response to the visible spectrum. In photopic vision, commonly called day vision, where there is plenty of light, a great deal of information is provided to the cones of the eye. Cones are concentrated around the fovea, or focal point of the retina, and in normally sighted individuals they are sensitive to a full range of colors and send visual signals to the brain at high resolution. At high illumination levels such as those during the day, the eyes depend primarily on the cones to perform detail-oriented tasks like reading. The cones' peak response comes at 555 nanometers (nm), where the light is yellow. This is perfect for sodium sources, whose average peak output is at approximately 580 nm.

James Robert Benya, FIALD, FIES, is a principal at Pacific Lightworks, located in Portland, Oregon.



High-pressure sodium light turns clouds of steam that are white during daylight hours to a golden-yellow color at night.

In the dark, the cones are almost useless, and most visual information is sensed by the rods. The rods, which are located everywhere around the retina except for the fovea, are responsible mostly for peripheral vision. Rods provide low-resolution black-and-white images but are much more sensitive to light than cones and are especially good at detecting motion. The rods produce scotopic vision, or night vision. But rods are sensitive to different wavelengths than cones. Their peak sensitivity occurs at 507 nm, well into the blue region of the spectrum. The change in peak sensitivity from the cones' yellow to the rods' blue is called the Purkinje shift. Rods do not respond very well to yellow light. Whereas the HPS peak yellow light excites cones to around 90 percent of their peak output, it excites the rods to only about 10 percent of their peak output. It has long been known that lower lighting levels cause an increasing reliance on rods and, therefore, change the effective spectral response of the vision system.

People always sensed that there was a problem with HPS light. And it was easy to blame the color, which HPS aficionados call golden or gaslight, although HPS is really a very poor color-rendering source. But the problems weren't just with bad color.

The first clues were revealed in the work of Dr. Sam Berman and

his colleagues at Lawrence Berkeley National Laboratory (LBNL) in Berkeley, California. Berman reported improved visibility at low lighting levels when sources rich in blue light were used. Among the findings Berman reported through the 1990s was an exaggerated dilation of the pupil for a given light level when a blue-poor source was used. In "Bluer Light, Better Sight" [RECORD, February 1991, page 83], I reported that Berman had proposed a correction scale to help account for the improved visibility caused by these bluer light sources.

On this scale, HPS compared poorly to other sources. Later, a demonstration booth built by LBNL allowed people to experience the phenomenon of scotopically enhanced light. It showed that human vision could actually be improved by adding bluer light to the spectrum even at indoor task-light levels. In other words, the rods could be made to respond to light and contribute to visual acuity at much higher levels than anyone had previously imagined.

More evidence to support these findings has been found in the years since Berman's experiment. In 1995, Dr. Mark Rea and his colleagues at the Lighting Research Center (LRC) conducted experiments to determine whether the differences in visual response between metal-halide outdoor lighting and HPS could be measured. In a paper with dramatic implications, the LRC reported that peripheral vision was 50 percent better with metal halide than with HPS, when both were at equal, ordinary, parking-lot-lighting levels. Since visibility tends to change only a small amount for relatively large changes in illumination, the finding that such a high increase in visibility could be achieved simply by changing light sources was extraordinary.

There is an unmistakable correlation between LBNL's work and the LRC's findings. Spectrum does make a difference in human vision. The blue portion of the spectrum, which is abundant in sun-, moon-, and starlight, is needed for the proper function of the human eye, and it appears that its importance to a person's vision increases as light levels decrease. Blue-deficient light sources like HPS do not provide the same amount of visual stimulation as sources that produce spectra rich in blue.

The impact of this revelation is profound. The lumen, the basic measurement of light quantity used in all lighting calculations, is based on the photopic, or day-vision, curve. But at lower light levels, the color of

COMPARISONS USING GRENALD'S CONSTANT

In concept, light measurement and the methods of calculating levels of illumination are not very difficult. For example, the standard measurement of illumination on a surface is expressed in footcandles: if one lumen of light falls uniformly on a one-square-foot area, the illuminance is expressed as one footcandle.

However, what the eyes actually see when viewing light reflecting off a surface is not explained so simply. The percentage of light falling on a surface that is reflected is referred to as the reflectance factor. Reflectance factors are not corrected for the color of the light falling on an object or the hue of the object itself. When a monochromatic light source, such as a red light, falls on an object whose color does not reflect that particular wavelength, the eye is not stimulated, and the object appears black. To take this one step further, light that has an incomplete spectrum falling on a polychromatic object will result in a distortion of some of the colors—some will appear dirty, muted, or grayed out, while others will turn black.

A typical footcandle meter measures the light that is falling on a surface, and while it is corrected for the eye's assumed spectral sensitivity, there is no built-in correction for variations in the spectral distribution of different light sources. Furthermore, the meter can't be adjusted to compensate for the color of the object being illuminated. In many situations the meter will tell you that an object is reflecting more or less light than it appears to be; if you believe the meter, you must disbelieve your eyes. Which should you believe? What your eyes tell you, or what an instrument indicates?

As an experiment some 20 years ago, I illuminated one side of my office with cool-white fluorescent lamps, which produced 3,150 lumens. I illuminated the other half with deluxe cool-white lamps, which produced 2,200 lumens. After six months I quizzed my staff, who had been unaware of the experiment, as to their preference. They were unanimous: the side with the deluxe cool-white-lamps was brighter—a direct contradiction of what the footcandle meter measured.

When I compared other light sources, such as high-pressure sodium and metal-halide lamps, I discovered an interesting relationship that seems to predict—more accurately than a light meter could—how the eye will respond to a given light source. It is derived through a simple formula, which I call Grenald's Constant, that seems to be applicable to virtually all light sources. Where lm/W equals the lumens per watt (as provided in lamp manufacturers' catalogs); CRI equals the color-rendering index, a measure of spectral quality as compared with a standardized light source (also available from lamp manufacturers); and RV is a number I have named "relative visibility," as perceived by the human eye:
lm/W x CRI = RV.

One problem with this simple formula is that the eye-sensitivity curve currently in use is only a studied approximation. It is inaccurate because it doesn't take into account that the sensitivity of the eye varies with age and several other factors, objective and subjective. Therefore, the relative visibility figures below are significant only relative to each other. (For the sake of simplicity, ballast loads have not been included in the thumbnail calculations.)

180W low-pressure sodium:
183 lm/W x 3 CRI = 550 RV

400W high-pressure sodium:
140 lm/W x 22 CRI = 3080 RV

40W T12 cool-white fluorescent:
76 lm/W x 62 CRI = 4790 RV

40W T12 deluxe cool-white fluorescent:
55 lm/W x 89 CRI = 4895 RV

400W metal halide:
100 lm/W x 70 CRI = 7000 RV

32W T8 high-efficacy high-CRI fluorescent:
89 lm/W x 82 CRI = 7300 RV

In spite of metal halide's higher lumen depreciation in comparison to that of high-pressure sodium, these numbers still favor it. My firm has found that when we replace high-pressure sodium lamps with metal-halide lamps of equal wattage, the relative visibility increases despite the decrease in measured levels of illumination. The bottom line is that for interior work, we can design with lower levels of illumination when we use higher-color-rendering lamps. But don't take my word for it. Do your own tests, and draw your own conclusions. *Raymond Grenald*

Raymond Grenald, FAIA, FIALD, FIES, is principal of Grenald Waldron Associates in Narbeth, Pennsylvania.

Shown with optional accessory cartridge.

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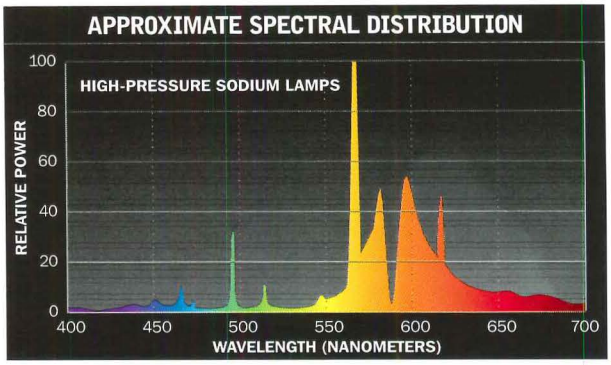
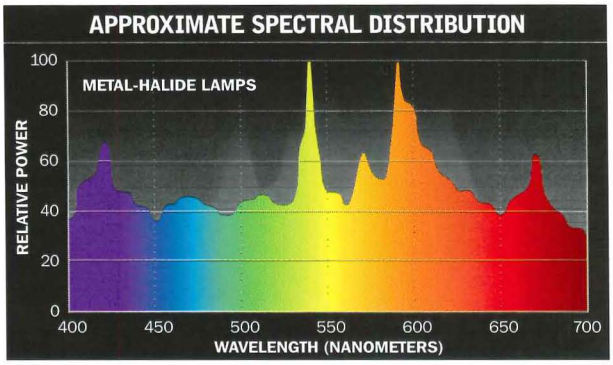




The spectral distribution of high-pressure sodium (far left) is very low in blue but comparatively rich in red and yellow. Metal-halide light (left) contains a much greater quantity of blue.

the light has a greater influence on vision than the quantity of light. Therefore, everything based on lumens becomes questionable or incomplete, starting with typical indoor light levels and decreasing to almost total darkness. Footcandles and lux are suddenly no longer complete measures of light as it relates to human vision. Neither are other common measurements, such as luminance or brightness. And if a metal-halide source stimulates the eyes better at low light levels than HPS, even source efficacy, the energy efficiency of a light source as measured in lumens per watt, becomes invalid.

This suggests that there is a need to revisit the entire scientific foundation upon which we base lighting standards, design, and measurement in the mesopic (twilight vision) and scotopic regions. Berman, Dr. Alan Lewis of the Michigan College of Optometry, in Big Rapids, Michigan, and others have developed proposed scotopically corrected factors for various light sources. Not surprisingly, sodium-based sources are inferior to most other sources.

Based on the evidence to date, there are literally millions of locations lit with HPS that would be better served by other light sources, or at least by the addition of task lighting. In many instances where HPS has been used, designers should consider other options: metal halide, fluorescent, compact fluorescent, electrodeless fluorescent, and even the sulfur lamp are all energy-efficient alternatives that offer long life. "White" HPS lamps are very different from standard HPS lamps: they lack the long life, high efficacy, and other qualities that made HPS so popular.

Should HPS lamps be eliminated? Of course not. There are plenty of locations where their deficiencies aren't an issue, such as unused outdoor areas, storage yards, warehouses, and floodlighting for building exteriors.

Low-pressure sodium (LPS) lamps, which produce bright yellow light like the incandescent A-lamps that are used to repel insects, have their own problems. They are considered to be a monochromatic source because they produce no color except yellow, and compared to HPS, they are far worse for night vision. But LPS is aggressively supported by astronomers and has become mandatory in some American cities and counties because its rays don't interfere with viewing the sky through telescopes. Limits on unshielded light sources, hours of operation, and even lighting levels all make sense in meeting astronomers' needs to minimize light pollution, but requiring the use of a light source that limits visibility and peripheral vision in a way that significantly affects safety and security is no longer justified.

RESEARCH SUGGESTS THAT WE A NEED TO RETHINK THE VERY BASIS OF HOW WE MEASURE LIGHT QUANTITY FOR SCOTOPIC VISION.

Because of the eye's poor rod and peripheral-vision response to HPS, this type of lighting may be unacceptable in many of the places it is traditionally used. It certainly explains what has prompted those who operate parking lots and garages in the retail and gaming industries to replace their HPS with metal halide. When people can see better, they feel safer. One can only wonder what the implications of vastly improving the peripheral vision of people who drive at night might be.

At higher levels, HPS's blue deficiency appears to cause problems with task visibility. Workers can't see detail because they have trouble focusing on the task. This can be explained by using a simple analogy comparing the way the pupil works to the mechanics of a camera lens. Berman showed that the human eye's pupil dilates much more when it is viewing an object under HPS light than it does when viewing surfaces under bluer sources. This is true even though the scene illumination is identical. The pupil is acting like the aperture of a camera lens—the wider the lens aperture, the shallower the zone of sharp focus. It can be assumed, then, that using HPS to light fine work is a questionable practice.

But neither the night-vision deficiency nor the focusing difficulties of HPS explain the instances of illness in schools and industrial facilities. Those were caused by the flickering of the light source. In each of these cases, HPS luminaires were used in relatively small spaces—small enough for all the lighting to be powered from one branch circuit. High-pressure sodium lamps exhibit the greatest flicker of any normal light source, and all of these luminaires were on the same phase, flickering in sync. The result was that the environment took on a stroboscopic effect, which can cause people to become ill.

How did HPS gain such wide acceptance?

Many will wonder why lighting designers and manufacturers didn't perceive that there were problems with HPS long ago. At the time it was introduced, HPS was a real improvement over mercury vapor in lamp life, efficiency, and cost, and there were no practical alternatives. HPS entered the mainstream very quickly. It is also important to consider that one cannot easily "see" the problems discussed here. On the other hand, if lighting research had been better funded when HPS was gaining in popularity, perhaps knowledge of its fatal flaws would have spurred manufacturers to develop alternative sources.

There are still many challenges ahead for those involved in lighting research—it is a serious problem that basic lighting science doesn't address how the eye sees light at low levels. And there is a great need for establishing a quantity that could replace the lumen, that could be used to make calculations for applications where mesopic and scotopic vision are in use. And on a practical level, perhaps there is a need for a popular movement that would send HPS the way of mercury vapor. ■

Halogen's New Challenger: Miniature Metal-Halide Lamps

by Lindsay Audin

If you can afford to, say goodbye to halogen and hello to Microsun, the newest lighting system on the block. Microsun Technologies' series of high-end table and floor lamps combines a pair of 15W incandescent bulbs with a new 68W metal-halide lamp that provides a blast of light: 6,000 lumens with a 3000K color temperature. The metal-halide lamp is powered by an electronic ballast. While significantly more expensive than halogen fixtures, these new luminaires should find a place in hotels, institutional settings, and upscale homes. If the cost can be lowered, the technology has the potential to expand to other markets.

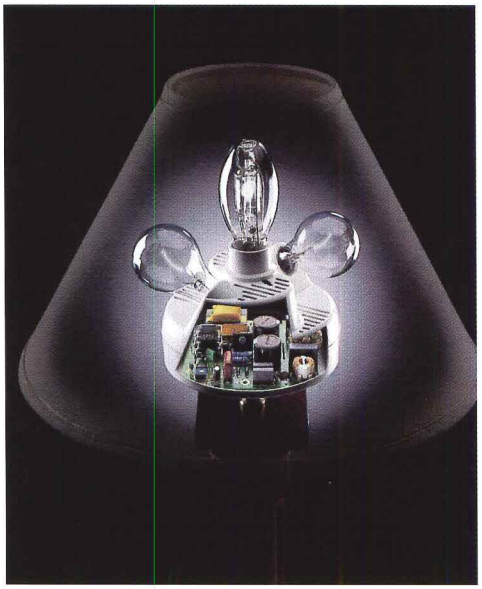
Taking the torch out of torchère

One example of Microsun's technology in use is Orbis, the Cleveland-based company's answer to the inexpensive halogen torchères that are extremely popular and extremely dangerous: considered fire hazards, they have been banned by many colleges and universities. Halogen torchères with a double-ended 300W T-lamp can be purchased for less than $30, so they're widely used in homes and dorm rooms. Such uplights are a cheap way to provide the indirect lighting that eliminates dark spots in a room as well as eye-tiring high-contrast lighting. But during operation, the surface temperature of a halogen bulb can approach 1,000°F, hot enough to ignite paper or fabrics on contact. Even if it has been covered by a wire frame or a glass shield, which people may discard when changing bulbs, a halogen lamp can easily start fires if knocked over—a lesson a lot of people learned the hard way. The Manhattan apartment of renowned xylophonist Lionel Hampton went up in smoke in 1997; he is suing the importer and retailer of the halogen fixture that caused the fire for $30 million. And it was a halogen lamp that started the 1992 fire in Windsor Castle.

The Microsun lamp assembly does a good job of replicating a halogen's high light output and good color rendering but uses only about a third of the wattage. What's more, the lamp doesn't need its own fire extinguisher—its glass bulb reaches only 250°F. When turned on, the incandescents provide instant low-level light and the metal-halide unit comes up to full output in 30 to 45 seconds. Measurements taken under identical conditions found that the 100W Orbis torchère provided 24.1 footcandles (fc), while a typical 300W halogen unit yielded 23.4 fc.

A kinder, gentler light

A more subtle problem in areas with fine furnishings is the ultraviolet (UV) output of halogen lamps, which can be considerable. Sensitive fabrics (such as silks and even some synthetics), tapestries, and paintings can be seriously damaged by prolonged exposure to ultraviolet light, whether from halogens or from sunshine passing through nearby windows. While the UV levels put out by most sources of electric light are only a small fraction of those of direct sunlight, halogen fixtures tend to yield noticeable UV output if they are not covered by a special shield. While most lighting designers also consider metal-halide lamps to be major sources of UV rays, the Orbis exhibited a surprisingly low output. When bounced off a freshly painted white ceiling, the halogen's light yielded about 69 microwatts per lumen (μW/lm) of UV-A (typical for incandescent light), while Microsun's light showed only about 14 μW/lm. Neither source emitted any significant UV-B (which is generally more damaging to organic materials). Interior designers may find Microsun's lowered UV-A output valuable as a way to provide quality lighting while safeguarding furnishings or exhibits.



Microsun uses a pair of 15W incandescent lamps to provide illumination during the 30 to 45 seconds the miniature metal-halide lamp needs to warm up. An electronic ballast powers the device.

Operating costs

Where lamps are operated for many hours—such as in institutional settings—the much higher energy efficiency of the Microsun system helps recoup the initial high price. Assuming operation for 4,000 hours per year (typical for public spaces), the differential cost between the halogen and metal-halide fixtures is paid off in about four years at the national average electric cost of $.08/kWh. Where power costs much more—in New England, California, and the mid-Atlantic states, for example—that payback period drops to less than three years. Metal halide also has a much longer life than halogen, reducing replacement and maintenance costs for an even better payback. The bottom line: the $200 to $300 investment for one of these fixtures is well worth it. ■

Lindsay Audin is president of Energywiz Inc., an energy consulting firm, and lighting research consultant to E-Source, a Colorado-based energy consulting group.

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The quality of historically-styled outdoor lighting can vary greatly. Was the piece hastily mass-produced in a run of thousands of identical die-cast units, with their bland, vacant surfaces and harsh, abrupt edges? Or was the iron shaped by genuine sand-casting, whose characteristically rich surface texture and beautifully softened angles convey the metal's full evocative beauty?

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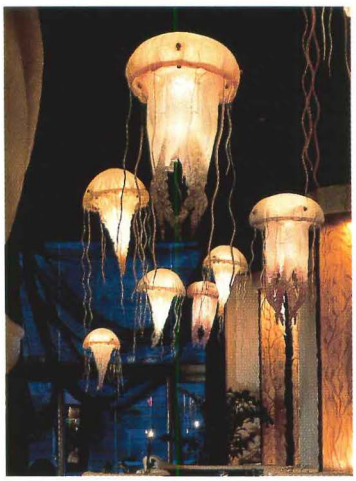
LIGHTING BRIEFS



◄ Material effects

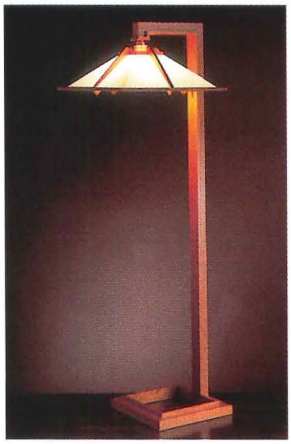
Sirmos's latest lighting project, for Pat Kuleto of San Francisco's Farallon restaurant, is a collection of retro-tinted jellyfish look-alike fixtures made of CyTron, a clear synthetic material that can be made to resemble marble, alabaster, onyx, or sandblasted or colored glass. All mold-making and modeling is done in house and CyTron, available in 13 ultraviolet stabilized colors and in matte, gloss, or semigloss finishes, can be inlaid with colors and shapes, etched, or sandblasted. 718/786-5920. Sirmos, Long Island City, N.Y. **CIRCLE 260**

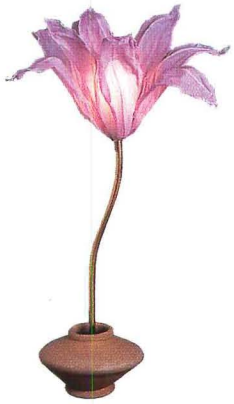
► Folded arc

When artist Kevin Walz decided to use DuPont Corian as the diffuser for his arc wall sconce, part of Baldinger's Kevin Walz Collection, he challenged Corian colorists to create a custom color that would capture his vision. The result is an amber-colored sconce shown here in an antique brass finish that measures nine inches wide, four inches deep, and 11 inches high. 718/204-5700. Baldinger, Astoria, N.Y. **CIRCLE 261**

► A design legacy

The latest lighting product to come out of the ongoing collaboration between the Yamagiwa Corporation and the Frank Lloyd Wright Foundation at Taliesin West is the Taliesin 1 floor lamp. Originally designed for the interior of Wright's own home, the lamp has been redesigned and reproportioned. It now stands 49 inches tall and is available in cherry with a natural stain and brass socket or in black ash with a black socket. 818/879-8611. Yamagiwa, Westlake Village, Calif. **CIRCLE 262**



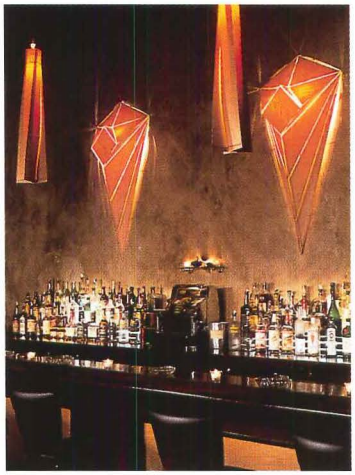


▲ Whimsy shade

Helen Hiebert's 22-by-10-by-10-inch potted lamp plants a handmade-paper-flower shade with a copper stem in a terra-cotta pot. 718/369-3308. Helen Hiebert, Brooklyn, N.Y. **CIRCLE 263**

▼ A feast for the eyes

The maple-veneer sconces behind the bar at Torch, a New York City 1940s-style supper club, are three feet, six inches high and two feet in diameter at their widest point. 718/935-1809. Stewart Osborne Design, Brooklyn, N.Y. **CIRCLE 264**



▲ Swedge sconce

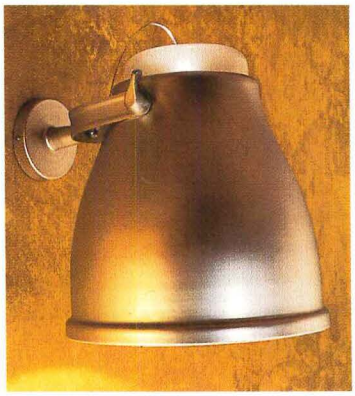
This polished chrome and satin nickel wall sconce with a linen shade is available from Powell and Bonnell, a Canadian furniture and lighting design firm. The sconce measures 16¼ inches high with a 5⅝-inch projection. 800/272-2058. Powell and Bonnell, Toronto, Ont. **CIRCLE 265**

▼ Vine chandelier

Lighting designer Robert Ferraroni, of Ferra Designs, collaborated with architect Adam Tihany to create this eight-foot-wide fixture for the New York City Greek restaurant Artos. The spiderlike hand-rolled steel arms are finished in black patina and coated with a satin lacquer. Each of the 14 incandescent fixtures is covered with a parchment shade. 718/852-8629. Ferra Designs, Brooklyn, N.Y. **CIRCLE 266**

▼ A big boy's bell

Italian manufacturer Antonangeli's Big Bell wall lamp, shown, measures 21½ by 25½ inches. Also available at Totem, the company's United States distributor, is a floor model or a lamp with cable or telescoping suspension. 212/925-5506. Totem, New York City. **CIRCLE 267**



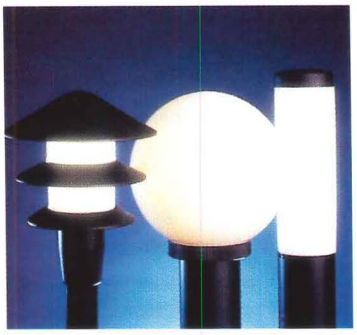
LIGHTING BRIEFS

▼ Compact lighting

Cooke's portable spotlight, called Megaray, illuminates objects beyond 3,000 feet and has three different beam settings: low, high, and strobe. The light source is a 125W short-arc Xenon lamp. Made from lightweight molded plastic, the Megaray comes with two IR filters and a power unit (which consists of a long-life battery pack and recharger). With the use of a switched-mode power supply, Megaray can be powered directly from light vehicles, trucks, or aircrafts. 716/833-8274. Cooke, Tonawanda, N.Y. **CIRCLE 268**

▼ Automated outdoor luminaire

Created specifically for outdoor architectural applications, the rotatable EC-1 from High End Systems has a completely sealed waterproof design and a six-position color wheel with replaceable dichroic filters. The fixture has a 575W source, a high-color temperature of 6200K, convection cooling (no fans are necessary) via an integrated heatsink/reflector combination, and a shutter for instant blackout and strobe effects. 512/836-2242. High End Systems, Austin, Tex. **CIRCLE 271**



▲ Garden of earthly delights

Alpan is a manufacturer of solar-powered garden lights, indoor lighting, and electronic home-security devices. The company's Monterey series—the Tier, Globe, and Pagoda—features energy-efficient 9W compact fluorescent lamps that are as bright as 35W incandescent bulbs but use less energy. They can also be equipped with a photo sensor and/or a timer. 805/383-8880. Alpan, Camarillo, Calif. **CIRCLE 269**

▼ Timeless beauty

The New England company Conant Custom Brass carries antique lighting and lamp glass. The UL-listed AS-1 classic sconce, just one example from a vast collection, is finished in a dark antique brass. 800/832-4482. Conant Custom Brass, Burlington, Vt. **CIRCLE 272**

► Directional projections

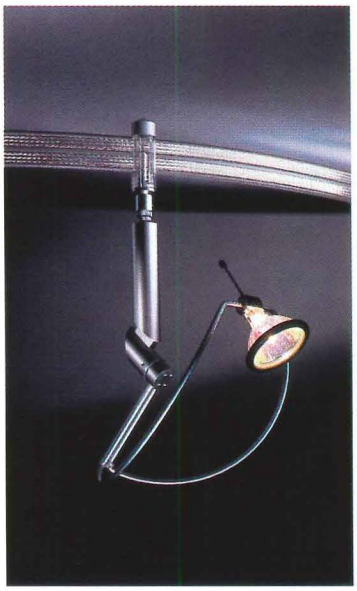
According to Lee Hedberg, an engineering manager at Targetti, the company's Mondial F1 system is a "modular space frame structure that incorporates precision directional projection." First designed in early 1997 by industrial designers Paolo Targetti and Piero Landini, and made from lacquered steel and a matte-aluminum finish, each module measures either 10 or 20 centimeters. Sixty- and 120-centimeter models are also available. The system is prewired and can be surface- or pendant-mounted (either horizontally or vertically) or suspended in clusters. Both open structural and closed versions are available. The Mondial F1 also incorporates a UL-listed module interconnect system (a wiring connection from one module to another). There are 30 interchangeable lenses that create various beam spreads. Application possibilities include restaurants, nightclubs, and museums. 714/708-8765. Targetti, Santa Ana, Calif. **CIRCLE 270**

▲ Revolving range

The latest low-voltage fixture from Lighting Services is the adjustable 216 Series Orbiter, which uses a 75W MR lamp. The lightweight, specification-grade Orbiter module revolves around two separate axes for off-track striking angles. 800/999-9574. Lighting Services, Stony Point, N.Y. **CIRCLE 273**

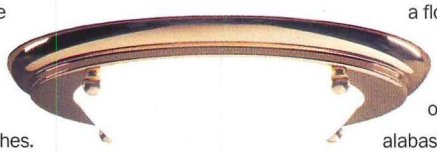
▼ Flexible installation

Flex-Line is a low-voltage suspended track-rail system from Bruck Lighting U.S.A. Designed and engineered in Germany, Flex-Line has four flat copper strands connected to Makrolon, a UV-resistant transparent plastic, for either a curved or linear installation. The minimalist design uses remote transformers that supply power to two independent circuits, rated for 300W each. Other possible applications include tungsten halogen lamps, accent or task lighting, and wall-washing effects. 714/259-1000. Bruck Lighting U.S.A., Tustin, Calif. **CIRCLE 274**



► Ceiling edition

The AC2015, a semirecessed ceiling fixture from Advent Lighting that can be used with drywall or grid ceiling, is available in three sizes—all with shallow projections that vary from 2 to 4¾ inches. The fixture is also available with compact fluorescent options, including electronic ballasts, and with two to four 26W quads. Advent Lighting's collection of new products also includes an interior luminaire that handles up to a 400W metal-halide lamp and an ADA-compliant interior luminaire that is constructed with a shallow profile and a floating lens. The latter sconce includes an option for faux alabaster, hand-painted stone, or opal acrylic. A changeable ¼-inch-thick bar stock gives the sconce durability. 800/739-9144. Advent Lighting, Greenville, Wis. **CIRCLE 275**



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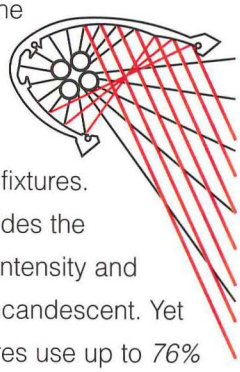

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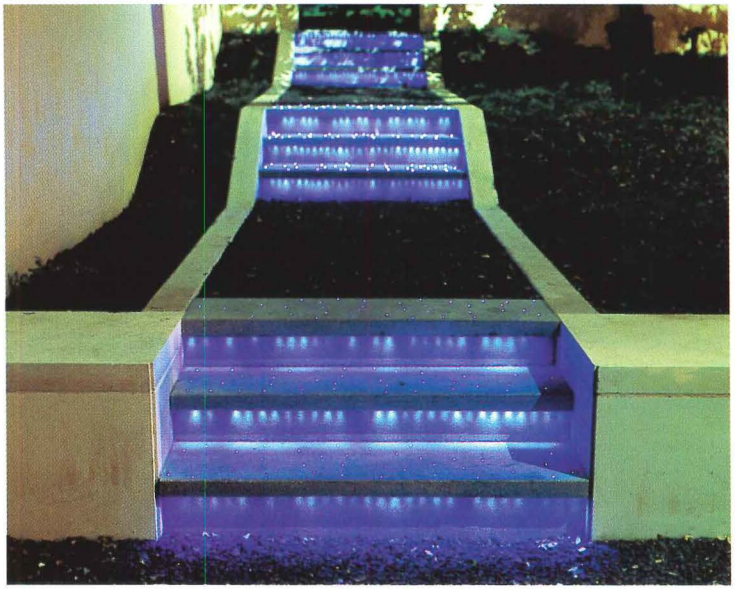
LIGHTING BRIEFS

▼ Security system

Ruud's square fixture, part of the SE series, is a security system for walkway, entrance, or perimeter lighting installations. The UL-listed series offers four optical systems in either 8- or 12-inch die-cast aluminum housings. Other features include a seven-year warranty (with DeltaGuard finish), heat-sunk electrical components, and vandal-resistant polycarbonate lenses. Available in wattages from 50 to 175. 414/886-1900. Ruud, Racine, Wis. **CIRCLE 276**

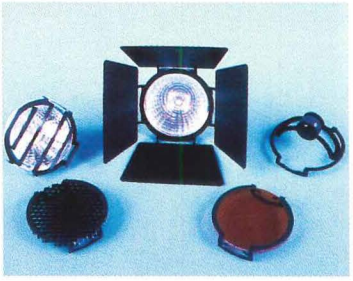


▲ Fiber-optic options

This exterior step lighting outside a Texas home uses quartz halogen and metal-halide lamp sources, which are contained in a black box called an illuminator at a remote location. Fiber-optic cable is then routed from the illuminator to the desired points of light (in this case, under the steps). Cable can be either end- or side-emitting, glass or plastic. In an application such as this, lamp maintenance is easily accessible. Since fiber-optic fittings are so small in scale, they allow for illumination precisely where it's needed. 210/227-7329. Lucifer Lighting, San Antonio, Tex. **CIRCLE 277**

▼ MR16 peripherals

The new lightweight, stainless-steel, easy clip-on attachments for American Lighting's standard MR16 lamp include barn doors, louvers, deco clips, and color filters. All of the durable attachments can be mixed and matched to change the direction, intensity, and/or color of the light. The deco clips and filters are available in blue, green, and red. The barn doors can be used in pairs for four-way control. The louvers can be used to help reduce glare and diffuse light. 303/363-6945. American Lighting, Aurora, Colo.
CIRCLE 278



► Landscape lighting

The MG Series fixture from Phoenix is made of corrosion-resistant, copper-free aluminum—the same material that is used in the marine industry to protect against harsh outdoor conditions. The internal optic system is controlled by two exterior sets of screws that allow for 30-degree vertical and 360-degree horizontal aiming. The finish is powder-coated, and the base serves as the wiring compartment. 414/438-1200. Phoenix, Milwaukee, Wis. **CIRCLE 279**

▼ Electrodeless

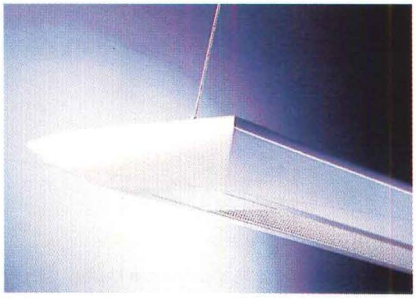
Icetron, from Osram Sylvania, is an electrodeless fluorescent lamp system with a lamp life of 60,000 hours. Instead of an electrode at each end of the fluorescent tube, the Icetron lamp uses magnetic induction to generate light-producing electrons. 508/777-1900. Osram Sylvania, Danvers, Mass. **CIRCLE 280**

▲ Wet light location

The new aluminum housings for SPI's Echo series of lights, in lengths up to eight feet, provide structural integrity and corrosion resistance for most wet locations. Also new are weathered finishes for outdoor applications. Opticals up to 85 percent efficient accommodate linear, fluorescent, metal-halide, and halogen in single and multiple configurations. 414/242-1420. SPI, Mequon, Wis.
CIRCLE 281

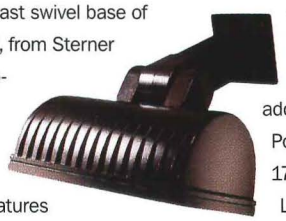
▼ Superthin supermodel

Known in the lighting industry as a leading manufacturer of linear lighting, Ledalite has a new product, called Crescendo, which has a compact, sleek design and aerodynamic form. The new T5 luminaire, part of the company's Ergoline series, measures a mere 2½ inches deep and takes standard T8 and biax lamps. It offers optical systems in indirect, semi-indirect (shown), and direct/indirect versions. Designed by the Canada-based lighting designer Galina Zbrizher, Crescendo is also available in 11- and 12⅞-inch widths. 800/665-LEDA. Ledalite, Langley, B.C. **CIRCLE 282**



► Precision

The heavy-duty, die-cast swivel base of the Infranor Polaris-6, from Sterner Lighting Systems, provides a number of aiming angles for very precise lighting possibilities. Other features include rectangular optics, a protective dual-seal gasket system, and a wiring compartment that is integrated into the swivel (eliminating the need for an additional junction box). The Polaris-6 operates lamps up to 175W. 800/328-7480. Sterner Lighting Systems, Eden Prairie, Minn. **CIRCLE 283**



Indirect lighting from 32′ above the ground.

[And other small miracles performed daily.]

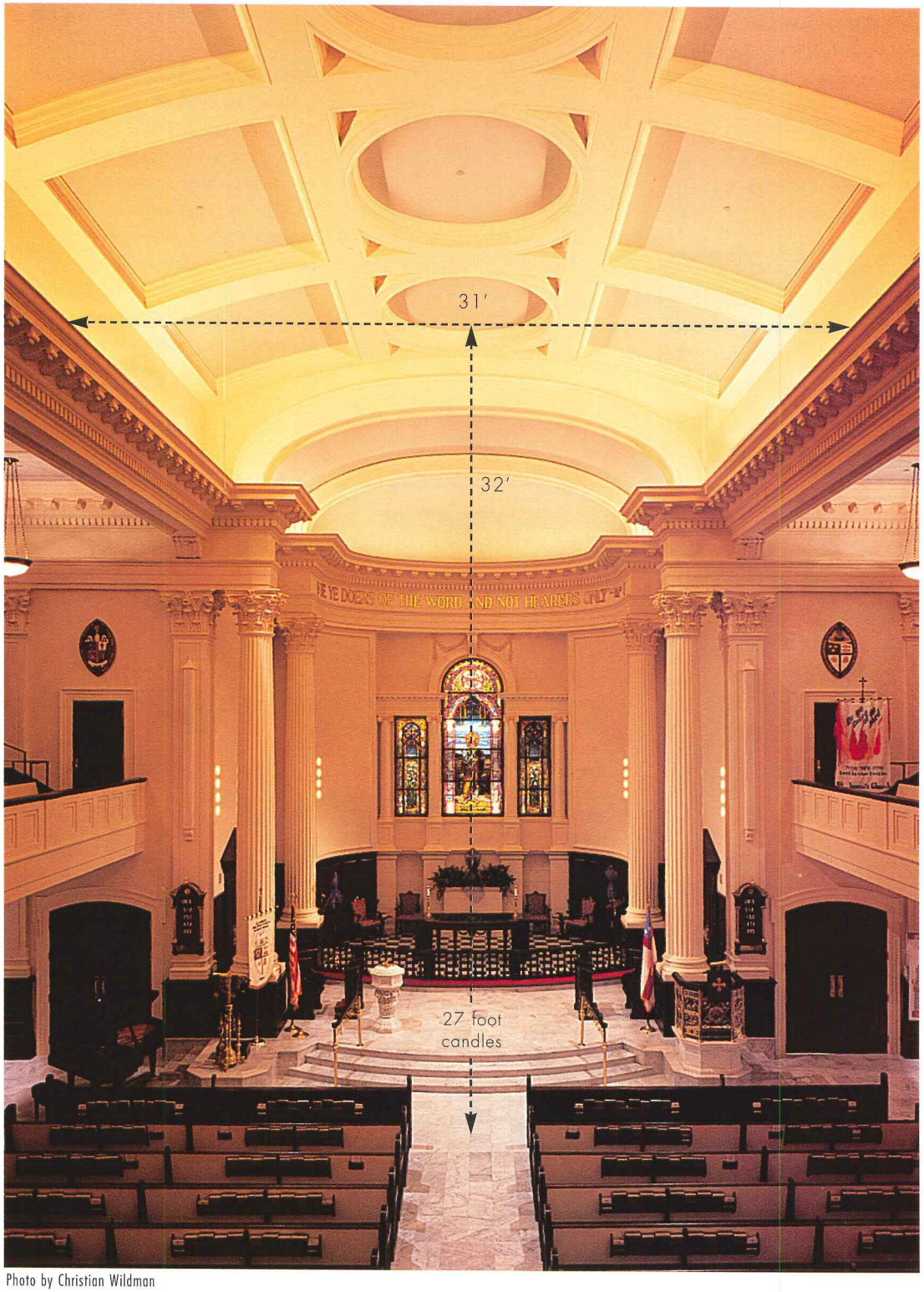
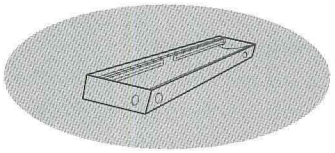
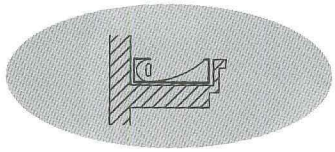


Photo by Christian Wildman



You can't do this with strip lights in your cove. The CL Series of fluorescent cove lights offers predictable photometrics that integrate into



your design. Our patented reflector projects light out of the cove and into the room, providing ample light below. Just think how heavenly that could be. For more information call us at 626.579.0943 or visit our website at www.elplighting.com.

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ENGINEERED LIGHTING PRODUCTS

LIGHTING BRIEFS

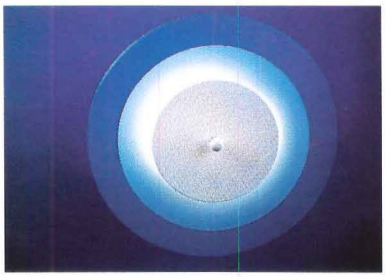
► Clean up light pollution

Commonly referred to as skyglow, light pollution can be caused by many factors, such as the poor aiming—or directional control—of light being emitted from a fixture's housings, or the artificial increase in ambient light surrounding roadway signage. Quality Lighting's SignMaster reflector system is made of hydroformed aluminum with a computer-enhanced reflector design for light uniformity. The system uses a thermal- and shock-resistant clear, tempered flat

glass lens to further reduce light trespass and glare and eliminate skyglow. 847/451-0040. Quality Lighting, Franklin Park, Ill. **CIRCLE 284**

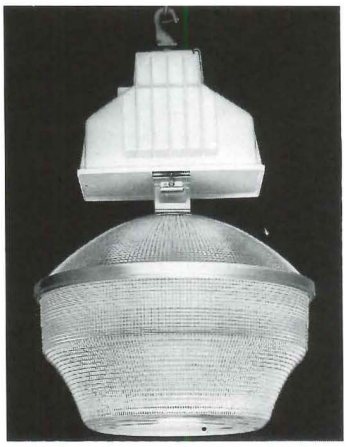
► Designer series

Luxo's Designer Series includes 24 different models of wall sconces and ceiling pendants. Based on Swedish designs, the fixtures are crafted in metal and acrylic forms reminiscent of the Machine Age. Plated or painted metal lamps, with clear or opal acrylic light diffusers, emit light from a range of low-wattage incandescent or compact fluorescent sources. Selected wall models meet ADA requirements for maximum projection from the wall. 914/937-4433. Luxo, Port Chester, N.Y. **CIRCLE 286**



▼ Energy-saving watt system

The Uni-Form Pulse Start 200W system (lamp and ballasts) can replace a 250W metal-halide lamp and ballast combinations. It offers energy savings of 63W per fixture (-21 percent); identical initial lamp output (21,000 lumens); 50 percent longer lamp life (15,000 hours); and longer periods between maintenance. 800/437-0111. Venture Lighting, Solon, Ohio. **CIRCLE 285**



▲ Hanging around

Designed to supply both up- and downlighting, Holophane's CentaGlo has a borosilicate prismatic glass reflector and refractor. The uplight skims the overhead to reduce the contrast between the ceiling and the fixture; the downlight provides vertical illumination for improved visuals. The CentaGlo offers energy-efficient HID ballasts and lamps. Holophane, Newark, Ohio. **CIRCLE 287**

For more information, circle item numbers on Reader Service Card

LIGHTING BRIEFS

▲ Jungle fever

The Hanible lamp from Brunschwig & Fils (#A0149-MMM) is made of hand-painted carved wood. The dimensions of the floor lamp are 13 by 16 by 16 inches; the tabletop is 22½ inches high. The shade is made of an 18-inch-wide natural paper. 212/838-7878. Brunschwig & Fils, New York City. **CIRCLE 288**

► Two to tango

Designed by the Spanish firm Marset in Barcelona and distributed exclusively in the United States by Tango Lighting, the Bau industrial-style cast-aluminum framed pendants are part of a contemporary collection of wall, ceiling, and portable fixtures. The Bau is available with either a metal (painted gray or white) or translucent acrylic shade, and in 9- or 12-inch diameter. It takes an incandescent lamps of 100W maximum. 201/662-7012. Tango, North Bergen, N.J. **CIRCLE 289**

◄ Choice mount

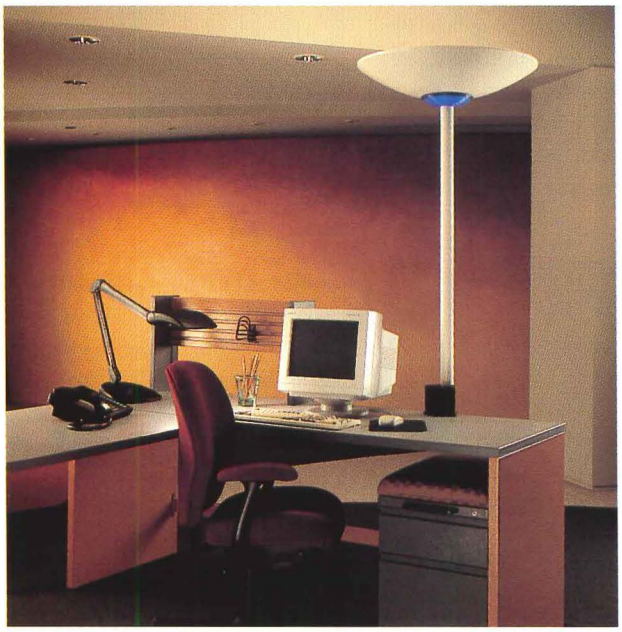
The Avatar fixture from Visa Lighting has die-cast end caps with solid brass or aluminum decorative domes; extruded aluminum housing and mounting plates; a removable housing for cleaning; and white acrylic or clear prismatic lenses. Available as a wall or ceiling mount, with both vertical and horizontal capabilities. The lights are both UL and CUL recognized. 414/354-6600. Visa Lighting, Milwaukee. **CIRCLE 290**

▼ Dutch design

Developed by WILA and the Dutch design firm n/p/k, the E Control compact luminaire is available as a recessed, surface-mounted, or pendant fixture for use with 22, 40, 54, or 60W lamps. The circular fluorescent lamp TR16 is also equipped with prism covers, opal screens, or glare-free louvers for lighting workstations. 401/435-5800. WILA, East Providence, R.I. **CIRCLE 291**

For more information, circle item numbers on Reader Service Card

Why Two-Component Lighting Is Your Single Best Solution



When corporate clients need to eliminate glare, reflections and shadows from VDT screens and work surfaces, lighting professionals often recommend indirect lighting: a one-component solution.

Installed in monotonous rows, most indirect lighting proves inflexible and unappealing. It fails to cut glare where most needed – on VDT screens and work surfaces. Now Luxo offers the intelligent alternative: two-component lighting. Interchangeable families of energy-efficient, high-performance, indirect luminaires – supplemented by portable, adjustable asymmetric and symmetric task lighting.

Available in a range of wattages, in original contemporary designs, all Luxo two-component lighting is UL and CUL listed.

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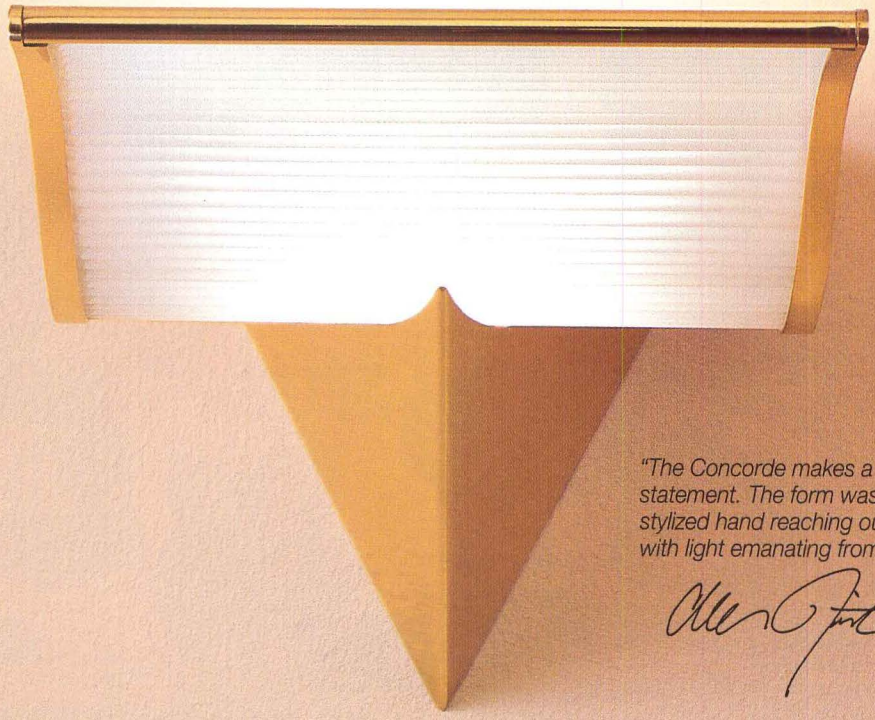
CIRCLE 114 ON INQUIRY CARD

BALDINGER



"The Concorde makes a highly sculptural statement. The form was conceived as a stylized hand reaching out from the wall, with light emanating from its palm."

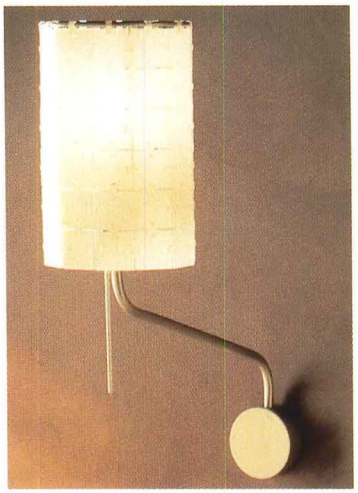
BALDINGER ARCHITECTURAL LIGHTING INTRODUCES "CONCORDE" — A CHARLES PFISTER DESIGN
19-02 STEINWAY STREET, ASTORIA, NY 11105 TEL: 718-204-5700 FAX: 718-721-4986

CIRCLE 115 ON INQUIRY CARD

LIGHTING BRIEFS

▼ Pole-mounted fixture

The inverted tapered pole of the Amalfi fixture is made of corrosion-resistant steel. The luminaire is anodized aluminum with a domed, temperature-resistant borosilicate glass lens that will not discolor with time or use. The trim is finished in a textured-matte, silver/gray metallic color. Also available as metal-halide or halogen lamps. 704/471-2211. Hessamerica, Shelby, N.C. **CIRCLE 292**



▲ Don't forget to use Flos

The Bloc lamp, designed by Rodolfo Dordoni, has a varnished-metal frame and a diffuser made of polycarbonate meshwork. It is available in amber, white, blue, or green. In order to be visible in the dark, Bloc is equipped with a rod-operated switch varnished with a fluorescent material. The light is available as either a wall-mounted or a pendant fixture. 516/549-2745. Flos, Huntington Station, N.Y. **CIRCLE 293**

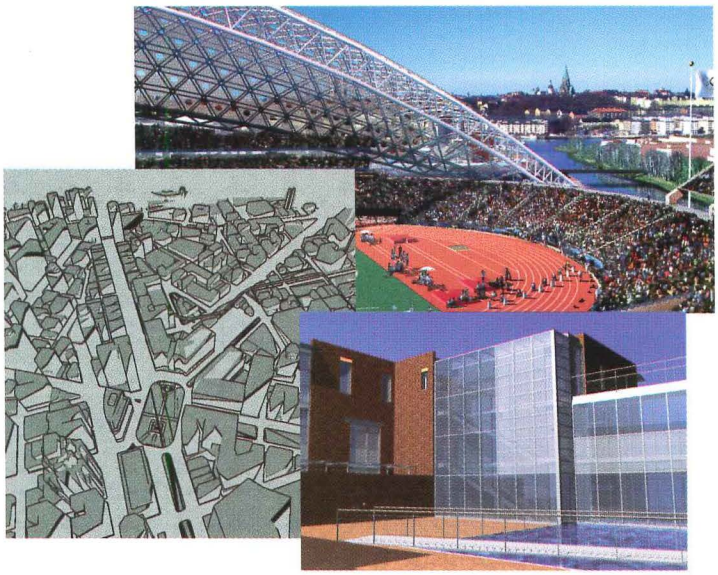
► Motion detection

The CX-100 turns lights on when a space is occupied and off once it is vacant using passive infrared technology to provide occupancy detection throughout a building. This can cut energy waste from lighting by as much as 60 percent. The sensors can cover up to 2,000 square feet for walking motion and 1,000 square feet for typical desktop activity. 408/988-5331. Watt Stopper, Santa Clara, Calif. **CIRCLE 294**

◄ Meet certain requirements

Hubbell's Kemlux II KS/KH series is designed for use in hazardous locations as defined by Article 500 of the NEC—areas involving combustible dusts and fibers; refineries; chemical plants; steel mills; and offshore platforms. It also meets CSA-listed wet conditions and NEMA 4 hosedown conditions. 800/270-3737. Hubbell, Christiansburg, Va. **CIRCLE 295**

For more information, circle item numbers on Reader Service Card



LEADERSHIP

Leadership of a profession or an industry is defined in many ways. To some, the leader may simply be the largest company who has sold the most products. We believe that most people would ascribe to leadership the quality of vision and the ability to make it real.

Over the past 16 years, we have built a company around a vision of computer technology serving the architectural profession and the building industry as a whole. Through our flagship product, ArchiCAD, as well as articles, speeches and other media, we have communicated and acted on our vision, which we describe as the "virtual building."

We believe that software for architects can do more than automate their daily work; it can transform their profession. We believe that architectural software should be specifically for architects, and not spread across an "enterprise." We believe that the problems faced by architects are fundamentally three-dimensional, therefore their software should be, too. We believe that the future of the architectural profession lies in using computers and software to create buildings, not just draft documents. And, we believe that this is important for many more people than just architects.

We are also gratified that our vision is shared with more architects every day. In 1997 alone, the number of ArchiCAD users grew from 30,000 to more than 40,000 as our distribution spread to 80 countries and 22 languages. As Graphisoft has grown to become one of the world's largest CAD software developers, our technology remains cutting edge; ArchiCAD for TeamWork recently received the Software Publishers Association's coveted Codie Award, the only CAD software to be so honored.

These statistics are encouraging, but we don't believe that they make us leaders. Our job is to listen to you, think, develop, communicate and act. From these qualities comes the kind of leadership with which we want to associate the name Graphisoft.

Gábor Bojár
President, Graphisoft R&D Rt
gbojar@graphisoft.com

CONTENTS

Time, Trust and Architecture

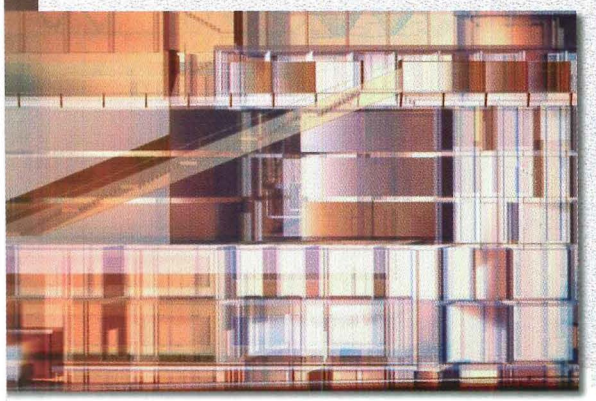
by David Marlatt, AIA

While almost any architect would recognize that forces of technology are sweeping vast change across society and the business world, very few consider the long-range effects of these forces on the practice of architecture or on architectural form. For example, the prospect of the World Wide Web as a primary media connecting businesses and individuals — a direction in which society is currently heading — specifically challenges two important assumptions that architects have accepted for generations, if not centuries.

The first of these assumptions is that architects, occupants and clients share more or less the same concept of **time** and that great architecture is generally designed, built and *appreciated* slowly. The second assumption is that great architecture requires a strong relationship between architect and client that is built upon **trust**. Now, we are not claiming by any means that the Web signals the end of Time and Trust, but it is marking important shifts in their character that will profoundly effect architectural form and practice. We believe that these shifts have started already and that architects should be paying attention.

TIME

It is cliché to speak about the "compression of time" or the steady quickening of life's pace. But at the time scale of architecture, this phenomenon assumes special meaning. This is not the same issue as mobility, which has literally been with us since Moses. This is about new conceptions of what is permanent and what is temporal. It's about people taking "real time" very seriously and considering gratification the highest form of spiritual fulfillment.



Traditionally, great architecture has required great sums of time to be appreciated. If a society no longer respects great spans of time, however, can it value architecture that can only be understood in that context? Does it grow impatient and build theme parks around that which was intended to be static and contemplative?

Stepping back for a moment, strategies have been developed in the past which address problems of time within the realm of architectural form. Four representative strategies are:

1. tents and other tensile structures that address mobility;
2. panelization and pre-manufacturing, which move architecture closer to a commodity (did Vitruvious foresee panelization when he wrote of firmness, commodity and delight?) and shorten the building's time to market;
3. "market driven" design for an anonymous client type (think of home plan services) to "mass produce" the design process and shorten the time to begin construction;
4. separation of a building frame or shell from its contents (such as in the case of shopping malls or the work of Herman Hertzberger), which addresses mobility by occupants while relegating "architecture" to the more permanent container.

The above strategies, however, only address the imperatives of speed and efficiency. None of them seriously question whether the best architecture should be "timeless" (meaning in this sense that it will endure and be appreciated across many ages). Are our architectural values inextricably interwoven with a fixed concept of time or can the two be separated?

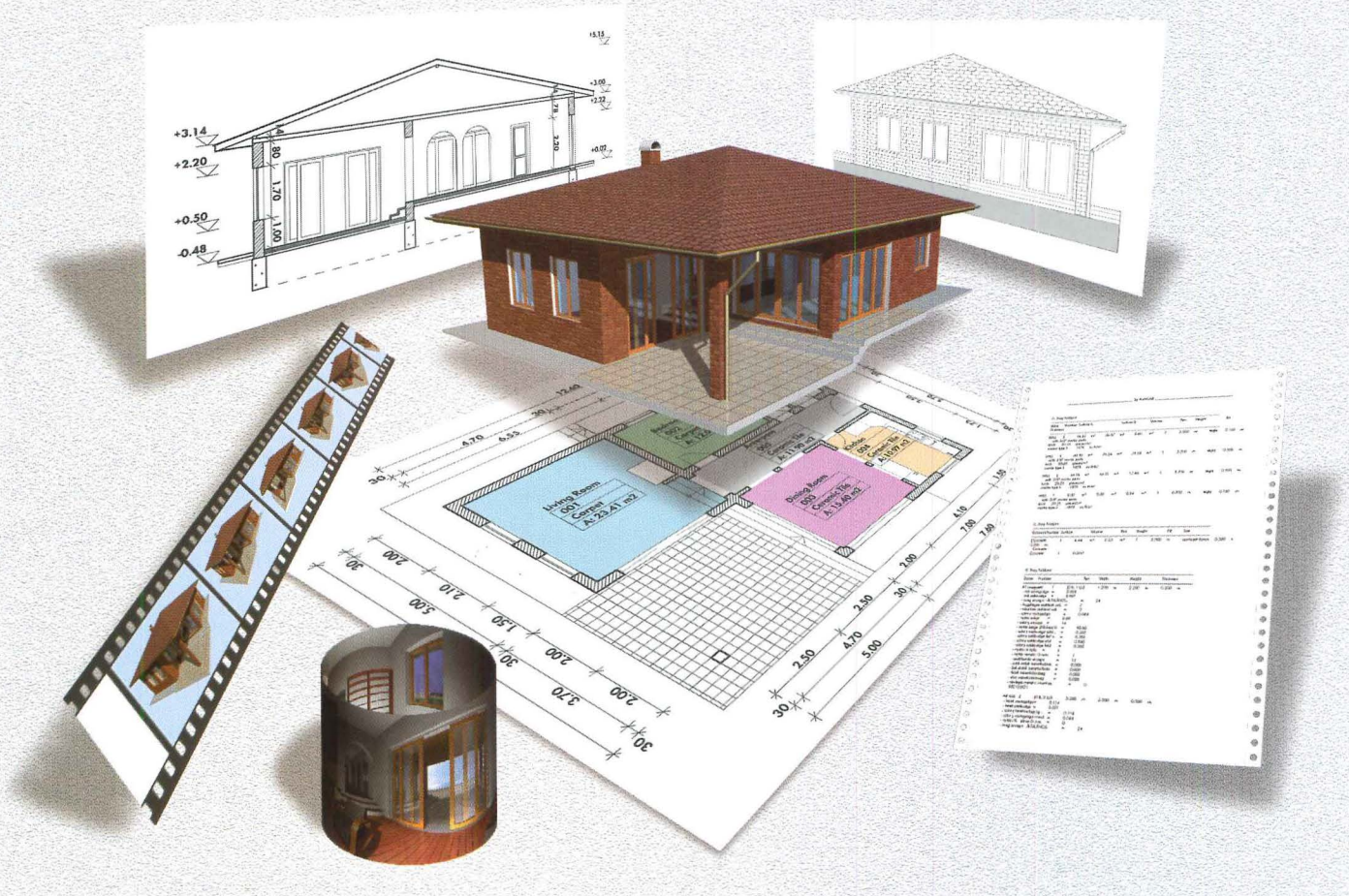
The impact of new notions of time on form certainly deserves to be the subject of future study. Also worth exploring is the complex relationship of time and architectural practice, which is where this article will turn its attention.

So Much To Do, So Little Time

The classic response to a complex problem is to automate. When time is perceived as the problem, the first response is to "go faster" by automating drafting, by fast tracking, and by cutting steps through Design/Build. Like trying to squeeze extra modem speed from old phone lines, however, automating an old process to address a new reality is ultimately a losing proposition.

The problem with current architectural practice is not that it is too slow, but that the right building information is not where it needs to be at the right time. To get that information to the right place at the right time, one or more pieces of information — or entire projects — usually have to be resolved or get out of the way first. Offices that are accustomed to sketching on paper, building models, then drafting aren't leveraging the information in the 3D model for detailing and communication. The solution does not lie in automating the traditional practice to make it go faster, but in simulating the building process to make more building information available simultaneously.

Automation characterized the Industrial Age. Simulation is the key to problem-solving in the Information Age. Think of the World Wide Web as a very sophisticated simulated world with virtual stores, governments, universities and private citizens. It effectively addresses the problem of access to informa-



tion in a complex society, not through speed (and this is quite an understatement), but by offering replicas of libraries, stores and other institutions without physical travel, business hours or human contact. One can lament the loss of human interaction but hardly deny the benefits of having access to knowledge from around the world at any hour of the day thanks to simulation.

Similarly, the virtual building does not save time and money through acceleration of old design and drafting processes, but through simulating the building process and making all known building information available to everyone on the team simultaneously and immediately.

Here is an example of the limits of automation confronting the benefits of simulation. Graphisoft prides itself that ArchiCAD is "always" in 3D. In other words, just drawing a wall in a plan view generates a three-dimensional wall even if you don't look at it. Almost invariably architects find ArchiCAD's 3D functionality useful and powerful even as a production tool, but sometimes they tell us that they don't use 3D much because their "clients won't pay for it."

Even with ArchiCAD, consistently producing good 3D models of a building carries some initial cost such as additional upfront time for the user to design, compute time for renderings, and perhaps extra RAM or paper for the color printer.

But the benefits of this investment can be overwhelming for both architect and client. They include avoiding construction errors, improved communication among all team members, improved design and client satisfaction. Furthermore, the client has materials he or she can use to begin marketing the building while the architect can continue offering visualization services of the virtual building. As visualization becomes more of a consumer and government expectation, investing time in 3D modeling should become even more compelling.

So, why aren't clients demanding that their architects "do 3D?" Why are not architects with the capability to create 3D models just doing it anyway so they can save money later in the project?

Part of the problem is communicating the benefits to the client and internally; and to some extent project planning. A deeper problem lies in the natural limitation of accelerating an old business model based on separate design and drafting rather than adopting a new one based on building simulation.

The architect's classic fee structure rewards drafting as the ultimate activity in a linear process so documenting the building doesn't receive adequate attention early even though the integrated model already contains most of the necessary information. Project managers

often don't realize that they can start working drawings simultaneously with the schematic design and save time on the back half of a project. Through simulation, all aspects of a project can advance together and a wide variety of information (material lists, details, floor areas, pictures, VR scenes, etc.) is accessible at any time to other team members without interrupting the overall progress.

Architectural Process Management is Three-Dimensional and Simultaneous

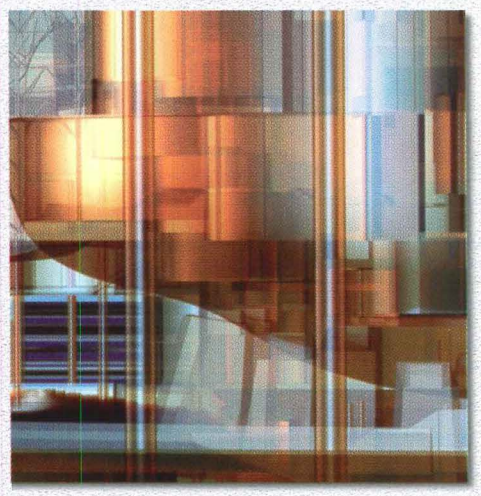
If architects would begin simultaneously developing and managing all of the information about a building instead of taking an assembly line approach to design, practices would probably operate more like servers of building databases, with limited access for clients, consultants, building officials, and others. The architect would be responsible for the building intelligence contained in the virtual building, but not necessarily for generating field drawings needed by a particular discipline. Software would control access, maintain security and accountability, and answer queries about the building. The role of the architect as creator would be stronger than ever, but documenting the building would evolve from drafting and specifying to developing and managing the building's knowledge base over its lifecycle. Rather than draw the location of a standpipe, the knowledge base would indicate where to find it, identify experts who can tell you more about fire prevention in the building, and identify all related information as well.

TRUST

If one tenet of successful architecture is time, the other is trust. Another cliché: there is no great architecture without great clients. This means great architecture requires a strong singular relationship between architect and client founded in a qualified trust that endures at least as long as the project.

Trust is the foundation of all commerce. Companies know that they cannot persuade you to give them your money (more than once) unless you trust them to return something of comparable value. Trust requires predictability and persistent identity. High trust consistently translates into high value (Nordstroms department store knows this well). The inability to establish trust usually translates into discount pricing and eventually lower quality goods or services. CAD developers know this, too. The high value vendors try to establish trust through security, service, and building a professional rapport. CAD software bought through catalogs need not (or cannot?) do the same.

Architects know intuitively how important personal trust is to their practice and value.



AIA member firms also report that repeat business is responsible for 86 percent of their business. If traditional assumptions about trust change, upon what will architects base their own value and relevance in the future?

The nature of trust is clearly changing and the symptoms are all around us in architecture. Not only in the latest "tougher than usual" fee negotiation, but in the fact that the largest nine percent of U.S. firms now control more than 61 percent of all architectural billings, one in six AIA firms employ an exclusive marketing staff to find work, and 40 percent of all billings can now be attributed to services expanded beyond traditional practice. Architects say that the economy is more competitive, but there is more wealth than ever before. The competition they sense is in establishing and defending their value to an increasingly distrustful and sophisticated client.

Once again, the problem and the solution are both in the technology. Some very large and sophisticated companies are struggling with the problem of how to build trust on the Internet. Why? They want to sell their products and only a few companies so far have made much money doing it. For Web commerce to grow at the exponential rates being predicted, sellers must establish trust with buyers.

However great and powerful the Web is for other things, personal trust cannot occur there. A human experience such as trust can only be simulated in the electronic world of the Web.

As a result, consciously or not, successful companies on the Web are simulating trust through three important strategies: "Customer Service," "Branding" and "Self Service." Architects should understand these strategies and think about potential corollaries in their practices.

Customer Service and Diversity

Customer service has become a buzzword and a key selling point in many industries in the past few years. It's not just a fad. Being friendly and responsive, even if it is an automated response, is the most obvious way to replace a face-to-face relationship with a customer. Through increased customer service, companies spend more time with a customer, which increases the chances that the customer will make other purchases; they win deeper customer loyalty; and they add value to their product or service.

Money back guarantees are also a form of customer service for manufacturers. The nature of professional services tends to a make the idea of a money back guarantee moot. One U.S. firm, however, has already successfully experimented with occupant-satisfaction based fees. Fees based in part on a measurement of a building's performance are probably not far away.

Architectural firms are generally already 100

percent customer service and deeply focused on a small number of clients. For them, the challenge is not to go deeper in a personal relationship, but to accept that a client relationship during the traditional design phase cannot be as intense or long-lasting as it used to be. These firms substitute breadth for depth to hold their traditional value.

The latest AIA firm survey indicates that more firms in the United States are diversifying their services. Many services such as visualization, analysis, planning and programming are by-products of the stores of building data amassed through their CAD systems. Other services such as interior design are simply leveraging the same building data to offer a more complete set of services. In both cases, a well-developed virtual building is the basis for extended client services.

Branding and Reputation

Branding is a buzzword for what most architects simply call building a reputation. Large companies employ branding strategies to build a reputation for their products before the buyer may have had any direct experience with them.

Many common branding techniques are already used by large architecural firms with marketing departments. For example, establishing a firm's credentials through statistics ("according to X, we're the largest, oldest, employ the most architects, etc."), building comfort through market share ("we're #1 in prison facilities in the Midwest"), and prestige through professional awards and publications.

Technology has also become part of branding, although it is no longer so impressive to brag about how much of it you have. Rather, the emphasis is now on how well a firm understands and leverages its technology.

Employing CAD software for more than just drafting is one example of this as are developing a job Intranet site and publishing construction documents on CD-ROM. Since many clients have experienced the benefits of technology in their own businesses, a firm can build its own reputation on the idea that its technology is to be trusted.

Company websites are probably already too common to build brand by themselves, but some firms are using them to offer "virtual tours" of their projects, demonstrating both their assimilation of technology and their architectural design skill.

Self Service and Client Service

The idea of self-service to build a product brand is one of the sweetest ironies of the Information Age. It is drawn from the simple idea that, in a virtual world, the only "real" person available to trust is yourself. Companies such as Dell Computer, Amazon.com and FedEx say in effect, "we know you can't trust us, so we trust you to help yourself." Through a friendly interface and a few helpful hints (customer service!), the company trusts you with their technology to browse for a book, build your own computer, and track your own package.

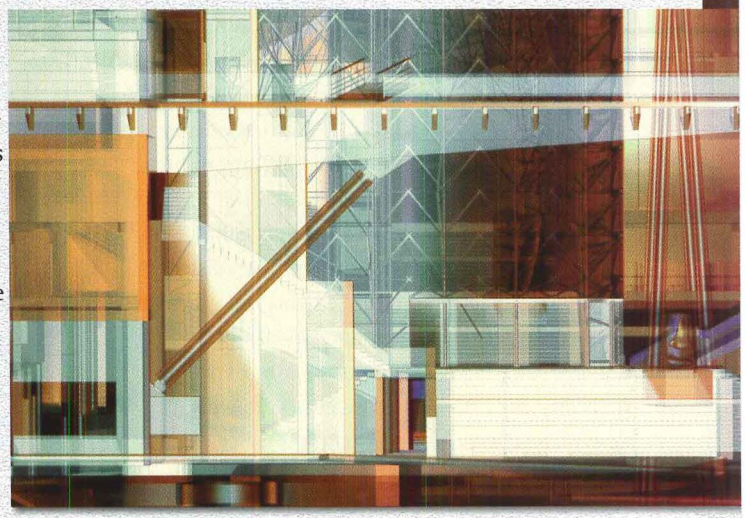
Because of the Web and other economic reasons, we are building a society where self-service has assumed a different connotation than 20 to 30 years ago. Within the architectural profession, this translates into opening the black box of design and inviting the client to participate more in the architectural process, potentially even working side-by-side with the architect as a 3D model is developed. It also means giving clients direct access to browse information about his or her building, perform analyses and generate reports. There are risks involved, but the rewards can be great as well. For a self-service model to be feasible in architecture, information needs to be as comprehensive and immediate as possible because a question related to area, specification, cost or aesthetic can come from any direction and must be answered with the same authority. For many architects, this will cause a huge shock, but their practices will eventually depend on helping their clients to help themselves.

ARCHITECTURE

Two years ago we predicted trends that will change billing structures and scope of services. Many of these changes were the result of technology, others the result of economic forces. Today, more architects than ever have joined their own clients by embracing the available technology to improve their practice. Nevertheless, it is still astounding how many have not employed technology at a meaningful level. The reasons are financial, technological, generational and cultural.

Two years ago, architects by and large were at the threshold of the Information Age. Today, they are inside and facing their greatest challenges and greatest opportunities. Almost all of the attention paid to the Information Age has focused on technology, but technology such as CAD, the Web, email and computer processors is avoidable. The change that they induce is not. Technology is a tool set to build what we will in the midst of change.

To paraphrase an old adage: When all you are is an architect, every problem tends to look like a building. When you are an architect in the Information Age, however, your problems may look like opportunities to broaden your influence in the building process, extend your reach into the 3D world, and develop a more durable and profitable architectural business.



ArchiCAD® 6.0

Built on the solid foundation of integrated virtual building, ArchiCAD 6.0 offers new features and enhancements that benefit every facet of architectural practice. Long-time users of ArchiCAD will see in version 6.0 the fruition of themes initiated with ArchiCAD 5.0: the ability to customize and add functions, communicate with databases, and work in multiple views. This latest version also delivers innovations that accelerate 2D production and 3D modeling. And, as with all major ArchiCAD upgrades, users from around the world will recognize Graphisoft's responsiveness to their input and suggestions.

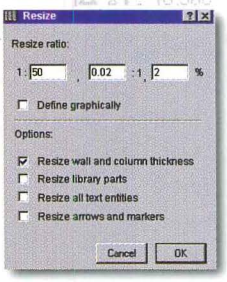
We've classified the hundreds of new and enhanced features into the 6.0 categories below and presented the highlights of each. Here's a guide to what's inside the latest version of ArchiCAD:

Get the Drawings Out the Door Faster

Ten's of thousands of architects depend on ArchiCAD every day to produce complete and professional working drawings, and ArchiCAD 6.0 delivers a variety of intelligent and sophisticated tools to make "getting the drawings out the door" easier than ever before.

New options include a rotatable grid, a "repeat last" command, and a powerful "send to back/bring to front" feature that controls the order in which drawing elements are displayed. Lines and 3D elements can be offset. ArchiCAD's intelligent cursor is even smarter with more snapping options. A new ellipse tool completes ArchiCAD's palette of 2D shapes.

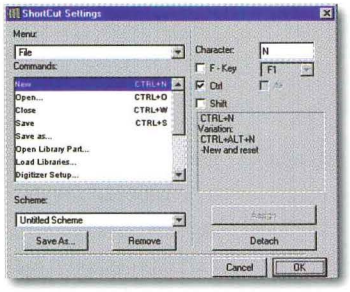
ArchiCAD 6.0 can also resize a selection of elements with intelligent options to preserve text, markers and objects.



ArchiCAD's Multiply command goes to new extremes with the ability to distribute an entire matrix of new elements on screen. Each construction element line type is now editable, offering users complete control over their drawings. Similar to ArchiCAD's powerful Line Type Editor, custom fill patterns can be created quickly.

For easy detailing, new "Patches" can be glued to wall intersections, building sections and wherever details are needed. Because patches are ArchiCAD objects, they can be stored in libraries, made parametric, included in quantity calculations and appear differently according to drawing scale.

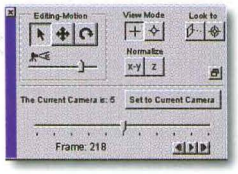
While it retains its familiar organization, users will immediately notice that ArchiCAD sports a new look and several tools have been consolidated into logical groups to further simplify its workspace. Drag & Drop technology is implemented throughout ArchiCAD 6.0 so objects can be pulled directly into a project from the Explorer or Finder, and clipping files can be sent to any Drag & Drop enabled application.



Power users can create custom keyboard shortcuts for all menu items, while a new Pet Palette containing frequently used tools follows the cursor and allows command changes on the fly. An enhanced QuickViews palette provides instant access to plans, stories, layers, sections, elevations, scale and display options. Group/Ungroup/Autogroup, introduced with ArchiCAD for TeamWork, keeps logical element sets together for easy editing.

Keep Your Work in Perspective

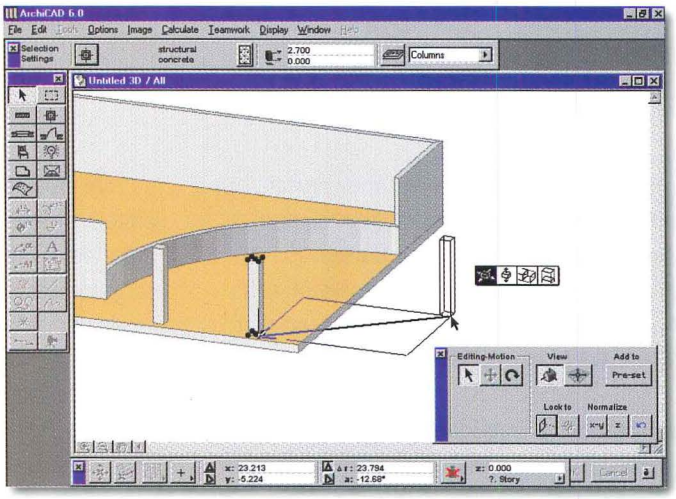
In 1982, Graphisoft was the first company to offer 3D modeling on a desktop computer. In 1998, with the availability of more powerful computers and a new generation of architects, ArchiCAD 6.0 breaks new ground again with an intuitive and integrated interface for working directly in any 3D view.



With ArchiCAD, working in 3D is easy and can be done in shaded, hidden line and wireframe modes. The 3D view can be rotated on screen without having to reset cameras or views. Or, simply click on a wall, roof or other surface to turn the view perpendicular to a work surface. Fast "ghosting techniques" provide a real-time preview of each element as it moves, keeping you oriented and in control even in very complex spaces. Thanks to the virtual building, changes in

Packs Features for All Facets of Architecture

oriented and in control even in very complex spaces. Thanks to the virtual building, changes in the 3D view update the 2D drawings and vice versa.

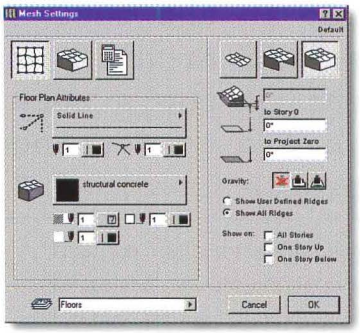


Build Better Architecture

A new Surface Mesh tool constructs site models and irregular forms, and a Magic Wand tool creates new building elements with a single click on any shape.

The new ArchiCAD supports non-parallel and irregular vertical walls. Walls and objects such as doors and windows can be trimmed to complex roof shapes. Composite roofs automatically heal into walls and floor systems.

A time-saving concept called "gravity," automatically places walls, columns or other elements on the slab, roof or ground plane below them, eliminating the need to search for the Z coordinate. While the Gravity feature is on, a new Coordinates Bar displays the height of any point on a roof or floor system as the cursor passes over it.



ArchiCAD 6.0 can also join, divide and intersect any polygon, fill, zone, roof or slab element using Boolean operations.

Connect with the Data

Architects will immediately benefit from ArchiCAD's re-written properties database by generating customizable door and window schedules on demand (and hotlinking them to PlotMaker drawings). This feature, however, represents only a fraction of ArchiCAD's awesome power to filter and customize any building data and to work dynamically with external building product databases, whether on your own computer or across an Intranet.

Additional power and control appear in the new Properties Object, which stores details such as manufacturer, price, schedule symbol and other properties. These new objects provide a practical way to turn generic objects into manufacturer-specific ones. A single building components database also simplifies defining, tracking and maintaining all of the building elements. The database can be as basic as a list or as sophisticated as a relational database on a remote server, and it can be used across multiple projects.

Customize Your Workplace

Certainly one of the most significant changes in the new ArchiCAD is its complete and robust set of links for customization, called an Application Programming Interface (API). Although the average user will not begin immediately writing new software to run on top of ArchiCAD, he will benefit from the dozens of custom applications available now or in the near future that perform a variety of functions such as complex shadow studies, framing calculations and smart file translation.

ArchiCAD's GDL environment has also been improved with new GDL entities as well as scripting tools to help users create objects more efficiently than ever.

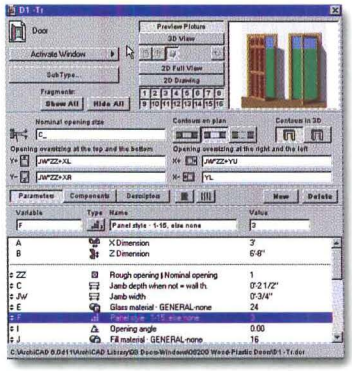
Collaborate In and Out of the Office

In 1997, ArchiCAD for TeamWork introduced an entirely new method for architects to collaborate by sharing the 3D building model (and winning the Software Publishers Association's coveted Codie Award for Best Groupware Product along the way).

ArchiCAD 6.0 enhances the TeamWork functionality introduced last year and, thanks to its new API, delivers a richer set of data exchange formats. For example, ArchiCAD for TeamWork users can now change their workspaces on the fly.

Using the new API technology, ArchiCAD 6.0 offers an enhanced DWG 14 file translation that preserves ArchiCAD's wall structure and recognizes model and paper space within PlotMaker. And, thanks to ArchiCAD's Grouping technology, ArchiCAD can preserve Xrefs when DWG files are imported and exported. A DGN translator based on API technology is also planned for ArchiCAD 6.0.

With all of its changes and enhancements, anyone would expect that a more powerful computer is needed. Version 6.0 offers good news again as RAM requirements remain the same as previous versions of ArchiCAD, and its new 3D data structure can actually reduce files sizes by up to 50 percent.



ArchiCAD 6.0 truly delivers to architects the dedicated tools and technologies they need to make better architecture, deliver construction documents efficiently, and build their practices through additional client services around the virtual building.

Graphisoft Sparks High Tech on Danube

Graphisoft R&D Rt. – Budapest, Hungary

Some companies might balk at the prospect of practicing what they preach, but when Graphisoft R&D had the opportunity to test its concepts of creating and managing the "virtual building" on its own new corporate headquarters, it jumped at the chance. "There was really no question about it," said Graphisoft COO Péter Hornung, who manages the entire project. "We were convinced that the effort to develop and maintain a 3D model of our buildings would offer immediate payback, and it has."

The company was rapidly outgrowing its facilities in Budapest and needed to find a long-term solution to house its R&D staff, and worldwide sales, marketing and administrative employees. Today, Graphisoft employs more than 140 people in Budapest spread out over five small buildings east of downtown. Rather than just find a larger building, the company decided to purchase a seven hectare (18 acre) tract of land along the Danube River just north of central Budapest and develop Graphisoft Park, Hungary's first high technology office park. "Some people call it the Danube Silicon Valley," said company founder Gábor Bojár. "Our concept behind Graphisoft Park is to nurture the region's software development business and help it become a real industry."

Three of the 15 buildings are under construction now. Graphisoft will occupy the largest building, at 3000 square meters (32,000 square feet). The other two buildings have already found software developer tenants including the Hungarian office of Microsoft. Formerly owned by the state's gas utility, the site required some environmental cleanup. A decision was made to cover only 15 percent of the area with buildings. The result is a low-density campus with drives made of interlocking pavers, tree-lined footpaths along the Danube and large landscaped areas. "Graphisoft Park offers our close strategic partners and independent ArchiCAD-partner-product developers a relaxed working environment," Bojár explained.

Six local architectural firms were invited to compete for the commission to design Graphisoft Park. Winning architects Ferenc Cságoly and Ferenc Keller from Építész Stúdió Kft (Architects Studio Ltd.), immediately put ArchiCAD to use creating a rich vocabulary of brick, glass and steel that recalls the site's industrial heritage of the last century, but is clearly looking forward to the next. Cságoly and Keller divided the Graphisoft building into two parts and kept them to only three stories to reduce the building's mass and segregate R&D from other company functions. Small floor plates ensure everyone is afforded views of the Danube or surrounding trees.

"We insisted on developing and maintaining a complete 3D model from the very beginning," Hornung reported. "The entire company was caught up in the design process and ArchiCAD's visualization tools were invaluable to getting people involved. We posted renderings and VRs to our company Intranet site so everyone could see their new space, and now we are posting the buildings under construction. From an operations point of view, I think this will have a huge benefit by making the transition from the old to the new space as smooth as possible. I also have to stress how important the 3D model was to quickly leasing all of the space."

> "The entire company was caught up in the design process and ArchiCAD's visualization tools were invaluable to getting people involved."

Since the architect's "virtual building" contains almost all of the information used for construction, it will be maintained and updated later for continuing facilities management and leasing. "We're looking forward to this next phase of using ArchiCAD. I think playing the role of client helps us to better understand and respond to our users," Hornung said.

The Graphisoft building will be completed in June 1998, followed in the summer by two additional buildings.

Stockholm Plans Olympic Stadium

Berg Architects
Stockholm, Sweden

Designed to resemble a Greek amphitheater proudly overlooking Stockholm, the Victoria Stadium created jointly by Berg Architects and Wingardh Architects was chosen from eight entries in an international competition to design a home for the 2004 Olympic Games.

Svante Berg, president of Berg Architects, was confident in his team's ability to win the competition. An ArchiCAD user since 1992, Berg relied on ArchiCAD's speed and seamless integration with other software. "The speed of ArchiCAD really helped in the early phases of the project. It was also important to have the ability to present it in a 3D form that was easily understood," Berg said.

The city of Stockholm organized the invited competition for the $333 million stadium in 1996 as part of its bid for the 2004 Olympics. Situated along the Hammarby waterfront, the stadium was required to seat 70,000 people and adapt to multiple events after the games when it would be converted into an indoor arena seating 35,000. The architects had to give special consideration to a range of environmental issues, including energy consumption, water and timber resource conservation and waste production.

"We used the excavated earth for landscaping, so as not have to transport any away," Berg explained. "Like the ancient Greeks we wanted to minimize construction efforts by using the slope created when excavating."

The 40-person team had only 12 weeks to develop their ideas. In that short time, they relied on ArchiCAD, Lightscape and Photoshop to successfully bring their design to life and deliver a winning presentation to the jury. After the competition, the material was used for an interactive, computerized multimedia presentation.

According to the jury, "The Victoria Stadium scheme was selected because of its amphitheater design solution which closes around the sports playing fields and yet opens to the wider world providing a view of the Olympic Village and a beautiful vista of Stockholm."

Berg's design calls for a thin, transparent roof over the grandstands, in deference to the Nordic tradition of integrating nature and design. "The Victoria Stadium is an ecologically sensitive and modern design meeting all of the city's environmental requirements for the Hammarby waterfront," Berg stated.

Founded in 1958, Berg Architects employs 18 people and has been involved with such diverse projects as infrastructures, airports and public buildings. The firm recently used ArchiCAD for feasibility studies, for client presentations and acquiring building permits for their new Mango design for the Norwegian oil company Statoil.

> "The speed of ArchiCAD really helped in the early phases of the project. It was also important to have the ability to present it in a 3D form that was easily understood."

New Orleans Transforms Landmark Auditorium

Haynes + Associates – New Orleans, LA

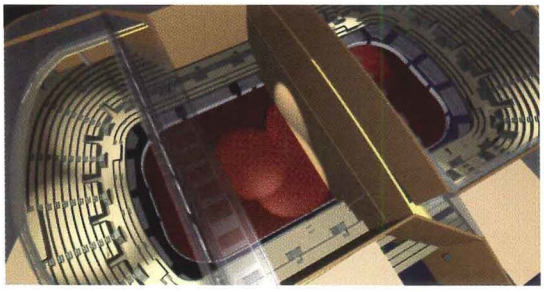
When the city of New Orleans needed to transform one of their historic treasures into a multi-purpose arena and auditorium, they wanted to visualize what it would look like before construction began. Using ArchiCAD, local architects Haynes + Associates took city officials on a "virtual tour" of the building. The city could see exactly how their money was going to be spent.

The Morris F.X. Jeff Municipal Auditorium, erected in 1930s New Orleans adjacent to the French Quarter, was used for Carnival Krewes Mardi Gras celebrations for 63 years. The city's decision to renovate was an economic one, fueled by the desire to bring more profitable events to the historic facility. The project was to build a regulation hockey rink inside the building flexible enough so that it could be converted back to an auditorium for other uses.

According to Paul Haynes, president of Haynes + Associates, the design challenge was the need for versatility. "The building can now go from a hockey rink, to a concert hall, to a basketball court, to a Mardi Gras ball setting in a one-day turnaround." In addition to the rigors of an accelerated schedule, another challenge was to place a modern venue inside a cultural landmark. "It raised a lot of issues concerning how to protect the historic value of the building," Haynes said.

> "We placed ourselves in the design to see what a game would look like from the seats..."

Within a week after winning the project, the auditorium was modeled in ArchiCAD. Renderings were created using Art•lantis Render, a ray-trace rendering program, to provide the realistic visualization required by the client. "The visualization allowed us to communicate the effects on the building quickly so they could understand what was going to happen," Haynes said. "Within the first month we were able to generate answers to all of their design questions. We knew what we were showing in ArchiCAD was accurate. In addition to doing construction documents it was a very persuasive and powerful tool for visualization."



Testing the sight lines of the arena in ArchiCAD was another critical step for insuring accuracy. It was important that fans could see each player on the rink from any seat in the arena. "We placed ourselves in the design to see what a game would look like from the seats and could see potential problems immediately," Haynes said. "We ended up taking a whole section of seats out because of this. ArchiCAD helped us to avoid a catastrophe."

3D renderings allowed the city to choose between varied scoreboard styles. Advertising space was also displayed "virtually" so potential advertisers could view banners from different vantages throughout the arena. "ArchiCAD was used as a marketing tool not only for us but for the city as well," Haynes said.

Completed in October of 1997, the newly renovated 200,000 square-foot building features a 5,000-seat arena and is the new home of The New Orleans Brass, a minor league hockey team of the East Coast Hockey League. Concluded Haynes, "This project really led to the rejuvenation of the building, and had a positive impact on people's perception of what New Orleans has to offer."

East Turns West in New Office Building

Alexander Kolbe Architects
Berlin, Germany

The former East German Ministry of Foreign and Domestic Trade building in Berlin needed to be converted into a new office building for members of the German Parliament. The building's location on Berlin Unter den Linden, one of the city's most distinguished avenues, posed many challenges for architect Alexander Kolbe. "We invested a lot in this job," Kolbe said. "Although it was a renovation project, we tried to redesign the whole building in every detail."

Taking on his most significant and complex project in 1991 at the young age of 29, Kolbe knew he needed to enlist the help of a 3D CAD system. Through his research he found ArchiCAD. "Its ease of use, coupled with the fact that Graphisoft took the needs and requests of its users into consideration in every software update, was the reason we chose ArchiCAD," Kolbe reported.

Because the building's structure was sound, a decision was made to keep the concrete frame intact and replace all of the facades and interiors. The Parliament dictated strict space requirements for the building's 33,000 m2 (348,000-square-foot) area, while the new facades had to win the approval of both the senate building director and the Office of Protection of Historical Monuments.

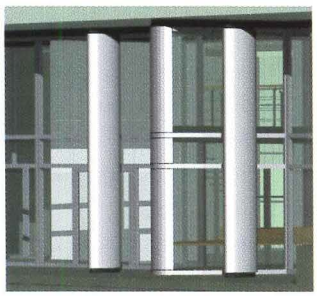
A new entrance proved to be one of Kolbe's greatest challenges. "We designed a very complicated entrance with a doorman's office that had the shape of a ship's bow. It was incredibly difficult due to the bent shape and everyone tried to convince us that it was impossible," Kolbe explained. "Finally it was built as designed and we were extremely happy with the result."

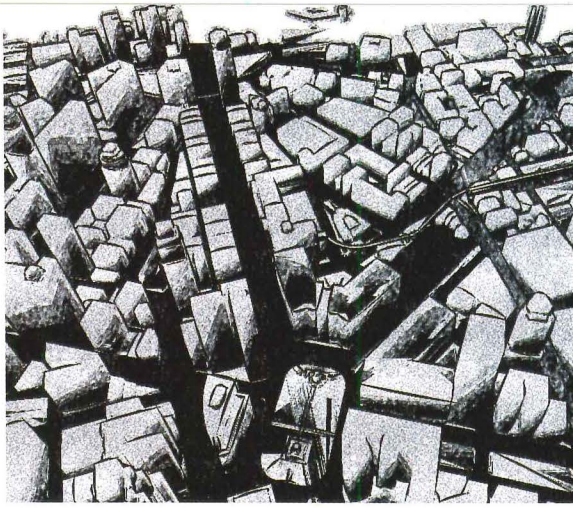
The design phase of the project was completed by 1996 using ArchiCAD for all of the plans and details. To the delight of Kolbe and the team working on the project, even a building of this size in all of its complexity could be kept as a single building model in one file. Added Kolbe, "And with the TeamWork functionality, this is even more efficient because I now have the option of working together with other people on the same building model at the same time."

> "Although it was a renovation project, we tried to redesign the whole building in every detail."

On almost every project, Kolbe employs ArchiCAD's 3D presentation tools — renderings, animations and QuickTime® VRs — to sell sometimes unconventional ideas to clients, often bringing his laptop computer and projector right into their offices. Kolbe appreciates the ability to view designs in 3D and imagine space and proportion. As useful as the "virtual building" is to developing and communicating design, Kolbe feels that ArchiCAD's 2D functions are of equal importance. "Construction and detail planning is a major part of our everyday tasks and ArchiCAD does these extremely well," Kolbe relayed.

The prominent Berlin office building for the German Parliament challenged the reputation and skills of one of Berlin's hottest young architects. This project has "earned good credits" for Kolbe and his 8-person firm, and brought him additional challenges — from shopping centers to apartment buildings, in Germany and surrounding countries.





"The new LiveStyles rendering engines ... help people visualize projects in a familiar and non-threatening way."

Toronto-based urban design firm Urban Strategies Inc. utilized ArchiCAD to transform a 2D DXF file into a 3D model of downtown Detroit in just a few weeks. Michel Trocmé, an associate with the 24-person firm leading the Detroit study, is planning a reinvestment strategy for the city's 5-square-mile downtown area over the next 10 to 20 years, which will be presented to a diverse constituency. "We don't want to mislead people with detailed views when it is uncertain what the city will look like

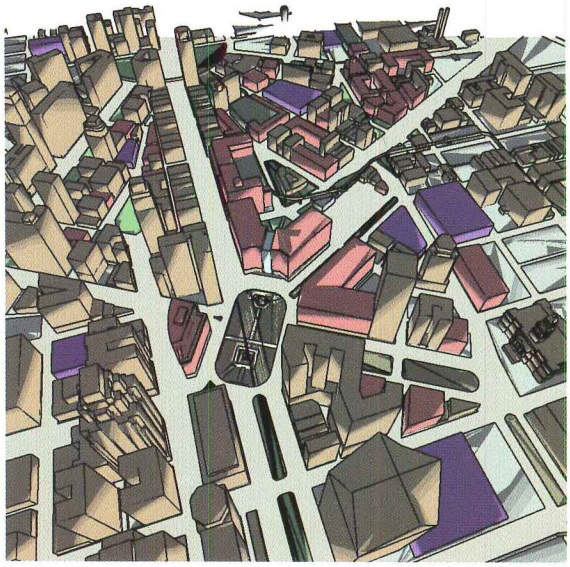
Soft Plan for Downtown Detroit

Urban Strategies Inc.
Toronto, Canada

in 20 years. That's why the regular hard-line rendering associated with CAD isn't necessarily appropriate," Trocmé said. "With urban development, you need to get the feel of the open spaces and the relationship between the buildings. It's not about the buildings themselves."

Working from their "virtual building" ArchiCAD model, the firm used ArchiCAD's new LiveStyle™ rendering engines to keep the visuals simple and loose and help stakeholders better understand the design. "The new LiveStyles rendering engines are a brilliant move from Graphisoft. This new development will help people to visualize projects in a familiar and non-threatening way. There is a definite need out there for hand-sketched presentations," Trocmé said.

Using a laptop and an overhead projector, Trocmé routinely walks his clients through projects using ArchiCAD's VR (virtual reality) technology. "Some clients have never seen anything like this before," he said. "And now with LiveStyles, we have the ability to create impressionistic VRs."



The downtown Detroit reinvestment strategy is intended to establish a redevelopment framework and identify key investment opportunities that aim to revitalize the pedestrian environment, reconnect the downtown to the riverfront, and attract new residential, retail, and office developments. Four districts within greater downtown Detroit are being studied, re-envisioned and targeted for strategic investment.

The downtown area has been struggling to recover from steady decline and lack of investment coupled with the loss of one half (one million residents) of its population since the 1950s. "In urban planning, projects tend to have an afterlife. The project has to make sense in an economic, social and environmental perspective that outlives political situations. It requires a different way of thinking," Trocmé said.

In Lower Woodward, the heart of downtown, the design re-introduces an element of Detroit's original plan — the public square of Campus Martius sits adjacent to an emerging community of loft apartments, galleries and restaurants. Responding to an RFP produced by Urban Strategies, developers are poised to build as much as 2 million square feet of commercial space around Campus Martius. "Rather than individual, stand-alone projects, such as a couple of tall buildings that would have no impact on the area, we're squashing it down and spreading it out to encourage place making and city building," Trocmé said.

Urban Strategies began using ArchiCAD in 1994, recognizing that ArchiCAD's software development was moving faster than other available CAD systems. Trocmé feels that having the city plan in ArchiCAD is the lifeblood of a project but the 3D views are almost as important. "3D has previously been secondary to the plans but that is changing now as there are more and more uses for it."

New Landmark Bridges Bay

Donald MacDonald Architects
San Francisco, CA

To non-residents of San Francisco, it may be surprising that the design of a new, more earthquake-resistant Bay Bridge is only now nearing completion nine years after the 1989 Loma Prieta earthquake. But for residents of this city encumbered by politics and special interest groups, replacement of the 58-year-old span cannot be over-studied, over-discussed or over-designed.

Currently on the boards (or on the screens) are four alternative designs for the two-mile long, $1.2 billion east span of the San Francisco-Oakland Bay Bridge, slated to begin construction in the year 2000 and open in 2003-2004. Under the aegis of the California Department of Transporation and T.Y. Linn International, the San Francisco architectural firm Donald MacDonald Architects is developing two of the bridge designs using ArchiCAD.

"You get 3D results instantly with ArchiCAD, which is crucial in the early design stage," MacDonald said. With the help of ArchiCAD, MacDonald's team modeled and presented six suspension bridge schemes to the Bay Bridge Design Task Force and Engineering and Design Advisory Panel in only four weeks.

In addition to the obvious requirement of earthquake resistance — the two mile span must withstand an earthquake of 8.3 on the Richter scale — MacDonald had to include a bike lane, study views for both cyclists and motorists, consider the effects of added pollution to the Bay and adjacent Oakland wetlands, and accomodate the constraints of navigation channels and setting foundations on the Bay's muddy floor.

MacDonald notes that the bridge design should work in the context of the man-made environment. "The designs are based not only on how to carry the stresses, but also the context in which they are placed. We decided to keep the necklace of suspension bridges across the Bay intact to keep the continuity of design. It is more modern but similar in scale," MacDonald said.

Bridge design is not new to MacDonald. A recently completed project to retrofit the Golden Gate Bridge afforded him the opportunity to further understand not only the engineering and architectural principles which drive design, but the social awareness surrounding a national landmark as well. Since opening his practice in 1965, MacDonald has received numerous awards for such diverse projects as low- to middle-income housing, bridge design, urban infill and commercial projects.

The Bay Bridge Design Task Force commissioned two teams to develop designs for self-anchored suspension and cable-stayed bridges. MacDonald's team developed six suspension designs while another team within T.Y. Linn's office developed the cable stay schemes. After an initial review in early March, two suspension — a twin tower and a single tower — and two cable stay designs were selected for further development. If chosen, the single-tower, self-anchored suspension bridge (shown at left) would be the first in the world. The task force is scheduled to select among the four designs in June of 1998.

Having used ArchiCAD for many projects in the past two years, MacDonald appreciates that he can keep his overhead low thanks to the software's efficiency. "I'm able to keep my office lean and productive now," MacDonald said. "You can get started so quickly because the learning curve is so much shorter than other CAD programs."

> "You get 3D results instantly with ArchiCAD, which is crucial in the early design stage."

ArchiCAD® 6.0

For more information on ArchiCAD or the name of a distributor near you, please contact Graphisoft.

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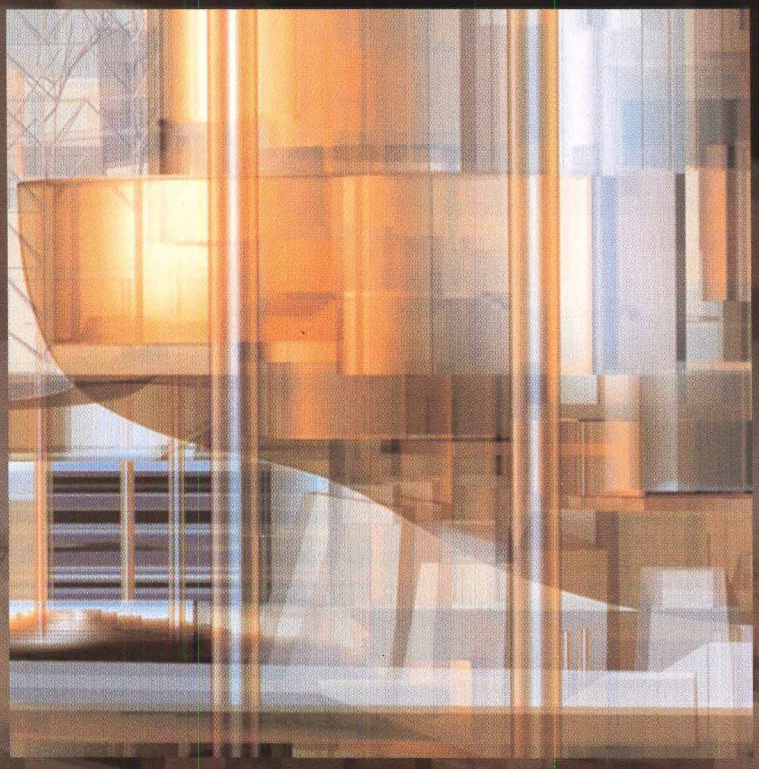

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CIRCLE 118 ON INQUIRY CARD

NEW PRODUCTS

With commercial vacancy rates diving, rents rising, and office managers scrutinizing use of space, there is a great demand for products that store more items in less space. Homeowners, too, are clamoring for better storage options, and sophisticated consumer tastes have resulted in more attractive designs, as can be seen on the following page. Also highlighted here is the latest offering from Steelcase—the long-awaited Pathways collection of office furniture and interior architecture—and a new AC gearless elevator system from Montgomery-KONE that should have the industry buzzing. ***Elana H. Frankel, New Products Editor***

SAVING STORAGE SPACE: THE LATEST IN FILE DRAWER FASHION

In many cases, the computer revolution has created more information storage problems than it has solved. Offices now generate and store more paper, impeding efforts to streamline the workplace. The paper has to go somewhere, and that has often meant the proliferation of space-eating file cabinets. One solution is mobile aisle storage systems, which not only take up less space than file cabinets, but also incorporate sophisticated technology to meet accounting, security, and safety needs.

In a mobile aisle system, carriages of shelves are bunched together, leaving the files inaccessible until someone moves one of the carriages on its tracks to create an access aisle. With only one aisle open at a time, the system can pack two to three times as many items (files, videotapes, or X-rays, for example) into the same footprint as conventional systems. The carriages can be moved manually—by mechanically assisted handcranks geared to high ratios—or automatically by motors.

Computer software can be used to track the stored items, opening the carriage system to the proper spot when an item is selected on the screen from a remote PC. When users are required to enter a password for access, either at the PC station or on interfaces on each carriage, the software can keep track of who last held what file. Bar-code technology can also be applied to the system.

Sharon Hyder, a records management consultant based in Glendale, California, estimates that 99 percent of misfile incidents—each costing $125 to $150 in lost resources—can be eliminated with such new accounting mechanisms in place. Combining the savings that accrue from efficient tracking methods and better use of space, a company can recoup its investment in a mobile aisle system within 10 months of purchase, says Hyder.

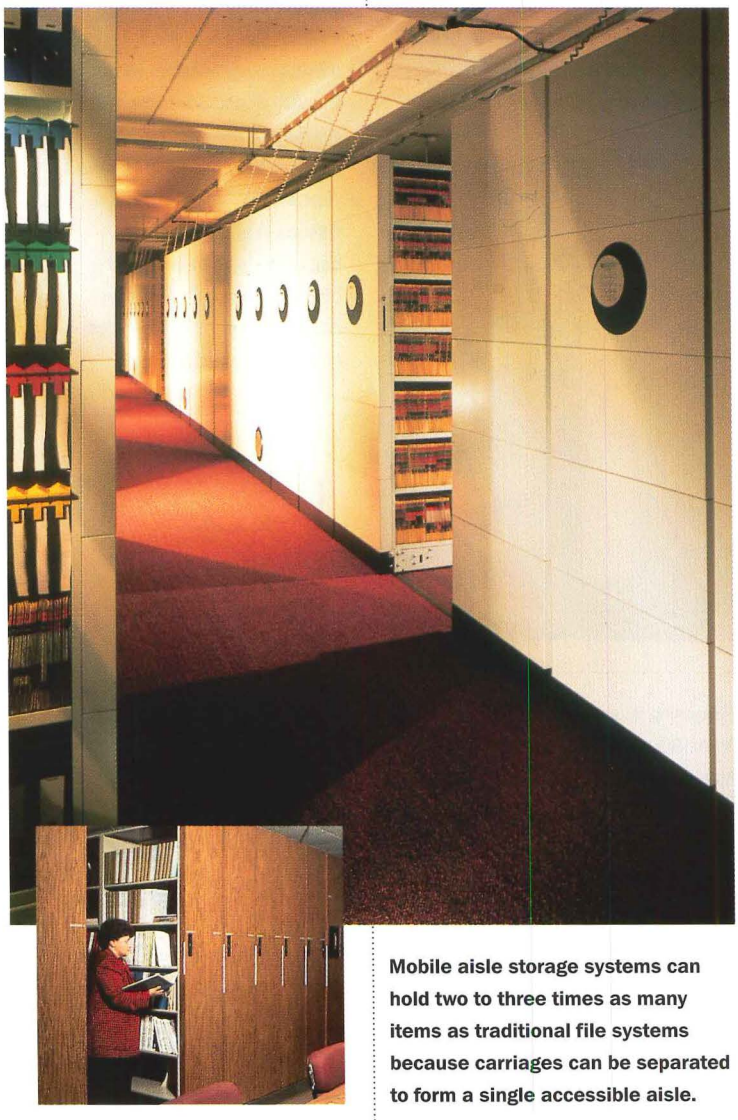
Security on these systems far exceeds what is available for file drawers. Users can be required to log in with a password before the carriages will move. More expensive methods such as infrared sensors and photo scanners are also available to detect the presence of anyone within the aisle space.

Putting hulking shelves in motion may make for a dangerous situation. Most mobile aisle systems on the market do not allow more than one aisle to be open at a time. Those systems with infrared sensors can detect whether someone is in an aisle and will lock all the carriages in place until the filing is complete. Some systems require a user to log out of an aisle before another one can be opened. The carriages on all systems stop in response to pressure, either at track or shelf level.

These mobile filing systems can be paneled with various materials, including the full range of Wilsonart laminate colors. Cables and wires are kept out of sight in armatures above the carriages. As for extra flourishes, Holga's Roll-X system rounds the corners of its carriages. Nordplan's Scandi Line 9000 system (below) has computers in each carriage, allowing users to readjust the position of stationary carriages in each setup.

Apart from the quality of construction and, therefore, the cost, there is little differentiation among the various systems—which are produced by such manufacturers as Office Speciality, Spacesaver, Holga, Nordplan, Kardex (inset), and Equipto—although not all features are available with all models.

For more industrial applications, Stanley Storage offers a vertical equivalent of the mobile aisle system that takes advantage of the large empty overhead spaces in warehouses. The appropriate drawer comes to ground level when a code is entered at a PC or carriage interface. Office managers would do well to adapt it for their use, conquering ever more space for storage. *David Simon Morton*



Mobile aisle storage systems can hold two to three times as many items as traditional file systems because carriages can be separated to form a single accessible aisle.

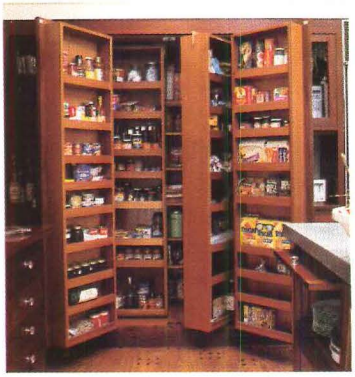
Equipto, Dallas
800/323-0801. **CIRCLE 296**
Holga, Van Nuys, Calif.
818/782-0600. **CIRCLE 297**
Kardex Systems, Marietta, Ohio
800/234-3654. **CIRCLE 298**
Nordplan USA, Conshohocken, Pa.
800/992-2795. **CIRCLE 299**
Office Specialty, Holland Landing, Ont.
905/836-7676 **CIRCLE 300**
Spacesaver, Fort Atkinson, Wis.
800/492-3434. **CIRCLE 301**
Stanley Storage, Allentown, Pa.
800/523-9462. **CIRCLE 302**

EXPANDING SPACE WITH MORE CHOICES

Manufacturers are providing more storage product options in the marketplace, increasing the number of available colors, materials, and add-ons. Storage products are also being made in more convenient forms, so that they can be easily stored or transported themselves. Most important, many new storage systems—such as the following examples—have a high degree of modularity, allowing them to be customized to meet specific needs. *D.S.M.*

► Clothing closet

The Cabina Armadia, part of Poliform's Senzafina collection of floor-mounted modular shelving systems, is designed to make the closet feel and function like a large piece of furniture. The elegant system offers glass-front drawers, shelf space over doors, glide-out trays, and a choice of leaf, folding, sliding, or concertina for the interior doors. The frame comes in white, walnut, and beech melamine, as does the interior, which is also available in an elegant staved walnut. 888/POLIFORM. Poliform USA, New York City. **CIRCLE 303**



▲ Food for thought

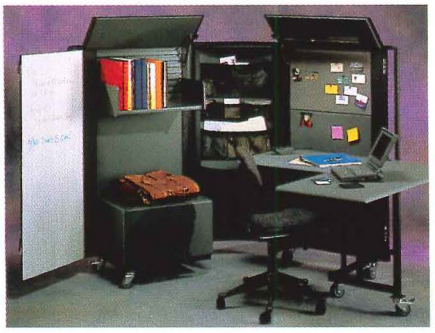
Independent architect Ronald Berlin designed this pantry for a New Jersey home. Not wanting to sacrifice kitchen space for storage, the architect integrated the pantry into cabinetry only 24 inches deep and 42 inches wide, a space slightly larger than that taken up by a standard refrigerator. Three layers of shelving, each of a different depth, are enclosed. The forward two layers swing out on sturdy piano hinges; the front layer of shelves forms the inside of the cabinet door. 609/921-1800. Ronald Berlin, Princeton, N.J. **CIRCLE 304**

▼ If the shoe fits...

The shelves of the larger shoe rack shown below retract into the wall with the touch of a rod that joins them. Those on the smaller model are weighted to retract when empty. Shelves come in red, black, blue, and white, and the casings come in galvanized steel or black powder-coat steel. 914/764-5679. Rais & Wittus, Pound Ridge, N.Y. **CIRCLE 305**

► A perfect fold

Herman Miller's Puzzle mobile office unit arrives completely assembled, and need never be taken apart. Measuring 5 feet high, 7 feet wide, and 5 feet deep, it folds into a five-by-two-by-three-foot box, small enough to fit in a closet or ship to another site. For a short move, lockable casters allow the 300-pound box to be easily wheeled around. The surfaces are covered in black vinyl and the steel frame is finished in graphite. A nylon bag is available to seal up the office, protecting it from dust and scratches. All the features of a conventional office are built in: tackable, magnetic, and white marker boards; a lockable lateral file; a task light; four storage pouches; shelves; and a mail slot. A single 15-foot extension cord supplies power. No tools are necessary for setup. 800/851-1196. Herman Miller, Zeeland, Mich. **CIRCLE 306**



► Fine grain storage

The new Keyeira line of open plan furniture from Geiger Brickel is distinguished by the variety of fine flat-cut wood that can be specified: maple, cherry, birch, sapele, beech, or even custom selections. The system has components common to open plans—fixed and mobile storage pedestals, overhead cabinets, horizontal shelving—but its styling is a bit more classic. Cabinet doors don't roll or flip up; they open on hinges. Everything is protected by a urethane finish. 800/444-8812. Geiger Brickel, Atlanta. **CIRCLE 307**

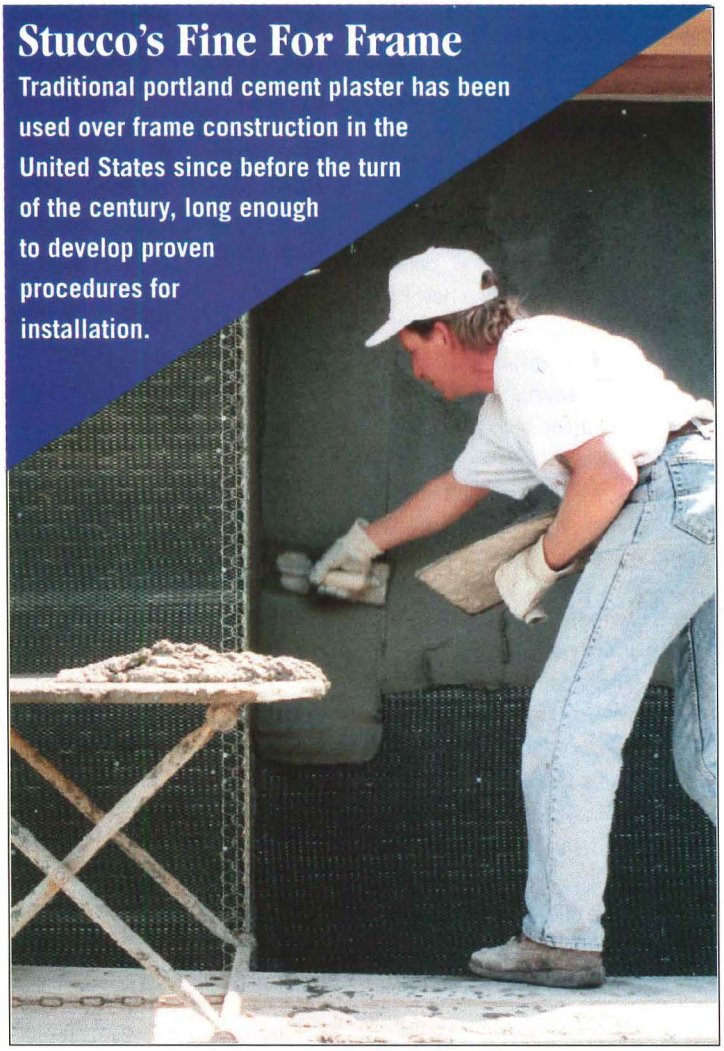
◄ A television tower

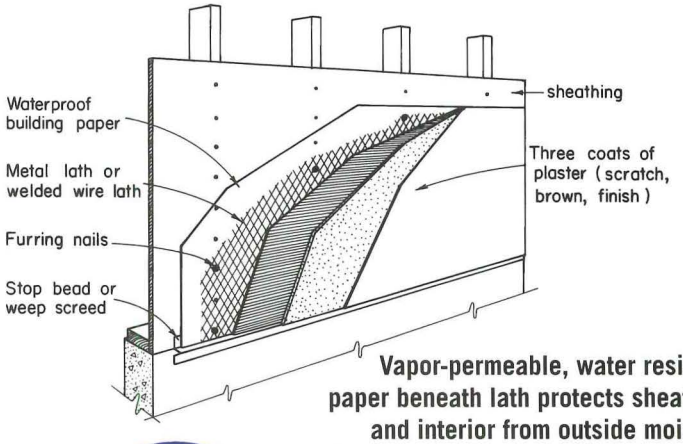
This television and stereo stand by Alan Sklansky, a San Francisco–based architect and furniture designer, appears to be built from the ground up, with steel framing and supports. But like other Modernist gestures of function, this one is illusory: the supports are for show. The fiberglass front and back panels on the top half of the unit are covered with brass mesh and slide vertically. Three blond plywood shelves are fixed in place, and more shelves can be added to fit in between. The stand, which measures 40 inches wide, 76 inches high, and 24 inches deep, is balanced to hold a television on the third shelf, despite the high altitude. 212/253-0111. Christina Modern, New York City. **CIRCLE 308**

IT'S TIME TO RETHINK STUCCO

Stucco's Fine For Frame

Traditional portland cement plaster has been used over frame construction in the United States since before the turn of the century, long enough to develop proven procedures for installation.





Vapor-permeable, water resistant paper beneath lath protects sheathing and interior from outside moisture without trapping moisture vapor in wall

The Real Thing

Traditional portland cement plaster is a time-tested exterior finish. It consists of portland cement-based materials and sand, mixed with water to form a workable plaster. Portland cement provides strength, durability, and toughness in portland cement plaster.

It's Not the Same as Synthetic Stucco

Portland cement plaster (sometimes called "traditional stucco") should not be confused with exterior insulation and finish systems (EIFS) or "synthetic stucco systems." Traditional stucco has high impact resistance and sheds water, but breathes, allowing water vapor to escape. It's a proven system that works in all climates.

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CIRCLE 120 ON INQUIRY CARD

RETHINKING WORK IN THE OFFICE; REWORKING SPACE FOR PRODUCTIVITY

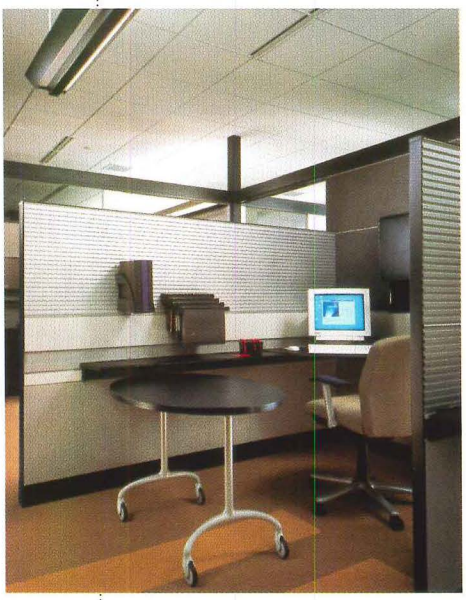
To keep up with the latest corporate trend of open workspaces, Steelcase's ambitious new line of office products, Pathways, attempts to speak to the needs of executives who have to plan for adequate communal and teaming spaces, the integration of technology, and long-term flexibility.

The new workspace

The Pathways approach to space allocation includes an interior architecture system (a basic framing infrastructure), freestanding furniture and storage towers, and mobile tables and file carts that can be moved to accommodate formal or informal meetings. Makeshift private offices, for example, can double as group meeting spaces. To address the need for visual and acoustical privacy, Pathways includes systems for creating shared private offices, as well as mobile nylon visual shields and Armstrong's UL-certified acoustical ceiling tile.

A Pathways office environment offers a number of ways to access power. A post-and-beam system, Conjunction, with wiring and cabling integrated into the system, can be attached to walls or remain freestanding to define space. Steelcase and Tate Flooring have partnered to create a raised-floor system called ConCore 1000, which distributes power, voice, data, and HVAC services to individual work spaces. Quotient is a floor-to-ceiling wall product that provides workstations with access to power.

Only a fraction of the Pathways products are mentioned here, and potential buyers should be forewarned: when talking to a Steelcase dealer, you'll need the company's phrase book to keep track of all the product names. 800/227-2960. Steelcase, Grand Rapids, Mich. CIRCLE 352

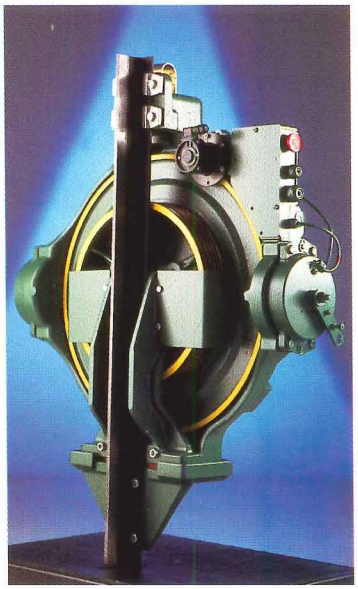


THE LATEST IN ELEVATOR DESIGN: AN ECO-FRIENDLY, AC GEARLESS SYSTEM

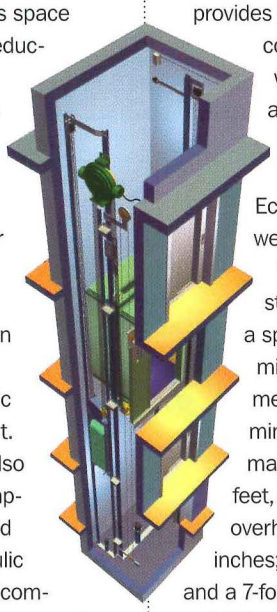
Traditionally, architects have had limited choices when it comes to elevator systems. They could either specify a hydraulic elevator, which relies on hydraulic oil that could eventually leak into the ground, or traction, which requires the addition of a penthouse unit to a building as well as large structural loads placed on top of it. Now, with the new EcoSystem from Montgomery-KONE, there is a more environmentally friendly, cost-saving alternative for low- and mid-rise buildings.

The AC gearless EcoSystem is powered by EcoDisc, a compact machine design that integrates the traction sheave, brake flange, and rotor into a single flat, thin design with two independent brakes. No hydraulic oil or additional building space is needed. "All EcoSystem products—EcoSpace and MonoSpace being the original launch products—are built with EcoDisc," says Eric Rupe, communications director for Montgomery-KONE. "It's a slim, synchronous axial motor built with permanent magnets. This disc is what makes space savings possible." By reducing machine room requirements and thus avoiding the use of laborious, expensive crane systems, EcoSystem lowers elevator construction costs. It also eliminates time-consuming coordination issues such as hole drilling (for the hydraulic lift) and jack placement.

EcoSystem can also reduce energy consumption by almost one-third (compared with hydraulic elevators) to one-half (compared with traction) because of the downsized power supply and low energy consumption. But even with reduced energy use, "it still provides the performance reliability and ride quality associated with AC gearless elevators," Rupe explains.



EcoDisc (above), a small, slim synchronous axial motor built with permanent magnets, is what makes space savings possible with the EcoSystem products.



In conjunction with the launch of EcoSystem, Montgomery-KONE has released a CD-ROM that calculates project cost savings and provides information on the company's Web site, which can be found at www.montgomery-kone.com.

The specifications for EcoSystem include a weight capacity of 2,000 to 2,500 pounds (NEII standard platform sizes); a speed of 200 feet per minute; travel measurements of 8 feet, 4 inches minimum and 80 feet maximum; a pit depth of 5 feet, 6 inches; a minimum overhead of 12 feet, 9 inches; a standard 8-foot cab; and a 7-foot entrance.

While freeing up building space for other uses and reducing costs and potential environmental hazards, EcoSystem provides a high-performance and quiet elevator ride. 800/956-KONE, Montgomery-KONE, Moline, Ill. CIRCLE 353

PRODUCTBRIEFS

▲ Tall order

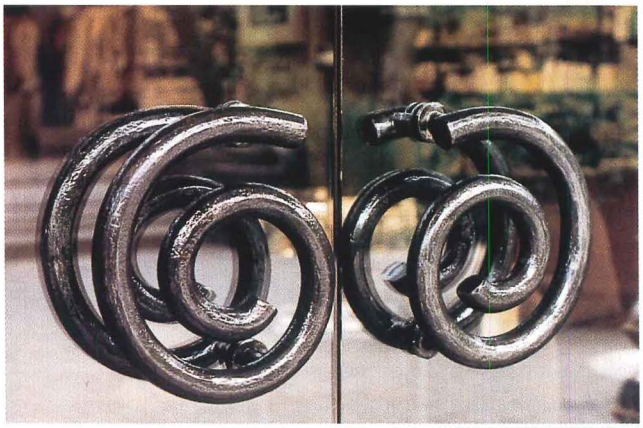
Totem Design Group's ongoing relationship with various manufacturers around the country has resulted in a collection of American-designed furniture and lighting products. Included in this new venture is work from Lloyd Schwan's Low collection (upholstered sofas and chairs) and Surface collection (casegoods and tables). Most notable is this five-tiered Tall Cabinet, which is also available in a slightly different configuration with open shelving. Made from Finn-Ply and Wilsonart plastic laminate, the cabinet shown here measures 87 inches high, 16 wide, and 14 deep. Watch for other Schwan pieces in the future for the Italian company Cappellini. 212/925-5506. Totem, New York City. **CIRCLE 267**

▼ Design-conscious decking

Made from recycled milk jugs and recovered wood fiber, Smart Deck Systems (a division of Eaglebrook Products) include railings, column posts, balusters, top and bottom rails, and fascia boards that will not rot, warp, split, or splinter. To hide cabling or wiring, each composite is extruded with fluted channels, and the overall design eliminates exposed fasteners. SmartDeck weathers like natural lumber into a driftwood-gray color. 888/733-2546. SmartDeck, Chicago. **CIRCLE 309**

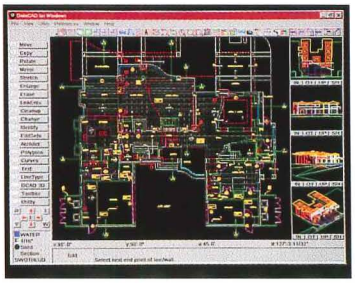
▲ In Vitra

Named after its designer, the ergonomic office chair by Alberto Meda sits on a five-star base with casters or gliders. Armrests can be upholstered in black leather and the back in Netweave, a mesh fabric. Other upholstery options include tesso. 800/33-VITRA. Vitra, New York City. **CIRCLE 310**



▲ Hammered by hand

Using traditional blacksmithing techniques, California designer Jefferson Mack forged these contemporary-styled iron door handles at 2,000 degrees. Then, the 1¼-inch roundbar was rolled into a 12-inch-diameter spiral. Finally, Mack hand-hammered the texture to create what he refers to as a unique set of Earthsake entry pulls. 415/550-9328. Jefferson Mack Metal, San Francisco. **CIRCLE 312**



◄ DataCAD update

With the release of DataCAD 8 for Windows 95/NT (compatible with previous versions, sharing the same drawing files, templates, symbols, fonts, linetypes, hatch patterns, and DCAL macros), users can access the first 32-bit version of the 2D/3D CADD software. 800/394-2231. DataCAD, Avon, Conn. **CIRCLE 314**

▼ Want not, waste it

Metal-Form waste containers and ash urns from Wausau Tile add style and snap to an unglamorous and thankless task: taking out the trash. The 14-gauge perforated-steel containers come standard with cast-aluminum tops that easily snap out and polyethylene liners. Available in 10- and 31-gallon sizes as well as a variety of colors including yellow, green, brown, red, and blue. Also available freestanding or mounted. 800/446-8020. Wausau Tile, Wausau, Wis. **CIRCLE 311**

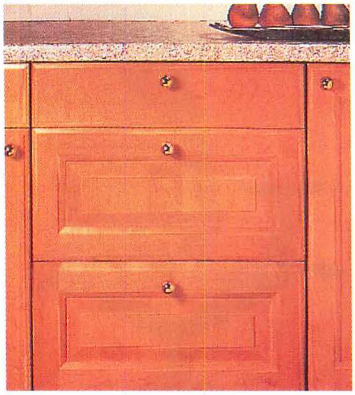
▼ Wok & roll

Viking Range's built-in gas wok measures 24 inches wide and 24 inches deep, standard cabinet depth. Components include a 20-inch stainless-steel wok with a top, a two-piece cast-iron removable surface burner grate, and a center trivet. The wok reaches 30,000 BTUs (restaurant caliber). Spills and grease are caught in a removable stainless-steel drip tray, which pulls out on roller-bearing glides. The wok is also available with optional brass trim on the drip tray pull, nameplate, and knob bezel. 888/845-4641. Viking Range, Greenwood, Miss. **CIRCLE 313**

PRODUCTBRIEFS

▲ Hidden beauty

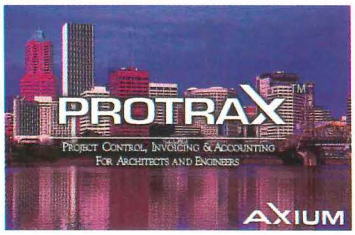
Since it first introduced the electric dishwasher to Europe in 1929, Miele has been creating efficient and quiet dishwashers around the world. The fully integrated Miele dishwasher G879SCVi, shown, hides behind kitchen cabinetry, as do the control panels. To conserve



energy, a top-only option washes the cutlery and top basket. The dishwasher holds a substantial 14-place setting and has separate specially designed areas for crystal and fine silver. 800/843-7231. Miele, Princeton, N.J. **CIRCLE 315**

▼ Management software

Axium's Protrax software for Windows 95 provides contract management, invoicing, and accounting support for AEC firms. 800/872-1540. Axium, Beaverton, Ore. **CIRCLE 316**



▼ Certified ceilings

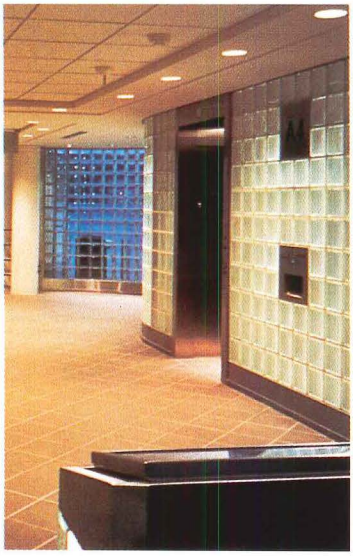
All Armstrong commercial ceiling tiles for acoustical performance are now UL certified, making Armstrong the only company to meet the independent classification testing and monitoring program. This assures architects that the product will perform as specified, reducing much of the risk of callback and liability, particularly in open workspace environments. 888/CEILINGS. Armstrong, Lancaster, Pa. **CIRCLE 318**

▲ Punctuate a room

Lampa's Asterisk Chair, designed by sculptor and Pratt University professor Cliff Baldwin, is made of molded maple plywood and a steel base. The chair is available in five colors—cyan, magenta, yellow, black, and natural—and its overall measurements are 35 inches high, 19 inches wide, and 17 inches deep, with a seat width of 17½ inches. 516/722-9450. Lampa, Aquebogue, N.Y. **CIRCLE 317**

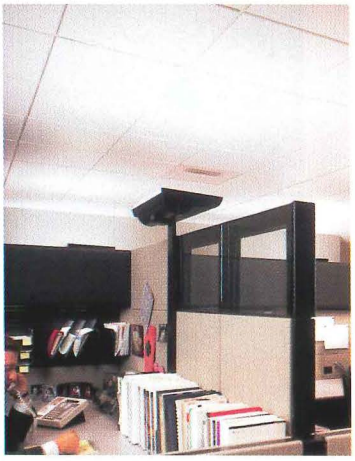
▼ Parking patrons see the light

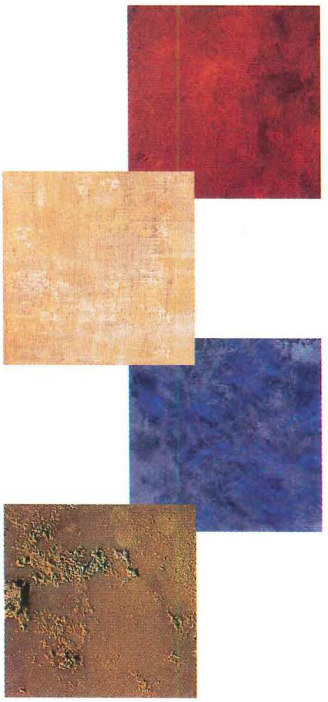
Inside the glass-block tower of the newly renovated parking garage at National Airport in Washington, D.C., the elevator banks feature Pittsburgh Corning's Essex line of lighted glass-block facings. Dubbed the "Wayfinder," the lighted glass-block configuration illuminates the points of entry into the garage and helps people find their way through the three levels of the parking garage. Another guiding light is the glass-block pylon (right foreground in photo), also from the Essex line, which serves as an information and help center. VUE pattern glass blocks were also used to create the rounded edges. 800/359-8433. Pittsburgh Corning, Pittsburgh. **CIRCLE 319**



▲ Old style new again

Domco's Azrock Linosom Linoleum provides a durable retro look that's environmentally friendly. Linoleum is homogeneous and easy to maintain and its single-layer structure of cork, wood, and linseed won't wear or fade over time. Also, it's flexible, making it easy to install, with less waste. 800/558-2240. Domco, Florence, Ala. **CIRCLE 320**





▲ Finish it off

The Hopper Company recently became the exclusive United States distributor of Algalite, an Italian line of wall-finishing products. And this happened just in time to cover 25,000 square feet of the J. Paul Getty Museum in Los Angeles with their Venetian product, a blend of polymers and cements that is applied with a trowel to produce a matte finish with subtle mottling. 602/273-1338. Hopper Company, Phoenix. **CIRCLE 322**

▼ Commercial VCT

Kentile's Kenstone, 12-by-12-by-⅛-inch vinyl composition tile (VCT), is available in six neutral solid colors textured with random contrasting flecks. Colors include coalstone black, hearthstone gray, claystone taupe, soapstone tan, sandstone beige, and limestone white. For 1998, the company also introduced KenColors (31 environmental hues) and asphalt-style VCT, reminiscent of marbleized asphalt tiles produced by Kentile earlier this century. 888/4-KENTILE. Kentile, Chicago. **CIRCLE 321**

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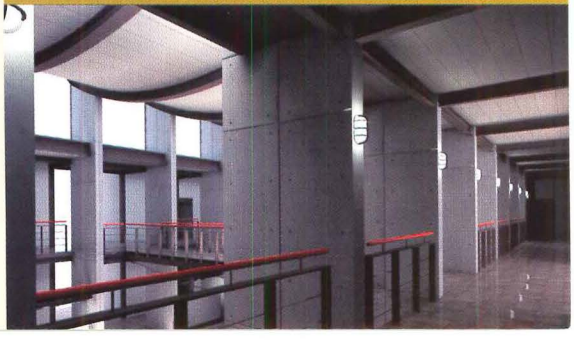

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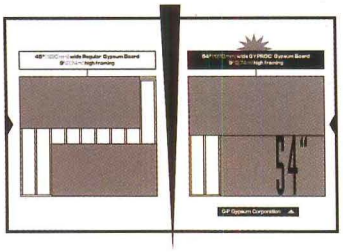


▲ Expanded gypsum board

Georgia-Pacific Gypsum expanded its manufacturing and sales of 54-inch-wide GyProc Gypsum Board. While four-foot-wide board requires two horizontal joints on a nine-foot ceiling, 54-inch board installs with only one joint. Available in ½- and ⅝-inch thicknesses; lengths of 8 and 12 feet. 800/225-6119. Georgia-Pacific, Atlanta. **CIRCLE 323**

▲ Rooftop material

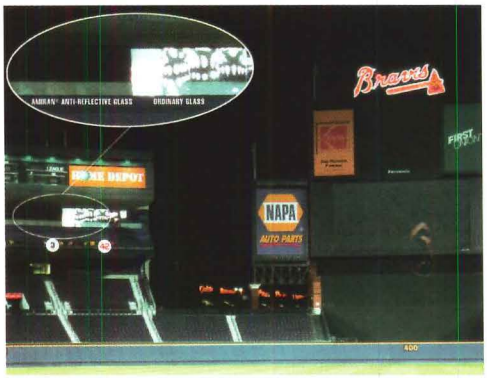
Rustic Shingles are made from an alloy that is 98 percent recycled aluminum (primarily beverage cans). Available in nine colors, they are typically installed directly over old roofing materials (including wood shingles on spaced sheathing) and look like authentic wood shake. Rustic Shingle is rustproof and lightweight (45 pounds per 100 square feet). The shingles were also proven by the Florida Solar Energy Center to reduce attic heat gain by up to 34 percent over composition roofing materials. 800/543-8938. Classic Products, Piqua, Ohio. **CIRCLE 324**

▼ Electric legs

The UL-listed Powered Milano Leg brings 110 volts to the desk. The leg, in matte black, polished chrome, or unfinished metal, has two duplex electrical outlets. The next generation will feature fourplex outlets. 800/523-1269. Doug Mockett & Company, Manhattan Beach, Calif. **CIRCLE 325**

▼ Ballpark design

With opening day for the 1998 baseball season attracting thousands of fans to Atlanta's Turner Field, home of the Braves, officials credit Schott's tempered Amiran anti-reflective glass for eliminating reflective glare in the ballpark. At four times the strength of regular Amiran, tempered Amiran also met local wind load restrictions. Available in sizes up to 84 by 141 inches. 914/968-1400. Schott, Yonkers, N.Y. **CIRCLE 326**



▲ Cork it up

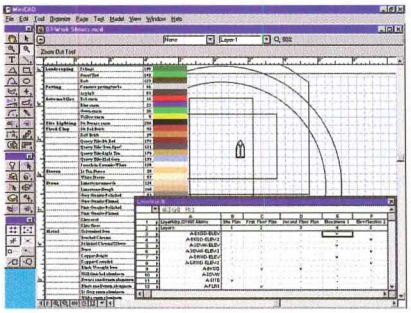
Originally founded in the late 19th century in Sweden, but currently based in Portugal, the cork capital of the world, Wicanders has a long European history of supplying cork floor to architects and designers for offices, retail spaces, and hotels. Now available in North America through Ipocork, cork flooring provides a cushioning effect that reduces noise. 800/828-2675. Ipocork/Wicanders, River Edge, N.J. **CIRCLE 327**

▼ Filter system

Metered valve design hasn't always allowed for filter use. Thanks to an engineering effort, the Dual-Filtered By-Pass is now part of Sloan's Flushometer valve. The filter and a backup prevent dirt from clogging the system and water from running out. 847/671-4300. Sloan, Franklin Park, Ill. **CIRCLE 328**

▼ Workflow technology

Based on Windows 95 Explorer's graphic user interface, Revision Master from Diehl Graphsoft tracks updates, revisions, and corrections to computer files. Users check files out of a library system, creating a changeable file, and then place the file in a specified location. No one else can make changes to the file until the original user checks it back into the system. This latest form of document control is an efficient way to locate, store, retrieve, and monitor changes to electronic documents. Revision Master will keep track of word-processing, spreadsheet, desktop publishing, CAD, and HTML files. 410/290-5114. Diehl Graphsoft, Columbia, Md. **CIRCLE 329**



▼ Workstation wary

There is a lot of scientific evidence pointing to the fact that the use of computers causes repetitive stress injury (RSI) and muscle fatigue. One of the main causes of RSI is poor keyboard positioning. One $380 solution is Ergo System's XK99, an ergonomically correct keyboard support system that fits under a desk. With the touch of pneumatic control levers, users can create a keyboard custom fit by lowering or raising the tray; tilting it forward or back; or swiveling it 360 degrees (or even pushing it completely out of the way). Will it foster office productivity? Yes, as it will surely keep people comfortably typing away at their desks. 860/282-9767. Ergo System, East Hartford, Conn. **CIRCLE 330**

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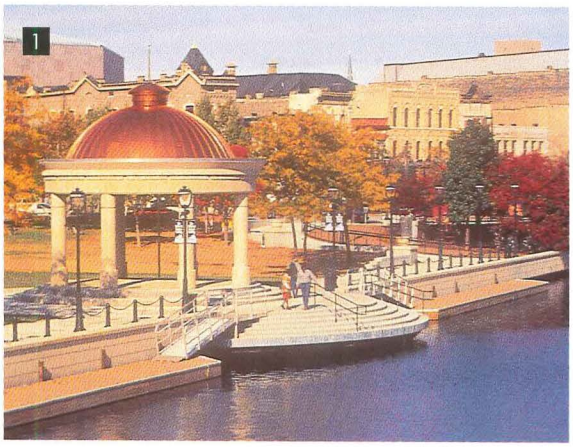

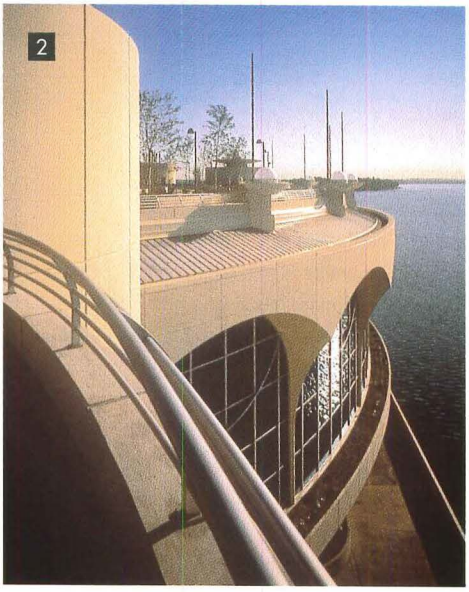

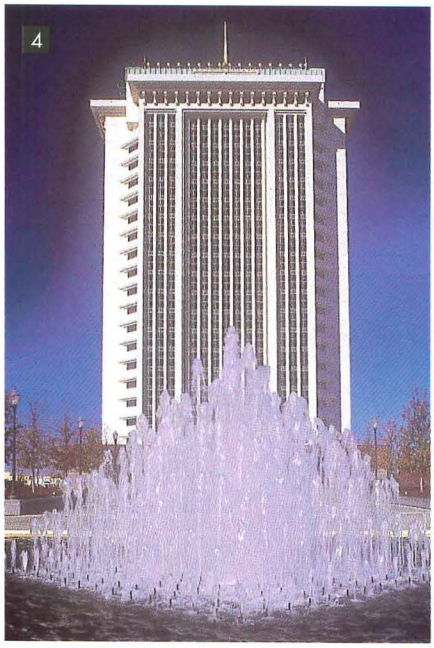

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Manufacturing: International Concrete Products Germantown, WI

2 ***Winner:*** Monona Terrace Convention & Community Center
Design: Taliesin Architects, Ltd. & Potter Lawson Architects
Manufacturing: International Concrete Products Germantown, WI
Photographer: Hedrich Blessing

3 ***Winner:*** Molecular Biology Building
Design: Harper Kemps Clutts Parker Jennings Hackler & Partners
Manufacturing: Continental Cast Stone Manufacturing, Inc. Shawnee, KS

4 ***Special Commendation:*** The RSA Tower Office Building
Design: PH&J Architects, Inc.
Manufacturing: Castone Corporation Opelika, AL

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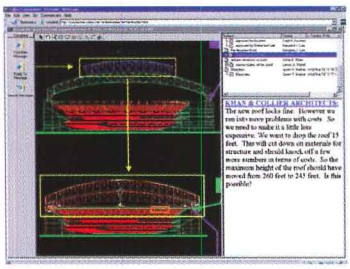
PRODUCTBRIEFS

► Paperless office option

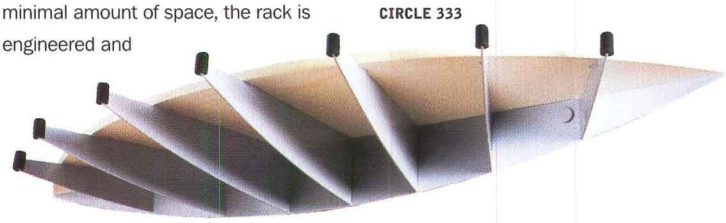
Express mail is a thing of the past with ReviewIt, a software package that is designed and marketed by ex-Autodesk developers at the West Coast start-up company Cubus. With this first-ever offering of collaborative design review software for the Internet, AutoCad users can now exchange, review, revise, and organize blueprints, drawings, and documents over the Internet. Users can pan, zoom, and mark up a design document and also view or create accompanying



text messages. And the Cubus server guarantees high-level security. Available as a monthly subscription service. 510/654-5823. Cubus, Oakland, Calif. **CIRCLE 331**

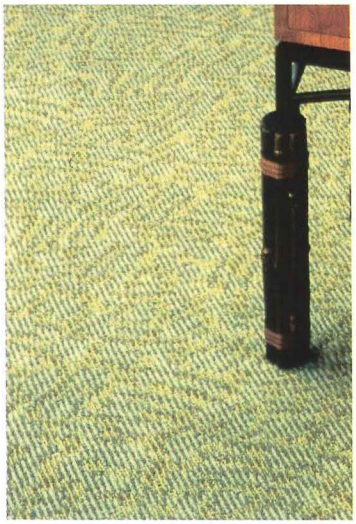
▼ Hanging around

Peter Pepper Products Artform collection includes this wall-mounted coatrack finished in stainless steel, chrome, aluminum, glass, or wood. Requiring a minimal amount of space, the rack is engineered and designed in Germany and has a sleek and modern look. Also available in the collection are a hat shelf, hangers, and matching wall tables. 310/639-0390. Peter Pepper Products, Compton, Calif. **CIRCLE 333**



▼ Custom carpet

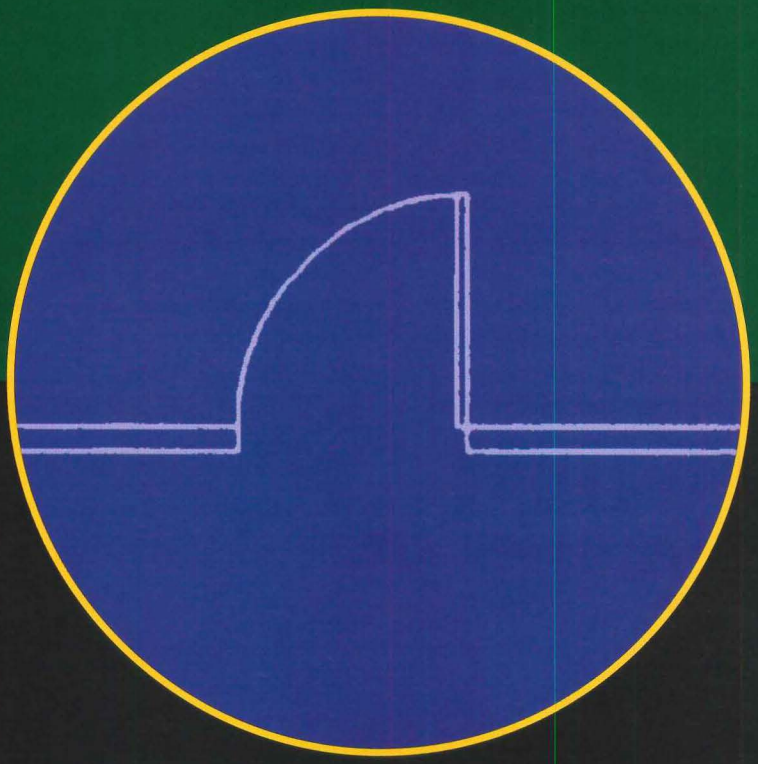
Atlas Carpet has two new commercial products made of DuPont Antron Legacy nylon, which can be custom designed with a minimum order of 45 feet. Paletta, inspired by primitive stone rubbings, is available in 36 color combinations. Available in 24 colors, Brushworks, shown, was inspired by Oriental carpets. 800/372-6274. Atlas Carpet Mills, Los Angeles. **CIRCLE 332**



▲ Occasion for classic design

The top of the occasional Paris table from North Carolina–based Charles McMurray Designs is available in clear or etched glass, marble, granite, or veneered wood. It fits snugly within the base while seeming to float within its frame. The base of the table can be made of polished stainless steel, brass, or statuary bronze. Only solid ¾-inch bar stock is used, and 12 standard sizes—both square and round—are available. The table can also be custom made for corporate or residential environments. Remarkably simple in its design, the Paris table mixes well with previous collections. 800/438-4830. Charles McMurray Designs, Charlotte, N.C. **CIRCLE 334**

IT'S THE INTERNATIONAL SYMBOL FOR WASTED SPACE.



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HÄFELE

CIRCLE 126 ON INQUIRY CARD

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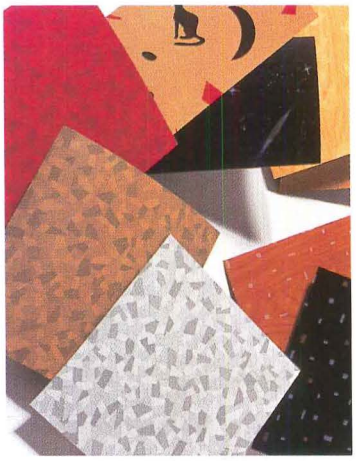
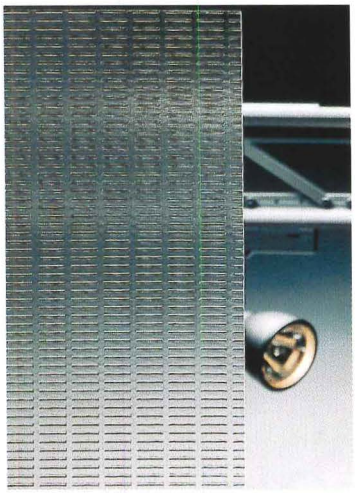
PRODUCTBRIEFS

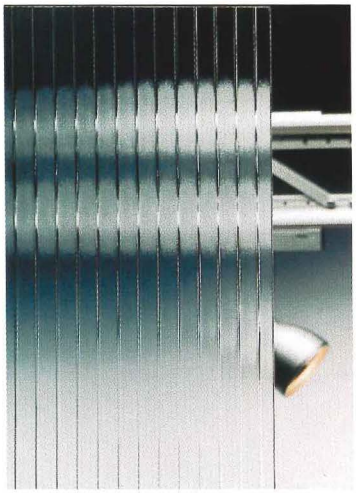
▼ Playful laminates

Formica's latest laminate series, the Laurinda Spear collection, includes four new designs: the Rainforest Kraft, a collage of black and red shapes on craft paper; the grids and dots of Aerial Fields, which replicate a crazy quilt pattern; Millennium, which features gold and silver forms; and Ellipse Eclipse, which uses elliptical shapes and inlays. 800/FORMICA. Formica, Cincinatti.

CIRCLE 335







▲ Patterned-glass innovation

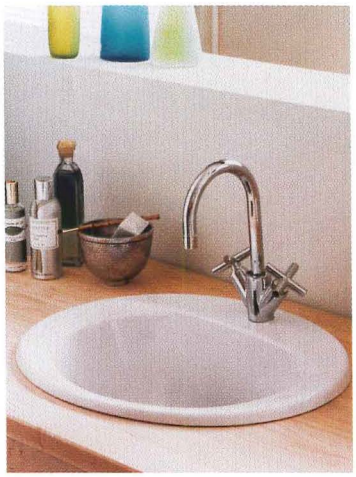
Founded in 1927, the third-generation company Bendheim Architectural Glass, a New York City–based resource center that carries more than 2,000 varieties of specialty glass, is now the exclusive United States distributor for Masterglass, precision-rolled glass developed in Europe. Masterglass is known for its geometric design patterns: squares, dots, and lines that appear in cut relief against a translucent matte background similar to sandblasted or etched glass. It can be used in both interior and exterior applications and also works well in insulated glass units. Shown here are Masterray (left) and Masterligne (right), two of the four available patterns. Not shown are Masterpoint and Mastercarre. Bendheim's future marketing plans call for a major expansion of Masterglass throughout the United States. 800/835-5304. Bendheim, New York City.

CIRCLE 336

▼ New lavatory design

TOTO USA now offers a line of lavatories designed to coordinate with their high-performance toilets—though the lavatories are color-compatible with other brands as well. The front overflow of model #LT502, shown, is concealed from view and measures 19 inches in diameter. The rounded vitreous china shape defines its elegant contouring. 800/350-8686. TOTO, Pasadena, Calif.

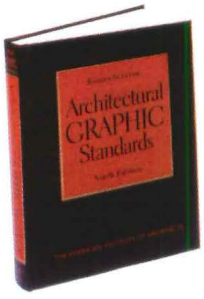
CIRCLE 337



Some architects might argue that this year's most significant achievement in architecture is Frank Gehry's astounding new Guggenheim Museum in Bilbao, Spain.

We disagree.

This year, John Wiley & Sons is changing the speed of architecture with the release of the new upgraded 2.0 CD-ROM version of Ramsey/Sleeper's ARCHITECTURAL GRAPHIC STANDARDS. In its new electronic format, this venerable classic is now an amazing, state-of-the-art, high-tech design tool. Architects can now instantly download and manipulate over 10,000 architectural elements. And almost every drawing is linked to manufacturers' product information – providing immediate access to the information you need most! In the words of one reviewer, *"This is an example of how computerization can improve the usefulness of a publication."* But don't take his word or ours. See a demonstration of this new tool in action at www.wiley.com/ags. What the book has been to architects in the past, this CD-ROM will be to architects of the future.



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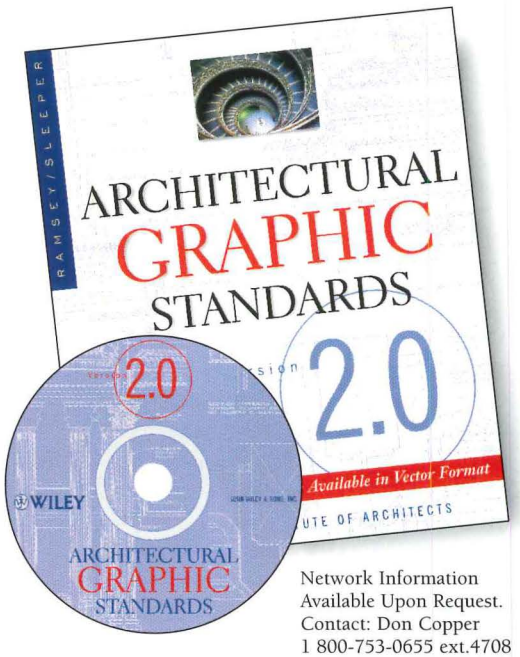

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CIRCLE 129 ON INQUIRY CARD

Changing the *Speed* of Architecture

PRODUCTLITERATURE

Introduction to lighting
Osram's CD-ROM, *An Introduction to Lighting*, is a tutorial on the basics. 800/LIGHTBULB. Osram Sylvania, Danvers, Mass. CIRCLE 280

Light and architecture
Louis Poulsen's catalog includes old favorites, updated classics, and new products. Divided into 10 sections, the binder has information on all fixtures. 954/349-2525. Louis Poulsen, Fort Lauderdale, Fla. CIRCLE 338

Styrofoam insulation
Dow Chemical's Sweet's brochure describes Styrofoam uses for commercial, roofing, geotechnical, and low-temperature applications. 800/441-4369. Dow Chemical, Midland, Mich. CIRCLE 339

Lateral design guide
An introduction to the lateral load design of wood-frame buildings is available from the APA-EWA as a 20-page handbook. 253/565-6600. APA-EWA, Tacoma, Wash. CIRCLE 340

Builder software on CD-ROM
A new CD-ROM outlines System Thinking for the Home and the Builder Alliance. 800/GET-PINK. Owens Corning, Toledo. CIRCLE 341

Bricks that insulate
Thermo Brick is a fired-clay brick panel that yields an 8.7/RSI 1.53 R value—the equivalent of a three-foot-thick solid brick wall. The brochure outlines energy-efficiency benefits. 613/735-6849. Thermo Brick, Pembroke, Ont. CIRCLE 342

Bright ideas
The 1998 calendar for the Philips Lighting Center includes information on retail and residential workshops and technology updates. The company's Retail Collection brochure provides solutions for merchandising challenges. 800/555-0050. Philips, Somerset, N.J. CIRCLE 343

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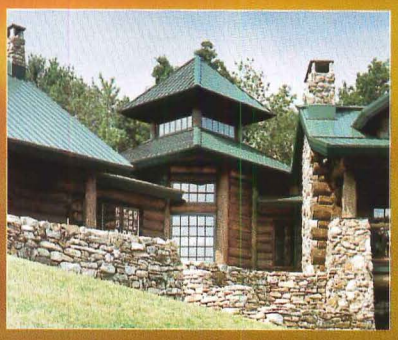

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PRODUCTLITERATURE

Lighting courses
Cooper Lighting's Source, an educational center, has a 1998 calendar of course schedules and descriptions. The training facility provides architects with an understanding of residential, commercial, and industrial lighting. 847/956-8400. Cooper Lighting, Elk Grove Village, Ill. CIRCLE 344

Custom kitchens
Dwyer's custom kitchen catalog, a 12-page, full-color brochure, showcases the company's full line of custom compact kitchens. 800/348-8508. Dwyer, Michigan City, Ind. CIRCLE 345

Resource-efficient building
The Guide to Resource Efficient Building Elements, from the Center for Resourceful Building Technology, includes information on foundations and block walls; framing; panel systems; sheathing and wallboard; roofing; insulation; and finishes. Center for Resourceful Building Technology, Missoula, Mont. CIRCLE 346

Rubber/vinyl stairs and floors
Musson safety products include fire safety, grit strip, and glow strip stair systems. Matching entry flooring products include low disc, square, diamond, fluff cord, and traffic tiles. 800/321-2381. Musson Rubber, Akron, Ohio. CIRCLE 347

Commercial window treatments
The Hunter Douglas commercial window treatment catalog and CD-ROM includes product design information on designs, energy efficiency, and new features. 800/933-6665. Hunter Douglas, Upper Saddle River, N.J. CIRCLE 348

Vendor catalog service
Information Handling Services has published a catalog of more than 15,000 manufacturers in 22 vendor groups. 800/716-3447. Information Handling Services, Englewood, Colo. CIRCLE 349

Decking system
A four-page brochure on the PVC vinyl Uni-Decking System from L.B. Plastics is now available. 800/752-7739. L.B. Plastics, Mooresville, N.C. CIRCLE 350

Safety grating and stair treads
GS Metals has a new 35-page catalog that features the company's safety grating and stair tread products. 800/851-9341. GS Metals, Pinckneyville, Ill. CIRCLE 351

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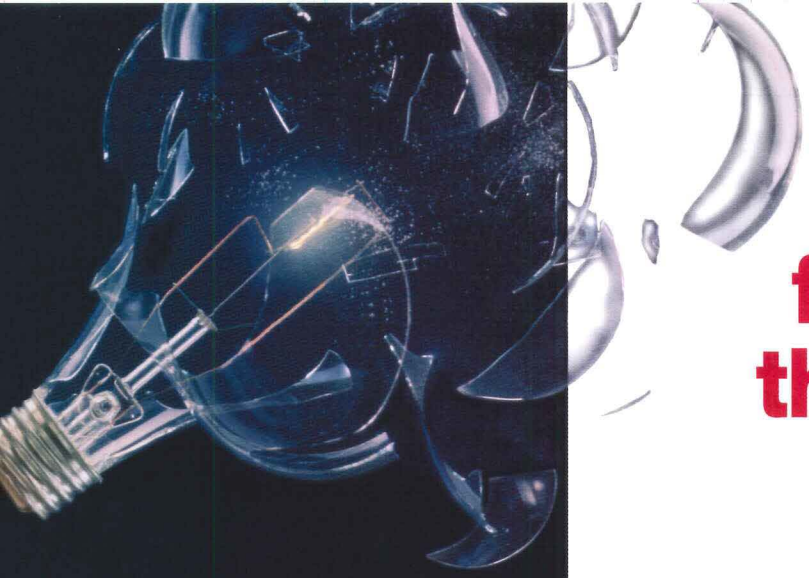

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CIRCLE 134 ON INQUIRY CARD

(continued from page 26)

ARCHITECTURAL RECORD asked Andy Covington, P.E., to share some of the basic questions that new project architects should address with consulting engineers during a project's planning phase.

A project architect who is new to his or her role and blindly relies on mechanical, electrical, and plumbing (MEP) consulting engineers is looking for a career of grief and misery. As a new project architect, you should be prepared to answer a few basic questions in order to give consultants the guidance they need to do their jobs well.

What is the project's engineering budget? It is all too common for architects to issue construction documents on a project only to have all bids come in over budget. Not only is this embarrassing, but it can also consume your profit. Once they know the budget, your engineers should be able to tell you what your options are based on conceptual architectural plans. It is better to find out that you will have to specify synthetic countertops instead of Italian marble as soon as possible rather than after you have shown the owner the marble samples. Otherwise, you may be forced to ask your client to choose between Italian marble and air-conditioning, which would be awkward late in the game.

The budget should be determined early and discussed often. At every design submittal, costs should be reviewed for accuracy to allow for adjustments should budgets creep over the original allocations.

What space do you have available for MEP equipment? One of your biggest tasks as an architect is to provide the owner with the maximum amount of usable space per unit area of construction. Based on the type of building under design and the area of the building, your engineers should be able to tell you how much space the electrical, mechanical, plumbing, and fire protection equipment will require.

Electrical engineers do not place their large gray panels at whim. The National Electrical Code requires a certain amount of clearance around these panels for the safety of maintenance personnel, a fact that is often overlooked by younger, inexperienced architects. While the finished design may vary from initial calculations (the clearances may vary depending on the panel ratings), the engineers should be able to estimate, early in the design, how many panels will be needed and what clearances each one will require.

Most architects don't want to have to move walls late in the design process to accommodate mechanical equipment, especially after the majority of the space has been allocated to some other function. It would also be unacceptable to place plumbing vent stacks in the middle of second-story executive offices. Find out as early as possible how much space you'll need for your engineering systems up front so that you can accommodate them on the first try.

What type of fixtures do you wish to use? Engineers and architects tend to view the design process from different perspectives, with the engineer placing a premium on functionality rather than aesthetics. Standard fixtures that MEP engineers select include luminaires, plumbing fixtures, plumbing actuation devices (handles, buttons, and electronic sensors), and heating, ventilation, and air-conditioning diffusers. Give your engineers some guidance in selecting equipment that will enhance, not detract from, the architectural mood of each space.

When lighting is a key issue on a project, seek out the services of a lighting designer with architectural training who is capable of meeting your functional *and* your aesthetic lighting requirements. Don't expect the average electrical engineer to

(continued on page 356)

Any way you cut it, there's no better drinking fountain on the market.

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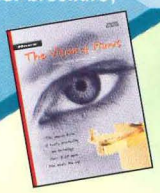

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CIRCLE 136 ON INQUIRY CARD

(continued from page 354)
know what light fixtures will complement, say, your Romanesque design. Instead, tell the engineer how a fixture should look and point out the parts of the room you wish to accent with light. Do take advantage of the lighting engineer's expertise, however; it may lead to design innovations.

What auxiliary systems are included in the design? Expect to hear this question most often from your electrical engineering consultant, whose purview is, basically, lighting and power systems. Electrical engineers sometimes work with fire-alarm systems, but they are installed by their providers in many instances. Auxiliary systems that may or may not be handled by your electrical engineering consultant include security, cable television, intercom and public address, time and bell control, telephone and data, video projection, and even nurse call systems.

Most electrical consultants can design these systems if necessary, especially if the building owner wishes to have them tested before the general contractor leaves the site. However, if the systems are installed during construction, the electrical subcontractor is likely to contract with the provider-installer (and attach his own profit margin), thereby increasing costs.

What energy sources are available? Does the owner have a preference? As long as electricity, oil, and natural gas (or propane) are provided by different companies, there will be disagreement as to which fuel to use. Your mechanical engineering consultant should be able to provide you with figures on which is more economical in both the short term and the long term. The choice is more often dictated by owner preference than by economics. Whatever energy source you go with, it's imperative to make the decision early, as its delivery system will greatly influence a project's design.

What special equipment will be in the building? Who will furnish it? Building owners and engineers generally manage to plan well for the basics. However, some kinds of equipment—such as wastewater-treatment systems, special ovens or ranges, vending machines, sensitive electronic devices, and other unusual machinery—are more likely than others to be overlooked in the early phases of the design process.

It may sound obvious, but cooking equipment should be designated during the schematic phase. Coffee makers and vending machines often require water connections and always require electricity, as do refrigerators, freezers, and automatic ice makers. Automatic ice makers always require water connections.

Your engineering consultants need as much information as possible to design appropriate systems. If you can't provide the answers, point them to someone who can.

Now that you know what kinds of information your consultants will be seeking, you should be able to get the most out of preliminary project meetings. The earlier you address these issues, the quicker your engineers can provide you with contract documents that meet your expectations.

As a project architect, you are often responsible for coordinating the work of all design disciplines, and you are the individual that the owner holds responsible for the project's success. Be sure that you and your engineers are asking the right questions. ■

Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to soren_larson@mcgraw-hill.com. Submissions may be edited for space and clarity.*

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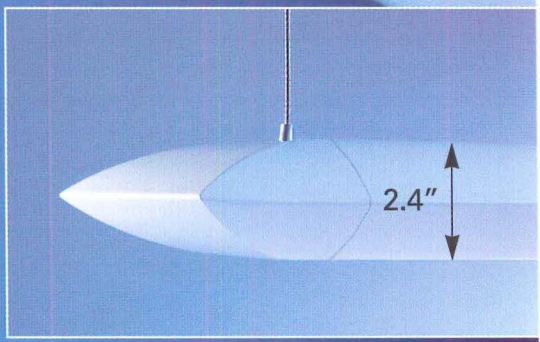

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CIRCLE 236 ON INQUIRY CARD

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(continued from page 69)

SAMPE Symposium and Exhibition
Anaheim
May 31–June 4
This theme for this year's gathering of the Society for the Advancement of Material and Process Engineering is materials and process affordability. About 200 companies will have products on display. Anaheim Convention Center. 626/331-0616.

A/E/C Systems '98
Chicago
June 2–5
The largest information technology conference for the building professions will be held in conjunction with such expositions as Build USA, featuring building products; the EDM/PDM Expo, focusing on the management of technical and engineering documents and data; and the M/cad Expo, showcasing engineering, computer-integrated manufacturing, and mechanical-engineering applications. Tutorials and seminars will be offered. McCormick Place. For more information, call A/E/C Systems at 800/451-1196 or visit their Web site at www.aecsystems.com.

National Housing Conference
Washington, D.C.
June 3–4
A conference that examines cutting-edge strategies for would-be home owners; assisted housing; and achieving self-sufficiency. Also features a site tour of innovative neighborhood developments in Washington. Sphinx Club. 202/393-5772 x22.

International Design Conference
Aspen, Colorado
June 3–6
The 48th annual IDCA focuses on design and sports. Designers from every field will examine high-performance forms and materials; rituals and traditions; the sports landscape; rule systems; biomechanics; street fashion; and the language of sports symbols. To register, call 970/925-2257; fax 970/925-8495; or E-mail idca@csn.net. Information and updates are posted on the IDCA Web site at www.idca.org.

Cities on the Move 2
Bordeaux, France
June 4–August 30
This collaborative exhibition assembled by artists, architects, filmmakers, and other "creators" explores the shapes and forms of Asian cities. Musée d'Art Contemporain. Call 011/33-05-56-52-78-36 or E-mail capc@mairie-bordeaux.fr for details.

NeoCon '98
Chicago
June 7–10
The world's largest trade show for interiors will incorporate the Buildings Show, featuring building products and facilities management services; DECOREX, a high-end furnishings show; Office Expo/BPIA, with a full spectrum of office furnishings; *NEW* Hospitality, featuring products for restaurants, hotels, and clubs; and TechnoCon, featuring CAD solutions for interior design. Merchandise Mart. 800/ 677-6278.

RAIC Festival of Architecture
Regina, Saskatchewan
June 10–13
The Royal Architectural Institute of Canada's annual convention will focus on connecting architects to the communities in which they live. A trade show will take place on June 12. Delta Hotel. For information call Rory Picklyk at 306/352-2660.

Entrepreneurship, Innovation, and Design Conference
Wellesley, Mass.
June 15–17
A conference by and for senior corporate executives about methods for achieving success through design. Babson College. Call the Corporate Design Foundation at 617/350-7097 for details.

Competitions

New Public Space Competition
Registration deadline: May 1; submission deadline: June 1
A design competition for a new public square on the Buffalo, New York, waterfront. For information, call Judy Camp, AIA Buffalo/Western New York, 716/852-1900, or E-mail jcamp@buffniag.org.

AIBD and HomeStyle Design Competition
Registration deadline: May 5; submission deadline: June 5
Part of this year's American Institute of Building Designers convention in July, the competition recognizes the best work of AIBD members. For information, call Bobbie Currie at the AIBD, 203/227-3640.

San Francisco Urban Design Competition
Submission deadline: May 18
A competition to develop an urban design vision for the revitalization of 24th Street, a major

(continued on page 362)

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CIRCLE 142 ON INQUIRY CARD

(continued from page 360)

cultural, economic, and social artery in the Mission District and the city. The goal is to create a healthy, vibrant Latino corridor that serves the local community, attracts city dwellers and tourists, and draws Latin American investments, products, and services. Write Brava, 2180 Bryant Street, San Francisco, Calif. 94110; call 415/641-7657; or fax 415/641-7684.

Precast Concrete Design Awards

Submission deadline: May 22

The Precast/Prestressed Concrete Institute offers awards for structures built substantially out of precast concrete. To be eligible, projects must have been completed in the last three years or be substantially complete at the time of entry. Entries must be located in North America to qualify. Open to all registered architects, engineers, and government agencies. Write PCI, 175 W. Jackson Boulevard, Chicago, Ill. 60604; call 312/786-0300; or fax 312/786-0353.

AIA/Continental Europe International Design Awards

Submission deadline: May 22

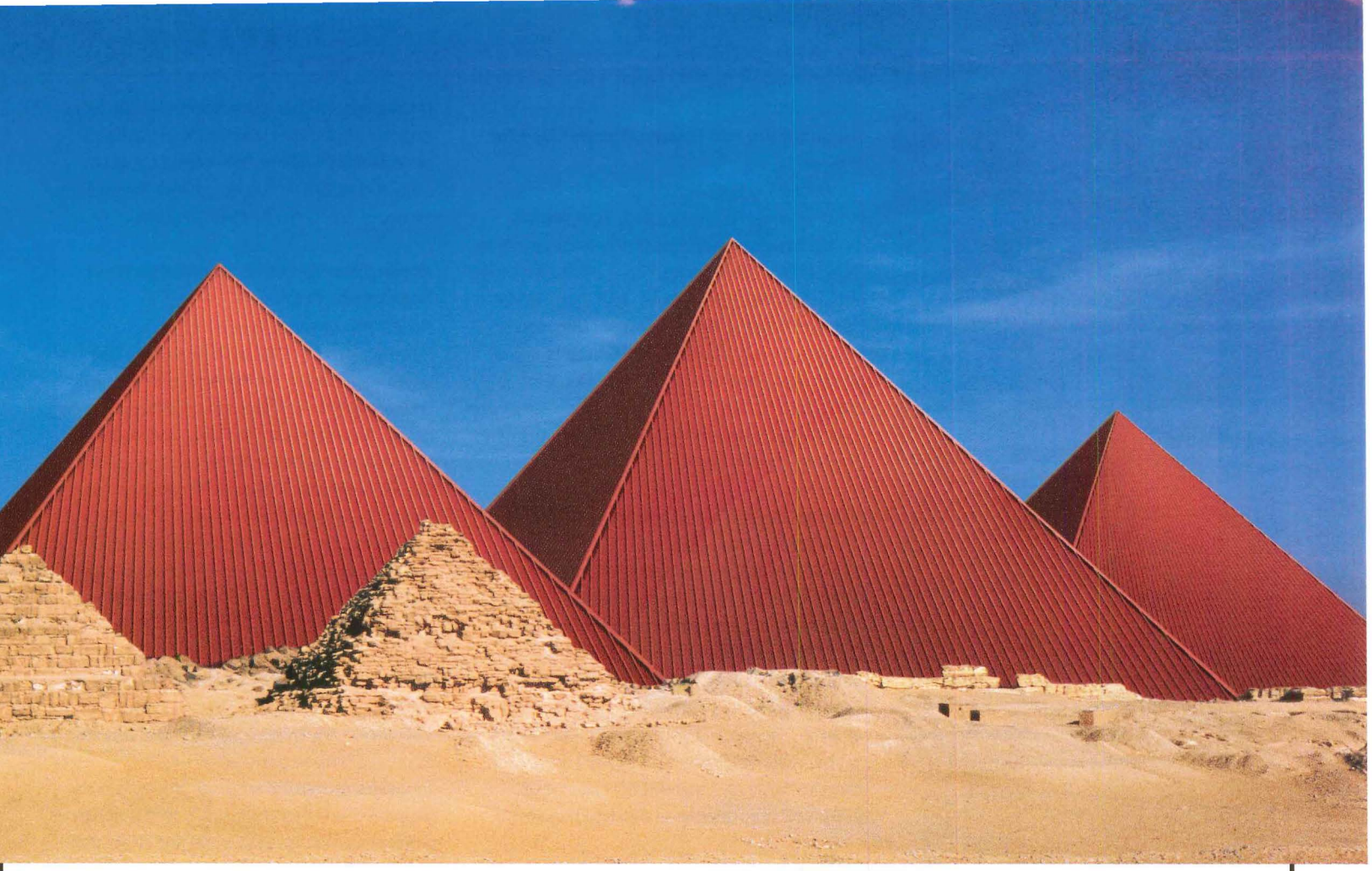
Awards will be given for excellence in architecture, interiors, urban design/planning, and environmental graphic design. Projects built on the European continent and completed after January 1, 1995, are eligible and may be submitted by any member of the AIA. Members of the AIA/Continental Europe Chapter may submit projects built anywhere in the world. For complete entry information, E-mail Frimmel Smith at frimmel@compuserve.com.

Ermanno Piano Scholarship

Submission deadline: May 31

Architects who graduated in 1997 are eligible to further their education by applying for this $10,000 grant, which includes a six-month internship at the Renzo Piano Building Workshop in Genoa, Italy. Call 011/39-10-61711 for application information.

(continued on page 364)



OK, the tourists wouldn't like it as well, but the architects would have been amazed and inspired.

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See us in Sweet's Catalog at 07610-COP (metal roofing), 07415-COP (wall panels) or 05586-COP (metal column covers).

CIRCLE 145 ON INQUIRY CARD

(continued from page 362)

National Art and Design Competition for Street Trees

Submission deadline: June 5

Anyone, design professional or otherwise, is invited to submit a proposal to save street trees. Submissions will be accepted in three categories: Protective Measures (above- and below-ground design solutions), Communicative Concepts (signage or art), and Sidewalk Solutions (street furniture and the like). Call Caitlin Cahill at 212/642-2970 to receive a manual on street tree care, which also includes guidelines for the competition; or fax a request to 212/642-2971.

Architecture + Energy Competition

Submission deadline: June 5

The AIA has announced a call for entries for the 1988 Architecture + Energy Awards: Building Excellence in the Northwest, for the successful integration of outstanding design with energy-efficient technology. Open to completed nonresidential new construction and major renovation projects in Idaho, Montana, Oregon, and Washington. Write AIA/Portland, 315 SW Fourth Avenue, Portland, Oreg. 97204; call 503/223-8757; or E-mail aeprogram@aiaportland.com.

Vital Signs Student Competition

Submission deadline: June 15

The Vital Signs Project, administered through the University of California, Berkeley, announces its 1998 Student Case Study Competition. Undergraduate and graduate students in ACSA member schools of architecture and ABET member schools of architectural engineering in the United States, Canada, and Puerto Rico are asked to investigate, measure, evaluate, and report on the performance of existing buildings. Write Gail Brager, Vital Signs, UC Berkeley, Berkeley, Calif. 94720; E-mail vitalsigns@ced.berkeley.edu; or visit www.ced.berkeley.edu/cedr/vs/act/act_main.html.

Urban Studies and Architecture Institute Competitions

Registration deadline: June 25; submission deadline: July 1

Two idea competitions—one for the proposed redesign of a neighborhood in Verona, Italy, and one for the proposed creation of artificial islands in New York—offer $3,000 prizes and $12,000 grants. Call 212/727-2157 for details or E-mail Ldusainst@aol.com.

Gold Key Awards for Excellence in Hospitality Design

Submission deadline: July 1

Categories for submission are small and large restaurants, lobbies, guest rooms, suites, and senior living facilities. Entries must represent projects constructed or completed between January 1, 1997, and June 1, 1998. For an entry form, call Ron Zobel at 914/421-3315.

James Marston Fitch Charitable Trust Mid-Career Grants

Application deadline: August 15

Research grants of $20,000 are being awarded to professionals in the fields of historic preservation, architecture, landscape architecture, urban design, environmental planning, archaeology, architectural history, and the decorative arts. Eligible are those who have an advanced or professional degree and at least 10 years of experience. Smaller grants of up to $10,000 are also being awarded. For more information, contact Morley Bland at Beyer Blinder Belle, 212/777-7800.

Boston Society of Architects Design Awards

Submission deadline: August (unbuilt awards); September (honor awards)

The BSA's Architectural Design Honor Awards program is open to all Massachusetts architects' projects anywhere in the world and to all architects who have designed built projects in Massachusetts. The Unbuilt Architecture Design Awards are open to architects, architectural educators, and students anywhere in the world. Call BSA at 617/951-1433 x221; fax 617/951-0845; or E-mail bsarch@architects.org.

Membrane Design Competition

Submission deadline: September 2

This year's Membrane Design Competition, sponsored by Taiyokyogo Corporation, honors the creative design of airport structures using membrane. Write Membrane Design Competition, 4-8-4 Kigawa-higashi, Yodogawa-ku, Osaka 532-0012, Japan; fax 011/81-6-306-3154; or E-mail mh_001600@fc.taiyokogyo.co.jp.

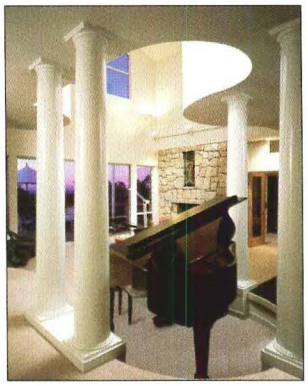
Shinkenchiku Residential Competition

Submission deadline: September 10

Kyoto architect Shin Takamatsu will judge this year's idea competition, sponsored by *The Japan Architect* magazine. Winners' work will be published in the December 1998 issue of *JA*. To receive a copy of the rules, fax a request to 011/ 81-3-3811-0243.

Please submit information for exhibitions, conferences, and competitions at least six weeks prior to the magazine's publication date (e.g., June 15 for the August issue).

Chadsworth's 1.800.Columns



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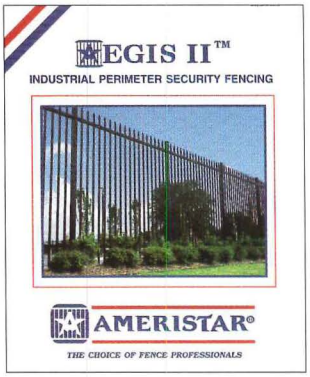
Chadsworth's 1.800.Columns

CIRCLE 158 ON INQUIRY CARD

AEGIS II

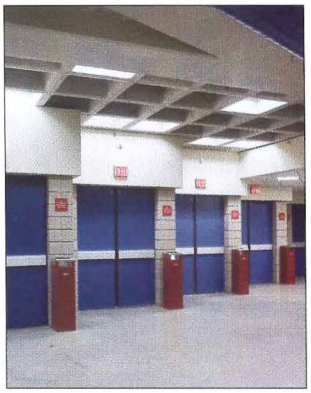


Aegis ornamental fence systems feature strong Forerunner™ rails, internal retaining rods, & designed panel brackets. Aegis II industrial fence offers the strongest security fence avail. Aegis is specified by more architects & builders than any other on the market. Industrial & residential brochures incl. data on structure, design & options. Easy shipping panel design. (800) 321-8724. POB 581000, Tulsa, OK 74158-1000, F: (918) 835-0899.

Ameristar

CIRCLE 159 ON INQUIRY CARD

Total Door® The Openings® Solution



Total Door® is a fire rated door assembly that includes all hardware. Pairs do not require coordinators, vertical rods, astragals, flush bolts, or floor strikes. Will retrofit to any frame. Meets all codes and ADA. Wood and metal faces available to 3 hours. Lifetime limited warranty on locks and panics. For more information call 1-800-852-6660.

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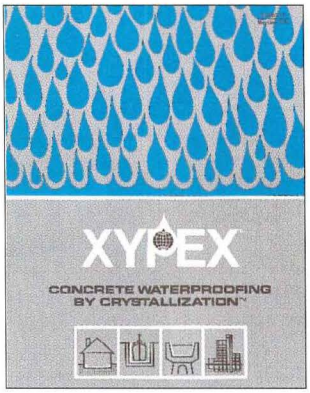
Concrete Waterproofing by Crystallization



Applied as a slurry coating Xypex is a chemical treatment that waterproofs by penetrating the concrete with a crystalline formation that "plugs" the pores of the structure preventing water seepage. Xypex is ideal for use on the "inside" of wet underground structures.

Xypex Chemical Co.

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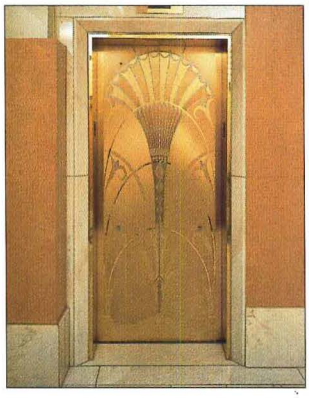
Custom Metal Graphics



These bronze elevator door facings were manufactured by Surface Design + Technology specializing in custom & standard metal graphics. Using sheet metal finishes of a variety never offered before. There is virtually no limit to the types of patterns which can be created by combining multi-directional satin brushing, electroplating of gold, nickel, or copper. For information on custom or standard designs call (800) 537-1127.

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A full color catalog will explain the different Handy-Shield safety covers offered for the new or retrofit projects that need to comply with the American Disabilities Act. The specific use, sample specifications, drawings and color choice are all summarized in this easy to understand catalog. (800) 475-8629.

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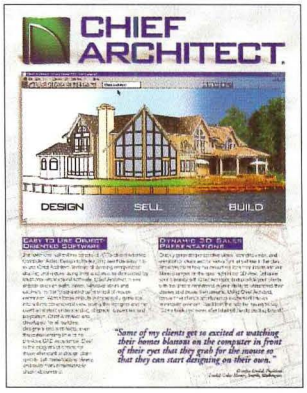


Proves that top quality architectural software can be easy to learn. Straight out of the box, Chief simplifies the process of creating full working drawings. Over 300,000 people worldwide prefer ART's architectural software with its full 3-D capabilities. Advanced Relational Technology, Inc. 3731 N. Ramsey Rd, Suite 150, Coeur d'Alene, ID 83814. T: (800) 482-4433, F: (208) 664-1316, artchief@chiefarch.com www.chiefarch.com

ART

CIRCLE 165 ON INQUIRY CARD

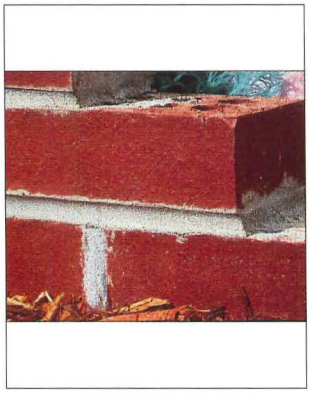
Buckingham-Virginia Slate

has been sheltering America for over two centuries. As a roofing material, it is prized for its high mica content, natural cleft and texture, as well as its non-fading and distinctive hand-made quality. Because of it's permanence and natural beauty, it was specified by Thomas Jefferson in the 1800's and remains today the roofing choice of eminent architects. Buckingham-Virginia Slate, P.O. Box 8, Arvonia, VA 23004. T: 1-800-235-8921.

Buckingham-VA Slate

CIRCLE 166 ON INQUIRY CARD

Mortar Net Weep Vents



are inexpensive and easily installed in weep holes to insure masonry cavity walls breath, drain and dry quickly. Made from 100% recycled polyester with a 90% open mess in 2.5" x 4" x.5, they are available in white, tan , almond, gray, and brown. Weep Vents add to the beauty of the wall by duplicating the texture and color of mortar, thus eliminating open holes and dark shadows while restricting entry to insects. Call (800) 664-6638 for more information.

Mortar Net

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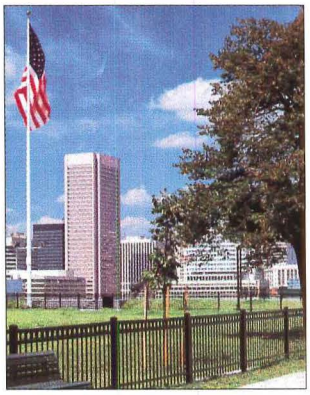
Ornamental Picket Fence with a Purpose



We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: (410) 633-6500, Fax: (800) 239-2963.

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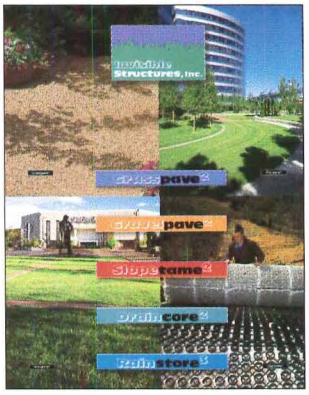
CIRCLE 168 ON INQUIRY CARD

New Invisible Products Roll Out

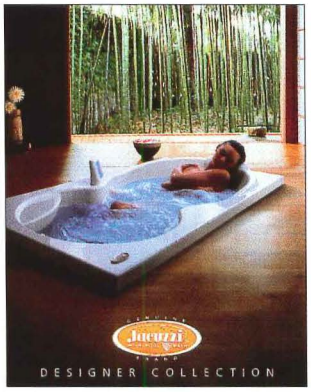


3 new invisible products have been added to the family of Grasspave² & Gravelpave² - Slopetame², Draincore², & Rainstore³. For 16 years we have provided grass paving ring structures with 92% void area for root development. Now we're applying this technology to erosion control, drainage, & water storage with easy installation in 9 roll sizes. Call our knowledgeable staff for CADD details, specs, & product specs at (800) 233-1510. Web Site: http//:wwwinvisiblestructures.com

Invisible Structures, Inc.

CIRCLE 169 ON INQUIRY CARD

Jacuzzi Whirlpool Bath

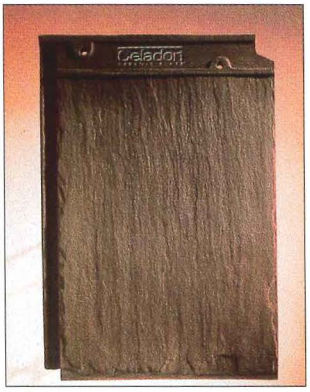


presents The 1998 International Designer Collection of whirlpool baths, faucetry and The J-Dream™ Family of shower systems. This full color catalog features beautifully styled products, integrating the most innovative luxury features. For more information please call 1-800-288-4002. (www.jacuzzi.com). Catalog free of charge.

Jacuzzi Whirlpool Bath

CIRCLE 170 ON INQUIRY CARD

Celadon™ Ceramic Slate™



A kiln-fired, interlocking clay roof tile designed to look like thick slate with a breaking strength greater than 300 pounds; impervious to freeze-thaw degradation with less than 1% moisture absorption; color will not fade, flake, or effloresce—offered in slate gray, slate red, montpelier green, plumstone, and brunswick black. Sixty-year limited, transferable warranty.

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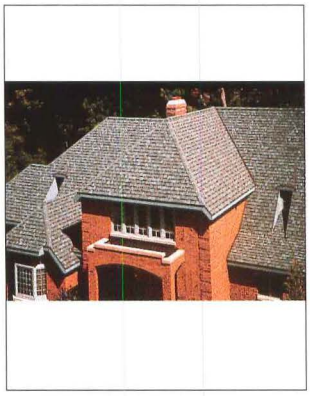
CIRCLE 171 ON INQUIRY CARD

Grand Manor Shangle®



CertainTeed's Grand Manor Shangle® is a super heavyweight shingle built on two full-size one-piece shingles with random 8" tabs applied on top. Patented shadow lines and a unique color palette give Grand Manor the look and depth of natural slate and wood. UL Class A. Lifetime limited, transferable warranty. Algae-resistant. Meets ASTM D 3462—Tear Strength.

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Tuflex Rubber Flooring

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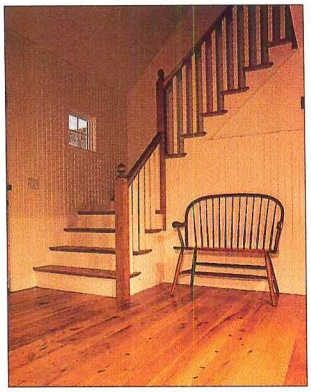
Reclaimed, Remilled. Remarkable

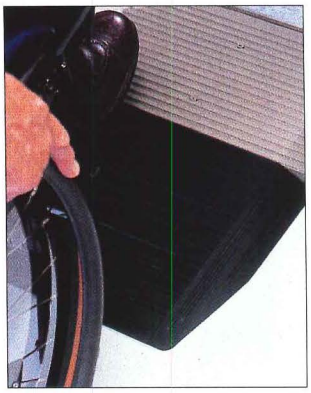


Vintage Lumber Co., Inc. has been manufacturing exceptional antique T&G plank flooring since 1973. Our extensive selection, consistent quality, on time delivery, and technical expertise is unequaled in the industry. For more info call 800-499-7859 or fax 301-845-6475. P.O. Box 104, Woodsboro, MD 21798

Vintage Lumber

CIRCLE 174 ON INQUIRY CARD

ADA Compliant Rubber Ramps



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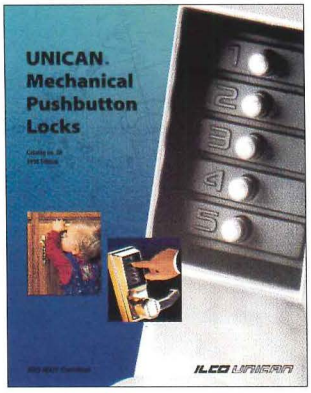
CIRCLE 175 ON INQUIRY CARD

Millions of Pushbutton Locks in Use Worldwide



ILCO UNICAN® pioneered mechanical pushbutton locks, & we continue to be the world leader in this type of security. Our locks help secure The Pentagon, US & Canadian embassies, McDonald's fast-food restaurants, plus major universities, banks, & airports around the world. We offer a wide range of models & styles to fit many applications. Most anything presently secured by a key can have the security & convenience of a pushbutton lock. (336) 725-1331.

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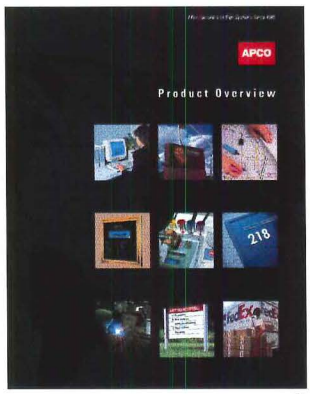
Architectural Signage



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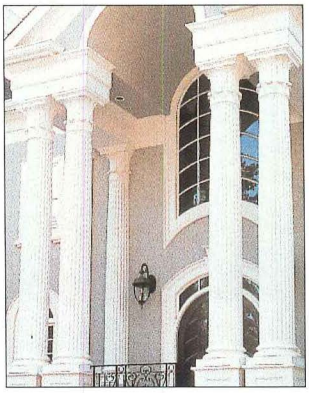
APCO

CIRCLE 178 ON INQUIRY CARD

Columns & Balustrades



Classically authentic yet affordably priced columns and balustrades from Melton Classics, Inc. Quality products include architectural wood columns for paint or stain, fiberglass columns, poly/marble columns and synthetic stone columns and balustrades. Interior/Exterior, Custom Orders, Jobsite Delivery. Call 800-963-3060 for free literature or see us in Sweet's (06400Mel) or (04720Mel).

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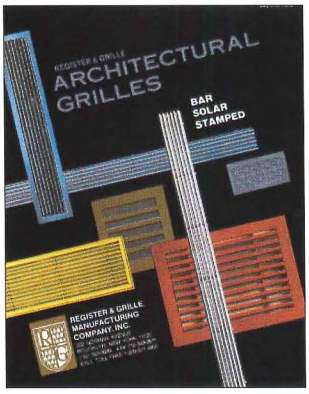
CIRCLE 179 ON INQUIRY CARD

Decorative Grilles



Unusual visual effects emerge when our grilles are designed for area effects. Versatility is the theme. R&G offers architects and interior designers many ways to express the changing forms of metal with the integrity of R&G's architectural grilles. Custom or standard finishes are available plus any grille can be made in matching color to blend with your deco. 202 Norman Ave., Bklyn, NY 11222. 800-521-4895, Fax: 718-349-2611.

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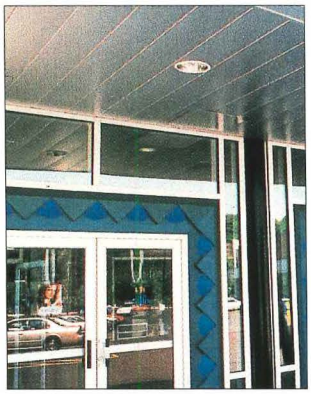
Peerless Jumbo® Mounts

Feature adjustable height, width, tilt & swivel. Mounting plate allows the fine-tuning of gravity in relation to degree of tilt, while top clamps provide stability. Constructed of heavy gauge steel with durable epoxy finish, mounts are avail. in sizes to accom. 13" - 42" screens & 125lb. - 300lb. UL listed & CSA cert. Several OSHPD apprd. VCR attachments & tamper resistant security fasteners opt.

Peerless Industries

CIRCLE 181 ON INQUIRY CARD

Luxalon Wide Panel Systems

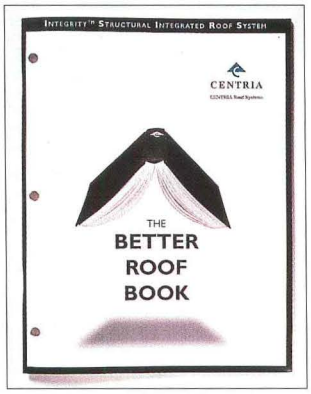


This revolutionary ceiling system offers nominal 12" (300mm) wide panels in lengths up to 19' 8" (6m) creating a clean, sophisticated, monolithic ceiling plane. Long spans are available with a soft beveled edge or a reveal edge. The system provides both acoustics and aesthetics with easily installed panels. Available in 8 finishes and 2 perforation patterns. For further information call 800-366-4327.

Hunter Douglas

CIRCLE 182 ON INQUIRY CARD

CENTRIA Integrity™ Structural Integrated Roof



The "Better Roof Book" details the installation and performance of CENTRIA's Integrity™ Structural Integrated Roof System (SIRS). Integrity SIRS are composite panels that reduce costs by eliminating the need for separate decking and minimizing roof framing requirements. Rated up to R-32, Integrity consists of an exterior of G-90 galvanized steel—coated in more than 20 colors—and a finished steel interior panel with a core of high-density urethane foam core.

CENTRIA

CIRCLE 183 ON INQUIRY CARD

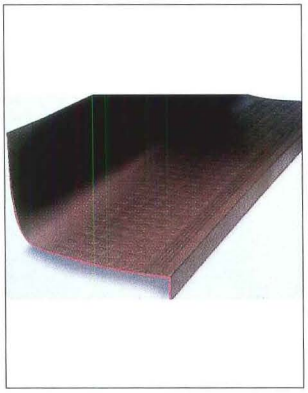
Ultra-Clear Corrosion-Resistant Industrial Intercoms

Versatile communications for difficult, corrosive, wet, noisy sites. Unmatched simplicity of installation. Indoors/outdoors. In extreme temperatures. Industrial-strength cast aluminum cases; neoprene gaskets, seals. Heavy-duty switches tolerate extremely rough handling. Many models, including hands-free. ADCO's tech support answers questions; designs systems tailored to individual site requirements. T: 650/583-9845, F: 650/876-0111, email: adco@mcn.org.

Atkinson Dynamics

CIRCLE 184 ON INQUIRY CARD

New One-Piece Stair Tread/Riser Combination

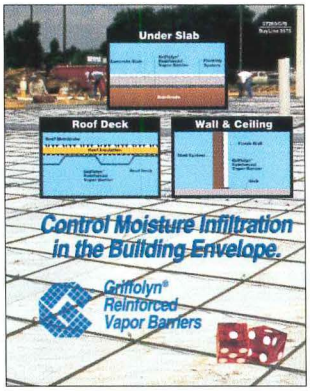


Mercer Products Company introduces its new one-piece Stair Tread/Riser Combination. This quality one-piece stair nose/stair tread/back riser is molded together as a single seamless unit and is ideal for high traffic areas and easy installation and maintenance. Available in lengths of 48" and 72" and in 12 standard Uni-Color® System colors. 800-447-8442 or www.mercerproducts.com

Mercer Products

CIRCLE 185 ON INQUIRY CARD

Griffolyn® Reinforced Vapor Barriers

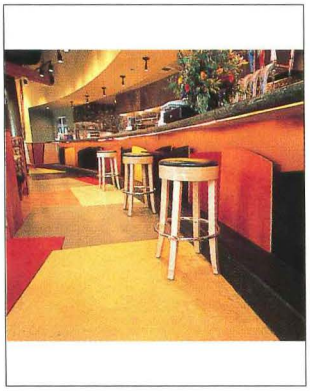


Color catalog covers the system approach to vapor barriers — Griffolyn® reinforced vapor barriers — for under slab, wall and ceiling, and roof deck applications. Catalog includes product descriptions, ASTM test results and application selection guide. For information: 800/231-6074. Griffolyn reinforced vapor barriers by Reef Industries, P.O. Box 750250, Houston, TX 77275-0250.

Reef Industries

CIRCLE 186 ON INQUIRY CARD

Patène Artectura

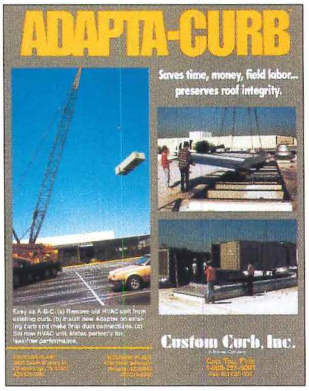


Patène Artectura by Bomanite is a revolutionary systems approach to concrete flooring and pavements. Designed to enhance the beauty of any project, Patène Artectura melds creative techniques in coloring, patterning, texturing and finishing methods to achieve customized results. Appropriate for interior and exterior applications, new or existing concrete. Call (209) 673-2411 or visit www.bomanite.com.

Bomanite Corporation

CIRCLE 187 ON INQUIRY CARD

Sloped Adapter for Retrofit Solutions

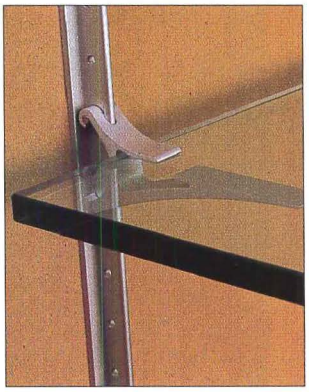


Exclusive sloped adapter is designed for positive water run-off & proper load distribution. Informative Adapta-Curb brochure details the many configurations & options available for easy addition or replacement of HVAC units, vents, plumbing stacks, skylights & other rooftop equipment without disturbing the roof or substructure. The system is a solution for retrofit or for new construction where equipment size will be determined later. 1-800-251-3001.

Custom Curb, Inc.

CIRCLE 188 ON INQUIRY CARD

Parallel Design Partnership Limited

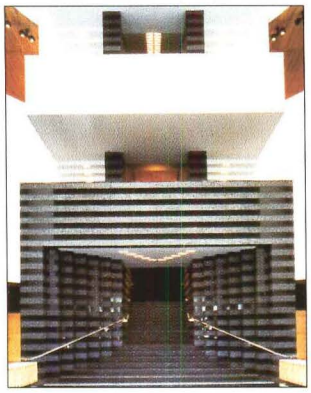


"ellen's brackets", and anodized-aluminum shelving system designed by M Ali Tayar, provides an elegant alternative to existing bracket-and-track systems. Cantilevered brackets come in two sizes, for shelves 3/4 or 3/8-in. thick and 10-in. deep. Wall-mounted tracks permit 1 1/2-in. adjustment of wood, glass or plexiglass shelves. For more info phone Parallel Design Tel: 212/989-4959 Fax: 212/989-4977.

Parallel Design

CIRCLE 189 ON INQUIRY CARD

Granite Design Award

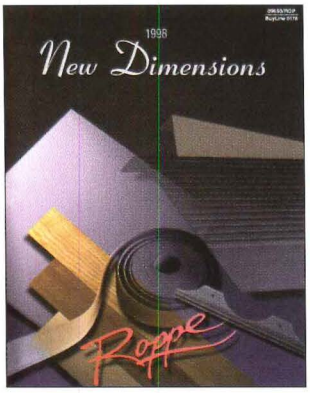


The winner of the Marble Architectural Awards '97, Section 2 (Interior Design), is HOK with Mario Botta. The winning project, utilizing Peribonka Black granite, is the San Francisco Museum of Modern Art. The jury's comments were, "a really harmonious central reference element".

Granicor

CIRCLE 190 ON INQUIRY CARD

1998 Catalog

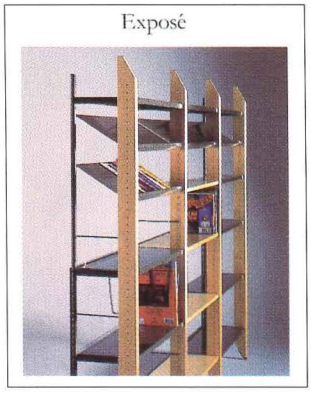


Roppe enters 1998 with more colors & styles of high quality flooring products. The North Coast Collection luxury vinyl tile line features Wood & Terra Naturals. Wood Naturals feature wood-look planks & tiles in many colors & styles. Terra Naturals contain a variety of marble, granite, & stone looks. Our expanded line of stair treads, including abrasive strip treads, meet current access code requirements. Offering more cove base varieties with a broad color selection. Products focus on quality & ease of installation & maintenance.

Roppe

CIRCLE 191 ON INQUIRY CARD

Scania® Contract Furniture



Gressco offers a unique, non-dominating shelving system that lends a feeling of airiness, yet is inherently stable. Expose is a flexible, modular design shelving system with many accessories for the different media. As in other Scania shelving designs from Gressco, Expose offers flexibility and function well suited to public use. For literature and the name of dealer in your area call 800-345-3480 or e-mail our website www.gresscoltd.com

SCANIA® from Gressco

CIRCLE 192 ON INQUIRY CARD

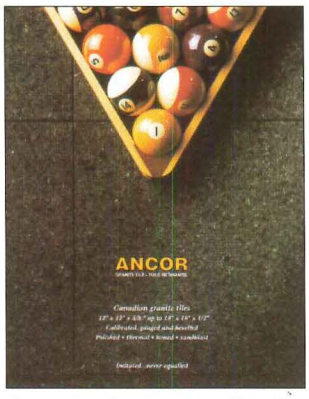
Decorative, Thin-Film Intumescent Fireproofing

Improved spray characteristics and ratings up to 3 hours! A/D FIREFILM®II permits designers to use the appearance of exposed steel with the steel protected from fire. The product is applied as a thin-film coating 0.4 to 3.3 mm (16 to 130 mils) thick. When exposed to fire it expands to form a meringue-like insulating layer up to 4 in. thick. A/D COLORCOAT topcoat is available in a wide range of colours. Call 1-800-263-4087 or 416-263-4087. Internet: www.adfire.com

A/D Fire Protection

CIRCLE 193 ON INQUIRY CARD

Ancor Granite Tile



Ancor produces over fifty No. American and Imported granites in a full range of colors and finishes for residential, commercial and institutional use. Standard format is 12 x 12 x 3/8"; other sizes up to 18 x 18 x 1/2" available. Honed finish tile is particularly suitable for high traffic commercial areas, 435 Port Royal West, Montreal, Quebec, H3L2C3, Canada. Ph# (514) 385-9366, Fax# (514) 382-3533.

Ancor Granite

CIRCLE 194 ON INQUIRY CARD

Pan-Tech

manufactures composite building panels in a variety of different face materials and finishes. Aluminum: two, three and four coat Kymar finishes, anodized, colour & brushed. Stainless Steel: 304, 316 grades, #4, #8 finish, coloured stainless and patterned. Zinc: Rheinzink preweathered. Porcelain: for Spandrel applications. Copper: prepatinated.

Pan-Tech, Inc.

CIRCLE 195 ON INQUIRY CARD

Hadrian Lockers for Nagano Olympics

Hadrian's open face hockey lockers, illustrated, were supplied to the Nagano Olympics. Hadrian's complete locker line includes durable hybrid epoxy powder coated standard locker systems and Athletic Lockers, all of unsurpassed quality. Both have in common single point latching, double pan box doors hung on sturdy full length continuous hinges.

Hadrian, Inc.

CIRCLE 196 ON INQUIRY CARD

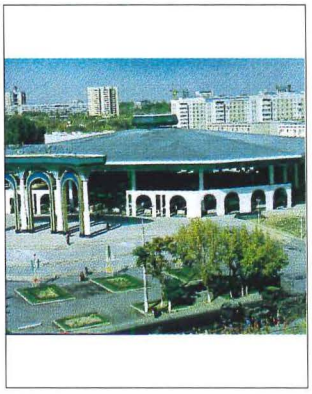
Teamboard The Interactive Whiteboard

Teamboard Inc., a new company by Egan Visual, has developed the industry's most powerful computer interactive whiteboard. Teamboard runs with Microsoft NetMeeting software allowing remote users to collaborate with the simplicity of a whiteboard. Share documents, print whiteboard notes in color & more. Project any computer application on the Teamboard surface & create a large area touch screen permitting you to control the projected application by touching the whiteboard. For more information 1-800-263-2387 or visit www.teamboard.com.

Egan Visual Inc.

CIRCLE 197 ON INQUIRY CARD

S+P Daylighting System

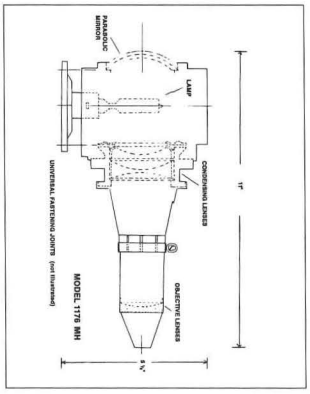


S+P's Daylighting System (DS) is a result of the newest developments in plastics and building industries and provides complete architectural solutions for applications such as skylights, covered walkways, pool enclosures, solariums, atriums, greenhouses and any vertical or sloped translucent glazing. Our daylighting systems combine superior performance and design flexibility with simplicity and affordability.

S+P Architectural

CIRCLE 198 ON INQUIRY CARD

Wendelighting

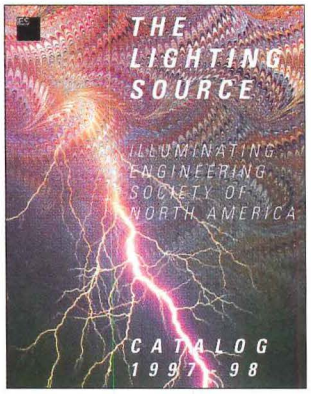


The energy efficient 1176MH 35watt metal halide projector, with a lamp life of 6-8000 hours is applicable to commercial, industrial and home uses (UL approval pending). It features (optional) our patent ed Systeme Photographique (image recording). 1-800-528-0101, e-mail Wendeltg@pa bell.net, on the web at Wendelighting.com.

Wendelighting

CIRCLE 199 ON INQUIRY CARD

Illuminating Engineering Society of North America

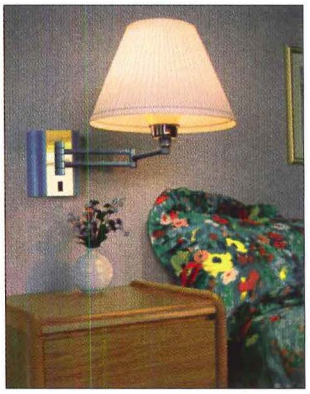


The LIGHTING SOURCE by the IESNA offers a vast selection of standards and publications for the lighting professional. The IESNA has 10,000 members and offers many benefits. If you wish to receive a a complimentary copy of the catalog, please call Albert Suen at T: (212) 248-5000, F: (212) 248-5017, or e-mail bethbay@aol.com.

IESNA

CIRCLE 200 ON INQUIRY CARD

Nightingale® Brass 'n Color® Wall Mount Overbed Lamp

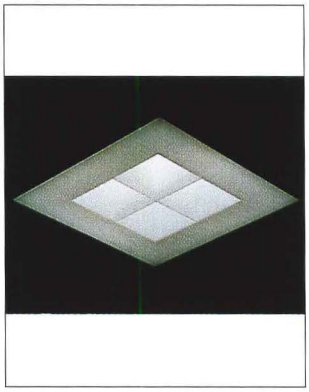


Award-winning lighting design – an attractive, economical lighting solution designed for multi-housing, healthcare & institutional applications. Handsome Brass 'n Color detail, solidly built to resist breakage. Eliminates flimsy, sagging wall lamps. Exclusive PolyLast™ Shade features delicate pleatwork, yet it's virtually indestructible. Energy-saving options. Beauty, security & stand-up durability with surprising economy. Adjustable Fixture Co., Milwaukee, WI. www//adjustablefixture.com.

Adjustable Fixture Co.

CIRCLE 201 ON INQUIRY CARD

Recessed Compact Fluorescent Downlight

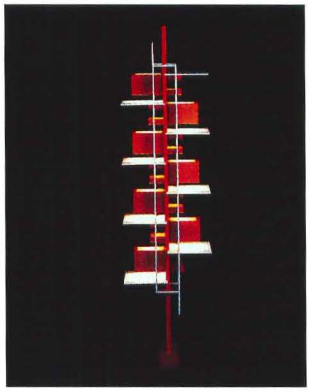


"FANCY FREE", the 1997 APEX lighting award winner. The concept of this new design was to create an aesthetic, 12" square recessed compact fluorescent downlight that eliminates the harsh visual contrast between the ceiling and the fixture aperture, and offers designers numerous variations in lighted appearance. At the heart of this innovation is the design of the translucent louver cell assembly. T: (718) 456-7400 • F: (718) 456-5492 • http://www.neoray.com

Neo-Ray Products

CIRCLE 202 ON INQUIRY CARD

Taliesin® Pendant



Wright planned the first Taliesin Playhouse, the room required hanging fixtures that would illuminate but not be glaring. Wright denounced the bare light bulb & described it as "electric lighting without glass". When the original theater burned in 1952, Wright updated the pendant design, as reproduced by Yamagiwa USA Corp. Available in two sizes. For further info call 1.888.879.8611 (toll free). Yamagiwa USA Corp, 31340 Via Colinas, Ste 106, Westlake Village, CA 91362.

Yamagiwa USA Corp.

CIRCLE 203 ON INQUIRY CARD

AR6™ and AR7™ Recessed Luminaires

Irideon, Inc. manufactures architectural lighting with automated color change, movement and beam control capability, providing a means of choreographing light in an interior or exterior space. Our new AR6™ and AR7™ recessed luminaries are completely user-configurable, offering a variety of long-life lamps and only the colors, patterns and beam options you require.

Irideon, Inc.

CIRCLE 204 ON INQUIRY CARD

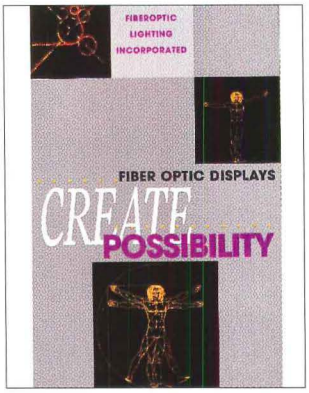
Lexington Aluminum Lighting Standards

Cost-effective durable, attractive, & strong describe Lexington Standard's aluminum lighting standards. Models include round tapered/ straight /decorative, square, hinged, & embedded. The wide range of finishes & colors appeals to architects; contractors appreciate the ease of installation; distributors are attracted to the economical prices; owners enjoy a product that's virtually maintenance-free.

Lexington Standard

CIRCLE 205 ON INQUIRY CARD

Bright Ideas with Fiber Optics

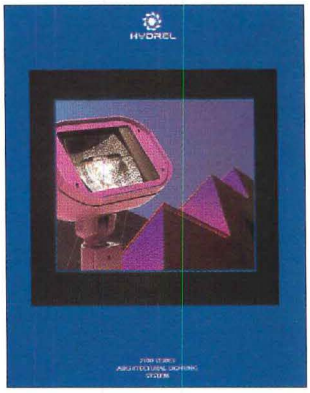


Paint with light! Fiber optic displays are an ideal medium for use in any environment. These low maintenance displays are used for wall murals, ceilings, indoor or outdoor enhancements, hotels, museums, restaurants, retail, office and healthcare facilities. Changing colors and implied motion add to the magic.

Fiber Optics

CIRCLE 206 ON INQUIRY CARD

High Performance with Uniformity and Control



Hydrel's 7100 Series Architectural Lighting System provides high performance with maximum uniformity and control. Eight standard light distributions. Standard internal glare control. Multiple mounting capabilities. Contemporary styling to complement any architectural statement. Up to 175 watts HID.

Hydrel

CIRCLE 207 ON INQUIRY CARD

Versatile Tripod Pendant

Versatile tripod pendant custom made in 20 different finishes and a multitude of diffusers of hand slumped glass or acrylic. Many sizes available using incandescent, halogen or PL. New: etched patterns from our standard collection of your imagination. For information, call (510) 849-1842 or fax (510) 849-2328.

Classic Illumination Inc.

CIRCLE 208 ON INQUIRY CARD

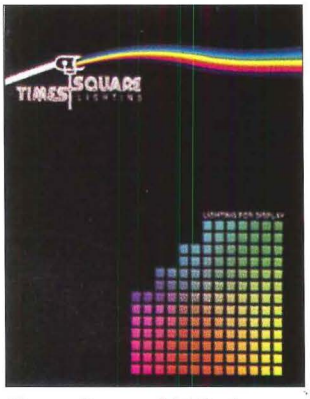
Cast Aluminum Lighting

Sun Valley Lighting manufactures an extensive line of Standard & Custom cast aluminum lighting poles & fixtures in all period styles. Our 50 years of design & manufacturing experience provides you with unexcelled product quality. Our staff of designers, engineers, and tool makers are here to assist you. Our in-house foundry assures quality and prompt delivery at competitive costs.

Sun Valley Lighting

CIRCLE 209 ON INQUIRY CARD

Lighting Fixtures

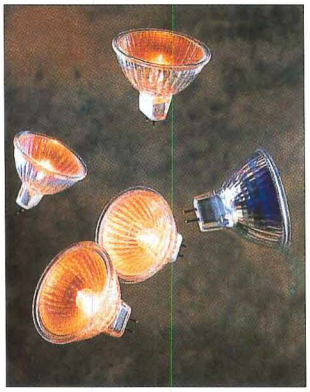


Times Square Lighting's condensed catalog contains our complete line of line and low voltage specification grade lighting fixtures. Numerous mounting options as well as accessories for our fixtures are available. Times Square Lighting, Rte. 9W, Stony Point, NY 10980, 914-947-3034.

Times Square Lighting

CIRCLE 210 ON INQUIRY CARD

Ushio's Ultraline™ 10,000 hour MR-16



Ushio's Ultraline™ 10,000 hour MR-16 lamps are rated at more than twice the life of any MR-16 lamp on the market. The Ultraline™ series maintains consistent color throughout the life of the lamp & the halogen capsule protects ultraviolet sensitive objects by eliminating 90% of the harmful UV emissions. Available in medium, wide & soon to be released spot beam spreads. Ushio America is located at 10550 Camden Drive, Cypress, CA 90630. Call (800) 218-7446. www.Ushio.com

Ushio Specialty Lighting

CIRCLE 211 ON INQUIRY CARD

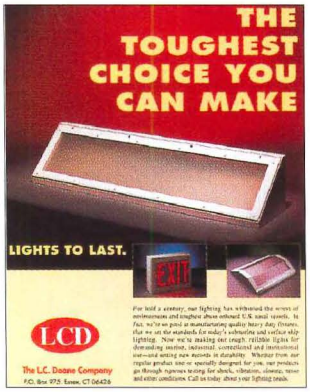
The New Saturn

The newly expanded Saturn series offers a wide variety of contemporary and classic finishes coupled with three diffuser materials. Shown here is the SNC-277D-4DP1 which couples a Brushed Brass finish and cable hanging system with a White Acrylic diffuser. This fixture will accommodate four 26W quad fluorescent lamps. The Original Cast Lighting Inc. 6120 Delmar Blvd., St. Louis, MO 63112, 314-863-1895, fax 863-3278, www.theOCL.com.

The Original Cast Lighting

CIRCLE 212 ON INQUIRY CARD

The L.C. Doane Company



We Wrote the Book on Toughness. Our lighting has withstood the worst of environments and toughest abuse onboard U.S. naval vessels. In fact, we set the standards for today's naval ship lighting. Now we're making lights for demanding industrial, correctional and institutional use. Our products go through rigorous testing for shock, vibration, closure, noise, etc. The L.C. Doane Company, P.O. Box 975, Essex, CT 06426, Tel: 1-800-447-5006, Fax: 1-860-767-1397

The L.C. Doane Company

CIRCLE 213 ON INQUIRY CARD

When Gremlins Strike

. . . Metpar partitions always win!

"Heck, this stainless steel plywood core has seven layers. I just can't penetrate it. Look, all my efforts can't scratch the surface and graffiti just rubs right off. Taking down the building was easier than this!"

"Gee, I've been prying at this full-height bracket for hours. Nothing is bringing this partition down."

"This leather grain stainless steel finish is repelling my strokes of genius. Darn, it's been formed and cemented under pressure and secured with steel reinforcements. I'm outta here!"

"Man, this full-length multi-cam hinge won't rust or bend no matter what I do. Its 16 gauge, type 304 stainless steel construction is indestructible."

Metpar's heavy duty stainless steel system is designed to withstand whatever your gremlins dish out. Whether it's graffiti, scratches, or corrosion, Metpar's state-of-the-art partitions make winners out of every designer, architect, and builder in the battle against gremlins.

"Let's find ourselves an easier target. Metpar's stronger than we are."

Send for your free catalog or CD-ROM for specifications and details on domestic and international installations.

Put the power of Metpar in your plans.

Metpar

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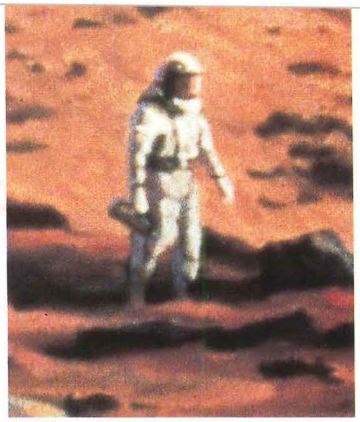
CIRCLE 152 ON INQUIRY CARD



THE FUTURE Building on Mars and living off the land.

BY KEITH DAWSON

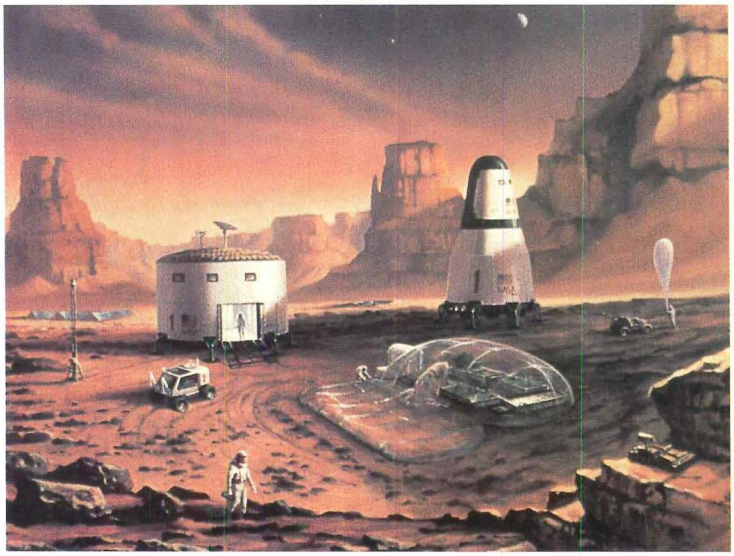
It is likely that sometime in the next 10 or 15 years, we will see astronauts taking their first steps on Mars, followed by the first wave of long-term exploration there. What once looked like mere science fiction is now the domain of technology planners who are trying to determine the best way to build structures for long-term living and working on Mars.

Although much farther away than the Moon, Mars is a warmer, windier, far more Earthlike place with distinct seasons. Once you accommodate the need for airtight containment and pressure resistance, the constraints of building structures on Mars are not too different from those of building on Earth. You can use much of the same available material. The real questions, then, are what can be found, made, or transported there, and how to make use of the materials.

Robert Zubrin of the National Space Society explains that within 10 years we could be visiting Mars, with the hope of future colonization.

Robert Zubrin, an astronautical engineer with the National Space Society, a research center, is one of the founders of Mars Direct, a program that proposes sending people to Mars for colonization. The plan emphasizes the use of currently available technology to send equipment, fuel, and machinery to a landing site on Mars and to prepare locations for people to inhabit. The key element in the Mars Direct plan, says Zubrin, is "living off the land," or making use of Mars's natural resources to create fuel for the return flight and for the construction of additional structures beyond the initial habitation units.

A report published for NASA in February of this year by a panel of scientists and engineers at the National Research Council lent support to this approach. Space-based natural-resource extraction was one of six areas that the report recommended for modest investment by NASA to achieve the most technological development between the years 2000 and 2020.



Zubrin explains that within 10 years we could be sending the first wave of explorers on missions that would last several years and cost dramatically less than NASA's estimates for similar programs in the 1980s. He has proposed (and current NASA planners now endorse) a plan that includes, as a starting point, prefabricated, tuna-can-shaped, metal habitation units that would be large enough to house the crew of a mission.

Zubrin says that they will be able to use indigenous materials to build add-on structures. For example, the compounds necessary for making Portland cement—calcium, gypsum, lime, and mortar—are in ample supply on Mars. Ceramics, concrete, and steel can all be fabricated on Mars with present-day technology and used in surface construction.

Given Mars's low gravity (slightly more than one-third that of Earth), some materials may be easier to use there because of their lower weight: steel becomes as easy to manipulate as aluminum. Brick can also be made on Mars, says Zubrin, and will probably be used in the first structures.

Once settlers are ready to branch out beyond their tuna cans, add-on structures can be built on the surface or below the ground. In either case, they must be able to retain their atmospheric pressure and screen out the high level of background radiation coming through Mars's thin atmosphere.

Going underground would mean using earth-moving equipment to dig trenches, which would be filled with a concrete foundation and a series of brick-and-mortar arched roofs. These would be covered with a layer of sandbags to maintain the internal atmospheric pressure and screen out radiation. The problem with this approach is that it is incredibly labor-intensive; of all the construction elements that must be transported to the surface of Mars, labor is the most difficult and the most expensive.

Zubrin leans instead toward building domes made of a metal geodesic framework and covered with layers of plastic fabric and an antiradiation coating. From a human point of view, the advantages are obvious: a more spacious environment with natural light. "You get a large living space," he says. In addition, domes are less labor-intensive. "What you have to do is excavate a crater, as opposed to building Roman arches underground."

As Mars Direct helps collapse the time line for exploration, the tools for building on the planet are already available. Neither fabricating materials nor actual construction on Mars is impossible; the greatest difficulty is getting finished products from here to there. But once the challenges of constructing the international space station are conquered, building on Mars may seem almost easy. ■

Keith Dawson is a freelance writer based in New York City.

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