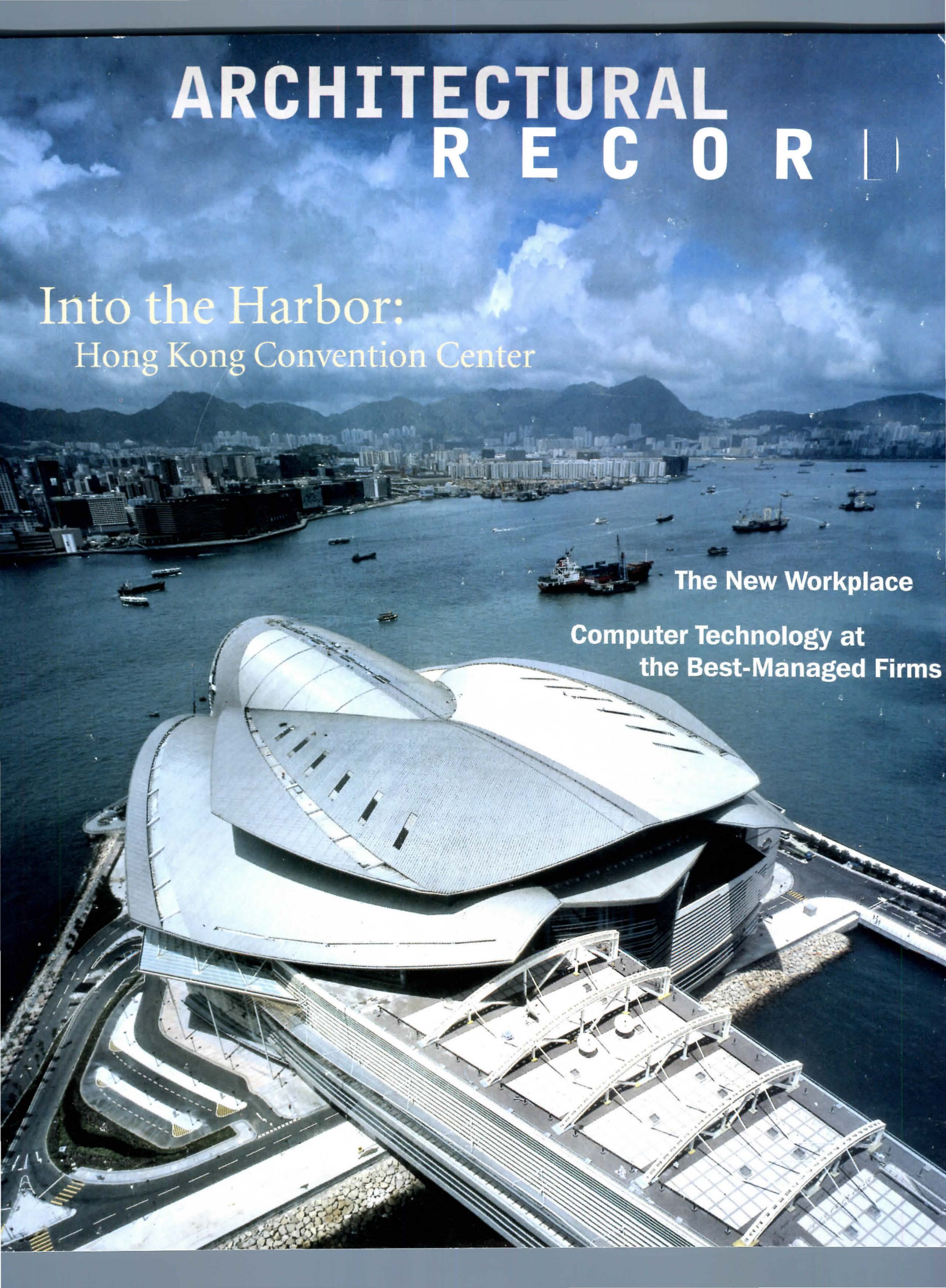


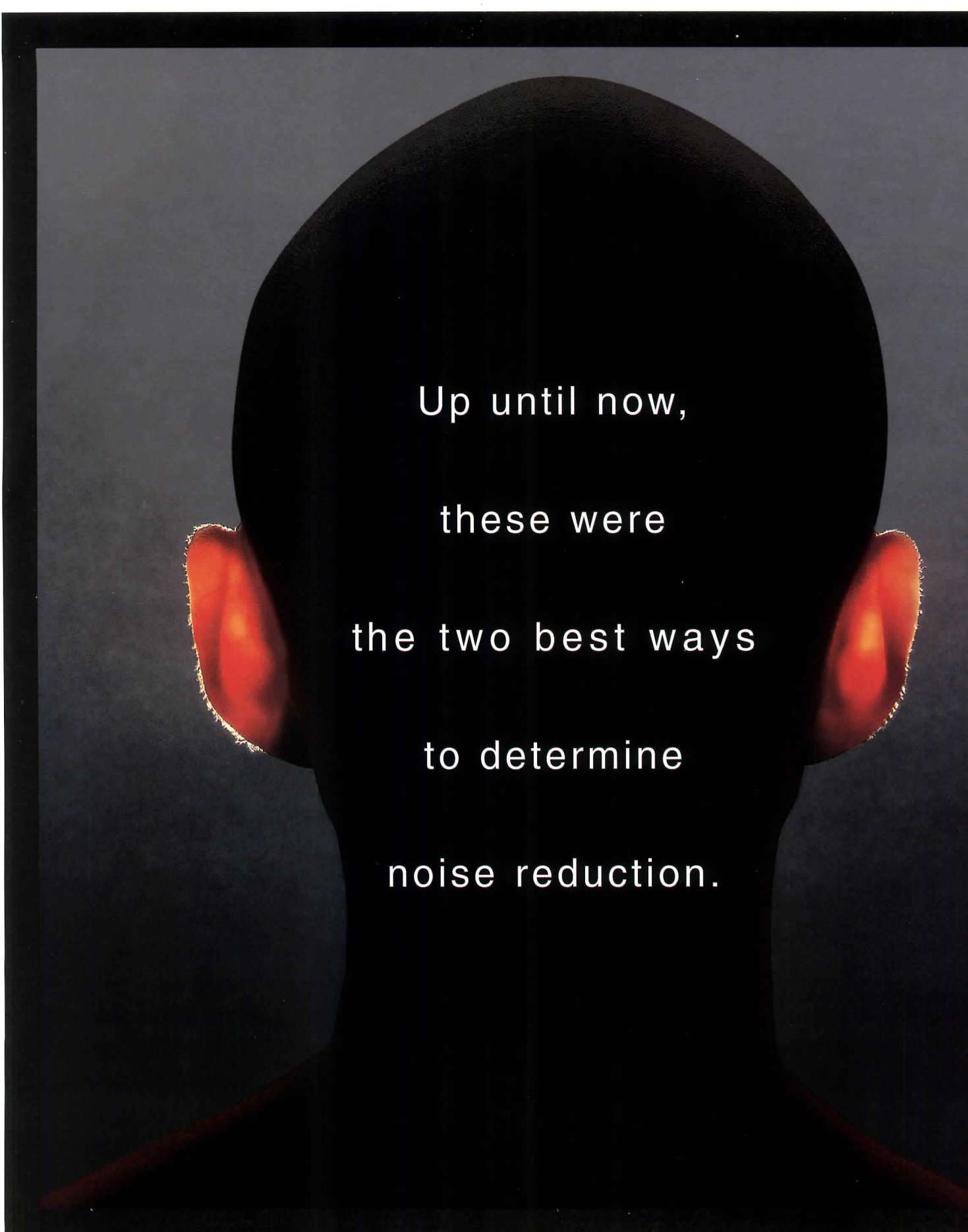
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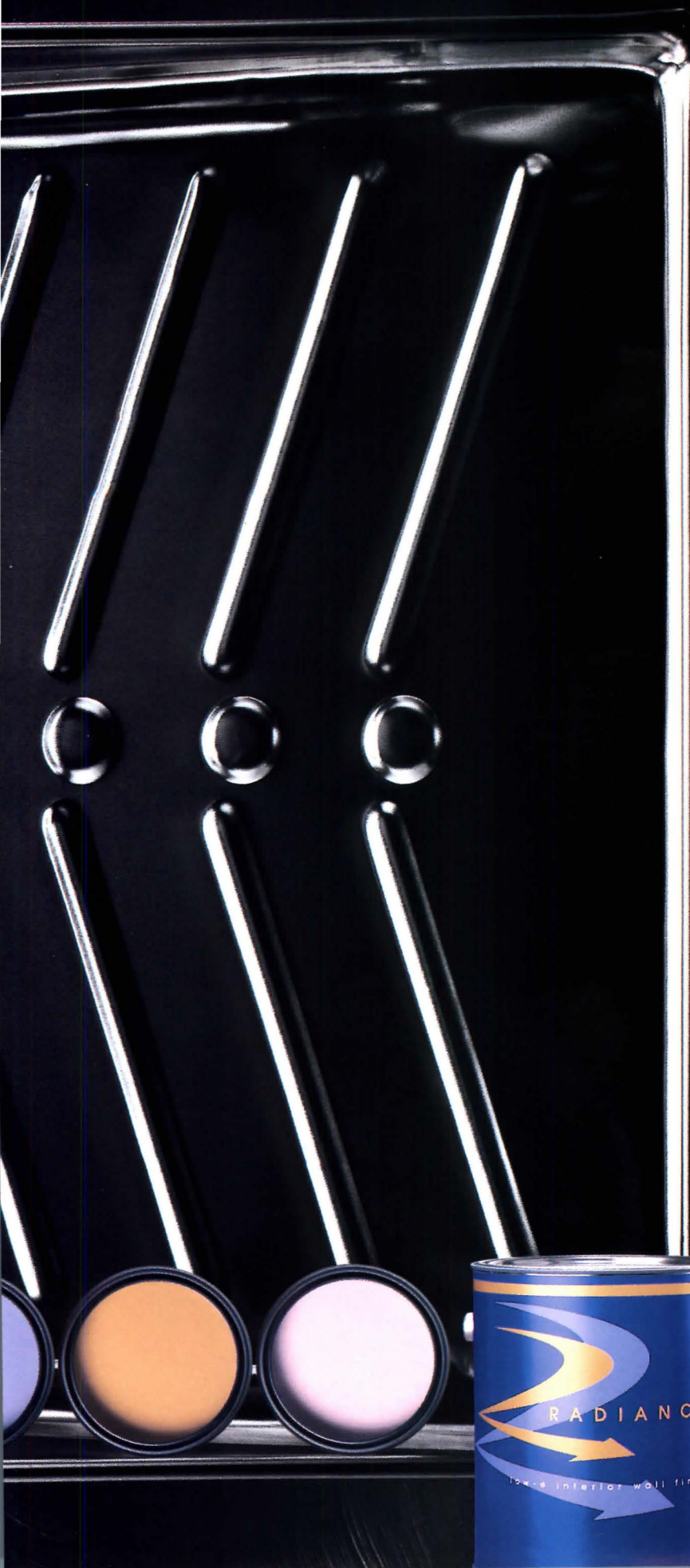
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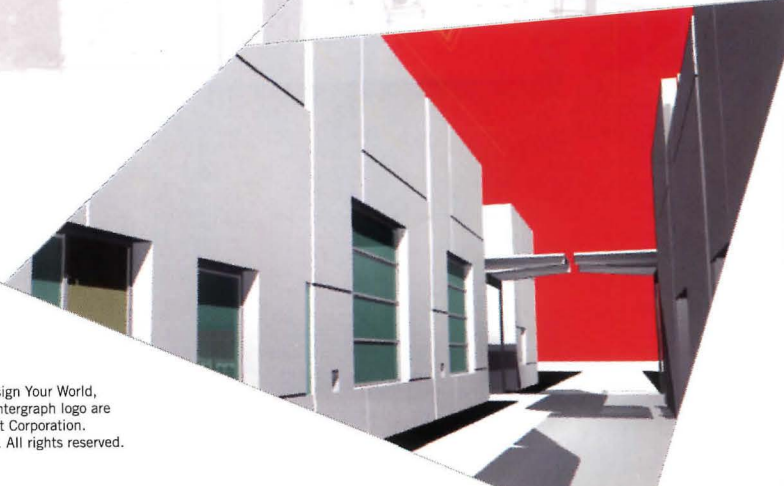
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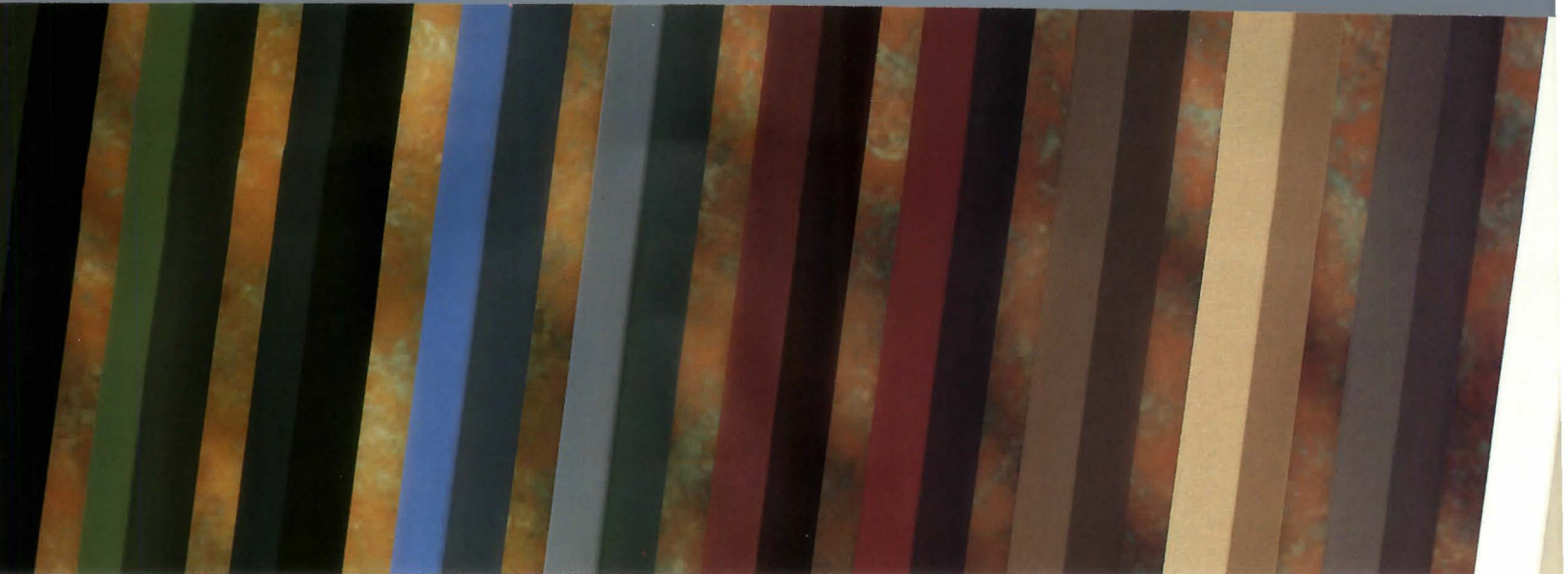
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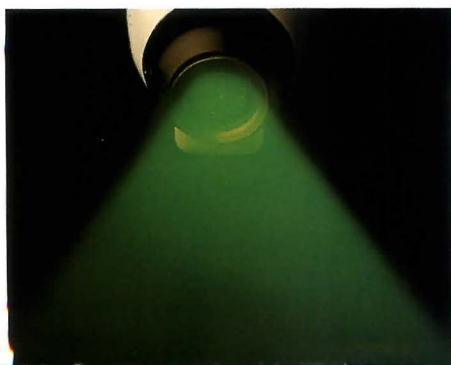
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EDITORIAL

Architecture without borders

BY ROBERT A. IVY, FAIA

In a sense, this is the American moment in architecture. As the world shrinks and global commerce is ascendant, as Europe's borders and competing currencies melt away, American architects are finding a worldwide appreciation for our particular organizational skills, our technical wizardry, our access to clients and capital, and our ability to get things done. The whole world seems hungry for American skill.

Check the international waiting rooms at JFK or Sea-Tac airports. The 747s are packed with Armani-clad design professionals, busy calculating their frequent flyer miles as they speed toward work abroad. A subculture is developing among American architects who are comfortable in the best hotels in Hong Kong, able to order meals in German in Cologne, and adept at translating the British pound to dollars.

Who are these road warriors? Large firms, those with 50 or more employees, account for most of the business: 40 percent or more can claim work overseas. Since it takes money and effort to sustain business outside the United States, smaller firms, particularly those with a specialty, tend to join larger American or foreign companies. Well-known designers from the United States regularly enter and win international competitions. While the percentage of all firms working outside North America may be small, it matters, since it represents a trend toward broader markets in a changing world.

The global practice of architecture came about in part because of quantum advances in transportation and communication technology. Cell phones, faxes, and laptops permit instantaneous conversation between continents and the simultaneous transmission of plans and specifications through cyberspace; jumbo jets can land on the smallest archipelagos.

If this mobile, hip scene sounds attractive, there are complications. Virtually every firm engaged in international work finds itself married, sometimes in a shotgun wedding, to foreign companies with very different professional cultures and work ethics, as well as variance in training and a predilection for their own construction methods. In Russia, protocol with

clients demands entertaining into the night, vast reserves of vodka, and infinite patience; in Portugal, shop drawings seem to be the exception to the rule. Such differences demand adjustments in our methodology and attitudes.

The ride can be bumpy. Political systems founder, and currencies tumble overnight. Consider the firms that gambled heavily on the Asian economy only to face big write-offs with their Seoul or Bangkok clientele. Lawsuits, bankruptcies, courts, and lawyers plague every continent except Antarctica.

Here is another concern. While our acumen is sought after in other countries, it may engender a subtle backlash, to which we all should be attuned. With the end of the Cold War and the opening of world markets, we can easily be perceived as shifting into a kind of neocolonialism, where American planning expertise and heft overshadow those of our international partners. Our designs are sometimes not as universally admired as are our more pragmatic skills: not all the French welcomed McDonald's to the Champs Elysées.

The lessons for American architects resonate at home and abroad. We must become acutely responsive to the unique cultures we serve, avoiding imposed solutions and seeking answers in the matrix of each project. On a Chilean street, for example, there is no call for a generic office building that would be better suited to California. We must listen to our peers overseas and observe how they live, respecting their skills and their appreciation for cultural nuance. We have much to learn, and they can serve as our guides.

If American architects set aside our hubris and open our eyes and ears, all of our work should mature as our fortunes expand. This moment may seem to be our own, but the perception is illusory: it belongs to a larger, richer world.

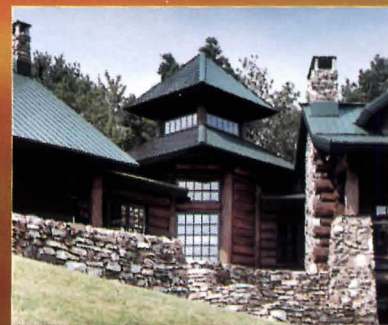
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LETTERS

Germany's architectural wave

Claudine Weber-Hof claims that "the architectural wave Germany is riding is really a tectonic tsunami, a phenomenon unparalleled anywhere on the continent" [Correspondent's File, February, page 41]. I'd agree: no country in Europe employs so many architects as a percentage of building costs, has produced so many unemployable dilettantes from its universities, or suffered so many architects' bankruptcies. No other country supports a construction industry where the cheapest house costs the equivalent of \$277,000 or tolerates a tortuous and time-wasting building-approval process that rewards political connections and enjoys such cavalier rights of rejection.

—Bill Collett
Philadelphia

Arrogance and the spec house

I read with interest about Riverbend House, designed by Hariri and Hariri for local developer Manou Faily ["Making a Spec House Special," April, page 70]. The article fails to point out that, as a speculative investment, Riverbend House is a disaster. I believe that this situation is due largely to the professional arrogance of out-of-town architects who apparently pride themselves on ignoring a rich local vernacular and who have misread the realities of our local marketplace.

In 1988 I sold 21 lots in my Riverbend subdivision, including this site, to a local architect-spec builder, whose lender ultimately foreclosed. Our local landscape is littered with the financial corpses of architects, builders, and lenders who have similarly failed at marketing million-dollar spec homes. In the case of Riverbend House, this completed white elephant has languished on the market for a year, and the asking price was recently dropped from \$1,150,000 to \$950,000. The \$165,000 "hit" doesn't include the opportunity

cost of perhaps \$90,000 in lost interest, and the story is not over.

On a final note, I am surprised that RECORD still applies the cliché of "California contemporary"; these houses happen to be Virginia contemporaries. Some are inspired and successfully respond to the setting, financial as well as physical; others, like Riverbend House, fail, both as architecture and as investments, because they ignore it. When will architects learn?

—John G. Colby, AIA
Great Falls, Va.

Answering interior designers

I was very disappointed with the forum discussing the relationship between interior designers and architects ["Listening to Interior Designers," April, page 66]. Instead of investigating how the relationship could improve, the panel simply offered ridiculous generalizations about our profession and revealed the interior designers' painfully narrow point of view.

I have tremendous respect for the interior designers with whom I work. A talented designer brings a fresh perspective and expertise to the table, which augments the architecture and enriches a project for all those involved. But the interiors are just part of the big picture.

Architects deal with a multitude of complex problems that need to be solved quickly and cleanly, from disputes with regulatory agencies to managing dozens of consultants simultaneously. The thought that architects design from the outside in is preposterous. A building's end result need not only be dazzling, it must also be appropriate and, yes, even legal.

—James Mehaffey, Assoc. AIA
Lancaster, Pa.

Reading "Listening to Interior Designers" upset me. As a commercial interior designer, I have had conflicts with architects. But this problem won't improve with articles like this one circulating.

Many of the differences between architects and interior

designers go back to our system of higher education. We are taught differently, but not as differently as David Ling maintains in the article. While I was working on projects with real clients who had real budgets and real programs, my friends in architecture school were designing conceptual models. Sure, we learned about color and furniture and draperies. But we also learned how color affects patients in psychiatric wards, how furniture is constructed, and which drapery fabrics help control the spread of flames.

One of the most enriching design classes I ever had was a joint studio with fourth-year architecture students. Working side by side with architects is what I do every day, and even though that studio revealed a lot of our differences, it also taught us all how to achieve our goals in spite of those differences.

—Jill M. Watkins, IIDA
Cleveland

The competition question

A successful competition ["Playing the Competitions Game," November, page 62] depends on a multiplicity of factors: the program, the jury, terms fair to the architects, good judgment, time frame, feasibility, and credibility.

I believe that a lot of damage has been done to the environment and the profession, particularly in Europe, by a blind adherence to the belief that competitions will produce brilliant designs. In fact, *competitions* is too limiting a term. What is required is a carefully designed method for finding the right architect to address the needs, program, and aspirations of the client.

—Bill Lacy, FAIA
Executive Director
The Pritzker Prize Committee
Purchase, N.Y.

Bamboo technology

Thank you for putting the time and effort into writing such a forward-thinking article about building with bamboo ["The Future," April, page

200]. I'm glad that there are people willing to keep the architecture community informed about new technologies, like bamboo, that are not so obviously new.

The article mentions the work of my brother, Jeffree Trudeau. Along with his colleagues, Jeffree makes significant sacrifices to develop technologies whose importance it will probably take many years for most people to fully grasp.

—Bart Trudeau, AIA
Principal
Trudeau/Architects
Latham, N.Y.

Proper credit

I see that RECORD typically lists credits for the projects featured inside. Usually listed are the architect, the engineer, and the contractor. My question is, Who actually "built" those beautiful works of architecture featured in your pages? Who laid the tiles, painted the walls, did the carpentry, installed the electrical work, and so on?

Why doesn't RECORD list the subcontractors by trade and company name? Shouldn't you give credit where credit is due?

—Paul Peterson
via E-mail

Credits/corrections

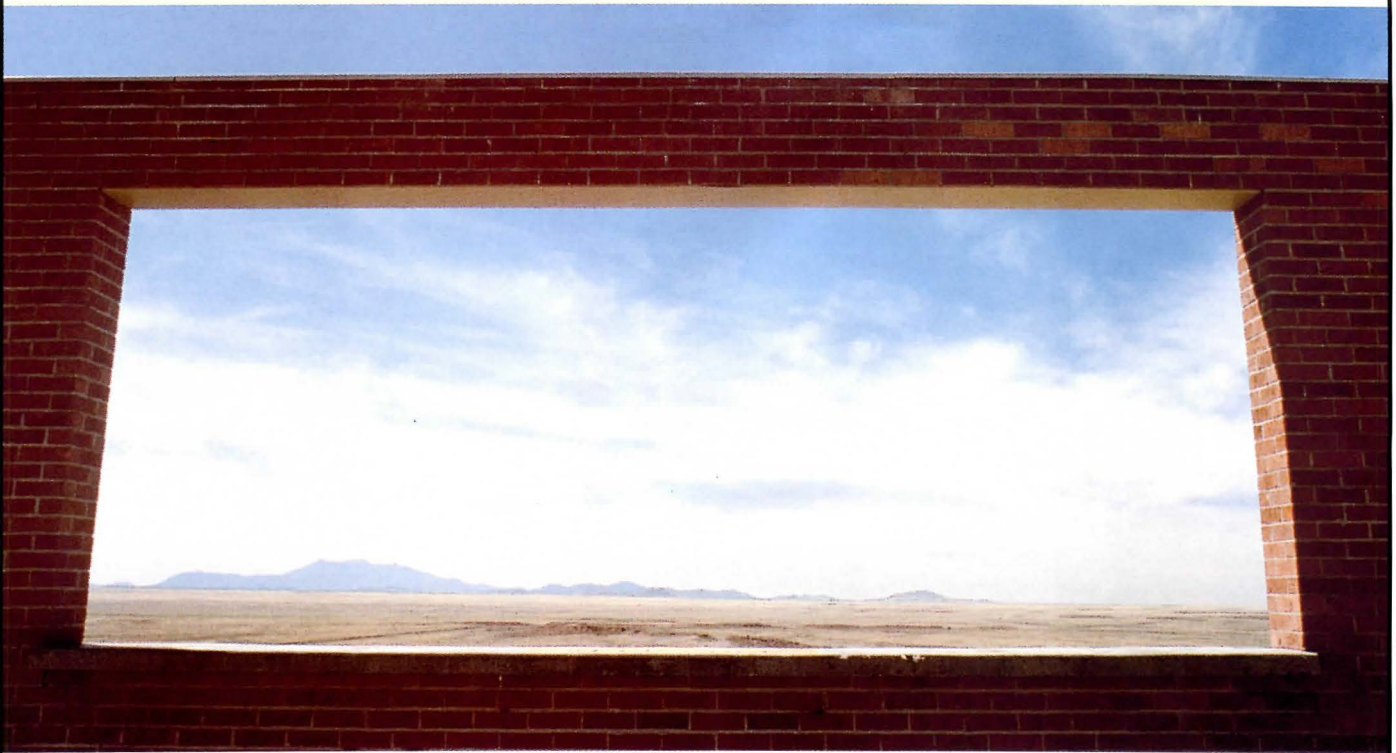
The name of Carol R. Johnson Associates was misspelled in a news item on the Boston Federal Courthouse (May, page 77).

The name of Erik Kvalsvik, whose photographs of the White House appeared in "America's Most Visited Houses" (April, page 76), was misspelled in the photo credits.

LMN Architects designed Redmond Town Center, which appeared in "Retail Facilities: Main Street Goes Suburban" (March, page 126).

Letters may be E-mailed by visiting 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.

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CIRCLE 11 ON INQUIRY CARD

SPEAK OUT Sixteen keys to success offered by principals of Centerbrook, winner of this year's AIA Firm Award.

WILLIAM GROVER AND JAMES CHILDRESS

William Grover, FAIA, worked with Charles Moore for 10 years before becoming president of Moore Grover Harper in 1975. James Childress, AIA, joined Moore Grover Harper in 1979. The firm's name was changed to Centerbrook Architects in 1982.



1. It is bad luck to turn down a job. Every job is an opportunity to design something.

2. Art always comes first; money is second (a close second). You can't keep doing art if you have no money.

3. Don't be disappointed if a client rejects your design. It is another opportunity to design. You like to design and there are many answers to the same problem.

4. Always exceed your client's expectations. This means establishing realistic expectations that you can exceed.

5. No matter what they may say, or what you may think, cost is foremost in the minds of all clients regardless of how wealthy they may be. Make sure everyone has a clear, written understanding of the expected cost of the project. Have a plan of how you will proceed if it comes in over budget.

6. Meet with your partners, senior staff, office manager, and bookkeeper every Friday for a one-and-a-half-hour lunch in a private room in a nice restaurant away from the office. Avoid invitations to other places on Fridays. Follow an agenda. Review finances and schedule each employee's time for the next week. Strictly limit the meeting to one and a half hours. Everybody should get up and walk out when the time is up. If you don't, the meetings will get longer and nobody will want to waste their time on them.

7. Be as diverse and flexible as possible. Everybody should be able to do everything—write good letters, spell, get jobs, design, build models, take out the trash, make a good cup

of coffee, charm clients and contractors, do construction documents. Don't compartmentalize. The one exception is photography.

8. Have projects professionally photographed. Spend money for the best professional architectural photographer you can find. Map out the views you want on a plan of the building. Go to the job site with the photographer. Explain what is most important to you about the building and what views are most exciting to you. It may seem expensive, but it will be money well spent.

9. Enter awards programs, especially ones sponsored by the state, regional, and national AIA. Make the presentation simple and beautiful. Never, under any circumstances, include a bad photograph in a presentation, no matter how important you may think it is in explaining your concept. If at first you don't win an award, keep entering the project. The juries are always different. If it's a good building, some jury will recognize it.

10. Learn to recognize problems as opportunities to show how good you really are.

11. Bad news travels fast. An unhappy client will spread the word about you. A satisfied client will be a good friend and a good reference. Remember this when you are tempted to tell a client to go to hell.

12. Surround yourself with the most talented and enjoyable people you can find and take good care of them. Put them at the top of the wage scale. Pay them time-and-a-half for overtime; give them two weeks of paid vacation (three weeks after seven years); provide health

insurance without co-payment (it is possible if you aggressively pursue insurance companies); and, most important, give people pride of ownership in what they are doing. Give them credit—publicly and in print—for their design contributions. Architecture is not done by a single person.

13. Share financial information with all employees. Empower them to be responsible for time and money budgets. They should all, even student interns, know the budget constraints and have a say in what they can do by when.

14. Maintain a sense of creative energy by not having private offices, mixing partners and staff together, and spreading jobs throughout. Have one coffeepot where everyone has to meet.

15. If you focus on making every project an artistic success, you will get rich. If you give first priority to making money, you will go broke.

16. Clients are spending a lot of money for your advice. They should enjoy themselves. You should too. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk) 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 by visiting www.archrecord.com and clicking on News/Features/Dialogue. 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 text approval.*

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MENTORS A “matchmaking” expert describes the advantages of working with an executive search firm and gives pointers on choosing the right one.

Donna Gaines is president of Gaines & Associates International, an executive search firm specializing in the fields of real estate, design, and construction. The 17-year-old firm has offices in Chicago, Atlanta, Albuquerque, and New York City.



ARCHITECTURAL RECORD asked Donna Gaines to discuss the process of hiring and working with an executive search firm to help fill positions within your company.

To be truly effective and stand apart from your competition in today's marketplace, you must be able to identify and attract job candidates who are qualified, experienced, and innovative—exceptional people with leadership potential. Sounds easy, but where do you start?

The easiest, most economical, and practical place to begin is with networking. Tell your staff you're looking for new blood and let them help you find good people. Posting openings allows current employees to consider applying themselves. Offering them incentives, such as finders' fees, encourages them to take an active part in your search. Also, making use of professional societies' job listings can target specific audiences.

A college recruitment program ensures a continuing flow of good candidates. Campus recruiting adds a useful marketing dimension to your search because it publicizes your company's name to tomorrow's corporate principals and presidents.

Broad-stroke advertising in help wanted pages of trade publications and newsletters can be effective, depending on current employment levels and the types of positions you're trying to fill.

Search firms can do much of your work for you, especially when you're looking to fill managerial and technical positions. At first blush you might think search firms are beyond

your means. But can you really afford to hire an individual who won't fit into your company's culture or, even worse, someone who may cost you tens of thousands of dollars by making performance or judgment errors?

Executive search firms produce both direct and added-value results. They can explore and penetrate larger pools of candidates than you could reach alone and can increase your chances of finding the best people by conducting focused and confidential searches. The “matchmaking firm”—a more accurate term than “headhunter”—evaluates candidates objectively, thoroughly investigates references, negotiates compensation packages, and ensures as much as possible the best fit between your company and the candidates you hire.

Search firms probe candidates for reactions, vision, and goals while presenting your company's mission and possibilities. It is their business to analyze and match mutual expectations, helping to turn them into shared advantages.

The easiest way to evaluate a search firm is to ask key questions and compare the firm's responses to your company's needs and ways of doing business. Here are some of the most important questions to ask:

1. What ethical guidelines do you follow when conducting searches?
2. What other searches have you done? (Names and companies may be confidential, but the matchmaker should be able to describe the nature and results of past searches. Whatever the case, ask

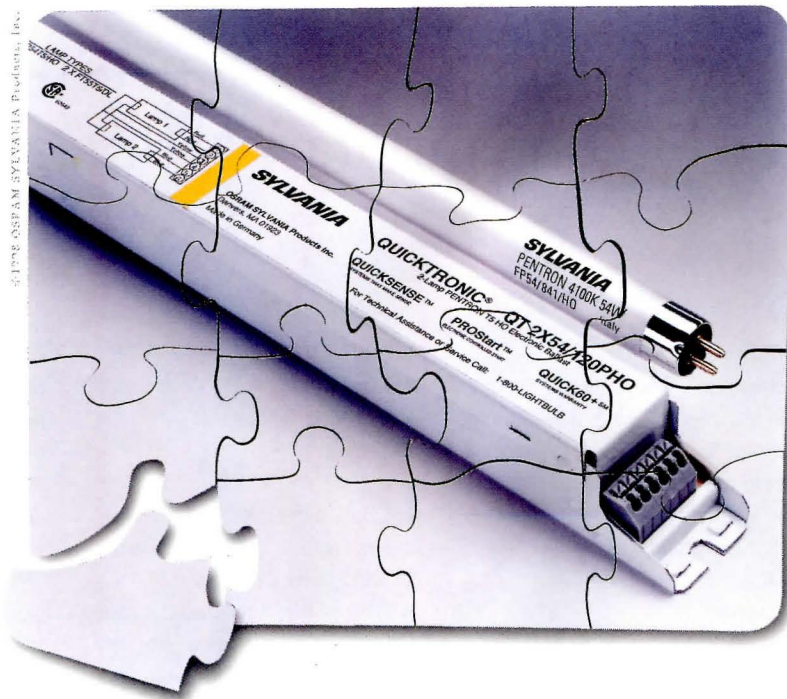
for references—then check them.)

3. Who will do the work?
4. How soon, how often, and in what form will I receive feedback?
5. What is your fee structure? Do you work on a contingency or retainer basis?
6. What expenses are reimbursed? Do you mark up research and administrative costs? How detailed are your invoices?
7. What guarantees do you provide?

Ask how the search firm conducts assessments and evaluations. How does it determine whom to check as references? How does the matchmaker structure interviews, and what input will you have in presenting questions? If appropriate, how will the search firm conduct testing; license, professional, credential, and other verification; and behavior and character appraisals?

Look for ways to work collaboratively with the search firm you select. Become involved in the search and help the firm understand who and what your company represents. The results will save you time, expense, and frustration, and in the end will benefit your company. ■

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 by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*



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CIRCLE 13 ON INQUIRY CARD

PULSE RECORD readers were asked: Should the unbuilt work of significant designers be resurrected and constructed by contemporary architects?

No: There are a number of great designs conceived in the present that have yet to be realized. Wouldn't it be more exciting to build some of these first before turning to the past for inspiration?
—Henry T. Chao, AIA
Boston

No: Architectural expression is related to the architect's responses to codes and program. Building an unbuilt work designed in a different era, with different codes in place and a different program, is not the same as, for instance, performing a classical masterpiece in the present.
—Donald F. Vidal, AIA
Camden, N.J.

No: The public may want this, but who cares? Design is of the time and place it was created. A great design will have relevance in its par-

ticular era. If you could ask the original architect to design the same building for the present, I'm sure he would want to significantly change the design, if not completely rework it from scratch.
—Ronald M. Reim
St. Louis

No: It's impossible to realize someone else's vision. Consider, for example, Alvar Aalto's Washington Seminary.
—Frank Douglas, FAIA
Houston

No: It's like taking a '23 Packard, which was grand in its time, and building it today. If the building couldn't even be built when the time was right, it certainly won't be right for now.
—Robert Swan, AIA, CSI
New Orleans

No: Only if it's a Frank Lloyd Wright.
—Fred Rick Minson, AIA
via E-mail

No: During the course of his long career, Frank Lloyd Wright himself recycled ideas, but as part of his evolving process of design. To take a design from another time, site, and client is to separate the design from its originating culture. Resurrecting projects that had previously been lost to history only reaffirms the lack of any true culture or talent in our present.
—Eric Corey Freed
San Francisco

No: On the whole, it's probably better not to. There's something nice about a project remaining unbuilt; more is left to the imagination. If you are going to do it, though, you have to keep in mind that architects

of the past continually revised their designs during construction. You therefore have to respect decisions made by those interpreting the design for present circumstances.
—Coreina Chan, Shawn Watts
Leroy Street Studio
New York City

No: Let's look forward, not backward!
—Herman Orcutt
Phoenix

Yes: If someone thinks it is worth building, that's great. But only if the contract documents are completed, checked, and coordinated by the significant designer. Those who have tried to interpret the designs of others usually don't do a good job.
—William Krisel, AIA
Los Angeles

This Month's Question

Do architects make good clients?

A number of architecture school graduates have found jobs outside traditional practice. They find employment in a variety of settings: in government, on campuses, as developers, and as real estate coordinators. Many eventually serve as clients for other architects. Do client-architects, sometimes not trained formally in management or business, serve effectively as clients?

Do architects make good clients? Yes No

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CORRESPONDENT'S FILE An ambitious mayor and major plans for the Millennium are making the Eternal City a hotbed of design.

BY ILENE STEINGUT

Ilene Steingut has practiced architecture in Italy for the past 15 years. She has offices with her husband, Giuseppe Vallifuoco, in Rome and in Cagliari, Sardinia.

After what seemed like decades of relative inactivity, architecture is in the forefront in Rome. Although the historic center and the many archaeological monuments will always occupy a primary role in the public's perception of the city, Rome's planners and administrators are now grappling with problems of designing and managing a modern metropolis.

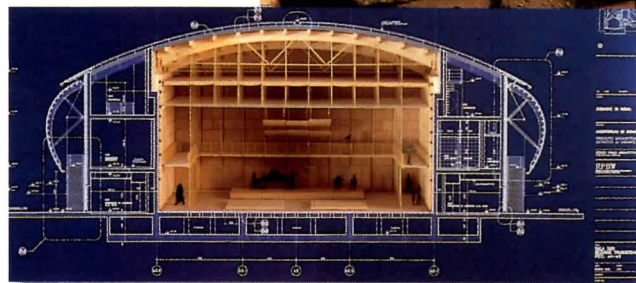
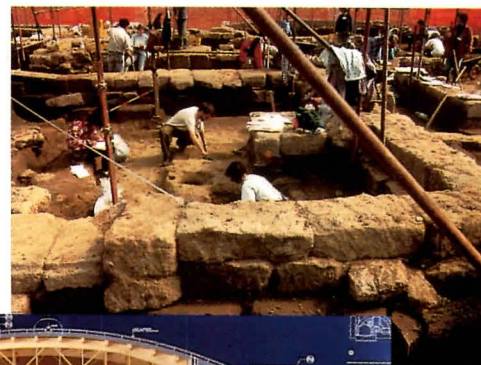
While some of the current spurt of activity is a result of commissions undertaken by previous city administrations or other institutions, much of the action is being propelled by mayor Francesco Rutelli, who took office for his first term in 1993 and was subsequently reelected in 1997.

Man with a plan

The Rutelli administration articulated its position regarding the city's overall planning strategy early on. Traffic, air pollution, the deterioration of historic monuments, and the effects of a vast amount of unplanned building and illegal construction, together with the admitted failure of the 1962 city plan and its successive variants, led to a rethinking and reviewing of the strategy.

The new perceptions by Rutelli and his cohorts eventually produced the existing city plan, approved by the city council in July 1997. The Piano delle Certezze (the Plan of Certainties) was declared a first step in drawing up an entirely new formula that seeks to stimulate a process of urban growth and development in qualitative rather than quantitative terms.

Work has begun on Renzo Piano's new Auditorium; for one of the first times in contemporary Rome, archaeological relics found on the site are being integrated with the building.



The Piano delle Certezze's guiding principles address the problems of three major planning areas: open green space within and surrounding the urban heart of Rome; the built urban fabric; and traffic and mobility.

Among the various goals set forth by the administration, the most decisive action has been taken regarding the city's existing public surface transport system, a key element in the new plan. Modernizing this system and increasing its capacity will help create new urban poles to catalyze renewal, giving energy and quality of life to areas formerly devoid of these characteristics.

The Millennium approaches

The emphasis on public transportation has also been a necessary factor in the planning of the Catholic Church's Jubilee celebration in Rome for the year 2000. Myriad

important works are planned for that event, with most having to do with the restoration of important monuments, museums, and archaeological sites, as well as the necessary infrastructure and hospitality for the predicted influx of 24 million visitors and religious pilgrims during the course of the Holy Year.

Unfortunately, and perhaps embarrassingly, the city canceled the construction of the Castel Sant' Angelo underpass, which would have been the hallmark public works project for the event. However, a parking structure for 105 buses and 800 cars will be constructed underneath the Gianiculum Hill adjacent to the Vatican, and according to the special office set up for the Jubilee Celebration, over 80 of the 109 planned projects are under way, turning the city into a huge construction site.

In February, the mayor optimistically stated that the only

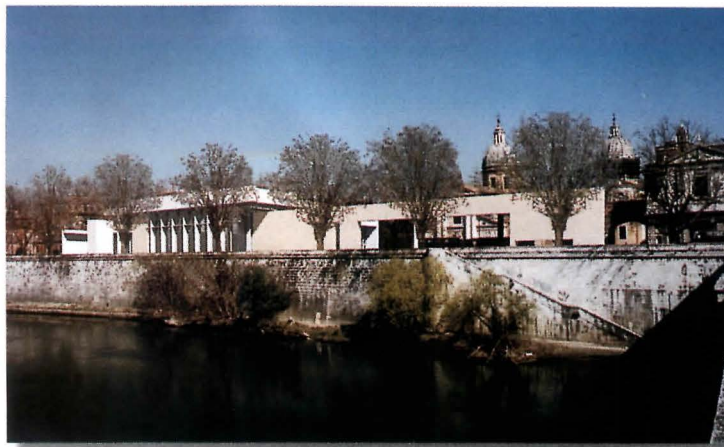
construction site that will be visible in 2000 will be the open-air exhibit of the ongoing archaeological excavations of the Roman Forum, indicating the administration's ambitious intentions to complete all other work by that date.

A lengthy project portfolio

While the Jubilee has major ramifications, perhaps the most visible sign of new architectural vitality in Rome is the construction of the Auditorium—the city's performing arts center—in the Flaminio neighborhood near Villa Borghese. Ending a decades-long saga involving competitions and site changes, nine invited submissions were judged in 1994; Renzo Piano's winning project is now under way. The first part of the parking structure as well as foundation piles are completed and work has begun on the 500-seat concert hall.

For one of the first times in contemporary Rome, important archaeological relics found on the

site are being coherently integrated into the building project, rather than indefinitely halting construction (as is currently happening with the new subway in Athens). According to Piano's office, the entire complex,



composed of three scarab-like forms and an amphitheater, is slated for completion by November 1999.

The Rutelli administration has undertaken many other projects. The city sponsored a competition in

1995 for the Borghetto Flaminio, a deteriorated former industrial zone in a neighborhood just outside the Porta del Popolo and Villa Borghese (the area was once designated as a site for the Auditorium).

The winning project, by Antonello Monaco, now in the construction documents phase, proposes a cultural center whose volumes create a series of open spaces on the sloped site while respecting many of its preexisting elements.

In 1996, Richard Meier was asked directly by the city administration to submit a proposal for the redesign of Piazza Augusto Imperatore as well as for a container to replace the 1938 glass structure protecting the Ara Pacis (a partial reconstruction of an altar dedicated by Augustus in 9 B.C.). In an interview earlier this year, Rutelli reiterated his commitment to complete this project in time for the Jubilee.

This isn't Meier's only project. In 1994, a competition for two churches in outlying neighborhoods resulted in a first prize for only one of the sites; Milanese architect Bruno Bozzini's church has already been completed. For the second site, the church administration subsequently invited a new roster to propose the "Church of the Year 2000." Meier's selected project, with its three double-curved shells, is becoming a testing laboratory for innovative building technology and construction methods.

PHOTOGRAPHY: © RICHARD MEIER & PARTNERS (ARA PACIS); R. CAROTENUTO (BOZZINI)

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CIRCLE 18 ON INQUIRY CARD

Meanwhile, the city administration commissioned INARCH, the National Institute of Architecture, to compile regulations for an intra-European (if not international) competition for the city's new Directional System, where the 1962 city plan had called for the construction of a civic hub of offices, government ministries, and commercial activities in the Pietralata neighborhood.

Only part of the vehicular axis that was to connect this new urban pole to the city center was built, leaving a vast urban void in the

midst of what is now a densely populated area. The consultation was a first step in the resolution of the neighborhood's urban problems; it has now been made official that the city will hold separate competitions (the forms of which are yet to be determined) for four strategic sites in the zone.

At almost the same time as the Pietralata consultation, the State Railway Company invited international architects to contribute ideas for the Tiburtuno Rail Station and the surrounding undeveloped area. This zone is destined to

become one of Rome's most crucial nodes, given the city's strategy of extending the potential of existing surface railway lines and stations.

Nearby, on the site of the former Centocelle airport, an international competition was held for the design of an urban and archaeological park. Results of the competition were announced last summer; the winning project, by British architect Mark Ruthwen, is conceived as an urban forest in which open spaces are created for various leisure, recreational, and cultural uses.

Next, the city administration, within an urban renewal program called Centopiazze (One Hundred Squares), held a national competition called Neighborhood Squares for the renovation of a significant piazza in each of the city's 19 administrative districts.

At the same time, a series of construction sites were begun in select squares located throughout the city.

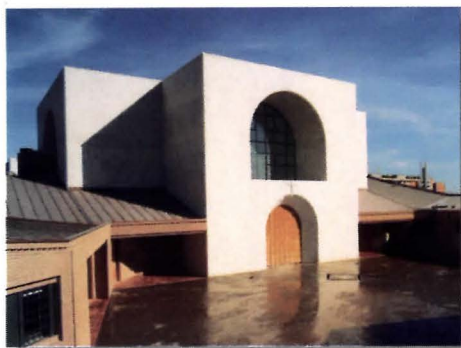


The best-laid plans

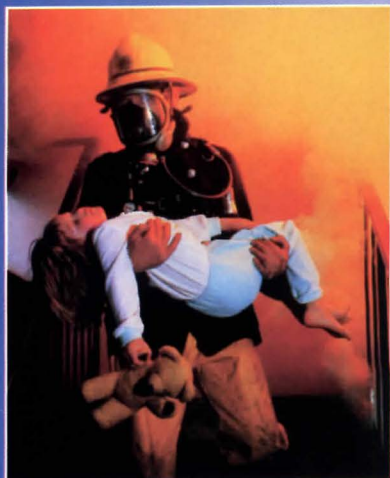
With the number of large projects being undertaken, some question whether the transformation will be complete by 2000. In Italy, it is acknowledged that it takes two years longer than in other European nations to complete a building project. In Rome, great effort is being made to effect not only physical and functional change, but the way in which that change is managed.

The coming years will demonstrate if these efforts meet the expectations of the mayor and his citizens. ■

Richard Meier's Ara Pacis design (opposite); Bruno Bozzini's church, recently commissioned by the Catholic administration (right); Michael Hopkins's design for the Tiburtuno Rail Station and surrounding neighborhood (above right).



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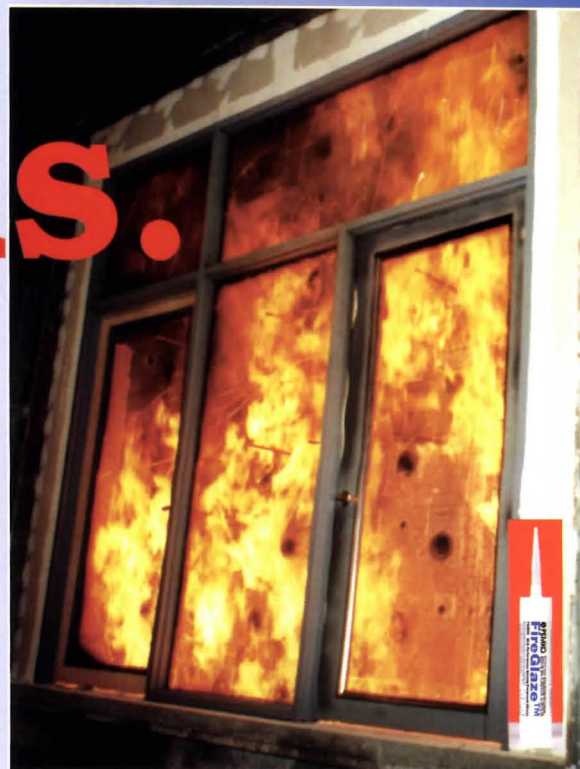
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CIRCLE 19 ON INQUIRY CARD

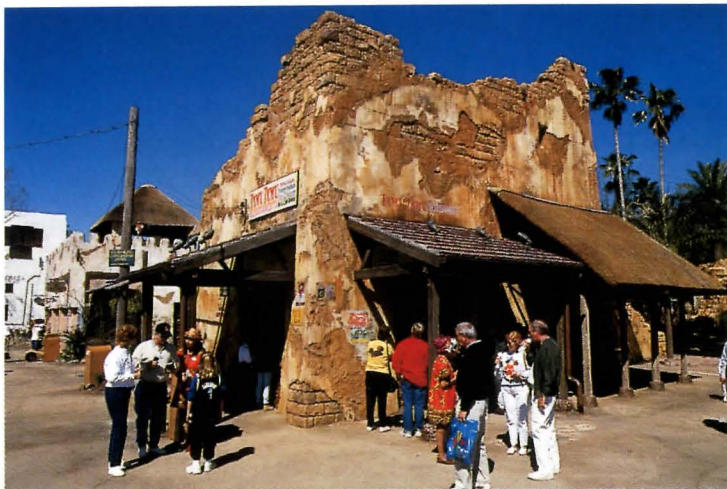


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DISNEY'S IMAGINEERS GO WILD WITH REALITY-BASED PARK DESIGN

The builders of Animal Kingdom, Walt Disney World's new 500-acre theme park, revised the standard Disney program of having architecture give shape to pure fantasy.

"You have to project real-life experience to get drama," says Joe Rohde, the park's chief designer and a key player at Disney Imagineering, the design house of hypercreative types who, among their many duties, conceive the theme park attractions. To that end, there are allusions in Animal Kingdom to such things as armed poachers and the specter of extinction. They make the fantasy more memorable, Rohde says.

Harambe, an area of the park intended to look like a modern-day East African port town, appears to have been battered by successive tides of history. There is a crumbling fort, a survivor of the Portuguese invasion; an Arabian-style marketplace; and, typical of postcolonial architecture, a whitewashed, reinforced-concrete terrace. A mud brick building is topped with a working satellite dish that has been left unconcealed.

Of course, says Rohde, this is not the sort of authenticity found in museum exhibits. Animal Kingdom is less about reality than the aura of reality, one that is consistent with

the popular image of adventuring in the savannah or the jungle. The thatched roofs of the village, for instance, were assembled by Zulu contractors, even though the Zulus (and their roofing technique) are South African, not East African.

The extensive detailing of the colorful wood carvings of the nearby

Safari Village suggests that the carvings are imitations of some exotic precedent. They were, in fact, inspired and executed by Balinese artisans, but they were designed by Imagineers to represent a style that is a fusion of South American, Polynesian, and African themes and not specific to any one place.

The buildings of Animal Kingdom were scaled to give priority to the living environment of four million trees and plants representing 3,000 species from six continents. Commanding most vistas are oversize artificial plants, such as the 14-story Tree of Life and a number of wide, faux baobab trees.

Architect Peter Dominick of Urban Design Group and Disney Imagineering have teamed up to plan Animal Kingdom Lodge, a 1,290-room resort hotel complex to be completed outside the park by 2001. Giraffes, antelopes, and gazelles will be able to come within six feet of guests' windows.

Disney wants to do more work like the lodge. Two years ago, the Disney Development Company, the



Disney set up the Harambe village to look like an aging port town.

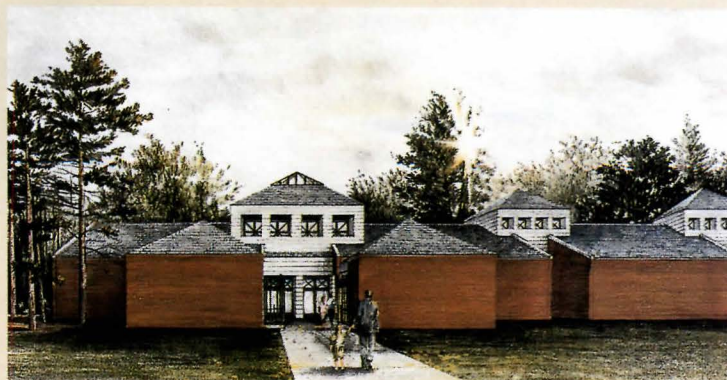
division that employed architects to design hotels and office buildings, merged with Walt Disney Imagineering. Although the merger happened too late to affect Animal Kingdom, Disney executives expect future buildings in the theme parks to have greater architectural integrity, while resorts outside the parks, like Animal Kingdom Lodge, will have more thrills integrated into their design. *David Simon Morton*

POW'S HONORED WITH A MUSEUM Andersonville, the notorious Confederate prison camp, was open for just 14 months at the end of the Civil War. But nearly 45,000 Union soldiers were held there, and 12,000 of them died. "There is so much filth about the camp," one prisoner wrote in his diary, "that it is terrible trying to live here." Now the site has a redemptive purpose. In April a museum that honors Americans who have been prisoners of war opened at this national historic site in southwest Georgia.

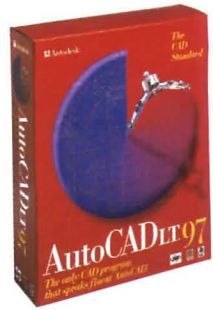
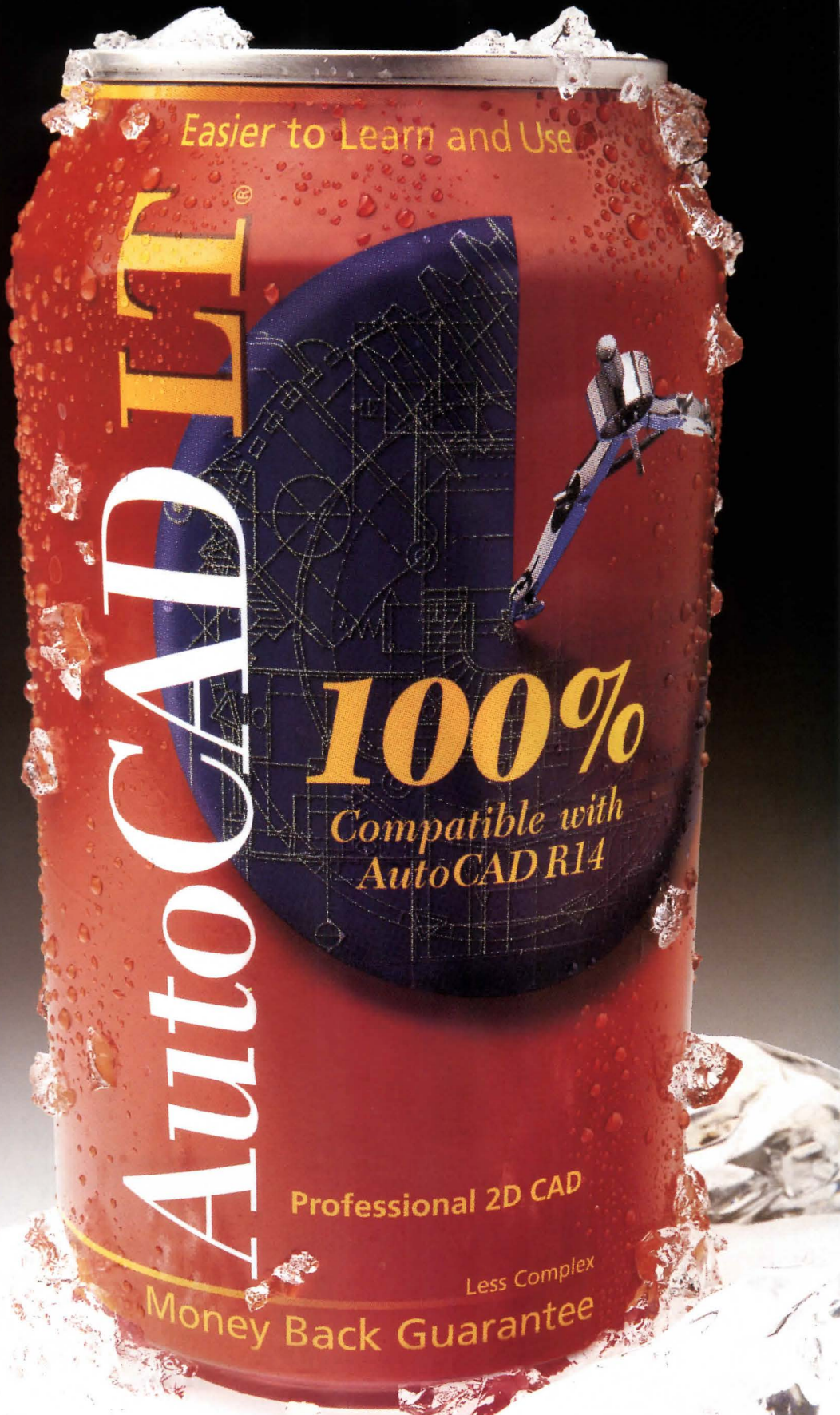
Designed by two Denver-based National Park Service architects, the National Prisoner of War Museum resembles a small prison; visitors enter the 10,000-square-foot brick building through a gated opening between two guard houses. "These buildings and the entry gate constrict the approach to create a feeling of tension," says Carla McConnell, AIA, who designed the museum with her supervisor, G. Rodger Evans.

Once inside, visitors are met by streams of natural light, while a central corridor leads to the exhibit areas. "We talked to a number of different former POWs," Evans says. "They told us about the fear they experienced, the isolation, the agony of wanting some kind of resolution. And these were the core themes that we used."

Most of the \$5.8 million cost of the museum was paid for by private veterans groups, notably the American Ex-Prisoners of War. Former National Commander John Edwards, who was shot down over Germany during World War II and held captive for five months, says the vets "wanted it to be dramatic enough to make the point that life as a POW was not easy. And I think it does that." *David Hill*



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AFTER ANGST-RIDDEN COMPETITIONS, LIBESKIND WILL DESIGN S.F. MUSEUM

Culminating a problematic, years-long selection process, Berlin-based architect Daniel Libeskind has been chosen for what will be his first commission in America, the Jewish Museum San Francisco.

The museum will go up in the Yerba Buena district, with a significant portion of the 70,000-square-foot project housed within the 93-year-old Jessie Street power station.

The architect was chosen based on an interview and on his past work, with his nearly completed Holocaust Museum in Berlin weighing heavily in his favor. The San Francisco museum will be completed by 2001 at a projected cost of \$30 million.

Peter Eisenman won the initial competition, but he departed last year after difficulties arose with the museum's new management. In September, three finalists in a second competition—Eric Owen Moss, Studios Architecture, and Enrique Norten—were chosen from a group who had been asked to submit

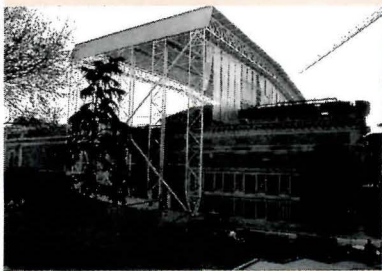
notebooks of conceptual sketches.

Changing direction yet again, the committee decided it wasn't satisfied with its choices and invited Libeskind and the Swiss firm Herzog & de Meuron to enter the competition. Around this time, Norten and then Moss were dropped from consideration.

"Maybe it's not according to Hoyle to bring white knights in at the eleventh hour," says museum director Rabbi Brian Lurie, "but we had only one chance to get this right. It was too important to do it according to whatever is standard procedure."

Charles Dilworth of Studios says Libeskind was an excellent choice, but he hopes that the "ultimate outcome is not poisoned by the bungling and cynical manipulation that characterized the selection process." An equally angry Moss says, "If ever there is a discussion of how destructive the process of giving out work can be, I can't imagine a better example than this." *D.S.M.*

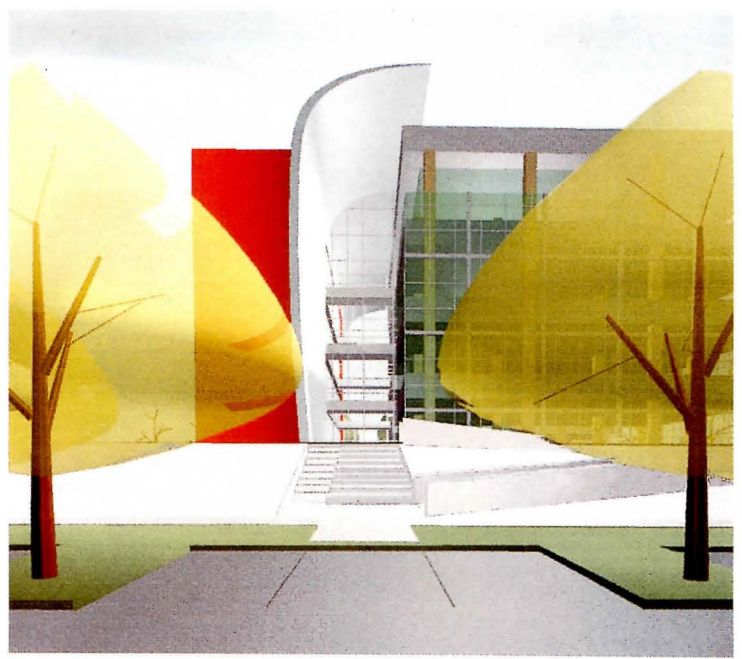
THE PRADO'S MAKEOVER To protect the Prado Museum in Madrid during the replacement of its roof, the Spanish construction company FCC designed a remarkable shed. At 100 feet high and 250 feet long, it straddles the entire width of the museum and is mounted on rails that allow it to be moved as work progresses.



The project restores the original roofing designed by Juan de Villanueva in 1785 and replaces its underlying structure with modern mechanical services. Dionisio Hernández Gil and Rafael Olalquiaga are the architects behind the restoration, which is part of a larger effort to enlarge and modernize the Prado.

After an international competition in September 1996 concluded without a winner, the Ministry of Culture has been advancing slowly, following a program developed by Prado director Fernando Checa. Its main element is a new building for temporary exhibitions, restoration studios, and other services, to be built around a ruined Baroque cloister behind the museum, with an underground connection to the entry hall.

In addition, administrative offices and the library were moved to a building behind the museum early this year, freeing space for new galleries, and the Army Museum, which occupies a surviving remnant of the 17th-century Buen Retiro palace, will be taken over to allow the restoration of Philip IV's throne room as decorated by Velázquez. *David Cohn*



THE MURRAH BUILDING'S REPLACEMENT: IN SEARCH OF A SECURE SPACE

Defensible space figures heavily in the plan for a federal campus to replace the Alfred P. Murrah Building in Oklahoma City, where three years ago 168 people died in the worst terrorist attack on American soil. But the design, by Chicago architect Carol Ross Barney, FAIA, of Ross Barney + Jankowski, strives to avoid the impression of a fortress.

Scheduled to open in 2001 and expected to cost at least \$25 million, the complex is to be built on three city blocks at the northern edge of downtown. Just to the southeast, on the site of the now-demolished Murrah Building, is a chain-link fence that is a makeshift memorial to the victims of the blast. A permanent memorial consisting of 168 empty chairs, one for each of the victims, will eventually replace it.

With exterior walls set back from the curb by 100 feet, Barney's scheme is based on federal guidelines that seek to avoid a catastrophic structural collapse like the one caused by a bomb at the Murrah Building.

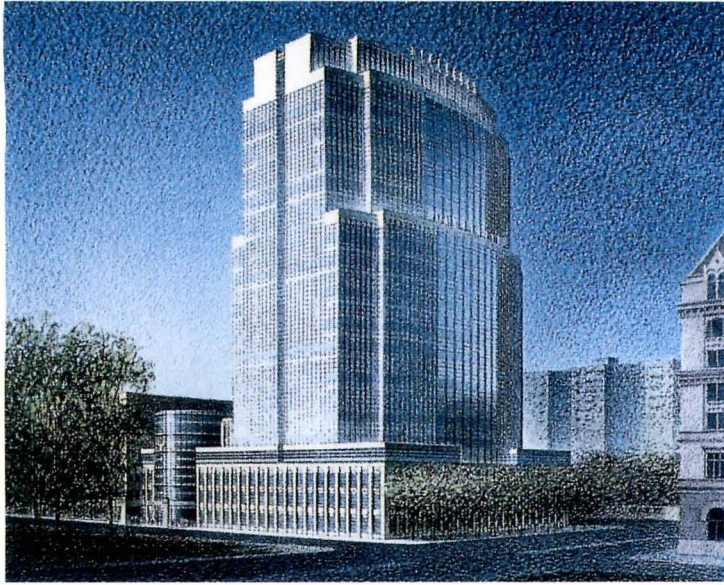
Barney and her client, the U.S. General Services Administration, concede that no building is bomb-proof, but they have taken big steps

to increase security. To slow or stop an approaching vehicle, the four-story buildings will be raised on mounds and surrounded by boulders. The mounds also are supposed to give office workers the feeling of occupying the equivalent of the military high ground.

For all the safety measures, the design seeks to project an air of normalcy. Tree-lined esplanades on the edges of each block aim to preserve the fabric of the downtown street grid. A curving, 70-foot-tall wall heralds each main entrance, endowing what might have been nondescript office buildings with a sense of monumentality.

Although flying glass accounted for the majority of the survivors' injuries at the Murrah Building, glass will be used as the main facade material for the replacement buildings. In addition to providing an office environment that is light and airy, the material is meant to symbolize the accessibility of government.

If the design wasn't accessible, says GSA chief architect Ed Feiner, *it would mean those behind the bombing of the Murrah Building had triumphed: "We didn't want them to win."* *Blair Kamin*



NO SHORTAGE OF BUILDING ACTION IN NEW YORK'S BIGGEST BOROUGH

As New York City celebrates its centennial this year, Brooklyn may resent being overshadowed since its merger with Manhattan. However, the city's most populous borough is taking dramatic steps to create a forceful design presence of its own.

Leading the way is an ambitious plan by the U.S. General Services Administration to update and expand the civic center, which encompasses the 1851 Borough Hall and the nearby public works.

One site that originally housed federal courts and a post office is undergoing a sweeping \$130 million renovation designed by R. M. Kliment & Frances Halsband Architects. Much of the space will be converted to bankruptcy courts, while a U.S. Attorney's Office and other facilities will be added and post office retail services will be relocated.

The bulk of the work will be restoration. A multistory atrium with



skylights will be reinstated as a center of gravity (below), and many other original decorative elements—down to an unusual orange-ochre paint and wall ornamentations—will reappear.

"The approach was to restore what was restorable," says Robert Kliment, FAIA, adding that additions were designed to stand out as being separate from the original construction, which dates to 1892. Among the additions is a new flight of steps, to be built along the western wall; a mezzanine, which will be added to the 1933 extension to allow for a view of the older site; and office space, to be placed on the top.

Across the street sits an empty lot where a new, 750,000-square-foot federal courthouse designed by Cesar Pelli is slated to open in the year 2000 (above). The 18-story tower will be connected to the existing six-story courthouse via a connecting entry hall.

Downtown isn't the only place getting attention. The waterfront from the Manhattan Bridge to Brooklyn Heights, comprising 75 acres mostly owned by the state, is lying fallow. A plan to turn it into a mixed-use, self-funding park has been pending for years, though developer David Walentas also has designs on the site. *Soren Larson*

AFTER A DRAMATIC DISPLACEMENT, HUNGARY GETS NEW NATIONAL THEATER

The curtain went up on the first act of Hungary's new National Theater on April 1, when ground was broken for the 300,000-square-foot structure in Budapest's city center. The first performance is scheduled for October 23, 2000—the 44th anniversary of the Hungarian uprising against the Soviet-dominated regime.

The National Theater hasn't had a permanent home since 1965, when the grandiose building it had occupied for 54 years was demolished to make way for a transportation center. It was forced to move to a nondescript, Socialist-style structure away from the central area.

Now it will be housed in a multi-level building—the stepped design ranges from 10 to 13 stories—being erected on 54,000 square feet of an 85,000-square-foot plot, with the remaining space to be a park.

The design includes three performance areas on different levels: a grand theater seating up to 650; a studio theater accommodating up to 200; and an outdoor amphitheater-like facility that will serve variously as a playground and a venue for street performers and other artists.

"The building is multifaceted," says István Fiala, an architect and the government commissioner for the theater. "It will be fronted by 19 freestanding columns, each 30

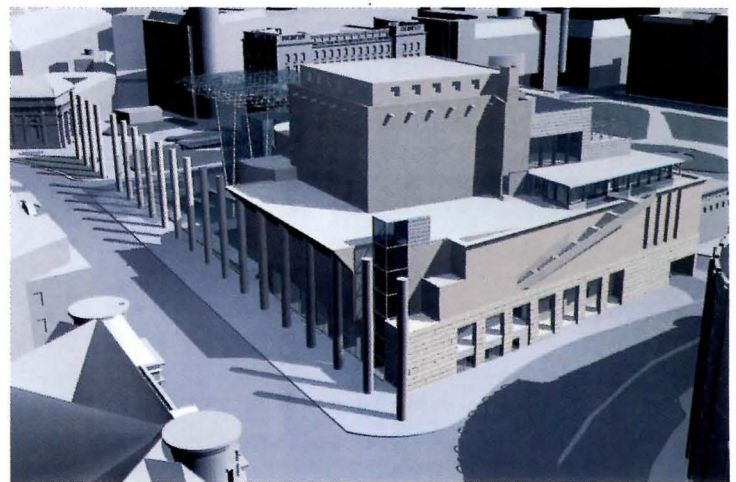
meters high, and will have a fully enclosed glass-and-steel entry hall."

The design, by architect Ferenc Bán, who lives and works in Nyíregyhéza, in northeast Hungary, was selected early last year by a jury of 12 Hungarians. Bán—who picked up the equivalent of \$30,000 for his efforts—describes his design as incorporating "the timelessness of a castle with floating steel structures and spaces delineated by glass, suggesting lightness."

A number of architects who participated in the competition didn't take it lightly when the jury, after selecting the winner, chose only 16 of the submitted designs for public viewing last May. They complained to the Ministry of Culture and Education, which calmed them down by staging an exhibition of all the submissions four months later.

The new theater will likely cost around \$71 million. The national government, Fiala reported, has allocated about \$38 million. In addition, \$11.9 million in private donations, earmarked exclusively for a new theater, has been held in state banknotes since 1983.

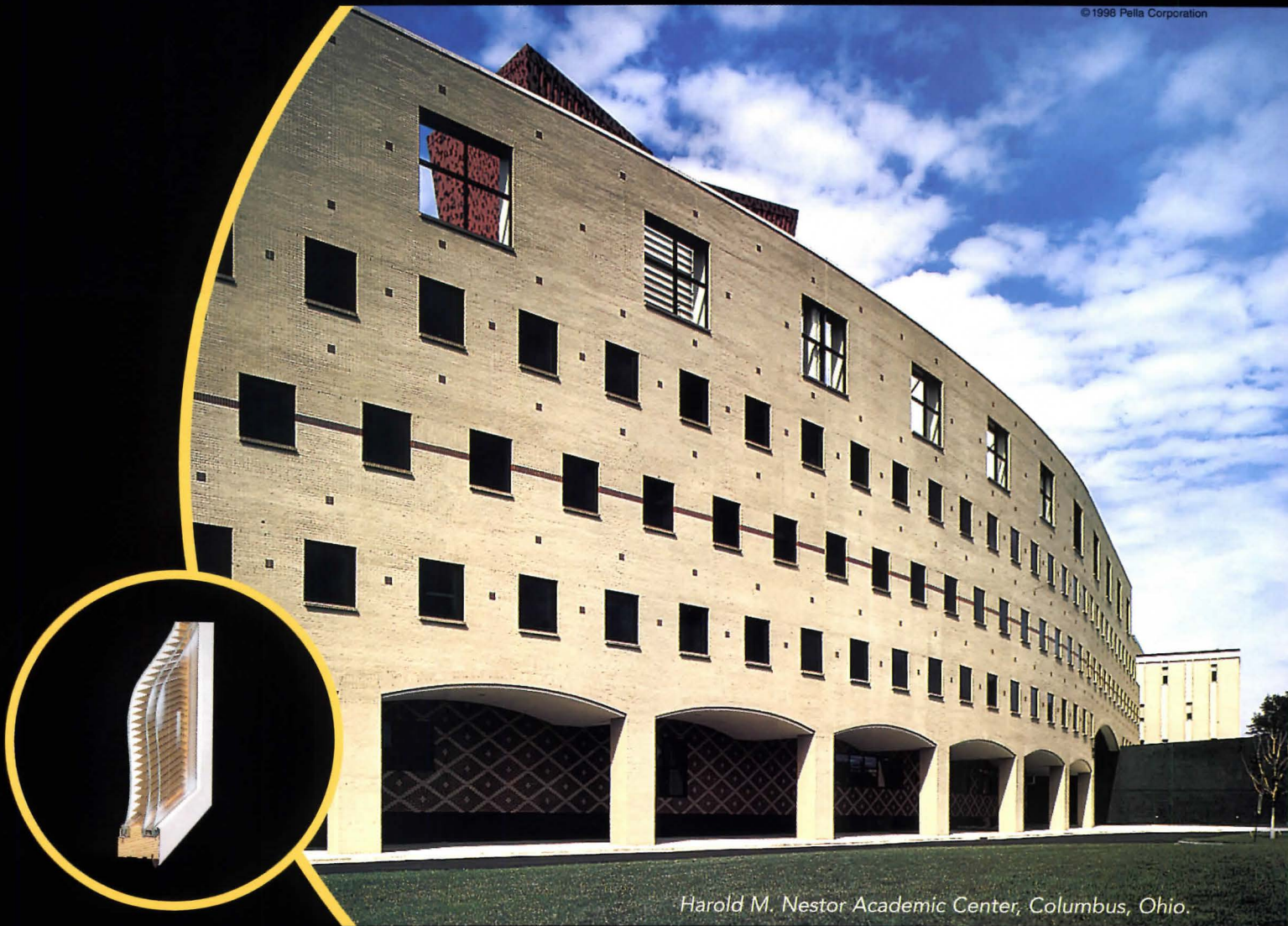
Fiala hopes that multinational corporations doing business in Hungary, along with wealthy individuals, will contribute and become sponsors of the theater. *Carl Kovacs*



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CIRCLE 21 ON INQUIRY CARD

U.S. AND MEXICAN STUDENTS BRAINSTORM FOR A FRIENDLIER BORDER CROSSING

NAFTA has helped goods flow freely across the border between the U.S. and Mexico, but people still can't help feeling less than celebratory when they pass through the oppressive, concrete-and-asphalt port of entry for San Diego and Tijuana.

To counteract this deflating situation, California Polytechnic State University's Pomona campus invited architecture students on both sides of the border to design a friendlier, more welcoming border crossing for pedestrians. The program for *La Puerta* (The Door) included a bicultural arts center and library, a plaza, social services agencies, and guarded checkpoints.

The proposals, which were exhibited in San Diego this spring, reflected the participants' experiences with the border. One Cal Poly

student, Hector Rochin Gaxiola, seemed to compensate for today's poor border relations with festive vernacular buildings (below).

Students from Universidad Iberoamericana Noroeste in Tijuana tackled the frosty reception Mexicans sometimes experience when traveling north by designing a complex that would straddle and thereby "erase" the border.

From afar, Universidad Iberoamericana students in Mexico City produced the most formal solutions. Their *Engranes* (Gears), which is linear in plan, would invite people to crisscross the line at will through interlocked building segments.

Overall, the common theme of the projects was to build a civic plaza to encourage interaction and replace a forbidding no-man's-land. *Ann Jarmusch*



SAFETY FIRST: L.A.'S CITY HALL GETS PREPARED FOR EARTHQUAKES

Following decades of earthquake damage, the Los Angeles City Hall is set to receive major repairs—just in time to mark the building's 70th anniversary. The building is undergoing a seismic rehabilitation to make it safer when the earth starts to move, while other improvements will bring it up to current fire, life safety, and disabled-access codes.

Rising 32 stories and with a footprint of roughly 750 by 350 feet, the City Hall sits in L.A.'s geographical center. Its bulk and distinctive profile, as well as its civic function, make it an enduring landmark. Designed by architects John C. Austin, Albert C. Martin, and John Parkinson, the building was dedicated in April 1928; Martin's successor firm, AC Martin Partners, designed the present rehabilitation.

AC Martin's plans call for "base

isolation" seismic construction so that the building can remain stable even when the ground shakes beneath it. The steel-frame building's 430 structural columns will be uncovered *a few at a time, and each* will be retrofitted with a layered steel and rubber isolator attached above its footing.

In addition, a four-foot-wide separation joint will be constructed around the building's perimeter. As a result, the structure will remain independent of the ground motion during seismic activity, with the base of each column able to move up to 12 inches without the transfer of major forces into the building. When repairs are completed, the City Hall will be the world's tallest base-isolated structure.

Although seismic upgrade is the primary focus of the \$180 million being spent on improvements, more visible to the public will be the restoration of historical areas, such as the City Council and Public Works Chambers, and of the building's exterior. Decorative ceilings, marble columns and floors, and damaged terra-cotta cladding will be restored or replaced.

As downtown welcomes new works by Frank Gehry and José Rafael Moneo, Angelenos will also be able to walk through the old City Hall with pride and enjoyment once more—this time with an added sense of safety. *Alice Y. Kimm*

FRENCH COMPETITIONS IN QUESTION France may be in hot water with the European Commission over what some see as a pattern of unfair awarding of public service contracts. After securing the cancellation of several architectural competitions involving irregularities in a case in 1995, the EC subsequently received additional complaints concerning various competitions organized by the general council of Réunion, a French island near Madagascar. As a result, in April the EC announced its decision to send the French government a reasoned opinion—which is the second stage of infringement proceedings—for the breaching of European Community rules that govern the opening of public service contracts to competition.

In the four contested competitions, two winners have links with jury members, in breach of an article which stipulates that the jury must be independent. In another scenario, the contracting authority rejected certain candidates on the grounds that they had not been selected in earlier procedures, which contradicts a requirement that selection criteria must be clear beforehand. Finally, one of the projects selected turned out to be incompatible with the land-use plan and was subsequently revised, in breach of the principle of equal treatment of competing designs. The French authorities are called upon to terminate the award procedures in question and take necessary steps to ensure that competitions in Réunion are just that: competitive. *W. B. Schatzman*

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CIRCLE 22 ON INQUIRY CARD



A GIANT NEW MALL IN PROVIDENCE SITS ON BOTH SIDES OF THE TRACKS

The problem, as co-architect Friedrich St. Florian puts it, was to put a New York-size building into the center of a delicately scaled New England city of 150,000.

The solution for 1.35 million-square-foot Providence Place, a mall taking shape in the center of the Rhode Island capital, was to design it not as a building but as a city block. Each section has a different facade (designed within a set of unified criteria) and often a different architect. The mall will also have numerous entrances, as well as many on-street restaurants and shops.

The project is also momentous in that it connects two sections of Providence split by the Woonasquatucket River and the railroad tracks. A glass-enclosed, arched-roofed wintergarden forms a bridge over the river and the railroad, connecting the two halves of the mall and at the same time breaking down its volume.

Unlike big-box malls that have often siphoned urban life into the suburbs, Providence Place is intended to draw people into the

downtown area, where they might otherwise never go. A few blocks away is the 1828 Providence Arcade, which locals say is probably the oldest enclosed shopping street in America.

City officials hope that the arcade and other small stores will not only survive the new mall but prosper from the influx of visitors to the area, as happened in Boston after the construction of Copley Place.

Arrowstreet Inc. of Somerville, Massachusetts, was responsible for the interior public spaces and construction documents; St. Florian of Providence was in charge of exterior elevations; HOK Architects of St. Louis and Callison Architecture of Seattle designed the three department stores (with the help of 24 public workshops); and the developer is Commonwealth Development Group.

The \$430 million project—which is bigger than the entire Brown University campus, located nearby—is scheduled to be completed in August 1999. *Jonathan Hale*

VINOLY'S NEW PHILADELPHIA STORY IS ABOUT OPENNESS AND INCLUSION

In designing the new Regional Performing Arts Center in Philadelphia, Rafael Viñoly wanted to do away with traditional notions of a confined lobby and an aura of exclusion. "It was more of a notion of creating and extending a public space," he says. "I didn't want it to be so closed off, so uninviting."

The solution was to drape an arched envelope of glass with steel supports over the performance spaces, creating an environment that the architect says is protected but still open and filled with natural light.

Groundbreaking for the new 435,000-square-foot center, located on the corner of Broad and Spruce Streets in the downtown area, will be in November; completion is set for 2001.

Inside will be a 2,500-seat concert hall in the shape of a cello that will be home to the Philadelphia Orchestra, as well as a 650-seat recital space with a stage on a turntable, which allows one act to

set up or rehearse while another faces the audience.

Theater designer Richard Pilbrow worked on the interiors and acoustician Russell Johnson created the sound environment. The cello shape is not just symbolic or decorative but in fact is said to be conducive to first-rate acoustics for classical music. *S.L.*

SHARED SENSIBILITIES Architect Ron Petralito wasn't after a commission when he contacted the author of an article about co-housing. The self-described "back-to-the-woods kind of guy," who'd done a stint in a communal arrangement in his younger days, just liked the idea of group living. As a single father, he hoped the co-housing concept would provide a support network for him and his son.

In co-housing, a Danish import, individuals and families maintain their own homes but share cooking, meals, and clean-up in a communal dining room. American architects Kathryn McCamant and Charles Durrett spent a year in Denmark studying co-housing communities, and their book, *Co-Housing: A Contemporary Approach to Housing Ourselves*, introduced the idea to the United States.

Since 1991, 36 co-housing projects have been constructed nationwide and over 150 more are in the planning stage, according to Ann Zabaldo, regional coordinator for the Co-Housing Network. The concept strikes a chord in a variety of people, she says. Some are looking for a support network of similarly minded souls; families in which both parents work like the idea of coming home to a waiting supper. While co-housing is not to be confused with assisted-living facilities, it encourages the kind of helpfulness that enables many elderly to remain independent.

Petralito liked what he saw enough to join a co-housing group planning to live in Libertytown, Maryland. Fellow members called on his design expertise, and the IIT grad eventually became the project architect. They're ready to break ground, according to Zabaldo, as soon as financing is completed. *Ellen Sands*



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CIRCLE 23 ON INQUIRY CARD

REVAMPING EFFORT GETS UNDER WAY AT HISTORIC SOUTH AFRICAN COLLEGE

Phase one of an ambitious effort to rehabilitate and enlarge Wilberforce University, the first American-funded college in South Africa, has just been completed, with groundbreaking for phase two, a new academic building core, slated to begin in August.

For architect William Stanley, FAIA, whose Atlanta-based firm, Stanley Love Stanley, has been involved in the project since 1996, the undertaking provides "an opportunity to be on the ground floor of something so significant to the future of South Africa—the effort to

provide quality education to black South Africans."

Wilberforce University was established in 1908 in Evaton, just outside Johannesburg, by the African Methodist Episcopal Church and developed gradually over the next five decades. In its prime the university educated many of Africa's leaders; in the 1960s, though, the school was closed by the government, largely because of the role students played in organizing protests against apartheid.

The university's 13 core historic buildings, primarily stucco and brick

with metal roofs, have been restored to their original Flemish and N'Debele (a people of northern South Africa) styles, in a process that was fast-tracked to be completed in time for President Clinton's visit to South Africa this past March.

The second phase will consist of a classroom; an administration and library complex; a modest conference center; and additional academic buildings. Once funding is secured, phase three, a "distance learning center," will begin construction some time next year.

Funds are coming from a grant by USAID-ASHA (American Schools and Hospitals Abroad), part of the U.S. State Department, as

well as from private donations.

The design work was done by Stanley Love Stanley in collaboration with M. Peter Malafane, the first black architect trained in South Africa, to maintain consistency with the local architectural vernacular.

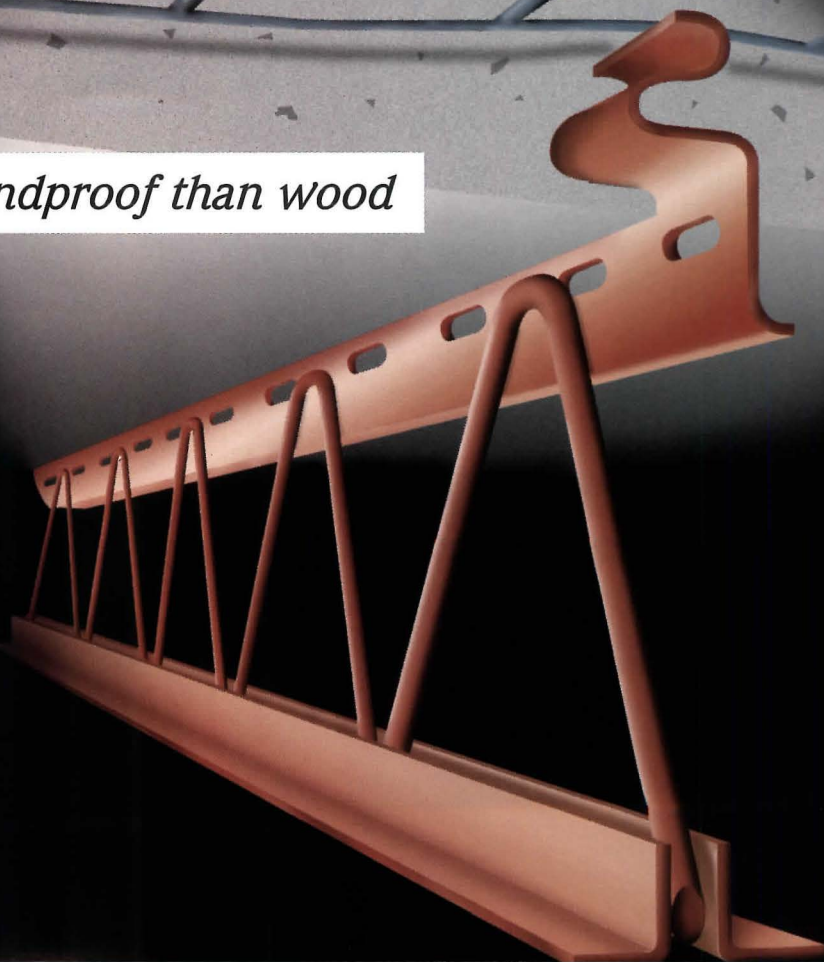
Stanley Love Stanley's campus plan is organized around a central quadrangle whose axis extends from the original campus quadrangle. The design was made to be flexible, Stanley explains, to allow for future enhancements, which could include additional academic buildings, housing, a research center, and facilities for local government, a performing arts complex, and retailers. *Julie Moline*



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GWATHMEY HEADS FOR HOME TO DESIGN NEW ART MUSEUM FACILITY

He's already done the Guggenheim Museum addition in New York and the Henry Art Gallery at the University of Washington. Now Charles Gwathmey is turning his attention to the St. John's Museum of Art, a small but regionally respected institution in Wilmington, North Carolina, that is building a new facility. "I pursued it even though it's a small job for us because I do have a legacy [there] that's important," says Gwathmey.

Born in Charlotte, Gwathmey spent his first 18 summers at Wrightsville Beach, near Wilmington. More important, his father, the artist Robert Gwathmey, and his mother, Rosalie, a photographer, were close friends of the Wilmington artist Claude Howell, a longtime supporter of the St. John's Museum who died in 1997.

The museum has outgrown its patchwork of 19th- and 20th-

century buildings in downtown Wilmington (at left in photo, next to the 1804 St. John's lodge), says director Ren Brown. Gifts last fall of \$4 million from the Bruce B. Cameron Foundation and five acres of land from the children of Louise Wells Cameron, a museum patron who also died in 1997, enabled the museum to plan a new 30,000-square-foot facility.

The new site, at the intersection of two major arteries outside of downtown, offers an opportunity for the sort of art museum that doubles as a work of art, Brown says.

"I would certainly think we're going to build the most significant building in Wilmington in the 20th century," says Brown, noting "not much competition" in a town known for 19th-century-and-older buildings.

"I think what a building like this should do is in a sense make a



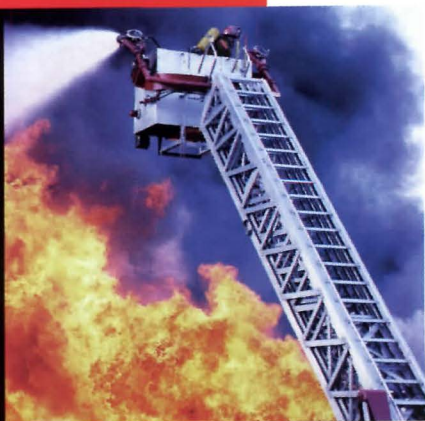
compelling architectural object that engages people's curiosity and also is memorable in the most positive way," says Gwathmey, who hopes to present initial designs soon.

Construction could take another two years. In the meantime, the museum must raise the balance of the expected \$7 million cost—a goal that will be easier to achieve now that Gwathmey is involved, says Brown.

St. John's is one of several area art museums that are building or considering an expansion. The state-owned North Carolina Museum of Art is seeking funds to expand and refurbish; the Mint Museum of Art in Charlotte is renovating a downtown building as a crafts museum; and Reynolda House in Winston-Salem has hired Beyer Blinder Belle to design additional space. *Chuck Twardy*

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CIRCLE 24 ON INQUIRY CARD

NEWS BRIEFS

Ellerbe Becket suit settled

The litigation between Ellerbe Becket and the Justice Department was settled in late April when the two parties agreed to a compromise of disputed claims. Justice had alleged that Ellerbe Becket was not designing its sports facilities according to Americans with Disabilities Act rules, though the firm claimed that its constructions provided proper elevated sightlines for wheelchairs, and that the ADA was unclear. In the end, Justice published a standard volume called "Accessible Stadiums" to set criteria; Ellerbe Becket incurred no civil penalties and agreed to use the new guidelines.

AIA gets go-ahead At the AIA's national convention in San Francisco last month, delegates voted in favor of a proposed multimedia ad campaign—an effort intended to boost the image of the architecture

**The Postal Service's homage.**

field. Members will be charged \$50 a year in order to extend the current print effort to include network and cable television, along with radio. In addition, Ronald L. Skaggs, FAIA, was named the 1999 first vice president/president elect. He will become president of the AIA in 2000; Michael J. Stanton, FAIA, will succeed Ronald Altoon, FAIA, as president next year.

Stamp of approval Art Deco has been recognized by the U.S. Postal

Service. Late in May, a stamp featuring the Chrysler Building's spire began circulating. It is being offered on a sheet commemorating the Roaring Twenties.

Not the old school Avon, Indiana, will soon be home to a \$65 million high school. Designed by Fanning/Howey Associates, the facility, which will sit on a 104-acre site outside Indianapolis when it's completed in August 1999, will feature five baseball fields, a football field and four practice fields, two soccer fields, and 12 tennis courts for this sports-crazy state. Avon High School will also have 91 teaching stations or classrooms, organized in "academic houses" comprising four classrooms and one science lab per house.

In a White room In 1902, Payne and Helen Hay Whitney thought it a splendid idea to have Stanford White create an opulent reception room for the Fifth Avenue townhouse he was designing for them.

The result was the Venetian Room, which welcomed swells until 1948, when it was painstakingly dismantled and moved to Long Island. In 1997 the family donated the room to the French-American Foundation—which happens to reside in the original 1902 house. The foundation reinstalled the room and now displays it for those interested in a glimpse of the Gilded Age.

Miele digs Graves First Michael Graves appeared in an ad for a Miele dishwasher in 1994. Now the architect has furthered his relationship with the international appliance company by designing its new U.S. headquarters in Princeton, New Jersey. Ground was broken in April and the 31,400-square-foot facility should be occupied early next year.

Danger zone The State of New York's Protecting Home & Family program, which was created to educate architects and others about protecting residences against



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natural menaces such as hurricanes, is building a hazard-resistant model home. Located at SUNY Maritime College in the Bronx, the project will be a training center and an example of the latest techniques in weathering natural disasters.

Basket case The Longaberger Co., the largest manufacturer of handmade baskets in the U.S., has completed construction of its new headquarters in Newark, Ohio. Rather than go with a standard office building, the company created a monument to its bestseller by designing the structure to resemble a huge basket—160 times the size of the Medium Market Basket, to be exact. Longaberger designed the exterior and interiors.

Predock gets another Antoine Predock—who recently designed Skidmore College's art museum—has been selected as architect for the Tacoma Art Museum's new 50,000-square-foot building.



Longaberger's new office will be built to resemble its top-selling product.

Groundbreaking is set for mid-1999 for the museum, which will be Predock's first project in the Northwest.

Not that Alhambra Most people don't think of New York's Bedford-Stuyvesant area when they hear the

word *Alhambra*. But Spain isn't the only place to find one; on Brooklyn's Nostrand Avenue there stands an 1889 Queen Anne Revival apartment building with that name. The landmark building is being renovated by architect and preservationist Tom Anderson and will soon house 46 apartments as well as 7,000 square feet of retail space.

Doing their homework Students in the University of Oregon's Urban Architecture program have some real projects on their hands. They're designing a Hispanic center and helping adapt a post office in downtown Portland. Free of charge, of course.

Peter, historian; Mann, architect

John Peter, a longtime magazine consultant and art director who recorded oral histories of many of this century's top architects, died in May at age 81. He was the author of several books, including his latest, *The Oral History of Modern Architecture*, an encyclopedic volume published in 1994.

Arthur Edwin Mann, FAIA, a founder of the Los Angeles-based Daniel, Mann, Johnson & Mendenhall, died in late April. He had gone from selling drawings during the Depression to building one of America's largest architectural firms, which has done extensive work in public transportation. ■

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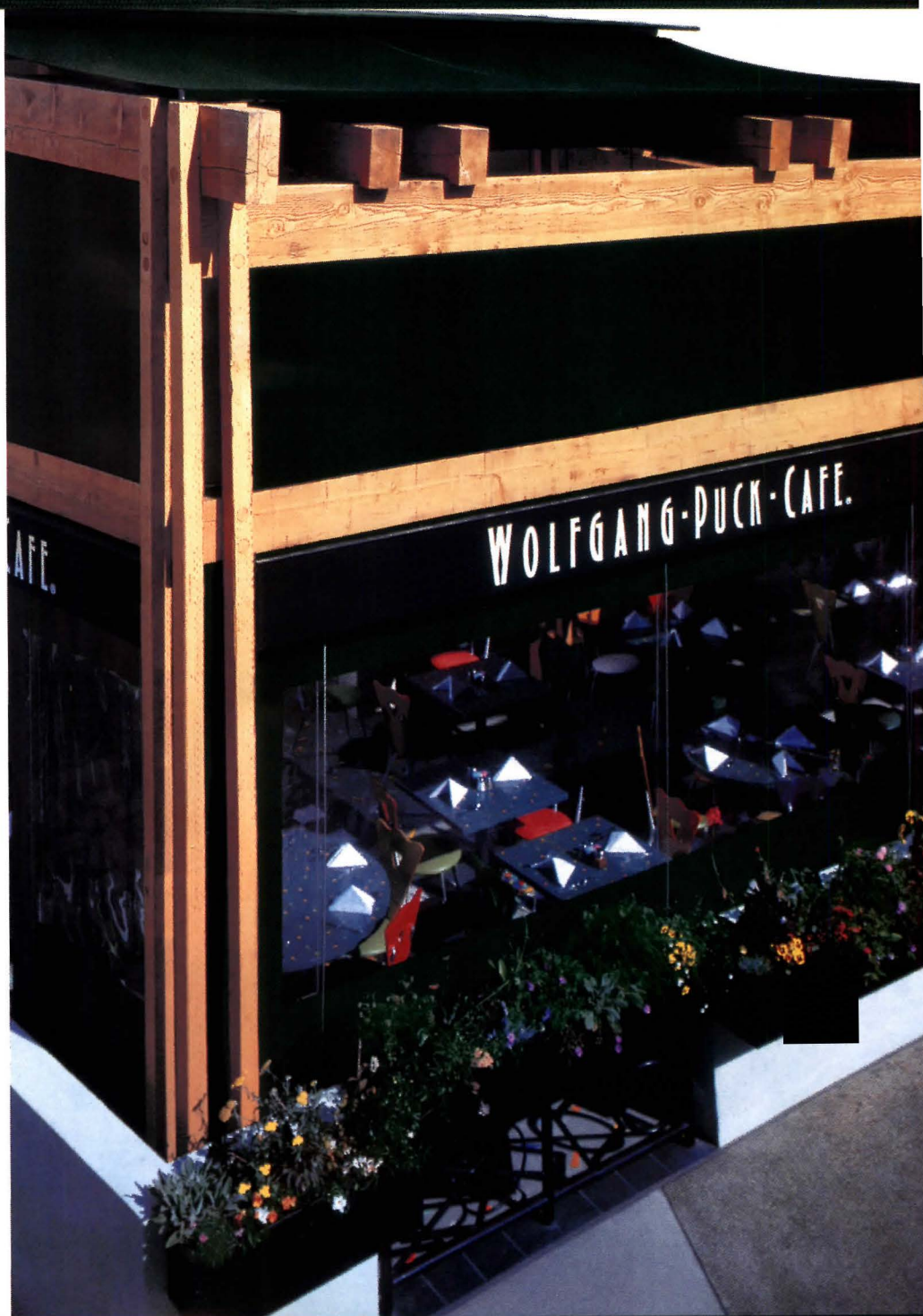
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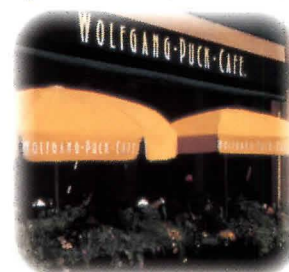
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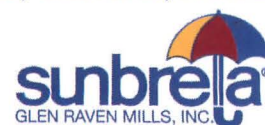
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CIRCLE 27 ON INQUIRY CARD

DATESEVENTS

Calendar

Kisho Kurokawa Retrospective
London*Through June 13*

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

Philippe Starck Exhibition
Miami*Through June 14*

Housewares, lamps, furniture, flatware, books, and other objects by the celebrated and controversial designer are on display. Arango. 305/661-4229.

Maya Color: The Painted Villages of Mesoamerica
Washington, D.C.*Through 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.

Finnish Modern Design: Utopian Ideals and Everyday Realities
New York City*Through June 28*

Featured in this exhibition are glass, ceramics, furniture, textiles, metalwork, and industrial design. Organized by the Bard Graduate Center for Studies in the 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*

Paintings, maps, plans, and photographs document Southampton sites and how they have changed over time. The show explores issues of village planning, land use, and demographic change. Parrish Art Museum. 516/283-2118.

The City as Memory: International Sculpture
Chicago*Through July 12*

Sculpture and other artworks created by artists from Europe, Asia, and North and South America. Chicago Athenaeum Museum of Architecture and Design. 312/251-0176.

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.

A New Campus Center: The IIT Competition Results
Chicago*Through July 25*

A show of materials submitted by the five finalists in the competition

to build a new campus center for the academic complex designed largely by Mies van der Rohe. The exhibition includes work by Peter Eisenman, Zaha Hadid, Helmut Jahn, Kazuyo Sejima and Ryue Nishizawa, and Rem Koolhaas, who won the commission for the campus center. Art Institute of Chicago. 312/443-3600.

Landmarks of New York
New York City*Through August 23*

An exhibition of historical photographs marking the 100th anniversary of New York City, accompanied by a symposium, walking tours, and panel discussions. New-York Historical Society. 212/873-3400.

The Inflatable Moment: Pneumatics and Protest in '68
New York City*Through August 29*

An exhibition focusing on the French architects and activists Utopie. Also on display are models by Archigram, Frei Otto, Gernot Nalbach, and Coop Himmelblau, as well as structural fragments of built pneumatic projects. Architectural League of New York. 212/753-1722.

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 exhibition documenting the development of the Ronald Reagan Building and International Trade Center on Pennsylvania Avenue, starting from a design competition in 1989 and culminating with 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.

Shifting Gears: In Pursuit of a Greener City**Toronto***Through September 27*

An exhibition proposing urban design strategies for reducing carbon dioxide emissions. Design Exchange. 416/216-2145.

The Design and Building of Girard College**Philadelphia***Through October 23*

Surviving entries in the 1832 design competition for the college, the first architecture competition to attract nationwide attention, will be on display, as well as drawings of the construction of the winning entry, completed in 1848. Founder's Hall. 215/787-2601.

New Ways of Revitalizing the American City
Washington, D.C.*Through January 3, 1999*

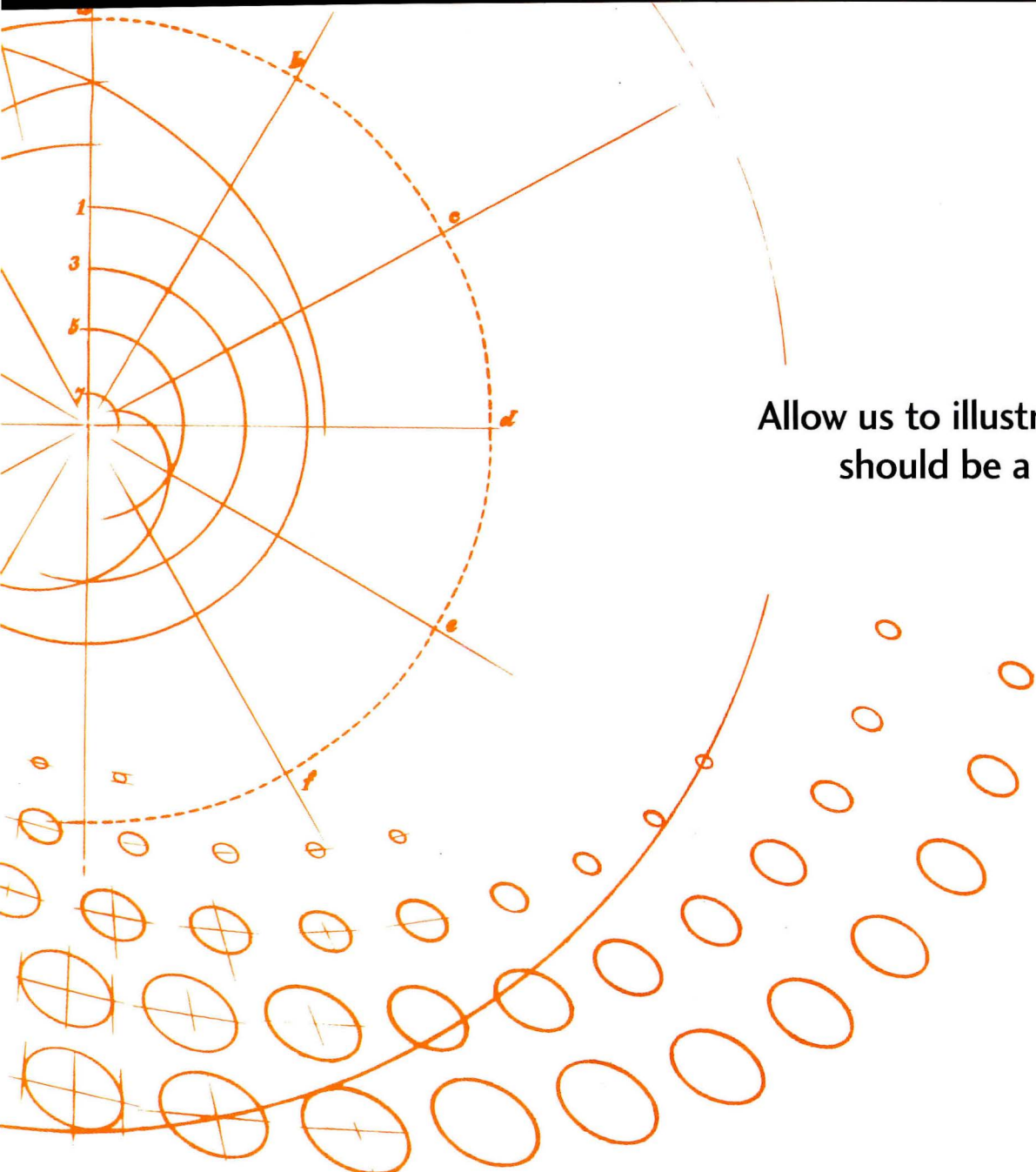
An exhibition illustrating how new cultural facilities have brought life back to tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

Cities on the Move 2
Bordeaux, France*June 4–August 30*

This collaborative exhibition put together 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.

The Business of Innovation: Bechtel's First Century
Washington, D.C.*June 5–January 4, 1999*

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Highlighted "megaprojects" include the Hoover Dam, the Marinship shipyard, San Francisco's rapid transit system, and the Channel Tunnel, connecting England and France. National Building Museum. 202/272-2448.

Japan 2000: Design for the Japanese Public
Chicago

June 6–September 7

An exhibition of recent winners of Japan's G-Mark, an annual awards program sponsored by the government, which promotes good design. On display are such winning products as Casio G-Shock watches, Yamaha bicycles, and mini automobiles. Art Institute of Chicago. 312/443-3600.

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, bars, hotels, and clubs; and TechnoCon, featuring CAD solutions for interior design. Merchandise Mart. 800/677-6278.

The New Toronto and Envirofest '98

Toronto

June 8–10

The first two days of this convention will feature lectures on adaptive reuse, infill, regulatory reform, transportation, and infrastructure and their predicted impact on Toronto's future. Envirofest '98—an exhibition showing how available building products, furniture, interior furnishings, and services contribute to environmental sustainability—will take place on the third day. Design Exchange. 416/216-2124.

Forma Italia
Chicago

June 8–September 6

The opening of this exhibition of Italian furniture, lighting, and industrial design coincides with NeoCon '98 (see above). On display are objects from the permanent collection of the Chicago Athenaeum Museum of Architecture and Design, as well as several new pieces that were introduced this past April at Milan's Salone del Mobile. Chicago Athenaeum Museum. 312/251-0176.

Fountains: Splash and Spectacle

New York City

June 9–October 11

This exhibition elucidates the role of European and American fountains—and water as a design force—in defining urban space, with examples ranging from the Renaissance to the present. Cooper-Hewitt National Design Museum. 212/849-8300.

RAIC Festival of Architecture
Regina, Saskatchewan

June 10–13

This year, 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.

We, the House Builders of Austria

Vienna

June 10–August 3

This exhibition traces the development of the single-family home in postwar Austria, the housing choice of 80 percent of the country's population. Architekturstudium Zentrum Wien. 011/43-1-522-31-15.

The Architecture of Graham, Anderson, Probst & White
Chicago

June 11–September 6

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Solar '98: Renewable Energy for the Americas
Albuquerque, New Mexico

June 13-18
Policymakers, scientists, architects, and businesspeople will be leading and attending symposia and workshops, joining the efforts of the American Solar Energy Society, the AIA Committee on the Environment, and the American Society of Mechanical Engineers, concerning the integration of solar energy use into design. Albuquerque Hilton. For information call 303/443-3130 or visit www.ases.org/solar.

Entrepreneurship, Innovation, and Design Conference
Wellesley, Massachusetts

June 15-17
A conference by and for senior corporate executives about methods of achieving success through design. Babson College. Call the Corporate Design Foundation at 617/350-7097 for details.

International Conference on Universal Design
Hempstead, New York

June 17-21
The conference offers workshops on designing buildings that are universally accessible. Submissions for a student competition, "A Community Gathering Place for the 21st Century," will be on display, and the winners will be announced during the conference. Hofstra University. Contact Adaptive Environments at 617/695-1225 x0 V/TTY for an informational brochure, which is also available in Braille, large print, or on disk.

Megaform as Urban Landscape
Jerusalem

June 21-23
At this year's Jerusalem Seminar in Architecture, Richard Meier, Rafael Viñoly, Ricardo Legorreta, Henri Ciriani, Fumihiko Maki, Steven Holl, and other designers will present projects and discuss how the megaform could help ameliorate today's urban landscape. The seminar is moderated by Kenneth Frampton. International Convention Center. Call 011/972-2-563-904 or visit www.jersemar.org.il for more information.

Under the Sun: An Outdoor Exhibition of Light
New York City

June 21-October 25
An exhibition of solar-powered installations, including commercial products, experimental prototypes, and commissioned designs. Cooper-Hewitt National Design Museum. 212/849-8300.

Construction Specifications Institute Convention
Baltimore

June 25-28
The CSI, celebrating its 50th year, expects 9,000 construction professionals to attend this year's convention and exhibition of new commercial building products. Former HUD secretary Jack Kemp will be the keynote speaker. Baltimore Convention Center. For more information call the CSI at 800/689-2900 or visit www.csinet.org.

Competitions

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

(continued on page 210)

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The Urban

Vibe

EVERY CITY HAS ITS OWN VIBE, SAYS MICHAEL SORKIN, WHO ROAMS THE STREETS OF AMSTERDAM, VIENNA, BERLIN, AND HIS HOMETOWN OF NEW YORK TO FIND IT.

by Michael Sorkin

Strolling through Amsterdam you can catch the cannabis whiff wafting from the coffee shops. For '60s me, this has always stood for the combination of tolerance, practicality, and a kind of decadence that seems especially Dutch. Down the street, hookers perform self-commodification, advertising their wares in the bay-window showcases adjoining their boudoirs. This tableau is also very Dutch in its architectural expression. Holland is the nation of the window and the invitation to gaze in.

Cities have vibes, and Amsterdam is an especially mellow place. The feeling in the street is one of tolerance and solidarity; the boundaries of fear are set very wide. Amsterdam isn't a city that provokes anxiety when one has to ask for directions or advice from strangers, and this, I think, is a hallmark of a great urban culture. Such civility—so eloquently set out by Jane Jacobs in her descriptions of the character of good neighborhoods—is, of course, a product of culture, not architecture. But architecture is also a product of culture. How does architecture reinforce this sense of vibe?

Amsterdam marks a high point of the architecture of neighborliness. Its architecture is extremely complex, constructed from the delimited vistas of winding streets and canals, from the richness and charm of a texture built up by small increments—bricks, pavers, window panes, fittings—and from the centuries-old patina of both careful addition and the minor de-symmetries of subsidence and wear. Colluding in this conviviality are also ease of movement and the preference given to walkers, bikers, boaters, and trams; the small, local scale of commerce; the density of cafés, restaurants, bars, and those “coffee” shops; and especially the luminous, graceful, and intimate domestic architecture. Holland is still the most densely populated country on earth, and in its old cities it has produced an exemplary culture—not of congestion, but of density.

One of the striking qualities of Dutch domestic architecture is its transparency. Walking those Dutch

streets, a passerby gains access to the whole spectacle of bourgeois domesticity. Through the big windows of the beautiful party-walled houses, people pursue daily life unselfconsciously. Here's a wonderful seam between culture and architecture, a set of building practices that have been worked out to serve both necessity and values. Dutch architecture summarizes Dutch culture very succinctly. And, to me, there's no question that the magic in the environment contributes to the vibe, reinforces the civility. Part of this springs from a sense of openness, a productive surrender of privacy in which surveillance goes both ways. For the Dutch, this visibility works because of a kind of cultural frankness, the idea that there's nothing to hide because all is tolerated.

I've noticed the same sort of casual civility in certain vacation spots on Fire Island or Cape Cod. There's an implicit compact of good



In the streets of Amsterdam, walkers, bikers, and trams interact and overlap with an ease of movement. The scene is typical of Dutch culture, which is known for density but not congestion.

Michael Sorkin, a *RECORD* contributing editor, is the former architecture critic of *The Village Voice*.

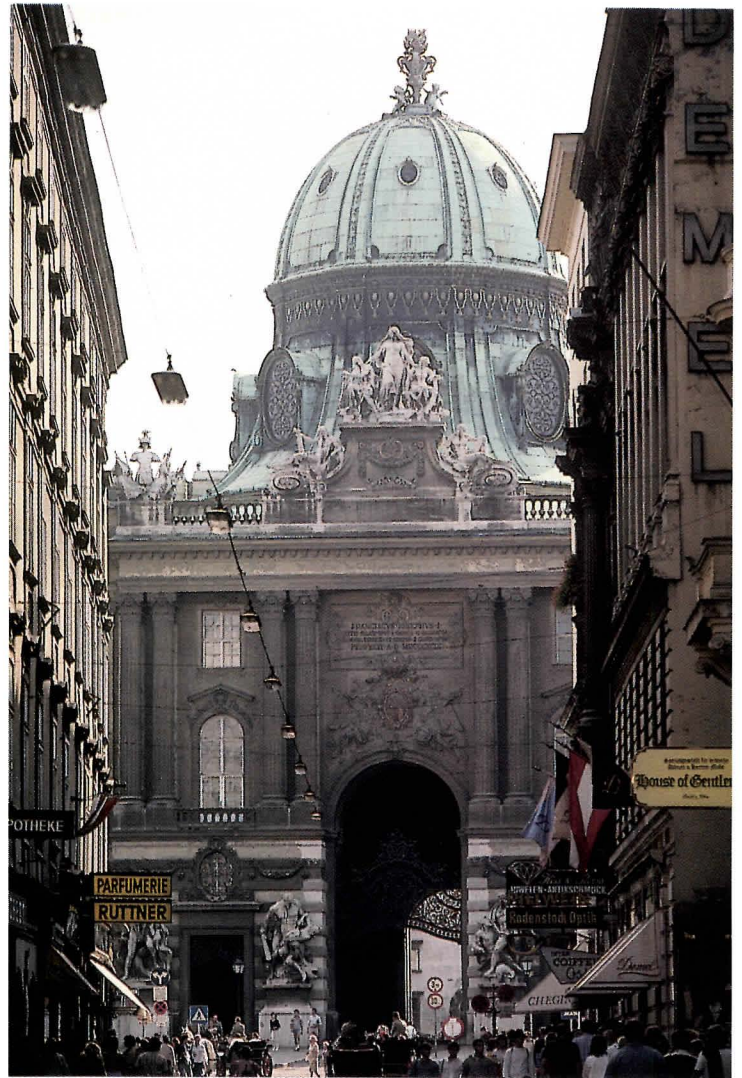
behavior, well beyond what one expects at home. People greet each other in passing, doors are left unlocked, merchants extend tiny amounts of credit to regular faces who in turn make a great show of repaying the two bucks they were short for yesterday's lobster and chardonnay. Bad behavior also takes a holiday. Although there's an elective uniformity about holidays, it's not just the solidarity of the leisure class and the more relaxed holiday behavior, but the quality of the specially designated, circumscribed, "other" landscape that makes it possible. A vacation always presents the opportunity to participate in another set of rules, if only those that allow you to sleep until noon and never wear shoes.

The mass-market version takes place in Disneyland—the "magic" kingdom, where self-policing behavior is produced in visitors who, enjoying the hygiene and the idea of an environment dedicated to pleasure, litter less and smilingly organize themselves into orderly queues. This is not the result of a sense of literal proprietorship but stems from an implicit compact in defense of a vibe enabled by special circumstances. The question is whether this behavior is coerced. I don't think so. People are attracted to places where the deal is clear, where the possibility is visibly established.

Vibe, then, is produced by a combination of space and behavior. But the vibe can also be bad. For the last several years, I've been teaching urban design in Vienna, a city which is part of a culture that extols correctness to the point of oppression. Almost every New Yorker who visits Austria (or Germany) comes back with the same story. The street is empty but the light at the pedestrian crosswalk is red. Of course, as a New Yorker, you cross. On the curb, though, is a knot of locals waiting patiently for the light to change, their eyes boring into your back in rebuke. The behavior is all cultural: a corner where I often jaywalk has a cop stationed round-the-clock to protect the Turkish Airlines office from bomb-throwing Kurds. I've never seen him issue a jaywalking summons. Perhaps he isn't supposed to leave his post. In New York City, jaywalking has long been considered a civil right. Mayor Giuliani's recent crackdown (motivated not by any consideration for pedestrian safety but simply for the convenience of cars) has, I'm happy to say, been roundly challenged. In Los Angeles, on the other hand, jaywalking is not advised. Drivers rule the road and cops are scary: no one wants to be Rodney King.

Vibe can shift suddenly and it can be very personal. Firearms unnerve me anywhere. I don't like hunters and I hate those encounters with Brink's men in the city as they escort their brethren bearing bags of dimes into the bank with their six-shooters drawn. In Vienna, although the pistols are invariably holstered, the machine guns are out. One of the more *soigné* bistros in town (very popular with architects) is catty-corner from an Israeli restaurant and up the street from a synagogue that managed to survive the Anschluss. Both of these places rate 24-hour police protection. Unlike their compatriots guarding the airline, though, these cops carry submachine guns. It's a sight one also sees in Germany in front of Jewish institutions. For me this evokes enormous fear. I'm made anxious by the sight of any Germanophone in uniform, especially carrying a gun. "Your papers please!"

In fact, Vienna is remarkably safe. Walking the city late at night, even down along the isolated quay sides of the canal that flows through the city center, I have no anxiety about crime, except an imported dread I bring with me from New York that periodically surfaces to suggest that in similar circumstances at home I would become fearful, which in turn makes me slightly afraid. This kind of grafted dread—the fear of fear itself—also strikes me from another angle. Walking those empty streets late at night, I realize that it was just over 50 years ago that the act of being seen in Vienna—erstwhile epitome of urban civilization—would have put

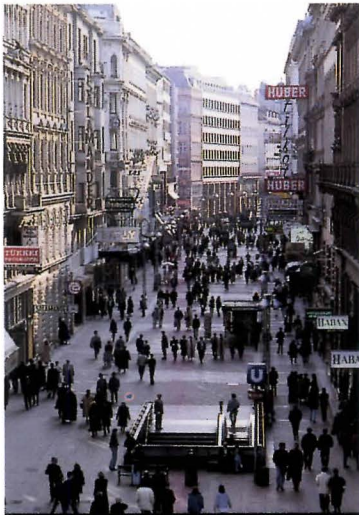


St. Michael's entrance to the Hofburg in Vienna (top) and a flak tower in the city's Esterhazy Park (bottom). In Vienna jaywalking is uncommon, except, perhaps, for visiting New Yorkers.

PHOTOGRAPHY: © ARNO ZEPLIN (OPPOSITE); CHARLES WEST (TOP); GISELA ERLACHER (BOTTOM)

me in far more danger than any I might face in the most crime-ridden neighborhood in America. I become aware that the eyes at any window—those beloved peepers of Jane Jacobs—could have fingered me for extermination. Vibe, the measure of collective intent, is also a Janus.

This reflection, which cannot be repressed, extends, for me, to a deep suspicion of the elderly. When in Vienna, I often wake up in a jet-lagged daze in the middle of the night and go into the kitchen for some water. Out the window, I have a view of an old-age home across a wide



Kärntnerstrasse, a popular shopping district in downtown Vienna, where pedestrian order prevails.

garden, and I always see—in those wee hours—that many of the rooms across the way also have their lights burning. I wonder why, thinking first that in old age waking time becomes more precious. Then I wonder whether it's just guilty conscience. Unlike America, where urban fear is generally focused on youth, my Viennese criminals are geriatric. Where were they, I wonder? What was their complicity? White-haired ladies become fiends. Is this the real Vienna? Insomniac Nazi grannies eating strudel?

Fear is also a cultural production, and every society invents its own bogeymen. In a climate of fear, everyone becomes an object of suspicion. Walking late at night in an American city, falling in

behind a woman alone, for example, whistling, heavy footfalls, and clearing of the throat are necessary to reassure her that you are not a mugger waiting to spring. Something similar sometimes occurs when competing for a cab. The basic ethics of such competitions are clear: the first arrival has priority. Complexity arises when someone appears after you, but at a distance upstream, raising a near Einsteinian conundrum of space-time. The real difficulty, though, comes if the competitor is a black man. If, for me, the sight of a cab is a godsend, for him it can be a crisis—cabbies famously pass black passengers by. Do I, I wonder, appear to cabbies to be a citizen of sufficient integrity to compel them to drive by the black man ahead of me in line? And what is that man thinking? Merely having to contemplate being victimized is an affront. And, for black people in New York, it's a definite part of the vibe.

Michel Foucault's great insight into the workings of power is his close observation of the ways we internalize the means of our own repression. The appearance of surveillance—as in his celebrated metaphor of the panopticon—causes us to behave as if we are being surveilled. Like the panoptic prisons of the early 19th century—circular jails in which an unseen central guard has the ability to look into every cell—culture looks remorselessly over our shoulders. Like docile behavior at traffic lights, the legal honor system in Vienna (and other European cities) extends to public transportation, a form of civility we'd never be able to sustain over here. When I'm in Vienna, I often take the subway to work. I always pay my fare in spite of the fact that one can simply get on the U-Bahn or a tram without either paying or passing through a turnstile. Part of my behavior may be coerced: the first week I was in Vienna, my ticket was actually “controlled” by a conductor. This early lesson was instrumental in

shaping my behavior although I might easily have unlearned it by now. I haven't been controlled since.

The low frequency of these inspections would suggest that the most economical and efficient behavior is never to buy a ticket and simply to pay the fine on the rare occasions one is caught. In my own case, the reason I always buy a ticket is a combination of fear, honesty, a dedication to the idea of public transportation (something Vienna provides in efficient abundance), and a slightly more complicated desire not to give any Austrian a moral advantage over me. Why the Viennese pay (and why they wait on the curb) is another question. I see jaywalking and fare-beating as very different orders of transgression. The Viennese do not.

The way in which urban cultures impose their everyday morality is more complex than a simple reproduction of general cultural mores. The most architectural means of teaching such urban morality are styles of monumentalization and memory: cultures signal their values via their choices about what to physically revere. Amsterdam's most popular monument is the house where Anne Frank and her family hid during the Nazi occupation. There's something typically Dutch about this memorial, not simply in its evocation of resistance but also in its domesticity. An immense tragedy finds its legibility in a little house. The Frank family, packed into insane proximity, turns the physical character of this achievement upside down. And, in the end, it's a failure of neighborliness that doomed them.

In Austria, the memory of the Nazi era is deeply repressed, the subject of an almost total national amnesia. Official remembrances are few and far between. At Vienna's main memorial, those murdered by the Nazis are carefully associated with residents killed in Allied bombings. But, despite this official indifference, there are tremendous unofficial city monuments, a truly monumental unconscious. Looming over the city are half a dozen gigantic *flakturm*, or flak towers, massive concrete structures used as command posts, shelters, and gun emplacements for the wartime anti-aircraft system. Enormous but unseen, these towers are arguably the largest invisible objects on the planet.

For many years, there's been an on-again, off-again debate about what to do with them, and they make frequent appearances as studio problems in the architectural schools. One has been converted into an aquarium, and it's just been announced that another will hold a museum

LIKE FEAR, VIBE IS A CULTURAL CONSTRUCT. THE NEUTRALITY OF THE ENVIRONMENT IS A MYTH. EVERY PLACE — KNOWABLE ONLY THROUGH OUR READING OF IT — PRODUCES A VIBE, OR WHAT USED TO BE CALLED A GENIUS LOCI.

of coffee. In their way, they're quite beautiful. Architects see them with the same fondness Paul Virilio shows for the raw, expressionistic forms of the fortresses of the Atlantic wall reproduced in his *Bunker Archaeology*. The debate in Vienna, however, always founders at the same extreme: everyone, it seems, repeats the argument that the *flakturm* must remain because it would simply be too expensive to tear them down. Such economic logic has the gloss of practicality and is allowed to overwhelm more fundamental truths. The case of the *flakturm* is especially striking because the value of a bad memory is given an exact price.

In the beginning, I was ambivalent about the *flakturm*. To be sure, the megalomaniac, minimalist corner of my architectural taste finds them compelling and butch. But, over the years, I've come to believe that they must go, and as soon as possible. The reason is simple: people have become habituated to them. They no longer carry any force of evil, an

aura they must retain if there is any logic to their monumentalization. Without this, they simply become like the pyramids, huge monuments to a vanished culture that existed way back when—tourist attractions. Stripped of evil, they can only become monuments to the Nazis.

Monuments are mnemonics of aura, bearers of the buzz of meaning in the environment. But the existence of the artifact is not enough. The more its originating context recedes, the more active and supplemental the work of interpretation. Monuments, after all, do not merely represent the past, they're containers and institutionalizers for our fantasies of the past. Modernism sought to neutralize this problem of interpretation by banishing history with the delusion that its meanings could be comfortably ensconced in "pure" abstraction. By making the global environment as uniform as possible, by celebrating an idea of subjectivity, modernity sought to harmonize vize.

Architecture is always a form of mind control, often self-imposed. That the aggressive, destabilized forms of so-called deconstructivist architecture have, for example, flourished in Austria and Germany must certainly be connected to the desire to come to terms with a nasty sense of roots. The urgency of such in-your-face design is especially resonant in the homelands of the purveyors of orderly, criminal chaos, the builders of the *flakturm*. Although we have learned to resist pat psychoanalytic explanations for artistic behavior, it's clear that the generation of creators who spent their youth under the Nazis, as well as the local boomer generation—whose parents were Nazis—have created an art that is deeply enmeshed in the anxieties of lineage. Whether we speak of the "*blut und boden*" artists of Viennese Aktionismus, with their offal-streaked, abusive art, or their heirs in decon, the obvious sense of rage is not merely picturesque. Nor is it a one-dimensional response to the hackneyed maelstrom of contemporaneity. This is an art about guilt, and its fractious forms must be considered in the context of a culture that chooses to retain its flak towers.

A similar debate about the privileges of the past goes on in Berlin, and with far greater intensity. The most interesting current question is over what's to be done with the architectural legacy of the East. One side argues that the buildings are cheap and dilapidated and ought to go. The other contends that this architecture is a part of German history and should, therefore, be preserved. The discussion reminds me of a clarifying and hilarious project that was reported in the *New York Times* a few years ago, a proposal to create a theme park based on life in the vanishing East. Fume-belching Trabants were to cruise the potholed streets among the dreary buildings. The food was to be terrible. And, among the staff of the park were to be a number of informers who would arbitrarily arrest visitors and throw them in theme-park jail.

Nazi Germany was itself perhaps the most ambitious and sinister theme park ever imagined, not simply a gated community but a gated country: Germanyland. The manipulation of history was critical to this project, and I don't simply mean the racist fantasies of Nazi ideology. The

Nazis had a vision of space that has been described by many as the ultimate expression of modernity's dark side, a fantasy of a hideous uniformity. Architecture was to play a key role in producing the Nazi new



A view of downtown Berlin with the Kaiser Wilhelm church and surrounding office buildings. The city struggles to decide how to incorporate the more dilapidated architectural legacy of the East, which, some argue, is an essential part of Germany's history.

man. To do so, the criminal Albert Speer theorized an architecture derived from a vague sense of historic consequence. But Speer understood that history was not place but process, and his most succinct vision of the way in which history was to inhere in these buildings lay in his notion that they were to be designed for ruin (although he underestimated the time span of ruination by about a millennium). Here was an idea of history that could be entirely internal to the object, projective history, a truly terrible abstraction.

The Berlin debate describes a particularly interesting divide because neither side advances the kind of preservationist argument that dominates our own thinking: no one argues that (*continued on page 218*)

America's Best-Managed Firms:

Changing the Face of Practice with Digital Technologies

GOING BEYOND CAD, ARCHITECTS ARE USING COMPUTERS TO TIE EVERYONE TOGETHER.

by B. J. Novitski

When computers first arrived in offices about two decades ago, many architects predicted that computer-aided drafting systems would change the nature of practice. Better design, less paper, and lower overhead were commonly predicted. Firms have in fact benefited, but in different ways: in improved communications, coordination, and efficiency. These improvements may or may not aid in the design effort, but they have not reduced overhead or paper consumption.

The firms interviewed for this article, though different from each other in size and design philosophy, have all embraced technology early enough to have suffered on the "bleeding edge" of change. They now have important lessons to offer the rest of the architectural profession about how well-managed technology can support advances in firm management, and vice versa.

They know, for example, that the computer's role in architecture firms goes far beyond drafting to the broader realm of information technology (IT). Project managers benefit from systems that track how fees are being spent. Electronic mail and file exchange improve communications within the firm and with clients and consultants. Project data is saved and reused for marketing and on subsequent projects. Construction administration is increasingly automated. Eventually, well-managed firms will tie all these functions together in a unified information infrastructure. Here, a dozen firms offer advice about how to approach that goal.

Being a leader among firms

A technologically advanced firm depends on its principals and IT directors to be vigilant about what is working and what is not—and to remain willing to shift direction when appropriate. "We try to maintain a culture of self-examination," says partner Ken Sanders of Zimmer Gunsul Frasca (ZGF), in Portland, Oregon. "Any technology decision is based on a set of assumptions, and sometimes those assumptions are wrong. You constantly have to recheck what you're doing and ask your people how the technology is working for them."

ZGF is a leader in the use of customized "extranets" (private electronic networks connected via the Internet) to facilitate communications among designers, consultants, and clients [RECORD, October 1996, page 46]. Yet Sanders discounts the suggestion that his personal vision is responsible for these innovations. The original idea



Hatfield Clinical Research Center, Bethesda, Maryland, created by Zimmer Gunsul Frasca Partnership on AutoCAD 3D StudioMax

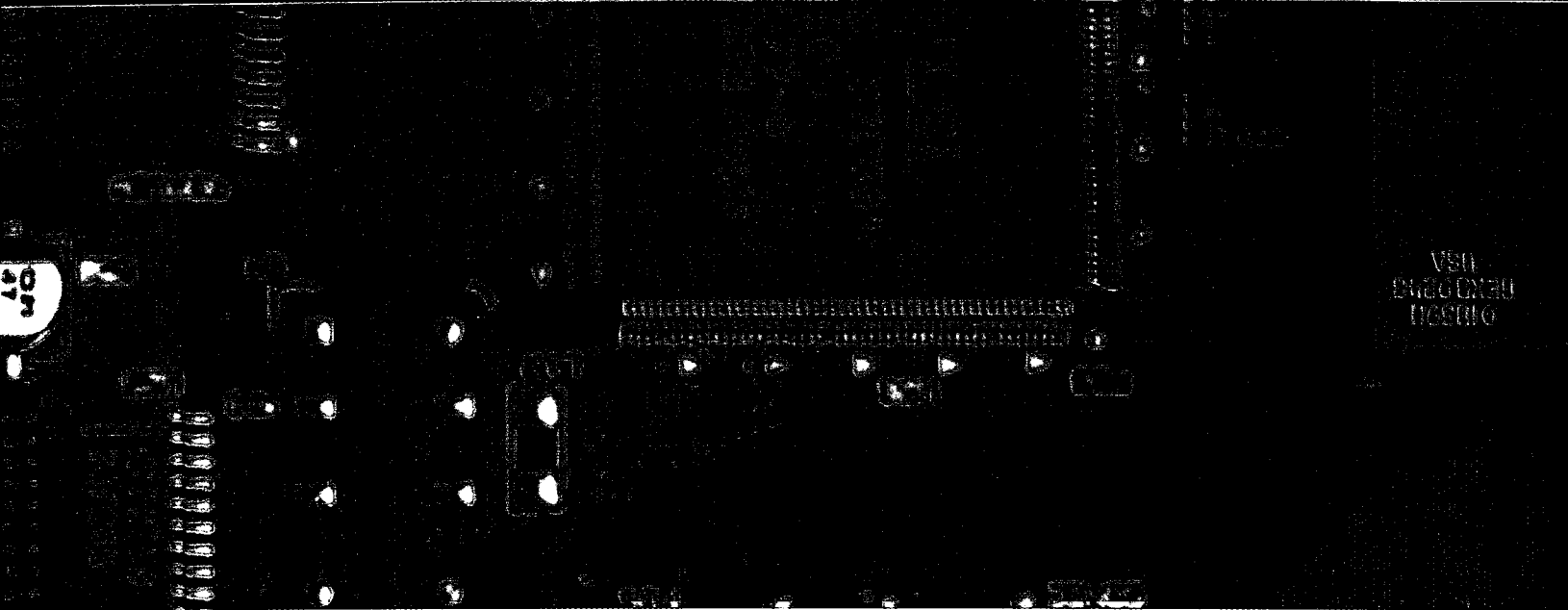


Continuing Education Use the learning objectives

below to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. Then follow the instructions on page 228.

Learning Objectives After reading the article, you should be able to:

1. Explain how firms have benefited from computerization.
2. Identify what principals in a firm must do to make computer technology successful.
3. Contrast issues of standardization with a creative atmosphere.
4. Identify appropriate backgrounds, roles, and promotion tracks for information technology staff.
5. Discuss the benefits of planning for information technologies.



came from a client who had developed an on-line construction administration database. Sanders notes: "You never know who is going to have the next good idea, so you want to create an environment where those ideas can come to the surface."

You also need to seek out new ideas. Jill Rothenberg, IT director of ADD Inc in Cambridge, Massachusetts, is always investigating emerging technologies. "It's not enough," she says, "to notice that other firms have certain capabilities and decide that you might as well do that too; that's not being a leader." Instead, she makes a point of attending conferences and seminars that aren't necessarily directed at the AEC industry. After learning some new aspect of technology she can make the creative leap to implementation for the benefit of the firm.

Dan Mitchell, a principal in the St. Louis firm Mackey Mitchell Associates, emphasizes the importance of being a risk taker. His firm began to invest in computing equipment in the early 1980s, when sophisticated systems were phenomenally expensive by today's standards. He doesn't regret those decisions because being at the front of technological change now gives him a competitive advantage. Mitchell asserts, "I'd rather fail one time out of four and have a wonderful success story to tell the other three times."

The owners' role

One of Mitchell's secrets to success is that he was both a firm principal and a technology enthusiast at the time of those early purchases. Computer savvy among firm owners is also characteristic of NBBJ in Seattle and Eastlake Studio in Chicago. More commonly, however, technology is first embraced by a staff architect who takes it upon him- or herself to bring computers into the firm, then faces an uphill battle to obtain sufficient funding from skeptical principals. That lone architect has often become the CAD manager, then the IT director, even the chief information officer (CIO), but has often lacked the credibility with the rest of staff to enforce the standards necessary for optimum efficiency.

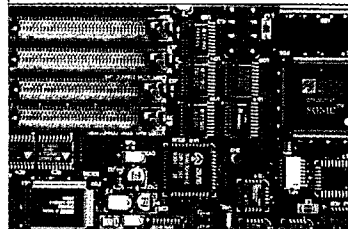
In recent years, more firm principals have become technology proponents: some because they have been "trained" by their children or grandchildren; some because they discovered that they need computer capabilities to remain competitive; some because they recognize the

B. J. Novitski is a freelance writer specializing in the use of computer technology in architectural practice and education. She can be reached at bjn@efn.org.

genuine benefits to their staff and clients that technology can offer.

In other cases, a younger, more computer-literate generation has risen to leadership. These information technology directors may not have to struggle as hard to get the funding they need, but they sometimes complain that a little literacy can be dangerous. For example, a principal may expect *Titanic*-quality computer graphics in the firm's architectural

KEY LESSONS FROM SUCCESSFUL FIRMS



Here is a list of strategies and policies that some of the firms interviewed for this article have found work for them:

- Automate and integrate all firm data (Kohn Pedersen Fox)
- Seek a balance of computer and architecture expertise in your information technology staff (Lester B. Knight and Associates)
- Make adherence to standards the path of least resistance (Venturi Scott Brown and Associates)
- Plan carefully for technology implementations, but also encourage risk-taking (NBBJ)
- Reward staff members for acquiring computer skills (Wimberly Allison Tong & Goo)
- Make information technology a part of top management (HDR Inc.)
- Automate your administrative functions so you can focus on design (Eastlake Studio)
- Standardize and simplify your hardware and software configurations (Zimmer Gunsul Frasca)
- Give project managers access to financial information (Mackey Mitchell Associates)
- Learn about emerging technologies (ADD Inc)



Private residence by Mackey Mitchell Associates, modeled in Alias Upfront and rendered in Photoshop by Paul Wuennenberg

presentations or may make unrealistic scheduling promises in contract negotiations.

One thing that everyone interviewed for this article agreed on is that a genuine commitment from firm principals is essential to the success of technology integration. They must not only commit financial resources but also support the discipline needed for creating some degree of firm-wide conformity. Such standardization is especially critical for achieving coordination in multioffice firms. Angelo Privetera, CIO of HDR Inc., notes that a firm's IT director should ideally be part of management. He reports relatively little resistance to standardization by HDR employees. "We simply told people that this was the way management wants things done," Privetera says, "and that defused any argument."

Principals must be committed to IT for another reason: the cost. According to a recent survey conducted for ARCHITECTURAL RECORD by Summit Research Group of Berkeley Heights, New Jersey, architectural firms spent an average of \$40,800 on computer hardware and software in 1997 and plan to spend an average of \$42,700 in 1998. The biggest question and the most difficult to answer is whether this investment is paying off. Are computers reducing staff costs, increasing productivity, or expanding business enough to warrant the level of investment that firms are making in them? For most firms it's tough to say.

Information access

Another reason for principals' involvement in managing IT is that they can help guide the content and distribution of information. Some firms struggle with balancing a traditional desire for privacy, especially regarding financial data, with the realization that the more open the information, the more useful it can be.

For example, it is invaluable for a project manager to have access to timely accounting of a project's labor budget. Jay Vaught, former CAD

leader at Ellerbe Becket in Minneapolis and now an independent consultant for that firm, recalls the old days when project managers struggled with inch-thick, week-old printouts of accounting reports. "Now," he says, "you can get an up-to-date figure of budget spent and compare that with some measure of how far you are on a job. You instantly find out if you're behind schedule."

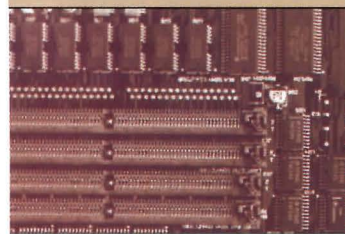
"Firms that withhold this information are insecure," asserts Mitchell, of Mackey Mitchell Associates. "I empower my staff when I tell them that I value their work and respect their decision making. If I were insecure about telling them how profitable we are, they would be suspicious of me. But if I enable them to manage a job profitably and reward them for it, it's a win-win situation for all of us," he explains.

Other information is also useful in firm management. As an example, Rothenberg reports that at ADD Inc, a project's complete history is maintained as a resource for the entire firm. Everything from initial leads through archives is kept in a database. The firm's in-house intranet also includes human resources information, with manuals, policies, and a "who's who" section

that becomes more necessary as the firm grows. "Our intranet puts all that information in one place," Rothenberg says, "so it's easily updated and everyone has equal access to it."

A lot of the information that is now available in digital form was once the purview of the traditional mail room. Tomas Hernandez, IT director for Kohn Pedersen Fox in New York, says that E-mail, voice mail, desktop faxing, electronic transfers of drawings, and digital archiving can replace conventional paper-based communications and storage.

HOW DO YOU MEASURE UP?



Selected items from an information technology survey of 122 architecture and engineering firms conducted by Zweig White & Associates in 1997:

- Firms with a World Wide Web site: 50 percent
- Median percent of employees with Internet E-mail: 90 percent
- Firms with homogeneous standards: 28 percent
- Firms giving project managers on-line access to accounting reports: 43 percent
- Operating system of choice: Windows 95—74 percent; Macintosh—11 percent
- Firms giving employees on-line access to human resource information: 9 percent
- Firms with a dedicated CAD manager: 30 percent
- Firms that provide no formal training to their employees: 40 percent
- Firms with a registered Internet domain name: 70 percent
- Firms without a computer network: 7 percent

PROFILE

Wimberly Allison Tong & Goo (WAT&G), one of the 10 largest architectural firms in the United States, faces the challenge of disseminating computer skills among a multicultural staff in offices from Honolulu and Newport Beach, California, to Singapore and London. One way to do this is to make sure computer-proficient associates don't

get stuck in support roles but are promoted to leadership positions.

Many firms have a tendency to pigeonhole interns with CAD expertise and deny them opportunities to advance as architects. "They're so valuable and effective as CAD technicians," says Larry Rocha, WAT&G's director of information services, "that they're not given a chance to

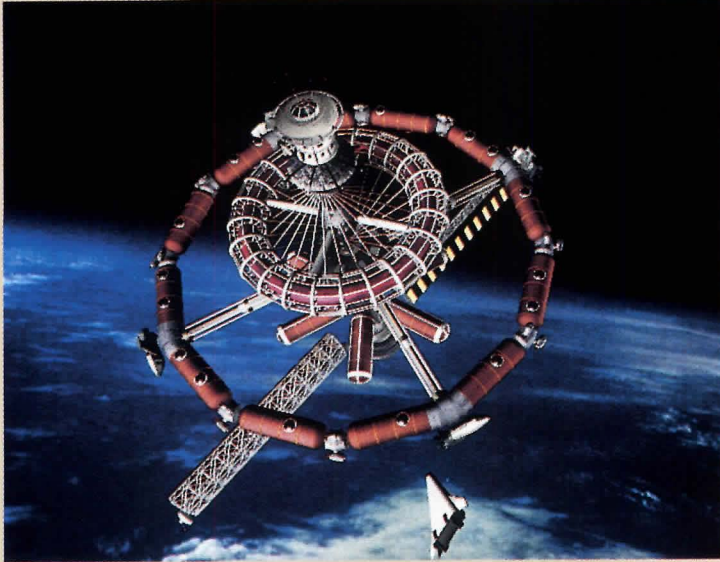
blossom in leadership roles." To counter this trend, WAT&G has developed the CAD Coordinator Program to reward those with CAD skills. This recognition program promotes them from technician to CAD coordinator, to project coordinator, then to project manager or designer. It also assures all employees that they can develop CAD skills without risking a dead-end technical job.

The program does not succeed on its own, however. Rocha points out that it's very important for someone to champion it, to participate in hiring and firing decisions, and to be constantly vigilant about its implementation. This takes time and, therefore, management support for the associated costs and commitment to the program's success. "Without support from management," Rocha adds, "the program doesn't work; and for management to support it, they have to understand it."

A second related initiative is called the Super-User Program, which encourages employees to develop a special expertise in computer areas other than CAD. The firm wants to recognize, promote,

and support people who take the initiative to solve business problems through technology. For example, someone may come up with a spreadsheet or word processing template for a standard log or form, which they are encouraged to share with the rest of the firm. These innovators are rewarded with opportunities for additional training classes and are considered more valuable to the company. This value is remembered when it comes time for bonuses and raises.

Like other firms, WAT&G grapples with finding the right balance between conformity and flexibility. Sharing drawings and other information electronically can be simpler and less expensive if all offices operate with the same hardware, software, and standards. But enforcing those standards is difficult, not only because many architects believe that conformity is incompatible with creativity, but also because international firms are characterized by cross-cultural differences. Standards are needed, but it's important for regional offices to feel they have the power to respond to local circumstances, says Rocha. *B.J.N.*



Space Resort Orbiting the Earth, created by Wimberly Allison Tong & Goo on AutoDesk 3D Studio

Electronic communications can ease decision making; digital archiving can make information retrieval a snap instead of an arduous task. "All this needs to be automated and integrated," he says. "I'd rather do an electronic search on a couple of compact discs than go through 18 boxes of paperwork in search of a project's history."

Unfortunately, there are obstacles to the digital transformation. The mail-room staff may not have the background to work with computers, and the IT staff, which probably evolved from CAD management, is often organizationally separate from the office-management staff. Although it's important, the automation of paperwork may be uninteresting to the technically savvy. "Everyone has this problem," Hernandez concludes, "but if we can solve it, it will improve how we communicate among ourselves."

Standardization: demon or angel?

For a profession that prides itself on its creativity and, occasionally, its eccentricity, technology's need for conformity can be a difficult pill to swallow. Most firms interviewed here accept that medicine and enforce hardware and software standards. ZGF, for example, uses only one CAD system and one generic PC platform. Sanders claims that this keeps things simple, facilitating file exchanges, easing printing and plotting, and reducing the cost of operational support and training. All 47 HDR offices have

the same hardware, software, and CAD system configurations, enabling long-distance collaborations. Privetera says that every HDR office can borrow the expertise of any other, and geographically distant teams can work as easily and productively together as if they were in the same room.

But conformity has its disadvantages. According to Mark Evans, CIO of Knight Advanced Technology in Chicago, standardization is at odds with the democratic and creative atmosphere found in many firms. "Many studios are almost independent practices," he points out, "and each project manager has developed a following and a way of doing things. That's where a lot of the synergy is. If you want integration and uniformity, you almost need a dictator."

Clearly, finding a balance is a delicate job that each firm needs to work out according to its own culture. Once you've decided that the advantages of standardization are beyond question, how do you persuade creative people to conform? One common strategy is to make the desired behavior the path of least resistance by presenting the firm standards as software defaults.

At Venturi Scott Brown and Associates in Philadelphia, associate James Kolker has tackled the dry but crucial issue of job list management in this way. "For a medium-size firm," he notes, "we have a lot of projects, with a lot of numbers, subnumbers, services, and so on. It used to be easy for people to post their time to the wrong job numbers. Now that we

PROFILE

Defying conventional wisdom

that a company must grow to survive, Eastlake Studio in Chicago works hard to stay small. And computer technology is key to that effort.

The firm, now numbering 12 people, was fully automated from its inception in 1987. Principals David Johnson and Thomas Zurowski chose Macintosh computers then and still use them today. Rather than focus exclusively on CAD, Eastlake exploits technology by integrating a collection of simple tools into an information infrastructure that simplifies administration. "This allows us to focus on the design side of what we do," says Johnson.

Using FileMaker Pro, Johnson and his staff have created an intranet that captures and distributes all the project information in the firm. It includes, among other things, financial and administrative

information, an in/out board, a time-keeping system, a Rolodex, an active project list, an invoice database, a list of leads for marketing, telephone messages, and to-do lists. There are no computer passwords or locked files, and all the firm's databases are fully accessible to everyone on the staff.

Construction documents are also accessible so, for example, a contractor can get a fast answer to a question even if the project architect is out of the office. The compilation of project information gives the designers flexibility to make even major changes once design gets under way.

Johnson estimates that this efficiency enables each person in the firm to do the work normally assigned to two people. Still, he insists that speed in itself is not the goal. Technology makes practice management relatively trivial, allowing him and other staff members



Lakeside Residence, Lakeside, Michigan, by Eastlake Studio, modeled on form*Z and rendered on Studio Pro by Mark Niemi

to put more of their personal energy into design work. "It allows us to free our minds," he claims, "so we can be designers rather than deal with bureaucratic or technical details."

Universal access to information also tends to flatten the firm's hierarchy, a strategy he says can be useful for small and large firms.

Ironically, Eastlake Studio's success in taming the paper tiger

has given it an unwanted reputation as a "technology" firm. It has developed database tools for the facility management departments of corporate clients, for example, but does not want to be overlooked as a potential design consultant. Consequently, the firm has spun off a separate company, Facility Wizards, to sell database products, while Eastlake Studio focuses squarely on design. *B.J.N.*

have instituted a central database of job numbers and names, people just select from a list."

Capturing a firm's corporate memory

Making it easy to do the right thing has streamlined the firm's book-keeping procedures and made its archives more accessible to future researchers. "It may seem like an uninteresting management chore," says Kolker, "but it has helped us capture our corporate memory."

Other strategies for enforcing standardization are to allow architects a degree of desktop personalization and show them how standards will help them with their work. Sanders recalls that when ZGF retired its Macintoshes and standardized systems using PCs with Windows-based software, he didn't need to convince the Mac users that Windows was better. "We avoided that debate by acknowledging that their concerns were real," Sanders says. "We conceded that Windows hadn't caught up, but we showed them that standardizing could help them be more successful."

Sanders notes that the projects at ZGF are not uniform in the degree to which they embrace technology. Not all use extranets for design communications, for example. He explains: "It all depends on the client's technological preparedness and comfort level."

Devising an effective training program

Just as firms must find their own balance on the issue of standardization, so too must they devise their own training programs. These can include reimbursing tuition costs for formal college classes, short courses offered in-house, informal peer guidance, and self-guided tutorials. Individuals have different learning styles, so a range of options is often most effective.

It might once have seemed that the need for training would diminish over time, but the end is not in sight. The good news is that

young architecture graduates have a high degree of computer proficiency, and software is becoming easier to learn and use. The bad news is that technology is changing so rapidly that everyone needs an occasional refresher course or some kind of ongoing training.

Sanders has discovered that the most effective training is "just in time." He says: "If you put someone in a class for a week, and they start using what they learned a month later, they will remember only a fraction. But if they are trained the day before, or even the minute before, they'll retain more and be more productive. So our project teams train each other, and we stay away from training in formal classrooms."

IT staff: computer programmers or architects?

Now that IT has become so complex, encompassing telephony, networking, and Internet technologies in addition to CAD and office applications, many firms are reconsidering who should run their technology departments. Should it be an architect self-taught in computers? Or should it be someone trained in computer science but unfamiliar with the architecture profession? Although the typical IT director is smart, it is rare to find one with extensive expertise in both worlds. Mark Evans of Knight Advanced Technology, who was trained as an architect, has found this dilemma particularly irksome as he and his firm struggle with the Year 2000 problem. Systems that compute years as two-digit numbers are unable to distinguish between the year 2000 and the year 1900. If this glitch isn't remedied, soon a bill that is not yet payable, for example, could be incorrectly calculated to be 100 years overdue.

This problem is most serious among institutional mainframe computers, but Evans has discovered that architects are not immune. "A client asked us to reassure them about this," he says, "and we discovered that about 15 percent of our machines are not Year 2000-compliant. We

still have shop drawing logs and other applications running on a non-complying database, so we need to upgrade them. The problem is more pervasive than anyone expected, and ideally it should be tackled by computer experts. Architects don't necessarily know all the right places to look."

On the other hand, computer programmers may not know how to customize software to fit the needs and culture of an architecture firm. Rothenberg has been supervising the development of a database to store a project's entire history. ADD Inc hired a consulting firm to program the structure, "but we were very involved in its design," she emphasizes. "We were particular about the interface design and picked a tool, FileMaker Pro, that we could work with in-house." Similarly, Privetera says his staff monitors the network that connects HDR's 47 offices but outsources the technical network management details to Sprint.

Customized software: does it really pay?

From time to time, firms feel obliged to develop their own software. ZGF, for example, has done a lot of its own work on its project extranets because no commercial software can yet handle the complex "transactions" that characterize construction administration. But Sanders insists that he and his staff are not programmers and that their work is a short-term solution until they can buy equivalent software off the shelf. "Other firms should look carefully at the economics," Sanders advises. "Customized software has to have a short-term payback period because in most

THE GOAL IS TO TIE ALL OF A FIRM'S FUNCTIONS INTO A UNIFIED INFORMATION INFRASTRUCTURE.

cases you'll be able to buy the tools you've developed." As a result, Sanders focuses his energy on communicating to software developers what the profession needs and encourages them to assume the development work. Sanders says ZGF's advantage lies in gaining experience with the tools before other firms do, not in owning a proprietary solution.

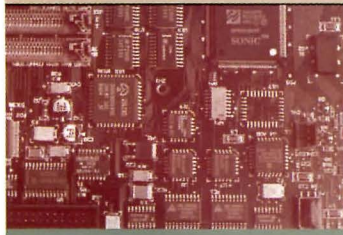
A final trait of firms that successfully manage information technology is a deliberate approach to planning. Rather than adopt hardware, software, and practices in reaction to what others are doing, these firms take the time to reflect on where they want to go and how to get there.

ADD Inc is one firm with an extensive planning process. Every year Rothenberg and a small group outline in detail everything they plan to do and assess how that positions them for the coming year. "This ensures that we are implementing tools that will be useful for everyone," she says, "and that work within the culture of our firm." She writes a detailed budget that includes purchases, upgrades, even itemized travel costs. And each year the firm focuses on specific projects: last year it set up an office database for leads tracking, project history, and employee history. It also selected and implemented new CAD software. "This year," Rothenberg says, "our focus is in integrating capabilities and technologies so we can optimize our resources."

How to change systems

One payoff of a thorough planning process is that major transitions can occur without disrupting a firm's efficiency. This is evident as NBBJ begins a six-office switch from AutoCAD to MicroStation TriForma as its main CAD platform. Former IT director Tim Stiles, who led much of the planning effort, attributes its success to the commitment of the partners, the studios, and the IT team. A core group spent a year researching the switch, experimenting in a freewheeling manner, and then reporting back what they found. "We'll have a studio doing something that seems off the

DOES INFORMATION TECHNOLOGY PAY?



In the early days of CAD, when architects first began to invest large sums of money in computers, hardware and software vendors claimed that technology would boost productivity and, therefore, profitability. Whether or not this has occurred is a matter of opinion, and often it's an opinion unsupported by hard numbers.

According to a 1997 information technology survey of architecture, engineering, planning and environmental consulting firms by Zweig White & Associates, "less than a quarter of firms have tried to measure their return on investment in information technology." Yet only 3 percent of the survey respondents believe they have overinvested.

The survey authors speculate that technology purchases are perceived by many firms as a necessary "price of entry" into the design business. Forty-four percent of the survey

respondents believe that such investments actually put profitability at risk.

One firm that has tried to quantify productivity is Zimmer Gunsul Frasca, based in Portland, Oregon. The firm compared several dozen projects—half of which use CAD, half of which don't—and measured significantly fewer hours per sheet in the CAD projects, indicating a good return on investment.

However, notes Ken Sanders of ZGF, "productivity is difficult to measure precisely because you don't have identical projects done with and without CAD. And there are many factors besides computer use that determine how productive people are and how profitable a job is."

Even more important than productivity, but harder to quantify, Sanders says, is information technology's effect on improved quality of service and of design. Sanders notes that as firms respond to market forces and determine how to do more work in less time, they need to stay focused on value, not hours, so that increased productivity isn't penalized through lower fees. *B.J.N.*

wall," Stiles explains, "but it helps us understand whether going in any of these directions makes sense."

The transition of 380 seats from Windows 3.1 to Windows NT took six weeks, and the complete move from AutoCAD to MicroStation is expected to take three years. But, Stiles notes, similar moves in the past have taken only half as long as expected because the studios took the technological ball and ran with it faster than anticipated. He says: "In the NBBJ studio environment, there is no resistance to the new and different. Inquisitiveness and risk taking are encouraged." Now, in preparation for the big move, the core team is carefully developing the firm's CAD standards in the new format and fine-tuning a training program. After a set of pilot projects has been initiated in each office, every subsequent project will start with the new system. Stiles expects the transition to be both smooth and fast.

If there is one conclusion to draw from these diverse stories, it is that there is no single path to technological success. But certain key factors are essential: a strong commitment from leadership, a readiness to invest both time and money, a willingness to change, and a belief that new technologies will eventually benefit both firms and their clients. ■

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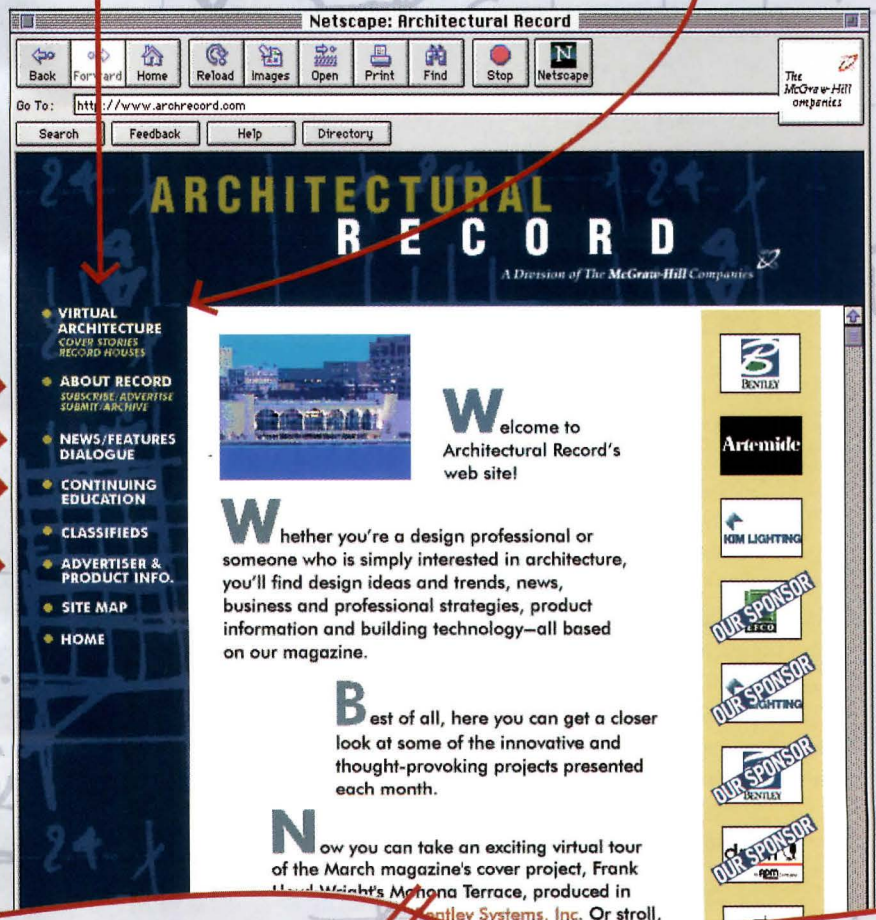
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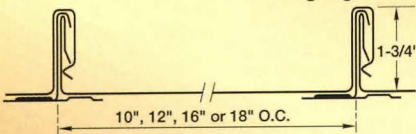
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Built on landfill, the HKCEC extension juts into Victoria Harbor from Hong Kong Island (opposite). Although it can be entered from the original convention center building by way of the atrium link, the extension has its own main entrance on Expo Drive (below).

SOM and Wong & Ouyang's extension to the HONG KONG CONVENTION CENTER looks toward China and, perhaps, the future.



by Naomi R. Pollock, AIA

On July 1, 1997, the world watched with mixed emotions as Hong Kong was returned to China, bringing to a close more than a century of British rule. While some observers feared that the event might mark the beginning of Hong Kong's demise, others saw it as a fresh start for the territory. Among the optimists were the designers of the extension to the Hong Kong Convention and Exhibition Center (HKCEC). "We aspired to make more than a landmark," explains design partner Larry Oltmanns of Skidmore, Owings & Merrill in Chicago, whose firm collaborated with the Hong Kong firm Wong & Ouyang (HK) Ltd. on the project. "We aimed for something symbolic that marked this significant point in time." Reflecting the city's sense of ascendancy and its spirit of optimism, the new building is crowned by a series of winglike roof planes whose curving forms appear poised for flight as they hover over Victoria Harbor.

Built on landfill—like much of Hong Kong

An addition to HKCEC's first phase, the 1,688,000-square-foot, six-level extension more than doubles the original center's capacity. Due to the spectacular growth of Hong Kong's convention and trade-fair industry, plans to expand the facility began to take shape just three years after its initial building was completed in 1988. The Hong Kong Trade Development Council (TDC), the semipublic organization that owns the original HKCEC, was asked by the Hong Kong Government, which fully funded and owns the \$620 million extension, to oversee the design and management of the new facility. Because finding an appropriate spot to expand in the congested city center was all but impossible, an artificial

island was created from 31.6 million cubic feet of sand and gravel secured by battered rock walls.

Surrounded by water on three sides, the 16-acre landfill site offered tremendous design freedom, but "we really didn't start with a blank sheet of paper," states Oltmanns. Indeed, the architects had to contend with a host of predetermined conditions. The shape of the island was determined by engineers before architectural design got started. Besides that, the architects had to work with a network of roads cutting through the middle of the site and the anticipated development of a strip of landfill stretching along the shore of Hong Kong Island all the way to Causeway Bay, east of the site. Even the placement of the 3,000 foundation pilings, which were driven in at the same time as the island was constructed (to speed up the construction process), was fixed before design development was completed.

In addition, there was the TDC's requirement that the extension and the original HKCEC be connected as seamlessly as possible. This

Project: Hong Kong Convention and Exhibition Center Extension, Hong Kong
Owner: Hong Kong Trade Development Council

Architect: Wong & Ouyang—Wo Hei Lam, director-in-charge; Patrick S.K. Chung, project architect; Si Hung Ha, deputy project architect; Winston Sung, V. Y. Choong, Bing Tung Lam, architectural design team; Ricardo Asis, May Wong, interiors team; Danny Tang, Ken Montgomery, Mark Kelly, Jocelyn Chung, Sabrina Law, Raymond Fan, Stephen Valentine, Ralph Walker, Pak Shun Lee, George Tang, project team

Associated Architectural Consultant: Skidmore, Owings & Merrill—Larry Oltmanns, AIA, design partner; Alan Hinklin, AIA, project director; Paul DeVlyder, AIA, project manager; Richard Smits, AIA, senior technical coordinator, Marshall Strabala, senior

designer; Dan Bell, Joe Castner, AIA, Sophie Dahdah, AIA, Peter Freiberg, AIA, J. T. Hsu, AIA, Kamalrukh Katrak, AIA, Elizabeth Michalska, Ronald Ng, Dan Ringelstein, AIA, project team

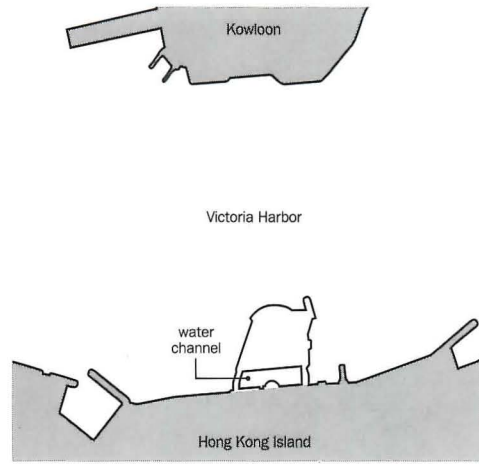
Structural Engineers: Wong & Ouyang—Joseph K.M. Mo, Richard K.W. Kwan, Sandie Choi, Fong Ming Sum, Li Tai Wah, Peter Dorber

Associated Structural Engineers: Skidmore, Owings & Merrill—Stan Korista, Ron Johnson, Srinivasa Iyengar, Robert Halvorson, Tim Kaye, David McLean, Raul Pacheco

Consultants: Heitmann & Associates (external wall and roof cladding); SL&A Graphics (graphics and signage); PHA Lighting Design, Fisher Marantz Renfro Stone (lighting); James Carpenter (sculpture, main lobby)

General Contractor: Hip-Hing/ Dragages Travaux Publics

Naomi R. Pollock, AIA, is RECORD's Tokyo-based correspondent. She contributed to Japan 2000: Architecture and Design for the Japanese Public and curated the exhibition of the same name, now at the San Francisco International Airport.



Measuring 1,000 feet from the atrium link (below) to its northern tip facing Kowloon, the extension is as long as many of the neighboring towers are tall. Aluminum banding provides much-needed sunshading (below and opposite). The curving planes of the multipart roof help establish the building as a sculptural presence at the base of the Hong Kong skyline (left and opposite).





challenge was made all the more complicated by the 330-foot-wide water channel that will eventually be filled in by a new expressway and subway line separating the two parcels.

The architects resolved these issues with their design for an atrium link, a glass-enclosed bridge supported by two monumental trusses cantilevered off the site of the original HKCEC. While doubling as a place for overflow registration, display, and exhibition, the link's real strength lies in the way it maximizes the entire center's flexibility. Joining the two buildings at five different levels, it enables pedestrians to move freely from one side to the other and allows component pieces on either side to be mixed and matched in multiple combinations depending on

From here a sequence of cascading escalators leads the way up to the four main halls stacked on three 50-foot floor-to-floor levels. Interstitial mezzanines provide breaks in the escalator runs and house meeting rooms, lounges, and restaurants.

A new prototype for convention centers

Though the extension may seem very low and horizontal by Hong Kong standards, its vertical massing contrasts sharply with the sprawling, single-story convention centers found in many U.S. cities. But unlike its American counterparts, many of which are built on remote sites, this facility sits in a highly visible, attractive location that encourages its use

THOUGH BUILT ON LANDFILL, THE FACILITY HAD TO ACCOMMODATE PREDETERMINED CONDITIONS SUCH AS A NETWORK OF ROADS AND A FUTURE SUBWAY LINE.

conventioners' needs. At the same time, the atrium link permits the two pavilions to operate independently since it is accessed from, and therefore preserves, the original building's main entrance.

Many visitors, however, bypass the link and enter the extension through its Expo Drive main entrance, fronted by a 131-foot-tall glass curtain wall. This entry opens onto a lobby spacious enough to handle the crowds of people registering for the many events that take place at the convention center.

for purposes other than just business. "This was a chance to explore a new convention center prototype that could have applicability in the United States, where many municipalities look to convention business to bring vitality back to the city," says Oltmanns.

Located at the building's core, the three black, boxy exhibition halls were configured to best accommodate the layout of booths inside. But they are surrounded by auxiliary spaces designed to take advantage of the site. While private service functions, such as loading docks at the

Due in part to future urban development, the extension's service functions are concentrated on the building's east side. A granite

wall conceals ramps connecting truck docks located at three major levels with an internal truck-marshaling area on the ground floor.



three major levels, are concentrated on the building's east side, public pedestrian areas occupy its north and west sides, where additional development is not expected. Here, ground-floor restaurants and retail stores command choice locations overlooking a waterfront promenade. And from various prefunction and circulation concourses, visitors can enjoy stunning views of Victoria Peak and the city's Central District, as well as the harbor teeming with fishing boats, oceangoing tankers, and the Star

had to be finished in just three and a half years to be ready in time for the handover.

Shaving months from the schedule

Taking advantage of the economic benefits of concrete construction in Hong Kong, where labor costs are still relatively low, the designers employed a combination of steel and concrete structural systems that also

THE BUILDING'S PROMINENT LOCATION AND ITS FIVE-LEVEL STACKING SET IT APART FROM MOST CONVENTION CENTERS IN THE UNITED STATES.

Ferry's famous green-and-white boats shuttling people between Hong Kong Island and Kowloon.

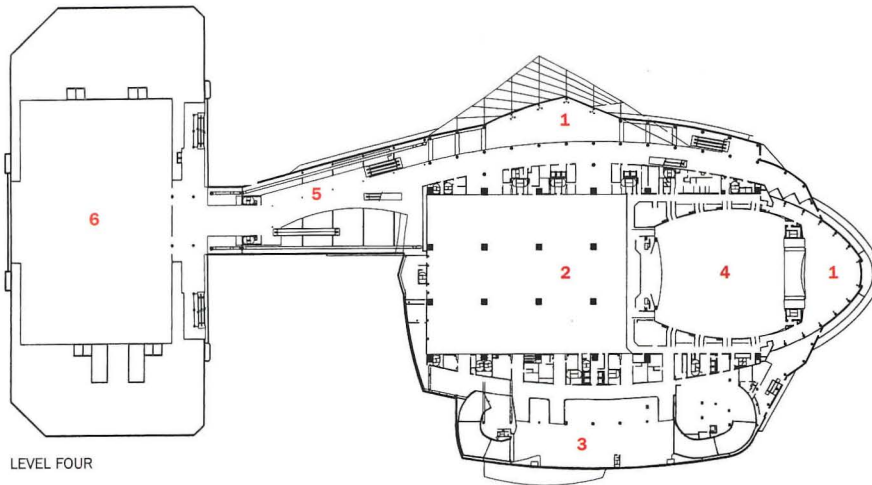
While maximal exposure to the scenery was desired, roof overhangs, fritted glass, and aluminum sunshades were used where necessary to reduce solar-heat gain. Nonetheless, the extension provides close contact with the harbor as surprisingly few Hong Kong properties do. "There is generally a sad lack of interaction between the city and the water," laments Oltmanns. "The two are often separated by expressways, and in many cases the buildings simply ignore or turn their backs on the harbor."

Another bonus of the water-bound location was the ease with which materials, the bulk of which were imported, could be brought on site by boat, reducing the need for trucks to traverse congested city streets. This arrangement helped complete the project according to its extremely fast-tracked schedule: from land reclamation through fit-up, the complex

shaved valuable months from the schedule. As the concrete core walls were being poured on site, 262-foot-long roof trusses were being assembled in the Philippines using components from England and the United States. Delivered by barge, the trusses were pulled on rollers from a makeshift dock at the edge of the reclamation area and jacked up into position where they support the main roof covering the core as well as cantilevered elements beyond.

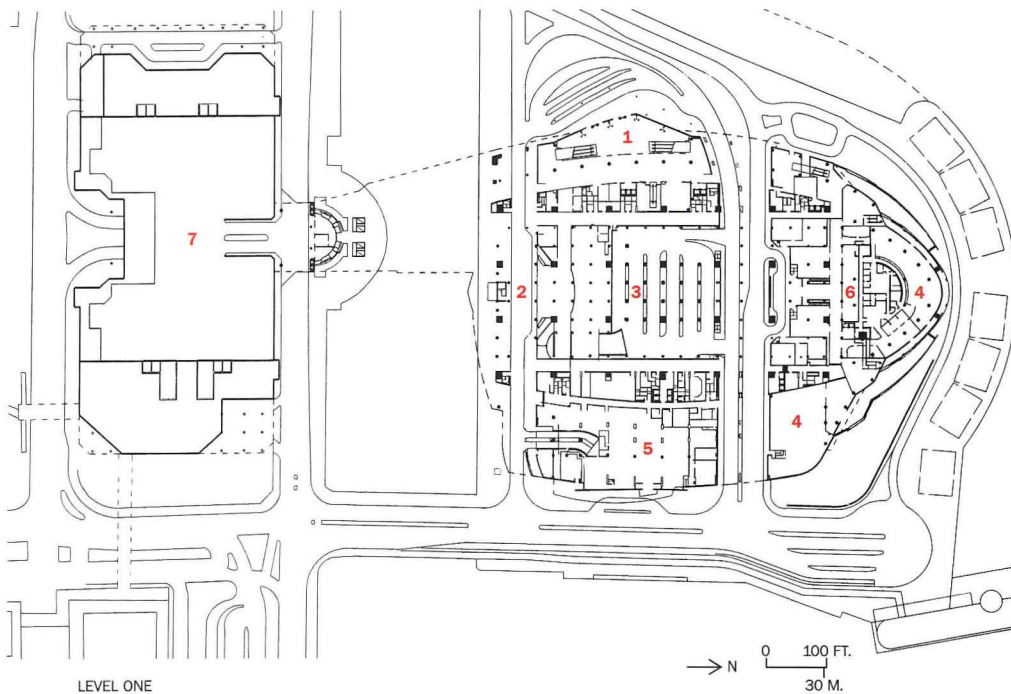
Advantages and disadvantages of a unique roof design

Because of the roof's variable geometry, the shape of each truss is unique; this system was easy to model on the computer screen but required more effort to fabricate than a repetitive system would have. However, the use of cantilevers reduced the weight and cost of each main support. The clear-span truss structure also enabled the top-floor exhibition hall to



LEVEL FOUR

1. Prefunction
2. Exhibit hall
3. Loading docks
4. Convention hall
5. Atrium link
6. Existing building, exhibit hall



LEVEL ONE

1. Main lobby
2. Bus drop-off
3. Truck marshaling
4. Restaurant
5. Administration
6. Retail
7. Existing building, loading docks

To have a significant impact on Hong Kong's visually chaotic cityscape, the extension to the convention center had to be monumental. But it also needed to respond to the human scale. The sweeping canopy marking the main entrance (right) mediates between the building's massive roof

planes and the pedestrian activities below. Metal banding and window detailing also help make the transition in scale. The horizontal truss system, for example, not only supports the lobby's window wall but also throws a delicate lattice over the immense transparent panes (far right).



The most striking feature of the convention center extension is its roof, whose spectacular, curving form was designed as a metaphor for the rise of the post-handover Hong Kong. A collage of wing-shaped planes that have been cut and rotated, the roof contrasts strongly with the Central District's rectilinear skyscrapers in the background.

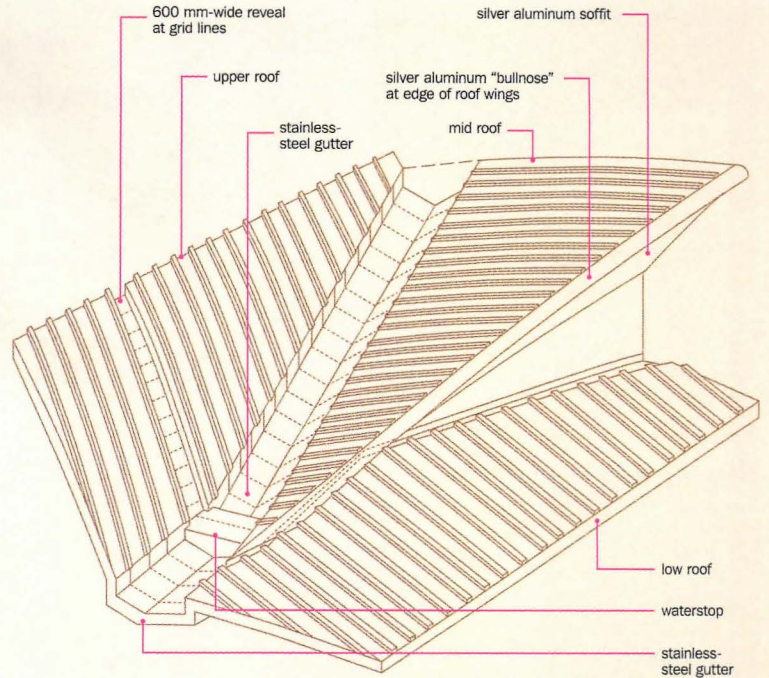
Oriented to the north and overlooking the harbor, the symmetrically arched upper roof crowns the center of the building, where it juts out dramatically to provide sunshade for the panoramic clear glass curving below. By balancing the entire building, the roof allows the extension to sit comfortably in its surroundings and makes it sympathetic to the Chinese desire for stability, explains architect Wo Hei Lam, a director with Wong & Ouyang.

The upper roof is flanked by cantilevered, swooping planes that step down gradually, both in height and scale, and culminate in the canopies sheltering the main pedestrian entrance on the west and a secondary entrance for administrative offices on the east. Each

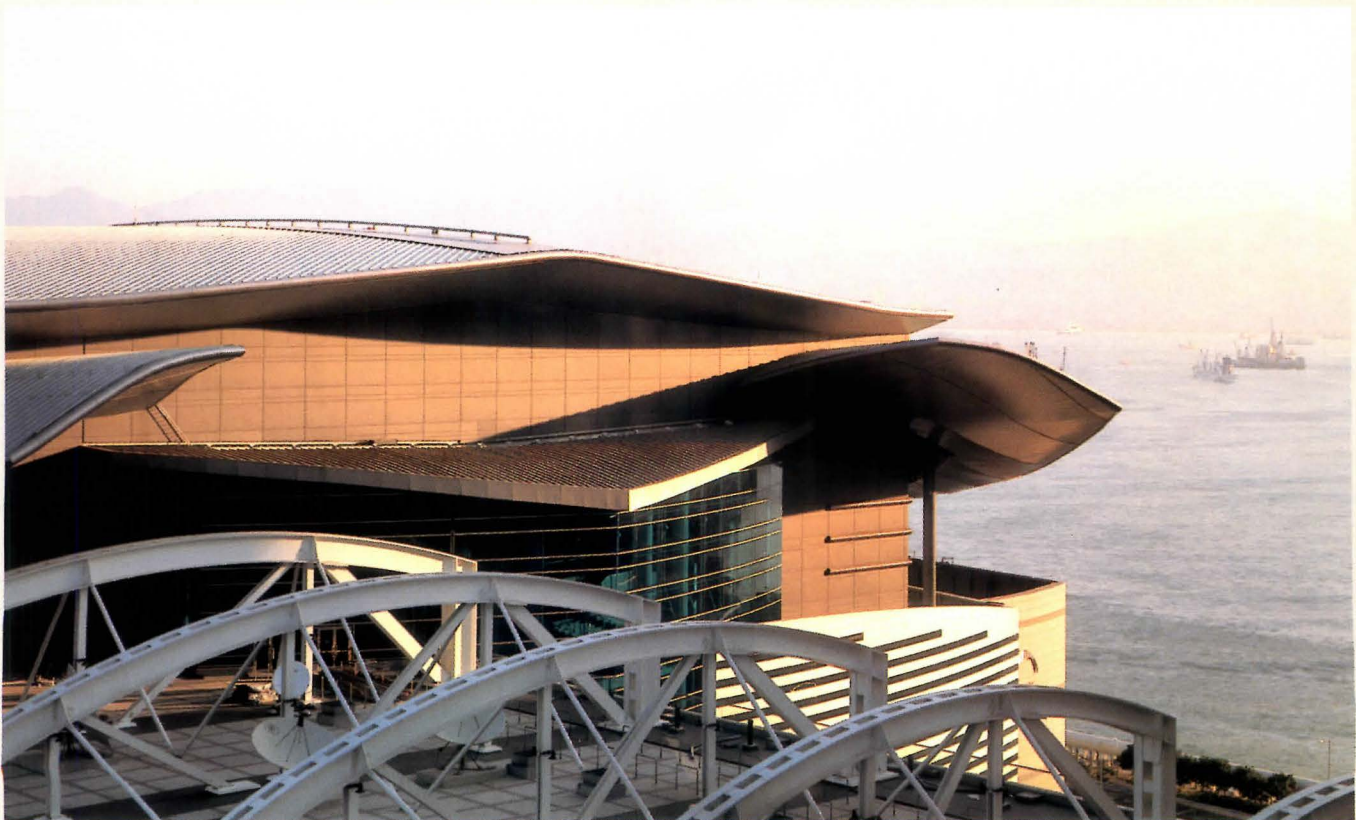
undulating piece is made of straight, parallel-sided, structural metal decking that was assembled without having to be curved or warped. Thirteen main trusses that span the 266 feet between the core's reinforced concrete walls support the upper roof. The profiles of the trusses, spaced 44 feet apart, vary in accordance with the profile of the curving roof. Secondary trusses between the main trusses support the roof cladding. At the northernmost point of the building, where the floor plan extends beyond the core walls, the secondary trusses are supported on columns.

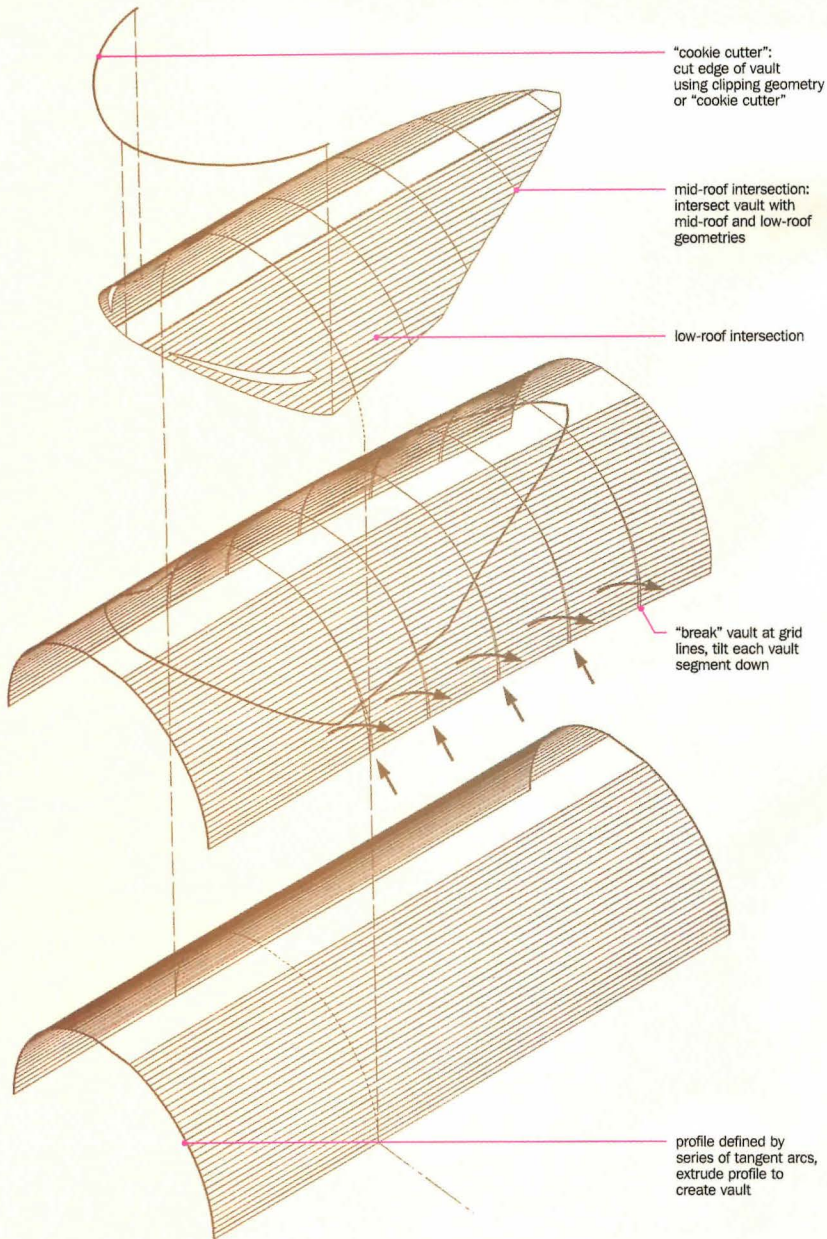
To combat typhoon-magnitude wind loads, batten-seam construction was used to lock in the roof-panel edges. The batten-seam system also accommodates the metal roof's thermal movement. Gutters at edges and joints, as well as in the roof surfaces, channel storm water to risers.

At the extension's southern end, curved planes overlap with the roof to cover the atrium link. Here, in contrast to the extension, the roof and each floor plane are suspended from exposed arched trusses. *N.R.P.*

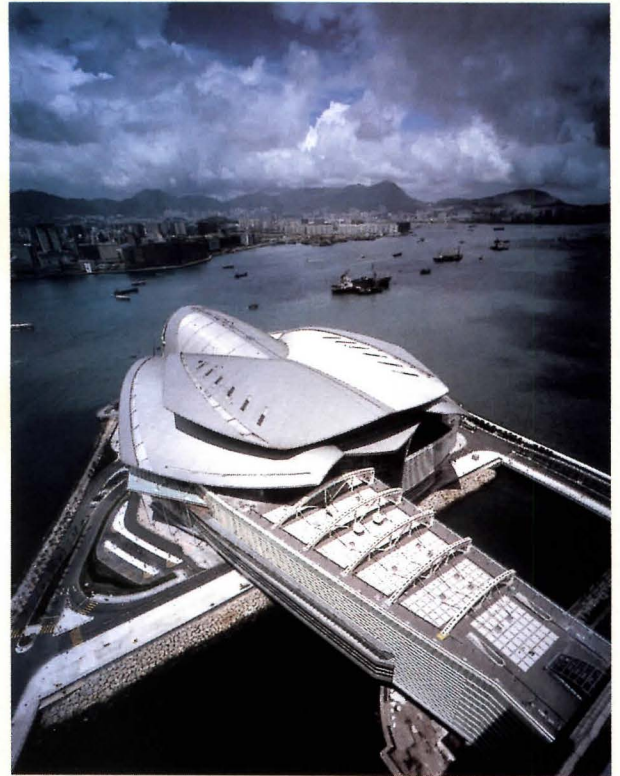


ROOF DETAIL: INTERSECTION OF UPPER, MID, AND LOW ROOFS



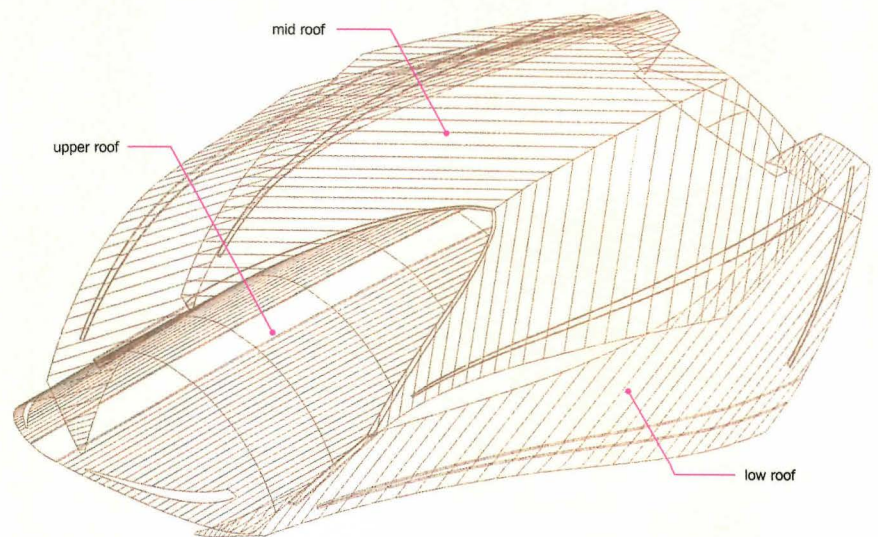


UPPER ROOF SURFACE GENERATION



Though the roof appears complex, it is basically a series of arched planes that have been cut and rotated (diagrams left). Designed to express the idea of flight, the

extension's metal roof dictated the profiles of its structural supports. By contrast, the atrium link's roof is dominated by the trusses from which its roof and floors are suspended.



3D COMPUTER MODEL OF ROOF

Responding to a variety of conditions, the extension's skin consists of a number of curtain-wall types, ranging from clear glass in some places to varying degrees of opacity in others. The basic strategy was to maximize transparency in the large gathering spaces where people can appreciate the harbor views and reduce it in places such as the atrium link where people are moving either vertically or horizontally.

Reducing solar-heat gain, another key factor in the designers' calculations, pushed them to increase opacity on the east and south elevations. A final goal was to create a highly articulated wall system to help break down the extension's monumental scale—no small feat in a 1,000-foot-long building.

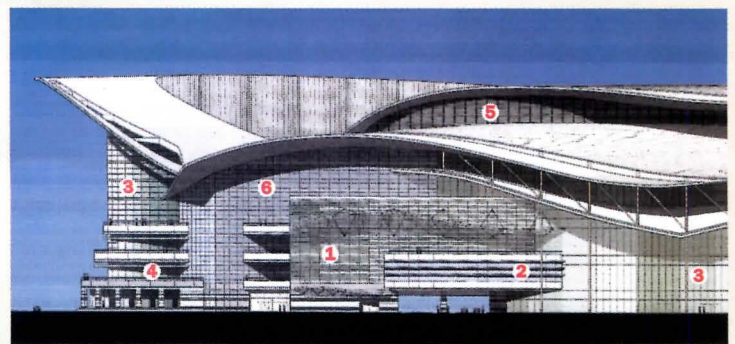
Where maximum visibility was desired, such as in the 131-foot-high grand foyer and the multilevel main entrance, bands of clear glass supported by a lightweight pipe frame open the interior spaces to expansive views. Horizontal steel trusses

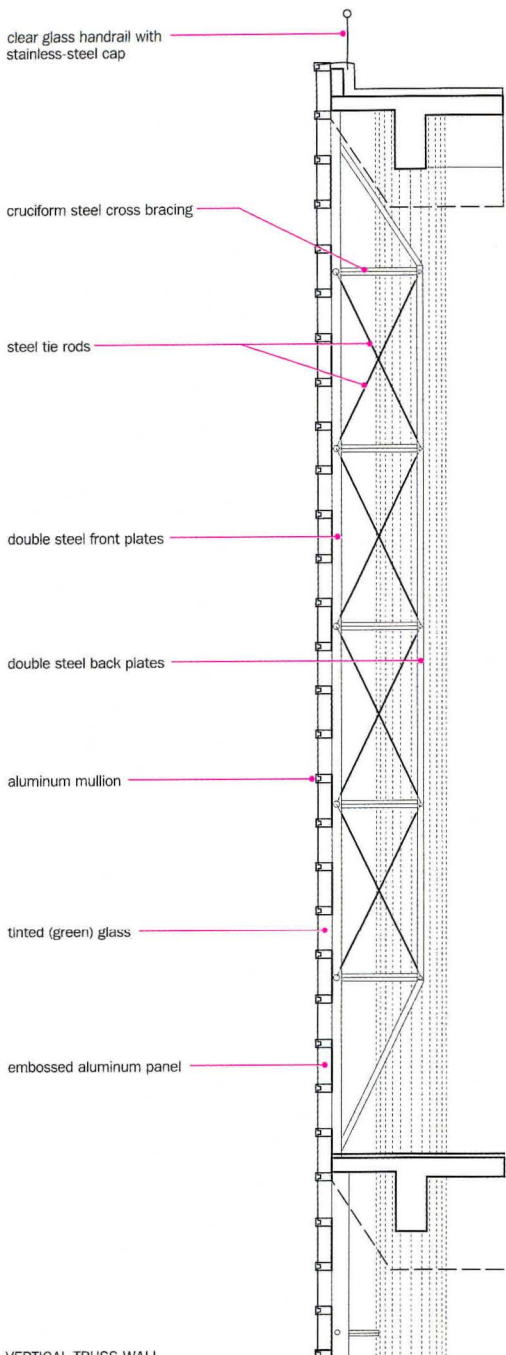
(see drawings, opposite), spaced to correspond to the height of the glass bands, span 45 feet between building columns and resist lateral wind loads. The trusses are suspended from the roof by steel rods, and vertical movement is taken up by slip mullions at the top of the first grade-level glazing panel. The cross members of the trusses are cruciform to make them appear as light as possible. All trusses are pinned at one end and have a slip connection at the other. Both connection points allow complete vertical movement, since the wall must be able to expand and contract with solar-heat fluctuations and accommodate roof-structure deflections in high winds.

Where solar-heat gain is a greater concern, a vertical truss wall with a more screenlike character is used (drawings, opposite). Here, bands of insulated aluminum panels alternate with 25-inch-high horizontal bands of green-tinted glass. The butt-jointed glazing is held in place by horizontal mullions supported

and braced at the ends of each segment by vertical trusses suspended from the roof structure. The front and rear chords of the vertical trusses are steel plates separated to provide room for cross bracing. Thin steel rods serve as cross bracing and as horizontal ties between trusses. The same system is applied in walls that use a combination of clear, fritted glazing and special blue-tinted glazing. The details remain the same, although the spacing between the horizontal bands varies. *N.R.P.*

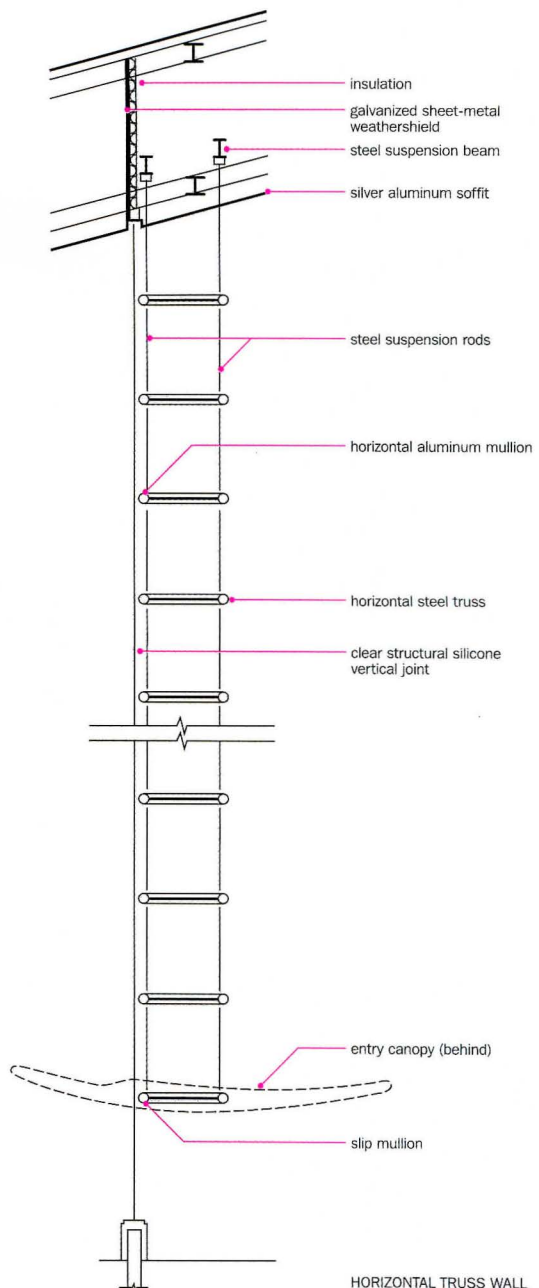
1. Vertical truss wall with tinted glass and aluminum panels
2. Glass, granite, and aluminum fins
3. Horizontal truss wall with clear glass
4. Glass fin wall
5. Louver wall
6. Vertical truss wall with clear, fritted glass and tinted glass



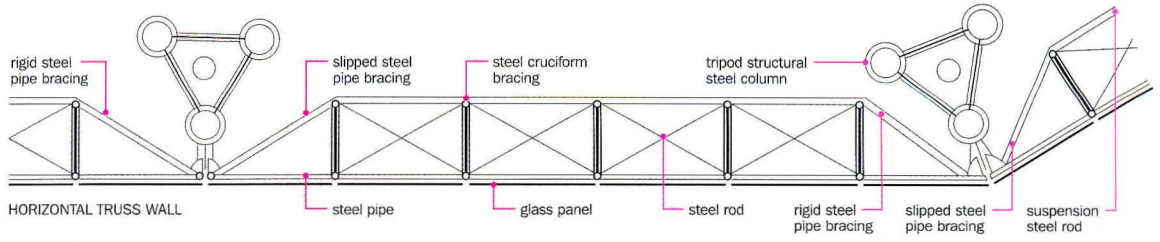


VERTICAL TRUSS WALL

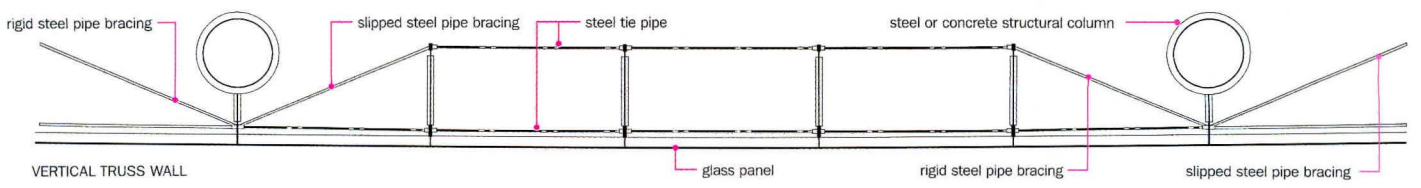
Horizontal truss walls (section and plan this page, photo opposite left), used where maximum visibility was desired, consist of clear glass bands supported by plate-and-rod trusses spanning between columns. Bands of green-tinted glass and insulated aluminum panels make up the vertical truss walls (section and plan this page, photo opposite right), used to limit solar-heat gain.



HORIZONTAL TRUSS WALL



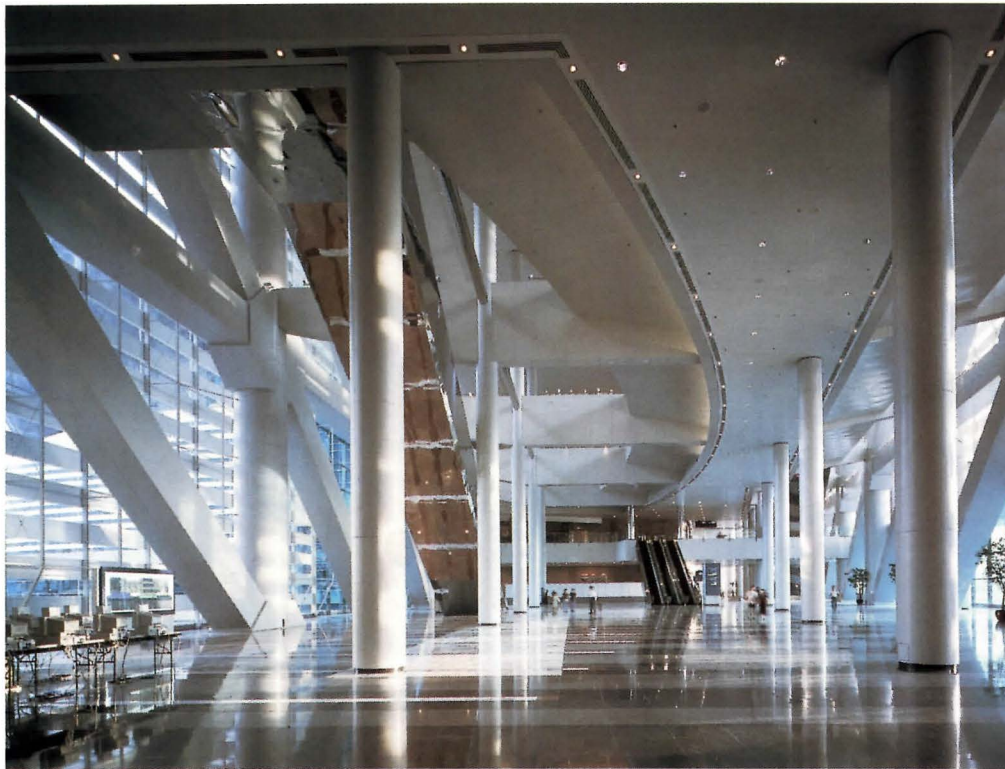
HORIZONTAL TRUSS WALL



VERTICAL TRUSS WALL

PHOTOGRAPHY: © NICK MERRICK/HEDRICH-BLESSING (OPPOSITE BOTTOM LEFT)

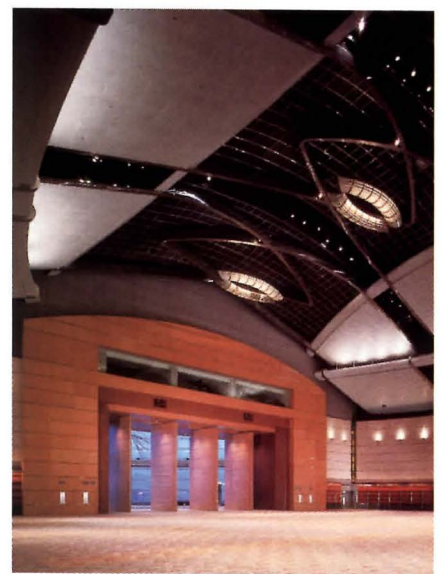




Moving from the outside in, building materials gradually evolve from granite, aluminum, and glass at the main entrance (opposite) and the

atrium link (above) to carpet and wood at the heart of the building, as in the Grand Hall (right), where the handover of Hong Kong to China took place. The

architects' aim was to balance warm colors at the building's center with cool ones around the exterior, a design approach often used in Chinese architecture.



remain column-free. Capped by an arched ceiling shaped by the curved roof, the open space can accommodate assemblies, such as tennis tournaments and basketball games, as well as standard trade-show fare. The other exhibition halls are divided by columns into 90-foot-square bays, as is the norm in single-story convention centers throughout the United States. But because the halls here are stacked on top of each other, a two-way grid of trusses serves to buttress each floor and redistribute loads without adding visually obtrusive columns.

In the Grand Hall, the scene of the handover ceremony, now used for conventions, the undulating roof doubles as the dramatic, 45-foot-high ceiling for the extension's most spectacular space. The 262-foot-wide, column-free space has specialized equipment for simultaneous translation and audiovisual presentations, in addition to ceiling-suspended rigging strong enough to support an automobile from above.

"We were worried about being able to book this space because it is so big and so grand," says Cliff Wallace, managing director of the HKCEC. But since it can handle everything from formal banquets for 3,000 to conferences for 4,200, the hall is very much in demand. And when the need arises, the Grand Hall can be expanded further by opening its four 33-foot-high pivoting doors to the curving prefunction area. This area commands a panoramic view of the harbor and looks north toward Kowloon and China.

Not wanting to offend the convention center's neighbors, the architects respected the Chinese aversion to overly angular or aggressive shapes when they were molding the building's dramatic form. "There was a great deal of discussion about the shape of the north end of the building, which points to China," explains Oltmanns. Several times during the design process, *feng shui* experts were consulted to make sure the scheme conformed to cultural norms.

"*Feng shui* isn't meant to be something superstitious," explains Wo Hei Lam, the director in charge of the project for Wong & Ouyang. "It is simply in the Chinese mind what is comfortable and stable from a cultural point of view." In its effort to accommodate rather than challenge China, the extension to the convention center is emblematic of Hong Kong's new era. ■

Sources

Metal-glass-stone curtain wall:

Builder's Federal, United Reliance

Aluminum batten seam roofing:

Builder's Federal, Weatherwise

Glazing: PPG Industries (*Azurlite, Solex, clear glass, fritted glass*)

Roof soffits: Epic Metal Co. (*Epicore*

acoustic roof deck ceiling system)

Granite and marble walls and floors:

Tsien Wui Marble Factory

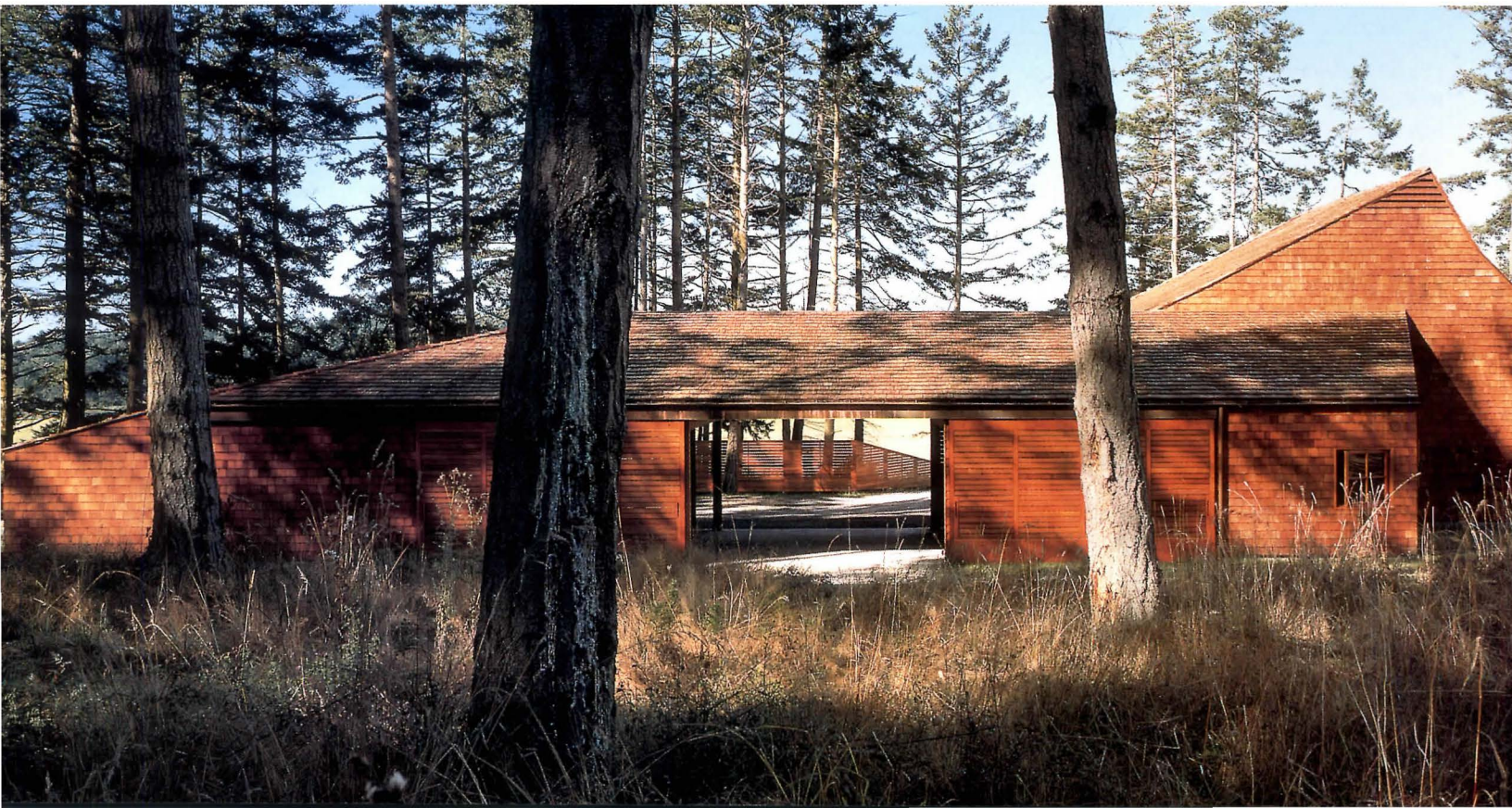
Elevators: Kone

Escalators: Otis

GRC column covers and slab-edge

fascia: Delta Pyramax

Carpet tile: Milliken



Thompson and Rose's **EQUIPMENT BUILDING** in rural Washington State demonstrates that there can be elegance in utility.



by Karen D. Stein

The roof of the shop, along the road (site plan below), peaks over the garage wing (left and opposite top) with its drive-through bay (opposite bottom).

by other islanders. “The idea is to gradually bring the farm back to life,” says its owner.

By the early '90s, the reinvigoration of the property included a plan by Thompson and Rose, who had become the unofficial family architect, to rescue an existing farmhouse near the barn. “We were going to nuke it,” jokes the owner of the undistinguished bungalow. Instead,

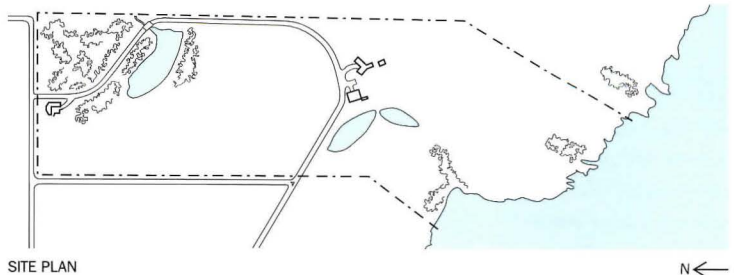
the architects reoriented its main rooms around bay views, adding new windows and ample porches to make it a suitable vacation home. When an equipment-storage shed on the property blew away in a violent storm, the farmers who work the land asked the owners for a new one. The owners decided to “raise the aesthetic bar,” they say, by asking Thompson and Rose for “an objet d’art.”

The architects worked with Van Valkenburgh to determine an appropriate site for the new 3,700-square-foot shed-cum-barn, locating it along the road and the edge of a meadow, tucked among a sprinkling of giant cedars that thicken into a grove. The building is at its highest along the street, giving it an amplified public presence, and it steps down toward the farm, as if to merge with the landscape.

Placing the structure within the line of trees “enhances the mysterious quality,” says Thompson. In fact, the trees give the impression of a veil around the building, with the sunlight dappling over (*text continues*)

Small projects that evolve slowly are not the favorites of most architects, particularly those who are eager to establish a name. But projects for repeat clients often are. So what are the chances that a series of seemingly disconnected small commissions for the same client will lead to something memorable, if not iconic? Good, according to architects Maryann Thompson and Charles Rose. When they were just starting their Cambridge, Massachusetts-based practice in the early 1990s, like many young architects the duo did what Rose calls “a lot of kitchen jobs” to build their portfolio [see RECORD, June 1997, page 98]. One such remodeling project was for a Boston-area couple, who later hired them to do work for the family on Martha’s Vineyard. The architects found their ongoing association ideal because these clients “are interested in ideas and construction,” explains Thompson, even if they don’t move quickly in architectural matters. “They are focused on incremental change,” says Rose. “He, in particular, likes to tinker and tinker and tinker to get things right.” Their client concurs. “Frankly, we love architecture and we love the process,” he says.

After the couple purchased Straitsview Farm, 125 acres of rolling farmland nestled in San Juan Island, Washington, in 1988, they hired the landscape architect Michael Van Valkenburgh to transform what he recalls as “a residence with passive agriculture” into a working organic farm. Van Valkenburgh’s scheme called for the creation of three ponds to collect and store enough water to irrigate 10 acres of farmland. The remainder of the property is intended for cattle grazing and berry picking



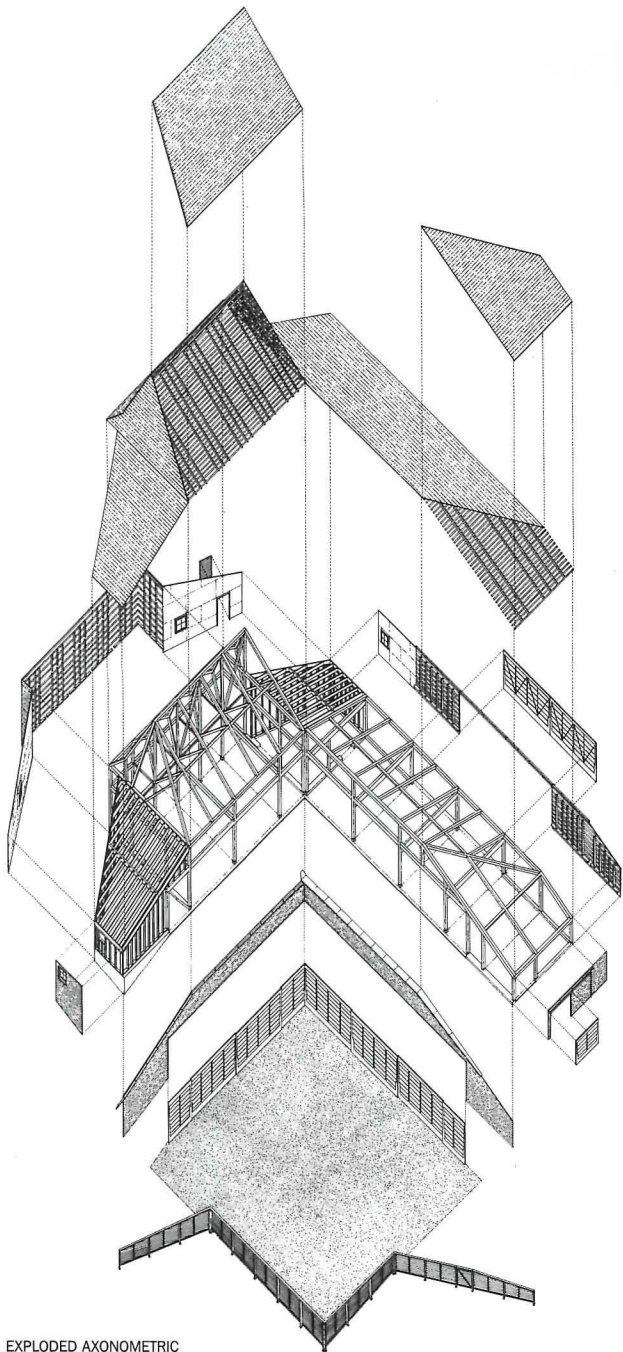
Project: *Equipment Building, Straitsview Farm, San Juan Island, Washington*

Designer: *Thompson and Rose Designers—Charles Rose, David Martin, Maryann Thompson, team*

Landscape Designer: *Michael Van Valkenburgh Associates*

Consultants: *B&B Engineered Timber—Ben Brungraber (structural); Giovanni Giustina (craftsman)*

Contractor: *S.B. Inc.—Steve Bobb*



EXPLODED AXONOMETRIC

“The only historic antecedents for this are covered bridges and Japanese temples,” says contractor Steve Bobb, explaining Thompson and Rose’s wooden kit-of-parts design (above). Sliding and swing doors faced with 1-by-4-inch red cedar slats open to the semi-enclosed court-

yard. Steel pipes are imbedded in the chamfered concrete feet at the shop’s perimeter. Timber framing in the wood shop is larch (right). Floors are pigmented poured-in-place concrete. Exterior siding is red cedar shingles, roofing is cedar shakes, and the gutters are copper.







The treelike structural exhibitionism of the wood shop (opposite) contrasts with what engineer Ben Brungraber calls the “deforested” truck storage bays (below and left).

1. Vet’s station
2. Shop
3. Farm office
4. Equipment bay
5. Drive-through equipment bay
6. Storage





the cedar slats and spotlighting the courtyard between the L-shaped structure and a low wood wall. “The forms are very connected to the topography,” says Rose. “The building changes as it reveals itself,” offers Thompson. “It’s like a sleeping animal emerging from the earth.”

To determine the structure of the shed’s two wings, a wood shop and a garage, shop drawings went back and forth between Thompson and Rose and their structural engineer, Ben Brungraber. Larch was used for the more dramatic interior of the shop. It came from trees in Idaho that were killed in a forest fire 65 years ago, making it unusually dry, dense, and thus desirable, according to contractor Steve Bobb. In the shop, the architects decided to expose each layer of the structure, as if to glorify the process of construction for those who would eventually work in the 28-foot-wide, 40-foot-long, and 28-foot-high space. Black asphalt-impregnated felt—a building wrap and vapor barrier—shows between the post and infill framing. Even the steel rods, which were used to meet the 90-mile-per-hour wind-load resistance and seismic-zone 4 requirements, were threaded through the forest of beams as additional patterning.

And while there is an air of uniformity to the construction, the reality is more complex. “It was a difficult assembly, but I hope it doesn’t look that way,” says Bobb, explaining that there are 25 to 30 different types

of joints in the space, none of which use nails. “It’s exuberant, but structurally rational,” observes Rose. “While it looks sculptural, every piece does work.”

The structural challenges of the truck-storage bay were different, according to Brungraber. Since the architects refused to use plywood because the panels would interrupt the woven look of both interior and exterior surfaces, steel rods were inserted to bolster the roof. Though the garage is lower than the other wing (its roof peaks at 16 feet, 12 feet lower than the shop’s roof), the effect of wind loads was complicated by the two long walls of sliding cedar-slat doors, which had to be reinforced. When the doors are opened, the building is transformed into a wooden frame for the landscape beyond.

The overall effect so intrigued a neighbor that she contrived a reason to get inside. Afterwards she wrote to the architects, commenting that the building “has its own identity, but it fits right in.” Says the owner, in response, “Mission accomplished.” ■

Sources

Cedar-colored stains: *Cabot*

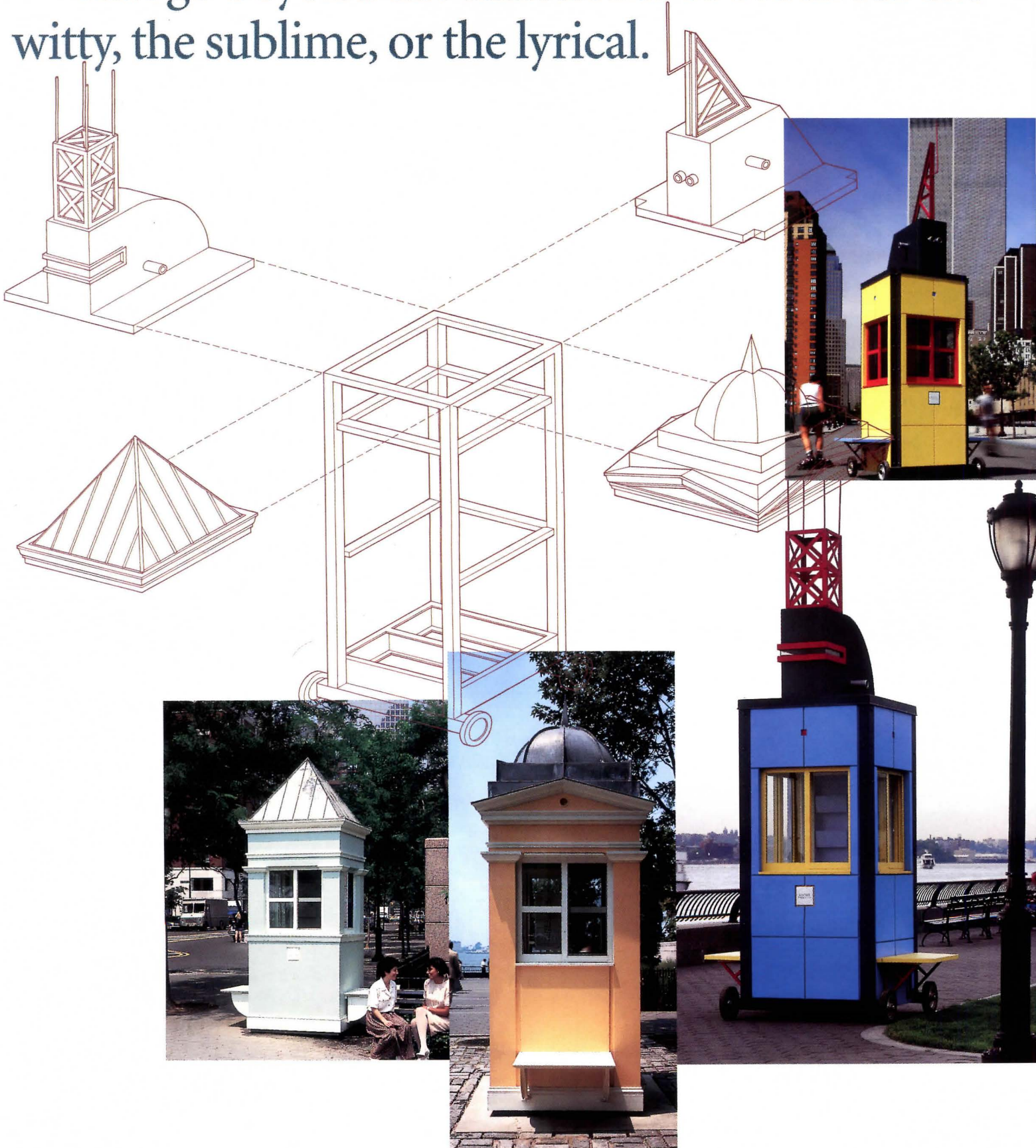
Locksets: *Schlage*

Hinges: *Stanley*

Downlights: *GE, Halo*

Exterior lights: *Poulsen*

SMALL PROJECTS A portfolio of structures that go beyond the functional to reach for the witty, the sublime, or the lyrical.

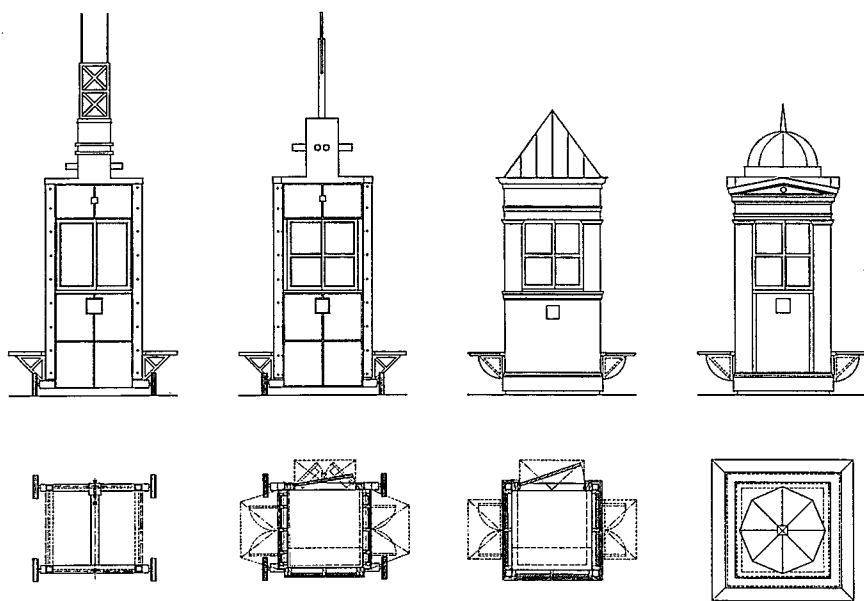


A work of architecture can evoke as many emotional responses as there are people to experience it. After all we architects go through to design a building and then get it engineered, drawn, bid, and built, our most satisfying moments come when we see that we have elicited the intended response. This is what keeps us at the boards year after year.

I would describe my favorite kind of architecture as witty. Small projects like Alexander Gorlin's guard houses (below and opposite) seem to present especially wonderful opportunities for the injection of a little laughter. Gorlin grafted historic references, like temples and skyscrapers, onto structures so far removed in use and scale from the originals that if passersby don't smile at them, at least they will ponder them. I do not classify these designs as playful. (That word should be banned from architecture writing: buildings are not playful; puppies are.)

The old saw about humor—dying is easy but comedy is hard—applies to wit in architecture as well. I, for one, have had a much easier time being funny than doing architecture. So it stands to reason, by my logic anyway, that witty architecture would rate a much higher degree of difficulty than either comedy or architecture by themselves.

Complexity, too, plays a role in what I consider witty. The Grasshopper Bridge by artist Ed Carpenter (featured on page 113) appeals to me in a way that another of architecture's great witticisms, Philip Johnson's Duncan Phyfe-crowned Sony Building in New York City, never will. Why? The notion that a giant insect can safely carry children on its back across a dangerous place makes me think, and smile. On the other hand, the Sony Building seems to be a witticism based solely on scale. In my book, if you're going to build a joke that's 50 stories high, it should be more than a one-liner. Charles Linn, AIA



BATTERY PARK CITY GUARD BOOTHS

WHIMSICAL BOOTHS STAND GUARD OVER BATTERY PARK CITY

A quartet of fantastic portable guard booths, designed by architect Alexander Gorlin, have replaced the generic white booths originally installed in Battery Park City at the southern tip of Manhattan. They

Andrea Truppin is a documentary film maker and freelance writer who lives in New York City.

respond to the urban context of the adjacent financial district's hodgepodge of styles: earnest imitations of Greek temples, early steel frames dressed in Beaux Arts, neo-Gothic towers, and the oversize late Modernist gesture of the World Trade Center. Gorlin's nine-foot-tall guard booths, which mimic skyscrapers, robots, and Italian villas, take them-

selves less seriously, however. Their sober intent—to enhance public safety—is hidden behind their whimsy. Two booths recall the nostalgic classicism of the garden follies and tempietti that once graced the private parks of European nobility; the other two were inspired by the outrageous costumes and machines of Russian Constructivist stage sets.

The booths were constructed by a shipbuilder, which is fitting, since Battery Park City, like much of

lower Manhattan, sits on land reclaimed from New York Harbor. *Andrea Truppin*

Project: Battery Park City Guard Booths, New York City
Owner: Battery Park City Authority
Architect: Alexander Gorlin Architect—Alexander Gorlin, AIA, principal-in-charge; Christian Dickson, project architect
Engineer: Eric Blohm
Builder: Derecktor Shipyards

NEW POOL COMPLEX PROVIDES COOL OASIS FOR MISSOURIANS

On a blazing hot summer day, few things are more satisfying than a dip in a cool swimming pool. But many residents of Sedalia, Missouri, where July temperatures can top 110 degrees, have been deprived of that distinct pleasure since the Liberty Park pool closed in 1992. Built as part of the Works Progress Administration initiative in 1937, the pool had far outlived its design life.

The city needed a new pool, and Shaughnessy Fickel and Scott Architects seized the opportunity to create much more than a place to swim. According to Mike Fickel, FAIA, principal-in-charge, "a swimming pool has to provide plenty of incentives and opportunities for entertainment."

Such was the thinking behind the Liberty Park Family Aquatic Center, a complex with numerous swimming and outdoor recreational features. The north elevation of the bathhouse is barracks-like, but its slanting, textured-aluminum roof, open on the south side to pick up breezes for natural ventilation, suggests that something special might be going on inside. The roof itself is supported by a rhythmic progres-

Elizabeth Harrison Kubany received a master's degree in architectural history and theory from the Architectural Association in London.

sion of concrete and painted steel columns, highlighted by criss-crossing steel cables. These elements also ornament the complex's visual focal point, an outdoor eating pavilion shaded by a tensile fabric structure whose spiraling form resembles a nautilus shell. A shade structure made of wood slats and grass decks provides additional space for lounging. "Rather than a single static structure, we wanted to create a set of dynamic spaces that would accommodate a variety of activities," explains Fickel. "Each element is a place where people congregate and have fun."

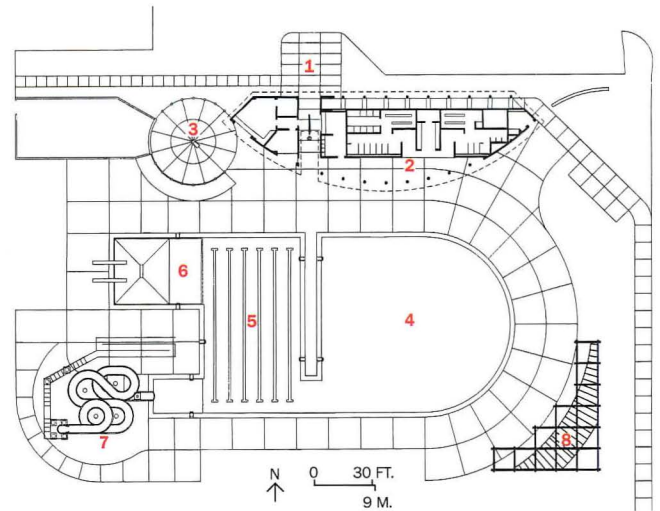
The pool includes a one-meter diving well, a spiraling water slide with a plunge pool, six 25-meter competition lanes, a shallow area, and a zero-depth entry with water-play features, such as water-spouting columns. *Elizabeth Harrison Kubany*

Project: Liberty Park Family Aquatic Center, Sedalia, Missouri

Owner: City of Sedalia

Architect: Shaughnessy Fickel and Scott Architects—Mike Fickel, FAIA, principal-in-charge; Kerry Newman, project designer

Engineers: Larkin Aquatics (pool design); Kerr Conrad Graham Consulting Engineers (structural)



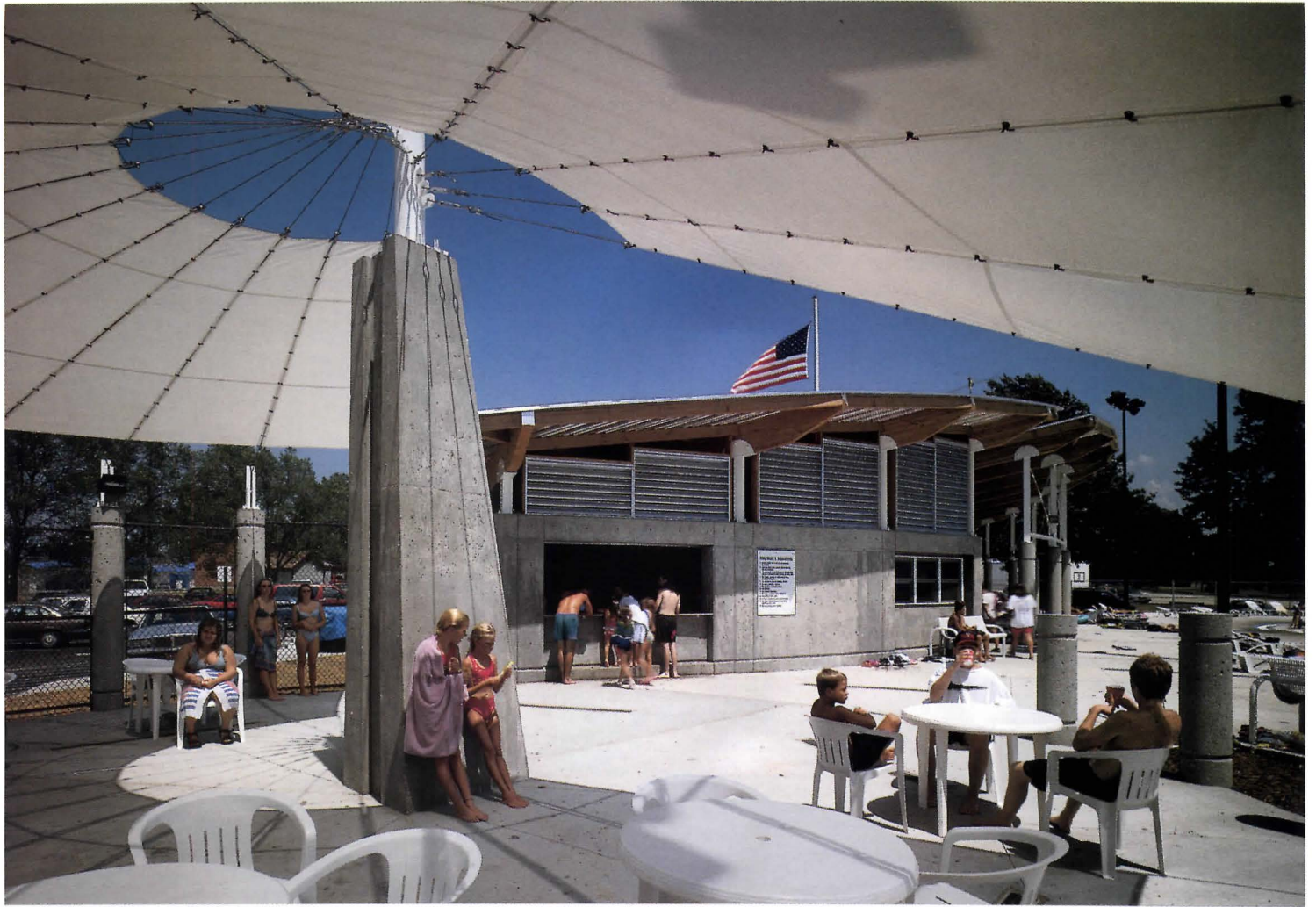
- | | |
|---------------------|---------------------|
| 1. Entry | 5. Lap pool |
| 2. Locker rooms | 6. Diving pool |
| 3. Tensile sunshade | 7. Water slide |
| 4. Wading pool | 8. Trellis sunshade |



The raised, sloping metal bathhouse roof is open on the south side of the building to

allow cool breezes to enter (left and above). The tensile fabric-covered picnic shelter

(left and opposite top) is shaped in a spiral, somewhat like a nautilus shell.



The shallow end of the pool (left) has special features, including two water-sprouting columns and a crescent-shaped concrete bench that sprays water into the air. The south elevation of the bathhouse can be seen in the background.

CHICAGO SUBWAY STOP EXEMPLIFIES VIBRANT PUBLIC ARCHITECTURE

In the realm of public architecture, everyday, much-used structures face the most rigorous tests of function, durability, accessibility, and aesthetics. Successful examples address all four concerns.

Respectful of precedent without veering toward pseudohistorical redundancy, the Blue Line subway stop at Wells and Lake Streets represents the vibrancy of Chicago public architecture.

Thomas Hoepf, AIA, of the Chicago firm Teng & Associates, designed the refurbished three-level station. Immediately accepted by the public and the design community, it has been adopted by the transit authority as a prototype for city subway stops.

Hoepf says his own experiences as a subway rider influenced the design. "This stop used to be depressing, dark, and damp," he says. "And it looked dangerous."

As the initial step in the design process, the architect looked at entrance canopies around Chicago, Paris, and New York City and considered the neighborhood context. "We wanted to incorporate the historical form, but in a modern interpretation—not a replication," Hoepf says.

The fluid roof form lends itself to the motion of descent, and the station's site under the elevated-

Linda Hallam edits shelter books for the Meredith Corporation.

train tracks also became a point of reference. The canopy's upside-down, U-shaped steel columns reiterate the structure of the el.

Above ground, Hoepf specified granite as the architectural and aesthetic base for the jewel-like structure. Glass for the walls and roof protects riders from the weather without blocking scarce natural light. Attention to detail continues below. At the mezzanine level, Hoepf repeated the granite as dark and light bands to allude to the strata of the earth.

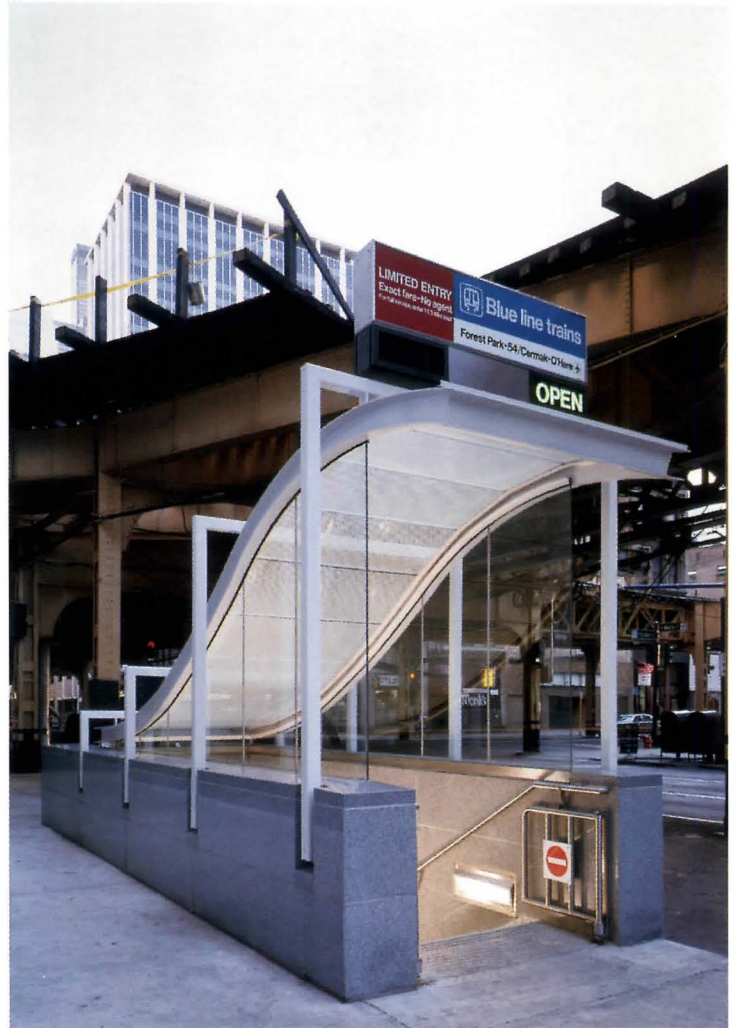
Carefully matched caulking provides visual continuity as a calm counterpoint to the visual chaos of mass transit. The same uncluttered treatment is evident at the lowest boarding levels, where Hoepf worked with engineers to consolidate all the necessary utility and mechanical conduits inside sleek corrugated metal panels. *Linda Hallam*

Project: Chicago Transit Authority Wells/Lake Subway Station, Chicago

Owner: Chicago Department of Transportation

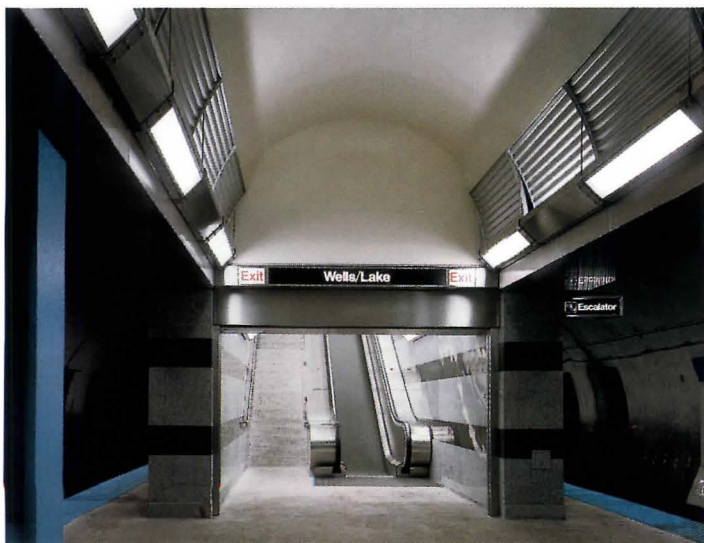
Architect: Teng & Associates—Jerry Cibulka, AIA, principal-in-charge; Thomas Hoepf, AIA, principal design architect; David Stuhlmacher, AIA, project manager

Engineers: d'Escoto (civil); Teng & Associates (structural and electrical); T&M Associates (mechanical)



The glass walls and roof of the subway station at Wells and Lake in Chicago allow a generous amount of

daylight into the subway station itself (left). Light and dark granite bands (above) allude to the strata of the earth.



NAUTICAL-THEMED BRIDGE IS PLEASING TO DRIVERS AND PEDESTRIANS ALIKE

Bridges offer architects the opportunity to marry traffic functions with memorable aesthetics. In the new Main Street Bridge over the Root River in Racine, Wisconsin, designed by HNTB Architects Engineers Planners of Milwaukee, that union is a happy one.

For transportation improvements, the new bridge, supported by piles, accommodates four full 12-foot-wide traffic lanes, instead of the 10-foot lanes of the old 1927 bridge. Equally important, vertical clearance has been increased from 8 to 16 feet, allowing many more boats to safely pass underneath and reducing traffic disruption when the spans are opened for taller boats.

Though only one tower was needed to house the bridge operator, HNTB's plan features two towers

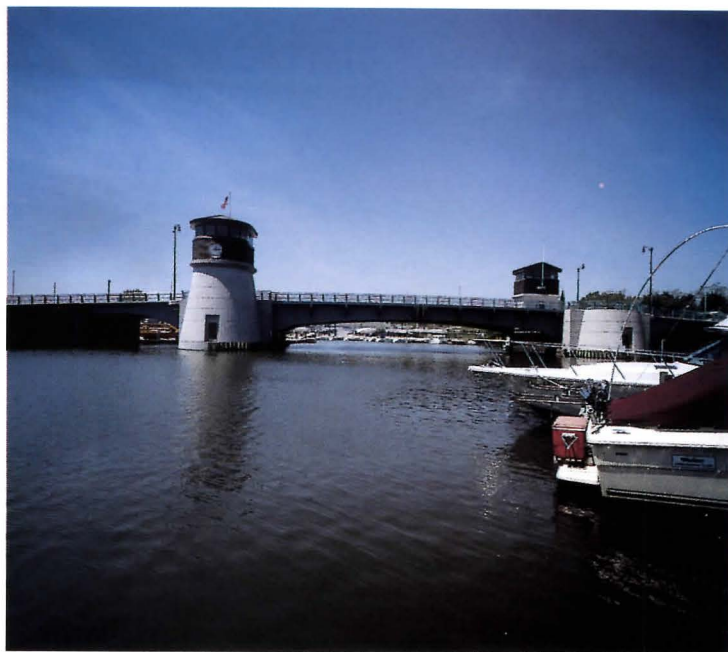
and two pedestrian overlooks at opposite ends of the 294-foot-long span to balance the design of the bridge. In keeping with the maritime ambience of the riverfront, HNTB chose rusticated bases of hand-rubbed concrete, solid bronze waist louvers and gutters, and naval glass accents that allude to lighthouses.

The bridge also has a pleasant pedestrian aspect. It is placed in a parklike setting, and the circular overlooks opposite each tower give walkers views of downtown, the lakefront, the marina, and scenic residential areas. *L.H.*

Project: Main Street Bridge, Racine, Wisconsin

Owner: Wisconsin Department of Transportation

Architect: HNTB Architects Engineers Planners



As the bridge towers' copper-clad roofs age to a green patina (above), they will echo other spires in Racine.

Phoenix's Grasshopper Pedestrian Bridge (below) is decorated with silhouettes of scorpions and snakes.

GIANT GRASSHOPPERS CARRY PHOENIX CHILDREN SAFELY ACROSS STREAMBED

The East Fork Cave Creek in north Phoenix's Moon Valley neighborhood is normally a dry wash. But the thunderstorms that occasionally rumble through the desert can turn Cave Creek into a raging river without warning in a matter of seconds.

Because the threat of a surprise flood presents a real danger to children passing through the area on their way to school, who are tempted to try and wade across the creek, Gail LeBrun, a neighborhood resident, asked the city to build a pedestrian crossing over the streambed. City officials responded in typical Phoenix fashion by soliciting artists for an innovative solution to their infrastructure problem. Backed by Moon Valley residents, who helped in the selection process, the city awarded the commission to Ed Carpenter, an artist from Portland, Oregon.

Throughout the process of creating and building the Grasshopper Pedestrian Bridge, Carpenter worked closely with the surrounding community, as well as Phoenix's

Street Transportation Department and its Arts Commission, to arrive at imagery that would be appropriate for and appealing to youngsters. The final design—a pair of giant grasshoppers waiting to transport the children safely across the wash—refers to the Sonoran desert without resorting to cactus clichés.

Local engineer Jerry Cannon, of Cannon Associates, was instrumental in realizing the 210-foot-long steel bridge. And students in art classes at the middle school nearby made a significant contribution: they worked with Carpenter to create insect silhouettes, which were made into templates used to sandblast designs into the bridge's concrete deck. *C.L.*

Project: Grasshopper Pedestrian Bridge, Phoenix, Arizona

Owner: City of Phoenix

Artist: Ed Carpenter

Engineer: Cannon Associates—Jerry Cannon

Metal fabrication: Sandvick Equipment and Supply



DELICATE OBELISK SHIMMERS ABOVE WHITE SANDS OF FLORIDA'S SEASIDE

The Coleman Pavilion in Seaside, Florida, pays homage to one of the earliest forms of architecture: the monument. The 50-foot-high, broadly proportioned obelisk straddling the dunes marks the boundary between the town and nature, a sweep of white sand along the azure waters of the Gulf of Mexico.

As a symbol for Seaside, the well-known 80-acre planned community in the Florida panhandle, architect David Coleman decided that the obelisk should embrace all the community's eclectic styles without referring directly to any of them. His subsequent search for what he calls an "elemental form" led him to ponder the power of ancient monuments, such as Mayan temples. His pavilion, towering over nearby buildings and topped with a pyramidal copper cap, suggests a Celtic menhir, a Chinese pagoda, a New England lighthouse, and an Egyptian pyramid. It also contrasts opposites such as opaque/transparent, solid/porous, inside/outside, and light/dark to provoke perceptual shifts and ambiguities that engage both mind and body.

Seen from the center of town, the obelisk appears solid and heavy, its shape suggesting stone. But on

approach, it reveals itself as wood, its surprising delicacy enhanced by open joints between the horizontal slats cladding the skeletal frame. The wide-skirted structure hovers lightly on the toes of its four king rafters over four arched openings, but the arches are so broad and shallow that they appear to be flattened by an immense weight.

A circular bench, from which one can observe a 360-degree view through the arches, provides a humanely scaled place of repose. Wheelchair access to the beach is via a series of switchback ramps that suggest processional movement. These long, gently sloping paths have become a favorite destination for socializing and watching the sunset.

A couple of years ago, the pavilion stood fast against a major hurricane, earning itself a modest place among the timeless monuments of old. *A.T.*

Project: *The Coleman Pavilion, Seaside, Florida*

Owner: *Seaside Community Development—Robert Davis, president*

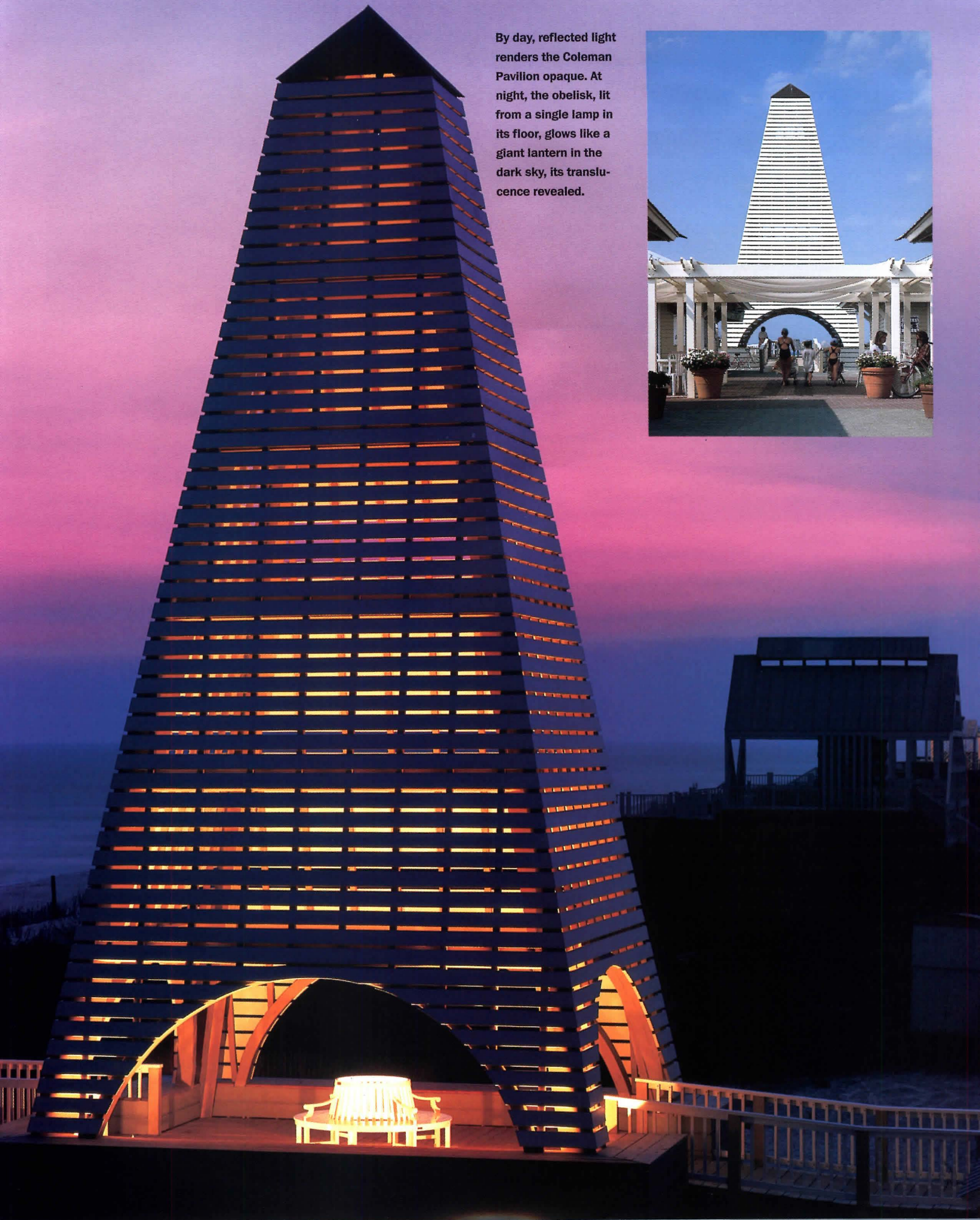
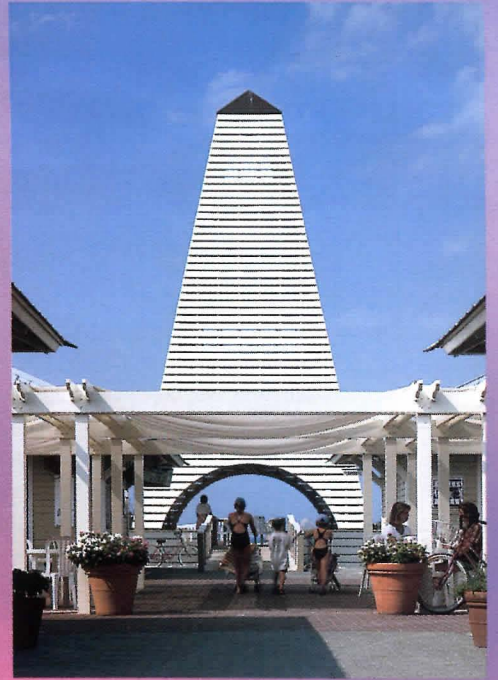
Architect: *David Coleman/Architecture*

Engineer: *Johnson, Creekmore, Febre—Sam Johnson*



PHOTOGRAPHY: © JACK GARDNER

By day, reflected light renders the Coleman Pavilion opaque. At night, the obelisk, lit from a single lamp in its floor, glows like a giant lantern in the dark sky, its translucence revealed.



TWO HALVES MAKE A WHOLLY PLEASANT CARPORT-GREENHOUSE COMBO

"When our client phoned the first time, he sounded almost apologetic," recalls architect Max Levy, AIA, of Dallas. "He said that he was getting on in years, and he had always wanted to build something but never had. He wondered if we would design a carport and a greenhouse for his backyard."

When Levy visited the site, he found a quaint 1920s bungalow in perfect condition fronting a backyard that the client, who raised his own flowers, had planted as a miniature English garden. The only problem was that to build both a greenhouse and a carport behind the house would mean sacrificing a good deal of the space occupied by the garden.

Levy proposed that the carport and greenhouse be combined into one structure. The carport would be just wide enough for the car, and

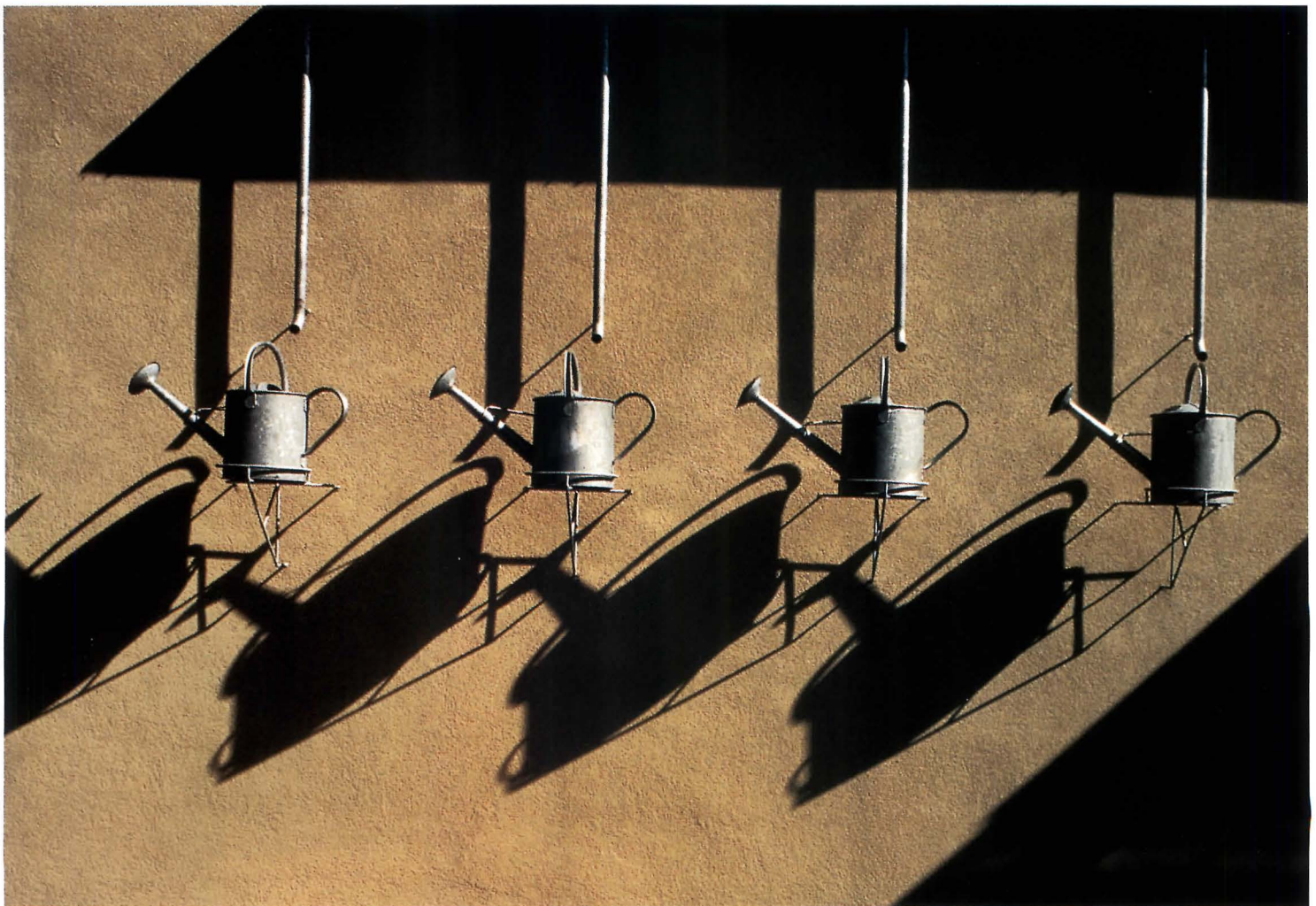
the attached conservatory would be a half-section of a premanufactured greenhouse. The client agreed.

The carport's roof skin is made of translucent, synthetic canvas. "I think a carport should be as welcoming and pleasant as an entry hall, since it's the first thing you see when you're coming home," says the architect.

The roof's gutters and downspouts drain into several watering cans the client bought on a visit to England. He uses the collected rainwater in the garden. Even this tiny project afforded designer and client the chance to explore green architecture. "Every building should give something back to the earth," Levy says. *C.L.*

Project: *Carport and Greenhouse, Dallas*

Architect: *Max Levy, AIA*



PLAZA AND FREE SPEECH WALL TAKE CENTER STAGE ON IOWA CAMPUS

The Kautz Plaza/Free Speech Wall, at the University of Iowa in Iowa City, sits on a triangle of land left over after a new pedestrian street was installed, but it functions as if it were integral to the original design. Designed by Herbert Lewis Kruse Blunck Architecture and developed by principal Rod Kruse, FAIA, and project architect Paul Mankins, AIA, the plaza consists of a simple concrete slab and a limestone wall. It provides space for formal and informal outdoor gatherings.

The pedestrian street links the Pentacrest, the academic center of the university, with other major buildings, placing the Kautz Plaza at the heart of campus life. Mankins notes that buildings to the west of the curving yellow limestone wall are brick and those to the east are limestone. The wall is the line between the two, although it establishes definable spaces on either side.

The limestone was taken from the same Indiana quarry as the stone used for Frank Gehry's Advanced Technology Laboratory building, which is located on the campus nearby. It was cut and laid

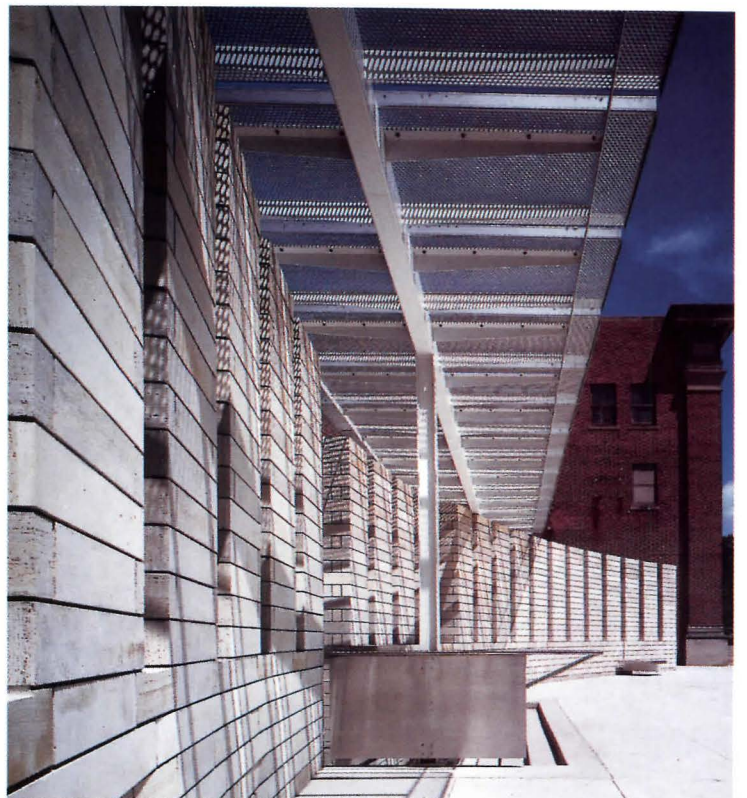
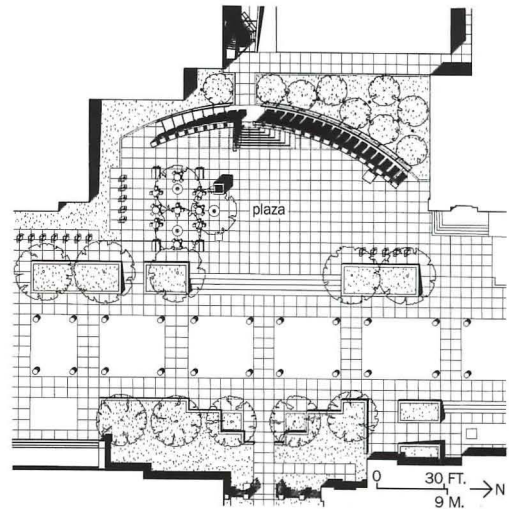
like bricks, to suggest both the stone and brick of nearby buildings. The south half of the plaza was developed for use with tables and benches, with space for street vendors. The plaza's north half serves as a gathering point for speakers, and a platform supported by the wall calls out to orators who wish to exercise their right to free speech.

The wall is topped by a perforated stainless-steel canopy. Its leading edge is straight rather than curved like the wall, casting patterns of shadow and light that change throughout the day. Beams of light also penetrate a series of narrow, seven-foot-high slits in the limestone walls. Uplighting inside the slits softens the wall's character at night and illuminates the plaza. *L.H.*

Project: Kautz Plaza/Free Speech Wall, University of Iowa, Iowa City

Architect: Herbert Lewis Kruse Blunck Architecture—Rod Kruse, FAIA, partner-in-charge; Paul Mankins, project architect/designer

Consultants: Shive Hattery (structural, electrical); Crose Gardner (landscape architecture)



At the south entrance, which serves the adjacent auditorium and staff areas, a pattern of alternating solid blocks and glazed connectors is established.



Inviting the public inside, the **ONTARIO PROVINCIAL POLICE HEADQUARTERS** offers openness without sacrificing security.

by Beth Kapusta



The project's basic organization is easily read by visitors arriving at the forecourt: office blocks with generously glazed atria sit behind a curving, glass-fronted indoor "street" linking all public components.

As the public's taste for megabuildings wanes, the need for big centralized institutions remains. Such was the dilemma facing the Ontario Provincial Police (OPP), which wanted one complex, encompassing some 572,000 square feet of space, to consolidate eight facilities previously located all across Ontario. Given a 60-acre rural site bounded by a stand of hardwood maple trees on one side and sensitive wetlands on the other, a pair of Toronto-based architecture firms was asked to design a very big building to be the headquarters of Canada's largest provincial police force.

The big building is not something the current generation of architects has done particularly well in Canada. An earlier generation—including Ron Thom at Trent University, John Andrews at Scarborough College, and Arthur Erickson at Simon Fraser University—adeptly wove together the contradictions of landscape and large buildings to create uniquely Canadian responses that captured the optimism and unself-conscious expression of the time. But today such grand gestures tend to come across as unflattering examples of megalomania.

Learning from others' mistakes

History already provided a lesson in what could go wrong with an overly grand law-enforcement building. Several years ago, when the metropolitan police of Toronto erected an impenetrable granite fortress as their

Beth Kapusta is a Toronto-based freelance journalist and an adjunct professor at the University of Waterloo School of Architecture.

headquarters, the public hue and cry made it clear that such excessive, megalithic edifices don't help bolster the police force's image in the eyes of the public.

And so the OPP headquarters, designed by Dunlop Farrow Inc. Architects and W. M. Salter Associates (working as a joint venture) came to be defined by a series of near-contradictions: value without opulence; considerable size without intimidating scale; openness without compromised security; coherence without oversimplification. The desire to be seen as a community-based police force serving both rural and urban constituencies prompted the OPP to choose this site just outside Orillia, a large town located near the center of the province but just off a major highway that runs north from the city of Toronto.

Much of the program required very high security. But a desire

Project: Ontario Provincial Police Headquarters, Orillia, Ontario

Architects in joint venture: Dunlop Farrow Inc. Architects/W. M. Salter & Associates—Douglas Neville, W. M. Salter, principals-in-charge; Michael Moxam, Christian Klemt, Tye Farrow, John Jeffery, Gerry Pilon, project architects; George Bitsakakis, Robert Boraks, Janice Brown, Robert Chang, May Chow, Steve Clishe, Dede Dorsey, Janet

Gasparotto, Agnieska Gontarz, Barbara McLean, Barbara Miszkziel, David Morgan, John Persano, Alan Power, Todd Scott, Mira Sener, Colin Tennent, Jim Tushingham, Grant Wilder, Miranda Wong, Robert Wu
Engineers: Carruthers & Wallace (structural); Skelton, Brumwell (civil)
Landscape: EDA Collaborative
General Contractor: PCL Constructors Eastern, Inc.



The main entrance to the headquarters is marked by a metal-and-glass canopy (above). Public elements such as the library (right, top and

bottom) are pulled out and treated sculpturally. Landscaping around the site was inspired by existing wetlands and old-growth trees.



for openness and accessibility was one of the main requests to emerge in the numerous client focus groups that were part of the design process. These potentially conflicting requirements were resolved in a plan that locates the public elements along a glazed two-story indoor “street” anchored at one end by a day care center and at the other by a research library. Publicly accessible program elements such as an auditorium (for press conferences and training sessions), a gift shop, a museum, and a cafeteria are all articulated as distinct volumes off the curving spine.

EVEN AS THE PUBLIC’S TASTE FOR MEGABUILDINGS WANES, THE NEED FOR BIG INSTITUTIONS REMAINS.

According to Michael Moxam, one of the project architects, the architectural strategy was rooted in the idea of an “open, accessible image—a large part of which is about transparency.” To this end, the glazed wall of the indoor street is canted to maximize transparency during the day, and it looks onto the project’s circular entry court (which doubles as a ceremonial space).

A sense of light and warmth is expressed in the curving public space in a rich palette of materials: tapered steel columns, Tyndall stone (a limestone that is remarkable for its high fossil content), and dark gray terrazzo irregularly divided to simulate a stone patchwork. The materials

are durable, yet they are used in such a way as to wipe away any institutional trace. Some of the slicker materials of the early design were purposely dropped to avoid any semblance of ostentatiousness and were replaced with simple but elegant staples like masonry and judiciously used maple panels.

Holding down the budget

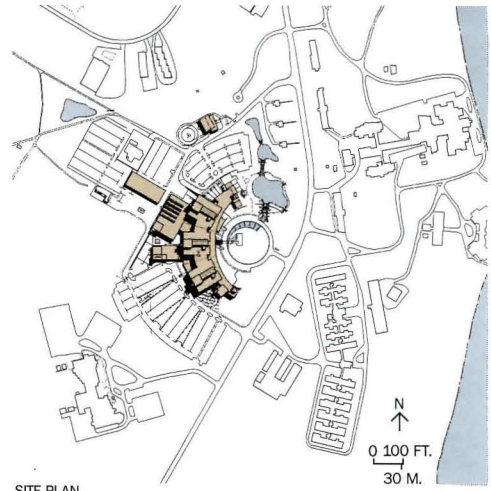
Even with the budget for the building ending up at only \$70 per square foot, Moxam says there is the occasional complaint that the headquarters “looks too good.” The fact that the project was undertaken in the middle of the last recession was a big help in achieving such value, explains Moxam. In addition, the architects kept costs down by using a fairly limited palette of materials and making the most of repeated elements.

The building’s planning strategy is based on surrounding an open core with a secure periphery. The publicly accessible zone is the inner ring of the radial plan, to which the more secure program elements are visually connected but not physically accessible. Atria bridge the gaps between four-story brick office blocks. The two-story mass of the glazed street tempers the scale of the higher office volumes beyond.

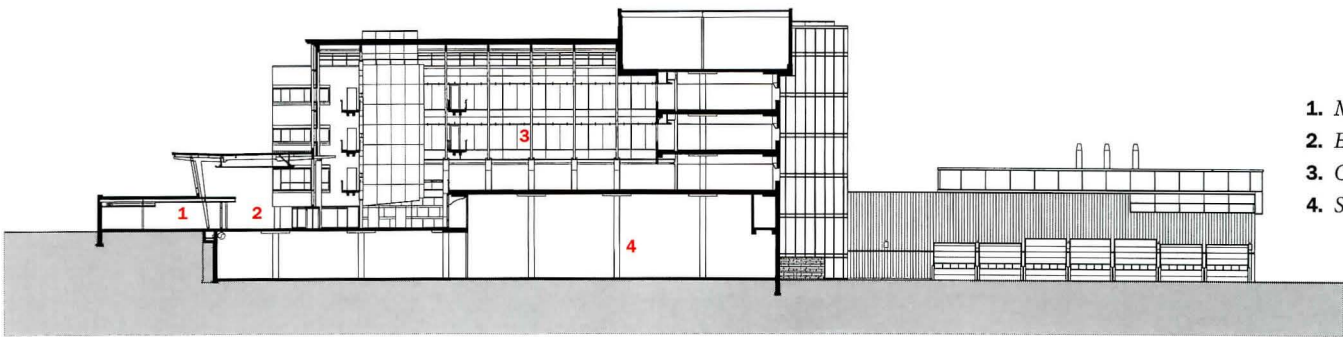
A secure internal street connects the atria, each of which is capped by a tilting arched roof and lit by north-facing clerestory windows. A third ring extends out beyond the office/atrium blocks, comprising the shedlike, metal-clad forms that contain *(text continues)*

The police headquarters sits on a 60-acre site that slopes down to the north, allowing the architects to tuck a large service garage behind the main building (section and plans

below). Other facilities such as an emergency operations center (including a helipad), a canine training center, and a rifle range are located on distant parts of the site.



SITE PLAN



- 1. Museum
- 2. Entry
- 3. Office
- 4. Storage

SECTION A-A



TYPICAL OFFICE FLOOR



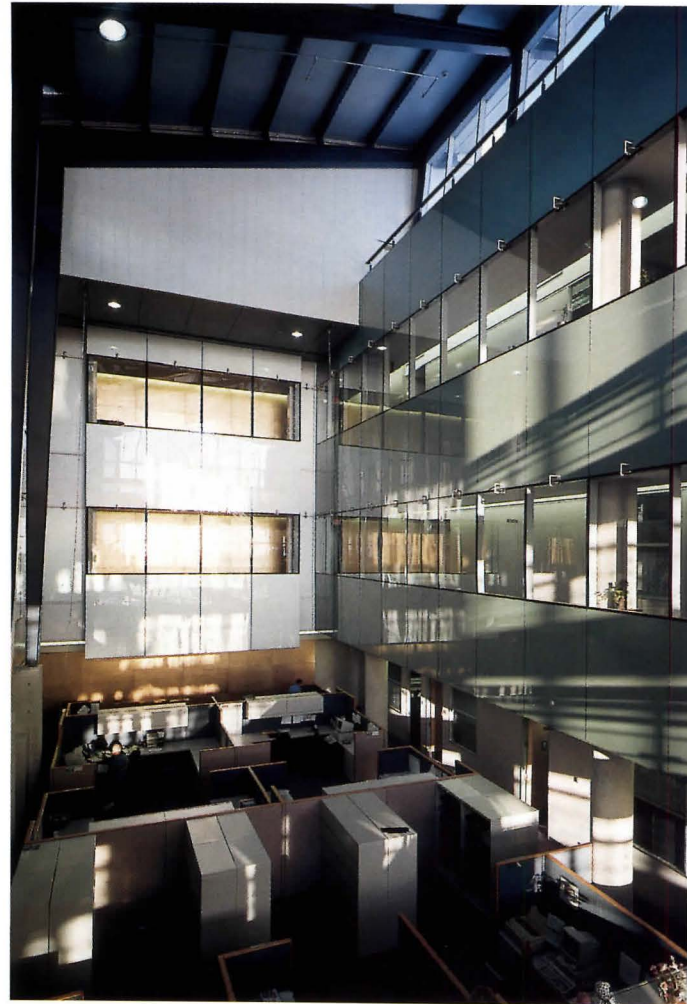
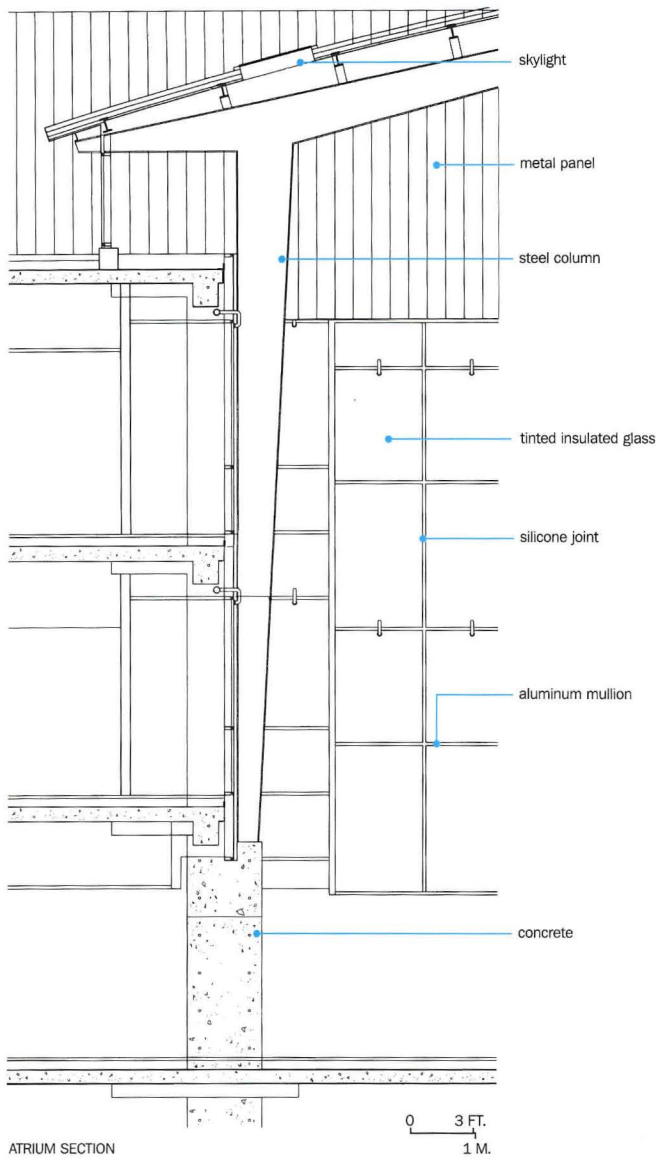
- 1. Entry
- 2. Library
- 3. Auditorium
- 4. Gift shop
- 5. Museum
- 6. Cafeteria
- 7. Day care
- 8. Offices
- 9. Storage (floor below)
- 10. Laboratory
- 11. Service garage (floor below)

GROUND FLOOR



Although all of the four-story office blocks are secured areas closed to the public, glass-enclosed atria between the blocks bring plenty

of daylight into interior spaces and present an open, accessible image to the public. Atrium bridges offer places for informal socializing.

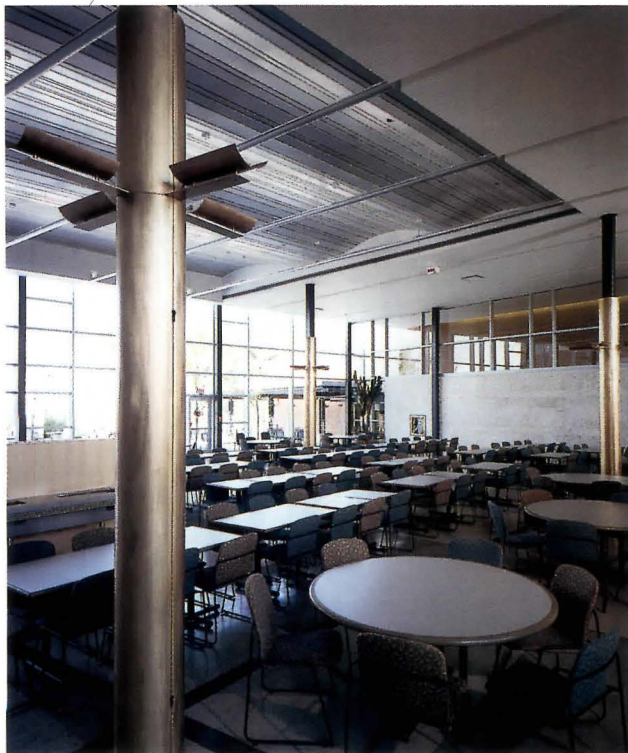


Public components in the headquarters complex—a library, an auditorium, a museum, a gift shop, and a day care center—feed off the indoor “street” (far right). The public’s first point of access is the main desk in the entry lobby (right). Workstations are set up in the atrium (above right).





A museum (above) engages the public with exhibits on the history of the Ontario Provincial Police and various aspects of police work. The building's cafeteria (right) and library (far right) are also open to visitors, as is a gift shop and an auditorium.



One goal of the police headquarters was to include community-oriented facilities to bring the public into the building on a regular basis. The complex

even has a day care center (below and right). Set at the north end of the project, the day care area has its own palette of colors and its own identity.



forensic and photography laboratories and a police-vehicle service garage. The natural slope of the site facilitates service access to this area, which is one floor below the level of the secure street.

The rest of the functions are located in remote buildings for canine training, storage, and emergency training (including a helipad).

Fitting the building into the landscape

The terrain in Orillia is typical of the transitional area where the Canadian “shield” begins to surface: hilly, forested, and with igneous rock outcroppings. Rather than build at the crest of the hill, the designers

THE BUILDING STRATEGY WAS TO SURROUND A PUBLIC INNER CORE WITH A SECURE PERIPHERY.

opted for the more modest solution of siting the building at mid-slope. The landscape plan offers a subtle gradation of plant life from mature trees on one end of the site to wetland plants on the other.

A fountain in the project’s ceremonial forecourt introduces water as an important design feature. Water then passes through a cascading crescent, finally draining into a series of picturesque retention ponds, which are surrounded by native species and accessed by way of a circuitous promenade.

Managing the OPP project was a major challenge because of its size and the fact that two firms worked together as a joint venture. But the

simplicity of the diagram allowed for teams to be set up on specific elements, working within what Moxam calls “a clear set of architectural guidelines.” And the joint venture was organized to enhance cooperation. Teams of people from both firms worked together from the beginning of design all the way through the completion of working drawings. This arrangement eliminated the usual division of roles played by design architect and local architect and provided “more satisfaction for the individuals working on the project,” says Moxam.

With as many as 25 people working on the project at peak times, coordination was a major issue. “We met every Sunday morning to review everything,” says Moxam. The result is a remarkable unity of language, in everything from the expressive structure right down to the carefully detailed benches that line the indoor street. The completed project belies the notion that the big building cannot have a human face. ■

Sources

Curtain wall: LBL

Exterior aluminum panels: Rush, Novaspan

PVC roofing: Proxfex

Tinted, insulated bulletproof glass: AFG

Entry portals: Secur-able Tech

Security devices: Von Duprin

Acoustical ceilings: Armstrong, CGC

Paints and special coatings: PPG

Wall coverings: Crown, Metro

Plastic laminates: Formica, Wilsonart, Nevamar

Cabinetwork (museum): Exhibits International

Carpet tile: Interface

Wall finishes: Kurtz Mann

Linoleum flooring: DLW

Office furniture: Knoll

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ALTERNATIVE WORKPLACE

The Way We Work

EXPLORING AND UNDERSTANDING A CORPORATION'S BUSINESS AND CULTURAL GOALS IS THE FIRST PRIORITY IN DESIGNING A SUCCESSFUL ALTERNATIVE WORKPLACE.

by James S. Russell, AIA



1

Stamford, Connecticut

Not far from New York City's hallowed financial district, Skidmore, Owings & Merrill created one of the largest trading floors in the world.



2

Pittsburgh

The Robert L. Preger Intelligent Workplace, located in a new penthouse atop an academic hall at Carnegie Mellon, is an office environment research lab.



3

Mountain View, California

Silicon Graphics' new campus, designed by Studios Architecture, embodies the casual but fertile corporate culture of Silicon Valley.

The alternative workplace is much more than an office building with coffee bars and a health club. The projects presented in this study are the types of innovative work settings increasingly valued by clients. They represent flexibility in technology, and they inspire the creativity and social interaction that corporate America craves. However, the alternative workplace is not an endpoint but a constant evolution. Just when a given office is reconfigured, technology or business practices change again. Faced with these variables, the goal of the architect must be to create a building framework that supports ongoing change while continuing to embody corporate values.

The alternative workplace is not very alternative anymore," says a gratified Franklin Becker, director of the International Workplace Studies program at Cornell University. For years, Becker, along with Michael Brill of BOSTI and Volker Hartkopf and Vivien Loftness of Carnegie Mellon's School of Architecture, were voices crying for change in the corporate wilderness. Workplaces designed to emphasize teamwork, technology, flexibility, and creativity were all ideas these people advocated. Now, at last, their cries have been heard and these ideas are moving into the mainstream. In fact, the four are now the leading advocates of a movement taken up by such prominent companies as MCI, AT&T, CIGNA, and the Discovery Channel, as well as many small but progressive firms. Each of these companies realizes that one-shot restructurings are not enough to stay competitive. Transformation is an ongoing process.

Executives, meanwhile, are trying to keep the corporate engine running while they are busy making repairs and, in some cases, tearing it apart. "You can reorganize every three years, but you can't make that reorganization operational so quickly," says Gene Rae, a historian, an anthropologist, and a partner at Studios Architecture who helps provide the firm with a better understanding of the human issues that businesses face. "The reorganizations don't have meaning for people, and you throw the organization into chaos. The company must be explicit about what its values are and how it can transcend reorganizations to make change occur more quickly and holistically."

And that is where architecture comes in. Design will highlight the cultural direction the company wants to follow. Cisco Systems, for example, used consistent facility design to unify and integrate the cultures of the 21 companies it has acquired in recent years. Creating constancy amid volatility should be a challenge and an opportunity for architects.

THE CHANGING CONTEXT OF WORK

| | PAST | PRESENT | FUTURE |
|--------------------|-------------------------|------------------------------|--------------------------------------|
| WORK FOCUS | INDIVIDUAL | TEAMS | PROJECT DEPENDENT |
| WORKSPACE REFLECTS | STATUS | WORK PROCESS | OPTIONS FOR CHANGE |
| OFFICE REFLECTS | STRENGTH/IMAGE | CULTURE/IMAGE | VALUES/IMAGE |
| SPACE ALLOCATION | STATUS | FUNCTION AND STATUS | FUNCTION ONLY |
| BALANCING PRIVACY | SCHEDULED INTERACTION | SCHEDULED PRIVACY | CONTINUUM OF OPTIONS |
| RATE OF CHANGE | STATIC ORGANIZATION | CONTINUOUS CHANGE | CONTINUOUS CHANGE |
| MARKET FOCUS | STATIC/INWARD | GLOBALIZATION | BOUNDLESS |
| TECHNOLOGY | ANCILLARY | INTEGRAL | FULLY INTEGRATED |
| SOCIALIZATION | NEGATIVE VIEW | ENCOURAGED | VALUE ACHIEVED |
| WORK/LIFE | 9 to 5 | 8 to 8 | TIME/PLACE FLEXIBILITY |
| CAREER PATH | ONE CAREER, ONE COMPANY | EVOLVING CAREER, ONE COMPANY | MULTIPLE CAREERS, MULTIPLE COMPANIES |

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But compared to the functional-relationship diagrams and square-footage allocations that comprise the usual programming process, planning for change is abstract to architects and requires working and thinking in new ways.

When the process of planning for a new facility moves from counting heads to creating an environment for endeavors that may not yet be knowable, the architects involved may feel as if they've landed in the rhetorical muck of management gurus who talk of "human networks" in describing the kinds of creative social interactions companies need to foster. Understanding the need to create these networks, even when the

agement. And they must now make a space that can, if needed, be easily rearranged, often within months of its completion.

The fluid, low-cost workplace

If business cultures are murky and difficult to draw out, at least the broader trends in the way these change-driven businesses function are becoming clearer. "The one absolute is mobility," Becker says. But this can take lots of forms. Cubicles or offices may be augmented by a variety of meeting places, from formal conference rooms—which can be outfitted with full computer, electronic whiteboard, and videoconferencing capabilities—to a loose collection of tables, chairs, and partitions commandeered from the storage room.

Many businesses surround employees with amenities that are intended to lure them away from their desks and into settings where a casual remark or chance meeting may inspire "the next great idea." The gourmet cafeteria is no longer an oxymoron. For example, when the engineers at Fore Systems, in Warrendale, Pennsylvania, are forced to work long hours, their families may be mollified when the cafeteria chefs pack them a heat-and-eat meal. At many companies, the copy and fax area is placed next to a well-appointed coffee bar. Corridors widen into lounges. Fitness centers, company stores, handsome garden courtyards, and light-flooded stair lobbies and indoor atria are proliferating.

CORPORATIONS ARE BEGINNING TO TRUST MORE INTUITIVE WAYS OF ORGANIZING THEIR OFFICE SPACE TO HELP ENCOURAGE EXPERIMENTATION AND CREATIVITY.

circumstances seem a little "out there," is central to interpreting the needs of corporate customers. "Clients are looking at very strange things," says Christopher Budd, an associate at Studios. Budd is also not an architect, but a graduate of Becker's workplace study program at Cornell. "We see the concept of *feng shui* [an ancient Chinese method of creating harmony within a space] being used to bring meaning or spirituality into a space. Another client may hire choreographers. People are beginning to trust more intuitive ways of organizing their company."

Companies are increasingly seeking environments that encourage experimentation. "Design studios and theaters are the kinds of metaphors companies are using to develop innovative capabilities," says John Kao, an author and consultant who specializes in business creativity.

Architects may inadvertently overlook the degree to which change drives, or should drive, a company to reexamine its most closely held values. In other words, where change is the only constant, corporate soul-searching moves to the top of the agenda. The stated corporate culture, expressed in "mission" or "vision" statements, may not accurately reflect the circumstances under which the business actually operates. So it is left to the architect to interpret those values and design accordingly.

Asking an architect to decipher a company's vision is a tall order. It means that architects must reassess their role in office-building design; they must now define the values to be expressed rather than simply laying out cubicles. They must design for patterns of human interaction rather than simply detailing exotic wood paneling for upper man-

At the same time, company managers are working to drive down occupancy costs. The result: companies today build fewer private offices and fit them out more minimally. They have shrunk and reduced the number of cubicles, recognizing that many are occupied only a fraction of the workday anyway. For example, KMD Architects' Mark Miller, a project director for client Sun Microsystems, says Sun asked him to bring in a new campus for the company in Newark, California, at the same cost and with the same features and standards of design as the company's campus in nearby Menlo Park, California, which was completed two years ago. The problem is that the real estate market has gone up 12 to 15 percent since then. Keeping to the budget meant simplifying elevations, saving the expensive details for the most visible locations, and eliminating complicated curves and angles from the floor plan.

Consulting firms have been especially aggressive about reducing work areas devoted to individuals since consultants may spend up to 80 percent of their time in client offices or on the road. Back at the home office, they are assigned by a concierge to a carrel or cubicle fitted with phone and data-network connections, and perhaps a caddy containing stationery and supplies. A facility for management consultants Deloitte & Touche in Pittsburgh, recently completed by Burt Hill Kosar Rittelmann, involved designing an entire floor that takes advantage of previously unused faceted projections in the facade of Philip Johnson's mid-1980s neo-Gothic PPG Place. These "touchdown" areas—with desks or cubicles used by consultants checking in at the home office—are located in the

highly traveled external corridors of the plan, which means that the consultants can more quickly pick up news and developments in the office from passersby.

A new Paris facility for Andersen Consulting, a management and consulting firm, designed by architect Jean Michel Willmotts, takes the concept of accommodating the management consultant who veritably lives on the road one step farther. After being greeted by the concierge, the consultant is issued an electronically coded card. A card reader recognizes the consultant and displays on a screen a map that shows the consultant the route to his or her temporary workplace and to other resources: a quiet library, the work group to which the consultant is assigned, a meeting room set up for teleconferencing, and so on. Andersen expects to triple its business in Europe within the next 10 years but cannot afford to triple its space. Using whatever desks are available minimizes the number of empty office areas and reduces space needs to about 50 square feet per person, compared to the conventional American office, which budgets about 250 square feet per person.

A few years ago, Gaetano Pesce designed a floor for Chiat/Day advertising in New York City that provided fixed work spaces only for those bound to their desks by technology needs, such as art directors, who need powerful computers and large-format screens (RECORD, September 1994, page 92). The rest of the staff works collaboratively in "project rooms," teamwork spaces dedicated to particular clients or products. Or they can take a laptop and a portable phone to a variety of settings to work individually. This "nonterritorial" environment was greeted with suspicion at the time, but it has continued to work for the firm (now TBWA Chiat/Day). In the meantime, many of the innovations have been assimilated by other agencies.

Becker and other alternative workplace proponents see such environments as harbingers of even greater fluidity in the use of space. Fewer employees have fixed duties; fewer companies have fixed jobs. Instead, each new project, each new service, and each product innovation is handled by an interdisciplinary team with members that change, and who work in locations that may shift, depending on the project. "Design must accommodate the increasingly project-oriented, temporal quality of work," says workplace consultant Kao. "The idea of lifelong work, of going to a physical location and doing one thing, is gone."

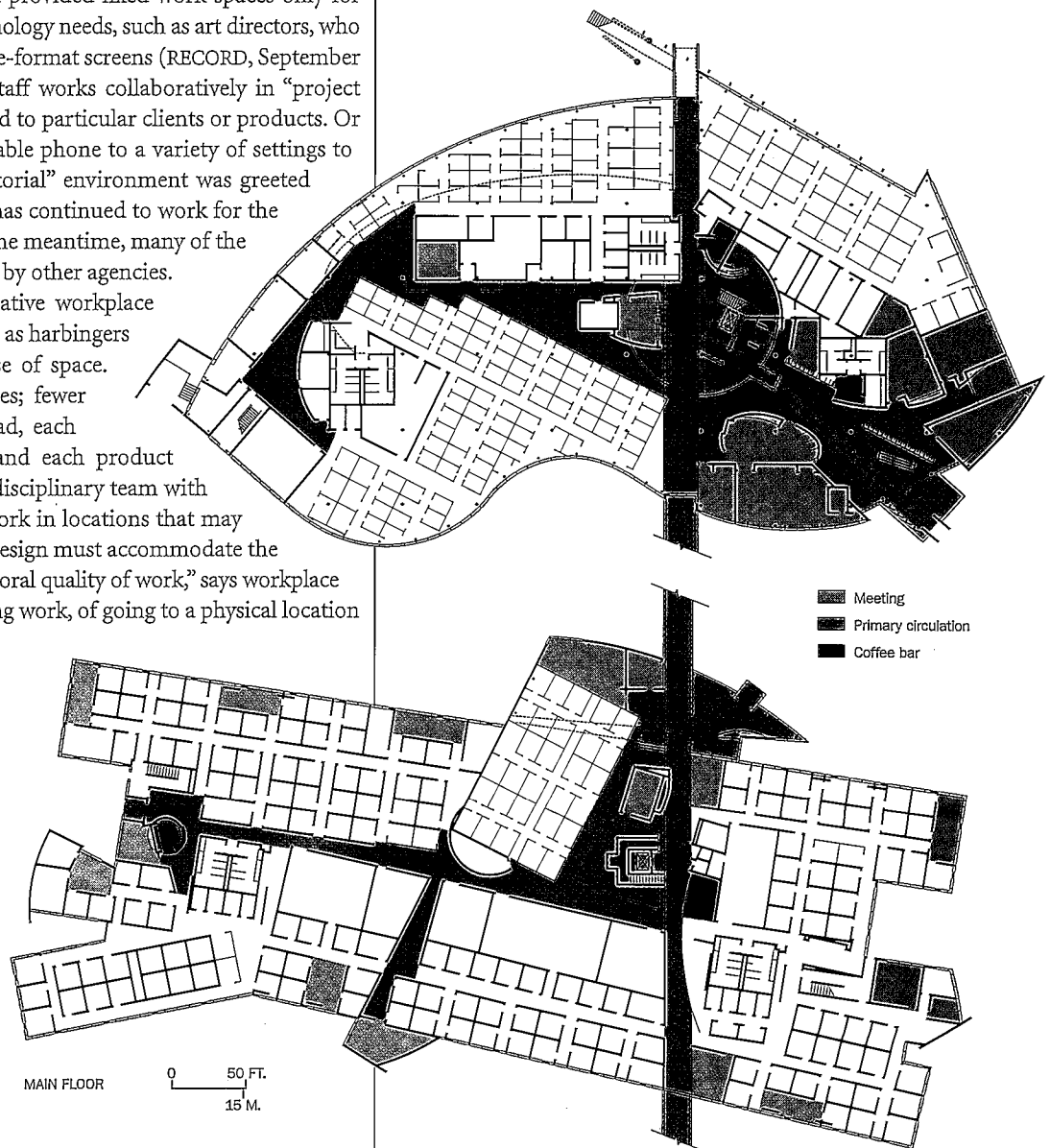
The layout of Fore Systems, a computer networking business in Warrendale, Pennsylvania, has ample formal and informal meeting areas. Designed by Studios Architecture, the space reflects the current shift toward understanding workplaces as networks of human interaction.

Working apart, working together

The trend to work at home appears to be growing rapidly, though most people are there only part time and some still maintain an office in a corporate setting. According to a Louis Harris poll released this spring, 19 percent of those who responded work at least a few hours per week at home. As this trend began to take hold in the early 1990s, experts predicted the end of the formal office, since everyone would be on-line in virtual work spaces.

But many businesses have discovered that just the opposite is true, that the speed of business change today requires more people to work together more intensely. Hence the increasing number of teaming environments at the workplace, and the increased thought given to the nature of social interaction—the coffee bars, breakout spaces, and fitness areas. Some corporations now want to keep people in the office. As a result, clients are more receptive to amenities the architects may work into the design.

Architecture that conveys egalitarianism creates an environment



that's more comfortable for everyone, and keeps employees feeling like they're part of the team. On the interior, the predominant features of such environments include high-ceilinged, loftlike floors, where daylight and views are accessible to everyone, regardless of rank (see Silicon Graphics, page 154). Expressive exterior architecture is increasingly used to connote

to that of a conductor and an orchestra. Senior traders, or "market makers," use voice and gestures to guide the work of trading subgroups and junior traders. A sudden spike in activity across the room cues the trader to important breaking news in another market segment. The trader can react before the news hits CNN, Bloomberg, or other news services.

THERE CAN'T BE A RICH CULTURE OF INFORMATION AND KNOWLEDGE EXCHANGE IF INDIVIDUALS ARE ISOLATED IN HOME OR "VIRTUAL" OFFICES.

an innovative, creative image. Such distinctive work environments are helpful in attracting and retaining valued staff in today's skills-short economy.

Finance may seem to be the most placeless of businesses. After all, detailed financial information is available just about anytime to almost anyone with a computer, a modem, and a certain amount of technological savvy. But those who work in most facets of the finance business recognize that being a virtual employee is not enough; it's better, for example, to group brokers desk to desk and monitor to monitor in a single room so they can read each other's visual cues.

"Trading is a group effort, not just people looking at a screen or working by themselves," says Markus Buegler, executive director of corporate real estate for the Swiss Bank Corporation, whose new trading floor in Stamford, Connecticut, is one of the largest in the world (page 142). He describes how traders function under an intricate hierarchy akin

The few moments gained by the traders being able to see each other offers them a key competitive edge, according to Buegler.

The renewed appreciation for human contact and proximity is extending beyond the business world to encompass cities and metropolitan regions. "You can't have a culture of information and knowledge exchange if individuals are isolated," says Frank Duffy of DEGWA, a London-based architectural firm that provides strategic planning and assistance in the development of workplaces that support change. That's why places where certain types of businesses are concentrated are so prosperous: they are "places where people meet, marketplaces for talent." Duffy sees the rediscovery of the fundamentally social nature of work as reinvigorating for cities. "You can see the office turning into a kind of club, and people walking around the city [or the metropolitan area] and encountering each other in very rich social ways."

New York City, for instance, may be slow in adopting more fluid office layouts, but the city itself provides a diversity of settings; business is conducted on street corners, in restaurants, in "corporate challenge" footraces, at theater outings, museum openings, and charity events. The same may be said of Silicon Valley, where a shared culture and emphasis on technology provide fertile ground for new ideas.

Designing for the unknowable

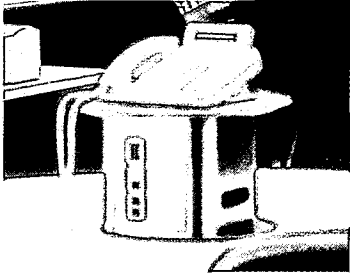
"Change is not a three-to-five-month project," Becker says. "Most companies try to do it in three to five years. Even so, they don't find it easy." A common scenario in the process of actualizing the alternative workplace goes like this: The company first decides to put all low-level staff in the same standardized cubicles—essentially because they perceive that the design of the space "doesn't really matter." Private offices are still used to confer status or job level. Then the company decides that everyone should go into the same universal cubicles. But then they find that standard shoulder-high cubicles "do nothing well," as Studios' Christopher Budd says. It is only at this point that management begins to differentiate space, laying it out based on job function rather than status.

When a business reaches this crucial juncture, the company may question whether architecture can support its new work struc-



At Deloitte and Touche, conference spaces may be formal or casual (above). Consultants who spend most of their time on the road are issued carrels (right) equipped with office supplies.





Information technology is upending conventional workplace planning notions. Technological gadgets—including computers, printers, faxes, and even telephones—that once tied workers to their desks and offices have become increasingly portable. The long-anticipated paperless office is closer to becoming a reality as work is stored on data networks and transferred, via E-mail, to remote workers, while low-priced scanners and software that recognizes and digitizes text and images are more widely available.

In fact, technology may someday move us from paperless offices to deskless offices. Right now there are plans to commercialize a palm-

sized computer that will be worn on the user's belt. The tiny computer will react to voice commands delivered through a headset and display information on a small screen suspended in front of the user's eyes.

Consider the possibilities just within an architecture office. The wearer could record site conditions using voice and video, return to the office and meet directly with the project team and consultants, then move on to the library to work out design details or specifications—all without having to sit at a desk, typing up notes and checking files. A project may have a space and a task may have a space, but the individual no longer does. The consequences of such a workspace, of one that is oriented around networks of use instead of employees, are just beginning to be understood.

Videoconferencing setups are costly and require customized conferencing rooms. But this technology, too, is becoming less expensive and more portable. Soon, a project team will be able to set up a meeting on short notice without

specialized facilities. The conference could be viewed on any computer screen with a camera attached to it.

Wireless networks already permit greater fluidity in staff location, though these are limited in data capacity and may actually entail more wiring than conventional networks. But wireless phones are currently used in offices, and a wireless network might allow someone at a meeting to call up a spreadsheet residing on a network from a laptop without plugging in.

Only a few years ago, the idea of universal cabling took hold, with the result that each change in technology could be accommodated without having to rip out old cables and replacing them with new ones. Data cabling needs are still rapidly evolving, which means that making cables readily accessible is more important than ever (see *The Robert L. Preger Intelligent Workplace*, page 148).

Raised-access floors offer flexibility and allow offices to be rearranged within a 10- to 12-foot radius with no recabbling. Exposed

overhead cable trays are popular in software-engineering environments because they are accessible to the engineers themselves, who would otherwise jury-rig all kinds of provisional cabling. They are also inexpensive, compared to raised floors. But they are considered unattractive and are rarely used.

Carnegie Mellon University is involved with researchers who are trying to digitize voice and video so they can be scanned, searched, sorted, and displayed on screen, just as text is. As a result, workers will, for example, be able to search network news archives for keywords to find visual information. They will also be able to translate voice messages so they can be read on the computer screen, or translate E-mails and faxes into audio messages so they can be heard over the phone from an airport or a hotel. Says Anthony Nuciforo, a principal at Robert Director Associates, a telecommunications consultant in New York City: "It's just another way to keep people from becoming tied to their desk." *J.S.R.*

tures and whether architects have the skills to realize and implement the ambitions that the company itself may not be able to fully articulate. Meanwhile, the burgeoning field of workplace change management is redrawing the boundaries of conventional practice for many professionals, not just architects. Large interior design practices now promote "alternative workplace" strategizing, moving into territory formerly occupied by management consultancies, who, in turn, see office design as an increasingly important aspect of what they do.

Clearly architects must be ready to differentiate themselves from other professionals. The first step is to recognize that conventional programming processes usually prove inadequate. Instead, those who have managed workplace reorganizations say it's essential to "drive the dialogue deeper," or learn the real attitudes and behaviors of the company and its workforce. This may require extensive interviewing. Focus groups can be useful as well. During the process, it's important to remember that space should be designed to suit attitudes, behaviors, and processes, rather than job descriptions. "There is so much ambiguity creeping in," Kao says. "An architect must be alert to differing agendas."

Another effective tactic in reorganizing the workplace is to talk to the right people, those in the company who are leading change. Facilities managers, fearful of losing control, may not be fully committed to a less rigid workplace strategy. Peter Miscovich, director of the Workplace Transformation Practice at Arthur Andersen in New York City, says his company is beginning to train managers to be agents for internal change. These nascent "change-management departments" can go a long

way toward helping employees and, therefore, architects, to understand a company's goals.

Conversely, leadership-driven change may underestimate the role of such departments as human resources or information technology, even though the success of the reorganization may hinge on them. "Everyone talks about promoting collaboration, but we see very few companies that do training at any higher level than word-processing skills," says Budd. An architect can build credibility by making sure that these key departments are involved.

Architects need to be aware that companies expect to lower real estate costs as part of the restructuring process. Most firms develop targets for cost or personnel ratios per square foot early in the process. As the design concept or work methodology becomes more explicit, the architect can test the owner's early assumptions. Aggressive cost targets can sometimes be met by giving individual business units more freedom to determine how they use their allotted space.

Clients who are fundamentally reevaluating themselves and the way they use facilities expect architects to do more handholding and invest more "face" time. But the design of the physical space may be the means by which companies express their identity and carry the company forward through generations of wrenching change. Indeed, simply making workplace ideas physical, via quick, inexpensive prototypes, often reveals much to clients about how realistic or appropriate their intentions are. It is also the best way for architects to experiment with innovative business models. ■

1

Swiss Bank Center Stamford, Connecticut

TO MAKE 800 TRADERS COMFORTABLE IN ONE GIANT ROOM, THE ARCHITECTS PAID CAREFUL ATTENTION TO ACOUSTICS AND TECHNOLOGY.

by Virginia Kent Dorris

Project: Swiss Bank Center, Stamford, Connecticut

Owner: SBC Warburg Dillon Read

Architect: Skidmore, Owings & Merrill LLP—John H. Winkler, FAIA, administrative partner; David M. Childs, FAIA, Mustafa K. Abadan, FAIA, design partners; Marilyn J. Taylor, AIA, urban design partner; Stephen A. Apking, AIA, interior design partner; Gert D. Thorn, AIA, project director; Stephen Weinryb, AIA, senior technical coordinator; Kenneth A. Lewis, senior designer; Lois A. Mazzitelli, senior urban designer; Randy Fahey, senior interior designer

Engineers: Cosentini Associates (lighting, MEP); Thornton-Tomasetti (structural); Allan Davis Associates (civil, traffic); Langan Engineering and Environmental Services (geotechnical); Cerami & Associates (acoustical, A/V)

Consultants: Hines Interests Limited Partnership (development); Van Deusen & Associates (elevator); Schiff & Associates (security); Poulin & Morris (graphics); Walsh-Lowe & Associates (information technology); Cini Little International (kitchen); Weintraub + di Domenico (landscaping); Metcalf & Eddy (technologies, environmental)

General Contractor, Construction Manager: Turner Construction Company—Robert E. Fee, construction manager; Richard C. Bach, project executive

Working as a trader for a major bank must be one of the most anxiety-producing jobs in the world. With eyes glued to multiple computer screens and ears pressed to telephone receivers, all the while watching for signals from other traders, these merchants of stress can make and lose millions of dollars instantly as the world's financial markets fluctuate. A moment's hesitation can mean big losses. It's little wonder, then, that SBC Warburg Dillon Read, a division of the Swiss Bank Corporation, sought to make the trading floor at its new Stamford, Connecticut, complex as convenient and efficient as possible.

The trading floor is at the physical and operational center of the Swiss Bank Center, designed by Skidmore, Owings & Merrill's New York City office. The first phase of the project, completed last fall, is 861,000 square feet. It includes the trading floor—located atop five floors of parking and a data floor—and a 13-story office building with a street-level steak house. SOM is now developing phase two of the plan, which will extend the trading floor 120 feet to the east and include a second office tower. A third tower, located to the north of the trading floor building, is included

Virginia Kent Dorris is a freelance writer specializing in architecture. She lives in Brooklyn, New York.

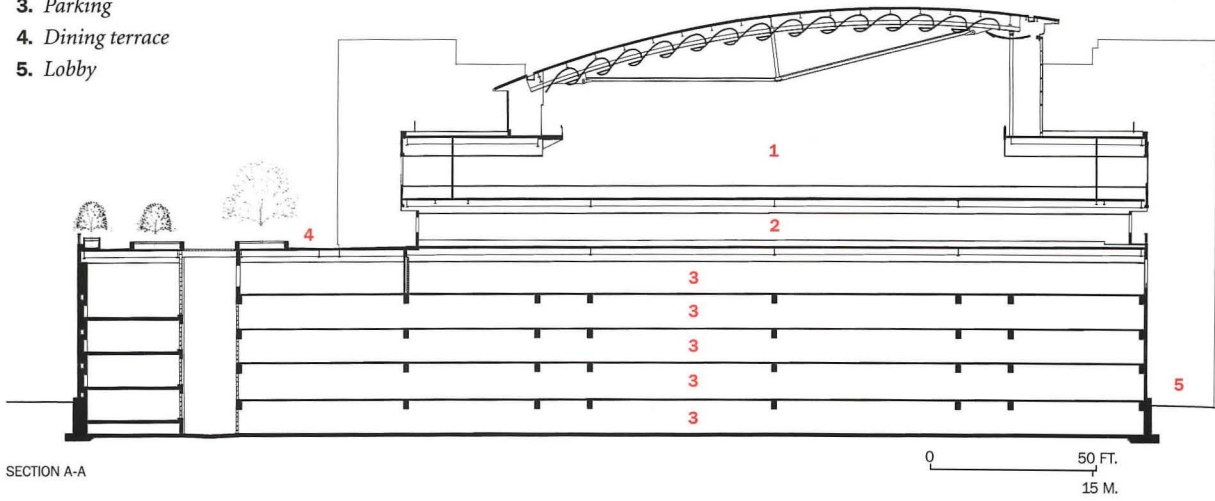


in the final phase of the master plan, making the center a total of 1.4 million square feet.

Creating a single space large enough to accommodate 600 to 800 traders was the bank's top priority, says Markus Buegler, executive director of corporate real estate for SBC. The new 50,000-square-foot trading floor, with its clear span

of 210 feet by 132 feet, is among the world's largest column-free trading spaces. The room permits unimpeded and constant opportunities for spoken and visual communication between the traders, providing them with a previously unavailable awareness of each other. "Trading is a complex, team effort," explains Buegler. "The different trading

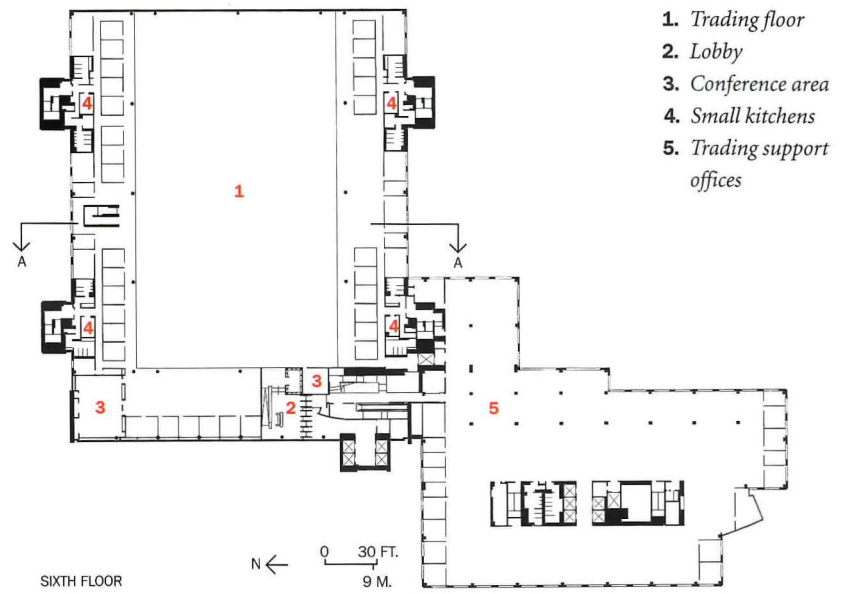
- 1. Trading floor
- 2. Data floor
- 3. Parking
- 4. Dining terrace
- 5. Lobby

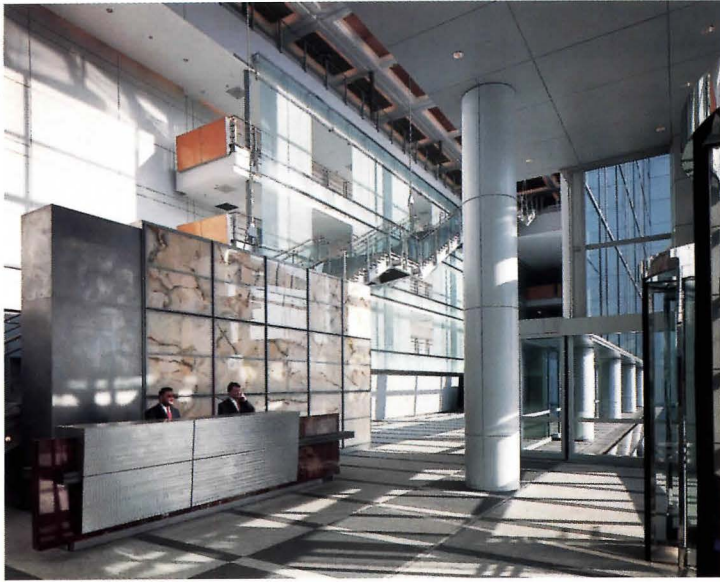


The Swiss Bank Center is located near Interstate 95, a commuter rail station, and the Long Island Sound (opposite top). The first phase of development is complete (left and below). Two more office towers and an addition to the trading floor are planned.

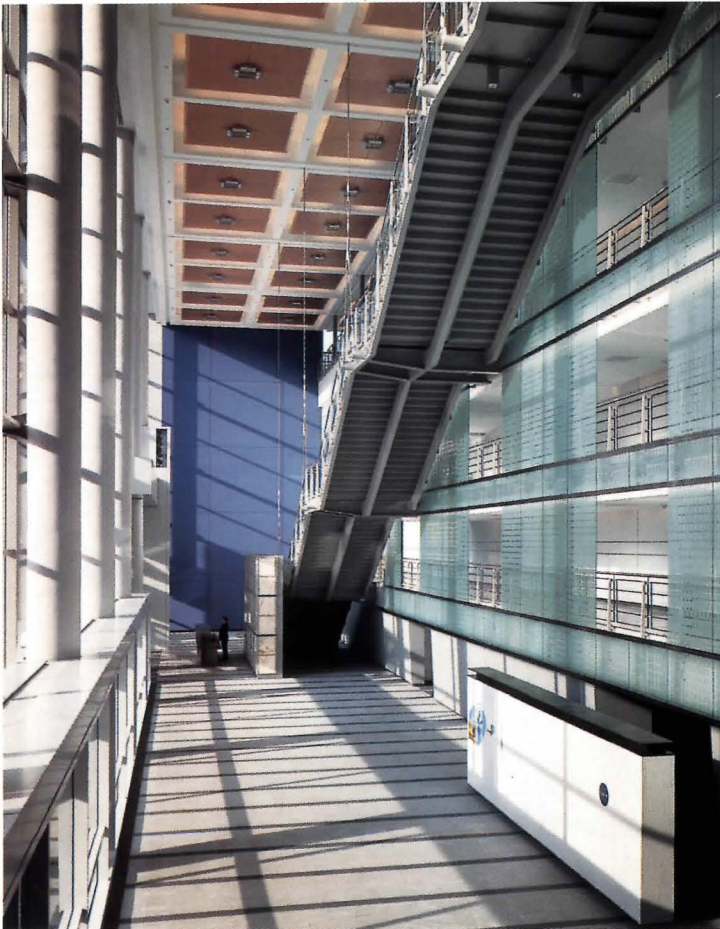


The elegant five-story, glassed-in lobby (below) proclaims to passersby that this is the site of a major financial institution. In fact, once a pending merger is complete, SBC will become the second-largest financial institution in the world.





The lobby walls (left) hide a parking garage. The stairway in the lobby (below) appears to be suspended from steel cables, but it is cantilevered off the adjacent wall. A conference area atop the office tower (right) offers a view of Long Island Sound.



groups don't function independently. You need to bring them together so they can interact in an ideal way."

In 1993, faced with a need for more room and a desire to upgrade financial services technology, the New York City-based bank hired SOM to analyze alternative locations. At the time, the bank was in a

period of growth. Finding a site with plenty of room for expansion was important.

From an early list of 30 sites, most in existing office towers, the bank narrowed the list to six possibilities, four of them in Manhattan. SOM's analysis showed that it would be difficult to create a trading

floor of the ambitious proportions wanted by the bank in an office tower. Upgrading power and communications technologies also seemed more difficult in a tower.

Influenced by generous tax incentives from the State of Connecticut and logistical help from Stamford's Urban Redevelopment Commission, the bank eventually chose the 12-acre Stamford site. About 15 percent of the 2,200 workers commute to Stamford from New York City. "Today, we trade with phones and computers. We are not so dependent on location as in the past. The move out of Manhattan's financial center was not a major hurdle," explains Buegler. The strong technical underpinnings of the facility have allowed the traders access to computer-based financial technology not available in their previous Manhattan location.

From the start, the plan was to create an atmosphere that encouraged interaction between the bank and the surrounding community. A broad walkway in front of the building invites pedestrians to cross the site, even if they are simply walking from the commuter rail station across the street into downtown Stamford. The bank also created a three-acre public park along the western edge of the site. Trees all around help to hide views of Interstate 95, which borders the site. The park is traversed by narrow paths

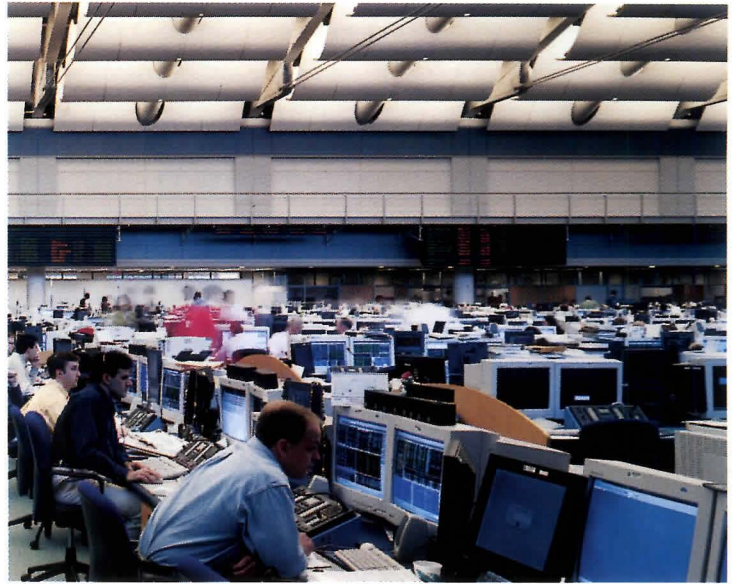
that bring to mind the paths made by college students walking across campus greens. When completed this year, the park will contain numerous sitting areas, a café, and a 50-foot-tall stained-glass cone by British artist Brian Clarke.

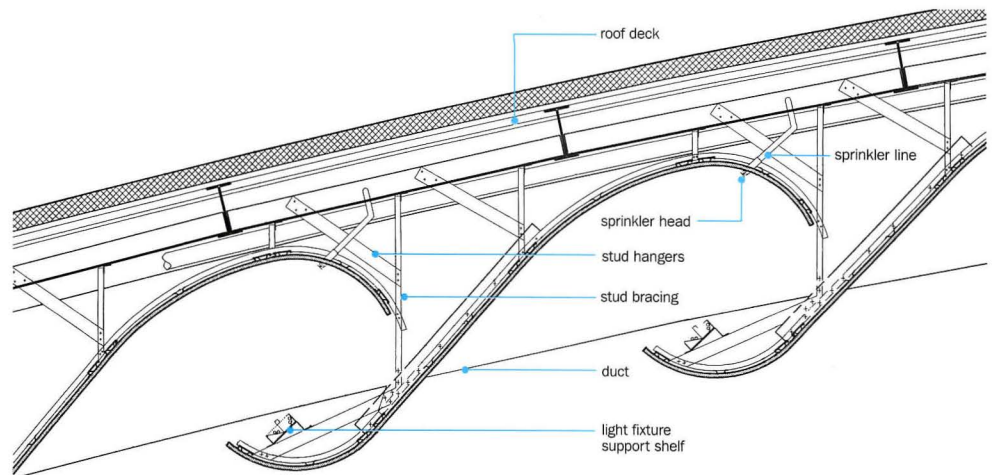
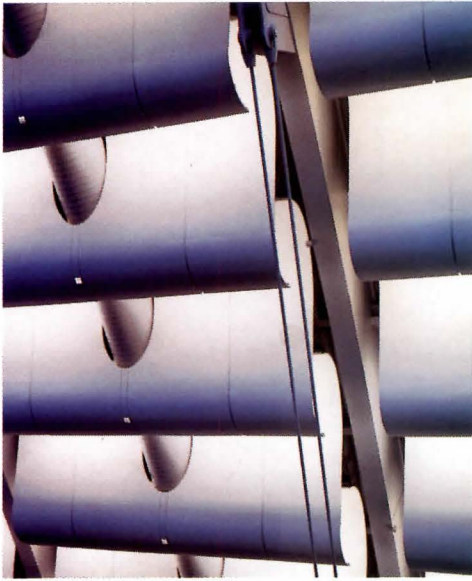
During Stamford's "urban renewal" days of the '60s and '70s, office towers were perched atop multistory parking garages, leaving the human portion of the buildings disconnected from the street. SOM didn't want to repeat the mistakes of the past. "We didn't want another freestanding parking garage next to an office building," says Ken Lewis, SOM's senior design associate on the project. However, they were required to include above-grade parking within the complex. Their solution was to disguise the garage by placing it within the main mass of the vaulted structure, where the trading floor is located. This treatment, combined with the airy, accessible street-level lobby, makes the parking invisible to the passerby.

Swiss Bank was not looking for a "trophy" building for the Stamford site, says Mustafa K. Abadan, FAIA, SOM's project design partner. But the building's grand, five-story, glass-enclosed lobby makes it clear that this office complex is home to one of the world's major financial powerhouses. At the back of the atrium, a sculptural steel staircase, cantilevered from the walls of the

SOM has designed numerous trading floors, but never one of the magnitude required by SBC (below). Among the issues SOM faced was finding a way to create the column-free space and supply as many as 800 traders with vital power and data links (right). The solution was a four-foot-deep plenum beneath the floor for wiring and cabling, with extra space to fulfill future needs. The

plenum is easily accessible, and wiring can be reconfigured as desks are rearranged and traders are relocated. The wavelike acoustical ceiling panels are pierced by conditioned air and power conduits (opposite top). Overhead light fixtures are directed toward the panels, creating soft, glare-free light below. Conference rooms overlook the trading floor (opposite bottom).





ACOUSTIC CEILING DETAIL

adjacent parking garage, appears to be suspended from the ceiling on steel cables. Behind the staircase, fritted glass panels edge a balcony that takes employees from the parking garage into the building. The mostly glass exterior maximizes views of the park. The back wall of the atrium is washed in blue light, SBC's corporate color, by neon fixtures located in ceiling coves.

Flexibility was a priority throughout the complex. The bank expects to move every employee at least once a year, so SOM laid out the office building on a five-foot module and specified interior partitions that could be moved overnight to create new offices. "We have had constant changes in groups and in adjacencies, so we wanted to be able to tailor the space to meet business needs," explains Buerkler. Lighting, ventilation, and even fire-protection systems are installed in ceilings and floors so they do not have to be adjusted when the office layouts change.

Openness is stressed throughout. In the office tower, most employees are in offices separated only by low partitions. Glass walls enclose perimeter offices. The row of offices surrounding the trading floor, most of them used by head traders who also have desks on the floor, have glass fronts permitting views of the action beyond.

SOM also designed the trading

floor with maximum flexibility in mind. A four-foot-deep, easy-to-access plenum contains cables that supply power, communications, and financial data to the desks of the traders. There's even room to spare for future technologies. SOM also designed the room to be easily reconfigured, if needed. An arena-style raked floor could be installed, using part of the space below the current floor, without disrupting the building's technical systems.

The complex takes electric power from two separate sources that travel through the building along two separate paths. If one power source is disrupted, a second supply is already available. In the unlikely event that both supplies are disrupted, there's a generator that can supply 100 percent of the building's power needs for a week. Uninterrupted power is essential for the complex's data center, one level below the trading floor, where the massive computer storage and monitoring systems are located. Power is supplied to the trading floor from electrical hatches in the floor, connected with flexible cable so they can be easily moved.

Uniform, indirect light is provided by north-facing clerestory windows and fluorescent overhead fixtures that bounce light off billowy acoustical panels. Inspired by the center's proximity to Long Island Sound, the wavelike panels, made



of fiberglass-coated insulation, are suspended from the 35-foot-high ceiling. The panels help to evenly distribute cool air supplied from exposed ducts located near the ceiling. The panels also help mitigate the noise level in the frenetic trading space below.

Nine 144-foot-long king-post trusses support the vaulted roof. Each truss consists of a curved steel box girder top member that is attached by a pair of steel cables to the bottom member, a cylindrical steel tube. During erection, contractors jacked the tension in the cables to 150,000 pounds to create the necessary support for the roof.

The room is flanked by four small kitchens, each with vending

machines that make coffee and snacks convenient and constantly available to the busy traders. There is also a 375-seat cafeteria in the office building that has an open terrace with an additional 140 seats for dining. The terrace is high enough to afford a view of the calm, blue sound. ■

Sources

- Stone curtain wall:** *Metro Panel Systems Inc.*
- Metal and glass curtain wall:** *Lessard, Beaucauge, Lemieux, Inc.*
- Precast concrete panels:** *Saramac Inc.*
- Elastomeric roof:** *Hypalon*
- Standing-seam metal roof:** *Innovative Metals Corporation*
- Glazing:** *Viracon*

2 Robert L. Preger Intelligent Workplace Pittsburgh

A NEW WORKPLACE LABORATORY FOR ARCHITECTURE STUDENTS SITS IN A PENTHOUSE ATOP A 91-YEAR-OLD ACADEMIC BUILDING.

by Mildred Schmertz, FAIA

Project: Robert L. Preger Intelligent Workplace, Pittsburgh

Client: Carnegie Mellon University; Center for Building Performance and Diagnostics

Architect: Pierre Zoelly, AIA; Center for Building Performance and Diagnostics, project research, development, and conceptual design; Bohlin Cywinski Jackson—Peter Q. Bohlin, FAIA, design partner; Jon C. Jackson, AIA, partner in charge; Gregory R. Mottola, AIA, project manager; Robert S. Pfaffmann, AIA

Engineers: R. M. Gensert & Associates (structural); RAY Engineering (mechanical); LTI Lichttechnik Heiko Schnetz GmbH, with Siemens and Zumtobel (lighting); Hornfeck Engineering (electrical and telecommunications); AMP, with Siemens and Johnson Controls (data, voice, and controls)

General Contractor: TEDCO Construction Corp.

Size: 7,000 square feet

Carnegie Mellon University recently opened the Robert L. Preger Intelligent Workplace, a 7,000-square-foot laboratory where the newest and most advanced environmental components for the workplace of the future are tried out. The laboratory is not an actual office or even a simulation of one. Rather, it is a high-tech setting where professors of architecture and their graduate students in the Center for Building Performance and Diagnostics, a division of Carnegie Mellon's School of Architecture, study, test, and assess the effectiveness of new products and office systems.

The environmental characteristics of the building envelope itself and the mechanical and electrical systems are also continuously studied, since they affect the office setting and, therefore, the performance of the worker. There is no fixed arrangement of cubicles, desks, or walls. Instead, experimental layouts are planned, erected, studied, improved, evaluated, and then replaced by new systems, which are put through similar paces. Only Volker Hartkopf, director of the center, and his handful of associates occupy a full-time office environment, though even this is subject to revision.

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

The Intelligent Workplace occupies a new penthouse designed by Bohlin Cywinski Jackson. It sits atop Margaret Morrison Hall, designed by Henry Hornbostel and completed in 1907. Formerly home to the women's college, Morrison Hall now holds classrooms. The penthouse solution for the expansion was first conceived in 1991 by Pierre Zoelly, a Swiss architect who was a student and, later, a teacher at Carnegie Mellon's architecture school. He was looking for ways to expand the hall without destroying its character.

Established in 1988 by a consortium of university, industry, and government researchers, the objectives of the Intelligent Workplace include devising systems and products that improve the health, motivation, and productivity of office workers throughout the United

States and around the world. They also look for ways to make the office buildings themselves more cost-efficient and flexible. These goals were created by a multidisciplinary team led by Hartkopf and including Zoelly, Bohlin Cywinski Jackson, and various structural, mechanical, and electrical engineering consultants.

According to Hartkopf's research, post-World War II office buildings are notorious for the lack of attention paid to HVAC, lighting, air quality, acoustics, and the other "hidden" components of workplace infrastructure. That's partly because American business was growing so rapidly that buildings went up without a lot of thought to worker comfort, and partly because corporations were unwilling to invest in systems that would accommodate such needs. The result, Hartkopf



In 1991 an architect at Carnegie Mellon had the idea of putting the Intelligent Workplace laboratory in a pent-

house on the roof of the historic Margaret Morrison Hall (opposite and below), which was built in 1907.



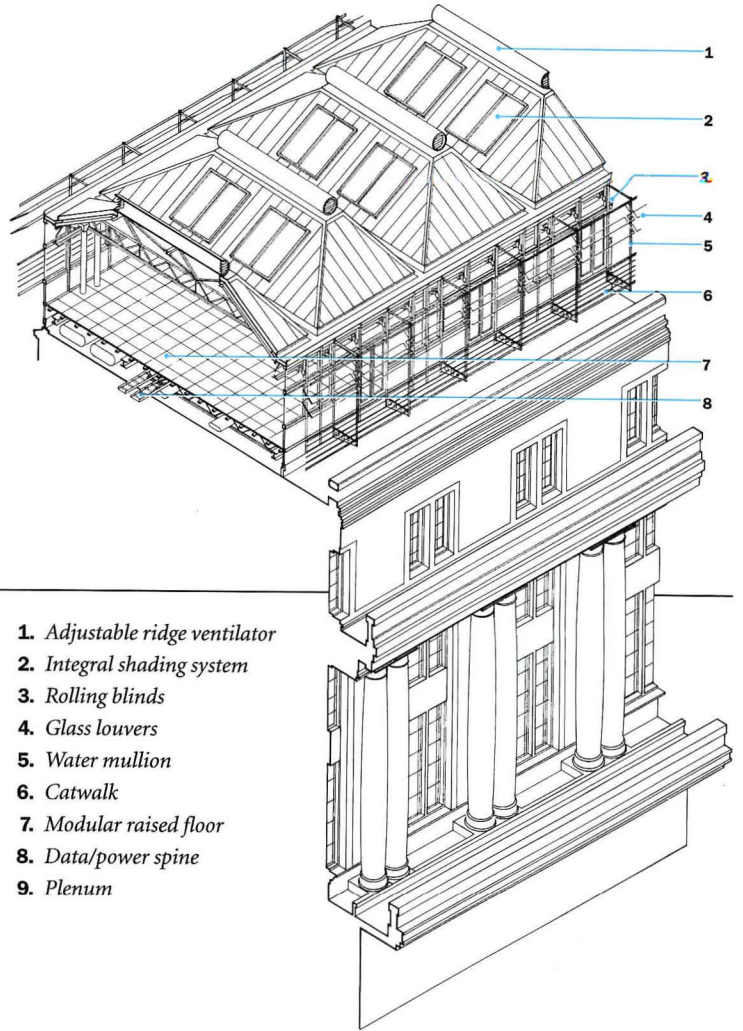


The sawtooth roof (left) provides room for skylights and for solar panels, to be installed soon. It also diminishes the weight of the penthouse addition, helping it blend with the rest of the building. Louvered shading devices above the catwalks help mitigate heat and glare.





Glass louvers shade the windows and reduce glare (left). The six-inch-deep floor plenum (right) contains a central spine of data and power cabling. Heat, air-supply, and white noise controls at each workstation plug into this spine and the adjacent ductwork.



1. Adjustable ridge ventilator
2. Integral shading system
3. Rolling blinds
4. Glass louvers
5. Water mullion
6. Catwalk
7. Modular raised floor
8. Data/power spine
9. Plenum

says, was poor health and inefficiency among workers, as well as high energy and maintenance costs.

The steel frame of the penthouse consists of nine column-free bays on 16-foot centers. The penthouse floor lies three and a half feet above the hall's roof level, leaving space for the standard bar-joint floor structure and a six-inch-deep plenum. The main data/power distribution spine is threaded through this plenum. Passing through the joists are the underfloor return air ducts and the main supply air spine.

Getting power and data services where they are needed has become a significant problem as technological requirements have increased. At the Intelligent Workplace, a modular, highly sophisticated new floor system, which includes data connections, outlets, and other services, goes beyond the typical raised floor. It also provides excellent sound absorption and high durability.

The roof of each bay is supported by paired structural steel trusses, one on each perimeter, and carried by four columns, forming a tablelike module. The truss construction provides an open horizontal plenum for continuous power/data/voice networking and easy reconfiguration of the HVAC system. Made of recycled steel, the system was bolted together in the factory for minimal waste. In the

future, these tables can be disassembled and relocated elsewhere. While the Intelligent Workplace is unlikely to move its quarters, the system could be applied to corporations in need of good office space that's movable.

The asymmetrical sawtooth roof maximizes solar orientation and breaks down the scale of the structure, making it more sympathetic with the roovescape of the original building. The roof will eventually support photovoltaic panels to help power the center's heating and cooling system. Skylights with fritted glazing introduce soft, even daylight while avoiding glare.

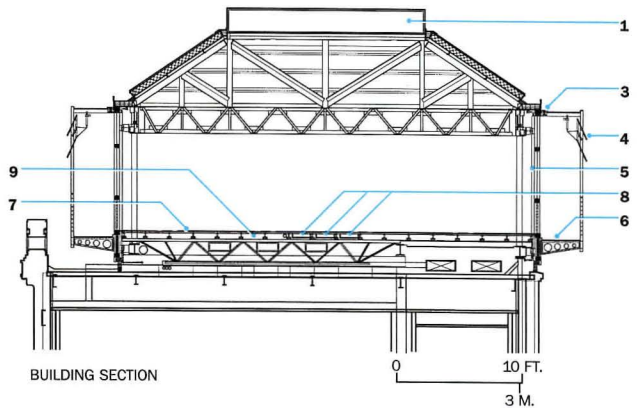
A daylight sensor on the roof feeds data to a lighting control panel that switches ambient lighting on or off, according to daylight levels, within the structures zones. The panel reduces energy costs by allowing the building personnel to program facility-wide lighting levels. Wall-mounted luminaires provide dimming, programmable lighting, and centralized control.

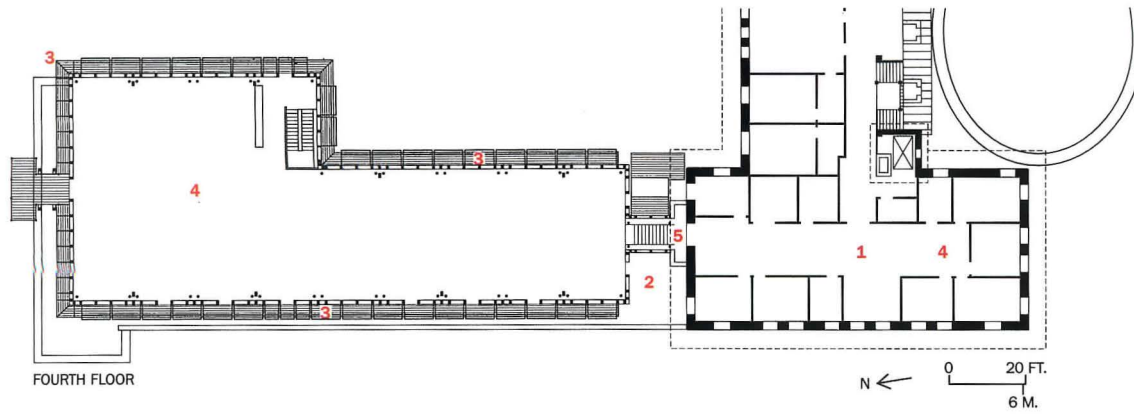
The high-performance glass curtain-wall system balances indoor and outdoor environmental conditions with a water-flow mullion system. The wall automatically adjusts shading devices, which include exterior rolling blinds that admit sunlight on cold days and provide shade on warm days. Both the east and west faces of the penthouse have

computer-controlled, movable glass-louvered sunscreens, which are mounted on projecting catwalks. The walls contain operable sash to admit fresh air at every workstation.

The building interior is an "intelligent village," a space that encourages interaction while allowing the workers to withdraw into privacy "coves." The faculty and graduate students who staff the

center work with major vendors of workstation technology to test new configurations and provide feedback on how to more fully integrate their products with HVAC, lighting, and ergonomic technologies. Modular interior components are being tested that will, for example, allow a conference room to be quickly constructed from several offices for a special meeting, or multiple small offices to be created from large





- 1. Existing floor of Morrison Hall
- 2. Outdoor terrace
- 3. Catwalks
- 4. Open office area
- 5. Stair from penthouse to Morrison Hall

Daylight floods workstations (below), helping workers feel more connected with nature. Abundant natural light also means less artificial light, which saves money. Operative windows at each desk make this space a far cry from the hermetically sealed offices typical of the 1970s and '80s.



The Intelligent Workplace is essentially an open laboratory where office components are tested (far right). Each experimental workstation is equipped with an innovative, energy-saving environmental control system (right). The steel truss system (below) is made of recycled material.



ones without wasting time and materials.

The Intelligent Workplace project seeks to persuade all those who are concerned with the design, construction, and furnishing of work environments that it's time to put an end to such pervasive problems as

thermal zones that are either too hot or too cold but that workers have no control over; uniform overhead lighting that cannot be programmed by employees; snarled cables and technology connections; limited access to natural lighting and outside views; and offices that

let in noise from adjacent manufacturing centers or highways.

The workstations set up in the laboratory give each occupant the ability to control the thermal, visual, acoustical, and air-quality characteristics of his or her micro-environment. The worker can change the temperature of the immediate work space, adjust task lighting, or easily move a computer or phone to another work space.

A desktop "environmental control module" allows workers to control air flow, temperature, and noise level (by means of a low-volume electronic sound screen) within the workstation. The module senses when the desk is unoccupied and automatically adjusts to a setback mode. These systems significantly reduce the amount of energy that would normally be used to heat or cool the entire office while offering a greater level of individual comfort. In addition, students and researchers can monitor the performance of the entire system.

Direct access to the underfloor mechanical and electrical infrastructure allows users to quickly and safely reconfigure their setting to meet changing organizational and technological needs. Zones and connections can be added and removed as required. Obsolete or damaged systems are easily disconnected, while new technologies are simply plugged in and tested.

This unique "plug-and-play" technology eliminates the usual budget problems and time constraints that are involved when equipment must be changed.

The modular rhythm of the penthouse facades expresses the program and structure of the Intelligent Workplace, instead of echoing Hornbostel's classical module. Nevertheless, the structure appears elegant and graceful behind the original bold and beautiful terra-cotta cornice. The sawtooth profile of the penthouse roof and the lightness and delicacy of the glass-and-steel structure enhance the historic landmark building. ■

Sources:

Glass curtain wall: *Josef Gartner & Co.*

Structural steel supplier: *Nucor-Yamato*

Steel fabricator: *Littel Steel*

EPDM roofing: *Versico*

Glazing: *Viracon, PPG*

Skylights: *Viracon, WASCO, Bayer USA, Exttech*

Environmental controls: *Johnson Controls*

Lighting controls: *Siemens Energy and Automation, Zumtobel Staff Lighting*

Acoustics: *Armstrong World Industries*

Flooring: *MAHLE*

Office furniture: *Steelcase, Inc./Grahl Industries, Inc.*

Carpeting: *Interface, Inc.*

3

Silicon Graphics Mountain View, California

KEEPING A COMPANY FULL OF COMPUTER GENIUSES HAPPY REQUIRES ATTENTION TO TECHNOLOGICAL NEEDS AND PLENTY OF AMENITIES.

by **Cathy Lang Ho**

Project: *Silicon Graphics Amphitheater Technology Center, Mountain View, California*

Owner: *Silicon Graphics Computer Systems, Inc.*

Architect: *Studios Architecture—Erik Sueberkrop, FAIA, David Sabalvaro, AIA, Charles Dilworth, AIA, principals; Lawrence Rugg, Clifford Wong, Neil Wallis, Stuart MacDonald, Sarah Wilmer, AIA, Jeffrey Benningfield, Jaden Fong, Helen Kim, Anders Hench, Jolie Kerns, Fredric Sherman, AIA, Tom Pinkowski, David Ogorzalek, Lawson Willard, AIA, Daniel Lewis, Yung Chang, Nicolo Bini, Kelly Haeggglund, Paul Kinley, Angela Blosen, Colin Walker, Bob Bradsby, AIA, Timothy Crum, Amy Adamson, design team*

Engineers: *GFDS (structural); Sandis, Humber, Jones (civil); Ackerman Engineers (electrical); Encon (M/P/E); Woodward-Clyde (soils); The SWA Group (landscape); Schirmer Engineering Corp. (fire protection)*

Contractor: *DEVCON Construction Inc.*

Size: *500,000 square feet*

The Silicon Valley is legendary as the cradle of electronic civilization, but first-time visitors to this technological mecca are always surprised to find that the physical environment is uninteresting, architecturally and otherwise. At odds with its image as the gleaming cauldron of creativity, Silicon Valley is a sprawling, undifferentiated landscape, with relentless roadways slicing between bland office buildings and residential subdivisions. Rather than projecting glitz or grandeur, the valley's buildings are inwardly oriented, from ranch-style tract homes to mile-long shopping malls to airtight office boxes set in seas of asphalt parking lots.

Part of the valley's identity problem is the local architecture's emphasis on flexible, inexpensive space—essential for companies that can't imagine the future beyond their next quarterly earnings report. Experience has shown that departments can double in size, split into fragments, or disappear altogether in less time than it takes for the paint to dry.

But even older, more stable Silicon Valley firms, like Hewlett-Packard and Intel, have, in the past, consciously commissioned buildings that say nothing about what's going

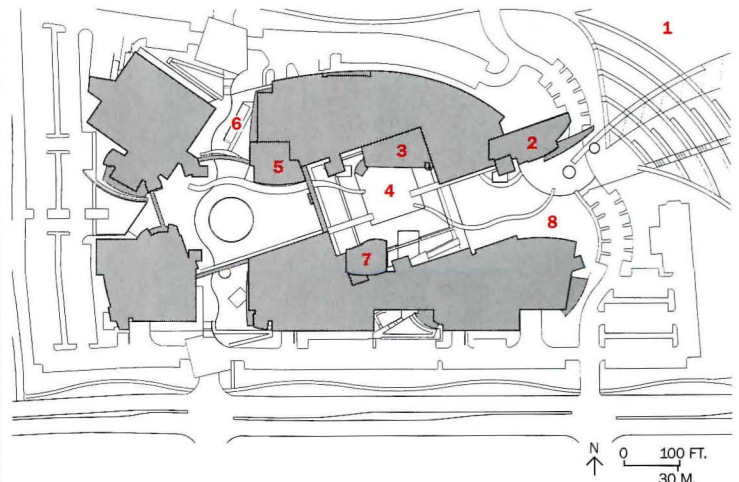
on inside and are oblivious to their surroundings. Secrecy pervades the technological development scene, and most companies would rather invest in product research and development than in something that requires as much physical and financial commitment as good architecture.

However, now that the Silicon Valley ranks as one of the most expensive real estate markets in the United States, companies are finding it as economical to commission original architecture as it is to lease and modify generic space. As a result, the architectural landscape is about to improve.

The new 500,000-square-foot research and development head-

quarters for Silicon Graphics Computer Systems, Inc. (SGI), designed by Studios Architecture, may be one of the early standouts. SGI manufactures high-end 3D animation hardware and software that are the cornerstone of the film world's special effects industry and were used to create, among other movies, *Jurassic Park*, *Twister*, and *Flubber*.

The new, four-building campus, in Mountain View, fulfills the basic Silicon Valley demand for flexible space while addressing issues important to this manufacturer in particular: easy and ample distribution of electricity and data; natural lighting (unusual for glare-wary computer firms); and, most of all, a



- | | | |
|------------------------|---------------------------|----------------------------|
| 1. Public park | 4. Outdoor dining | 7. Theater/training center |
| 2. Presentation center | 5. Library/fitness center | 8. Employee park |
| 3. Dining area | 6. Bocci ball court | |

Cathy Lang Ho is the editor of Design Book Review, a literary design journal based in Berkeley, California.



SGI's colorful buildings in surprising shapes (left) are in sharp contrast to the dull architecture typical of the rest of the Silicon Valley. The campus-

like setting (below) is meant to encourage exploration, collaboration, and competition. Courtyards (bottom) provide informal meeting places.





SGI's buildings are organized around 15,000-square-foot floorplates, which bring a smaller scale to the 500,000-square-foot campus. Unique shapes give the buildings identity, creating landmarks and providing employees with a sense of neighborhood.

- | | | | |
|---------------|------------------------|-------------------------|---------------|
| 1. Entry | 4. Fitness center | 7. Open office area | 9. Laboratory |
| 2. Coffee bar | 5. Theater | 8. Hardwall office area | 10. Library |
| 3. Cafeteria | 6. Presentation center | | |



SECOND FLOOR



FIRST FLOOR



congenial, inspiring environment for its prized, mostly wunderkind employees.

Studios Architecture is a favorite of the high-tech community, with a client roster that includes techno-stars like 3-COM, Novell, Quantum, General Magic, and Fore Systems. In designing for such clients, the firm has developed a keen sense of what works best for companies who must strive to keep their employees happy. For example, they have found some basic features to be effective, such as 15,000-square-foot floorplates, a feature they carried over from their design of SGI's highly stylized marketing/gateway building, completed in 1995. The architects have found that floorplates that size are big enough to be cost-efficient and easily divisible, yet small enough so that employees don't feel lost—a genuine dilemma for firms that hire and fire en masse.

"The scale of these 'neighborhoods' feels small," says principal Erik Sueberkrop, noting the clear sightlines across the floors and the central courtyard to the buildings opposite. "The advantage is that the forms of smaller spaces can be more energetic than those of behemoth buildings, and they can take on distinct personalities depending on their use."

The floorplates also lend themselves to being creatively arranged

Most of SGI's amenities are located on the courtyard sides of the buildings (right). The "gourmet" cafeteria seats 500, and there is space for outside dining (below). Outdoor pathways connecting the buildings are reminiscent of a college campus (below).



in the larger plan, which in this case includes two elongated, two-story, shed-roofed buildings that border the long sides of the 26-acre site, and two three-story square buildings that anchor the end opposite the main entry.

Interior expansion is abetted here by the custom-manufactured furniture system. SGI and Studios devised a system in which primary cubicle walls, or spines, do double duty as data and power carriers. Standard wall panels hook into the hard-wired spines, allowing workstations to be reconfigured with ease. If, for example, one department gains a manager who needs an expanded cubicle, the office-scape can be altered without disrupting the work of surrounding employees.

SGI's workplace also departs from the corporate norm in its distribution of private offices and open cubicles. Only the engineers—the brains of the outfit, whose work demands quiet—have the option of a private office. Everyone else, from the chief executive officer on down, works in exposed cubicles.

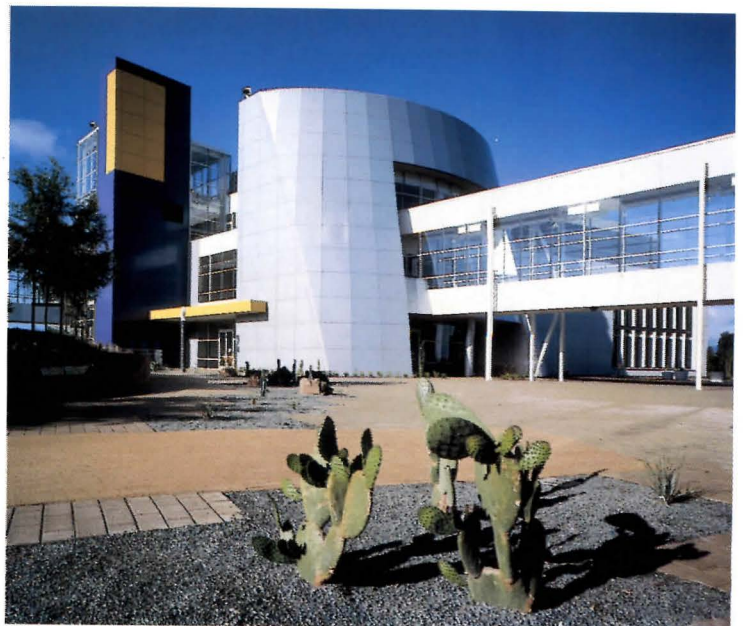
To dispel the typical equation of status and space, and to ensure that everyone enjoys natural light and views of the outside, the hard-walled offices are in the middle of the space, leaving the glazed perimeters open. Natural light also enters through clerestories, which

face north to reduce glare on the computer screens. The permanent, private offices sit like boxes beneath the soaring loft roof. Because their walls are only 12 feet high, natural light flows around them, infiltrating areas far from the windows.

"The job of the architecture is to provide the staff with settings that will help them do their jobs," says Studios principal Charles Dilworth. "Engineers need peace and quiet when they are programming, but they also need to get out of the office and connect with others. It's like fish who live in a coral reef and come out every so often to swim in a school."

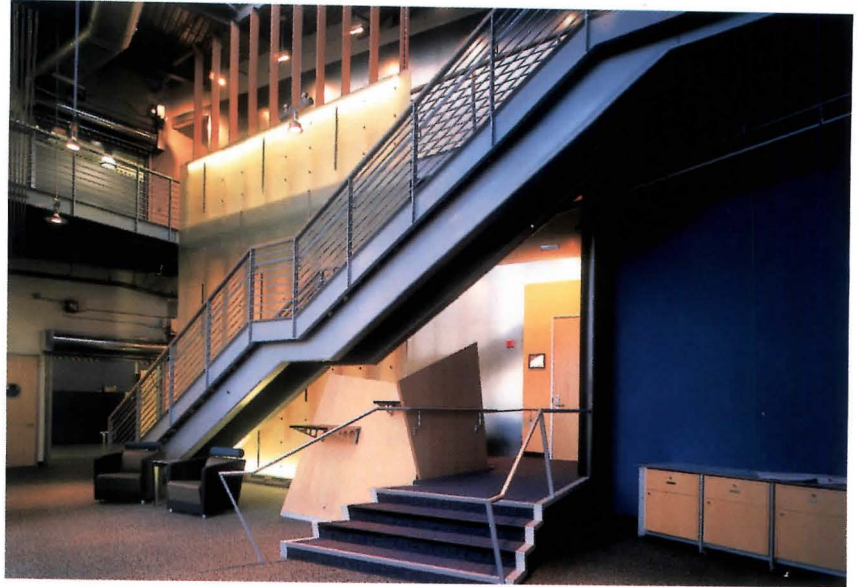
The work culture responsible for the Silicon Valley's astounding technological ferment is folkloric, fed by tales of company-organized sports tournaments, concerts, bashes, and vigilantly casual workplaces. This corporate philosophy means that budgets allow for such amenities as lounges, coffee bars, gyms, and gourmet cafeterias to keep the jeans-clad geniuses happy, productive, and loyal.

The college campus is the obvious model for most of the newly built, or soon-to-be-built, Silicon Valley offices. The intention is the same: to provide a liberating atmosphere that encourages exploration, competition, and collaboration. At SGI's campus in Mountain View,



Wood detailing, brilliant colors, and comfortable chairs help to create interior spaces that are playful and not too high-tech (right). Ready views to other parts of the campus make the complex feel

smaller and more personal, while windows connect employees to the outdoors (below). The cafeteria keeps employees on campus and encourages impromptu meetings (bottom).



lounge areas and coffee bars, appointed with whiteboard-topped tables for doodling, dot each neighborhood. Walls are painted vibrant colors, an inexpensive and impermanent way to enliven otherwise basic spaces while visually encoding each neighborhood. The wild colors project an air of fun and are closely identified with SGI's trademark purple-and-teal workstations, anomalies in the gray and beige world of computer equipment.

The campus plan centers around an inner quadrangle—a place for workers to hang out and collaborate. The orientation of the quad and the geometry of the buildings' inner facades form a diagonal axis that points to SGI's gateway building. Paved pathways lead the way from one building to another and help orient new employees and visitors.

The courtyard-facing sides of the buildings are devoted to public amenities, such as the 500-seat "cafetorium" and an outdoor terrace. There's also a theater/training center housed in a slightly undulating volume with wood-sided walls, an earthy contrast to the buildings on the rest of the campus, with their glass curtain walls and white and gray aluminum panels. The pale, Alaskan yellow cedar siding is intended to evoke old wooden schoolhouses.

The campus, which sits

slightly above ground level, is built atop a concrete parking podium, which eliminates the need for a monolithic parking structure or the acres of parking that traditionally distance buildings from the street (though some street-level parking was still necessary). Workers don't have to hike to their cars; they need only descend a flight of stairs. This more urban approach is a response to the region's rising land values and an attempt to make the buildings more accessible from the street—an unusual approach in the valley of high-security office parks.

The campus's central quad connects to a five-acre park surrounding the formal entrance. A gift to the local residents from SGI, the park was given in exchange for the long-term lease to this desirable site, granted by the City of Mountain View. The park, together with other public amenities and retail spaces that are gradually appearing in Silicon Valley, suggests that the barren architectural landscape there is slowly becoming more interesting as the valley develops an urban character. ■

Sources

Curtain wall: *Mitsubishi*

Glazing: *Walters & Wolf, Inc.*

Precast panels: *Lafayette Precast*

Metal roof: *Berridge Manufacturing*

Locksets: *Schlage*

Office furniture: *Herman Miller*

Making the Most of the A/E/C Systems Show

THIS YEAR'S COMPUTER EXPO FOR ARCHITECTS AND OTHER BUILDING PROFESSIONALS WILL BE BIGGER THAN EVER. TRY A LITTLE PLANNING, AND THE EXPERIENCE WON'T BE LOST ON YOU.

by Steven S. Ross

Even if you stay at the A/E/C Systems show for the full three days, it's impossible to see everything. This year is no exception: the exhibition, which runs from June 2 through 5 at McCormick Place in Chicago, will be huge. But it's a great opportunity for architects and other building professionals to see state-of-the-art computer software and hardware systems—from more than 500 exhibitors—all under one roof, albeit one very big roof. With a little advance planning, you're sure to get a lot out of the experience. Here are a few helpful tips.

The show is organized into subshows, so you can usually find what you're looking for concentrated in one section. Some are sponsored by individual vendors, like Autodesk, Bentley, and Visio; others cover a specific category of products. The EDM/PDM Expo, for example, targets the managers of technical documents, product data management, and drawing file conversion software. The E/NET show features the latest in Internet, intranet, and extranet technology.

It's fun to wander through the exhibits, but since your time is probably limited, it's a good idea to make a list of must-sees. But don't be a slave to your list. Remember, the unexpected item that would really help your practice might be just around the corner. Explain your exact needs to booth personnel before they start their standard sales pitch. You may learn immediately that what they're selling isn't for you and save everyone's time. If you are interested, listen to their standard presentation. But be sure to pipe up when you don't see or understand what's going on.

With software, pay attention to the equipment used in the demonstration. Bear in mind that a dual-processor 333 MHz behemoth with 256 MB of RAM might run 3D software like a dream, but all that power may not fit into your budget.

Question salespeople carefully, and look for hidden costs. Many of today's products, for instance, won't run without ODBC-compliant database software, which, depending on your network setup, can cost anywhere from a few hundred to several thousand dollars to install if you don't have it already. And be sure to ask about support and maintenance contracts. Major CAD manufacturers are all heading for "subscription-style" support, just like the mainframe vendors of old.

If you're close to a purchasing decision, don't be shy about bringing a few test files of your own to the show. It's the best way to learn if the program you're eyeing is compatible with what you already own, and whether you like working with it. Talk to other potential or existing users—and be on the lookout for user-group meetings. You can also meet kindred spirits at various seminars and tutorials.

CAD and 3D software to look for

At its show, Autodesk will announce a version of AutoCAD 14 specifically for architects called AutoCAD Architectural Desktop, and rumor has it that Bentley Systems will announce a new version of the TriForma 3D



Visitors to the A/E/C Systems show say

you'll get the most out of your time on the

exhibition floor by planning ahead.

package for architects at its subshow. Other software on exhibit: the latest releases of MiniCAD (manufactured by Diehl Graphsoft), ARRIS (Sygma Design), ArchiCAD (Graphisoft), Architrion (BAGH Technologies), IntelliCAD (Visio), and Vdraft (SoftSource).

Internet solutions at E/NET

The highlight of E/NET '98 will be software that lets you share drawings and other documents over networks, especially the Internet. Look for Diehl Graphsoft's Revision Master, which tracks changes to files using a central repository, and Aspects from Framework Technologies Corporation, for project-specific Web sites.

Cyco International will show the latest version of AutoManager WorkFlow. Also look for a document-management outfit called Pigeon Hole and Spicer's imaging software Imagenation. Cubus Corporation's Review It is a nice file-sharing tool.

Hardware highlights

Silicon Graphics will launch a new line of Intel-based computers this year. Look for CPU upgrades like the MXPro from Evergreen, a \$200 part that can triple the speed of an old 75 MHz Pentium. New scanners and printers will be offered by CalComp, CADNET, Image Scans, Xerox, Ricoh, GTX Corporation, HP, Ideal Scanner & Systems, Oce-USA, softelec's HybridCAD Sunscan, and Zeh Graphic Systems.

To get the most of the A/E/C Systems show, take 20 minutes before you go to think about and make a list of what your computing needs will be, next month, next year, even five years from now. Then plan your time wisely. ■



Entering the Third Dimension

INCREASINGLY SOPHISTICATED SOFTWARE AND POWERFUL HARDWARE ARE CHANGING THE WAY ARCHITECTS WORK. BUT IT'S STILL TOO SOON TO CLOSE THE DOOR ON 2D.



by Steven S. Ross

In a survey of large architecture firms conducted by software maker Bentley Systems last summer, 94 percent of principals responding ranked “collaboration throughout the building process” over “individual productivity” in their five-year automation goals. In other words, the capacity for design team members to turn 3D renderings and computer-generated concept drawings into computer files that can be used to create construction documents has become more important than the simple ability to draft.

This is a significant shift in architects’ perceived technological needs. Over the previous five years, surveys by Bentley and others tended to show 80 to 90 percent of respondents focused on the desire for better drafting and drawing systems. As those wishes have been granted with a host of sophisticated programs, a more pressing need now is for them to work together. This creates a dilemma that only cheaper, faster hardware and even better software can solve. The computers and software available now do allow both collaboration between designers and powerful drafting, but not at the same time.

Equipment vendors have picked up on this trend. Last year, Hewlett-Packard, Dell, and Compaq expanded their lines to include Windows NT workstations equipped for CAD and 3D. They joined Intergraph and smaller firms such as NetPower and Tri-Star Computer, who were among the only national vendors of such equipment. IBM and Gateway 2000 joined the party late last year. This January, Compaq announced it was buying Digital Equipment Corporation, gaining access to Digital’s superfast Alpha CPU.

The future of design software—the near future, in fact—belongs to 3D. But at this point in time, not all 3D programs are cost-effective. Video in particular is problematic, even if more clients demand it. Indeed, the “visual experts,” producers of photorealistic renderings and videos who often run service bureaus for architects, still admit to resorting to trickery to make images look good. A close look at really great images reveals such oddities as semitransparent marble and wood, rogue extra “hidden” lights, and 2D objects that tilt or twirl so you always see them full-face in supposedly 3D renderings. These tiny, almost imperceptible details move the underlying 3D database a few steps closer to having a photorealistic quality.

It is clear that to vendors 3D software presents possibly the last big opportunity to change the dynamics of the industry, and thus to become competitive with Autodesk, whose typical annual sales of AutoCAD equal the combined sales of its major competitors. “We know we are not going to beat AutoCAD in the production end,” says Serge

Architects have been debating the merits of 3D visualization for years. Is it worth the expense, time, and trouble? Will today’s powerful new software and hardware allow architects and other construction professionals to use 3D as easily as they used 2D a few years ago, or even more easily? Would the amount of time and money firms invest in 3D be better spent on other equipment or services for clients, such as site supervision and better 2D documentation for the building’s life cycle?

Vendors of CAD and specialized suppliers of 3D software answer that because 3D software represents buildings being drawn on-screen as if they were solid, “real” objects rather than collections of wireframe-like lines, 3D makes designing buildings easier and less error-prone. That’s an advantage for both clients and architects. The disadvantage is that at this time, producing working drawings from 2D is still easier than producing them from 3D.

Contributing editor Steven S. Ross has been reviewing software and hardware for this magazine for more than 11 years.



A gameroom (above) and courtyard (right) modeled in Sygma Design's ARRIS renders shades, shadows, water effects, and reflections nicely.



This radiosity rendering in Lightscape (left) shows light and shadow patterns well. Note the soft lighting effects in a bar rendered with Radioray from Kinetix (below).



Bouhadana of BAGH. "So we are concentrating on the design end." BAGH Technologies' flagship production drafting product, Architriion, has 17,000 paying users ("seats") worldwide; Autodesk claims 3 million customers, mostly for AutoCAD.

Bentley Systems did score a big win in December, announcing that the nation's second largest architecture firm, NBBJ, had selected MicroStation TriForma to replace 330 AutoCAD seats. NBBJ principal and business manager Robert Klie III explains part of the firm's reasoning: "We recognized that two-dimensional drawings were losing their power. The developing relationship between entertainment and architecture was increasing the demand for work produced in three dimensions. Instead of just viewing drawings, clients wanted to walk through, fly through, live through the architectural experience."

Klie also notes that when NBBJ convened a task group on the subject two years ago, they could produce beautiful three-dimensional images, but they still needed the 2D CAD drawings to actually produce construction documents. Likewise, NBBJ was playing around with 3D for the design-concept stage but could not use the files generated at that point to kickstart the production-drawing cycle.

NBBJ explored Graphisoft's ArchiCAD and Bentley's TriForma as alternatives to AutoCAD. The first test had mixed results. In March 1997, NBBJ transferred the Burlington Healthcare project to TriForma. The project team was keen on trying 3D, but Bentley's TriForma trainers were still learning the software themselves, so almost all the standard details were still in 2D. NBBJ finished the project in 2D MicroStation instead. But 3D is becoming more common.

3D goes public

The public has become accustomed to 3D wizardry, partly because so many cities have been beneficiaries of 3D modeling. For instance, Bill Jepson, director of computing at UCLA's School of Architecture and Urban Design, is leading a team of architects and planners on a simulation of Los Angeles. They're using a Silicon Graphics Onyx2 and uSim software purchased in part with a grant from the City of Los Angeles Housing Department.

Three-dimensional renderings are easier to grasp than flat drawings, and since they've come into use Los Angeles has enjoyed broader-based, better-informed public involvement on redevelopment proposals. A virtual reality video at a hearing on the Village Center Westwood elicited a strong response from residents of Hollywood and Pico-Union: many felt that the project as designed was simply too big for the neighborhoods. After the hearing, the plans were scaled back, according to Jepson.

Although the "fly-through" software Jepson uses is great for images (Silicon Graphics based it on military flight-simulation programs), there's usually no provision for an underlying database. Merging geographic information systems (GIS) data with the simulation could make for an enormously useful planning tool, even for nonprofessionals.

The state of the art

Three-dimensional representation technology today is roughly where 2D CAD was at the beginning of the decade: no one package can do everything. But many packages, covering the full range of architects' needs and budgets, can work together or stand alone. Here are just a few 3D programs, and the stages of a project where they tend to be most useful:

Design concept. Virtus Walkthrough Pro and ConceptCAD. Autodesk WalkThrough. Nemetschek Arch14, BAGH ArchiDesign and modeling packages such as auto.des.sys Form.Z.

FINDING THE 3D SOFTWARE PROGRAMS THAT MEET YOUR NEEDS

There is an almost bewildering array of 3D tools, add-ons, and accessories available, so you may have to do some research before you find the exact item that fits your needs, budget, and equipment platform. They range from extremely powerful, costly pro-

grams, which require workstations with advanced processors, to the most basic, costing only about \$50. Here is a rundown of some of the best-known products, including price information, a basic description of what the software does, and how to contact the vendors. S.S.R.

3D Studio VIZ

A subset of 3D Studio MAX, offering most of the features for under \$2,000. Kinetix offers Radioray, a radiosity and ray tracing renderer that includes sunlight and luminaire calculators. Kinetix (division of Autodesk), 642 Harrison St., San Francisco, CA 94107; 800/964-6432; www.ktx.com.

Arch14 Modeler

A \$99 add-on for AutoCAD 14. Nemetschek Systems, 100 Shoreline Hwy. (B), Suite 125, Mill Valley, CA 94941; 800/479-0735; www.arch14.com.

ArchiCAD

Versions available for Macintosh and Windows 95/NT. Price per seat is roughly \$5,000. Graphisoft USA, 235 Kansas St., Suite 200, San Francisco, CA 94103; 800/344-3468; www.graphisoft.com.

ArchiDesign

Available for Macintosh, Windows, and SGI Unix computers for \$1,995. ArchiDesign runs extremely fast on the small Silicon Graphics O2 machine. BAGH Technologies, 4446 Blvd. St-Laurent, Montreal, Quebec, H2W 1Z5, Canada; 514/285-1717; www.BAGH.com.

ArchT 14

An AutoCAD add-on, one of the cheapest ways to get 3D into AutoCAD (\$495). Free trial available on the Web site. Ketiv Technologies, Inc., 6601 NE

78th Court, Portland, OR 97218; 503/252-3230; www.ketiv.com.

ARRIS

Everything from 3D conceptualization to production drafting and design, in software that runs in Windows NT, including several Unix variants. Complete suite of drafting and modeling tools for architects lists for \$4,200.

Sigma Design International, 654 Madison Ave., New York, NY 10021; 888/990-0900; www.arriscad.com.

Autodesk Walkthrough

A less-than-\$200 add-on for the less-than-\$3,000 AutoCAD 14. Autodesk, 111 Mcinnis Pkwy., San Rafael, CA 94903; 415/507-5000; www.autodesk.com.

ConceptCAD

WalkThrough Pro, with a retail price of \$495, offers good modeling tools and the ability to "walk through" your models by moving the mouse. ConceptCAD does even more, and comes with thousands of everyday objects prebuilt. The price is \$1,595. Virtus Corp., 114 MacKenan Dr., Suite 100, Cary, NC 27511; 919/467-9700; www.virtus.com.

Form.Z

Arguably the best stand-alone modeling package, with versions for Windows 95/NT and Power Macintosh. Versions below 3.0 (due for release soon) will run on Windows 3.1 and older Macintoshes. Auto.des.sys, 2011 Riverside Dr., Columbus, OH 43221; 614/488-8838; www.formz.com.

Lightscape

Probably the best single stand-alone package for taking a 3D still image and rendering it in a pleasing, photorealistic way. List price: \$595 for Windows 95/NT. Can also be used to design a light fixture or to estimate the effects of a light source. Lightscape Technologies (subsidiary of Discreet Logic), 1054 South DeAnza Blvd., Suite 200, San Jose, CA 95129; 408/342-1900; www.lightscape.com.

MiniCAD

This low-priced (\$795) Macintosh/Windows program gained a Boolean 3D in version 7. It supports QuickDraw 3D on the Mac. Diehl Graphsoft, Inc., 10270 Old Columbia Rd., Columbia, MD 21046; 410/290-5114; www.diehlgraphsoft.com.

PlantSpace

A high-end product that works with MicroStation to scope out complex plant-design tasks (especially piping and valving) in 3D. This isn't really creative architecture, but it offers a sophisticated glimpse of one aspect of 3D visualization. Jacobus Technology, 7901 Beechcraft Ave., Gaithersburg, MD 20879; 301/926-0802; www.jacobus.com.

Poser 2

Poser was originally developed by Fractal Design, which merged with MetaTools (formerly KPT for its flagship Kai's Power Tools product), in Spring 1997. Poser 2 is available for Macintosh and for Windows 95/NT. List price is \$149, but usually discounted. MetaCreations Corp., 6303 Carpinteria Ave., Carpinteria, CA 93013; 805/566-6200; www.metacreations.com.

Simply 3D

Expect to pay about \$50 on the street for this animation and drawing tool. Micrografx, Inc., 1303 E. Arapaho Rd., Richardson, TX 75081; 972/994-6767; www.micrografx.com.

SolidBuilder

Really a builder's product, but architects should pay attention. There are excellent 3D tools here, and a database system that treats 3D objects as entities for tracking costs and functionality. Eagle Point Software, 4131 Westmark Dr., Dubuque, IA 52002; 319/556-8392; www.solidbuilder.com.

TriForma

An add-on for MicroStation 95. Overall cost for the seat will be roughly \$4,000. Bentley Systems, Inc., 690 Pennsylvania Dr., Exton, PA 19341; 610/458-5000; www.bentley.com.

TrueSpace 3

Typically sells for under \$500, although the list price is \$795. Originally developed for the movie industry, but has fairly good tools for creating and animating a scene, especially for walkthroughs. Produces VRML files. The Web site allows a demo download. Caligari, 1959 Landings Dr., Mountain View, CA 94043; 800/351-7620; www.caligari.com.

TurboCAD

The firm, which specializes in low-cost CAD products, recently took over Corel's 3D modeler line, which will sell for higher prices. IMSI, 1895 Francisco Blvd. East, San Rafael, CA 94901; 415/257-3000, 800/833-8082; www.imsisoft.com.

VDraft

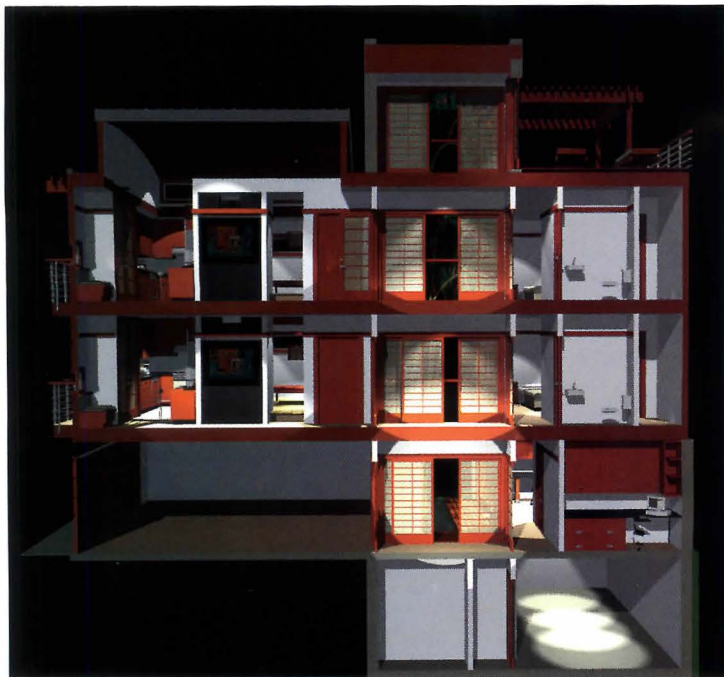
A fairly close clone of AutoCAD at an attractive price, but it lacks some AutoCAD R14 features. You can download a demo and a free SVF (simple vector format) Web browser plug-in, or purchase better versions of the plug-in, from the VDraft and SoftSource Web sites. SoftSource, 301 W. Holly, Bellingham, WA 98225; 360/676-0999; www.vdraft.com.



The Oxxo Calzada was modeled in AutoCAD and 3D Studio MAX by Guillermo M. Leal

Llaguno (above). A section of the Nakamura residence in Osaka, Japan (below), was ren-

dered by architect Curt Cline using ArchiCAD. Note the lighting effects.



COMMON VIDEO AND 3D FILE FORMATS

AVI Audio-Video Interleave. Lets you add audio to a video presentation. This feature doesn't work well for photorealistic presentations, because files tend to be huge, but less-detailed AVI files compress well. Modern Web browsers read AVI files automatically.

FLC, FLI Movie industry slang for "flick" formats. Originally intended for animation packages such as 3D Studio. As with AVI, compression is

poor for "realistic" images.

MPEG Motion Picture Experts Group (developer of the formats). There are two flavors right now: MPEG 1, which comes with many computers, is easier to work with. Highlights in MPEG 1 images tend to develop "spikes" and other distortions, which may be quite pretty or quite distracting. MPEG 2 is near-perfect for photorealistic videos, but images in this format require machines with

Detail design and design/drafting work. AutoCAD with Softdesk AutoArchitect 8.0, Ketiv ArchT, Arch14, various Eagle Point products. CAD products such as BAGH's Architrion with ArchiDesign, Sigma Design's ARRIS, Bentley's MicroStation Triforma, Graphisoft's ArchiCAD. At the low-cost end, Diehl Graphisoft's MiniCAD, DataCAD, or DenebaCAD.

Client and regulatory presentations. Kinetix 3D Studio VIZ, Lightscape, MetaCreations Poser 2 and Bryce, Caligari TrueSpace, Micrografx Simply 3D, IMSI Dream3D.

Depending on how you work and the types of projects you take on, packages can move outside the niches described above. Lighting designers, for instance, will certainly want to consider Lightscape, BAGH ArchiDesign (which includes Lightscape), or even 3D Studio VIZ, with its RadioRay plug-in, at the concept stage. Design Vision, a three-person architecture firm in Hawaii that specializes in high-end residential work, uses Lightscape's visualization tools with their clients rather than a strictly architectural 3D program.

3D Studio VIZ, basically an animation package, is often employed for preliminary "sketching out" of designs that will later be fleshed out in AutoCAD 14 (VIZ is compatible with AutoCAD 13 and 14, and can import and export their files). Likewise, TriForma is easy enough to use that designers can sketch with it in front of clients at the design concept stage. So is ArchiCAD. But to walk the client through the project at an early stage, a program like ConceptCAD is a better bet. Other programs do walk-throughs, but they're harder to work with and take longer.

Designers who like the Boolean functions—with which multiple solid shapes can be manipulated to form intricate models—in high-end CAD packages such as AutoCAD, MicroStation TriForma, and ArchiCAD—will probably find modeling packages such as Form.Z a bit more congenial than the modeling tools in ConceptCAD. But other designers will prefer ConceptCAD because of its speed and nice shape libraries.

BAGH ArchiDesign is marketed as being able to produce designs that can easily be converted to any CAD software (BAGH recommends its own Architrion, of course). But its drawing tools are fairly complete, allowing a designer to do a fair amount of hard-line drafting before switching over to complete CAD packages for production work. And ArchiDesign includes lighting and scene controls (from Lightscape, in part), which can come in handy after hard-line drafting is completed. ArchiDesign is not as interactive as packages such as ConceptCAD, but it models true solids and complex surfaces.

fast processors and a great deal of memory.

QuickTime VR Originally developed for Apple and now available for Apple and Windows computers. Lets you create and view 3D scenes interactively. It's not great for photorealistic scenes, but the images are better than cartoons.

RealVR Based on VRML and JPEG technology. Often confused with QuickTime VR, RealVR can produce smaller files with less distortion and larger screen sizes than QuickTime.

There are versions of the RealVR "player," called Traveler, for both Windows and Macintosh. Requires a sophisticated production operation to use well.

VRML Virtual Reality Modeling Language. This is a common file format for 3D. Version 2.0 was finally approved as a worldwide ISO standard in late January. VRML can be read by modern Web browsers and allows 3D walk-throughs with no distortion. Files in this format are quite large.

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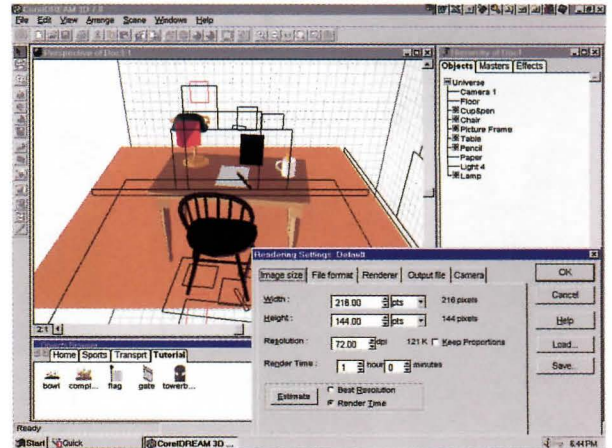
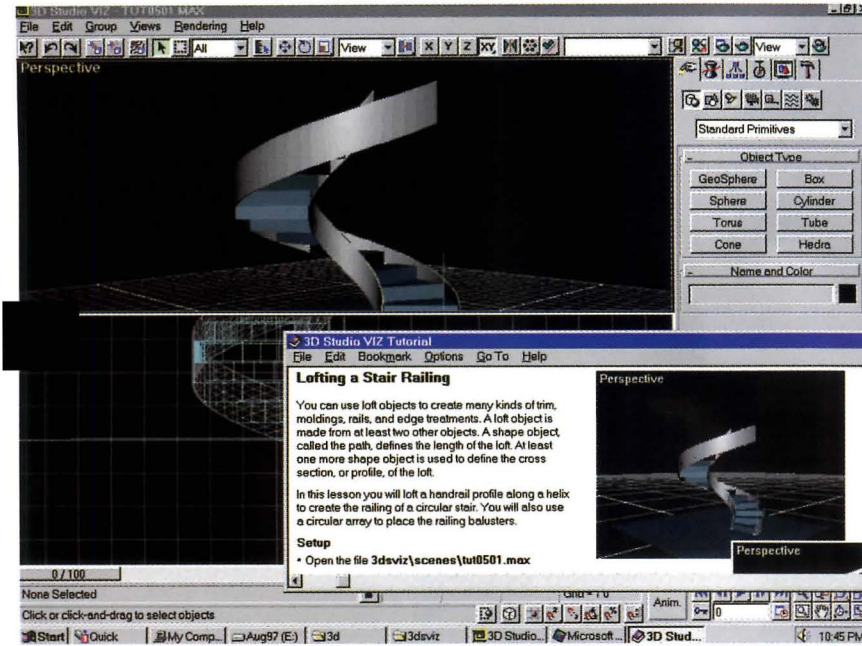
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3D Studio VIZ can take a scene and render it, then animate it. If you don't know anything about video, 3D Studio

VIZ comes with fine tutorials (left). The view of the desk (above) was created in Corel DREAM 3D.

There are speed limits

The current class of inexpensive Windows 95 or Windows NT desktop computers will handle almost any 3D task with ease. The one big exception is making full-screen photorealistic or near-photorealistic scenes. In one test, rendering an 800-frame scene (enough for about 25 seconds of video) with 3D Studio VIZ took 40 hours on a 200 MHz Pentium with 64 MB of RAM running Windows NT.

Moving up to more powerful equipment (a 300 MHz MMX Pentium and 128 MB of RAM) should cut that time to 12–15 hours. You can split the task, if you have a license to run the software on more than one computer, by instructing one to process half the frames and others to process the rest. Some of the more advanced packages allow one copy of the software to spread the processing around a network automatically.

The more advanced modeling packages have been fairly quick to learn drafting tools, but they are mainly for drawing and sketching. Even those that offer precise hard-line design usually fall short when it comes to production drafting needs: dimensioning, labeling, 2D repre-

sentations, and so forth. Does it matter? If you use the modeling tool for conceptualizing an initial client feedback and then move the file into hard-line production drafting, you usually won't have any problem. But if you expect to go back and forth, you may want to stick to solutions that do not degrade the production work in a file translation step.

Consider the following options: TriForma with MicroStation or Softdesk/Autodesk AutoArchitect, 3D Studio VIZ, EaglePoint or Ketiv or Arch 14 with AutoCAD. Or a complete solution from BAGH (Archi-Design and Architron), Graphisoft (ArchiCAD), Nemetschek (AllPlan), or Sigma Designs (ARRIS). At the low end, consider Diehl Graphsoft's MiniCAD or DenebaCAD as round-trip solutions that cost well under \$1,000.

Transporting 3D is tricky. The easiest and perhaps cheapest technique is to write to a CD-R disk. Each holds about 65 MB of video or images, and can be viewed on any computer that has a CD-ROM drive. Drives that can write CD-R cost only \$300 to \$500. The blank disks themselves are under \$2 if you shop wisely. ■

3D SOFTWARE AND HARDWARE TERMINOLOGY

AGP Accelerated Graphics Port. With the new Pentium II "cartridge" CPUs, Intel has created a faster link between the CPU and system memory. This promises to speed graphics processing. The best examples of AGP-enabled software right now are computer games. But you'll want AGP for next year's software if you do a lot of "realistic" 3D. The extra equipment cost now is close to nil.
Boolean software Allows you to create new shapes by adding to various shapes, combining them, or subtracting from them. A sphere

partially intersected with a wall plane, for instance, can leave a Boolean "dimple."

FXI32 Digital Equipment's software fix that lets most Pentium-based applications run on the DEC Alpha CPU. It can work well but not always at a big speed advantage, considering that the Alpha is a much faster CPU than the Pentium. Check carefully with your software vendor before you buy.

Radiosity Great for reproducing actual lighting effects. It calculates light emitted from a source but does

not take multiple reflections fully into account. This makes radiosity calculations faster than ray tracing. It also puts a pleasing "glow" around point sources, especially in darker scenes that aren't fully lit anyway.
Ray tracing More accurately represents reflections and fine detail than radiosity. Software can be set for multiple reflections, which increases processing time but makes for great detail.

Software Z-buffer The typical default for Windows 95/NT display drivers. These drivers are essentially built into Windows and will work with minimal equipment. If your com-

puter has a more advanced video card, use that card's drivers rather than the default.

Threading A feature of software that lets it distribute its computing needs among multiple CPUs in the same computer to get the work done faster. Even when a package is not threaded, it can work with no performance penalty in the background on one CPU while you work in the foreground on a different task using the second CPU in a multiprocessor system. These days, a two-CPU system might cost only \$500 more than a single-CPU computer.

NEW PRODUCTS



THE FUTURE OF FIRE SAFETY AND BUILDING PROTECTION

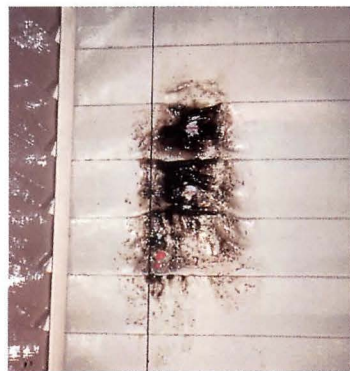
The National Institute of Standards and Technology (NIST), based in Gaithersburg, Maryland, is in the process of developing a number of new fire-safety products, including foam fire suppressants to protect a building's exterior and "smart" fire alarm panels.

Dan Madrzykowski, a fire protection engineer at the NIST's Building and Fire Research Laboratory, is working with a variety of foam fire suppressants. According to Madrzykowski, one of the most exciting experiments his team recently performed was with a durable agent, a biodegradable protein-based compressed-air foam that protects a building's exterior from igniting.

To demonstrate the effects of the foam fire suppressant, the NIST team took exterior wall sections made of vinyl siding over sheathing on wood framing and formed two corners. Corner A was treated with the sticky, protein-based foam (see before and after photos above), while corner B received no treatment (photos above right). One hour later, both corners were exposed to a 50KW fire for 10 minutes. Within three minutes, the untreated corner had ignited, with flames extending into the eaves and roof areas.

Corner A did not ignite, and after 10 minutes, the foam was washed off, revealing only minor damage (photo below).

Madrzykowski explains that if a building next door or trees in a backyard were on fire, the foam fire suppressant could be applied to a house to protect it from burning embers or radiant heat. A hose could be used to apply the foam, or even a unit with plastic water tanks on wheels. The foam could also be



applied through a hose line on a fire truck, if the truck were equipped with a compressed-air tank and pump to make the foam. Or, if the foam were mixed at a low ratio (approximately 1 percent), the fire department would have to carry only small amounts of it to mix with water.

On a recent trip to Orlando, I watched a fire level a forest in minutes from my hotel window. The fire was about 200 yards away, but I could smell the smoke and feel the heat. It prompted me to ask some of the hotel staff what built-in precautions there were in the guest rooms and shared areas. "Sprinklers" was the only answer I got. It goes without saying that fire safety in both commercial and residential construction is of the utmost importance. However, with the ever-changing codes, regulations, and technology, it's hard to keep up. ARCHITECTURAL RECORD is here to help. *Elana H. Frankel, Products Editor*



Smart wall panels

Walter Jones of the NIST's fire-safety engineering department is in the preliminary stages of working with the fire-detector industry to build an in-wall system that would discover a fire, pinpoint its location, and predict the short- and long-term effects of its growth and the spread of smoke.

Most high-rise buildings are equipped with an annunciator panel—a big box with a flat plane, approximately two by three feet, and rows of trouble lights that monitor and report a building's conditions. Jones's project would add a "smart sensing" capability to the annunciator so that the fire department could create an effective strategy to put out the fire. This "smartness" would come from Intel chips (the same kind found in home PCs) embedded in the annunciator, which would help create a real-time response system and show, for example, the amount of carbon monoxide in a space, or which doors should be avoided.

The final result, "a sort of cybernetic alarm," says Jones, would

These photos document the experiment that Dan Madrzykowski and his team performed using foam fire suppressants to protect a building's exterior. The siding that was treated (left) sustained little damage.

combine the NIST's fire-modeling software with the advanced sensors and annunciator. "In a large building," says Jones, "time is critical. The 'smart' wall would show what is happening [with the fire] and predict what will happen. It would have sensor data available and create a model environment that foresaw smoke spread."

Not surprisingly, Jones has been receiving calls from upscale home builders and developers around the country who want to install the fire-security panels, which are now under development. However, researchers will not have a working model of the system ready until the year 2002 and are still seeking industrial partners for the five-year project. 301/975-3058. NIST, Gaithersburg, Md.

CIRCLE 200

PROTECTING RESOURCES FROM FIRE AND DAMAGE

Fire is one of the most dramatic destructive forces to act on a building. An insurance company may reimburse for material loss in the aftermath of a fire, but it is the architect's and engineer's responsibility to think ahead to avoid human loss. These fire-safety products will help protect valuable human and material resources from draft, smoke, and flames.

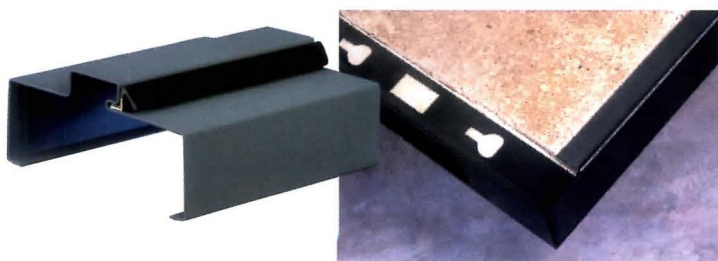


▲ Decorative fireproofing

In the event of fire, A/D FireFilm II, an intumescent film for structural steel, softens and expands to form a meringue-like layer that insulates and protects the structure. The decorative topcoat, A/D Colorcoat, acts as a second protective layer. 800/263-4087. A/D Fire Protection Systems, Scarborough, Ont. **CIRCLE 203**

▼ Draft and smoke control

Ceco Door Products' Smoke Tech doors are made of either 18- or 16-gauge cold-rolled steel and feature an effective smoke seal that is fire-rated (NFPA-compliant). The flush or embossed panel doors are available as heavy-duty or extra-heavy-duty with sidelights, transoms, frames, and windows. Ceco Door



► Interior protection

The new M100 rolling fire door control system from Cornell Iron Works (shown) protects Benjamin West's painting *Christ Healing the Sick in the Temple*, which hangs in Philadelphia's Pennsylvania Hospital. The door measures approximately 18 feet wide by 21 feet high, and all of the controls and coils are recessed in an overhead soffit for a streamlined look. 800/233-8366. Cornell Iron Works, Mountaintop, Pa. **CIRCLE 201**



▼ Fire-rated glass ceramic

FireLite Plus, the impact-safety-rated version of the wireless fire-rated glass ceramic FireLite from Technical Glass Product (TGP), now meets the impact requirements of ANSI Z97.1 and CPSC 16CFR1201 Category II (400 fpi). TGP has also recently released a new four-

page brochure on fire-rated glazing that features full-color installation photography, product descriptions, and specifications. Six of TGP's products are featured, including FireLite, FireLite Plus, FireLite NT, FireLite IGU, Pyrostop, and Pyroswiss. 800/426-0279. Technical Glass Product, Kirkland, Wash. **CIRCLE 204**



Products' Fuego Fire Door satisfies NFPA-80 recommendations for vertical egress and has a solid mineral fiber core that can withstand 250-degree maximum temperature rise. Standard to extra-heavy-duty models in sizes up to 4090 single and 8090 pair are available. 615/661-5030. Ceco Door Products, Brentwood, Tenn. **CIRCLE 205**



▲ Fire door protection

Instead of having to manually reset an Atlas Door fire door, the Fireset 1 motor operator will automatically reset it by pushing the Open button. The UL-rated and FM-approved motor is designed for 22-gauge fire doors of up to 275 square feet in size. 888/553-5445. Clopay Building Products, Cincinnati. **CIRCLE 206**

▼ Glazing for larger vision lights


Pemko's FG3000 glazing compound has been UL 10B tested and approved to allow for much larger lights in 20-, 45-, and 90-minute-rated doors and screens. For 90-minute hollow metal door applications, previous codes restricted wire-glass vision lights to 100 square inches. With FG3000, vision lights can be as large as 12 by 46 inches (multiple lights are allowed, but their combined total visible glass must not exceed 2,208 square inches). This is an increase of more than 2,000 percent. 805/642-2600. Pemko, Ventura, Calif. **CIRCLE 202**



▼ Digital data display

The Firetrol D³ATA (Digital Data Display Acquisition and Time Analysis) System monitors and displays fire-pump system information and provides access to historical data and events. The D³ATA is available as a modification to all Firetrol full-service electric pump controllers (600 VAC MAX) and includes the D³ATA display, FTA470 pressure monitor, and printer-recorder. At the heart of the D³ATA system is the FTA437 power monitor, which measures and records RMS motor voltage and current. 919/460-5200. Firetrol, Cary, N.C. **CIRCLE 207**





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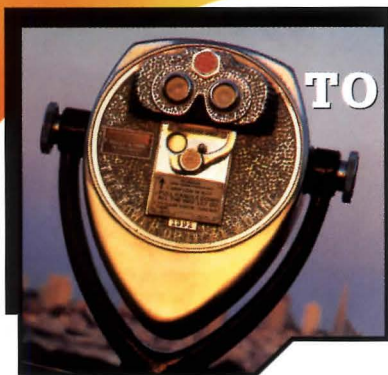
ARCHITECT MAYA LIN CREATES HER FIRST LINE OF FURNITURE FOR KNOLL

To celebrate Knoll's 60th anniversary, the company commissioned Maya Lin to create a line of furniture that honors its design philosophy and tradition. Ten months of "a great shared experience," says Lin, resulted in furniture that is the product of an obvious love of architecture and design and a sculptor's eye for how forms and details interact with their surroundings. The Maya Lin Collection (subtitled "the earth is not flat") was inspired, she says, by her recent honeymoon in New Zealand and the South Pacific, her new life as a wife and mother, and Florence Knoll's legacy. Lin also researched the project by reading books on furniture and chair design. "The chair is the hardest to design," she says. "It is ultimately a self-portrait of who you are: what you would look like as a chair."

The first pieces Lin designed, called Stones (opposite right), are

for both indoor and outdoor use, and Lin jokingly refers to them as the Honeymoon Suite. The group of hollow, lightweight fiberglass-reinforced cement elliptical stools with slightly concave seats (available in adult and children's sizes) and coffee tables with slightly convex tops are reminiscent of the pre-Columbian stones her husband

collects, Lin says. "And they look like people sitting around a fire," she adds. "They are also a bit inspired by Brancusi." The muted earth tones—slate gray, gray-blue, pale green, pale yellow, and terracotta—are reminiscent of an exotic landscape, says Lin, and the curves echo the earth's horizon line. "On my honeymoon, I spent a lot of time looking out at the ocean and trying to see and understand the earth's curve," she says. Eventually



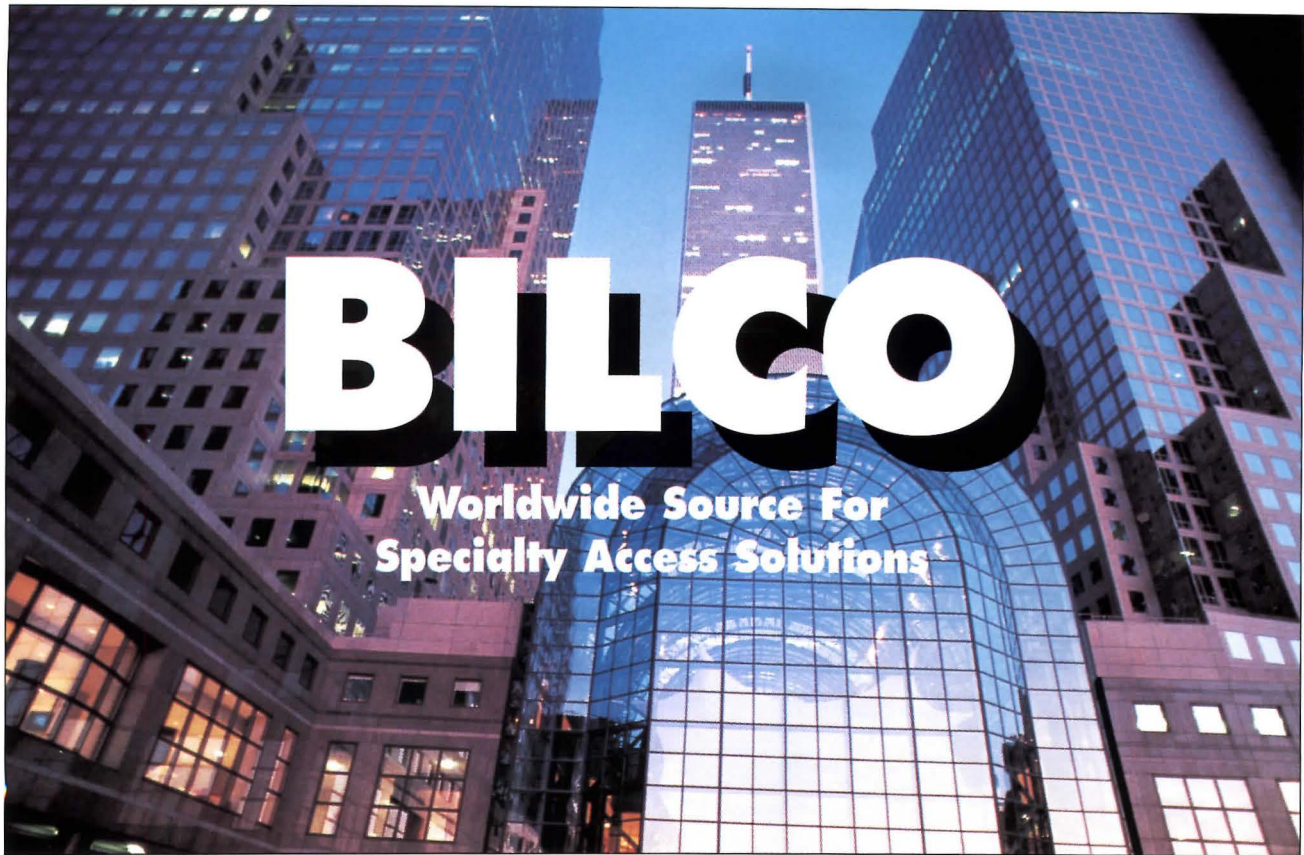
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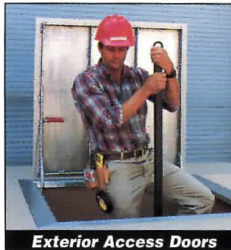
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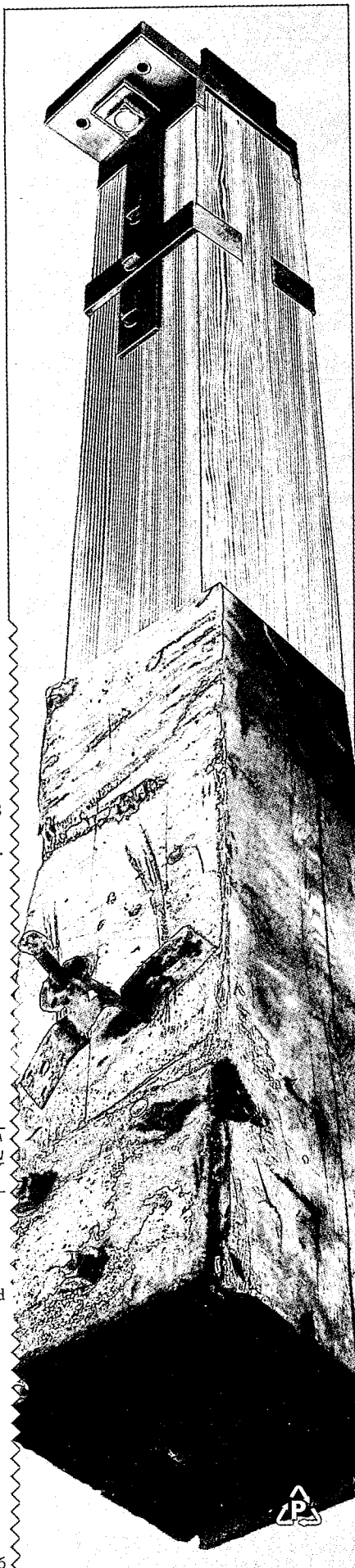
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PRODUCT LITERATURE

Watertight wall

Dryvit's three-layer Infinity wall system is a pressure-equalized rainscreen that is engineered to prevent water infiltration. The new brochure highlights its benefits and use in projects around the country. 800/556-7752. Dryvit, West Warwick, R.I. **CIRCLE 223**

Steel innovations

Five newly designed brochures describe steel use in roofing and facades; passenger stations; older buildings; shopping centers; and residential construction. 202/452-7100. American Iron and Steel Institute, Washington, D.C. **CIRCLE 224**

Coordinating fabrics

The new Sunbrella brochure shows awning and canopy fabrics and coordinating furniture fabrics. 336/227-6211. Sunbrella, Glen Raven, N.C. **CIRCLE 225**

Vinyl siding

The Vinyl Siding Institute released a list of more than 200 products, manufactured by 15 companies, that have been independently verified to meet or exceed ASTM D3679, the national standard for quality. 888/FOR-VS11. Vinyl Siding Institute, Washington, D.C. **CIRCLE 226**

Solid brass accessories

A new Omnia brochure focuses on brass bathroom accessories. 973/239-7272. Omnia, Cedar Grove, N.J. **CIRCLE 227**

Eco-responsible concrete

The Environmental Life-Cycle Assessment brochure evaluates concrete's environmental impact. 800/994-ECCO. Environmental Council of Concrete Organizations, Skokie, Ill. **CIRCLE 228**

Bathroom enclosures

Metapar's new CD-ROM contains specifications, colors, cuts, and technical product information on toilet, dressing, and shower enclosures. 516/333-2600. Metapar, Westbury, N.Y. **CIRCLE 229**

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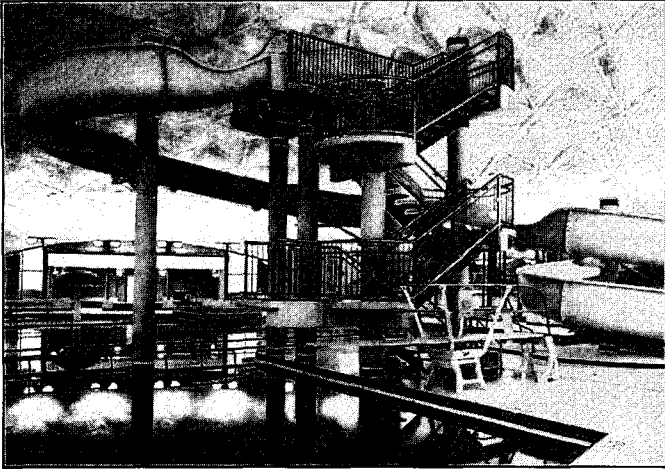
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Multimedia design

Kolbe & Kolbe's Interactive Design System (KIDS) on CD-ROM presents various window options. KIDS answers questions about jamb size, type of glass, and exterior finish, and displays drawings of the specified windows. 800/955-8177. Kolbe & Kolbe, Wausau, Wis. **CIRCLE 230**

Composite panels

The Composite Panel Association (CPA) has published three new technical bulletins on medium-density fiberboard moldings, particleboard for stepping, and particleboard underlayment. 301/670-0604. Gaithersburg, Md. **CIRCLE 231**

Lighting lines

Irideon's brochure highlights two new products—the AR6 recessed spot luminaire and the AR7 recessed wash luminaire. Both products provide automated beam movement, shaping, color changing, and pattern projection. 800/255-1727. Irideon, Dallas. **CIRCLE 232**

Stone products

See and select cultured stone products with StoneCAD version 1.1, a CD-ROM by Stone Products. The latest enhancement is the AutoCAD hatch pattern installer tool called StonePAT. 707/255-1727. Stone Products, Napa, Calif. **CIRCLE 233**

Seismic handbook

The Portland Cement Association's (PCA) handbook on the design of low-rise concrete buildings for earthquake forces provides an analysis of such structures according to the 1996 BOCA National Building Code and the 1997 edition of the Standard Building Code. 800/868-6733. PCA, Skokie, Ill. **CIRCLE 234**

Gypsum board

The Gypsum Association's brochure provides architects with ideas for using gypsum board in construction. Photos feature projects that were the winners or honorable mentions in the association's recent design and construction program. 202/289-5440. Gypsum Association, Washington, D.C. **CIRCLE 235**

Sweet's CD-ROM

SweetSource is a product selection and specification tool that provides AEC professionals with the Sweet's catalog files in electronic format. 800/227-0038. Sweet's, New York City. **CIRCLE 236**

Fire code on disc

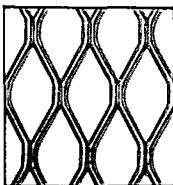
Intermedia Design Systems (IDS) has new and updated software called autoBOOK: NYS Uniform Fire Prevention and Building Code. 800/288-5453. IDS, Latham, N.Y. **CIRCLE 237**

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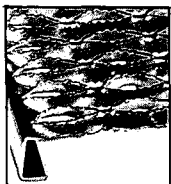
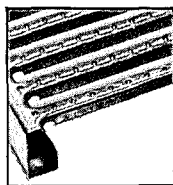
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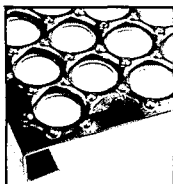
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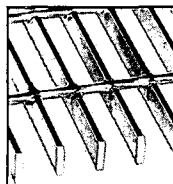
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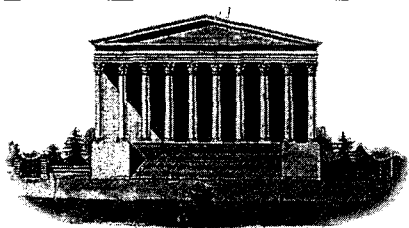
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CIRCLE 86 ON INQUIRY CARD

(continued from page 56)
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. For information, write Gail Brager, Vital Signs, UC Berkeley, Berkeley, Calif. 94720; E-mail vital signs@ced.berkeley.edu; or visit www.ced.berkeley.edu/cedr/vs/act/act_main.html.

Religious Art and Architecture Design Awards

Registration deadline: June 19;
submission deadline: July 24

Faith & Form magazine and the Interfaith Forum on Religion, Art, and Architecture are sponsoring three competitions under the categories of religious architecture, liturgical/interior design, and religious arts. Projects must have been completed since January 1, 1993. Contact *Faith & Form* at 919/489-3359 for an entry form.

Urban Studies and Architecture Institute Competitions

Registration deadline: June 25;
submission deadline: July 1

Two ideas 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 submissions include 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.

Youth Salon Competition

Submission deadline: August 4

Architects and artists under 35 years old are eligible for this ideas competition. The challenge is to identify a problem in one's city, solve it with design, and evaluate the solution. For entry requirements or more information, visit www.makoto-architect.com.

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 preserva-

tion, architecture, landscape architecture, urban design, environmental planning, archaeology, architectural history, and the decorative arts. Those who have an advanced or professional degree and at least 10 years of experience are eligible. Smaller grants of up to \$10,000 are also being awarded. Contact Morley Bland at Beyer Blinder Belle, 212/777-7800, for more information.

Pier 40 Competition

Registration deadline: August 17;
submission deadline: September 17

The Van Alen Institute and a local community board are sponsoring a design competition for a 15-acre pier on New York City's Hudson River waterfront. The pier is at the center of proposals to turn the entire waterfront into green space. Visit www.vanalen.org for details.

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 Taiyokogyo 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.

Shinkenchi Residential Competition

Submission deadline: September 10

Kyoto architect Shin Takamatsu will judge this year's ideas competition, sponsored by *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.

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The Museum presents exhibitions which invite visitors to think about the built world around them; publishes books and an award-winning publication, *Blueprints*; and offers a wide range of programs for students, families, and adults.

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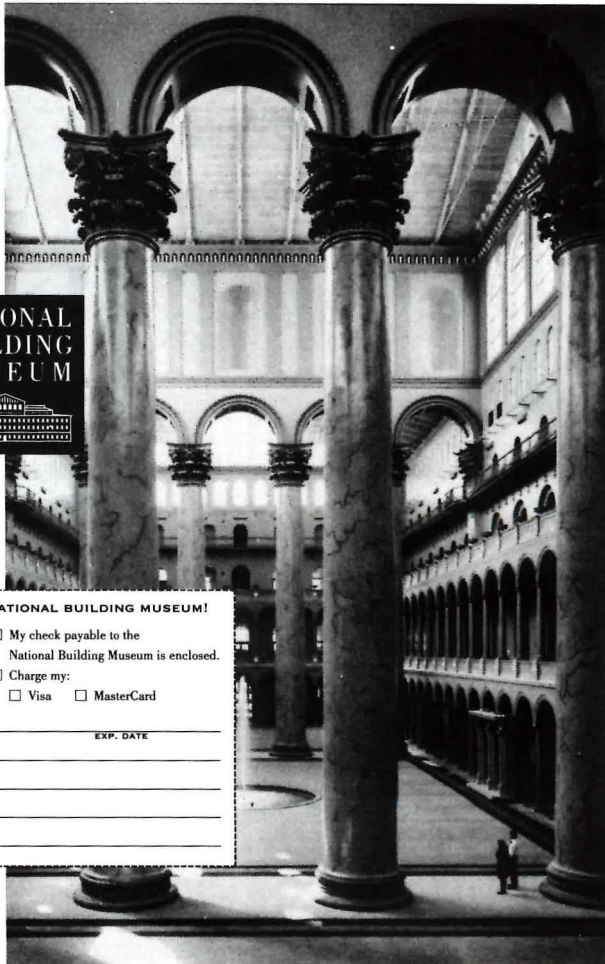


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URBAN VIBE *continued from page 71*

these buildings have positive architectural qualities. The reasons offered for retention are either practical (whether it is the crude Viennese argument or a more subtle appeal to the ethic of recycling and reuse) or didactic. History, of course, is always written by the victors, but every historian makes choices. As discussions like these make clear, the past is one of the most useful tools for controlling, even banishing, the past. By reducing the character of pastness to a bit of shrivelled aura evoked by a narrow range of closely controlled, decorative signifiers, the past is captured from itself: this is the Disneyland effect. In this sense, historicist architecture carries on the task of modernity far more succinctly than modernity itself.

If the past cannot be distinguished as being inhabited by anything but "pastness," our fantasies surely can be. Fantasies can be judged. There are good and bad fantasies, and all embody someone's desires. Every monument is also a monument to the desire to remember. Such collective fantasies always presume their own flip side: a consensus of fear. The *flakturm* stand because the Viennese have insufficient anxiety about the Nazis and thus see their artifacts as harmless. Not seeing themselves as opponents or victims, they have no reason to dread the victimizer.

The town where I grew up had, near its main intersection, a statue of a Confederate soldier, leaning on his rifle, looking south. This monument was not simply about acknowledgment, it was about celebration—the emblem of the town. But who was celebrating what? However many football games it waves over, the Confederate flag is still the emblem of a racist culture. But it's only such a symbol to those who revile racism, and only until that meaning is lost or buried, only until the stars and bars

finally become just another logo. We manage such transformations and we must do so with care.

Like fear, *vibe* is a cultural construct. The neutrality of the environment is a myth. Every place—knowable only through our reading of it—produces a *vibe*, or what used to be called a *genius loci*. But reading offers the promise of difference. Amsterdam is delightful to me both because I find the Dutch congenial and because the spaces and architecture there interact beautifully with values I see as continuous with this

**THE LEGIBILITY OF VIBE IS FURTHER COMPLICATED
BECAUSE DIFFERENT GROUPS (AND INDIVIDUALS)
REACH DIFFERENT FORMS OF CONSENSUS
ABOUT THE MEANINGS OF DIFFERENT SIGNIFIERS.**

congeniality: openness, informality, intimacy, sensuality. But my sense of this comprehensive congeniality would probably not be so appealing to Jesse Helms or the Ayatollah. *Vibe* always raises the question of relativism, and relativism always risks evading the ethics of the situation.

Consumer culture creates empty differences, and this lack of meaningful distinction frustrates consent, which cannot genuinely be given without real choice. The legibility of *vibe* is further complicated because different groups (and individuals) reach different forms of consensus about the meanings of different signifiers. The gated community has very different meanings for those within and without, and the *flakturm* seem sinister only to those who revile their builders. And this is why monuments—and architecture—are so important to *vibe*: they fix our desires where everyone can see them. ■

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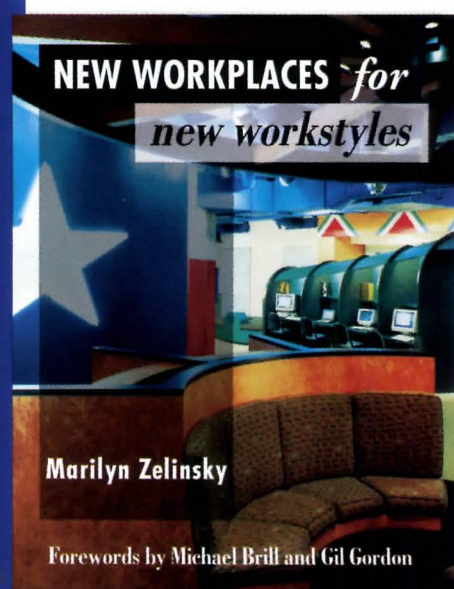
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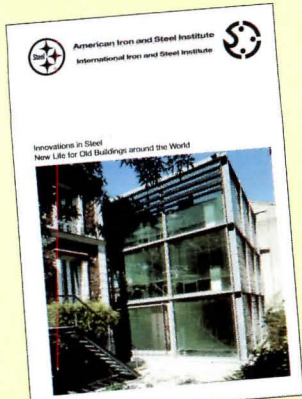
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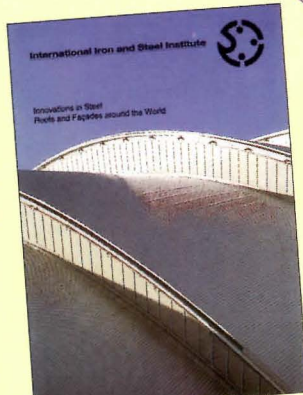


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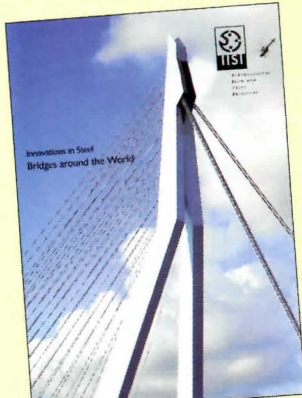


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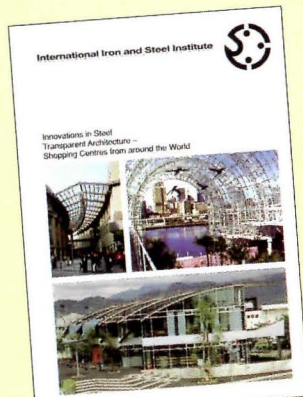


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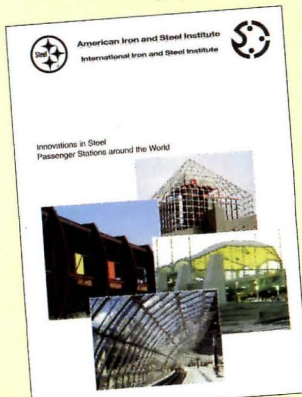


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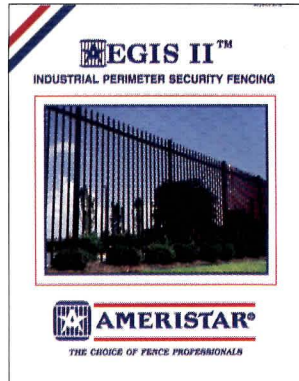


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Total Door® is a fire rated door assembly that includes all hardware. Pairs do not require coordinators, vertical rods, astragals, flush bolts, or floor strikes. Will retrofit to any frame. Meets all codes and ADA. Wood and metal faces available to 3 hours. Lifetime limited warranty on locks and panics. For more information call 1-800-852-6660.

Openings®

CIRCLE 112 ON INQUIRY CARD

**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.

CIRCLE 113 ON INQUIRY CARD

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.

Surface Design

CIRCLE 114 ON INQUIRY CARD

**Accessible Lavatory
Insulation**



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.

Plumberex

CIRCLE 115 ON INQUIRY CARD

**New Fireplace Tested
as a Wall Furnace**



Our products have taken direct-vent technology & incorporated it into a new high performance fireplace. Model 6000 Supreme is a high efficiency fireplace (thermal efficiency up to 74%) & has an AFUE (Annual Fuel Utilization Efficiency) rating of 63%. The 6000 Supreme is standard with a variable regulator to adjust the flame & BTU input with the turn of a dial. Heat-N-Glo, 6665 West Hwy 13, Savage, MN 55378, 1-800-669-HEAT.

Heat-N-Glo

CIRCLE 116 ON INQUIRY CARD

**Advanced Relational
Technology, Inc.**



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 117 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 its 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, Arvonnia, VA 23004. T: 1-800-235-8921.

Buckingham-VA Slate

CIRCLE 118 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

CIRCLE 119 ON INQUIRY CARD

Ornamental Picket Fence with a Purpose

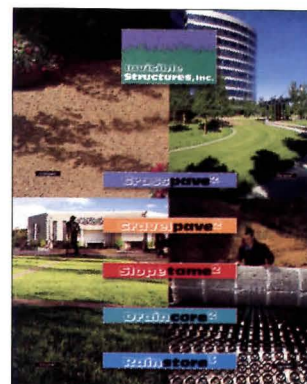


We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: (410) 633-6500, Fax: (800) 239-2963.

Monumental Iron Works

CIRCLE 120 ON INQUIRY CARD

New Invisible Products Roll Out

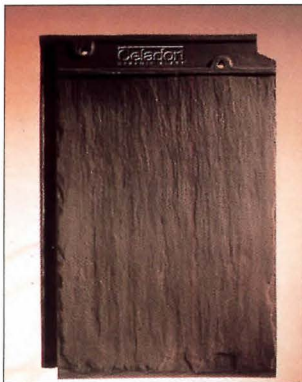


3 new invisible products have been added to the family of Grasspave² & Gravelpave² - Slopetame², Draincore², & Rainstore². For 16 years we have provided grass paving ring structures with 92% void area for root development. Now we're applying this technology to erosion control, drainage, & water storage with easy installation in 9 roll sizes. Call our knowledgeable staff for CADD details, specs, & product specs at (800) 233-1510. Web Site: <http://www.invisiblestructures.com>

Invisible Structures, Inc.

CIRCLE 121 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.

CertainTeed Corporation

CIRCLE 122 ON INQUIRY CARD

Recycled Resilient Athletic Surfacing



Tuflex rubber flooring is designed for commercial and sports applications. This 3/8" thick resilient flooring is excellent for weight rooms, locker rooms, hockey/ice rink off-ice areas, and golf pro shops. Tuflex exceeds OSHA and ADA standards for excellent traction. For samples, call 1-800-543-0390. Tuflex Rubber Flooring, 4521 W. Crest Avenue, Tampa, FL 33614. Phone: (800) 543-0390, Phone: (813) 870-0390, Fax: (813) 875-2312.

Tuflex Rubber Flooring

CIRCLE 123 ON INQUIRY CARD

Reclaimed, Remilled. Remarkable

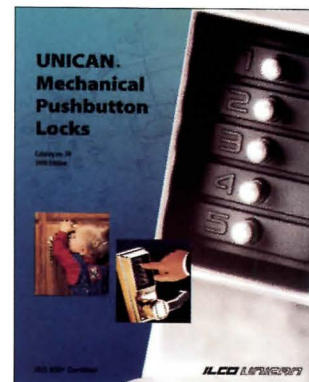


Vintage Lumber Co., Inc. has been manufacturing exceptional antique T&G plank flooring since 1973. Our extensive selection, consistent quality, on time delivery, and technical expertise is unequaled in the industry. For more info call 800-499-7859 or fax 301-845-6475. P.O. Box 104, Woodsboro, MD 21798

Vintage Lumber

CIRCLE 124 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.

ILCO UNICAN®

CIRCLE 125 ON INQUIRY CARD

Mini-JOMY



The JOMY Safety Ladder Co. proudly introduces the Mini-JOMY, a scaled down version of the JOMY Safety Ladder, specially designed for residential & light commercial applications. The Mini-JOMY looks like a drainpipe but folds out to a 17" wide ladder with slip resistant rungs constructed of extruded anodized aluminum & stainless steel. The Mini-JOMY is maintenance free & will last the lifetime of any building. Call 800-255-2591 for additional information.

JOMY Safety Ladder Co.

CIRCLE 126 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).

Melton Classics, Inc.

CIRCLE 127 ON INQUIRY CARD

Tactile Warning Rubber Floor Tiles

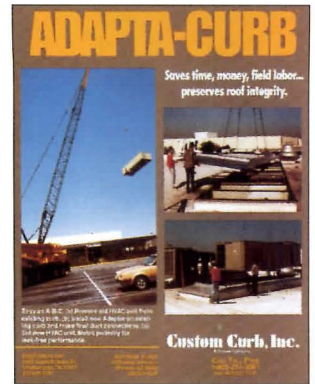


Tactile Surface Floor Tiles are engineered to meet the highest safety standards including all ASTM and ADA compliance requirements. Molded of first quality rubber, tactile rubber surface tiles are designed to withstand wear in heavy traffic areas, are scratch and burn resistant and feature color throughout the full thickness of the 3.5 mm gauge rubber tile, increasing the product's life. 800-447-8442 or www.mercerproducts.com.

Mercer Products Co., Inc.

CIRCLE 128 ON INQUIRY CARD

Sloped Adapter for Retrofit Solutions



Exclusive sloped adapter is designed for positive water runoff & 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 129 ON INQUIRY CARD

Parallel Design Partnership Limited

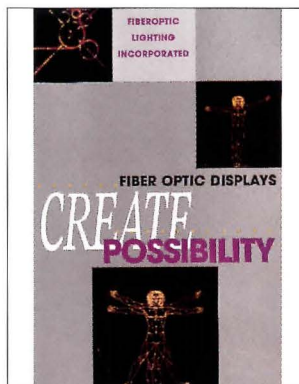


"ellen's brackets", and anodized-aluminum shelving system designed by M Ali Tayar, provides an elegant alternative to existing bracket-and-track systems. Cantilevered brackets come in two sizes, for shelves 3/4 or 3/8-in. thick and 10-in. deep. Wall-mounted tracks permit 1 1/2-in. adjustment of wood, glass or plexiglass shelves. For more info phone Parallel Design Tel: 212/989-4959 Fax: 212/989-4977.

Parallel Design

CIRCLE 130 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 131 ON INQUIRY CARD

Floating Stones Fountains

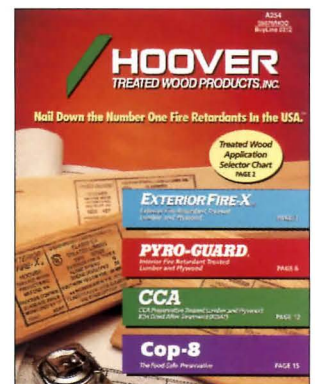


The highly polished granite sphere gently rotates on a thin film of water. Water pumped up from below at 10 to 12 psi is all that is required to begin the ball's rotation. The fountains are made to order in a wide range of materials and colors. Diameters range from 2ft (670lbs) to 8ft (45,000lbs).

Quarry Line, Inc.

CIRCLE 132 ON INQUIRY CARD

Fire Retardants and Preservatives



New 16-page Sweet's catalog features Pyro-Guard® interior type FRT lumber and plywood; Exterior Fire-X® FRT lumber and plywood for exterior uses; CCA/KDAT preservative treated lumber and plywood that's Kiln Dried After Treatment; COP-8® the food-safe preservative; PWF treated wood for Permanent Wood Foundations; and PLYWALL engineered wood noise barriers, from Hoover Treated Wood Products Inc, <http://www.frtw.com>

Hoover, Inc.

CIRCLE 133 ON INQUIRY CARD

**PORCH-LIFT®
Vertical Platforms**



PORCH-LIFT® Vertical Platform Lifts from Access Industries are designed to raise and lower a wheelchair user from one level to another indoors and outdoors for public buildings of all kinds. Easy to install and operate, the lifts require little to no site modification to install next to stairs or a landing. Standard models can be installed in a custom hoistway (shown above) to blend with any building design or accessibility plan.

Access Industries

CIRCLE 134 ON INQUIRY CARD

**Commercial Window
Treatments**

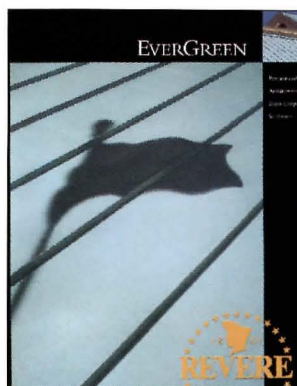


Springs Window Fashions provides the best value in commercial mini blinds with their Bali S3000. Premium features include curved headrail face, rear light blocking lip, aluminum slats with anti-static paint finish, hidden brackets, clutch tilter, all at standard cost. Privacy slat option provides enhanced light control with hidden cord holes. Springs also manufactures Graber and Nanik brand products. Call SpecFax for information at 800-327-9798.

Springs Window Fashions

CIRCLE 135 ON INQUIRY CARD

EverGreenBrochure

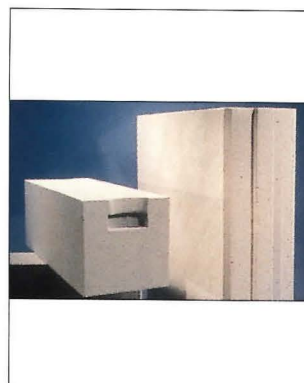


New Revere EverGreen™ pre-patinated architectural copper lets you specify the rich, warm look of patina, without waiting decades to fulfill your vision. Completely matures after 4 to 6 rainfalls. Adds striking beauty & character to any roof or accent. New EverGreen brochure. Revere Copper Products, Inc. P.O. Box 300, Rome, NY 13442-0300, 800/950-1776; F: 315/338-2105; <http://www.reverecopper.com>

Revere Copper, Inc.

CIRCLE 136 ON INQUIRY CARD

**YTONG Autoclaved
Aerated Concrete**



YTONG autoclaved aerated concrete (AAC) products are part of an integrated building system including interior and exterior wall panels, floor and roof panels, blocks and lintels. Ideal for single and multi-story structures, YTONG AAC is 30% lighter than standard CMU, can be cut, sawn, nailed and drilled easily, and provides excellent thermal and sound insulation, fire and termite resistance. 800-YTONGFL (986-6435) or www.ytong-usa.com.

YTONG

CIRCLE 137 ON INQUIRY CARD

**Custom Signage
& Graphics**



Imagine having one design that mirrors your architectural intent and successfully complements your image throughout the building. SCOTT Sign Systems, Inc. is your source for custom signage and graphics made to your design specifications including signs to comply with ADA. With our extensive custom capabilities, we can produce signage to incorporate custom materials such as laminates, woods and solid surfaces. Call 800.237.9447.

SCOTT Sign Systems

CIRCLE 138 ON INQUIRY CARD

**A powerful new idea in
accent lighting**

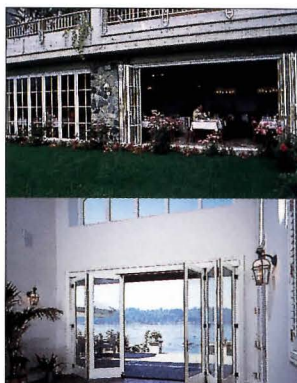


ProSpec® Linear combines the versatility of track with the unobtrusiveness of a recessed downlight. Featuring a range of 2, 3 and 4-lamp configurations in line voltage, low voltage and metal halide sources, the compact dimensions of ProSpec Linear allow a significantly cleaner installation while permitting larger focal pools to be created. (800) 215-1068.

Lightolier®

CIRCLE 139 ON INQUIRY CARD

The Opening Glass Wall

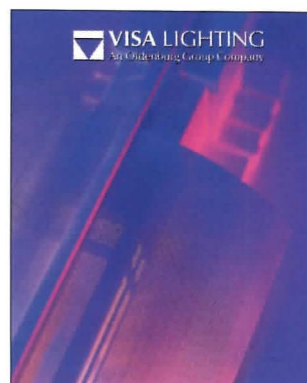


A full line of aluminum & wood framed systems that make large exterior openings possible. Expand space with indoor/outdoor areas. Increase business with large, inviting entrances. Ideal for residential & commercial applications. An aesthetic, engineered solution offering weather tightness, security, & ease of operation can be provided for almost any conceivable application. Available are folding, paired & individual panel systems. Call (800) 873-5673 or fax (415) 383-0312.

Nana Wall Systems, Inc.

CIRCLE 140 ON INQUIRY CARD

The 1998 Visa Magazine

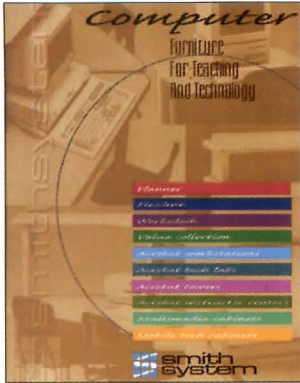


Introducing the newest specifying tool that Visa has to offer - The 1998 Visa Magazine! Used as a desktop tool, a quick & easy way to reference Visa fixtures. This 224 pg. color magazine includes the entire array of Visa products including wall sconces, ceiling mounts, pendants, table & floor lamps & outdoor products. It also highlights the Visa Quickship program as well as specification data & application shots. Call 1-800-788-VISA, fax: 414-354-7436, website: www.visalighting.com.

Visa Lighting

CIRCLE 141 ON INQUIRY CARD

Smith Leads Classroom Design



Teacher stations, student work centers and nearly infinite arrangement possibilities make Smith System furniture the key to classroom comfort and efficiency. Rugged, colorful and adaptable. For more information: Smith System, P.O. Box 860415, Plano, TX 75086. T: 800-328-1061, F: 972-578-2631, www.smithsystem.com

Smith System

CIRCLE 142 ON INQUIRY CARD

Mount Catalog Covers Industry



Mounts for everything through state-of-the-art plasma screens. Over 150 projector and speaker mounts, suspension adaptors, mobile carts and security devices cross referenced to manufacturers. Custom design and fabrication from prototype to inventories. www.mounts.com. For more information: Progressive Marketing Products, Inc., 2890-A Enterprise Street, Brea, CA 92821. T: 800-368-9700, F: 800-832-4888, pmpi@pmpi.com

Progressive Marketing

CIRCLE 143 ON INQUIRY CARD

Senergy's New Aurora Stone Finish

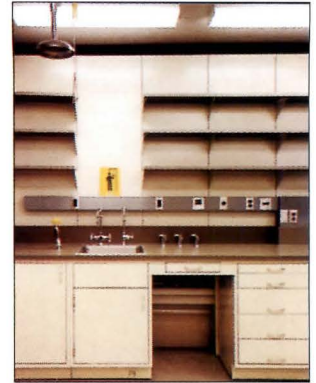


The Senergy Division of Harris Specialty Chemicals, Inc. introduces Aurora Stone Finish for EIFS, stucco and masonry. Aurora Stone Finish replicates the appearance of granite or marble, and is available in twelve standard colors. Acrylic-based Aurora Stone Finish is spray-applied, and is also suitable for interior applications.

Senergy

CIRCLE 144 ON INQUIRY CARD

For labs & clean-rooms New Dowcraft Twin Wall



Twin Wall is custom-designed for scientific research and hi-tech manufacturing facilities. Clean lines, durable finishes, optional filler cores permit Twin Wall to perform in categories to Class 10. Acoustical rating: STC 41 up. Self-supporting steel walls shipped ready to install. Heights up to 16 ft. Send for new brochure. Dowcraft Corporation.

Dowcraft Corporation

CIRCLE 145 ON INQUIRY CARD

Graffiti Proof Panels



Mapes Industries manufactures a complete line of architectural panels with a graffiti proof finish of porcelain enamel. The panels are available in both porcelain on aluminum or steel in a wide variety of colors. The panel applications include window replacement, curtain wall, soffit & ceiling projects. The panels are an ideal solution for high traffic/abuse areas such as schools & institutional buildings. For a free sample to test, please call 800-228-2391 or fax 800-737-6756.

Mapes Industries, Inc.

CIRCLE 146 ON INQUIRY CARD

Basin-Guard™ Undersink Enclosure

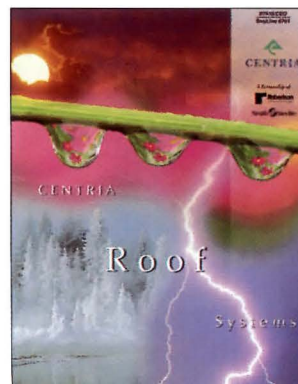


The Basin-Guard™ undersink enclosure attractively conceals unsightly plumbing and mechanical connections while maintaining knee and foot clearances mandated by A.D.A. It can be installed under kitchen sinks or restroom lavatories where countertops and sidewalls are present. The Basin-Guard™ is offered in 36" and 42" widths in white or beige and is easily trimmed down with common tools.

TRUEBRO, INC.

CIRCLE 147 ON INQUIRY CARD

Roof Systems Product Line

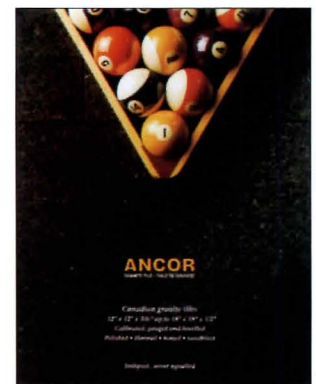


CENTRIA Roof Systems offers several economical and premium roofing solutions. The Integrity™ Structural Integrated Roof System combines an exterior and interior skin with insulation for a superior roof system that reduces installation time in half. CENTRIA also offers Architectural Design Panels and Structural Design Panels, both standing seam roof systems, and Utility Panels for new construction and renovation applications.

CENTRIA

CIRCLE 148 ON INQUIRY CARD

Ancor Granite Tile

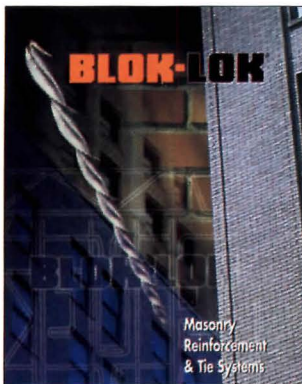


Ancor produces over fifty No. American and Imported granites in a full range of colors and finishes for residential, commercial and institutional use. Standard format is 12 x 12 x 3/8"; other sizes up to 18 x 18 x 1/2" available. Honed finish tile is particularly suitable for high traffic commercial areas, 435 Port Royal West, Montreal, Quebec, H3L2C3, Canada. Ph# (514) 385-9366, Fax# (514) 382-3533.

Ancor Granite

CIRCLE 149 ON INQUIRY CARD

Masonry Reinforcement & Tie Systems



Blok-Lok, with over 35 years experience in the design and manufacture of masonry reinforcing and tie systems, provide innovative solutions for the repair and stabilization of defective walls. Blok-Lok offers an economical stainless steel helical wall tie that is driven into position through a properly sized pilot hole, providing a positive connection between wythes, while allowing for differential movement. 1-800-561-3026.

Blok-Lok Limited

CIRCLE 150 ON INQUIRY CARD

**Teamboard
The Interactive Whiteboard**



Teamboard Inc., by Egan Visual, has developed the most powerful computer interactive whiteboard. It 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 allowing you to control the projected application by touching the whiteboard. For info 1-800-263-2387 or visit www.teamboard.com.

Egan Visual Inc.

CIRCLE 151 ON INQUIRY CARD

**Hadrian Toilet
Compartments**



Hadrian's double pan panels, pilasters & doors are honeycomb-cored for impact resistance. All panel parts are permanently sealed for strength & hygiene. Available in Stainless Steel or Galvanneal zinc-iron treated sheet steel, powder coated with easy maintenance hybrid epoxy. Nineteen standard colors plus graffiti resistant textured finishes. Door latch meets handicapped requirements. Call 440-974-7120. Fax: 800-536-1469.

Hadrian Inc.

CIRCLE 152 ON INQUIRY CARD

Pan-Tech

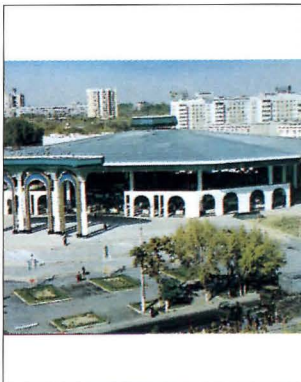


manufactures composite building panels in a variety of different face materials and finishes. Aluminum: two, three and four coat Kymar finishes, anodized, colour & brushed. Stainless Steel: 304, 316 grades, #4, #8 finish, coloured stainless and patterned. Zinc: Rheinzink pre-weathered. Porcelain: for Spandrel applications. Copper: pre-patinated.

Pan-Tech, Inc.

CIRCLE 153 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 154 ON INQUIRY CARD

**Vision Control@:
Louvered Glazing**



Custom-made hermetically sealed glass unit consists of rigid pivoting aluminum blinds, manually operated or motorized, no cords or strings attached! Dust-free & maintenance-free, thanks to its hermetic seal. Provides privacy, hygiene, control of light, heat, sound. Endless lighting possibilities available in various shapes, sizes, glazing options. Suited for windows, doors, skylights, interior partitions; for all commercial, institutional, & residential applications. Call 800-668-1580.

Unicel

CIRCLE 155 ON INQUIRY CARD

**SPACEAIDE
Compact Kitchens**

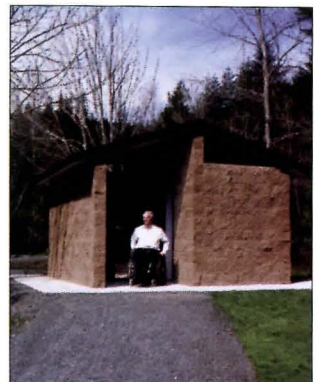


Full service kitchen, with refrigerator, oven, range and sink all-in-one appliance. Ideal for hotel/motels, condominiums, apartments, studios, hospitals, seniors accommodations, and any other location where space is at a premium. Available in a variety of sizes (30", 39", 51", 60") and colours (white, almond, black, custom). For further information call (613) 925-4250 or (800) 266-0034, or fax: (613) 925-4506.

Bremm Metal Products

CIRCLE 156 ON INQUIRY CARD

**Romtec Sierra
Pre-Engineered Restrooms**



Complete pre-engineered systems for parks, golf courses, sports facilities, boat ramps and urban recreation areas. Plans include compact single-user and large multi-user facilities with showers & space for storage & concession sales. Complete systems include all fixtures, hardware, doors & windows. Romtec's SplitLok™ dry-stack concrete block system & pre-fabricated steel roof panels provide for fast installation. Free video available. Call 541-496-3541 or visit www.romtec-inc.com.

Romtec, Inc.

CIRCLE 157 ON INQUIRY CARD

POSITIONS VACANT



**MICHAEL LATAS
& ASSOCIATES**

*Executive search and professional recruiting services.
Serving the construction industry exclusively
nationwide since 1975.*

Your premier source for executive, managerial, and
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St. Louis, MO 63132

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**ARCHITECTURAL CONSTRUCTION
ADMINISTRATORS**

Two full-time Architectural Construction Administrators to assist with providing general architectural services for our client base. Provide construction administration for buildings under construction including visits to construction sites to observe progress in work, processing of technical shop drawings (fabrication drawings), interpret contract documents and produce contracts, and response to general inquiries from the general contractor. Responsible for ensuring scheduling compliance, review of test data, ensure quality control on job, product final inspection punch-out, issue Certificate of Substantial completion, produce Change Order estimates. Assist with production of construction documents, utilizing AutoCAD. Must have a Bachelor's degree in Architecture or Architectural Science. Must have five years of experience in the job offered or five years of experience as a Graduate Architect. Experience must have included AutoCAD. Must be eligible to sit for Architectural Registration Exam. Salary \$50,981/yr. Overtime 1 1/2. Send resume to: Georgia Department of Labor, Job Order #GA 6224604, 1535 Atkinson Road, Lawrenceville, GA 30043-5601 or the nearest Department of Labor Field Service Office.

JOB CAPTAIN

Positions available with client firms in PA, FL, OH, WI, MO, VA, AZ, and other states nationally for qualified degree and nondegree professionals with cadd, dd, cd and coordination experience. All positions are permanent status with paid relocation, fees, etc. Mail confidential resume to Greg Marshall PE, RA @ G. Marshall Assoc.-P.O. Box 66083-Chicago, IL 60666 or fax: 773-736-1802. Nationally known recruiters of architects and engineers for twenty-five years.

ARCHITECTS

International architectural firm specializing in cinema design with offices in Kansas City and London is seeking entry level architects, project architects and CAD technicians proficient with AutoCAD, release 14. We offer competitive salary, excellent benefits and opportunity for advancement. Send resume in confidence to HR Department, 106 W. 11th, Suite 1900, Kansas City, MO 64105, or fax to (816) 842-9817.

ENGINEERS - \$40,000-\$135,000

Key positions nationwide with leading ENR Top 500 regional and national firms. Highway, bridge, traffic, transportation, civil, electrical, mechanical, structural & environmental positions. Highly confidential! No fee! Group One Search, 639 N 7th St, Grand Junction, CO 81501. Tel: 970/241-2499, fax 970/241-2504, e-mail: GrplSearch@aol.com. Visit our website at "www.grouponesearch.com" today!

SENIOR MEDICAL PLANNER

Established West Los Angeles architectural practice seeks Senior Medical Planner with a minimum of ten years of healthcare experience. Registered architect preferred. Must have excellent visual and verbal skills with sensitivity for design. Must show extensive experience in hospital programming, blocking and stacking, departmental layout and have current knowledge of healthcare equipment and trends. Career opportunity to participate in a major \$400M university replacement hospital. Fax resumes with salary history to Joe Balbona at RBB 310-312-3646.

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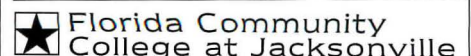
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Review will begin July 15, 1998.

Application is required to be considered. Contact human resources department (904) 632-3210 days, and (904) 632-3160 evenings/weekend; e-mail address: employment@fccj.org. FCCJ is an equal access/equal opportunity/affirmative action college.



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THE FUTURE Robotic parking and the ever-changing dynamics of land use.

BY ELANA H. FRANKEL



Close your eyes and imagine driving up to a parking facility's clean, well-lit entry station, similar in appearance and size to a single-car residential garage. (If you live in New York City, ignore the sign that says two hours of parking costs \$25.) Soon after you pull into the bay, a motion detector triggers a sign that lights up and alerts you to stop the car, turn off the engine, put on the failing brake, push down the antenna, exit the car, lock it, and step out. Then a ticket is automatically dispensed from an ATM look-alike. Once you take the ticket, the back door of the parking facility closes and the front door opens. The car is moved on a pallet—similar to the technology used at a car wash—to an empty storage compartment on any one of the facility's levels.

When you are ready to retrieve the car, you insert the ticket into the parking system's machine and pay your bill with a debit or credit card. Once you've paid, the system moves your car from its parking space to the exit bay—and away you go. You never see or speak to a garage attendant.

This scenario, not so far in the future, is made possible by robotic parking. A Florida-based company with this same name recently landed a patent for such a system of parking, storing, and retrieving cars. Called a modular automated parking system, it consists of a parking structure that can be up to 20 stories high and is made of open-steel-rack con-

struction with a built-in computerized system. A full-time hired operator or a Robotic Parking employee at a remote location can monitor the system via an on-site personal computer running Windows NT.

The automated garage's size is about half that of a conventional facility, and it optimizes space by doubling the number of parking

no space between cars, and lower ceiling heights. And because there are no people walking around the structure, it is safer, eliminating the risk of car damage, theft, or injuries.

"This will also change the dynamics of land use," says Gerhard

specific circumstances, but it generally costs 30 percent less than building a conventional underground parking lot. For on-ground robotic parking, the price is the same as for conventional systems, but operating costs are lower.

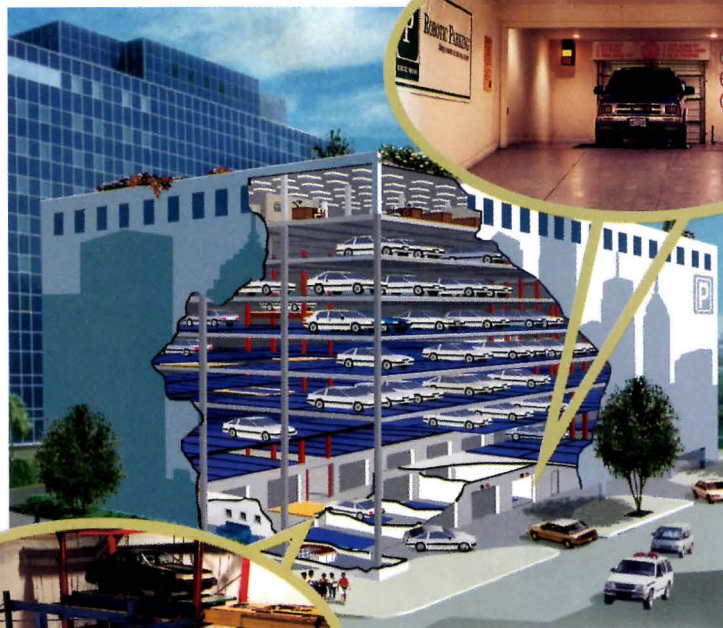
Robotic Parking has built a test facility in Leetonia, Ohio, and modified earlier

European and Asian designs that relied on bulky stacker crane systems. In late April the city of Hoboken, New Jersey, accepted a bid to build an automated

system in a residential area. "The entire city needs parking," says Don Pellicano, one of the city's five Parking Authority Commissioners. "The area is very densely populated. For every 100 spaces, there are 110 cars waiting."

The preliminary designs for the structure, which will be open to customers who pay monthly, blend in with the surrounding homes—it uses three shades of brick and has windows—so as not to disrupt the community's appearance. "The cars will be able to move both vertically and horizontally," says Pellicano. "And the office will be staffed 24 hours a day to ensure safety."

The lot measures slightly more than 100 feet wide and 95 feet deep, and the six-story automated parking structure will store 324 cars. Because the spot is too awkward a space to hold a conventional garage, an open surface lot would be the only other alternative. And that would accommodate only 30 cars. ■



Haag, president of Robotic Parking. "For example, with a limited amount of land available in cities and a high demand for parking, the system could have a major impact in urban development projects."

Developers can easily accommodate parking needs because the robotic parking system can be built on a very small lot (as little as 60 square feet); on top of or under existing buildings; or as a retrofit. The cost of building such a structure, Haag says, depends on the

places of a ramp-style garage. For example, twice the amount of cars accommodated in a conventional garage that measures 200 by 300 feet can be parked in a 100-by-150-foot robotic parking structure. The robotic garage allows for so many cars because it has no ramps,



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