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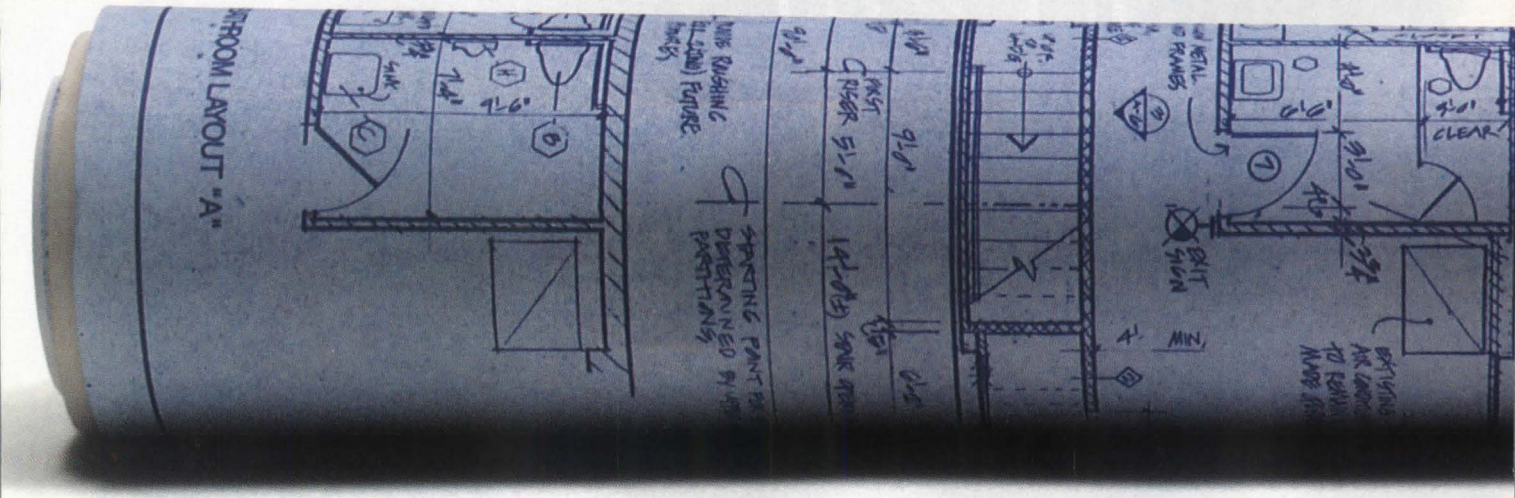
Tomorrow's Schoolhouse:
Making the Pieces Fit

ALSO IN THIS ISSUE:

- Environmentally Sensitive Houses
- Critique: Chicago Public Library
- Rehabbing a Housing Landmark
- Windows and Glazing



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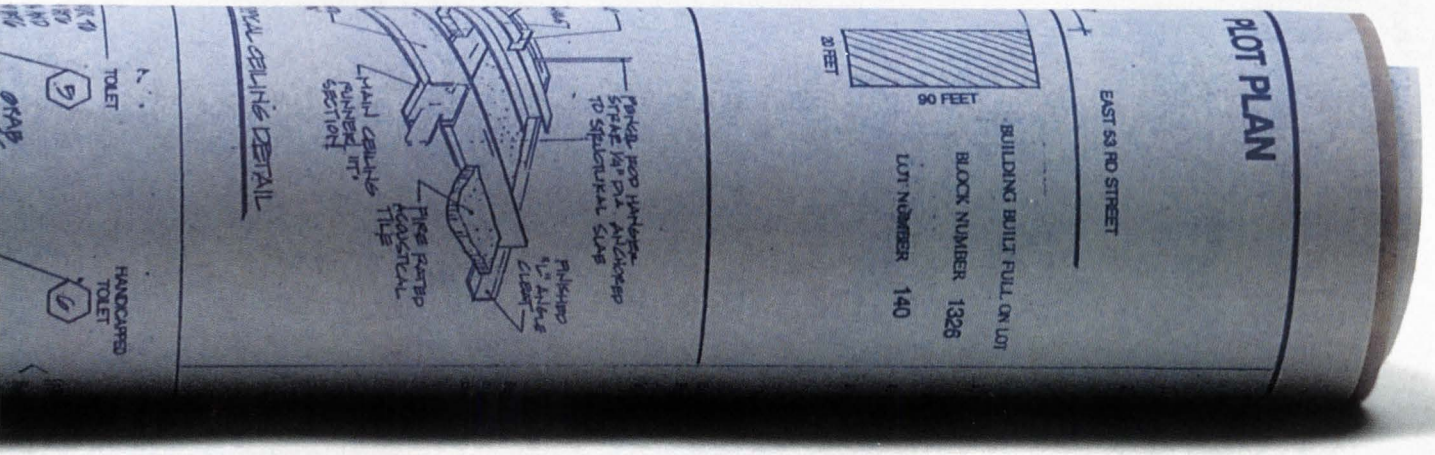

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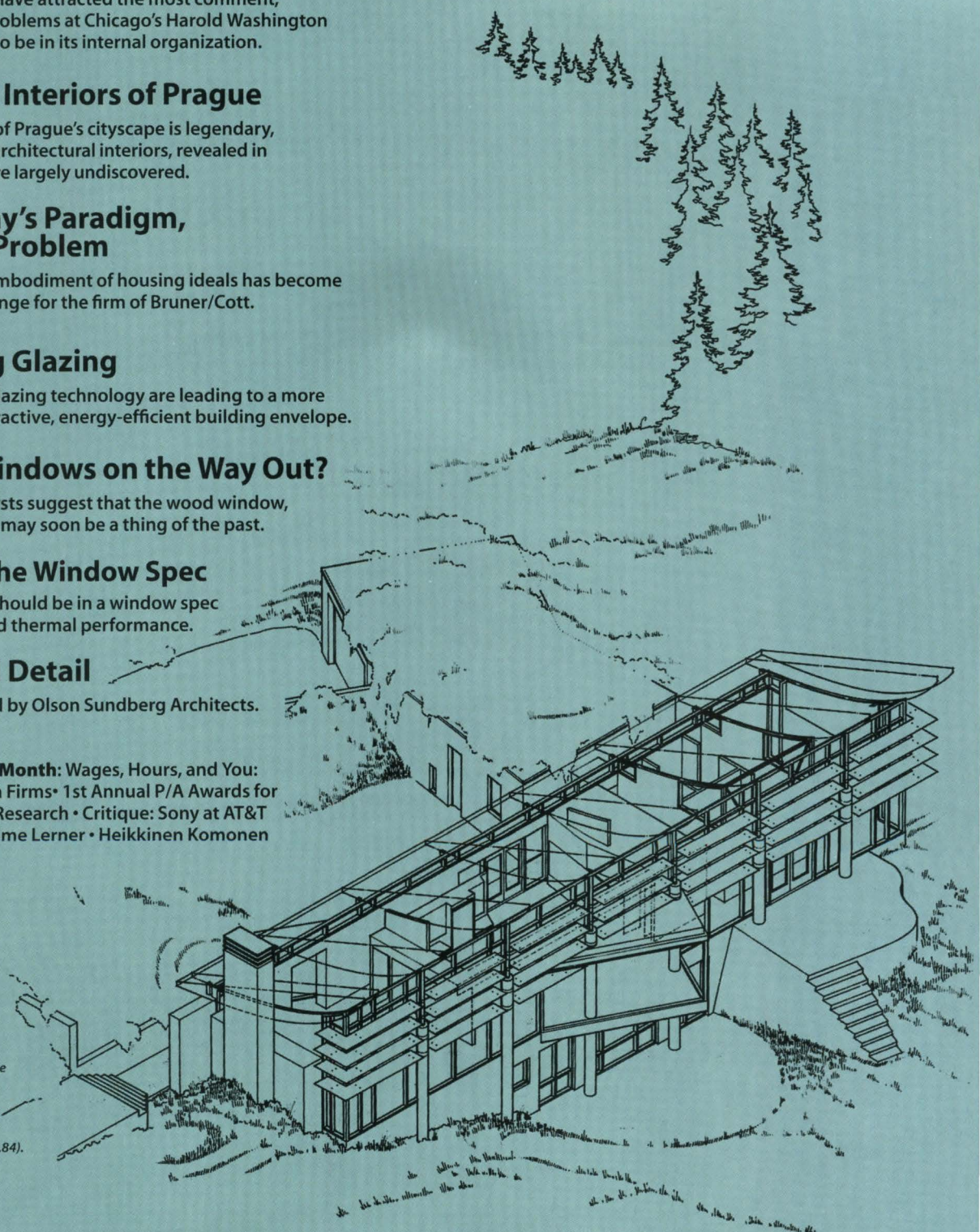

COVER: *Photo courtesy Dewitt Historical Society Cover design by Julie Anne Yee*

THIS PAGE: *Perspective rendering of House Two, Olson Sundberg Architects (p.84).*

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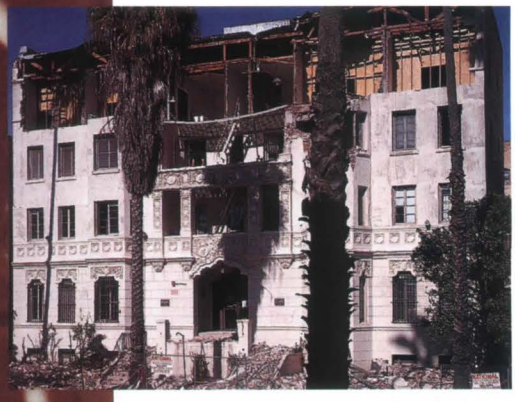

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The Color of Money

The green architecture movement has come a long way from its beginnings 25 years ago. What started as an outgrowth of the 1960s counterculture fascination with alternative forms of energy and self-sufficient commune living became nearly mainstream during the oil crisis in the 1970s. In the "Go-Go Eighties," when oil became cheap again, the solar movement seemed to go into hibernation, as the architectural profession, the press, and the schools turned their attention elsewhere.

The profession needs better financial incentives to design buildings that consume fewer resources and less energy.

Now the green architecture movement, spurred by our realization that there is a price to pay for everything we waste on this planet, has gained new momentum. In 1990 the American Institute of Architects formed its Committee on the Environment (which quickly became one of the fastest growing of AIA's Professional Interest Areas). The Institute devoted its 1993 convention (and Susan Maxman her term as AIA President) to the theme of sustainable design.

And there has been a marked change in the dialogue going on in architecture schools. While the Post-Structuralists chattered at countless symposia, obfuscating on thin ice, students began asking questions about the architect's social responsibility and architecture's role in mending the environment.

We have come to understand, as researchers at Lawrence Berkeley Labs relate in an article in this issue (p. 108), that there is more to sustainable design than just throwing technology at the problem. Architects, engineers, and clients must take a coordinated approach to building and system design. Such a concerted effort magnifies the cumulative rewards of energy-efficient windows, better daylighting, smaller systems, reduced building volume, and ultimately more comfortable users who, studies now show, are more productive as a result.

But what has remained unchanged in the intervening years is the profession's fee structure, which gives little incentive to design and administer the construction of energy-efficient buildings. This became clear at a recent conference, sponsored by Carrier, which brought together some of the leaders in green architecture. Randolph Croxton, whose firm designed the headquarters for the Natural Resources Defense Council and the National Audubon Society (P/A, March 1993), articulated the dilemma that architects face: Why should they spend time trying to figure out how to lower energy consumption, downsize mechanical systems, and reduce artificial lighting equipment when their fees are tied to the building's cost? And clients have no incentive to accept the alternative of hourly rates for design services, which would compensate us for research time.

Amory Lovins of the Rocky Mountain Institute echoed these concerns later in the conference, when he spoke of the perverse way that architects are compensated for their services. "You're penalized for efficient design and rewarded for inefficient design" noted Lovins.

Lovins has been working with the AIA to develop new fee structures that would encourage architects to do the right thing. One possibility is to charge a conventional percentage for the basic design, and then a percentage fee for every dollar saved in reducing the building's energy consumption and cost. Part of a building's anticipated energy savings might be awarded to the architect up front. There could be additional compensation calculated on the actual energy savings over a period of time. This would encourage architects to become more involved in building commissioning, making certain that systems are installed, operated, and maintained correctly. Ongoing monitoring of building performance could become part of the scope of services.

Another strategy is to work with utilities, which are always looking for ways to reduce demand instead of building more power plants. According to Lovins, Ontario Hydro Electric came up with a scheme where they would give three years' worth of energy savings as a rebate directly to the design team.

The federal government is also interested in using its leverage to encourage such compensation schemes. Mark Ginsberg of the DOE's Office of Federal Energy Management says that a demonstration program is in the works with the General Services Administration that would reward the design team with "fee-bates," a share of the savings for reduced energy consumption and lower mechanical systems costs.

But architects shouldn't wait for these institutional changes. Start discussing these ideas today with your clients and other members of the building team. Sustainable design comes in many shades of green. □

Michael J. Crosbie

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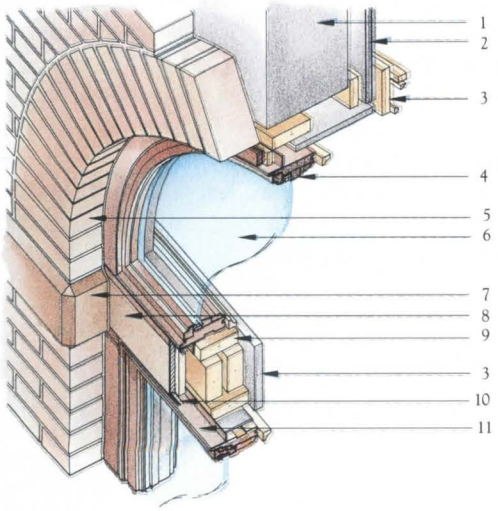

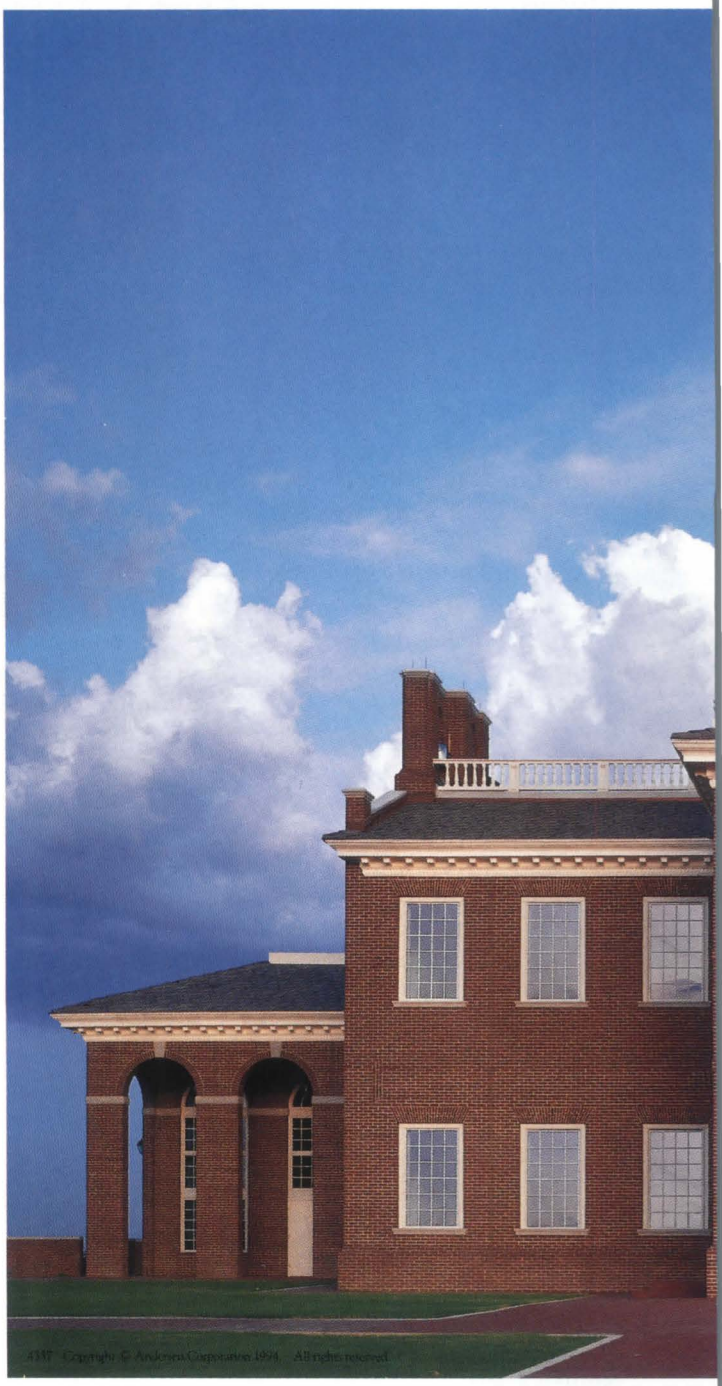

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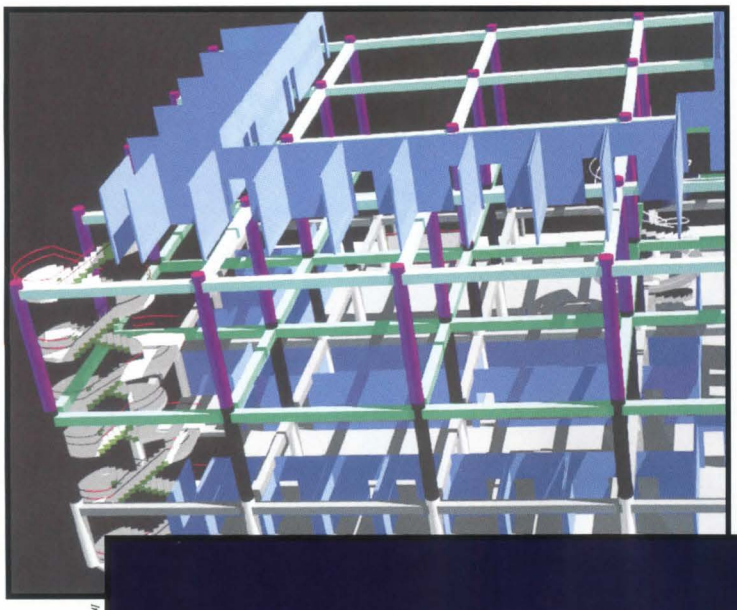

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AIA: Worth the Price of Admission?

Suspicions confirmed. Your portrayal of where the money goes (April 1994 issue) is eye-popping. Certainly these aren't figures that one can go to AIA and have portrayed in this light.

The credibility of your article was driven home when I held out my right hand imitating the picture on page 64 (recipient's hand holding AIA pin) and realized that my shirt cuff was also frayed, this at a time when architects are struggling to survive while National is proud they are actually doing better than the local chapters.

Thank you for a courageous and eye-opening piece of reporting.

John J. Hernikl, AIA
Walnut Creek, California

I have just finished reading the article entitled "AIA: Worth the Price of Admission?" (April 1994 issue) I would agree the AIA has some work to do to become more responsive and useful for its members. But I disagree with the format of the article, which seemed to be vindictive, as though someone had a personal axe to grind with the organization.

In reading the subsection "Why Do Architects Join?" I feel the most important reason was left out. That is that members should join to give back to the profession which supports them. The AIA is an organization in which collective membership by architects gives the potential to promote the profession. This will only happen when active and dedicated members join for that purpose. We owe it to our profession. In return, by making our profession better, we can be better as individuals. The AIA will not become better when we sit back and complain, or publish biting investigative reports about the organization.

I hope that in the long run your article stimulates more architects to join the AIA for that reason. Then we can take care of some of the problems mentioned in your article. I encourage my fellow architects who have not joined the AIA to do so. It is apparent they are needed now more than ever if we wish our profession to survive and prosper.

Mark Harberts, AIA
President, AIA Albuquerque

Ah, a breath of fresh air! Michael J. Crosbie's article, "AIA: Worth the Price of Admission?" (April 1994 issue) was the editorial equivalent of shouting that the emperor wears no clothes. Every year I anguish over whether or not to pay my dues, as I have every year since 1982. It bothers me that my dues are equal to two-thirds of my health insurance co-payments, equal to all of my life insurance premiums, equal to one-half of that cheap computer I keep promising to buy my son, equal to 16 decent professional books, and equal to a ten-year subscription to your journal.

Why pay the dues? Why not quit, especially when I read that the AIA spends more money on its 49-member board of directors than it does on lobbying and public outreach combined? Well, as a federal government employee, I've decided that I do it solely for my professional pride and ego. It is the last vestige of professionalism that I retain in a less-than-professional working environment. I believe that "AIA" behind my name buys me at least 30 I.Q. points in the estimation of the private sector architects and engineers that I deal with (although it solicits suspicious and snide remarks from fellow government employees, who view those letters as a vain perversion somewhere between a nose ring and Harley-Davidson tattoo).

In the past I've felt that "AIA" conveyed the status of "real" architect, not some wanna-be. As time passes, this seems to be less and less true. Of course, I expect that your article will be rebutted by the Institute with the standard "Great Things We Have Done For You" list. If the Institute does respond with a circle-the-wagons mentality, they are missing the point. There is genuine disenchantment in the ranks. Architects are renowned for their innovative thinking -- it is time to apply that innovative thinking to the Institute itself.

Randy L. Guy, AIA, Architect
Mount Pleasant, South Carolina

Three cheers for your article (or should I say exposé) on the AIA!!! I joined the AIA four years ago with great pride as a newly registered architect. As a professional, I felt that it was absolutely vital to "invest" in a cause that would address at the national and state levels the concerns and issues of the profession. This, as the article clearly points out, seems to be financially one of the AIA's lowest priorities.

This alone, however, was not enough to discourage me from my membership. With each successive year, I struggled to meet the ever increasing yearly dues for the national and local chapters until I was faced with the $400+ dues this year. As any practicing architect knows, this is not a drop in the bucket but a significant percentage of our yearly salaries. As a matter of fact, lawyers of similar experience (but a completely different pay scale) pay less to be a member of the Bar. To add insult to injury, I found that even when I did scrape together the dues, the benefits I received from my membership were few and far between. The national and local events scheduled almost always had high price tags associated with them (dinner seminars with $100 price tags or extensive travel) and the AIA "membership card perks" (health insurance, car rentals, etc.) could easily be matched or beaten by pricing the competition.

In the face of ever increasing fees and tenuous benefits, I decided to drop the AIA suffix. In my seven years of practice, I have never been questioned by a client about my AIA status, and I know that I have little to fear in that area on the future. I applaud last month's article not only because it aired many concerns about our national representation but also because it suggested some possible solutions to these problems. I sincerely hope that the AIA is out there listening and will prove me wrong!

Blake Auchincloss
Mansfield, Massachusetts

Thank you so much for your article on the AIA. If this is the sort of investigative journalism you intend to pursue in your new format I will look forward to every issue. There are plenty of other sacred cows in the architectural field ready to be skewered. One issue you failed to raise, however. If the AIA fails to serve the profession, who's really at fault? A truly democratic organization is only as moribund and pathetic as its members. If, on the other hand, members do not have a real voice in decision making, that is the crux of the problem. After 13 years in the profession I have never felt the need to become a member, and so leave it to you and your readers to answer this question.

Richard Jackman
AIDS Housing Research Project, New York

Michael Crosbie's quirky, breathless, hackneyed, and altogether delightful riff on the AIA (April 1994 issue) is only a barely realized product of a good editorial idea.

Indeed, I suggest that P/A do an annual report card on the AIA and its chapters. Such an evaluation, however, must appre-

(continued on next page)

Views

(continued from page 11)

hend and elucidate much more clearly the inextricable link between the national office and its local chapters throughout the country. It is difficult for me to understand the AIA as a whole without perceiving it as an organization of over 300 offices. It is not just an office in Washington, and it seems goofy to me to write about the AIA as if the national office and the local chapters did not share an identity, common members, common goals, common means, and daily work relationships. My staff of four and I could not respond to the daily needs of our 3,000+ members and thousands of nonmember customers/clients in Boston if we were not able to draw daily on our Washington office for information, advice, materials, tools, and substantial other resources for our members and ourselves.

Michael Crosbie's gleefully youthful enthusiasm for his task is terrific. Next time a more substantive intellectual reach into the AIA ideally would scurry beyond the likely truisms of most human associations (unwieldy boards, salaries that are too high whenever they are higher than mine or yours, frequently increasing distances between dreams and behavior, etc.) and begin to assess through modulated and thoughtful analyses how (through the AIA) we perceive our culture and our profession, how these perceptions diverge from our professional fantasies and popular wisdom, how perceptions can be more finely and more elegantly tuned to reflect reality (or at least the perceived reality), and how all of us in and near this beleaguered profession can figure out how to use the cultural mechanisms available to us (such as our only professional alliance) to find God, Mammon, Eros, and a free lunch.

Michael Crosbie and P/A have caught our attention with a titillating tweak ... but understanding the profession's ailments and prescribing useful diagnoses and remedies is an intellectually rigorous marathon and not a sprint. I hope you'll keep on.

Richard Fitzgerald, Executive Director
Boston Society of Architects

"Responsible" Journalism

When I was in architecture school in the late 1960s (U. of Washington, B. Arch., 1970), the confusion, enthusiasm, vision, and fear that informed all of our work was inescapable. This was the era of students telling their *professors* that an assigned project wasn't relevant to the pressing political and social needs of society. We were involved in advocacy architecture. We wanted to change the world. It was a naïve and wonderful time to dream dreams.

Well. Three years later, I returned to the U.W. to get my Master's degree. In the intervening time the nation had slipped into recession. Particularly hard hit Seattle, where Boeing laid off 70,000 people in the space of a couple of years, had billboards proclaiming "Will the last person to leave please turn off the lights!" And the architecture school students had turned into technobots. The design studios were full of intent, but not intense, people practicing their lettering, because they knew that if they had any hope of finding work upon leaving, it would be as a junior drafter in some factory firm. The scene I had remembered of the studios was one of passionate arguments. The scene I returned to was a view of assholes and elbows. The buildings being designed were solid, competent, boring, and completely risk free.

When economic times are tough, survival instincts take

(continued on page 14)

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Views

(continued from page 12)

over. Unfortunately, this malady seems to have afflicted you r magazine. As Yogi Berra once said, "It's *déjà vu* all over again."

P/A has for decades been a place where we could go to see projects that inspired us, confused us, angered us, and awed us. Just like in school way back when, it was ideas turned into architecture that made it all so wonderful. The work you published before was both evocative and provocative. Even the craziest of your buildings at least challenged our notions about this noble profession. They showed us the possibilities.

In the current recessionary times, people in your focus groups may have been afraid for their professional and financial futures, and been looking for "responsible" archi-journalism in lieu of what many perceived as a fashion rag. Lord knows there are plenty of serious problems that need to be addressed. But please don't lose the passion your magazine once possessed.

Craig Hanson, Architect
Vashon, Washington

Workplaces

Design workplaces conducive to teamwork, design spaces to increase interaction, design quality space to improve productivity and efficiency of teamwork.

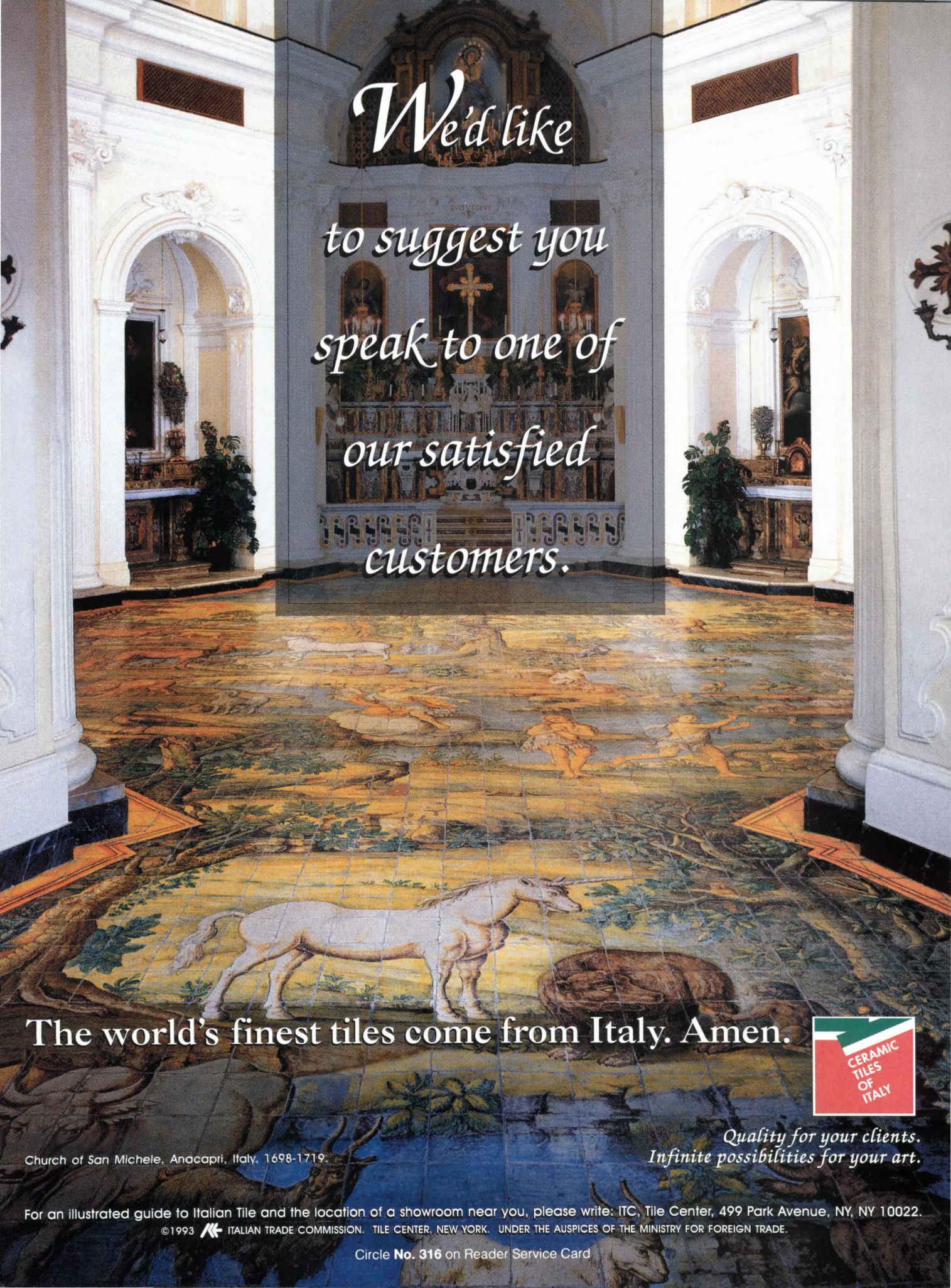
These are heady remarks. I certainly applaud Ziva Freiman's efforts (March 1994 issue) to expose a truly significant opportunity for architects. The caveat must be noted, though, "assuming willingness on the part of the client." It is now up to us to use BOSTI's research, Hertzberger's paradigm, and Vivian Loftness's exhortation "to establish the infrastructure to support constant change" in order to foster that willingness.

I find these ideas particularly compelling since both my educational and work experience center on design creativity through teamwork and quality interaction. W. Edwards Deming notes that one aspect of a successful business is to break down the barriers to staff areas. Now architects can actively assist in making their clients' businesses more successful.

Richard O. Podulka, President
North Park Studio, Architects
Berea, Ohio

CORRECTION
Oxford Brookes

The Joint Centre for Urban Design (Books, P/A, March 1994, p. 12) is at Oxford Brookes University in Oxford, England, not at Oxford University.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Entries must be received by 7 October 1994.

Jury

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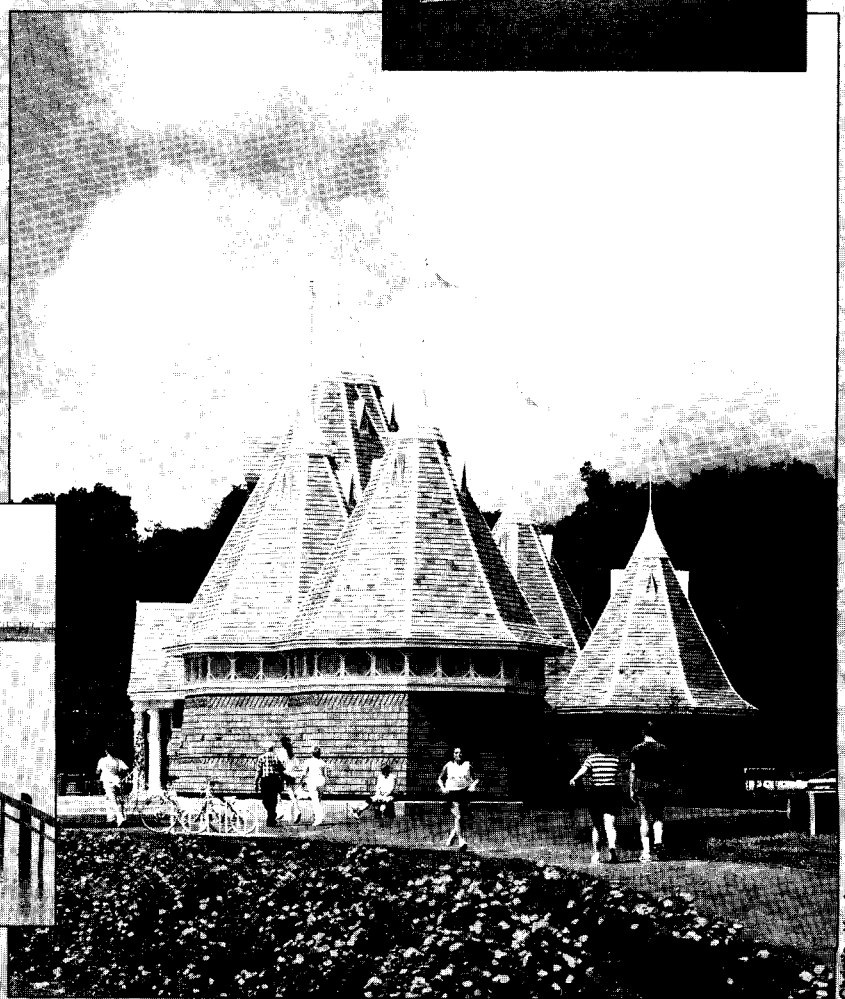
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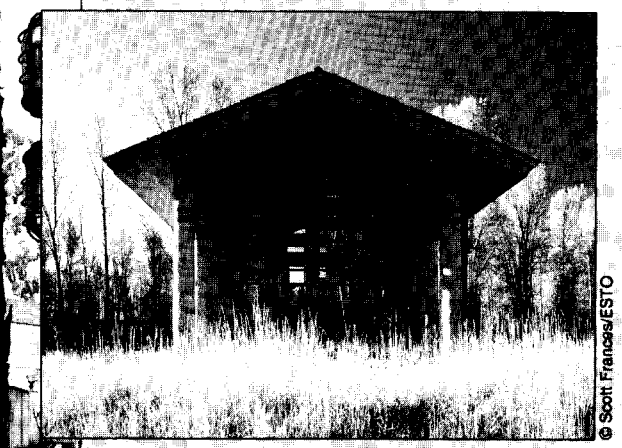

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To receive more information and complete entry forms, write or call the **American Wood Council Wood Design Award Program,** c/o ACSA, 1735 New York Avenue NW, Washington, DC 20006, telephone: 202/785-2324, facsimile: 202/628-0448.

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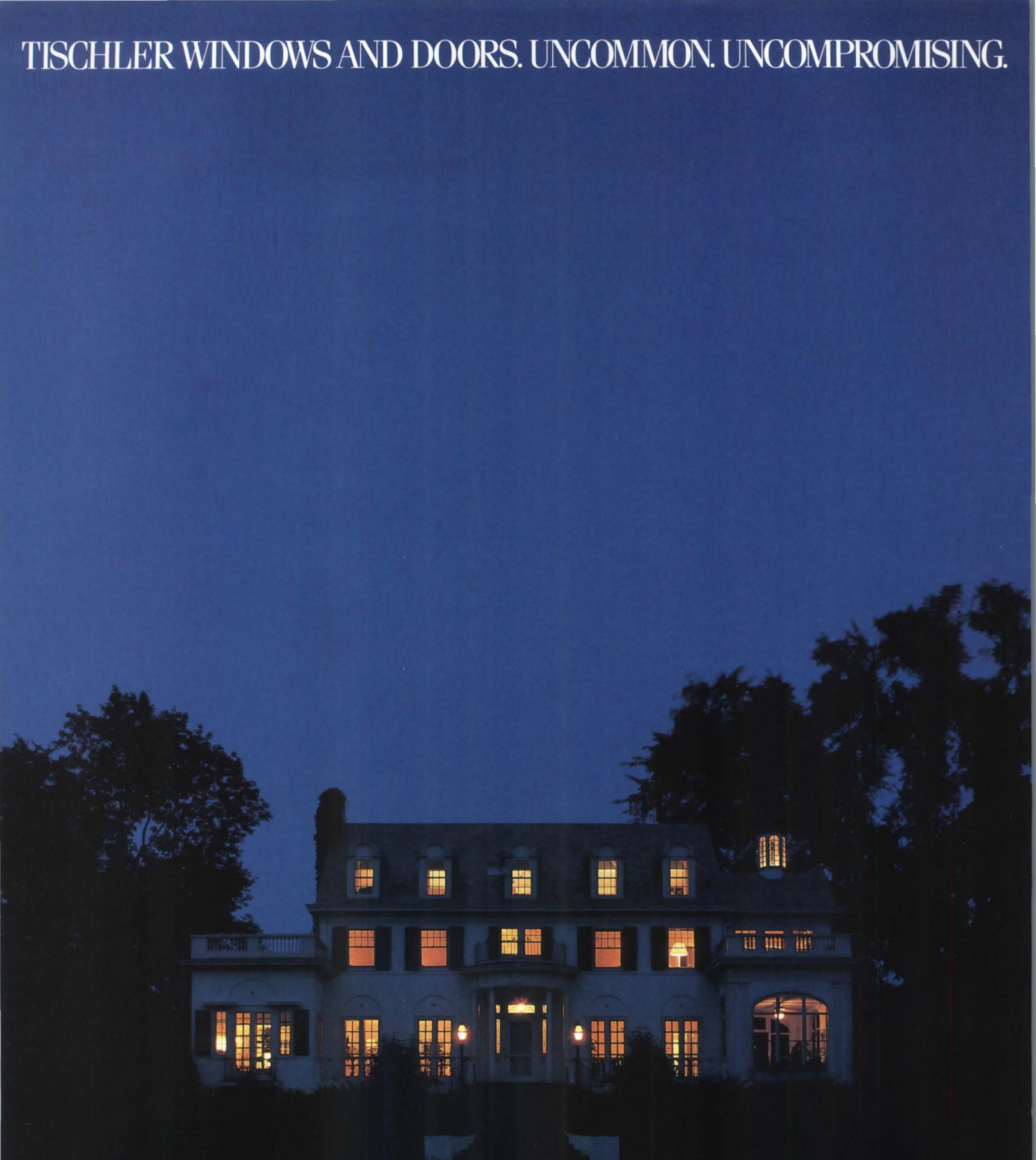

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Deadline for Submissions: September 9, 1994

Judging will take place in October 1994 and winners will be notified, confidentially, by October 31. Public announcement of the winners will be made in January 1995, and winning entries will be featured in the January issue of P/A. Clients, as well as professionals responsible, will be recognized. P/A will distribute information on winning entries to national, local, and specialized media.

42nd Annual P/A Awards

Progressive Architecture announces its 42nd annual P/A Awards program. The purpose of this awards competition is to encourage outstanding work in architecture and urban design before it is executed. Awards and citations will be designated by a jury of distinguished, independent professionals, basing their decisions on overall excellence and innovative ideas. In an effort to address the broader concerns of the profession, P/A is encouraging this jury to take into account various considerations in addition to qualities of form; response to program and context, management of the design and construction process, technical solutions and details, social and economic contributions. Potential entrants are urged to interpret the call for "outstanding work" as broadly as possible, consistent with the awards program's limitation to specific projects that have been accepted for execution.

Eligibility

1 Who Can Enter.
Architects and other environmental design professionals practicing in the U.S., Canada, or Mexico may enter one or more submissions. Proposals may be for any location, but work must have been directed and substantially executed in offices in those countries.

2 Real Projects.
All entries must have been commissioned, for compensation, by clients with the authority and the intention to carry out the proposal submitted. In the case of design competitions, the proposals eligible are those the client intends to execute.

3 Architectural Design Entries.
Entries in Architectural Design may include only works of architecture scheduled to be completed after January 1, 1995. Indicate anticipated completion date on Projects Facts page (see item 7, below). Prototypical designs are acceptable, if commissioned by a client.

4 Urban Design Entries.
Entries in Urban Design must have been accepted by a client who intends to base actions on them. Implementation plans and anticipated schedule must be explained in entry.

5 Verification by Client.
The jury's decision to premiate any submission will be contingent on verification by P/A that it meets all eligibility requirements. To that end, P/A will contact the clients of projects the jury selects for recognition. P/A reserves final decision on eligibility and accepts no liability in that regard. Please be certain your entry meets the above rules.

(Submission requirements and entry form on the following page)

Jury

Michael Dennis,
Principal, Michael Dennis & Associates, Boston
Professor of Architecture
Massachusetts Institute of Technology

Merrill Elam, AIA
Principal, Scogin Elam & Bray Architects, Atlanta

Richard Fernau, AIA,
Partner, Fernau & Hartman, Berkeley, California
Professor of Architecture
University of California, Berkeley

Nicholas Grimshaw, RIBA,
Chairman, Nicholas Grimshaw & Partners, Ltd., London

Emanuel Kelly, AIA
Principal, Kelly/Maiello Inc., Philadelphia
Professor of Architecture, Temple University

Entry Form: 42nd P/A Awards Program

Please fill out all parts and submit, intact, with each entry (see paragraph 12 of instructions). Copies of this form may be used.

Entrant:
Address:

Credit(s) for publication (attach additional sheet if necessary):

Entrant phone number:
Project:
Location:
Client:
Client phone number:
Category:

Entrant:
Address:

Project:

I certify that the submitted work was done by the parties credited and meets all Eligibility Requirements (1-5). I understand that any entry that fails to meet Submission Requirements (6-18) may be disqualified. Signer must be authorized to represent those credited.

Signature

Name (typed or printed)

Fees:

Subscriber $90 ☐ Non Subscriber $125 ☐ Entry plus one-year subscription, $125 ☐

Awards Editor/Progressive Architecture
600 Summer Street, P.O. Box 1361, Stamford, CT 06904
Project:
Your submission has been received and assigned number _____
(P/A will fill in this number and return this receipt. Please retain it for reference.)

Entrant:
Address:

(Receipt)

Awards Editor/Progressive Architecture
600 Summer Street, P.O. Box 1361, Stamford, CT 06904

Entrant:
Address:

(Return label)

Submission Requirements

6 Binders.
Entries must consist of legibly reproduced graphic material and text adequate to explain it, in English. All entry material must be firmly bound in binders no larger than 17" in either dimension (9" x 12" preferred). Avoid fragile bindings. Supplementary documents such as research reports or urban design appendices may be bound separately to avoid unwieldiness, as part of the same entry. Occasional fold-out pages are permissible, but unbound material in boxes, sleeves, etc., will not be considered.

7 Project Facts Page.
To assure clear communication to the jury, the first page in the entry binder must list PROJECT FACTS under the following explicit headings: Location, Site characteristics, Surroundings, Zoning constraints, Type of Client, Program, Construction systems, Funding, and Schedule. Give hard data (square footages, costs, specific materials) where possible. All Project Facts should fit on one page. Paragraphs amplifying this data, covering design philosophy, etc., should be included on subsequent pages.

8 Documenting the Process.
It is desirable for entries to document the design process, as well as its result: entrants are encouraged to include copies of preliminary sketches, alternative preliminary schemes, information on context and precedents for the design, and excerpts from working drawings.

9 Research Behind Projects.
While P/A is cosponsoring a separate annual competition for architectural research (results of the 1st annual Research Awards competition in July 1994 P/A) we encourage the inclusion of any research done in support of a specific architecture or urban design project that is otherwise eligible.

10 No Original Drawings.
Original drawings are not required, and P/A will accept no liability if they are submitted. No models, slides, or videotapes will be viewed by the jury.

11 Anonymity.
To maintain anonymity in judging, no names of entrants or collaborating parties may appear on any part of the submission, except on entry forms. Credits may be concealed by tape or any simple means. Do not conceal identity or location of projects.

12 Entry Forms.
Each submission must be accompanied by a signed entry form, to be found on this page. Reproductions of the form are acceptable. Fill out the entire form and insert it, intact, into an unsealed envelope attached inside the back cover of the binder.

13 Entry Categories.
For purposes of jury procedure only, please identify each entry on its entry form as one of the following: Educational (including any campus buildings), House (single-family), Housing (multifamily), Commercial, Cultural, Governmental, Health-related (including nursing homes), Industrial, Recreational, Religious, Urban design. Mixed facilities should be classified by the largest function. If unable to classify, enter Miscellaneous.

14 Copies of Key Pages.
To provide P/A with basic information on your entry, even if it is not premiated by the jury, please include xeroxes of six or more key pages (including Project Facts page), stapled separately and slipped inside the back cover of the binder.

15 Entry Fees.
Entry fee must accompany each submission. Fee is $90 for P/A subscribers, $125 for nonsubscribers. (Nonsubscribers can choose to subscribe at a special rate of $35 per year and pay the $90 entry fee; see entry form.) Make check or money order payable to Progressive Architecture. Canadian and Mexican offices must send drafts in U.S. dollars. Fee must be inserted in unsealed envelope with entry form (see 12, above).

16 Entry Receipts.
P/A will send a receipt by October 1, which will indicate an entry number to save for your reference.

17 Return of Entries.
P/A intends to return all entries by January 1, by U.S. Mail. P/A assumes no liability for loss or damage.

18 Entry Deadline.
Deadline for sending entries is **September 9, 1994**. All entries must show some date marking as evidence of being in the carrier's hands by September 9. Hand-delivered entries must arrive at P/A's offices (address below, 6th Floor reception desk) by 5 p.m., September 9. In order to assure arrival in time for the jury, P/A recommends using a carrier that guarantees delivery within a few days.

Address Entries to:
Awards Editor
Progressive Architecture
600 Summer Street
P.O. Box 1361
Stamford, CT 06904
(For carriers other than mail, delete P.O. Box)

Deadline: September 9 Strictly Enforced

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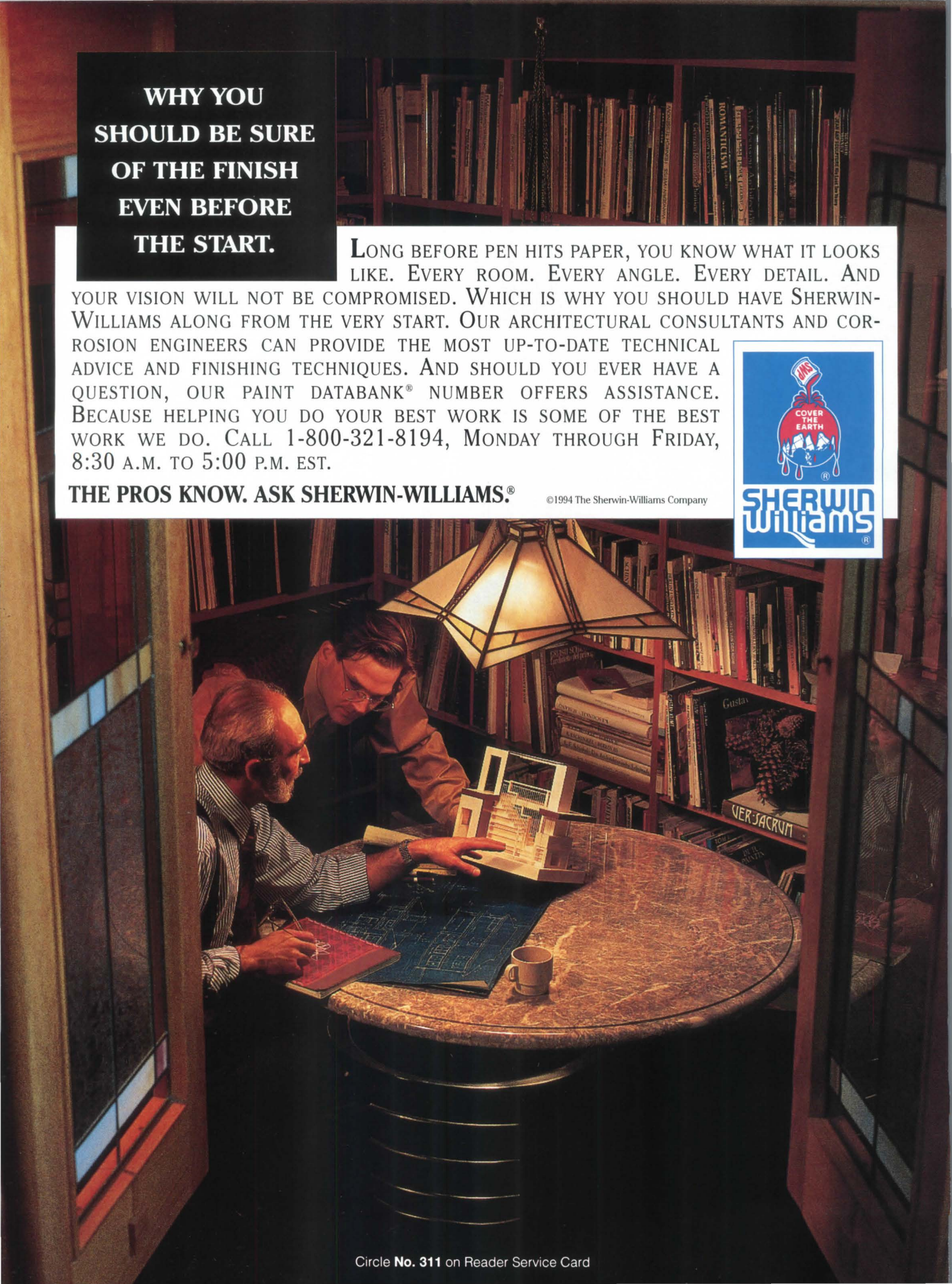

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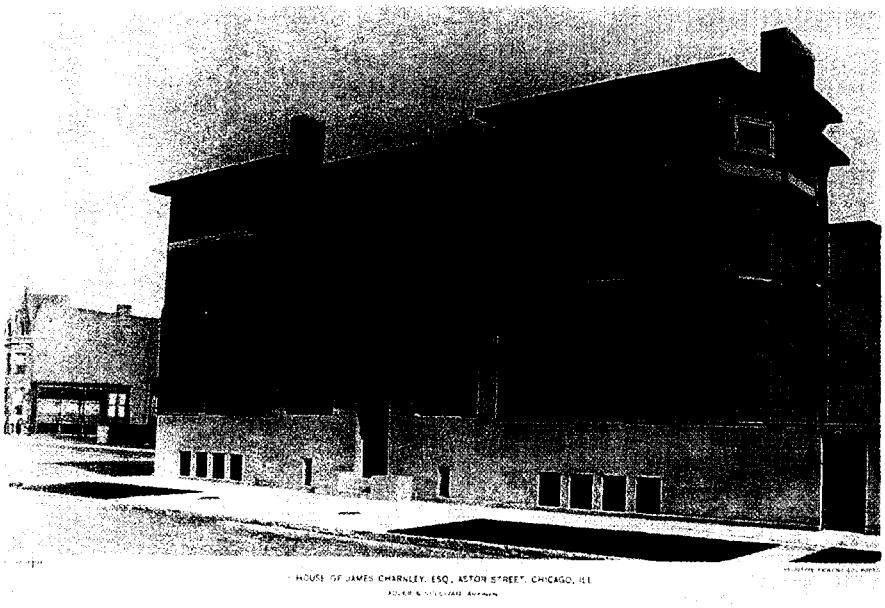
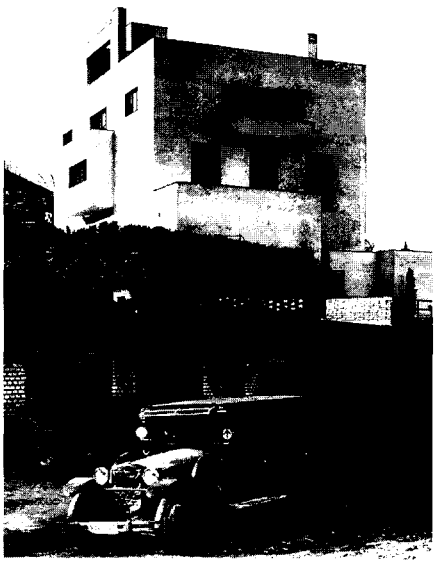
News



Courtesy Skidmore Owings & Merrill



Efforts to "Save" Historic Houses in Chicago ...

The Chicago Athenaeum, a museum of architecture and design, is mounting a campaign to buy the Charnley House, the landmark Chicago building by Frank Lloyd Wright and Louis Sullivan that until recently housed the Skidmore, Owings & Merrill Foundation (P/A, April 1989, p. 76). SOM is trying to sell the 1891 house, which has been vacant since 1992, for a reported $2 million. The Athenaeum says that its purchase of the house would "safeguard the landmark and its public accessibility." For more information, contact the Athenaeum at (312) 280-0131 or FAX (312) 280-0132.

In a similar story, Adolf Loos's seminal Villa Müller in Prague (see p. 99), currently open to the public, is for sale. According to Kent Kleinman and Leslie Van Duzer of the University of Michigan, authors of a new monograph on the villa from Princeton Architectural Press, the Müller family, who reclaimed the well-preserved 1930 house from the Marxist-Leninist Institute after the "velvet revolution," intends to sell the property. The Czech government has yet to exercise its right of first refusal to buy the house, and time is running out. Letters of support can be sent to the mayor of Prague District 6: Jirí Hermann, Starosta, Zastupitelstvo Mestské Cásit, Praha 6 Cs. armády 23, 160 00 Praha 6, Czech Republic. □

... and in Prague

Somebody Open a Window

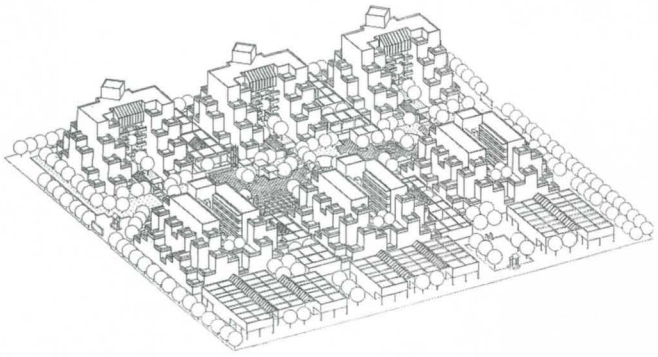
According to a study just released by the National Energy Management Institute, the productivity of America's workforce could rise by as much as $54.5 billion a year if commercial building owners adhered to existing voluntary indoor ventilation and temperature guidelines. The study maintains that productivity gains would recoup all necessary construction costs within two years, making such improvements economically feasible. An executive summary of the report is available for free. Contact NEMI: 800-458-6525. □

AIA Online Now Free to Members

The AIA announced at last month's convention that members may now obtain free software for AIA Online, its computer network for architects. The Institute is promoting the online service, which provides access to AIA communications, building product information, E-Mail, Professional Interest Areas, and the publication *Commerce Business Daily*, as an exclusive member benefit. Line time costs 15 cents per minute; there is no monthly charge. For more information, fax Ben Silverstein at the AIA: (202) 626-7420. □

Hodgetts & Fung, Piano Honored

Los Angeles architects Craig Hodgetts and Hsin-Ming Fung, cited for their "imagination and ingenuity," received the Academy Award in Architecture from the American Academy of Arts and Letters in New York on May 18. The Academy, a 250-member group of leading writers, artists, architects, and musicians, also honored Italian architect Renzo Piano with its Arnold W. Brunner *Memorial Prize*, and inducted James Ingo Freed of Pei Cobb Freed & Partners as a member. □



Chinese Students Win Housing Competition

An urban housing design (above) by a group of students from Tianjin University in China has won the grand prize in the AIA's and ACSA's 5th annual international student design competition. The competition program called for midrise housing appropriate to the students' regions and "incorporating vertical transportation." (Otis Elevator is the competition's sponsor.) The Tianjin students share a $5,000 prize; regional prizes of $2,500 apiece went to teams from Tbilisi State University of the Arts in the Republic of Georgia, the University of Hong Kong, and the University of Chile. □

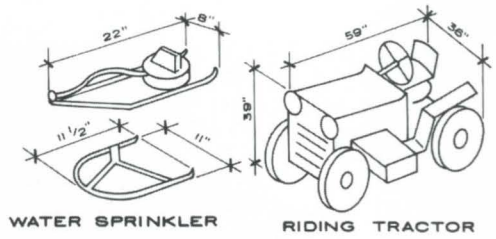
Johnson and Trump at Columbus Circle

The face of New York's Columbus Circle may be changing soon after all. While developer Mortimer Zuckerman tries to renegotiate his deal with the Metropolitan Transit Authority to develop the New York Coliseum site (with an oft-revised design by Skidmore, Owings & Merrill), Donald Trump has plans for the nearby Gulf + Western (now Paramount) Building. Philip Johnson is at work on a plan to strip the Modern tower down to its steel and rebuild it as a condominium tower. Johnson's design for the prominent site, which adjoins both Columbus Circle and Central Park, will be unveiled in October. Johnson is also at work on a block for Trump's Riverside South development (P/A, June 1993, p. 118). □

AIA Names Honorary Fellows

Eight foreign architects have been selected for honorary fellowship in the AIA: Juan Basegoda-Nonell of Barcelona, an authority on Antoni Gaudí; A.J. Diamond of Toronto; Toyo Ito of Tokyo; Azusa Kito of Tokyo, president of the Japan Institute of Architects; Dogan Kuban of Istanbul, a professor emeritus of architectural history and conservation; Juha Leiviskä of Helsinki; Robert Peter McIntyre of Kew, Australia; and J. Brian Sim of Vancouver, president of the Royal Architectural Institute of Canada. □

Books



Architectural Graphic Standards, Ninth Edition *edited by John R. Hoke, Jr., Wiley, New York, 1994, $190.*
Sixty-two years after its first edition appeared, this one updates the book from its last revision in 1988, and contains more than 10,000 drawings. Much of the new or revised material addresses changes in the building industry brought about by the Americans with Disabilities Act (passed in 1991) and greater emphasis on waste management and recycling, indoor air quality, and building and site security. There is also new information on land planning at community, urban, and regional scales. Resource pages at the end of each chapter listing references, trade associations, and government and regulatory organizations are also a welcome addition. Yearly supplements will keep the information up to date, and the publisher is working on a CD-ROM version to be released next year.

Frank Lloyd Wright and Le Corbusier, The Romantic Legacy *by Richard A. Etlin, St. Martin's Press, New York, 1994, $39.95.*
Architectural historian Richard Etlin traces the legacy of Romanticism – Viollet-le-Duc's emphasis on structural expression, Gottfried Semper's focus on mythic forms, Auguste Choisy's exploration of the picturesque – in the work of both Wright and Le Corbusier. The reader comes away from this book thinking that the apparent differences in the work of these two architects may, in the end, matter less than the commonality of their ideas .

Architecture and Disjunction *by Bernard Tschumi, MIT Press, Cambridge, Massachusetts, 1994, $27.50.*
In his introduction, Tschumi says that his essays, written between 1975 and 1991, "were conceived as successive chapters of a book that could – somewhat in the manner of Le Corbusier's *Vers une Architecture* and Robert Venturi's *Complexity and Contradiction in Architecture* – provide a description of our architectural condition at the end of the twentieth century." The essays are provocative, but do not reach the pinnacle of thought the architect sets for himself.

Briefly Noted

Critical Architecture and Contemporary Culture *edited by William J. Lillyman, Marilyn F. Moriarty, and David J. Neuman, Oxford, New York, 1994, $35.*
Papers from a conference on the relationshp between Post-Modernism and architecture.

Andrea Palladio: The Architect in his Time *by Bruce Boucher, Abbeville, New York, 1994, $95.*
Newly commissioned photos included.

On Disk

The Great Buildings Collection *created by Kevin Matthews, Van Nostrand Reinhold, New York, 1994, $225.*
Well-suited to the beginning student of architectural history, this innovative electronic encyclopedia of architecture offers images of and data about nearly 600 canonical buildings throughout history. The solid models for walk-throughs and the video clips of some structures, along with the ability to do thematic data searches, are among its real advantages, but it needs many more drawings and more material on recent work if it is to be of use to practicing architects.

AIA (and P/A) in L.A.

A recent P/A article provokes unusual attention to the AIA's problems – and the profession's – at the Institute's 126th annual convention.

by Mark Alden Branch

Photos: Oscar & Associates

Sharon Sutton (center) and James Fallows (right) addressed the convention. The exposition hall entrance was dominated by a space-frame dragon (left) by Pearce Systems International and convention graphics coordinators Sussman/Prejza.

While P/A is more accustomed to reporting the news than making it, we would be remiss if we ignored the fact that our April cover article, "AIA: Worth the Price of Admission?" was the talk of this year's AIA convention, held from May 13 to 16 in Los Angeles. From new CEO Terrence M. McDermott's opening address, which placed an unusual stress on the value of membership (he even used the words "worth the price of admission") to a pair of resolutions that seem to respond directly to issues raised in the article, the 11,000 conventiongoers (including 8,000 professionals) found an Institute more eager than ever to portray itself as an organization in the midst of reform.

But throughout the convention, in panel discussions, seminars, and hallway conversations, there was a strong theme of self-examination and criticism, not only of the AIA but of the profession and its future. Events like the Walter Wagner Educational Forum – which ostensibly was to deal with the issue of entrepreneurship in architecture – became forums for discussing solutions to an increasingly familiar litany of problems: unemployment, the erosion of architects' responsibility, inadequate education, a shrinking client base, and more.

"Chicken Little Critics"

Not everybody was convinced: Stephen Kliment, Editor of *Architectural Record*, told the Wagner Forum that the current "architect-bashing" was "a straw man not relevant in a changing profession." And Thomas H. Teasdale, chancellor of the AIA College of Fellows, decried the profession's "Chicken Little critics"; for every negative thing these critics could say about the profession, he asserted, he could cite more than one positive thing.

Under the circumstances, the theme Chapin chose for the convention, "Edges: Succeeding Through Change," was especially appropriate, but it was only spottily and vaguely honored by the theme speakers until the last day. Then, as the convention expo was being dismantled next door, *Atlantic Monthly* editor James Fallows presented a thoughtful, well-reasoned look at institutions that have emerged successfully from critical times.

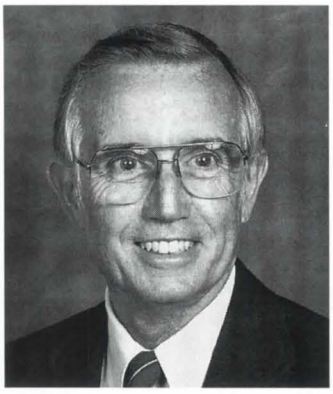
The other speakers were hit-and-miss. While it was clearly seen as essential to hear from Frank O. Gehry, L.A.'s premier architect, Gehry proved much more captivating as a designer than as a speaker. 1994 Gold Medalist Sir Norman Foster, on the other hand, was low-key but fascinating as he described his firm's remarkable technical and design innovations. Sharon Sutton, tapped to speak about multiculturalism, proved adept at multimedia as well: her uneven but rousing speech included a slide show to the rhythm of Tracy Chapman's song "Material World." Sutton's criticism of conventional capitalism might have been expected to anger an essentially pro-business audience, but she received a warm standing ovation.

The choice of Jonas Salk to speak at the annual Fellows dinner was controversial, given his intransigence on expanding the Salk Institute (P/A, Oct. 1993, p. 48). The applause for his talk, which skirted the issue, suggested that those present had missed the entire episode.

Resolutions to Make Change

In official business, delegates passed two resolutions – introduced from the floor, rather than through the AIA Resolutions Committee – that were apparently reactions to P/A's April article on the AIA's operation. One called for AIA to "focus its organizational structure" to emphasize the empowerment of state and local components, as suggested in a recent report by Summit Consulting Group. That report, known as the "Weiss Report" for its author,

(AIA Report continued on page 31)



Young Citation, Kemper Award from AIA

Ki Suh Park of Los Angeles, the managing partner of Gruen Associates, received the AIA's Whitney M. Young, Jr., Citation last month at the AIA Convention. Park (above left), who was born in Korea, was cited for his community service work in Los Angeles and as a "role model" for minorities. The citation honors "significant contributions to society" by architects.

Also honored at the convention was Harry C. Hallenbeck (above right), the state architect of California. Hallenbeck received the Edward C. Kemper Award, presented for contributions to the AIA, for his work with the AIA on both state and national levels. □

Berlin Architect Wins Spreeinsel Competition

In the latest of a series of urban design competitions for reunified Berlin, a jury has awarded first prize in the Spreeinsel competition to Berlin architect Bernd Niebuhr. The Spreeinsel, an island in the Spree River, is among the city's most important sites; it contains a group of museums (including one by Karl Friedrich Schinkel) and the Palast der Republik, the former home of the East German Parliament. The open first stage of the international competition attracted 1106 entries; in December, a jury selected 52 entrants to develop their schemes further. O.M. Ungers, who won fourth prize for an entry with S. Vieths, is the only well-known name attached to a premiated entry. □

Rome Prize Winners in Design

In an April 21 ceremony at the White House, the American Academy announced the centennial-year recipients of its Rome Prizes. Among the 20 winners were Garrett Finney of Philadelphia (architecture), architect Leslie Gill of New York (design arts), and San Diego landscape architect Leslie A. Ryan (landscape architecture). Winners study at the Academy's campus in Rome; the fellowships are financed by private funds and grants from the National Endowment for the Arts and the National Endowment for the Humanities. □

Calendar

COMPETITIONS

AIA Awards
The AIA has announced its 1995 awards programs. Upcoming deadlines are: Religious Art and Architecture Design Awards (nomination-Jun. 29, submission-Jul. 22); Honor Awards for Architecture (entry-Aug. 1, submission-Aug. 29); Twenty-Five Year Award (submission- Aug. 29). Contact Frimmel Smith, AIA, 1735 New York Ave., NW, Washington, DC (202) 626-7300.

Cedar Design Awards
Deadline: submission-July 1
Any building using Western Red Cedar in its construction may be entered in this annual awards program. Contact Cedar Architectural Design Awards, WRCLA, 1200-555 Burrard St., Vancouver, British Columbia V7X 1S7 (604) 684-0266, FAX (604) 687-4930.

Waterfront Awards
Deadline: submission-July 1
Completed projects and approved waterfront planning documents may be submitted to the annual International Excellence on the Waterfront awards program. Contact Waterfront Center, 1536 44th St., NW, Washington, DC 20007 (202) 337-0356, FAX 625-1654.

Firm Management Awards
Deadline: submission-July 15
The Professional Services Management Association invites entries to its Management Achievement Awards. Contact PSMA, 4726 Park Rd., Ste. A, Charlotte, NC 28209 (704) 521-8890.

Fulbright Scholarships
Deadline: application-August 1
Fulbright scholarships for 1995–1996 may be pursued by educators and practitioners in nearly any field. Contact Council for International Exchange of Scholars, 3007 Tilden St., NW, Ste. 5M, Box GNEWS, Washington, DC 20008-3009 (202) 686-7877.

P/A Awards
Deadline: submission-September 9
The 42nd annual P/A Awards recognize projects scheduled for completion after January 1, 1995. See p. 19 for details.

EXHIBITIONS

Urban Revisions
Museum of Contemporary Art, Los Angeles. Through July 24
Urban design and planning projects developed over the past five years are in "Urban Revisions: Current Projects for the Public Realm."

The New Public Realm
Peachtree Center Mall, Atlanta. June 8 – 22
Atlanta is the last stop for "The New Public Realm," a traveling exhibition of public works proposals submitted to P/A's ideas competition (P/A, Oct. 1992, p. 73); ADPSR Metro Atlanta is the local sponsor.

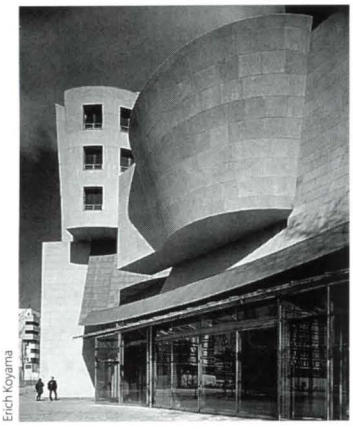
CONFERENCES

A/E/C Systems®'94
Washington, DC. June 20 – 23
This year's show will include a virtual reality exposition. Contact Sharon Price, A/E/C Systems '94, PO Box 310318, Newington, CT 06131-0318 (800) 342-5718.

Computer Integrated Building Sciences
McLean, Virginia. June 22–24
SCIBS'94 Symposium will present integrated, multidisciplinary applications in automation for planning, design, construction, operation, and management. Contact Dr. Harold Jones, SCIBS'94, 1700 Asp Ave., Box 13, Norman, OK 73030-0001 (405) 325-1947.

Lesbian and Gay Design Conference
New York. June 24
"Reclaiming the Past/Mapping the Future" is the theme of the first International Lesbian and Gay Design Conference. Contact OLGAD/Design Pride '94, PO Box 927, Old Chelsea Sta., New York, NY 10113 (212) 969-8773.

Good Neighbor Gehry



Erich Koyama

Michel Denance/Archipress

In a jumble of "wildly inappropriate" Paris buildings, Frank Gehry's American Center is notable for its propriety.

by Thomas Vonier

The American Center (above) sits in a confused context. A zinc-clad "skirt" hovers over the building entrance (left).

One hot day last summer, in the Bercy quarter of Paris, a sweating roofer cursed, demanding of nobody in particular: "*Pourquoi une chose pareille?*" ("Why would anyone do such a thing?") The man was struggling with the last, complicated details on a swooping curve of zinc for the "awning" above the Seine-side entrance to the American Center in Paris, designed by Frank O. Gehry & Associates with local architects Saubot et Jullien.

Why *would* one do such a thing? As Gehry explains it, the awning is "a dancing figure, joyous, friendly, and welcoming. This building has to say what's in it." What's in the building, set to open this summer after an eight-month delay attributed to program budget shortfalls, is more than 150,000 square feet of space for performances, visual arts events, films and videos, conferences, and lectures.

The center houses a rich, dense array of top-notch facilities: a 400-seat theater, a 100-seat cinema, two large "black boxes" (flexible multimedia spaces outfitted for performances and recordings), numerous classrooms, 26 apartments for resident scholars and artists, administrative offices, visual arts studios, rehearsal areas, dance studios, galleries, and terraces. It will also house an American book shop, a restaurant, bars, and a travel agency.

Promoting American Culture

Founded in 1931, the American Center was one among a number of nongovernment institutions – including the American Library, the American Church, the American Cathedral, and the American Hospital – established in the first half of this century to cater to a growing American "colony" in France and, in this instance, to promote French understanding of American art, culture, and language.

After occupying a central place in French-American art and literary circles for decades, the Center closed in 1987, decided upon a move from cramped left-bank quarters on the boulevard Raspail (now the site of Jean Nouvel's Cartier building – see page 65) to new facilities in Bercy, where the city of Paris was promising to do great new things. Most of what has been done in the area is indeed new, but very little is great. The American Center stands out as one of the best new works in the neighborhood.

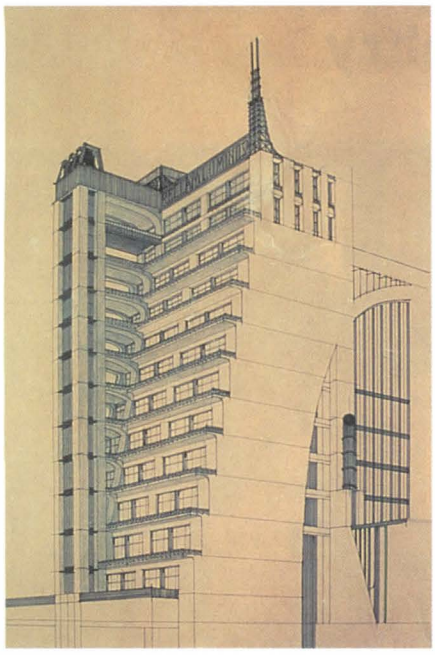
"Where Can I Be Creative?"

A center staffer says Gehry blanched at design guidelines laid down by the city of Paris, which required his scheme to remain within strict three-dimensional boundaries and even to echo forms of a truly awful neighboring speculative office building. "Where can I be creative?" he is said to have cried at one point. The answer seems to lie within. Interior spaces soar and provide remarkable, enjoyable views. Inside, one easily imagines a place bustling with creative life and activity. It seems like a home.

The program divides the building into two parts – one for the public and one for residents – and this is evident in Gehry's design. Predictably, both interior and exterior are filled with idiosyncrasies and referential gestures, supposedly tied to Parisian architectural traditions. But in today's Bercy, weird buildings (and ones that use everyday materials more or less wittily) pop up like geometric carbuncles in the jarring landscape that radiates from Chemetov & Huidobro's giant Ministry of Finance.

Less Wacky Than Expected

In this setting, Gehry's building – which looked alarmingly wacky and topsy-turvy *(Gehry continued on page 32)*



Pompidou's Unprecedented Look at European Cities

"La Ville, 1870–1993," at the Centre Pompidou in Paris this spring, was probably the most comprehensive show ever mounted on urban design, architecture, and art applied to European cities. The exhibition gathered hundreds of seminal documents from museums and private collections around the world.

The original works on display, by luminaries such as Le Corbusier, Otto Wagner, and Sant-Elia (above), were presented with commentaries on the social and aesthetic milieus that shaped them. Astounding in its breadth, variety, and vitality, the show will live on in an excellent color catalog (in French, about $60, from Flammarion Press, Paris). □

NJIT Sponsors Prototype Houses

In an effort to "promote the most innovative technical approaches to affordable housing," the New Jersey Institute of Technology's Architecture and Building Research Group is planning a "Housing Technology Demonstration Park" in West Windsor, New Jersey. The group is reviewing proposals from the building industry for innovative prototypes for up to a dozen 1,200-square-foot houses starting early next year. The New Jersey Department of Community Affairs and the U.S. Department of Housing and Urban Development are funding the program. □

Practice Notes

After Four Years, Billing Rates Rise

Hourly billing rates for design services have risen by 4 to 5 percent since last year, the first increase in four years, according to a survey by *Professional Services Management Journal*. But publisher Frank Stasiowski says that when inflation and less favorable contract terms are taken into account, fees are still lower in real terms than in the 1980s. Contact *PSMJ* at (617) 965-0055.

New Prison Construction Likely

Prison may be in some architects' futures: while the House and Senate crime bills had yet to be reconciled at press time, the final legislation is likely to contain a significant outlay for building prisons. The Senate version passed in December calls for $3 billion in construction of regional prisons over five years. The House bill approved in April allocates $13.5 billion for prisons. President Clinton is said to prefer the House's figure.

Top Firms in Healthcare Market

NBBJ of Seattle is the nation's leading architecture firm in healthcare, according to a survey in the March 21 issue of *Modern Healthcare* magazine. Surveying a market it characterized as "stable and optimistic," the magazine ranked firms by fees. NBBJ's topped $51.5 million last year; they were followed by HKS Architects of Dallas ($36.7 million), and Henningson, Durham & Richardson of Omaha ($35.9 million).

Technics Notes

New Window and Door Guide

The National Wood Window and Door Association has just published its 1994 directory of manufacturers and suppliers. Along with names and addresses the directory includes product lines offered and other services provided. For a free copy contact: NWWDA, 1400 E. Touhy Ave., Suite G54, Des Plaines, IL 60018, 708-299-5200.

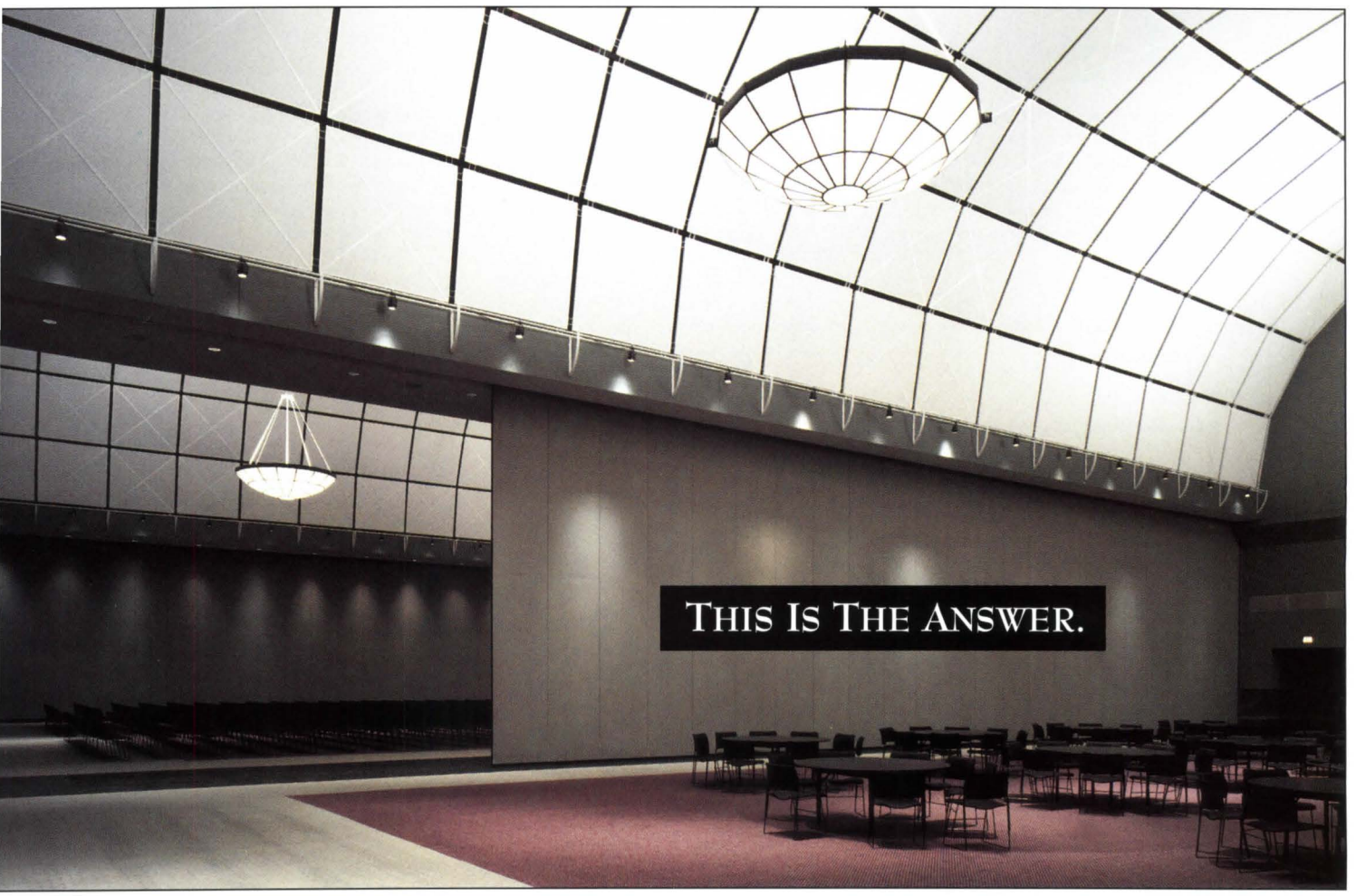
Seismic Standards Revamped

The American Society of Civil Engineers has revamped the seismic load provisions of its latest "Minimum Design Loads for Buildings and Other Structures Standard: ASCE 7-93." It features revised earthquake load criteria and associated load combinations for the design and construction of buildings. For more information or to order, contact ASCE at 800-548-ASCE.

Progress of Solar Technology

A new report, "Progress in Solar Energy Technologies and Applications," concludes that "emerging solar technologies are now seen as legitimate supply options by utility executives, conservative mainstream energy planners, and policy makers." The report, published by the American Solar Energy Society, offers in-depth analyses of events and innovations propelling solar energy from the labs to the marketplace, including photovoltaics, wind, biomass combustion, daylighting, and passive and active solar heading and cooling. Copies of the report are $21 and can be ordered from ASES, 303-443-3130, fax 303-443-3212.

YOUR CLIENTS HAVE BEEN ASKING FOR EASY, ELEGANT SOUND CONTROL.



For superior sound control and superior customer satisfaction, specify Modernfold Ultra-Seal.™

You've heard it time and time again. "It has to be upscale. With a 50-plus STC. It has to look great. And last."

It has to be Ultra-Seal.

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Modernfold

Have you recently designed a recreation building or a prison or jail facility?

In October 1994, we will publish plans of recreation facilities and prison and jail facilities. These can be of any size or location, and can involve new construction or additions to or renovations of existing structures. The deadline for submission is July 1, 1994. Address all submissions to: P/A Plans Editor, P.O. Box 1361, 600 Summer Street, Stamford, CT 06904. Provide a self-addressed stamped envelope to ease our return of graphic materials.

To submit projects, send clear, unlabeled black-and-white floor plans and sections in the form of photostats (PMTs, K-5s). Graphic scales, north arrows, and room functions should be supplied on accompanying photocopies of the drawings. We also need two or three photos (prints, slides, or 4x5 transparencies are acceptable) of completed projects or model photos or renderings of unbuilt projects. Be sure to include photo credits where applicable.

We ask that you provide the following information for each project you submit, in typed form and in this order.

Project: (name of project, city, and state)

Architect: (include credits for people in firm plus the names of associated architects)

Client: (name and contact person, if relevant)

Program:

Building area: (net and gross square feet)

Cost: (per gross square feet, and year of construction, if relevant)

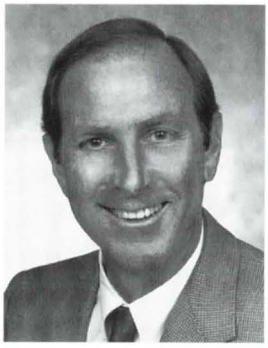
Major materials: (keep list brief)

Consultants: (list firm names and specialties)

CAD-developed? (yes or no)

Architect's statement: (about 150 words, describing design intent and final design)

AIA (and P/A) in L.A. (continued from page 25)



AIA President-Elect Raymond G. "Skipper" Post.

Alan Weiss, was the subject of another resolution. Frustrated by the limited distribution of the report, the resolution's sponsors called for a copy to be distributed to each AIA component, with availability of it on AIA Online. Both resolutions passed with the stated support of the AIA Board of Directors; officers maintained that such steps were in fact already being taken.

In other resolutions, delegates rejected a call for uniform registration laws based on NCARB's model statute, approved the exploration of creating a firm membership category, and decisively rejected a Texas-bred resolution that would have limited "political or social actions" by the Institute to "issues where members, through their professional education, training, and experience, have expertise." A related resolution from Alabama, which was approved, directs the AIA board to "authorize funding only for purposes which directly enhance the profession of architecture." Although sponsors would not identify any particular issues that had prompted the resolutions, other delegates interpreted them as responses to the AIA board's condemnation of Colorado's anti-homosexual law. (The board, under fire for meeting in Colorado, gave $10,000 toward the effort to overturn the law.)

New Officers

Raymond G. "Skipper" Post, Jr., of Baton Rouge, Louisiana, was elected first vice-president/president-elect of the Institute, defeating Raj Barr-Kumar of Washington, D.C. Three unopposed candidates were elected as vice-presidents: Ronald A. Altoon of Los Angeles, Phillip H. Gerou of Evergreen, Colorado, and Carole J. Olshavsky of Columbus, Ohio. James H. Anstis of West Palm Beach, Florida, was elected secretary.

A generally lackluster line-up of seminars and consultations (especially when compared to last year's environmental extravaganza in Chicago) led many to escape the new Convention Center (by Pei Cobb Freed & Partners and Gruen Associates) for tours covering L.A.'s rich architectural history: Frank Lloyd Wright, Greene & Greene, Gehry, the Case Study Houses, and other attractions.

A Whole Lotta Shakin'

In his talk, James Fallows identified five characteristics of institutions or nations that have managed change successfully; one of them was that they had been "shaken but not shattered" by events leading to the change and were thus not at risk of complacency. In some of the last words spoken at the convention, Chapin evaluated Fallows's list as it applied to architects: "We've been shaken," he said, "but I'm sure we're not shattered." For the Institute, such an acknowledgment is progress. □

Good Neighbor Gehry *(continued from page 27)*

Erich Koyama

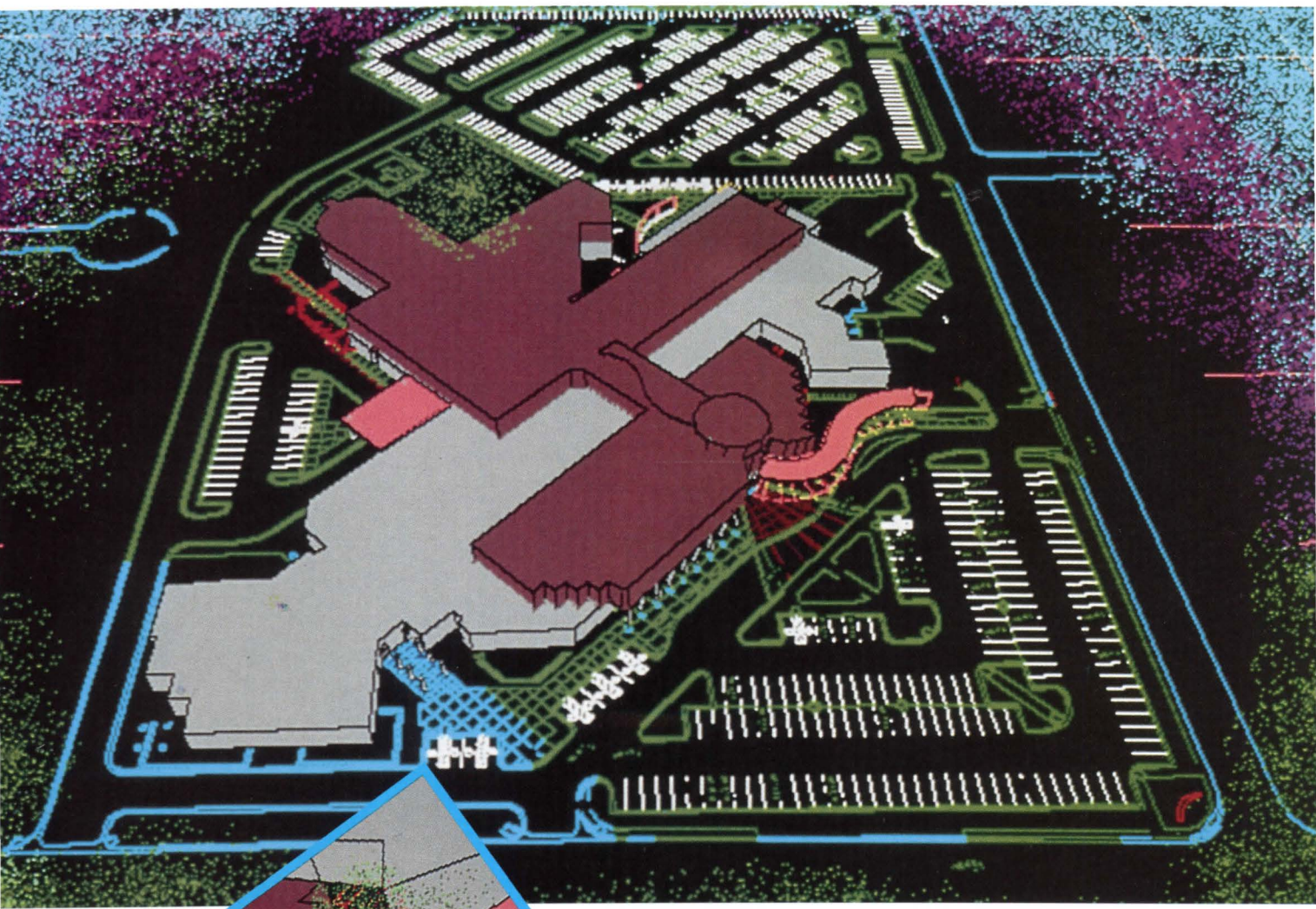
Entry to American Center as seen from an adjacent park.

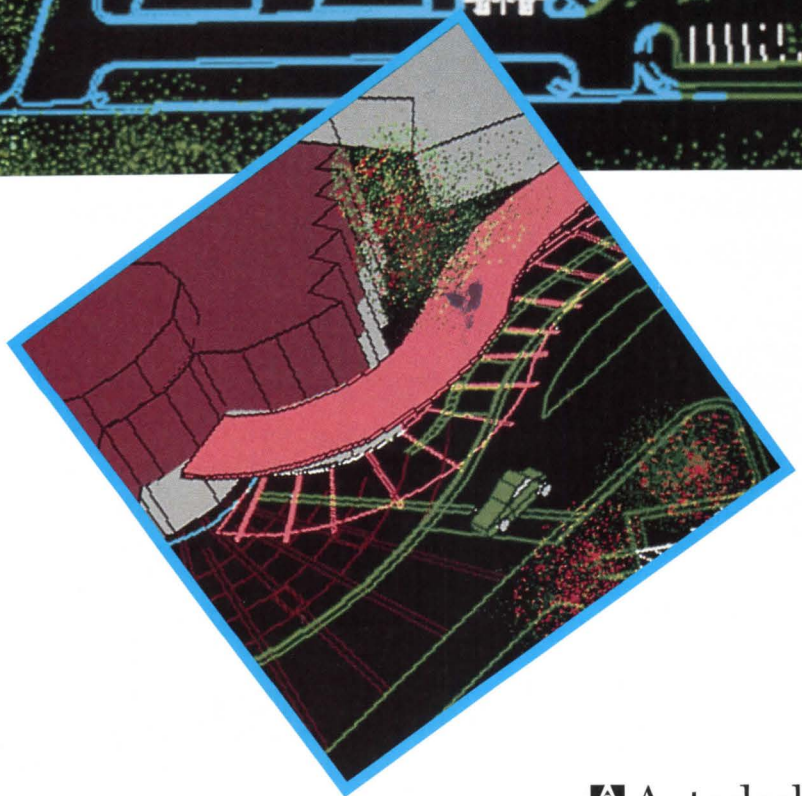
in model form – appears quite staid. Joint lines in the limestone cladding are not nearly so pronounced or jazzy in reality as was suggested in models, lending the finished work a surprisingly warm unity. His trademark oddball protrusions, and formal twists and turns, seem muted and dignified here, helped by a certain harmony in exterior materials and a contrast with many dreadful surrounding experiments.

Showing the increasingly chauvinistic French a trick or two about how such things are better done, if one must do them, Gehry's work is welcome in this sea of garish, wildly inappropriate buildings – now joined by the dreary, unpromising towers of Dominique Perrault's Bibliothèque de France, that looms on the opposite bank of the Seine.

While Bercy is anything but a "center" and is well off the tourist path, this will probably change with completion of a park that is roughly the size of the Tuileries gardens, a footbridge across the Seine to the Bibliothèque, landscape improvements along the river to screen a noisy freeway – and with the long-awaited opening of a lively American Center. □

To Be Competitive Today, You Need More Than Just CAD





In the highly competitive architecture, engineering and construction (AEC) marketplace, how do you differentiate your firm from the competition and continue to win new business? In this special section, we'll discuss how design automation technology will help you respond to the changing AEC market, and how it enhances project team skills so you will win the business that sustains your firm's growth.

Autodesk®

Not only are you looking at a building that doesn't exist. You're about to ride the elevator to the 6th floor, walk across the boardroom and watch the city as the fog rolls in.

3D STUDIO RELEASE 3.0

Too bad this is only a magazine. Because if this page could move, you'd be seeing a workstation-quality, high-speed 3D graphics tool that lets you create designs right on your PC. You'd be seeing 3D Studio® Release 3, animation software that provides such vivid walkthroughs of mechanical and architectural designs, it's hard to believe they haven't already been built. ● Since it makes it easy to control both cameras and objects, you'd not only be able to stroll across the boardroom, you'd be able to look down at the lobby as the elevators move up and down. Even lights can be animated with ray-traced shadows to accurately simulate the shadow-play on the courtyard below. The fog? That's just one of the countless special effects and backgrounds you can create. ● Of course, you don't have to let the fact that this is a magazine keep you from seeing 3D Studio software. For a free demo disk, just call 1-800-879-4233 and ask for Demopack D253 or visit your local Authorized Autodesk Multimedia Dealer. Outside the U.S. and Canada, fax 415-491-8311.

Autodesk.

Special pricing available for students, faculty and schools.

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A Letter from Carol Bartz CEO, Autodesk, Inc.

The AEC/FM industries are in a time of tremendous, but exciting change. With the increasing demands on them for greater efficiency, higher-quality design, extending traditional services and shorter lead times, architects and engineers are turning to new tools to help them accomplish their tasks. As a result, design automation products are now used throughout the AEC/FM industries—for predesign, schematic design, design development, construction documentation, construction and facilities management. These tools simplify or eliminate repetitive tasks, and allow changes and revisions to be managed with greater efficiency. Drawing accuracy and clarity increase.

Because so many different disciplines are involved in a building project, these design automation solutions should share a common drawing database. They must allow the architect or engineer to adapt and respond quickly to changing client and project requirements. And they need to be available to design teams on a global scale.

At Autodesk, we have always supported this method of working. With more than a million users worldwide, AutoCAD® software, the world's best-selling design automation software, is not only highly customizable, it also allows design and construction drawings to be prepared in a single .DWG format that can be shared by every team member. That's only the beginning.

We are providing customers with new tools such as ADE™ (AutoCAD Data Extension™). ADE software allows users to open and view multiple AutoCAD drawing files simultaneously, or analyze a whole building or complex of buildings rather than one floor—and one drawing file—at a time. ADE technology heralds a new paradigm for the AEC and FM markets: Networked users now have concurrent access to a single drawing or a set of drawings. This capability makes for better project coordination and greater consistency across drawing sets.

Other Autodesk products further enhance the design automation and visualization processes for the building industry. AutoVision™ software, for example, operates entirely within AutoCAD Release 12 to help designers and architects better convey and sell ideas through photorealistic project images. Clients or approvers can clearly see the design direction in these accurate images. Industry-leading 3D Studio® software provides advanced rendering and animation tools to produce realistic flybys and walk-throughs that enhance the communication process.

At Autodesk, we are committed to helping the AEC/FM industries meet the revolutionary demands they now face. So we're not just selling products: Together with our virtual corporation partners, we're providing solutions that encompass more than 4,500 design automation applications.

We understand the importance of interoperability among related applications, particularly in the AEC industry. We work closely with our two thousand development partners to continually refine data-exchange methods and to promote even better coordination across design disciplines. Our goal: To support architects, consulting engineers, project managers, contractors and other professionals with fully integrated design automation solutions so they can clearly, convincingly communicate their design visions.

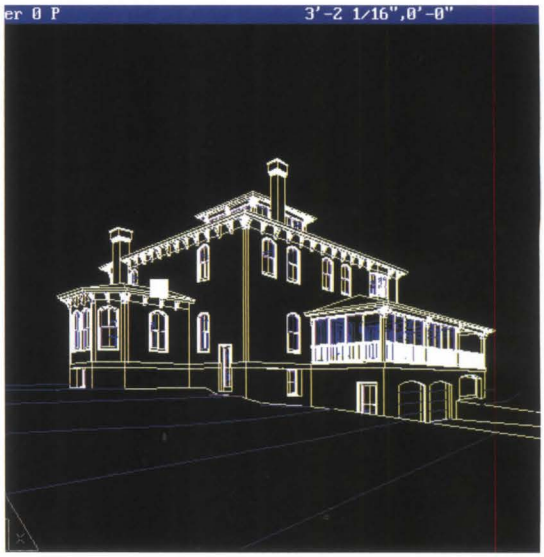
Today, design automation tools such as AutoCAD, ADE, AutoVision, 3D Studio software and discipline-specific products from our independent developer partners are used throughout the AEC/FM industries. These solutions enable an entire team—from architects and engineers to builders and space planners—to transform their ideas into reality.

However, much work is still left to be done. We look forward to meeting that challenge. With our virtual corporation partners, we will continue to set the standard in design automation—with tools, technology, service and support.

Principal/Partner

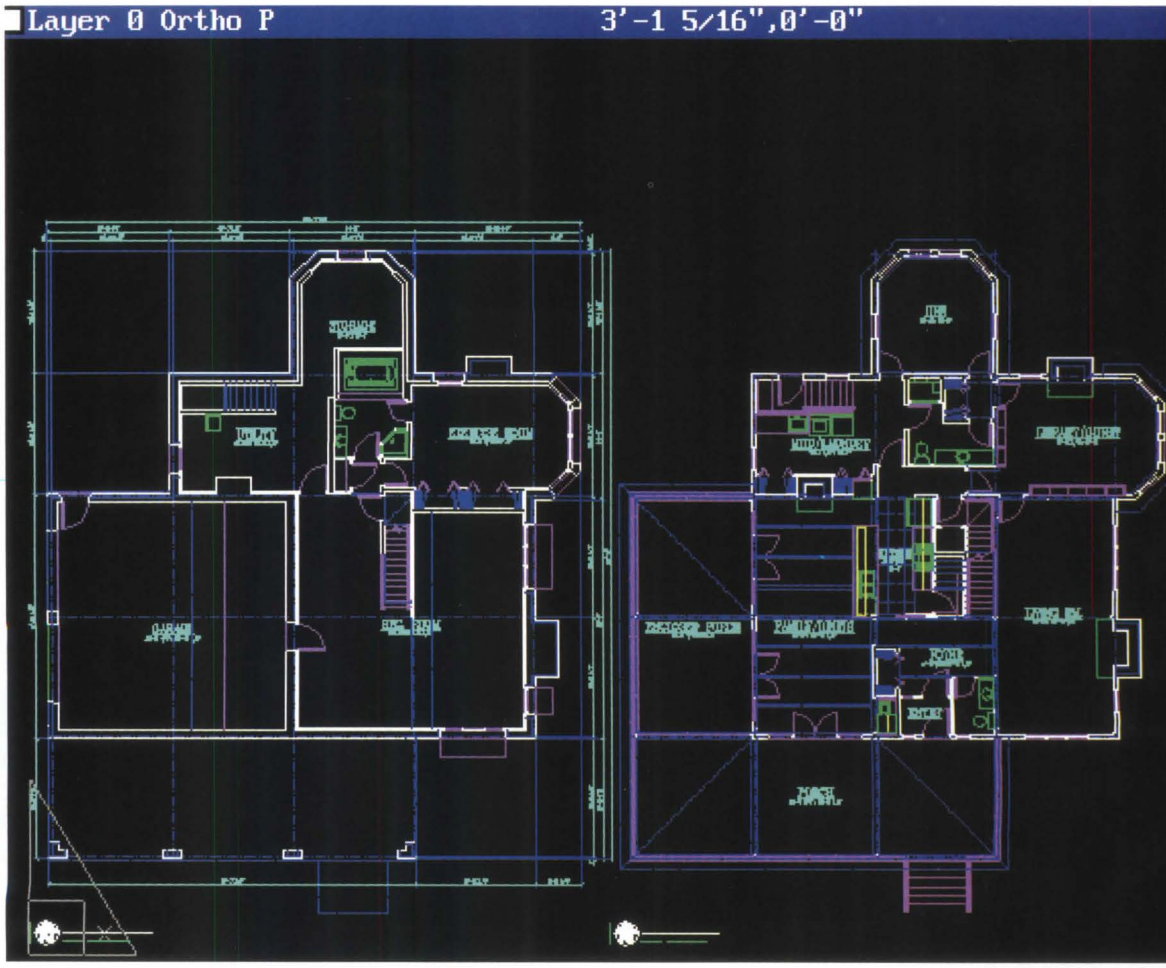
Maintaining Your Competitive Edge

As a principal in your firm, you're probably concerned with capturing profitable new business and responding to rising customer expectations even as you streamline company operations. A fully implemented design automation system could be the key to resolving these seemingly contradictory goals.



Design Automation: The Key to Success

Design automation entails much more than a CAD program on a desktop PC. Successful design automation employs software tools that help your project teams automate and unify all associated design and documentation process-



These plan and perspective house views illustrate AutoCAD software's ability to produce varied drawings and images for different project stages. Both views were produced by Charles A. Rice.

es. This goal can be accomplished through a common drawing database driven by AutoCAD® software—the leading CAD system for AEC industries—and related Autodesk products and third-party applications. This common database meets the needs of all team members, including outside consultants and contractors, by allowing them to share drawing resources and software tools. And you control and better coordinate all of the design/build processes. The advantages of design automation include:

- Faster design verification (see "Designer" section, page 8).
- Enhanced project coordination (see "Project Manager" section, page 12).
- Improved team skillset for greater drawing accuracy and faster turnaround (see "Drafter" section, page 17).
- Enhanced marketing capabilities with rendering and animation software (see "Model Maker" section, page 20).
- Sounder project planning and more accurate estimates (see "Specifier/Estimator" section, page 23).
- Access to specialized applications, including facilities management services (see "Value-Added Services" section, pages 27).
- Fast, easy communications and data exchange with customers and associates.
- Cost-effective solutions for every staff member's unique requirements.
- Implementation without confusion.

A Surer Foundation for a Growing Business

Many of your large corporate and institutional clients already require the use of CAD on their major projects. They want to realize the benefits of improved coordination and reduced delivery times. They may also require CAD-based plans for postconstruction applications, such as facilities management. When you position your company to meet these demands with AutoCAD-based solutions—while aggressively marketing an array of value-added, design-automation-based services—you'll clearly distinguish your firm from the competition, bring more perceived value to your customer and continue to win new business.

Knight Seavey Design used this street-front elevation of a new mixed-use commercial building to compare it to existing building façades on the main street of a Western mining town.

Implementing an Autodesk-based design automation solution begins with the help of knowledgeable industry professionals (see sidebar this page) who can analyze your needs, recommend software and hardware solutions, install a system that performs to your specifications, and provide custom training.

Getting Started: Authorized Autodesk Dealer Support

Buying a product is easy. Using it productively and profitably is an altogether different story. Authorized Autodesk Dealers know why. Their extensive AEC-industry knowledge and experienced technical staff will ensure long-term system performance. They're nearby so response time is quick, and you avoid costly downtime and inefficient workarounds. And Dealer training is tailored to your staff's needs, so they can fully utilize your software and hardware investment.

You know the value of expert consulting; you offer it to your clients. Authorized Autodesk Dealers provide it for you and help you avoid the difficulties common with new system purchases. To locate the Dealer nearest you, call 800-964-6432, extension 961.

These architects survived the re
Now you can learn

Few firms in the building and construction industry have remained immune to the recession. But TAG Architects of Southern California has fared much better than most.

TAG's strategy was to go after banks. But instead of taking along the usual hacksaws and explosives, they selected a more powerful tool: AutoCAD software.

"AutoCAD allowed us to grow beyond the traditional role of the architect," says TAG's managing partner, Robb Axton, A.I.A. "It gave us more control over project coordination and let us offer new services, like facilities management consulting. That's critical if you want to keep winning new clients during a recession."

"We've already helped three major financial institutions cut costs by standardizing their facilities and building operations on AutoCAD," Axton says. "Now we're using that expertise to attract other kinds of clients."

Axton also sees AutoCAD as the most viable way for architects and other trades to streamline their operations. "With AutoCAD, we no longer need design-development drawings. We just move back and forth between schematics and working drawings, coordinating every aspect with our engineers along the way."

The ability to share AutoCAD files and drawings with other disciplines—like structural, mechanical

cession by breaking into banks. from their example.

and electrical engineers—is the key. "Some projects drown in revisions because there's no coordination between the trades," says Axton. "That never happens here. With a modem and a telephone, we can make revisions in an hour that would take other firms days."

Why, one might ask, is an architect giving away his trade secrets? Because Axton sees huge benefits when all the building disciplines and their clients standardize on AutoCAD. "With everybody working from the same base drawings, we could cut months off projects," Axton says. "That way we could all submit more competitive proposals, without digging any deeper into our own pockets."

Certainly it beats robbing banks. Would you like to learn how AutoCAD can make your firm more competitive? Just ask for our compelling AutoCAD brochure for the architecture, building-services, and construction industry. Or our guide for facilities management. They're both full of application information. And they're free. Call 1-800-964-6432, ext. 834. Outside of the U.S. and Canada, fax 415-491-8303.

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Designer

Are You Exploring All Your Design Alternatives?

Goody, Clancy Associates imported an AutoCAD model of MIT's new biology building into 3D Studio to obtain this rendering of interior lab space. A photograph of MIT's campus was scanned in and merged with the lab window to add context to the image.

How do you meet tight deadlines and still do your best design work? Support the design process with AutoCAD and specialized architectural solutions. With these tools, you can produce 2D drawings and 3D models simultaneously or convert 2D sketch plans to 3D massing studies, then examine the models from any perspective. By rotating models, you can even "walk around" a conceptual study to examine each design element—a process that, on a drafting board, is difficult and time-consuming. This approach considerably shortens the design iteration process. You visualize and evaluate designs with confidence and speed and produce final design layouts sooner.

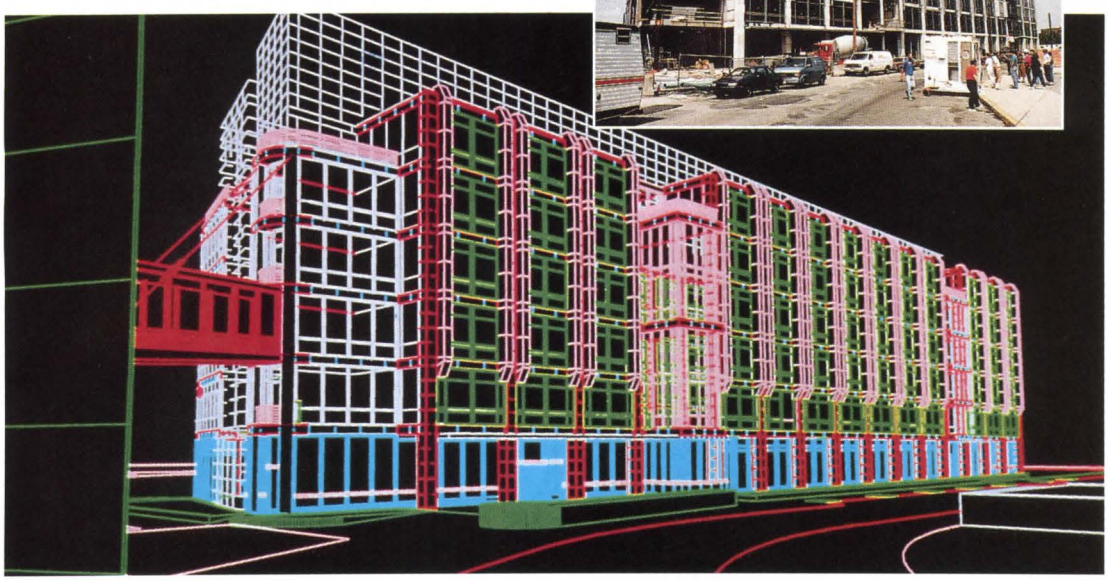
These software tools also mean that building refinements—a façade, a parapet—can be accurately assessed from varied perspectives with no extra development time. "Generating 3D models in AutoCAD has given us better design perspective. You get an understanding of interior and exterior spaces faster," states David Graham, CAD System Manager at Goody, Clancy Associates, a Boston design firm. Goody, Clancy Associates used AutoCAD with Softdesk architectural software to model the MIT biology building. Designers placed exhaust and air supplies on the building exterior and used AutoCAD-generated models to explore how to integrate the ductwork, yet maintain the elegant design of the façade.

Communicate Your Design Vision

High-quality rendering and animation are part of any AEC design solution. With the right software, such as Autodesk 3D Studio®, the industry-leading rendering and animation package, or the AutoVision™ photorealistic still-renderer, you can present your design vision more cost-effectively and persuasively. Each product gives you a wide array of lighting, texture and materials options so you can carefully decide upon and then present your concepts to project teams or clients.

For example, designers at Einhorn Yaffee Prescott, a 300-person design firm in Albany, New York, use AutoCAD interactively with clients. Principal Ed Kohlberg states, "We display initial design studies in AutoCAD and modify designs to show basic concepts and what-if scenarios. That's been an especially useful visual tool."

Through design visualization, clients can see design impact for themselves instead of relying on descriptions and static drawings. This method streamlines the design development process and ultimately creates more satisfied clients, whose recommendations will become an invaluable marketing resource.



Goody, Clancy Associates examined AutoCAD perspectives of MIT's biology building to study potential exterior designs. The construction photo above the perspective shows the accuracy of the AutoCAD perspective.

AutoCAD-Based Architectural Software

AutoCAD and specialized architectural add-ons address a variety of design requirements:

- Streamlining layout for standard features such as doors and windows.
- Automating the conversion of 2D drawings to 3D models so elevations and sections can be quickly developed.
- Providing layout symbol or detail libraries.
- Organizing layers and trade documents to facilitate communication with consultants, contractors and other designers.
- Organizing your drawing database by specific elements such as interior walls or plumbing fixtures for materials takeoffs and schedules.

For more information on AutoCAD-based architectural software, call:

CADKit	303-987-2376
CADPlus Products Co.	800-423-8127
Eagle Point Software	319-556-8392
Eclipse Software, Inc.	206-676-6175
Ketiv Technologies, Inc.	503-252-3230
LandCADD International	303-799-3600
Softdesk, Inc.	603-428-3199

New Technology Opens New Markets

The field of facilities management is in the process of being revolutionized by the emergence of CAFM (Computer-Aided Facilities Management). This new technology offers an unprecedented degree of control over facilities operations: instant access to data, a seamless link between drawings and a database, the ability to forecast various alternatives, and so on.

At the same time, however, this new technology poses new challenges to those in facilities operations. And this is precisely where an architect can step in, to offer expertise and services on a long-term or short-term basis.

"By offering additional CAFM services, architects and interior designers provide their clients with 'value-added' capabilities that contribute to increasing a client's productivity and profitability. Our ARCHIBUS/FM Application Specialist Program is designed to give you the knowledge and skills required to deliver these CAFM services.

"As the developer of ARCHIBUS/FM, the #1 CAFM solution in the world, ARCHIBUS, Inc. has enabled its clients to effectively manage over 1.2 million buildings—a total of over 13 billion square feet or 51,000 square miles."

—Bruce Kenneth Forbes, President/Founder, ARCHIBUS, Inc.

Why Should You Include CAFM in Your Array of Services?

Computerizing architectural and facilities services can change the way you do business. Architects who have been working with computers, for years or for just a few months, say that not only has it made their job easier—speeding and simplifying their work—but it has also expanded the potential scope of their business. They can do more than they ever thought possible, with the result that their business is more stable and more profitable.

Technology Enhances Abilities, Makes Tasks Easier and Quicker

For years, architects have found that computerizing the design process gives them dramatic new abilities. However, in addition to aiding design, the technology also provides a new relationship to the people who manage the ongoing operations of the finished facility.

As Constantine Kriezis, an architect with Jung/Brannen Research & Development Corporation, notes, "The computer provides a perfect environment on which to model a building or a site both graphically and alphanumerically. That electronic model can be re-used over and over and is thus as important to the architect as to the facility manager."

Barbara Hendricks, Principal and Architect with Duvall/Hendricks, cites some of her new abilities: "We recently reconfigured 45,000 square feet in six weeks. We measured the space, input a space plan, inventoried the space plan, put the data in the Space Management module, reconfigured the floor plan, and generated reports. They were making changes up to the last minute, and we were providing an accurate configuration of what they would need up to the minute of the move. It's that flexible and accurate."

Unique Abilities Enhance Competitive Positioning

CAFM takes architecture away from initial design and more broadly into the realm of real estate analysis and planning, as well as facilities operations.

Chris and Jennifer Keller, both AIA, say that "Providing CAFM services allows an architect to combine architecture and computers in a field where professional facilities and design perspective is needed. Being able to combine two areas of expertise (computers and architecture) is rare, and provides a much better understanding of what a CAFM system can do."

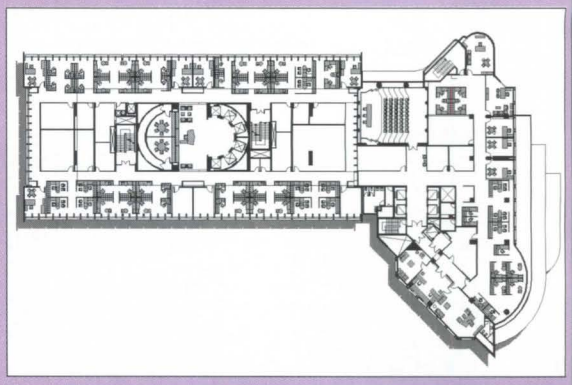
Moreover, using computers to accomplish certain tasks—such as chargeback and space planning—can take significantly less time and money than manual methods. Therefore, you can charge less for these services.

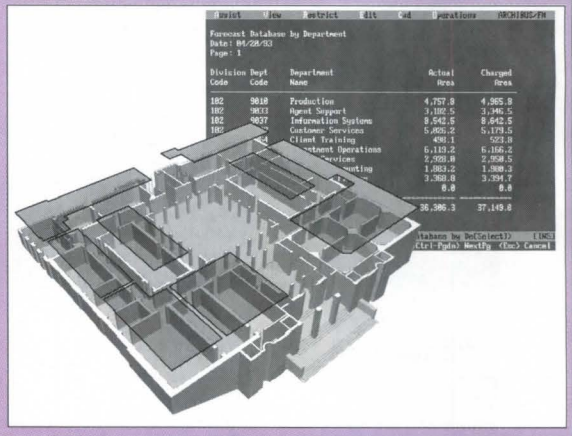
New Skills Enlarge Potential Client Base

Many architects are currently using their FM skills to appeal to new types of companies. They are expanding their focus from simple design and construction to ongoing FM tasks.

The Kellers cite such a case. "We used CAFM to complete a signage replacement project for Bristol-Myers Squibb. Using a CAFM database, we brought together, in a single drawing with attributed intelligence, the floor-plan illustrating where new signs were to be placed—with the actual signage text. We then output the drawing, with attached data, and used it as a list of text for manufacturing and printing and also as a drawing for installation.

"CAFM pared down the time required for the entire project, and allowed our company to win the contract and deliver the product in a timely fashion."

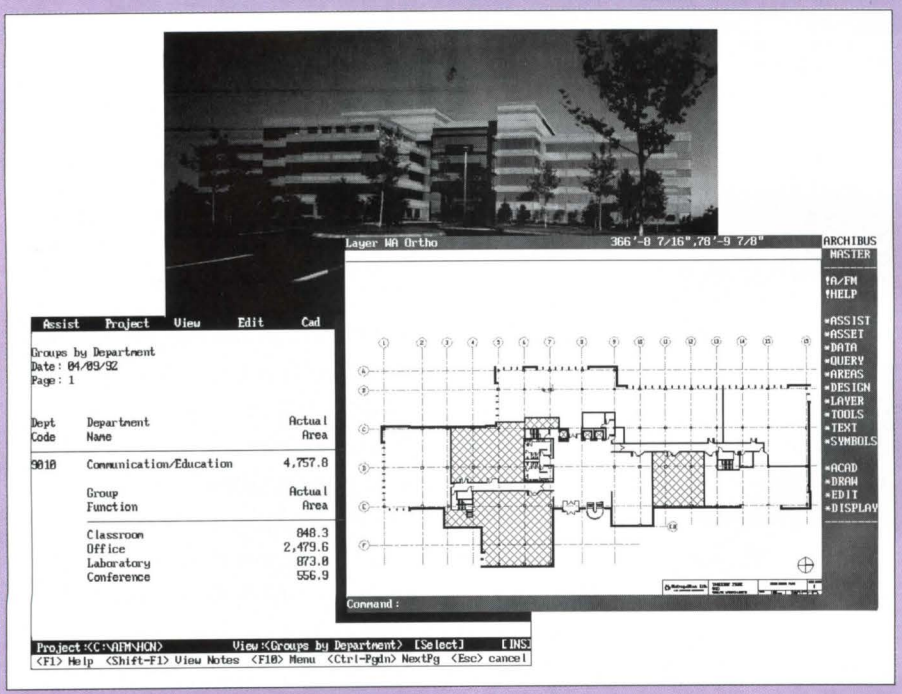




Speeds Drawings, Lays FM Groundwork

While a CAD package on its own can enhance an architect's abilities immensely, a good CAFM package will also offer new tools for designing.

Duncan Pendlebury, AIA, partner in Jung/Brannen Associates, is using CAFM on a new project. "We use ARCHIBUS/FM for all our area calculations, as it speeds up our work considerably. We completed the first plan for a new corporate headquarters in three days. The project consisted of 15 floors—all with furniture layouts, for 1200 people, in a space of



250,000 square feet. We transmitted drawings to the client yesterday, via satellite. They cannot believe the turnaround time we're delivering."

Access to Different Departments in the Same Organization

How a facility is maintained affects every department in an organization. Being able to enhance the operation enables you to work with people across every group.

As Barbara Hendricks notes, "We have been working with a client, restacking their spaces. We have been able to compare the impact of new standards with existing standards. They had been doing chargebacks to departments by hand. With ARCHIBUS/FM doing chargebacks, the process is now fairer, more logical, more accountable, and easier to maintain."

Constantine Kriezis says that "there is a great opportunity to provide related services, from design and construction, to master planning or feasibility analyses."

CAFM Services Vital in All Economic Climates

During economic growth, companies typically expand and change, and they need FM services to keep up. However, in hard times, companies need FM services just as much, to contract their operations.

Al Kraul, Facility Administrator with the CUMIS Group Ltd., notes how CAFM helped his company save money. "Essentially the bottom line in selling CAFM at CUMIS was the savings we could offer the corporation. Thus far we have cut the square footage for one of our leased locations in half, and next year we hope to eliminate it entirely... The cost savings related to facilities are immediate."

FM Services in Constant Demand

Providing FM services provides a more stable base for a business. As the Kellers say, "Traditional architectural commissions tend to be large, single instances of design service, whereas the day-to-day space moves and reshuffling/churn rate of corporations creates a smaller scale but steadier flow of work. Your bread and butter, if you will."

Choosing the Best CAFM System

Once you have decided to broaden your services to CAFM, how will you know which system is the best? The answer is simple: Go with the proven solution, the #1 CAFM system in the world: ARCHIBUS/FM.

ARCHIBUS/FM is the only Autodesk Strategic Developer for facilities, offering a seamless link between drawings in AutoCAD and data in the database.

ARCHIBUS/FM offers a wide variety of products, in a modular format: standalone or network, seven different application modules, DOS or UNIX, and more.

ARCHIBUS/FM is an open system that you can easily customize to your clients' exact needs. And it is currently in its sixth generation, a product of a company that spent the last decade pioneering CAFM techniques. Finally, ARCHIBUS/FM offers mainframe performance at a fraction of the cost.

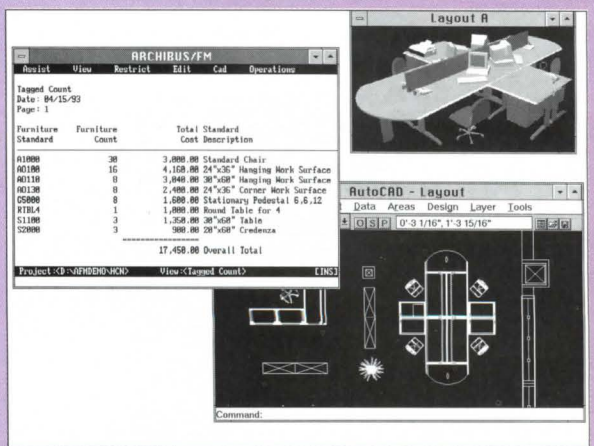
"ARCHIBUS/FM helped streamline our approach by enabling us to get information to our clients more efficiently and for less cost. It has distinguished us from other architectural firms because, with the additional FM services, we are a single point of contact for our clients. And it has enabled us to better understand our clients—we have an integrated approach to their spaces, furniture, design ideas, and their culture.

"We can provide services that other firms are unable to offer—programming, analysis of their present and future space needs, and more."

—Barbara Hendricks, AIA
Duvall/Hendricks Architects, Baltimore, MD

The Bottom Line

An investment in CAFM technology today can, very quickly, benefit your clients, your competitive position, and the future of your business.



ARCHIBUS/FM Controls 66.5% of the Integrated CAFM Market

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Project Manager

Are You in Control of Your Entire Project?

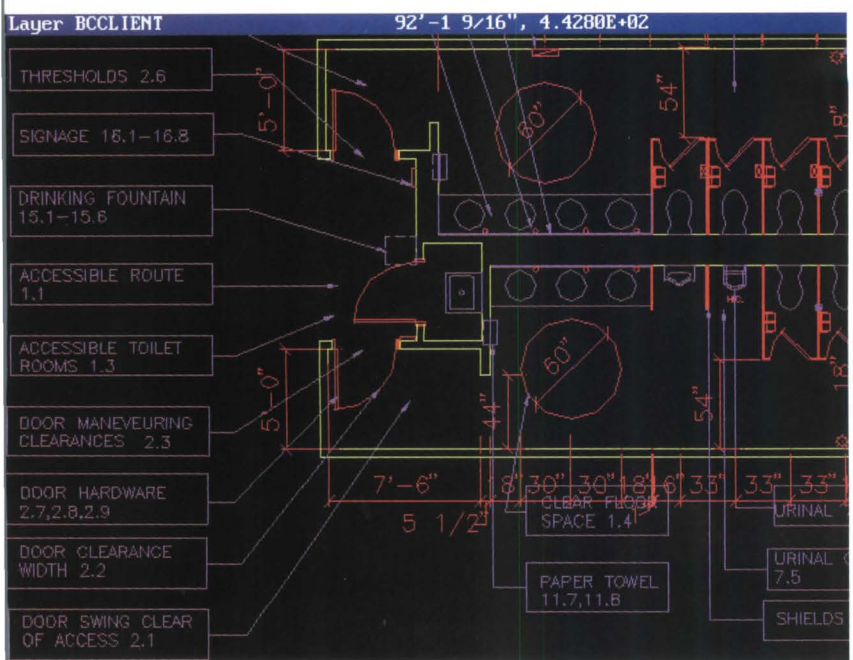
Your job involves the coordination of the design process, consolidating information from several sources and managing deadlines. With so much information to deal with, you can always use more help. AutoCAD software simplifies these processes because it's already used by a large percentage of AEC professionals. Lewis Bishop, a sole practitioner in Palm Desert, California, uses AutoCAD with Eagle Point Advanced Architecture software to coordinate his projects. "First, get a layout for the piece of property from the surveyor," Bishop says. "If your surveyor is using AutoCAD, just pop in a disk." For a recent Marriott Hotel design, Bishop continues, "We took the working drawings and modemed the information to the mechanical engineers. It was an expeditious means of combining and communicating data from a variety of sources."

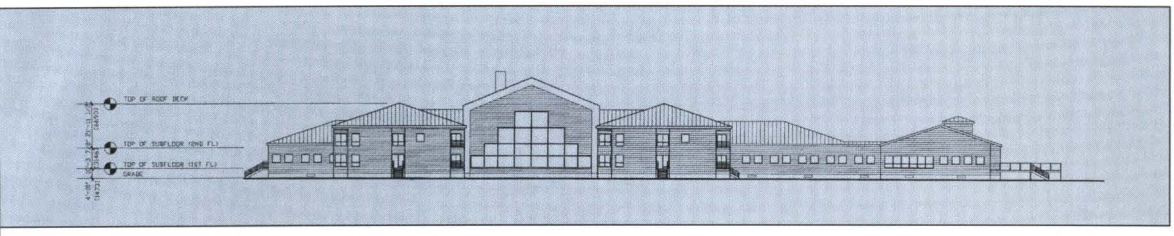
Because it is the world's best-selling design automation software, AutoCAD also helps you expand your markets globally. Kumin Associates, a design firm in Anchorage, Alaska, landed a hotel project that was financed in Japan, designed in Alaska, engineered and partly constructed in Idaho and Washington state, and erected in Siberia using Chinese construction workers. "We literally sent [AutoCAD] files all over the world," says Jon Kumin. To keep project members informed, design files and check plots were shipped to Japan and to the US engineers, so everyone had up-to-date information. Then, for example, engineers superimposed their work on the AutoCAD base drawings and returned them. It was a smoothly managed project, and information was promptly communicated. The project couldn't have succeeded any other way, given its global scope.

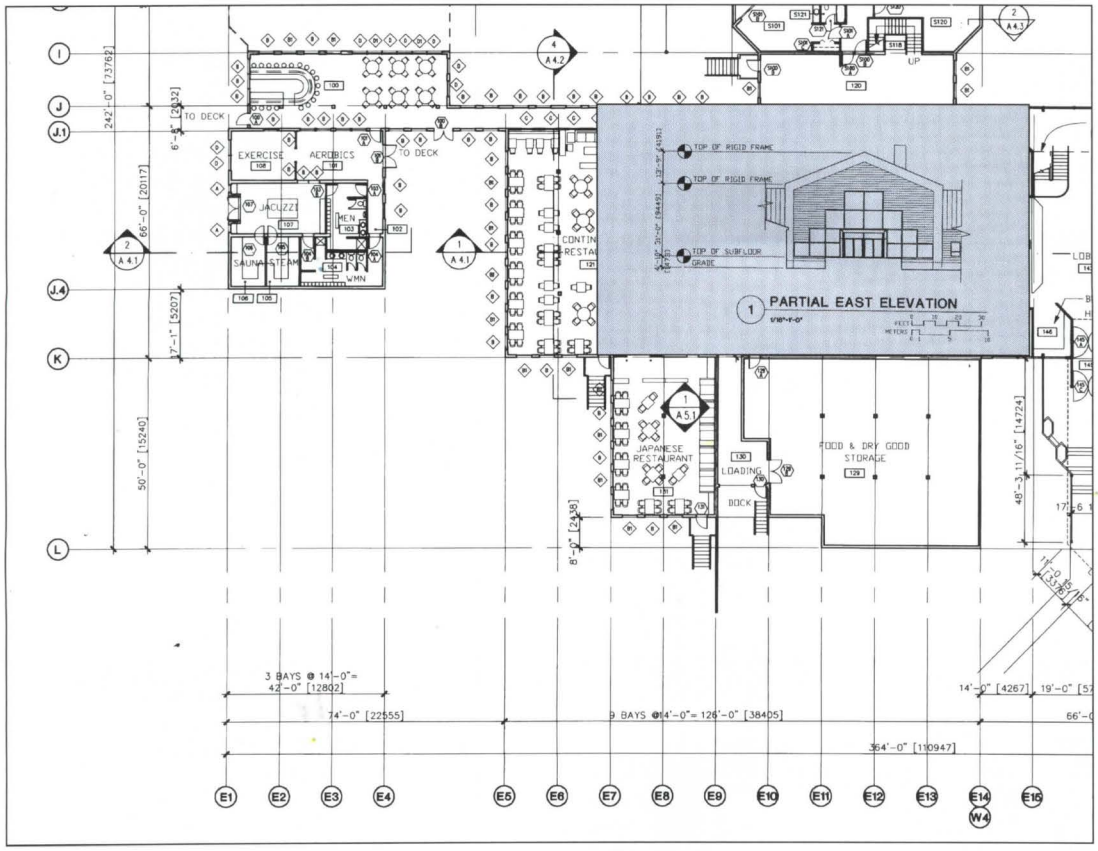
The Haskell Company customized AutoCAD software to create its own bathroom layout. The layout contained a detail library for design items and a cross-reference to building codes and ADA requirements. The figure on the right shows how Haskell engineers overlay their work on base plans.

Work Concurrently and Productively with ADE™ Software

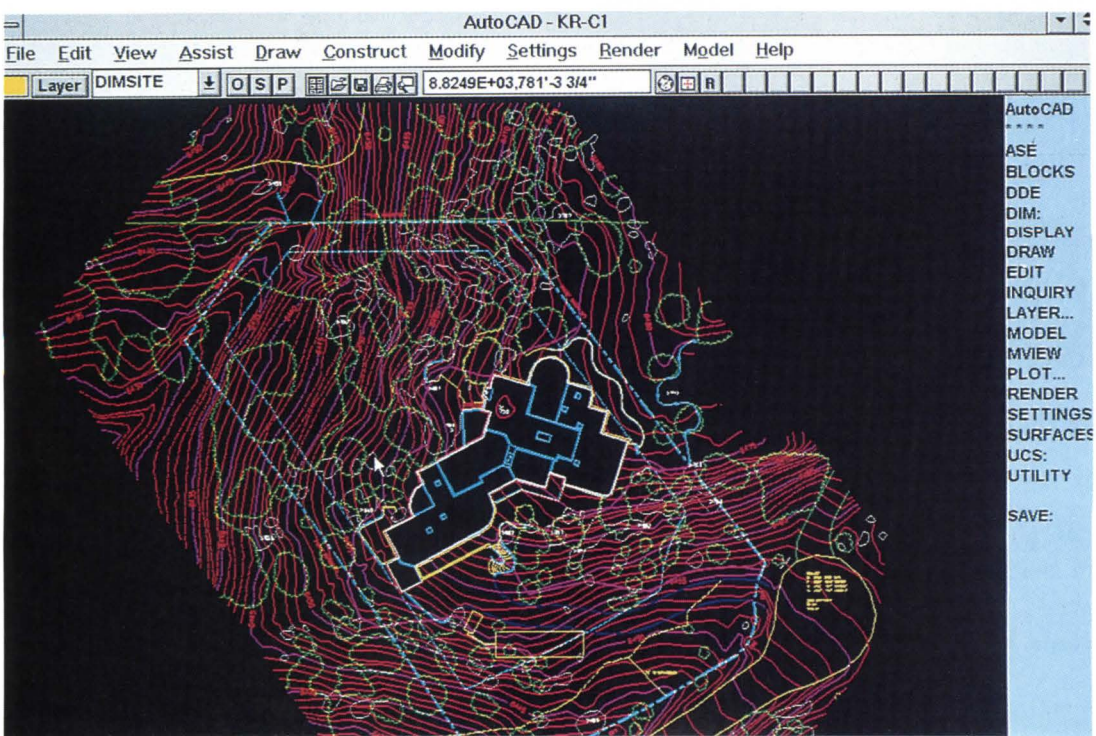
As project manager, one of your biggest challenges is to help architects and engineers work concurrently, not sequentially. AutoCAD







Kumin Associates worked on this Siberian hotel, a project that required coordinating work with engineers, financiers and builders in North America and Asia. AutoCAD simplified the logistics of transferring electronic data globally and deftly handled routine tasks such as calculating dimensions in multiple scales.



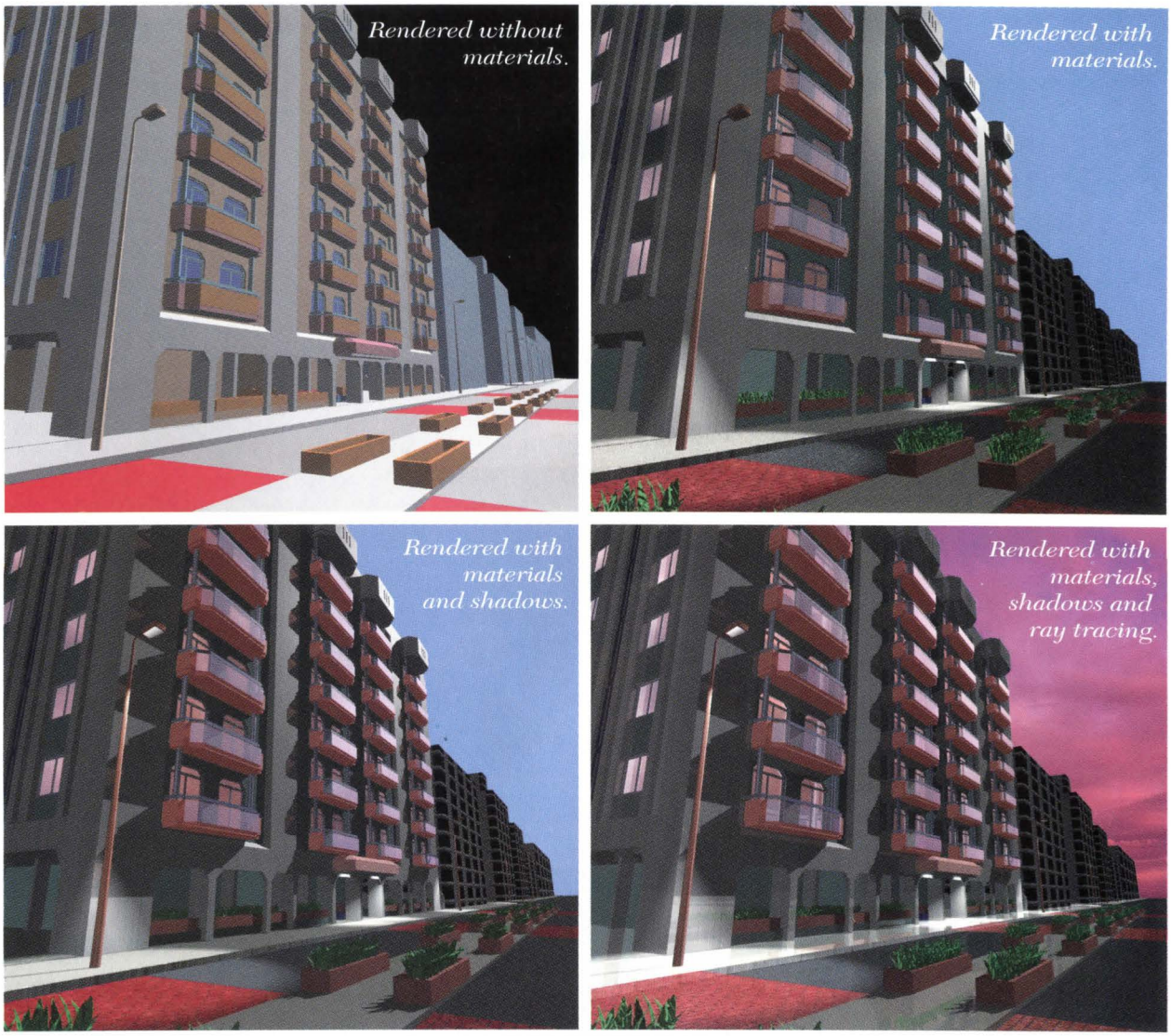
This AutoCAD site plan created by Knight Seavey Design places an adobe-and-timber structure on a rocky knoll in the foothills of the Sandia Mountains. Koogle & Pouls Engineering helped assemble site data.

with AutoCAD Data Extension™ (ADE™) software facilitates this collaboration. ADE allows project participants to view and modify their portion of base plans concurrently, and its security features, such as layer locking and assignable access, protect design integrity. When plans change, ADE-networked engineers have immediate access to the new layouts. ADE is a powerful query tool that allows everyone on the design team to access the exact set of graphic and nongraphic information needed, at any stage of a project. ADE also simplifies linking of drawing entities and nongraphic data—such as materials pricing or suppliers. AutoCAD software with ADE addresses numerous project coordination problems, enables concurrent access to the latest drawings and helps avoid inconsistencies and costly errors.

Autodesk Training Services

Autodesk offers a variety of training options to get you quickly up to speed on our software, including AutoCAD, ADE, AutoVision and 3D Studio. Maximize productivity, increase performance levels, maintain that competitive edge through instructor-led courses at Autodesk Training Center (ATC®) locations; through the Autodesk Customer Education and Training Department, which has developed the Autodesk Learning Resource Series; the annual Autodesk University™; and the Autodesk forums on CompuServe®. Call 800-964-6432, extension 560, for the location of the ATC nearest you.

For information on purchasing the Learning Resource Series, comprised of easy-to-use training guides and tutorials, call 707-794-1450.



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Drafter

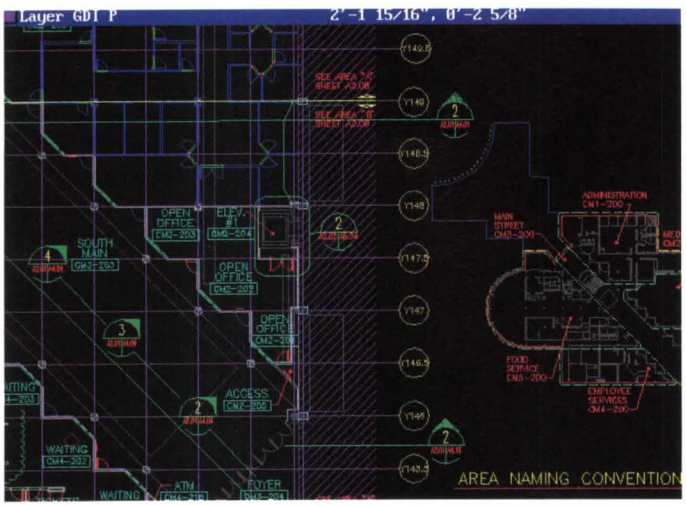
Are You Using All Your Abilities?

Moving to design automation technology traditionally has begun with drafters, who usually are the most proficient CAD users. Help your firm maximize its CAD investment by fully implementing the AutoCAD toolset.

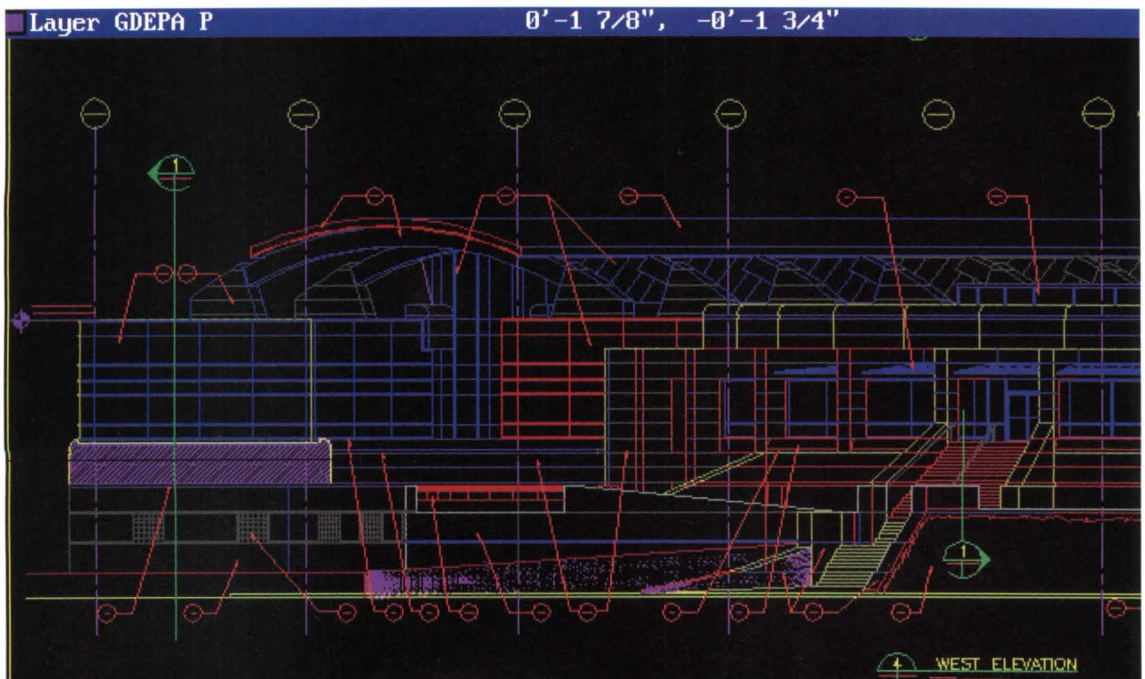
AutoCAD shortens throughput by automating numerous drafting processes—creating complex wall structures, producing elevations, generating piping strategies, completing schematics. When you improve and apply your drafting skills in these areas, you add tremendous value to your company's designs and its ability to meet tight deadlines. You'll quickly draft high-quality, multiperspective drawing sets so clients can study—and readily approve—your designs.

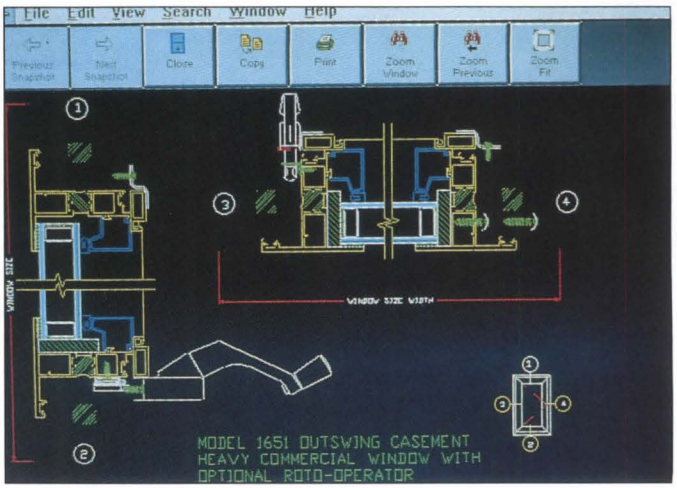
You streamline workflow and improve operational efficiency when you:

- Archive graphic information by creating a library of AutoCAD details and linking them with nongraphic cost and product data in external databases. Then generate takeoffs from architectural documents as a check against contractors' estimates.
- Explore AutoCAD® LT as a tool for field-data collection, redlining and even AutoCAD training. It's a low-cost CAD application that broadens access to your drawing database for people who don't require AutoCAD software's complete toolset. To obtain AutoCAD LT product litera-



Frankfurt Short Bruza used AutoCAD software to create multiple drawings from a single model during drawing preparation for a United Airlines maintenance facility.





Drafters can access electronic product catalogs (such as SweetSource) and extract AutoCAD details for their drawings.

ture, call 800-964-6462, extension A230.

• Explore the sophisticated possibilities of photorealistic rendering and show how it can eliminate artists' fees. You can produce impressive renderings in-house, right in AutoCAD, with Autodesk's AutoVision software.

• Review the *AutoCAD Resource Guide* to learn which additional independent, AutoCAD-based architectural software can leverage your firm's AutoCAD investment. To request the *Guide*, call us at 800-964-6462, extension 961.

As you expand your AutoCAD knowledge and skills in these areas, you'll also find that you accomplish more with less effort. Your stress levels will go down while productivity goes up. And your company will be in a stronger position to respond quickly and confidently to all of its clients' needs.

The Autodesk Advantage

When you buy Autodesk software, you join a global network of AEC and FM professionals. You also tap into the Autodesk virtual corporation, a resource-rich pool of people, businesses and applications that have made Autodesk the world's leading supplier of design automation software.

As an AutoCAD software user, you also have the opportunity to reap the benefits of Autodesk's family of CAD and multimedia solutions. With more than two million Autodesk software users and over 4,500 independently developed, AutoCAD-based applications, you have a wealth of resources on which to build your CAD capabilities and your business.

For product literature on the Autodesk software family, or the location of the Authorized Autodesk Dealer nearest you, call 800-964-6432, extension 961.

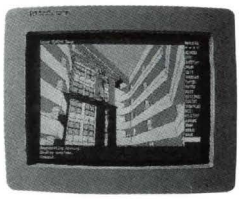
ANOTHER REASON TO SPEC PELLA® PRODUCTS

Pella® Designer™ Software. The most innovative package for AutoCAD® in the window industry.

Along with conventional window and door design, Pella® Designer™ software features bow/bays, circle-head/transom matching, and sunroom design programs.

The Pella product catalog is at your fingertips.

Simple toggle feature lets you change from 2-D to 3-D effortlessly.



"Quick Draw" feature streamlines design stages by simplifying plan/elevation view.

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Pella® Designer™ software delivers everything you'd expect in CAD software and *more*. An MS-DOS compatible, menu-driven computer program, Designer software works within AutoCAD® Release 12 and with AutoCAD Release 12 for Windows,™ or Softdesk ASG Architectural™ 6.0 CAD software. It generates plan views, 2-D and 3-D elevations, cross sections in two levels of detail, plus accessories and window/door schedules of the Pella product line.

Designer software allows more creativity with less design and drafting time. And so easy to use, it's the perfect choice for beginning as well as experienced CAD users.

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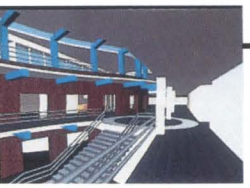


Model Maker

Visualization Sells Innovative Designs

Physical models are effective, but expensive and time-consuming to make. Visualization software complements physical models by giving you practical, powerful context-analysis tools that allow you to render structures and site topography, then refine your innovative designs before building models. Clients, financiers, civic organizations or prospective tenants can also make better-informed decisions by actually "seeing" the relationship between a design and its environment.

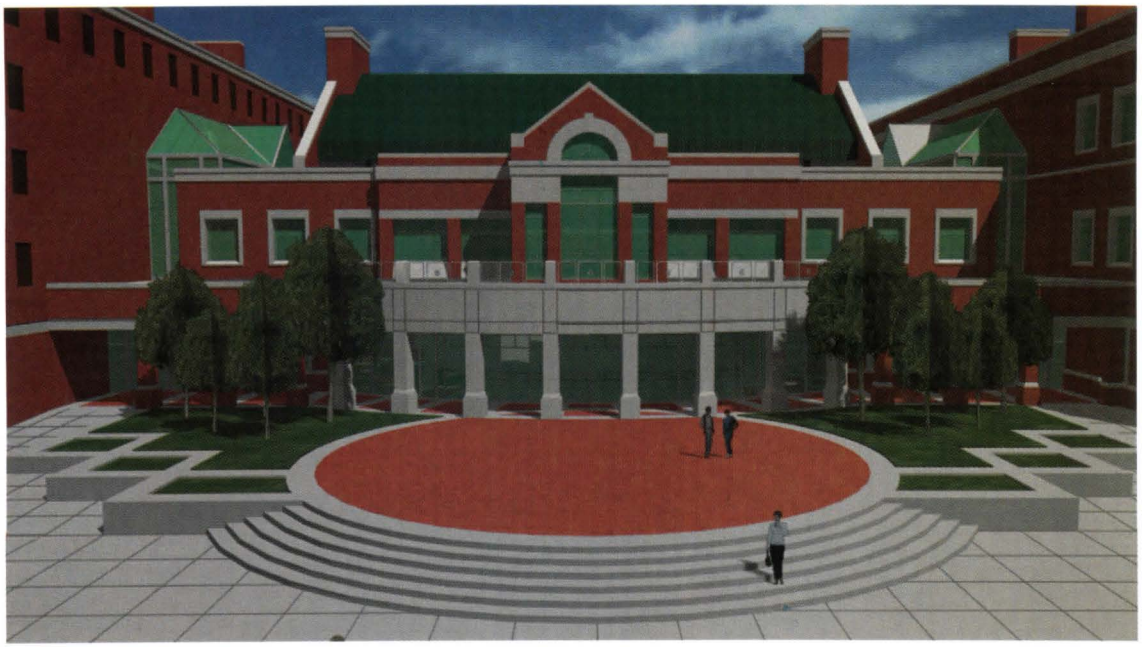
Neal Bastable, Land Plan Design Group, Lakewood, Colorado, collaborated with Visual Environments in Elizabeth, Colorado, to produce photorealistic images of mausoleum landscaping for a New York client. Using 3D Studio to combine an AutoCAD model and landscaping created with LandCADD, these images, according to Bastable, "Helped show the impact of landscape screening . . . and settle a dispute regarding building mass and visibility."

Visualization software lets you compare materials and lighting effects so you can determine the best design. AutoVision renderings, for instance, can represent stonework or wood. And for lighting studies, AutoVision has a Sun Locator feature that allows you to examine every play of light and shadow at any time of day or year.

Take a Walk . . .Through Your Designs

Animation allows clients to realistically "walk" through proposed designs. Flatow, Moore, Shaffer, McCabe Architects (FMSM) in Albuquerque recently renovated and expanded the Eastern New Mexico Medical Center. FMSM had a unique concept for the center's atrium: Certain design elements would help direct patients. In early presentations, according to Jim McNamara, director of FMSM's Health Care Studio, "We wanted to sell the concept to the client, so that even if funds got tight, it would still be an integral part of the project." Using 3D Studio, AutoCAD and CADPlus Total AE Design System, FMSM created a video walk-through of the atrium and convinced the center's key decision makers to go with it. "A physical model just wouldn't have done the job," McNamara concluded.

This mausoleum rendering is being used to settle disputes over the impact of landscape screening. Visual Environments, Land Plan Design Group and David Barrett & Associates collaborated to create the image using 3D Studio, LandCADD and AutoCAD software.



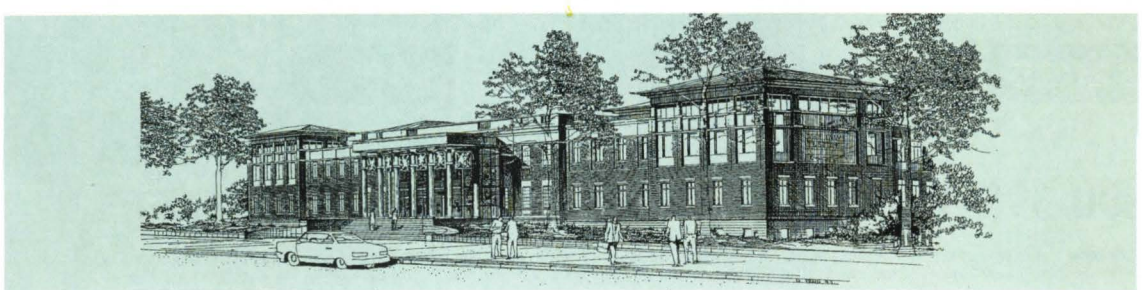
Frankfurt Short Bruza created this image of Oklahoma State University's Advanced Technology Research Center with AutoCAD and 3D Studio.

Autodesk Visualization Software

The Autodesk product family includes AutoVision still-rendering software and 3D Studio, the best-selling rendering and animation software. AutoVision software operates within AutoCAD and has a Materials Editor, ray-tracing capability, a Sun Locator and built-in textures. The best-selling 3D Studio photorealistic rendering and animation, software is ideal for persuasive video walk-throughs and flybys. Visualization benefits include:

- Reduced costs, in-house control, faster, more accurate presentation development.
- Persuasive design communication.
- Photorealism for context and materials analyses.
- Walk-through, flyby and walk-around animation studies.
- Massing studies and solar and artificial lighting evaluation.

To obtain product literature, call Autodesk at 800-964-6432, extension 376 for AutoVision and extension 257 for 3D Studio.



Many firms prefer to present sketches to clients rather than refined CAD plots. So they often produce AutoCAD perspectives and sketch over them for presentations, as Goody, Clancy Associates did for this Dorchester Court House perspective.

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Specifier/Estimator

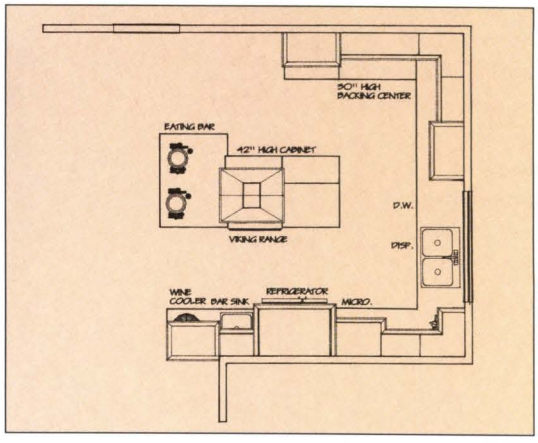
Are You Working Harder Than You Need To?

Sharing drawings through a common database promotes collaboration among team members and allows you, as project specifier/estimator, to access critical information. To ease your workload, the design automation solution also lets you link drawing information to non-graphic data such as materials and labor costs for easier development of takeoffs and bills-of-materials.

Increase Your Efficiency

With this linked information, you ensure accurate perimeter and area takeoffs and that no

Qty	Part Name	Mfg	Finish	Width	Height	Depth
1	BC36R-LS	GENERICI		3'	2'-10-1/2"	3'
1	B36/2	GENERICI		3'	2'-10-1/2"	2'
1	BD24-D4	GENERICI		2'	2'-10-1/2"	2'
1	B9-FDL	GENERICI		9"	2'-10-1/2"	2'
1	BB48L-24-FD	GENERICI		4'	2'-10-1/2"	2'
1	BD36-D3	GENERICI		3'	2'-10-1/2"	2'
1	TEP5/896	GENERICI		5/8"	7'-9-1/4"	2'-1-1/2"
1	W391824	GENERICI		3'-3"	1'-6"	2'-1-1/2"
1	TEP5/896	GENERICI		5/8"	7'-9-1/4"	2'-1-1/2"
1	BEP1	GENERICI		1"	2'-10-1/2"	2'
1	BS24L	GENERICI		2'	2'-10-1/2"	2'
1	V27-FD	GENERICI		2'-3"	2'-6"	2'
1	VD18-D2	GENERICI		1'-6"	2'-6"	2'
1	B27/2	GENERICI		2'-3"	2'-10-1/2"	2'
1	WC2430-PCL	GENERICI		2'	2'-6"	2'
1	WMD2742	GENERICI		2'-3"	3'-10-1/2"	1'-6"
1	W2130R	GENERICI		1'-9"	2'-6"	1'
1	WC2430-PCR	GENERICI		2'	2'-6"	2'
1	W4530	GENERICI		3'-9"	2'-6"	1'

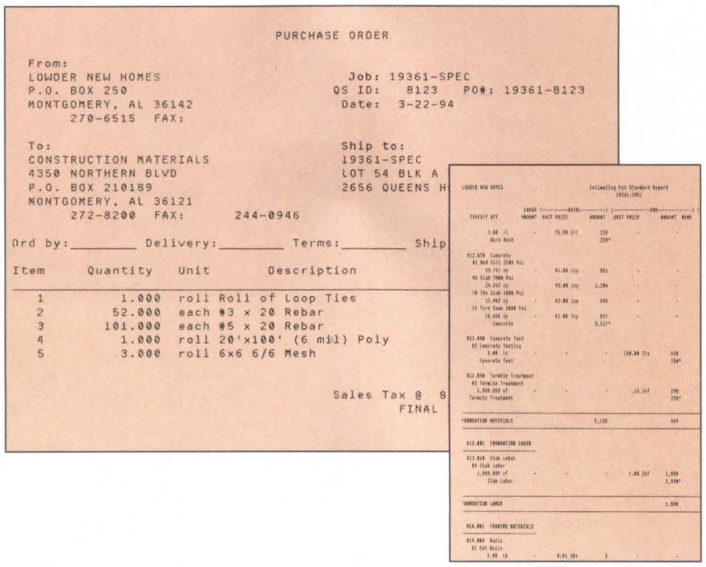


After producing this kitchen plan using AutoCAD software, Nelson-Dye Construction created a perspective to give potential tenants a better feel for the space. A bill of materials for the design was also automatically generated.

items are left off a count. Matt Lovo, chief estimator at Lowder Construction explains, "The manual estimation process, including digitizing and takeoffs, used to take about six hours. Now, it takes about one hour." To achieve this efficiency, Lovo uses Timberline Software's CAD Integrator and Precision Estimator to extract data from the most current design plans located in AutoCAD drawings, then calculates up-to-the-minute budgets.

Angie Kizior of Eden Architects in Mesa, Arizona, uses AutoCAD and CADSoft for

Lowder Construction uses AutoCAD to design homes and produce the associated drawings, such as this foundation plan. The firm uses Timberline software to extract drawing data and compute cost and time estimates, and automatically generate purchase orders.



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From:
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MONTGOMERY, AL 36142
270-6515 FAX:

Job: 19361-SPEC
QS ID: 8123 PO#: 19361-8123
Date: 3-22-94

To:
CONSTRUCTION MATERIALS
4350 NORTHERN BLVD
P.O. BOX 210189
MONTGOMERY, AL 36121
272-8200 FAX: 244-0946

Ship to:
19361-SPEC
LOT 54 BLK A
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2	52.000	each	#3 x 20 Rebar
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4	1.000	roll	20'x100' (6 mil) Poly
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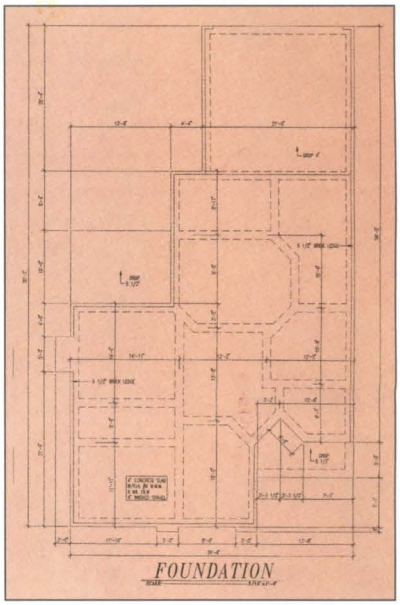

design and drafting as well as takeoffs and cost estimates. "We create detailed estimates from a list showing every wall, stud and joist used on a job. We then compare this with contractors' final materials lists." You can also use estimation software for calculating rough costs and timelines. Clients will benefit from these tools, which provide better project control to avoid overruns of money and time.

The Right Details

Thousands of manufacturers have product databases with associated CAD details, so you can quickly produce quantity takeoffs of specific building components. Using a Pella Windows library, for instance, you can quickly take off window schedules, instead of manually counting windows and searching catalogs for the right models. Then you automatically print purchase orders using the library's information. Such detail libraries encompass virtually all design and construction details and are updated regularly. And since you work hard to get the details right, this can save you and your company considerable time and money.

Manufacturer's Detail Libraries and Estimation Software

Manufacturers of construction materials and components (e.g., roofing, glazing, windows, fixtures) produce a variety of detail libraries with current dimension and pricing information. Check the *AutoCAD Resource Guide* (call 800-964-6432, extension 961, to obtain the *Guide*) or directly contact the component manufacturers. These libraries can be used with estimation software and AutoCAD drawings to produce budgets and accurate cost estimates.

Suppliers of estimation software and detail libraries include:

CADKit	303-987-2376
CADPlus Products Co.	800-423-8127
CADSoft International, Inc.	519-836-3990
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Value-Added Services

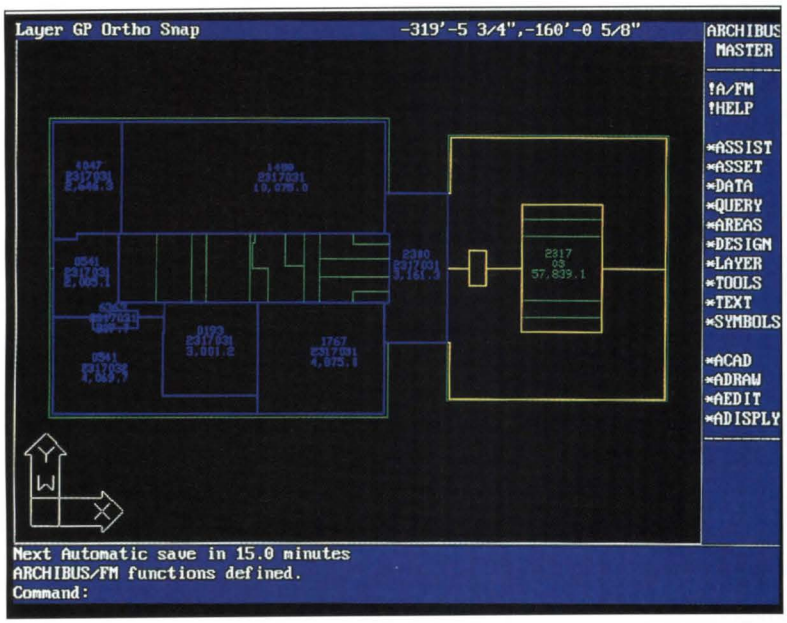
Are You Leaving Money on the Table?

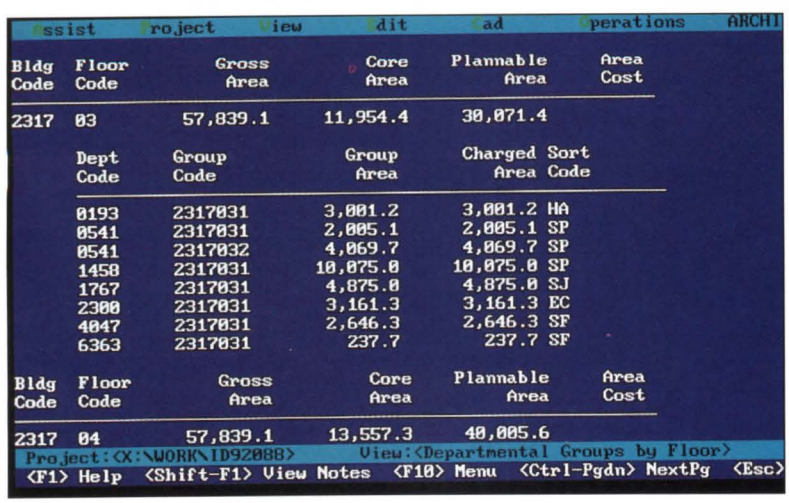
Chemical Bank manages its New York facilities using AutoCAD and ARCHIBUS/FM. Their space-occupancy reporting system was created by their facilities department and Skidmore, Owings, Merrill architects.

Many AEC firms are becoming more competitive by broadening their client service offerings, especially those for interior design and FM. Adding higher-margin services stabilizes cash flow, adds value to your customer offerings and meets more customer needs.

About 63 percent of all corporate facilities managers already use AutoCAD. You can show these potential customers how they can benefit from using AutoCAD for more effective FM and, with your existing AutoCAD-based design and development database, create a highly profitable FM offering. You can offer:

- Complete facilities drawing sets with field measurements of existing facilities. AutoCAD LT on a laptop is the perfect tool for this.
- AutoCAD drawings linked to external databases to support inventory control, cable tracking and lease management.
- Consulting services to help clients select and use AutoCAD-based FM software.
- Renovation and tenant build-out project design and management, using existing AutoCAD data.
- Assistance for on-site maintenance staff, ongoing provision of annotated AutoCAD drawings for work orders.
- Ongoing property management using reliable AutoCAD location drawings and schedules.





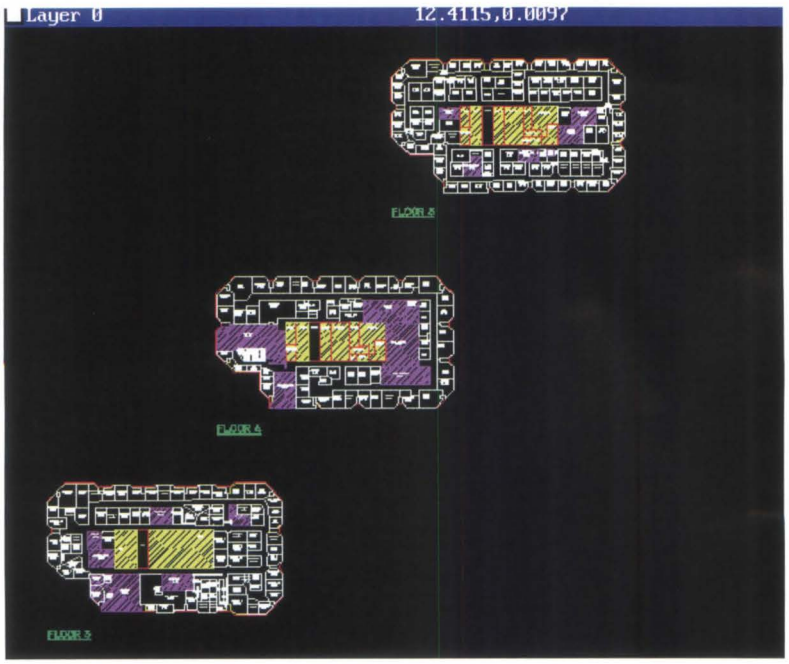
Expand Your Services and Your Revenue Base

Skidmore, Owings, Merrill (SOM) offers FM services to provide continuous customer support and expand its revenue base. When Chemical Bank and Manufacturers Hanover consolidated 25 New York facilities, SOM helped them with space programming and configuring an FM system that encompassed all bank property. Chemical Bank requested that SOM base the FM system on AutoCAD software. First, SOM transferred building data into AutoCAD, then implemented ARCHIBUS/FM software to manage space-occupancy data. This project put SOM in a prime position to win further contracts with Chemical, including space programming for its New York headquarters. SOM has used this success story to market its FM services to other clients.

Managing Multiple Buildings

Because it can simultaneously access data in multiple AutoCAD drawings, AutoCAD Data Extension™ (ADE™) software strengthens your FM capabilities. With ADE, you can view drawings and query databases for more than one floor or building at a time. If, like Chemical Bank, you manage many buildings, ADE allows you to treat all building plans as a single portfo-

This image demonstrates ADE software's ability to open and display multiple AutoCAD drawings simultaneously.



Value-Added FM

A comprehensive choice of FM-specific, AutoCAD-based software is available to help you build your FM capabilities.

- Reduce costly errors by ensuring the accuracy of area calculations.
- Provide stacking and blocking analyses.
- Efficiently manage asset databases with view/query techniques.
- Manage renovations and build-outs using existing base data.
- Provide a foundation for future space planning and management.

Specialized FM software is available from:

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CAP Sweet's Electronic Publishing	616-454-0000
FM: Systems	919-870-9800
Innovative Tech Systems	215-441-5600
Softdesk, Inc.	603-428-3199

lio of drawings. For instance, you can view unallocated areas on different floors of different buildings, view block plans of those floors and print reports on total space occupancy—all from within AutoCAD software. With ADE, it's also easy to link essential facilities databases to AutoCAD drawings for an integrated information tool driven by the AutoCAD plans. To obtain ADE product literature, call Autodesk at 800-964-6432, extension 435.

The Future of AEC

The successful implementation of design automation technology based on the concept of the common drawing database is crucial to the continued growth of the AEC industry.

A common drawing database lets you control and manage every facet of the design/build process and expand service offerings. And because of AutoCAD software's flexibility, you can customize architectural applications to fit your unique requirements. Combined with a wealth of AutoCAD-based add-on applications, you can build a system that takes your firm profitably into the next decade.

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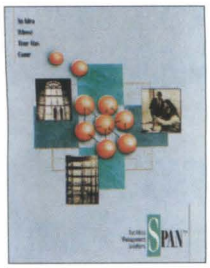

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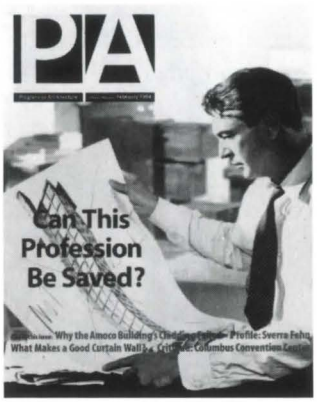

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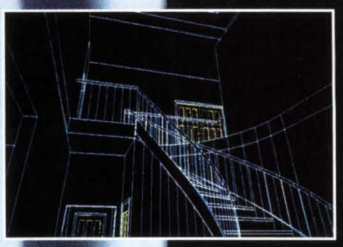

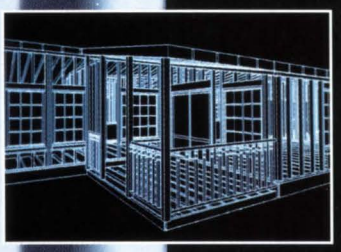

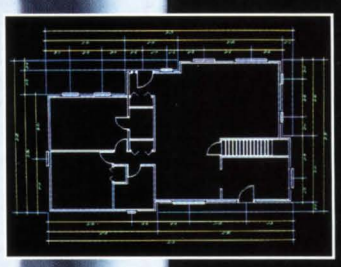

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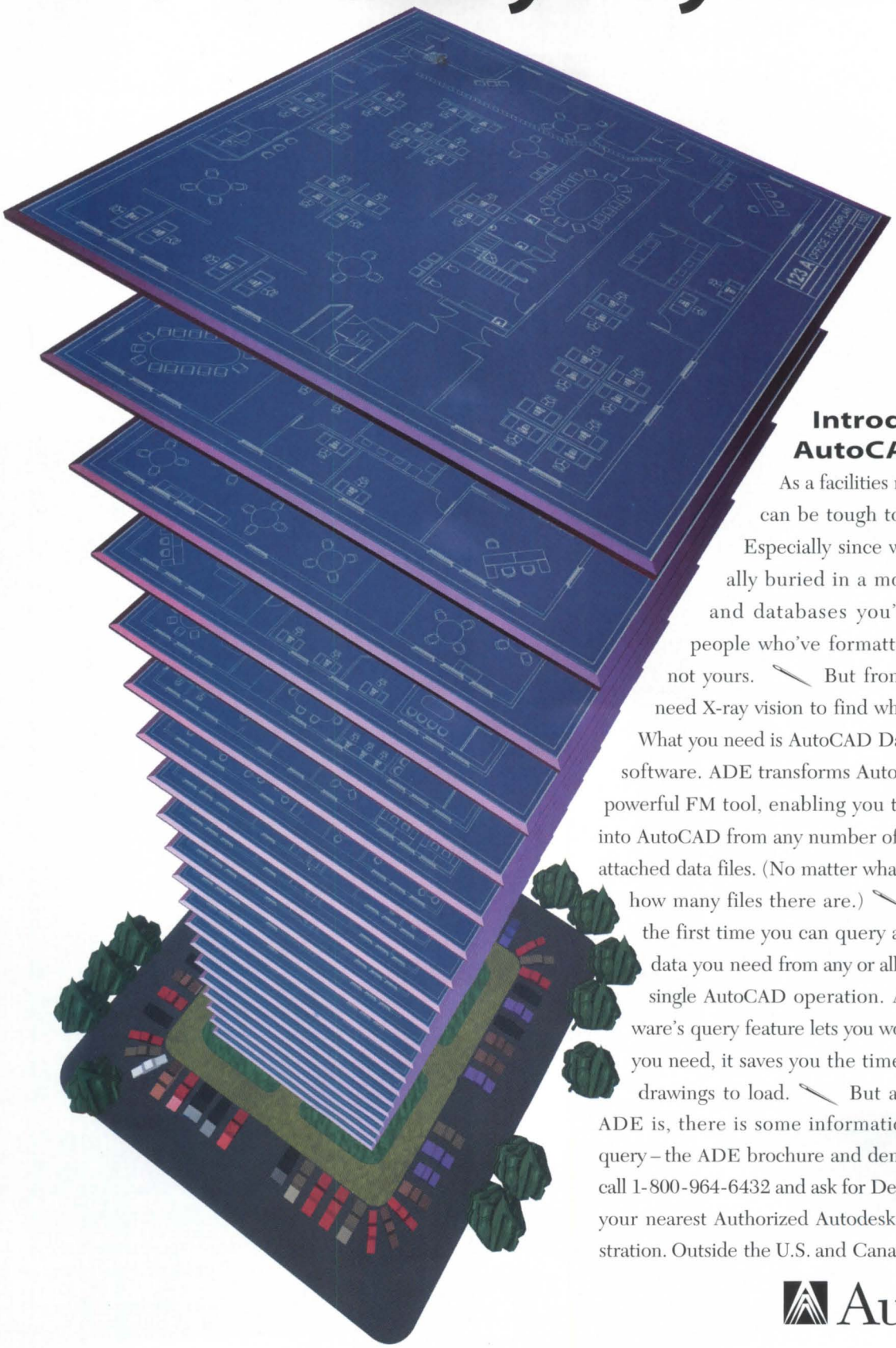
How to find a needle in a 21-story haystack.



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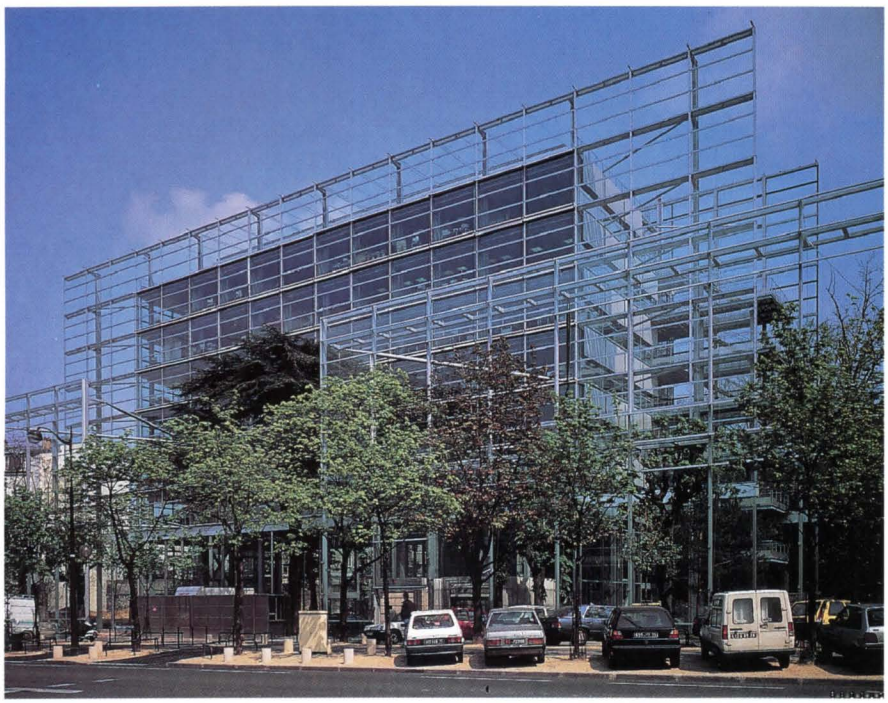
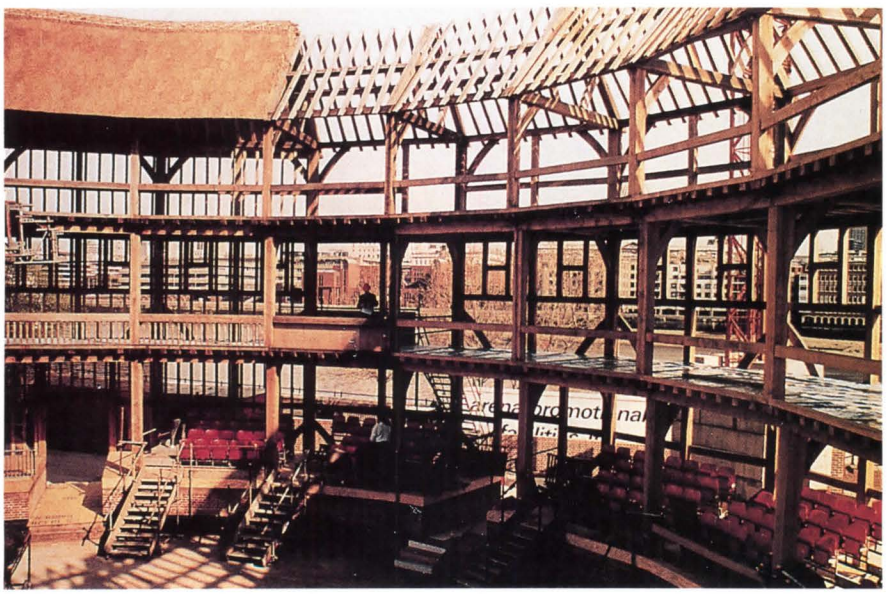


Stephane Couturier

New Headquarters for Cartier by Jean Nouvel

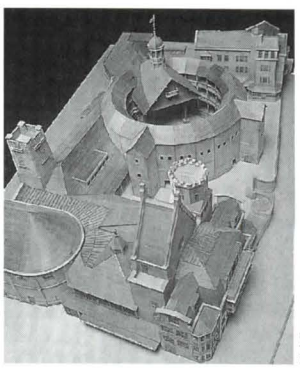
Ensconced on Paris's Right Bank since 1847, Cartier has opened a new headquarters on the Seine's Left Bank for its French operations and arts foundation. Designed by Jean Nouvel, the striking glass box on the Boulevard Raspail, former site of the American Center (which has moved to a new building by Frank Gehry on the Right Bank, page 27), is remarkable for its transparency and illusion of movement. Twin glass screens, each about half the height of the building, create complex façades that seem to shift and change as one passes by. From the spartan, elegant upper-floor offices it is difficult to distinguish between inside and outside, an appropriate experience as the building is set in a preserved historic garden.



Photos: Jon Greenfield

Shakespeare's Globe Theater Rises Again

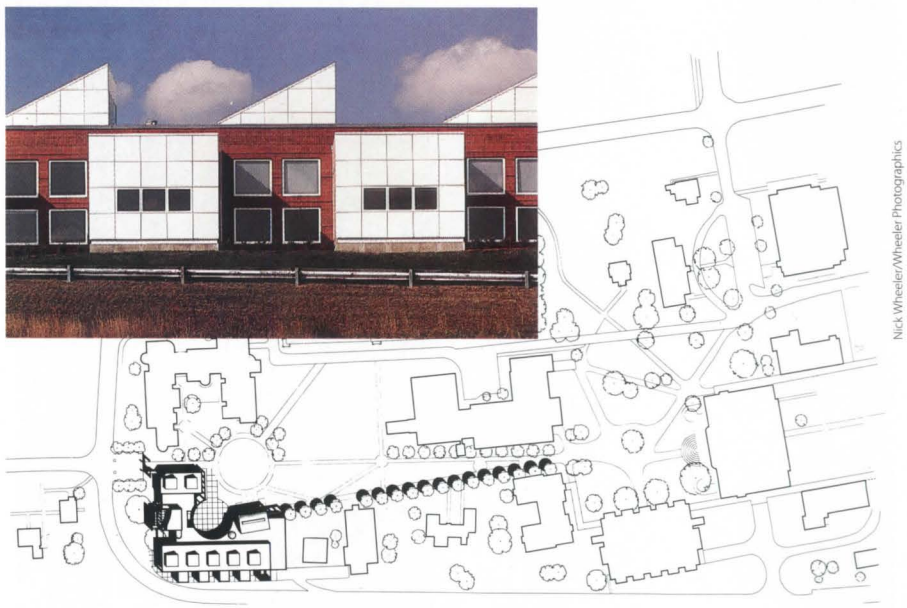
William Shakespeare's open-air Globe Theatre, which burned down in 1599, is currently being reconstructed as part of a larger complex on London's South Bank, near the site of the original building. Craftsworkers are using 16th-Century joinery techniques to assemble the oak frame of this 1,500-seat, 20-sided theater; the timbers are being fastened together with traditional joints and pegs; no nails or glue are being used. To meet fire codes, two extra staircases were added to the plan, and the timber and the thatched roof will be treated with fire-retardant chemicals. Scheduled for completion next year, the project, by Pentagram Design, London, will also include a smaller indoor playhouse (based on drawings by Inigo Jones), a restaurant, a museum, and a row of apartments.



Nick Turner

Arts Center Blends into Eclectic Campus

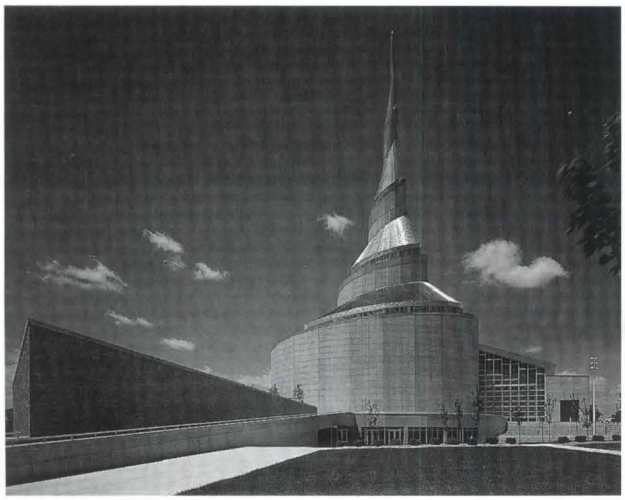
A new visual arts center at the Loomis Chaffee School in Windsor, Connecticut, was designed by Stecker LaBau McManus Architects, Glastonbury, to blend with the campus's stylistically diverse stock of existing buildings, constructed over the past 70 years. The center's brick exterior alludes to the school's original Georgian style buildings from the 1920s, and like them includes an arcade. The new arcade ends in a courtyard that sweeps in a three-quarter circle to the building's main entrance and anchors the southeast corner of a quadrangle. Studios are along the building's east side (inset) and are lighted from above through north-facing skylights, their jagged forms recalling the angular architecture of a nearby 1960s building.



Nick Wheeler/Wheeler Photographics

SITE PLAN

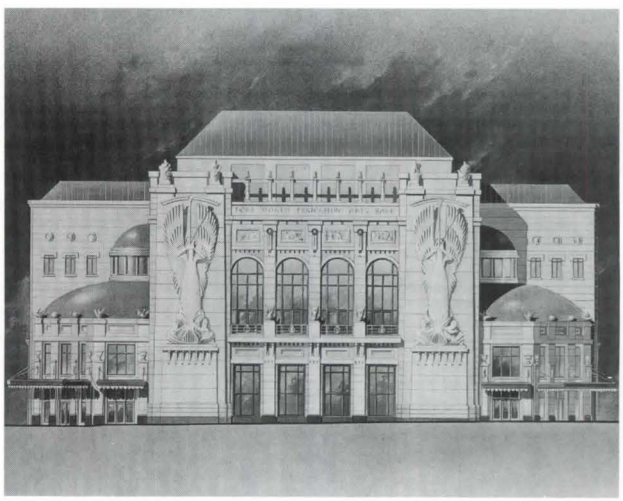
N → 100'/30m



Balthazar Korab

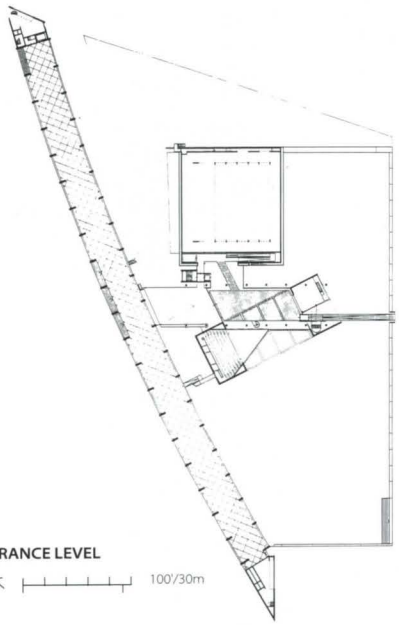
A Church Like No Other

The design of the $35-million Reorganized Church of Jesus Christ of the Latter Day Saints Temple, located on a 13-acre site in Independence, Missouri, was "intended to distinguish the church from all other religious structures." Its 340-foot-high spiral, the equivalent of a 26-story building, was designed by Gyo Obata of Hellmuth, Obata & Kassabaum, St. Louis, to recall the form of a sea shell (the spiral shell of the chambered nautilus), a symbol of nature writ very large. A band of clerestory windows follows the spiral of the roof line and provides the sanctuary with natural light. A school and offices are located in an L-shaped wing that wraps around the south edge of the temple. A two-story reception hall is located in the transitional space between the sanctuary and the school/office wing.

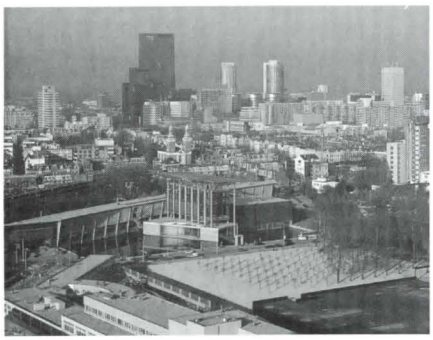


A Performance Hall for Fort Worth

An elaborately ornamented, $60-million performing arts hall is planned for a site in downtown Fort Worth, Texas. Designed by David Schwartz/Architectural Services, Washington, D.C., architect of the Texas Rangers's ballpark in Arlington (P/A, Nov. 1991, p. 26), the multiuse facility will provide a permanent home for the city's symphony, ballet, opera, and other performing arts groups. The auditorium, a "modification" of the classic opera house plan, will have aligning balcony parapets forming a grand court, a forestage zone, and a coffered dome ceiling. Jaffe Holden Scarborough is responsible for the hall's "state-of-the-art" acoustical system. Completion is slated for 1998.



James Linders



James Linders

New Home for Netherlands Architecture Institute

The Netherlands Architecture Institute (NAI), a competition-winning design by Jo Coenen & Co. Architekten of Maastricht, is the newest addition to Rotterdam's Museum Park, an ambitious cultural center clustered around the Boymans Museum that includes Rem Koolhaas's Kunsthal. Coenen's bold forms, together with the NAI's inclusion on this prominent site, demonstrate the city's serious commitment to architecture and its role in the creation of a strong cultural base. Defining one edge of Museum Park, the NAI is composed of four distinct pieces, each housing a specific function (exhibition/museum, archive, auditorium, and administration) and clad in a different material (brick, metal sheeting, concrete, and glass). Public walkways connect the institute to the park and the other museums.

Rehab and Infill for 1960s Housing in Toronto

The Moss Park Community Development Project in Toronto, by Paul Reuber, Inc. (P/A, Aug. 1992, p. 61), includes the refurbishment of four 1960s subsidized housing blocks and the infilling of adjacent parking lots with 220 units of new housing. The rehabilitation of the towers, based on design guidelines created by Reuber, will be executed by other architects and will include new street-oriented lobbies with sitting areas and communal facilities, modification of the two-story maisonette units to promote better security and access, and a new waste management system. The infill portion of the project will include new streets, lanes, and walkways, creating eight new housing sites with row houses, townhouses, small apartment houses, and a courtyard apartment complex; a community/cultural center will be located in the park. This phase, which requires a complicated rezoning process, is currently being reviewed by the Ontario Ministry of Housing.

Gerald Ratto Photography

International Terminal for San Francisco Airport

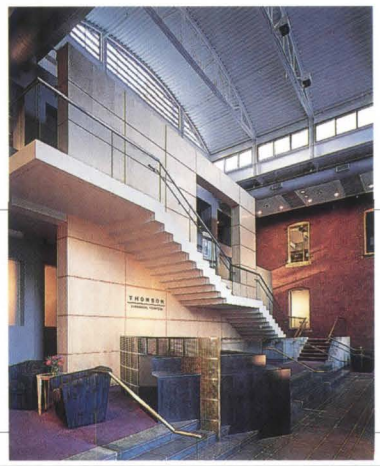
The San Francisco Airports Commission has selected the team of Skidmore, Owings & Merrill, San Francisco, Del Campo & Maru, and Michael Willis & Associates to design a new 1.5-million-square-foot international terminal. The largest component of a $2.4-billion airport master plan, the terminal is designed with the capacity to process 5,000 passengers per hour and to improve passenger satisfaction with a 45-minute "out-the-door" maximum for international arrivals (the average processing time is currently one to two hours). The long-span structure will be built in airspace over the existing main airport terminal access roads. Two new concourses, designed by other architects, will provide a total of 26 new gates.

Training Center for U.S. Fish and Wildlife Service

Construction is under way on a national education and training center for the U.S. Fish and Wildlife Service on a 500-acre site in Shepherdstown, West Virginia, along the banks of the Potomac River. Florance Eichbaum Esocoff King Architects of Washington, D.C, designed the master plan, which includes facilities for physical training, instruction, laboratories, a commons, a museum, an auditorium, and housing. A bridge over a gorge will connect the commons building (above) to the instructional building. The architects chose low maintenance, sustainable materials for the complex. The buildings will be sheathed in batten metal siding with a high recycled steel content. Other materials include local stone, farmed American hardwood, and exposed concrete block. The height and footprint of the buildings were kept modest to limit their visual impact on the wooded site, and to fit well with the existing topography.

Urban Design Strategies Internalized for HQ Complex

The new corporate headquarters of Thomson Financial Services, a progressive software/publishing company, occupies seven brick and timber warehouse buildings in Boston's historic Fort Point Channel district. Architect John H. Uzee of ADD Inc., Cambridge, was charged with unifying 220,000 square feet, spread over 27 disparate levels. The architects devised an interior urban design solution: the buildings serve as neutral enclosures housing working "neighborhoods," linked by a meandering purple carpet "path"; each neighborhood comprises typical offices with sloped maple roofs and skylights, organized around a storage "tower" and a "landmark" pavilion that holds kitchen, copy, fax, and recycling. The entire complex was given a new two-story entrance lobby, which is dominated by a monumental stair (photo) leading to the company's primary level.



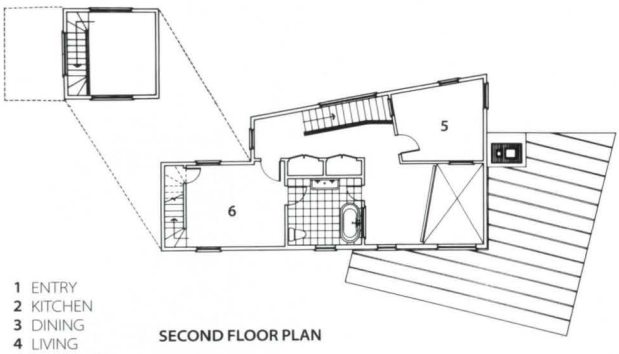
Vanderwarker

MAIN FLOOR PLAN AND AXONOMETRIC

N 40'/12m

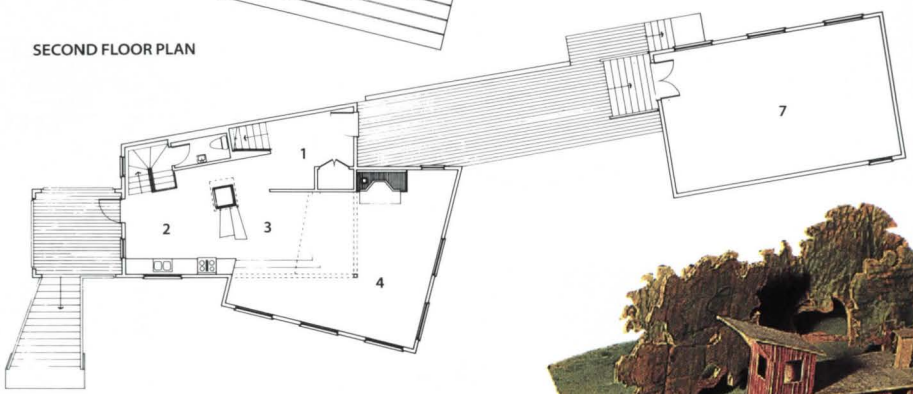
Context is Everything for Rural House and Studio

Turner Brooks's design for a small house and studio on abandoned farm land in Westby, Wisconsin, uses the colors, textures, and forms of its agricultural context. The 1,800-square-foot house for two artists and their daughter will have red-and-white board-and-batten siding, inspired by local Amish barns; creamy yellow clapboards, a tribute to the local cream and butter industry; and other materials typical of this rural landscape – standing seam galvanized metal roofing, maple floors and trim. The 800-square-foot studio is just east of the house, which it is connected to by a deck.

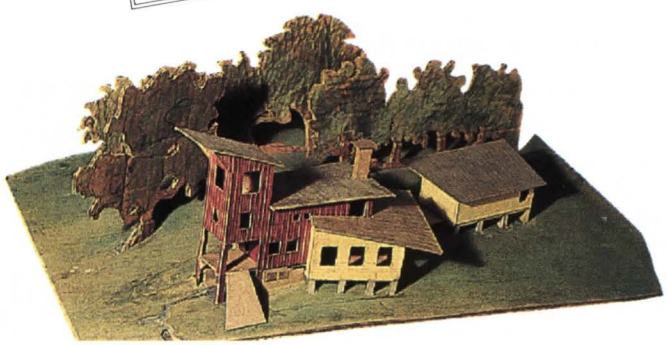


1 ENTRY
2 KITCHEN
3 DINING
4 LIVING
5 BEDROOM
6 MASTER BEDROOM
7 STUDIO

SECOND FLOOR PLAN

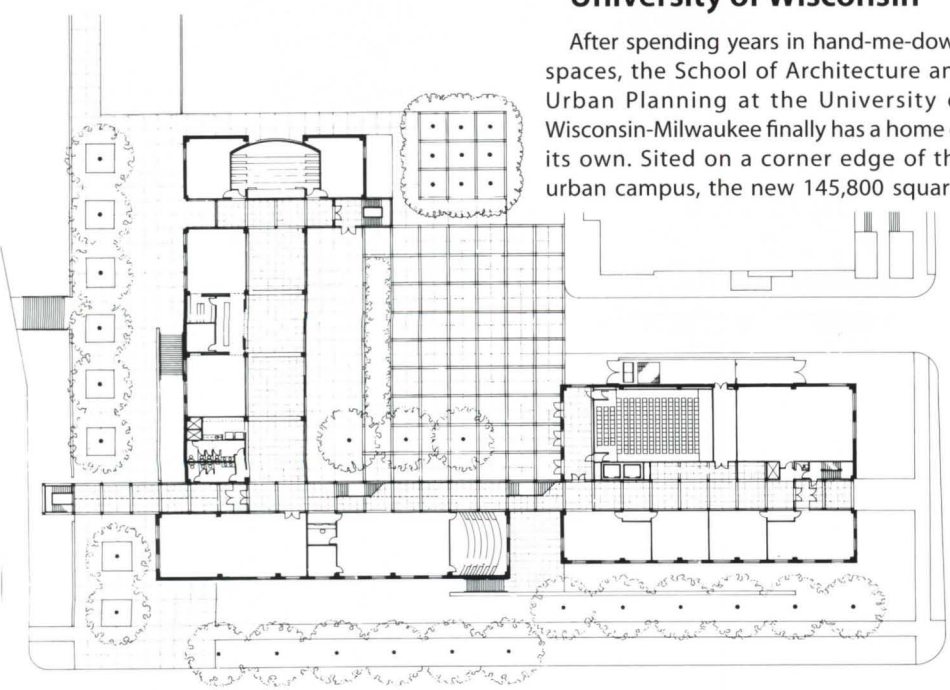


FIRST FLOOR PLAN

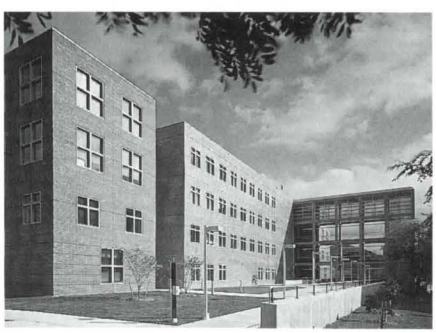


Architecture School for University of Wisconsin

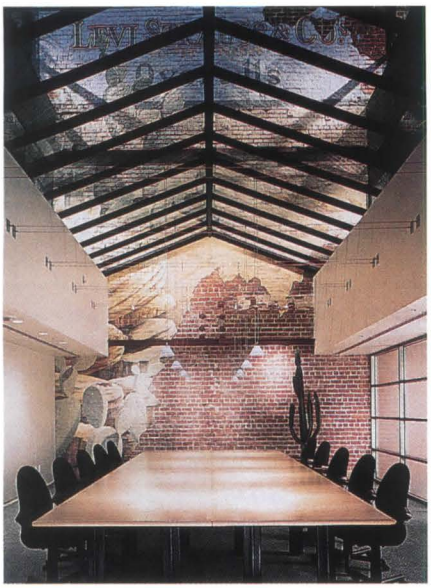
After spending years in hand-me-down spaces, the School of Architecture and Urban Planning at the University of Wisconsin-Milwaukee finally has a home of its own. Sited on a corner edge of the urban campus, the new 145,800 square-foot building is split into two four-story volumes, together accommodating up to 800 students. Its austere brick-and-glass exterior is in stark contrast to the lively interior walls that form a courtyard. The program mixes studios, faculty offices, classrooms, libraries, research labs, special facilities, and common spaces in a plan that the designers hope will promote a sense of community. The architects are Holabird & Root, Chicago, in association with Eppstein Keller Uhen Inc., Milwaukee; Dean Robert Greenstreet and Associate Dean Lawrence Witzling acted as advisors.



GROUND FLOOR PLAN



Bob Freund Photography



Chas McGrath

1

First AIA Honor Awards for Interiors Presented

The AIA's first annual Honor Awards for Interiors, a program designed to elevate the status of the institute's interior architecture awards to the level of the Honor Awards, were presented at the AIA convention in Los Angeles last month. The jury was chaired by Graham Gund of Graham Gund Architects, and included Scott Johnson of Johnson Fain & Pereira Associates; Milton Glaser; and Jack Lenor Larsen.

The eight winners were:

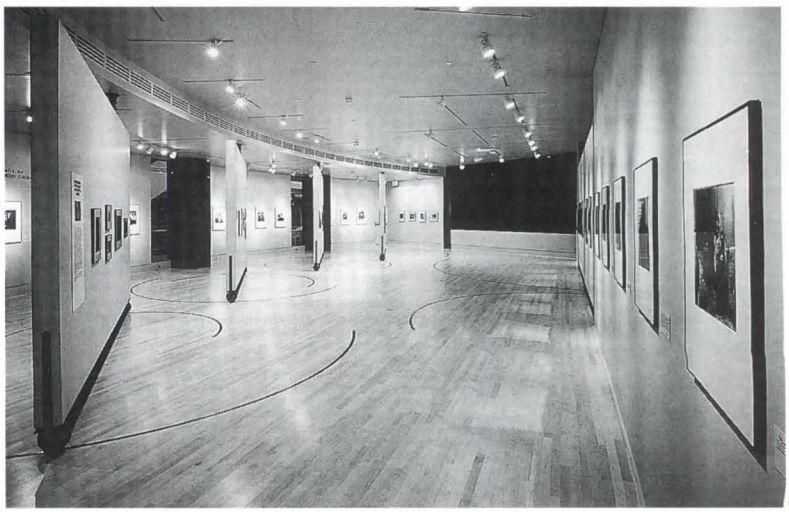
- The Icehouse, San Francisco, by Swatt Architects, San Francisco (1);
- Lawson/Weston House, Los Angeles, by Eric Owen Moss, Santa Monica (P/A, May 1993, p. 68).
- Arrow International, Reading, Pennsylvania, by Kallmann McKinnell & Wood Architects, Boston, and Stephanie Mallis, New York (2);
- Adelbert Hall Administration Building at Case Western Reserve University, Cleveland, by R.M. Kliment & Frances Halsband Architects, New York;
- Restoration of Josef Urban's John Tishman Auditorium, at the New School for Social Research, New York, by Prentice & Chan, Ohlhausen, New York (3);
- Seafirst Gallery, Seattle, (P/A, Apr. 1994, p. 106) by NBBJ, Seattle (4);
- residence, Greenwich, Connecticut, by Elliott + Associates Architects, Oklahoma City, and H.T. Graves & Associates, Greenwich;
- Knoll International Showroom, Frankfurt, Germany, by Studios Architecture, San Francisco.

Steve Rosenthal

2

Brian Rose

3

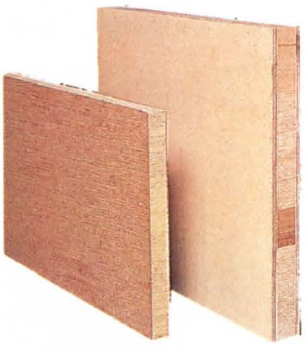


Chris J. Roberts Photography

4

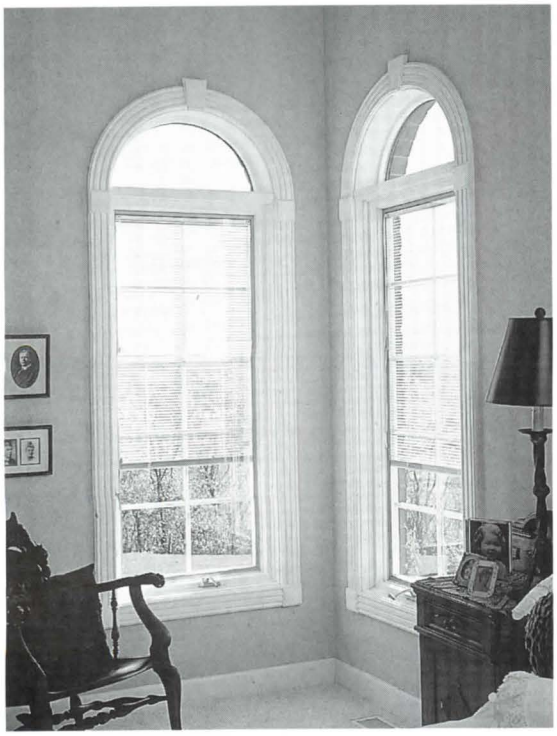
Windows for Cold Climates

Manufactured and distributed in Scandinavia for more than 30 years, the H® Window from the H-Window Company is now manufactured in the U.S. Known for its cold weather performance characteristics, the H Window has a low air infiltration rate (.006 CFM/ft. at 25 mph) and R-Values from 3.8 to 7.7. In addition, a patented hinge system allows the window to be rotated 180 degrees, without disrupting interior blinds or drapes during cleaning. The windows have a dual-frame, composite construction with an all wood interior and a fully extruded aluminum exterior. Custom sizes, finishes, and hardware can be ordered.
Circle **100** on reader service card



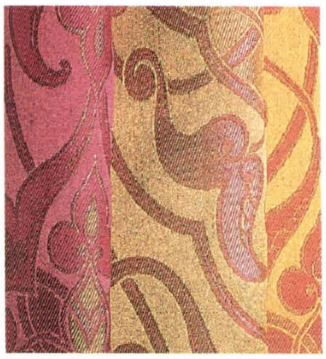
Wood Panel from Renewable Source

ECOFORM panel products are positioned as a lightweight alternative to particle board and medium density fiberboard. Manufactured by Baltek, ECOFORM products (available in 4′ x 8′ or 5′ x 10′ panels) are made of an end-grain balsa core (with wood from a company-owned plantation in Ecuador) sandwiched between thin, high-strength skins. ECOFORM HPC is for use in doors and shelves, and ECOFORM HPX is for work surfaces, conference tables, and doors. No formaldehyde-based adhesives are used in the manufacturing process.
Circle **102** on reader service card



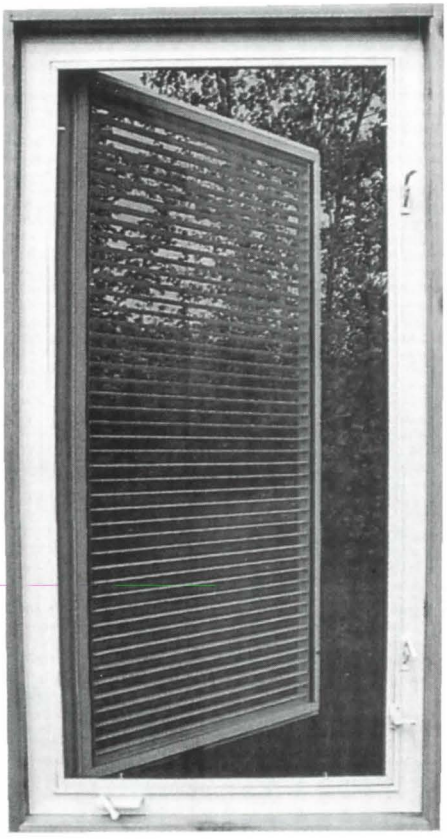
Operable Between-Glass Blinds

Pella has expanded its line of between-glass accesssories (stationary blinds, pleated shades, and wood muntins) to include Raise and Lower Slimshade blinds. The blinds, part of the Designer Series, can be combined with wood muntins in SmartSash II products or chosen as a single option in SmartSash III products. The blinds are available in white or energy-efficient Goldtone Type E.
Circle **101** on reader service card



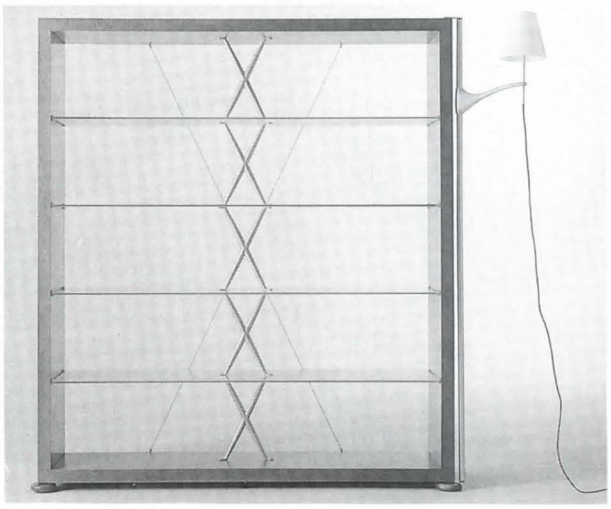
Textiles by Romeo Gigli

Italian fashion designer Romeo Gigli has produced his first collection of woven textiles for residential use. Commissioned by Donghia, the eight patterns in the collection is woven in a variety of materials, including cotton, polyester, acrylic, viscose, silk, wool, and linen. Shown above is the viscose and cotton Islamica pattern, available in three colorways.
Circle **103** on reader service card



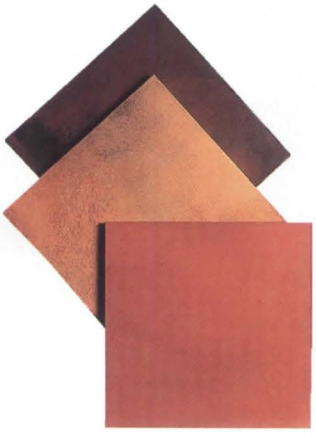
Acoustical Glazing

VISION® Control acoustical glazing products, manufactured by Unicel, have pivoting blades (manually operated or motorized) hermetically sealed between sheets of glass in a variety of sizes and shapes. The sound dampening effect of the louver and a 2-inch air space make the products suitable for sloped glazing, interior partitions, windows, and doors in hospitals, schools, labs, and conference rooms.
Circle **104** on reader service card



Shelving Unit by Pascal Mourgue

French designer Pascal Mourgue has produced a new collection for Ligne Roset, including a shelving unit (shown), mobile trolleys, and occasional tables. The shelving unit is constructed of particle board with a pearwood-color-stained beech veneer; glass shelves with a ceramic matte finish; stainless steel bracing; and cast aluminum shelf spacers. An optional hinged, tubular steel column with an adjustable light fixture or table is also available.
Circle **105** on reader service card

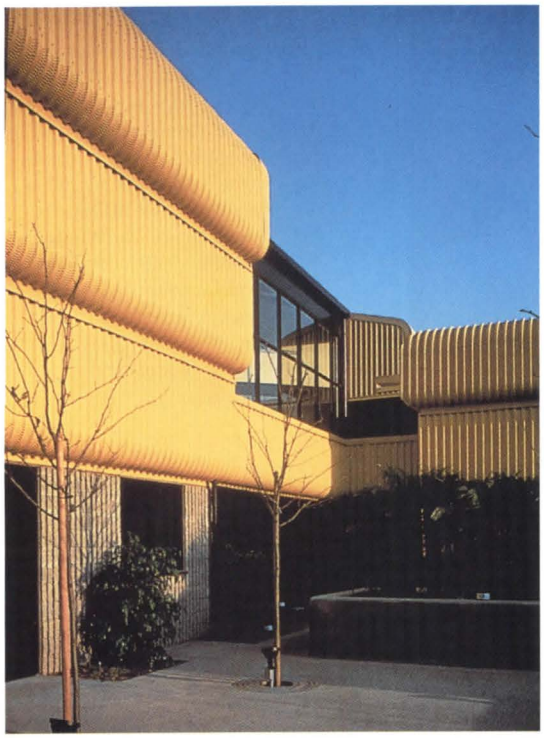


New Tile

GranitiFiandre has added three new tiles to its Pietre Preziose and Onici Rari collections: Diaspron has various shades of amber and also incorporates minerals that evoke the color of jade; Luxor is a red onyx; Emperador is a black onyx, but appears to have a range of colorations from indigo to gold. All of the tiles are 16" x 16," with a polished surface.
Circle **106** on reader service card

Soft Lighting

Marc Sadler's new fixtures for the Arteluce Collection by FLOS use molded silicone slipcover diffusers to soften light from an energy-efficient fluorescent light source. Called *Drop*, the ceiling and wall fixtures have an ADA-compliant 4-inch profile for use in public spaces; a UL-listing for "damp location" status makes them suitable for use in kitchens and bathrooms. Drop/1 (shown) uses a 9-watt fluorescent twin-tube lamp and is 5 inches wide and 9.7 inches high; Drop/2 uses two 9-watt fluorescent lamps and is 7 1/2 inches wide and 10 inches high.
Circle **107** on reader service card

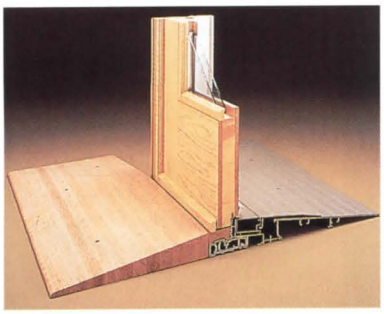


Exposed Fastener Panel

N.A.T. Industries' T-5 exposed fastener panel is suitable for commercial and industrial roofing and wall applications. Using press-forming technology, the manufacturer can custom-modify the panel's profile (1 1/2" deep and 36" wide, with a 6" pitch) to meet special requirements. The panels can be curved to form contour walls, mansards, canopies, and fascia. They are available in 26-16 gauge steel or aluminum and can be finished with a variety of paint systems.
Circle **108** on reader service card

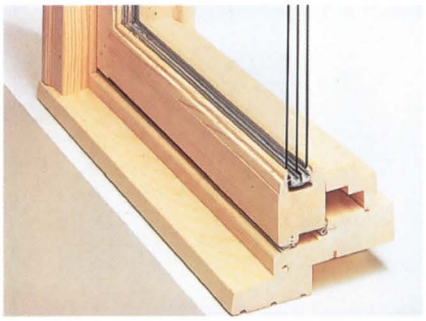
Ceramic Roof Slate

Manufactured by CertainTeed, Celadon™ Ceramic Slate™ is an "affordable," kiln-dried clay roofing product designed to have the same appearance and performance characteristics as premium-cost clay roof tile. (A photo of this tile was printed upside down in the March issue, p. 45.)
Circle **111** on reader service card



Wheelchair Accessible Door Ramp

Andersen's new Ramped Sill Insert for patio doors is designed to meet the remodeling criteria of the 1986 American National Standards Institute Code (ANSI #A117.1) for providing access for people with disabilities. The ramp has a solid oak interior; the exterior ramp, center ramp, and track cover are made of extruded aluminum. The insert is available for Andersen® Frenchwood® Hinged, Frenchwood® Gliding, and Perma-Shield® Gliding Patio Doors.
Circle **109** on reader service card



Tripane Glazing System

High R glazing from Marvin Windows & Doors consists of three panes of glass, two of which incorporate Low-E coatings. Depending on the unit's size, the two sealed spaces between the panes are filled with argon or krypton insulating gas; both gases are vacuum-sealed between all three panes, forming a layered barrier to heat loss. High R windows, for both commercial and residential applications, also have a Warm-Edge spacer to help maintain warmer temperatures at the edge of glass, where condensation could occur.
Circle **110** on reader service card

Hurricane-Resistant Glazing Brochure

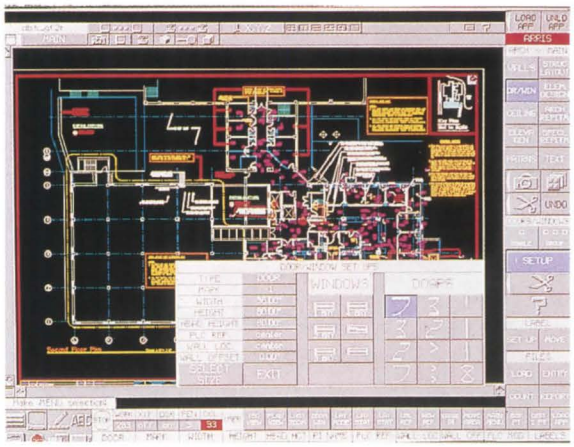
In response to Hurricane Andrew's devastating touchdown in Florida, Monsanto has published *Glazing Systems for Effective Hurricane Resistance.* The brochure contains information about: the hurricane-resistant qualities of laminated glass with Saflex®; hurricane effects on buildings; building codes and standards; residential and commercial glazing protects being developed and in use; and technical resources and references.
Circle **200** on reader service card

Window Film

ITD/Metallized Products (Sun Guard) recently introduced the Designer Series window film. The film provides solar heat and ultraviolet reduction without changing the color of the view seen through the glass. A 4-millimeter-thick safety version of the window film is designed to minimize storm damage and to deter vandals.
Circle **112** on reader service card

Production Drawings

More than 40 new features have been added to Choice Computing's TrueCAD for Windows Version 2. Users, for example, can now read and write AutoCAD® .DWG files directly. A new Power Bar™ provides full editing control using a more intuitive format. All objects created in TrueCAD now have Grab Handles that can be used for stretching, moving, and rotating.
Circle **113** on reader service card



ARRIS for Windows

Originally developed on the UNIX operating system, Sigma Design's ARRIS software for design, drafting, facilities management, and building visualization, is now available for Microsoft Windows 3.1. Billed as the first full 32-bit UNIX-class CAD product line in the Windows environment, ARRIS for Windows is designed as a more affordable alternative to workstation-based products.
Circle **116** on reader service card

3D Modeling and Rendering Upgrade

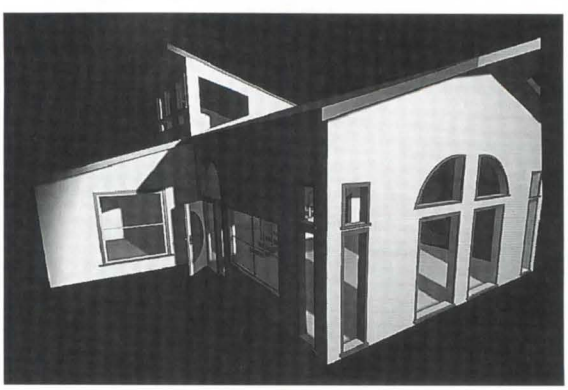
Sketch! Version 2, Alias's 3D modeling and rendering application for the Macintosh, includes more than 50 new features such as sweeping; numeric keyboard input; surface and curve cutting; improved snapping tools; support for polygon models and Adobe dimensions; and network rendering. Version 2.0 will ship with both Alias Sketch!Net™ and Alias Render!Q™, two separate applications dedicated to faster and more efficient rendering.
Circle **114** on reader service card

3D Plants and Trees

Design Vision has announced the introduction of AMAP (Advanced Modeling for the Architecture of Plants) Version 2. Each species depicted in AMAP has a unique mathematical algorithm and database that include specification parameters such as age, time of year, and pruning history. Two main components are used: Growth Engine simulates plant growth with 3D output in the form of a polygonal-based matrix of a tree or plant; LandMaker, which includes a Renderer and a Shading Editor, creates images of landscapes, gardens, interiors, and urban landscapes in both plan and perspective views with simple planting elements. Optional modules are Terrain, Plant Modeler, Data Transfer, and Animation.
Circle **117** on reader service card

CAD Program Upgrade

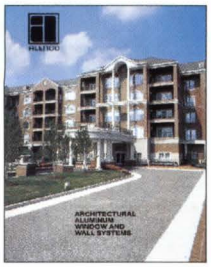
Engineered Software's PowerDraw™ 5.0 includes several significant new features such as the OverView Window, which provides the ability to view an entire drawing while working on an enlarged portion regardless of the monitor size. New Externals have also been added to Version 5.0: Dimension Palette, which allows fast "on-site" dimension editing; the Status Window, which contains several frequently changed and monitored functions, including Move and Edit All Layers; and the Smart Layer External, which enables a color, a scale, or specific tools to be assigned to a layer.
Circle **115** on reader service card



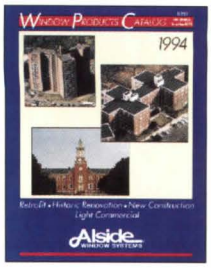
2D to 3D Modeling

Eclipse Software is now shipping Facade 2.0, a modeling software for AutoCAD Release 12. Users draw building elevations in 2D and Facade converts the drawings into finished 3D models, not extrusions, in fewer than 15 minutes, according to the software producer. The model can then be used to produce renderings or animated walkthroughs in programs such as Autodesk 3D Studio.
Circle **118** on reader service card

Windows & Related Products Literature Digest



Alenco's 1994 product guide includes product photos and details of single- and double-hung, horizontal sliders, projected, casement, and fixed commercial windows. The guide also includes sections on installation accessories, replacement window systems, and design/engineering issues.
Alenco Commercial Division. Circle No. 330



Alside manufactures a full line of vinyl windows for your historic preservation, new construction, and light commercial needs. Available in custom and standard sizes, the windows are adaptable to virtually any opening. Our vinyl windows are tested to national standards including NFRC. Energy-efficient options include high-performance glazing and warm-edge spacer systems.
Alside. Circle No. 331

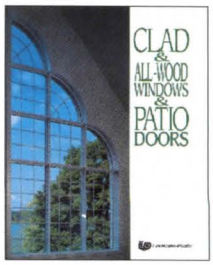
Andersen Windows, Inc., offers Andersen CADD-I for AutoCAD. The software creates 3D symbols, 2D elevations, and details and schedules for all Andersen products. The DXF symbol library provides 2D plan and elevation symbols in addition to a product specification disk in CSI format.
Andersen Windows, Inc. Circle No. 332

Baudisson Windows manufactures custom-made windows of all sizes. The windows contain casement awnings and pivot horizontally. They can be used as a roof window or a door occulus. Any size trim is available for quick delivery.
Baudisson Concept Window. Circle No. 333

Case Window and Door manufactures windows, doors, window walls, and rolling glass walls for commercial and residential projects. The all-wood products are custom laminated with any appropriate wood species. The products can also be metal-clad with aluminum, anodized and powder-coated, and architectural bronze. The hardware options are virtually unlimited.
Case Window and Door. Circle No. 334

This full-color catalog describes Chase-Durus traffic doors for industrial, commercial, and institutional applications. The products described include automatic, high-speed motorized traffic doors, and gravity- operated impact doors made of flexible vinyl, solid wood core, metal-clad, and insulated construction. Custom options, materials, and finishes are avilable.
Chase-Durus. Circle No. 335

Forms + Surfaces's Series 1000 Door Collection features an extensive selection of standard design elements which may be specified in an almost limitless number of combinations: Honduran mahogany is accented by carved wood, bonded metal, or patterned glass to create exquisite 3' x 7' and 3' x 8' doors for interior and exterior installations.
Forms + Surfaces. Circle No. 336



Louisiana-Pacific's wood windows and hinged and sliding glass patio doors have the natural warmth and traditional good looks on the inside, with two exterior finishing options: A wood exterior fully primed for paint or stain or a high-performance factory-coated finish (48 colors available) – guaranteed for 10 years. The products are available with low-e, high-performance glass, wood grilles, and dust-free muntin bars.
Louisiana-Pacific. Circle No. 337

(continued on page 117)

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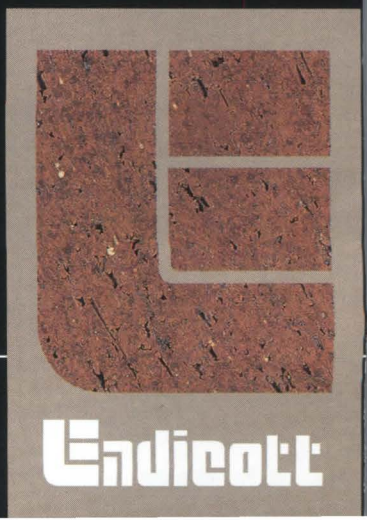

Endicott Clay Products Company

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Circle **No. 323** on Reader Service Card.

Tomorrow's Schoolhouse:

Making the Pieces Fit

In the absence of a consensus on what constitutes school reform, architects must permit change without requiring it.

by Mark Alden Branch

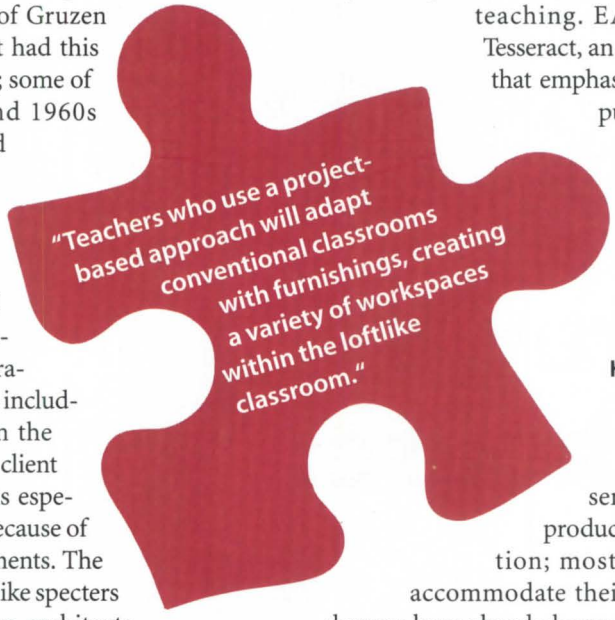
In 1971, the 300 or so students at my Oklahoma elementary school moved from a conventional two-story school building with double-loaded corridors – circa 1914 – to a sprawling, flattened facility that represented the state of the art in school design. According to theory, the open-plan school would allow flexibility, facilitate team teaching, and encourage interaction among grade levels. The only trouble was: no one told the teachers. Without a clear sense of what the open plan was for, they kept doing what they knew best: the four-foot-high bookcase-dividers between classes stayed put all year, the desks stayed in rows facing the (one) teacher, and half the battle of teaching became a quest for quiet. It was like the old school – only much, much noisier.

I tell this story as a cautionary tale. At a time when school construction is on the rise (with a high birth rate suggesting more to come) and school reform is on the minds of nearly everyone in education, it is important for architects to know what educators, students, and citizens want from school buildings. But it is also terribly important to remember that pedagogies may have a shorter life span than school buildings, and that physical changes in schools to promote instructional change are useless, even damaging, if teachers and administrators are not behind the process from the start. *(continued on next page)*

"We are moving into an uncertain period," says architect Ezra Ehrenkrantz, a principal in the New York firm of Ehrenkrantz & Eckstut and a veteran school designer and researcher. "Within the range of different experiments, there is great difficulty for the architect in orchestrating a school program." That range includes experiments in the use of computers and advanced information technology, in private management of public schools, in increasing community uses for schools, and in new (or rediscovered) teaching methods.

"Many communities are rethinking their schools now," says Peter Samton of Gruzen Samton in New York. "We haven't had this kind of interest since the late 1960s; some of our school work is in 1950s and 1960s schools that are outmoded and need new kinds of spaces."

In responding to the demand for both new and remodeled school buildings, Joe Agron, Editor of *American School and University* magazine, thinks that listening to clients and users is of paramount importance. "Architects are including teachers and even students in the design process," says Agron. While client and user input is nothing new, it is especially important in school design because of lingering distrust over past experiments. The open-plan schools of the 1960s are like specters haunting the relationship between architects and educators; while everyone agrees that, in the end, they didn't work, each seems to think the other forced the concept on them. "Actually, it was each egging the other on," recalls Ehrenkrantz, who says he never believed in open plans. "The main problems were that team teaching failed, because of pressures on teachers that took away time for planning, and that educators did not articulate the variety of spaces they needed, which led to the open plan."



What Might Private Management Bring?

How might the numerous efforts to reform education affect school design? The most publicized trend, private management of public schools, is just getting off the ground, and the physical implications are not yet clear. Officials at The Edison Project, the heavily hyped effort led by publisher Chris Whittle and former Yale president Benno C. Schmidt, declined to talk to us about their design plans. While Whittle had originally planned to build for-profit private schools to compete with public schools, The Edison Project will instead take over the management of public schools. (This spring, they received 3 of 15 "charters" handed out by the City of Boston to manage schools.) Apparently, Edison's architectural ambitions have moved to the back burner as well: the four architectural firms they had hired to develop prototypes (Venturi, Scott Brown & Associates, William Rawn Associates, Frank O. Gehry & Associates, and Billes/Manning Architects) are no longer actively working on the project. Even so, Edison's plan to create "houses" – *in which* students stay with the same team of teachers for two to three years – might have architectural ramifications, as could their commitment to computer technology. (They promise to place a computer in every student's home.)

Educational Alternatives, Inc., a Bloomington, Minnesota, company that runs a dozen public schools in Baltimore, is the first company to enter the school management business; they are currently negotiating with the city of Hartford, Connecticut, to operate all of its 32 schools. Kathryn Thomas, a vice-president of EAI, says that their representatives work with the schools they manage and allow them to choose their own methods of teaching. EAI prefers a method they call Tesseract, an amalgam of educational practices that emphasizes "basic skills" work on computers (there are typically four terminals in an EAI classroom) and the presence of two teachers in each classroom. The latter idea, says Thomas, requires that each classroom have "a minimum of two learning areas."

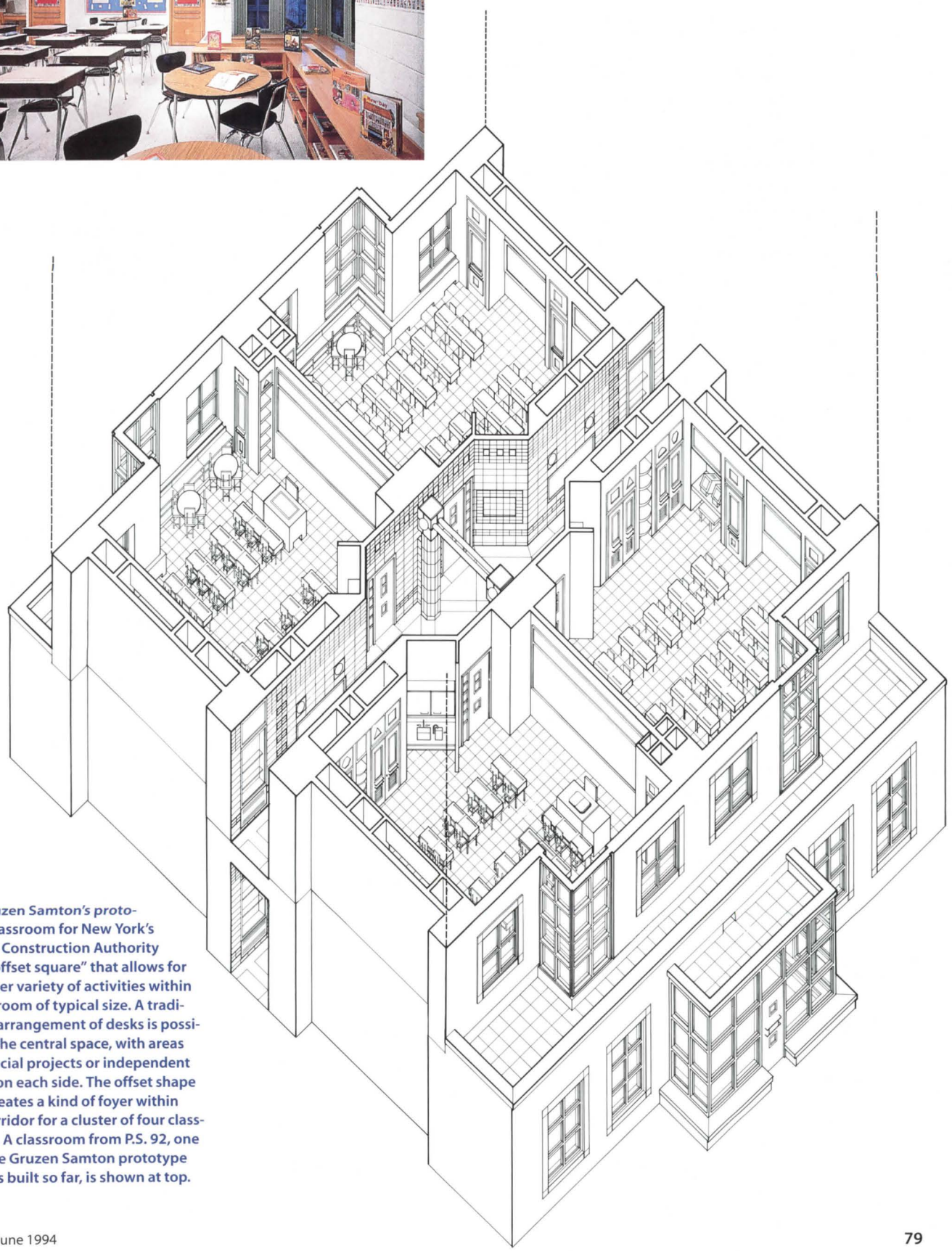
How Pedagogy is Changing

Private management, for the most part, though, is more about the efficient delivery of an essentially conventional educational product than about changes in instruction; most often, existing schools easily accommodate their needs. But some pedagogical changes have already begun to affect how some teachers use their classrooms, and suggest to architects that some adaptation – and adaptability – is in order.

The leading thinkers in the reform of pedagogy – including Theodore Sizer at Brown University and Howard Gardner at Harvard – advocate a "project-based" approach to learning that allows students to work individually or in small groups on projects tailored to their own learning styles. (Some educators look to architectural education as a model for a project-based curriculum.) This idea is informed by psychologist Gardner's theory of "multiple intelligences," which posits that there are at least seven different kinds of intelligence that everyone possesses in varying degrees. By playing to students' strengths instead of building education around test-taking, they can learn the same concepts and develop the same skills through different means. In the classroom, this means that students in the same space may often be working in very different ways. Teachers who use a project-based approach will adapt conventional classrooms with furnishings, creating a variety of workplaces within the loftlike classroom. Such active learning bears little resemblance to the scenario for which most classrooms were designed: a teacher facing a grid of desks where students passively absorb a body of facts (though a number of classrooms will probably continue to function this way.)

Some architects – to varying degrees – are now trying to accommodate a project-based curriculum in the design of new schools. On the most basic level, Kevin Sullivan of Wold Architects & Engineers in Minneapolis says he has found that rectangular classrooms work better than traditional square ones be-

Chuck Choi



Gruzen Samton's prototype classroom for New York's School Construction Authority is an "offset square" that allows for a greater variety of activities within a classroom of typical size. A traditional arrangement of desks is possible in the central space, with areas for special projects or independent study on each side. The offset shape also creates a kind of foyer within the corridor for a cluster of four classrooms. A classroom from P.S. 92, one of three Gruzen Samton prototype schools built so far, is shown at top.

cause "the rectangular geometry increases spatial efficiency by increasing space for grouping and clustering." Sullivan's firm uses a standard dimension of 24 by 37½ feet for elementary school classrooms.

Other architects believe the classroom can be improved through certain eccentricities in plan – extra alcoves, corners and spaces that provide varying levels of privacy for individuals and small groups. Joe Agron says more teachers are asking for "private reading nook areas" for students, "a place where they can pull away from the group as necessary."

"Technology represents a single arrow in the quiver.... There are wonderful teachers out there who don't want anything to do with computers."

Gruzen Samton's prototype school design for the city of New York's School Construction Authority (which has already yielded three new schools) features a classroom Peter Samton describes as "an offset square"; the plan (previous page) yields subspaces for special projects or independent study.

Graduate students at Massachusetts Institute of Technology, under the direction of associate professor Roy Strickland, created a number of classroom configurations as part of a spring 1993 studio on school design. The students concentrated on providing flexible interstitial spaces between classrooms by means of movable partitions and shared spaces (facing page, top). Says Strickland: "A range of scales of spaces seems to be important to everybody; teachers and students want different levels of privacy, corners where kids can go, places students and teachers can call their own, wall surfaces broken and divided into subspaces."

But Ehrenkrantz, for one, is cautious about altering the shape of the classroom; in his firm's prototype schools design for New York (Richard Dattner and Perkins & Will were also commissioned to do prototypes), the classrooms are conventional rectangles, but with patterned tile floors that permit division of the room into four parts and with suspended trellises for temporary partitioning (facing page, bottom). "There are certain advantages for nooks and crannies, but odd shapes can constrain how things go together," says Ehrenkrantz.

Ann Trowbridge of Venturi, Scott Brown & Associates, who has worked on the Edison Project, agrees: "The furnishings and equipment have more to do with change than the space itself; simple loftlike spaces are not necessarily bad."

Beyond flexibility within the classroom, architects are also addressing a demand for options in combining classroom spaces for shared, larger-scale activities. Team teaching, a concept that never quite got off the ground in the last generation (despite educators' optimistic enthusiasm for the open plan), is now happening more frequently. As a result, teachers look for ways to share resources and combine their students as required but still retain the option of a discrete classroom. Like many school designers, Kevin Sullivan specifies a "cluster" arrangement, where modules of three classrooms open onto a "common resource area" with places for small groups and computers.

Clustering and similar design concepts correspond well with a revisit to the 1960s trend toward dividing schools into "houses," smaller units within a large school. Such "houses" respond in an economically feasible way to the notion that small schools are better than large ones. Students may stay within a "house" for more than one grade, and thus get to know teachers and students better than in a more conventional large school. Ann Trowbridge of VSBA says that in Edison schools, "any open classroom system would be within a house of 150 to 300 students."

Accommodating Technology

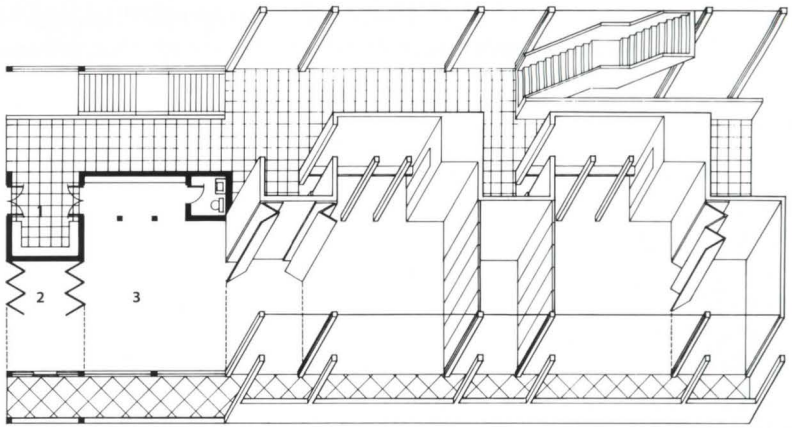
While the idea that computers are revolutionizing education has become almost a cliché, their impact on the shape of the school is not yet easy to see. The most basic change that computers force, according to Agron, is in a school's size. "More computers mean more square feet per student," says Agron, who adds that – in a parallel to the workplace – computers do not seem to make other space-consuming materials and equipment obsolete. Private managers Edison and EAI talk up computers in their descriptions of how to run schools better. Edison says it stresses universal access to computers, both in students' homes and at school. They describe a "fully networked" computer system where students, teachers, and parents in all member schools can communicate. The broader implications of such a network, again, bring to mind parallel changes in the workplace. Will such technology result in students' working at least part-time at home, going to school for occasional meetings and group activities? What would such a network mean in terms of day care? Would it hinder students' socialization? (Or will time in front of a computer *constitute* socialization in the future?) Such sweeping change is not in the forefront of discussion today, but EAI's use of computers to drill students in basic skills suggests that technology is already changing the dynamic of teacher-student interaction.

As in other areas, Ehrenkrantz prescribes circumspection in designing for computers: "Technology represents a single arrow in the quiver. If you try designing for one arrow, you may find the teachers aren't interested in that one. There are wonderful teachers out there who do a great job and don't want anything to do with computers."

Two Schools That Look at Space Differently

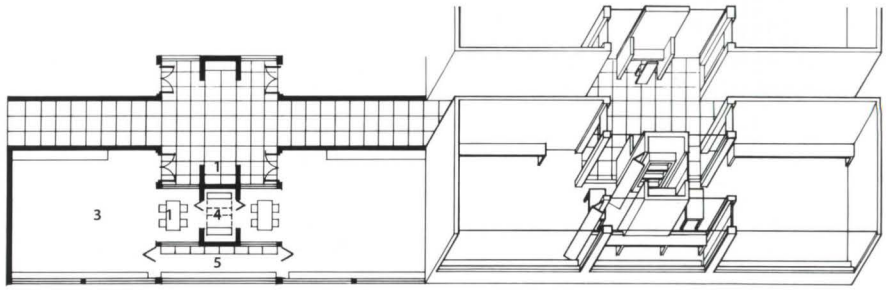
But a school in McKinney, Texas, demonstrates how computers could serve a project-based, student-specific approach – and change the way students and teachers use space. The ACT Academy, a 250-student K-12 public school developed with the help of a Federal grant, combines computer technology with an educational theory called constructivism. The theory, heavily influenced by Piaget and Gardner, holds that students learn best by constructing their own understanding of concepts rather than by direct instruction from a teacher. (Their teachers are called "facilitators.") Each student 12 or older has a laptop computer, while younger classes are allotted one per two stu-

Students in Roy Strickland's spring 1993 graduate studio at MIT offered designs for an urban school in Boston. Their classroom designs emphasized interstitial spaces, sometimes shared, to increase flexibility. A scheme by student Veronica Pedrini (top right) includes a foyer with lavatory and a simple system of moving partitions that can provide adjunct space for one classroom or allow the combination of two or more classrooms. Peter Brockman's plan (below right) has a shared computer area, shared storage space, and separate study areas for adjacent classrooms. As in Gruzen Samton's prototype, this plan opens up the corridor for activity.



1 STUDY/CONFERENCE AREA
2 SHARED SPACE
3 CLASSROOM
4 STORAGE
5 COMPUTER AREA

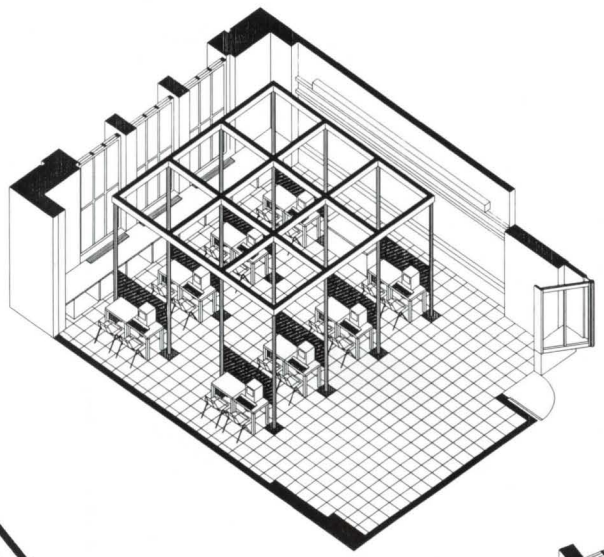
VERONICA PEDRINI SCHEME

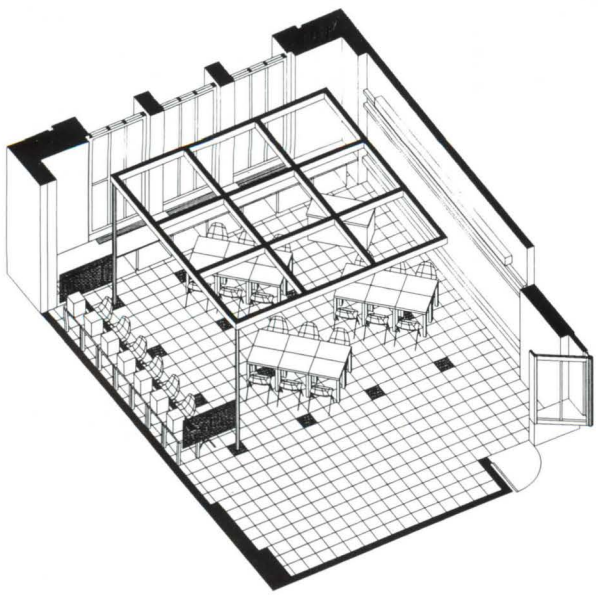


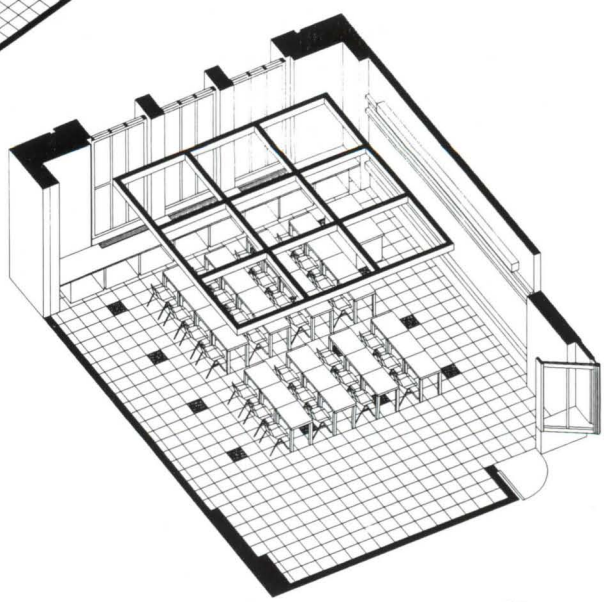
PETER BROCKMAN SCHEME

40'/12m

Ehrenkrantz & Eckstut's prototype school for New York opts for a more conventional plan shape, but uses a suspended trellis system within the classroom to allow for various options ranging from a conventional grid of desks (below right) to a group arrangement around tables (below) to a grid of semiprivate computer work stations wired from above (right).







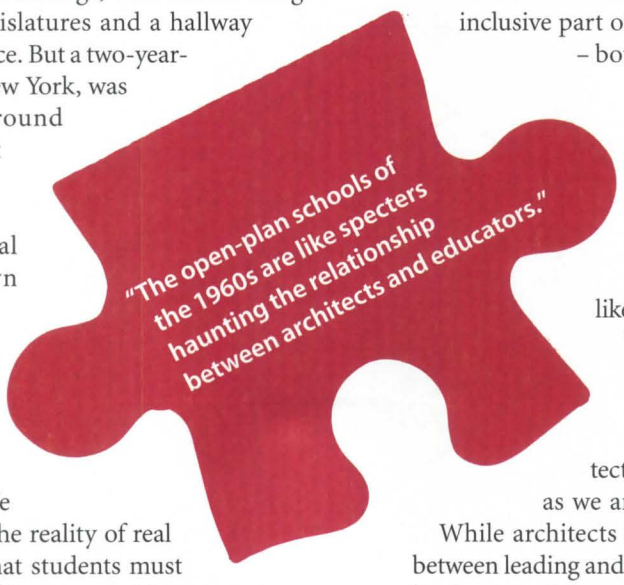
dents. After a group meeting with facilitators in the morning, the students are permitted to work in different places throughout the school. "Learning happens anywhere," says principal Linda Farley, "so the students can be anywhere they need to be."

In adapting a 1930s school building for the academy, which opened last fall, architects SHW Group of Irving, Texas, replaced many interior walls with columns to create an open environment. Students can connect their laptop computers to a mainframe through "data drops" placed throughout the school – both indoors and outdoors. (One major piece of the renovation, was the stringing of "miles and miles" of cable.)

While the school's use of computers is an important part of its identity, project architect Gary Keep says they avoided a Buck Rogers aesthetic. "The school wanted to create an environment that employs technology with a background of history," explains Keep, "so a renovation was the best approach."

Another example of an educational approach with direct physical implications is the "MicroSociety school," a concept for elementary students developed by George Richmond, a former teacher. Students in MicroSociety schools – there are about 120 of them right now – spend their mornings in more or less conventional classes. But in the afternoon, they take up their roles in a model town where they make and enforce laws, conduct commerce with their own currency, and learn about "real life" through experience.

Richmond says that most MicroSociety schools are housed in conventional buildings, with rooms designated for courts and legislatures and a hallway that serves as a marketplace. But a two-year-old school in Yonkers, New York, was specifically designed around the MicroSociety concept by architects Anderson LaRocca Anderson of Rye, New York. A central atrium with scaled-down buildings serves as a marketplace and town square; classrooms are in "streets" off the square. (MicroSociety schools deal in sometimes harsh life lessons; among them is the reality of real estate. Richmond says that students must pay rent on their desks; if they are unable to pay, they must sit on the floor.)



The Role of Schools in the Community

Perhaps the trend that could change the look of schools most strikingly is the increasing call for the integration of schools with other types of programs, from daycare centers to public libraries to senior housing. According to Joe Agron, some of the motivation for community schools is political: "In a time of tight budgets, schools are able to pass bond issues when they incorporate community facilities that everyone can use." The idea is not completely new, of course; school gymnasiums, cafeterias, and libraries have always accommodated community meetings and social events.

But some community-school plans are direct responses to the problems of working parents. Dr. Edward Zigler, a co-founder of the Head Start program who is now the director of Yale's Bush Center in Child Development and Social Policy, promotes a community school concept called "School of the 21st Century" that combines supervised care before and after school with adult education and other social programs. There are already 250 Schools of the 21st Century in 10 states.

Community amenities were also a subject of Roy Strickland's 1993 MIT studio. The students offered varied proposals for the proposed K-12 school's neighborhood, between Boston's South End and Roxbury areas. Among them were a public library, a health center, senior housing (senior citizens could help look after children before and after school), and a college dormitory for nearby Northeastern University (to provide tutors and role models).

Loading up the school program with community facilities raises issues for a designer, though. On a practical level, spaces available to the public must be accessible at times when educational spaces are not, which requires the ability to lock up or block off classroom areas. Or, suggests Strickland, if classrooms have lockable storage space, they can be opened for community use.

A broader issue – especially in dangerous urban neighborhoods – is the balance between making the school an inclusive part of the community and ensuring the safety – both real and perceived – of the students inside. "The stronger you can make the school in the community, the better," says Ehrenkrantz. "But first, the school has to work for the kids."

Proceed, but with Caution

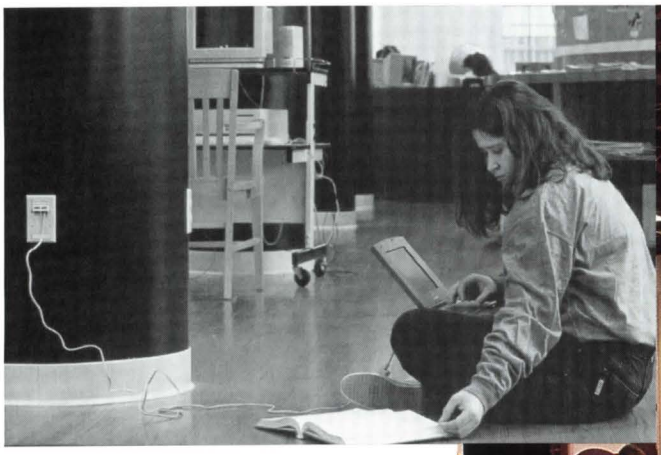
With the exception of some research like Ehrenkrantz's at New Jersey Institute of Technology and Strickland's New American School Design Project, architects have little to do with generating change in the design of schools. "Architects are not leading the charge in education as we are in housing or prisons.," says Samton. While architects always have to strike a difficult balance between leading and following a client – and schools are a textbook case – Samton sees schools as fertile territory for architects' innovations: "There is no building type more exciting for architects than a school. What other building can make as much impact?"

To ensure that that impact is positive, architects must keep an eye on both the short-term requirements of immediate users and the long-term possibilities for change. Otherwise, the educational trend of the moment may be set in stone for a client typically too underfunded to remedy it when the time comes. The best gift we can give tomorrow's children is a school not shackled to yesterday's methods. □

Don Gormly

Don Gormly

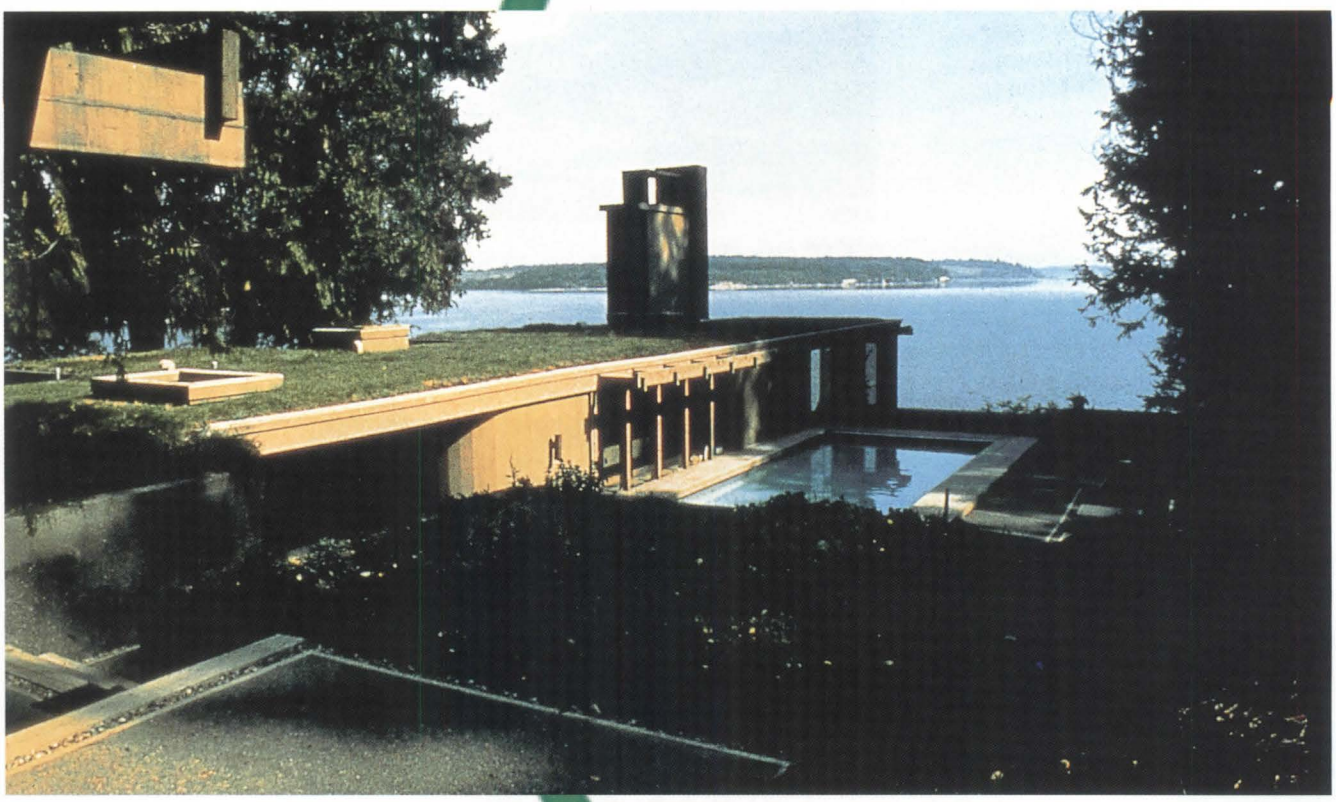
The Eugenio Maria de Hostos School in Yonkers, New York, is the first school built around the Micro-Society concept, wherein students spend part of their day functioning as their own commercial and social community. On a tight urban site (above), architects Anderson LaRocca Anderson found room for a skylighted "town square" dominated by government offices and two banks (right).



Students are not confined to classrooms at the ACT Academy, an experimental public school in McKinney, Texas. The K-12 school, in an existing building renovated by the SHW Group, is filled with "dataports" that laptop-computer-toting students can use to plug into the school's mainframe (above). Students are encouraged to work in comfortable places such as the school's "gallery" (right).

Earth Cycle

Spanning 25 years in the work of Jim Olson of Olson Sundberg Architects, three houses illustrate the evolution of a sustainable design sensibility rooted in the 1960s. *by Donald Canty*



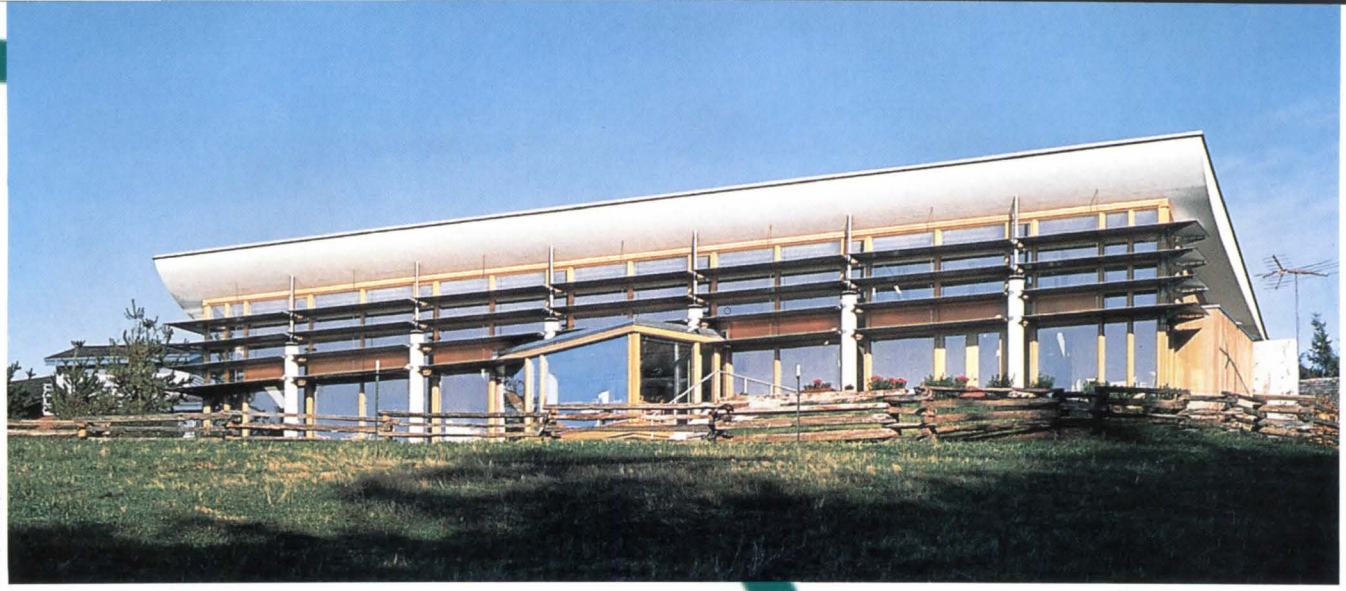
Dick Busher

The relationship of architecture to the land – and to the water and the sun and the wind – has been a constant concern in the work of Jim Olson of the Seattle firm, Olson Sundberg Architects. Olson grew up in the powerful landscape of the Pacific Northwest, where environmental awareness is less a response to crisis than a matter of respect for forces of nature larger than ourselves and our buildings. "Our culture is at a turning point as we begin to shift our roles from consumers of limited resources to stewards of the planet," the architect says, in explaining the credo that guides his firm's efforts at sustainable design.

Shown here are three houses that punctuate Olson's career: one a quarter-century old, from his architectural beginnings, one recently completed, and a third that is about to be built. They are interesting both for their commonalities and their differences; seen together, they illustrate the evolution of sensible strategies of energy conservation and sensitive responses to the landscape.

One thing the houses have in common is relevance to the theory of refuge and prospect, developed by the British geographer Jay Appleton, which analyzes the innate affinity humans have for particular physical settings. As summarized by architectural historian Grant Hildebrand, the theory holds that from the earliest time humans have needed "a place of

The author is P/A's correspondent in Seattle.



Michael Ian Shopenn

Representative images of the three houses demonstrate how the architects returned full circle to an environmentally sensitive aesthetic engendered more than two decades ago: the first house (facing page), designed in the late 1960s, is bermed into the hillside and integrated in the landscape with sod roofs; the second house (above), completed in 1992, is more conspicuous in both massing and structure; the third, projected house (left) echoes the first residence's simple forms and unobtrusive siting.

secure hiding, closed to weather and to attack from predators, a relatively dark place from which, looking out, we are not seen." This is the refuge. At the same time, "we must have ... a place of hunting and foraging, a place of open views over long distances in bright light to illuminate and cast shadows." This Appleton named the prospect.

The first of the three Olson houses, designed in the late 1960s, is on a steep, densely wooded cliff (near a beach where Olson played as a youth) overlooking south Puget Sound and, in the distance, mighty Mount Rainier. The house is a weathered cedar object inserted into the landscape. Grass and wildflowers continue from the hill behind onto the roof. The sod is penetrated by a large sculptural concrete chimney intended as a vertical foil to the horizontality of the house.

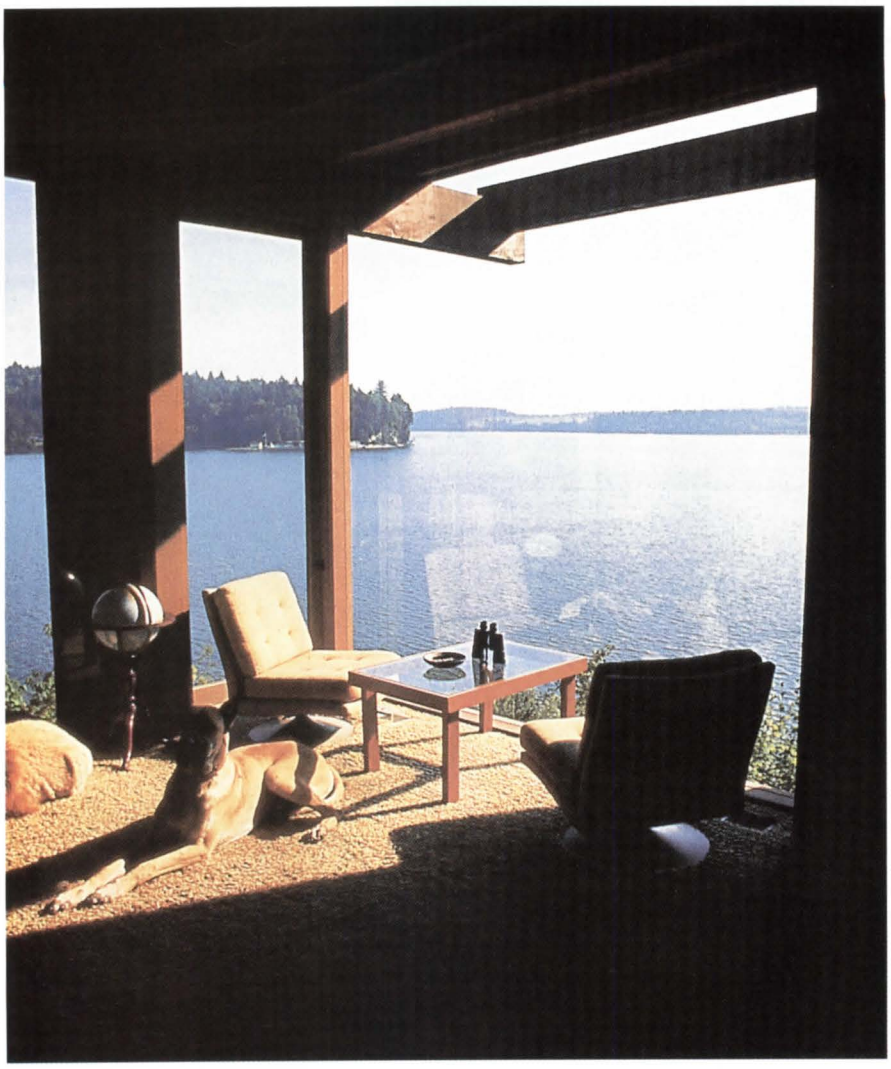
Cantilevered over the hillside, the house is pointed directly at the mountain and is flanked by a pool. The master bedroom is against the bermed rear of the house, clearly a place of refuge. At the same level, a small parlor with a large hearth is a refuge with a view. A few steps down is a second living room, its glass walls on all sides bringing in the dramatic prospect of water, woods, and mountain. In all, the house has an elemental quality, a power reflecting that of the setting. It has weathered well until it is virtually a part of the landscape.

The Next Generation

The second house, built in 1992 in the suburb of Kirkland east of Seattle, bursts cheerfully from the landscape instead of hunkering into it. Yet the principle of prospect and refuge is at work here too. The clients, a family with small children, wanted the house to seem like a pavilion in the meadow, and that is exactly its feel. It is a house that, in project architect Tom Kundig's words, "celebrates light": major rooms are aligned in a rectangle with a long glazed south wall; the roof swoops upward, reaching its high point at the south façade. The rooms in this wing are suffused with light reflected from the white slope of the ceiling high overhead, which acts as a luminaire. The prospect of meadow and water is seen through the south wall's grid of wood framing members, horizontal metal fins, and round concrete columns. (The grid looks mechanical enough to be operable but is not.)

The rear wing of the house is more refugelike in character, set into the sloping meadow and bermed, the planting continuing over the garage and the children's bedrooms.

The differences between the first, rather rustic house, and the second, more "mechanistic" building, reflect how time, tastes, and Olson's ideas changed in the interim: demand for rugged simplicity had ebbed and, by the time the second

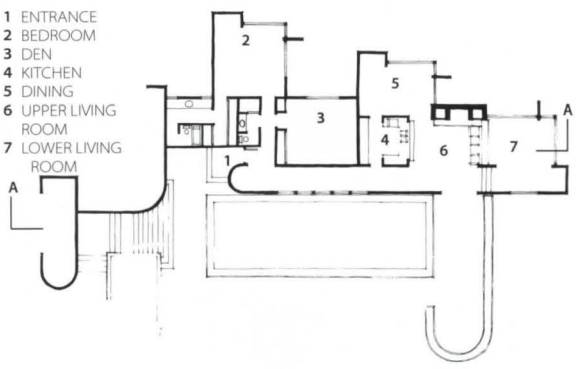


Dick Busher

House One

In the first house, designed in the late 1960s, passive conservation strategies were simple and effective. Serving as insulation, but also as a means of integrating the building in the landscape, the sod roofs are supported by heavy exposed wood beams. The floors throughout are exposed-aggregate concrete, which stores the heat from the sun coming in through large expanses of glass. As a result, heating bills are very low and natural ventilation obviates the need for air conditioning on all but the hottest days.

Rounded corners along the entrance sequence relieve the house's rectilinear form. The hillside flanking the pool, visible from a glazed gallery running the length of the house (facing page), is softly landscaped for further relief. The house steps down from the entrance toward the Sound, culminating in a relatively protected room with a hearth that serves as a living room at night and in bad weather; a lower, more exposed room at the end of the house is used primarily on sunny days (left).



FLOOR PLAN

N

20'/6m

SECTION A-A

10'/3m

Michael Ian Shopenn

house appeared, the residential work of the office had grown larger, more complex and, in some instances, more formal.

The 1960s Revisited

Yet the third house discussed here returns to many of the themes of the first – a "return to roots" brought about in no small part by the client's close collaboration in its design.

Like Olson, the client is a Northwest native with an ingrained respect for nature. She acquired the site for her house largely because of its fine views of one of the region's most beautiful urban lakes. Once densely wooded, it was cleared for development that never occurred.

On the advice of an interior decorator she at first turned to a Los Angeles architect, who produced a scheme that had the house rising imposingly from the very center of the site. This the client summarily rejected and turned to Olson through acquaintance with some of his clients. She told him that she was more interested in a garden than a house, and that the house should be low-key, natural, and anything but glitzy.

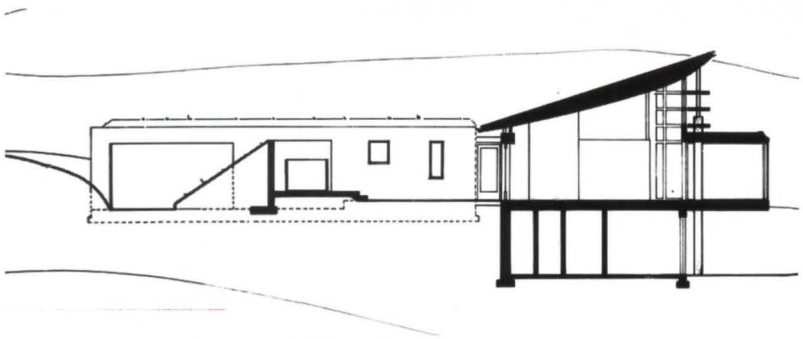
When Olson saw the site he termed it "a scar" of brown earth in the otherwise verdant landscape. He determined not just to respect the site but to heal it.

Olson has a technique of getting clients to join in making collages out of architectural images they like. The one made with this client was revealing: the images she responded to were of simple, rectilinear houses blending with nature, melding indoor and outdoor space, often partially covered by vines and other landscaping; their forms were straightforward, colors subdued; several had glass butting into walls and all had huge fireplaces. Interestingly, one of the images she chose for the collage was taken from the first of the three houses.

Olson tries to make "private worlds," using perimeter walls as buttresses and creating a quiet interior space, sometimes enclosed and sometimes open. He quickly produced a sketch applying this approach to the sloping lakeside site and it was immediately accepted.

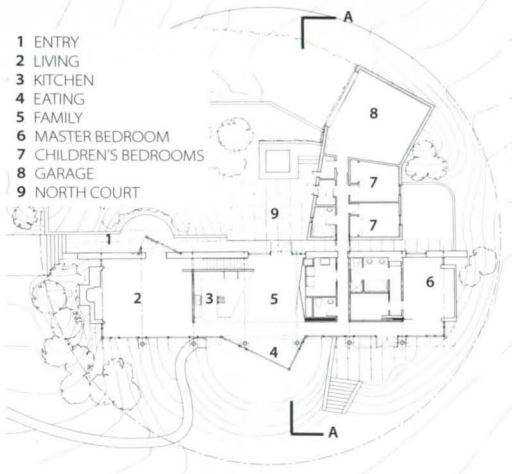
The sketch divided the body of the house into two parallel wings, with the garage, kitchen, dining, and family rooms on one side, bedrooms, exercise room, library, and indoor pool on the other. The wings began as berms at the rear of the site, and were bridged by an entry and a living room overlooking the lake. The client said that she would like to enter the house from a garden path so the "valley" between wings would be a garden. Other plantings would cover the roofs of the wings.

Once the basic scheme was established, Olson and associate Kundig began to elaborate on it. A cross axis through the



SECTION A-A

20'/6m



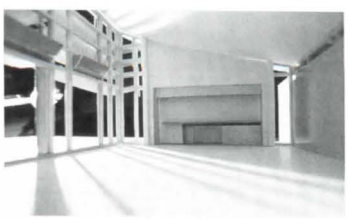
FLOOR PLAN N

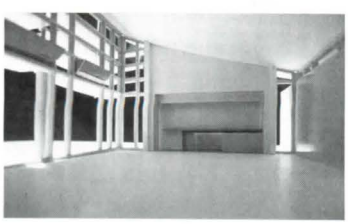
40'/12m

Photos: Michael Ian Shopenn

House Two

While the second house is not as retiring in its relationship to the land as the 1960s residence, its design was guided by a number of environmental considerations: sited perpendicular to the access road, the building presents a relatively compact, modest face to the street (top left); the horizontal fins on the south façade (facing page) function as a *brise-soleil* sheltering the main spaces located along the glazed wall; daylight studies simulating conditions at 3 p.m. on the winter (below) and summer (bottom) solstices determined the placement of the metal members. The slope of the main wing's roof serves another climatic purpose: in summer, small windows at the top of the south wall draw cool air from a landscaped patio on the north side to chill the entire wing. Comprising the physical and functional center of the house, a single big space contains the kitchen and family room, with an eating area in a glazed, cantilevered wedge penetrating the façade. Minimal partitions enclosing the kitchen allow open vistas (bottom left) to meadow and water.





Olson Sundberg Architects

Steve Young

two wings and the bridging element was twisted and deliberately interrupted so that it became a meandering lateral path through the house; the wings were to be largely illuminated by clerestories. They would be deep refuges with a strong sense of enclosure. The living room, the architects reasoned, should be pure prospect, a seemingly open pavilion facing the lake view. Not only would it be glazed on three sides, but the sheets of glass would have planting at their bases both inside and out so that they virtually disappeared. The roof was to be raised high overhead so that it seemed to float above the walls. Weightlessness and illusion were the watchwords. The room began to take on the look of a temple; various roof forms, including a dome and a pyramid, were studied.

Keeping it Simple

The client would have none of it – no illusions, no architectural tricks. She wanted simplicity: the living room roof would be flat, its windows perceptible as such. The cross axis would be straight and uninterrupted.

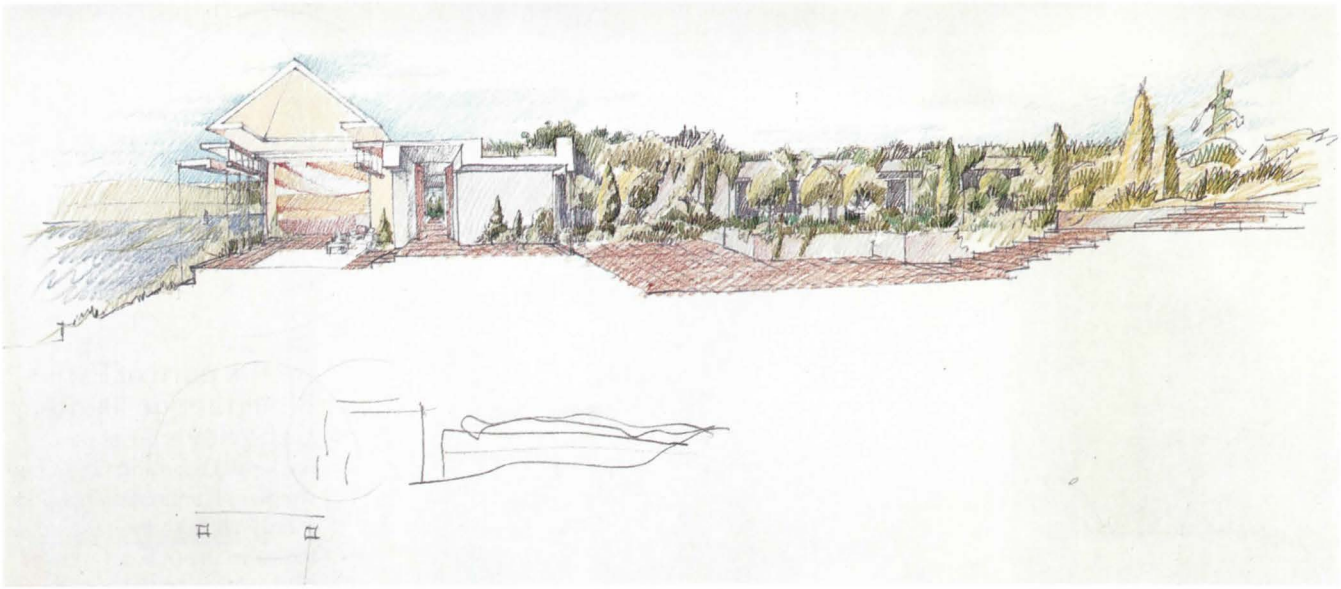
The architects were devastated to have their favorite devices rejected. "It was as though she were the artist working through us," Olson recalls. But he came around. What the client had done, he realized, "was to take us back to our roots" and, specifically, to the first house. Once on track together architects and client undertook to make the house ever more naturalistic. With perimeter gardens and trees and grasses on the lake side, the entire site will read as a garden with a house embedded in it.

The house is emerging as one of Olson's favorites, as was the first. He hopes that it will be "timeless, like a Mayan ruin disappearing back into the landscape."

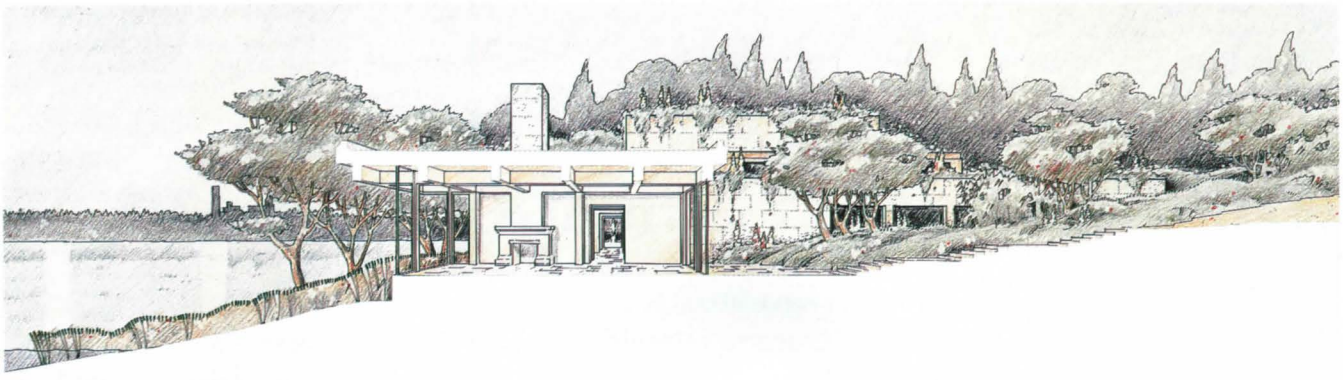
Olson Sundberg has a loosely organized "eco-committee," comprising a changing group of interested employees who research and advise on diverse aspects of sustainability in the firm's designs. The committee was partially responsible for such conserving elements as the stone floors, wide overhangs, zoned heating and air conditioning, and the use of recycled and recyclable materials that will be employed in the house.

But Olson sees the most basic kind of conservation as building to last. "These houses should only get better with time," he says, and time already has proven him right about the first one. □

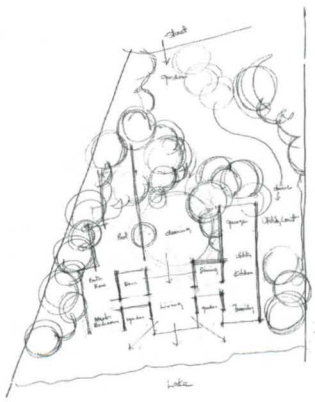
First House: Jim Olson, architect.
Second House: Tom Kundig, Jim Olson, principals; Marc Brown, design team.
Third House: Jim Olson, Tom Kundig, principals; Janice Webb, Rob Nevitt, Jay Coupard, design team.



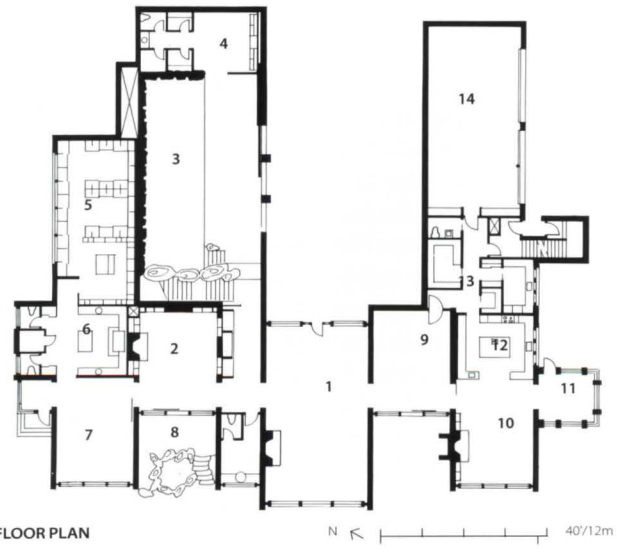
INTERMEDIATE SECTION THROUGH LIVING ROOM



FINAL SECTION THROUGH LIVING ROOM



PLAN SKETCH



FLOOR PLAN

1 ENTRY/LIVING
2 LIBRARY
3 LAP POOL
4 EXERCISE
5 DRESSING
6 MASTER BATH
7 MASTER BEDROOM
8 HOT TUB AND TERRACE
9 DINING
10 FAMILY
11 BREAKFAST
12 KITCHEN
13 PANTRIES, LAUNDRY
14 GARAGE

House Three

A collage of architectural images (facing page), generated in collaboration with the client, led to Olson's early parti sketch for the plan (far left). Although the architects sought to elaborate on the section with stylized strategies for the living room (top), the client hewed to the original vision, requiring a simpler treatment of the main space overlooking the lake (section above). Reflecting Olson Sundberg's emphasis on the use of recyclable materials, the house will utilize structural timber and flooring salvaged from old warehouses. The recycled 14 x 21-inch wood beams will support 18 inches of sod on the roofs (see Selected Detail, p. 120). The walls of the wings will be reinforced concrete, expected to stand up under the moisture generated by the planting and to function "like retaining walls." With a mind to the structure's rustic weathering, the beams will be left uncoated and the plaster walls unpainted.

Judith Bromley

Like **the parti of Paris's Bibliothèque Sainte Geneviève**, the library has a solid base and tall arched windows illuminating reading rooms. While that clearly indicates the public nature of the building on the outside, the Sainte-Geneviève parti has been so enlarged in scale that the public tends to get lost inside.

Critique

Lost in Chicago

Its aesthetics have attracted the most comment, but the real problems at Chicago's Harold Washington Library seem to be in its internal organization.

by Thomas Fisher

Looking at buildings can save your life. On a particularly cold and blustery day this winter, I was walking around Chicago's Harold Washington Library Center, which was developed by the SEBUS Group, a design-build team that included architects Hammond, Beeby & Babka and A. Epstein & Sons (P/A, Feb. 1992, pp. 59–71). Examining its impressive masonry walls, I happened to see several large icicles falling from the building's metal cornice, headed right at me. Because of the cornice's height – about 130 feet up – I had enough time to jump out of the way before the ice crashed to the sidewalk at my feet. (Another man wasn't so lucky; he was killed by ice falling from another building in downtown Chicago this winter.) Only then did I see a hastily done sign near the building that read "Danger, falling ice."

That wasn't the only makeshift sign I saw at the library. In fact, the building, which has been open for about 2½ years, is full of such signs, needed to direct people through the facility and to indicate the location of things. A design professor of mine once said that if a building needs a lot of signage, there is something wrong with its plan. He was right; at the Chicago Library, there is something wrong.

Not Finding Your Way

You get the first indication of this in the building's lobby, a two-story space encircled by a mezzanine. From what I have observed, first-time visitors tend to follow the same pattern. They come in, look around, and not seeing the expected cues of a library – book shelves, tables and chairs, a circulation desk – they begin to wander. Most go, initially, to the large circular hole in the center of the space, which overlooks a theater and a gallery lobby below. But since there is no obvious way of getting there – the escalator is tucked in an alcove off a side hall, not visible from the main lobby – I saw few people attempt it.

Newcomers then either ask a guard for directions or go over to a desk along the lobby's back wall, on which they find an ad hoc sign with the cryptic message, "Direct all inquiries to the third floor." At that point, many first-time visitors spot the single escalator up, which is behind the projecting wall of the front vestibule and not immediately apparent from either of the two main entrances. The difficulty people have in finding the escalator is apparent in yet another makeshift sign that says "escalator up" on a stand near the middle of the lobby.

But even those who find their way to the moving stair are not home free. Because the first escalator stop is the mezzanine,

Judith Bromley

The mezzanine is lined with offices, whose window blinds are kept tightly shut, and the children's library, which seems squeezed into what feels like an interstitial space.

Although grand in scale and orderly in appearance, **the lobby** gives first-time visitors few cues as to where to go. Primary access to the third-floor library is via a single escalator hidden behind a pilaster.

The circular railing gives a view to the theater lobby below, but there is no evident way to it. Most people I saw going there had to be shown how by a guard.

I saw two young men wandering around that level in search of the library, peering into the windows of the offices there, whose inhabitants keep their blinds tightly shut, and eventually asking for directions in the mezzanine's children's library.

The *Piano Nobile* Problem

It is true, a lobby guard pointed out to me, that regular patrons of the library know where to go. (The lobby guards, by the way, were among the few people I talked to who do not find the building disorienting, perhaps because that confusion makes them feel needed.) The regulars I talked to, however, had their share of complaints: a few found it annoying to have to go up to the third floor to reach the library, and one person disliked the narrow escalators, which prevent those in a hurry from passing those who are not.

But this entry sequence raises a larger architectural issue: the *piano nobile* problem. The Harold Washington Library, as well as Hammond Beeby & Babka's Conrad Sulzer Regional Library, also in Chicago (P/A, Dec. 1985, pp. 51–61), recalls Henri Labrouste's mid-19th-Century Bibliothèque Sainte-Geneviève in Paris, with storage and service functions in a relatively solid base and with the reading rooms and open stacks on an upper level – a *piano nobile* – illuminated by large, arched windows.

In organizing a library in this way, the design problem becomes one of how to get people up to the reading rooms. Labrouste at Sainte-Geneviève, as well as others who have followed his model, such as McKim, Mead & White at Boston's Public Library, terminated the main entrance with a grand stair and suppressed anything else that might lead first-time patrons astray.

This is where the Harold Washington Library fails. The escalator, though a necessary substitute for stairs in this age of accessibility, is not large enough or in an obvious enough position to lure patrons up. And the mezzanine, with its children's library and other doorways, looks enough like an entrance to the main library to confuse at least some people.

Earlier plans of the library show a somewhat better arrangement. The up escalator was in the corner of the lobby and would have been somewhat more visible, and a hall on axis with the main entry led to the elevator bank at the rear of the building, which might have helped matters slightly. But as built, the link between the main library and its two-story base is a weak one at best.

Staff Circulation

Another flaw in the circulation affects the library staff. Almost all of the librarians I talked to complained of the distance and delays they encounter moving through the building. In some cases, this stems from adjacency problems: the children's librarians on the second floor, for example, have a work area on the sixth floor. But even those librarians lucky enough to have work space nearby, complain of the time it takes to get in and out of the building or to get to the staff lunchroom on the ninth floor. "You have a choice of taking the single-file escalators," says one librarian, "which make it hard to pass, or one of only two staff elevators, that double as freight elevators; they have no lights to show what floors they are on, and one of the two is often out of order." Says another librarian, "It was a mistake putting the staff room on the ninth floor. You can blow most of your break time getting there and back. It also takes

Once past the narrow turnstiles on the third floor, patrons seem able to find their way around easily, aided by the **escalators and librarian counters** at the center of each floor.

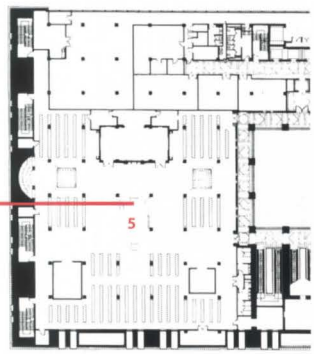
THIRD FLOOR

NINTH FLOOR

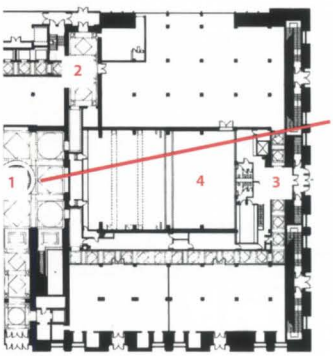
Access up to **the winter garden** is via a single, hard-to-find escalator. To get to the lunchroom, the staff must take one of two back elevators also used for freight, making for a slow trip.

1 LOBBY
2 REAR ENTRY
3 SIDE ENTRY
4 THEATER BELOW
5 CHILDREN'S LIBRARY
6 CIRCULATION DESK
7 READING ROOM
8 WINTER GARDEN
9 STAFF LUNCHROOM

The children's library, through orderly in plan, seems chopped up and somewhat chaotic in real life. That stems in part from the skylight and the carrel enclosures that divide the space.



SECOND FLOOR



FIRST FLOOR

Access to the lobby from the north and west entrances, as well from the elevators is circuitous. *So is the* access to the third-floor library from the lobby; switchback escalators require patrons coming in the main entrance to make four 180-degree turns.

me 10 to 15 minutes just to get from the staff entrance to my desk in the mornings."

The inconvenience seems to stem in part from one of the most ingenious aspects of the design. To open up the center of the library, the core was spread around the perimeter, with fire stairs in the thick of the north and south walls and with the elevators, stairs, and toilets along the western rear wall. The resulting open interior no doubt offers the library future flexibility. But the distance and apparent inadequacy of the vertical circulation, at least for the staff, must be counted against the idea of a perimeter core.

Watching Children

There are parts of the library, though, that seem remarkably inflexible. On the second floor, for instance, two large skylights illuminating a first-floor hall protrude into the children's library, blocking the librarians' view of a reading space and stack area from the central desk. "The skylights are a horrible waste of prime space," says one librarian. "They make no sense to the department." While those elements could conceivably be removed in the future, the fact that a commissioned mural in the hall below extends into the skylight wells makes their elimination unlikely. Further blocking the view from the central circulation desk are high partitions around fixed carrels and freestanding bulletin boards.

Unlike the more open and more visually coherent floors above, the children's library seems cluttered and chaotic. Accordingly, says one of the librarians, "when the children walk in, they don't know where to go. The signage is too subtle – small gold lettering on light wood. Heaven forbid that a child has a sight problem." To compensate, the librarians have bedecked the room with makeshift signage: large letters at the ends of each stack, a large sign indicating the location of the copy machine, and so on.

Uniform Versus Figural Space

The children's library points to one of the more interesting, and problematic aspects of this building. The middle six floors of the library are essentially loft spaces, with large open areas amidst a uniform grid of columns. From my conversations with staff and patrons and from simply observing how people use those floors, these spaces seem to work well. There is a clear circulation system of facing switchback escalators and a nearby bank of elevators. And there is an obvious order to each floor, with librarians' desks and reading areas grouped near the vertical circulation, and stacks arranged along perimeter zones. In contrast to the lobby, the middle floors have almost no makeshift signs. The only problem occurs at the third floor, where some patrons apparently have difficulty finding their way back to the first floor. "One of the most frequent questions I'm asked," says a librarian at the third-floor information desk, "is 'How do I get out of here?'."

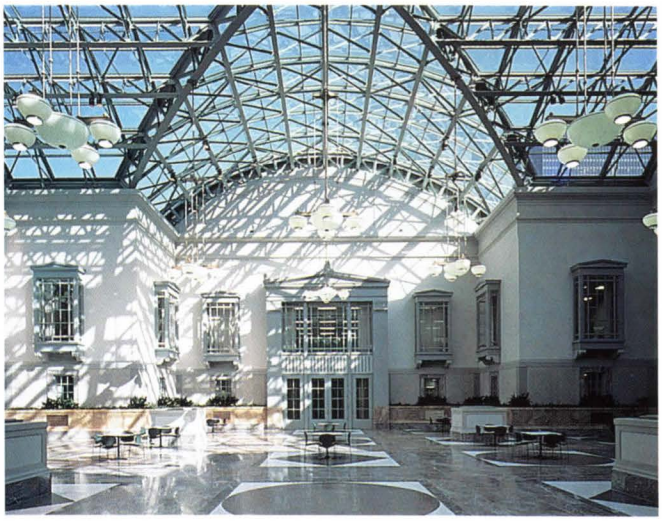
A much different plan strategy, however, occurs on the first two and the top two floors of the building. There, the column grid is frequently interrupted by figural spaces, such as the theater, the lobby, and the winter garden. Those figural spaces play an important role: they are the major places of entry or assembly and are, by far, the most memorable parts of the library. But problems arise when important functions, such as the children's library, are wedged into the leftover space around the lobby and among its skylights.

When juxtaposing uniform and figural spaces, in other

The custodial staff report that the lamps in **the hanging fixtures** have performed poorly and may all have to be replaced. Over the main escalators, replacing the lamps requires the erection of scaffolding.

The grandest space – **the winter garden** – occupies the center of the top two floors and is little used by library patrons. Architect Thomas Beeby wants the winter garden to be a reading room, but the library seems more intent on renting it out for parties.

Timothy Hursley/The Arkansas Office



Timothy Hursley/The Arkansas Office

words, it becomes important not to let functions suited to one type of space "leak" into the other, as seems to have happened with the children's library. Had it been placed on another more flexible floor without having to work around figural spaces, I sense that at least some of the children's librarians' complaints could have been avoided.

Room at the Top

The area under the library's great cross-gabled roofs presents another dilemma. The figural spaces on the top two floors – the winter garden, the staff lunchroom, the (future) public restaurant – seem disconnected. Neither the lunchroom nor the restaurant, for example, is visually or spatially connected to the central winter garden.

A similar disconnectedness exists between the winter garden and the library below. The escalators that take patrons up from the library are tucked in a back corridor, separated and not immediately visible from the main escalators in the center of the building. As a result, admitted one guard I talked to on the ninth floor, few people find their way up to the winter garden, the most successful space, architecturally, in the entire building.

Organization and Aesthetics

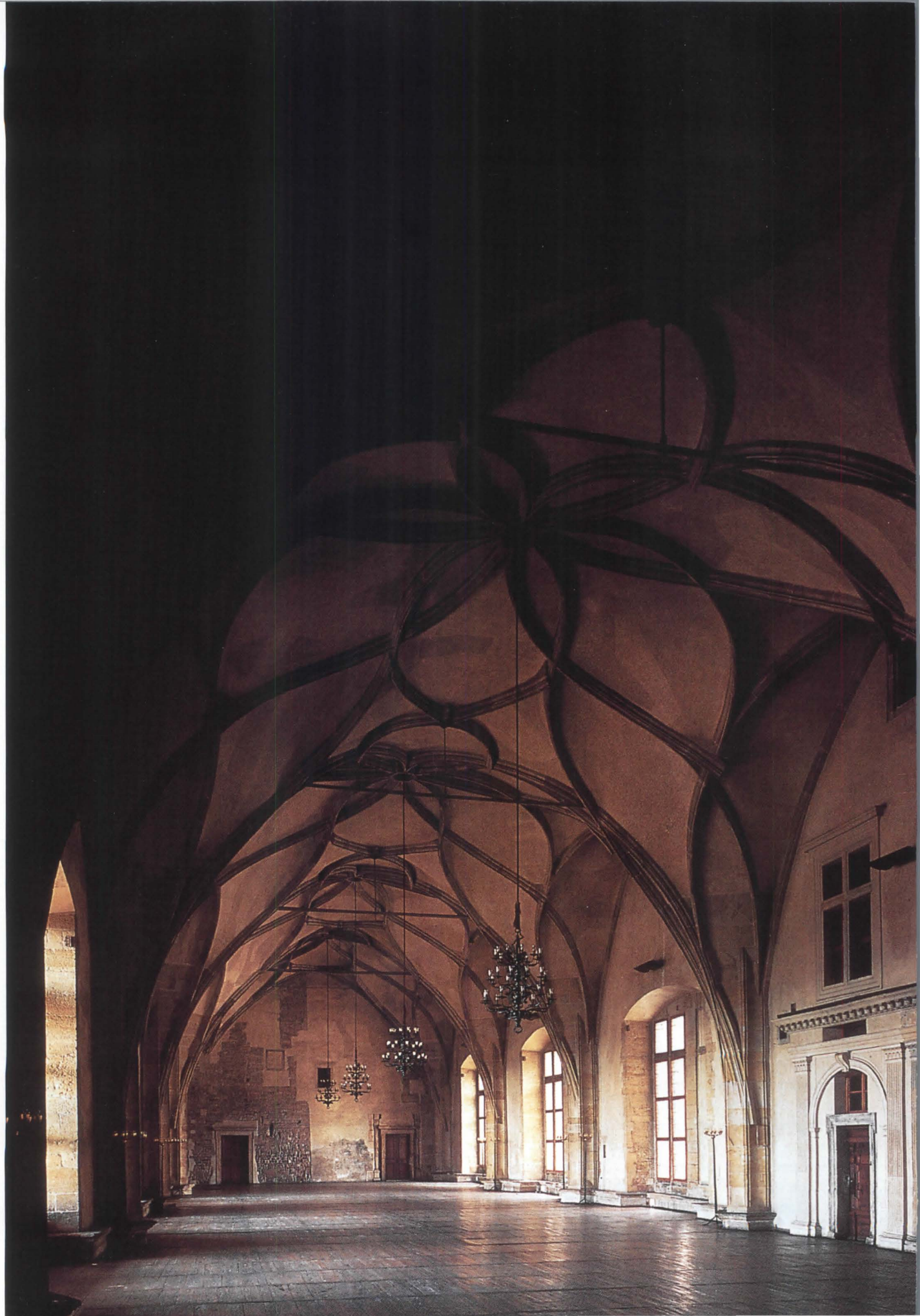
It is not hard to see why the SEBUS Group's entry to the library competition won. It was a bold attempt to adapt the organization of the first modern library – the Bibliothèque Sainte-Geneviève – to current requirements. On the exterior, that move was largely successful, I think. Apart from the fussiness of some of the ornament, the stone base, the tall brick-arched openings above, and the broad metal-and-glass roof create an appropriately monumental presence that everyone I talked to clearly recognizes as a public building.

The problems arise in the adaptation of the Sainte-Geneviève model to the interior. Although the three parts of the building – the two-story base, the middle library floors, and the space under the roof – are internally coherent, they are inadequately linked to each other. And, as in the case of the children's library, problems occur when the functions suited to one part end up in another.

Perhaps the most important question raised by this building is one of scale. Can an organizational idea developed for what was essentially a two-story library in 19th-Century Paris work for a twelve-story library in Chicago in the late 20th Century? At what point, in other words, does the scale of something fundamentally change its nature?

Such questions are particularly relevant to historicist buildings such as the Harold Washington Library, where past precedents are applied to present problems. And they are questions for which answers are not easily had. Like the icicles that occasionally fall from the library's cornice, problems of scale are hard to see and even harder to avoid. □

Project: Harold Washington Library Center, Chicago.
Design-build team: SEBUS Group (Schal Associates Partnership, A. Epstein & Sons International, Hammond Beeby & Babka, U.S. Equities Realty).
Consultants: A. Epstein & Sons International, structural, M/E/P; Avila & Associates, civil; Schirmer Engineering, life safety; Colin St. John Wilson & Partners, library; Architectural Interiors, interiors; Gage-Babcock & Associates, security; Shiner & Associates, acoustics; Rolf Cambell & Associates, landscape.



Photos: Pavel Stecha

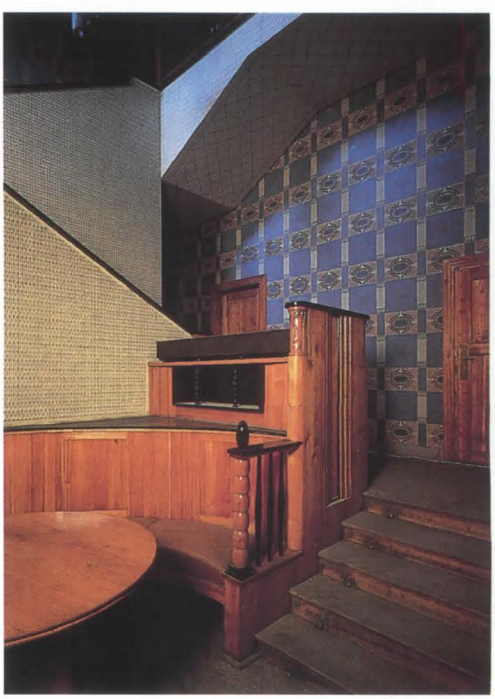
The Epic Interiors of Prague

The romance of Prague's cityscape is legendary, but the city's architectural interiors, revealed in a new book, are largely undiscovered.

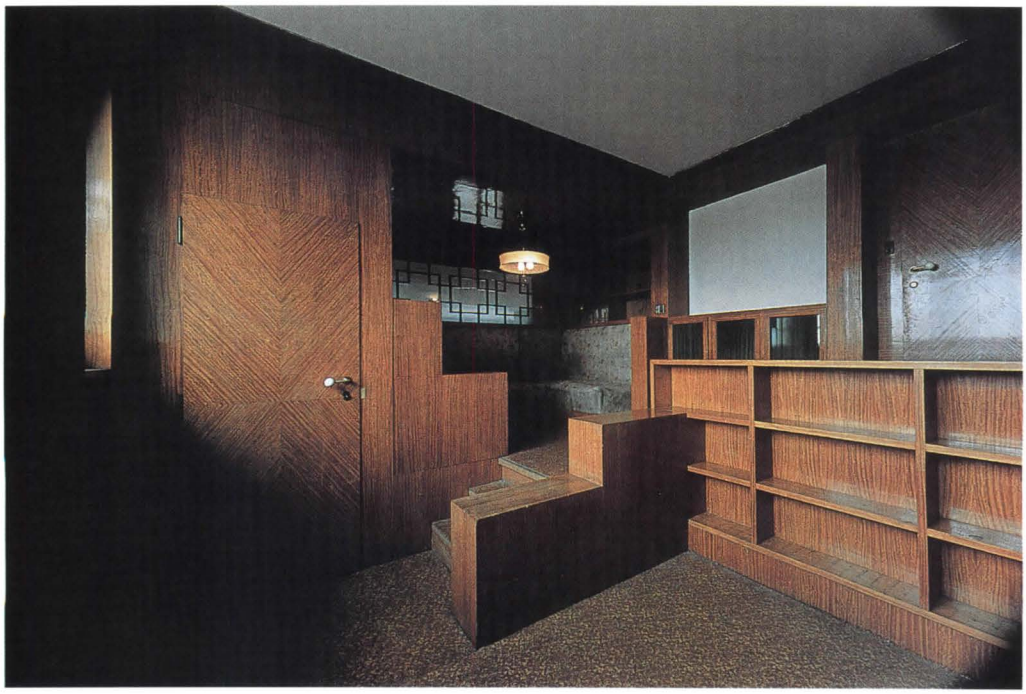
Plagued by political turmoil throughout its history, Prague has survived surprisingly intact. Its Romanesque, Gothic, Renaissance, Baroque, Classical, Art Nouveau, Secessionist, and Modern buildings live side by side, sometimes one inside another. Pavel Stecha's exquisite photographs of private and public interiors published in *Prague: Hidden Splendors*, due out this month from Flammarion of France and distributed in the U.S. by Abbeville, convey the richness of the city's interior world. In their introduction, authors Marketa Theinhardt and Pascal Varejka quote poet Rainer Maria Rilke's comparison of Prague to "a rich, vast epic poem of architecture." The monumental scale and lyrical intensity of Prague Castle, for example, clearly prove Rilke's point: originally a Pre-Romanesque fortress destroyed, rebuilt, and expanded countless times, the castle's architecture is an extraordinary combination of styles, from the Romanesque through the Modern. □

Vladislav Hall (facing page), a Gothic confection designed by Benedikt Ried in the late 1400s, and Jože Plečnik's (Post-) Modern renovation of St. Matthias Hall of 1930 (this page) are part and parcel of Prague Castle. The two architects shared a predilection for quirky gestures: Some of the curved ribbing of Vladislav Hall's lierne vaulting drifts off into space; and Plečnik's signature meshing of Classical and Modern styles is seen here in the triple-stacked columns – two courses of Doric and one of exaggerated Ionic.

Built between 1722 and 1727, the main room of the library of the Klementinum (above), part of a large complex of Baroque structures (originally built as the first college established by the Jesuits in Bohemia), was designed by František Maxmilián Kaňka, one of the major exponents of Prague's Baroque movement. The Klementinum currently houses the National Library. A masterpiece of Czech Secessionist design built between 1903 and 1905, the Hotel Europa (facing page, top) was designed by architects Bedřich Bendelmayer and Alois Dryák, both disciples of Friedrich Ohmann. Jan Kotěra's house for publisher Jan Laichter (right), constructed from 1908 to 1909, uses a hybrid of Secessionist and Arts and Crafts styles. Adolf Loos's Villa Müller (facing page, bottom), completed in 1930, a fine example of the raumplan, *is currently for sale (see News, p. 23).*



Photos: Pavel Stecha

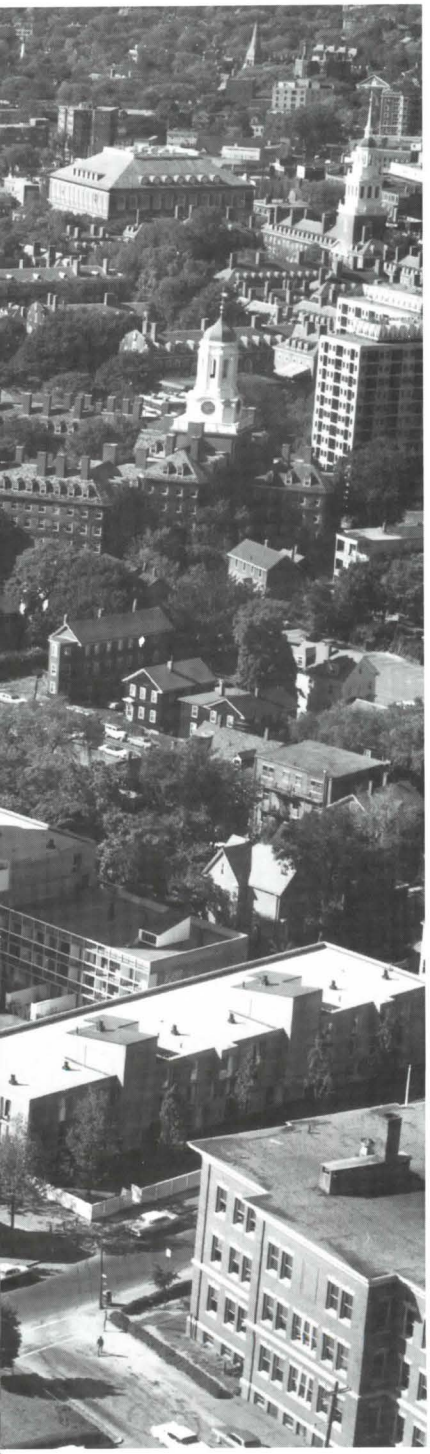


Yesterday's Paradigm, Today's Problem

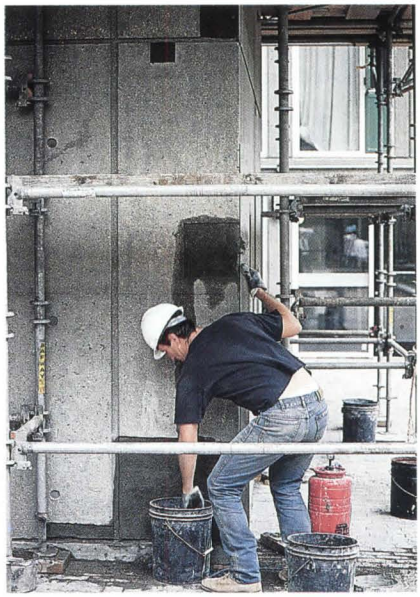
Sert's 1960s embodiment of housing ideals has become a 1990s challenge for the firm of Bruner/Cott. *by John Morris Dixon*

SITE PLAN N 200'/60m

Tod Aufiero



Laurence Lowry



Peabody Terrace's three 22-story towers are not freestanding like their Modern predecessors, but embedded in low-rise masses that define open spaces. A garage and a visitor parking lot along the project boundaries (see site plan) blunted Sert's effort to relate the project to the community. The three-year renovation effort here involves concrete problems typical of 1960s buildings.

In the early 1960s, when the dream of a new Modernist world was still alive, Josep Lluis Sert distilled this vision in his Peabody Terrace housing at Harvard. With some 500 graduate student apartments and their shared facilities, the complex is virtually a community in itself, combining both architecture and urban design and marking the campus-city boundary. Even today it exudes the confidence of its time in design based on economy, technology, and abstract reason.

By the 1990s, however, Peabody Terrace had become something of an embarrassment to Harvard, the last resort of graduate students who couldn't find a better place to live. But High Modern buildings such as these resist renovation; their cellular spaces, tailored to earlier standards and bounded by monolithic exposed concrete, would not easily accept the kind of improvements the firm of Bruner/Cott was called upon to carry out.

Modernist Mainline, Contextual Twists

When this housing was designed and built, it was noted more for its departures from the Modernist canon than for its adherence to it. While the International Style to that point had sharply distinguished low-rise structures from towers, Sert Jackson & Gourley's Peabody Terrace scheme melded them seamlessly, assembling all parts of the complex from the same structural modules. As P/A's October 1964 feature on the just-completed project observed, this massing yielded "a fluent continuity from low to high, and from old to new structures." By wrapping the housing structures around the shared open spaces, the architects subordinated the geometrical integrity of the architectural objects to the defining of the voids (and not incidentally recalled the massing of Harvard's nearby Georgian Revival undergraduate "houses").

While the streets that crossed the site were closed, in line with the superblock mentality of the time, a broad public walkway through the complex made a prophetic effort to restore the previous permeable street grid. In playing down Modernism's accepted distinctions between high and low, existing and new, object and field, Peabody Terrace foretold an emerging respect for history and context.

Although the project's evolutionary advances in design seem less daring in hindsight, its image as an exemplar of Modernism has been more persistent: Sert's gridded façades never ceased to make charming patterns, by day or night lighting, articulating the modular units. The casual massing and meandering open spaces seemed to mitigate the high density of 85 units per acre. But to its neighbors, the complex was merely a concrete highrise, and inside it, all was not well.

Conceived as a much needed haven for "married students," the complex had come to house any graduate students – alone, in groups, or in families. As private rehabilitation broadened off-campus housing options, the curtain walls of Peabody Terrace leaked

more cold winds, the spartan interiors seemed increasingly bleak, the concrete began to spall, and the cockroaches reveled in the casually abandoned food containers. The development's notoriety struck home when a prospective student calling from Baghdad begged not to be placed there.

Rehabbing Over a Three-year Period

But how to rehabilitate such a complex? The administrators, Harvard Real Estate, Inc., and the architectural team led by Bruner/Cott & Associates faced multiple challenges. The economically optimized Modernist interiors and the structure that contained them offered virtually no tolerance for reconfiguring rooms or installing new systems. The prominence of the complex in the *oeuvre* of Sert, who had chaired Harvard's architecture department, precluded any drastic design revisions. And, the university could not spare these 500 units for an academic year.

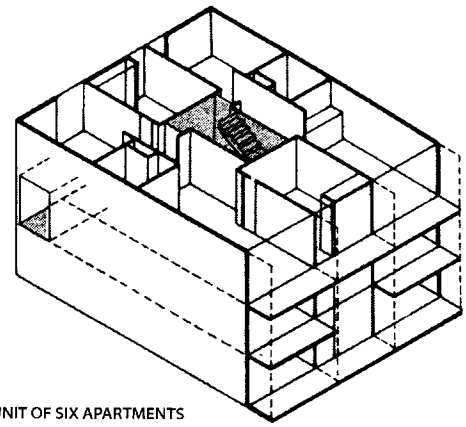
Fortunately for the rehabilitation effort, Peabody Terrace is divided into three fairly equal parts, around each of the towers. A decision was made to rehab one third each year, during the summer, when demand for apartments is lightest. The tight-knit team of architects, administrators, and contractors that accompished the first summer's work is staying together for the remaining two. The 12-week schedule, they say, has necessarily eliminated squabbles, and the first phase has given them a rare chance to apply "20/20 hindsight" to succeeding phases. The first priority was to increase the resident appeal of these spare, minimally dimensioned apartments. Economy and the housing market of the 1960s had determined the 7'-5½" ceiling height, the exposed slab surfaces, the alcove kitchens, and other features in the monastic tradition of college dorms, but these units were no longer competitive on the local market.

Only limited improvements were possible: expanding the kitchens, replacing bathrooms, reconfiguring storage walls (see page 104). In bedrooms, exposed concrete walls were clad in gypsum board. Cable TV lines and wiring for Harvard's computer network were threaded through, with difficulty. Handicapped accessibility was required in 5 percent of the apartments, necessitating conversion of some two-bedroom units to one bedroom.

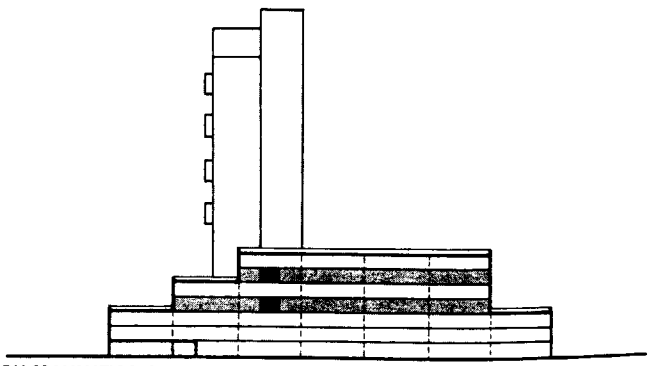
A major effort was replacing the extensive windows, installing insulating glass in thermal-break aluminum frames where there had been single panes in steel frames (page 105). A more severe technical challenge was the rehabilitation of the project's prominent cast-in-place concrete; judging from painstaking efforts here, it is not clear whether such concrete can ever be repaired without visible patches (page 106).

A More User-Friendly Development

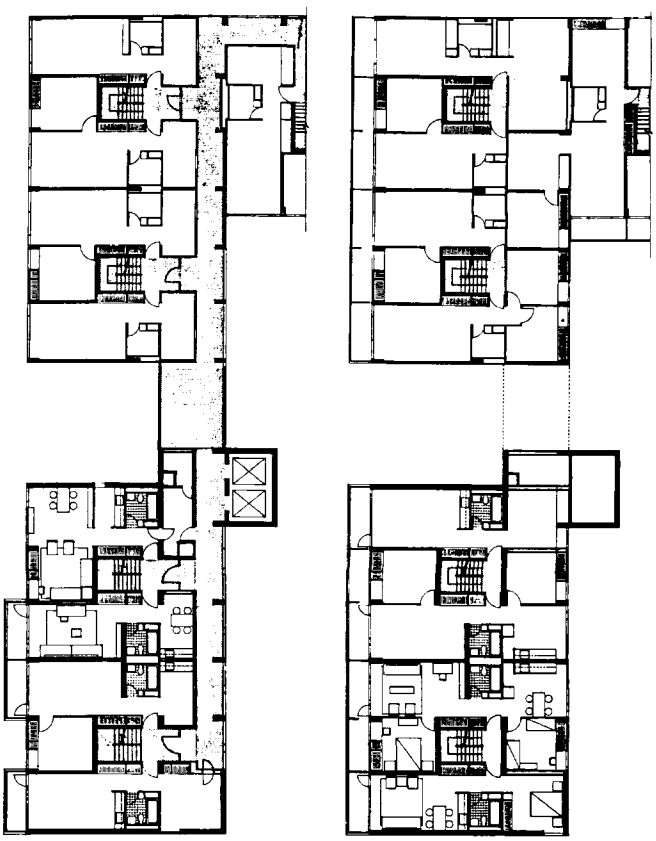
The austerity of the public spaces was seen as a liability. The dark surfaces of vestibules and corridors were replaced or repainted; new signage help visitors negotiate the *labyrinth* of stairs and hallways created by the skip-stop elevator system. The common room on the central plaza has been refurbished and made accessible, but the convenience shops that once activated a corner of the plaza – long since vacated – have not been replaced. *(continued on page 105)*



MODULAR UNIT OF SIX APARTMENTS



DIAGRAMMATIC SECTION, SHOWING ELEVATOR STOP FLOORS



TYPICAL CORRIDOR FLOOR

TYPICAL OFF-CORRIDOR FLOOR

20'/6m

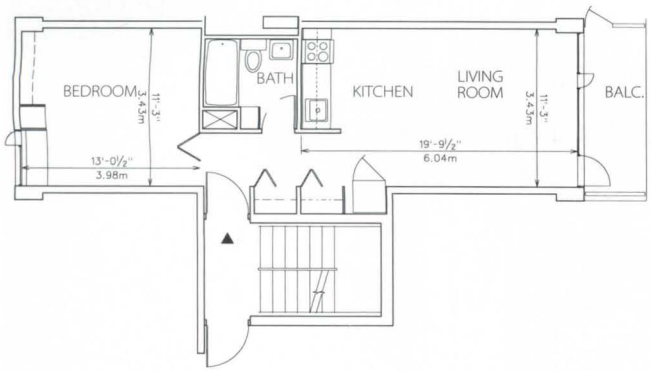
Steve Rosenthal

Steve Rosenthal

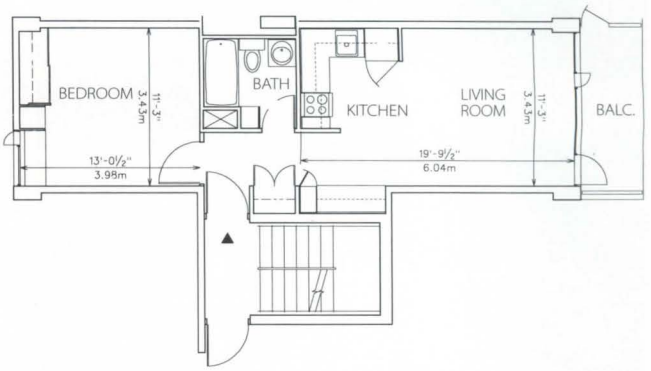
John Morris Dixon

The building block of the entire complex is a three-story, six-unit module (facing page, top) laid out around a central stairwell, with an elevator corridor only every third floor. Most apartments thus run through, with two distinct exposures. The standardized unit lent itself to very economically cast-in-place construction – about $15 per square foot in 1964. There were so many variations in plan, wall treatments, and balconies that the rehab architects found 400 different versions among 500 units.

First-phase renovation included installing an iron fence around Peabody Terrace reminiscent of other campus fences, which violates the original concept of an uninterrupted ground plan. On the other hand, the original fences around individual yards (bottom left) are being removed and replaced by common fenced yards (above); the typically short-term tenants rarely gardened these tiny plots, which became unsightly.

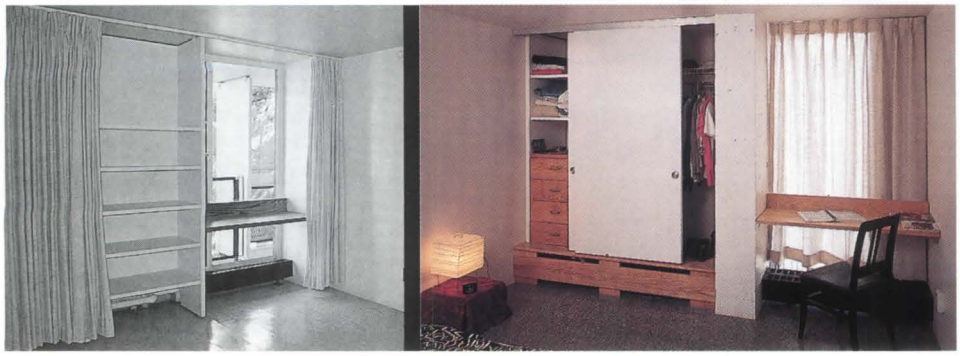


TYPICAL ONE-BEDROOM UNIT BEFORE



TYPICAL ONE-BEDROOM UNIT AFTER

Color photos: Steve Rosenthal



Floor plans above indicate the modest extent of changes to typical units: folding bedroom door, intended to maintain fluidity of space, was replaced to give greater privacy and eliminate a maintenance headache; revised bedroom dimensions reflect the covering of exposed concrete walls with painted gypboard.

The bedroom window wall (bottom left photos) originally included a standard closet and desk, with a curtain that screened either or both, but could not cover the window while the desk was in use; the current arrangement of closet doors and window curtains is more conventional, but it works. The fin-tube radiator that originally ran along the closet floor is now housed in a convection base beneath a raised closet floor, so that the heat warms the room, not the shoes.

Kitchens (middle left photos) now require counter space for microwaves and other appliances. The original linear layouts have been expanded into Ls, with more cabinets on a facing wall; cabinets are faced with white laminate, and have hardware that architect Cott calls "battle ready." Vinyl asbestos floors were removed and replaced by new synthetic tiles. Previous improvements had included sprinklers, with pipes that remain exposed.

In the apartment corridors, concrete surfaces that had been painted gray after they dirtied were repainted white; wall lighting was replaced with similar new units. New signage throughout helps residents, guests, and even maintenance staff, find their way through the labyrinth of skip-stop elevator scheme, with stairs from the corridor to *most units.*

The central plaza itself had been designed as an uninterrupted brick plane. By the time of this rehab, its austerity was seen as a drawback, and architect Paul Krueger, a member of Sert's original project team, was commissioned to make it more inviting. He has undoubtedly provided more greenery, plus some new places to pause or sit, but there is little to distinguish it from a thousand other plazas.

Modest efforts have been made to improve pedestrian routes through the project. Sert had conceived of the central east-west walk as a public route from the community to the river, but neighbors never seemed to feel comfortable on Harvard turf. Meanwhile, resident traffic typically entered from the north, along the edge of a parking lot, a route that has been widened and repaved to give it some dignity. And the "big eye" lights once mounted atop the towers for security have been replaced with lighting less suggestive of a penitentiary.

Resident Opinions

Current Graduate School of Design students living in renovated units at Peabody Terrace generally appreciate the original design qualities and the success of the rehab. They find the space adequate for their needs – and perceptually expanded by generous windows and wide views – but they acknowledge that families must feel cramped. They feel that increasing the kitchen counter space was an imperative but the energy savings of the new window walls are reportedly countered by the widespread opening of vent panels to deal with excess heat from a system that is not adequately zoned.

Architect Tod Aufiero of New York, one of many GSD alumni who have lived at Peabody Terrace, did a "critical redesign" of the complex as his master's thesis. His studies showed that all of the site's units could have been accommodated in four-story structures, and that the need for a garage could have been obviated by some additions to the original street grid, with resident parking stickers. High towers, street closings, and garage construction were not, in fact, necessities, but Modernist preferences.

Landmarks Worth Careful Renovation

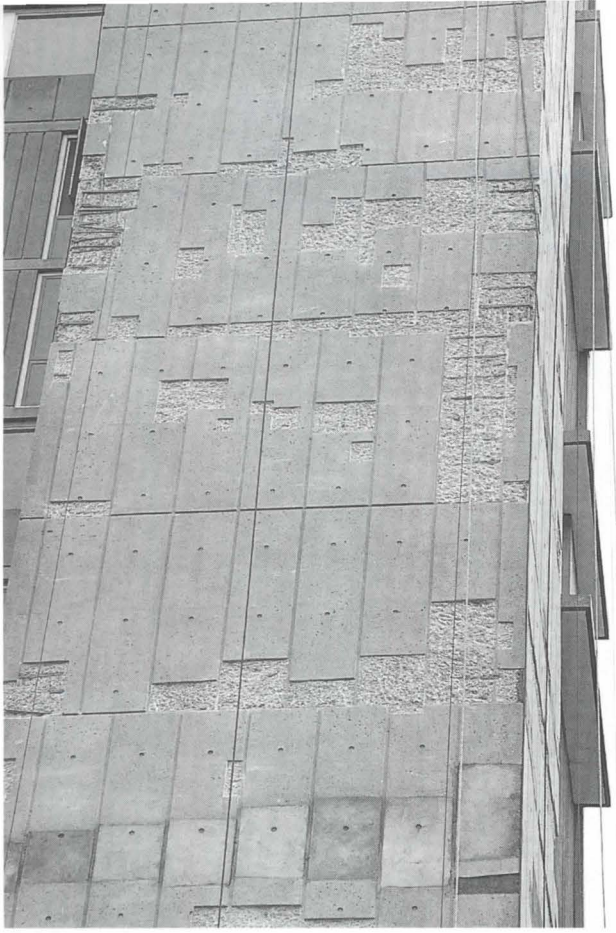
For all their flaws, the Peabody Terrace buildings deserve the meticulous renovation they are getting. While one could question the cautious redesign of the plaza and some interior resurfacing that blunts the original design,it is hard to argue with user satisfaction as a criterion.

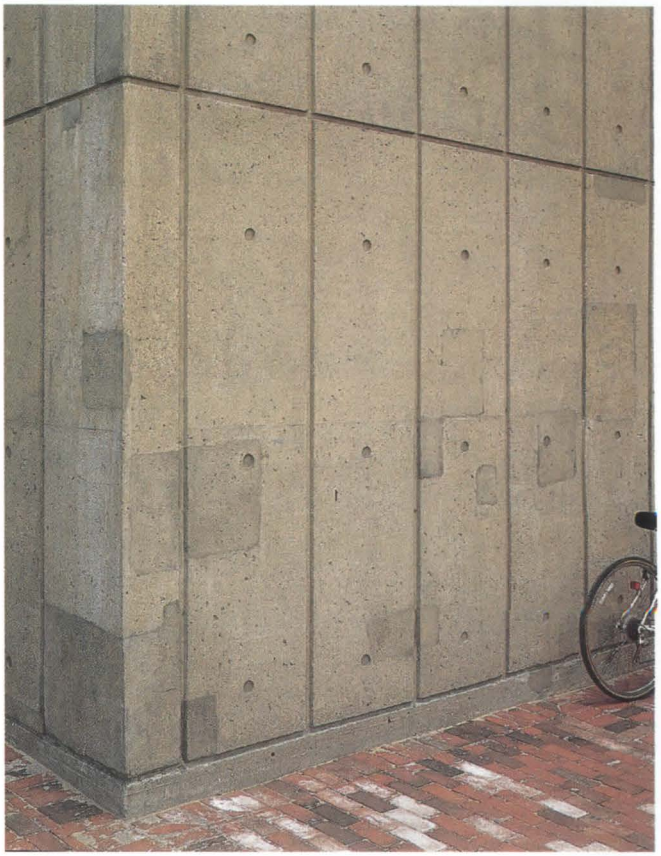
It is particularly timely to reconsider the value of Modernist work such as this, based on Le Corbusier's example. Dating from a time when Modernism was tending toward the sobrieties of Miesian Classicism, Kahnian gravity, and Brutalist bulk, these buildings were maintaining an earlier Modernist vision of lightness, brightness, and moderate scale, even at large size. At the same time, they represent a pioneering, if tentative, recognition of context. Peabody Terrace may now be rehabilitated in terms of its place in history, as well as its function at Harvard. □

Steve Rosenthal

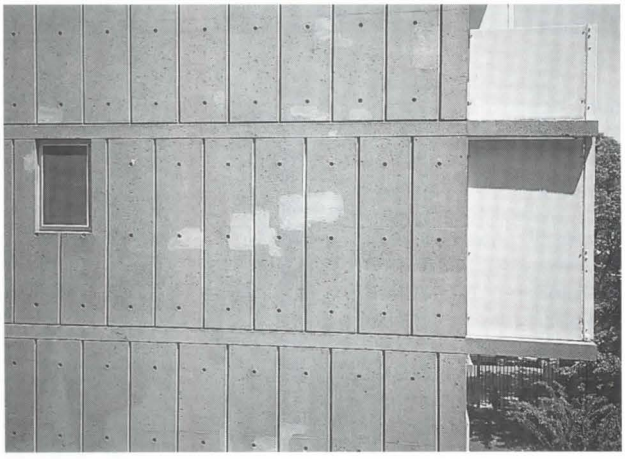
Sert's design of the window wall pointedly separated glazing from ventilation openings, which had vividly painted hinged panels. Exposure was acknowledged by putting all corridors on either north or east sides, balconies to south and west. To the south, limited glazing and balcony overhangs provided for sun control. To the west pivoting vertical louvers were used for sun control; most louvers had ceased to pivot at some point, but were repaired before this rehabilitation.

The apartment windows and ventilation panels have been totally rebuilt. Single panes of glass in steel frames have been replaced by insulating glass in thermal-break aluminum frames, which have been internally reinforced in order to maintain profiles similar to the original ones. The ventilation panels, originally simply sheet steel, have been replaced with insulated, weatherstripped aluminum units; the vivid red and green of these panels are now truer to the original colors than were intervening repaintings.





Steve Rosenthal



The massive cast-in-place concrete walls that figure so prominently in both the structure and image of Peabody Terrace posed a serious restoration challenge, prefiguring the problems hundreds of 1960s structures will present. (A nearby example is Harvard's nearby Carpenter Art Center, by LeCorbusier with Sert, where concrete is also beginning to spall).

In the early 1960s, there was apparently too much confidence and not enough experience in casting. At Peabody Terrace, some of the rebars bowed out of position, especially near the bottoms of pours, so they had an insufficient covering of concrete. The result was scattered spalling, typically just above floor lines.

Before this renovation, the university had commissioned a thorough survey of concrete deterioration, and all spalling areas had been patched with a concrete that was harder, whiter, and smoother than the original, so all too visible (bottom left photo). Now defective areas are being cut out and in many cases extended to visible form joints (top left photo), to minimize the patchy look.

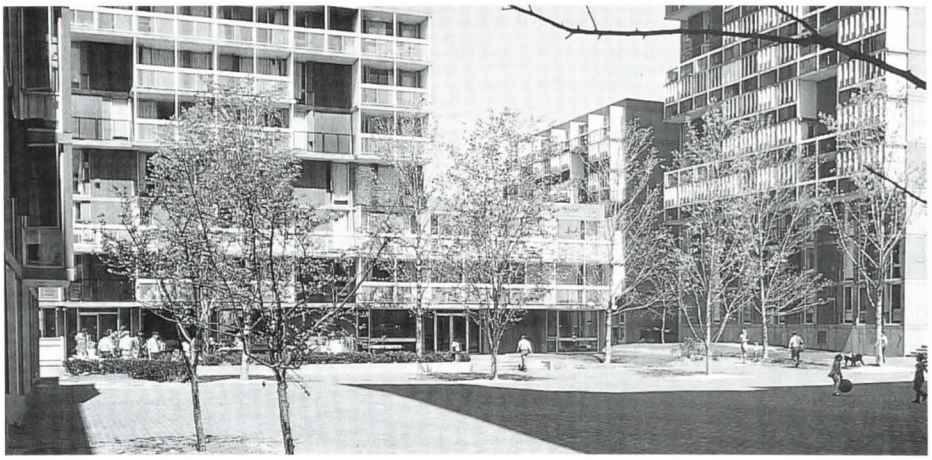
Working with Boston Building Consultants, the architects and contractor determined to use sand from the original pit, with no coloring agents. The original texture was effectively duplicated by embedding soluble gelatin pellets in the new surface. In the only completed phase, a sample panel was not approved until July 1993, so that much of the actual patching did not cure completely before an unusually harsh winter. Faced this spring with patches that are too dark, especially around the edges (photo above), the contractor has been trying some bleaching agents.

Fortunately, as the complex was being designed, Sert's firm was making increased use of precast components. Factory fabricated with greater precision, the precast infill wall panels are virtually unflawed after 30 years of Cambridge weather.

It remains to be seen whether patches in Peabody Terrace's cast-in-place concrete can ever be rendered invisible. Architects restoring the many other concrete monoliths of the 1960s can look to this project for its lessons.

Steve Rosenthal

Sert's Peabody Terrace plan showed three major courtyards, two planted and the central one paved with an unrelenting brick surface (right) that he hoped might be a setting for meetings and rallies. (For children, there is a playground at the southeast corner of the site, and smaller play yards outside day-care areas.) In this renovation, Harvard wanted a more inviting central plaza (above) that might encourage residents to pause and socialize. Architect Paul Krueger has provided a variety of planting beds and seating areas; clearer definition is given to the original main pedestrian spine (right to left in photo above) and the more frequently used route linking the complex to the rest of Harvard (right side of photo above). The result is a more humane space, with a better sense of orientation, yet lacking strong visual identity. It is certainly not fortunate that one of the 22-story towers casts a midday shadow across much of this space (right; also aerial photo and plan, pages 100-101).



Project: Renovation of Peabody Terrace apartments, Harvard University, Cambridge, Massachusetts
Renovation Architects: Bruner/Cott & Associates, Cambridge (Leland Cott, AIA; Lynne Brooks, Oliver Radford).
Original Architects: Sert, Jackson & Gourley, Cambridge.
Client: Harvard Real Estate, Inc. (Scott Levitan, Assistant Vice President for Construction and Planning; Susan Keller, Assistant Vice President for Residential Housing).
Project Manager: Harvard University Planning Group.
Consultants: Norton Remmer, codes; Foley & Buhl Engineering, structural; Zade Company, mechanical; Diversified Environmental Corp., hazardous materials; Krueger Associates, landscape.
Construction Manager: Barr & Barr, Inc.

CSI SECTION 08810

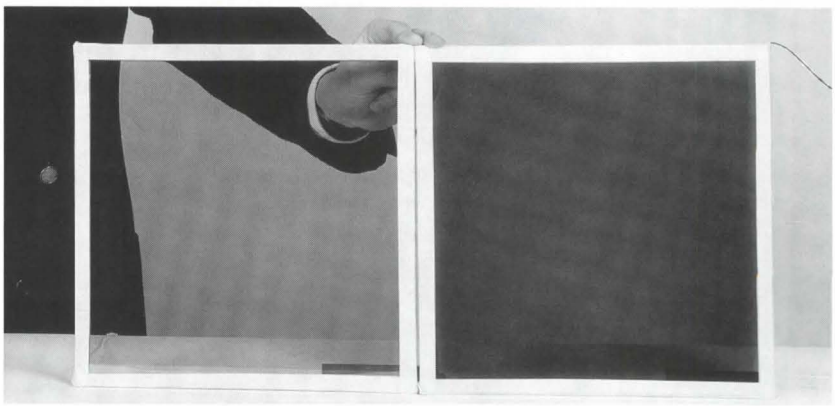
Amazing Glazing

Advances in glazing technology are leading to a more dynamic, interactive, energy-efficient building envelope.

by Stephen Selkowitz and Stephen LaSourd

Abstract

Recent developments in glazing technology have drastically cut solar radiation to reduce cooling loads while admitting daylight. Improved insulating values have made glazing more economical in cold climates. But these glazing advances will reach their full energy-saving potential only if combined with proper design of other building operating systems.



1 ELECTROCHROMIC GLASS IN TRANSMISSIVE AND REFLECTIVE STATES.

In the past few years, designers of commercial buildings have come to rely on an array of glazing materials to curb energy consumption, reduce peak electricity demand, and lower building operating costs. Now, further advances in the design of glazings, coupled with new developments in lighting, HVAC, building automation, and photovoltaics is leading to a convergence of interrelated technologies, materials, and capabilities, with the potential for significant integration of these disparate systems. This will enhance aesthetic expression, energy efficiency, increased occupant comfort, and productivity.

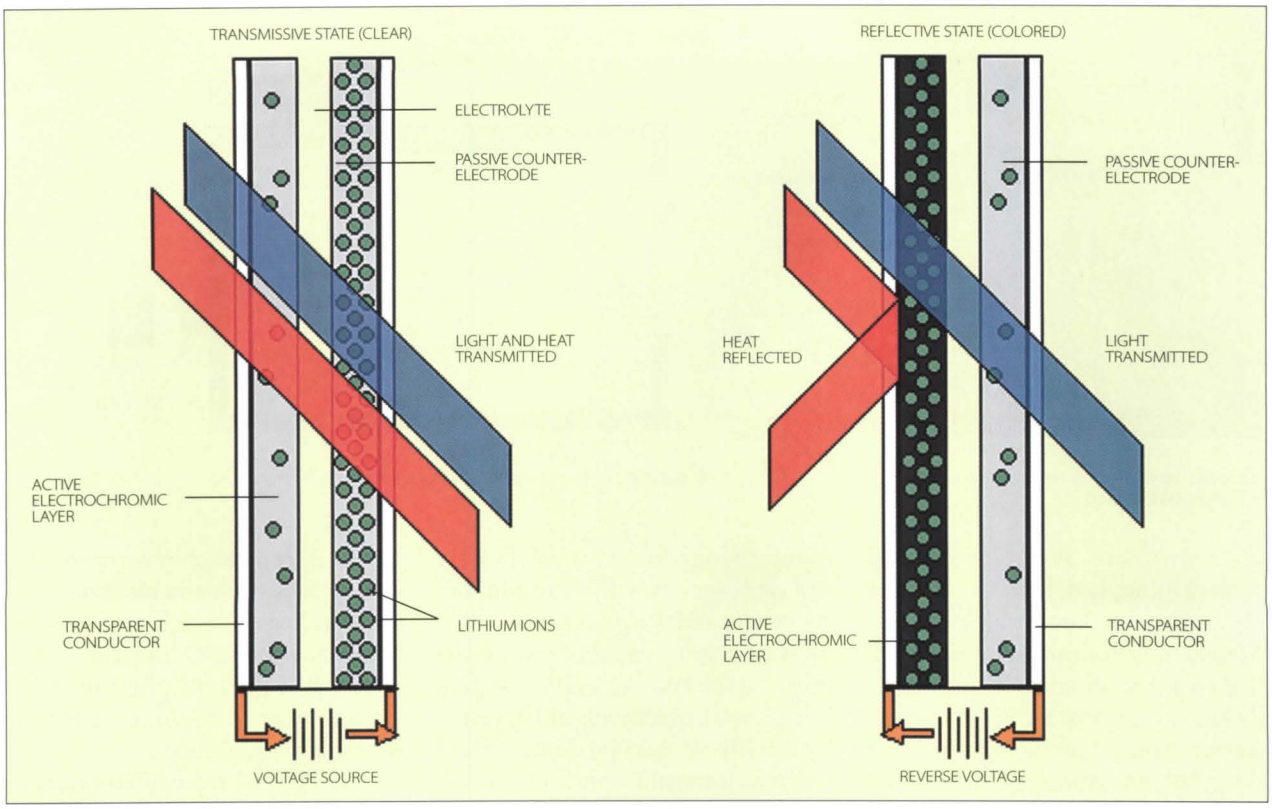
To appreciate this trend it is useful to back up for a moment and consider the rapid changes that have occurred in the evolution of glazing to control heating and cooling loads over the past few decades. Beginning with the increased use of highly reflective coatings in the 1960s and 1970s, it became possible to design façades with large glazing areas while reducing unwanted solar heat gains. The trade-off was reduced interior daylighting and a dulled view on overcast days. Building codes (and common sense) forced designers to begin to switch from single to double glazing in the 1970s, since windows were still a substantial source of heat loss in commercial buildings in cold climates. The advent of transparent, low-emissivity window coatings in the 1980s, and later the addition of insulating gas fills, greatly improved the insulating value of glazing. The heat loss rate of a conventional double glazed window was reduced by 50 percent without adding to the weight and only modestly increasing the cost.

The 1990s have seen a continuing effort to improve the energy performance of both glazing and window frames. Highly insulating "superwindows," using multiple low-e coatings with argon or krypton gas-filled cavities between several layers of glass and plastic, are such good insulators that even in the coldest climates they have been shown to gather more thermal energy than they lose over a 24-hour period in winter. A building with such a transparent, super-glazed skin could have a lower annual heating load than one with an R-19 insulated opaque wall, even on its north side. The premise of building codes in the 1970s, that windows are heat leaks and should thus be minimized, has been shown to be an overly simplistic approach to design. While targeted initially for residential buildings, these glazings could reduce the energy loss of the exterior walls of commercial buildings to such a low level that perimeter heating would be unnecessary. The message for the future is that if we select the proper high-performance window technology, suited to the climate and building's requirements, it is possible to meet both client and national environmental needs with the same design solution.

Omitting Half the Sun

In commercial office buildings in moderate to hot climates, the choice of glazing materials for the optimization of energy performance may be viewed as a trade-off between lowering the solar heat gain coefficient (or the related shading coefficient) and maintaining the visual transmission of the glass to admit daylight and permit views. Since about 50 percent of sunlight is visible radiation and the remainder is invisible UV and infra-

Stephen Selkowitz is program head and Stephen LaSourd is a research assistant in the Building Technologies Program, Energy and Environment Division, Lawrence Berkeley Laboratory.



2 ELECTROCHROMIC GLAZING

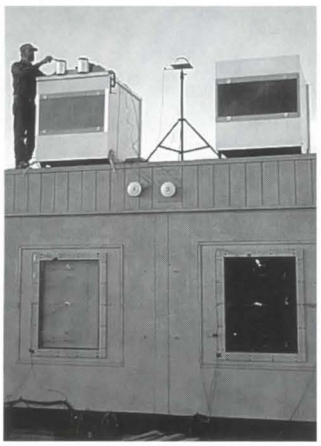
red radiation, it is technically desirable to reject the half of the sun's energy that boosts cooling loads without loss of daylight. Recently, a variety of wavelength selective "cool" glazings have been developed with the capacity to transmit a greater portion of the visual spectrum while blocking the shortwave infrared component of sunlight (see P/A, April 1992, pp. 136–141). Adequate interior daylight levels can reduce the need for additional electric lighting, so that dimmable lighting systems can save electric energy directly and can also reduce internal heat gains from lighting, providing further savings in cooling costs.

Beyond Static Systems

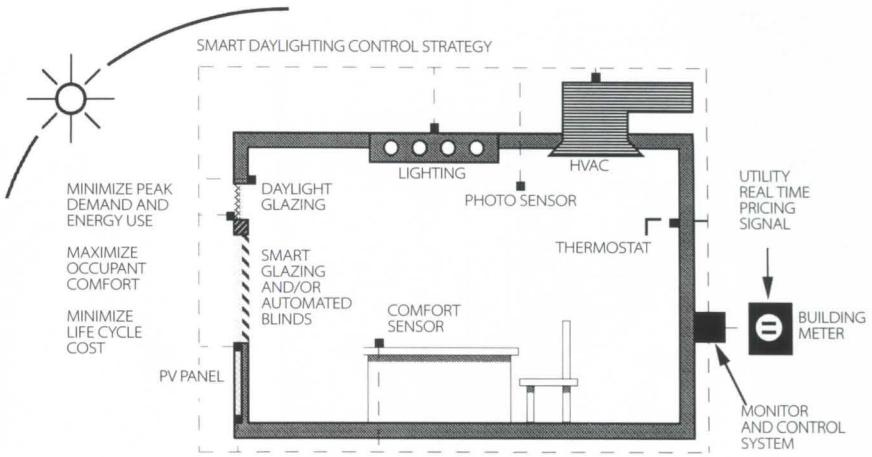
Harnessing daylight in a building is a significant technical challenge for architects because of the great variability in intensity during a typical partly cloudy day. The sky is a light source that can change output randomly by 1,000 percent over the course of a day. In order to achieve the desired energy savings under these dynamic conditions, it is necessary to look beyond fixed, static systems and to consider the possibility of creating a dynamic relationship between the fenestration system of the building envelope, the internal electric lighting system, and the HVAC system. There are various ways of handling this relationship. Daylighting controls employing photosensors, for example, must be linked to dimming ballasts to reduce electric lighting levels when the available sunlight is sufficient to provide adequate illumination. By linking such an electric lighting system with daylighting controls to a fenestration system capable of automatically modifying the transmission of daylight, it becomes possible to control the cooling and lighting energy balance on a real-time basis, while addressing glare and thermal comfort.

In terms of automatically modifying the fenestration, motorized louver, blind, and shade systems have never captured a significant market share and are likely to be overtaken by an emerging generation of "smart" glazing materials. Photochromic glass, which reversibly changes optical density when exposed to light, has been widely used in sunglasses although it is still not available as an architectural product. Thermochromic glazings, which become translucent when a preset thermal threshold is reached, should be available on the market in the near future. These could be activated passively in response to changing sun and temperature conditions, or actively triggered by an additional thin film layer within the glazing, which acts as a heating element. Switchable glazings, using liquid crystals sandwiched between two glazing layers, are also available, offering the capacity to change from a translucent to a transparent condition when electric current is applied. This provides the added benefit of visual privacy, but unavoidably diminishes transparency in its low-transmission state. As such, it may not be well suited for vision glazing applications.

Electrochromic glazings(1), however, now under development in laboratories throughout the world, offer the best potential for achieving the dynamic control of daylight transmission and solar heat gain. The technology consists of a multilayered, thin film device (2) that can be applied to a glass or plastic substrate or as part of laminated glazing. The electrochromic coating is typically a complex five-



3 MOBILE WINDOW TEST FACILITY WITH AUTOMATED BLINDS



4 SECTION, MOBILE WINDOW THERMAL TEST FACILITY

layer structure. When low-voltage current is applied, ions move to the electrochromic layer, which changes continuously from a clear to an increasingly dark, colored state – typically blue, gray, or bronze. Reversing the voltage returns the coating to its clear state. "Broad-band" electrochromics switch from transmitting to absorbing over the entire solar radiation spectrum, while a more efficient, ideal "narrow-band" electrochromic would switch from transmitting to reflecting in the visible portion of the solar spectrum only, with a high reflectance in the near infrared solar spectrum to minimize cooling loads. Prototype glazings range in light transmission from 6 to 60 percent.

By employing electrochromic glazings in a curtain wall, we now have a technology that allows us to dynamically alter the daylight levels in the space, to control the visual privacy of the space, and to alter the aesthetic appearance of the building, from both the interior and the exterior. Imagine a horizontally segmented window whose lower portions darken to provide privacy but whose upper portions admit light and permit view, or a system in which multiple horizontal glazing bands are incrementally controlled to provide a visual gradient from floor to ceiling. The ability to transform the "window" into a semitransparent or an opaque "wall" not only provides the architect with new avenues for artistic expression, but also with the capacity to control the energy flows in the entire building envelope, transforming it into a variable heating and cooling element that can admit or reject light and thermal energy.

Such a responsive system would be linked to the building's HVAC system by a network of sensors, and operated by intelligent energy-management controls. Internally, light and temperature preferences could be achieved on an office-by-office basis by controlling the glazing in each space. The state of such a dynamic building envelope could be closely coupled to variable external and internal conditions – the sun going behind a cloud, or the changing functional needs in a room, such as visual tasks on a computer. The system can be designed to accommodate occupant preferences for the control of view, glare, privacy, and task-lighting levels when the space is occupied, and could adapt to a minimum energy consumption mode whenever the occupant leaves the office.

The Integrated Envelope

To develop a preliminary assessment of how an integrated, dynamic envelope and lighting system would perform, researchers at Lawrence Berkeley Laboratory have been developing and evaluating prototypes of several integrated envelope-lighting systems. The prototypes include designs with planar skin systems as well as designs with articulated skins including light shelves and exterior shading devices. Several of the designs split the window into an upper daylight-admitting aperture and a separately controlled lower-view window. A series of building simulation tests has been conducted, measuring both conventional glazings and automated blind systems, which are serving as a near term stand-in for the electrochromic glazings.

The DOE-2 energy simulation program was used to predict the hourly and annual performance of a prototype building, with many types of glazings and control strategies. This powerful computer tool lets us examine a wide variety of "what if" questions for glazing products that do not yet exist and helps us to understand the performance of a variety of different operating control strategies. The initial results show that automated systems with motorized blinds that are adjusted continuously to maintain desired light levels and block sun penetration, provide substantial energy and demand savings compared to more conventional static glazing design solutions.

In a second study, field measurements were taken in an outdoor Mobile Window Thermal Test (MoWITT) Facility. Side-by-side tests (3,4) were made of the performance of conventional tinted glass compared to a high-light-transmission, spectrally selective glazing. The latter had an automated, motorized venetian blind, in which solar sensors and a smart controller kept the blinds tilted at the optimum angle throughout the day. The automated blind with photocell controls showed a 50 percent reduction in total electric use for a south-facing window.

Additional field measurements of these systems will be followed by demonstrations in fully furnished rooms before the systems are ultimately demonstrated in occupied office buildings. Measurements will include an assessment of visual and thermal comfort as well as energy savings.

Determining True Costs

Widespread application of many of these new, high-performance and emerging technologies has been slow because of the increased first cost of the glazing systems relative to their "conventional" alternatives. Energy is still a cheap commodity that reflects neither its full replacement value nor its true long-term environmental impact. However, there are several other emerging trends that suggest a more dramatic impact for these glazing systems than traditional energy cost-benefit calculations alone.

1. *Comparing full building systems and utility systems trade-offs in first and operating costs.* Glazing not only influences monthly utility costs for heating, cooling, and lighting (if we include daylighting controls) but it has two other significant first-cost impacts that are not always directly associated with the glazing selection process.

First, glazing frequently is a determinant of peak cooling loads and thus of chiller and HVAC system sizing and first cost. A more efficient glazing system will allow the entire HVAC system (plant and distribution system) to be downsized, with significant cost savings that can be applied to offset some or all of the glazing first cost. These savings can be as high as $10 per square foot of installed glazing. However, from the perspective of the liability of the design team, the glazing must perform as part of a complete building system and must reliably provide the expected performance.

Second, a reduced peak HVAC load should translate into lower peak electric demand. This may result in monthly savings in demand charges, but it will also reduce pressure on the utility to add new generating capacity. In the case of a retrofit of an existing building, it provides new available capacity for other needs. Utilities are increasingly willing to "purchase" these "negawatts" with upfront rebates that help offset the building owner's first cost. Conceptually, the glazing system becomes an energy source (relative to a conventional alternative) and the utility makes an investment in this "energy system" as if it were a new small power plant. These payments can range from $0.50 to $5.00 per square foot of glazing.

2. *The price and cost of new technology.* When new building technology is first introduced, its price to the purchaser often far exceeds its ultimate market cost. Costs come down over time because of competition; innovation; efficiencies in production, distribution, and marketing; repayment of research and start-up costs; and other market forces. As noted above, utilities have become large purchasers of some energy-efficiency products and have begun to exercise greater marketing influence. How might this work? Imagine a new highly efficient glazing that is offered as a high-priced specialty product because the market is too small to justify the capital investment needed for lower-cost mass production. Utilities, via their demand-side management programs, and other direct purchasers of the products pool their potential purchases to create a large enough market (via performance specifications and bids) to justify the winning manufacturers' investment in new production equipment. Innovative programs of this type are under way in several different areas of technology and we may see such an approach for new glazings in the future.

3. *Health, comfort, and productivity.* By far the largest economic factor in commercial buildings is the cost of employee time. All other first costs and operating costs are but a tiny fraction of this cost – a person whose annual salary and benefits total $60,000 and who occupies a 120-square-foot office costs $500 per square foot of space per year. Design solutions that improve productivity by even a small amount are thus highly cost-effective. While there is little hard data that shows a direct relationship between energy-efficient glazing designs and productivity, there is anecdotal evidence that views of the outdoors, connections with the outside, and a glare-free and thermally comfortable environment all contribute to a more satisfied worker, who is likely to be more productive than an unhappy, uncomfortable worker.

Design Implications

Capturing these benefits will require better design tools used with more of a systems approach to design and a more explicit integration of the glazing with the rest of the building. If the envelope is designed without considering HVAC interactions, the first cost savings described above are not possible. There are substantial technical and organizational obstacles to the comprehensive integration of building envelope, lighting, and HVAC systems. For consistent and correct operation, such integrated systems must rely upon sophisticated whole-building automation programs, which are still in their infancy. Added first cost, and possibly higher maintenance costs, may discourage potential buyers, and few developers are willing or able to take increased risks with their own projects. Once completed, new buildings will need to be properly commissioned and their occupants may need operating manuals. More thorough training of building managers, and continuous, real-time feedback on the building's operation will be needed, allowing adjustments to changing operational needs, but still maintaining efficient performance.

Despite these challenges, the concept of "dynamic envelope systems" holds considerable power to stimulate the architectural imagination. It suggests a fundamentally different approach to optimizing the energy performance of buildings with new glazing technologies while also improving the quality of the indoor environment, and displaying in a very tangible way the ever changing relationship between the products of human ingenuity, the local environment, and the imperative for sustainable design solutions. □

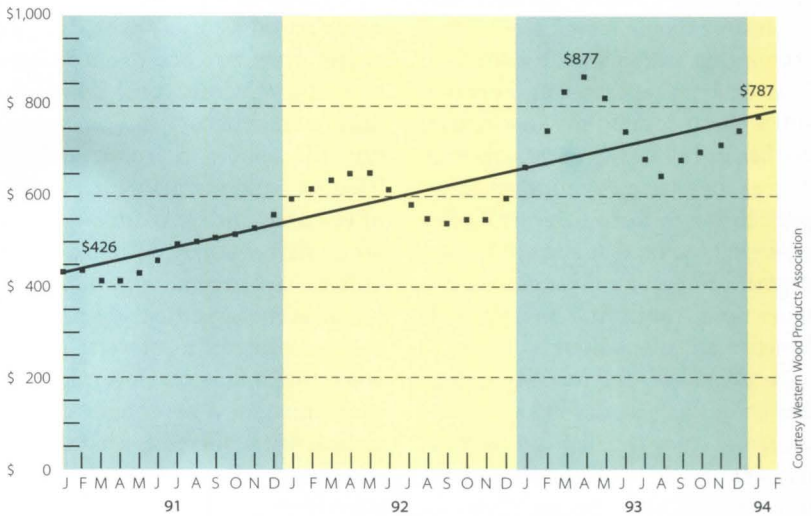
CSI SECTION 08610

Are Wood Windows on Their Way Out?

Industry analysts suggest that the wood window, as we know it, may soon be a thing of the past. *by Alex Wilson*

Abstract

As lumber prices rise and certain species become scarce, window manufacturers are searching for alternatives to the clear, select softwoods they have relied on for decades. Research is yielding a wide range of alternative materials, including vinyl, fiberglass, and various new composite materials.



1 LUMBER PRICE FOR PONDEROSA PINE

Approximately 20 million wood windows are produced each year in the U.S., according to the American Architectural Manufacturer's Association (AAMA). In 1992, the Western Wood Products Association estimates that 1.7 billion board feet of top-quality western timber were sold to the window, door, and millwork industries, with ponderosa pine comprising 73 percent of that.

Efforts to protect the nation's remaining old-growth forests and more stringent harvesting regulations are making this wood harder to come by and more expensive (1). Even as supplies tighten, demand for the look and feel of wood windows is growing, especially in commercial and institutional buildings, where some designers are seeking a more homelike atmosphere. The search is on for alternatives.

Doing More With Less

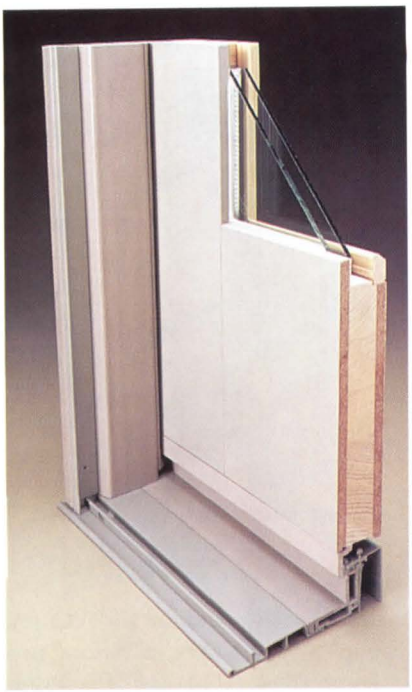
Using wood more efficiently has been a priority across the board with window manufacturers. "We've done a tremendous amount of work to reduce wood use," says Michael Koenig, manager of advanced materials and processing research at Andersen, the largest window producer in the country. Increasingly, the company is making use of internally generated wood waste as a raw material in manufacturing. Many manufacturers have begun using fingerjointed pine in situations where the wood will be painted or clad. A few producers are turning to pine veneers over lower-grade fingerjointed pine or lesser species such as aspen and basswood. According to marketing manager Robert Wood, Hurd now uses such a core-and-veneer system for interior extension jambs and certain frame components of its casement windows that once required six-quarter-inch clear pine.

Going even further with efficient wood use, last year Caradco began using the MacMillan TimberStrand laminated lumber in window frame components that will not be exposed to view. Other window manufacturers are examining TimberStrand for sash construction – using vinyl or aluminum cladding on the exterior and veneer or glued-on solid wood on the interior (4). TimberStrand is produced from fast-growing aspen or yellow poplar. The wood is cut into long strands, coated with resin, then pressed into solid stock that can be cut to manufacturers' specifications. Trus Joint MacMillan achieves approximately 75 percent log utilization with TimberStrand, compared with only 25 to 40 percent log utilization in producing conventional lumber.

Wood-Plastic Composites

Perhaps the most unique alternatives are wood-plastic composites. In a sense, TimberStrand and oriented strandboard (OSB) fall into this category, but the percentage of resin is very small (typically less than 5 percent), and wood fiber properties determine its performance. The composite wood-resin product Werzalit, used in WENCO sills and frames, is made with the same resin as particleboard – urea formaldehyde – but at a

Alex Wilson of Brattleboro, Vermont, writes for numerous magazines and is editor of Environmental Building News, *a bimonthly newsletter on environmentally sustainable design and construction for builders and designers.*



2 ANDERSEN WOOD-PLASTIC COMPOSITE SILL

much higher percentage: 25 percent.

Advanced Environmental Recycling Technology produces a similar product for the window and door industry. Called Moistureshield™, it is used by Peachtree in sill construction, and by several smaller manufacturers. Moistureshield is a 50-50 mixture of post-consumer recycled high-density polyethylene (HDPE) and waste wood fiber from a perfume factory in Texas (wood chips are a by-product of extracting aromatic oils from incense cedar). The Moistureshield composite is solid in cross-section, strong, totally waterproof, and dimensionally stable. It cannot readily accept veneers or coatings, though, so can be used only in clad locations.

Andersen has introduced a quite different wood-plastic composite in its French door sub-sills (2). It is a wood-PVC composite (the company would not release information on the relative proportions) that is extruded through a die to form a hollow extrusion. Both components for the extrusion, which the company calls Reclaim Composite, currently come from waste streams within Andersen's plants.

Until this product was developed, according to Michael Koenig, a considerable amount of mixed-sawdust-and-vinyl waste was created as a result of trimming the company's vinyl-clad Permashield window profiles. "This product has taken away the need to landfill this one waste stream," he says. Though the company could provide no details, it is expected that Reclaim Composite will gradually be incorporated into much of Andersen's product line.

Fiberglass Pultrusions

One of the biggest newsmakers in the window industry this year has been the renewed interest in fiberglass pultrusion technology for window profiles. Owens Corning Fiberglass had only mixed success with this technology beginning in the late 1980s, dropped it altogether for a while, and has recently reintroduced a replacement window product. New product introductions by both Marvin and Winter-Seal demonstrate growing interest in the technology.

In the fiberglass pultrusion process, glass fibers are coated with resin (usually polyester) and pulled through a die to form the window profile. The thermoset resin cures, producing a hard, hollow profile. (This pultrusion process differs from an extrusion process, in which the material is pushed through the die.) The ratio of fiber to resin in such a process is estimated to be between 60:40 and 70:30 by an industry expert, though none of the companies would disclose proportions.

Marvin calls its new fiberglass window line Integrity and the material Ultrex (3). It is used for all parts of the sash and frame exposed to the exterior. It is coated on the exterior to improve resistance to ultraviolet light and to provide color choices. On the interior, solid wood is attached by mechanical means and with various adhesives to provide a solid-wood look. The new line is priced to compete with low-end wood windows or high-end vinyl windows.

Winter-Seal, the first company to introduce vinyl windows back in 1963, introduced its first fiberglass casement window in 1988 and completed the Comfort Line series this year with the introduction of a double-hung window. According to vice-president Mike Monaghan, Winter-Seal began looking at fiberglass because its vinyl windows simply were not gaining significant market share in new construction. "Builders have not readily accepted it [vinyl]," he said, "nor have architects."

Fiberglass offers significant advantages, says Monaghan. It is 9 times as strong as aluminum, 16 or 17 times as strong as wood, and 30 times as strong as vinyl, he claims. It also has almost the same expansion coefficient as window glass. This permits the glass to serve a structural role, which in turn lets the company make the profiles thinner, providing more view area and better thermal performance.

Winter-Seal laminates a 30-mil oak veneer right to the fiberglass on the interior. "When we went out and did our marketing and our research, builders wanted the 'feel' of wood, and the only way you can get the feel of wood is to put real wood out there," said Monaghan. The wood is fully paintable or stainable.

A New Twist to Vinyl

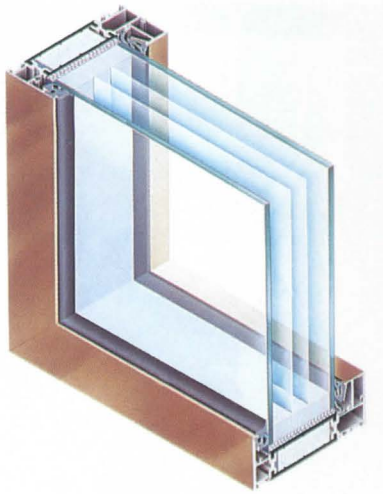
Vinyl windows, a mainstay of the low-cost replacement residential window market since the 1970s, have been gaining market share in new residential construction during the past ten years. With wood prices and availability problematic, that trend can be expected to increase. AAMA projects that vinyl windows will comprise about 27 percent of the total residential window market by 1995, up from about 23 percent in 1992 and just 11 percent in 1986.

Two significant developments are occurring with vinyl. One is the use of foamed PVC as an alternative to hollow PVC extrusions. The other is the use of PVC in wood-plastic composites. Foamed PVC is a relatively new material made by foaming tiny bubbles into PVC resin during the extrusion process. Instead of the hollow channel common in conventional extruded PVC window profiles, you get a solid white material.

WENCO is the first company to introduce foamed PVC in window profiles. Its new Eliminator line uses the material for all sash construction

3 MARVIN INTEGRITY WINDOW WITH FIBERGLASS PULTRUSIONS

4 TIMBERSTRAND LAMINATED STRAND SASH



5 HIGH-PERFORMANCE VISIONWALL WINDOW

and a composite wood-resin product called Werzalit for sill and frame construction. Because foamed PVC is not as hard as solid PVC, a solid PVC layer is coextruded with the foamed PVC to provide a hard, weather-resistant outer layer. The interior has either a white finish or a simulated wood-grain finish with fruitwood stain to look like pine. The foamed PVC sash has 2.5 times the R-value of solid wood, according to WENCO.

When the Eliminator window was introduced in late 1993, it was priced about 10 percent below WENCO's clad wood windows. But marketing manager Ron Brown said the company has already had to raise the price of its wood windows because of rising wood prices, increasing the price spread to 14 percent. "It's going to be very price-stable I think," said Brown of the Eliminator window, "more so than wood and clad-wood products have been in the last few years."

The move to vinyl is far from universal, though. Among the concerns with vinyl are its high rate of expansion with varying temperature and the fact that it can begin softening at temperatures as low as 165 degrees Fahrenheit, which is within the range that a window can experience. Another concern with PVC relates to the environment. Citing pollution problems in the early stages of manufacture and possible dioxin emissions during disposal, some organizations are calling for the phase-out of all chlorine-based materials and compounds, including PVC. It remains to be seen how this concern will play out and how it might affect the vinyl window industry.

Aluminum Composites

In residential construction, aluminum windows have seen their market share drop considerably over the past decade (from 44 percent in 1986 to 28 percent in 1992 according to AAMA). Most of this market has been lost to vinyl windows. Not surprisingly, aluminum continues to dominate the market in commercial buildings. As Visionwall Technologies, a Canadian company headquartered in Edmonton, Alberta, has demonstrated, aluminum window frames do not have to mean high heat loss.

Visionwall produces an innovative window system with interior and exterior aluminum frame extrusions separated by a fiber-reinforced polyamide web that is nearly three inches thick and is filled with insulation (5). The aluminum extrusions and low-conductivity web form a structural composite beam, and the entire window assembly produces a unit insulating value as high as R-6.5. By itself, the frame insulates to between R-5 and R-5.5.

Where We're Heading

The window industry is beginning a period of rapid change and new product introductions. In place of single materials – all wood, or all PVC, for example – we will see increasing use of composites. "The use of any one material exclusively will go away," says Koenig of Andersen. We have already experienced a lot of this transition. Clad windows are composites, according to industry expert Loren Abraham, and even "all-wood" windows are becoming composite in nature as simple surface paints are replaced with thicker, more durable surfaces integral to the window construction.

It is likely that within a few years clear, solid wood will be used only in window components that are in full view. The wood is too precious to hide away. There are cheaper alternatives, though we still have a lot to learn about using them. Field experience will likely lead to many refinements and further developments.

As we move in the direction of composites, we also need to address the issue of waste disposal and material recovery. Composites are inherently difficult to recycle. Vinyl-clad aluminum, for example, is recycled by flashing off the vinyl (burning it) and recovering the more valuable aluminum. Many plastic resins are worthless if contaminated with even small quantities of wood fiber or different plastic resins. Most manufacturers have yet to address such complex issues, and it is likely that we will still see considerable evolution as companies come to grips with this and other environmental issues. □

Writing the Window Spec

Tips on what should be in a window spec to ensure good thermal performance.

Editor's Note:

No matter how well a window is made, its thermal performance ultimately depends on its installation. Here are some excerpts from a window and door specification just developed by the Association of Window and Door Installers that address issues concerning insulation, vapor barriers, capping, and sealing. A complete copy of the spec, with other information on installation guidelines, is available from AWDI, 488 Route 24, Hackettstown, NJ, 07840, 908-813-1133.

Insulation

After the new window unit is mounted in the opening, fiberglass insulation, or equal, shall be used to insulate any perimeter voids between the main frame of the new window and the opening. At no time shall the insulation be compressed into the void(s) in a manner that lessens its insulation effectiveness, or in a manner that will exert pressure on the frame of the newly installed unit, that will distort the frame, or in any way impede the unit's smooth operation. It is also recommended that a proper air seal on the warm side of the insulation be provided.

Interior Air/Moisture Seal

An air and moisture seal on the interior side of the rough opening gap shall be provided using one of the following methods: Sealant, Barrier Tape, Polyurethane Foam, or Plastic Skirt. To prevent drafts and heat loss, and to further reduce the potential for the formation of condensation between the wall and the new window, it is essential that the rough opening gap not allow air and moisture to pass between the newly installed unit and the existing wall into the opening cavity.

1. *Sealant Method*: Caulk/Sealant shall be applied to the interior side of the rough opening in a continuous manner to provide an even, unbroken sealant bead sufficient to fill the gap between the new window unit and the rough opening. Where needed, foam or rubber backer rod shall be used as a "bond breaker" ensuring that the sealant bonds only to the newly installed unit's frame and the rough opening. The rod should be pushed in a distance equal to about one-half the width of the joint, and sealant is applied over the rod until flush with the inside of the window frame.

2. *Barrier Tape Method*: Tape that is impervious to air and moisture, with adhesive of sufficient strength to adhere to wood, vinyl, metal, and plastic shall be placed across the rough opening gap on the drywall and on the interior surface of the window or door frame, or between the new unit's frame and the existing frame. Interior Molding, Stops, or Casing trim is then installed over the tape.

3. *Foam Method*: For gaps that are ½-inch or greater, polyurethane foam is injected into place, taking care not to over-fill to the point where bowing of the frame members occurs. Note that foam takes time to cure and continues to expand as it cures.

4. *Preapplied Plastic Skirt or Apron Method*: Some manufacturers supply an applied apron or skirt that, when installed according to their instructions, can effectively prevent air/moisture leakage through the rough opening.

Weather Seal

A barrier shall be created to preclude the entry of water into the wall cavity and/or the gap between the rough opening and the window. It consists of exterior flashing and seals. Flashing shall be installed to drain water away from the window or door, while the seal shall be installed to prevent entry of water, snow, dust, and insects in the rough opening gap. The installed weather seal should not interfere with drainage holes in the window or be installed in such a manner as to function as an exterior and/or secondary vapor barrier that could trap moisture in the perimeter cavity.

1. *For Replacement and Renovation Applications*: The weather seal should be concealed behind new capping.

2. *For New Applications*: As with all fin applications, suitable and properly lapped building paper, sealing and flashing materials, and procedures shall be used. Integral nailing fins shall be continuous around all corners. In the event that snap-on nailing fins leave open corners, a ½-inch-wide moisture resistant material shall be installed on all sides, covering the fin and attaching to the sheathing. Apply first to the sill; then apply to jambs to overlap the sill; then apply to the header to overlap the jamb flashing.

Flashing

The flashing configuration will depend on the surrounding construction. Where required, the flashing will be provided before or after the new window is placed in the rough opening. Either way, flashing must be installed in a manner to preclude entry of water into the wall cavity and the rough opening gap. In some cases, the window manufacturer may supply special molding or flashing for the window. In other cases, flashing material will be used in conjunction with the application of the finish siding.

1. *Header Flashing*: At the window head, it is recommended that the flashing provide a drip cap from under the

CSI SECTION 08610

Writing the Window Spec

sheathing paper to beyond the exterior face of the window. It should also extend past the trim at the sides of the window. Install a continuous piece of aluminum or galvanized flashing material onto the building sheathing, under the sheathing paper, with a 90-degree bend to flash the new installed window. A ¼-inch return bend is applied down the face of the unit's header. To finish, the siding veneer shall counter-flash the header flashing.

2. *Perimeter Flashing*: Where the newly installed window or door meets new aluminum or vinyl siding, a continuous piece of aluminum or vinyl trim material shall integrate with, or be fastened to, the window and counter-flashed to the siding J-channel. If no fastening means exist, a caulk seam shall be applied where the siding J-channel meets the main frame of the window.

Capping

Whenever possible, the existing opening frame and/or the cavity created between the newly installed window and the building veneer shall be covered and sealed with properly installed capping materials.

1. Capped installations shall have the capping materials integrate or seal to the perimeter of the newly installed window in an air- and water-tight manner. Capping should be installed in such a manner as to allow ventilation and moisture to escape from under the capping.

2. Non-capped installations shall use suitable sealing materials and procedures to create a weather-tight seal between the newly installed window main frame and the opening into which it is installed.

Sealing

Each newly installed window shall be properly sealed to the interior and exterior.

1. Exterior: Caulking shall be applied where capping profiles abut one another but do not overlap. For non-capped installations, sealant should be applied between the exterior window frame and the building face. For siding type claddings, it is recommended that the sealant be applied not to the siding but to the sheathing below. For brick veneer and a non-capped installation, apply seal between the window capping or brick molding and the brick. In this case, it may be best to apply the sealant using a backer rod.

2. Interior: An aesthetically pleasing caulk seam should be applied where the frame of the newly installed unit meets existing interior trim materials. □

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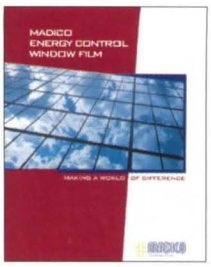

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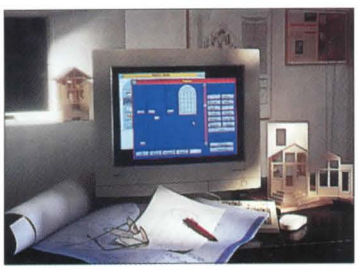

The Marvin Design System (MDS) software package from Marvin Windows & Doors has recently been selected as a finalist in the Windows™ World Open. The annual contest awards innovative, custom Windows applications that provide effective solutions to a business or organizational problem. MDS takes advantage of interactive software tools in Windows and has several unique features that simplify work for the designer.
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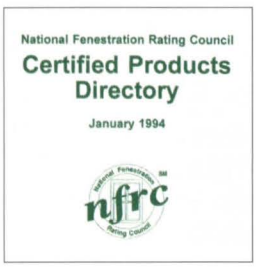

The NFRC *Certified Products Directory* lists comparable energy performance ratings and descriptive information for windows, doors, skylights, and other fenestration products. It is published twice a year and costs $10. NFRC also publishes a quarterly newsletter called *Update*, and has a variety of other educational materials available.
National Fenestration Rating Council.
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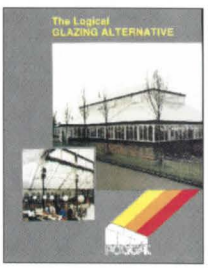

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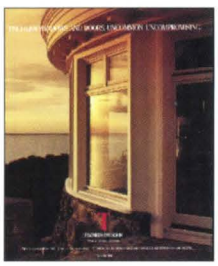

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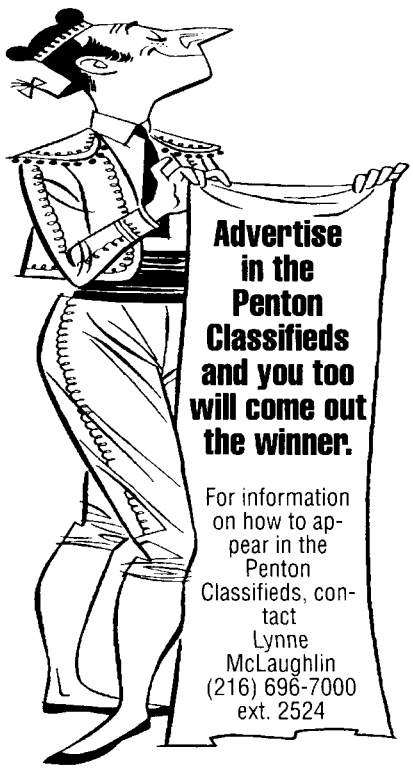

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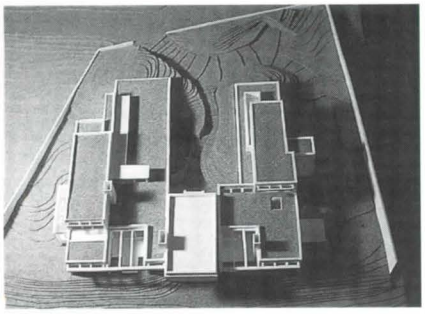
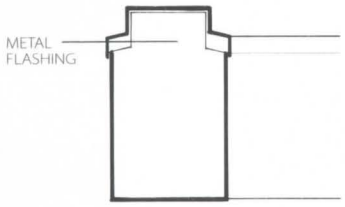
Selected Detail

Sod Roof

CSI SECTION 07501

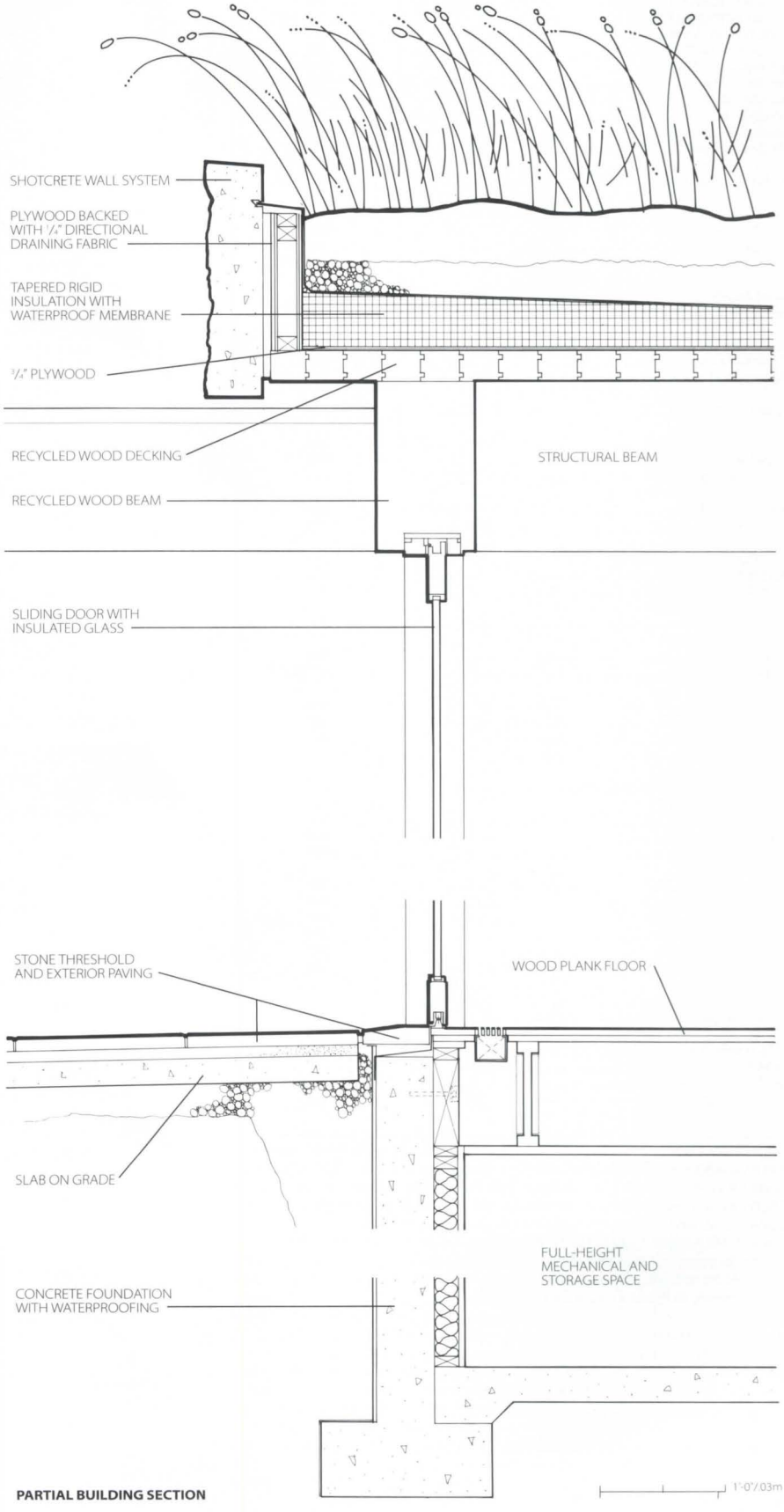


MODEL, HOUSE THREE



The sod roof proposed by Seattle's Olson Sundberg Architects for a new house in the region (see p. 90) is the latest iteration of a landscaped-building feature the firm has employed since the 1960s. Contained by shotcrete parapets, the sod, approximately one foot deep over a bed of gravel, is drained by a layer of rigid insulation installed with a waterproof membrane and filter fabric. The insulation tapers ¼ inch per foot to a series of drains and overflow drains that route water through exterior and interior walls to the storm water collection system. The roof planting is laid over recycled wood decking, which serves as both the structural and finish ceiling. Window frames are mortised into overhead beams, in oversized slots designed to accommodate installation, replacement, and limited movement. The tolerance needed for expansion/contraction is relatively small: the perpendicular recycled timber beams bearing the roof decking are supported by structural posts in the window mullions, with the beams above the glazing serving primarily as blocking. At grade, water is drawn away from the door/window sills and patio through a gravel bed to a perimeter foundation drainage system.

In keeping with the spirit of the house, the architects purposely sought minimal fenestration details that called little attention to themselves, the better to foster a strong sense of spatial continuity between indoors and outdoors. Ziva Freiman □



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