

The background of the cover is an abstract architectural photograph. It features a complex arrangement of geometric shapes, primarily triangles and rectangles, in shades of green, yellow, and orange. The composition is layered, with some elements appearing to be in the foreground and others receding into the background. The lighting is dramatic, with strong highlights and deep shadows, creating a sense of depth and three-dimensionality. The overall aesthetic is modern and architectural.

ARCHITECTURAL
RECORD

Business Design Engineering
A McGraw-Hill Publication, Six Dollars a Copy
May 1983

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On April 4, 1982, a national treasure was lost. The Filene Center, the summer festival theatre at Wolf Trap Farm Park for the Performing Arts, burned to the ground. Located outside Washington, D.C., Wolf Trap is the nation's only national park for the performing arts and, since its opening in 1971, many of the world's greatest artists have performed there to the delight of nearly six million people - for audiences of all ages and from all walks of life.

The loss is only temporary. An even larger and finer Filene Center II is under construction and will open in time for the 1984 season. An Intergraph computer graphics system was instrumental in this rapid rise from the ashes.

Scarcely six months after the fire, President Reagan signed into law a bill authorizing a \$9 million grant and an additional loan of up to \$8 million for the immediate rebuilding

of the Center. But, to be ready for the 1984 season, an architectural firm had to be found that could design the building in record time.

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management process, from creation of the initial design through production of construction quality documents. Each project phase is carried out with ease and accuracy in a fraction of the time required with manual methods. Manually, the Filene Center II project was estimated to take twelve months. Utilizing their Intergraph system, Dewberry & Davis completed the job in four months. Sixty-six high-quality architectural and engineering construction drawings were created in this short period.

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Ashes

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INTERGRAPH



I thought you would get a kick out of this spontaneous drawing (and Valentine!) made by my five-year-old daughter Hilary. Can you tell what issue intrigued her?

Peter H. Brown, AIA
Houston

Miss Brown's crayon drawing unmistakably shows RECORD's cover of October 1982. Though esthetic license has allowed a mirror image of the original, the composition is accurate down to the blue figure in the central window. The reverse of the drawing carries the text of a Valentine to the artist's family.—Ed.

The cartoons by Saxon are terrific! We want more!
Kim Weller
Perkins & Will
New York City

Charles Saxon's cartoons will continue to appear in RECORD. See page 6.—Ed.

I read with interest Barry LePatner's article on protecting the architect's ownership and use of plans in the January 1983 issue of ARCHITECTURAL RECORD [pages 47, 48]. The article clearly sets out information and advice of great importance to architects.

However, as an attorney representing various architects and as an academic teaching law to architectural students, I must disagree with the author's belief that the architect owns the architectural drawings unless the ownership is expressly granted to the clients or to the architect. This inconsistency among the Federal courts existed prior to the 1976 Copyright Act and still exists.

Since it is a relatively simple matter, as Mr. LePatner points out, for an architect to protect his drawings through copyright and/or contract, it seems the

architect would be best advised to take affirmative steps to assure his ownership of the drawings rather than rely on silence to protect his interest.
Keith A. Shuley, Esq.
Brown, Maroney, Rose, Baker & Barber
Law Offices
Austin, Texas

Mr. LePatner concurs. See his Rule 4: "All plans, specifications and related design documents should include a copyright notice at the bottom of the title block or on the front page of each document. Although not a necessary precondition to asserting a copyright, such notice... serves to effectively alert third parties... that any unauthorized use of these materials will subject them to an action for copyright infringement."—Ed.

Corrections

Credits for drawings in RECORD's February 1983 portfolio of current work by architect Barton Myers should properly have gone to Martin Leifhegger for the pen-and-ink perspectives of the Seagram Museum and Archives (pages 92-93) and to Jim Winkler for both aerial perspectives of the Exposition Multicultural Center in Los Angeles (pages 98-99).

It should also be made clear that Myers's design for the Royal Conservatory of Music in Toronto (pages 100-101) is a feasibility study for the University of Toronto and the Royal Conservatory of Music.

The structural engineers for Indiana University's Museum of Fine Arts (RECORD, March 1983, page 133) were Weiskopf & Pickworth.

The firm McElvy Jennewein Stefany Howard, Inc., were associated architects with Thompson, Ventulett, Stainback & Associates for TECO Plaza in Tampa, Florida, which received an award from the Prestressed Concrete Institute (RECORD, March 1983, page 66).

Through July 3

Exhibit, *Frank Lloyd Wright and Japanese Prints: The Collection of Mrs. Avery Coonley*; sponsored by the American Institute of Architects; at The Octagon, 1799 New York Ave., N.W., Washington, D.C.

May 3, 10, 17, 24

Four sessions with speakers and panels, sponsored by the Denver Urban Design Symposium '83; at The Space, Denver Center for the Performing Arts. For information: The Urban Design Forum, 1459 Pennsylvania, Carriage House, Denver, Colo. 80203 (303/629-5312).

May 5-6

Design ADAC '83, "Restoring the Past with a Look for the Future," at Atlanta Decorative Arts Center. For information: Atlanta Market Center Public Relations Department, Suite 2200, 240 Peachtree St., N.W., Atlanta, Ga. 30043 (404/658-5629).

May 22-26

National Convention, The American Institute of Architects; at New Orleans.

May 23-27

Seminar, "Lighting Fundamentals for Interior Designers and Architects," sponsored by the University of Kansas; at Lawrence, Kans. For information: Dru Toeppen, Division of Continuing Education, The University of Kansas, Lawrence, Kans. 66045 (913/864-3284).

June 12-17

International Design Conference in Aspen, "The Future Isn't What It Used to Be"; at Aspen, Colo. For information: Alexia Lalli, Lalli and Moore Associates, Inc., 330 W. 42nd St., New York, N.Y. 10036 (212/947-6628).

June 12-17

National conference, "Case Studies in Rhode Island Historic Preservation," sponsored by Rhode Island School of Design; at Providence. For information: Continuing Education Division, Rhode Island School of Design, Two College Street, Providence, R.I. 02903 (401/331-3511).

June 13-15, 16-18

A two-part Housing Conference, Session A covering Housing Technology, Session B having speakers on finance, energy and alternative housing, sponsored by Department of Design and Environmental Analysis, Cornell University; at Ithaca, N.Y. For information: Cornell Housing Forum, Department of Design and Environmental Analysis, Martha Van Rensselaer Hall, Cornell University, Ithaca, N.Y. 14853.

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It's convention time. Is it also time to think of conventions as a place to think?

The other day, as I was studying the program information for the AIA Convention and NEOCON, I got to wondering: Do we think about conventions in the right way?

I think many of us have looked at conventions primarily as an opportunity to meet with old friends we don't see much, sort of test out new ideas and theories and concerns on said friends—and maybe attend a few program sessions that seem particularly related to our current concerns. But if we miss the sessions, OK.

In the particular case of magazine editors, there is a particular feeling that comes over us at this time of year. Knowing what is going on in the world of architectural business, design, and engineering is, of course, what we do for a living; which means that, in the merry months of May and June, we are confronted with the AIA Convention (in New Orleans this year, May 22-25), Systems '83 (in Dallas, June 8-10), NEOCON (in Chicago, June 14-17), and the CSI Convention (in Kansas City, June 24-26)—a procession which tests the mental and physical strength of the most vigorous and cuts into a number of weekends, at a time of the year when it's especially nice to have long, free weekends.

However...

The programs of the AIA Convention and NEOCON (as well as the times in general) suggest to me that both sessions this year offer architects an opportunity to do some serious thinking about the nature of architecture and its goals. For example:

The AIA, following the pattern of earlier conventions, has three major theme sessions. This year they focus on architecture/urban design issues at three scales: John Naisbitt of *Megatrends* fame (and a public member of the AIA board) will discuss architectural concerns as they relate to those ten critical influences that he believes are radically transforming society and our lives. Speaking to issues on the city/neighborhood scale will be Dr. George Sternlieb—a thoughtful and persuasive expert on housing and urban affairs. And tackling the same concerns at the individual (or “interpersonal”) scale will be William H. Whyte, whose studies of how people use spaces are a legend. That combination of minds is irresistible to me—and I intend to listen not with note pad in hand but with mind wide open. It's got to be a good idea from time to time to back away from concerns about business, or architectural styles, or the computer revolution, and listen to thinkers of the caliber of Naisbitt, Sternlieb, and Whyte. In short, to take time to think...

NEOCON—which this year incorporates a Midwest Architecture & Design Conference co-sponsored by midwestern AIA chapters—is also focusing on evocative discussions. Item: The enormous potential of public-private partnership applied to urban development will be discussed by megadeveloper James Rouse, two important and influential industrialists, and the mayor of Indianapolis. Richard Keating of SOM Houston, Bill Pederson of Kohn Pederson Fox, and Jim Freed of I. M. Pei & Partners will discuss the fascinating and highly visible change in the design of skyscrapers and other giant-scale urban buildings—and its effect on the urban environment. Rob Krier of Vienna and Maurice Culot of Paris, two of Europe's most influential architects, urban planners, and “new classicists,” will discuss urban policy and planning in Europe's major cities. And, as part of a major effort “to provide a forum for professional and social exchange among architects in middle America,” the Chicago conference will offer an analysis and discussion of a new plan for Chicago, which climaxes with a proposed plan for the 1992 World's Fair—a plan devised by (and here's a team to stir some thinking!) Bruce Graham, Tom Beebe, John Holabird, Dirk Lohan, George Schipporeit, and Stanley Tigerman.

Both the AIA and NEOCON variously offer, of course, a strong and useful diet of seminars on computers, computers, and computers; preservation and re-use strategies; opportunities to study some first-rate architecture (notably, the AIA Honor Awards); lighting; office design; and practice management. At this date, if your interest is stirred by anything I've written and you've lost the office notices, you can get filled in on details of the AIA Convention by calling the AIA at 202/626-7300; on NEOCON by calling The Merchandise Mart at 312/527-4141. But (good fellowship, good practice seminars, and good displays of the newest product introductions aside) I have a feeling that this year might be a good year to take the time to do a little *serious* conventioning—to take the time to think. *W. W.*

Switching accents.



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Arbitrations to be speeded

Responding to a number of requests for changes in the way cases are handled—especially those that are large and complex—the American Arbitration Association has announced a subcommittee to draft supplementary rules that—with the agreement of the contesting parties—would expedite arbitration procedures. The subcommittee chairman is Robert Borg, president of Kreisler Borg Florman, and the members are Frank Muller of the engineering firm of O'Brien-Kreitzberg & Associates of New York City and Glen Abplanalp of the engineering firm of Havens & Emerson of Saddle Brook, N.J. Legal counsel is Allen Poppleton of Weinburg and Green. A timetable is being drafted for circulation of the proposed supplementary rules before publication. The target date for final adoption and publication is 1984.

The subcommittee welcomes suggestions from interested persons. These should be sent to Robert F. Borg, Kreisler Borg Florman Construction Co., 97 Montgomery Street, Scarsdale, N.Y. 10583, or to the Office of the General Counsel, American Arbitration Association, 140 W. 51st St., New York, N.Y. 10020.

Learn how to take advantage of preservation tax breaks

In 1982, over 1,800 rehabilitation projects qualified for the new 25 per cent investment tax credit. The staff of the National Park Service estimates that these projects represent a small fraction of the projects that could qualify if owners, developers and architects knew about the incentives and how to meet the rehabilitation requirements. Accordingly, the National Trust and Park Service and the Association for Preservation Technology are offering courses in tax benefits and required standards and applications—as well as conservation technology—in Baltimore, Pittsburgh and St. Louis. For more information contact the Trust at 1785 Massachusetts Ave., N.W., Washington, D.C. 20036 (202/673-4092).

Administration gives some mild support for preservation with jobs bill

An indication of the new strong role of preservation in the economy (see RECORD, Business News in April, page 35), the emergency jobs bill signed by the President in late March reinstated \$25 million for the Historic Preservation Fund, channeled through the Interior Department. In order to create jobs as quickly as possible, Congress stipulated that funding has to be obligated by October 1, 1983, states must at least match Federal money, work must be under way by January 1, 1984 and must be completed by October 1, 1984. The \$25 million is \$1 million less than funding in each of the last two years and less than half of the amount in 1980.

In the preceding months, the Federal Historic Preservation Fund—set up to provide matching grants or loans and to support other preservation efforts—had received scant attention. The administration proposed to shelve the fund, including its financial support for National Trust for Historic Preservation work, for fiscal 1984 and for the two following years.

At the same time, the administration had—persuaded by the architectural profession and the construction industry—streamlined application procedures for preservation tax credits under the 1981 tax act and two 1982 tax laws with the Technical Corrections Act of 1982, making interpretation and application of the rehabilitation credits an easier chore—in theory at least.

Noting that among the fund's activities was processing of these applications, AIA president-elect George M. Notter, Jr., in

testimony last February before the Interior subcommittee of the House Appropriations Committee, pointed out: "It makes little sense to increase the number and types of Federal preservation tax credits and then cut back on the personnel necessary for the implementation. Without sufficient support to the state historic preservation offices and the National Trust, the maximum intended consequences of the 1981 tax incentives will not be achieved. The state historic preservation offices should be funded as a model for guiding Federal government programs involving financial participation in state and local affairs, and not closed in budgetary haste.

"Historic buildings and districts will not survive the pattern of budgetary reductions proposed by the Department of Interior in FY 82 and FY 83." In terms of the national economy, Notter cited survey figures that showed 77 per cent of all 1981 construction activity by industrial construction companies involved preservation, adaptive use and rehabilitation, and, according to another report, over \$40 billion in income was derived in 1980 by recycling old buildings.

Notter believes the "across-the-board austerity" sought by the President has already been achieved. He states the AIA's view that at least \$30 million are necessary for an effective program, including the \$4.6 million appropriated last year for the National Trust for Historic Preservation. *Peter Hoffmann, World News Washington, D.C.*

Do you have computer phobia?

The American Management Association is offering a series of courses to help managers overcome their natural reticence about computers through learning the basics. Sessions are held in most major cities, and more information can be obtained from the association at 135 West 50th St., New York, N.Y. 10020 (212/586-8100).

Want to enter real estate development?

Billed as a way for architects to regain control of their profession, development will be the subject of a conference sponsored by the California Conference of the AIA on May 13 and 14 at the Monterey Conference Center. Call Margola Woods at 916/448-9082.



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Legal perspectives: How responsible are you for shop drawings?

The eminent attorney-architect reveals new developments in a nettlesome issue

By Arthur Kornblut, Esq.

Over the years much has been said and written on the subject of an architect's responsibility in regard to the approval of shop drawings submitted by the contractor to show his intended execution of contract documents. Until just a few months ago, however, much of the advice on this subject has been somewhat speculative, because there have been few reported cases to provide guidance. Then, in late 1982, there was an important court decision favorable to architects, illustrating the relationship between good contract protections and the successful defense of design professionals in litigation.

It has been suggested that an architect should never approve shop drawings, because the mere act of giving an approval can lead to liability. Conversely, many believe that when an architect permits a contractor to proceed with the work shown in the shop drawings, it is tantamount to giving approval, so why not call it such. The architect thus might be more cognizant of the required standard of care related to the processing of shop drawings.

The recommendations of the AIA take the latter approach: namely, that architects should approve shop drawings consistent with the terms in the architect's professional service contract and the general conditions of the contract for construction. In the standard AIA contract documents, the architect's approval of shop drawings is only for conformance with design intent and with the information called for by the contract documents. This approval does not relieve the contractor of his responsibilities in regard to shop drawings, and it does not make the architect a guarantor of the contractor's performance when the architect fails to catch something that is missing from the shop drawings.

A recent court case recognized and upheld the AIA's recommended approach

In Oklahoma, a lower appellate court had ruled that an architect was liable to the estates of two workmen killed (and to another workman who was injured), when unbraced steel collapsed during the erection of a building. Relying heavily on standard AIA contract language, the state's supreme court reversed that decision and held that the architect had no duty in regard to construction site safety or for the contractor's means and methods of erecting the building.

Even more important, the high court ruled that the architect's approval of shop drawings was only for conformance with the design concept; the architect was not negligent for failing to show temporary construction connections on the shop drawings that he had approved. (*Lunow, et al v Benham, Blair & Affiliates, et al*, November 30, 1982.)

The accident in the Oklahoma case occurred as the workmen were securing portions of the steel framework while a thunderstorm approached the site. Before the work could be completed, a gust of wind hit the unbraced steel, causing it to collapse. The injured worker and the estates of the deceased men sued the owners, the steel fabricator and the architect.

At trial, only the architect remained as a defendant, the others having been released from the lawsuits by dismissals and summary judgments. At the conclusion of the trial, the court directed a verdict for the architect. However, on appeal, the intermediate court of appeals in Oklahoma reversed the trial court by ruling that the architect owed a duty to the workers because the architect had undertaken to "supervise" the project. The case then was further appealed to the state supreme court. The high court reviewed the general law on the subject of an architect's duty, and noted that...

An architect's undertaking does not imply a guarantee of perfect plans or results

The court said architects are "...liable only for failure to exercise reasonable care and professional skill in preparation and execution of plans according to their contract." (The emphasis was supplied by the court.)

Looking carefully at the contracts in this case (and by the portions quoted by the court, it is clear that the construction contract included the standard AIA General Conditions), the court stressed that the architect was not required to make exhaustive or continuous on-site inspections to check the quantity or quality of the work or to be responsible for the construction means, methods, techniques, sequences or procedures or for safety precautions or programs in connection with the work. The court further noted that the contract required the contractor to be responsible for safety programs and for supervising the construction work.

The plaintiffs had alleged that the architect should have

included specifications for temporary bracing and connections, and that the architect was negligent for having approved shop drawings without providing for these temporary connections. The court rejected this argument, relying heavily on the contract provisions noted above.

The contract required the contractor to check and approve shop drawings in regard to various aspects of the construction work. The architect's approval did not relieve the contractor of his responsibilities or create any new duties for the architect other than as stated in the contract, i.e., to determine if the shop drawings conformed with the design concept and with the contract documents.

The court said: "...it was the duty of the contractor, not the architects, to see that the shop drawings included provision for temporary connections which fall into the categories of 'field construction criteria,' 'construction means, methods, techniques, sequences and procedures.' Since it was not the responsibility of the architects, they obviously would not be negligent in failing to require temporary connections."

This case contains one of the clearest statements yet by a court on this issue

It illustrates the importance of utilizing contracts with clearly established shop-drawing procedures for both the architect and the contractor (and the importance of enforcing those procedures). The architect's approval of shop drawings in the context of these contract provisions and procedures did not result in the architect becoming liable for the construction workers' deaths and injuries.

Architects should recognize that their liability in connection with shop drawings is not dependent on simplistic judgments about the use of a shop drawing stamp that does (or does not) contain the word "approval." When shop drawings are returned to the contractor and he is authorized to proceed with the fabrication or installation of the work, for all intents and purposes, the architect has given an approval.

The key legal question, however, is: What does that approval signify? The terms of the architect's contract and any limiting provisions (related to the approval) on the shop-drawing stamp itself will provide the answer.

Mr. Kornblut is a registered architect and practicing attorney in Washington, D.C.

This article is published with the understanding that the publisher is not rendering legal services. If legal advice is required, the services of a competent professional should be sought.



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Round Table on computers in architecture

How far have we come, how far are we going, and who will benefit from the revolution?

This Round Table was moderated by Sweet's computer-technology expert Harry Mileaf, as the culmination of his recent series of articles in RECORD on computers and computer use. It was held in Long Beach, California; and invited as panelists were architects experienced in computer use from firms of varied size, engineers, computer consultants, and educators. Invited as auditors were representatives of a number of companies producing computer hardware and software. The discussion was far-ranging—from "How do you get started?" to "Where will you be in ten years?" It offers some astonishing insights into a field that offers great opportunity—and not a few terrors—for many professionals.

Mr. Mileaf is Director, Technology and Product Development, for Sweet's Division, McGraw-Hill Information Systems Company. His achievements for Sweet's include Mechanical, Electrical, and Civil Engineering Catalog Files, technological planning over the past 15 years, and 14 research studies over the past three years on influences in the construction industry. Mr. Mileaf is the author of 16 books on technical subjects.

Moderator Harry Mileaf began the discussion with a question that goes to the core of most architects' concerns about computer use: "When you first started using computers, what were the major stumbling blocks, and how did you handle them?" And the first respondent—David Jordani of Ellerbe Associates—sounded the concerns that animated the conversation for most of the morning session: "Computers created fundamental change in the way we do our work, and created the need for a great deal of education of people at all levels of the organization. It's a difficult thing to tell the people who are responsible for a design project that they must rely on a tool they don't understand. But the problems are not just with people; the computer affects the way the office functions, the way we write our contracts, the way we market our services."

Said Richard Hayden of Swanke, Hayden, Connell: "Education is the problem, all right. Using computers involves a whole new process of thinking; and you have to prethink it through before you start. We just started using computer-aided graphics; but we started educating the drafting room three years ago in the techniques of layered drafting. Right now, about 80 per cent of our work is done with overlay drafting techniques, and the switch to the next step of computer drafting is going smoothly as a result. We are marrying the layered, photographic techniques of drafting with the computer plotting systems. Most of our draftsmen have been flexible in their thinking. They've jumped in

and volunteered to learn the computer techniques—and many attended the formal school that was part of our purchase agreement. . . ."

Said William Mitchell of Mitchell, Reeder & Hamer and professor at UCLA: "The problems of education relate, of course, to the immaturity of the field. Most architects in practice had no early training in computers, for very obvious reasons, and this will continue to be a problem because the universities are facing a tremendous crisis in teaching computer use. Eventually that bottleneck will be broken, and the problem of computer education will no longer be in the office but in the education system where it belongs. But at the moment, there are probably only a half-dozen schools where education in computer use for architectural students is at a high level; and even in those schools, such education is often limited to graduate students. What we need to do now is give all architectural students good exposure to computer use, and that won't be easy."

Eric Teicholz of Graphic Systems, Inc. and former Harvard professor: "When I was teaching, students were beginning to demand training in the use of computers. Not long ago, only architectural students with special interest and experience in mathematics were asking for computer-use training; now all students know they are going to need this technology and—at least at Harvard—classes that used to have 20 students have 100. The vendors have become aware of this problem and are beginning to

offer both grants and hardware/software systems to the universities. And, of course, as microcomputer systems come down in cost, the schools will be able to afford to make more computer time available to students. Systems in the \$25,000 range are certainly within the teaching budgets of most schools."

Further, argued David Jordani, it can't all be done in the schools: "A lot of the needed education is being picked up at a lot of the universities. But what about education for the people already in practice? That can't possibly be handled at the university level. The building industry is one of the last industries to be driven to the new computer technology; but architects and others in the decision-making roles today really have to understand the impact of computers. And they have to start to educate themselves now; the rate of change will make it much harder for them to learn what they need to know the longer they delay. . . ."

Donald Fullenwider of Welton Becket suggested that there is, or might soon be, a problem of matching skills with equipment: "We are now in the midst of a revolution that I think ranks with the industrial revolution—but is happening ten times faster. And we're not organized for it yet. We have architectural firms with hundreds of thousands of dollars worth of computer equipment sitting around with nobody trained to use it; and in other places a surge of graduates with good computer training and no place to use it. Right now I have a file with about 50 applications from young



*Joseph S. Brown
Managing partner
Everett I. Brown Company
(150 people in firm)
Indianapolis*

*Charles F. Davis, AIA
Davis Associates
(12 people in firm)
Chicago*

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"What we need to do now is give all architectural students good exposure to computer use, and that won't be easy."—William Mitchell

architects who learned to use computers at the university level and are interested in getting their hands on computer hardware. But with business slow, it is hard for them to break into the field."

(Question: "Do we need some new kind of directory?")

Reported Rich Hayden: "At the New York City Chapter of the AIA, we have established a Computer Committee to interface with the five major universities in the New York City area. Our goal is to feed back information to the schools on our needs, and to be aware of *their* progress and problems in computer education. Helping in any way we can during this transition period is not just a goal—it is a responsibility."

Dale Switzer of Hope Consulting Group added a related point on education: "It's not just the production staff that needs training; I think there is a bigger lag in knowledge within the marketing staffs. If the people who are out selling services to clients do not understand what the computer can do and is supposed to do, and how it will assist the client, then misunderstandings are inevitable. If the clients are exposed to a polished and/or canned demonstration, the first thing they will think is that you can do their building in a month. . . . Of course, most projects are not highly computerized—the CAD work is still only part of the over-all process. And so the marketing people should not over-sell computer use in the firm, or there are going to be a lot of misconceptions and perhaps misuse of the system."

The Round Table then turned from education to the question of costs: how much should a firm spend, how does it justify that cost, and how much is productivity increased?

Said David Martin of Albert C. Martin & Associates: "In our firm we are experienced and comfortable with computer drafting and computer-aided design. But from the start we worried about the cost—and we are still worrying. As architects, we are just not used to going out and buying much equipment—most of us got started with a pencil and a T-square. We put some money into a computer drafting system, and soon realized that we were spending more and more money all the time to make it work correctly. We got to a point where we had to make a decision: 'Are we going to keep putting money into this, or are we going to go back to open-line drawing?' We decided to stick with our computer system and make it work. I guess we were worried that everyone else in the field was getting ahead of us—and of course everyone else was having the same worries. A sophisticated system—for all of the talk about falling costs of hardware and software—is still an expensive proposition."

Moderator Harry Mileaf asked Richard King how a smaller firm (Moore Grover Harper has 25 people) justified the cost of a computer system. Said Mr. King: "When we were considering CAD, we approached it with the idea that the monthly cost of keeping the system in the office was to be approximately equal to the cost of an architectural employee. Thus, if a two-to-one

productivity gain were realized, then the system would at least be paying for itself. And we're closing in on that kind of performance."

Said Dave Switzer of the 120-person Hope Consulting Group: "When we purchased our system, we were looking for greater productivity and the ability to grow. We were promised enormous productivity gains and very fast payoffs—but we realize now those figures were based on using the system 100 per cent of the time, which assumes you have work applicable to the system 100 per cent of the time. And it just doesn't work out that way."

Said Todd Padgett, of the nine-person Stratford Design Group: "We approached a large engineering firm in San Francisco that we knew was low on work and leased part of their system from them. So they helped fund our learning curve. They have also written programs for us, and trained our staff—but we're now at the point where we feel we have our own expertise."

William Mitchell: "In talking about costs, I think we need to project a little into the future. Good architectural software is expensive, and it is going to keep on being expensive until the software industry both matures and gets more interested in our field as a market. That will happen as soon as there is more demand for software from our side. As long as we keep writing our own software, based on individual firm-by-firm research and development, costs will be high. But I expect lower prices soon. I also expect hardware costs to drop soon—because there is a whole new generation of

systems coming along."

Edward Friedrichs of M. Arthur Gensler and Associates asked a troubling question: "What are we really doing as professionals? The question we keep asking is whether we are really using computers as an adjunct to professional services, or are we playing with them as toys? We are probably one of the largest firms that does not have its own in-house graphics system; we have been using a variety of outside services for CAD, and we find that method has offered us some real opportunities to explore where we should be going. We use computers for word processing, accounting, energy-use studies—and we must have ten or a dozen Apples throughout the office, ten or 12 display writers, and heaven knows how many service contracts we are paying for. Our in-house enthusiasts keep finding 'marvelous applications,' but they forget to ask the question: 'Is it cheaper or more expensive to do it by computer?' We are now testing each application for the value that it provides compared with the cost."

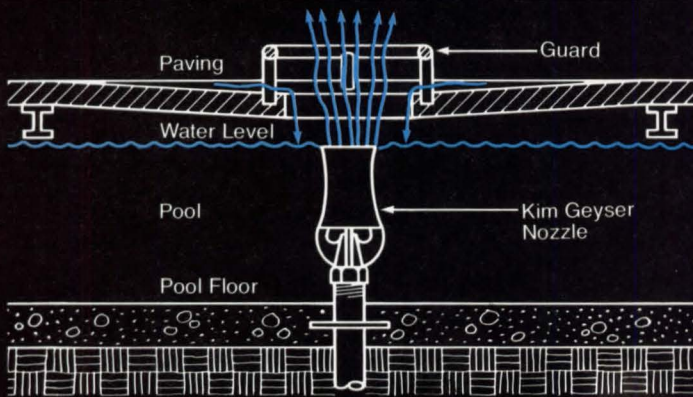
Michael Konopka of Wolfberg, Alvarez, Taracido, a 140-person firm in Miami: "You have to integrate the computer, and especially CAD systems, into the office just as you would any other new tool. When we started out using CAD about two years ago, we set up a separate computer department with a manager and technicians to input the work—and we found that didn't work at all. We are now in the process of dismantling the separate department and spreading the terminals among the architectural and engineering



*Thomas DeLorenzo
Manager, Systems
& Telecommunications
Gibbs & Hill, Inc.
(1,800 people in firm)
New York City*

*Charles M. Eastman
Formative Technologies, Inc.
(consultants)
Pittsburgh*

*Edward C. Friedrichs, AIA
M. Arthur Gensler and
Associates, Inc.
(450 people in firm)
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"The small, automated firm of the future will be able to deliver better services, faster and perhaps at lower cost, than the big ones."—Charles Davis

departments. The equipment will now be operated not by CAGD technicians, but by our experienced design draftsmen. Once they have learned to use the system, they will produce a much better quality of drawing. On a broader scale: The same management, the same design staff, the same production staff that made the firm successful before we had computers is going to make the firm successful now."

Joseph Brown of Everett I. Brown Company, a 150-person firm in Indianapolis, introduced the idea of using computers on multiple shifts, as an obvious efficiency boost: "We have been running three shifts for a little over three years—though it does create some problems. You can't really organize architectural work into three eight-hour days—when someone has a hot idea, they work into the night and even on weekends. But if you're using the computer, you can't really take the next guy's time if he needs the computer. Further, if you are counting on the computer to do a big drawing job, there is no way to speed up the process if you are running out of time. So sometimes we've had to pull a job off the computer and throw people at it to get it done in time, by hand. Making the most efficient use of the computer to keep your costs down doesn't work all the time."

In response to a question from moderator Mileaf, six Round Table panelists reported they use the computer system more than one shift a day. Nicholas Weingarten of SOM's Chicago office asked Mr. Brown: "If you are operating three shifts a day, how do you accommodate the

inevitable charette—48 hours of work to be done and 24 hours to do it in?" The reply: "As mentioned earlier, we sometimes have to go back to doing it by hand—lots of hands. But we do leave some computer time open on the second and third shifts so a job that is running late can be kept running later in the evening or start earlier in the morning. And then there are weekends. And then, of course, we occasionally miss a deadline."

Said Michael Konopka: "A charette with computers can be handled just as it is with manual drafting—you pull people and computer time off a job that's not in quite such a rush and put them on the rush job..."

David Jordani commented: "There's no doubt that the more you use the equipment, the less it costs on each project. We run two shifts—but we're aware of an undercurrent: Many of our professional people just are not interested in working a multi-shift operation. Computers must, among other things, help us in the way we want to work—we're asking people to work with a new tool, but no one can be forced."

Mr. Brown's answer: "On the day shift, we give most of the computer time to the designers. On the evening shift we have a sort of overlap of designers with the designer-draftsmen. On the third shift, we are running what is essentially a drafting job shop, servicing ourselves. That breakdown seems to work, and be flexible enough to handle most jobs running through the office."

Speaking of the cost of systems, and how the small firm can handle them, Charles Davis of Davis Associates, a 12-person Chicago firm, was forthright:

"Our firm was established seven years ago as a computer architecture company. The first employee was a computer. People were brought on at a fairly slow rate, and everyone has grown with the computer. As a result we avoided the whole problem of change, and I think have developed a very different process of delivering services. In the past, I dealt with the frustrations of trying to create change in a large firm; and I seriously wonder whether some firms do not have too much inertia to make the changes that absolutely have to be made to compete. I think the smaller firms growing with the computer are the future—the small, automated firm of the future will be able to deliver better services, faster and perhaps at lower cost, than the big ones..."

Computer-aided design is the glamorous use of computers, but is it the most productive?

Asked moderator Mileaf: "Are there applications in your firm that are more productive than others? Are there applications that you feel an architect starting to use computers from scratch should start with?"

Answered George Manos, whose two-person firm, Architecture/Environmental Design, is in Philadelphia: "For us the computer definitely saves time in design. But it also saves time and improves accuracy in scheduling, and in developing cost projections. We've written our own software, which is another story—but we're getting benefits in each of those areas."

Nicholas Weingarten of SOM: "I think our greatest productivity gains are in the middle area—not

word processing and accounting, and not design—but design analysis, exploration of alternatives, working drawings and schedules and specifications."

Said consultant Eric Teicholz: "The areas of work in an architectural firm where a computer is most productive are 1) the labor-intensive operations, 2) the kind of work that is prone to manual errors, and 3) the kind of work that offers easily understood input and output. Thus: word processing, spec writing, accounting functions, project-control management, cost control, material takeoffs; then automated preparation of engineering and production drawings using the layering techniques and/or automatic dimensioning capabilities of the computer."

Rich Hayden: "The computer has proven especially valuable to us in programming—both the building and the interiors. The savings are dramatic in working out stacking and adjacencies—in studying alternatives for highest efficiency."

Dale Switzer: "Our office has been using word processing and computerized accounting procedures for ten years, and those are probably the most 'efficient' areas. But 'most productive' in the broad sense is the capability the computer gives us in offering a better service to the client. The time taken in design development and in producing working drawings never seems to be shortened by the computer; but the computer does let us do more design revisions. And more and more clients seem to be expecting us to show them alternatives—'besides



*Donald R. Fullenwider, AIA
Director of computer services
Welton Becket Associates
(330 people in firm)
Santa Monica, California*

*Richard S. Hayden
Managing partner
Swanke Hayden Connell
Architects
(300 people in firm)
New York City*

*David Jordani
Manager
Interactive Graphic Systems
Ellerbe Associates, Inc.
(750 people in firm)
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"I foresee reducing the time required for working drawings from 50 per cent to 15 or 20 per cent, which means a great deal more time can be spent on design."—Joseph Brown

this, could I see what it would be like if we...?" In that sense, the computer makes possible a better service."

Charles Davis: "Just right. The computer allows us to provide services to the client that neither the client nor we could afford if they were done by hand—more analysis, more evaluation, more alternatives."

"We can also provide new kinds of services. We've made a major commitment to programming, for example, and are now following through an eight-year plan for one client, evaluating and analyzing relocation of units within existing facilities, with detailed scheduling information and cost alternatives."

"There are different ways of looking at how we use productivity gains—we can do what we have been doing in less time for less money, and thus cut fees; or (better) we can provide a better and more complete service than existing fee structures allow for."

Two Round Table panelists emphasized the need for integration of systems if we are really to get high productivity. Joseph Brown: "One obvious example: If your architects were into computer graphics and your engineering department or your consulting engineer weren't, you would not have much of a gain. To get real productivity, you need system compatibility among design, engineering, production, specifications. If we get real integration—real efficiency—I think the practice of architecture will change dramatically, perhaps within the next ten years. I foresee reducing the time required for working drawings

from perhaps 50 per cent today to 15 or 20 per cent, which means a great deal more time can be spent on design... And we must not forget in all of this computer talk, what we are about as architects is good design."

Louis Maloof of Heery & Heery: "Integration is the key word, and the way we are heading with all our energy. We're a big firm [450 persons] and have several companies, each freestanding and each with its own priorities. In learning to use computers, we found ourselves going in different directions—the engineers doing their thing, the program management company doing its thing, and the architects following behind because they never could decide about a drafting system or a graphic system. We finally realized that even though we had cost-justified a service of stand-alone applications, real efficiency was in integrating ourselves. And we're getting there. The goal is a completely integrated data base, with all of our applications working together from a common, and always growing, base of data."

Donald Fullenwider: "We could probably identify 15 or 20 separate applications in the production area alone—space planning, engineering analysis, and other applications. These are productive right now, but they will become far more productive when they start working in unison, cooperatively passing data back and forth in a centralized computer system. It's like an orchestra—when we all start playing the same piece of music in the same key and all tuned properly, we will make beautiful music."

Question to the Round Table: How do you program computer use, how do you charge out computer costs in-house and how do you bill the client for computer time on his job?

Thomas DeLorenzo of Gibbs & Hill: "As a large [1,800-person] engineering firm, we made some big investments very early in computerization. We got good productivity—increasing drawing productivity six or eight times in the electrical engineering area, up to 150 per cent in mechanical. We set up a system in which the project teams would buy computer time from a central computer department; and set the price at a rate which would recoup our initial investment. The problem: once our workload dropped off a bit, we had to jack up the cost per hour of computer use to cover our investment—and our project managers stopped 'buying' and went back to manual work. Using computers takes careful management planning..."

Michael Konopka: "That reflects something we learned the hard way. When we started with our graphic system, we thought we could do everything on it; and what we found is that you have to analyze very closely what work is best done on CAGD and what work is best done manually. We found, for example, that we were not getting good efficiency in some of the engineering disciplines, especially mechanical. So we got into the whole idea of hybrid drawings, where we may do the architectural drawings by computer, and then pull off the background as a basis for engineering drawings. Simply eliminating the need for

engineering draftsmen to do background plans proved beneficial. There's no sense in trying to force something onto the system that doesn't belong there. With time, our draftsmen learned to use the CAD system for part of the drawing, then to sit down and finish the work by hand."

Dale Switzer: "We had the same problem about charge-outs in the office as Mr. DeLorenzo reported at Gibbs & Hill. We had a so-called in-house service bureau that charged for the use of our in-house computer—and our people were reluctant to use it. Since that time, we have decentralized—the computer equipment is available to anyone who is trained to use it, and the costs of the computer are now overhead. So it is now to everyone's advantage to use the computer when they have an efficient application—the charge is the same whether or not you use the computer."

What about billing for computer time? Said George Manos: "If using the computer does not cut our costs—and sometimes while we are learning or developing new software it costs more—we don't try to bill the client. But for any work that does increase our productivity, we bill computer time to the client and pass the savings along."

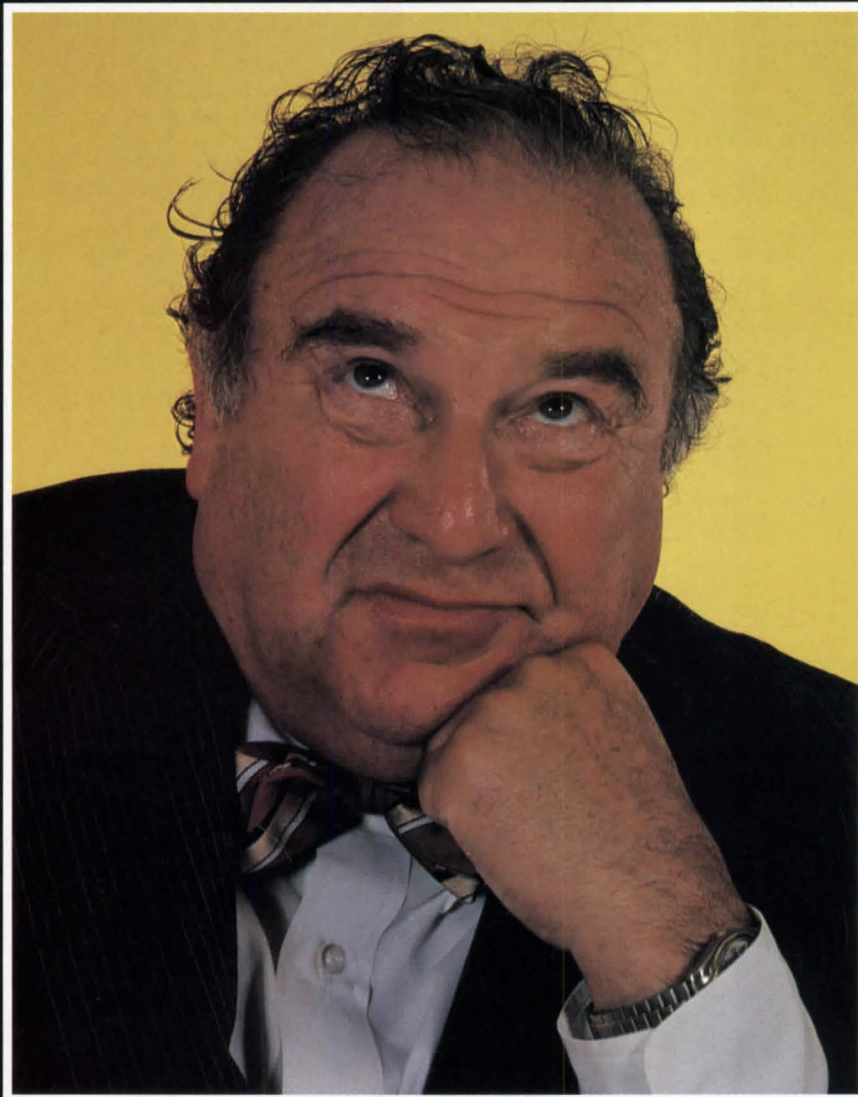
David Jordani: "Education is an expensive process, and the question of how much of that education the client should be willing to pay for is a difficult question. Our present goal is to keep our costs the same and make the same profit—while making major investments in computers and hoping to pay off



*Richard King
Moore Grover Harper
(25 people in firm)
Essex, Connecticut*

*Michael Konopka
Wolfberg, Alvarez, Taracido
(140 people in firm)
Miami, Florida*

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"I feel the small architect is, in the long run, going to be the bigger winner."—David Martin

those investments in increased productivity. In the future, I hope we can consider reducing fees because of our computer expertise—but that is a ways off.

"In the meantime, covering the costs of our commitment to computers is an evolving issue. Firms have to realize that they must make a major commitment if they want to make effective use of computers—and that commitment is expensive. Where the dollars come from and how much we get back is something that each firm has to deal with internally and—perhaps—negotiate with their clients."

Charles Davis, whose "first employee was a computer," reports a rather ideal result: "When we considering buying our CAGD system, our accountants told us we should expect a three to five times return on our annual costs—carrying costs and operating costs. We set our pricing to achieve this, and (perhaps a little to my surprise) we seem to be managing within the same fee structure that we would have if we were doing things manually. We found that clients, when they are first exposed to the graphics systems (since it is a little more blitzy than our other computer applications) seem to *expect* that the work will cost *more*. And since they see benefits that accrue to them, either in terms of shorter time for the project or fewer problems during construction, they seem to be willing to pay more. Maybe we are all a little timid about charging for the computer, because we think of ourselves as selling a service, and are used to budgeting and charging only for manhours."

The Round Table then turned to the possibility of basic (and perhaps frightening) change in the structure of architectural services brought on by computer use

Said William Mitchell: "To take a little broader view of these financial issues, consider this:

When you make extensive use of a computer-aided design system of any kind, the work that gets done is of two kinds. One is essential development of software and data base—which has no payoff now but will in the future. The more articulate knowledge that you encode in software, in a data base, the more productive you are going to be on future projects.

"So the financial issue really becomes: What is the optimal level of investment in software and data bases, who is going to do that work, and how is it going to get paid for? The more you invest in that development work, the more architecture becomes a capital-intensive, rather than a labor-intensive, process. And the question becomes: Is that investment in encoding architectural knowledge into machine-processible form going to take place within the framework of traditional architectural firms—or will it take place in some other kind of organization?"

Eric Teicholz added: "Do you see an almost standardized software which many architects could plug into? Answered Mitchell: "That is one way things could go. It is a question of who makes the investment. Clearly, we might see the development of what are essentially publishing operations with an enormous data base that could be used by a

great many firms. That has the advantage of spreading the costs of developing and maintaining the data base. It has the disadvantage that the knowledge that is being applied by a particular firm may become known to many firms.

"The implications for the small firm are clear. So far most of the development work for computer use in architecture has been done by the big firms that can afford the level of investment to get into the game. Most of the firms represented here at this Round Table are that kind of firm. But if we get centralized publishing-type sources of sophisticated software, the small firms can become very competitive without the enormous front-end costs."

Theodore Stanton of Yearwood & Johnson reported that the common data base is already a functioning concept in Nashville: "Several years ago, four architectural firms and three engineering firms in Nashville decided that it was time for us to really get involved in the computer revolution. The firms varied in size from 17 people to 200; our firm is about 90 people. We had all been using computers for accounting and word processing for some time. We established a task force and traveled together for 18 months. We checked out—on a hands-on basis—18 different systems. We met once a week and fought like cats and dogs about the systems we had seen, the things we wanted and the things we didn't want. Eventually, we chose one system we all felt would meet our needs, we all purchased the same system, and we are now developing a common data base and common details—a common

menu, if you will. This work is going ahead on a formal basis, with meetings every two weeks.

"No one is going to have any proprietary data or details. We have divided up the labor of developing and inputting the data base—our firm is responsible for one part, each other firm is responsible for something else. So we are sharing the considerable start-up costs and educational expenses; and we feel it has cut our start-up time considerably.

"But it took a lot of commitment from each of the firms; a real mind-set to share proprietary information and agree on a standard way of handling things. At any rate, we've done it, and we think we've come a long way in a short time."

Commented David Martin: "I really admire that approach. When we compete, we ought to compete not because one firm has computers and another doesn't, but because we are architects and engineers with different skills and talents. I think that kind of sharing is very compatible in the architectural world."

Edward Friedrichs of Gensler: "I certainly agree. We don't need provincialism or protectionism in the profession. We should be competing over the quality of design, on how well we create places for people—not over our efficiency at handling repetitive tasks that are not at all the important part of what we do."

What of the small architectural firms without the resources or time to become expert? How do they begin?


Said moderator Mileaf: "Most of the larger firms, like most represented at this Round Table,



*Louis N. Maloof, AIA,
President
Heery Program Management
Heery & Heery
(450 people in firm)
Atlanta*

*George Manos
Architecture/Environmental
Design
(2 people in firm)
Philadelphia*

*David C. Martin
Albert C. Martin & Associates
(220 people in firm)
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Manville

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"I think the way for a small firm to get started is just to get started."—Donald Fullenwider

have the ability to set up a separate computer department, or hire someone talented and knowledgeable in computer use, or pay for consultants to help them get started. As I see it, most small firms have neither the money, nor the time, nor, perhaps, even the inclination to become involved. Yet they're concerned about competition, about not missing an important boat. What's the answer?"

Todd Padgett, whose firm employs nine people: "I admit to being a gadget freak, and I had some programming experience. When I started my firm two years ago, I simply decided I was going to be computerized, or at least head in that direction. I looked for personnel that had computer experience and told people who were not interested in computers that this was not the place to work. I've found computerization to be a real key to growth, a real edge over competition. And it has given us a capability to compete with much larger firms.

"If I had been a complete novice, I would have started with a service bureau and chosen one very carefully. You need a good rapport and relationship if they are really going to educate you in the process. It does require a financial commitment—because I don't think the use of a service bureau can be counted on to pay for itself.

"I also believe in smaller and medium-sized firms banding together, as those firms in Nashville did. That would permit us to buy a much larger system, and that is an appealing idea."

John Sandberg of Daniel, Mann, Johnson & Mendenhall: "We are scarcely a small firm

[1,800], but we have a number of branch offices that operate like small firms. My advice is this: The owner of the small firm who has no interest in computers, but is concerned (properly) that he'd better find out what this is all about, simply must make the effort to learn something about the capability of computer systems, and how they could be used in his office. You don't have to learn how to use the computer—simply how it could be used in your office. If you do make the decision that you will benefit by computerization, I would then invest in one young person who is expert in computer use. There are a good many available—some looking for work, some held back in the larger firms because of work being slow right now. Give him or her a good salary, and the responsibility for developing the right system for your firm."

Charles Davis: "One model for the small firm is to get started the way large firms did ten or 15 years ago: Start with accounting, move into word processing, computerize your engineering calculations. You can buy software for these applications and use them without much learning time. And once the equipment is there, someone on the staff is going to say, 'Hey, we can use this system to...' and your applications begin to expand. It's a slow process, but within four or five years you will have meaningful applications in the professional area. And I don't think there is really any way to short cut that."

Donald Fullenwider of Welton Becket: "I think the way for a small firm to get started is just to get started. If the firm can

afford it, I would just buy a good system and hire someone with experience to make it work. If you can't afford that, I'd buy a micro such as an Apple or Radio Shack computer and start playing with it. For less than \$10,000 you can get a system that will let you learn how computers work and prepare you for the bigger systems."

What's the answer for the small firm that hasn't the time or the money to get involved with computers? Two answers:

Charles Davis: "That firm will be replaced by other small firms willing to take the chance."

Dave Martin: "There is always going to be the small architect who doesn't need the computer—because he does work where there is little repetition, little need for a data base. Like doing houses.

"But beyond that, I feel that the small architect is, in the long run, going to be the bigger winner—with computers, he will be able to do more work with fewer people; and if good data bases and standard details become available as software, he is going to be able to tackle very large projects."

How far off are integrated data bases, providing all the information for calculating design alternatives and producing all of the drawings?

Nicholas Weingarten: "There are really two kinds of integration: vertical and horizontal. In vertical integration you use the computer's data base for every step of the job from marketing the work right through to final working drawings. In horizontal integration, you use the computer in all disciplines through a

portion of the process. Both are a ways off, though we have been working on them for five years at SOM. Virtually all of our structural analyses are computer-generated; but only perhaps five per cent of our working drawings are done by computer. Integrating all the disciplines in a single program is a very tricky problem.

"Integrating the process vertically, from beginning to end, its probably easier. It is essentially a problem of management. But for true integration all the way through, you'll need a work station for every two or three people—and that is an enormous capital expense."

Donald Fullenwider: "There is no *technical* reason why we can't do all of our drawing on the computer for all our projects. But we simply don't have the software or the hardware. If you take a cold analytical look at a large firm, it is my opinion that only ten per cent of the work that is done, ten per cent of the drawing, is computerizable."

Consultant George Eastman of Formative Technologies, Inc. (and also Carnegie Mellon University): "There are indeed no *technical* reasons why we cannot have integrated data bases—just *money* reasons. The National Security Agency has a complete data base on every satellite, and every part of every satellite, they send up; so they can run analyses to solve any problem on the ground. That is something money buys; and it is a long way off for our field.

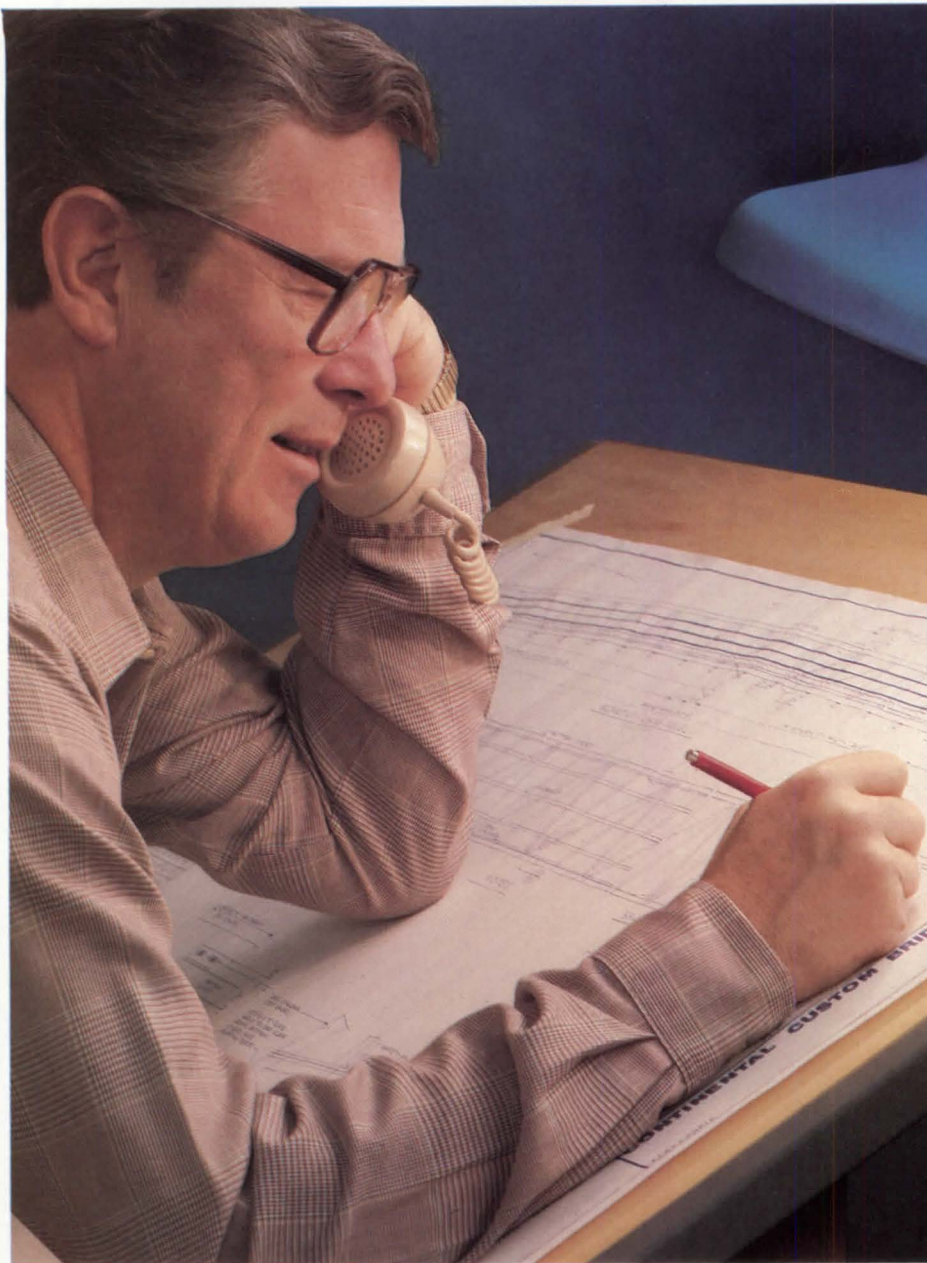
"The parallel in architecture is developing subsystems within architecture, and managing the complex issues of trade-offs



*William Mitchell
Mitchell, Reeder & Hamer
(consultants)
Santa Monica, California*

*Todd A. Padgett,
President
Stratford Design Group, Inc.
(9 people in firm)
San Francisco*

*John Sandberg
Daniel, Mann, Johnson &
Mendenhall
(1,800 people in firm)
Los Angeles*



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"Computers will enable us to fine-tune buildings—to explore 50 variations in the time it takes us now to do five."—Donald Fullenwider

among systems. That is where integration will pay off for us. It would enable us to make sophisticated trade-offs between the cost of the building shell and the mechanical systems; it would enable us to examine the costs and the benefits of all kinds of alternatives and changes."

Dale Switzer: "I think it will be a long time before we can take a design, assess various design alternatives, take each through structural/mechanical/electrical analysis, and then get automated working drawings. It would be nice, but it will be a long time."

William Mitchell: "The fundamental technical question is how to organize the data base... how you want to organize architectural information. Standard practice would be to go for some kind of transitional technology halfway between the way one thinks now about architectural information, and how you could think about it in a fully integrated computerized system. The crucial issue is going to be development of architects' sophistication in understanding how information needs to be put together and manipulated. And that has to come directly out of a very thorough, willful analysis of architectural issues themselves. The right computer technology can be developed."

"It all sounds complex and difficult, and it is. But the electronics industry, the aerospace industry, the automobile industry are all working on exactly the same integration problems."

Argued Charles Davis: "Integrated data bases are an issue for the computer technologist. For the practitioner, the important issue

is not the tool, it is the firm."

An end-of-the-Round Table round robin suggested (no surprise) that computer use has come a long way, but has a long way to go...

Said Charles Davis: "I really think that architecture in the future is going to be very different than it is today. I think we will be dealing with new problems and new issues that, until now, we have not even had time to think about. The banking industry offers an analogy: 15 years ago banks thought their job was counting money and balancing the books. Today, they are promoting broad financial service—from credit cards to brokerage service. I hope that we don't think about getting involved in computers just to survive, or just to decrease our costs and/or increase our profits. If we can free ourselves from the tedium of counting doorknobs, surely we can find more interesting or challenging issues to deal with. If we don't have to spend a lot of time doing engineering calculations, perhaps we can find the time to conceive new kinds of structural systems. I think the computer can help us improve the quality of design; and improve our decision-making by providing us with more and better information on which to base decisions. In short, I think automation will allow us to deliver more responsible and more professional creative services."

Charles Eastman: "There are more and more efforts underway to produce systems that are really responsive to the architectural field; companies in the field that are focusing on the architect's needs. I hope both

that they are successful and that the architects know how to nurture them—because there is a real symbiosis here that should not be neglected. I don't think it is yet time for groups of vendors—or groups of architects—to band together to do joint development work. I think what we would get is one big, bad system. What we really need at this time is a lot of small efforts to find out what a good system is..."

Several of the panelists emphasized the importance of management and understanding. Said Michael Konopka: "The management of a system—not just the management of people on the boards—is the big issue. We have to look more at the process, not the product. Perhaps we will develop totally integrated systems of the sort we discussed today; but the first question is not when is that integrated system coming, but is that integrated system really needed? And I'm not sure of that yet."

Said Louis Maloof: "I think the big payoff is going to come in an integrated data base, because that is what is needed for better control. I'm convinced that as professionals we do a pretty good job of design; but that the final product is sometimes lacking because of our inability to control and manage the design process. And that is an area where the computer can really assist us."

Thomas DeLorenzo: "I think total integration can be a reality. We already have an interactive reporting system tying together all of our offices. By the end of the year, we will have a pretty comprehensive architectural graphics package, with data

bases in facilities planning, real-estate management, interior design, cost estimating, door and lighting schedules, and so on. Gibbs & Hill has already designed and engineered a power plant almost entirely on the computer. All the analyses, and all the drawings were done by computer. An awful lot is possible..."

Donald Fullenwider: "As I try to make sense of where we all might be going in the use of computers, I think back to the early days of the horseless carriage. Back in 1903, the idea that someday everyone would have an automobile was a preposterous notion—there were no highways. Where would the cars go?"

"A couple of predictions as to where we're going: Computers will enable us to fine-tune buildings—explore 50 variations in the time it takes us now to do five. And I think computers may encourage us to explore new design rules of combination and proportion..."

Rich Hayden: "I should like to remind everyone that the business we are in has only one product and that is design. Without good management, you can't afford to design, and I think computers, by letting us manage better—indeed, by encouraging us to become better managers—will let us be better designers."

Other comments on the design impact of computers: Said George Manos: "The kind of total building-delivery system that is aided by the computer will affect client and architect and builder. With more and better information available, future buildings can provide a better fit



*Theodore L. Stanton
Executive vice president,
director of computer services
Yearwood & Johnson
(90 people in firm)
Nashville, Tennessee*

*Dale Switzer
Hope Consulting Group
(120 people in firm)
San Diego*



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"We need to focus on the fact that we are architects, and that our business is creating architecture, and that the medium is not the message."—Edward Friedrichs

between the user and the environment, by permitting study of more alternatives and a better understanding of the issues involved."

David Martin: "There is no doubt that the computer will enable us to explore a greater number of alternatives in a shorter period of time. For those of us who design, the computer is another tool—and I am convinced that sketching on the computer will lead to new interpretations of esthetics. That work has to be done by an architect, not a technician. But the technical side is important too: The first set of working drawings we did 100 per cent on the computer was the best and the clearest we had ever done, and it had the fewest mistakes."

Theodore Stanton: "We need to remember that people design; the machine merely supports that effort. Freed from a host of nitty-gritty problems that distract us from really thinking about the design problem, the architect can take the time and focus his mind on the design problem and its solutions."

And several of the panelists spoke of the influence or the impact on the client. Dale Switzer: "Clients are becoming more sophisticated in how they spend their money—and what they spend it for. And I think the computer can offer major advantages to architectural or engineering firms that can show the client that they are getting additional, or more sophisticated, service. I think clients will be willing to pay for a better service, if we are smart enough to market it."

Joseph Brown: "Computers have great marketing and sales

value—not just in our traditional markets but in new markets that they have and will open to us. They can help us develop new ways to sell our services, new ways of making more effective presentations. I think that the closer we come to integrated systems, the more valuable, the more profitable, the more adaptable, and the more usable the computer will be to all disciplines."

John Sandberg: "And we may be approaching the time when more than a few clients want computer-generated data and design because of the way they manage *their* operations. And that is whether or not we can cost-justify computer use within our own firms."

"One concern and one look into the future. I think we should be concerned about people using the computer as a substitute for training; I worry about people using a structural-engineering software package instead of hiring a structural engineer, for example. On the positive side, I wonder whether the computer won't make it possible for us to live, for example, in Aspen, Colorado, and still work for our firm in Los Angeles. It's an appealing idea, and it could save an enormous amount of travel and wasted time."

Two panelists spoke of their concern that architects and/or (more likely) the computer industry will push too quickly for standardization. Said consultant William Mitchell: "We have in computerization an explosive technology. As more and more professionals and more and more vendors strive to enter the field, we have all kinds of incompatibility developing; and

thus there is an enormous temptation to develop or impose standards. At this stage, I believe, that would be locking into place obsolete technology—and we cannot afford to do that. The benefits of most standardization undertaken at this time would be far outweighed by the cost of the constraint that would be placed on innovation and further technical development."

"Another point related to design: I think we are going to perceive computer graphics as an entirely new kind of design medium—it is the most exciting design medium I have ever gotten my hands on. It enables me to think in ways that I can't do drawing on paper. I think as more and more architects begin to understand computer graphics they will begin to structure their thoughts in those terms—and the results will far outweigh the benefits we have seen so far..."

Nicholas Weingarten: "I agree that any kind of standardization at this point can only kill competitiveness and innovation. The research has got to be done by the profession, not the computer vendors."

Richard King of the relatively small Moore Grover Harper firm sounded a reassuring note for the smaller firm: "The thought of integrating all these aspects of the process is very exciting. But I think we should reassure the people who feel threatened by the thought of that much automation that *that* goal is still a long way off. There is still time to get up to speed, and there will always be firms for which computerization is not the answer."

Edward Friedrichs: "I agree that the integration of all

systems is important. But I also think it is important that we focus on the fact that we are architects, that our business is creating architecture, and that the medium is *not* the message."

And Eric Teicholz had this final word: "It is very clear to me that design is going to be radically different from what it is now, within a very short time. I think that designers will have workstations that will be networked together and tied to all kinds of data bases—including some that we haven't yet envisioned."

"I agree that it is too early to attempt to standardize or control development of computer systems. We need more research, and that research is going to come from the profession as it becomes more sophisticated and educated in computer use. The vendors will of course be involved in the needed research. It is not clear to me who is going to do all of the research needed, or what the magnitude of the effort should be. But, again, it is clear to me that a joint effort is needed and that no one group should have the responsibility for coming up with standards. There needs to be a lot more dialogue, and I am happy that this kind of Round Table is at least getting the dialogue started."

And so ended the Round Table—with no comfortable or even comforting conclusions, but a lot of thinking by some very thoughtful people expressed and offered for debate. Which is, perhaps, all that a Round Table can do—most especially in so volatile an area of technology as computer use.

—Walter Wagner and Harry Mileaf

*Nicholas H. Weingarten
Associate partner and
director, computer services
Skidmore, Owings & Merrill
(1,500 people in firm)
Chicago*

*Eric Teicholz
Graphic Systems, Inc.
(consultants)
Cambridge, Massachusetts*

*For Architectural Record:
Charles K. Hoyt, AIA
Herbert L. Smith, Jr., AIA
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Although the small jewel-like building had a life of less than six months and was seen by relatively few people, the German pavilion designed by Mies van der Rohe for the 1929 International Exposition in Barcelona became one of the undisputed icons of the then embryonic modern movement. Now the myth is to be re-embodied on its original site in Barcelona's Monjuich Park, designated an historic monument, and listed as a protected building by the Spanish government. Reconstruction of the pavilion, which will begin this summer and is expected to take a year at

a cost of \$1.5 million, is being carried out by a team of three Spanish architects: Christián Cirici, Fernando Ramos, and Ignasi de Solà-Morales. The architects will work from contemporary photographs and from the original drawings, now part of the Mies archives held by New York City's Museum of Modern Art. The elegant materials—travertine, green marble, onyx—that defined the free-flowing space of the pavilion will be replicated, as will the furnishings, including the now-classical Barcelona chair, which will be a gift of their manufacturer, Knoll International.

East side, west side...

Amidst a swirl of controversy over what some see as an over-concentration of new skyscraper construction in Manhattan's crowded midtown, the Equitable Life Assurance Society has heeded Horace Greeley's dictum, "Go West,"—though not, to be sure, very far west. The company's new headquarters building will be at 51 stories the first major office structure on Seventh Avenue but will connect through a series of atria and other linkages with the present home office on the Avenue of the Americas and thence to Rockefeller Center. The apex of the limestone- and granite-clad tower will be marked by striking 58-ft-diameter circular windows fronting executive common spaces. Architects for the project are Edward Larrabee Barnes Associates.



The official theme of the California Council, AIA's fourth annual Monterey Design Conference, held from March 25-27, was "The Process of Design," but the implicit topic addressed by many participants remained the same as in earlier years: What are the distinctive qualities of West Coast architecture, and how can we best nurture their development? If the answers to these questions seemed as elusive as the California sun during this year's spate of gray weather, it was no wonder, given the long list of designers who exhibited work (over 70 in all), the geographical range of their practices (Oregon and Washington were also represented in force), and the varied fare in the architectural smorgasbord they served up. As at previous Monterey conferences, the absence of assertive ideological or esthetic factions, and the diversity of the projects shown, precluded facile trend-spotting. But then, probably the greatest value of this annual gathering is the opportunity it affords West Coast architects to gauge their own efforts within a common forum otherwise lacking in that part of the country.

The heterogeneity of current work was immediately apparent in the opening "West Coast Collage," a rapid-fire slide presentation of participants' designs. More deliberate scrutiny of regional identity got off to a cautious start with a panel discussion between California architects Daniel L. Dworsky, of Los Angeles, and Richard C. Foster, of Skidmore, Owings & Merrill's San Francisco office, and two so-called "carpetbaggers," non-California-based architects who had been engaged to design projects in that state, Bennie Gonzales, of Scottsdale, Arizona, and James Gattou of Caudill Rowlett Scott in Houston. Attempting to strike a few sparks amid the atmosphere of tactful cordiality, moderator Rob Quigley introduced the panelists as "bad guys" and asserted that the crucial issue at hand was not the validity of far-flung architectural practice—hardly a novel or rare phenomenon—but rather its impact on the quality of our surroundings. "Just as the electronic media are slowly eliminating dialects and different regional characters," said Quigley, "carpetbagging is homogenizing urban fabrics across America. What is the morality of homogenizing the

Continued on page 57

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Paper architecture

face of America?" Not surprisingly, the panelists ducked the question of morality, but all agreed that even the largest firms are increasingly eager to adapt to regional contexts and invoke the spirit of place when this is appropriate to the scope of the project and the client's needs.

A subsequent day-long show-and-tell comprised a barrage of brief presentations by nearly 50 different firms. Besides explicating their own design methods, the speakers also considered set themes such as the architect/developer, renovation, and energy. Admirably free of specious polemics, most of the talks drew directly on personal experience. The specificity of problem-solving remained sharply in focus, whether the subject was the role of the parking lot as a positive design element, strategies for gearing up the small firm to win competitions, the priorities of "multiheaded" institutional clients, or the cultural symbolism of earth-sheltered structures. While some presenters cleverly orchestrated film and sound to good effect—most notably Milford Wayne Donaldson, in a slide show about San Diego's Gaslamp Quarter Murals Competition, and Tom Grondona, in a New Wave intermezzo—less skillful *auteur*-architects merely gave object lessons on the folly of audio-visual excess. In the end, it was difficult for even the slickest productions to equal the impact of a hard-hat tour of Esherick Hamsey Dodge & Davis's half-completed Monterey Bay Aquarium on Cannery Row.

Three other major projects-in-progress on the West Coast—Pioneer Square in Portland, Oregon, the Portland Performing Arts Center, and the Beverly Hills Civic Center—were the subjects of more extensive "feature presentation" at the final session of the conference. It seemed especially apropos that each of these designs is the product of a national competition, since the still-growing importance of competitive architect selection was a recurrent topic throughout the conference. Moreover, as a coda to the carpetbagger motif, all three competitions were won by West Coast architects over designers from other regions.

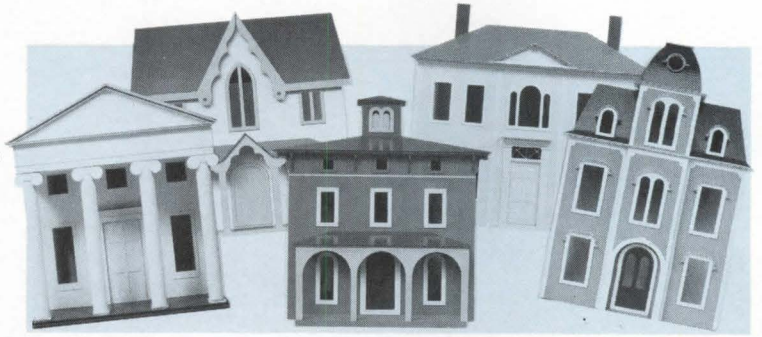
Interlarding slides of his team's project with telling headlines pro and con from local newspapers, Willard K. Martin of Martin/Soderstrom/Matteson Architects, in Portland, recounted the transformation of a parking lot into his city's

downtown multi-use public square (expected to be finished next winter). Donn Logan, of ELS Design Group, in Berkeley; Robert E. Oringdulph, of Broome, Oringdulph, O'Toole, Rudolf & Associates, in Portland; Thomas C. Payne, of Barton Myers Associates, in Toronto; and Richard Pilbrow, of Theater Projects Consultants, in London, England, traced the genesis of their firms' joint-venture project for the Portland Center for the Performing Arts. Now in design development, the center will include an Art Deco movie palace converted into a 2,750-seat concert hall, a 900-seat theater for repertory productions, and a 450-seat showcase theater. As an antidote to countless bromides about "people places," it was refreshing to hear Richard Pilbrow's cogent analysis of the role of the audience in theater planning.

Portland architect Donald J. Stastny, professional advisor for the Beverly Hills Civic Center Competition, reviewed the entries submitted by the six invited participants in that competition (see RECORD, January 1983, pages 72-73). In a trenchant assessment of the competitors, their presentation techniques, and the jury's deliberations, Stastny observed that Charles Moore's winning design was the only entry that met all program requirements and actually enhanced the importance of the existing Beverly Hills City Hall by integrating it into its context. Here, as in the two Portland competitions, Stastny concluded, local architects displayed a profound sense of place that transcended the stylistic preoccupations of outsiders. *D.B.*

A research center in Cambridge

The Whitehead Institute for Biomedical Research will occupy a prominent corner site in Cambridge, Massachusetts, opposite the MIT campus. The 160,000-square-foot institute will include four laboratory floors plus two lower levels of library, dining, and administrative facilities marked by tile-clad curved forms. Architects are Goody, Clancy & Associates.



In one of his "less busy periods" Jeffrey Milstein, a young architect who practices in Woodstock, New York, turned his hand to the design and production of note cards die cut from photographs of beautifully realized facade models of classic American house styles. Five to six inches high, the cards feature front doors that "open" and, on the backs, capsule historical

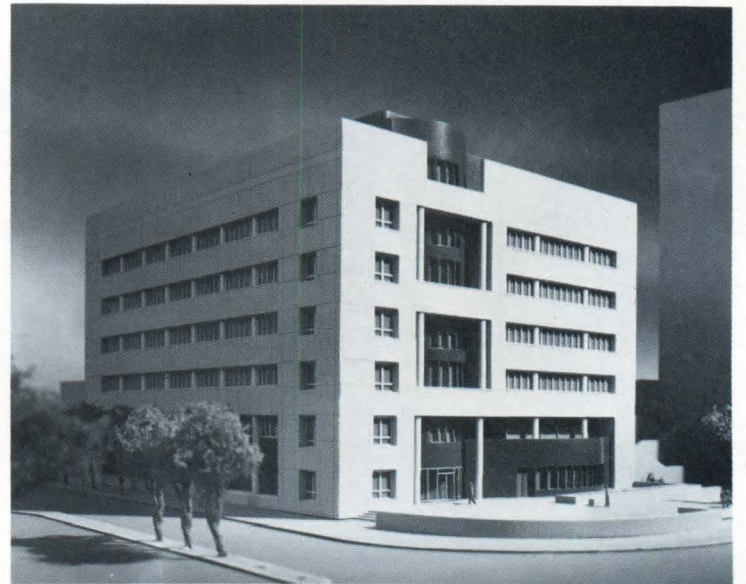
notes on the style of house depicted. The set includes authentically—and charmingly—rendered versions of houses in six styles: New England Colonial, Georgian, Greek Revival, Gothic Revival, Italianate, and Second Empire. And Milstein expects to add more styles to the line produced by Paper House Productions, P.O. Box 172, Woodstock, New York 12498.

Progress on Pennsylvania Avenue



Sears Roebuck and Company's purchase and restoration of the twin-towered, five-story Apex Building and the four-story studio of Civil War photographer Matthew Brady marks the first privately funded restoration start to be undertaken in Washington, D.C.'s historic Pennsylvania Avenue restoration program. Built in the 1880s, the buildings were prominent in the

city's pre-Civil War mercantile district. As restored, the 40,000-square-foot project will house corporate offices for Sears as well as rental office space. In addition to the restoration, a sixth floor will be added to the Apex Building and a narrow infill building between it and the studio. Architects are Geier Brown Renfrow.



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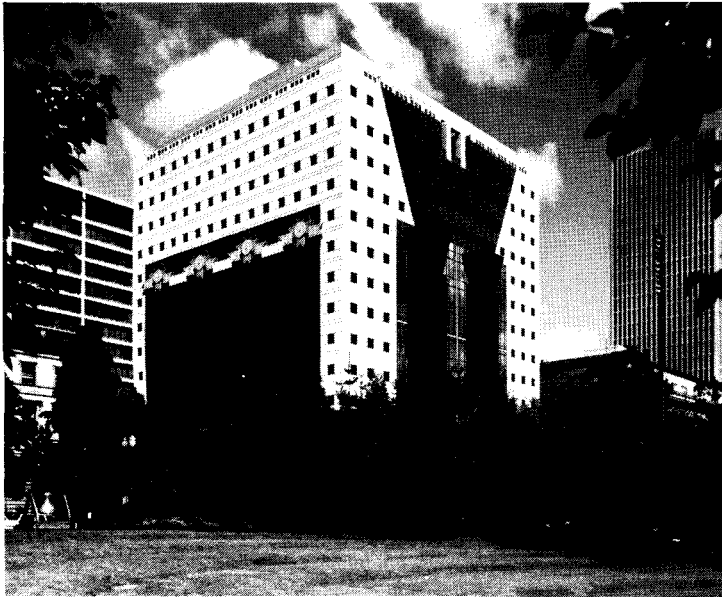
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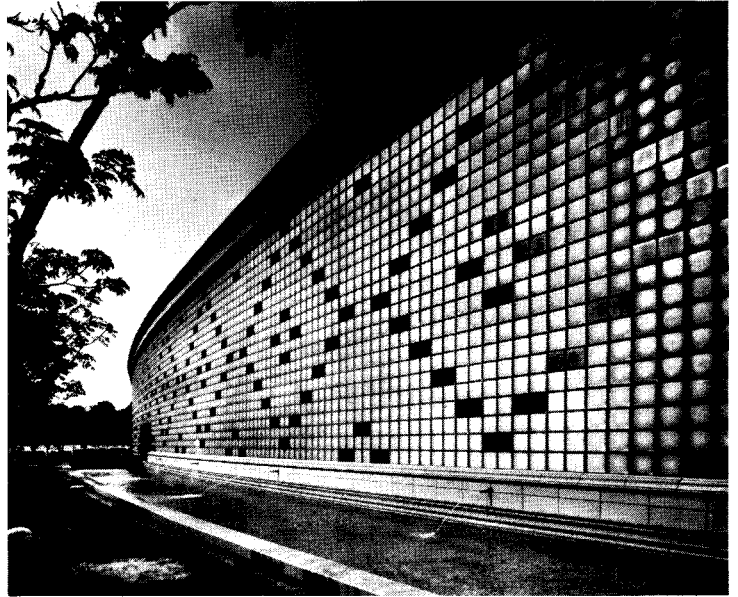
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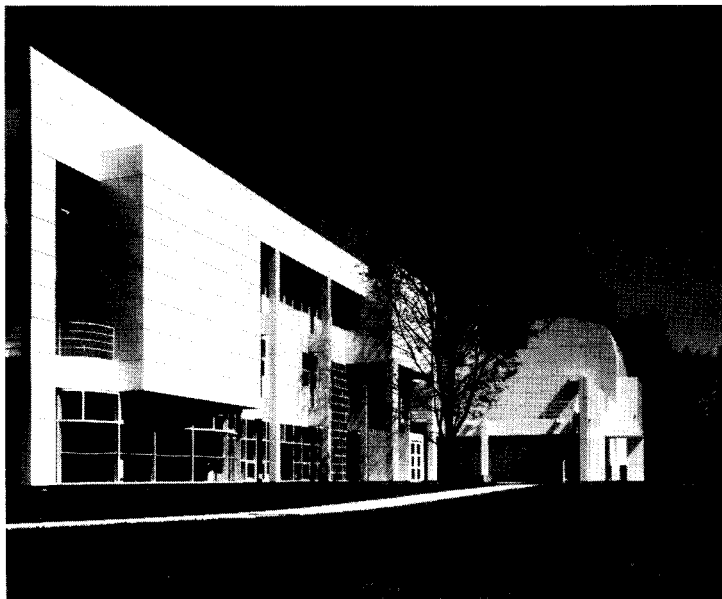
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3 ©Ezra Stoller/ESTO



4 ©David Franzen/ESTO

1. The Portland Building, Portland, Oregon; Michael Graves, Architect; Emery Roth & Sons and Edward C. Wundram, Associated Architects (see RECORD, August 1980, pages 96-101, and November 1982, pages 90-99). The jury reported: "Viewed from close up and from the nearby freeway, the competition-winning design creates a new image in the city and becomes a pivotal building in its time and place. The design has focused international attention on the city and raises a new and legitimate point of view with an architecture that was built for comparatively low cost. . . . The building's distinctive, over-all style and the new language it speaks offer an alternative to the design and construction of modern office buildings."

2. Best Products Corporate Headquarters, Richmond, Virginia; Hardy Holzman Pfeiffer Associates, Architects. Conceived as a 200,000-square-foot open-plan complex, to be built over a five-year period, the headquarters occupies a 25-acre site above a major highway intersection. A key element of the program was the display of an extensive collection of contemporary art. Commenting on the 68,000-square-foot building now completed, the jury noted that its sinuous facade "clearly seeks not to define its entranceway. Yet. . . the design [effectively] draws people through the glass-block curtain wall. . . . Rich textures and use of materials and color dignify the work environment. . . ."

3. Hartford Seminary, Hartford, Connecticut; Richard Meier & Partners, Architects (see RECORD, January 1982, pages 65-73). "The over-all esthetic of the Hartford Seminary is appropriate to its function as an educational and religious center. The building's meeting room and chapel make different yet exquisite uses of natural light and, in fact, the play of light on the internal forms and materials becomes a major element of the design. By concentrating on the worshipful aspects of sunlight, the design creates a poetic interpretation of a rational theme. Over-all, the seminary exemplifies an unusually consistent use of materials, from porcelain-enameled exterior panels to pipe railings and a floor plan that reflects the surface grid."

4. Mecklenburg County Courthouse, Charlotte, North Carolina; Wolf Associates, Architects. Added onto an existing downtown government center, the glass-and-white-limestone courthouse was designed to establish a sense of urban order in an area that previously lacked a strong focus. As a linear block, the building not only frames an adjoining street, but also defines a new public square. "By assuming a somewhat submissive role, the courthouse becomes a backdrop for the buildings nearby," the jury observed. "Yet, in its unpretentiousness, it adds a dignifying force, a unifying element, to the complex."

The American Institute of Architects will present its 1983 Honor Awards this month at the AIA National Convention in New Orleans. Selected from 599 submissions, the 11 award winners (illustrated below and on page 62) exemplify the pluralism of current design, according to jury chairman Charles Gwathmey, FAIA. "The submissions represented a variety which was nonexistent two years ago," Gwathmey said. "All of these buildings met their programmatic obligations while simultaneously recognizing contextual references, materiality and invention. . . . The jury was impressed by the theoretical as

well as the practical aspects of the projects, and the fact that the buildings do not merely accommodate, but insist on, intellectual evaluation." Gwathmey's fellow jurors were David L. Browning, Associate AIA Member from Dallas; Chris Coe, an architecture student at Louisiana Tech University; Robert J. Frasca, FAIA, of Portland, Oregon; Graham Gund, AIA, of Cambridge, Massachusetts; George J. Hasselein, FAIA, of San Luis Obispo, California; Bates Lowry, director of the National Building Museum; Antoine Predock, FAIA, of Albuquerque; and Milo H. Thompson, AIA of Minneapolis.



5 ©Marvin Rand



6 ©Glen Allison

5. Renovation of the California State Capitol, Sacramento, California; Welton Becket Associates, Architects. "What was once a deteriorating seismic hazard is now a magnificently restored tribute to the virtues of preservation and extended use in American buildings." Besides making the 1860s structure earthquake resistant (by applying 12-inch layers of gunite behind exterior walls, and replacing old floors, walls, and foundations with reinforced concrete), the project team undertook a meticulous restoration of all period detail. Their tasks ranged from the reinforcement of the 238-foot-high dome to the salvage of some 500,000 marble floor tesserae. Interiors were dismantled, rebuilt, and outfitted with authentic period furniture.

6. Immanuel Presbyterian Church, McLean, Virginia; Hartman-Cox Architects. The domestic character of the new building—a sanctuary and fellowship hall extended from an existing farmhouse—harmonizes with the surrounding neighborhood of large single-family houses. An arcade links old and new elements of the church and encloses a courtyard graced by mature linden trees. Plywood and wood batten walls, painted white, reflect the materials of the farmhouse. "Manipulation of interior space in the 4,500-square-foot addition permits an extraordinary series of beautifully sunlit spaces perfectly scaled to their intended uses."



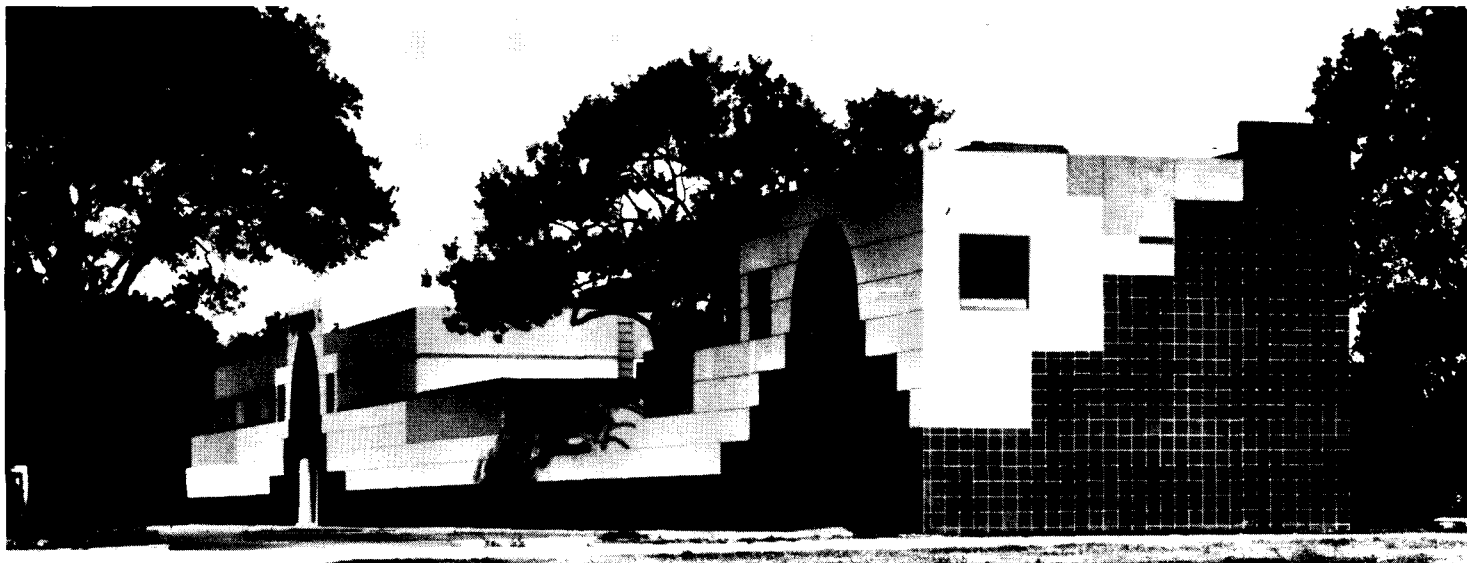
7 Robert Lautman



8 Thomas Bernard

7. Suntech Townhomes, Santa Monica, California; Urban Forms, Architects. Zoning restrictions and a small urban site necessitated a density of 36 units per acre for these speculative condominiums. The compact plan stacks 18 units over an underground garage. The jury remarked that high-density siting is here "countered effectively by a consistency of design esthetic throughout. From roof to garage entrance, every railing, light pole, and walkway is articulated to reflect the architect's thematic intention. Pedestrian bridges, rooftop communal areas, private decks, and a row-house arrangement that reinterprets the intimacy of narrow city streets confirm the project's sensitivity to its occupants."

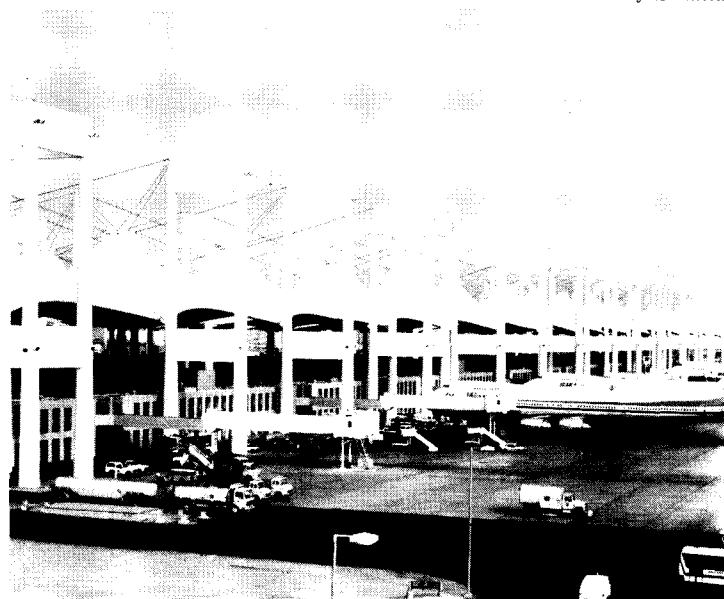
8. Cox/Hayden Studio, Block Island, Rhode Island; Venturi, Rauch and Scott Brown, Architects (see RECORD, mid-May 1982, pages 54-57). "The studio and separate guest house and garage act together in their open windy site in the intended, countrified spirit of generic buildings typical of the area in the 19th century. But these buildings reinterpret that heritage and achieve an apparent effortlessness of design. In response to the client's stated requirements for meeting functional, social, and emotional needs, the design incorporates a . . . comfortable, careful disorder of rooms and walls and an effective transformation of interior space not anticipated by visitors."



Taft Architects



©Greg Hurstley



Jay Langlois/Owens-Corning Fiberglas

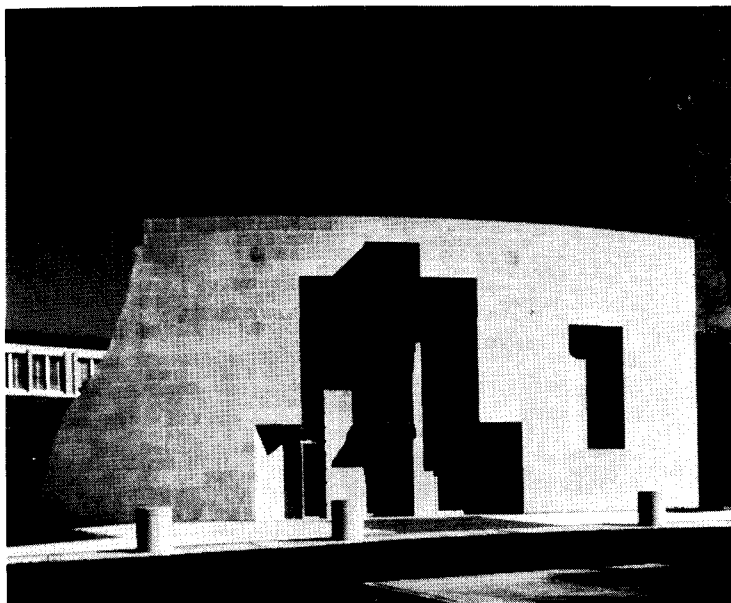
9. **YWCA Masterson Branch and Office Building, Houston, Texas;** Taft Architects. Located at the intersection of two busy thoroughfares, the 20,000-square-foot facility comprises a day-care center, classrooms, a crafts studio, a racquetball court, locker rooms, offices, an indoor swimming pool, and a multipurpose room. The jury found Taft's "Y" to be "a building of anticipation and hope. Its colorful entry and deceptively small exterior scale invite the public into expansive yet personal interior spaces appropriate to human use and enjoyment. The linear-spine structure succeeds because it houses multiple uses within a limited budget while participating architecturally at both a neighborhood and a freeway level."

10. **Douglas County Administration Building, Castle Rock, Colorado;** Hoover Berg Desmond, Architects. The program called for a "functional and economical developer-type building with civic character," to be erected on the site of a courthouse destroyed by fire. The interiors were to be flexible, with 20,000 square feet of finished space and 10,000 square feet of unfinished area for future expansion. A dignified effect was achieved by using masonry block construction, at the same time ensuring energy efficiency through heavy insulation and windows oriented for solar gain. "It is not a reflex solution," said the jury, "but a thoughtful design of quiet strength...."

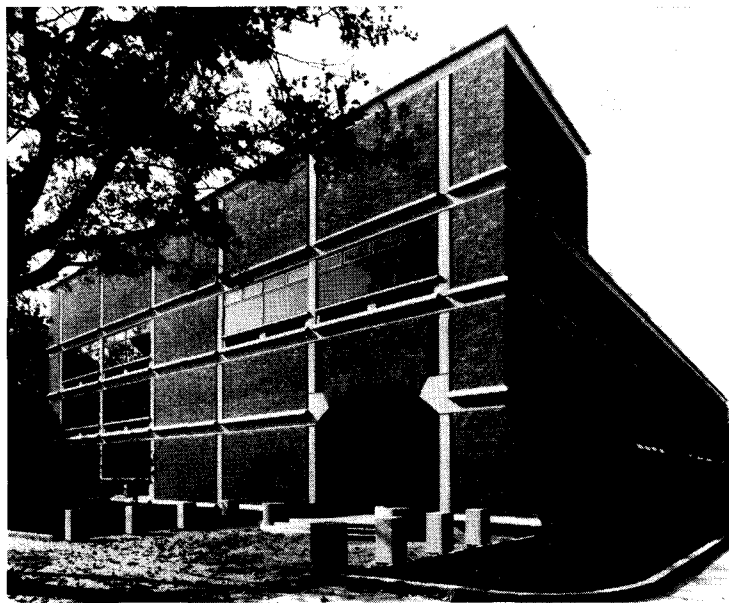
11. **Haj Terminal and Support Complex, King Abdul Aziz International Airport, Jeddah, Saudi Arabia;** Skidmore, Owings & Merrill, Architects. Sheltering an area of nearly 105 acres, the tensile fiberglass structure was designed to accommodate Muslim pilgrims en route to Mecca. The jury averred that "the design transcends its technology and poses a regional interpretation, a tented structure that is pre-eminently a desert building appropriate to its place and purpose. It is a mirage-like building that floats above the desert floor, matching the experience of flight and reflecting the spiritual quality of the pilgrimage. . . . This tent building takes on an aspect of soft monumentality, drawing and holding people to it like a desert oasis."

Design awards/competitions: Building Stone Institute 1983 Tucker Awards for Architectural Excellence

The Building Stone Institute, sponsor of the Tucker Awards, is an international trade association of quarriers, fabricators, dealers, and installers of natural stone. Jurors for the seventh annual awards program were William J. Conklin, FAIA, of Conklin Rossant; Danforth Toan, FAIA, of Warner Burns Toan Lundt; and Douglas Brenner, senior editor of ARCHITECTURAL RECORD. The jury conferred awards for recent nonresidential projects, renovation/restoration, and landscape design, but elected not to cite any entries in the residential category.



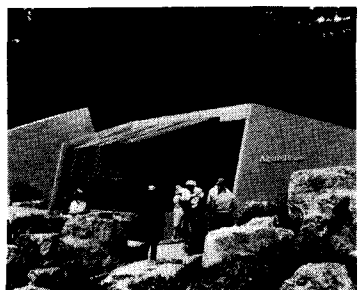
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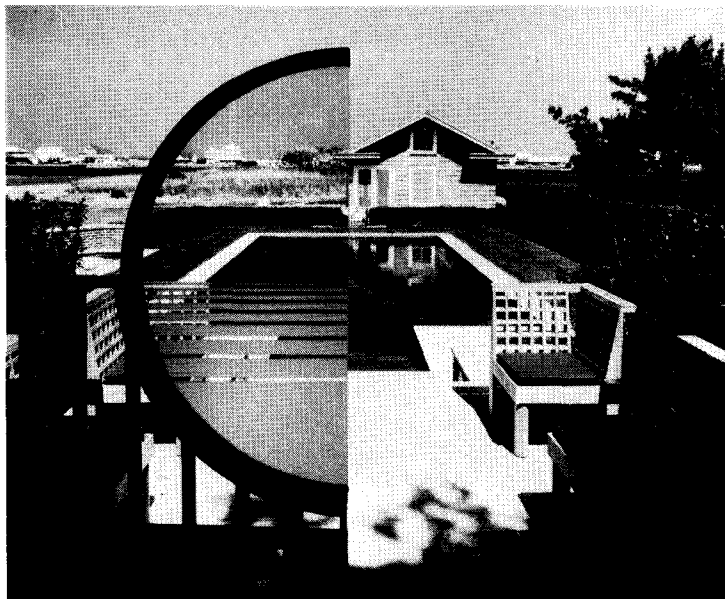
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1. Propylaeum, The Dayton Art Institute, Dayton, Ohio; Levin Porter Associates, Inc., Architects. Designed to accommodate the handicapped, furnish grade access from parking and provide improved security, the new Art Institute entry boldly reworks the classical articulation and limestone-and-brick facade treatment of the 1928 museum. The jury remarked, "This gateway panel is treated in stone in such an important way that you feel there must be an imposing element or series of elements contained behind it. The stone, as opposed to thinner and more theatrical materials, here provides a counterweight that keeps the monumentality intact."

2. Seeley G. Mudd Library, Yale University, New Haven, Connecticut; Roth and Moore Architects. The 70,000-square-foot government documents center and storage library houses 1.5-million books inside a masonry structure with limestone stringcourses, parapets, and spandrels, and red granite lobby flooring and counter tops. Fresh air is drawn into windowsill vents through curved spandrel sections. The jury praised the building's consistent fineness of detail.

3. Renovation of Newark Symphony Hall, Newark, New Jersey; The Grad partnership, Architects. The former Mosque Theatre was designed in the 1920s by Frank Grad in an eclectic classical style that mingled Egyptian, Greek, and Roman motifs. Grad's successors

have refurbished the 70-foot stage, baroque auditorium, and limestone exterior to give Newark a grand concert hall.

4. Alpine and Rock Garden, Denver Botanical Gardens, Denver, Colorado; EDAW Inc., landscape architect. Within an area of 8.6 acres the garden reproduces a variety of growing conditions, geologic structures, and topography characteristic of tundra and high mountain regions. The project required over 600 tons of rock, including granite, sandstone, and pumice. The panel judged the design "enormously satisfying because it portrays the romance that one associates with the alpine tradition, and yet there is an underlying logic to it all."

5. Pool and Bath House, New Jersey; BumpZoid, Architects. "Stone adds a permanent quality and elegance to a domestic pool that is rare indeed," said the jury. BumpZoid specified Italian limestone for consistent color and a slip-proof surface. Along all exposed edges, two-centimeter-thick slabs were laminated in three receding layers, with large mitered stones along the ledge.

6. Entrance, Barney's, New York, New York; Beyer-Blinder-Belle, Architects and Planners. Polished Carnelian granite, shot-finished limestone, Alabama white marble, and Roja Alicante red marble are combined in the discreetly luxurious portal of a well-known clothing store. The jury cited the architects' variations on classical elements in the existing store building.

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JUNE 14-17, 1983

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carpet: Equitec Properties Company, Oakland, California, Russell MacMasters photography

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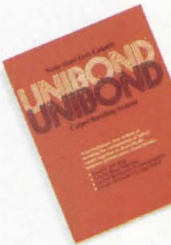
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Recreation facilities

Recreation, as we know from our own experience, comes in many forms; recreation facilities, in no fewer. So while the following 14 pages cannot comprehensively cover the recreation waterfront, the contents of the following 14 pages can—and do—at least suggest the length and variedness of the shoreline. But amid the conspicuous diversity of two ski lodges, three parks, and a civic recreation complex, there is also (though less conspicuous) consistency: not of program, not of budget, not of site, but of attitude—architecture and place are firmly moored.

Though the “place” New York landscape architect Leland Weintraub was given was a field of rubble in the South Bronx, and though the smooth pink and white concrete walls of the plaza he replaced the rubble with are as alien to their context as anything could be, Weintraub is adamant on the subject of Tiffany Plaza’s appropriateness (page 98). The 31-year-old director of the New York City Bureau of Open Space Design argues that if a place can’t inspire the architecture, then the architecture must inspire the place. Weintraub has a point. And the South Bronx has Tiffany Plaza. The Manitoba-based firm IKOY Architects fared only slightly better in the “place” they were given for a city-sponsored recreation complex servicing a 67-acre city park. IKOY was handed...well, a dump. Manitoba fishermen, however, will identify the Harborview Recreation Complex as a not-quite-traditional fishing village (page 102). While the clapboard theme village owes nothing to (and, happily, draws nothing from) the sanitary landfill site on which it sits, it nonetheless appears perfectly comfortable sitting there. Unlike Weintraub and IKOY, San Francisco architects Esherick Homsey Dodge and Davis (EHDD) cannot complain about the “place” they were given; nor can they share Weintraub and IKOY’s making-something-out-of-nothing award. But EHDD’s two late entries to the rich tradition of grand mountain resort lodges deserve special praise for not marring the postcard-perfect Utah mountain into which they have been so carefully nestled (page 92).

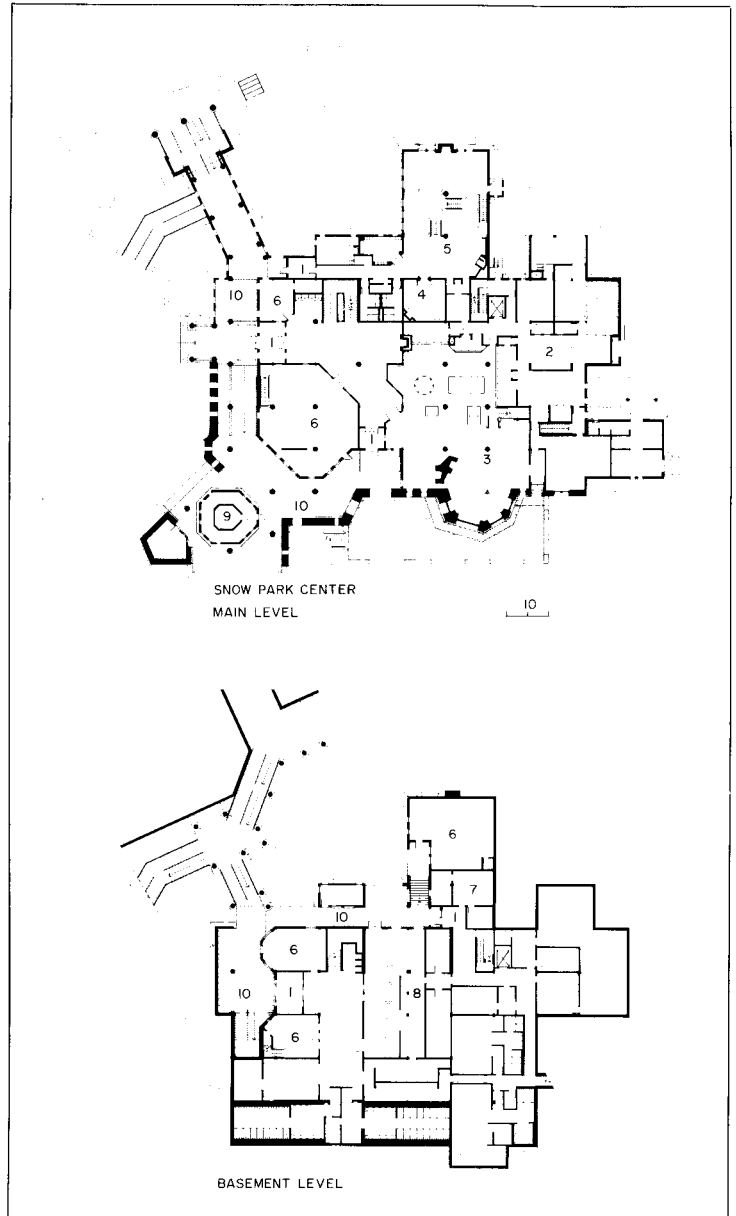
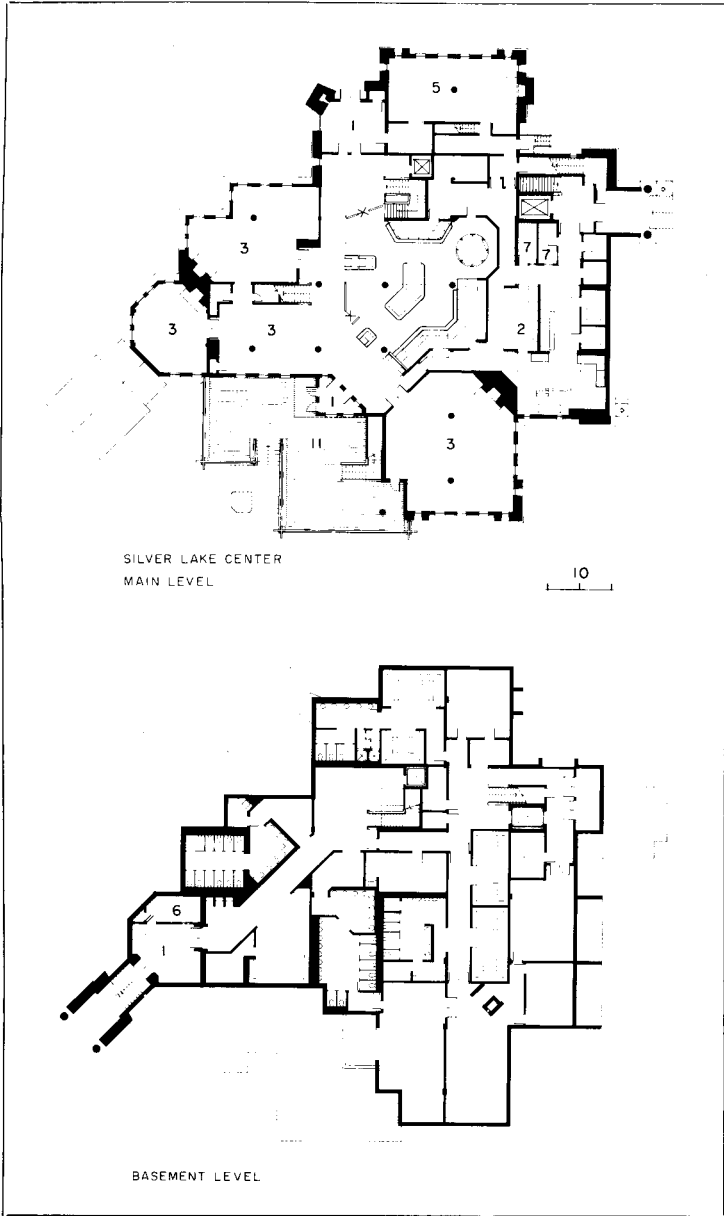
The final word on Esherick Homsey Dodge and Davis, IKOY, and Weintraub’s architecture-as-response-to-place argument rightly belongs to the skiers slicing through Utah’s fine white powder (page 92), to the golfers parring the 9th at Harborview (page 102), and to the children testing the water at Tiffany Plaza (page 98). No complaints. *Charles K. Gandee*

Uphill, downhill



Deer Valley Resort
Park City, Utah
Esherick Homsey Dodge and Davis
Architecture and Planning





1. Entry
2. Kitchen
3. Dining
4. Lounge
5. Restaurant
6. Retail
7. Office
8. Ski rental
9. Tickets
10. Arcade
11. Deck

Though Snow Park and Silver Lake Centers were designed to the same 20-foot-square module, and though they share exterior and interior materials and details, they differ significantly in feeling. Snow Park (photos far right) is large and expansive, its south facade open to views and sunlight. Silver Lake (photo previous spread) is more intimate, more like a hunting lodge. The respective "moods" of the buildings reflect their respective programs. Snow Park was designed for day skiers (plans above right): A tunnel from the nearby parking area, as well as a covered bridge from the drop-off area, allow arriving skiers to pass quickly through the building and on to the slopes. The basement level contains changing rooms, lockers, and ski rentals; the main level contains lift ticket sales, and dining and lounge facilities. The upper two floors (not

shown) house additional dining facilities and lounges. Two large, south-facing terraces (one at the main level, one at the second) invite alfresco dining. Up the hill at Silver Lake (plans above left), ski-related facilities are, again, located in the basement, with direct access to the lift area through the gabled skier's entrance canted off the southwest corner of the building. (The village that will eventually adjoin Silver Lake is to be built over an underground garage and service level; when the village is built, Silver Lake will be serviced at ground level.) The upper two floors are all but entirely given over to gourmet dining.

"There's silver in them thar hills!" rose the cry of three off-duty soldiers as they hurled their 1868-vintage picks into a rock outcropping one mile west of what is now Park City, Utah: \$400-million worth, as it turned out. And though the boom was bust by the time of the Crash of '29, silver was but one of the Beehive State's natural resources. There was another, just waiting to be mined. Sometime before 1945, some immigrants were seen barreling down the local mountains on boards; it caught on. Welcome Utah's second boom. For the last 38 years, since the first ski lift was set in motion, that boom has continued.

While "There's snow on them thar hills!" may not have quite the same clarion resonance as the earlier cry, it nonetheless rings clear if there are 825 inches of it per year, and if you've the talent, and the wherewithal, for marketing those 825 inches. Edgar B. Stern, Jr., chairman of the Royal Street Corporation, does—have the talent, *and* the wherewithal. As developer of the only-slightly-less-than-7,000-acre Deer Valley Resort outside Park City, Stern brought to the project unimpeachable credentials: owner of San Francisco's Stanford Court Hotel, former owner of New Orleans' Royal Orleans Hotel, and, not incidentally, owner of the largest single block of Sears, Roebuck stock. Stern also brought another valuable credential in the guise of San Francisco architects Esherick Homsey Dodge and Davis (EHDD), the firm responsible for Phase I (the two ski lodges shown here) of the mammoth resort development. This was not the maiden voyage of the Stern-EHDD partnership: in 1979 they "improved" the Stanford Court Hotel.

While sensitivity on Nob Hill in no way ensures sensitivity in Deer Valley, the most recent product of the Stern-EHDD partnership is not disappointing. On the contrary. The downhill Snow Park Center for day skiing (photos right), and the uphill Silver Lake Center for destination skiing (photo previous spread), speak eloquently of Stern's commitment to "quality" (read \$), and of EHDD's ability to render "quality." "They were designed to satisfy a number of specific programmatic objectives, as well as a fast and extremely difficult schedule," clarifies EHDD consulting principal Joseph Esherick. No mention is made of budget. The reason? The Deer Valley Resort is to be, simply, the best: The two recently completed lodges were intended to (and do) set a standard—a very high standard—for future development.

As other developers bid for the various parcels of land scattered about Deer Valley's 6,750 acres (parcels slotted for vast commercial development in addition to 2,000 units of "luxury" housing), they are being asked to keep an eye on Silver Lake and Snow Park Centers—a cribbing eye. What they will see—and hopefully be inspired to emulate—is a not unfelicitous, if idiosyncratic, mixture of Swiss chalet and Western mining camp: grandly splayed, clay-tile-capped roofs resting on red cedar walls resting on sandstone bases. The materials were chosen for their strength, beauty, and appropriateness; the forms, for their strength, beauty, and appropriateness. They were good choices. To some, Snow Park and Silver Lake will appear as if they've been there—nestled into the Utah snow—for a long time; to others, they will appear as if they simply belong there. Either way. It's an attitude about architecture and place: An attitude that says the former should spring *from*, not *on*, the latter. One hopes the attitude will prevail in the development of Deer Valley.



©Peter Aaron/ESTO photos

Deer Valley Resort
Park City, Utah

Owners:
Royal Street Corporation,
Edgar B. Stern, Jr.

Architects:
Esherick Homsey Dodge and Davis
Architecture and Planning—George
Homsey, principal-in-charge;
Joseph Esherick, consulting
principal; Dave Burness,
project manager

Landscape architects:

CHNMB Associates,
Don Carter, ASLA

Engineers:

GFDS Engineers, Edward
Diekmann (structural); J. J.
Johnson & Associates, Jack J.
Johnson (civil); Frederick H.
Kohloss and Associates, Inc.,
Richard Hughes (mechanical); The
Engineering Enterprise, Dan
Dibble (electrical); Charles M.

Salter Associates, Inc.,
Charles Salter (acoustical)

Consultants:

Andrew Delfino (interiors);
Lashober & Sovich,
Ed Sovich (food service)

General contractor:
Cannon Construction



Grand and rustic (and ostensibly indigenous) fairly characterize the materials and finishes of Silver Lake and Snow Park Centers, the two ski lodges comprising Phase I of the 6,750-acre Deer Valley Resort in Park City, Utah. Since the Richter Scale frequently gives high marks to the Park City area, architects Esherick Homsey Dodge and Davis took special care to accommodate the occasional tremor. Silver Lake and Snow Park share a heavy-timber-joined-by-steel-connector structural system; the main building columns are massive Douglas fir logs. Both buildings sit on concrete bases veneered in the local sandstone. (The concrete shear walls are veneered in the same local sandstone.) And both buildings are capped with "cold" double-membrane clay-tile roofs: The virtue of the "cold" roof is that it

keeps the snow from falling on unsuspecting skiers, and from melting—and staining—the Western red cedar board-and-batten siding. (An added virtue, of course, is added insulation.) Inside the lodges, the materials and finishes are slightly more refined: sandstone, or oak plank, or yellow pine floors; Western red cedar, or redwood board, or gypboard walls.



Urban oases

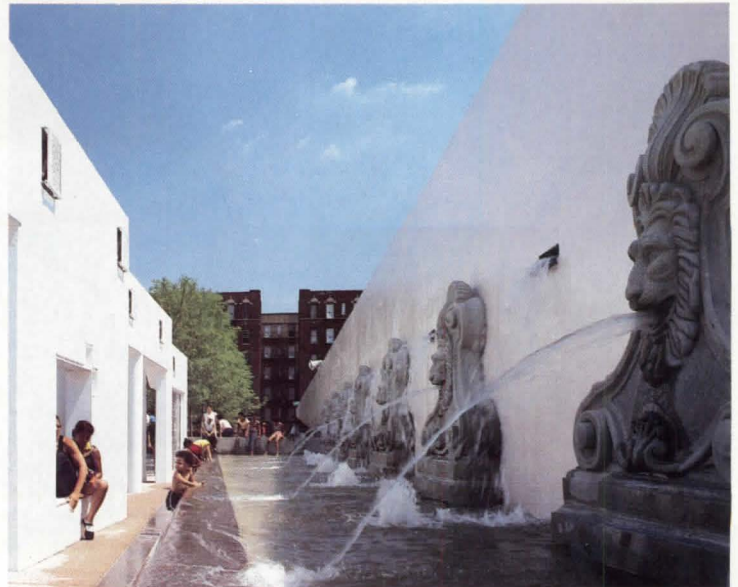
Tiffany Plaza
Bronx, New York
Leland R. Weintraub, Landscape Architect

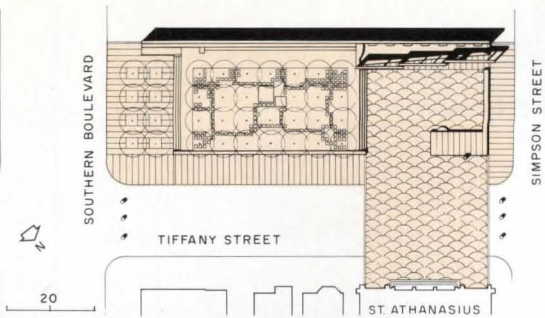
Father Louis R. Gigante, pastor of St. Athanasius Church and president of the South East Bronx Community Organization (SEBCO), is unabashed in his praise of landscape architect Lee Weintraub—"He's wonderful! He steals from the rich and gives to the poor." And understandably so. In St. Athanasius's front yard is Tiffany Plaza (photos right, plan above right), a more-than-slightly-surreal oasis in the near-devastated South Bronx Hunts Point Community, an area most commonly, and euphemistically, referred to as "troubled." Though Father Gigante's Robin Hood reference is sheer hyperbole—HUD willingly paid for the plaza—it is not ill-suited to the 31-year-old director of the New York City Bureau of Open Space Design (a component of the New York City Department of Housing Preservation and Development). For while "social architecture"—remember social architecture?—may not now be the *cause célèbre* it was in the '60s—remember the '60s?—it is nonetheless Weintraub's cause: "I'm interested in the people. . .the people who struggle to hold it together." Weintraub sees himself as assisting in that "struggle" through park design. Witness Tiffany Plaza (photos right) and Charlton Park (photos page 101)—"living rooms," according to Weintraub, for residents of HUD and sub-HUD housing. In addition to their physical value—as places to congregate, to "hang out"—Tiffany and Charlton carry symbolic value. But unless you've been to the South Bronx Hunts Point Community, it's difficult to appreciate the exhilaration one feels at first sight of Tiffany's graffiti-free pink wall, unbroken glass block windows, water-spewing lions, and grove of honey locust trees. It's an open window in a smoke-filled room. It's hope. Somebody cares.

Though Weintraub's heart clearly belongs to the Bronx—"I was born there, and spent a large part of my adult life there. . . I've had the opportunity to see the Bronx of love and life and vitality and spirit and a largely forgotten people. . .it's a special place for me."—New York City has four other boroughs requiring the attention of the director of the Bureau of Open Space Design, and the HUD Community Development Block Grant funds and City Capital Improvement funds that pay for the bureau's work. (The bureau and the funds have, over the last five years, built 12 parks; the next two years will add nine more.) Witness Washington Market Park (photos page 100): While the smoke may not be as thick there in Manhattan, the open window is no less welcome.



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*Tiffany Plaza
Bronx, New York*

Owner:
City of New York, Department of
Housing Preservation and
Development

Client:
South East Bronx Community
Organization (SEBCO)

Architects:
Leland R. Weintraub, R.L.A., John
A. diDomenico, R.A. (landscape

architecture and urban design)

Associate architects:
Davila Petraglia Architects—
Robert Reach, Stamatios Lykos,
Alyce Slosberg, design team

Engineers:
Gerald Palevsky, P.E.
(mechanical); Robert Silman
(structural)

General contractor:
Doyle-Baldante, Inc.



You'll recognize the neighborhood from the six o'clock news. It looks like Pruitt-Igoe after they blew it up—fields of rubble, abandoned cars, derelict tenements. But there's a glimmer of hope in the "troubled" Hunts Point Community, owing to the South East Bronx Community Organization (SEBCO), a consortium of religious, social, and development organizations "dedicated to fighting urban blight and deterioration." The fight SEBCO is fighting is the good fight, as they say, and there are signs that they are, if not winning, at least not losing. One of those signs is Tiffany Plaza, the symbolic and physical center of SEBCO's urban war. Intended as a point around which the neighborhood can rally, and as the single "open" space in the neighborhood's massive redevelopment drive, the Arquitectonica-style park appears

to be doing its job. Since Tiffany's completion in '81, residents of Hunts Point's 1,100 units of new and renovated Federally-subsidized housing have shown great affection for the plaza—lots of wear, but no graffiti. And though criticism has been more than generous—"high-design is inappropriate here"—on a hot summer day, mothers taking the shade of the honey locust grove, while their children splash in the "high-design" fountain, would argue otherwise.

Washington Market Park
New York, New York

Owner:
City of New York, Department of
Housing Preservation and
Development

Client:
Washington Market Community
Park, Inc.

Architects:
Leland R. Weintraub, R.L.A., Jose
Chieng (landscape architecture and

urban design)—Edward McGinnis,
Carole DeSaram, John Jones,
Miriam Friedlander, Meg Reed,
Kathryn Freed, James Stratton,
Harold Hirsch, Ronnie Moskowitz,
Mary Thomas, Jessica Williamson,
Robert Reach, Liz Christy, Paul
Viggiano, design team

Engineer:
Charles Falco, P.E. (electrical)

General contractor:
Edenwald Contracting Co., Inc.

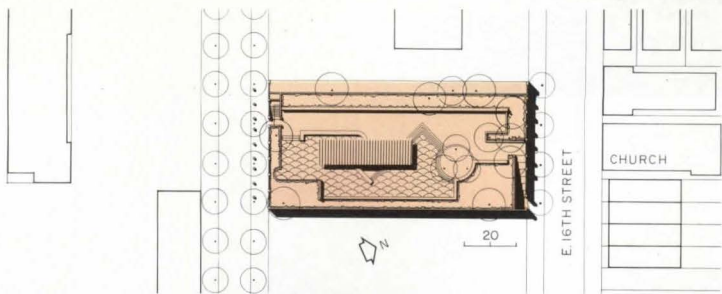


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It's a long way from the South Bronx to Lower Manhattan's fashionable Tribeca neighborhood. But in the shadow of the towering World Trade Center and the behemoth Manhattan Community College (with more shadows now under construction), Washington Market Park is a no-less-thanful reprieve from urban congestion than Tiffany Plaza and Charlton Park (facing page) are from urban

blight. "Romantic and traditional," best characterize the 2.2-acre park, according to landscape architect Lee Weintraub. And the characterization is apt: the sinuous path encircling the gently rolling lawn is a promenade worthy of 19th-century Bath; the delicate filigree of the cast-iron gazebo, worthy of its Victorian inspiration.





Charlton Park
Bronx, New York

Owner:
City of New York, Department of
Housing Preservation and
Development

Client:
Al Goodman Houses, South Bronx
Community Board No. 3

Architects:
Leland R. Weintraub, R.L.A., Jose
Chieng (landscape architecture and

urban design)—Bronson Binger,
Malcolm Young, Sarann
Lindenauer, Sam Kramer, Fraser
Davidson, design team

Engineer:
Robert Silman (structural)

General contractor:
Doyle-Baldante, Inc.



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The South Bronx's former Charlton Park was abandoned because of diminishing municipal resources and devastated surrounding housing stock. Rehabilitation—the South Bronx's current Charlton Park—was undertaken because of new housing, and the promise of more new housing, and a commitment to maintain the park by a consortium of local interests. (Neighboring Grace Gospel Family Church, for example, holds the key to the park—unlocking the gate at sunrise, locking the gate at sunset.) Working with the park and recreation committee of the local community board, landscape architect Lee Weintraub developed a “hard” park/garden scheme. (Since Charlton sits 10 feet above street level on a rock escarpment, subsurface conditions precluded the preferable “soft” green park/garden alternative.) Shade, however, is

supplied by a Maybeck-esque pergola: scalloped timber joists and beams rest on concrete columns embellished with caryatids “reminiscent,” according to Weintraub, “of the south porch of the Erechtheum.” Though the allusion to 5th-century B.C. Athens may be too grand for a 20th-century A.D. New York audience, the fact that the caryatids are there is nonetheless well appreciated.

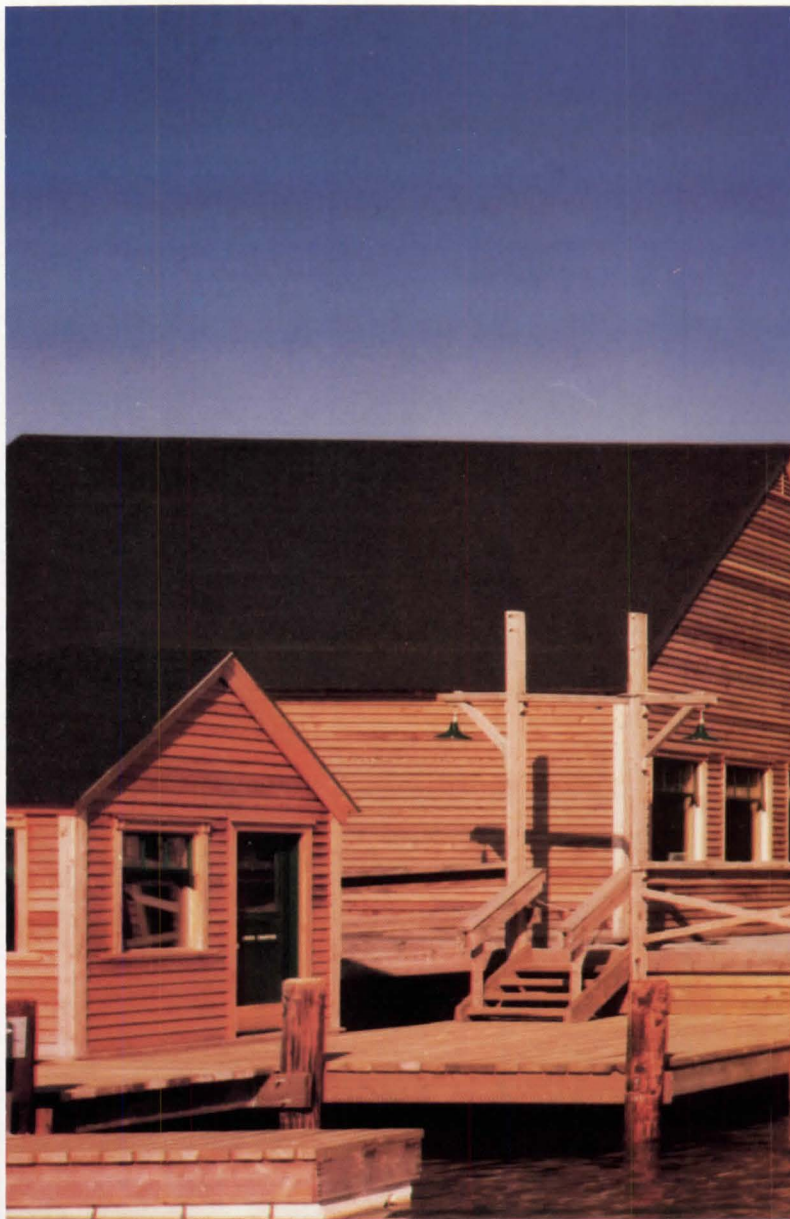
What a dump!

Harborview at Kil-Cona Park
Winnipeg, Manitoba
IKOY Architects

They used to unload garbage here on a 67-acre tract of land six miles northeast of downtown Winnipeg; now they unload golf clubs and swim fins, tennis racquets and water skis, ice skates and . . . For what was formerly a city dump is currently a city-owned-and-operated "family" recreation facility, dubbed Kil-Cona Park in honor of Winnipeg's Kildonan and Transcona neighborhoods. The park will ultimately encompass all of the 400 acres the city purchased in the '60s as a sanitary landfill, and then, over the next two decades, filled. Few Winnipegians—even those unlucky enough to bogey the 9-hole par-3 golf course or be becalmed on the man-made serpentine lake system—would deny their city fathers the congratulations they deserve for ingeniously accommodating the citizenry's refuse while anticipating the citizenry's recreational requirements. No less admirable, in concept and result, is the Harborview Recreation Complex (photo right), the centerpiece of Kil-Cona Park. As the premiated entry in a limited city-sponsored design competition, IKOY Architects' neat cluster of simple wooden structures is a fitting response to the city's esthetic mandate for a "fishing-village look"; to the city's programmatic mandate for pro shop, dining, banquet, administrative, classroom, and locker room facilities; and, not incidentally, to the city's budgetary mandate for a maximum \$1.1-million capital expenditure. According to IKOY architect Don Blakey, the success of Harborview—and judging from attendance, it is successful—stems from the Winnipeg-based firm's decision to eschew the competition's suggested one-very-large-building-containing-all guideline, "fracture" the program, and house each of the requisite facilities independently (plan overleaf). IKOY designed and built, quite literally, a small village—complete with a central village square (complete with lighthouse/campanile/lookout tower) which, according to Blakey, "acts as a transition from the large open expanse of the park to the intimately-scaled interior spaces," and where, according to Blakey, "people meet, pass and nod, stop to discuss the game and yesterday's business. The design concept amplifies the purpose, to have fun outdoors." It's a winsome notion, but then Harborview is a winsome complex.

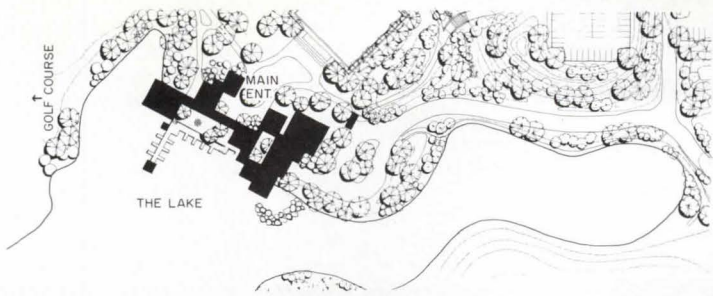
A postscript is supplied by Blakey: "Words such as weathered, casual, piers, docks, floats, boardwalks, meandering up and over, under, through and between are important." Sounds right. Better yet, looks right.

Not bad for a dump.



Gerry Kopelow photos

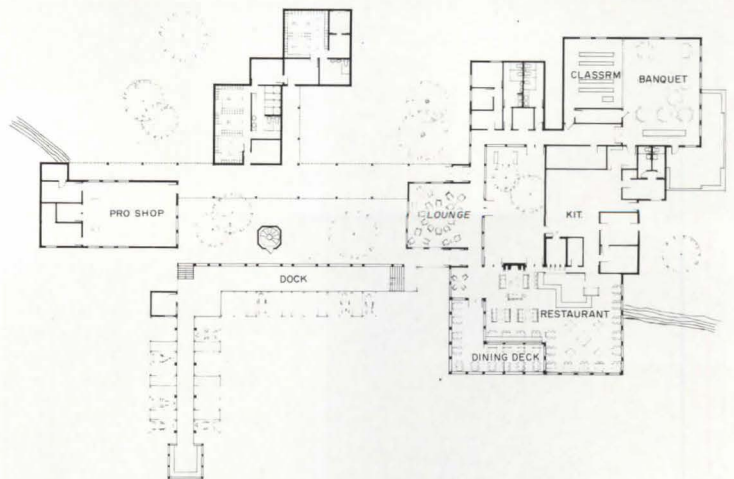
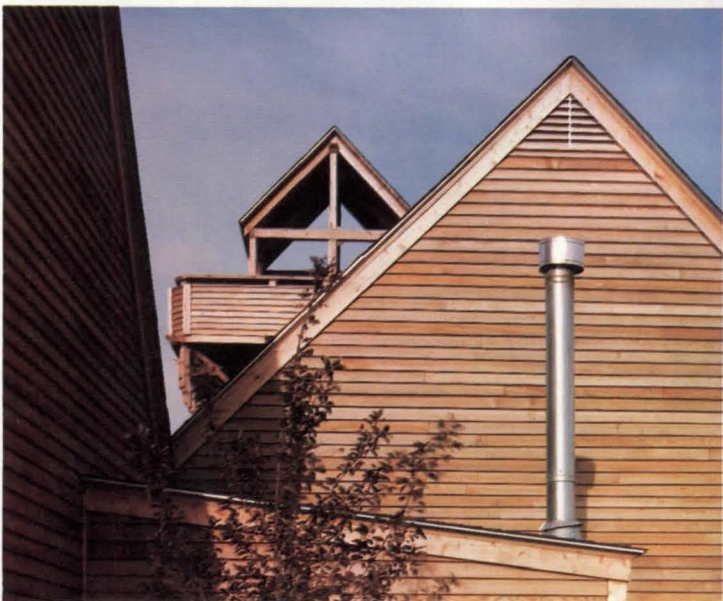




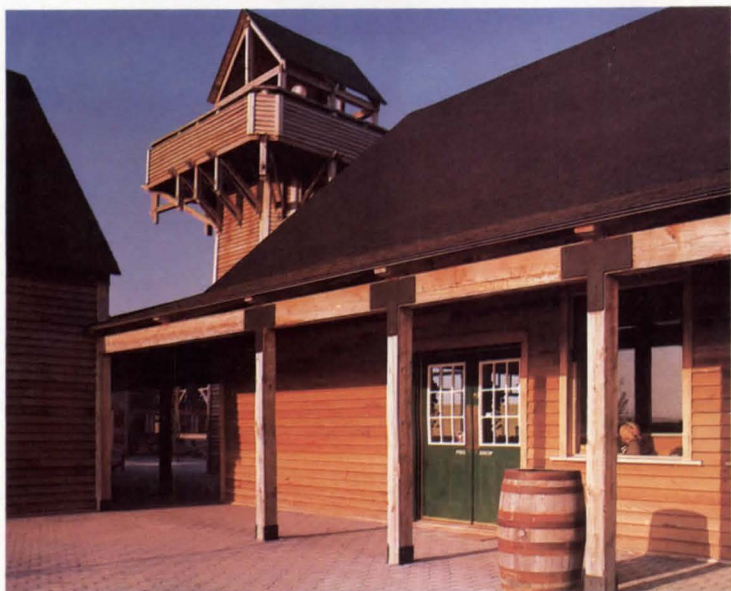
At the edge of one of Kil-Cona Park's many man-made lakes (used for water sports and for storm-water retention) nestles Harborview, the central activity center of the, at present, 67-acre city-owned recreation facility. IKOY Architects modeled the competition-winning cluster of rough-sawn cedar-sided pitched-roof buildings after a "traditional fishing village." And true to the model, IKOY Architects' "traditional fishing village" comes complete with "lighthouse" (children's viewing tower), "store" (pro shop), "cafe" (kitchen and dining rooms), "town hall" (banquet, classrooms, administrative offices), "residence" (locker rooms), and "harbor" (harbor).

From a distance, the Harborview Recreation Complex appears to be a simple enough enclave of simple enough clapboard buildings; yet when one moves closer, "simple enough" is no longer an apt descriptor. The architects at IKOY are no strangers to meticulous—if sometimes idiosyncratic—detailing (see *The IKOY Office Building*, April 1983), and despite a modest \$58-per-square-foot budget, they did

not make Harborview an exception. Note the dining room's massive inverted truss interlocked with the no-less-massive columns and fireplace (photo below). A smaller detail? Note the protruding ridge beam extending from the restaurant-building gable (photo top left): it's masquerading as a hoist beam . . . remember, Harborview is modeled after a "traditional fishing village." A still smaller detail? Note



the tiny rosettes decorating the corners of the window frames. While some may liken Harborview's open-air waterside square to an Italian piazza (photo right), and the viewing tower to a campanile (photo below right), such was not the architects' intention. More appropriate—and intended—is the analogy to a traditional fishing-village square.



*Harborview at Kil-Cona Park
Winnipeg, Manitoba*

Owner:
City of Winnipeg

Architects:
IKOY Architects

Engineers:
*W.H. Milley Associates, Penner
Keller Partners (structural); G.H.
Currie & Associates (mechanical);
A.E.B. Limited (electrical)*

General contractor:
Trident Construction

Keio University Library
Tokyo, Japan
Maki and Associates, Architects



A rare and rich response to context

By Joan E. Goody

A principal of the Boston architectural firm of Goody, Clancy & Associates, Joan E. Goody recently visited Japan as part of an official delegation to Boston's sister city, Kyoto. Afterwards, in Tokyo, Fumihiko Maki conducted her through his new Keio University Library. This is her firsthand report. H. L. S.

An American architect traveling in Japan for the first time, I was struck by the omnipresence of detailed attention to the appearance of things. Packages are wrapped with exquisite care. Food is served so that each dish is a visual delight. Market stall displays are works of art. Even greater care is lavished on architectural details—whether they be the carved or metal-capped beam ends in a traditional temple, the carefully selected and placed stones in a garden, or the fixtures and furnishings custom crafted for contemporary buildings.

After admiring the meticulousness of small-scale Japanese design, I was shocked to encounter the anarchic abandon with which most contemporary architects juxtapose their structures in the new downtown districts. Each project seems to ignore adjacent buildings, except perhaps to shout louder than its neighbors for attention.

The bravery and imagination of these architects who appear willing to try anything may be admirable, but the results often are not. Ideas that we might sketch on a napkin as conceptual sketches (or extreme cartoons of a possibility) get built as is: huge cantilevers, great cut-away sections. Much of this would be impossible to achieve here; some is best left on napkins.

Against this background Fumihiko Maki's Keio University Library stands out as a rare combination of traditional Japanese attention to detail and currently atypical sensitivity to surroundings. Set among mature trees on a campus composed of variously styled buildings (several faced in brick of buff or orange), the new library (left in photo opposite) responds brilliantly to the massing and color of adjacent structures and to the traffic patterns and axes of its site.

Like an iceberg, only a portion of the library emerges above ground: Maki has buried five floors of stacks, of the total of 12 levels, to reveal a volume compatible with that of the adjacent buildings. He relates the new library to these immediate neighbors (the old library, a notable symbol of the University; and the administration building) in several ways: First, he places it so that it forms the third side of a plaza with them. To

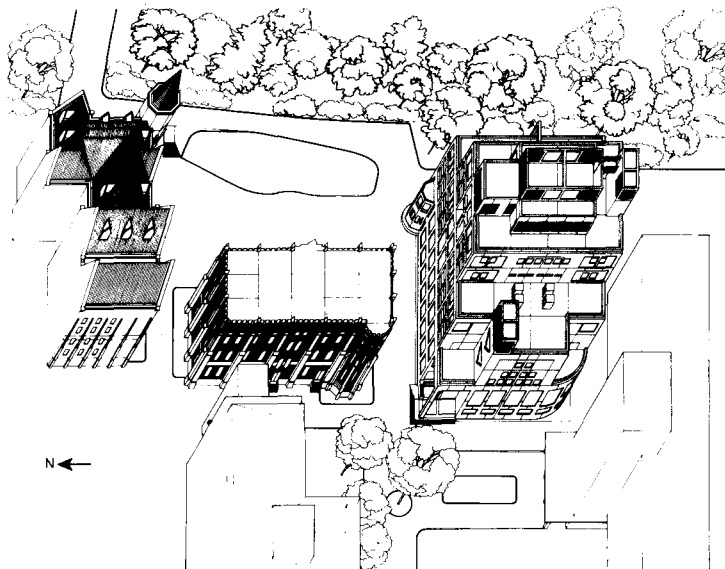
emphasize this relationship, he projects a two-story bay (reminiscent of one on the administration building) towards the old library, on axis with its entry. At the opposite end of this same facade, he picks up the crossing point of two important campus paths and turns toward a larger, more active plaza with his own building's strong corner entry (drawing below). Inside, the same north-south/east-west crossed paths are reflected in the major circulation corridors.

In a city where most new buildings seem to represent the extremes of texture (rough concrete, polished metal, or contrasting combinations of materials), Maki has covered the entire exterior (and part of the interior as well) with the same unglazed, ribbed, buff-colored tile. This resembles, in scale and tone, the brick of the surrounding university buildings. Only a hint of polished, terra-cotta-colored granite peeps out as a narrow base around the entire building, reappears on floor surfaces on the ground level, and rises in an exquisitely carved bench and ramp at the entry.

Throughout the building, furniture details, though similar, vary slightly from space to space—variations on a theme, complex and subtle. The total composition is rich and harmonious. As someone who builds for many New England colleges and universities, I was aware of the greater range of finish materials that seem available to Maki for use in a Japanese undergraduate setting, the respect for the furnishings and artwork displayed, the general appreciation of fine detail.

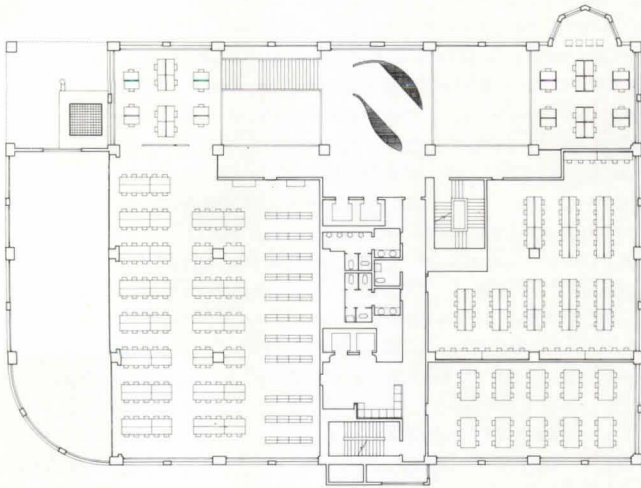
My visit to Japan had started in Kyoto as an official guest of the city where I was escorted from one exquisite garden or shrine to another (with little time spent in the downtown). Rich with the residue of 1,000 years as the capital of Japan (until 1868), and the only Japanese city not bombed during World War II, it is one place where Japan's past architectural heritage exists in large enough quantity to predominate over the strong (aggressive) image of contemporary construction.

As I was introduced to the modern scene only after a good dose of the traditional, I believe my perception of Japanese architecture is different from what it would have been had I arrived first in Tokyo, where the chaos of the Ginza overwhelms, and the few shrines left are isolated remnants. Thus, coming upon the Keio Library on the University's campus in Tokyo (somewhat of an oasis itself) was like rediscovering the old, the true Japan re-emerging.

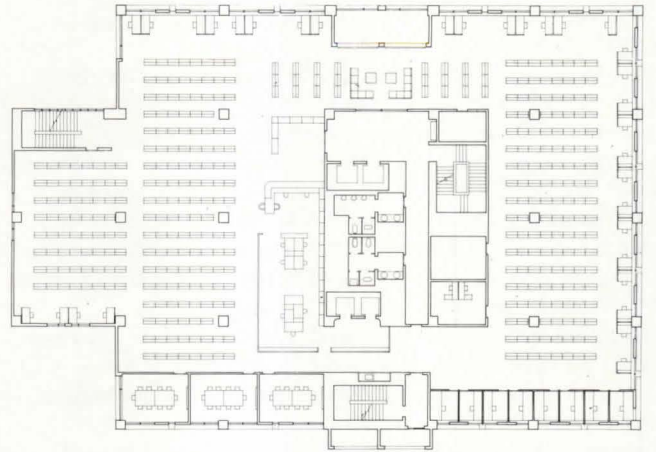


The library strikes no heroic attitudes, nor does it impose overscale or eccentric shapes on the quiet campus. Yet it assumes the dignity and importance due its role as the central university facility by the use of a two-story-high square module (8m by 8m corresponding to the structural bay) as the organizing element of its elevations. The first six floors above grade are paired in function as well as in

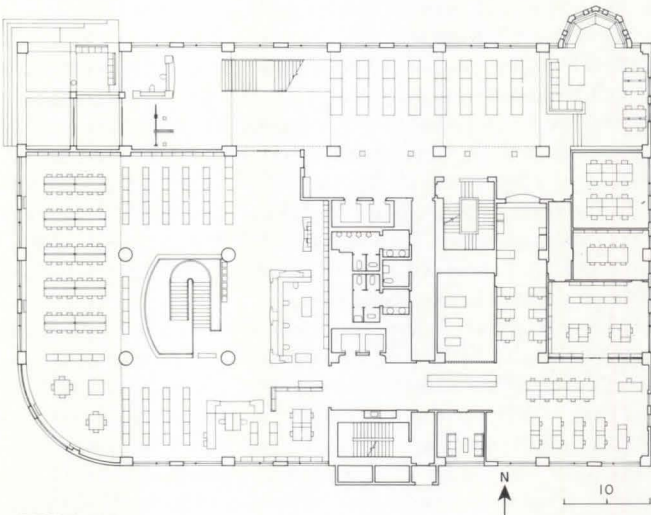
external expression and interior finishes. Floors one and two are the most heavily used public spaces: reading rooms, reference and catalogues. Floors three and four contain the specialized research libraries and seminar rooms; while less generally accessible spaces for rare books, computers and administration are located on the fifth and sixth floors. A smaller, recessed top floor for mechanical



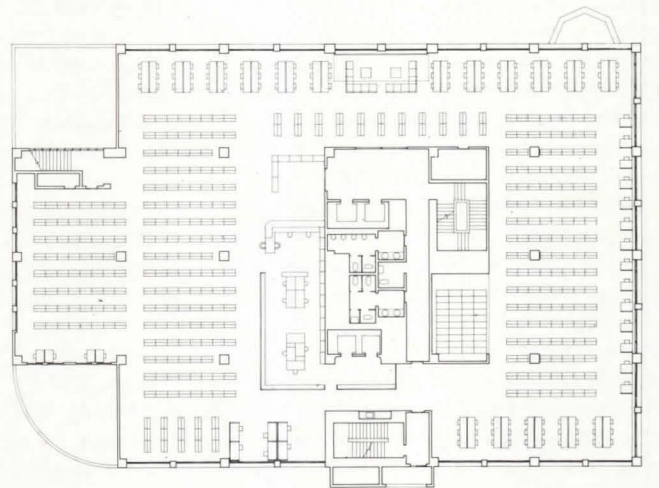
SECOND FLOOR



FOURTH FLOOR



FIRST FLOOR



THIRD FLOOR

Kaneaki Monma photos



equipment reads as a separate element (see photo of rear facade, below right). The two-story facade-squares subdivide themselves in different ways, often producing smaller squares within the larger ones. Although the half bay is a frequent subtheme, it never is carried up the full height of the steel frame and reinforced concrete building. Instead, it stops a floor or so short to declare its decorative

rather than structural role, deferring to the dominant pattern of the larger structural bay. The square presents itself on the facade in a rich variety of ways, ranging from recessed tile panels to glazed openings within them and aluminum-framed sash within these openings. The single largest square indicates the entry (photo below left): a cube hollowed from one corner of the building.



SIXTH FLOOR



NORTH ELEVATION



FIFTH FLOOR



SOUTH ELEVATION



Maki chooses materials, details the interiors, designs furnishings and selects graphics with the same discipline and refinement he uses in the spatial composition. The functional pairing of the floors expressed on the exterior is reinforced by a similarity of materials and motifs used on pairs of floors within. For example, the color and shape of the marble surround at the elevators changes

every two floors, as does the shape of a marble-faced clock between the elevator doors. There is a close coordination of the graphics and furnishings with the architectural design. White marble-trimmed checkout counters (in more and less elaborate designs) appear on the floors with white marble trim. Buff-color marble outlines counters on floors near elevators outlined in similar tones—and everything from



telephone alcoves to painted paneled doors is coordinated and composed into a harmonious whole. The wood finish and design details of the bookcases also vary in each section of the library, as do the tables, chairs, study carrels and the metal finishes on light fixtures (photos of various study and work areas are shown below). In one area armless, curved-back seats pull up to matching light oak tables with

chrome-framed light fixtures. In another, the metal frames are bronze, and armchairs with flat backs and upholstered curved tops are used. A similarly shaped chair, upholstered in rose velvet and finished in pale gray stained wood, distinguishes the rare-books room. The main catalog room (bottom right) incorporates fine cabinetry in a fairly grand and meticulously detailed space.



Inside, the square motif continues: in ceiling and floor-tile patterns, custom-designed chandeliers and other details. For example, squares are repeated in the guardrail for a stair leading to a roof terrace (below left) as well as in the glass block fenestration that encloses it at roof level and the stepped glazing that echoes and exaggerates the riser and tread pattern leading upward. Even fire stairs are

detailed with exquisite care: solid balustrades are capped with wood moldings; vertical slots mark the change of direction. A glazed tile mural (top photo) by Jennifer Bartlett covers the entire corridor wall on both sides of the elevator doors on the second (piano nobile) floor. It is composed of approximately one-foot squares, ranging from pale sunrise colors through bright day, dusk and star-



studded black night. Book shelves are both built-in and freestanding. In the main reading room (bottom right) they range beneath and between the windows in a cabinetry design that incorporates such refinements as fluorescent and candle-style incandescent lighting for a combination of evenness and sparkle. They also contain recesses into which vertical blinds can disappear.

Keio University Library
Tokyo, Japan

Owner:

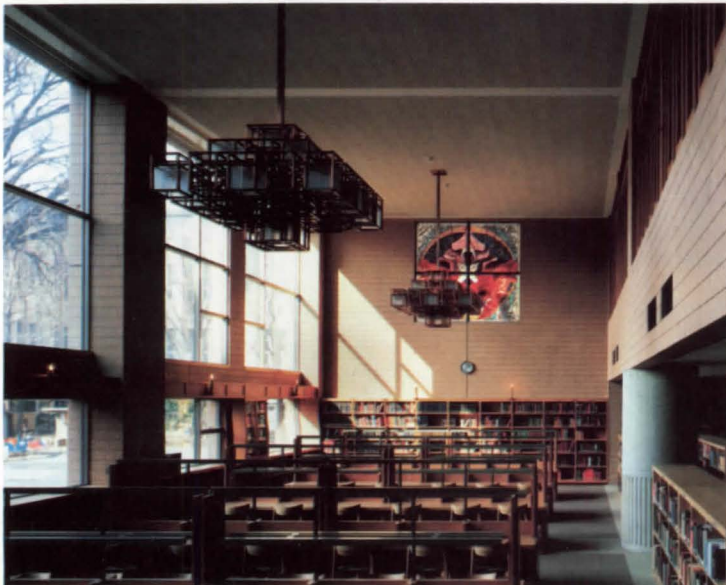
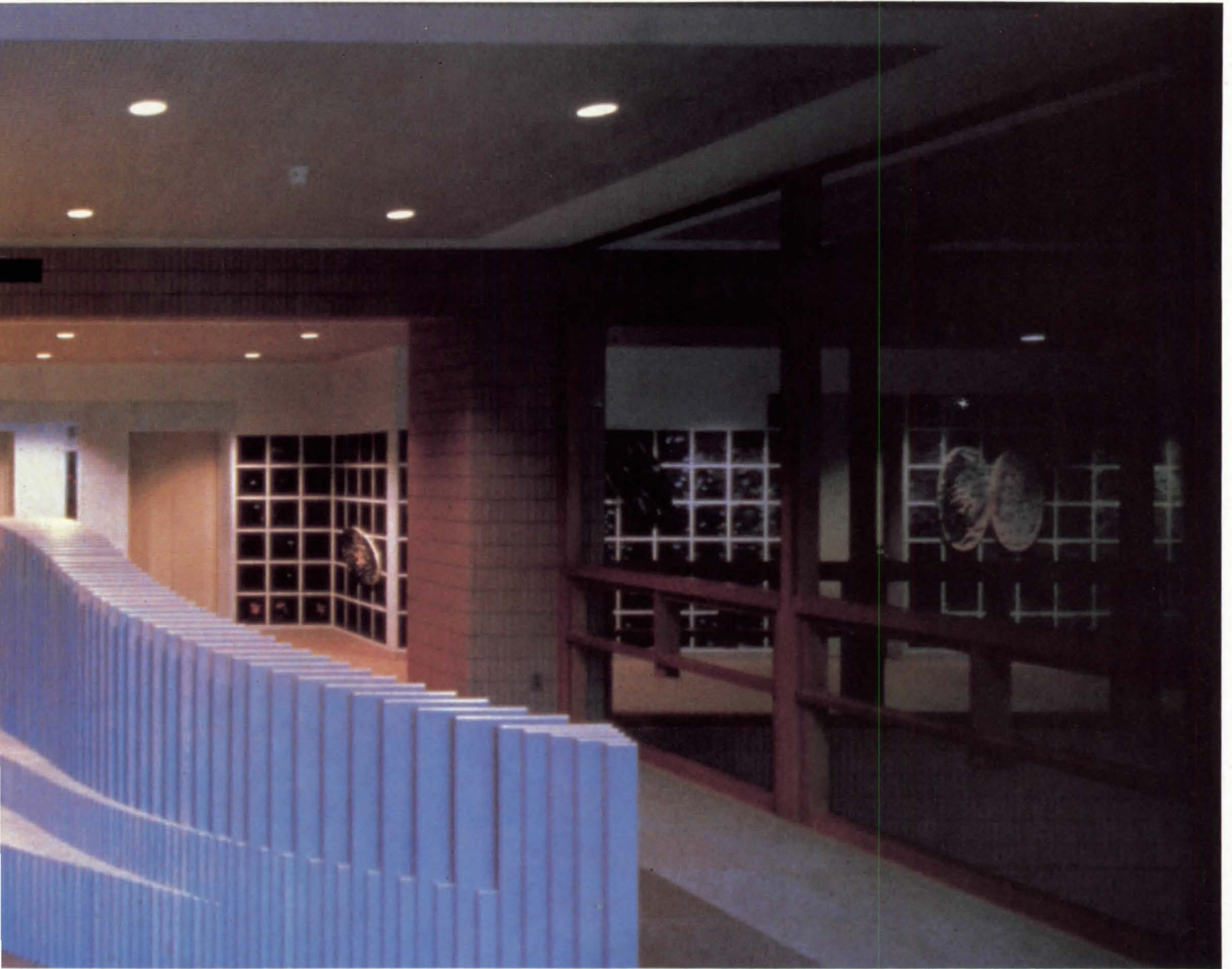
Keio University

Architects:

Maki and Associates

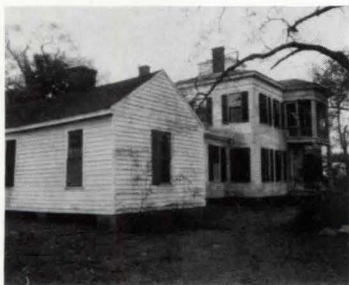
Contractors:

Joint venture of Ando Construction Co., Ltd.; Shimizu Construction Co., Ltd.; Toda Constructon Co., Ltd.



Restoration of Henderson House
and rebuilding of cottages, Selma, Alabama
Architects: Nicholas H. Holmes, Jr., FAIA
and James Seay, Sr., AIA, NSPE

A little corporate commitment



It's not that you can't get to Selma, Alabama from where you are—it's just that it takes awhile, even if the Circle "S" corporate plane is available to fly you in from Atlanta or Montgomery. In 1980, Larry Striplin, chairman of Circle "S" Industries, decided he wanted a rather more elegant alternative to the Holiday Inn for the increasing number of overnight visitors—and especially his board of directors and architects coming to see the plant and talk aluminum-window fabrication details with the staff of DISCO, his biggest subsidiary. The first thought was to build a conference center/guest house in the pecan grove behind the plant. But, says DISCO president Bill Spann, "We know enough about architects to know that no matter who we got to design the project, half of our visitors wouldn't like it—and that couldn't help the sales effort." The better thought:

In 1980, the city of Selma had purchased the historic, but long-abandoned and badly deteriorated, King/Siddens/Welsh house—hoping somehow to restore it. The "somehow," of course, was Circle "S," which purchased the property and—under the guidance of preservation architect Nicholas Holmes and supervising architect Jim Seay, and with some help from the city, restored it beautifully as a guest house and corporate meeting center. The house was rededicated as Henderson House in March 1982.

"The project has worked well from every point of view," says Spann. "I think every architect who has stayed there has been impressed. The board of directors clearly enjoys meeting here, and clearly believes we got our corporate money's worth. [About \$600,000. See financial details in caption, next pages.] The house is used on a weekly basis for company meetings, has proved helpful in recruiting executives, and allows us to be a good host to visitors from our branch offices, vendors, bankers, and other guests. The house is made available to other local companies for business meetings, and to the city for entertaining its guests—especially executives from corporations here at the invitation of the industrial-development staff. And the residents of Selma are pleased—everyone's come to see the house and it is back on the Selma Pilgrimage."

During the restoration of Henderson House, the company decided it would also undertake to restore the immediate neighborhood (called Fair Oaks Square) and purchased 12 turn-of-the-century cottages on the block and across the street (see site plan and photo below right). A third were abandoned, the rest occupied but generally in poor shape; all were purchased on the open market at prices ranging from \$15,000 to \$50,000. Various rebuilt, rehabilitated, replumbed, rewired, and remodeled—at a cost in Circle "S" operating funds of "plus or minus \$3/4 million"—the houses were put back on the market at prices ranging from the upper \$70s to \$175,000. The corporation expects, as was its goal, to break even on the rehabilitation.

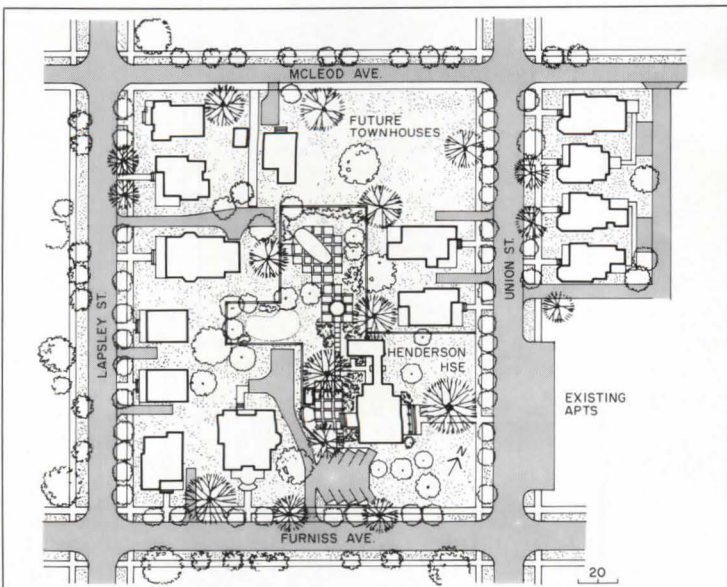
The project has clearly had a catalytic effect. At least 30 other houses in the surrounding blocks have undergone at least facelifts, and many have been completely rehabilitated—mostly by their owners. Nicol Lux—the young builder/craftsman who headed the Circle "S" building team—now has his own business and is restoring a number of larger houses for private clients. Two hourly workers from the company have bought houses in the area and are rehabbing them. And importantly, the rehabilitation of Fair Oaks Square has apparently established the idea that these cottages are worth saving, and that downtown living is a real alternative to the suburbs.

In all, it seems, a worthwhile corporate commitment. With, perhaps, some lessons for other corporations in other small cities.
Walter F. Wagner

Built in 1853, the Greek Revival-style house was not grand by the standards of the day, but played an important part in the history of Selma—as a center of social life for much of the 1800s and the early part of this century, and as a hospital during the Civil War. It is rated as a structure “of great importance” on the National Register of Historic Places. Behind the house (photos far left), the

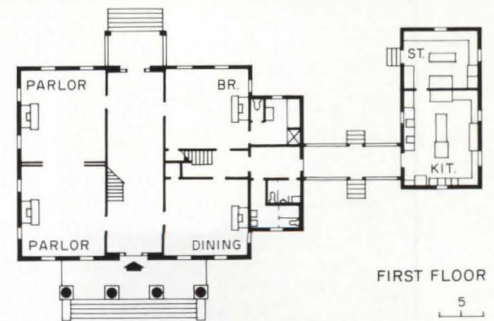
garden was rebuilt for recreation—with a gazebo disguising a grill, refrigerator, and wet bar; a pool; a putting green; and a number of patios. Many of the original trees and shrubs were transplanted and reused in the new scheme. At the bottom of the page: the site plan, and a group of the rehabilitated cottages of Fair Oaks Square.

Bill Hedrich, Hedrich-Blessing photos



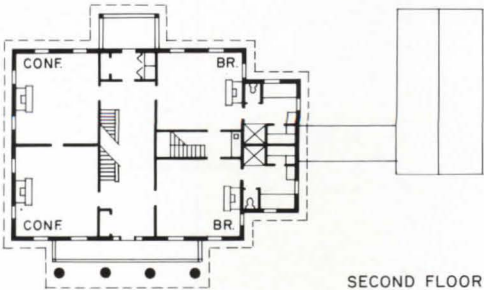
Architect Holmes researched the original colors, materials, and architectural and construction details, fit in the modern baths and kitchen, and, says Bill Spann, "made sure we lived up to our responsibility for the house." DISCO hired a staff of local people—ranging from 12 to 18 in number—to do the work on Henderson House and the cottages. The team was headed by Nicol Lux, who saw that

all of the original detailing—whether in wood or plaster—was reproduced exactly. "When we had to tear out a 130-year-old molding, we used a 130-year-old piece of pine to make the new one. Even replacement windows, where needed, were built with pegged mortise-and-tenon construction." Only the cantilevered stair required a bit of contemporary bolstering—with a steel angle.



Furniture and furnishings—a mix of antiques and reproductions—were chosen by interior designer Helen Sapp and project director Melissa Spann. The antiques are mostly from Selma, though some were “imported” from Charleston. The restoration cost about \$700,000—of which DISCO is committed for about \$600,000, including total repayment of a half-million-dollar bond issue passed by

the city. The city also contributed \$30,000 from a Model Cities grant; \$15,000 in city labor and services; and a portion of a \$200,000 UDAG grant given the city for new brick sidewalks, street lamps, road repair, and undergrounding of services. The city received \$55,000 from DISCO for the house. The restoration was completed in 291 days; the work took a total of 11,997 man hours.



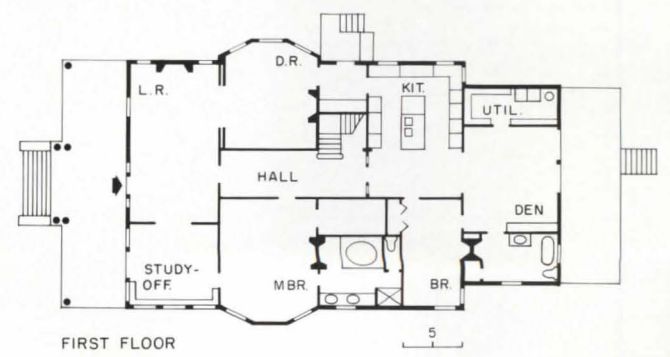
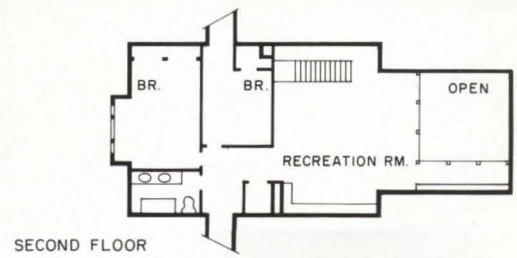
*Restoration of Henderson House
and remodeling of
Fair Oaks cottages
Selma, Alabama*

Landscape architect:
Sanford Chandler, ASLA
Project director:
Melissa L. Spann

Architects:
*Nicholas H. Holmes, Jr., FAIA and
James Seay, Sr., AIA, NSPE*
Construction manager:
T. Nicol Lux
Interior designer:
Helen Sapp Interiors



This is the largest of the 12 turn-of-the-century houses rehabilitated on Fair Oaks Square. Architect Jim Seay detailed the exterior rehabilitation of the houses; worked with project director Spann and builder Lux in remodeling the interiors—including all new services, baths, and kitchens. As in Henderson House, many details were authentically reproduced.

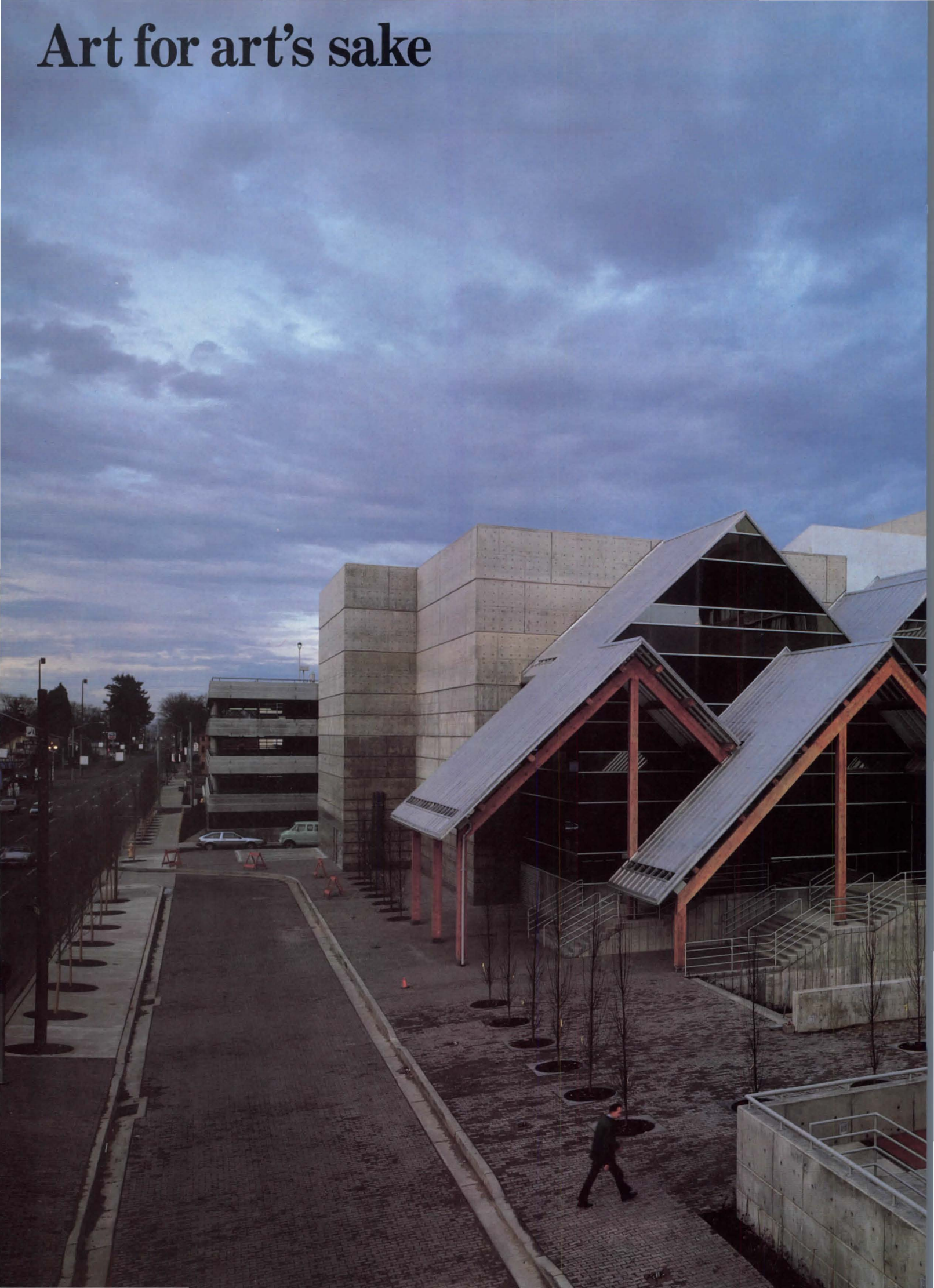




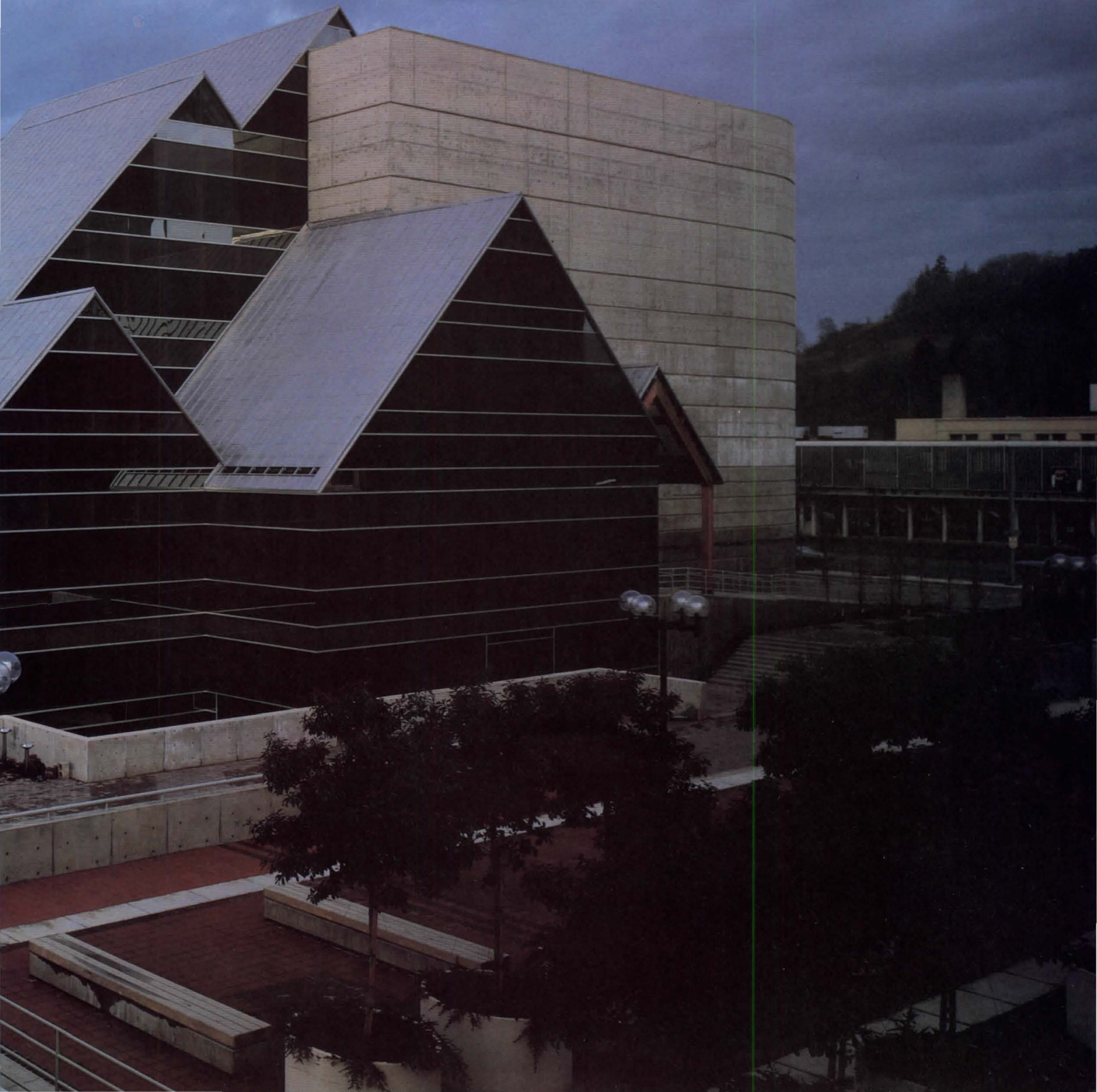
The 12-foot-high ceiling in this room was opened to create a more dramatic living space. A guest room and play area are tucked under the roof in the former attic space. Of the 12 houses rehabilitated, six are sold, and the company expects lower interest rates to move the others soon. The prices are about 10 per cent less than comparable subdivision houses in the Selma suburbs, but "perhaps 30 per cent

above what people are used to paying for downtown houses," says Spann. The cottages are finished to a very high standard, and of course have a special setting in the restored block. "Houses like this have not been much sought after in the South—they have none of the romance of Colonial houses in the North," says Spann. "But perhaps we've started something..."

Art for art's sake



The Hult Center for the Performing Arts
Eugene, Oregon
Hardy Holzman Pfeiffer Associates, Architects



Eugene, Oregon, once "The Lumber Capital of the World," has been suffering a depressed economy largely because of the housing slump. As part of its effort to diversify the economic base, revive the business district, and prevent further population decline, the city has recently completed a \$51.8-million two-block downtown development which includes two garages, a conference center and a 276-room Hilton. The centerpiece of this renewal effort is the Hult Center for the Performing Arts designed by Hardy Holzman Pfeiffer Associates.

Since it opened last fall, the new performing-arts structure has been widely acknowledged as a singular architectural achievement. It is also a great accomplishment on the part of the Eugene community. In recent years, across the United States, citizens have rarely been persuaded to vote bond issues—even for desperately needed services. The people of Eugene are an exception. In 1978, disregarding their small numbers (the current population is 105,000), the voters agreed to take on an \$18.5-million bond issue to build the performing-arts center and its garage. Because of inflation and a more complex program than originally contemplated, the total cost of the two facilities reached \$28.6 million, the difference having been made up by earned interest and private philanthropy.

In programming the facility, HHPA worked closely with Eugene's performing-arts organizations. "We had an open-door sharing policy with the community," acknowledged partner-in-charge Norman Pfeiffer. "There were 36 major groups that participated in the design review process, and each had an equal democratic right to comment on the designs, regardless of whether it would use the rooms one night a year or be a major user. To satisfy both the experimental groups and the traditional groups while keeping in mind the long-term goals of the community at large, we decided to build two rooms, the larger one formal and very traditional and the smaller flexible and adaptable. I think that the most important thing that we did was to convince the Eugene people that if they were going to build two theaters, the thing to do was to make them as opposite as possible—in size, in feeling and in function. In this way we gave them the widest possible range of performing choices."

From the beginning, Eugene's painters, sculptors and craftsmen expressed as much interest in contributing their talents to the performing-arts center as the city's actors, dancers and musicians did in the planning of the facilities. Soon after the

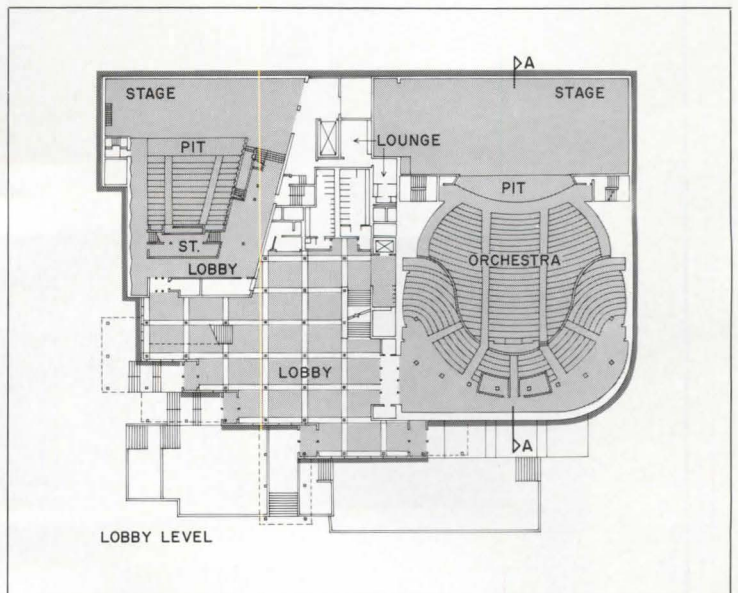
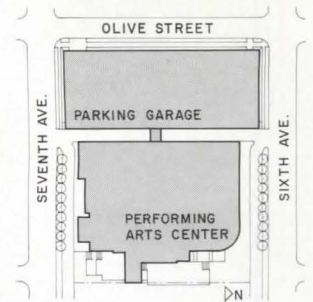
bond issue was passed, Lotte Streisinger, a local potter, began to encourage support for the use of art and craft in the center, proposing that it be used in two basic ways: either integrated structurally or as freestanding art. HHPA enthusiastically welcomed this effort. As a result of this nurturing spirit, a total of 15 works by about 30 artists and craftsmen became the building's ornament. The artists were chosen through national and regional competitions by four panels of jurors which included the architects.

Of all the art and craft works incorporated in the center, the most spectacular and beautiful is the Silva Concert Hall's curtain. One of its two designers, Eugene artist Margaret Matson, describes how HHPA encouraged and collaborated with her: "The architects made two separate presentations in Eugene for the benefit of the artists and craftsmen wishing to compete for work at the center. I was at the second presentation given by Hugh Hardy, in which he displayed floor plans and showed slides of model studies that gave a feeling of the spatial qualities that were being focused upon by the designers. He gave a very animated talk proposing ways that he imagined pieces could be incorporated. He described the different qualities they were striving for in each performance hall, such as a highly 'romantic' space for the main concert hall—'like a Viennese candy box,' he said, 'the kind of a room where a couple might just fall in love.' He spoke of the color palettes his firm had used in the past—pastels with a twist, I thought. After Hugh's presentation, the possibilities seemed wide open."

And the possibilities *were* wide open, not only for Eugene's artists but for HHPA's technical consultants as well. Engineers William LeMessurier and Wayne C. King were invited to design a timber-framed lobby without visible connectors; lighting expert Paul Marantz was urged to use his medium to make a huge hall seem intimate, acoustician Christopher Jaffe was chosen to install a highly sophisticated electro-acoustic system enabling the large hall to be tuned for the size and type of program being presented (pages 130-133).

For architects Hardy, Holzman and Pfeiffer, technique has the importance of an ideology and interests them far more than the game of styles. But paradoxically, by concentrating on the building arts they achieve style. Every one of their buildings has that HHPA look, and it is uniquely theirs.

Mildred F. Schmertz



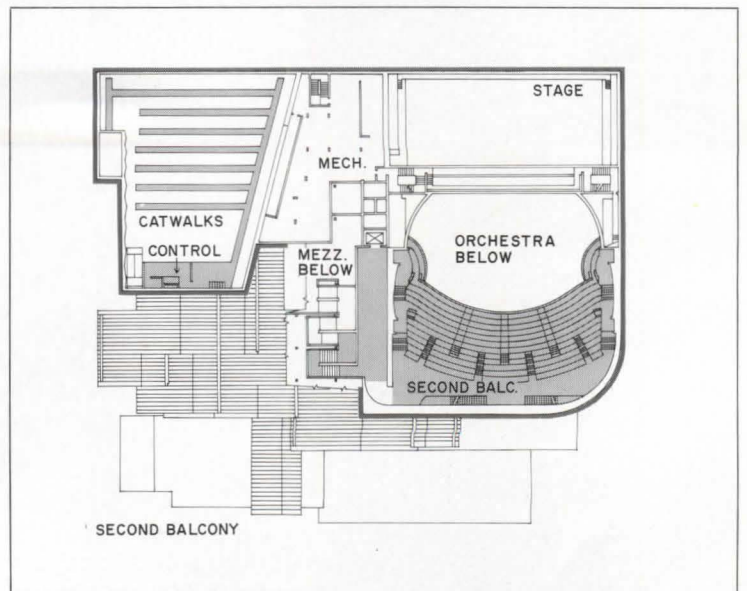
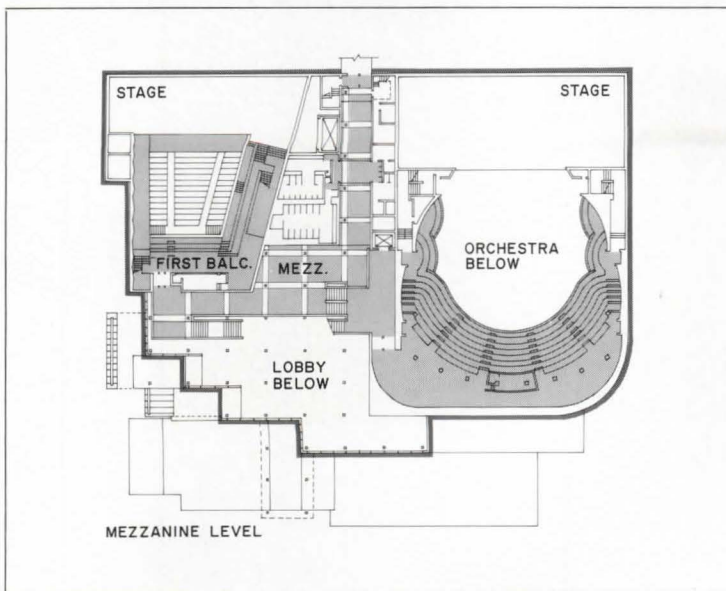
Timothy Hursley photos (except as noted)

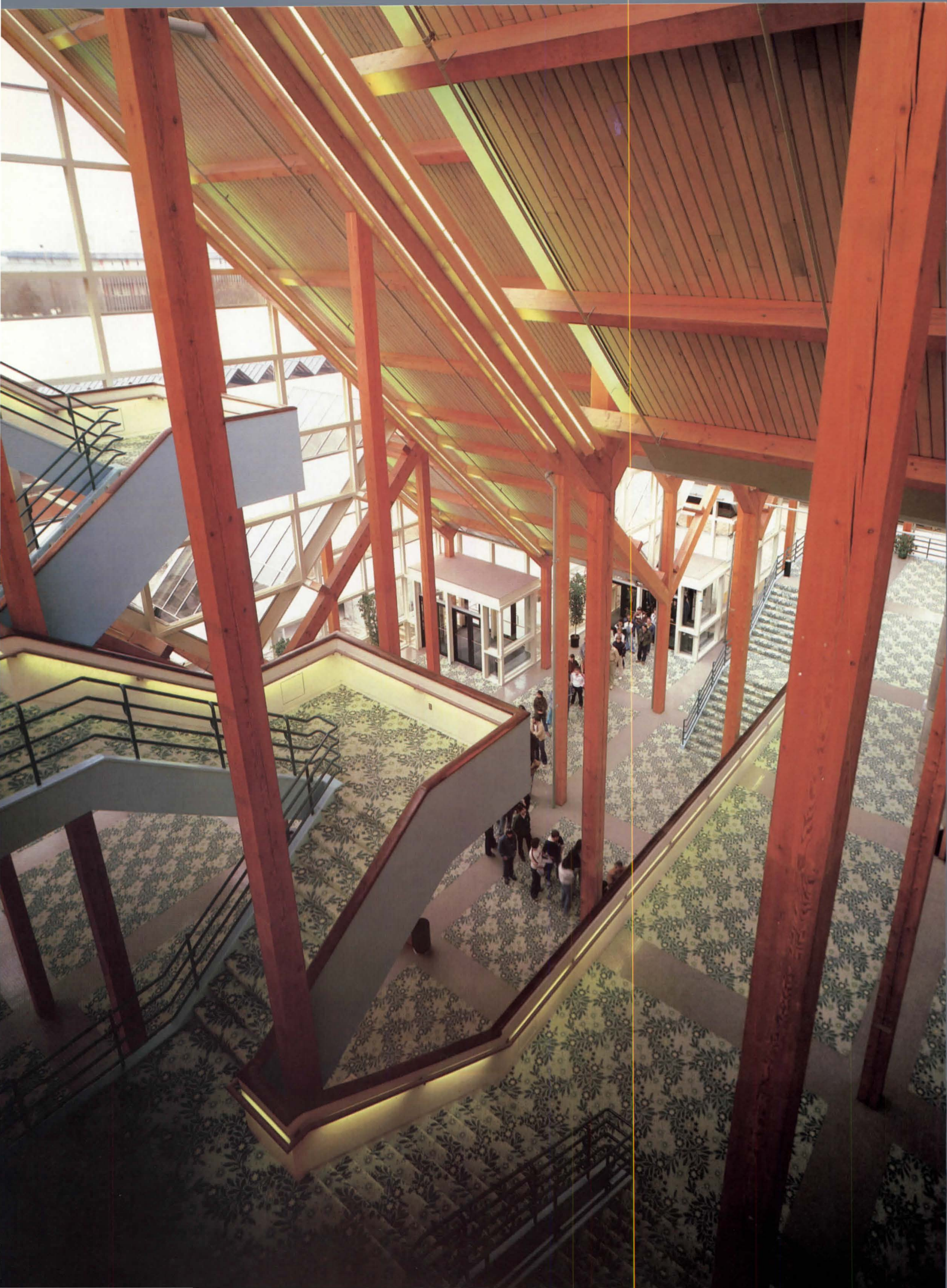
The \$24.1-million Hult Center for the Performing Arts consists of the Silva Concert Hall (2,531 seats) and the Soren Theater (515 seats), a lobby shared by both facilities and auxiliary spaces. A 515-car parking garage, built for an additional \$4.5 million, is separated by a service drive but connects to the lobby mezzanine by an enclosed bridge and passageway. Each auditorium is enclosed in a poured-in-place,

flat-roofed concrete shell. Because the site is noisy (a highway and a railroad track are nearby), this choice was made partially for acoustic reasons. Concrete also turned out to be the most feasible economic alternative at that time. In spectacular contrast to the gray and dense concrete, the four-tiered lobby is sheathed in alternating bands of transparent, semitransparent and opaque tinted

glass and defined by a series of steep roofs, each finished with standing seam metal on one pitch, skylights on the other, and supported by Douglas fir columns and beams. Viewed from the outside in daylight (below and overleaf) the lobby has a dark and jagged silhouette which echoes the nearby evergreen treetops. As seen at dusk (bottom left and cover) and in the evening, the interior

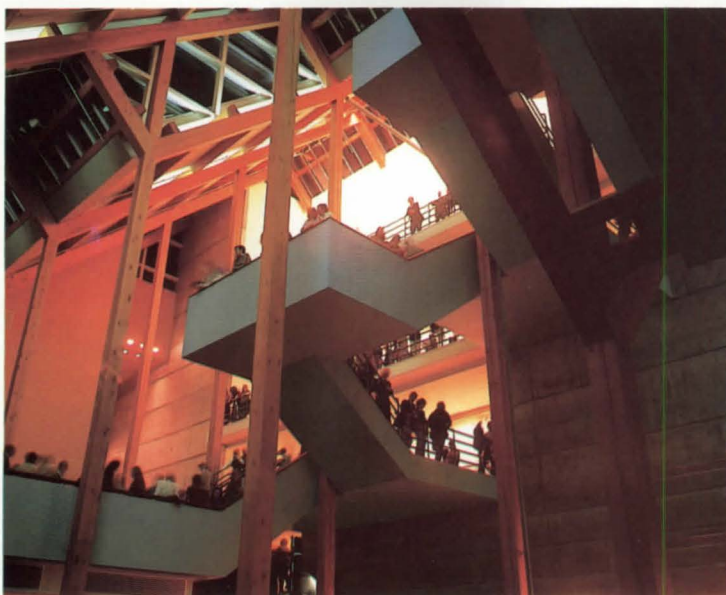
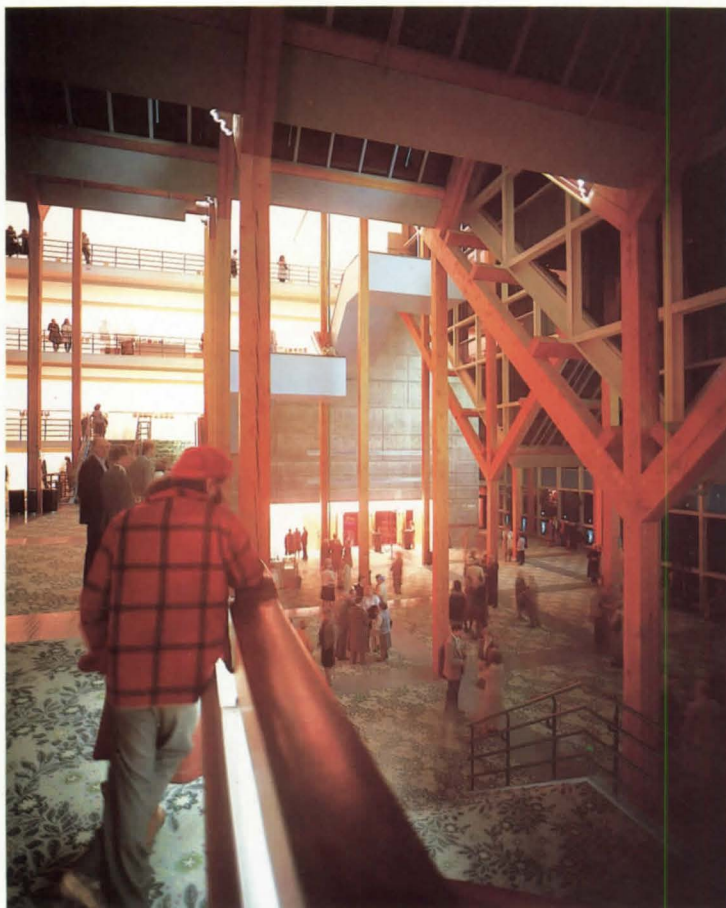
illumination is revealed in stripes, varied by the color and texture of the bands of glass. To the east just beyond the block indicated on the site plan, the performing-arts center adjoins a recently completed 12-story Hilton, a Eugene community conference center, and an additional 300-car parking facility, all designed by other firms but part of a master plan for both blocks prepared by HHPA.





Hugh Hardy, Malcolm Holzman and Norman Pfeiffer deny to a man that the inspiration for the lobby design was an evergreen forest and that the flowered carpet, designed by Hardy, is meant to suggest the woodland floor. "We wouldn't do anything so obvious," they insist. Although strolling through this lofty pinery isn't quite like hiking the Cascades, the great room is a splendid act of homage to

Eugene's silviculture and a wonderful space to be in. As the only major room in the center in which daylight is allowed to penetrate, the lobby welcomes it (left) through skylights and a glass curtain wall. At night (below), an unobtrusive lighting system washes the concrete walls of the auditoriums. The cantilevered staircases are of reinforced concrete.

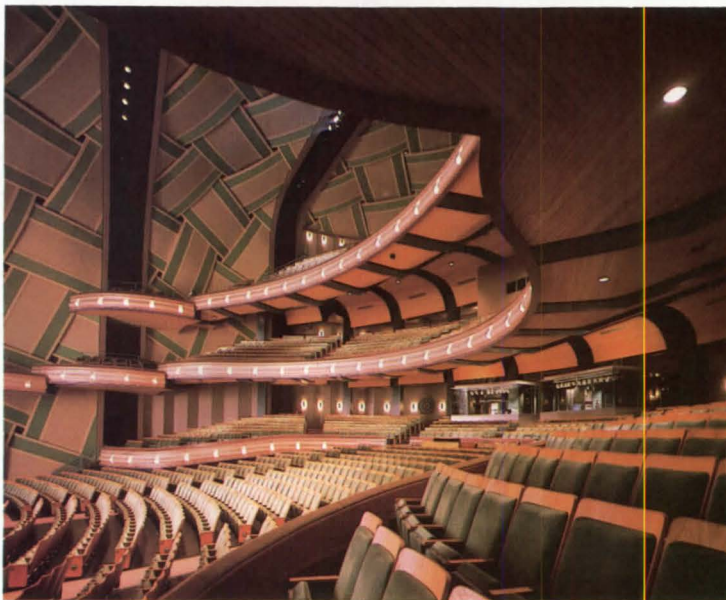
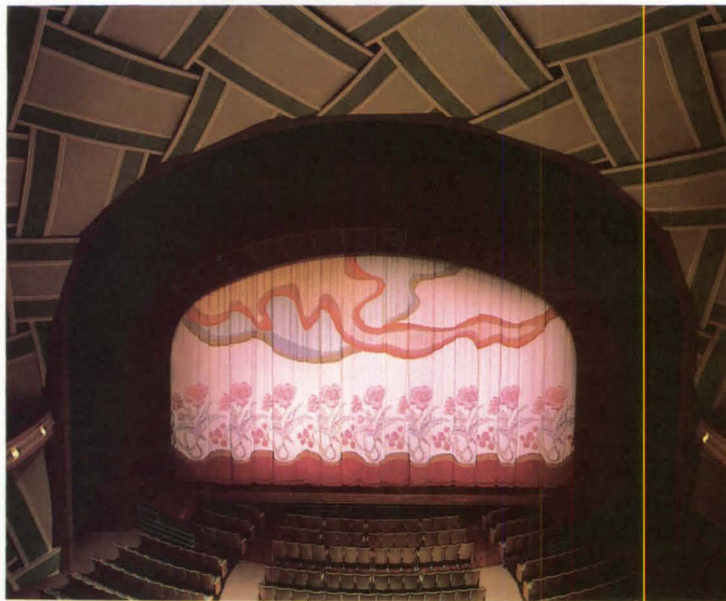


The umbrella is one of six life-size, realistic cast-bronze sculptures by Seattle artist Anita Fiske, located throughout the performing-arts building. The others include a broom, hat, glove, cup, spoon and a ticket envelope. The apple-green tile flooring at the base of the column helps define the lobby module and frames the carpet pattern (which would otherwise appear endless and scaleless).

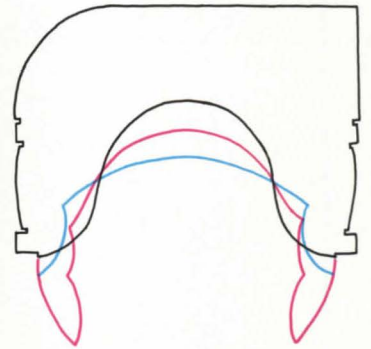
The easiest way to assemble the wood frame of the lobby would have been to use visible steel plates, brackets, bolts and rivets. HHPA, believing this commonplace technique to be inappropriate for a space which aspired to elegance, invited their structural consultants, William LeMessurier and Wayne C. King, to make the connections invisible. Thanks to more engineering than can be described

here and as many hidden steel plates as can be imagined, only small clusters of barely visible wooden plugs (concealing bolts), mark the smooth interconnections of column, girder and brace. The tallest columns are approximately 70 feet high and consist of three trees spliced. All columns are 12 by 12 inches, thick enough to provide fire protection for the hidden steel.

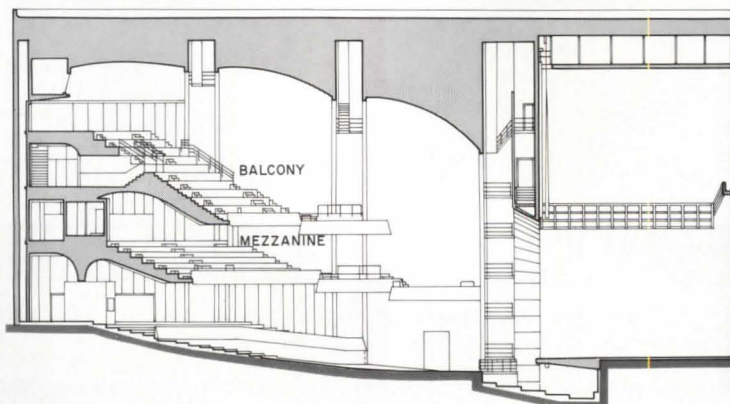
HHPA turned to Baroque and Neo-Baroque precedents (1650-1870) in the design of the Silva Concert Hall, the larger of the two auditoriums (this page and opposite), using a proscenium stage and inventing an axial, symmetrical, and more-or-less horseshoe-shaped auditorium which recalls in plan configuration the Schauspielhaus in Dresden (1914) and the Hoftheater in Weimar (1908). The curve of the proscenium arch is by courtesy of Dankmar Adler's and Louis Sullivan's Chicago Auditorium-Theater of 1889. Just a few more curves—cyma reversa plaster moldings of the balcony fascias—and the architects come to the end of their return to classical principles. Everything else that is important in this remarkable hall is the first of its kind—including, most spectacularly, the ceiling. HHPA wanted the room to have as little differentiation as possible between the ceiling and the walls. This called for a rounded shape which they also wished to divide into big segments to make the huge space seem smaller. The present shape was first thought of (so it has been said), when one of its architects held an inverted peach basket up to the sky to see the little dots of light come through. As installed there is no light above it or on it. (Lighting consultant Paul Marantz thought either effect would be too overpowering.) Fabricated by Benny Bartel Company, it consists of 18- by 21-foot shallow convex arcs with plaster centers and wire mesh borders, suspended from armatures attached to the precast bridge girders of the roof. The material behind the wire mesh borders is either absorptive or reflective depending on the acoustic role each panel plays according to its position



in the room. Such backing has been permanently installed and is not adjustable. Another first for HHPA are the balcony-plan profiles. As the diagram below indicates, the loge, mezzanine and balcony each has its own curve (in most concert halls they match). Further, as can be seen in the section, the balcony juts ahead of the mezzanine. Thus the biggest overhang is the highest up and as few people as possible are tucked under a low balcony (poor acoustics), and as many as possible are nearer the reverberant ceiling (a better place to hear). The beautiful stage curtain is ornamented with realistic blackberry bushes silk-screened on velour, and abstract clouds appliquéd. It is the work of two artists from the region, Margaret Matson and Mollie Favour, was made by Stagecraft Inc. of Portland and cost \$78,165.



Norman McGrath









1



2



3



4

The small Soreng Theater (left and below) encourages experimental staging techniques. Offering a different set of options from the Silva Concert Hall, it is asymmetrical, without a permanent proscenium, and allows performers and the audience to intermingle. Two essential functional elements become the decoration: the acoustical surfaces (left) and the edge-lit catwalk frames (below).



The performing-arts center is a treasure trove of locally created art and craft and includes occasional works by artists living elsewhere. More than 600 tiles made of iron red clay (1) band the exterior concrete of the Silva Concert Hall and continue into the lobby. They were produced at Catpaw Pottery in Portland. The center includes a series of porcelain masks by Mary Ann Fariello (2). Artist Dan Corbin did a series of raku life masks (3). There are 88 masks in all, by 12 different artists, ranging from realistic to abstract, from flat to three dimensional—and each is an image of the human face. Taken together they suggest the entire range of human emotion. Decorating the restrooms are sequences of tiles by Ann Storrs of Portland, including a series of an actor putting on makeup (4).

Hult Center for the Performing Arts
Eugene, Oregon

Owner:

The City of Eugene

Architects:

Hardy Holzman Pfeiffer Associates—Norman Pfeiffer, partner-in-charge; Harris Feinn, Alec Gibson, project architects; Gerald McDonnell, project field manager; Joan Chan, James Despirito, Maurice Farinas, Jaime Fournier, Leslie Lu, Vincent James, Carol Maryan, Brian Principe, Robert Reno, Craig Swanson, team; Leah Madrid, Darlene Fridstein, interiors; Hilda Lowenberg, construction

Associated local architects:

Lutes/Sanetel Architects

Engineers:

LeMessurier Associates/SCI (structural); Syska & Hennessy, Inc., Marquess Engineering Company (mechanical, electrical, plumbing)

Consultants:

Jaffe Associates, Inc. (acoustics); Jules Fisher Associates Inc. (theater design/stage lighting); Jules Fisher & Paul Marantz, Inc. (architectural lighting); Boyce Nemec Designs (film presentation); Mitchell & Nelson Associates, Inc. (landscape architects); Emile Mortier (code consultant)

Construction manager:

Todd Building Company

Adjustable acoustics derive from two electronic systems

Few communities can afford to dedicate a performing-arts building to a single facility such as a concert hall. Most of the time when diverse performing-arts groups use the same building, the public has to accept a compromise in acoustical fare.

Generally, the room characteristics that determine whether a room is satisfactory for speech or music, "dead" or "alive," are the volume of the room, its shape, and its ratio of hard to absorbent surfaces. In recent years some acousticians have "tamed" rooms acoustically live enough for symphonic music by providing absorptive banners that can be drawn from storage pockets to cloak portions of walls and make the space acoustically taut enough for the likes of actors and jazz bands.

Christopher Jaffe's approach to providing variable acoustics for the Silva Concert Hall is different—it's electronic. He planned the acoustics around two highly sophisticated sound systems that, through electronic wizardry, are designed to make the room more or less acoustically reverberant, and more or less acoustically intimate.

This is no *ordinary* amplified sound, however, but sound "tailored" and "groomed" to restore acoustical qualities. It was designed to restore, first of all, reverberation that was physically designed out of the room so that it is suitable for drama or for light opera. And the amplified sound also was designed to provide "acoustical intimacy" for music—an intimacy that is not present naturally in Silva Hall because of the room's shape and design. In concert halls designed exclusively for orchestral music, intimacy is achieved by early reflections of sound from close-in side walls and from the orchestra extending into the audience chamber. At Eugene the ERES electronic system is intended to compensate for the orchestra's position behind a proscenium and for the wider spacing of the walls.

To prevent reverberant sound developing when not wanted, Jaffe made the ceiling partly sound-absorbent. A selected portion of the dark strips of the basket-weave ceiling have fiberglass batts, but the larger lighter-colored panels are hard plaster and convex-shaped to reflect sound diffusely. The sound-absorbent materials are disposed as follows: 1) behind all dark strips in the first ceiling arch between proscenium and the first light slot, commencing above the heads of occupants in the first balcony, 2) second arch—none, 3) third arch—all dark strips. This amount of sound absorption reduces the natural reverberation time of the occupied hall, to about 1.3 seconds—very dry for music which needs reverberation times closer to 1.8 seconds, more or less.

Along with warmth, body and clarity, intimacy is a prized subtle acoustical attribute of concert halls. For intimacy to be present, early lateral reflections (from side walls in conventional halls) need to reach the listener about 20 milliseconds after the direct sound. To provide an electronic replacement for close-in side walls (or overhead saucer-like reflectors which have been used in a number of recent hall designs), Jaffe turned to a sound system he developed called Electronic Reflected Energy System. With ERES, strategically located loudspeakers are fed an electrical signal, originating from a single microphone in the shell over the orchestra, which is amplified and delayed electronically so that it reaches the listener at the same time as would natural reflections. The ERES system provides augmented sound in the broad range of 250 to 6,000 cycles. For the ERES system in Silva Hall, Jaffe mounted one column-type loudspeaker behind each leg of the mesh-enclosed proscenium arch, one speaker at the extreme edge of the first lighting catwalk, and four speakers, spaced equidistantly, along the second lighting catwalk. The ERES sound also is mixed with amplified

two groups of under-balcony speakers, 14 in each.

To add reverberation to the hall electronically, Jaffe drew on the expertise of engineers from AIRO (Acoustical Investigation & Research Organization) from Hertfordshire, England. Since the invention of the Assisted Resonance system by British building-research scientist P.H. Parkin to remedy the "dryness" of London's Royal Festival Hall (1969), AIRO has had the license for designing and installing these systems and has completed 12, altogether, in England, Europe and the United States. And of these 12, Christopher Jaffe has put in four. The Assisted Resonance system at Eugene electronically converts the dry (1.3 RT) hall to one that can have reverberation times up to 1.8, and even over 2 if desired. Any number of over-all settings (programs) can be developed for music ranging from opera through baroque, classical and romantic symphony. But for the time being, until the owner/operators of the Eugene facility have more experience, they will use three settings.

Basically, reverberation is merely the decay of sound energy. For reverberation time to be lengthened, sound energy has to be added to the dry room over the frequency range of importance, 63 to 1,200 Hz (cycles). "Essentially," says an AIRO technical paper, "Assisted Resonance employs acoustic feedback via the normal modes of vibration of a hall to increase the reverberation time. The principle of Assisted Resonance simply is to place a loudspeaker at a peak in the acoustic pressure response of the room and a microphone at another peak, to connect them with an amplifier, and to adjust the loop thus formed to be in phase so that an increase in amplifier gain will increase the reverberation time—stopping somewhat short of the point that results in feedback 'howl.' To prevent any coloration being introduced by the hall's response to a broad-band feedback system, Parkin, in the original Royal Festival Hall installation, made his loops comprising loudspeaker, microphone and amplifier (now known as channels) frequency selective so that any number of channels with a designed frequency separation could be used to modify the reverberation characteristics over a given range."

The Assisted Resonance system for Silva Hall consists of 90 microphones shielded within 90 tuned resonators that are strung along, and just slightly above, the catwalk of the first lighting slot. Signals from these 90 microphones are transmitted to a control room adjacent to the stage where, in a computer-controlled console, the sound is phase-adjusted, filtered and amplified. In its tailored and amplified condition, this sound is sent to 90 loudspeakers distributed in groups of six on stiff boards located above the catwalk of the lighting arch farthest from the stage. The 90 closed loops of the microphone, the electronic phasing, shaping and amplification, and the speaker develop the basic reverberant sound energy in excess of that naturally occurring in the hall. Sound from the 90 resonator microphones also is mixed and combined with Electronic Reflected Energy signal to be fed to six loudspeakers behind the proscenium, three in each leg, facing away from the auditorium so as to obtain delay and a better mix of the two sound sources. This same sound is fed to a series of 14 loudspeakers under each of the balconies to overcome acoustic "shadow."

What is the quality of the hall's sound? The warmth and blend are there. And one could not detect the electronically developed sound. But because the under-balcony ERES system was not adjusted until several months after the opening, the efficacy of the ERES system in providing an intimacy of sound remains to be judged. While the owner hoped for concert-hall quality, he also required acoustical versatility for multifunctional events—

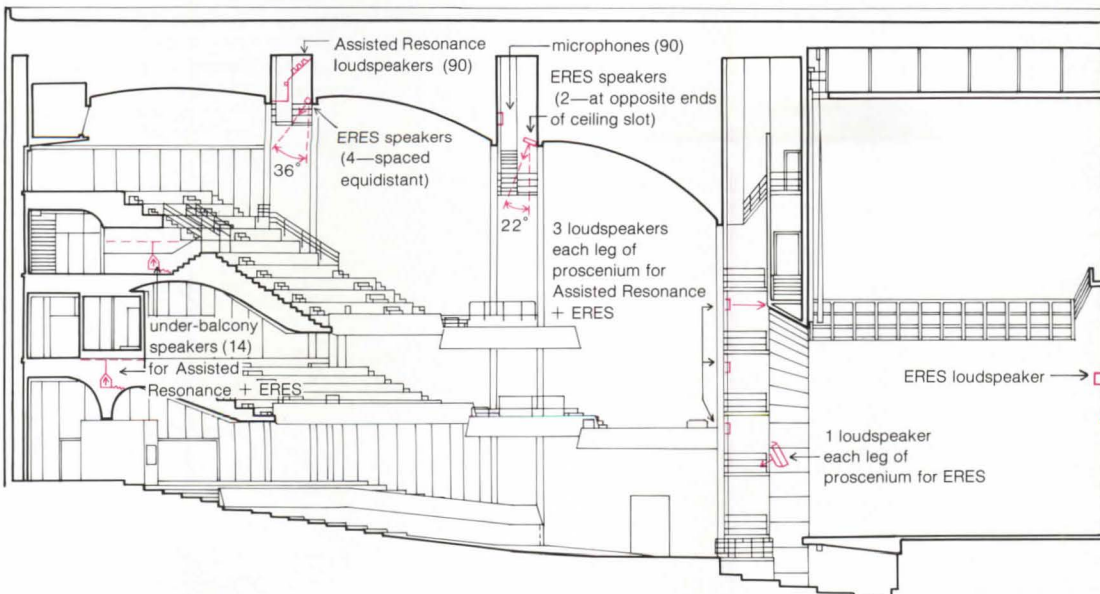
While the light-colored patches of the basket-weave ceiling are "hard" and convex to diffuse sound in the hall, the dark-green narrow strips are sound-absorptive in the ceiling arch nearest the stage and in the arch above the second balcony to reduce the natural reverberation time of the hall to about 1.3 seconds. This makes the room suitable for the speech of dramatic productions. To restore the room's acoustical

liveness for musical performance, Christopher Jaffe provided an electronic Assisted Resonance system. The basic elements of this system located in the auditorium are a series of 90 microphones hung from the catwalk of the lighting slot nearest the stage, and 90 loudspeakers above the catwalk of the lighting slot farthest from the stage. To make the room acoustically intimate, Jaffe used

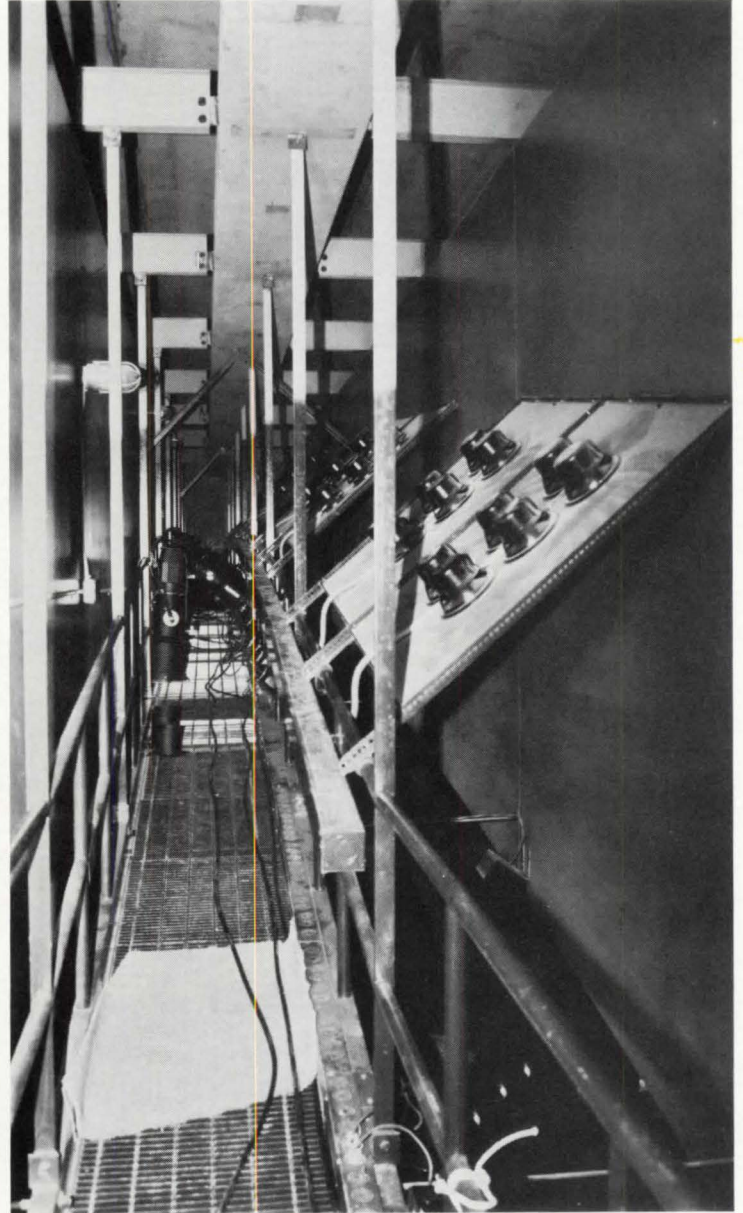
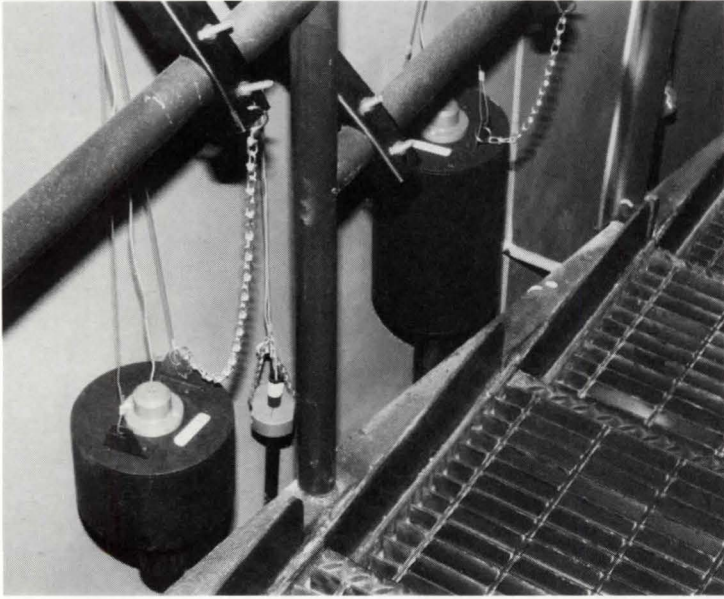
on Electronic Reflected Energy System (ERES) that delays sound electronically. Speakers dedicated to the ERES system are four in the rearmost lighting slot, two behind the proscenium, and one at the back of the stage. ERES sound also is mixed with Assisted Resonance sound for six proscenium speakers and for under-balcony speakers.



Timothy Hursley



The basic elements of the Assisted Resonance system include 90 microphones inside Helmholtz and tubular (quarter-wave-length) resonators (top, left), 90 board-mounted speakers above a lighting catwalk (right), and a computerized console (bottom, left).



Robert E. Fischer photos

The purpose of the resonators is to limit the sound picked up by the microphones to discrete narrow bandwidths in a range from 63 to 1250 Hz). This allows these narrow bandwidths to be amplified separately so that particular patterns of reverberation can be developed appropriate for different types of music—baroque, classical, romantic. How much of each bandwidth is amplified by the

system is determined first by trial and error. Once a particular series of settings proves satisfactory, this information is stored on a floppy disc that gives a permanent record of the settings, and provides input to the computer.

The schematic diagram shows the components and illustrates the logic of the Assisted Resonance system for Silva Concert Hall. One input amplifier is provided for every two resonator microphones to reduce their number by half, as well as the subsequent electronic components, except for the 90 main speakers. The signals are phase-adjusted so that the signals leaving the microphones are in phase with the

sound emitted by loudspeakers to form a sound-amplification loop that makes it possible to develop and vary reverberant energy electronically. While the basic variable reverberant energy is developed by the channel loops, conditioned sound from the 90 channels also is tapped off for mixing with Electronic Reflected Energy sound for the under-balcony speakers and the six proscenium

speakers. The table at the bottom of the page illustrates how Christopher Jaffe might select different gain steps for different frequency ranges to establish one particular reverberation decay curve, and thus one quality of reverberant sound.

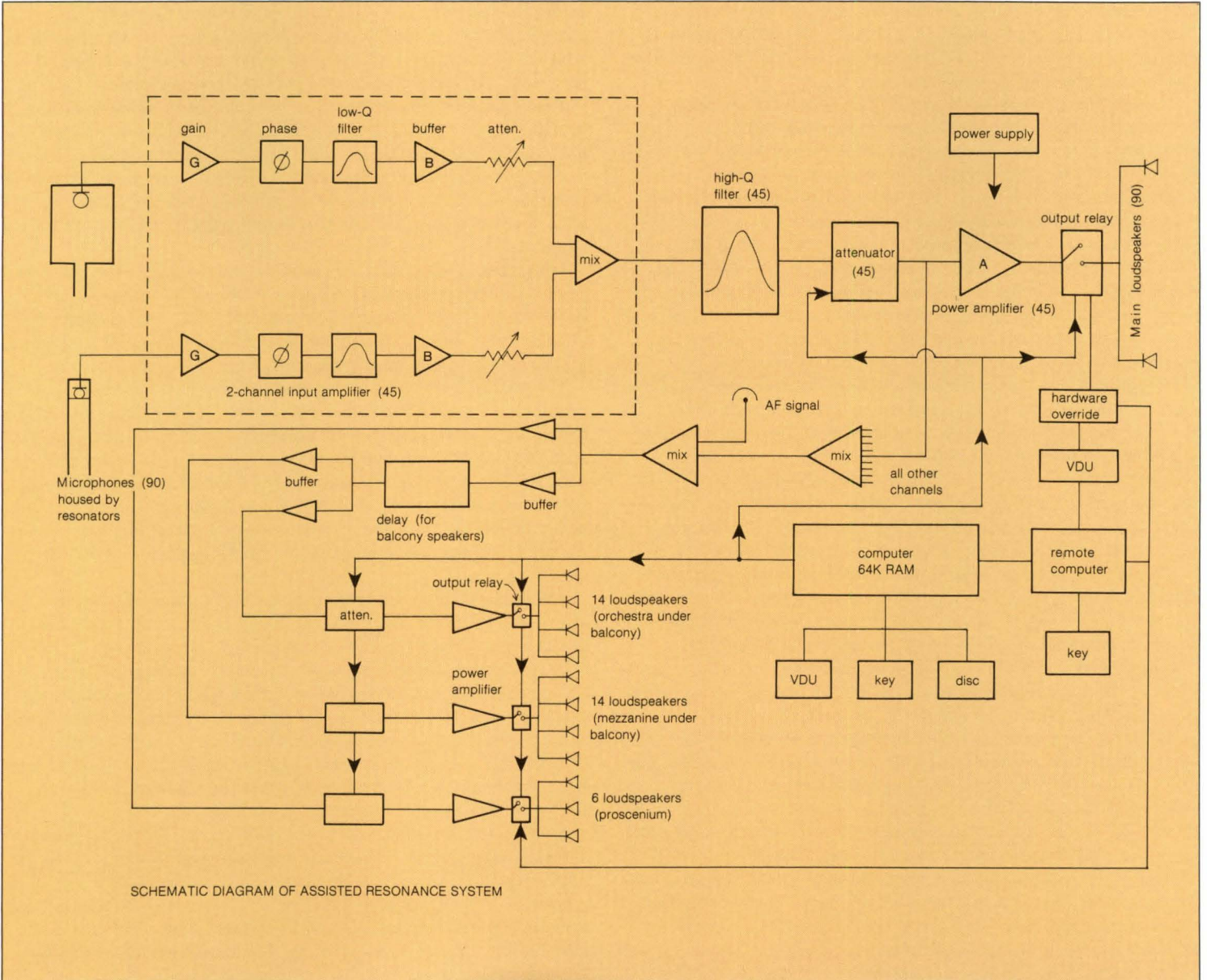


Chart by Peter W. Barnett of AIRO

Reverberation Times, seconds						
Frequency, Hz	63	125	250	500	1000	
Gain Steps	0	1.7	1.7	1.6	1.5	1.3
	+1	1.8	1.9	1.8	1.8	1.4
	+2	2.0	2.1	2.0	1.8	1.4
	+3	2.3	2.3	2.0	1.9	1.5
	+4	2.5	2.5	2.2	2.0	1.5
	+5	2.8	2.9	2.3	2.3	1.6
	+6	3.0	3.1	2.5	2.3	1.6
	+7	3.3	3.2	2.6	2.4	1.8
	+8	3.5	3.5	2.8	2.6	2.0
	+10	----- unstable -----				

Roofing in transition: implications of a new technology

*A detailed survey of the new materials;
coming in July: putting them to work*

The ability of a roof to withstand the rigors of weather from Maine to California depends on: 1) quality of workmanship, 2) quality of materials, and 3) how well its designers and installers understand the roof as a system.

The built-up roof (BUR) changed little in a hundred years because it worked well. Newer insulated roofs and large-area structures, however, presented problems of movement and stress that went unrecognized until failures began to occur frequently.

The success of roofing, as with any field-fabricated building component—but probably more so with roofing because of its severe exposure—can vary greatly with workmanship and weather conditions at the time of installation. Moreover, the fundamental integrity of the built-up roofing membrane is only as good as the longevity of the bitumens (asphalt or coal tar)—materials that are by-products of chemical processes and not compounded to suit specific environmental conditions.

Recognizing the limitations of the built-up roof—an ingenious system in many ways—and with an awareness of the huge market that roofing represents, a number of chemically based manufacturers used their expertise to combine synthetic polymers and other additives into sheets of a single ply. These materials have varying degrees of tensile strength, inertness to certain chemicals and pollutants, and resistance to abrasion, ultraviolet light, and fire, among other characteristics.

Single-ply materials are at once simpler and more complex than built-up roofing. Their installation can proceed much faster. But the uniqueness of each type requires different techniques for seaming, attachment, ultraviolet protection, and flashing.

While these complexities can be bewildering at times, even to those with long experience in the roofing industry, the architect cannot simply take a “let Joe do it” attitude. He should understand basic materials and installation procedures so that he can evaluate the suitability of different systems for a given job, and talk intelligently to the roofing contractor and owner. (In addition to learning from the growing body of technical literature, the architect can extend his knowledge through some of the outstanding seminar programs that exist.)

Many owners—as well as some architects—look to guarantees for assurance that the roofing work will be properly done. But there are “guarantees” and there are “guarantees.” In a sense, they tend to promote false security.

The real way to achieve quality work is, of course, for the

owner and architect to work with knowledgeable, reputable contractors and manufacturers—particularly with manufacturers who have competent and adequate technical staffs and field forces—to review drawings and inspect the field work.

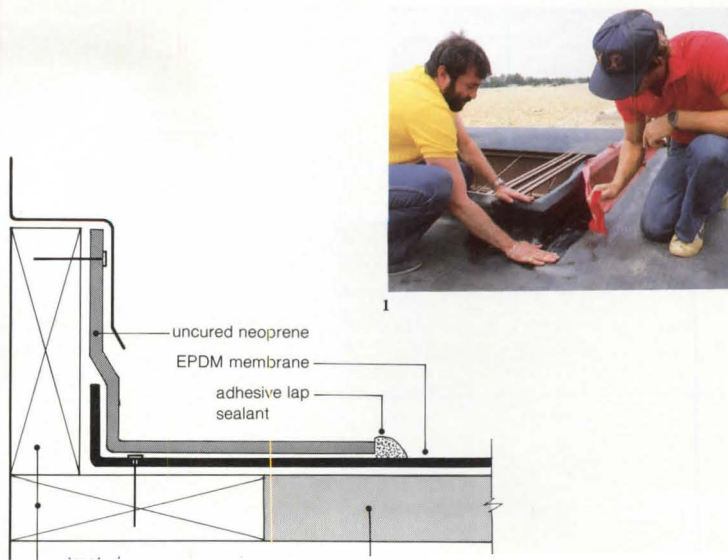
Traditional roofing contractors have not been quick to rush into single-ply roofing. For one thing, the skills used with BUR are not readily transferable to single ply. And finally, these contractors have capital investments in BUR equipment. But some progressive roofing contractors have familiarized themselves with the new materials, and can install both types of roofs with equal skill.

Manufacturers of built-up roofing products have responded to competition from the wide range of new roofing materials by improving the performance of BUR mainly through stronger, more durable felts, and by improving workmanship through contractor training and qualification programs.

The goal of a recently introduced two-ply built-up roofing system is to reduce field labor while ensuring serviceability by providing the requisite tensile strength in the reinforcement of each of the plies, and by establishing a rigorous training and qualification program for contractors. Closely allied to built-up roofs, but nevertheless members of the single-ply family, are the newly developed modified bitumens—asphalt modified with plastic or rubber-like compounds to give elasticity to fabricated sheets.

While single-ply roofing materials are no panacea, they do afford the architect an extremely broad range of options in basic performance characteristics. Among these are inherent waterproofness, tensile strength, flexibility, resistance to chemicals, and, in addition, some highly desirable architectural features such as color and conformance to unusual and steep roof shapes. And, to the owner's benefit, because of heightened competition with many large companies involved, the cost of an R-20, loose laid single-ply roof is about the same as a built-up roof with equivalent insulation.

As a general introduction to the subject, the following pages show, in some detail, progress in built-up roofing, the implications of bitumen metamorphosed into single-ply materials, the emergence of new substrates that insulate and also provide a substance for the positive attachment of membranes, and, finally, the broad range of chemical and thermal techniques for joining one sheet to another. *James B. Gardner*





As if in the midst of covering the infield, these roofing workers tug on a synthetic rubber EPDM (ethylene propylene diene monomer) single-ply membrane to lay it over a large-area metal deck insulated with blocks of polystyrene. For such large, flat roofs, EPDM sheets may be as large as 50 by 150 feet. This large-sheet installation is just one of many differences between this type of single-ply membrane and built-up roofing; another is that this membrane will be loosely laid and held down with a ballast of smooth-faced gravel. Manufacturers supply EPDM in such large sheets to minimize the number of field seams. The large sheets are made by assembling smaller production-sized panels of the membrane in the factory before the product is fully vulcanized. When shipped, the EPDM membrane is cured rubber

and field seams generally can be made only by using a contact adhesive which requires care in its application. Because EPDM does not conform easily to doubly-curved surfaces, penetrations and terminations of the membrane are sealed with a more pliable material such as uncured neoprene (photo 1 and drawing, left).

The roof must be designed and built as a system so that its components perform as intended and extend its life

With interest in single ply running high among designers and owners, and manufacturers adding production capacity and increasing educational and promotional efforts, it's a good guess that 40 per cent of commercial and industrial roofs will be single ply by 1987. Still, built-up roofing is likely to predominate for some time because of its lower installed cost and some owners' preference. Furthermore, BUR manufacturers are also making improvements in both materials and application techniques. Important examples, illustrated in the first four photos at right, include new types of fiberglass felts, and equipment and techniques that speed installation and ensure more uniform laying of felts and asphalt.

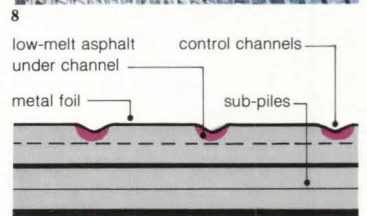
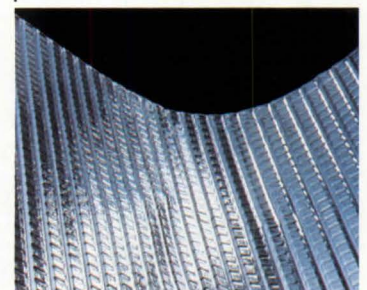
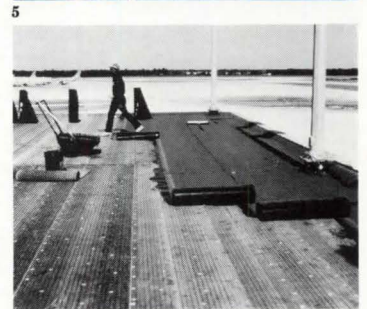
Fiberglass felts are increasingly used because they are much stronger than organic materials and because asbestos felts are off the market. The relatively high porosity of the fiberglass ply sheets allows gases or moisture which might be present on the felt ply or the substrate to escape when hot bitumen (asphalt or coal-tar pitch) is applied. Because it is the asphalt or other bitumen that keeps water from penetrating the roof, workmanship is exceedingly important. To obtain a good waterproof membrane, uniform layers of bitumen are a must, and this requires that roofers not only lay the bitumen evenly but avoid foot traffic which can squeeze out bitumen and leave voids. The felts keep the bitumen from running in hot weather and also help it resist shrinkage in cold weather to prevent alligatoring.



Modified bitumen—one of the early single-ply materials—consists of asphalt blended with plastic- or rubber-like materials to add elasticity and a reinforcement to add tensile strength. This approach is favored by some roofing contractors because of its family resemblance to built-up roofing. Modified bitumens are commonly seamed and fastened to the roof substrate by heating them with a torch. One type of modifying material—sequenced butadiene styrene, or SBS—is sensitive to ultraviolet light, so the exposed top layer of these sheets generally must be protected by granules, metallic foil or polyethylene film. A tactic polypropylene, a second common modifier, offers good weathering properties and requires only heat to flow (it is therefore a good torchable product), but it has less low temperature flexibility. Reinforcing materials such as fiberglass, polyethylene and polyester are applied randomly or in various mats to give the sheet strength.

Finished products come in rolls or sheets and can be torched to a substrate with automated equipment (5), set in hot asphalt (6) or other adhesives, or adhered to prepared substrates with factory-applied adhesives. Monolithic seams, which are often stronger than the sheets they join, are produced by torch welding some materials (7). Embossed control channels in an aluminum or copper facing, and a layer of low-melt asphalt (8, 9) enable the protective metal to expand or contract without splitting or delaminating from the sub-plies of this two-part composite system.

1. GAF Corporation
- 2., 3. Owens-Corning Fiberglass Corporation
4. Manville Building Materials Corporation
5. Owens-Corning Fiberglass Corporation
6. Tamko Asphalt Products, Inc.
7. Koppers Company, Inc.
- 8., 9. Siplast, Inc.
10. Manville Building Materials Corporation



METAL-CLAD MODIFIED BITUMEN SYSTEM
9

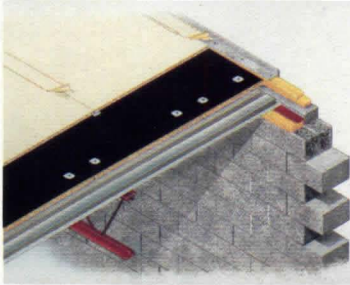
- 11. Benoit Inc.
- 12. ARCO Chemical Company
- 13. Koppers Company, Inc.
- 14. Owens-Corning Fiberglas Corporation
- 15., 16., 17. Dow Chemical U.S.A.

The substrate that underlies any single-ply roofing membrane has several important functions. First, if the membrane is adhered or mechanically fastened, the substrate must keep the membrane from pulling away when the wind produces uplift force—and this uplift can be amplified by parapet walls. Second, for fire-rated roofs, the substrate must have inherent fire resistance or be protected by a fire-resistive material. Third, it must be dimensionally stable; otherwise shrinkage or warping can disrupt the membrane. Fourth, it needs to be compatible with other materials, such as hot asphalt or adhesives used to bond membranes to a substrate. No one material meets all those requirements, so manufacturers have developed composites and product accessories to combine the best qualities of each.

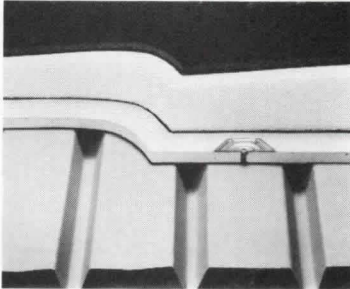
Polyurethane foam, for instance, gains greater dimensional stability, compressive strength and an improved fire rating when it is sandwiched between a fire-rated material such as perlite (10). Isocyanurate, because it has many good qualities by itself, was selected for one manufacturer's all-in-one membrane-insulation laminate (11). Tapered expanded polystyrene (which provides slope to drain) can be used for a hot built-up roof if it is protected from hot asphalt, for instance, with fiberboard (12). Phenolic foam boards, fabricated with corrugated kraft-aluminum facers (13), demonstrate desirable characteristics such as good insulating efficiency and fire resistance, but have only a short record of field use.



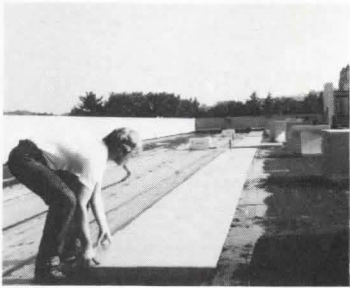
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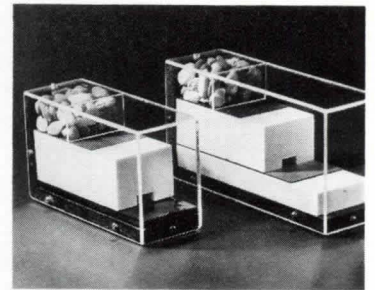


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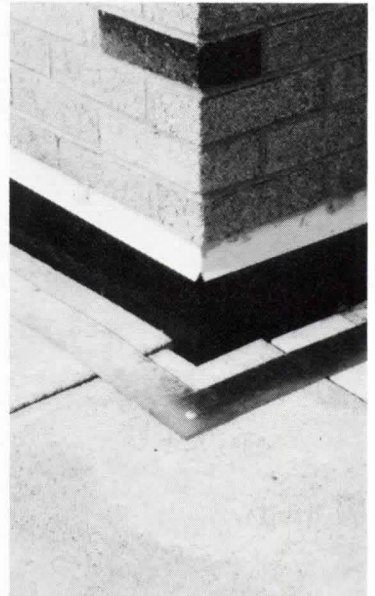


13

Because temperature change and ultraviolet light are the two main enemies of roofing membranes, particularly built-up roofs, some architects and owners have for a number of years favored the patented, protected-membrane roof systems developed by The Dow Chemical Company called IRMA—for Insulated Roof Membrane Assembly. Originally developed for built-up roofs (as an outgrowth of experimentation on one of Dow's own buildings), the IRMA system interposes a protective barrier between adverse weather elements and the roof membrane. The system has been successfully applied to single-ply systems as well. Until recently, extruded polystyrene insulation blocks, which are grooved and tapered for drainage, have been weighted down with stone ballast. Early this year, however, Dow introduced a self-ballasted block—extruded polystyrene bonded to a layer of precast latex-modified concrete. Panels lock together via tongue-and-groove configuration and perimeter fastening bars (16, 17) so that they can float on water and resist strong winds without coming apart. When rounded stones are used as ballast, for a BUR (model at left in photo 15) and single-ply system (model at right) and nonwoven synthetic fabric is placed on top of the insulation to keep stones from falling between joints of the insulation panels and displacing them, and to prevent them from being blown away as the assembly is installed. When a second layer of insulation is required for increased thermal efficiency, it can be placed beneath the membrane.



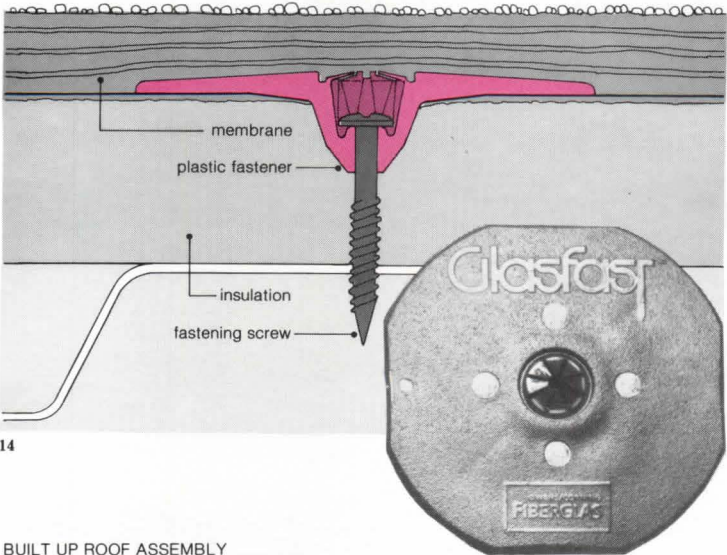
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14

BUILT UP ROOF ASSEMBLY

Recognizing the compressibility of its fiberglass insulation, which is popular in BURs, Owens-Corning Fiberglas Corporation developed a plastic fastening plate that can ride up and down under point stresses such as those produced by foot traffic, without impaling itself or the membrane on the fastening screw which holds the plate to the deck (14).

Attachment methods reflect concerns for wind uplift, building movement, and cost, but vary from material to material

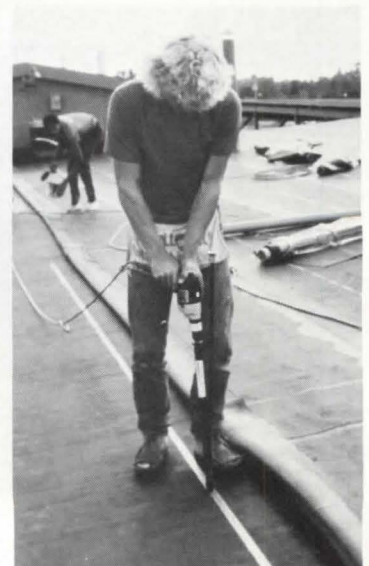
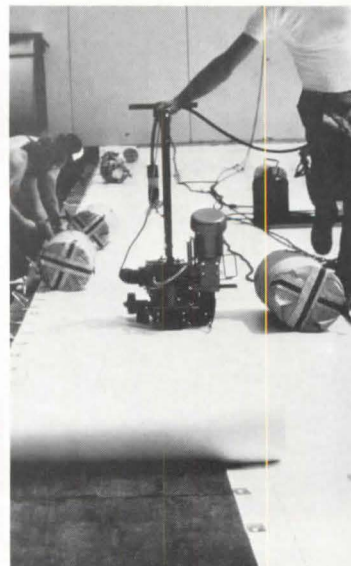
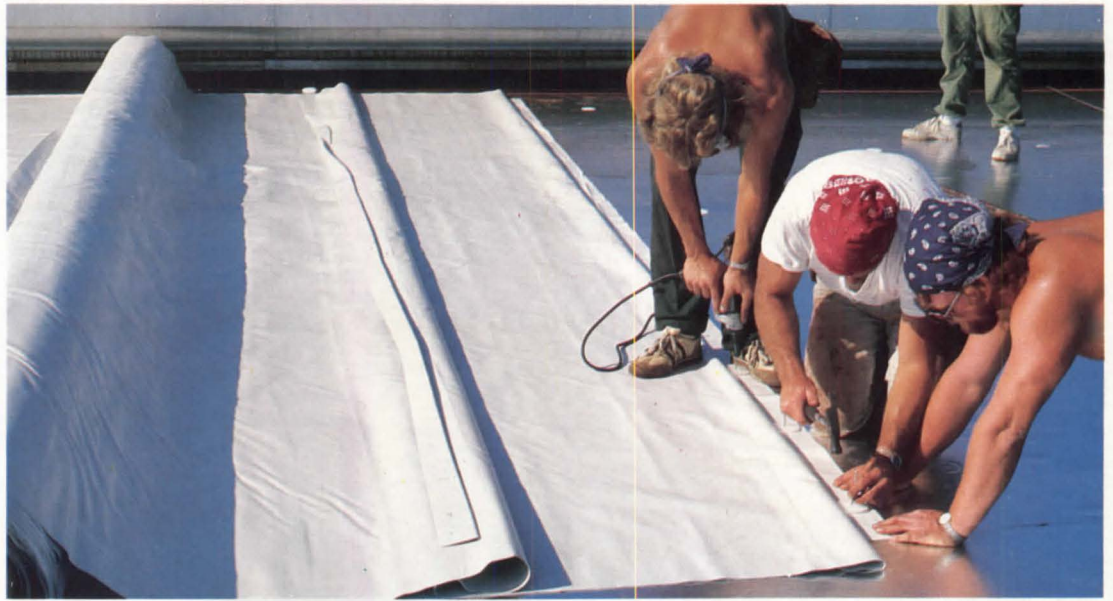
1. Seaman Corporation
2. Kelly Energy Systems, Inc.
3. J.P. Stevens & Co., Inc.
4. Cooley Roofing Systems Inc.
5. The Goodyear Tire and Rubber Company
6. W.R. Grace & Co.
7. Benoit Inc.
8. OTTO® Fabric, Inc.

Single-ply membranes are affixed to the roof in several ways: by the weight of ballast, with mechanical fastening devices, or with adhesives—or with a combination of these techniques. For instance, ballast and mechanical fasteners sometimes are used together near roof perimeters to increase resistance to wind uplift forces. The fastening method, as has been demonstrated by both field and laboratory studies, affects a roof's long-term performance in three important ways: 1) resistance to positive and negative air pressures that could contribute to wind uplift, 2) capacity of a membrane and its seams to absorb stresses and strains that could split or crack it, and 3) resistance of the roof assembly to water should a leak occur, and the degree of difficulty in locating and repairing it.

There are pros and cons to every system:

Ballast adds considerable weight to a roof. High winds can scour the smooth-surfaced gravel from corners—and in severe storms, blow it off. Leaks with this system may be difficult to trace, and troublesome to repair. Labor costs, on the other hand, are comparatively low.

Fully adhered membranes, though more costly, are lightweight. A fully adhered membrane prevents water from migrating beyond its point of entry, but is more susceptible to damage from movement of a substrate. When membranes are mechanically fastened with batten strips or discs, large areas remain unattached and, therefore, stresses are easily transferred from one area to another.



- 9. Carlisle SynTec Systems
- 10. Firestone Industrial Products Company
- 11. Hitchins America Inc.



The wide range of fastening techniques in use is shown in the photos at left. In one mechanical-fastener design (1), a factory-fabricated tab is secured to insulation and anchored to a deck with a nylon disc and a sheet-metal screw or with a toggle-bolt for lightweight concrete. In photo 2, fasteners penetrate hardboard squares, which both hold down the fiberboard substrate and provide contact area for adhering the membrane. Reinforced single-ply membranes, which can better withstand point loads without tearing, can be fastened by securing one sheet edge to the substrate with a row of disc fasteners and the adjacent sheet's edge to the first sheet by heat-welding its seams (3, 4). In a similar technique, a 1-in.-wide, 20-gauge galvanized steel batten secures a nonreinforced elastomeric sheet (5).



Techniques for fully adhered systems include: (6) a modified bituminous composite which workers lay by peeling off a release paper that protects a factory-applied adhesive layer; (7) a composite panel of isocyanurate insulation and EPDM membrane that is set in hot asphalt; (8) a prefabricated silicone-coated fiberglass membrane rolled into a spray-applied silicone adhesive/sealant; (10) a rubber-based contact cement spread on mechanically fastened insulation and overlaid by a similarly treated EPDM membrane and (11), a modified bituminous composite spot-adhered with a hot-applied rubberized asphalt. In ballasted systems, the weight of smooth stones applied with special machines (9), or by hand, holds the membrane in place.

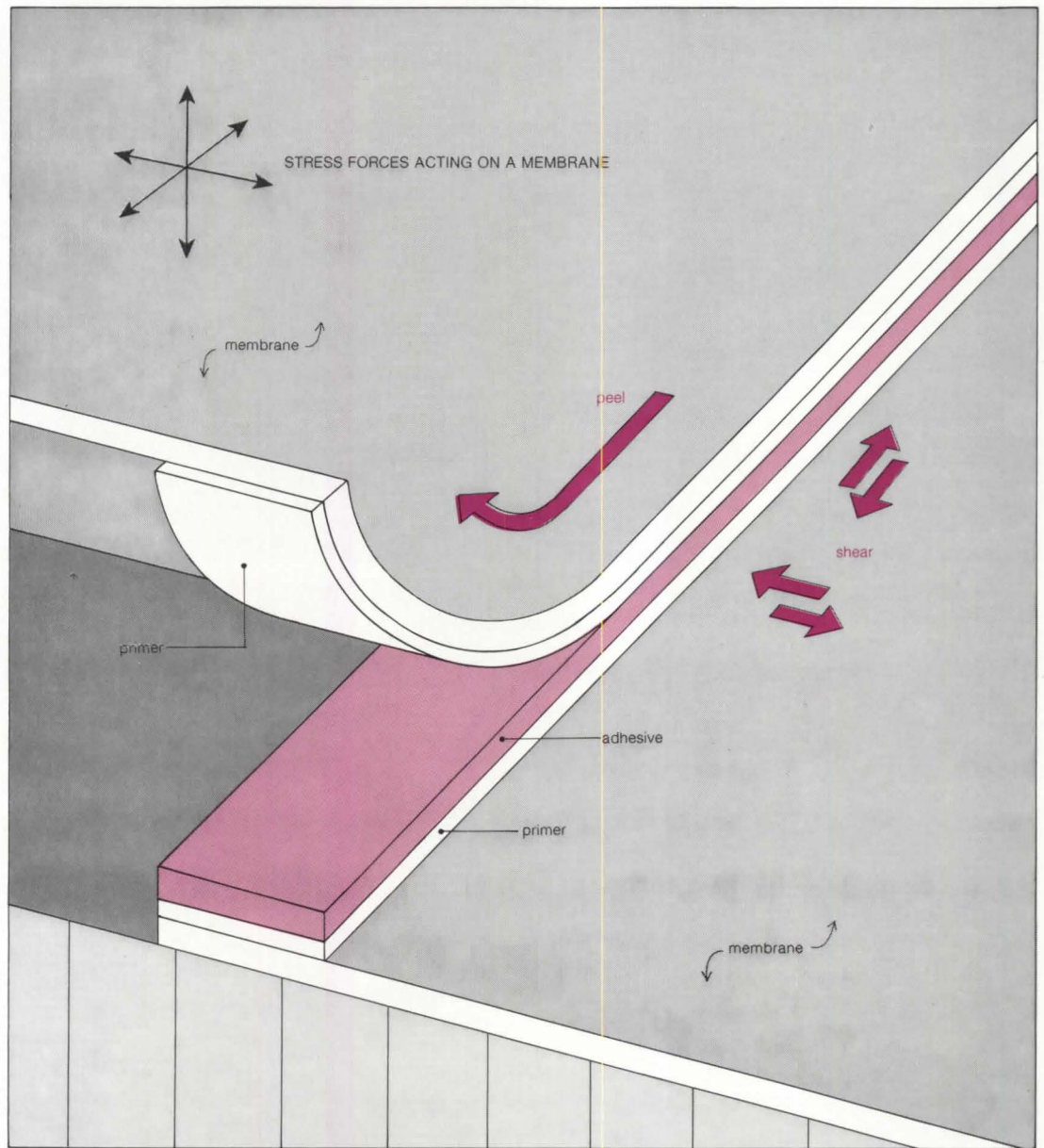


Seams, the most vulnerable aspect of single plies, require workers' vigilance, no matter what the material

- 1, 2. Lord Corporation
3. Manville Building Materials Corporation
4. Benoit Inc.
5. Dynamit Nobel of America Inc.
6. Sarnafil (U.S.) Inc.
7. Dynamit Nobel of America Inc.
8. OTTO® Fabric, Inc.
9. Seaman Corporation
10. Hitchins America Inc.

Fully vulcanized synthetic rubber elastomers—for example, neoprene and EPDM—can be seamed only with a contact adhesive. Because, for most elastomers, this is the only method, “developing adhesives that can produce durable, weathertight seams poses a real challenge for the adhesives technologist,” says Stephen Westley, an adhesives specialist with the Chemical Products Group of Lord Corporation. The difficulty stems from both membrane manufacturing procedures and dependency upon conscientious field installation. During manufacture, a separating material such as mica or talc must be applied to the sheet as it is spooled to keep it from becoming one big mass when it is vulcanized. During installation of EPDM, this film of mica or talc needs to be removed before adhesives are applied so that the sheet’s surface and the adhesive make a better bond.

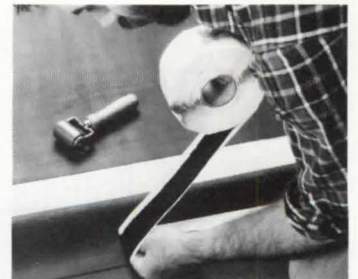
In their study of lap-joint strengths for a loose-laid EPDM (see ASTM SYMPOSIUM STP 790), engineering consultants Rene Dupuis and W. R. Moody recorded the break of an uncleaned lap (at -20F) when the sheet was elongated to 78 per cent beyond its original length. Seam laps of the same sheet, when cleaned according to manufacturer’s instructions, withstood elongation of more than 100 per cent. Lord has developed a primer that improves bonding properties beyond what is obtainable by simply cleaning the lap. “As yet,” Westley admits, “lap strength will be significantly less than the sheet itself, so workmanship is critical.”



2 Stress forces, as shown in the drawing above, challenge roofers to make their field seams with care. Shear stresses, caused by expansion or contraction of a building or the movement of insulation materials or other substrates such as decks, can deform seams, subjecting them to peel forces as well—to which they have less resistance. The



3 photo 2 at left. But before this step, the roofers first treated the EPDM membrane with the adhesive-promoting primer mentioned earlier. In a conventional seaming operation (photo 3) roofers join the laps after the solvent in the contact adhesive has “flashed off” and the adhesive has dried. The laps of a specially processed talcless EPDM



4 adhesive tape that vulcanizes (cures) under sunlight. Once joined, laps are pressed tightly together with a smooth-faced wooden hand roller. Roofers move the roller back and forth across the seam at right angles to the lap-line so that pressure from the roller does not deform the sheet and cause “fishmouths”—wrinkles and



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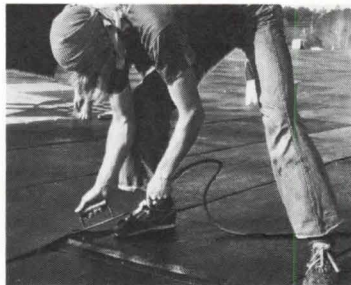
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Heat from an iron (photo 8) accelerates the curing of STK®, a silicone-based adhesive, which is sprayed beneath a silicone-impregnated woven-fiberglass membrane. The iron's surface also helps to encapsulate the exposed edge of the membrane within the sealant to keep it weathertight. (The iron need only be used on very cold days.) With a scrim-reinforced thermoplastic elastomer called

Fibertite® (9), seams placed parallel with the slope of the roof were made with a hot-air welder. To produce a monolithic joint between sheets of Nuralite®, a composite of asphaltic bitumen and encapsulated asbestos fibers, a roofer uses a propane torch and a trowel (10). The seam is torched in a two-stage process from inside to out, to ensure that there are no gaps or voids in the 3-in. lap.

With EPDM and other elastomers, seams are made without the basic material being affected. With thermoplastics, modified bitumen and semicured materials such as Hypalon, however, seams are made by fusing the material by applying heat or chemical solvents. Resultant laps are often stronger than the rest of the sheet.

When Dupuis and Moody studied lap joints for a nonreinforced solvent-welded PVC membrane system, they concluded that the lap joints between sheets were secure, regardless of test temperature (it varied from -20F to 120F). Materials failed—after they elongated to twice their original length—next to the lap, not at its interface. In a second test, designed to measure lap strength of a PVC membrane solvent-welded to PVC-coated metal (the typical method used for terminating the sheet at penetrations and perimeters), the interface consistently remained intact, but the sheet either tore next to the metal, or the PVC coating pulled away from the metal itself.

In the top photo at left, a roofer applies a liquid PVC compound, which welds laps of a PVC membrane, with a dispenser on wheels and then applies a bead of sealant (7), that incorporates a blue dye to show which seams have been sealed and checked. The seaming compound and sealant are very similar in chemical composition to the PVC membrane. For heat-welded membranes, roofers use large self-propelled units (6) for seams between sheets and hand-held units for more exacting work around penetrations.

NEOCON 15

The dates to set aside this year for NEOCON, The World Congress on Environmental Planning and Design, are June 14-17. Held at the Merchandise Mart in Chicago, NEOCON (the National Exposition of Contract Furnishings) marks its 15th year with an ambitious program focusing on the revitalization of world cities. Program highlights include the following:

On Wednesday, June 15, at 4:30, Parisian architect Maurice Culot will join Austrian architect Rob Krier to discuss "The New Architectural Classicism: A European Perspective." (Mr. Culot is the director of the Archives-History Department of the French Institute of Architecture; Mr. Krier, a professor at the Technical University of Vienna).

On Thursday, June 16, at 4:30, Richard Meier will talk about his work and its relation to current directions in American architecture. On Friday, June 17, at noon, the Architects Day Luncheon will be addressed by Nathaniel Owings, the recipient of the AIA Gold Medal to be awarded this month in New Orleans. At 2:30 on the same day, industrial designers Ettore Sottsass and George Sowden will analyze the Memphis collection in a workshop entitled "The Memphis Controversy: Design or fashion?" And at 4:30 a panel discussion, "Architecture in Transition: Skyscraper and Large Urban Facility," will feature: William Pedersen of Kohn Pedersen Fox Associates; James Ingo Freed of I.M. Pei & Partners; and Richard Keating of Skidmore, Owings & Merrill. Also speaking at NEOCON will be developers James W. Rouse, Bernard Weissbourd, and William Wong.

In conjunction with NEOCON 15, the American Institute of Architects will hold its first Midwest regional conference. The dates of the conference, located at The Merchandise Mart, are June 16 through June 18. And located in Expocenter/Chicago directly across from The Mart will be NEOCON International, the annual exhibit of contract furnishings from more than 20 foreign countries. For more information on these and other events, call The Merchandise Mart Communications Office at 312/527-4141.

On the following pages are products to be featured in The Merchandise Mart showrooms throughout NEOCON 15.

1. Handle: The cast aluminum *Modric* lever handle was awarded a 1982 IBD Product Design Award. It is available in satin or a choice of 9 colored finishes. The Ironmonger, Inc., Chicago, Ill.
Circle 300 on reader service card

2. Lamps: The *Facets* series, of solid brass, includes a floor lamp, a table lamp and a wall fixture. All use a PL9W fluorescent bulb, which is equivalent to a 60W incandescent bulb but said to burn for 10,000 hours. Koch + Lowy, Inc., Long Island City, N.Y.
Circle 301 on reader service card

3. Textiles: The *Trooping of the Colors* is a wool corded weave designed by Ward Bennett to introduce primary colors to this manufacturer's collection. Woven in Denmark, it is available in 10 colors. Brickel Associates, Inc., New York City.
Circle 302 on reader service card

4. Chair: The *Aurora*, available as a conference chair with a 19-in. seat height, or a lounge chair, wider and deeper, with a 17-in. seat height, is scaled to save space. It has a steel frame molded in urethane foam and a nylon webbed seat support. Arconas Corp., Mississauga, Ontario.
Circle 303 on reader service card

5. Office system: The *IPA System* consists of machined posts, panels, desks, tops, pedestals and accessories in several sizes. It comes in 3 choices of wood—oak, walnut and mahogany—and/or fabric. Hiebert, Inc., Los Angeles, Calif.
Circle 304 on reader service card

6. Fabrics: Polyester and wool-blend fabrics for panels and seating are available in 119 color and texture possibilities. The collection also includes a 100 per cent polyester basketweave in 26 colors. Haworth, Inc., Holland, Mich.
Circle 305 on reader service card

7. Fabrics: *Petit Point*, *Checkmate*, *Convoy Cloth* and *Mosaic* are 100 per cent wool-pile, color-, pattern- and weave-coordinated upholstery fabrics designed for executive suite applications. Design Tex Fabrics, Inc., Woodside, N.Y.
Circle 306 on reader service card

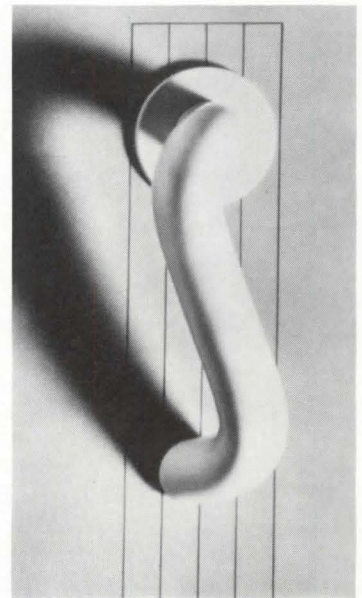
8. Office system: *Metrix* is a low- to moderate-priced line of wood office furniture created from a system of interlocking wood panels that forms desks, credenzas and storage areas. Modular workstations for word processing suitable for private offices or open plans are also available. Croydon Furniture Systems, Inc., Cambridge, Ontario.
Circle 307 on reader service card

9. Office system: *Valencia*, a new wood system available in mahogany and dark and light oak veneers, offers full electronic support capabilities with panels having 2- or 3-circuit wiring. Fixed angle connectors join panels in a straight line or at 45-, 90- or 120-deg angles. Variable height connectors allow panels of different heights to be easily connected. Base trims include wood veneer, polished chrome and any of this manufacturer's SCM paint finishes. Steelcase, Inc., Grand Rapids, Mich.
Circle 308 on reader service card

10. Chair: Part of designer Wendell Castle's *Atlantis Series*, this chair will be offered as a limited edition. It is upholstered in gray leather with black leather piping, and has legs representing columns with gold-plated capitals and circular bases. The Gunlocke Co., Wayland, N.Y.
Circle 309 on reader service card

11. Chair: The *Bitsch* chair features woven stainless steel fabric, leather or canvas fastened to a spring steel frame that has been finished in polished or satin chrome or baked enamel colors. Suitable for indoor, outdoor, contract and residential use, it comes in 2 heights with or without arms. Multiple seating is available on 2-, 3- or 4-seat frames. Complementary glass-top tables are also available. Harvey Propper, Inc., New York City.
Circle 310 on reader service card

12. Lamp: The *Pausania* table or desk lamp, designed by Ettore Sottsass, has a metal body finished in polyurethane resin lacquer with diffusor support columns in chrome metal. It uses the Norelco PL13 fluorescent bulb, which has a light output equal to that of an 85W incandescent bulb, but uses only 15 watts. Artemide, Inc., New York City.
Circle 311 on reader service card
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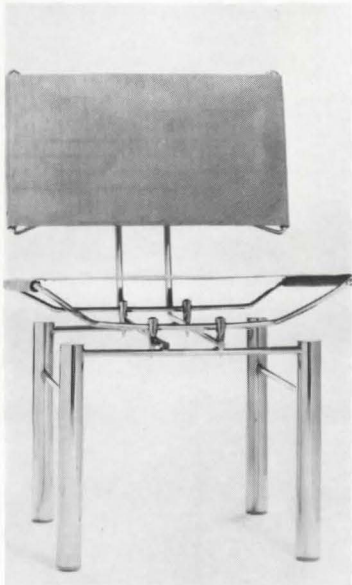
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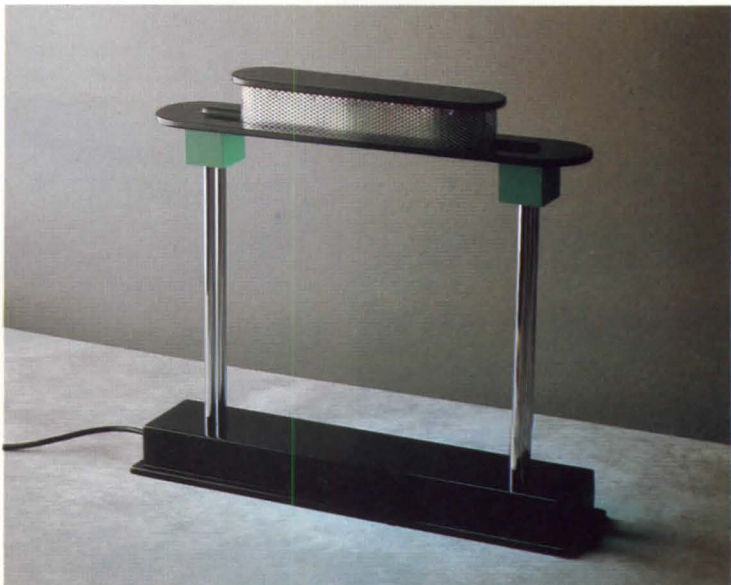
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13. Fabric program: Wool chair fabrics (shown top: Herringbone, checks and twill) coordinate with silk-blend panel fabrics (bottom). Also available are tweeds and billiard cloth. All-Steel, Inc., Aurora, Ill.

Circle 312 on reader service card



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14. Chairs: These designs by Mario Botta are interplays of rectangles and cylinders. Frames are steel tubing and seats are perforated steel. Backs are two cylinders of soft expanded polyurethane. ICF, Inc., New York City.

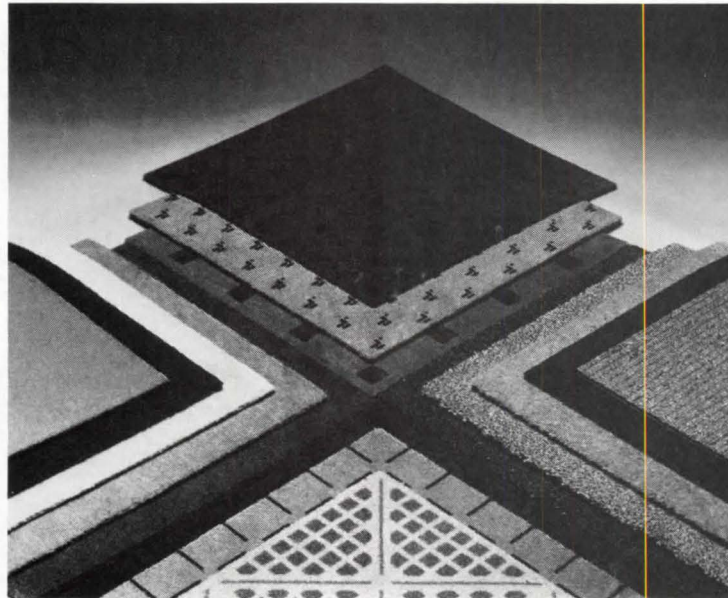
Circle 313 on reader service card



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15. Carpet tiles: Recommended for use in computer installations because of their static-controlling qualities, these carpet tiles come in a color line developed to coordinate with major contract furniture lines. Interface Flooring Systems, LaGrange, Ga.

Circle 314 on reader service card



15

16. Chair: The latest addition to the *Diffrient* collection has fingertip controls to tilt the back or lock it into an upright position. A user can adjust the back up and out from a sitting position. Knoll International, Inc., New York City.

Circle 315 on reader service card



16

17. Terminal stand: The keyboard and terminal surfaces of this stand have height adjustments of 27½ to 36½ in. The stand is available in almond or oak Formica finishes. Howe Furniture Corp., New York City.

Circle 316 on reader service card



17

18. Wallcovering: *Trelawney* is a heavy (30 oz per yard), vinyl-coated fabric that comes in a 54-in. width. It is available from Vicrtex in 21 colorways. L.E. Carpenter & Co., Wharton, N.J.

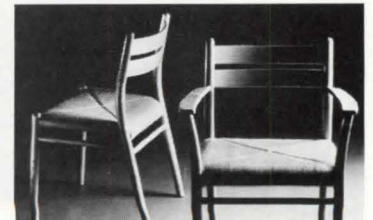
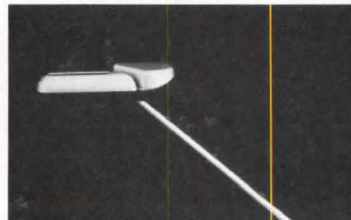
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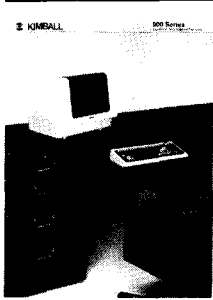
19. Lamp: The aluminum *Ring* table lamp, with a 100W halogen bulb, is adjustable: the reflector rotates 360 deg; the support, 180 deg. The lamp comes in a gray or red enamel finish. Atelier International Lighting, New York City.

Circle 318 on reader service card



20. Chair: The *Alpina* comes in solid, steam-bent ash with a leather- or fabric-upholstered seat. Suggested for use in restaurants, it comes with or without arms. Jack Lenor Larsen, New York City.

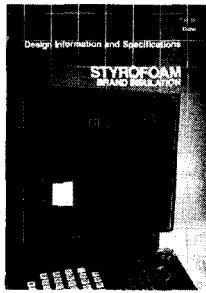
Circle 319 on reader service card
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Computer furniture

A color foldout features the *900 Series* of traditional office furniture in walnut veneers. New models designed for computer support (to be shown at NEOCON 15) include a number of VDT tables, a printer table and keyboard drawers for most desks. Kimball Office Furniture Co., Jasper, Ind.

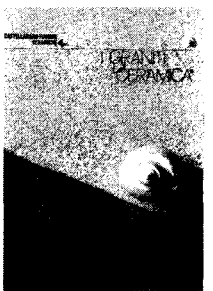
Circle 400 on reader service card



Insulations

A 12-page brochure on *Styrofoam* brand insulation for walls and foundations describes four product types, their physical properties and the range of sizes and thicknesses available. Diagrams illustrate a variety of applications. Dow Chemical Co., Midland, Mich.

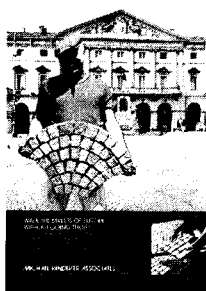
Circle 406 on reader service card



Ceramic tiles

Ceramic tiles with the look of granite are shown in a 10-page color brochure. Tiles are available in a variety of sizes and colors in either a polished or a matte finish. Technical data are included. Innovative Tile Distributors, Plainview, N.Y.

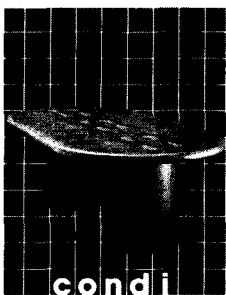
Circle 401 on reader service card



Cobblestones

Granite cobblestones from Europe that are pre-assembled into modules for easy installation are covered in a 6-page color foldout. Dimensions of fan- and square-shaped modules are given with information on colors and installation. Michael Vandever Associates, Studio City, Calif.

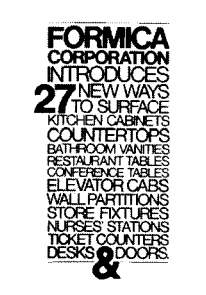
Circle 407 on reader service card



Conference tables

Photographs show different table tops with various pedestal options in a 12-page color brochure. Diagrams give dimensions and configurations, while charts show veneers, edges and bases. Condi/Pacific Furniture Manufacturing Co., Compton, Calif.

Circle 402 on reader service card



Laminates

Twenty-seven new designs—including 15 woodgrains and four textured fabrics in various colorways and a graphic print design with a 3-dimensional effect—are shown in an 8-page color brochure. Charts list applications, grades and finishes for each design. Formica Corp., Wayne, N.J.

Circle 408 on reader service card



Furniture and fabrics

The *Leading Edge* is a magazine/brochure covering this manufacturer's involvement in the areas of furniture and fabric design as well as featuring articles on topics of general interest. It is a quarterly publication. Sunar, Norwalk, Conn.

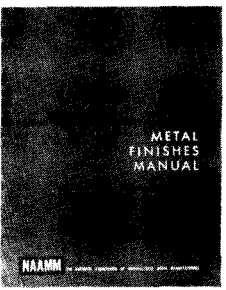
Circle 403 on reader service card



Carpet resource guide

An appendix added to the 1982-83 guide lists over 100 wool grades and collections, plus 17 more domestic mills, custom resources and importers. Wool carpet yarn suppliers are also included. The Wool Bureau, Inc., New York City.

Circle 409 on reader service card



Metal finishes

A manual covers mechanical and chemical finishes and coatings for aluminum, copper alloys, stainless steel, carbon steel and iron. Charts list methods of application and standard designations for different types of finishes. National Association of Architectural Metal Manufacturers, Oak Park, Ill.

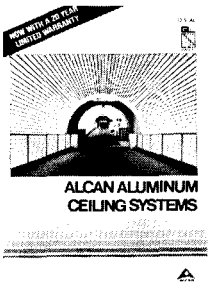
Circle 404 on reader service card



Sports surfacing systems

Seven systems for track, tennis and gym surfaces are covered in an 8-page color brochure. The polyurethane *Plexi-Trac* and all-acrylic, color-finished *Plexicipave/Plexicushion* systems and others are shown in photographs and section details. California Products Co., Cambridge, Mass.

Circle 410 on reader service card



Ceiling systems

Color photographs show installations of both the *Planar* and the *Plenum Mask* aluminum ceiling systems in a 15-page booklet. Section details, specifications, technical data and applications (interior and exterior) are included. Alcan Aluminum Corp., Warren, Ohio.

Circle 405 on reader service card



Office furniture

A 12-page color brochure, illustrated with photographs and line drawings, features this company's vos line of vertical office furniture, which is suitable for both open and closed office plans. Modern Mode, Inc., Oakland, Calif.

Circle 411 on reader service card
More literature on page 151

BURNDY CONNECTS

INTERNATIONAL SALES AND MANUFACTURING BRUSSELS, BARCELONA, PARIS, ROTTERDAM, STOCKHOLM, STUTTGART, TURIN, ZURICH, ST. HELENS (ENG), TORONTO, SYDNEY, TOKYO, MEXICO CITY, SAO PAULO

Low installed costs

It's the least expensive undercarpet system to install.

Convenience

Simple "one-second" connection for all tabs, splices, transitions, and ground shields.

Flexibility

Interchangeable components for all present and future requirements.

Built-In Reliability

One-tool, one-connector system; prewired receptacles; auto-ground/strain relief. UL listed. Meets NEC Article 328.

Burndy Flexway™ Everything you'll ever need... or want...in undercarpet wiring.

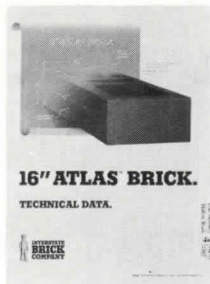
Power. Telecommunications. Data.

It's not only the most flexible, most cost-effective undercarpet wiring system on the market today—it's also the most reliable. We designed it that way. Right from the start. Everything has been system-engineered to simplify installation. Cut costs. And provide unrivalled reliability—everytime.

What's more, Burndy now offers you the complete undercarpet wiring package

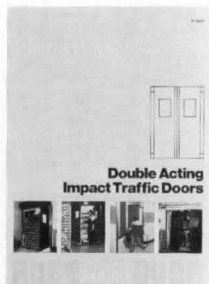
including power, telecommunications and data transmission. All available through one convenient source: Your local authorized Burndy FLEXWAY Distributor. For details, contact: Burndy Corporation, MS 142, Norwalk, CT 06856. (203) 838-4444.

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Brick

A 16-in. hollow, load-bearing, brick with a compression strength of 3½ times that of block is described in a 12-page brochure. Engineering data and specifications are given along with details and diagrams of available shapes. Interstate Brick and Ceramic Tile, West Jordan, Utah
 Circle 412 on reader service card



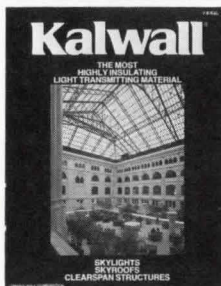
Double-acting doors

Six models of double-acting impact traffic doors for application in storage and industrial areas and hospitals are described and illustrated in a 4-page color brochure. Cutaway views of doors show construction. Eckel Industries, Inc., Ayer, Mass.
 Circle 418 on reader service card



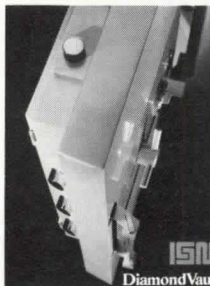
Bullet-resistant laminate

A 6-page brochure compares the performance of LEXGARD MP750 laminate with that of bullet-resisting glass and acrylic products. Typical applications include bank interiors, retail kiosks and guard stations. General Electric Co., Pittsfield, Mass.
 Circle 413 on reader service card



Light transmitting roofs

A Kalwall translucent roof system consists of structural aluminum grid cores faced with fiberglass reinforced sheets. As described in an 8-page brochure, panels are 2¾-in. thick and weigh 1½ lb per sq ft. Air space between panels provides insulation. Kalwall Corp., Manchester, N.H.
 Circle 419 on reader service card



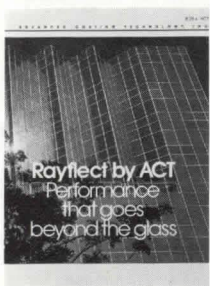
Vaults

A 4-page brochure features the components of the ISM Diamond Vault. Equipped with a UL Group I combination lock, the vault has passed the TRTL 30x6 test. Dimensions and weights of six models are listed. Israel Safe Distributors, Chicago, Ill.
 Circle 414 on reader service card



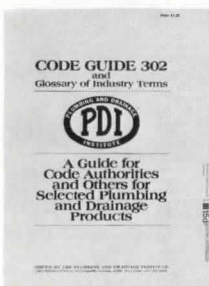
Ceramic tiles

Single-fired vitreous ceramic tiles are featured in a 12-page color brochure. Tile colors and finishes are shown beside photographs of typical installations. Available sizes, specifications and a list of distributors are included. International American Ceramics, Inc., Tulsa, Okla.
 Circle 420 on reader service card



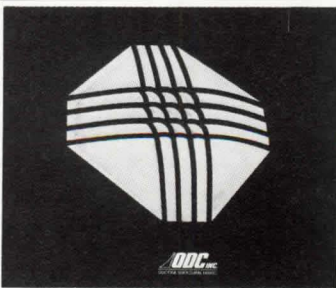
Metallic coated glass

Rayflect, a reflective, metallic coated glass available with clear, bronze, gray or green substrates, is shown in a 16-page color brochure. Performance data on windloading and thermal stress is listed. Advanced Coating Technology, Inc., Franklin, Tenn.
 Circle 415 on reader service card



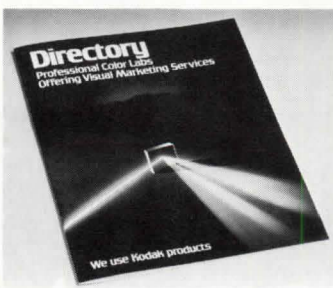
Plumbing and drainage

A 20-page guide discusses 44 plumbing devices, including where devices are required, their installation, and which standards apply. A glossary of more than 160 terms keys definitions to drawings of the products described. Plumbing-Drainage Institute, Indianapolis, Ind.
 Circle 421 on reader service card



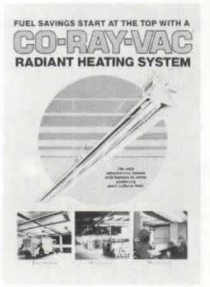
Structural fabric

Qualities such as translucence and weathering are described and illustrated in charts in a 16-page brochure on silicone structural fabric. Applications are discussed with a particular emphasis on fabric roofs. ODC, Inc., Norcross, Ga.
 Circle 416 on reader service card



Color lab directory

A directory of professional color labs that offer visual marketing services lists labs alphabetically by state and includes details on services offered, such as various size enlargements, mounting, graphics, and design and image resources. Eastman Kodak Co., Rochester, N.Y.
 Circle 422 on reader service card



Radiant tube heating

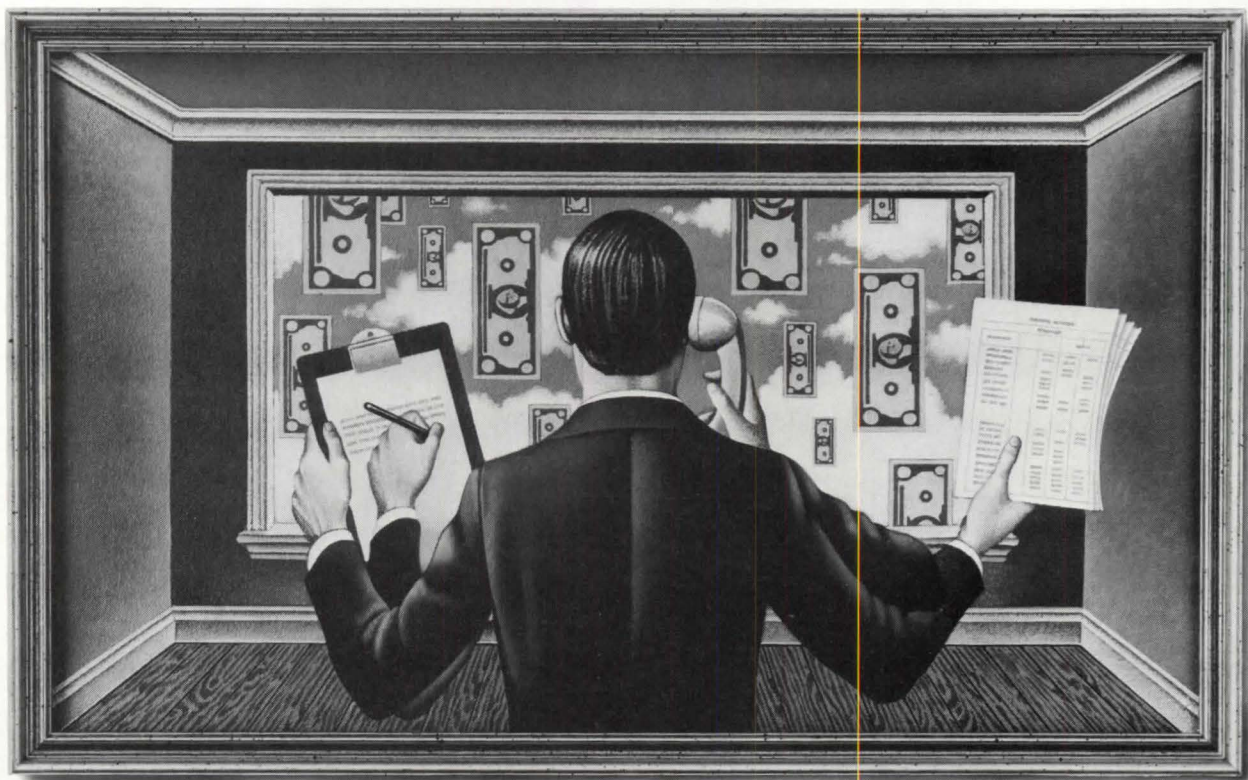
A low-intensity, gas-fired, infrared heating system is covered in a 6-page color brochure. Specifications for use with natural gas, LP gas or dual fuel LPN are provided along with a list of existing applications. Roberts-Gordon Appliance Corp., Buffalo, N.Y.
 Circle 417 on reader service card



Built-up roofing guide

"A Guide to Preparing Built-Up Roofing Specifications" features sections on roof assembly, design, materials, maintenance, reroofing and codes. The guide also lists which manufacturers make which products, reference sources and a glossary. Asphalt Roofing Manufacturers Association, Rockville, Md.
 Circle 423 on reader service card

Are your company's out-of-pocket travel expenses getting out of hand? Introducing American Express Reimbursement Funds.



How Reimbursement Funds can help reduce repayment costs—while enhancing control.

Handling the cash needs of your traveling employees can be a real managerial headache.

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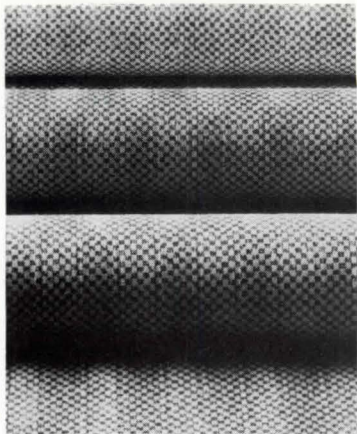
State _____ Zip _____

Phone _____ No. of Travelers _____

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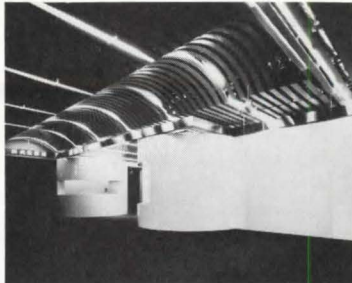
American Express® Travel Management Services



Fabric
Klio Faconne features a pointillist design printed over an embossed stripe. It is a 54-in.-wide cotton fabric and is available in 6 colorways. Zumsteg, New York City.
Circle 320 on reader service card



Keyboard drawer
A lockable keyboard drawer is designed with five stopping positions and a wrist rest. It can be attached to this manufacturer's open plan system work surfaces and nearly any other desk or work surface. GF Business Equipment, Inc., Youngstown, Ohio.
Circle 323 on reader service card



Walls
Marble-like *Neoparium* is a glass panel material used for cladding exterior and interior walls. Said to be stronger and more uniform in color than marble, it is available in curved panels for round columns and radius corners. Forms & Surfaces, Santa Barbara, Calif.
Circle 324 on reader service card



Seating and low tables
For contract and residential use, *Tandem* chairs are available in white oak or walnut as are low companion tables. Seats and backs feature a spring base upholstered in a choice of fabrics. Marden Manufacturing, Inc., Chicago, Ill.
Circle 325 on reader service card
Continued on page 155



Furniture group
The components of Douglas Ball's Cameron Group include choices of wood or plastic-laminate tops, natural or painted wood bases, and natural or painted wood or steel pedestals. All are interchangeable for they have specially designed connectors. The electrical and communication raceways are accessed from end panels or longitudinally on runoffs. Sunar, New York City.
Circle 321 on reader service card



Armchair series
A bentwood armchair series features stacking and non-stacking versions with box seats or slip seats and open or upholstered side arm panels. The design comes in either a curved arm or a slant arm variation. The frame is multi-ply red oak with natural oak, walnut or autumn oak finishes. R-Way, Sheboygan, Wis.
Circle 322 on reader service card

SCRATCH N' SCUFF

It won't show on Roppe cove base. Made of flexible extruded rubber, the exclusive satin finish resists scuffing, gouging, burns and chemicals. Cleans up with soap and water. Easy to install, Roppe cove base won't shrink, with maximum stability and fit for lasting attractive appearance. In 22 beautiful accent colors with matching molded corners. For your nearest distributor, write Roppe Rubber Corporation, 1602 N. Union Street, Box X, Fostoria, Ohio 44830. Or call toll-free.

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1-800-537-9527
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Circle 63 on inquiry card

In retail merchandising, environment must be consistent with the quality level of merchandise offered for sale. With IAC ceramic tile on the floor, an image of taste and high quality is the result.

And not only does IAC tile offer retail customers a warm welcome, it also means the most practical, long-lasting surface available today.

When IAC ceramic tile is utilized

in high traffic areas the owner benefits are superior wearability and a high resistance to stain. It also means maintenance is simple and minimal.

"Single-fired vitreous" IAC ceramic tile is available in a wide range of beautiful, contemporary colors, textures and sizes for both interior and frost-proof exterior applications. And because IAC tile is modular, it is

easy to combine different sizes to create unique and unusual designs and patterns.

For beauty that means business . . . specify "single-fired vitreous" ceramic tile . . . and to insure the highest quality possible . . . specify IAC.

Beauty That Means Business...

IAC Ceramic Tile



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(918) 428-3851

Reisherstown Mall
Baltimore, Maryland
4 x 8 Sandstone &
4 x 8 Chestnut



Chairs

Aspen chairs are ergonomically designed and feature pneumatic seat height adjustment. The design features arms and bases of solid oak available in natural, medium, and dark finishes. Cramer, Inc., Kansas City, Kan. Circle 326 on reader service card



Seating group

Taxi is a seating group designed by Giorgio Decursu. Metal frames are painted black, gray or yellow, and cushions are of polyurethane/Dacron foam. Backs and arms can be flipped into three different positions. Cover materials include a choice of fabrics and leather. Beylerian Ltd., New York City. Circle 329 on reader service card



Chairs

Additions to this manufacturer's N Series, are designed to support the lower spine. Chairs come in high- or low-back versions with or without arms. Frames are of steel construction and upholstery is nylon or wool in a choice of 47 colors, or leather. All chairs in this series have hydraulic lifts. Harter Corp., Sturgis, Mich. Circle 330 on reader service card



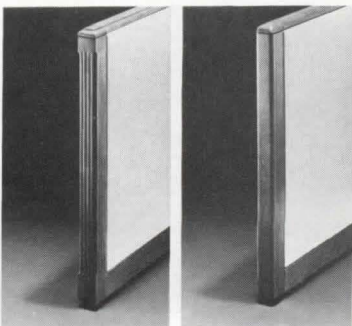
Sofa

The sofa designed by Milo Baughman for Thayer Coggin features a 100 per cent wool-knit upholstery with an elasticity which allows it to stretch smoothly over the lines of the sofa design. The color, also designed by Baughman, is "Plum Rose." The Wool Bureau, Inc., New York City. Circle 331 on reader service card Continued on page 157



Panel and furniture system

The Adapt system features wood furniture in black walnut or white oak. Panels hook together and are available in see-through acrylic, or fabric-covered fiberglass or steel. Panels come in widths from 12 to 60 in. and heights from 42 to 84 in. Fabrics come in 21 colors. Over 250 sizes of work surfaces are available in 18-, 24-, 30- and 36-in. depths. Furniture includes double- and single-pedestal desks, returns, credenzas, conference and occasional tables, lateral storage and bookcases. Lehigh Leopold/LBF, Burlington, Iowa. Circle 327 on reader service card



Detailing

The design of the edging and corners of the freestanding Plenum System enables the system to be used in conjunction with this manufacturer's standard caseworks, vertical office furniture, conference tables and bookcases. Photographs above illustrate two of the four designs, which are available in five veneers and 14 finishes. Modern Mode, Inc., Oakland, Calif. Circle 328 on reader service card

Sentinall by kenall
Lighting unequalled in style, efficiency and durability.

The Sentinall series by Kenall has been designed for the eighties and beyond. With its stylish, compact design, Sentinall can be used in any indoor or outdoor application where aesthetics and durability are important. Sentinall is available with several different trim effects and refractor combinations.

The Sentinall series combines contemporary looks and features. Included are a one piece injection-molded polycarbonate lens for unbreakability, a choice of several efficient low-wattage fluorescent lamps that provide energy savings, gasketing and an anodized aluminum backplate for weatherproof protection. A single tamperproof POSIGRIP \oplus screw or a standard slot screw is provided.

The Sentinall is here, providing all of the features you expect from a Kenall lighting fixture!

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Circle 65 on inquiry card

'CLOSE HARMONY



In Graceful Tension Structures By Helios.

The delicacy and beauty of these tensioned membrane structures is thoroughly practical. In this economical shelter for an outdoor music amphitheater, the natural beauty of the

site is preserved, with only minimal disturbance for footings for structural elements. The smaller white tensioned structure at the Aspen Design Conference in Colorado is even simpler, facilitating its erection and dismantling each year.

All these structures, including the festive rest area sunshades, are fabricated of vinyl-coated polyester material held in tension on a steel framework. The result is a lightweight, rigid structure engineered to withstand heavy wind. Though a tensioned membrane structure is in a higher price class than a tent, it offers far greater strength and durability. Compared to alternative structures of wood, steel or masonry, it typically results in important cost savings.

When your imagination calls up sweeping curvilinear shapes or great enclosed space, HELIOS INDUSTRIES, INC. are the people to try your ideas on. We specialize in helping architects



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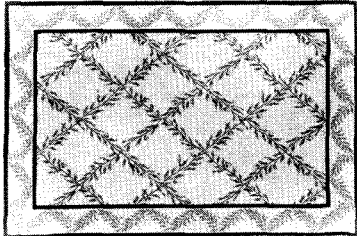
HELIOS INDUSTRIES, INC.
Soft Shell Structures Division
(Formerly Helios Tension Products, Inc.)



Office furniture

Avatar is a full line of desks, credenzas, conference and occasional tables and matching bookcases for the executive office. It is available in a choice of mahogany or walnut veneers in a wide range of finishes. Tops come in leather, crotch mahogany or English brown oak. Hardwood House, Rochester, N.Y.

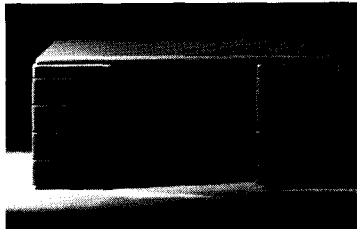
Circle 332 on reader service card



Rugs

Floral Vine Vert is made of wool yarns and is available with any border, design, color, texture, size or shape from the *In-Stock Designers* collection. Stark Carpet Corp., New York City.

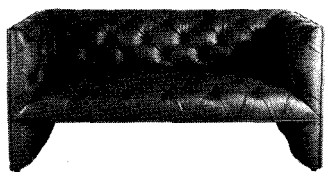
Circle 333 on reader service card



Desks and tables

The *Kane* groups include a management desk, desks with left or right returns and cabinets. Tables have pedestal or leg bases. Side and back panels and pedestal/storage fronts are finished in high-gloss polyester resin while desk, cabinet, return and table tops are available in stone, wood, leather or matching polyester resin. Metropolitan Furniture Corp., South San Francisco, Calif.

Circle 334 on reader service card



Lounge seating

The *Edwards* lounge seating series includes a lounge chair, 2- and 3-seat sofas and a chaise longue. Deeply tufted upholstery is available in fabric or leather. Stendig, International Inc., New York City.

Circle 335 on reader service card

Continued on page 159

This SICO® Room Maker is a sale maker.



Condominiums, townhomes, conversions—any home that makes better use of space has the competitive edge today. And you can offer prospective buyers two rooms in the space of one with The SICO Room Makers® Modular Wall and Bed System. They'll know you put extra thought and quality into your units. And quality sells itself.

Stack up the components with any bed size to make any room a sophisticated, comfortable bedroom. In the morning, fingertip pressure lifts the bed to conceal it in the wall system for a handsome daytime environment.

You can have delivery on any combination of modular components: shelves, night stand, three-drawer, two-door, glass-door display units and pull-down writing desk. For real comfort, select the queen, double or twin bed with quality mattress and vinyl upholstered box spring or foundation.

The SICO Room Makers Wall System is less costly than built-ins, with all the quality SICO is known for around the world. It just may be your best new salesman. Call or write today for full information.

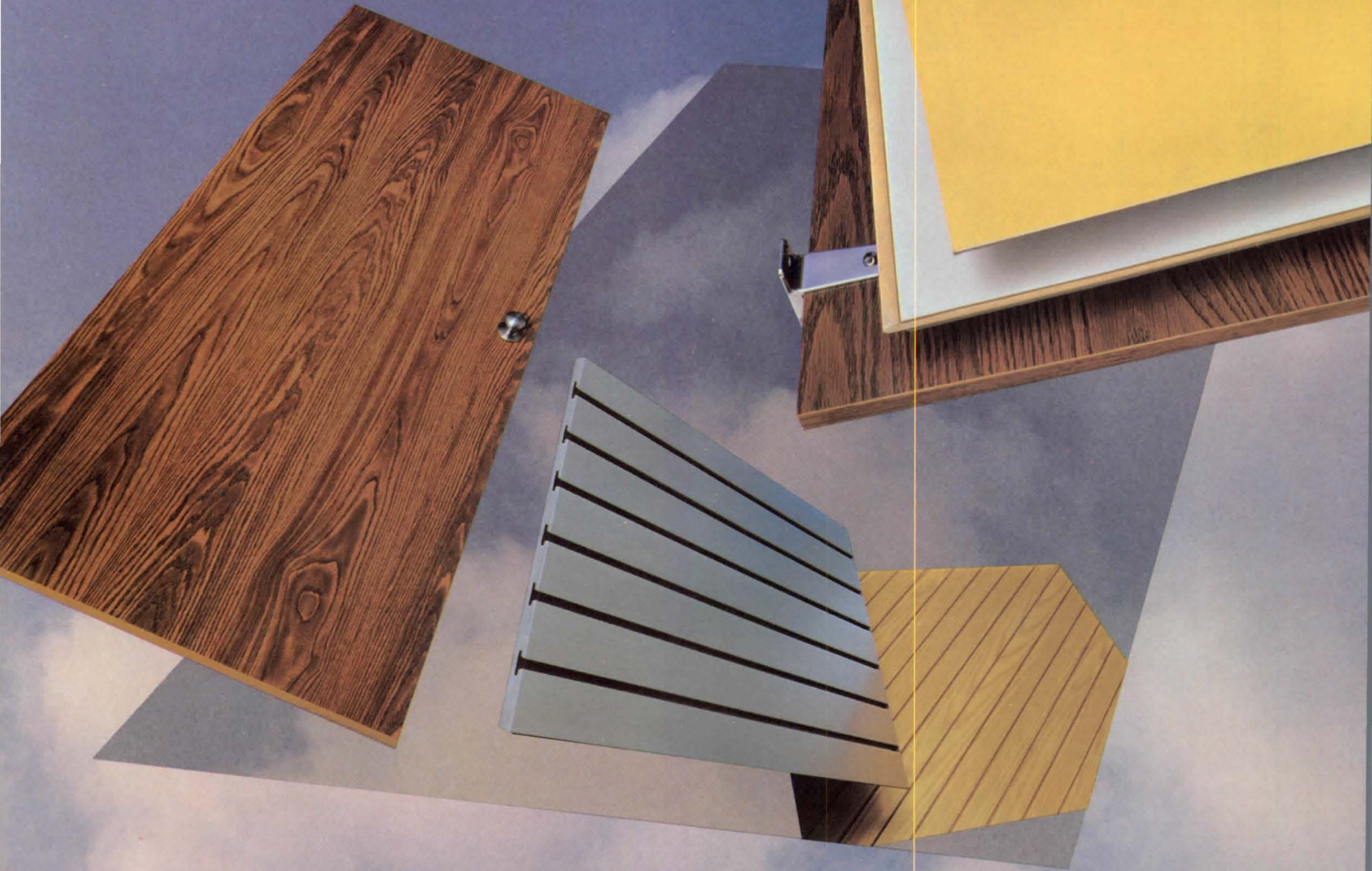
The Room Makers®



SICO INCORPORATED • Room Makers Division
7525 Cahill Road, P.O. Box 1169 • Minneapolis, MN 55440, Dept. AR-5
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Marlite® Brand Products enhance interior spaces and forgive the foibles of those who use them.

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Discreet protection is added to rich detailing and subtle tones to create walls, doors and even restrooms appealing to the eyes, accommodating to the touch and available from one convenient source...Masonite Corporation, Commercial Division.

Find out more about how Marlite Brand Products can help your interior spaces relate to those who use them, and how the Commercial Division's unique service capabilities can better relate to you. Simply send for more information, today.





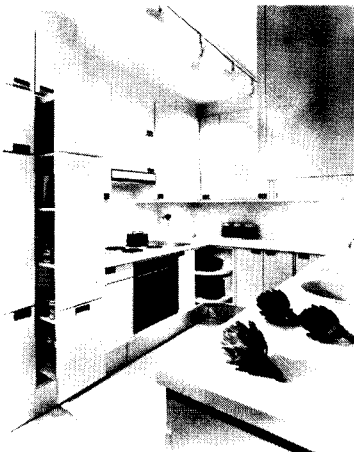
Fabric

The all-wool heather group shown above, which is available in 14 colorations, marks this apparel-fabrics manufacturer's entry into the contract field. Collections include fabrics for wallcoverings, upholstery and open-plan office systems designed specifically to coordinate with this manufacturer's *Gulistan* carpets. J.P. Stevens, New York City. Circle 336 on reader service card



Chairs

Designed by Richard Ogg, this chair is available in three versions: high-back, low-back and side chair. The design features a bent strip of wood laminate (white oak or walnut) that encircles the seat edge. The bases for the high- and low-back versions can be wood clad to match the wood border. Stow/Davis, Grand Rapids, Mich. Circle 337 on reader service card



Cabinetry

A winner of two German "Gute Form" design awards, the *CH 60* kitchen features rounded horizontal edges. It is available in white, beige, yellow, and green laminates, in sizes that accommodate any appliance or accessory. The design is suitable for bathroom application as well. Poggenpohl USA Corp., Teaneck, N. J. Circle 338 on reader service card Continued on page 203

Engineering the world's most critical barriers:

SOUND

You build a test environment so carefully that nothing will break its integrity. You need a door engineered so well that only a continuation of the wall would be any better. Then

you face a special problem like accessing your test environment with an over-the-door conveyor system, while maintaining sufficient sound isolation. That's one of the reasons the doors you select will come from Jamison.

Because you know forty years experience in designing and building of specialty doors gives us a unique ability to solve your problems. And an R&D department that can come up with specialized solutions to special requirements. Backed with the service you expect from Jamison.

For sound, temperature, chemical reaction and atmospheric control, we don't just build doors. We build solutions. To learn how, contact us with your requirements. And we'll engineer your most critical barrier.



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Jamison STC 51 doors tame the roar of powerful truck engines in 36-cell dynamometer testing facility. Custom-engineered, switch-controlled "guillotine" mechanism seals around overhead conveyor track that carries engines in and out of cells.

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Which, simply stated, is a quick and inexpensive way of sending any information, anywhere, anytime.

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For the six dollars it costs to produce and mail a typical business letter, you

could easily splurge on a patty melt and Perrier at The Blue Turtle.

Or, you could send the same letter for about 1/12 the cost using electronic mail.

This new technology enables your Apple to send or receive any correspondence to any compatible computer over standard phone lines. The same ones your voice has been using for years.



Stanley Construction Products.

From architectural and residential hinges to weather products, the industry's most complete product line. From start to finish, the industry's most comprehensive support network.

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We're the first name in quality. The last word in service.

We're Stanley Hardware, and our reputation is building.

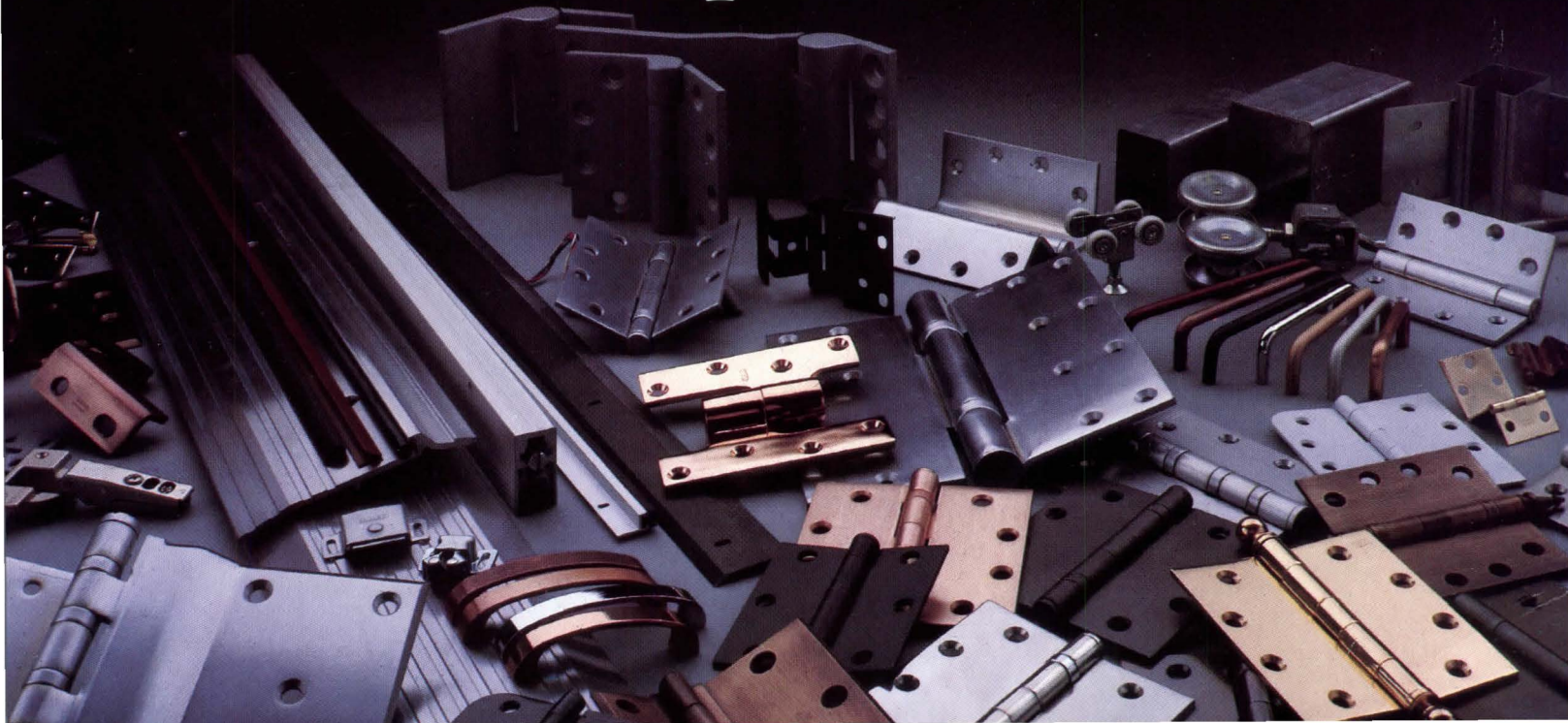
Stanley Hardware
Division of The Stanley Works
New Britain, CT 06050



Circle 107 on inquiry card

STANLEY

What's behind our products
is what keeps us in front.



A Sloan life-cycle cost analysis can save you a lot of dollars.

And it won't cost you a cent.

It starts with a movie.

Here's a short subject worth watching. Especially if you haven't yet decided on what's the best flushing system for your new building. And it's all with the compliments of your Sloan Representative.

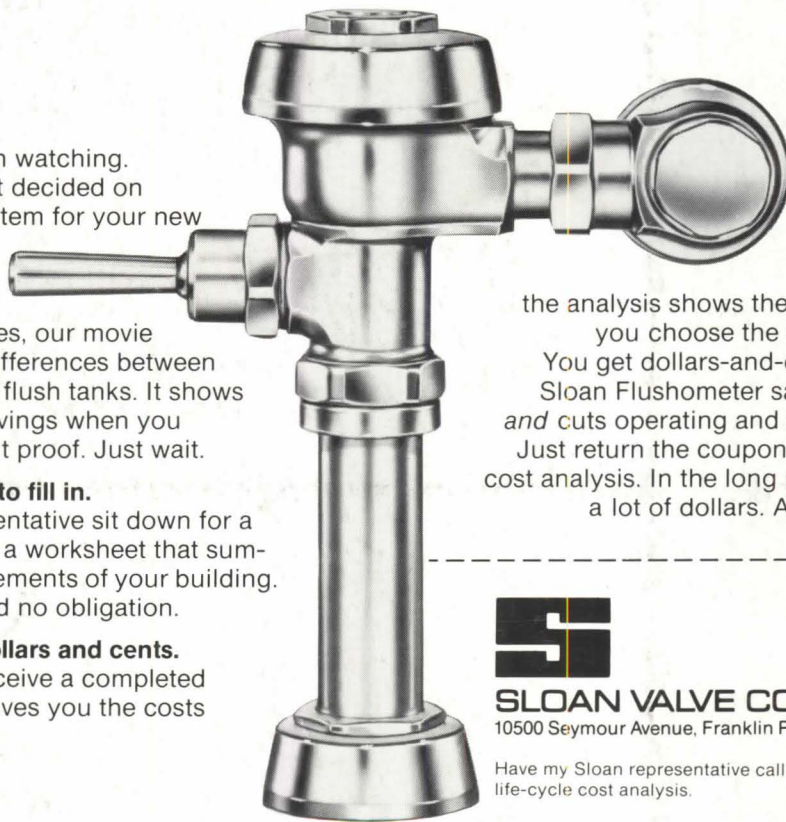
In less than fifteen minutes, our movie dramatizes the important differences between the Sloan Flushometer and flush tanks. It shows you there are significant savings when you choose Sloan. But you want proof. Just wait.

There's an easy worksheet to fill in.

You and your Sloan representative sit down for a few minutes. You complete a worksheet that summarizes the flushing requirements of your building. Again there's no charge and no obligation.

Finally, your savings—in dollars and cents.

Within a few days, you'll receive a completed life-cycle cost analysis. It gives you the costs



of owning, operating, and maintaining flushometers vs. flush tanks. And, on the bottom line,

the analysis shows the total savings when you choose the Sloan Flushometer. You get dollars-and-cents proof that the Sloan Flushometer saves on water costs *and* cuts operating and maintenance costs. Just return the coupon for a free life-cycle cost analysis. In the long run, it can save you a lot of dollars. And we can prove it.

**The Sloan Flushometer.
Provable savings.**



SLOAN VALVE COMPANY
10500 Seymour Avenue, Franklin Park, IL 60131

Have my Sloan representative call me to arrange a free life-cycle cost analysis.

NAME _____
 TITLE _____
 COMPANY _____
 ADDRESS _____
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