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DODGE/SWEET'S CONSTRUCTION OUTLOOK: 1975

TWO FORCEFUL NEW BUILDINGS IN ISRAEL

HOUSES IN THE SAN FRANCISCO BAY AREA

BUILDING TYPES STUDY: AIRPORTS

FULL CONTENTS ON PAGES 10 AND 11

ARCHITECTURAL RECORD

Ideas to build on.

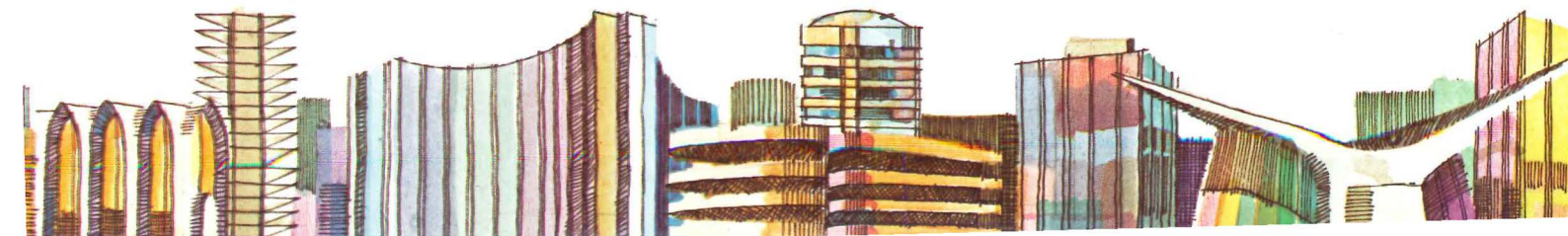
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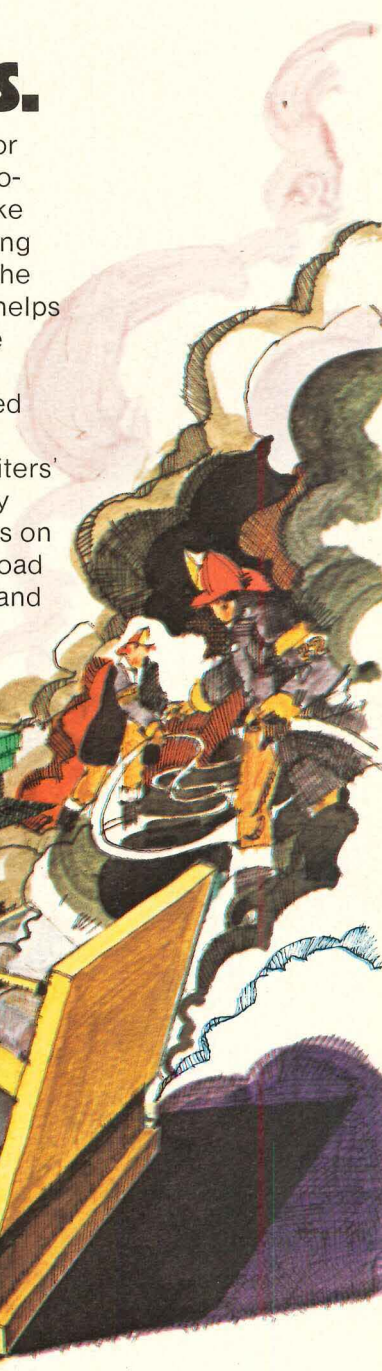




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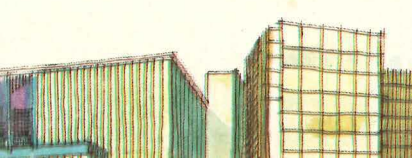


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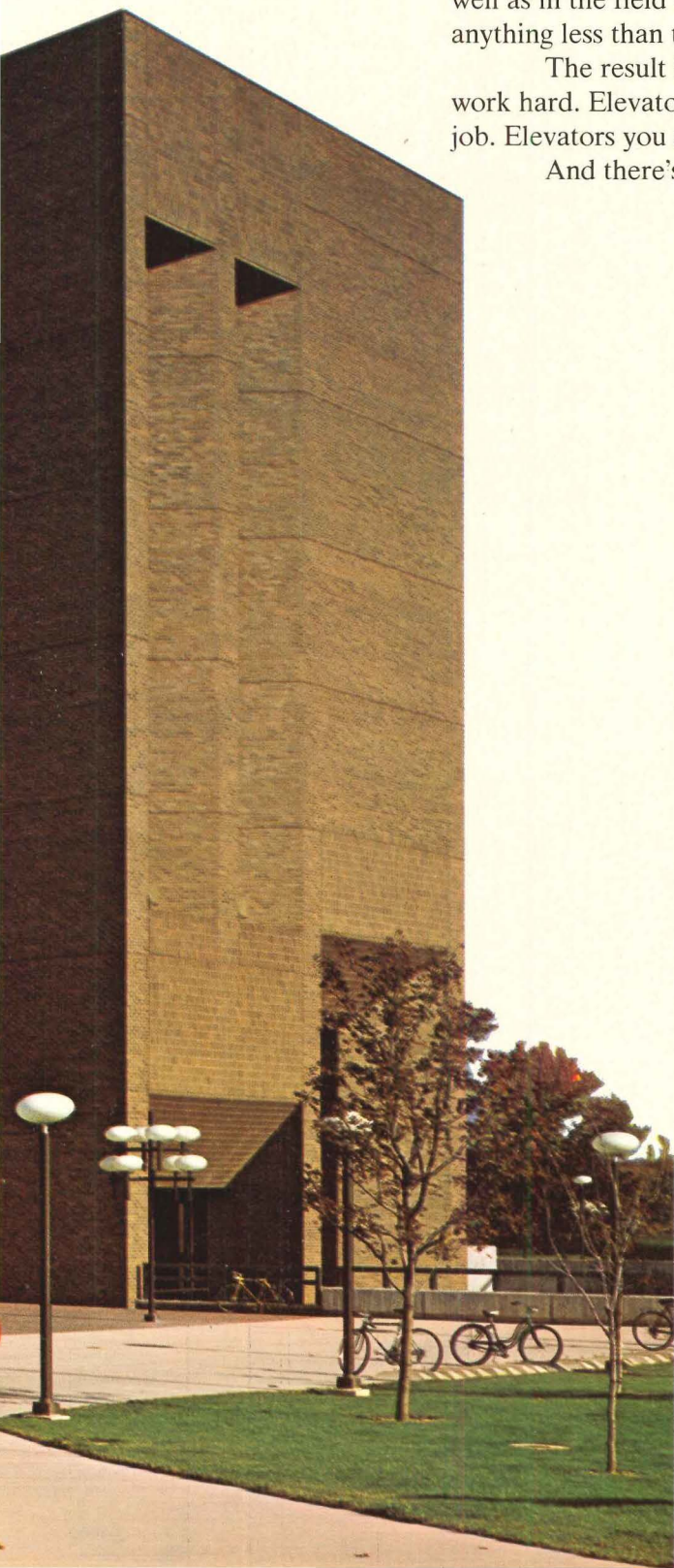
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DOVER

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Left: LIBRARY-LEARNING CENTER, UNIVERSITY OF WISCONSIN-GREEN BAY, ARCHITECT: Daverman Associates, Inc., Grand Rapids, Michigan, and Milwaukee, Wis. GENERAL CONTRACTOR: Fluor Brothers Construction Company, Oshkosh, Wis. Four Dover Geared Passenger Elevators installed by Northwestern Elevator Co., Inc., Franchised Distributor, Milwaukee and Green Bay.

Below: FIRST NATIONAL BANK BUILDING, DAYTON, OHIO, ARCHITECT: Harry Weese & Associates, Chicago, GENERAL CONTRACTOR: Turner Construction Company, DEVELOPER AND LEASING AND MANAGEMENT AGENT: Arthur Rubloff & Co., Chicago. Six Dover Gearless Passenger Elevators installed by Dover Elevator Co., Dayton.



Letters to the editor

We are proud to have our office lighting project for the Philadelphia National Bank published in *ENGINEERING FOR ARCHITECTURE*.

We hope you'll rectify two oversights: First the project was commissioned by Interspace, Incorporated, interior designers.

Second, the designs that you published should have borne "U.S. Patent #3389246" and the legend and other patents pending.

Sylvan R. Shemitz
Sylvan R. Shemitz and Associates, Inc.

I solemnly salute you. I had the immense pleasure of reading the mid-August issue of *ARCHITECTURAL RECORD* on *ENGINEERING FOR ARCHITECTURE*. It is one of the truly great issues. You are to be congratulated. You have highlighted the complexity of modern buildings and the critical interrelationships of all disciplines.

On a more personal basis, we were very pleased to see the recognition given to Steve Squillace and Dave DiLaura for their research at SH&G into more efficient lighting. You did a fine job making a tough subject understandable.

Philip J. Meathe, FAIA
Smith, Hinchman & Grylls

Many thanks for the excellent article on our Allied Chemical research building (August 1974, pages 127-130). The exposition, both visual and verbal, was clear and very well done.

I appreciate your attentiveness and the sensitivity you showed to a complicated project.

James Stewart Polshek
James Stewart Polshek and Associates

It was most encouraging to come upon Gerald Allen's article on Cram and Goodhue's St. Thomas Church on Fifth Avenue in the April issue. It was brought to my attention, interestingly enough, at the office of Mr. Cram's colleagues and successors, Hoyle, Doran and Berry, of Boston, where I am often to be found because I am organizing the firm's archives for transfer to the Boston Public Library Architectural Archive. (An outstanding part of the Cram and Goodhue Collection are the magnificent competition plans and perspectives for St. Thomas.) Your readers will also be interested to know, more generally, that a growing clan of young scholars, including myself, have lately begun to inquire into this firm's work, which has been for too long either ignored or misrepresented. I should be glad to forward

names and published articles to any who are interested, and would welcome any correspondence on the subject.

Insofar as Mr. Allen's article itself is concerned, it was not only more than well written, but refreshing in its admission that the modern American Gothic Revival, especially as Cram and Goodhue understood it, was at least as creative as archaeological. Of course, the integrity of explicit revivalism has long been suspect, but few care to inquire into its rationale. Even Mr. Allen goes astray here, I think, when he writes of "real Gothic." I don't know what he thinks "real Gothic" is, but I can tell you after some years of study what Ralph Adams Cram thought it was. For he discerned murder and not exhaustion in its abrupt termination at the Reformation, and early concluded that "real Gothic" was precisely a *creative development of Gothic* design principles (constructional honesty, or rigorously "organic" art, for instance) from the point where events had arbitrarily halted that development. For Mr. Allen a "boldly original" but "real Gothic" church is apparently a contradiction. For Cram "real Gothic" (as opposed to 19th century American "pictorial Gothic") could not be other than creative, the best example of which is probably the Cathedral of St. John the Divine, where Cram's nave is a Gothic *tour de force*.

Douglass Shand Tucci
Boston, Massachusetts

In terms of Gothic Revival lore, Mr. Tucci's definition of "real Gothic" is appropriate. In the St. Thomas Church article, the phrase was used in a more ordinary and relaxed way. But I know what I meant by it—and so does Mr. Tucci.

G.A.

I liked your tribute to Alan Dunn. I am particularly pleased that he will not be replaced but then, as you say, he can't. I'll look forward to seeing a collection of his cartoons from time to time.

I am so happy we honored him when we did.

Maria F. Murray, Director
Awards Programs
The American Institute of Architects

Compliments on a very well-written article [Scarborough Civic Center, July 1974, pages 91-98]. It is the best we have seen of the center—clear, comprehensive, concise.

Ted Teshima
Raymond Moriyama
Architects and Planners

Calendar

NOVEMBER

5-7 National Interior Design Show, Automotive Building, Exposition Park, Toronto. Contact Show offices, 1450 Don Mills Road, Don Mills, Ontario.

7-8 Seminar on How to Market Professional Design Services, Houston. Sponsored by Architectural Record. Contact: Building Industry Development Services, Suite 104, 1301 20th Street, N.W., Washington, D.C. 20036.

19-20 Evolving Systems for Building Delivery conference, Royal Orleans Hotel, New Orleans. Sponsored by the Systems Committee of the American Institute of Architects. For further information, contact Joseph A. Demkin, AIA, 1735 New York Avenue, N.W., Washington, D.C. 20006.

25-27 Quality Concrete for Building Construction, technical seminar, Lincolnwood Hyatt House, Lincolnville, Ill. Sponsored by the Portland Cement Association and the American Society for Concrete Construction. Contact: Educational Services Department, Portland Cement Association, Old Orchard Road, Skokie, Ill. 60076.

DECEMBER

4-6 Third National Bicycle/Pedestrian Planning, Design and Implementation seminar, Vacation Village Hotel, San Diego, Cal. For more information, contact: MAUDEP, Box 722, Church Street Station, New York, N.Y. 10008.

5-6 Seminar on How to Market Professional Design Services, Phoenix, Arizona. Sponsored by Architectural Record. Contact: Building Industry Development Services, Suite 104, 1301 20th Street, N.W., Washington, D.C. 20036.

5-6 Seminar on High-Rise Fire, Boston. Sponsored by the National Fire Protection Association. Registrations should be addressed to: F. James Kauffman, NFPA, 470 Atlantic Avenue, Boston, Mass. 02210.

17-20 International conference on housing for the emerging nations, Tel Aviv, Israel. Sponsored by the International Technical Cooperation Centre in cooperation with the Association of Engineers and Architects in Israel. Contact: ITCC Secretariat, 200 Dizengoff Street, Tel Aviv, Israel.

JANUARY

9-10 Seminar on How to Market Professional Design Services, New Orleans. Sponsored by Architectural Record. Contact: Building Industry Development Services, Suite 104, 1301 20th Street, N.W., Washington, D.C. 20036.

ARCHITECTURAL RECORD (Continued with AMERICAN ARCHITECT, ARCHITECTURE AND WESTERN ARCHITECTURE AND ENGINEER)

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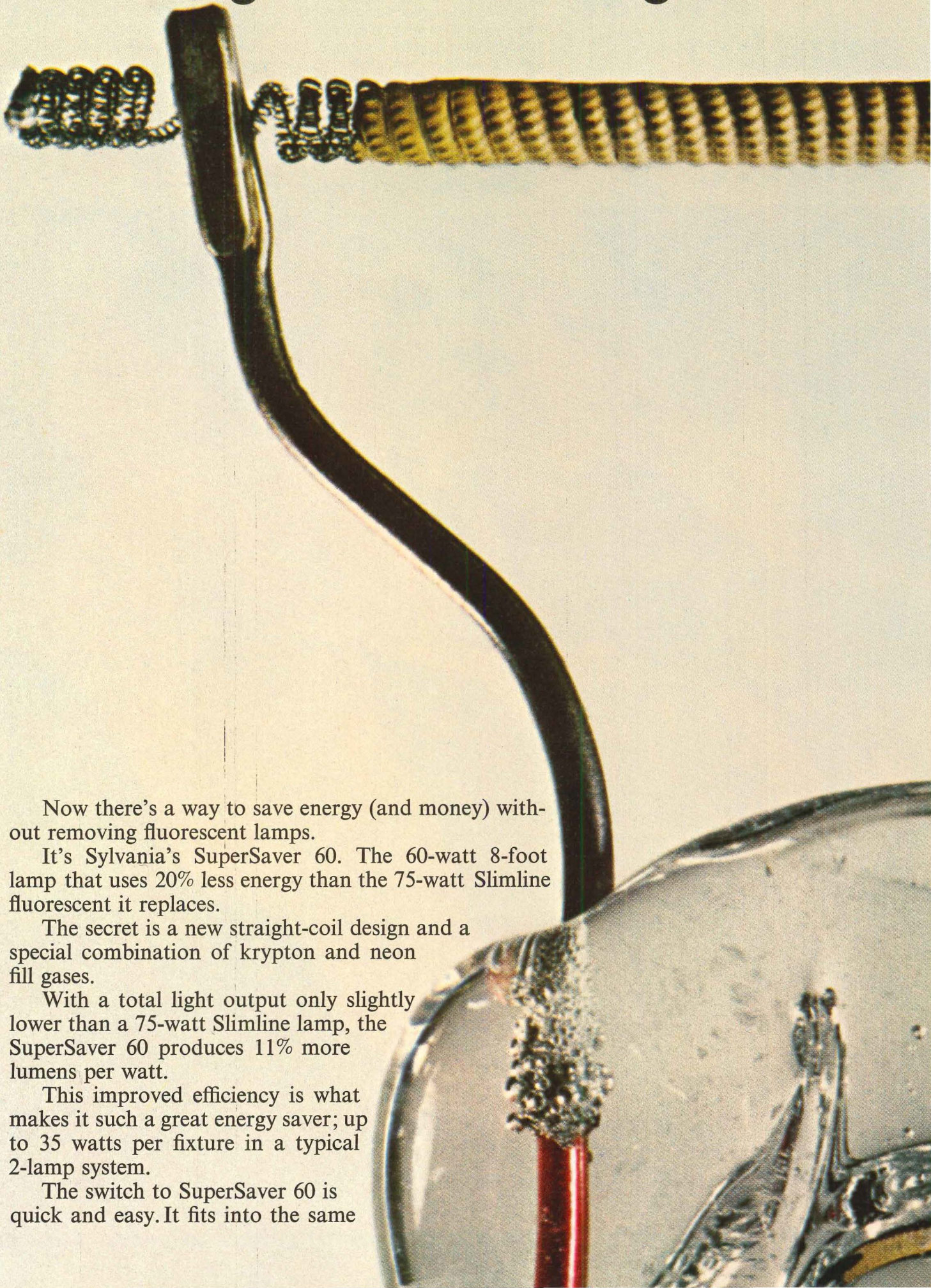
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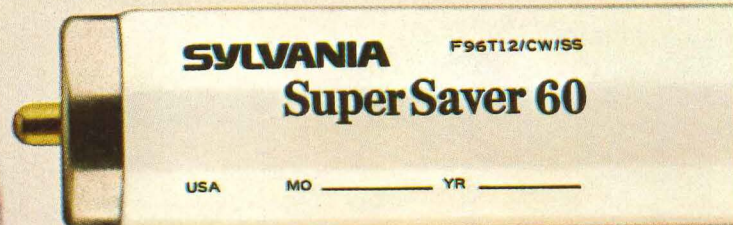
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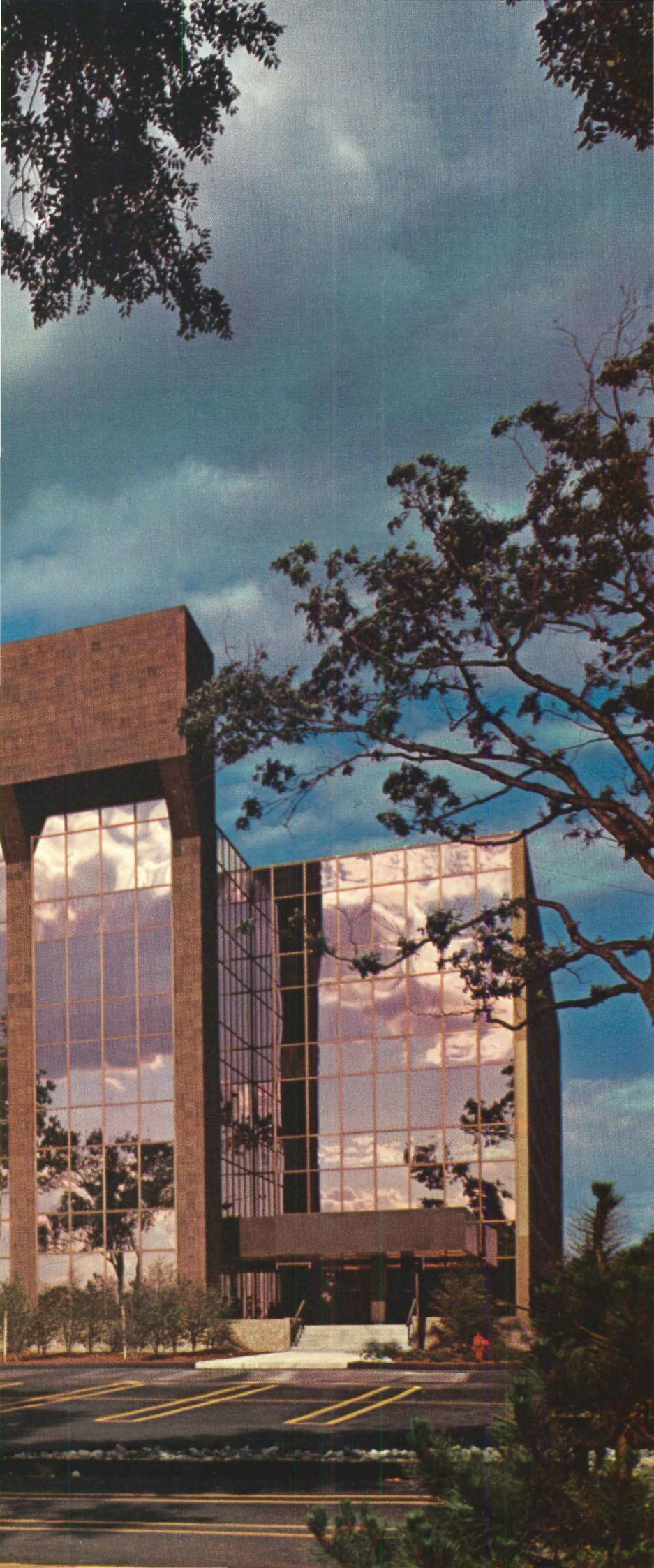
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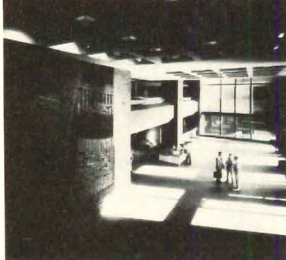
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ARCHITECTURAL BUSINESS

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While contract volume for non-residential
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year, except for possible strength in some
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more likelihood of recovery in residential
construction as mortgage money becomes
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be fairly strong, according to George
Christie's annual forecast.

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Position papers of George Dudley and
Milton Musicus focus on problems
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79 Building costs

Increase rate modifies.



FEATURES

Two current Israeli projects

After a first generation of architects primarily concerned with the necessity of shelter, Israeli architects are taking a look at the human values of their work, and they are coming up with some strongly individualistic results. The Negev University Library (page 101) and the Jerusalem Municipal Theater (page 104) by Nadler Nadler Bixon are excellent cases in point.

Police Plaza, New York City

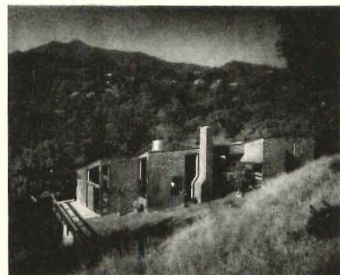
New York City's recently completed Police Plaza, by Gruzen & Partners, makes an extraordinary addition to the City's scant inventory of good civic buildings and presents an important image for "New York's Finest."

Two unique subway stations

These two stations on San Francisco's new BART system designed, by Corlett & Spackman and Ernest Born, with rare architectural quality, impart to contemporary transportation a grandeur once reserved for important rail terminals.

Houses in the San Francisco Bay Area

Three wood frame houses continue the lively tradition of design individuality—Donald Geddes' own residence (page 122); Daniel Gale's own residence (page 124) and Daniel Romano residence (page 126), by Esherick, Homsey, Dodge and Davis.



Robert Brandeis

Sea Ranch: a second look

RECORD associate editor Gerald Allen, in collaboration with architects Charles Moore and Donlyn Lyndon, has made a careful study of Sea Ranch for their recent book "The Place of House". Their report, excerpted from the book, focuses on what went wrong.

BUILDING TYPES STUDY 468

133 Airports: The airlines provide technical resources for design

Staff architects and engineers in the facilities departments of major airlines have increased their input through technical committees to the client-architect solutions of airport design problems.

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Heery & Heery combined the airlines' basic concepts with inventive systems construction to solve harsh economic and technical problems with a generally pleasing result.

138 Newark: where a sophisticated owner mustered talent from all sources

The in-house A-E resources of the Port Authority of New York and New Jersey were backed up by outside consultants in graphics and private architects and engineers for filling terminal shells in the Authority's redevelopment program.

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Searle Wilbee Rowland brought forward to the new Terminal 2 in Toronto, a straight-line, direct-docking facility, both staff and experience gained in masterplanning the airport and design of the round Terminal 1.

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147 The human dimension in airport design

Marvin H. Mills, senior architect on staff for Eastern Airlines, takes issue with the facile critics of airport ambience.

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149 Mechanical system designs respond to some special environmental control problems

Three disparate situations are described that called for ingenuity: two electronics manufacturing facilities, a naval electroplating plant, and centralized control for widely spaced buildings of a major university.

171 Product Reports**173 Office Literature****228 Advertising Index****230 Classified Advertising****231 Reader Service Inquiry Card****NEXT MONTH IN RECORD****Redefining architectural conservation**

RECORD's December 1974 issue entitled, "New Life for Old Buildings" introduced the timely and important subjects of renovation, remodeling and historic preservation. The editors are planning to revisit these subjects—but with a difference: We will argue for conserving, in the midst of growth and change, the essential character and human values of cities and towns and neighborhoods—preserving not just single buildings, but also the values they represent individually and collectively. We will urge that one be less ready to tear down, more anxious to look for new uses for buildings that are not necessarily of landmark worth, but which are essential to the human meanings of the place; and we will argue that when one does build new buildings one must learn to be more respectful of such meanings.

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Architecture and inflation (OR, and then Arch Rogers told the President...)

I guess every interest group in the country made some kind of presentation to President Ford's pre-summit and summit Conferences on Inflation. As usual, what the architects had to say didn't make the papers—at least any I saw. But what the architects had to say—in the form of a paper prepared for the Conference by Arch Rogers with the help of the AIA staff and other professionals (and approved as an official AIA recommendation by the Board) was extraordinarily thoughtful, and I'm taking the liberty of quoting it at length because at least architects should read it.

Arch talked first about the roots of inflation—especially the inflation in the construction industry (calling construction, with his usual memorable style in the use of words “an economic hermaphrodite—half boom and half bust”). He argued that “because of the expectation of inflation, each of the several past years has seen a surge of capital investment designed to put that year's dollars to work before they are shrunken by inflation” and added (most importantly) that “this consideration has often overridden questions that would be asked prudently in more stable times: Is the market real? What is the competition? The result: Excessive building which in some areas is depressing the market for new construction.”

He stressed once again the effect of construction regulation—arguing that while the regulations “if stated as standards to be met, are only marginally inflationary . . . probably supportable trade-offs between improved quality and price.” But, the AIA document suggests: “Where regulatory inflation really hurts is not in the standards promulgated; it is in the costly and unproductive prolongation of approval time for the administrative review to achieve these standards . . . All such delays add substantially to the cost of construction with no comparable gain in productivity. And this may be an unacceptable trade-off.”

Rogers argued that all of “our post-war apparatus, both public and private—designers, builders, and lenders—is structured to meet the suburban, and therefore the new construction market” whereas the greatest need is now, of course, in the cities.

The statement concluded, as any good statement should with “Recommended Actions.” For the short term, the AIA paper suggested possible reimposition of wage and price controls on a selective basis; a “pro tem” easing of credit restrictions, again with great selectivity “to nourish those sectors and regions now near starvation,” a balancing of the Fed budget “with budget cuts and tax increases . . .

designed so as not to burden unfairly the poor and other relatively powerless elements of our society”; and a selective public works program to fill “the most obvious gaps in our physical plant . . . with particular emphasis on housing.”

More important, however, are the long-term recommendations made by Arch Rogers on behalf of the AIA:

1. On the subject of conserving resources, the statement argues that “An approach towards self-reliance is valid only if (1) it does not result in economic isolationism and (2) it recognizes that dampening demand is as important as discovering and exploiting domestic sources of scarce resources.”

2. The statement points out that “the opportunity for conserving energy by designing (and redesigning) our buildings toward the highest feasible energy efficiency could cover alone two-thirds of the oil imports that would otherwise be required.”

3. On the efficiency of our urban settlements, the report points out that “as a by-product of the new and more modest consumer patterns proposed, will come a long overdue opportunity to improve the functional efficiency of our settlement patterns. This can be done by reconstructing the entrepreneurial and public management apparatus of the metropolitan area. The objective is not to penalize the suburbs, but to restore a reasonable balance—to encourage private investment in the center city.”

4. “Similarly, the opportunity presents itself for restoring and upgrading the physical plant both in center city and the suburbs. This, for the time being, may provide the most sensible alternative to the excessive costs of new building. This will require rethinking of codes and ordinances which now discriminate against remodeling.”

And finally. . . .

5. “With this kind of enforced rethinking of codes and ordinances and the reshaping of the industry to capitalize on the recycling opportunities, there is a good chance of restoring the industry to its pre-war efficiency. The single most important area for encouraging this evolution is to de-regulate the industry. Let the standards . . . follow the model of our national annual IRS self-certification—subject to spot checks for violations . . . and where violations are uncovered, subject to civil or criminal penalties.”

In all, it seems to me, an extremely thoughtful piece of work. Was anyone listening? We can hope. —Walter F. Wagner Jr.

Going public— why not??? . . . why???

I've been doing a lot of thinking about what everybody says is a trend: bigger and bigger architectural firms, offering "more comprehensive services" and the kind of management that those corporate clients really cotton to. I keep wondering (and observing), and I think someday soon I'm going to lose a lot of friends with an editorial that says bigness sometimes seems to result in less attention to design—in less involvement with clients as people and more involvement with clients as clients. I do know one thing: the happiest (not necessarily the best-to-do, mind you) architects have smaller firms.

Anyway, as I was thinking about that just the other day, what should appear on my desk but a thoughtful piece from a frequent contributor, Brad Perkins, managing partner of Llewellyn-Davies Associates' New York office. It's about the perils of going public, as bigger firms have been wont to do from time to time. It's worth thinking about. . . .

Here's what he has to say:

"The executive vice president of one design firm that went public several years ago said, 'It was a mistake. There is no viable public market for firms such as ours.' This sad comment is borne out by the current prices of publicly owned design firms or firms with a significant design-service component. Firms such as CRS Design Associates, CRS Corporation, Planning Research Corporation and Genje, Inc., are generally selling for less than a third of their original issue price and at less than 15 per cent of their highs. The same is true of virtually all of the other publicly held firms in our profession. Part of these current low prices are due to the generally depressed state of the stock market. As will be discussed in a future RECORD Architectural Business section, however, there appears to have been a long-term re-evaluation of design-firm prices.

"In spite of this current depression, the original reasons for public ownership still exist. Among the most important are the following:

"1. To provide additional working capital for the firm;

"2. To give the original owners a public market that eases their ability to 'cash out';

"3. To provide the firm with a negotiable instrument for acquisitions and mergers;

"4. To provide a meaningful instrument for employee incentives such as stock options.

"The current market evaluation of design-firm stocks, of course, brings the value of some of these benefits into question. Few firms like to use stock in their company to pay for acqui-

sitions when their own stock is priced lower (in terms of its price-earnings ratio) than the purchase price of the firm to be acquired. Most principals are loathe to give up substantial parts of their ownership for such low prices. And employees rarely find options in sinking stocks much of an incentive.

"In addition, a firm must balance somewhat tarnished benefits against the costs. Among these costs are the following:

"1. During periods of low market-valuation, such as today, most of the advantages do not apply.

"2. It distracts senior management. As one firm put it, 'The first year we ever had a dip in growth and earnings was the first year after our public offering. Everyone was so busy with the mechanics that they forgot to run the firm.' This may seem extreme, but, in the best of cases, going public and meeting the annual requirements of public ownership (shareholder meetings, reporting, etc.) drain a significant portion of management time.

"3. It is expensive to make a public offering. Printing, legal, accounting, and related costs can easily exceed \$100,000.

"4. It is expensive to meet the annual requirements of public ownership. Most firms feel that they must be audited by a 'Big 8' accounting firm; there are extra legal expenses; there are writing, printing, and distribution costs for annual reports, and a variety of other expenses. When combined with the salary cost of management time donated to public-ownership activities, the additional annual cost can easily exceed \$60-100,000 per year.

"5. There is a loss of privacy, and, if too much of the firm is publicly held, there is even the possibility of loss of control.

"All of these factors have led to one public firm taking steps to 'go private' again by buying back its stock. Others who might have considered a public offering are now paying more attention to alternative approaches to obtaining the advantages of public ownership. These include:

"1. Private placements to provide additional working capital. Sophisticated private investment money, however, can be expensive and investors usually expect to be able to get their money out easily within a few years.

"2. Being acquired. The advantages and disadvantages of this approach vary widely according to the firms and personalities involved.

"3. Acquisitions made without transfer of a public stock. Private shares, cash and other instruments are regularly used for such transactions.

"4. Annual private valuations of firm values and stock distribution plans. In privately

held firms, these can be structured to maximize most of the advantages of current public-stock option programs.

"If a comparison of these alternatives were made, the disadvantages of public ownership do not dampen a firm's enthusiasm for a public offering, the actual mechanics of such a step are well outlined in the many texts on public offerings. A more useful text, however, might be a discussion with one of the firms that is currently living with the pros and cons of public ownership."

National Endowment launches its City Options program

I keep being very impressed by the program that Nancy Hanks, Bill Lacy and their friends at the National Endowment think up. The announcement of grants in their City Options program is just in, and my admiration is unabated.

With 148 grants, the Endowment spread \$3 million over 43 states, Puerto Rico and the District of Columbia. Small towns and cities came in for a good number of awards: 24 went to towns of 25,000 or less and another 40 to cities of less than 250,000. On the other hand, most of the big grants—though none is larger than \$50,000—went to the urban areas. (The smallest—\$900—went to London Mills, Ill., to repair and clean some 19th-century brick sidewalks.)

More impressive than the amount of money dispensed or the geographical range of the program is the extraordinary variety of projects it poses that, in the eyes of the Endowment, fall within the scope of urban design. Some examples, taken more or less at random: \$10,000 to Samuel V. Noe, Jr., of Cincinnati for prototypical plans to decentralize urban universities; \$48,860 to the United Indians of the Tribes Foundation in Seattle to plan an Indian Cultural-Educational Center; \$16,500 to the New York Botanical Garden for research on the design of urban tree containers; \$30,000 to Peekskill, N.Y., to study the possible use of plus hot water from nuclear plants for heating and cooling; \$5,700 to Harry G. Robinson of Washington, D.C., to study the corner store as a source of stability and stimulation in inner city neighborhoods.

More than half the grants—76 of them—involve the preservation of historic neighborhoods and buildings, and 41 of these focus on the adaptive use of old structures. A trend that reflects, we're happy to see, our own ideas about one of the pressing issues in urban design—the next month's special issue on "Conservation in a context of change."—W.W.



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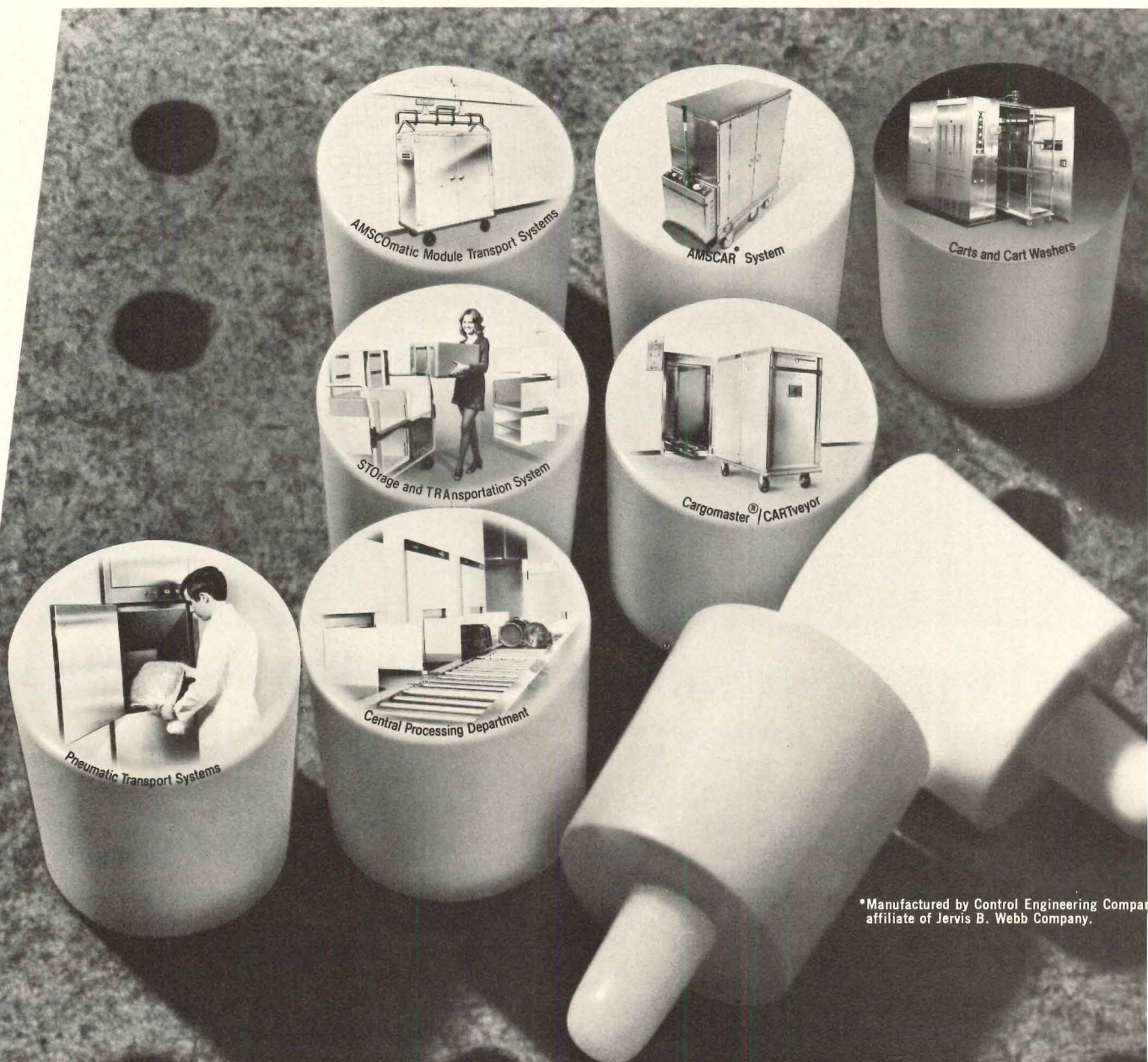
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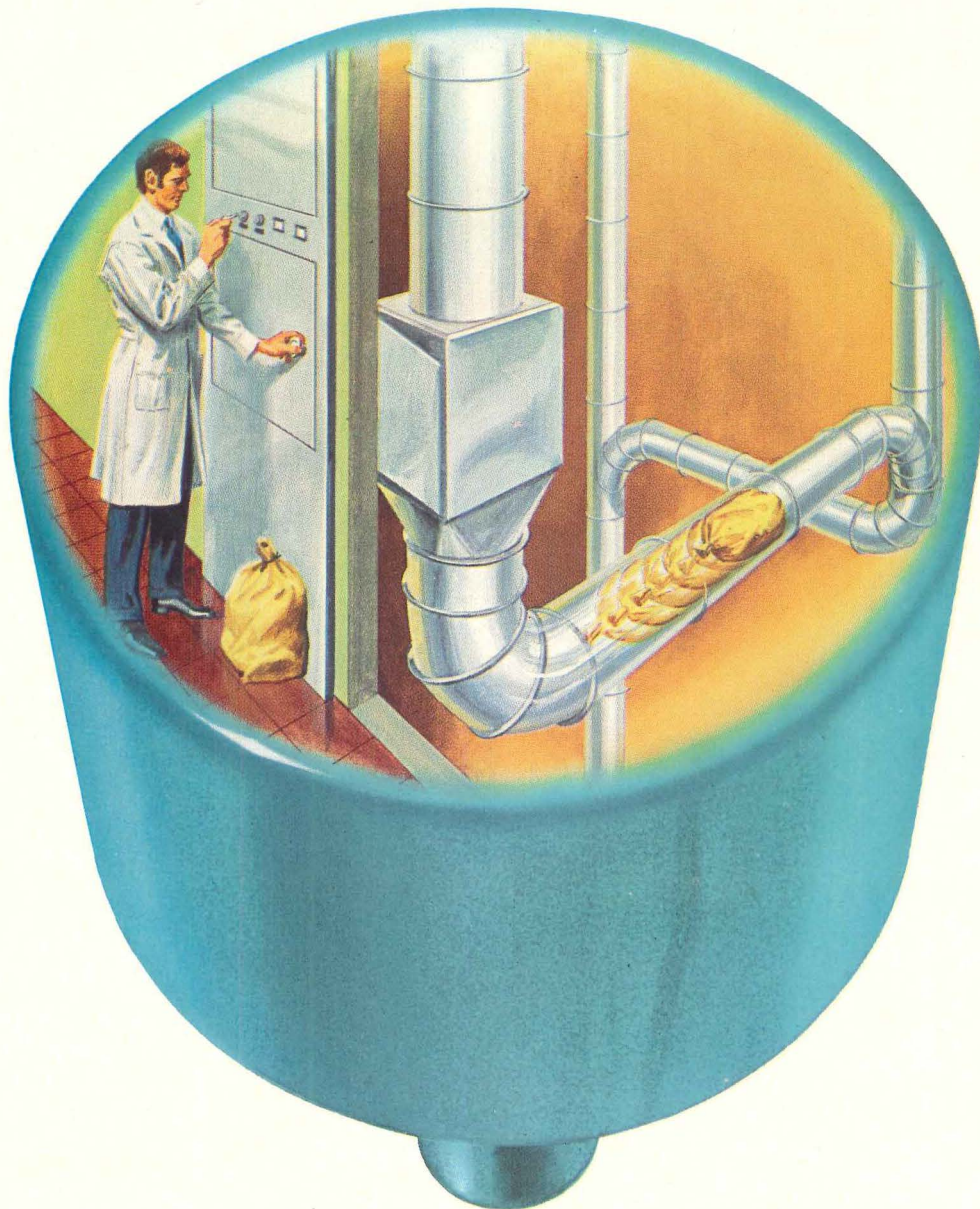
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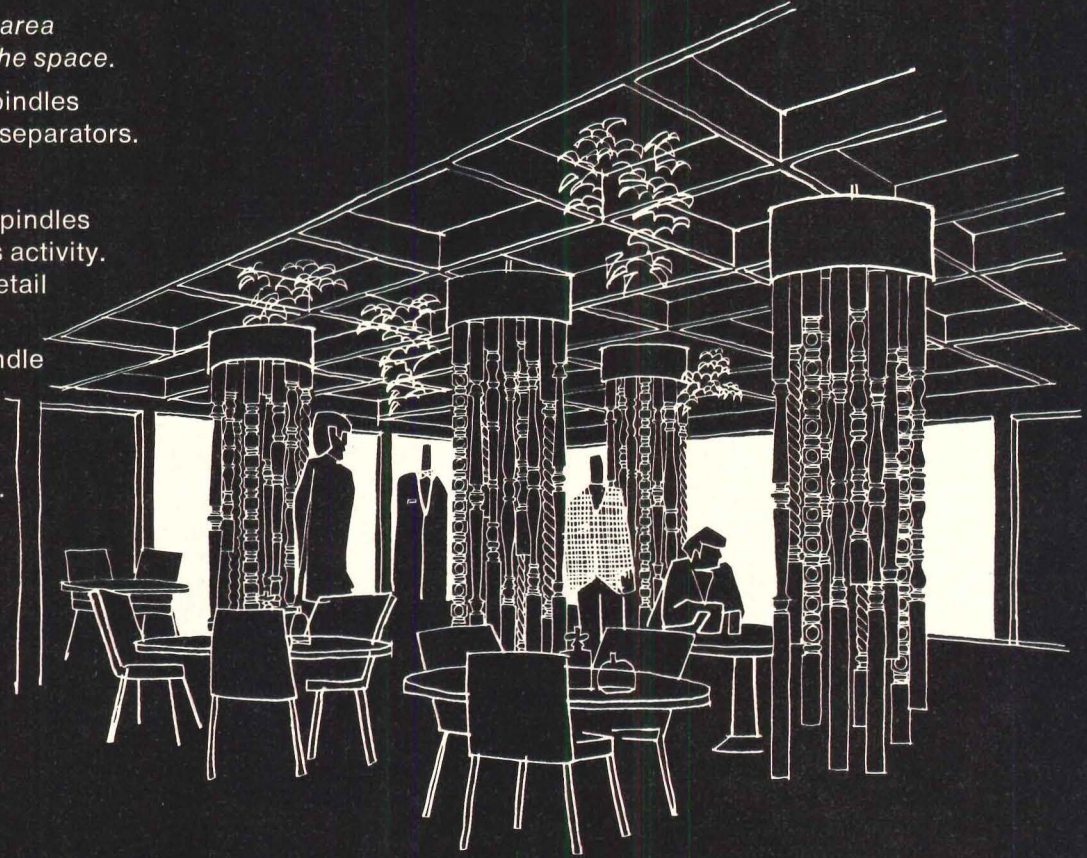
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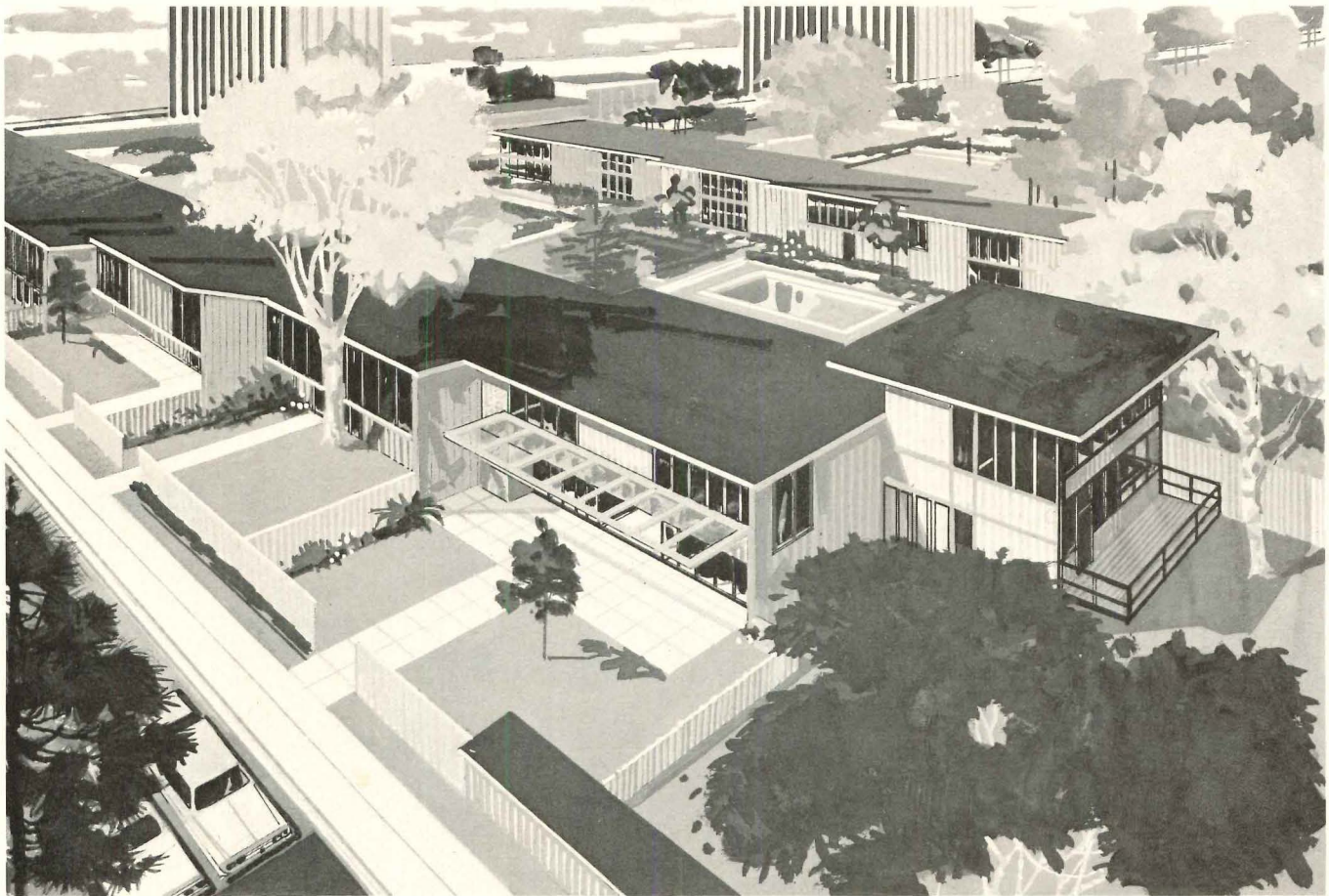
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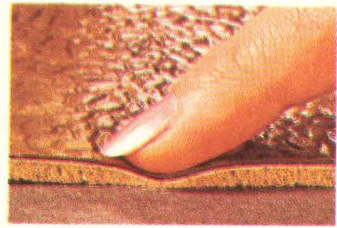
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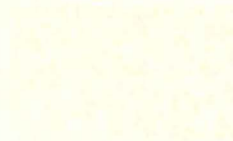
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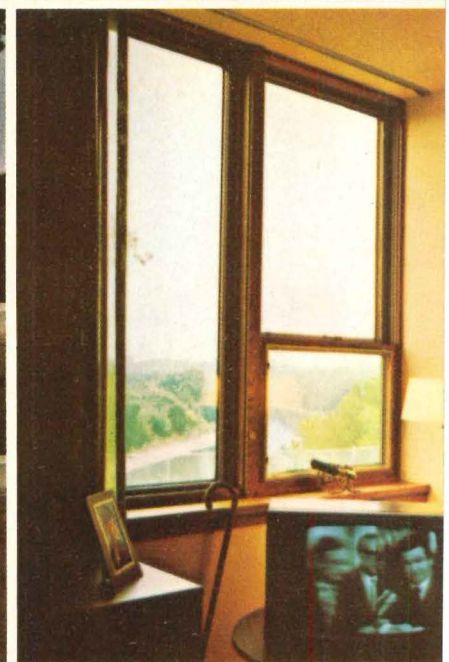
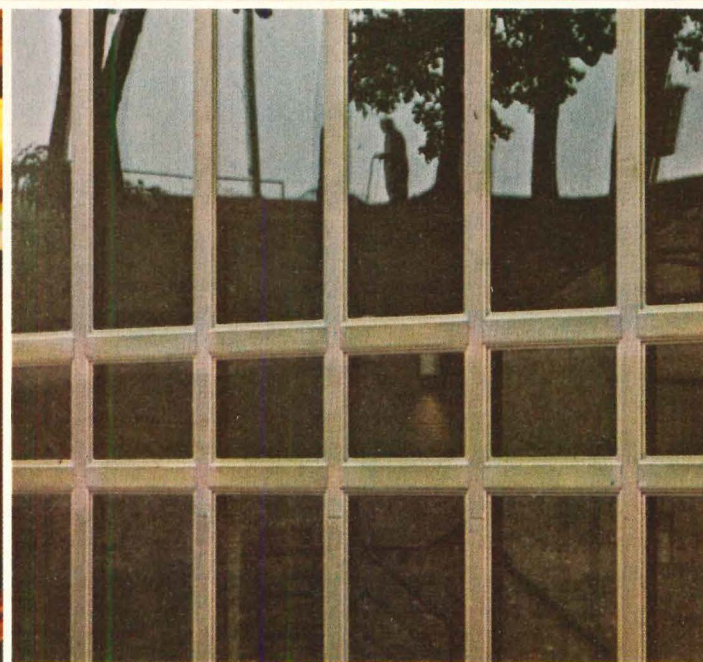
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(b)

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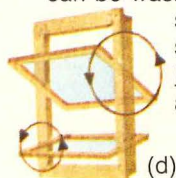
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(c)

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(d)



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Parkview Hills, a new residential development in Kalamazoo, Michigan, had three condominium apartment buildings planned on a 12-acre site as part of a 280-acre planned community. In the initial concept, the first condominium, a 33-unit, masonry-wall structure, Lake Villa West, priced out at a drawing-board construction estimate of \$1,680,000.

When this price tag proved too high for the developer, the architect/engineer redesigned the condominium in structural steel and determined that the apartment/home could be constructed for almost \$400,000 less. At that point the project shifted from the drawing board to the construction stage.

Increased housing demand poses problem

Soon after the foundation work and fabrication of the steel framing for Lake Villa West had been completed, however, the developers asked that a fourth floor be added to the butterfly-shaped structure to meet newly projected demand for the condominium units.

A request of that nature, at that phase of construction in the original masonry wall concept could not have been accomplished. But with the steel framing, the architect was able to add the fourth floor to the building plans without changing the size of the already fabricated steel columns. "Because

of the flexibility of steel design," said the architect, "we were able to provide the additional floor by transferring lateral loads from the columns, as originally planned, to a new, braced-bay system within the structure."

This fourth floor was added with steel framing for only \$200,000 more than the initial masonry wall concept, providing 44 housing units rather than the planned 33.

Cost increase pays off

The additional floor brings the total project construction cost to the 106,000-sq-ft condominium to about \$1,700,000. The investors were able to hold the total project cost of Lake Villa West at the \$2,650,000 originally projected. This includes land, landscaping, furnishings, and interest.

The Parkview Hills development was designed to blend with its environment of woods, meadows, marshlands, and waterways.

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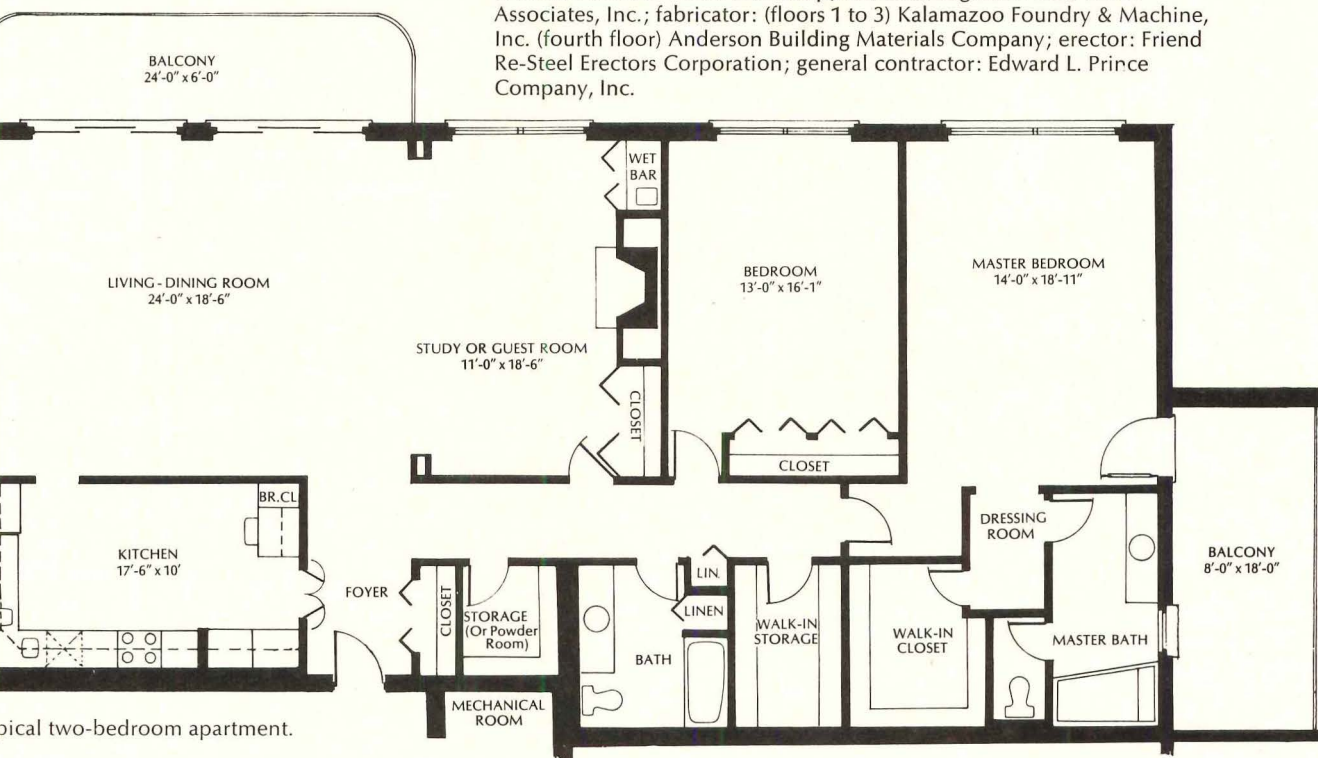


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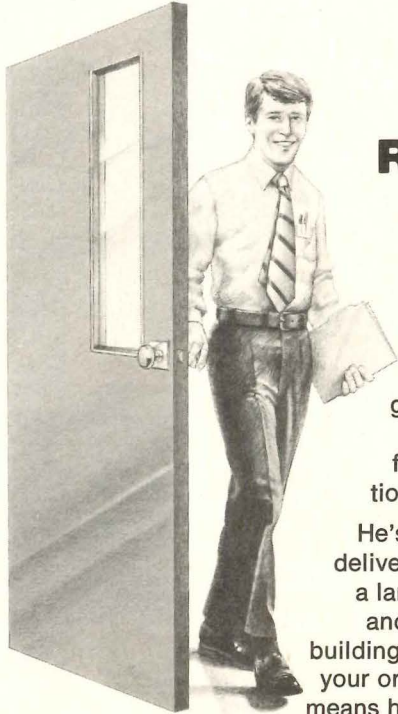
Owner: Parkview Hills Partnership; architect/engineer: Lake States Associates, Inc.; fabricator: (floors 1 to 3) Kalamazoo Foundry & Machine, Inc. (fourth floor) Anderson Building Materials Company; erector: Friend Re-Steel Erectors Corporation; general contractor: Edward L. Prince Company, Inc.



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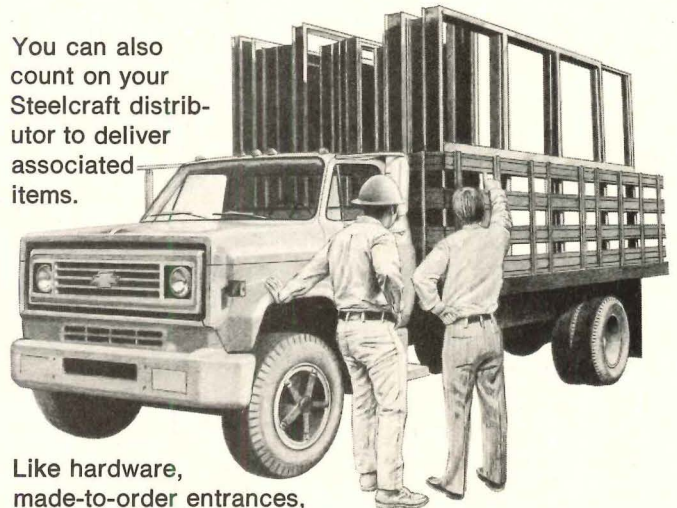


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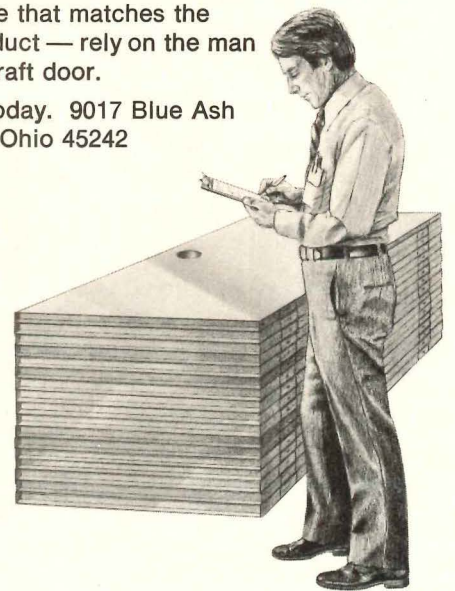
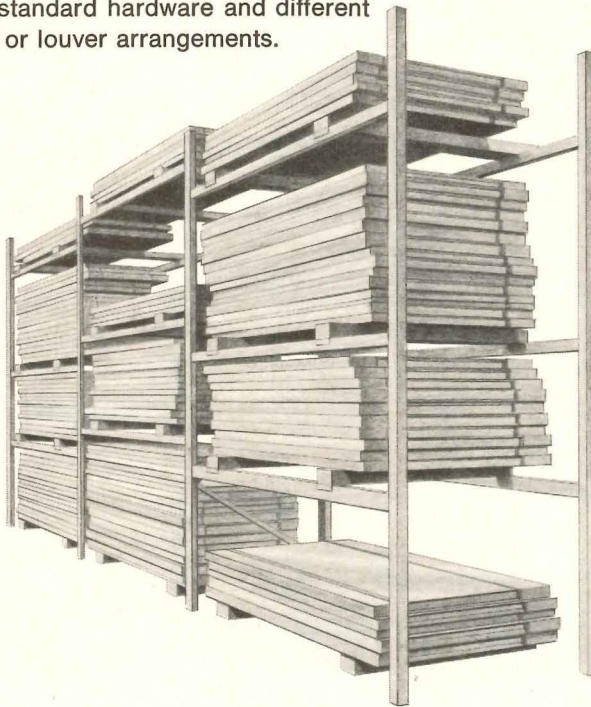
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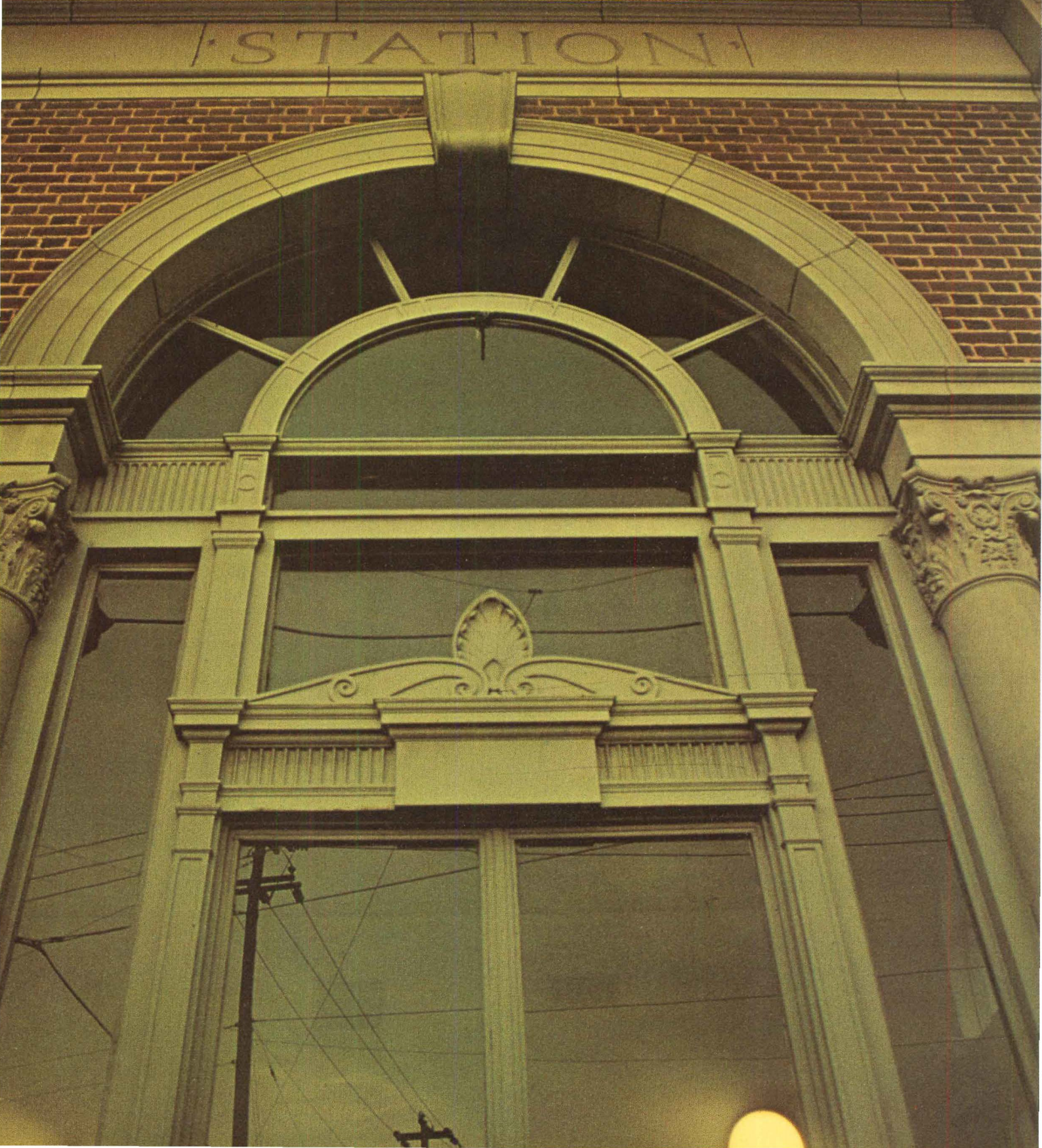
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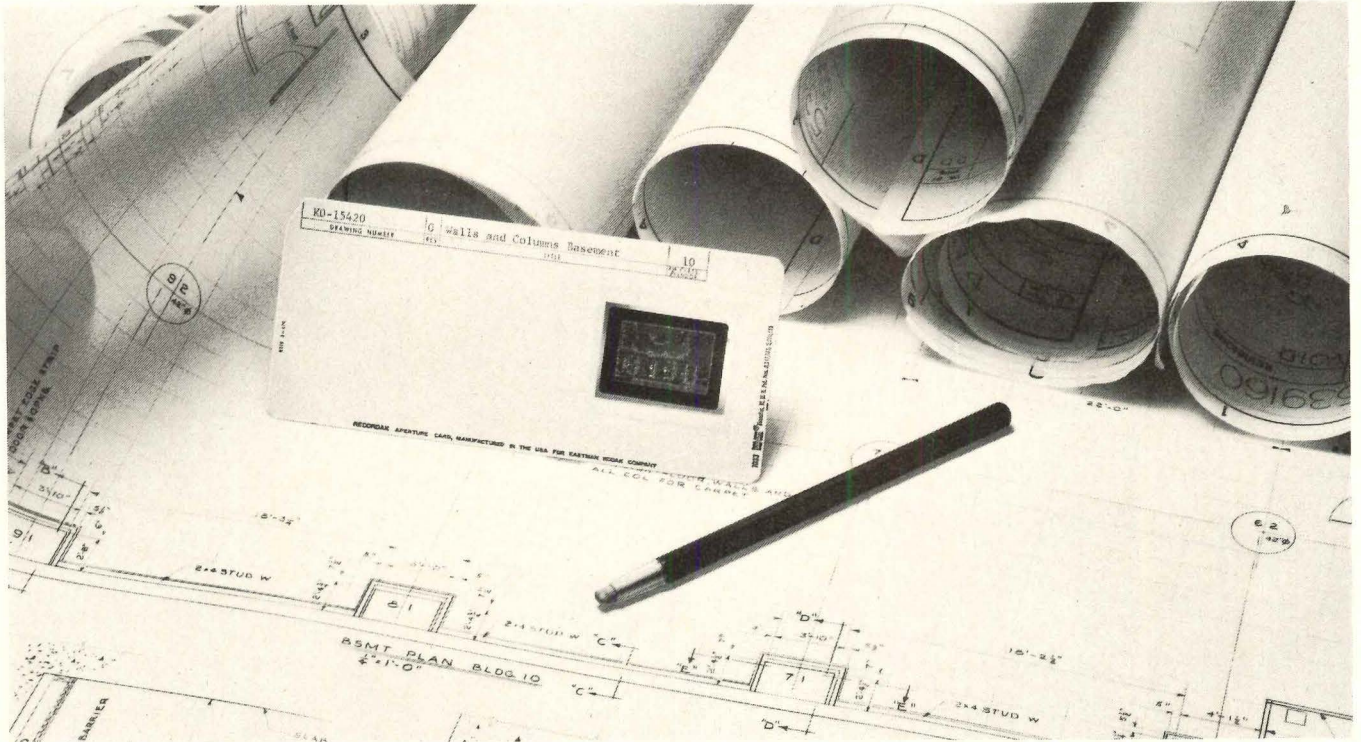
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The Dodge/Sweet's Construction Outlook for 1975 places the value of contracts at \$102.1 billion, up 8 per cent from the 1974 figure of \$94.8 billion. A gain of 12 per cent is predicted for residential building, estimated at \$41.3 billion. Non-residential building, with a decline of 4 per cent predicted, will total \$32.5 billion, and non-building construction is expected to increase 17 per cent over 1974, for a total of \$28.3 billion. The national 1975 Dodge/Sweet's Construction Outlook appears on page 65.

Walter A. Meisen has been named Acting Commissioner, Public Buildings Service of the General Services Administration, replacing Larry F. Roush, who is now acting Assistant Administrator of GSA. Both men are awaiting confirmation by Civil Service. Mr. Meisen, an architect, joined GSA in 1958, and has been assistant commissioner for construction management since 1970. During that time he supervised more than \$1 billion in Federal construction.

The \$11.8 billion mass transit bill is currently stalled again in Congress, as a result of the House Rules Committee refusal in October to move the bill to the House floor before the election period recess. House supporters promise to revive the bill. (For a report on the Sixth International Conference on Urban Transportation in Pittsburgh, September 8-10, see page 34.)

Regulations for distribution of community development funds have been published by HUD. Grants offered under the new Omnibus housing law are expected to start flowing to cities in January, based on applications HUD intends to take starting December 1. Details on page 34.

The U. S. Navy has awarded a \$250 million medical center contract to Ellerbe/Dalton Dalton Little Newport, a joint venture. The six-year-long project, called one of the nation's most advanced medical education and health care centers, calls for the existing National Naval Medical Center Hospital in Bethesda, Maryland to undergo a major reconstruction, involving new facilities totaling 880,000 square feet, and the remodeling of 255,000 square feet within existing buildings. The Ellerbe/Dalton Dalton Little Newport team was awarded the contract by the Naval Facilities Engineering Command. Design work has begun.

Barnett Sumner Gruzen, founder of Gruzen & Partners died September 27 at the age of 71, in New York. Mr. Gruzen was a Fellow of the American Institute of Architects, and until 1971, had been chief executive officer of the firm he founded as Kelly & Gruzen in 1932. More on page 34.

A bill in the Pennsylvania State Senate has been introduced to save the Louis I. Kahn papers. Introduced in September, the bill would appropriate \$500,000 to purchase the papers, models and drawings from the estate, which is hundreds of thousands of dollars in debt. The State would then turn the papers over to a non-profit corporation for viewing by the public. The move is an attempt to keep the Kahn papers in Philadelphia, Mr. Kahn's home. Several institutions and dealers are interested in purchasing the collection which would undoubtedly be removed from the city in the event of a sale.

Applicants are being sought for the 1975 Brunner Scholarship Award. Applications are available from the New York Chapter, AIA, until December 31. The award is open to any citizen of the United States engaged in the profession of Architecture and related fields. Announcement of the award will be made June 4, 1975. For more information contact the New York Chapter, AIA, 20 West 40th Street, New York, N.Y. 10018.

Design fellowships of \$10,000 each are being offered by the National Endowment for the Arts. Applicants are asked to formulate their own fellowship programs which will be evaluated according to their potential for advancing the individual's personal development and the value of the work to the profession. Applications must be postmarked no later than January 6, 1975. For further information, contact the Architecture and Environmental Arts Program, National Endowment for the Arts, Washington, D.C. 20506, attention Mr. Roy Knight, assistant director.

Funds are being sought to establish a Memorial lecture series in honor to Anthony G. Adinolfi, former general manager of the New York State University Construction Fund. Dr. Adinolfi, who died in 1971, was well-known for his efforts to bring the architectural profession and its related professions into the mainstream of governmental capital programming, planning and construction. Contributions to endow this lecture series for generations of future students may be directed to The American Institute of Architects Foundation, The Octagon, 1799 New York Avenue, N.W., Washington, D.C. 20006.

February 24, 1975 is the deadline for submissions to the Louis Sullivan Award for Architecture, sponsored by The American Institute of Architects and the Bricklayers, Masons & Plasterers International Union. The award is based on the submission of at least three and no more than five buildings in which masonry is a major element. Carrying a \$5,000 prize, the biennial award is offered to practicing architects in the United States and Canada. Intention to participate must be made known to the AIA headquarters in Washington, D.C. by November 15, 1974.

Barney Gruzen, FAIA, dies at 71

Barnett Sumner Gruzen, founder of the architectural-planning-engineering firm of Gruzen & Partners, died September 27 in New York City after a brief illness. He was 71.

Mr. Gruzen was a Fellow of the American Institute of Architects, and until 1971, he had been chief executive of the firm he founded as Kelly & Gruzen in 1932 in Jersey City, N.J.

Barney Gruzen was born on July 25, 1903 in Riga, Latvia. He came to the United States in 1905 with his family and became a naturalized American citizen in 1925. After earning his citizenship, he graduated from the Massachusetts Institute of Technology in 1926 with a bachelor of architecture degree and, two years later, with a master of architecture degree.

In 1930, Gruzen won the Rotch Traveling Scholarship, conferred on Massachusetts residents for travel and further education. On the basis of a design for a new Plymouth Rock monument, Gruzen earned the opportunity to travel extensively throughout Europe and to study at *L'Ecole des Beaux Arts* in Paris.

Returning to the United States in 1932, Gruzen worked briefly with the New York City architectural firms of Stone & Webster and Emery Roth. Later that year, he crossed the Hudson and established a joint venture architectural and engineering practice with Hugh A. Kelly of Jersey City.

In 1967, a year after the death of Colonel Kelly, the firm changed its name to Gruzen & Partners and admitted five additional architects to the part-

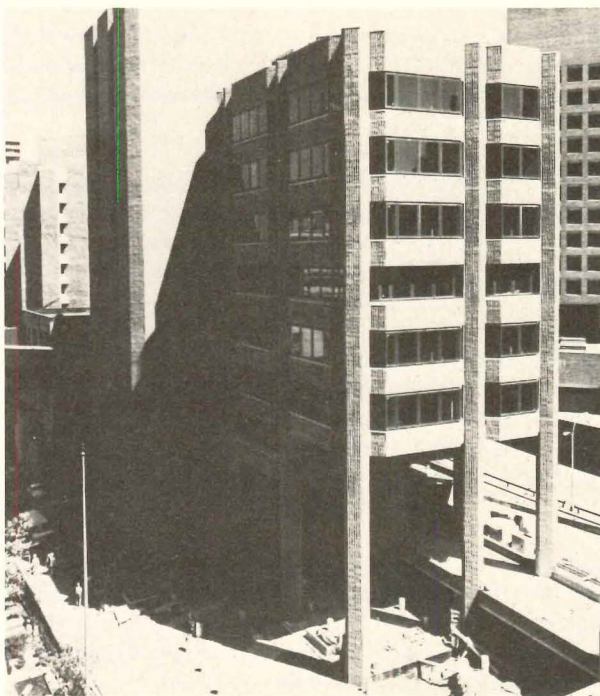


nership, among them Jordan L. Gruzen, the founder's son.

Projects in which Mr. Gruzen exercised particular influence were the U.S. Mission to the United Nations in New York City; Pavilion of Spain at the 1964 World's Fair; the New York City Police Academy; and the new U.S. Embassy in Moscow.

Perhaps the best example of Mr. Gruzen's work can be found around the western approaches to the Brooklyn Bridge in Manhattan's Civic Center. It was through his efforts that the firm, from 1960 through 1974, was able to earn 10 separate commissions for diversified design projects there.

The first was Chatham Green, a serpentine apartment structure which was inspired by similar plans in Europe. It was completed in 1962 and followed by the Chatham Towers Apartments (1965), Bache & Company corporate headquarters (1969), Southbridge Towers Apartments (1970), Beekman Downtown Hospital Staff Residence (1972), One Police Plaza (page 107), and the U.S. Courthouse Annex (shown below) to be dedicated in December.



AIARC studies revised GSA energy guidelines

A significant effort is underway to revise the presentation of material contained in the General Services Administration document, "Energy Conservation Guidelines for New Office Buildings." This compilation of guidelines was issued by GSA and its constituent agency, Public Buildings Service, several months ago and the Research Corporation of the American Institute of Architects has been doing a comprehensive analysis of its pages under Federal contract.

AIARC has proposed a comprehensive rearrangement of the contents of the guidelines book without changing, in any marked degree, the substance of the recommendations. And GSA apparently is prepared to accept the suggestions which are to appear in final form around the first of the year.

Discussions of the revision to date have emphasized that solar energy use and life-cycle costing as developed by GSA are extremely important ingredients of any energy conservation effort in building design and the two are tied closely together. More stress than before also is being placed on operation and maintenance, again involving the life-cycle cost approach.

As the important document is being rearranged by GSA and its consultants, the architects and engineers who will be using it on their Federal jobs are reminded that it will continue to be just what its name implies—guidelines to help them achieve code requirements in their designs. It will not become a standard or a code under any circumstances, it is promised, but will remain a performance requirement, based on the 55,000 BTU energy goal developed from the Manchester, N.H. experimental office building project.

Though the 55,000 BTU standard has drawn some criticism from industry sources, GSA is standing pat on it as it was developed from a theoretical computer analysis on the Manchester structure.

"Selling" transit is conference theme

Should the Federal government foster urban development including transit development, or should it simply support transit? Does transit serve cities or do cities develop around transit? How can modern man be wooed away from his first love, the automobile?

This chicken-and-egg debate characterized presentations by transit experts at the Sixth International Conference on Urban Transportation held in Pittsburgh, September 8-10. The position of the U.S. Government was made clear early when President Ford told conferees he will approve transit funds to a maximum level of \$11 billion spread over six years if the House and Senate can work out differences between their bills; and that he would modify a long-held position by approving "limited" operating subsidies for urban transit systems.

The other side of the coin for transit: the \$11 billion ceiling is half of what the house asked for in its original legislation.

"Marketing Urban Renaissance," the conference theme, became the very pragmatic problem of marketing urban transit, especially to people whom Chicago Transit Authority chairman Milton Pikarsky termed "transit independents"—the traveler who uses his own car for urban travel. Sir Richard Way, chairman of the London Transport concurred: the basic answer, he said, is to provide "such an attractive public transportation service—and I am using the word 'attractive' in every sense including financially attractive—that people would prefer to travel on it."

The \$11.8 billion mass transit bill is currently stalled as a result of the House Rules Committee refusal in October to move the bill to the House floor before the election recess. House supporters have promised to revive the measure.

Panel reports on unprofessional conduct

Since its establishment last May, the National Inquiry Committee of the American Institute of Architects has undertaken investigations of 15 cases involving alleged misconduct by architects the committee's chairman said in September.

Reporting to the AIA board of directors, F. Carter Williams stated that eight of the 15 cases are currently active (one already heard, with two more hearings scheduled); three others have been held up pending further evidence, and four have been dismissed unless additional evidence in support of the allegation of wrongdoing is found.

The AIA board voted in May to establish the inquiry committee to investigate matters that appear to involve un-

professional conduct in a major public interest, or recent allegations of misconduct by design professionals.

Twenty-five members of the Institute have been appointed to the committee, serving as a pool from which investigative panels assigned to individual cases of the investigative panels that valid grounds for complaint exist, the inquiry committee must decide whether a case should be referred to the Institute's National Judicial Board, to the appropriate architectural registration and/or to legal authorities.

In cases referred to the National Judicial Board, a inquiry committee is authorized to act as complainant in instituting proceedings against an alleged offender—a decision from earlier procedures have required that an individual bring charges.

Regulations issued for Omnibus-law grants

The detailed regulations proposed by the Housing and Urban Development Department for distribution of community development grants under the new Omnibus law have been published to include architectural and historic preservation matters.

The first year's amounting to \$2.5 billion in fiscal 1975 of a program of \$8.4 billion, can begin to cities and other local government jurisdictions as early as January, 1975, based on applications which HUD intend to take starting December 1. Requests will be submitted to HUD area offices on an earlier date, but no awards will be made until the next year and the application program year will not be until approval of a full grant allocation.

The newly proposed regulations dictate that recipients of grants must account for the effect on community development projects on any district, site, building structure or object listed or eligible for listing on the National Register of Historic Places. Every effort must be made to eliminate or minimize any adverse effect on a property.

Besides the \$8.4 billion contract authority to the program over three years, \$50 million for each of two years and \$100 million the third is authorized for site grants to communities with urgent development needs which cannot be met by title allocation provisions.

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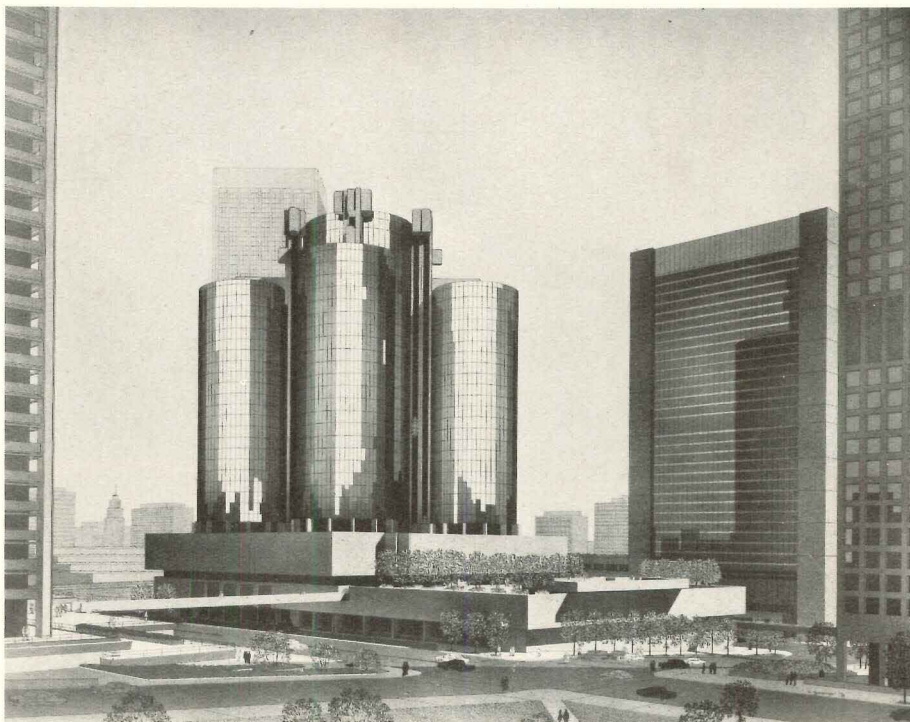
Group "white paper" meets OSHA standards

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\$100-million hotel-shopping center planned for Bunker Hill redevelopment

Atlanta architect-developer John Portman, and Western International Hotels, announced in September detailed plans for a \$100 million, 1,500 room convention hotel and retail center in the Bunker Hill Redevelopment Area of Los Angeles. Construction has begun, and completion is set for 1977.

The 35-story hotel, with five bronze mirrored glass towers rising above a podium structure with a large outdoor plaza, will be located on a

3.54-acre tract acquired from the Los Angeles Community Redevelopment Agency.

The concrete podium structure will contain retail shops and convention, entertainment, and other public facilities on six levels, all oriented around a large atrium space. Above that, will rise the glass-walled guest room towers. A cocktail lounge and revolving restaurant will top the central tower.

Elevators serving the guest

rooms and rooftop restaurant rise from the central atrium, penetrate openings in the skylight, and continue their ascent on outdoor tracks.

Pedestrian bridges will link the building's retail levels to the Atlantic Richfield Tower on the south, the Union Bank Building on the west, the Los Angeles World Trade Center on the north, the Security Pacific National Bank Building on the west and, later, to a proposed office building on the east.

State Street parade opens Calder festival

An Alexander Calder Festival in Chicago, held Oct. 25-26, revolved around two dedications—of a massive stabile in Federal Center Plaza and a "moving mural" in the Sears Tower lobby—and the opening of a retrospective exhibit that will continue through Dec. 8 at the Museum of Contemporary Art. Most festively, the proceedings got under way with a circus parade down State Street in celebration of Calder.

Japanese design program aids "right to light"

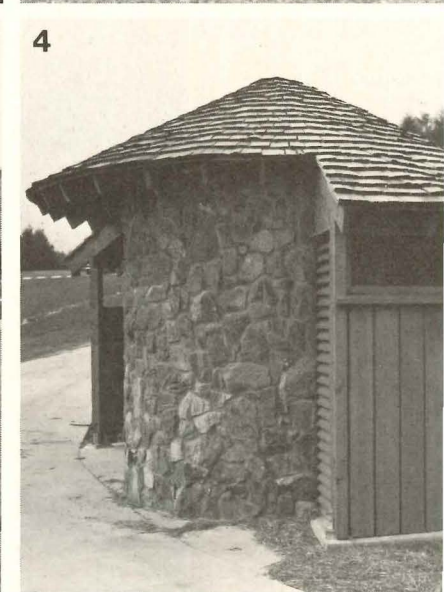
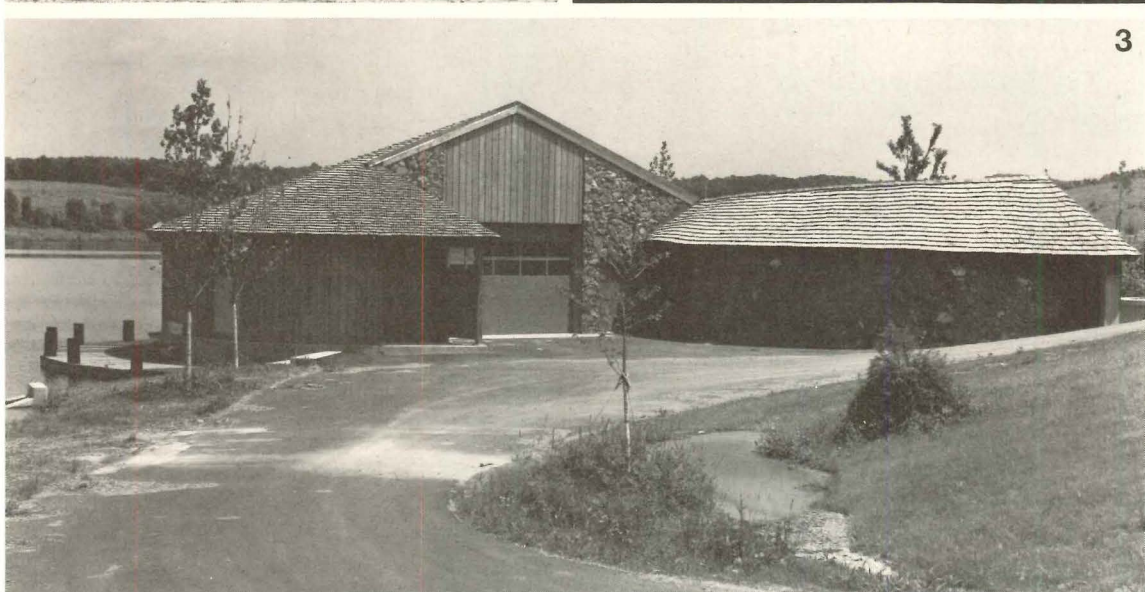
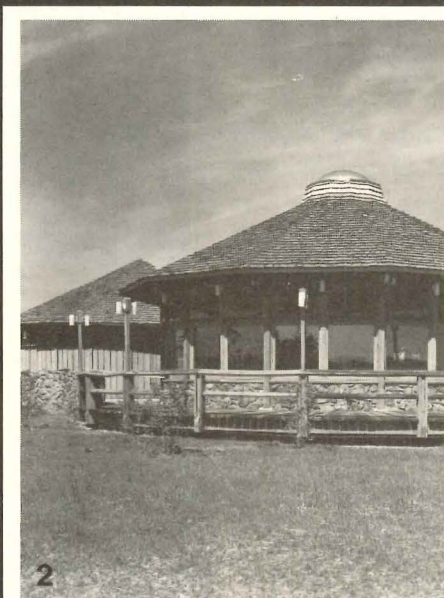
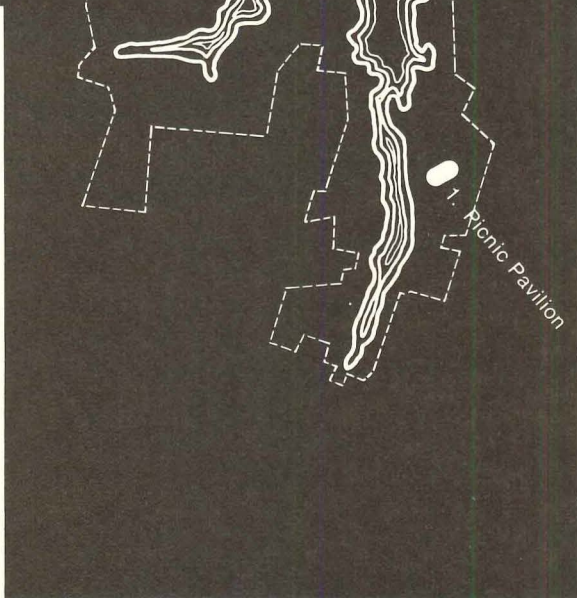
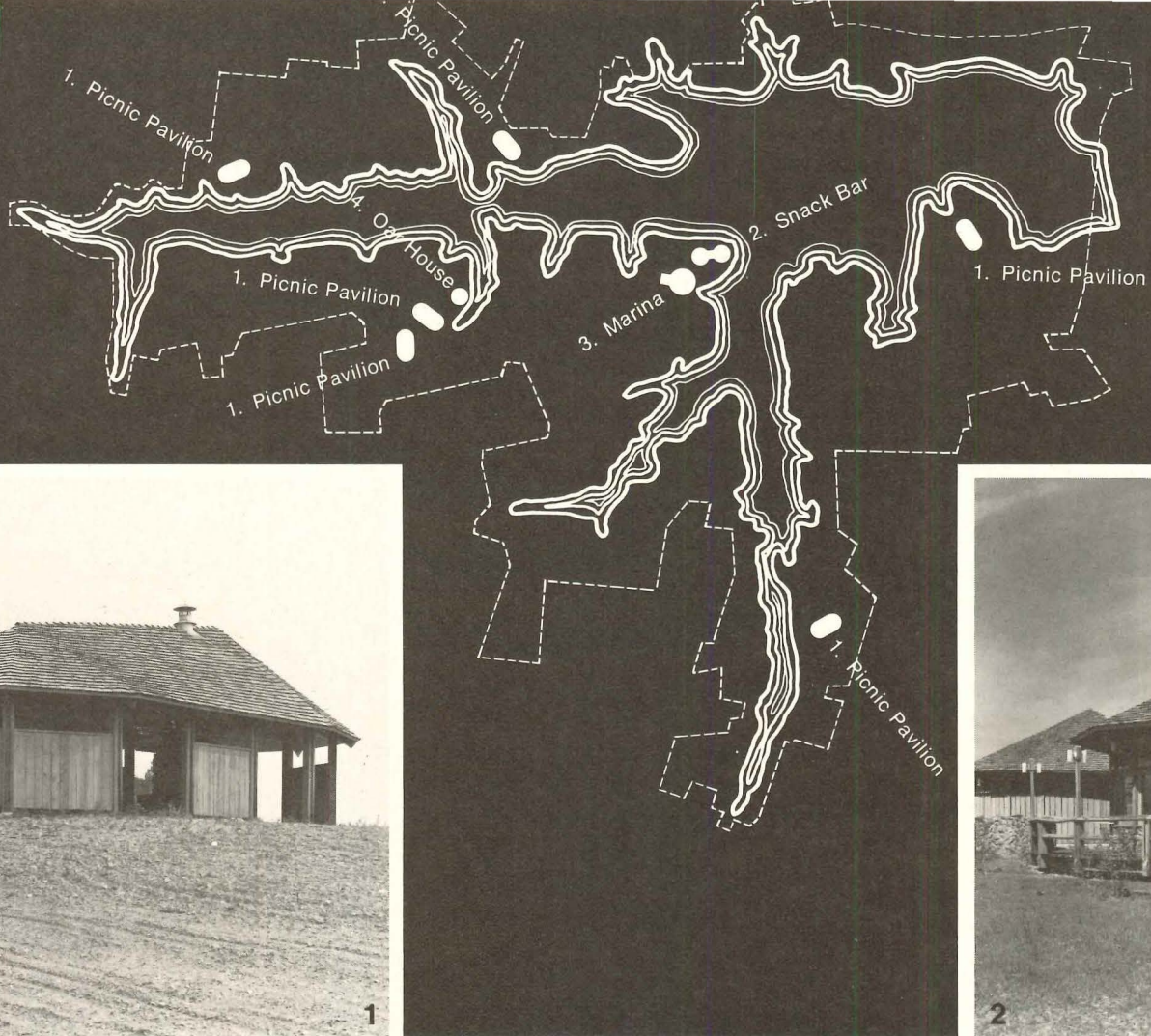
In much the same manner as the concern for the environment has resulted in widespread attention in recent years to the problems of fouling the atmosphere, land and waterways, and more recently, noise pollution, a movement is underway to protect the right to sunlight of inhabitants of large metropolitan areas. Several Japanese cities have taken the lead in safeguarding the "right to light" by passing municipal ordinances to deal with the condition.

Focusing on this situation, a new computer program has been developed in Japan to help engineers study the problems of shadows created by high-rise structures. The program has been developed jointly by the Aoki Construction Company, Ltd., of Osaka, and Nippon Univac Kaisha, Ltd. of Tokyo, and is available only in Japan.

Known as the Automatic Shadow Investigating System, (ASIS), the program is designed for use with large-scale computer systems linked to plotting machines. The computer calculates the shadows cast by tall buildings planned for construction over surrounding structures.

ASIS calculates the time from sunrise to sunset of a specified day or days of a year and the shade of a given building or buildings on a particular part of ground, produces the results of the calculations and generates a series of charts.

Charts produced by the plotter can be used during the design stage of new buildings and also for back-up data in filing applications to governmental agencies for construction permits. Besides the building calculations, ASIS can also calculate precisely the shadows produced by elevated roads. ASIS has been designed for use at any point in the southern and northern hemispheres.



Codorus State Park Buildings, Pennsylvania. Buchart Associates, Architects. Buchart-Horn, Consulting Engineers and Planner

Red cedar rounds out a state park.

These are one designer's answer to the problem of creating striking structures that harmonize with their natural surroundings.

Red cedar handsplit shakes were part of the solution. Their rough-hewn texture and rhythm lend distinction to the buildings, at the same time integrating them organically into the rest of the park.

No other material could do this. No other

material has red cedar's combination of beauty, durability and insulative properties.

Next time you have a problem like this, consider Red Cedar Certigrade Shingles or Certi-Split Shakes. They can round out things for you.

For more details, write Red Cedar Shingle & Handsplit Shake Bureau, 5510 White Bldg., Seattle, Washington 98101. (In Canada: 1055 West Hastings St., Vancouver 1, B.C.)



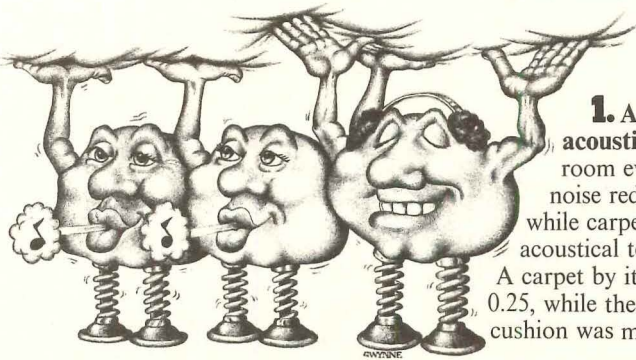
These labels on bundles of red cedar shingles or handsplit shakes are your guarantee of Bureau-quality. Insist on them.

Red Cedar Shingle & Handsplit Shake Bureau

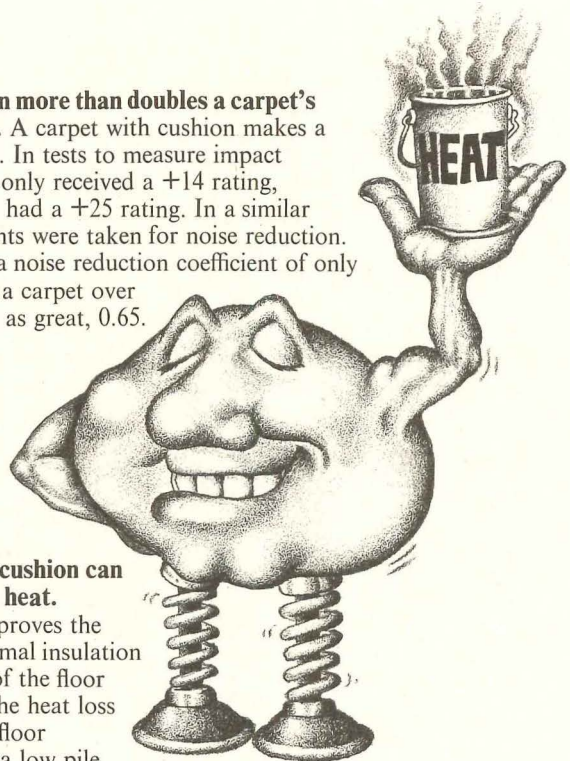
One of a series presented by members of the American Wood Council.

Before you pull the padding out from under another rug, read this.

Whenever your carpeting budget is up against the wall, the first thing you're tempted to do is pull out the cushion. Before you do, consider the underlying contributions carpet cushion can make to your next installation.

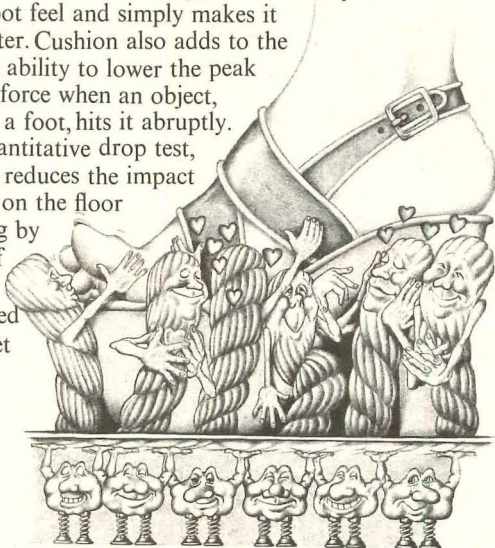


1. A carpet cushion more than doubles a carpet's acoustical properties. A carpet with cushion makes a room even more quiet. In tests to measure impact noise reduction, carpet only received a +14 rating, while carpet over cushion had a +25 rating. In a similar acoustical test measurements were taken for noise reduction. A carpet by itself measured a noise reduction coefficient of only 0.25, while the coefficient for a carpet over cushion was more than twice as great, 0.65.

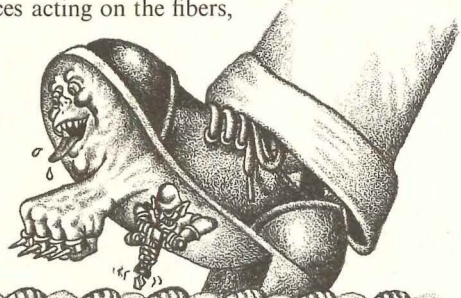


3. Carpet cushion can help retain heat. Cushion improves the overall thermal insulation properties of the floor covering. The heat loss factor of a floor covered by a low pile carpet and a cushion is about one-third of what it would be with the same carpet alone.

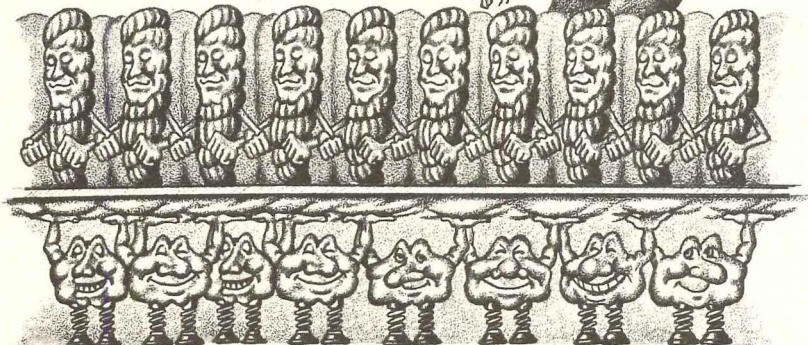
2. Separate cushion makes a carpet seem thicker and more luxurious. It upgrades the carpet's underfoot feel and simply makes it feel better. Cushion also adds to the carpet's ability to lower the peak impact force when an object, such as a foot, hits it abruptly. In a quantitative drop test, cushion reduces the impact exerted on the floor covering by one-half when compared to carpet alone.



5. Separate cushion makes a carpet easier to maintain. It lowers the maximum forces acting on the fibers, thereby reducing the pile crushing and the grinding action of imbedded dirt that can cut and fray fibers. That means a cushioned carpet—given a fixed maintenance cost—will look better for a longer period of time than a non-cushioned carpet.



4. The initial cost of a cushioned carpet need not be more expensive. Instead of putting money into a sub-floor, you can put it into a cushion. A cushion plus carpet can mask surface irregularities so that a lower-grade, less costly finish on sub-floors can be specified. In addition, a lighter weight, less expensive carpet can be used since the more expensive face yarns aren't needed to provide cushioning. And there are no expensive labor costs involved in the removal of an old carpet, as there can be with glue-down installations.



6, 7, 8. and more reasons why carpet cushion will add life, and cost less to install, can be found in our new brochure. For your free copy of "The Supporting Facts about Carpet Cushion," write: Carpet Cushion Council, P.O. Box 2048, Dalton, Georgia 30720 (404) 278-3176.

 carpet cushion council

Eighteen buildings selected by the New York State Association of Architects for design awards

At the annual convention of the New York State Association of Architects/AIA, held in New York City October 17-19, awards were presented to clients and architects of buildings located around New York State. The buildings selected for the state's highest architectural honors are said to reflect the in-

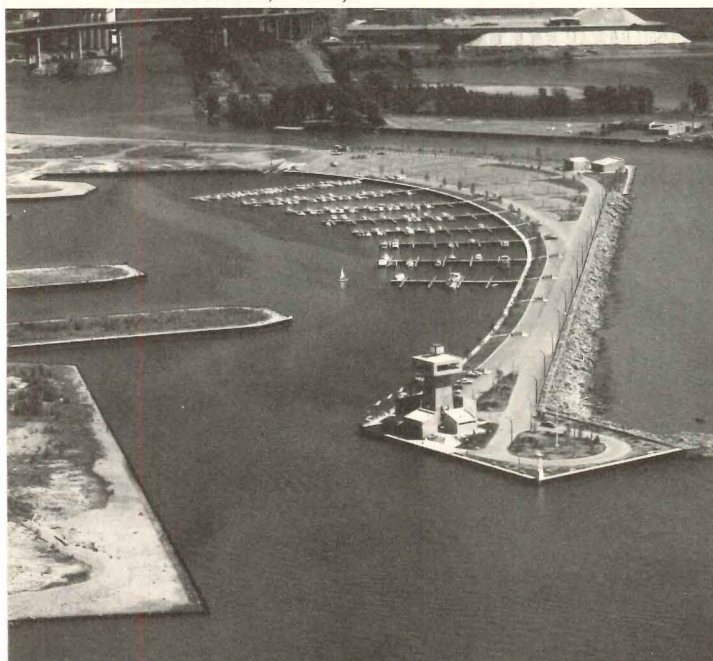
creasing involvement of architects with every type of design. Six buildings shown below were chosen for top honors (Certificate of Merit winners). They are: Cadman Towers, Brooklyn, New York, by Glass & Glass and Conklin & Rossant; Erie Basin Marina, Buffalo, New York, by Di Donato, Renaldo

Associates; Cohn residence, Amagansett, New York, by Gwathmey-Siegel; Police Facilities Building, Schenectady, New York, by Feibes & Schmitt; Biology and Psychology Building, State University of New York, Binghamton, New York, by Davis, Brody and Associates; and The

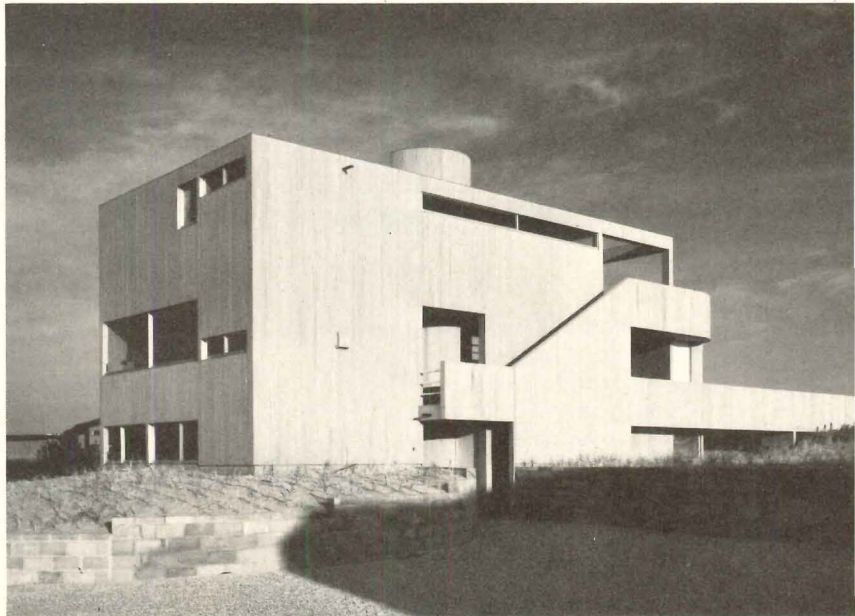
Cast-Iron Building, New York City, by Jacobs and Associates. Several of those buildings receiving honorable mention are shown at the far right. Members of the jury were: Theodore Biggie, Jr., Anton Egner, Giorgio Cavaglieri, Arthur Rosenblatt, E. N. Turano, J. D. Whalen, and Nicholas J. Senesey.



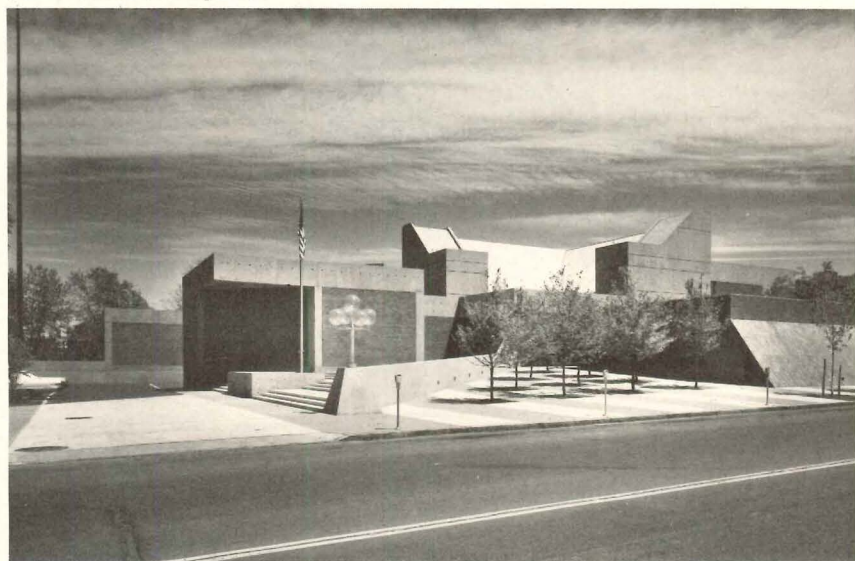
Cadman Towers, Brooklyn



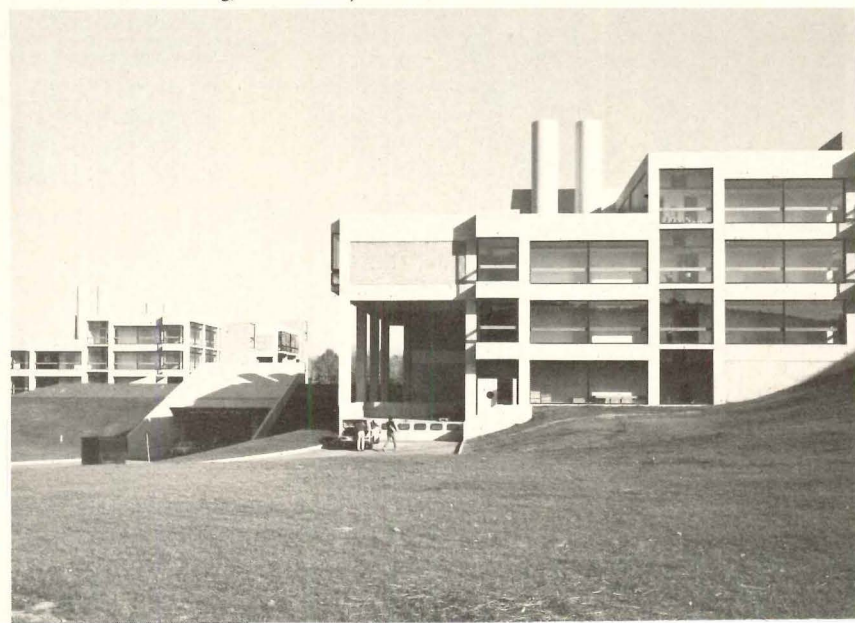
Erie Basin Marina, Buffalo



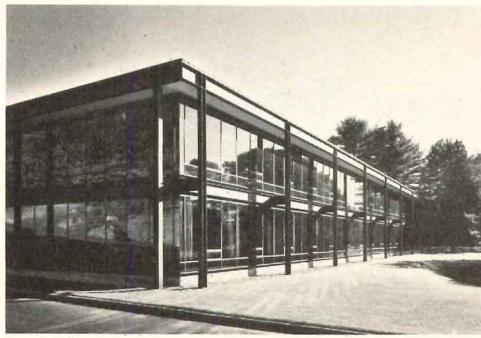
Cohn residence, Amagansett



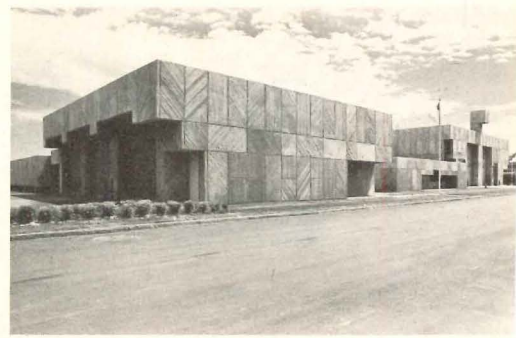
Police Facilities Building, Schenectady



Biology and Psychology Building, Binghamton



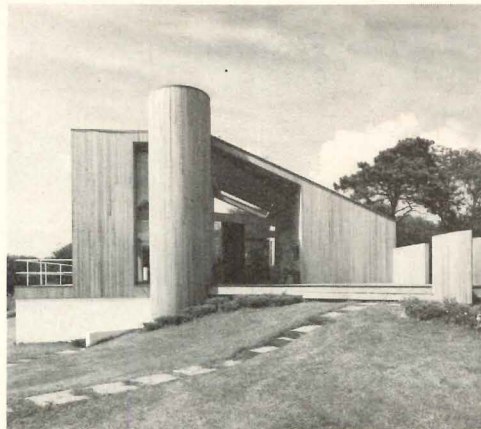
Office building, Briarcliff



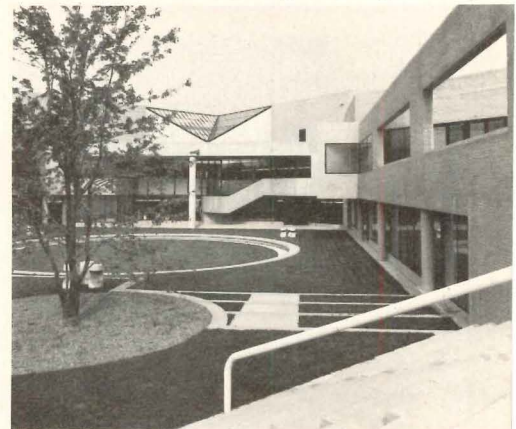
Water Pollution Control Facility, Plattsburgh



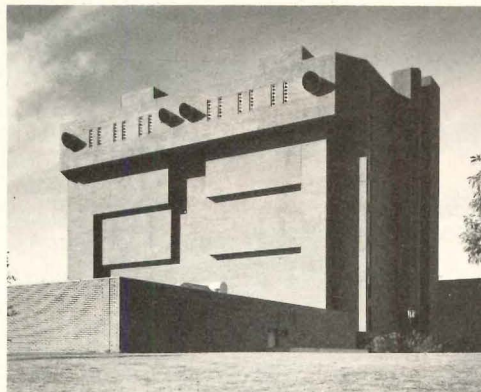
Cast-Iron Building, New York City



Silver house, East Hampton



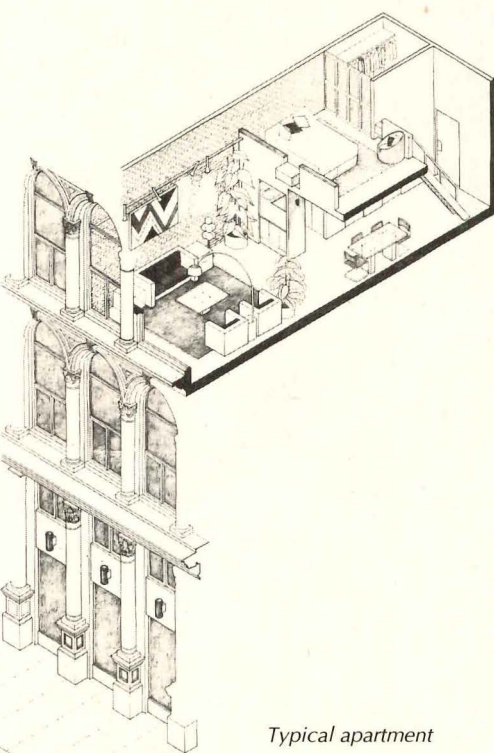
Student Union Building, Plattsburgh



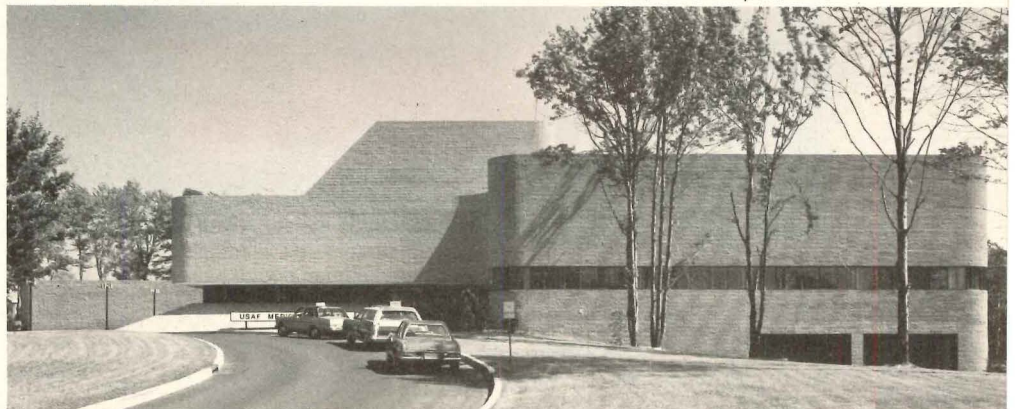
Research Tower, Ithaca



Friesner house, Westhampton



Typical apartment



Composite Medical Facility, Rome

Honorable mention went to twelve New York State buildings

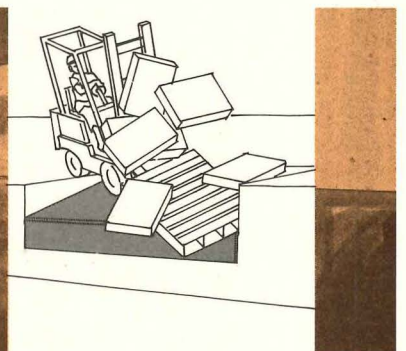
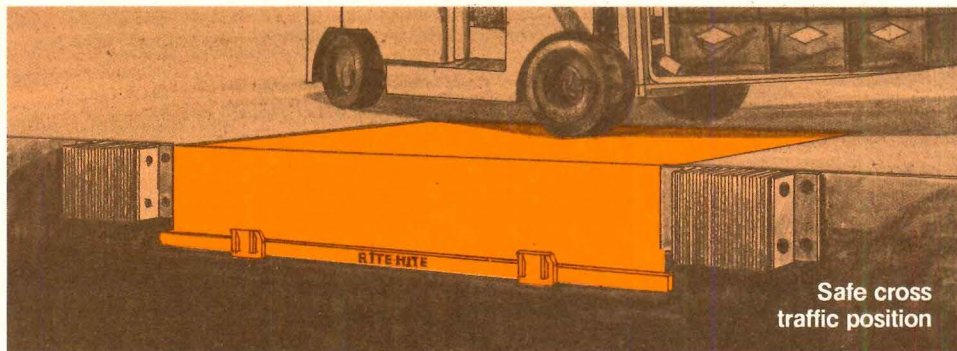
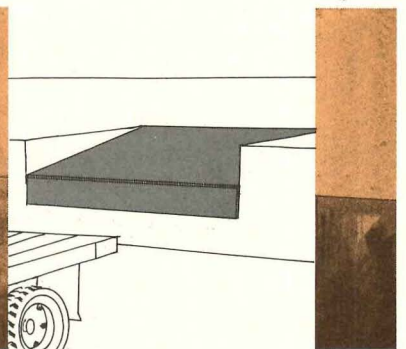
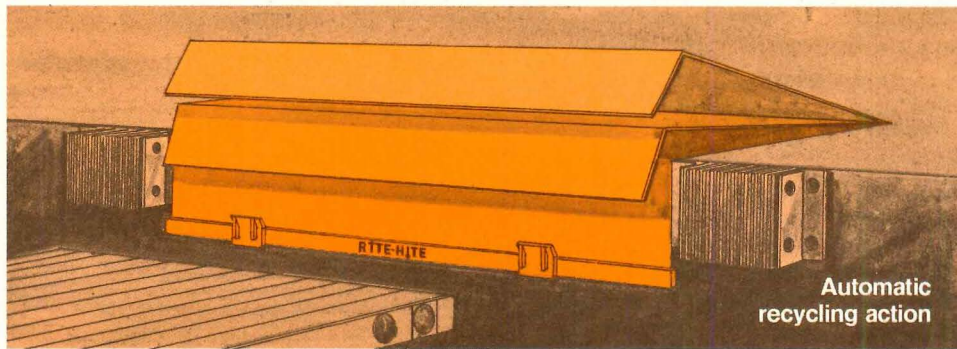
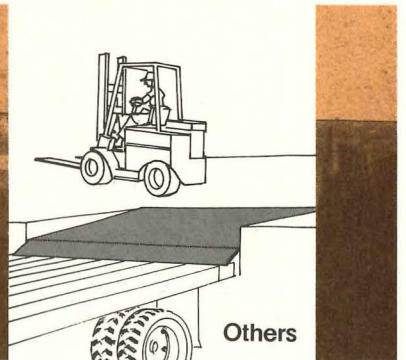
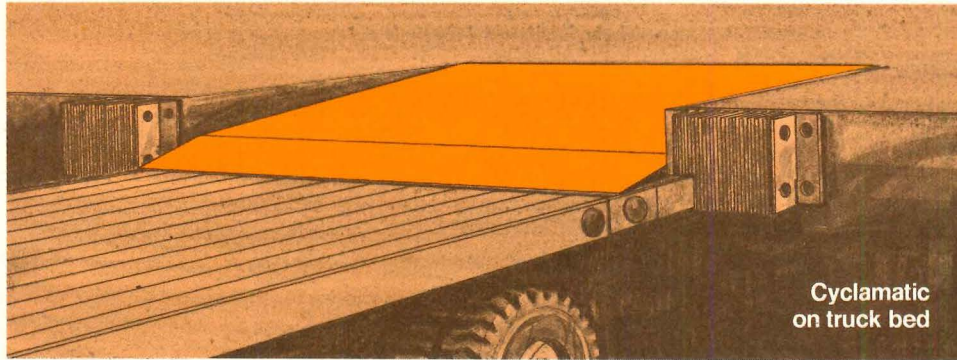
Selected for Honorable Mention in the AIA New York State awards program are: Office building, Briarcliff Manor, New York, by Fleagle and Kaeyer Associates; Water Pollution Control Facility, Plattsburgh, New York, by MacKnight, Kirmsse/Architects; Silver house, East Hampton, New York, by Edward M. Coplon; Student Union Building, State University College at Plattsburgh, by

Mitchell/Giurgola Associates; Research Tower and Laboratory Animal Wing, New York State College of Veterinary Medicine at Cornell University, Ithaca, New York, by Ulrich Franzen and Associates; Friesner house, Westhampton, New York, by Hobart Betts; Composite Medical Facility, Griffiss Air Force Base, Rome, New York, by Max O. Urbahn Associates. Not shown: Sarah Lawrence Col-

lege Library, Bronxville, New York, by Warner Burns Toan Lunde; Grasslands Reservation Modular Housing, Mount Pleasant, New York by Pokorny & Pertz; Joseph C. Wilson Health Center, Rochester, New York, by Parks Morin Hall & Brennan; Horace Mann Barnard School renovation, New York City, by Frost Associates; and Public Library, Jericho, New York, by Bentel and Bentel.

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Young architect designs for Micronesia

When Peace Corps volunteer architect Stephen H. Doty of Royal Oak, Mich. (shown) sits down to design a building, he has several unusual considerations to keep in mind.

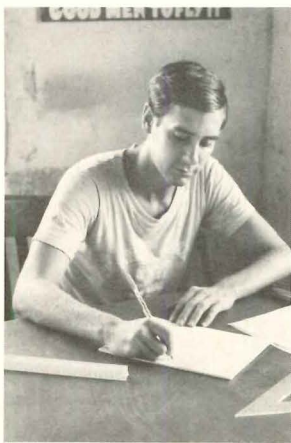
His buildings must be typhoon-proof, free of wood because of the termite problem, and full of windows because air conditioning is out of the question for cooling and ventilating purposes. The design must be simple, for the buildings will be put up by villagers with little or no construction skills. Once a facility has been designed, there is sometimes no telling when building materials will be available.

Such constraints simply come with the job when one is working in the tropical island district of Colonia, Yap District, Micronesia in the middle of the Pacific Ocean. Doty, 25, a graduate of Lawrence Institute of Technology in Southfield, Mich., has been working in Yap for the past two years to help meet the district's need for dispensaries and health centers, community buildings, village water systems and other public facilities.

Now winding up his two-year tour of Peace Corps service, Doty has been serving as a volunteer architect with the Yap district's community development office. The office provides technical aid—including Doty's services—to villages and municipalities in the four Yap islands proper and the district's outlying atolls and islands. Public facilities are constructed under a grant-in-aid program in which communities contribute village labor and the government provides building materials.

"The design requirements for Yap are pretty simple, and there's not a whole lot of variety in the materials we use," said Doty. "The biggest limitation is in the skills of the workers. They're not very skilled so I can't design anything very elaborate. Our construction has to be simple."

Ventilation is another ma-



major consideration. "You really have to stay away from anything elaborate because of ventilation," Doty said. "Most of the buildings are far away from electricity, so air conditioning is out of the question. Everything has to have lots of windows, as open as possible."

"Another big problem," he continued, "is the material shortages here. Ships come very infrequently, and when they do, there's rarely any good material on them." Yap lacks good building stones and gravel, and the abundant bamboo is not suitable for the permanent structures Doty is asked to design.

Doty estimated that about 60 per cent of the facilities he designed and built were water systems for villages and municipalities. He has been building two basic types of water systems. One is a water catchment system, in which rainwater is caught on roofs and channeled into reinforced concrete holding tanks. The other basic system collects water from springs and streams by means of miniature dams, and holds it in concrete water storage tanks.

There are no Yapese architects, but Doty has been working with a local draftsman who will take his place when he leaves.

Doty has been one of about 175 Peace Corps volunteers serving in Micronesia in a wide variety of education, professional services, health, economic development and other programs. Around the world, about 7300 Americans are serving as Peace Corps volunteers.

Club of Rome study exhorts rich nations to invest \$250 billion annually in the poor

An elaborate study has been released which calls for an annual investment of \$250 billion by the industrialized nations to help the poorer countries become economically self-sufficient. The project has been conducted by a German-American team on behalf of the Club of Rome, an international group of industrialists, scientists, economists and sociologists.

The project calls for organic growth of the world economy rather than a halt to growth. At present, economic growth is uncontrolled, according to the report.

While the report emphasizes that its goals are to identify solutions to the world's problems, it presents four forecasts if steps are not taken.

For instance, the study, in exhorting rich nations to help the poor ones become self-sufficient, describes terrorists plaguing the rich, and eventual nuclear blackmail curtailing any further orderly development.

The study has been financed by the Volkswagen Foundation of Germany, and was presented to the Club of Rome in Berlin last month. From early results of the study, it was projected that, if the birth rate in South Asia dropped to the level of the death rate within 50 years, the population would still grow to such an extent that a cu-

mulative total of 500 million children would probably die of starvation.

The study concludes that the only remedy is early curtailment of births and heavy investment in the industrial productivity of the region. The area could then export commodities to compensate for its food imports.

The analysis does not show either nuclear power or reduced oil prices as a solution to the energy crisis. The proposed energy strategy calls for a short-term dependence on oil, followed by an intermediate stage of 10 to 25 years dependent on coal, gas and liquified coal. The final stage, beginning in the next century would use primarily solar energy.

An interesting conclusion of the study was that a return to oil price levels of the early 1970's—\$1.35 a barrel—would be disadvantageous to the industrial nations.

The reasoning is that this would stimulate continued over-consumption of oil and delay the development of alternative energy sources.

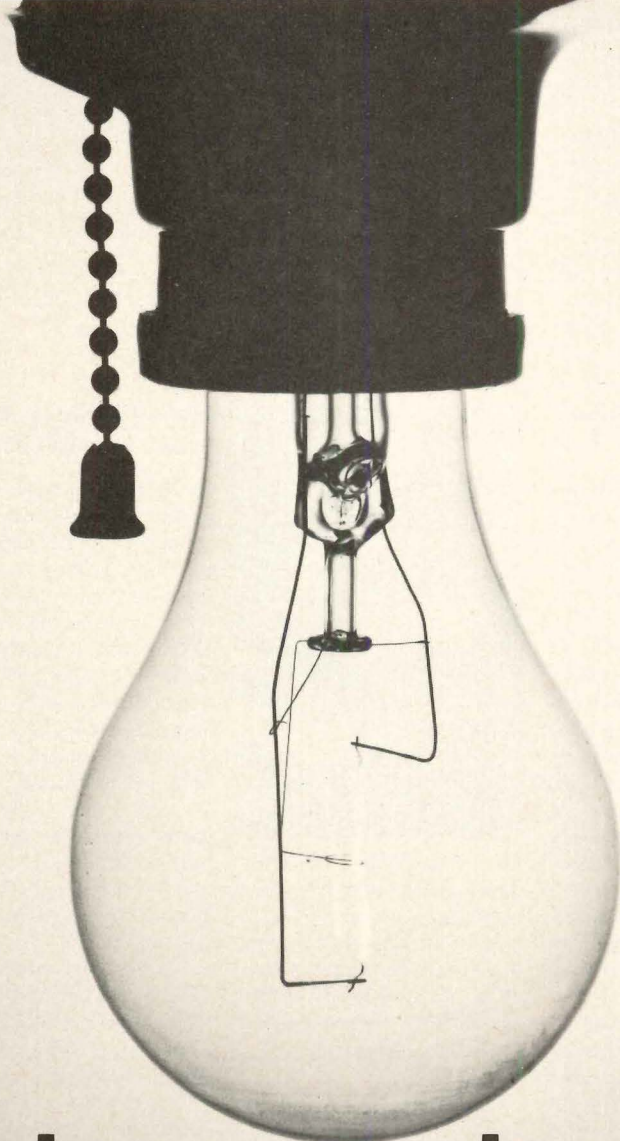
The report stresses the need for education suited to the 21st century, shedding the old notions of nationalism. The challenge of leadership is to bring about this transition, creating an orderly world economic growth situation.

Paul Hoffman, Marshall Plan administrator and managing director of UN special fund, is dead

Paul G. Hoffman, first administrator of the Marshall Plan after World War II, and former head of the United Nations Development Program, died in New York City on October 8, 1974.

Mr. Hoffman, also the first president of the Ford Foundation, was a major force in the United Nations efforts in behalf of emerging and poorer nations. It has been said that one of Mr. Hoffman's greatest contributions to the quality of life in underdeveloped nations was a project to rid North Africa and parts of Asia of locust plagues.

In implementing the Marshall Plan after being drafted by President Truman in 1948, Mr. Hoffman supervised the spending of \$10 billion, and is said to have laid the foundation for much of the subsequent economic growth of France and West Germany. Retiring from Federal service in 1950, Mr. Hoffman was named president of the Ford Foundation. Then, in 1959, he became managing director of the United Nations Special Fund, predecessor of the Development Program. He retired in 1972.



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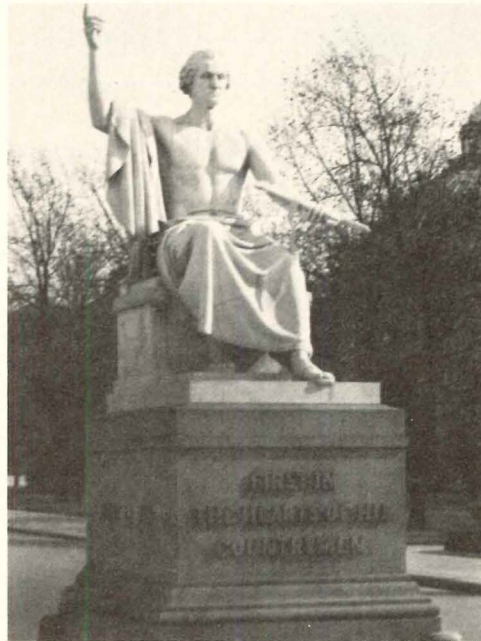
OUTDOOR SCULPTURE OF WASHINGTON, A COMPREHENSIVE HISTORICAL GUIDE, by James M. Goode; Smithsonian Institution Press, Washington, D.C., 1974, 615 pages, illustrations, \$10.00 cloth, \$4.95 paper.

Every year millions of visitors stream through Washington, D.C., from the architect on a hurried visit to the AIA to the schoolchildren whose buses become a familiar fixture on the Mall every spring. The average tourist is armed with a list of obligatory "sights"—the Capitol, the White House, the Memorials, and perhaps the *Spirit of St. Louis* and Jackie's Inaugural Ceremony at the Smithsonian. The results are a visual and informational overkill that dulls their senses beyond predetermined goals. Achievement and a queasy feeling at ever having to climb yet another mountain of marble steps are the more persistent. It is thus understandable that the bewildering array of Washington's public statuary goes largely unnoticed.

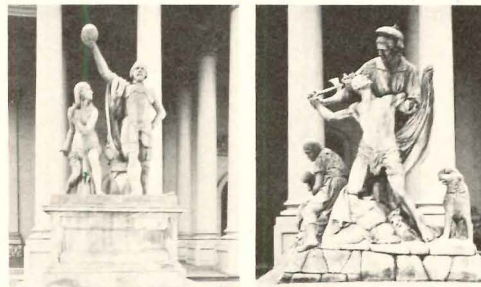
James M. Goode, curator of the Smithsonian's "Castle" on the Mall, focuses attention on the long-neglected outdoor sculpture of Washington in a book that is modestly subtitled "comprehensive" rather than "definitive," which is what it deserves. The most complete study of its kind for any American city, it gives a descriptive and critical analysis of the works illustrated; the book serves as well as a history of the changing patterns of taste and esthetic purpose in public sculpture as a whole, and it poses questions that transcend their local con-

text. From the Capital's first public monument (the *Tripoli Monument* of 1807) to the newly created Hirshhorn Sculpture Garden, we are presented with a detailed survey that says a great deal about the place of sculpture in America. Pierre Charles L'Enfant's city plan of 1791 and William Thornton's neoclassic design for the Capitol largely determined the demand for outdoor sculpture in Washington. L'Enfant's radial plan, with its squares, *rondabouts* and intersecting avenues, created spaces that in the classical vocabulary demanded statuary for focus, closure and scale. Thornton's Capitol, although modified from his original design, specified sculptural embellishments that left their mark upon building design in Washington as influentially as the colonnades that have become the city's most widespread architectural feature.

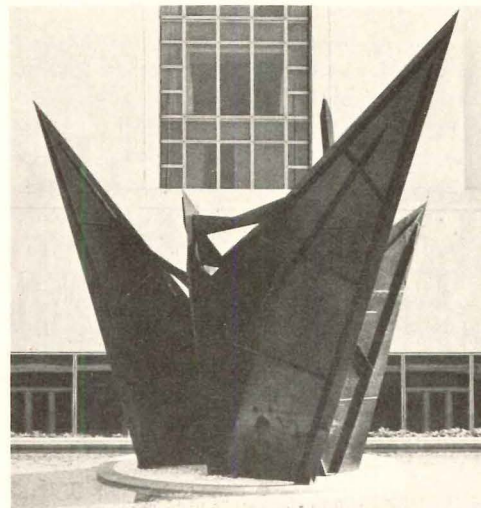
In the years before the Civil War, it was the City of Magnificent Intentions and endeavors were directed toward housing the Government and fleshing out the realization of an imperial plan on a sleepy Southern town. In



Lieut. Gen. George Washington, by Horatio Greenough, 1841, originally at the Capitol, now at the National Museum of History and Technology, Smithsonian Institution.



The Discovery, by Luigi Persico, 1844, and *The Rescue*, by Horatio Greenough, 1853, originally at the East Portico of the Capitol, now in storage at the Capitol Power Plant.



The Gwenfritz, by Alexander Calder, 1969, at the National Museum of History and Technology, Smithsonian Institution.

sculpture, it was still the Age of the Toga, and attempts at casting the Founding Fathers in the mold of ancient Rome met with properly democratic derision. "I said soap, not sword!" was the caption Capital wags gave Horatio Greenough's statue of a bare-chested George Washington commissioned for the Capitol, later removed and now in the Smithsonian. Two sculptural groups flanking the Capitol's East Portico hilariously botched Baroque compositions and later met with the same fate.

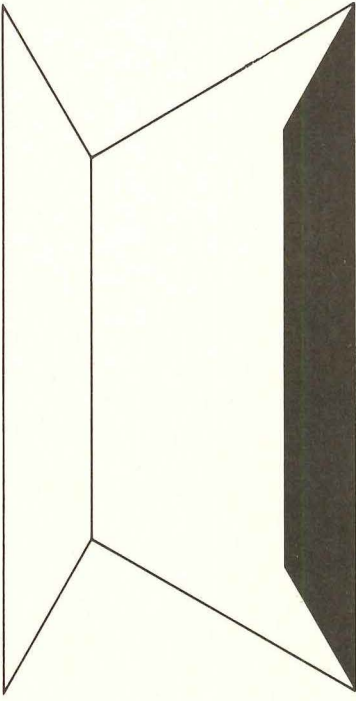
The city's first of many equestrian statues (and the first to be cast in the U.S.) was done in 1853 by Clark Mills, who was not deterred by never having seen an equestrian statue. It was a popular success, and today Andrew Jackson's charger still prances in Lafayette Park across from the White House. Mills also cast Thomas Crawford's *Freedom* for the top of the Capitol's dome, the only sculptural commission to proceed through the Civil War, as a symbol of the continuance of the Union.

The end of the Civil War began a different chapter indeed. The growth of Washington as a truly national Capital, combined with the desire to memorialize the recent and numerous illustrious dead, gave Washington many of its most uninspired pigeon-magnets. Statues of military leaders far outnumber any other (only ten presidents are represented) and their sculptors by and large remain deservedly obscure. The irresistible urge for sculptural commemoration proliferated to the extent that new sculpture now requires approval by an Act of Congress and from the U.S. Fine Arts Commission. Perhaps something else is needed; one can hardly condescend to 19th century gaffes when confronted by some of the most recent ones of the 20th.

Masterpieces are there, too: Saint Gaudens' *Adams Monument* ("*Grief*") and Rodin's *Burghers of Calais*, but for the most part they were either privately commissioned or collected. Why is there such a disparity in quality between works officially commissioned and those done independently, but later installed with often much greater success? Other works, like Daniel Chester French's *Lincoln* in his Memorial, have achieved a status beyond criticism as national icons. All of which raise questions about the future. The great age of the portrait sculpture may well be past, but what will succeed it?

Two recent works underscore the dangers of either approach. Robert Berks, whose sculptures have appeared on the cover of *Time*, has had three major commissions in Washington. Among them is the *Mary McLeod Bethune Memorial*. This School of Rockwell composition, executed in Berks' chewing gum manner,

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Mary McLeod Bethune Memorial, by Robert Berks, 1974, in Lincoln Park.

shows the black educator as if ready to toss away her cane and break into a cakewalk. Even Alexander Calder, whose dependable stabiles have become staple sculptural solutions in plazas throughout the United States, falls victim to what Ada Louise Huxtable has aptly called the "Capital jinx." Whatever the merits of his 40-foot *Gwenfritz* for the new Smithsonian building, it is reduced to coffee-table-ornament dinkiness by the crushing scale of the building it was meant to enrich.

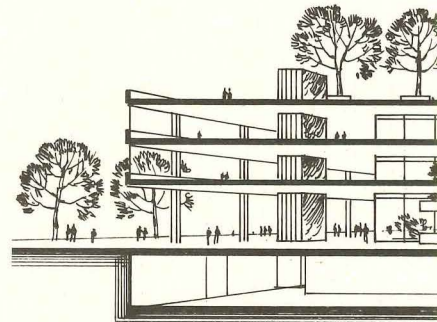
Given the inescapable demands of site and surroundings that bear all the more heavily in Washington, more horses and riders might not be the answer, but neither would a gigantic Claes Oldenburg *Tootsie Roll* on the Mall. Reawakened interest in 19th-century Academicism and the Art Deco sculpture of the 1930's (especially that created under the Federal Art Project of the WPA), both of which abound in Washington, has stimulated recognition, cataloging and preservation which other American cities would do well to follow.

Mr. Goode gives detailed explanations of even the most minor works. Banal pediments are described in iconographies worthy of Bernini's more complicated conceptions. Even funeral sculpture, fountains, flagpole bases and friezes are included, 400 works in all. It's rather like *The New York Times*: it's all there if you want to read it. Arranged geographically, rather than chronologically, it could also serve as a guidebook (excellent locator maps are provided), though the book's considerable size makes it impractical for those already overburdened by Nikons and bag lunches.

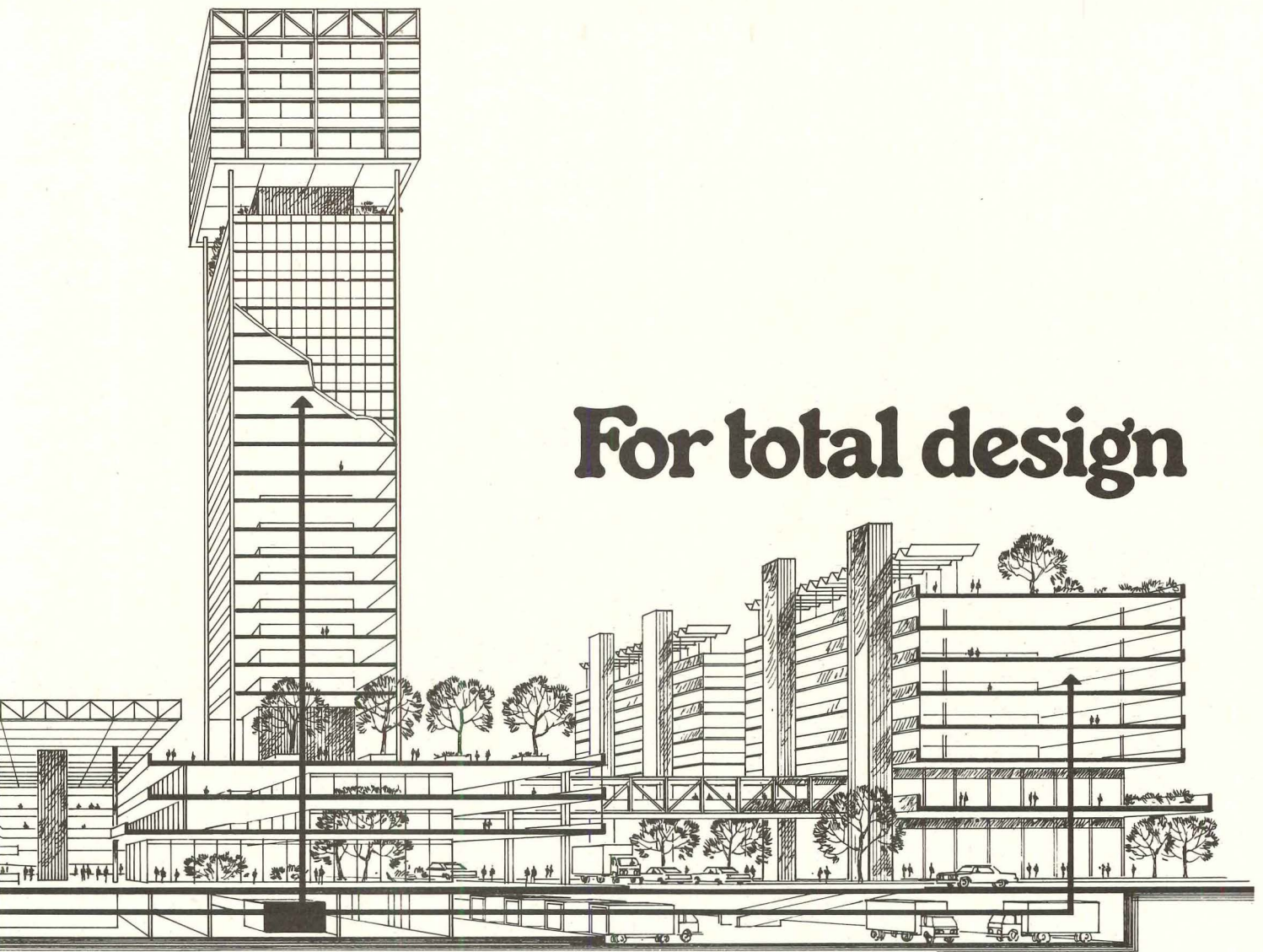
The Outdoor Sculpture of Washington, D.C. is a trivia trove for the history buff. Washington has works by the sculptors of the Statue of Liberty (Bartholdi), the buffalo nickel (Fraser) and Mt. Rushmore (Borglum), as well as the zany Victorian Temperance Fountain that now fronts a liquor store. But it also contains valuable lessons for the architect and city planner in evaluating the importance of public sculpture. If these works, and their equals across the country, are truly—in the words of former Interior Secretary Udall, "wayposts on the road of American history"—then this book provides an extremely thoughtful and engaging map to follow.

—Martin Filler

Mr. Filler is assistant manager of *Architectural Record Books*.



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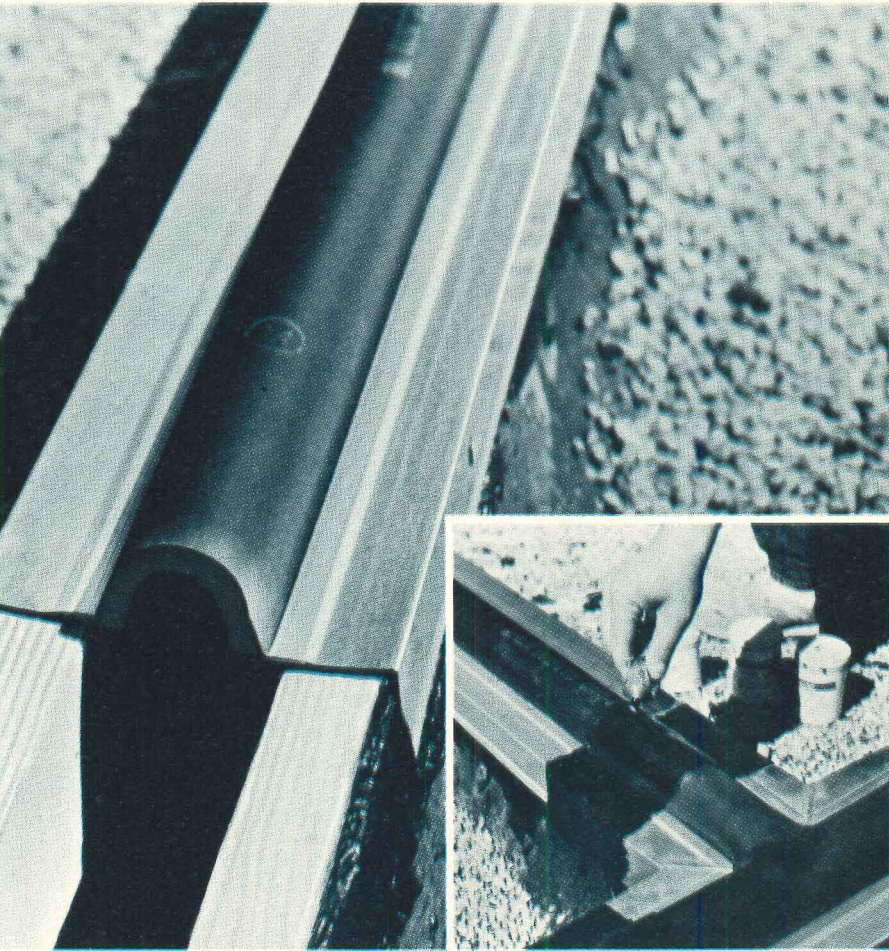
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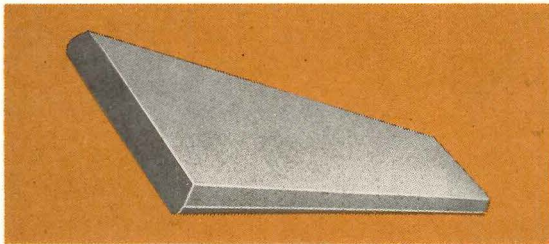
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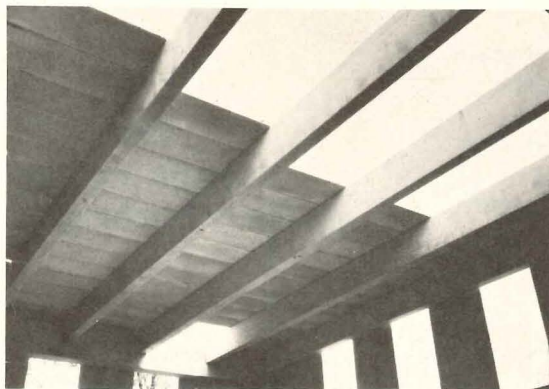
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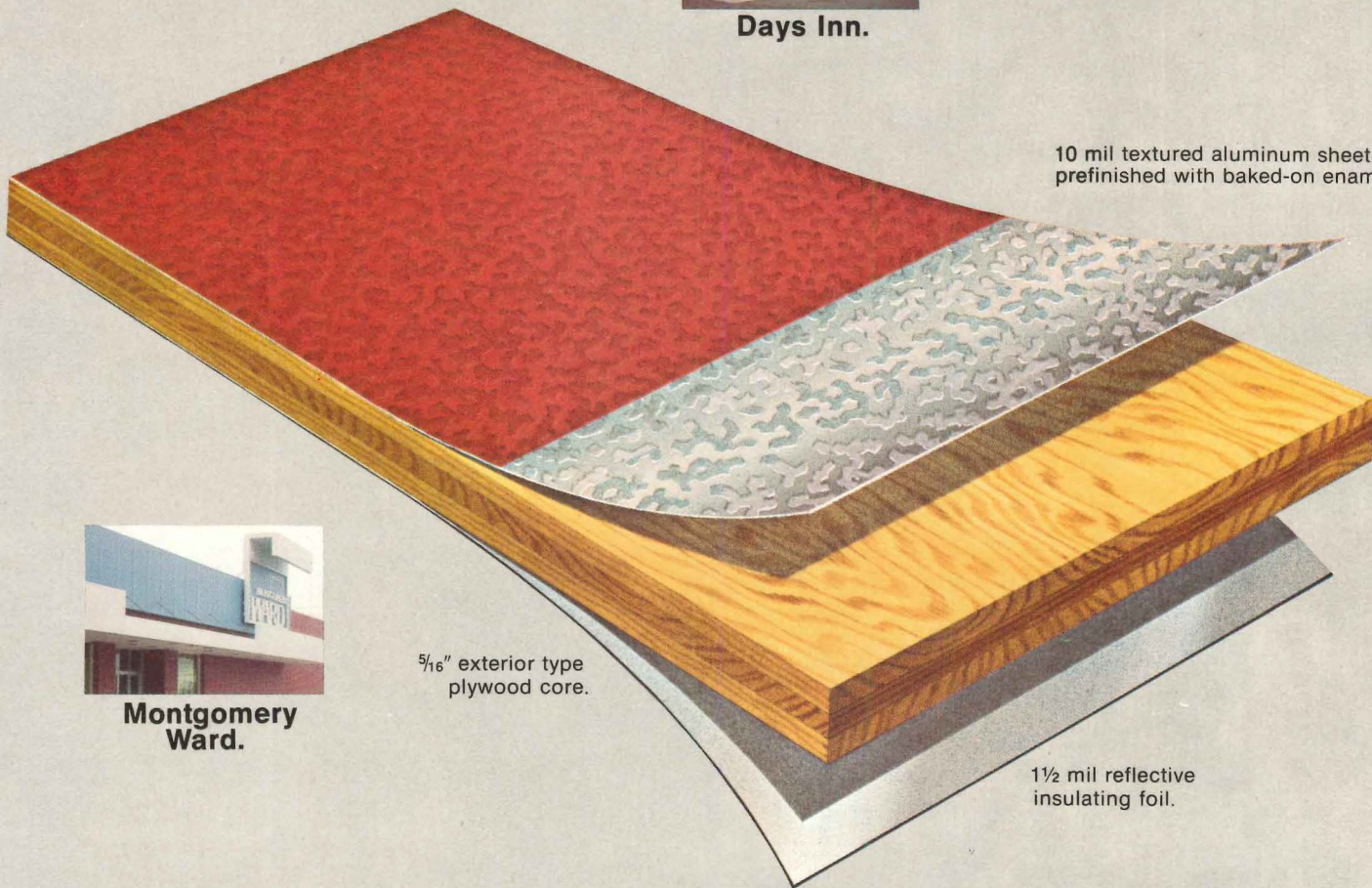
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OFFICE NOTES

New firms, firm changes

George Kennedy has recently announced that the firm **ARCHMEDIA** is now located in the Garret at 117 East Cary Street, Richmond, Virginia.

Vito Cetta has formally announced the opening of his firm, **Vito Cetta Architect** located at 321 Pacific Coast Highway, Santa Monica, California.

Donald R. Kann, AIA, president of the architectural firm of **Kann + Ammon, Inc.**, has announced the firm's new corporate location at Suite 109, One Investment Place, Towson, Maryland.

Donald D. Smith, AIA and Joseph W. Lapicki, AIA have formed **LSI Lapicki/Smith**, 1800 North Charles Street, Baltimore, Maryland.

Sverdrup & Parcel and Associates, Inc., the St. Louis-based firm of engineers-architects-planners, has opened a new design office at 8720 Georgia Avenue, Silver Spring, Maryland.

Raymond L. Crites and Gary H. Taylor have announced the formation of a new partnership, **CTA-Crites/Taylor & Associates**, and their association with **A & S Consultants, Inc.** CTA and A & S have offices located at 9725 East Hampden Ave., Suite 103, Denver, Colorado and 112 West Main Street, Montrose, Colorado.

The firm of The Sanders Vanderburgh Partnership, formerly located in Columbia, Maryland has changed its name to **Sanders Vanderburgh & Associates, Inc.** and is now located at the Maryland National Center, 401 North Washington Street, Rockville, Maryland. Additionally, a subsidiary, **SVA Interiors**, has been formed to handle business interiors commissions.

Stuart Baesel, FAIA, Robert Mason Houvener, AIA, and Jack T. Matteson, AIA, announce the organization of **Design Group/La Jolla** at 7760 Herschel Avenue, La Jolla, California.

Don Halamka and Harry Patterson have announced the formation of a new firm, **Halamka/Patterson & Associates Inc.** The new firm is located at 53 West Jackson Boulevard, Chicago.

Alden B. Dow Associates, Inc., Midland, Michigan-based planning, design and architectural firm have opened a branch office at Suite 407 National Bank Building, Traverse City, Michigan.

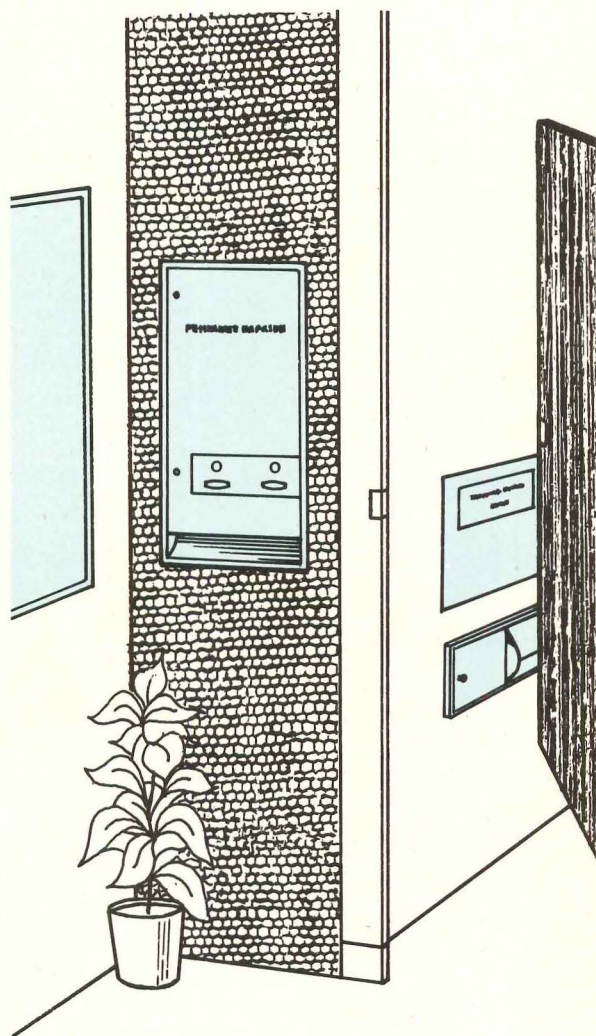
New partners, associates

Paul Engle AIA, has joined the firm of William Kessler and Associates, Grosse Pointe, Michigan, as a principal-in-charge of management and business affairs.

Kent Willoughby has joined the architectural firm of Killingsworth, Brady & Associates as vice president in charge of Hotel & Restaurant Interiors Associates, a newly formed arm of the Long Beach, California, company.

Richard E. Nevara, AIA, a senior designer and project coordinator at Walter Richardson Associates, has been named an associate of the Costa Mesa, California architectural and planning firm.

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SEE OUR FAMILY ALBUM IN SWEET'S ARCHITECTURAL FILE 10.16/Pa.

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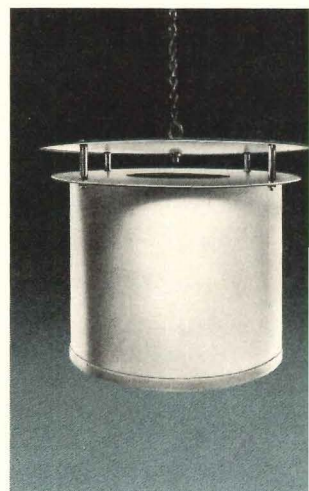
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For further information and our free 16-page guide, "Achieving Speech Privacy in the Open Office," write: N. K. Meeks, Architectural Products Division, Owens-Corning Fiberglas Corp., Fiberglas Tower, Toledo, Ohio 43659.

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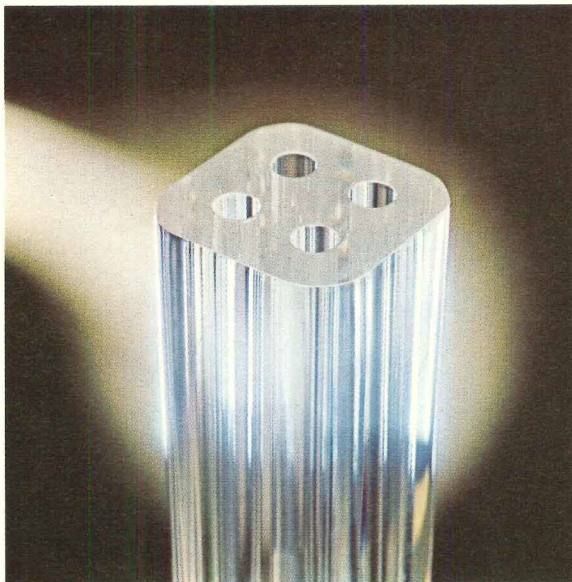
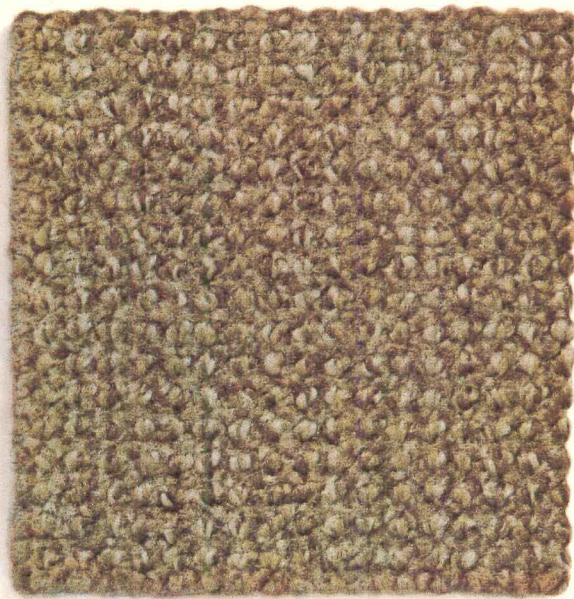
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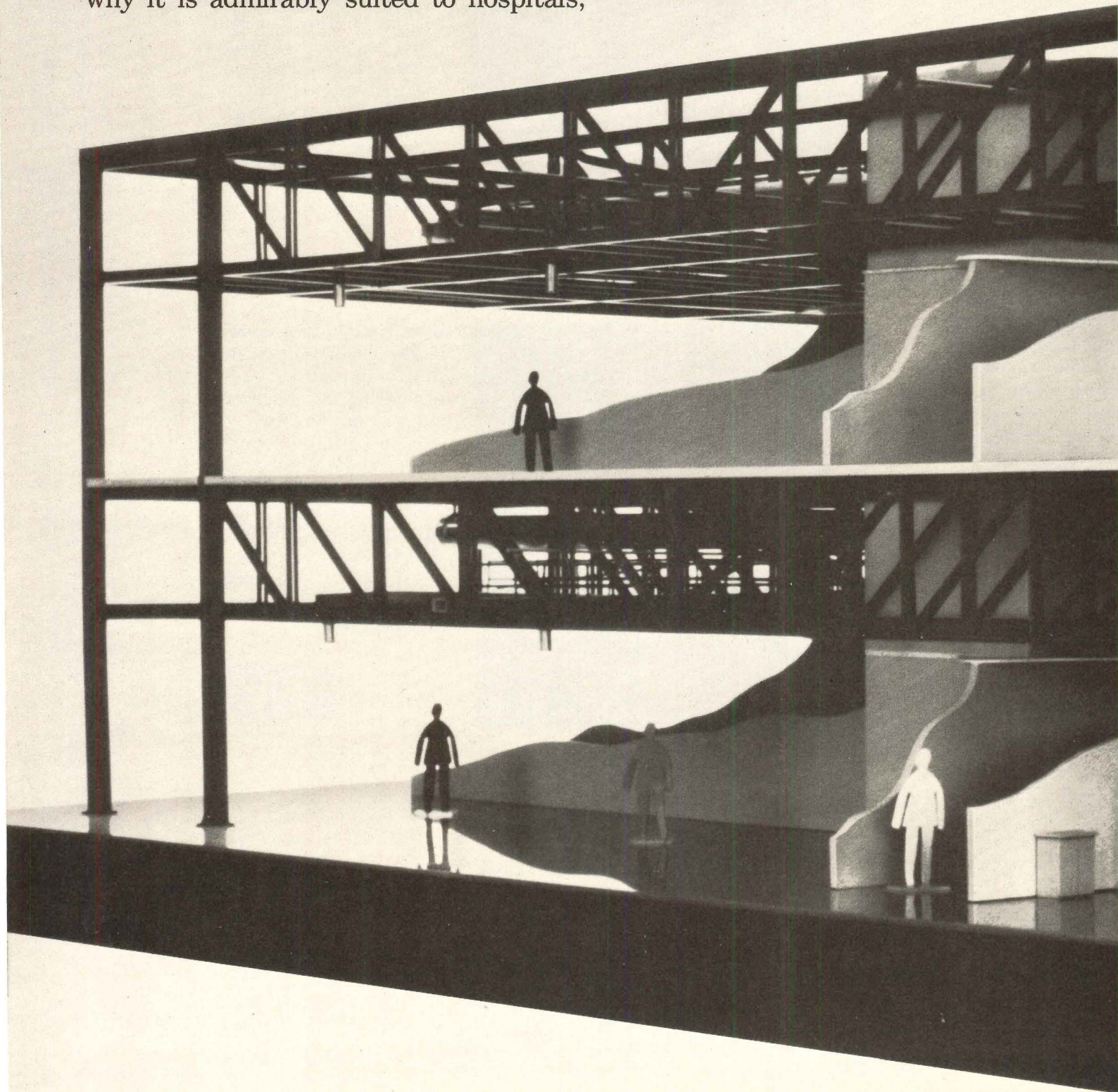
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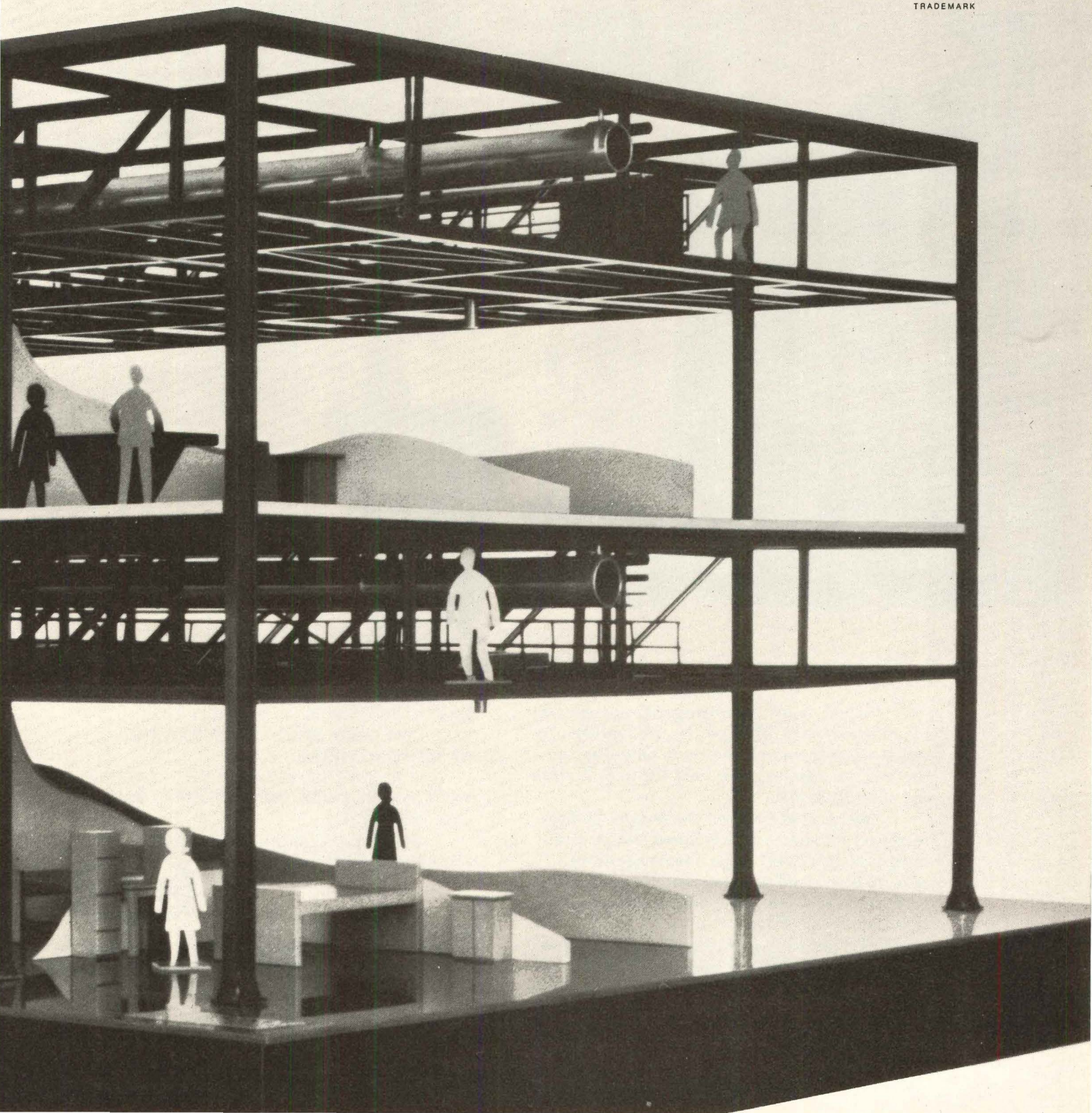
The Interstitial "sandwich" levels, of course, vary in height—depending on the specific functional needs of the floors they service. They can be constructed to a height in which men can work efficiently. Catwalks can provide access to equipment rooms and platforms located within the Interstitial service spaces.

Find out more about this developing concept. Contact a USS Construction Marketing Representative through your nearest USS sales office or write: United States Steel, 600 Grant Street, Pittsburgh, Pa. 15230.

United States Steel

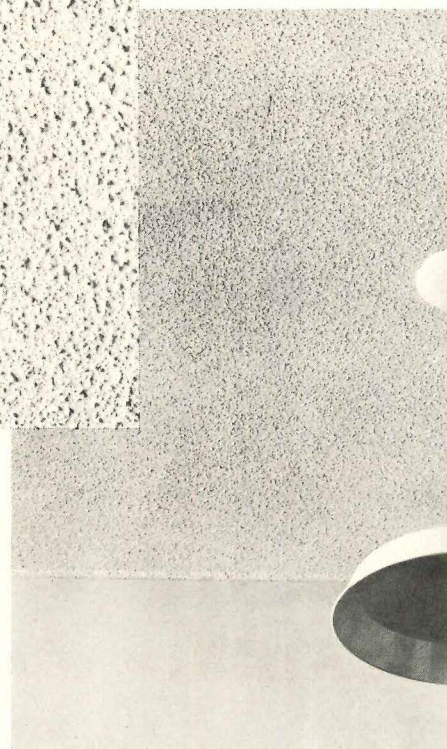


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2. Fiberglas Roof Tape then provides reinforcement at the roof

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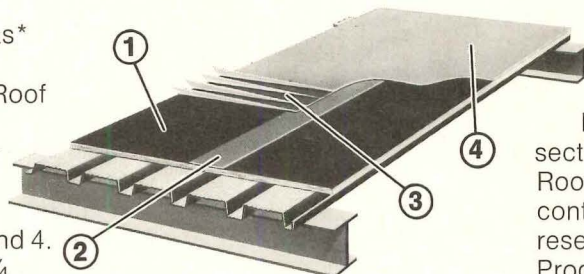
3. Fiberglas roofing felts come next. Unlike conventional felts, ours

won't absorb or hold moisture. So they won't char or rot. They resist curling, wrinkles and fishmouths.

And they're less subject to contraction and expansion due to changes in moisture.

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More information? Refer to our section in Sweets Catalog, Built-Up Roofing Systems 7.1/Ow, or contact your Owens-Corning representative. Or write: Architectural Products Division, Attn.: Mr. D. N. Meeks, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.



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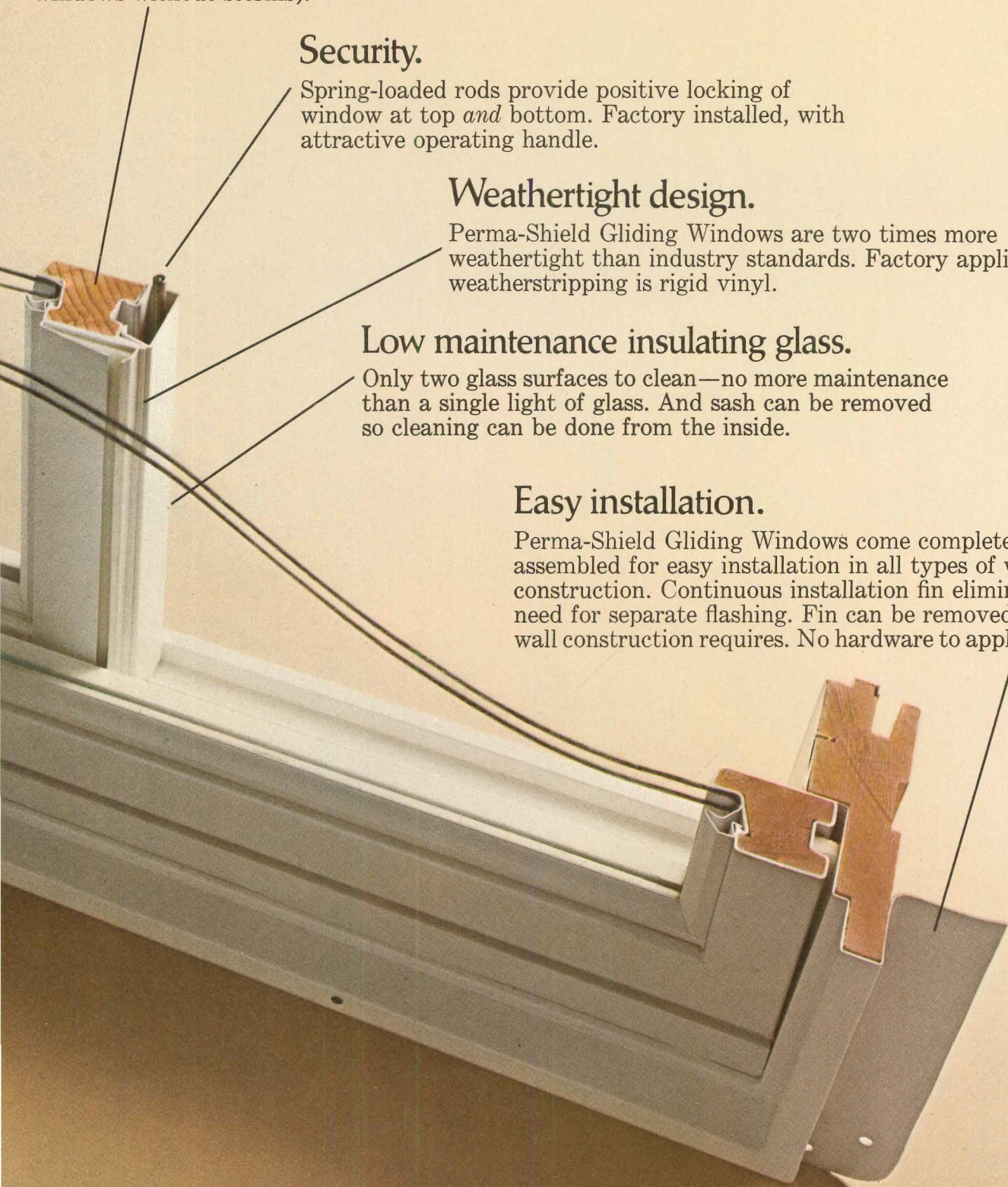
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Dodge/Sweet's construction outlook: 1975

inflation,
 recession and . . .
 construction

Credit crunch re-run

away financing, and building withers. It's simple. It happened in 1966. Again in 1970. And now in 1974.

Trapped in the now familiar "credit crunch construction cycle" for the third time in less than a decade, we can easily recognize its familiar sequence. As the demands for credit curtail the growth of the money supply, rising interest rates draw savings out of the thrift institutions (the process known as disintermediation). Mortgage money dries up, and the housing market collapses. If money is kept tight long enough, the eventual consequence is a general recession—a "mini" in 1967, and the real thing in 1970. Output declines, unemployment rises, and industrial and commercial building is sharply curtailed.

That's an oversimplified, but essentially accurate description of what happened in 1966-67. And in 1969-70. Now in 1974, it's opening all over again. Tight money—the Federal Administration's only answer to ramming inflation—has driven the rate of housing starts all the way down to 1.1 million, knocking 30 points off the Dodge Index of total construction contract value in the process. Yet, obviously enough, the chairman of the Federal Reserve Board still denies the existence of a credit crunch, and assures us that "in no event" will one occur.

In the past, under similar conditions, contracting for nonresidential buildings went into cyclical decline roughly a year after tight money brought housing down. Then, not very long after that, housing staged its recovery. Within a year following the housing upturn, residential building began to perk up.

In the 1974 re-run of this familiar script, we have reached a point where housing has been declining for more than a year, but have not yet seen the downturn in nonresidential contracting. If the pattern of the past two cycles has any predictive value, it could be warning us that (1) nonresidential building is becoming increasingly vulnerable to a cyclical decline, and (2) housing may soon be due for recovery.

Of course, the past is a useful guide only if the current cycle is basically similar to the previous two in its causes and cures, and not

just in a superficial way. Are we really experiencing 1967 and 1970 all over again? Or is 1974 different in some important way?

So far, at least, the similarities with the past two credit/construction cycles have been all too striking. In 1973 tight money led directly to the sharp reduction of residential building, just as in 1966 and 1969. And in 1974—as in 1967 and 1970—the evidence has begun to pile up that we are on the threshold of a general recession . . . if not already into its early stages. At the end of September the most encouraging statement that "White House advisers" were willing to make was that the nation does not face "depression and mass unemployment."

The next step is a big one. In each of the previous cycles, the recognition that highly repressive monetary and fiscal measures were serving only to strangle the economy brought a dramatic reversal of those policies. In 1967 money was eased greatly, and in the nick of time to avoid serious recession. Next time around we weren't so fortunate. It wasn't until mid-1971 that the so-called "Game Plan" was finally scrapped in favor of the "New Economic Program"—the 180-degree reversal which substituted stimulation (and controls) for austerity. That time the move turned out to be "too much, too late."

Whither government policy?

Once more we are at the point where a major redirection of economic policy is sorely needed. The search for a new approach to the stubborn problem of inflation was ostensibly what the recent summit conferences were all about, and in the opening round of meetings nothing came through more forcefully than the unanimous recommendation for relaxation of tight money. In response, there has already been a moderate easing in the credit markets. But the end result of the whole process—President Ford's 10-point anti-inflation program—just doesn't measure up to all the rhetoric that preceded it. While getting us away from exclusive reliance on monetary restraint by substituting austerity in other forms (higher taxes, budget cuts, energy conservation), this "new" program is essentially no more than an updated version of the "old-time religion" that is founded on the principle of trading inflation for stagnation. Perhaps the most convincing evidence that Mr. Ford's crash course on inflation economics has failed to produce any important change is his retention of all the chief authors of Nixonomics as the core of his new Economic Policy Board and the promotion of Mr.

Simon to the post of "principal spokesman on matters of economic policy." Loud and clear, this says more of the same for 1975.

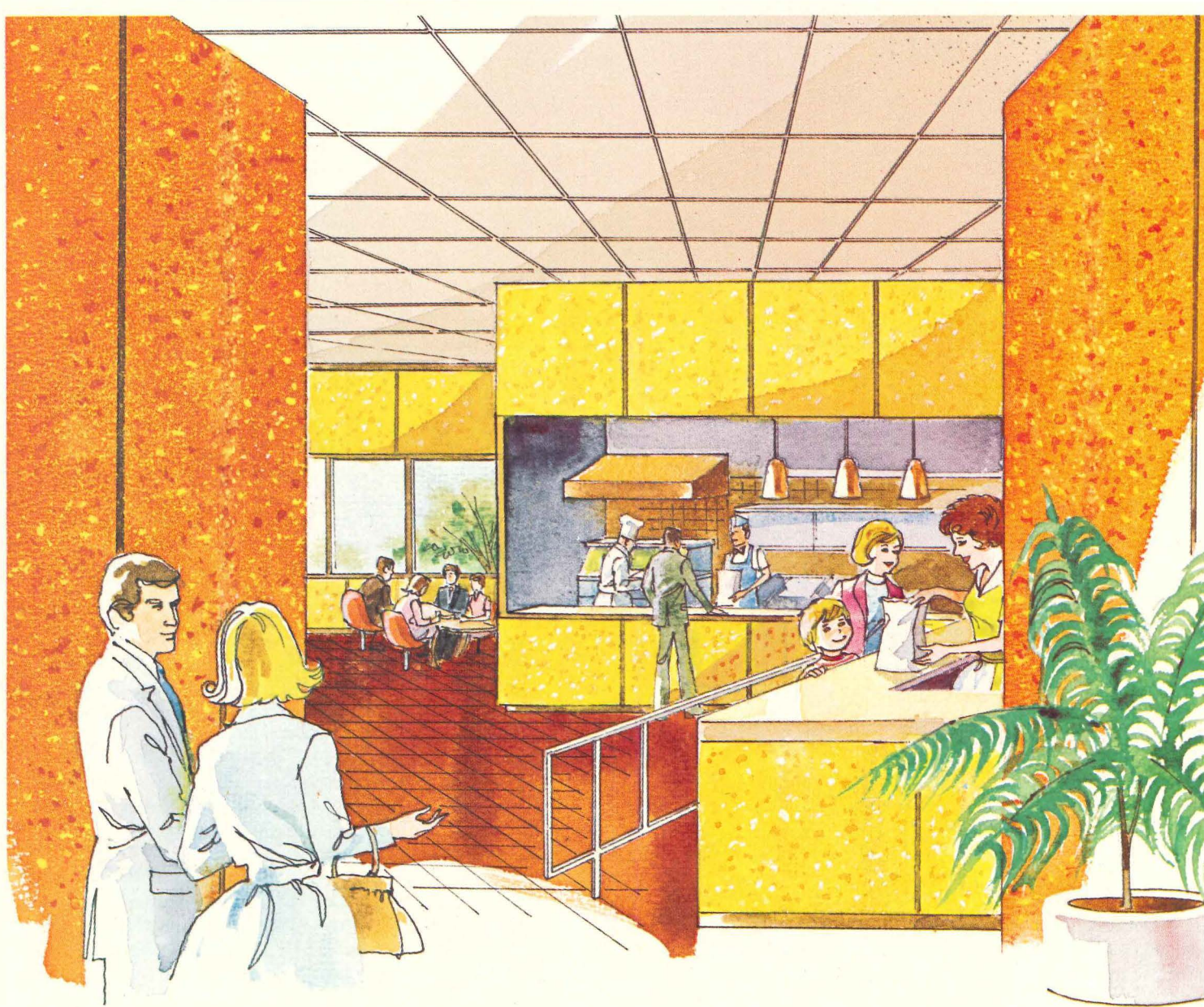
In the end, austerity will eventually yield to the pressure of rising unemployment. Every bit as critical an economic issue for 1975 as inflation is when, and how abruptly, the present policies of restraint will reluctantly be abandoned. If change is made soon (before the oncoming recession becomes unstoppable), relaxation of restraint could be accomplished gradually, with obvious advantages over previously violent reversals of monetary policy. More likely, though, it will take something on the high side of six per cent unemployment to crack the hard shell of ultra-conservatism that encases the Federal Reserve, the Council of Economic Advisors, the Treasury Department, and the Office of Management and Budget—all of which jointly determine our economic environment.

And what about inflation? It will be with us, in diminishing degree, for the next couple of years. And whether money is kept tight or eased moderately won't change this much. Neither will the difference of a few billion dollars one way or the other in the Federal budget. Our present hyperinflation is not so much of the "excess demand" type which might respond to these traditional forms of restraint. Rather, we suffer from something more like "cost-push" inflation aggravated by shortages of many critical commodities and by special situations such as prevail in oil and agriculture. The ultimate solution to these problems is higher productivity. Tight money is, if anything, more a hindrance than a help, since by discouraging investment, it inhibits growth.

What this situation analysis suggests is that the current declining phase of the Dodge Index of total construction value has some time yet to run—at least the balance of 1974.

National construction outlook

When the next upturn begins, the place to look for earliest improvement will be in housing. That should happen around the beginning of 1975. But unless this construction cycle turns out to be radically different from the two previous ones, it's likely that during the first half of next year, as housing is struggling upward, many types of nonresidential construction will be at their weakest, leaving the Dodge Index with the appearance of stagnation until a more general advance involving both housing and nonresidential building takes hold sometime in 1975's second half.

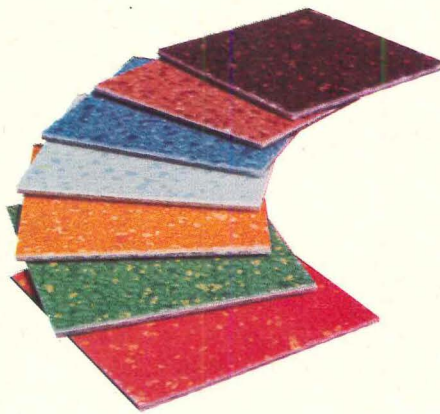


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one way or another, housing will make a recovery next year. And not just because things have become so bad in the third quarter of 1974 that they can't get any worse. They can—perhaps even might. But just the same, after a year and a half of steady decline, there are now two opportunities for improvement in 1975.

Monetary alternatives: The most desirable route to a housing recovery is via a shift to easier money and reactivation of suspended Federal housing programs. And these actions could do more than bring relief to the beleaguered homebuilding industry. They would also lend needed support to the economy as a whole, possibly even in time to help reverse the growing tendency toward recession.

The alternative is to continue with monetary restraint to the point of precipitating full-scale recession, as in 1970. Then, at some stage in the downward spiral, the reduced demands for funds by business and government would free up money for housing. By this route, housing's improvement would come largely at the expense of other sectors of the economy.

Neither extreme is as likely as is the probability of a combination of both circumstances.

The Administration's new anti-inflation program is, if anything, a tightening of the past and present policies of restraint, and could under no circumstances be misconstrued as a shift toward ease (as was 1971's New Economic Plan). Yet, paradoxically, within this disciplined program there is opportunity for the modest relaxation of *monetary* restraint. Other forms of austerity are substituted for tight money.

It is generally recognized, even in the most conservative corners of the Office of Management and Budget, that a slash of a few percent of the total budget (something like one percent of the total budget) would have a negligible effect on inflation in the short run. That's more, the proposed new surtax, if enacted by Congress, would only offset the additional expenditure planned for job programs, extra unemployment benefits, and other special provisions of the Ford program. But between the added tax revenue and the proposed \$100 billion budget ceiling, the Administration hopes to make a significant reduction of its present deficit. Since every billion dollars cut from a deficit budget is a billion dollars the government doesn't have to borrow on the open market, this move toward budgetary balance fulfills a necessary condition for monetary relaxation by the Federal Reserve.

Competition for money: While credit will be a little less tight in 1975, we must expect that the Fed will relax its grip only to a degree that is consistent with the Administration's broad anti-inflation program—in other words, not very much. And this means that some of the expected improvement in housing next year will depend on reduced competition from the business sector for the limited supply of funds. And there are signs that developments along this line are already in their early stages. In the

short-term money market, the prime rate has begun to retreat, and some of the longer-term business needs for funding also appear to be waning. Contracting for commercial buildings (especially stores and shopping centers) has been declining gently for the most part of a year. More recently, electric utilities have

begun cancelling many many projects. And contracting for industrial construction, though at a very high level, is no longer showing the strong expansion of a year ago as signs of excess capacity are beginning to appear.

As these trends develop, we might anticipate a progression in housing activity like this: (1) a few bad months still to get by in what remains of 1974, (2) the beginning of a sustained recovery early in 1975, but with only limited expansion in next year's first half, (3) a potential for acceleration in the second half, if and when there is a move to greater monetary ease.

Construction costs: One serious handicap to the recovery of the housing market—second only to the availability of mortgage money—is inflation itself, since sharply rising construction costs will be eating up much of whatever additional money becomes available for mortgage lending. If housing costs continue to go up at this year's 10 per cent rate, it means that in order to do no better than hold this year's depressed level of 1.4+ million units would take roughly \$5 billion extra in 1975. At stable prices, that \$5 billion could finance as many as 200,000 additional units. Stated another way, if costs continue to go up 10 per cent next year, it will take not \$5 billion more but \$10 billion more to increase the total of housing starts by 200,000 units. Under ordinary circumstances, a \$10-billion increase in the supply of mortgage money would pose no problem; under the kind of "perseverance" intended by Mr. Burns for the indefinite future, \$10 billion may prove beyond reach in 1975.

No forecast of the 1975 housing market is complete without consideration of the brand-new Housing and Community Development Act (signed into law in August 1974). Perhaps the only positive thing to happen in the residential building business this year was the passage of this legislation, which re-establishes a Federal housing program after the long vacuum in this area. Unfortunately, its short-run benefits will be barely measurable. While the new law authorizes Congress to appropriate a total of up to \$12 billion over the next three years—\$8 billion for HUD to spend on urban renewal, sewer and water programs, and other block grants for community development, and \$4 billion for housing subsidies and allowances—it will be quite some time before we see anything more than token spending here. In the meantime, Federal support of housing will likely be confined to secondary mortgage market operations which, in 1974 at least, were largely ineffectual.

■ **Outlook:** 1975 shapes up as an improvement over 1974, but that's not saying much. Next year's recovery will begin from a very low level, and its progress will be handicapped by a shrunken and disorganized homebuilding industry.

Considering the inflationary problems and priorities of 1975, we estimate only enough improvements in the supply of mortgage funds to support about 1,550,000 new dwelling units next year, deferring a considerable part of

National estimates, 1975

construction contract value (million of dollars)	1974 pre-liminary*	1975 forecast	per cent change
nonresidential buildings			
office buildings	\$ 5,700	\$ 5,300	- 7%
stores & other			
commercial	7,200	6,500	-10
manufacturing	5,200	4,900	- 6
educational	6,200	6,000	- 3
hospital & health	4,000	4,100	+ 3
other nonresidential buildings	5,500	5,700	+ 4
TOTAL	\$33,800	\$32,500	- 4%
residential buildings			
1- & 2-family homes	\$24,500	\$27,300	+11%
apartments	10,700	12,300	+15
nonhousekeeping	1,700	1,700	—
TOTAL	\$36,900	\$41,300	+12%
TOTAL BUILDINGS	\$70,700	\$73,800	+ 4%
nonbuilding construction			
highways & bridges	\$ 9,300	\$ 9,900	+ 6%
utilities	4,500	5,400	+20
sewer & water supply	6,100	7,000	+15
other nonbuilding construction	4,200	6,000	**
TOTAL	\$24,100	\$28,300	+17%
TOTAL CONSTRUCTION	\$94,800	\$102,100	+ 8%
Dodge index (1967 = 100)	172	185	
physical volume of floor area (millions of square feet)			
nonresidential buildings			
office buildings	190	180	- 5%
stores & other			
commercial	475	410	-14
manufacturing	255	240	- 6
educational	170	160	- 6
hospital & health	80	80	—
other nonresidential buildings	190	190	—
TOTAL	1,360	1,260	- 7%
residential buildings			
1- & 2-family homes	1,225	1,295	+ 6%
apartments	560	600	+ 7
nonhousekeeping	60	60	—
TOTAL	1,845	1,955	+ 6%
TOTAL BUILDINGS	3,205	3,215	—
*Eight months actual; four months estimated.			
**Includes an estimated \$2 billion trans-Alaska pipeline work to be started during 1975.			

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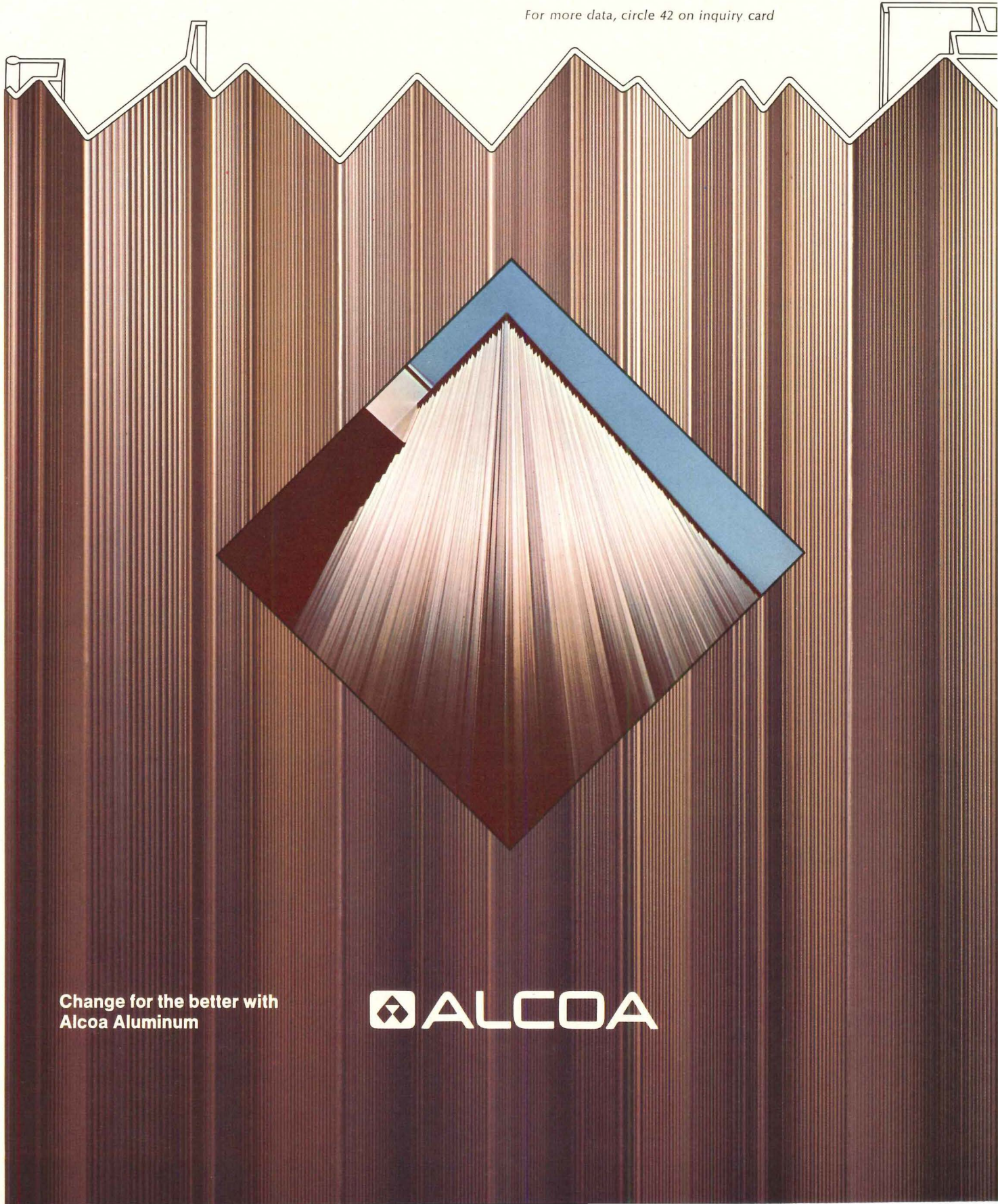
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ent demand into 1976, when easier credit and heavier funding of the new housing act permit a strong expansion to the 1.8 million-unit level.

Business construction

As in the 1970's, contracting for the construction of business facilities—factories, warehouses, utilities, offices, stores—has followed a characteristically cyclical pattern. Recession in 1970 brought a sharp break from the booming years of the late 1960's; recovery in 1971 was stunted by a large overhang of excess capacity and the uncertainty of price controls; by 1973 a new surge of capital expansion was under way, only to be aborted by 1974's winter energy crisis and subsequently rebited by the soaring cost of credit.

Now comes the latest element of uncertainty; how will industrial, commercial and institutional contracting (a \$30-billion package of cyclically sensitive construction) react to the daily worsening economic environment? Are we headed for another 1970-type collapse?

For some components of this construction boom, signs of softening are already beginning to show. Shopping center projects were an early casualty of the credit crunch, with some cancellations as early as 1973's final quarter. (That market stabilized without further decline through 1974's first half, however.) Electric utilities are next to fall victim to the times. At mid-1974 one power company after another was announcing the suspension or cancellation of previously announced additions to capacity. Interest rates and/or ecology constraints were most often cited as the reason for cutting back.

With office building lingering on a three-year plateau, this left industrial construction as the main source of strength among the various segments of business-related construction. And even in the industrial sector, gains were lumpy—very big in the "shortage" industries of petroleum refining, petrochemicals, food processing, paper and most metals, but not much doing in many other industries, like textiles, plastics, furniture, autos and other transportation equipment.

Outlook: If the usual nine- to twelve-month lead-lag relationship between homebuilding and retail/shopping center construction prevails, the best we can look for is an upturn in contracting for retail facilities sometime in the second half of 1975. That wouldn't be early enough to bring next year's total even with 1974, but it suggests the potential for a gain in 1976 after two years of decline.

Regional Outlook: Lacking the thrust of the "skyscraper boom" (New York and Chicago), where commercial office space is in surplus right now, the national total of office building contracting has not been sustained by a strong shift of demand to the South and the West. An office building boom in these regions kept things from slipping during 1972 and 1973, but now that has passed its peak, too.

In 1975 the Northeast and Midwestern

areas, which have been bumping along at a low level of office building for the past four years, aren't likely to decline any further (if that were going to happen, it would have been in 1974), but the dim prospects for general business conditions in 1975 aren't apt to encourage much speculative building, either. In the South and West, office building peaked in 1973, and the 1974 decline is more likely to extend into 1975 than turn upward soon again.

The outcome of these regional developments will be a further decline in square footage of new office buildings contracted for this year. What is needed to bring about a change in this situation is an upturn in the big city markets, and that's still a couple of years off.

Utilities: Overreaction to last winter's so-called energy crisis (translation: oil holdup) and current bargaining between utilities and their rate-making authorities leaves this construction market in a confused state of suspension. When the dust settles, we'll probably find that (1) some of the grandiose expansion schemes (for the short term, at least) that were hatched last spring were unrealistic and needed to be toned down a bit, and (2) the current wave of project cutbacks serves the dual purpose of avoiding a glut of capacity several years down the road, while applying pressure for rate increases and relaxation of ecological standards for the present. With state rate-making bodies being squeezed by the utilities from one side and the Federal government from the other, rate adjustments are forthcoming. As this happens, many of 1974's cancelled projects will be 1975's contracts. Next year's gain should be something like the large one that was expected for 1974, but never materialized.

Industrial: There is more uncertainty about industrial building than any of the other categories in the business construction group. Well-publicized expansion plans, backed up by substantial capital appropriations, point to a high level of investment in plant and equipment throughout the middle 1970's. Scarcities and soaring prices in key industries confirm the need for continued development. And the widely-recognized need for higher productivity as the ultimate solution to double-digit inflation is still another important incentive to industry's commitment to long-term expansion programs regardless of the phase of the business cycle.

These are all persuasive arguments in favor of higher levels of investment, but they fail to answer what is bound to be the most pointed boardroom question of 1975: How do you justify adding capacity when output is falling and profits are slipping?

With industry now operating at only 81 per cent of capacity, off seven points from a year earlier, and with inventories beginning to back up in all but the most serious scarcity situations, the temptation to rethink and reschedule industrial construction plans is growing. Postponement means higher future construction costs, but it offers the offsetting advantage of better financing terms.

Some stretch-out of industrial construction programs now seems inevitable and, in fact, is already in progress. After successive gains of 15 per cent in 1972 and more than 50 per cent in 1973, the rate of contracting for industrial construction has recently flattened out—despite a large and growing backlog of plans for future projects.

■ **Outlook:** Today's special circumstances—shortages and inflation, plus the prospect of tax incentives to encourage business capital spending—will prevent a recurrence of 1970's sudden collapse of industrial building. Nevertheless, a modest decline in contract value is the prospect for next year.

Institutional

As recently as a year ago, contracting for institutional buildings—schools and dormitories, hospitals and other health treatment facilities, and religious buildings—was running between \$9 and \$10 billion, an amount no larger than in any of the previous five years. By contrast, the Dodge Index of total construction contract value has increased by 60 per cent over that same five-year period. What's more, since construction costs were rising sharply all that time, it meant that as the dollar value of institutional building stabilized, the physical volume of construction was declining markedly.

That's not too hard to explain. The nation's needs for schools, and to a lesser degree, health facilities, are a good deal less urgent today than they were in the middle and late 1960's. Educational construction, which accounts for nearly two-thirds of the institutional total, reached its peak back in 1968, and then settled into a predictable decline as enrollments leveled off. Contracting for health facilities, after a decade of vigorous expansion in the 1960's, continues to grow, but at a slower pace now.

Against the background of these established trends of the previous five years, 1974 brought some surprisingly large gains in institutional contracting. Through this year's third quarter, school and hospital/health construction was ahead by roughly 20 per cent.

By far the largest part of the gain in institutional building—nearly half the national total—was concentrated in the South, where most of the recent boom in housing was also situated. Local governments got a big assist in meeting this surge of relocation demand for educational and health facilities from Federal revenue-sharing disbursements—a big factor in the recent improvement in the financial position of most states and cities. Analysis of the uses of revenue sharing payments shows that nearly one-third is applied toward capital and/or operating budgets of public educational and health facilities.

■ **Outlook:** While revenue sharing has provided the means for a reprieve from the sagging trend of institutional building, the current high rate of contracting is likely to last only until short-term needs arising from accelerated population relocation are covered. Then, in



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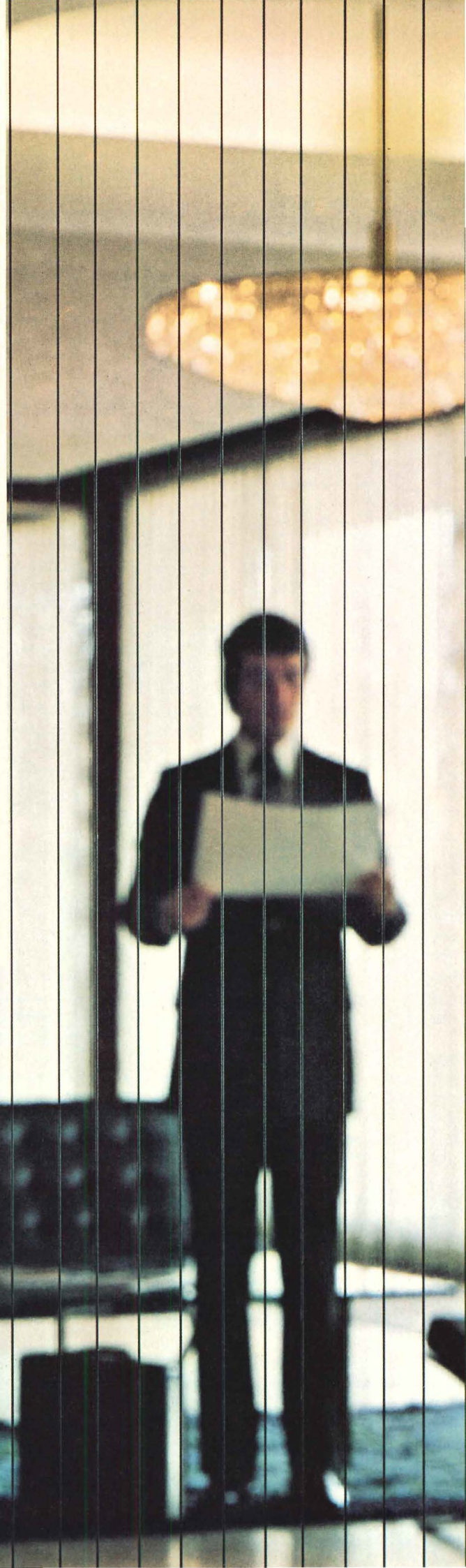
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her year or so, the essentially static condition of school enrollments will again dominate building market.

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Transportation: Nowhere in the entire construction business has inflation reached the extremes that it has in highway work, where many of today's scarcest materials are the main ingredients. Skyrocketing prices of bituminous paving (up 60 per cent), reinforcing steel (up 30 per cent), and Portland cement (up 35 per cent) have boosted the composite cost index of highway construction this year by 40 per cent. Always, the total amount being spent on highway building by the various levels of government is up (so far by eight per cent), but at these prices they'll be getting only two-thirds as much actual pavement as last year's contracts provided.

Sewer/water: Despite major deferrals of Federal funds for waste-treatment facilities, the amount of contracting for sewer and water projects has continued to grow in 1973 and 1974 depending by state, local, and private sources sharply.

Until now, impoundment of some \$9 billion of Environmental Protective Agency appropriations for sewer subsidies has been justified on the basis of its inflationary potential. Recently, however, a Federally sponsored study of sewer construction in relation to community growth and land use found that the availability of billions in EPA grants has endangered too many communities to overdevelop their sanitary facilities beyond all reasonable expectation of future population growth. This study now gives EPA two reasons instead of one to hold back its disbursements.

Like housing subsidies in the early 1970's, sewer subsidies appear to be another good concept suffering from poor administration.

Pipelines: The much heralded trans-Alaska pipeline finally got under way in 1974, though less than \$1 billion of its eventual \$5 billion contract has so far been started. Now that this line has become a high card in the international energy game of energy self-sufficiency, its pace of construction is being stepped up with perhaps another \$2 billion of work to be initiated in 1975.

Outlook: This is where some of the nation's most urgent demands for construction facilities needed to meet critical energy and environmental goals—run headlong into conflict with another priority—the need to limit federal spending to a non-inflationary level. The outcome of this confrontation is apt to be a trade-off: below-potential growth for public works against some slowing of costs.

Regional outlooks

Northeast: 1974 was in no way a banner year for construction activity in the Northeast. Single-family residential building in the region barely

maintained its share of the shrinking national total, both nonresidential and nonbuilding construction lost ground relative to other areas of the country.

This region's current market share of housing appears to have reached an irreducible minimum. In 1971, 1972 and 1973, the best three years for housing ever, some 900,000 units were started in the Northeast. That's also just about what the increase in household formations was in the region over this same period. There has been no surplus to compensate for deterioration in the region's housing stock, much less provide for any upgrading.

The region's share of nonresidential building dipped lower in 1974 as investment in the business-related structure types—industrial and commercial buildings—lagged behind the national rate. This year saw the continuation of a trend toward lower levels of business investment in the Northeast that goes back to the late 1960's, when the office building boom peaked out. Lower levels of office construction account for most, through not all, of the current weakness. Industrial building in the region is still some 15 per cent less than its pre-1970 peak.

Nonbuilding construction also turned out softer in 1974, but more in reaction to the extremely high levels of activity in prior years rather than the extension of a general downward pattern. Sharp growth in sewer and water contracting and transportation facilities has been the one major source of strength in the region during the early 1970's.

Next year should see the Northeast's share of total construction contracting advance slightly on the strength of a relative gain in nonresidential building, while residential and nonbuilding construction hold at about their current proportions of the U.S. total.

■ **Midwest:** The Midwest's stable of construction categories runs best in periods of buoyant economic growth. This holds true not only for the business-related building types, where the region's base of heavy industry is more or less expected to respond enthusiastically to upturns in the business cycle, but for other construction types as well. Business expansion creates additional demand for other types of construction, as well as the means to help satisfy that demand. Strong economic growth in 1973 saw the region's total construction market share increase by a full percentage point.

The sluggish economic environment in 1975 will not be compatible with the Midwest's industrial and commercial make-up. And while the negative effect of stagnation will fall most heavily on business-related construction, there is bound to be some spill-over into other types of projects as well.

The construction category most likely to succeed during 1974—perhaps even expand somewhat in market share—is Midwestern housing. The housing needs of the region are about on a par with those in the Northeast, and both regions should figure in next year's modest housing recovery.

■ **South:** Housing, which set the pace of the South's remarkable construction boom of the past few years, has now become this region's most vulnerable building market.

At the 1973 peak, contracting for residential structures made up 55 per cent of the South's total construction value; a year later that proportion had slipped to a still substantial 45 per cent.

Within the South's sagging residential market, multi-family building is (predictably) under greatest pressure. From more than one-third of the South's total residential contract value in 1973, multi-family building fell to less than 30 per cent in 1974. And even as credit conditions improve somewhat next year, the existence of pockets of speculative overbuilding will inhibit the recovery.

The Southern construction market's strength for 1975 is in nonresidential building. A continuation of the recent heavy flow of business investment in petroleum and petrochemical facilities may just keep Southern industrial building on a growth path next year, despite the prospect of stretch-outs and cut-backs in other regions.

■ **West:** Through the third quarter of 1974, the West was still holding close to 1973's record level of construction contract value, but it was mostly a single project—the trans-Alaska pipeline—that gave this region its appearance of strength.

Homebuilding throughout the West was down sharply in 1974, just as it was everywhere else. However, unlike the experience of this region in previous crunches, when Western housing took an exaggerated nose dive, this time around the region's decline has been in almost exact proportion to the rest of the nation's unsatisfactory experience.

Outside the distressed housing market, there was also a strong parallel between the West and the nation as a whole this year. Setting aside the distorting influence of the "pipe," the West and the nation have each been showing similar gains of 5 to 10 per cent in both nonresidential building and non-building construction this year.

Do these trends suggest that the once unique Western construction market is losing its individuality? Maybe, but probably not. Yet, it is a fact that the West's industrial base—a source of much of the region's volatility in the past—is becoming more diversified, a process that has been accelerated recently by the decline of the boom-and-bust aerospace industry. As might be expected, diversification is affecting the geographic distribution of construction activity within the region. The inland states are beginning to account for a progressively larger proportion of total contract value at the expense of California, Oregon and Washington. Such improved balance is likely to help sustain the West through the period of economic stagnation that lies immediately ahead.

*Prepared October 1974 by the Economics Department
McGraw-Hill Information Systems Company
George A. Christie, vice president and chief economist*

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ROUND TABLE:

Public procurement of A-E services—Part 2

month, a report on the ARCHITECTURAL RECORD Round Table began in position papers of the Federally involved participants: Vernon L. of GAO, Leo A. Daly representing the AIA and an interprofessional group reporting to a commission on public procurement, Arthur ampson, Administrator of GSA. The following are papers directed e intensively at problems at the state and local levels of architect

selection for public work. They were presented by George A. Dudley, Chairman of the New York State Council on Architecture, and Milton Musicus, formerly a key executive in the New York City administration of John Lindsay and previously executive director of the New York State Facilities Improvement Corporation. The roster of 22 participants is shown on page 107 of the October RECORD.

George Dudley reviews problems in public procurement practices at state and local levels

Chairman of the New York State Council on Architecture, a unique advisory commission to state agencies on architecture and building, George Dudley, architect, continues a role of familiar wisdom that was long nurtured during his tenure as trustee during the formative years—and spectacular performance—of the New York State University Construction Fund. A friend and adviser to Governor Nelson Rockefeller, and supporting sponsor of the late Anthony Adinolfi, who was an ardent spirit for good architecture in probably the fastest growth university construction surge in the nation, George Dudley fought, taught and learned about public procurement of A-E services in a pool of vast experience.

GEORGE A. DUDLEY: It would be an exhaustive exercise, obviously requiring computerization, and probably not very rewarding, to assemble information on all of the problems in procurement practices at state and local levels for procurement of A-E services, even in one state, to speak of all 50 states.

In New York State alone there are 46 building agencies, all of whom follow different practices in A-E procurement. The variation comes even more marked between the ten or agencies. There is comparable diversity between agencies in many other states, with which I am familiar, and I am not aware of a single state where all building agencies follow a single procedure.

To move to the so-called "local level," even in New York State, one starts with 62 counties, and if one were to attempt to look at local practices and problems across the nation one would undoubtedly find variations in relation to almost every project, which would therefore be hundreds of thousands of different procedures.

There are two over-all problems which state and local building agencies have in common in this country:

First, the agency is only one part of the total governmental structure within which it functions. There is therefore a set of interrelationships which the single building agency must follow, and which in many cases has a greater influence on the nature of the procurement procedure than the agency itself might desire.

The second general characteristic of state and local A-E procurement is that there are almost always external requirements or constraints. This derives from the fact that there are general regulations, and in most cases Federal

funding with its own set of related requirements—or for a town or village in New York State, much of its capital construction is based on county, state or Federal funding with the attendant regulations and procedures.

A classic case study of these interweaving sets of responsibilities and requirements was the recent process of selecting 12 architectural firms to design the stations along the Second Avenue Subway now under construction. The funding from the Federal Urban Mass Transit Authority brought with it all of the attendant Federal requirements and approved regulations. Similarly, the New York State Metropolitan Transportation Authority brought in some funding and both state regulations and its own independent procedures and regulations which were then visited upon the New York City Transit Authority, which not only has all of the City's constellation agency approvals to be met but, being the final contracting agency, it had to have clearance from the other levels of government.

MTA made an arbitrary selection of outstanding firms based upon their internal knowledge of the work of those firms. But as the architects began contract discussion, they found that there were contract provisions being proposed which were unacceptable, both professionally and operationally, and each of the agencies involved appeared to be saying that the requirements came from one or more of the other agencies.

The element most undesirable was the proposal that there be competitive bidding for the services. Each agency blamed this on the other until, through the Council, we were able to determine that it was essentially the State Department of Audit and Control which had been wanting to move in this direction for many years.

Once again it was made clear that the quality of the professional services to be rendered could not be measured by closed competitive bids, and negotiations gradually proceeded. Only one of the designated firms finally withdrew, but this process took at least a year.

Early in March, the New York State Association of Architects and the Council on Architecture, with an assist from Educational Facilities Laboratories of the Ford Foundation, and the Law Enforcement Assistance Administration, organized a seminar, the intended result of which was the creation of a set of seven regional committees, under the aegis of the Association of Architects, to make itself available to any unit of local government in the criminal

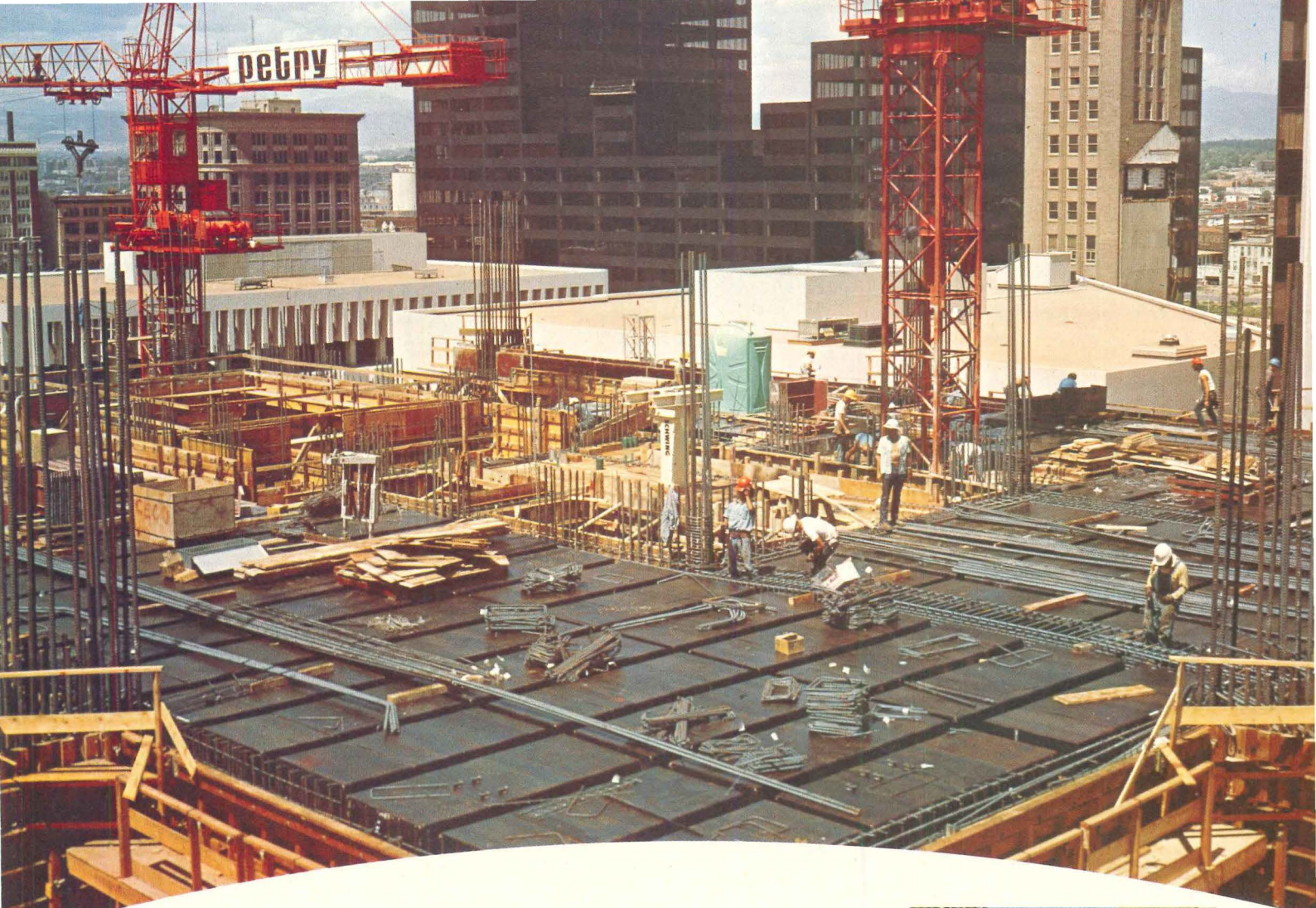
justice field contemplating the provision of new facilities (including renovation, addition, etc.). A county sheriff could speak with the chairman, or a member of such a committee, outlining his concept of need of facilities. The committee member could then advise him of a more clear definition of his program objective, could discuss with him the nature of his legal and financial entity, could review the relationship of the new facility to the community and its environment, and thereby act in effect as a professional adviser. He would next make clear a process of selection of A-E services, the criteria which should be established, the selection entity (the sheriff himself, the professional adviser, a selected "jury," a group of representatives of the local chapter of the AIA, or other devices).

This network of regional professional advisory committees is now being implemented in New York State. Many problems must be solved, not the least of which is the point at which any member of the committee, including its chairman, may find himself interested in being a candidate for selection for the work. I believe this can be overcome.

I will tell you some history in the mode of a parable.

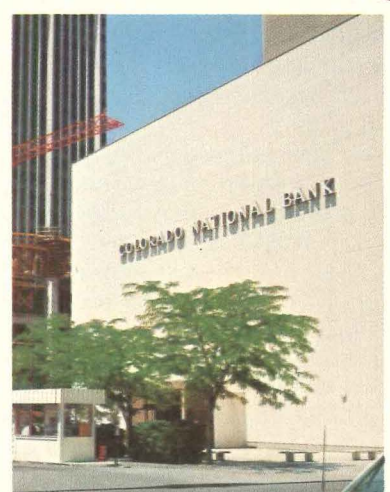
The governor of an empire state, aware of the already gestated generation of "war babies," knew that his state must provide not only the academic apparatus of a high quality commensurate with the stature of his state but also a very substantial set of physical facilities. Realizing that what was then referred to as the university of his state ranked very low on the scale of public state universities, he carried out a study which resulted in the creation of a separate governmental entity, the State University Construction Fund. This was separate in the sense that it was financed through bonds issued by the state against the anticipated income from tuitions and fees from the students, and in that separate position it had certain independence of action, such as in the selection of A-E services.

The governor appointed the chairman of the three trustees and directed him to administer this very substantial construction program (currently well beyond the \$2 billion mark, with four major postgraduate university campuses, 24 four-year campuses, and an additional 40 other installations). He directed the second trustee, the then chairman of the Housing Finance Agency, to work out the financing of this program. He directed the third trustee, an architect and planner, to be responsible for the fact that what was built was both of high



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consideration should be given to the development across the country of a mechanism of professional advisers at state and local levels."—George A. Dudley

"Since this is . . . a two-way communication, such a unit could, at the earliest moment, bring to the building agency the resources of the professions and . . . put (them) in operation before decisions are made which should have the input of the professions."—George A. Dudley

"Aggrieved consultants who do not receive public work contracts are always ready to suspect favoritism and possibly corruption."—Milton Musicus

architectural quality and well planned in relation to its host community and environment.

With this mandate, the third trustee had a hand (i.e., that of the governor) in selection of the architect-planner teams who participated in the development of workable architectural relationships enabling them to perform at a level of professional competence which ranked in one of the best public building programs in recent years.

Many of the architects selected had previously turned down state work due to their own problems of bureaucratic delay, both in decision-making and payment, inadequate preliminary review of work submitted, and particularly inadequate control of design submission. Many an architect did not see the results of his preliminary design until he might, or might not, be invited to the dedication of the completed building.

This archaic system was clearly reversed by the governor's new mandate. Why?

First—and this is not to be hoped for in all our 50 states—there was a knowledgeable leader with taste and clout.

Second, there was what we might begin to call an architectural circles a "professional adviser" i.e., the third trustee who, among others, brought in the head of the staff of the agency, Anthony Adinolfi, who not only put together an exemplary internal staff, but who worked to its fullest capacity, and inspired to its greatest potential, the architectural profession.

The point of the parable is that consideration should be given to the development across the country of a mechanism of "professional advisers" at the state level and at all of local levels.

It is not enough to send out to the elected and appointed officials of our public governmental structure brief statements on "how to evaluate, select, and negotiate with an architect." The pattern which we are developing in New York in the Criminal Justice facilities program, providing the availability of professional advisers to laymen in this field, may well be a step in the right direction. But it should be extended to many other fields—within the framework of local AIA chapters.

At the state level, an entity such as the New York State Council on Architecture can perform very much the same function. Many agencies come to us for advice and guidance in developing their procurement of A-E services and the monitoring of them.

A final point: Procurement is a two-way street. There are those who want services and there are those who want to serve. The role of

the proposed "professional adviser" would be to serve as a point of contact for those A-E firms wanting to know how to put themselves on stream for potential public work. Such a unit could at the earliest moment bring to the building agency the resources of the design professions and, on the other hand, put the resources of the design professions most effectively in operation before decisions are made which should have the input of the professions.

Milton Musicus proposes guidelines for state and local levels

Factors of competence in public office and competition among professionals are taken into account by Milton Musicus in a position paper that offers guidelines for setting up A-E selection and contracting systems in government agencies at all levels. He deals, of course, with those agencies that carry on a "repeat" construction business, rather than the one-shot sheriff's office, such as Mr. Dudley talked about. Mr. Musicus gained his broad experience over a long career of public service, notably as director of the New York State agency now called the Facilities Development Corporation and later in several advisory and executive roles dealing with planning and construction during the Lindsay Administration of New York City.

MR. MILTON MUSICUS: Any government seeking a method for obtaining architectural and engineering consultant services which is consistent with high professional and ethical standards must first recognize one prime essential—it must attract and retain capable public officials and then allow them to exercise their judgment within broadly prescribed financial and procedural parameters.

While it is folly to think that any system, however carefully devised, will function properly unless it rests in the final analysis on experienced and honest judgment, there are two major forces which seek to set restraints upon the Administrator's authority.

Aggrieved consultants who do not receive public work contracts are always ready to suspect favoritism and, possibly, corruption. Some believe their opportunity rests on some form of competition for award of consultant contracts and their legislative representatives often listen attentively, especially if there was evidence of malfeasance.

And, these grievances and desire for competition are then viewed by appointed guardians of the public purse as a means of reducing the cost of consultant services.

Under these circumstances, a decision by a public official to employ an individual or firm without competition makes the official suspect of overpaying for the services and, possibly, wrong-doing. The only form of competition, however, that can allay such suspicion and prevent corruption is to permit every licensed consultant interested in an announced project to submit a sealed bid which is opened at a stated time and place, with the award made to the lowest bidder.

Nothing less can fully satisfy the disappointed consultant, the zealous budget examiner, and the auditor.

Such a selection method, unfortunately, is not sufficiently reliable for a conscientious public official to assume responsibility for the successful fulfillment of his prime duty—that of constructing a facility that is esthetically and competently designed in a timely manner within a stipulated budget.

Once an appropriation is made to build the hospital, school, highway or water treatment plant that has been debated long and hard by the public and their representatives, the official responsible for its construction is expected to produce the facility in short order to offset the time lost by the democratic process. Moreover, the project must satisfy the functional needs of the director of the facility in office at the time the facility is completed and be aesthetically attractive to the public in the community and the critics inside and outside the design profession.

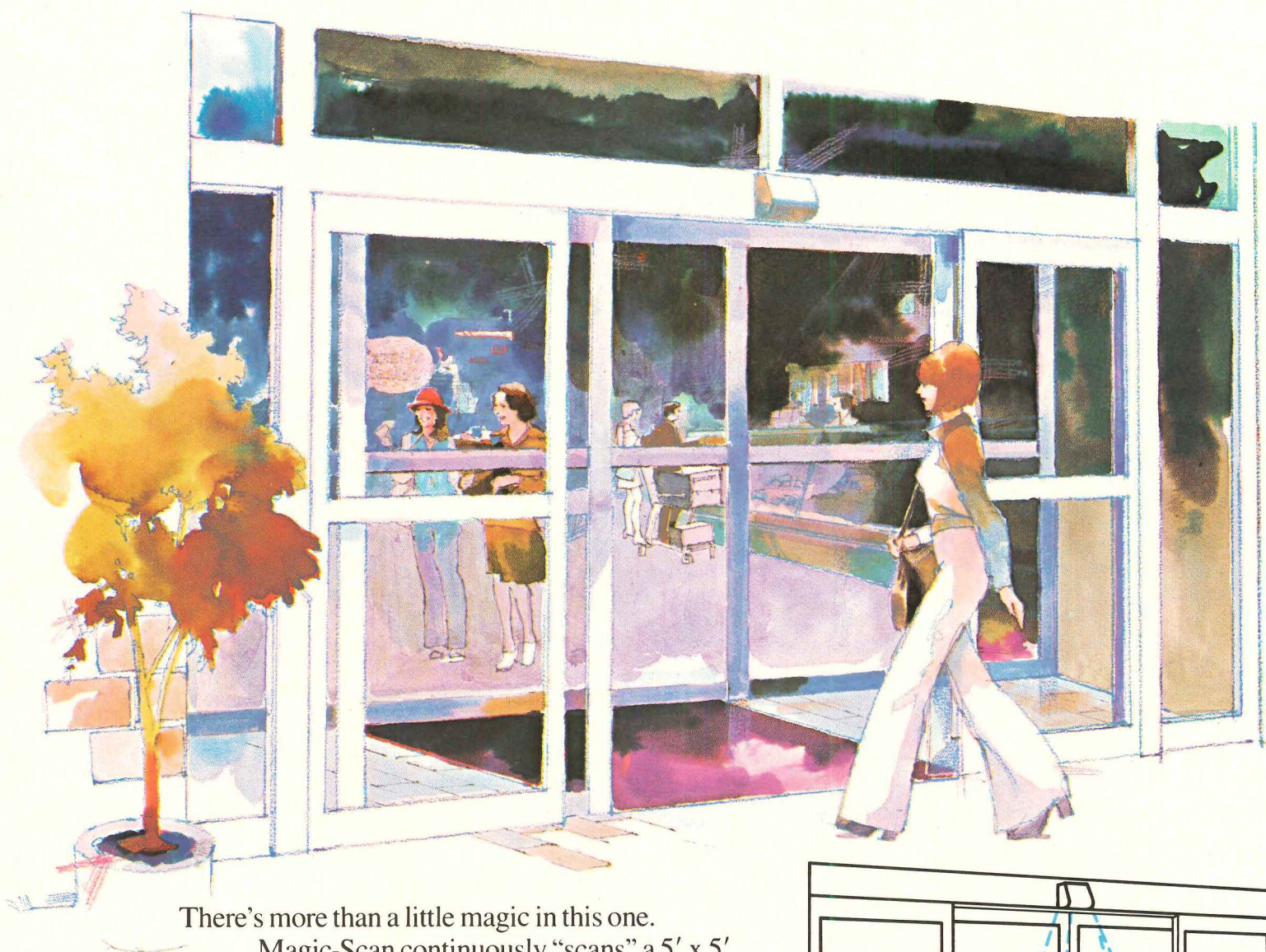
As the construction official faces this challenge, his first and most difficult hurdle lies in selecting the consultant and establishing his fee. Regrettably, the outside pressure is not directed toward obtaining the best qualified consultant but that there be a form of "rectitude" in the selection process and that there be a saving of funds in the design of the facility.

Admittedly the construction official has the responsibility of considering all the A-E consultants interested in obtaining contracts for public work. As a matter of fact, he has the added responsibility of attracting consultant talent that may not have indicated an interest in public work. He must also keep the fee for consultant work at a level no higher than is necessary to attract the quality of talent he believes he needs for the project.

It is within this context that it is proposed that the following guidelines be applied in selecting A-E consultants and negotiating contracts for their services.

1. The construction agency should maintain a complete and up-to-date file of A-E's in-

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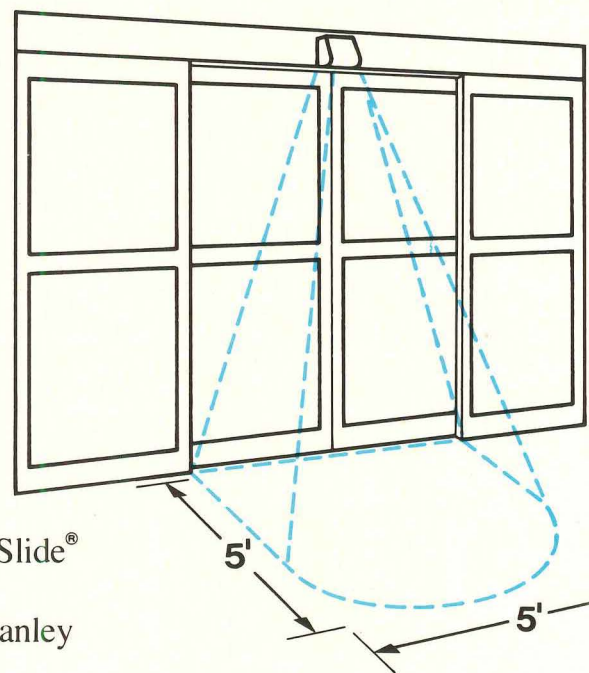
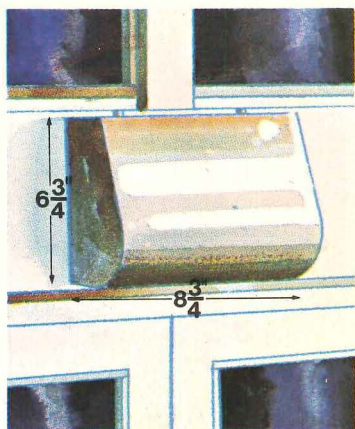
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Magic-Scan is solid state for dependability. Heat or cold won't affect it. Installation is simple. And its compact design makes for easy installation

and less clutter in far smaller spaces than typical electrical controls.

Magic-Scan can be used with all Stanley Auto-Slide® Door Packages.

Be smart and call us. Stanley Door Operating Equipment, Division of The Stanley Works, Farmington, Connecticut 06032



For more data, circle 46 on inquiry card

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do things right

ted in public work design contracts, with record of their past performance.

2. A committee of about three key officials in the construction agency should be selected by the head of the agency to report to which of the consultants appear best qualified to design the facility approved for construction, which one of these consultants should be selected, and on what basis the recommendation is being made.

3. Depending upon the size and complexity of the project, there should be a meeting preferably in the offices of the consultants not seriously under consideration, to determine the availability of the principal of the project, the competence of the project director who would be assigned to the project; and the manner in which the work of the office is produced and directed.

4. The final selection of the consultant should be made by the head of the agency on the basis of his personal review of the recommendations of his staff and a review of the consultant's record of performance.

5. To the greatest extent possible, the agency should have a "standard" form of contract approved by the appropriate legal and engineering officers, and a general "fee schedule" approved by the governmental unit's chief fiscal officer, and these documents with necessary explanatory material should be made available to professional associations, firms and individuals who would have a natural interest in them.

The terms and conditions of employment should be readily applicable to the standard forms of facilities for which the programs have been established and used, and for which no special site problems are expected. For such projects, there should, therefore, be little or no need for much negotiation. In such instances, letting A-E's compete in order to reduce the cost of consultant services would be an unfair demeaning process.

6. In the case of complex projects or projects for which new programs will be used, negotiation is important both to the consultant and to the client because of such intangible factors affecting cost as:

- a. The time limits placed on the design and construction work,
- b. The availability of a program for the facility in written form,
- c. The speed with which program questions will be answered and drawings reviewed with finality,
- d. The caliber of the construction management to be employed,
- e. Whether the construction work will be done by the fast-track method and by multiple contracts, and,
- f. The validity of the budget for the construction of the project.

The manner in which the construction agency plans to deal with these factors will determine to what extent there is a need to adjust the fee and the terms established under the standard contract. The head of the agency should not be the one to decide whether any increased costs requested by the consultant are warranted or negotiations should be started with another consultant firm. In these negotiations, it is in the best interest of the public that

a. The head of the construction agency have in attendance at all times his principal design, financial, and legal aides, and

b. That representatives from other agencies concerned with the legal and financial terms be permitted to attend the negotiating sessions if they so desire, but only for informational purposes,

c. That the head of the construction agency and the head of the consulting firm are responsible for negotiating the contract,

d. That the decision of the construction agency head is binding, and not subject to change or subsequent audit unless there is evidence of malfeasance.

The procedures described above are pre-

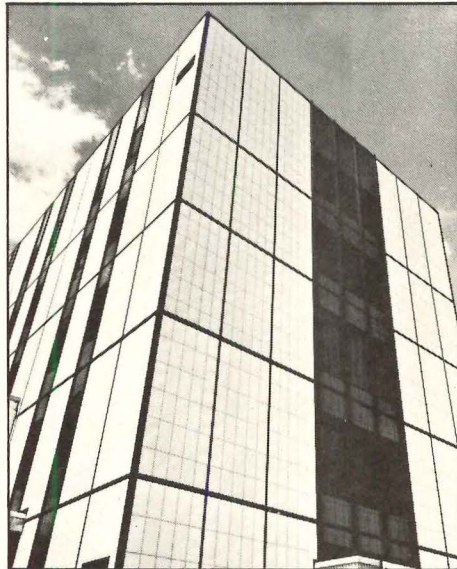
vised on the belief that the head of a public agency chosen for the quality of his judgment must be authorized to exercise it until his services are deemed unsatisfactory by the chief executive.

At the same time, the agency head must recognize his obligation to keep his work open to public scrutiny at all times, and that there will be procedural and financial parameters which he will not be permitted to transgress.

These parameters, however, must be so designed as to obtain the best possible talent at a fair and reasonable price, rather than have A-E's compete to do public work for the lowest possible price, or subjected to audit solely for the purpose of keeping their profits to a predetermined maximum regardless of their ability.

(Panel discussion to follow in later issues)

YOU SAVE ENERGY with KALWALL®!*



Kalwall is a complete, translucent, insulating wall

— or roof — system!

Kalwall lets you save heating and air conditioning energy — and use the sun's energy to even greater advantage to save on artificial lighting, and even pick up solar heat in the cold months! (We call this our Kalwall Solar Control System.)

You can design your buildings with a choice of key ENERGY SAVING factors:

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- It can have a light transmission value ranging between 3% and 75%!
- It can have Shading Coefficients from .50 to less than .10!

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- Random lengths and widths
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4 more of the 14 Townsend hardwood wall plank finishes:



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Potlatch

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Building costs: increase rate modifies

The latest construction cost survey shows a nationwide increase of 9.1 per cent over the preceding year. Last year there was a 12.6 per cent increase over the preceding year. This modification in cost increases can be attributed to the drastic drop-off in the housing field and the consequent higher competition for work in other fields of construction. This is resulting in an extremely large number of bidders on all construction projects.

Even though construction material prices are trending ever higher and labor rates are rising steadily, in many instances equipment costs are falling off. This is especially true in the heavy equipment field where lack of highly productive work has resulted in an over-abundance of inactive cranes. As a result, crane rental rates have dropped an average of 11 per cent nationally.

Contractor business failures are approaching an all time high. Cities and states with license requirements for contractors who work within their boundaries report few, if any, requests for licenses. Applications for building permits are also waning nationally.

Remodeling and renovation projects continue to be attractive to both owners and contractors. Architects are reporting more renovation projects than ever crossing their desks. Renovation is particularly desirable today because, generally, there are fewer delays caused by obtaining approval by town boards.

*John H. Farley, senior editor
Dodge Building Cost Services*

INDEXES: November 1974		1941=100.00 (except as noted)				
Metropolitan area	Cost differential	Current Indexes				% change last 12 months
		non-res.	residential	masonry	steel	
U.S. Average	8.3	474.1	453.6	465.2	453.8	+ 8.56
Atlanta	7.5	581.5	548.2	570.1	559.3	+ 5.46
Baltimore	8.6	542.9	510.4	531.2	516.7	+12.27
Birmingham	7.2	426.1	396.3	411.5	407.7	+ 4.63
Boston	8.7	468.0	442.1	465.1	451.3	+ 5.53
Buffalo	9.1	524.7	492.7	517.0	502.6	+10.12
Chicago	8.3	536.5	510.1	517.8	510.3	+ 4.03
Cincinnati	8.6	506.1	476.2	494.3	481.8	+ 8.05
Cleveland	9.0	516.1	485.6	504.7	493.0	+10.14
Columbus, Ohio	8.2	499.9	469.4	491.4	478.6	+10.67
Dallas	7.8	481.7	466.4	471.9	463.1	+ 9.41
Denver	8.2	515.1	484.6	505.2	491.6	+10.53
Detroit	9.7	544.1	518.4	554.1	531.2	+ 7.43
Houston	7.1	430.1	403.9	417.1	411.3	+ 8.64
Indianapolis	7.7	429.0	402.9	419.9	410.3	+ 8.25
Kansas City	8.2	450.1	425.3	442.7	429.4	+ 9.52
Los Angeles	8.4	544.0	497.3	530.1	518.5	+ 5.58
Louisville	7.6	469.2	440.6	457.5	448.3	+ 7.71
Memphis	8.3	487.3	457.6	468.8	462.0	+12.65
Miami	7.8	490.8	467.7	475.8	466.2	+ 8.46
Milwaukee	8.2	523.1	491.2	512.7	498.6	+ 9.47
Minneapolis	8.6	493.4	464.2	484.2	475.6	+ 7.02
Newark	8.8	465.1	436.7	457.5	447.0	+11.05
New Orleans	7.2	447.3	422.2	441.6	431.3	+ 5.02
New York	10.0	526.7	489.7	514.3	501.5	+ 6.08
Philadelphia	9.0	523.7	498.9	519.8	503.3	+ 6.79
Phoenix (1947 = 100)	7.8	270.3	533.6	261.0	256.6	+ 8.03
Pittsburgh	8.8	470.2	442.3	465.1	450.8	+ 9.60
St. Louis	8.5	482.4	455.3	477.6	466.3	+ 7.21
San Antonio (1960 = 100)	7.6	183.5	172.3	179.4	175.3	+14.87
San Diego (1960 = 100)	8.4	198.7	186.6	195.4	190.5	+10.43
San Francisco	9.2	686.9	627.9	682.7	659.6	+ 6.28
Seattle	8.4	461.3	412.9	457.0	440.0	+ 5.97
Washington, D.C.	8.2	468.1	439.5	457.9	446.4	+15.42

Cost differentials compare current local costs, not indexes.

Tables compiled by Dodge Building Cost Services, McGraw-Hill Information Systems Company

HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL NON-RESIDENTIAL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1973 (Quarterly)									1974 (Quarterly)						
	1964	1965	1966	1967	1968	1969	1970	1971	1972	1st	2nd	3rd	4th			
Atlanta	313.7	321.5	329.8	335.7	353.1	384.0	422.4	459.2	497.7	516.4	518.0	543.8	544.8	555.2	556.7	573.5
Baltimore	280.6	285.7	280.9	295.8	308.7	322.8	348.8	381.7	420.4	441.8	443.6	474.5	475.5	516.3	517.8	532.8
Birmingham	260.9	265.9	270.7	274.7	284.3	303.4	309.3	331.6	358.3	371.7	373.2	401.1	402.1	405.5	407.0	419.7
Boston	252.1	257.8	262.0	265.7	277.1	295.0	328.6	362.0	394.4	414.0	415.6	436.8	437.8	455.1	456.6	461.0
Chicago	306.6	311.7	320.4	328.4	339.5	356.1	386.1	418.8	444.3	465.3	466.9	507.6	508.6	514.2	515.7	528.1
Cincinnati	269.5	274.0	278.3	288.2	302.6	325.8	348.5	386.1	410.7	430.4	432.0	461.4	462.4	484.5	486.0	498.6
Cleveland	283.0	292.3	300.7	303.7	331.5	358.3	380.1	415.6	429.3	436.7	438.3	461.2	462.2	490.3	491.8	508.0
Dallas	256.4	260.8	266.9	270.4	281.7	308.6	327.1	357.9	386.6	407.3	408.9	435.4	436.4	453.7	455.2	476.4
Denver	287.3	294.0	297.5	305.1	312.5	339.0	368.1	392.9	415.4	429.5	431.1	460.0	461.0	476.1	477.6	508.5
Detroit	277.7	284.7	296.9	301.2	316.4	352.9	377.4	409.7	433.1	463.4	465.0	500.0	501.0	519.5	521.0	537.2
Kansas City	250.5	256.4	261.0	264.3	278.0	295.5	315.3	344.7	367.0	387.7	389.3	404.8	405.8	435.6	437.1	443.4
Los Angeles	288.2	297.1	302.7	310.1	320.1	344.1	361.9	400.9	424.5	453.3	454.9	503.2	504.2	514.3	515.8	531.3
Miami	274.4	277.5	284.0	286.1	305.3	392.3	353.2	384.7	406.4	419.0	420.6	446.2	447.2	467.6	469.1	484.6
Minneapolis	282.4	285.0	289.4	300.2	309.4	331.2	361.1	417.1	412.9	430.6	432.2	455.1	456.1	469.7	471.2	487.1
New Orleans	240.9	256.3	259.8	267.6	274.2	297.5	318.9	341.8	369.7	382.1	383.7	419.5	420.5	437.5	439.0	440.6
New York	289.4	297.1	304.0	313.6	321.4	344.5	366.0	395.6	423.1	453.5	455.1	484.3	485.3	497.4	498.9	513.8
Philadelphia	275.2	280.8	286.6	293.7	301.7	321.0	346.5	374.9	419.5	459.3	460.9	484.1	485.1	495.7	497.2	517.0
Pittsburgh	263.8	267.0	271.1	275.0	293.8	311.0	327.2	362.1	380.3	406.3	407.9	423.4	424.4	443.7	445.2	464.1
St. Louis	272.1	280.9	288.3	293.2	304.4	324.7	344.4	375.5	402.5	427.8	429.4	443.2	444.2	458.7	460.2	475.2
San Francisco	365.4	368.6	386.0	390.8	402.9	441.1	465.1	512.3	561.0	606.4	608.0	631.3	632.3	647.1	648.6	671.0
Seattle	266.6	268.9	275.0	283.5	292.2	317.8	341.8	358.4	371.5	388.4	390.0	423.4	424.4	437.8	439.3	448.7

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.0) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0 ÷ 200.0 = 75%) or they are 25% lower in the second period.

Sanspray, the beautiful alternative.

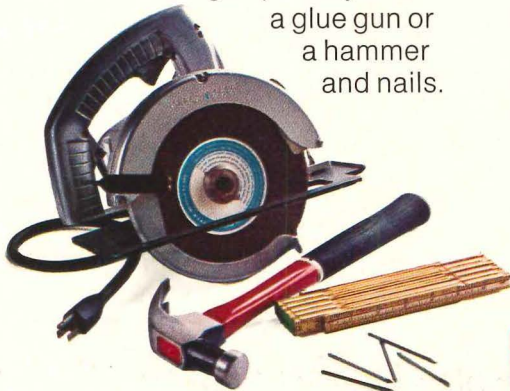


Sure, concrete and masonry are OK. But you know what they cost. Not to mention how much trouble they are.

You have a beautiful alternative. Sanspray®. A plywood siding with decorative stones bonded onto it.

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go up easily with a glue gun or a hammer and nails.



Sanspray is durable. The substrate is 3/8" exterior grade plywood. (Sanspray Shadowline™ is bonded to 5/8" plywood.) In fact, it meets the requirements of FHA/HUD and the major codes for single-wall applications.

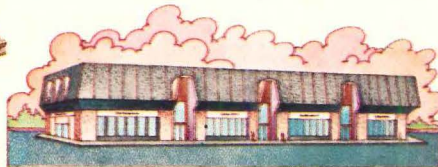
Sanspray doesn't need finishing and is virtually maintenance-free. (We're sure. We

tested it in all kinds of climates for ten years.)

Sanspray comes in Regular, Large and Jumbo size aggregates. And Sanspray Shadowline, which is a regular aggregate panel with vertical grooves spaced eight inches on center.

It comes in eight rich colors. Like Salt and Pepper, Gaelic Green, Monterey Sand and Tangerine.

So it gives you a lot of ways to make a lot of things beautiful.

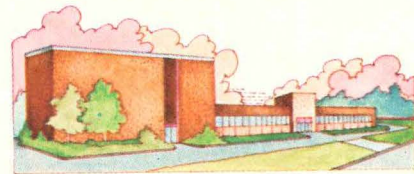
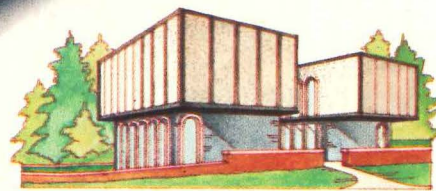


Homes for instance. (It's a natural for a Tudor.) Townhouses and condominiums. Stores and shopping centers. Factories and

industrial complexes.

Medical centers and hospitals. Schools and universities.

Use it outside. As a siding, skirting or facade. Or use it



inside. In lobbies, waiting rooms and public rooms.

In fact, for just about anything you want to make beautiful, you should use Sanspray, the beautiful alternative.

Find out more about it at your U.S. Plywood Branch Office.



**EXTERIOR
CLADDING BY
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777 Third Avenue, New York, N.Y. 10017

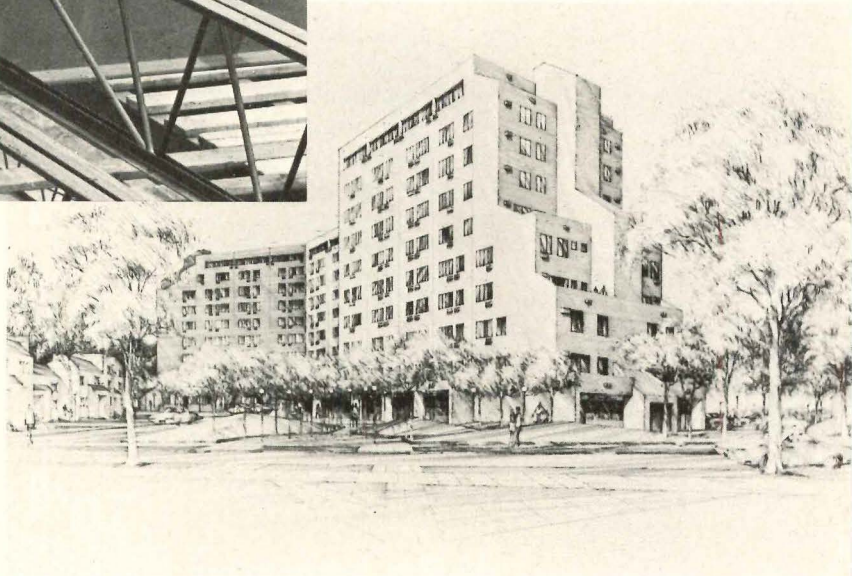
 **U.S. Plywood**
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*Why
steel joists were
the right answer
to this
building need.*

“Limited budget, fast erection, and simultaneous subcontracting made steel joists the logical choice for this building.”—Gilbert Switzer, AIA
Gilbert Switzer & Associates, Architects



Pynchon Terrace, a 10-story project sponsored by The Interreligious Housing Corporation of Greater Springfield, Inc., was built in Springfield, Mass. under the FHA 236 program. Fast erection and simultaneous subcontracting activity were critical to budget requirements.

Gilbert Switzer & Associates met those needs with open web steel joists for the roof and floor systems. Ideally suited to the unique building shape, the joists were set in place fast, without interruption to other activity. The open webs provided accessible throughways for electric, ventilation and other service systems. Unaffected by weather and other costly delays, erection was completed on time, on budget.

Designed to meet today's construction needs, open web steel joists are the practical answer to modern building requirements. For complete data, send for free copy of new Specifications and Load Tables.



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2001 Jefferson Davis Highway
Arlington, Va. 22202

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Introducing EnerCon.

AAF's heating/cooling system that c

It doesn't exhaust heat like other systems.

Instead, the EnerCon system takes heat exhausted by units on the cooling cycle and redistributes it to units that are heating. A simple, water loop makes it possible. The water loop—interconnecting each unit in the system—captures the heat and circulates it throughout the system. Or, stores it until it is needed.

Why pay to heat air you've just cooled?

Much of the time, the average office building calls for both cooling and heating at the same time. For instance, heat gain from lights, equipment and people is greater in core areas than perimeter areas. So, core areas usually

must be cooled even while perimeter areas are being heated. And during moderate weather conditions, the shifting of the sun from one side of a building to the other can make the difference as to whether you heat or cool the perimeter. Only the most elaborate, high energy consuming central systems can keep up with this fluctuating need.

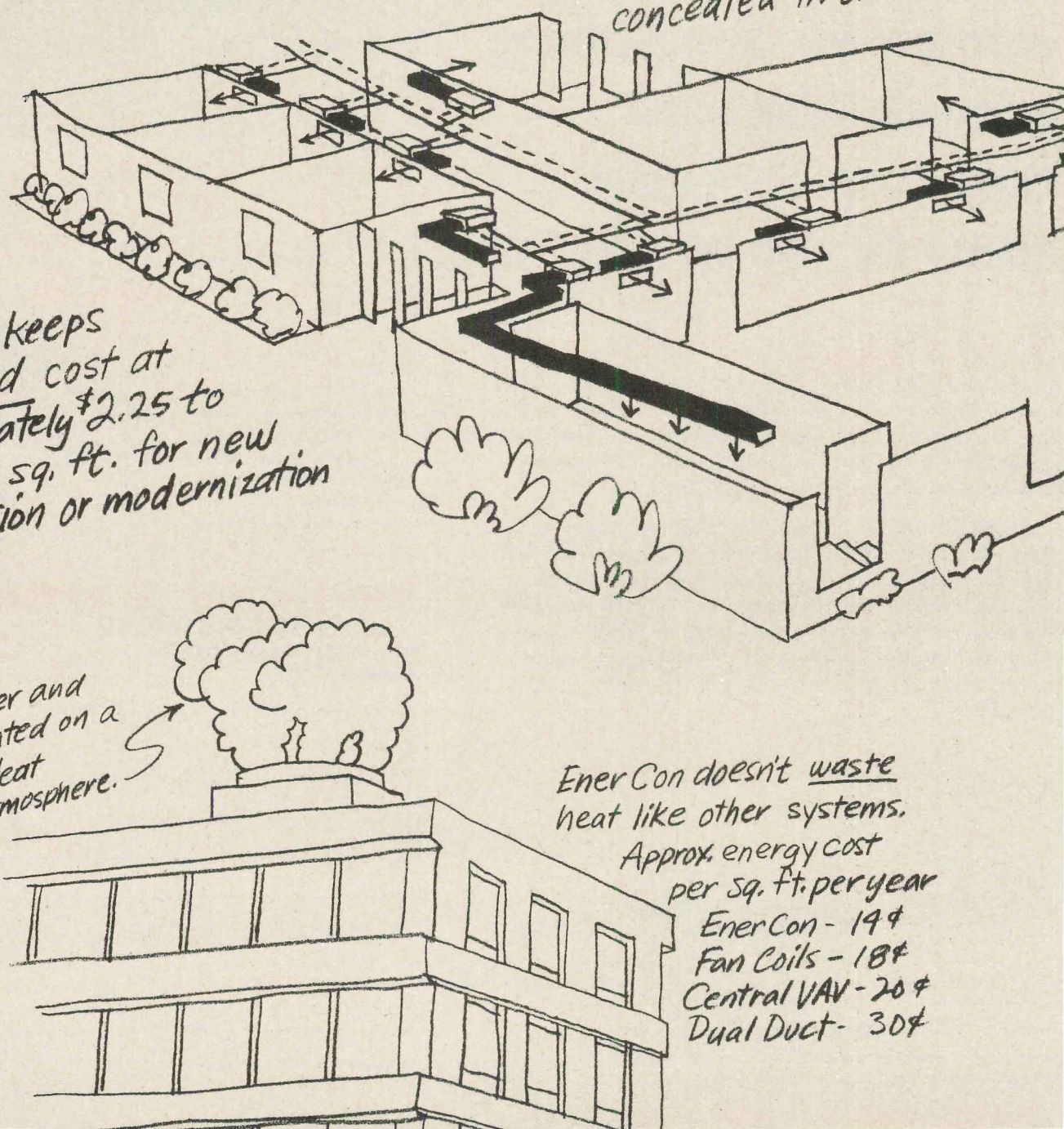
EnerCon does it easily. Your client gets cooling or heating where he wants it, quickly.

Units can be totally concealed in the ceilings.

This keeps installed cost at approximately \$2.25 to \$3.50 per sq. ft. for new construction or modernization

Cooling tower and chiller operated on a cold day. Heat wasted to atmosphere.

EnerCon doesn't waste heat like other systems.
Approx. energy cost per sq. ft. per year
 EnerCon - 19¢
 Fan Coils - 18¢
 Central VAV - 20¢
 Dual Duct - 30¢



Save your client up to 25% on energy costs.

In fact, much heating comes free of charge.

Just about all the heat needed to warm 100,000 square feet is produced by units in warmer areas of the building that are absorbing only 100 square feet. This redistributed "free" heat could, in many cases, be all the heat that is needed.

EnerCon uses simpler hardware, too.

No expensive ductwork, no rooftop equipment, no chiller or high pressure boiler. Most of EnerCon's apparatus is built right there in the unit. Add on the insulated water loop, a small in-line auxiliary water heater and an evaporative cooler and you've got the entire system. Easy to install, easy to maintain.

Complete installation flexibility.

EnerCon comes in a variety of sizes with more than 4 tons of cooling

capacity. Smaller units can be wall mounted in each room for individual climate control, or you can conceal larger units in ceilings and cool or heat several areas with one piece of equipment.

Cuts costs all around.

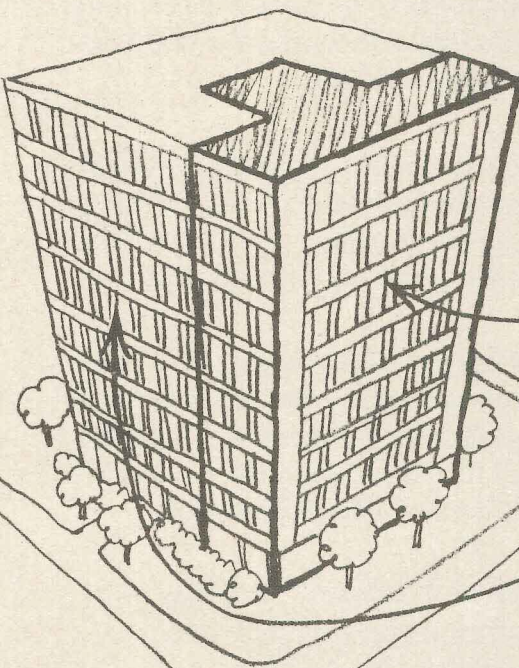
Energy costs. Installation costs. Owning and operating costs. They're all cut to the minimum with EnerCon, the heating/cooling system designed for your clients' needs today.

EnerCon. The new system from American Air Filter that can cut your energy costs up to 25%. For complete details, write: AAF, Dept. 389, Box 1100, Louisville, Ky. 40201.

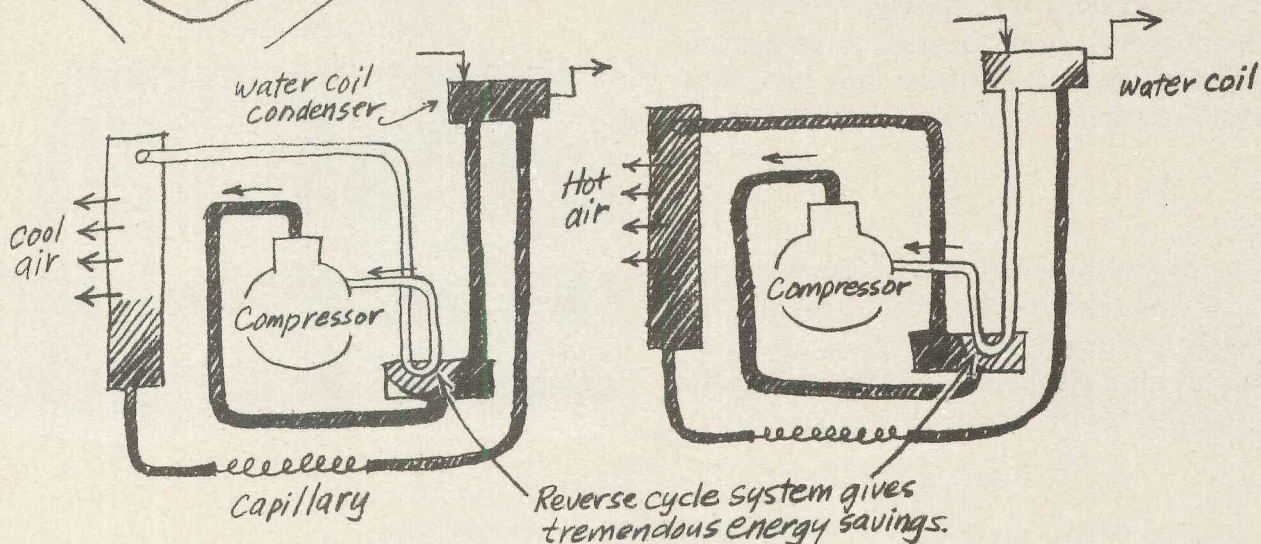
Better Air is our Business.

AAF American Air Filter
SELF-CONTAINED AIR CONDITIONING

For more data, circle 51 on inquiry card



Heat absorbed in water loop while these offices are cooling is stored and distributed to units calling for heat.



6 important reasons why you should look to Lees when selecting carpet for a commercial property.

1. Knowledge and experience of every conceivable type of installation... 40 years of successful applications in schools, hotels, airports, churches, restaurants, hospitals. First to use direct glue down... the last word on special situations.

2. Engineering know-how. Lees leads the industry in technical assistance and back up with practical know-how. Acoustical control. Flammability research. Maintenance procedures. Static protection. All researched in the laboratory... proven in the field.

3. Broad selection, styling. A combination of commercial lines plus residential carpets offers a selection that can successfully meet your most exacting needs.

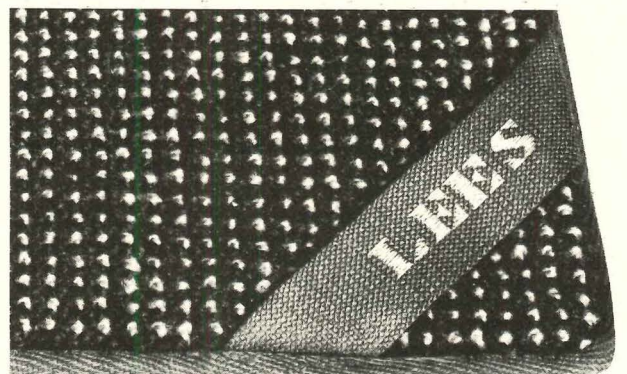
4. Highly qualified commercial carpet specialists within easy reach of your installation. Lees maintains more commercial carpet professionals working actively in the field than any other carpet mill.

5. Complete financing and leasing. Whether you measure your needs in hundreds or thousands of yards Lees can provide financing with a minimum of fuss at very competitive rates.

6. A dealer network of highly qualified and fully experienced professionals maintaining large inventories of commercial carpet lines for your immediate delivery.

If you need carpet now, or carpet is part of your plans call today for the name of your nearest Lees Commercial Stocking Dealer... toll free 800-523-5647 (in Pennsylvania call collect 215-666-9426).

America's largest-selling brand in commercial and residential carpet.



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The new GAF® 185.FL On-Demand Diazoprinter only works when it's fed.

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only works when it's fed.

You can feed it film, paper, intermediates, viewfoils,
cellulose acetate, and other materials. Blue line, black line, sepia.

It's ventless.

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And it's fast: 25 ft/min. (7.62 meters).

With a solid state system for *consistent* speed.

With a 48" (120cm) throat.

OSHA approved. UL approved.

Amazingly low priced.

And because it turns
itself off when it's through,

it doesn't eat power.



The new instant-on, instant-off
GAF 185.FL Diazoprinter works
only when you need it.



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Diazo... I'd like to know more about your
new GAF® 185.FL Diazoprinter.

- Please have a salesman call me for a
demonstration.
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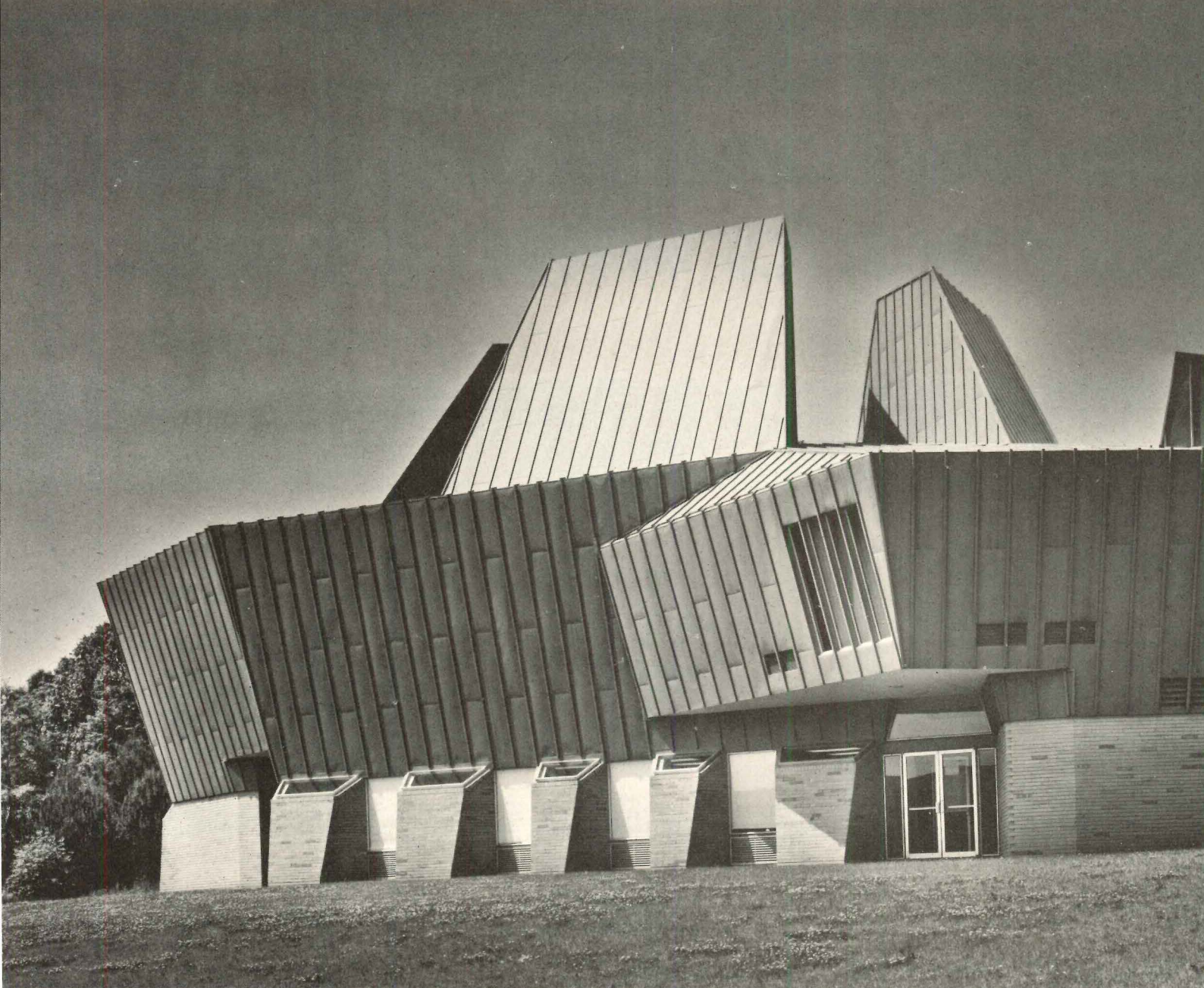
ADDRESS

CITY

STATE

ZIP

PHONE (AREA CODE)



Congregation Beth El, New London, Conn.; Architect: Paul Rudolph, FAIA, New York, N.Y.; Roofer: H. R. Hillery Company, Groton, Conn.

THE ARCHITECT, METALS AND IMAGINATION

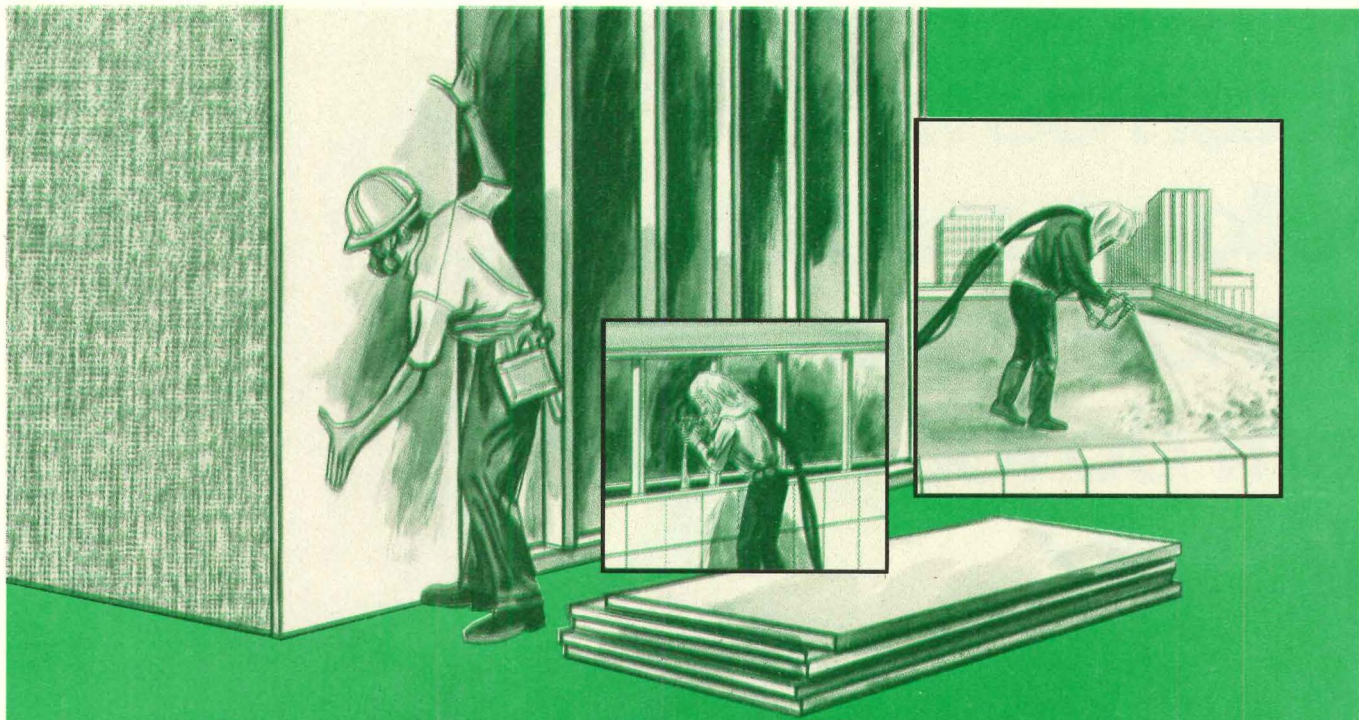
Many critics regard Paul Rudolph as one of the logical heirs to the late Frank Lloyd Wright's professional mantle, and his major projects have clearly influenced the whole range and dynamics of contemporary architecture. As Sibyl Moholy-Nagy once wrote, he has "great courage, comprehensiveness of talent, profound faith in the integrity of the architect's mission."

In conceptual felicity and strength of execution, Congregation Beth El is a notable example of Mr. Rudolph's recent work, and we are indeed gratified that in selecting a metal to sheathe and roof this distinguished building, he chose Follansbee Terne.

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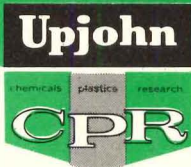
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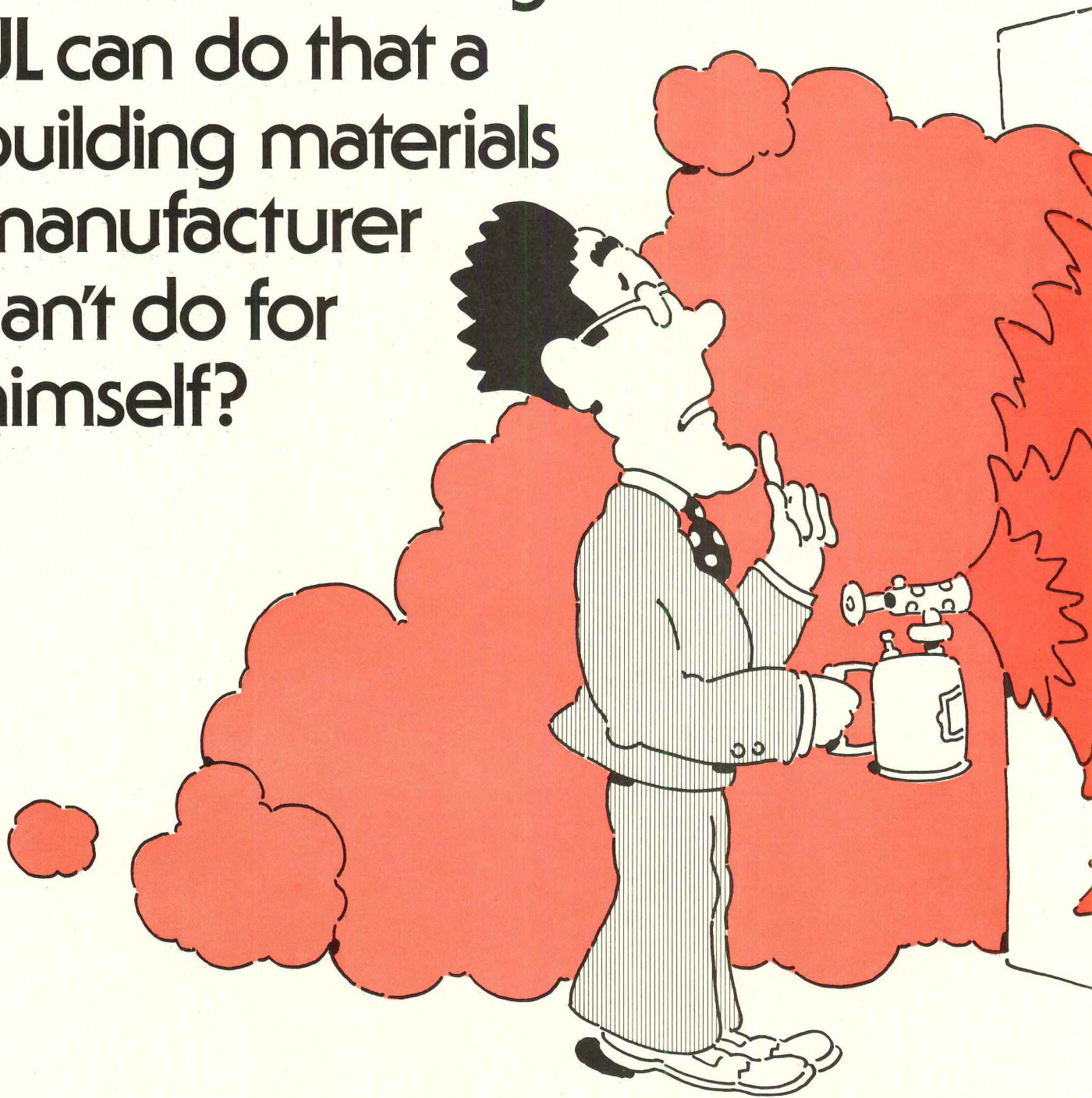
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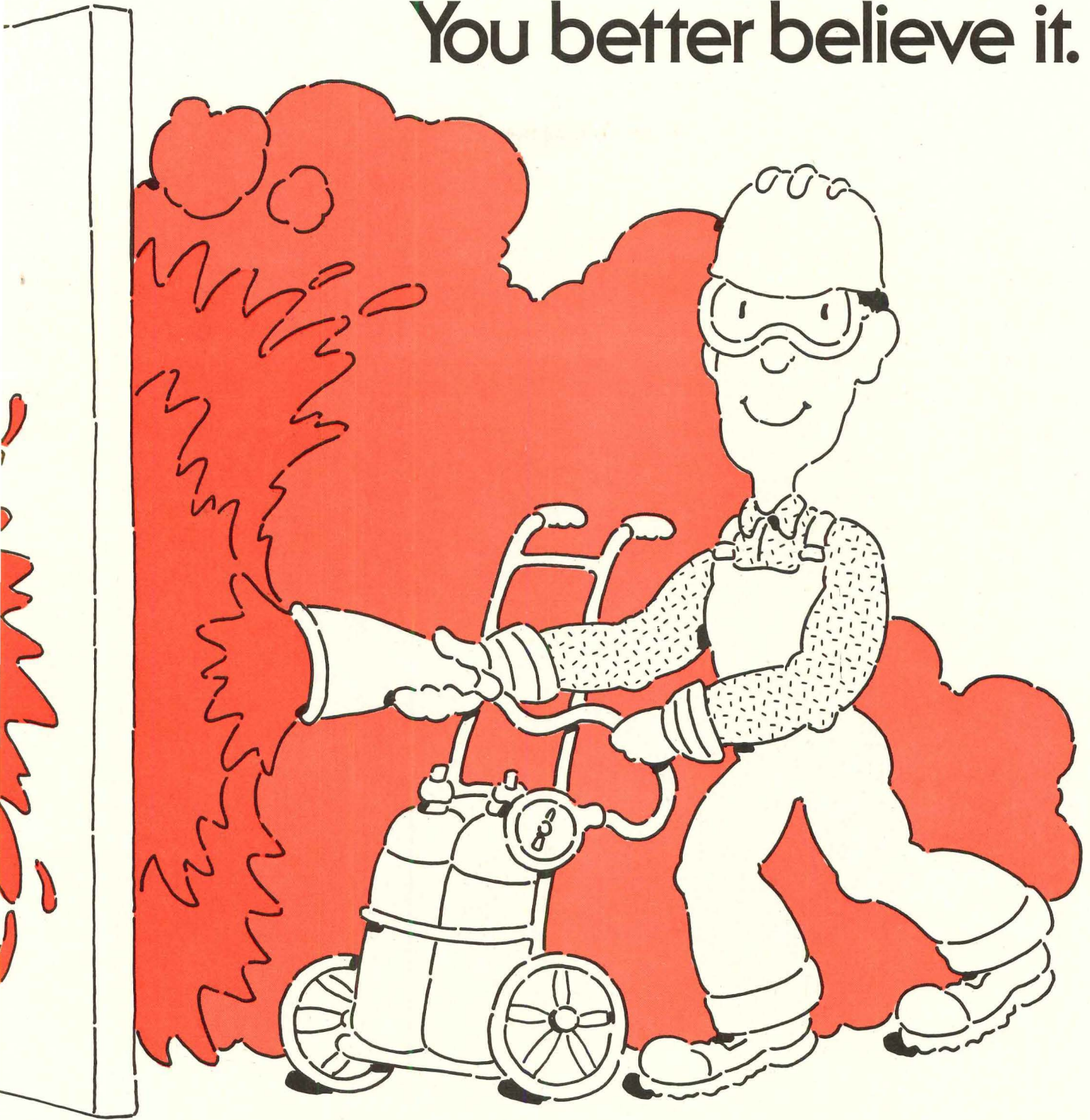
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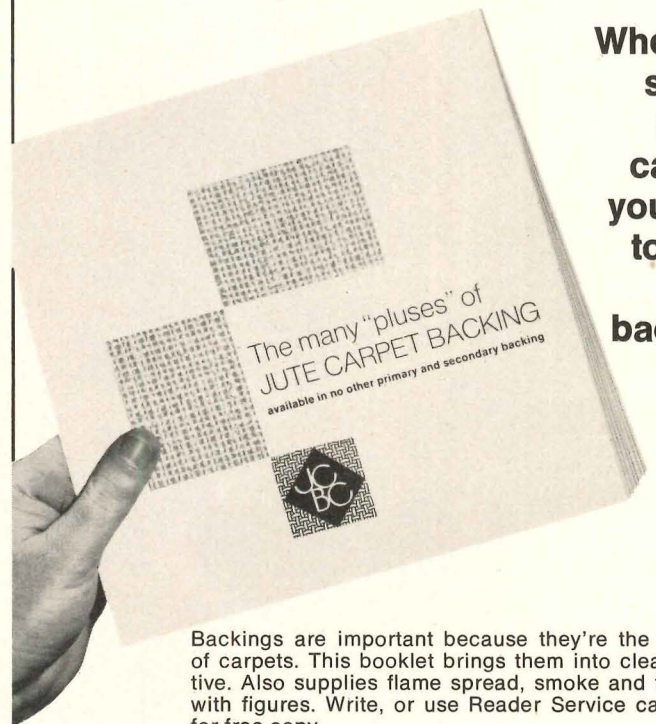
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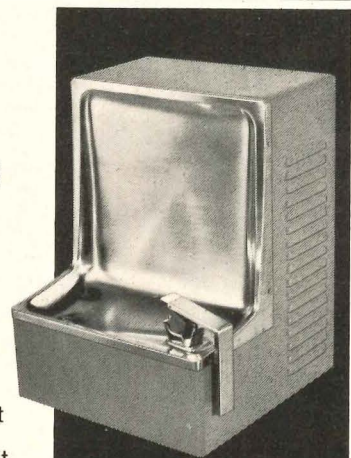
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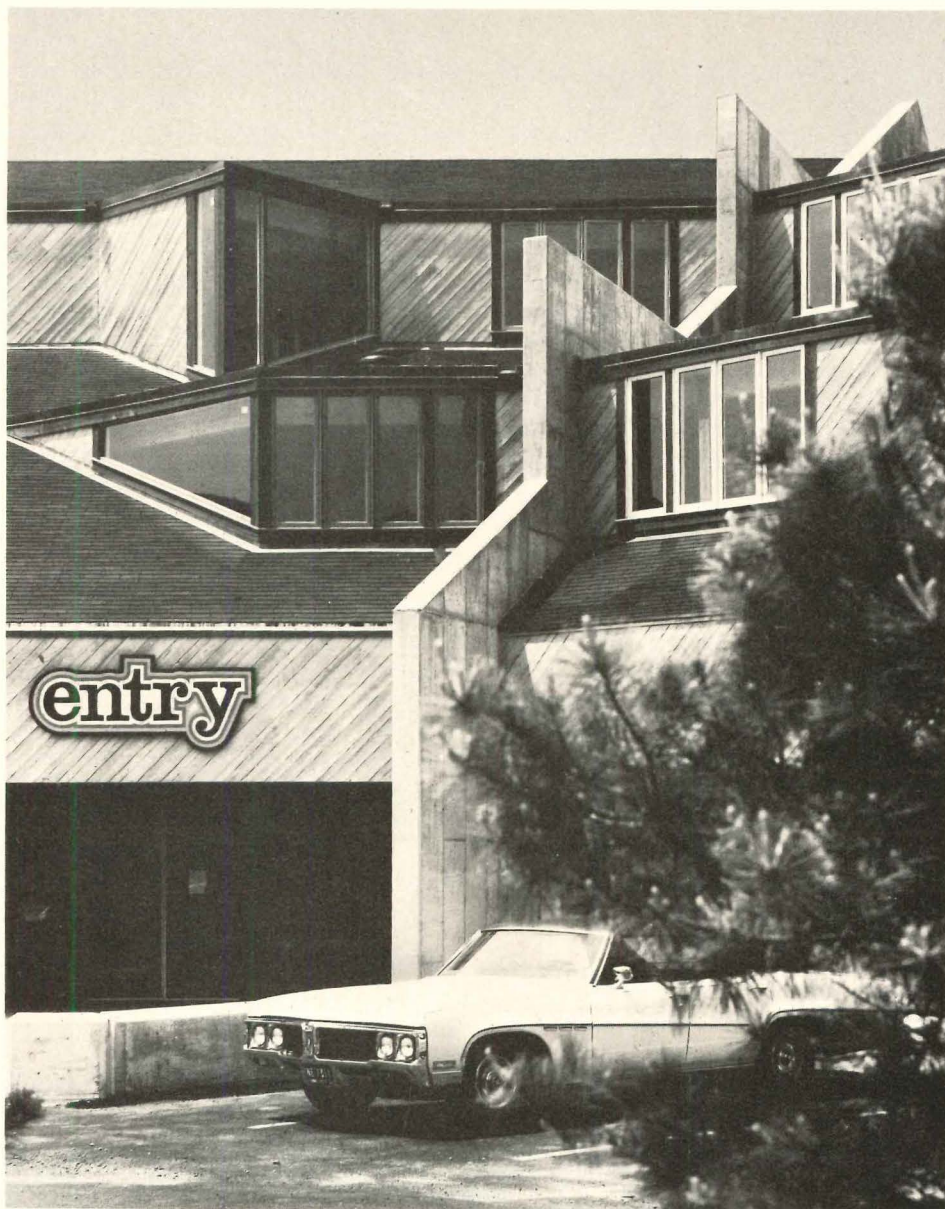
New England Shopping Mall Has "California-Style" Architecture and a Rotary Screw Chiller that Turns Off When Weather Turns Hot

Looking more like a woodsy country manor than a busy regional center, the Talcott Village Exchange is heated and cooled by a water-source heat pump system. The developer's aim was to save both scenery and energy.

Farmington, Conn. When last seen, the city of Hartford, Connecticut was still headed west. It is continuing the expansion begun soon after World War II as the growing population spilled over into the suburbs. In time its metropolitan area stretched out to touch, then overran, the once isolated city of West Hartford and is now reaching out in the direction of Farmington, a village that was founded in the mid 1600's and with a population of approximately 15,000.

Most towns in Farmington's position start to build up center city hastily to welcome the approaching boom. People here are reluctant to do this, however. They are profoundly content with what they have: hundreds of fine old houses in a lush, rolling countryside setting plus a quiet, pleasant downtown with a subtle aura of New England charm. Their inclination is to resist the population push from the east and to preserve the clean and comfortable status quo. And at this writing it appears that the citizens of Farmington have a good chance for keeping the place intact.

New Town in Town. Farmington's hope for preserving the status quo hinges on the "New Town" approach to land-use planning which has been tried with good results in several parts of the world. In theory, this approach eliminates the hazards of patchwork random growth by shifting the burden away from center city to an undeveloped area. Starting from scratch, land-use specialists work up a master plan for the project, which could range in scope from a self-sufficient community of modest size to a whole city. Brazilia in



Dormers with redwood-framed clerestories and casements overlook entrance to mall.

South America may be the ultimate example of the conceptual approach. In any case, the opportunities for bringing about orderly and well thought-out development are vastly greater than if the planners were restricted to compromising around existing buildings, roads and services.

Farmington's "new town" is Talcott Village begun by owner James S. Minges in 1969 on 200 acres of 40-year-old forest, more than half of which has been left in its natural state. Lo-

cated ten miles out from the center of downtown, it is described as a total living community where people can reside, work, play, shop and socialize without going outside its boundaries. Residential buildings on the site include 128 condominium units, 271 rental apartments and 22 single-family homes. Already completed or in various stages of planning and construction are three low rise office buildings, a 300-room inn and conference center, a professional park, twin movie theaters, a

In very cold weather when recovered heat is insufficient for the building's needs, the chiller comes on line to extract supplementary heat from well water.

health club and spa with indoor and outdoor swimming pools, and a day-care school.

Regularity Breakup. Flagship of Talcott Village is a ¼-million-square-foot, four-story structure called "The Exchange." The main level and mezzanine of this building make up an enclosed-mall shopping center. The two upper levels are devoted to commercial office space. The construction is of exposed heavy timber without conventional wall and ceiling finishes in both retail and office areas. A sloping roof with dormer-type windows keeps the building small and low in scale for its size. Interior wood trusses add to the angularity which is part of the conscious breakup of what the architects consider the "deadly regularity" normally found in square-box office space.

The interior environment of The Exchange is conditioned throughout the year by an energy conserving closed-loop water-to-air heat pump system. The system operates in conjunction with a series of wells which serve as a heat source in winter and a heat sump in summer. A notable feature of the system is a relatively new mechanical element, the rotary screw package chiller, which is used only for heating and not at all for cooling.

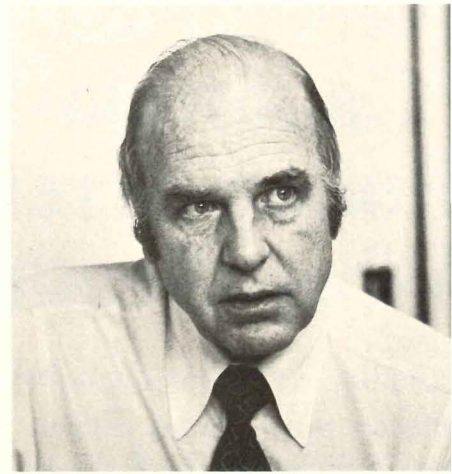
A Mayo Maybe. Farmington is also experiencing some home-grown ex-

pansion pressures in addition to those arising from its role as a suburb to Hartford. Located there in a dramatic new office building is the world headquarters of Heublein, Inc. which is booming as a result of the breathless success of its Smirnoff vodka. Among other firms that have important facilities here are IBM and Kodak. Probably the most important local influence is the State of Connecticut Health Center, adjacent to Talcott Village, which has been under continuing development since the 1950's. Long-range plans for the center involve hundreds of acres and many expect it to someday achieve the clinical capability and reputation of a Mayo or a Leahy.

Portions of the medical complex have been completed and are being staged into operation. The Health Center includes a 200-bed teaching hospital, classroom buildings for undergraduate education, outpatient clinics, dormitories, an animal research tower, administrative facilities, the state medical examiner's office, and a structure for family medicine. Under active consideration is a proposal to relocate the Veterans Administration hospital and related services onto the site.

Urgent growth pressures such as these eventually proved beneficial to at least one native resident of the area. James Mingos owned a large tract adjacent to the hospital site which he had wanted to put to use dating back to 1955. The townspeople, however, were generally against any large-scale development and back then it took him over five years to get approval to build a modest three-building office complex of only 78,000 square feet.

California Schemers. Mingos scored a breakthrough when he called on the planning and architectural firm of



Builder James S. Mingos' timely prescription for a "new town" provided some welcome relief for Farmington's growing pains.

Callister, Payne and Bischoff to come up with a new-town master plan involving his property and surrounding tracts as well. Headquartered in Tiburon, a remote hamlet northeast of San Francisco, they had achieved a national reputation for imaginative land-use schemes and community planning. The firm's founder, Charles Warren Callister, was one of the pioneers in so-called California-style design, a characteristic of which is liberal use of mellow tones of rough-sawn wood.

After a lengthy study, the firm prepared a coordinated plan which was then submitted to the town board for review. The plan proved to be a most convincing instrument for winning approval for Talcott Village. In the plan the board clearly saw the opportunity for relieving downtown's growing pains and gave its approval.

Much of the environmental quality of Talcott Village can be traced to the developer himself. Although he started his career as a professional civil engineer, his interests in conservation le-



Sloping roof of The Exchange mall helps building appear small in scale despite its four levels and ¼-million square feet.



Architect August Rath of Tiburon, Calif. feels there are some pleasant alternatives shopping and working in a blockbuster.

... to qualify as a registered landscape architect. He now heads the consulting firm James S. Minges & Associates, Inc. which handles assignments in both engineering and landscape architecture.

Heritage Legacy. "I originally thought the project should have a very strong New England flavor," recalls builder Minges. "But after seeing Heritage Village, which the architects had done earlier in Southbury, Connecticut, I was motivated by its western feeling and thought they could create some of that same rustic woodsy architecture for this project."

The Exchange as well as most of the residential buildings feature an imaginative adaptation of wood, inside and out. Windows—all ponderosa pine units with insulating glass—are major contributors to the community's "wood look." Most impressive in the shopping mall and office interiors are the exposed wood beams and rafters, some of which are as much as 24 inches in depth. The masses and beams are of laminated design which accounts for the notable static that "there are 30 tons of glue" in the structural framework erected on the site.

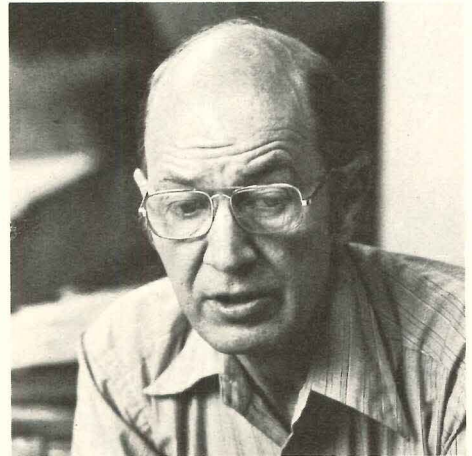
"We wanted the people who live, work and visit here to experience the beauty of natural materials," says architect August Rath. "The warmth and character of wood creates a greater harmony between building and land. It is the only renewable building material available and is also the most energy efficient, especially when you consider that the energy used in its 'manufacture' is solar."

Heatness Counts. The Exchange is heated and cooled by scores of independently-controlled electric heat pump units. These are deployed throughout the structure, suspended above the many shop and office spaces. The heat pumps are of the water-to-air type with

various ratings ranging from 1½ to 4 tons. All are coupled into a closed loop of pipe carrying circulating water. Because of the open ceiling feature of the design much of the mechanical system is visible to the people below. Electrical conduit, heat pumps and the short branches of air duct associated with each one, the network of glass fiber water pipe, are all on view giving much the same impression as a cutaway drawing of a building's innards.

The mechanical components are painted in vivid reds, greens, blues and yellows and contrast pleasantly with the soft natural wood colors of the cathedral ceiling. When a mechanical system is exposed like this and expected to complement the decor, neatness of installation is essential. The runs of pipes and ducts, for example, must be straight and parallel, corners square.

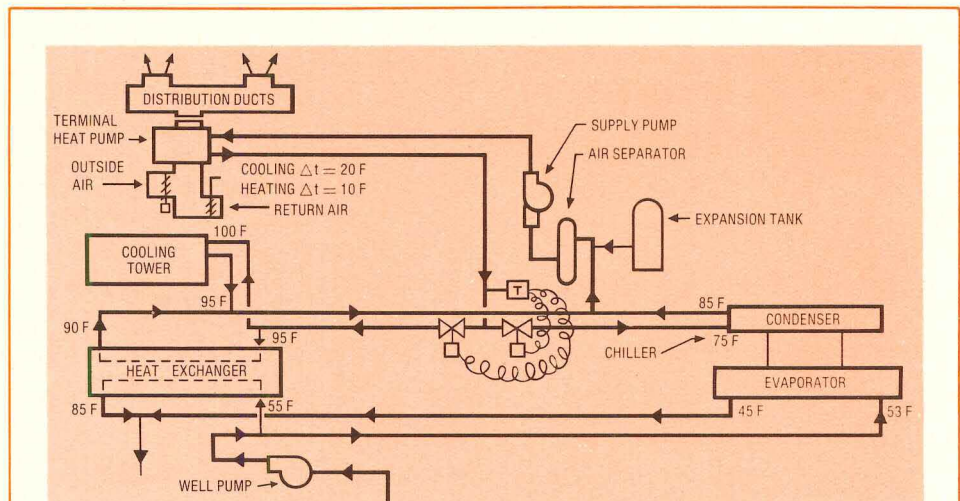
Does this requirement make the design of the mechanical system a more difficult task? "Not the design itself," answers engineer Evert M. Johnson. "As they come off the drawing board, mechanical layouts are inherently orderly affairs. The tools of the draftsman—T-square, triangle, protractor, etc.—make them all that way. But we do have to supervise the installation more closely to make sure the trades don't improvise shortcuts. Some improvisa-



Engineer Evert M. Johnson will allow shortcuts sometimes but not when ducts and pipes are destined to be parts of the decor.

tion on the job is O.K. when the system will be concealed above a finished ceiling, but not when it is to be on display over the life of the structure."

Energy Exchange. The use of an independent heat pump unit in each separate area opens the possibility for optimizing energy use in this multiple-zone structure. The water-to-refrigerant heat exchangers of all units are connected together by the closed loop of circulating water. A major advantage of this system is that it recovers excess heat from one zone and transfers it to another that requires it.



WATER-SOURCE HEAT PUMP SYSTEM

The basic subsystem for space conditioning The Exchange comprises a packaged water-to-air terminal heat pump unit and the short runs of distribution ducts. There are about 450 such installations, each assigned to one particular zone and controlled by an independent thermostat. Any given unit can be on heating or cooling to suit the needs of its space regardless of the season. All units are coupled into a six-inch main carrying circulating water which serves as a means for exchanging heat energy among units. In winter this system recovers enough heat energy to meet the heating demands of the structure without supplementary heat until outdoor temperature drops to 20F.

In summer water from a well-water heat exchanger is mixed with water circulating through the main loop to keep it in the 90-95F range. The heat exchanger is in effect taking heat from the loop and rejecting it into the deep wells. The cooling tower supplements the well-water heat exchanger. When the latter cannot carry the full load, the tower takes heat from 100F water and rejects it to outside air.

In winter the rotary screw package chiller is brought into the system. Its evaporator takes heat from well water directly, dropping it from 55F to 45F. The 85F water from the condenser is mixed with the circulating water in the mains connecting the terminal heat pump units.



Photography by Otto Batiz

Florist's knotty pine counters and light valances blend with exposed timber above.

Between seasons some parts of the building require cooling while others need heating. Hence some heat pumps will be operating in the cooling mode, depositing heat in the closed circuit. At the same time, other heat pumps will be functioning in the heating mode, extracting heat from the circuit to warm the areas calling for heat. When heating and cooling requirements are essentially in balance, the building may be said to heat and cool itself.

During summer months, excess heat is rejected into 55F water drawn from four deep wells on the site. Even in hottest weather, condensing head is kept low. Energy is conserved since at low condensing head, the heat pump compressor motors require less power input. In winter the heat generated by machines, lights and people is recovered for use in the building where needed. The random mix of operating modes—some terminal heat pump units on cooling putting heat into the water loop and some on heating extracting heat—is such that loop water temperature is above the 75F operating minimum until outdoor temperature drops to 20F.

Below this point supplementary heat is required and it is supplied by a 220-ton rotary screw chiller. The chiller, which does not operate at all in summer, removes heat from 55F well water and dissipates it into the closed loop. The chiller is effectively in cascade with the terminal heat pumps to provide a portion of the "lift" involved in extracting energy from 55F well water.

Blockbuster Antithesis. Energy con-

servation aspects of its mechanical system contribute generously to making The Exchange an appropriate building for today's needs. But they are hidden attributes and the public judges environmental relevance on what it sees. What people see here is a blending of building with site producing a feeling that must be described as pleasant despite the busy commerce it shelters.

"The Exchange is the antithesis of most people's image of a shopping center," says Augie Rath. "The vision that usually comes to mind is a blockbuster building in the middle of a parking lot. Our aim was to furnish space that was less overpowering and less institutionalized to help make shopping and working good experiences."

The informal residential shape of the structure helps achieve that aim. Credit must also be given to the woodland setting which nature supplied and which the builder took pains to preserve as much as possible. Minges estimates that the cost of saving trees and land contours added some \$1500 to each residential unit in Talcott Village.

"It is interesting to note," Rath points out, "that nothing in local codes prevents a builder from going in there with

DESIGN SUMMARY

GENERAL DESCRIPTION:

Area: 265,000 sq ft
Volume: 3,500,000 cu ft
Number of floors: three plus mezzanine and partial basement
Number of rooms: 45 retail shops, 50 private and general offices

CONSTRUCTION DETAILS:

Glass: double
Exterior walls: 3/4" T&G rough-sawn pine boards on wood studs, 3 1/2" mineral wool insulation (R-13), gypsum board
U-factor: 0.06
Roof and ceilings: asphalt shingles on 3/4" plywood deck, 3 1/2" mineral wool insulation (R-13), 1 1/2" T&G planks between exposed purlins; U-factor: 0.05
Floors: concrete slab on grade
Gross exposed wall area: 33,800 sq ft
Glass area: 7500 sq ft

ENVIRONMENTAL DESIGN CONDITIONS

Heating:

Heat loss Btuh: 8,745,000
Normal degree days: 6200
Ventilation requirements: 50,000 cfm
Design conditions: 0°F outdoors, 75F indoors

Cooling:

Heat gain Btuh: 7,685,000
Ventilation requirements: 50,000 cfm
Design conditions: 93F dbt, 78F wb outdoors; 75F, 50% rh indoors

LIGHTING:

Levels in footcandles: 25-75
Levels in watts/sq ft: 1-3
Type: incandescent and fluorescent

CONNECTED LOADS:

Heating & Cooling (800 tons)	1100 kw
Lighting	530 kw
Cooking	85 kw
Water Heating	50 kw
Other	300 kw
TOTAL	2065 kw

PERSONNEL:

Owner: Talcott Village, Inc.
Planners: Callister, Payne and Bischoff
Architect: August Rath
Consulting Engineers: James S. Minges & Associates, Inc.
General Contractor: Felix Buzzi & Son
Electrical Contractor: Mafco Electric Co.
Mechanical Contractor: Morris Fierber Co.
Utility: Hartford Electric Light Company

heavy equipment and flattening everything in sight. If you want to explain this tolerant attitude on the part of the citizenry you might look into New England history. The first order of business for the early settlers was to clear timber to make way for homes and agriculture. A clearing in the forest was a most desirable thing. Perhaps that feeling persists even if only subconsciously." Land-use theorists could infer from this that they may have to face subtle resistance from an unexpected quarter: the American heritage itself.

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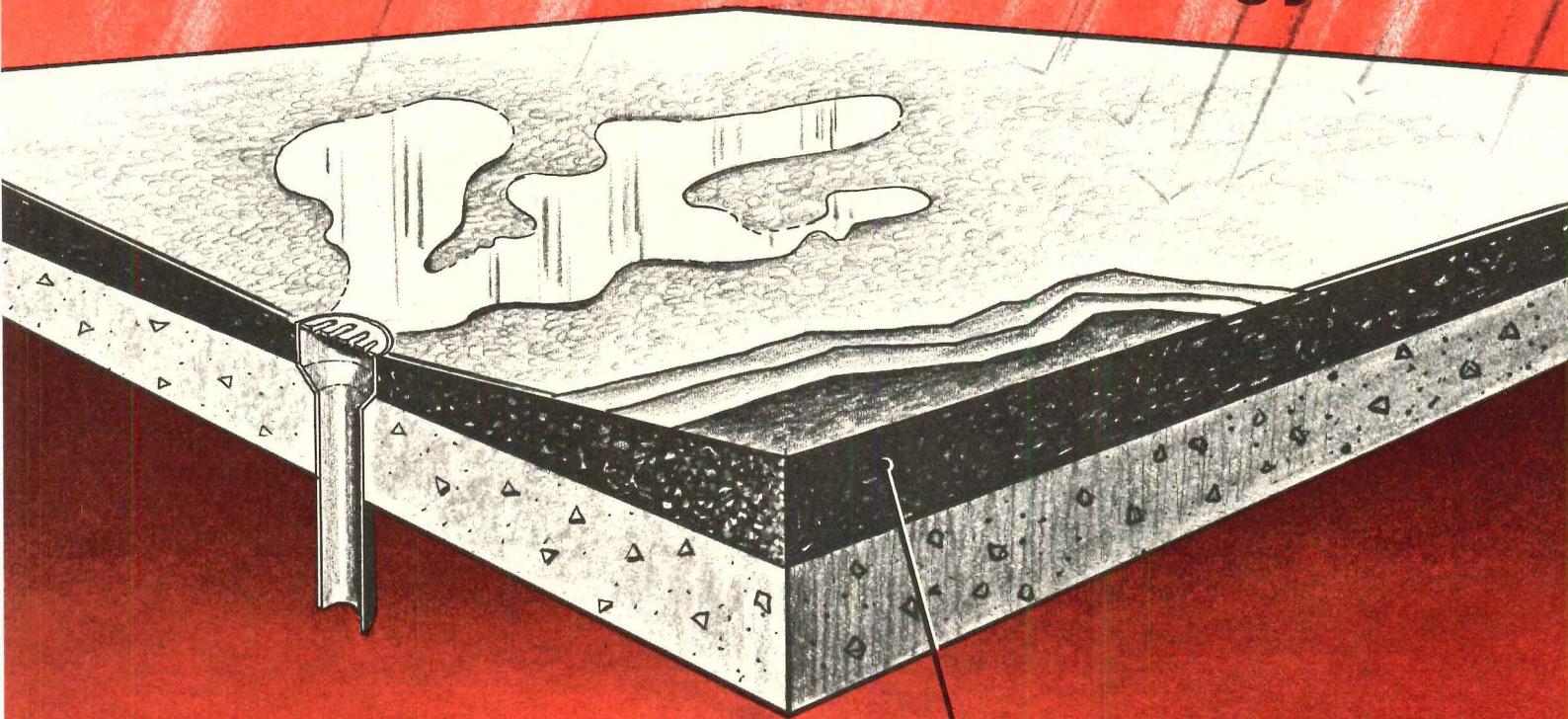
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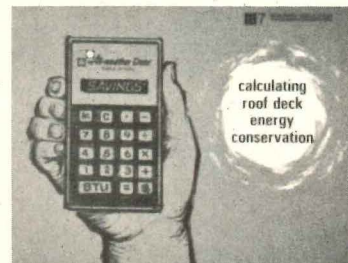
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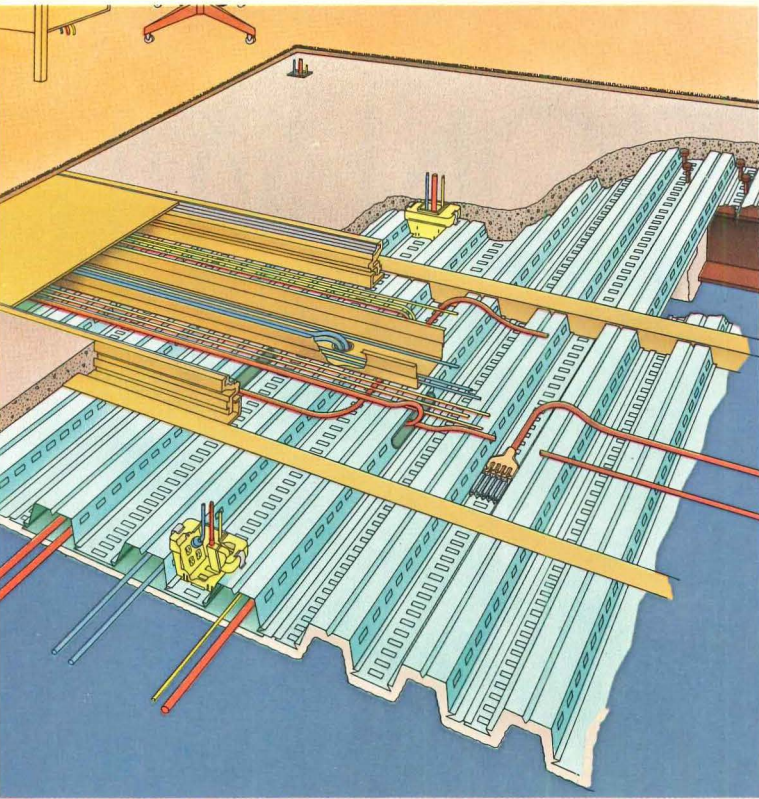


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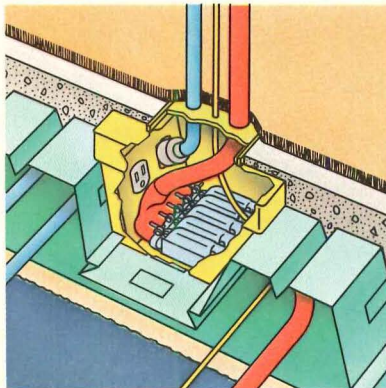
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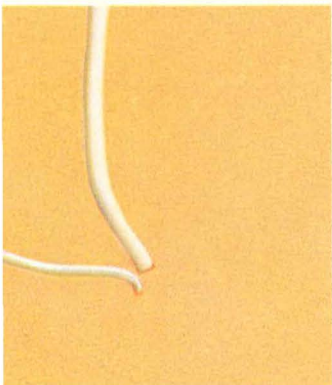


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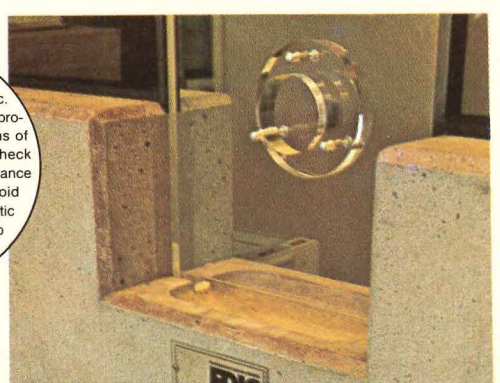
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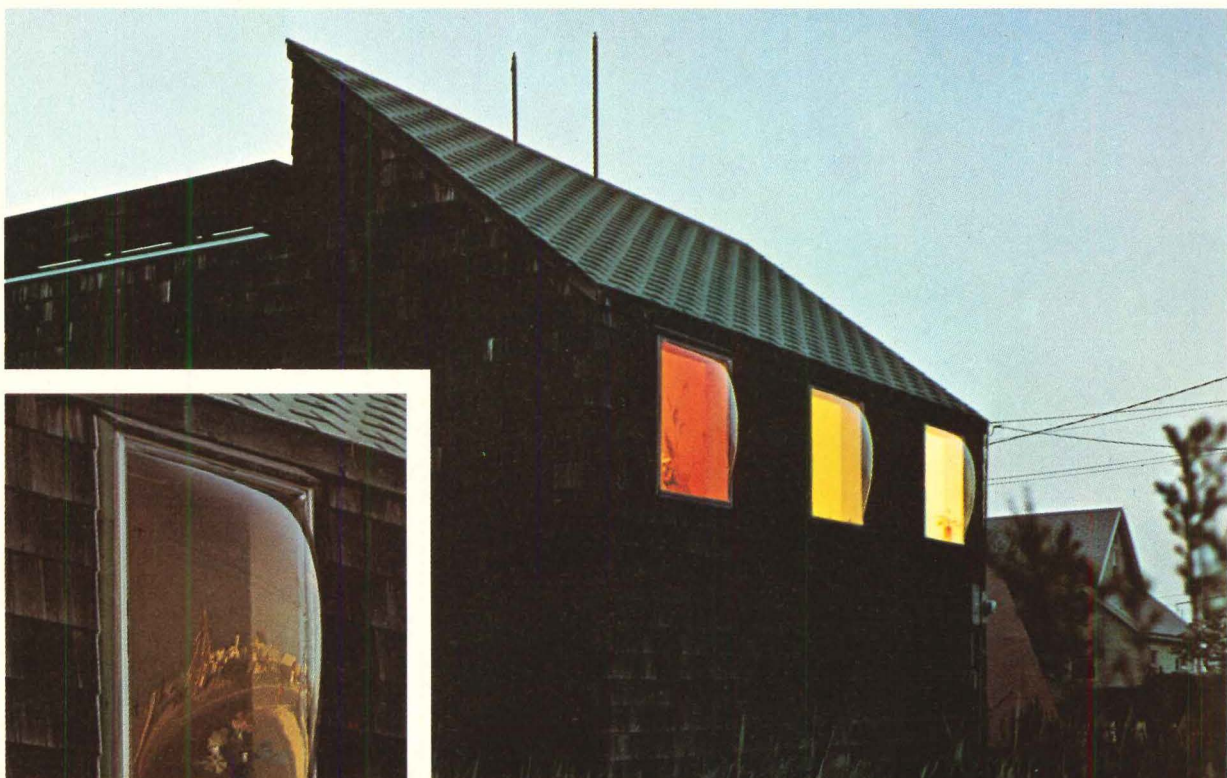
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Negev University Library, Harry Uvegi photo

TWO CURRENT ISRAELI PROJECTS

In the formative years of their nation, Israeli architects' first consideration had to be the provision of shelter. Today, subsequent generations in the profession are taking a second look at their buildings in terms of meaning as human environments and impact on the landscape, and they are coming up with some highly individualistic results. While many fine Israeli offices exist, the two projects here by architects Nadler Nadler Bixon have been chosen to illustrate the adaptive processes and the varied vitalities of design that can occur—not just in one country but within one collective mind.—Charles Hoyt

Negev University Library is a strong new form on a plain

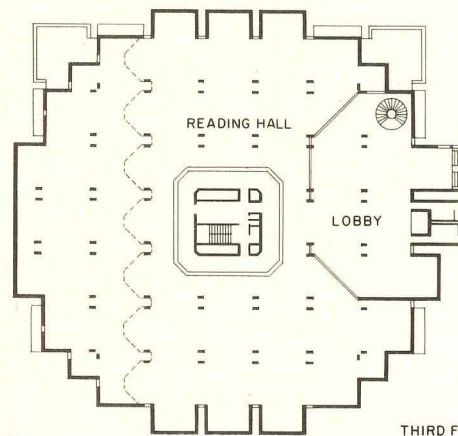
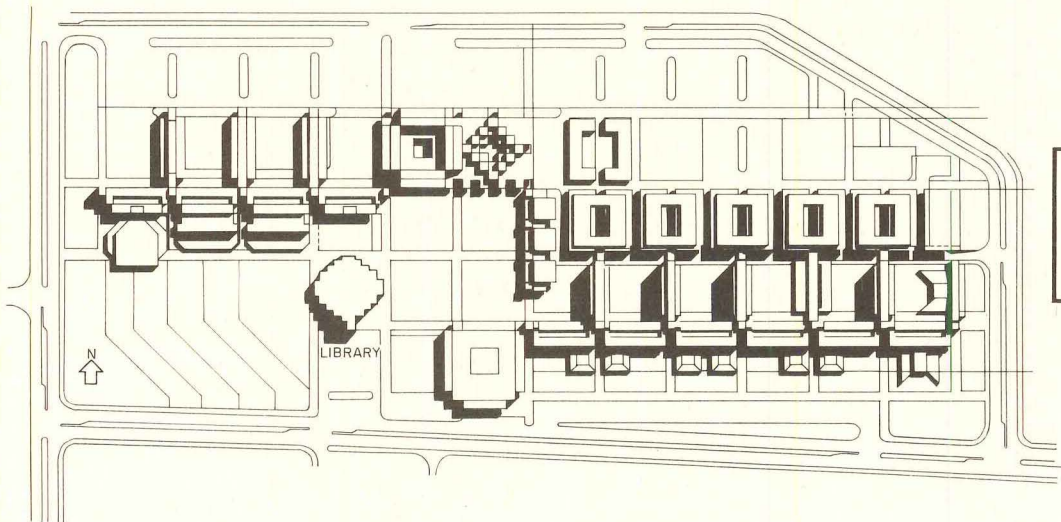
A strong sense that a building's form should be developed as sculpture is particularly appropriate in this project. The Library is the focal point of the large new Negev University which is currently under construction on the dry, flat plains near Beersheba (the site plan is below). The building is designed to both symbolize its function as a learning center and to provide a focus of visual interest on the monotonous terrain. Exposed concrete walls have been shaped to suggest a vessel for the storage of knowledge. The numerous skylights of the roof admit a diffused north light to the research and reading areas at the building's top. These cupola elements are built on a reinforced-concrete-shell principle, and are sheathed in white mosaic tile in contrast to the rougher texture below. They rest on steel beams whose minimal bulk allows a clear expression of their shape in the spaces below (photo opposite page, bottom).

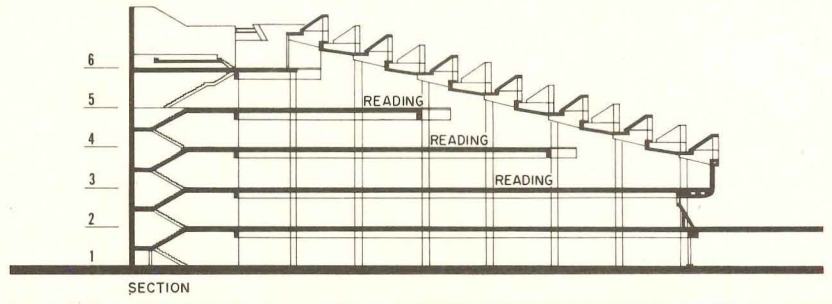
When the University is complete, the library is intended to house a half million volumes and accommodate up to a thousand readers at one time (the spaces are presently divided by partitions to provide temporary classrooms). Users enter on the second level which is immediately below the reading room lit by the skylights. On this level are small-scale spaces required for administrative offices, card catalogues and lending services. Natural light and views are provided by horizontal slit-windows which—viewed from the exterior—emphasize the angled soffits of the projecting "vessel" above. At the same elevation as the entrance, a raised plaza for pedes-

trians is intended to connect all of the buildings and cover the vehicular-service circulation at grade. The first floor includes a cafeteria opening to a subgrade court, the mechanical rooms, truck dock and a bomb shelter. Circulation from the entrance to the various levels is gained by means of the stairs in one of the two towers on the south side of the building. Viewed from the exterior, these vertical elements form a strong contrast to the horizontal arrangement of the building's mass (extreme left of photo, opposite).

The reading room contains about half of the building's approximate 100,000 square feet, and is arranged in three main tiers like stairs whose slope follows that of the roof (see the section, top of the opposite page). The concept allows a separation of the various activities of research and reading on the individual levels, and—at the same time—maintains a sense of one large space. The books are stored in open stacks at the back of each tier, and are placed to allow the pursuit of the various sciences—each one to its own level, but visually related to those around it. The building is estimated to have cost \$33 per square foot. The walls are structural concrete which was poured in place, and the foundations utilize spread footings.

THE CENTRAL LIBRARY OF THE NEGEV UNIVERSITY, Beersheba, Israel. Architects: *Nadler Nadler Bixon Gil*. Associated architect: *S. Amitai*. Engineers: *M. Lavie* (structural); *A. Zur* (soils); *Yani-Brau* (electrical & lighting). Landscape architect: *Yaron*. Library consultant: *N. Bargad*. General contractor: *Solel-Boneh Ltd.*





Harry Uvegi



Bernheim-Schwerin



The Jerusalem Municipal Theater reflects local tradition

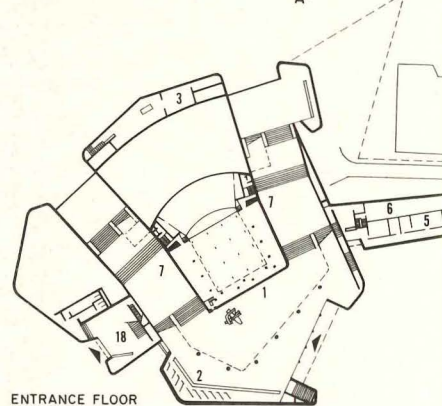
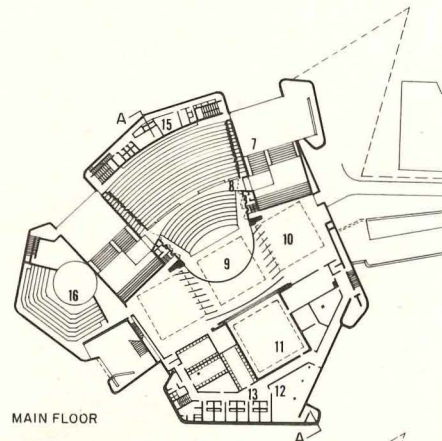
Here, an approach to architecture as sculpture is developed on two levels: the form of the building itself and the integration of a secondary sculptural system within it. The city has a tradition of stone construction whose profiles blend with and conform to those of the hills on which it is built. The architects were anxious not to break the established pattern on this outlying site which is located in an area of large houses, including—across the avenue—that of the theater's donors, the Miles Sherovers. The main problem was to reduce the visual bulk of a building that was to contain an auditorium for a thousand persons, another for 350, extensive backup facilities and a large lobby including a restaurant. The theater's massive stone walls curve along an irregular plan which echoes the contours of the hill behind it. A natural slope has been cut away to receive the rear wall and partially bury the man-made bulk, and the building's form appears to be a sculptural projection of the terrain. From the avenues, the impression of height is visually reduced by surrounding the high fly loft of the main stage by a series of descending levels whose horizontal projections cut off sight lines (photo, right). The levels are the roof above the lobby and a plaza whose terraces descend to street level. The general height of five stories and the higher stage enclosure behind can be seen from the plaza-entry steps located in the upper right corner of the plaza in the site plan (view on the opposite page, bottom). A composition which is literally sculptural threads through the building. It begins with a large composition on the plaza directed towards a

second element contained within the projecting side walls over the entrance. Further parts of the same sculpture are continued within.

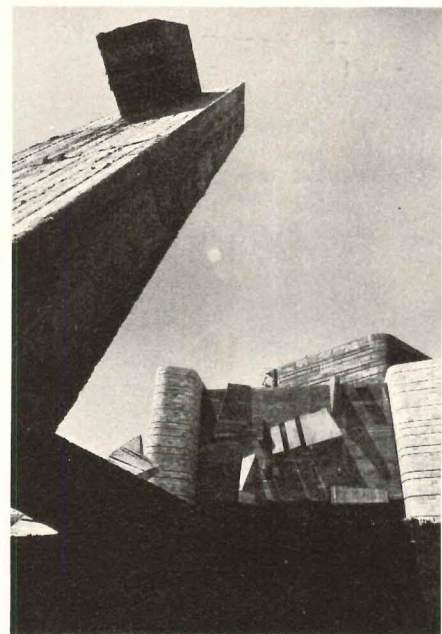
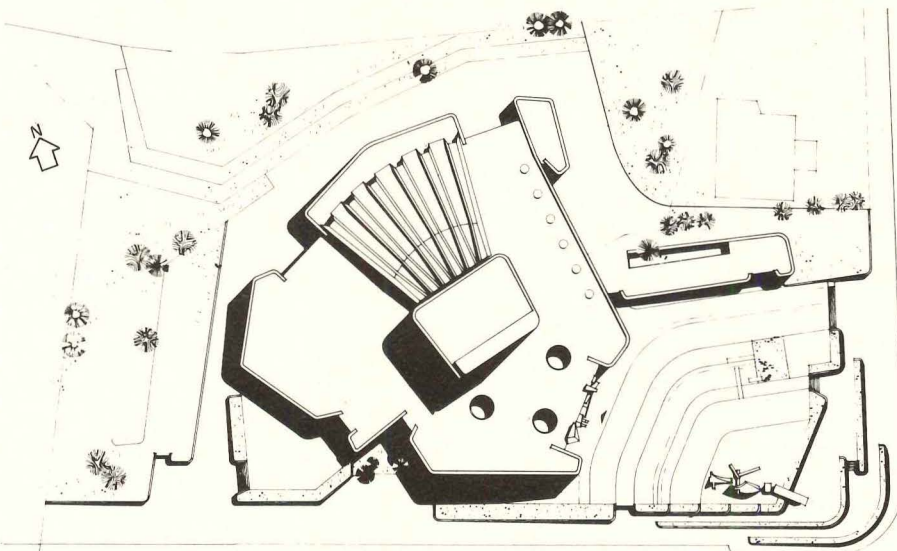
A local resident-troupe is provided with full facilities in the building. The lobby is an expansive two-story space which serves the two auditoriums and contains a restaurant on a balcony over the entrance. Diners have a view of the plaza (photo opposite, bottom). There are three levels of backup accommodations for the stages, (see section). A separate entrance to the smaller auditorium (not yet complete) is provided directly on the street to the south, and the intention is to allow for separate use. The larger auditorium is reached by an ascending series of small lobbies formed by the landings of the stairs, whose intimacy offers a contrast to the spacious main lobby.

Despite the apparent structural capability of the stone walls, the building is supported by several structural systems which are unrelated to the walls. A majority of the building is of poured-in-place-concrete column and beam construction. A concrete folded-shell spans the large auditorium. The main fly loft is supported by a steel structure. The entire building rests on spread footings. Construction cost is estimated to be \$34 per square foot for the 90,000-square-foot building.

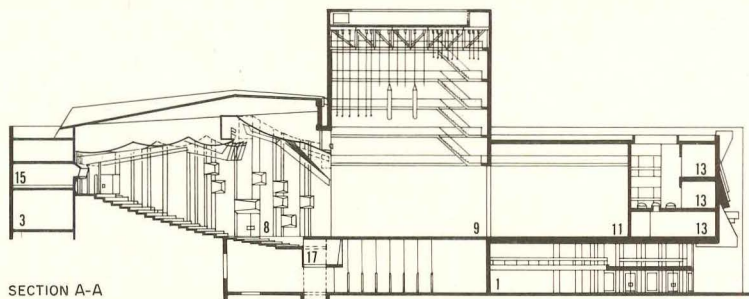
THE JERUSALEM THEATER. Owner: Municipality of Jerusalem. Architects: *Nadler Nadler Bixon*. Engineers: *M. Lavie* (structural); *Zeitlin-Komornik* (foundations-soils); *Y. Kaplan* (electrical). Consultants: *A. Cahanoff* (acoustical); *Y. Kaplan* (lighting); *G. Plotkin* (stage). General contractor: *Solel-Boneh Ltd.*



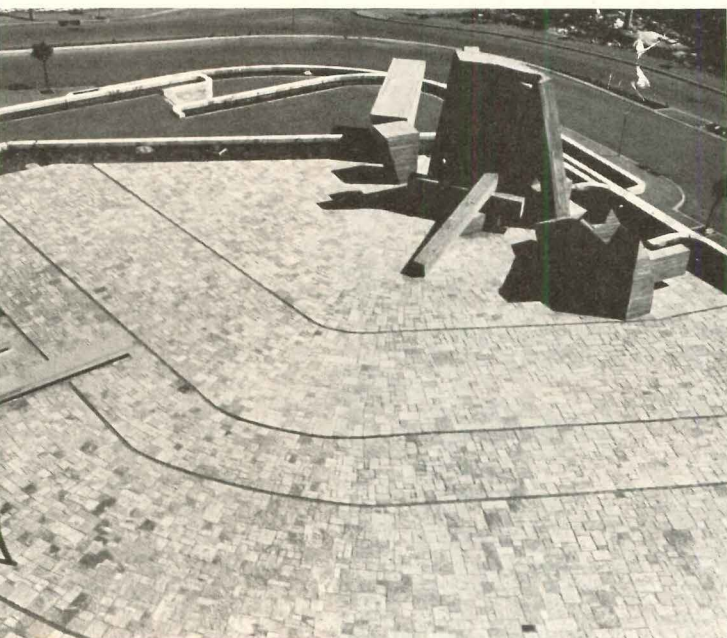
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| 2 Coats | 11 Back stage |
| 3 Mech. | 12 Green room |
| 4 Tickets sale | 13 Dressing rooms |
| 5 Offices | 14 Work rooms |
| 6 Patio | 15 Projection booths & c |
| 7 Lounge | 16 Small hall |
| 8 Main hall | 17 Orchestra pit |
| 9 Central stage | 18 Entrance lobby to sma |



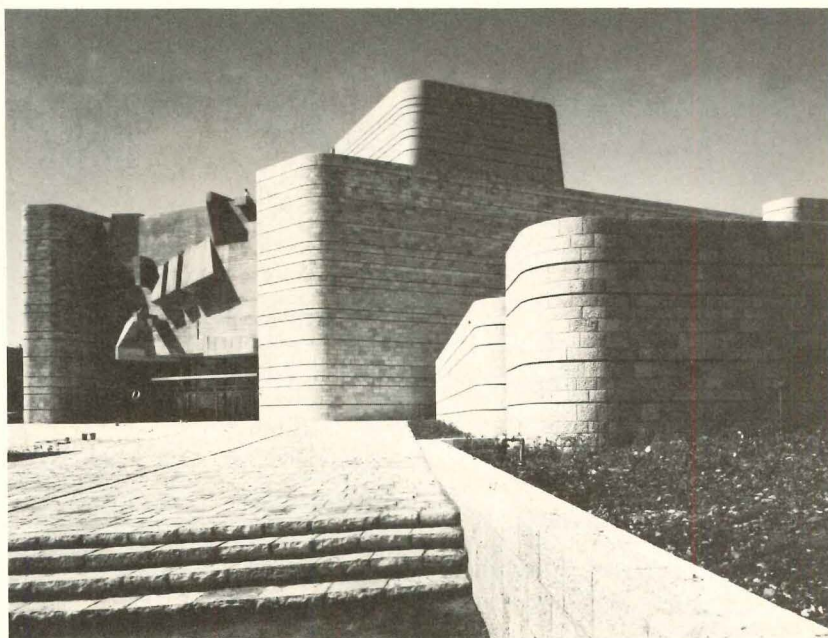
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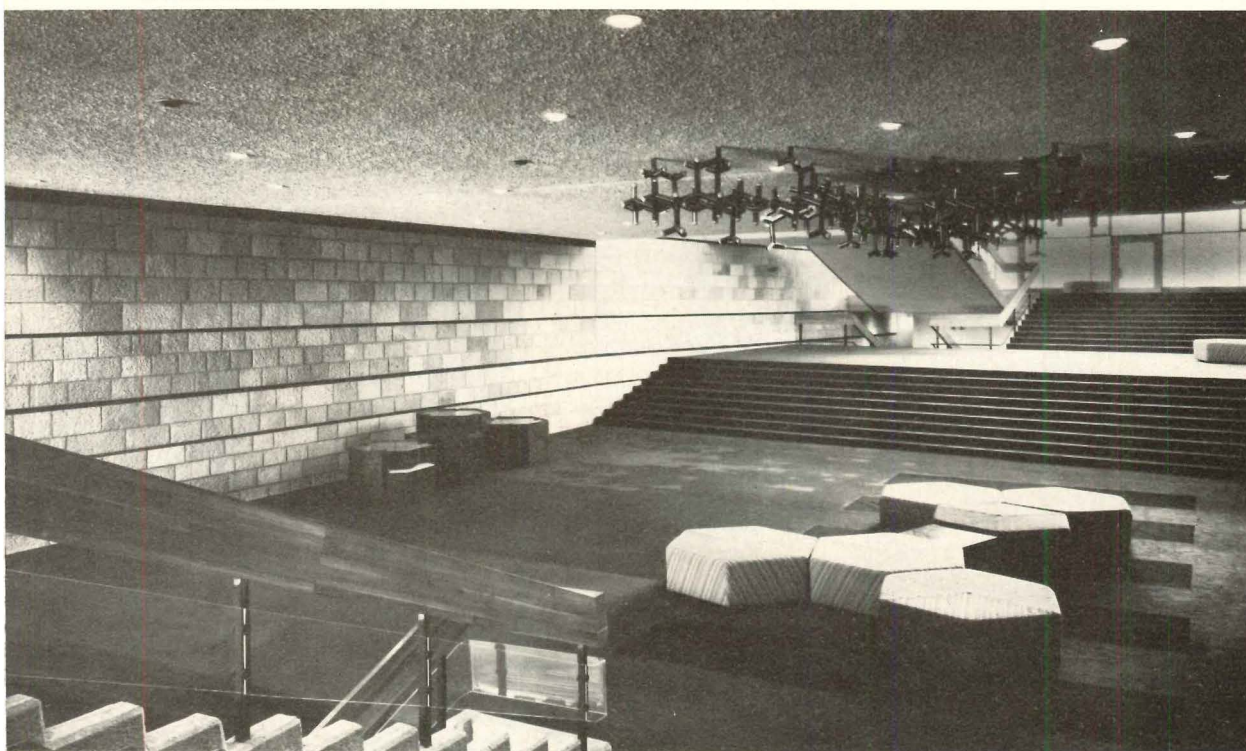
Bernheim-Schwerin

The larger auditorium accommodates a thousand viewers in continental seating. The wide room allows a maximum closeness between the audience and performers (there is no balcony). Stage lighting is concealed in the angled projections from the walls which recall the sculpture over the building's entrance. A generally subdued color-

ation of the walls and ceiling is enlivened by a brilliant red carpet. A landing in the wide stairs along the auditorium's sides (photo, below) is similarly carpeted and furnished with bright colored seating and hangings. These small lobbies provide an intimate contrast to an expansive lobby at the entrance which is paved with marble.



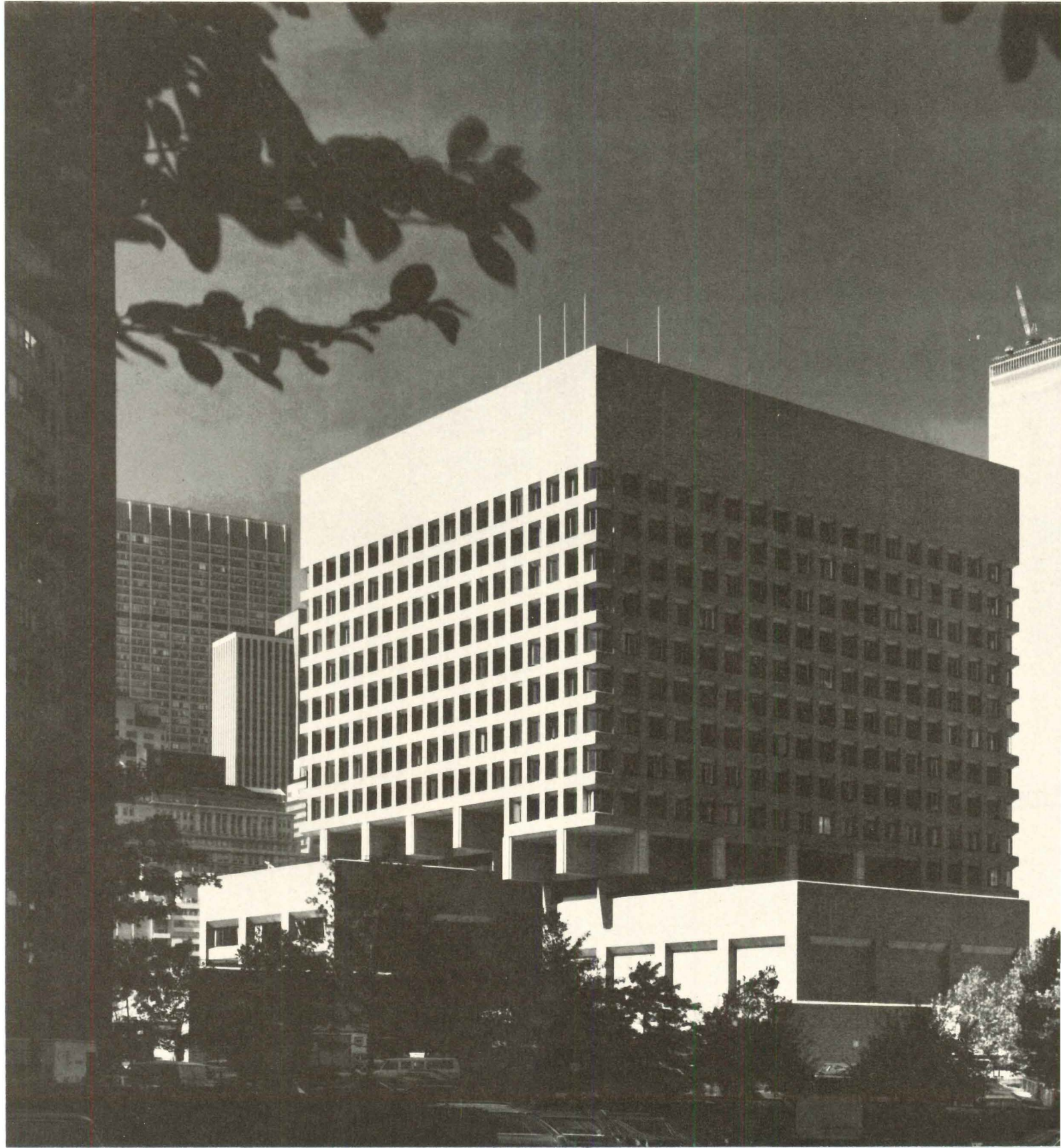
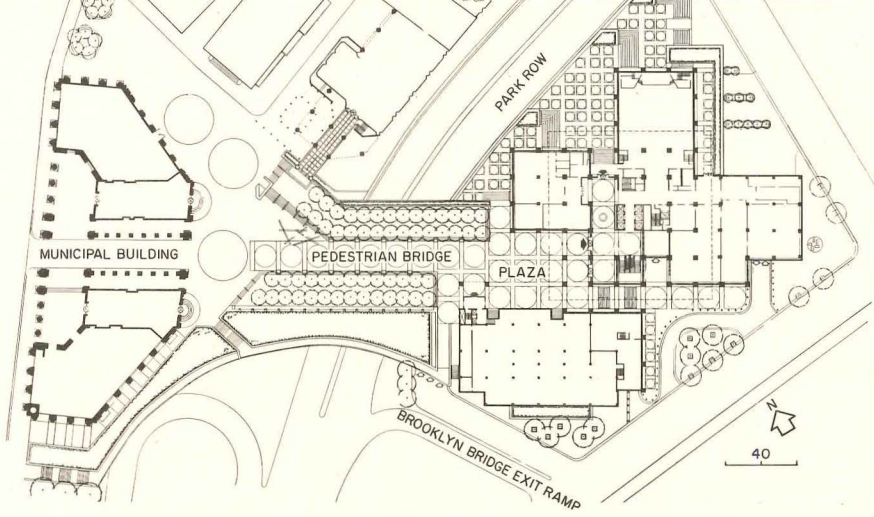
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A FIRM, NEW EDGE FOR NEW YORK'S CHAOTIC CIVIC DISTRICT

Lower Manhattan's new Police Headquarters, with its beguiling pedestrian plaza (glimpsed through the arch below) was commissioned nearly a decade and a half ago. Today, two mayors, six police commissioners, nine public works commissioners later, the building is complete and occupied. All these administrative changes, with their inevitable but vexing delays, architects Gruzen & Partners were the only continuing presence. Their patience and determination resulted in not only a splendid building but, perhaps even more important, in a sound and coherent piece of civic planning in a portion of the city where this virtue has been absent too long.—Barclay F. Gordon



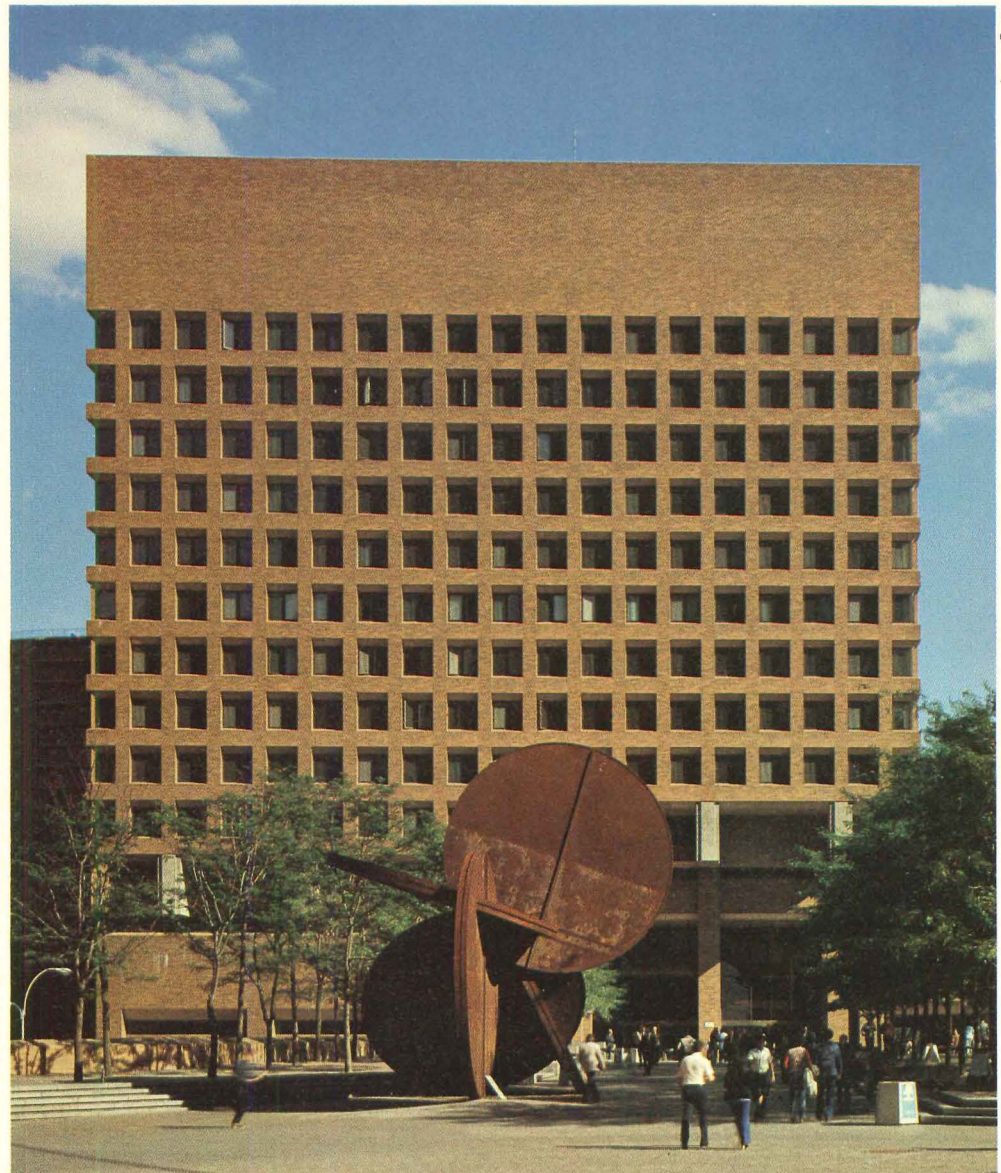


Chambers Street is a stop on Manhattan's West Side subway. Climbing to the street, up stairs softly frescoed in grime, the visitor finds himself near the intersection of Chambers and Centre Streets under the broad vaulting of McKim, Mead & White's colossal Municipal Building. This exuberant, faintly Italianate civic skyscraper, completed in 1914, houses a large chunk of the city's civil service. In a welcoming gesture, its colonnaded front opens, through an heroic central arch, to the southeast and now reveals New York's recently completed Police Headquarters Building and Pedestrian Plaza.

The 75-foot-wide pedestrian plaza, designed by Gruzen & Partners with M. Paul Friedberg & Associates, is so carefully planted that the visitor scarcely realizes he is on a bridge with a busy traffic artery—Park Row—cutting underneath. Strongly axial, the plaza is lined with honey locust trees and fitted with benches, a large sculpture executed in weathering steel by Bernard Rosenthal, and a variety of small pedestrian amenities that encourage strollers to pause, lovers to dally, city brown-baggers to linger over sandwiches and apples.

This grand space, with its seductive pedestrian ambience, seems so entirely appro-

priate that it is hard, in retrospect, to imagine that planners and police officials at first opposed its creation, favoring instead a narrow aerial tunnel reaching up, over Park Row and down again on the other side. The decision to depress Park Row and create the present plaza was agonizing. It required the shifting of several approach ramps to the Brooklyn Bridge. That meant the cooperation of a spate of city agencies and a helping hand from the Office of Lower Manhattan Development—as well as all the patience and persuasive powers the architects (and designer Peter Samton in particular) could muster. That the effort was worth it can no longer be doubted. Not only are the plaza spaces and subspaces handsome in themselves (though they show signs of hard use), but they bring to the edge of this civic district an amenity and a planning coherence it has long lacked. The Police Department is now physically and symbolically linked to the residential neighborhood to the south as well as to the courthouses along Centre Street—instead of being estranged from both in unapproachable, arterial limbo. The building itself sits squarely on its irregularly-shaped site. The main entrance is on axis with the Municipal Building and is recessed under the cantilever of the



Laura Rosen

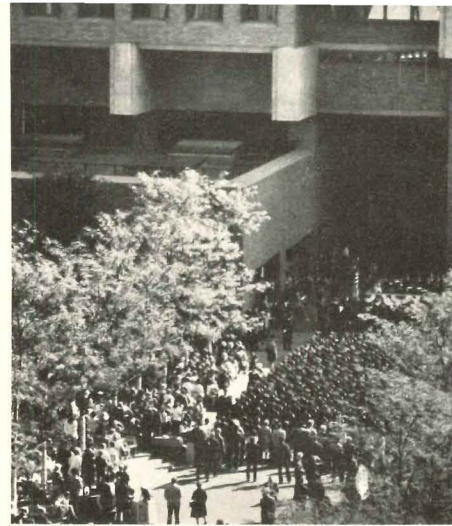
tower. The lowest levels contain a large public parking garage (478 cars), pistol range, detention cells, equipment stores and a host of specialized police spaces. The plaza level includes main lobby, the Department of Licenses, press and public spaces and a large assembly hall (photo opposite) hung with banners by Sheila White Samton. These spaces thrust outward in all directions forming low projections over which the ten-story cube of office spaces rises abruptly. Tower and base are both clad in brick, but the separation between them is clearly articulated by massive concrete trusses—that become walls inside—and that distribute the tower loads to heavy columns spaced on 30-foot centers. The regularized grid of window openings in the tower is nicely detailed in deep reveals and stands in contrast to the more or less windowless façades of the lower elements. A deep band of brick forms the parapet on all sides and conceals a mechanical penthouse and a helistop on the roof.

If the tower offices are rather ordinary in their finishes and furnishings, the lobby (see front cover), assembly hall and trial rooms are decidedly extraordinary. These are the prime spaces and the designers, as the photos reveal,

have worked to bring these spaces to a high level of civic design.

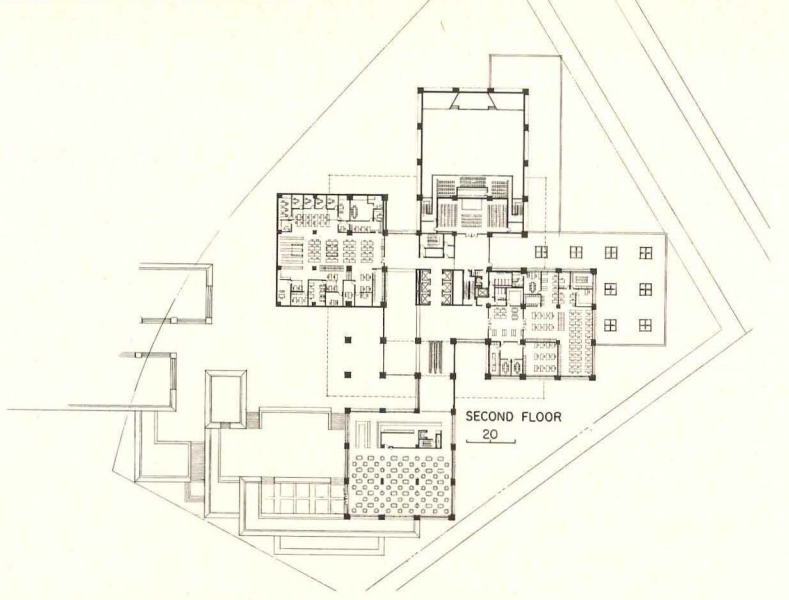
New York has sometimes seemed a city intent on leaching its future away in fragmented, ad hoc planning decisions. That it has not happened here at the new Civic Plaza is a cause for some rejoicing. Part of the credit must go to the Department of Public Works who acted as client and, by prearrangement with the architects, assumed responsibility for construction supervision. Partial credit is also due the Police Department who assessed their needs realistically and were not afraid to open their "front porch" to large crowds and the wider community. Finally, credit is due Gruzen & Partners who never gave up on the City, when others did, and who persevered to create an intelligently planned, unifying and dignified addition to New York's Civic Center against what many would reckon as formidable odds.

POLICE HEADQUARTERS, PEDESTRIAN PLAZA AND PARKING GARAGE, New York City. Architects: *Gruzen & Partners—Jordan Gruzen, executive director; Peter Samton, design director; Charles Silverman, production director.* Engineers: *Farkas Barron & Partners (structural); Joseph R. Loring & Associates (mechanical).* Landscape architects: *M. Paul Friedberg & Associates.* Contractor: *Castagna & Son.*





Bettina Cirone



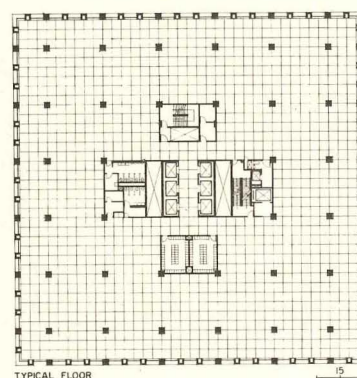
David White, London

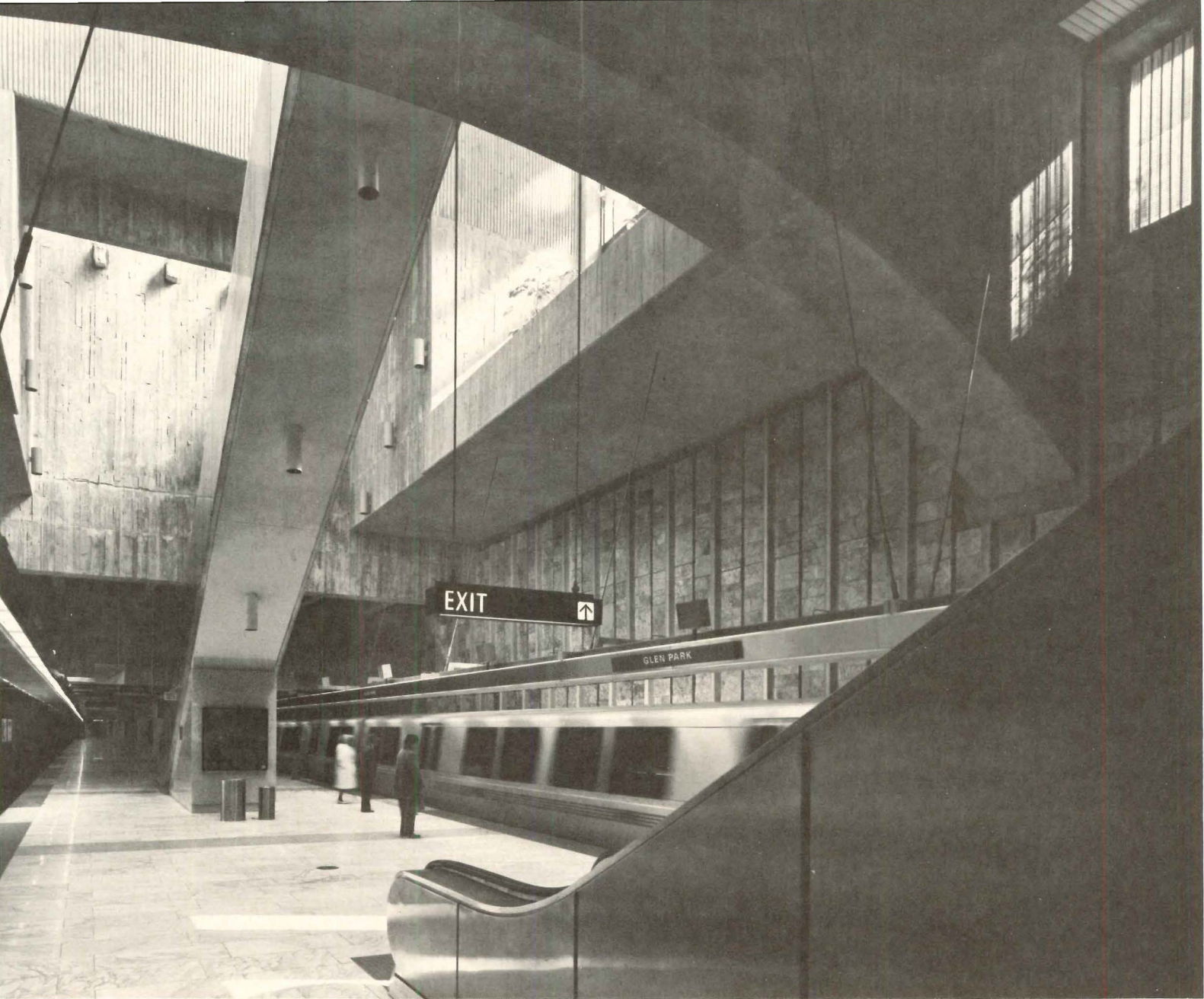


The photo above shows the office of the present police commissioner who sits at a desk once used by Theodore Roosevelt when he held the same post at the end of the last century.

Typical office space (photo left and plan below) is designed for flexible clerical use and is laid out generously around an efficient central core. The small courtroom (photo below), is one of two such spaces used for intra-departmental trials and/or hearings. Wood panel walls, parquet floors, especially nice furnishings and double-height ceiling give the space a high level of finish and express its organizational importance.

During the selection of finishes, the architects argued that exposed concrete in ceiling coffers and columns should be left unpainted to simplify the building's maintenance. They lost. All these surfaces, for better or worse, are painted—mostly in a light beige. A variable air volume system, with registers concealed by the lighting, is used here for the first time in a public building in New York and gives the Police Headquarters a "fine-tuning" capacity that is significant in terms of energy efficiency.





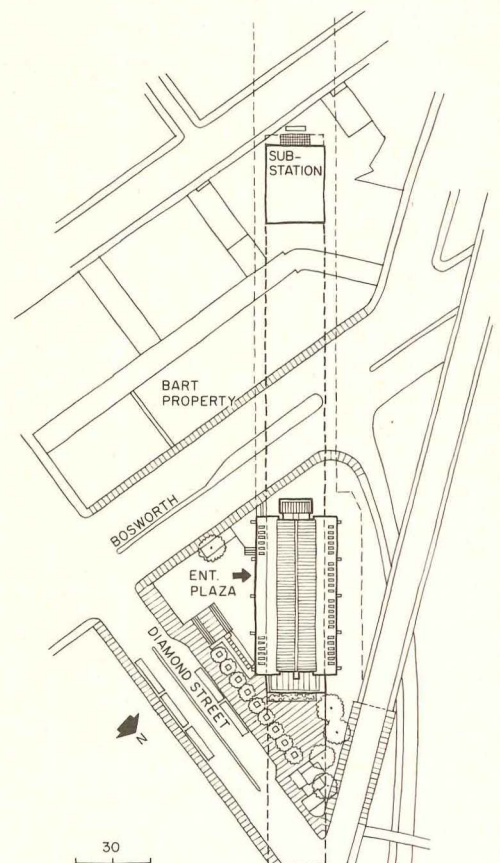
Roger Sturtevant

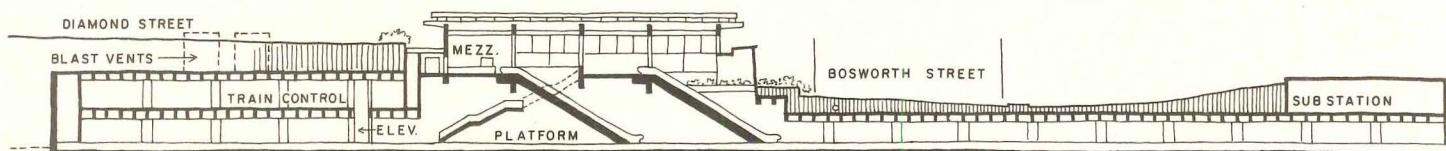
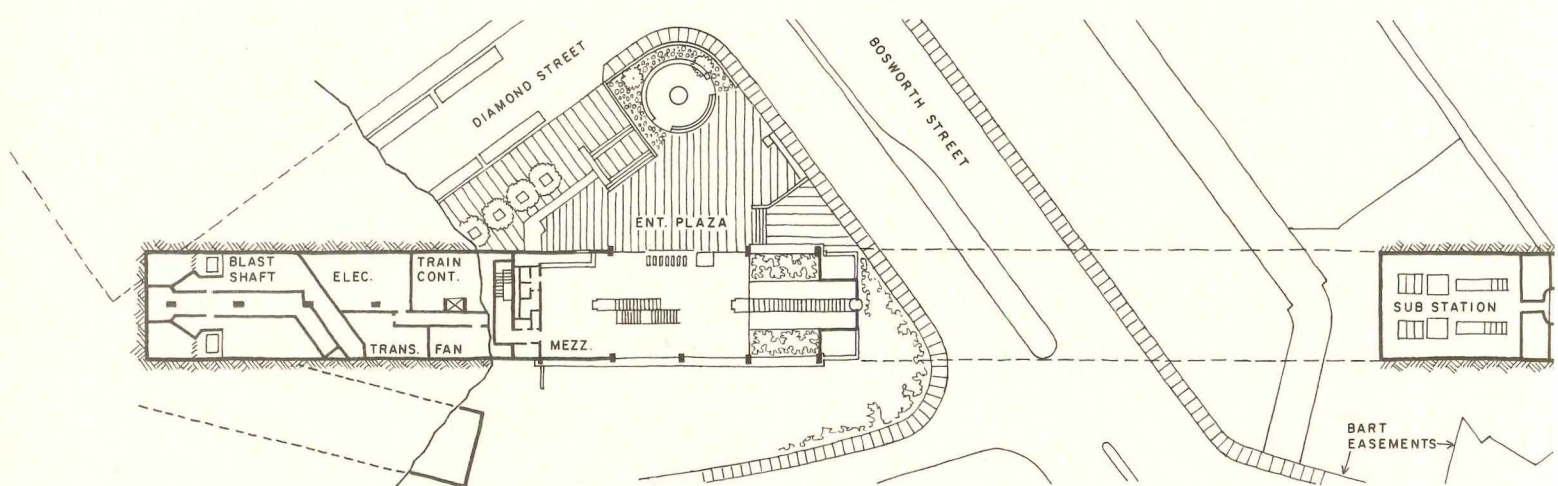
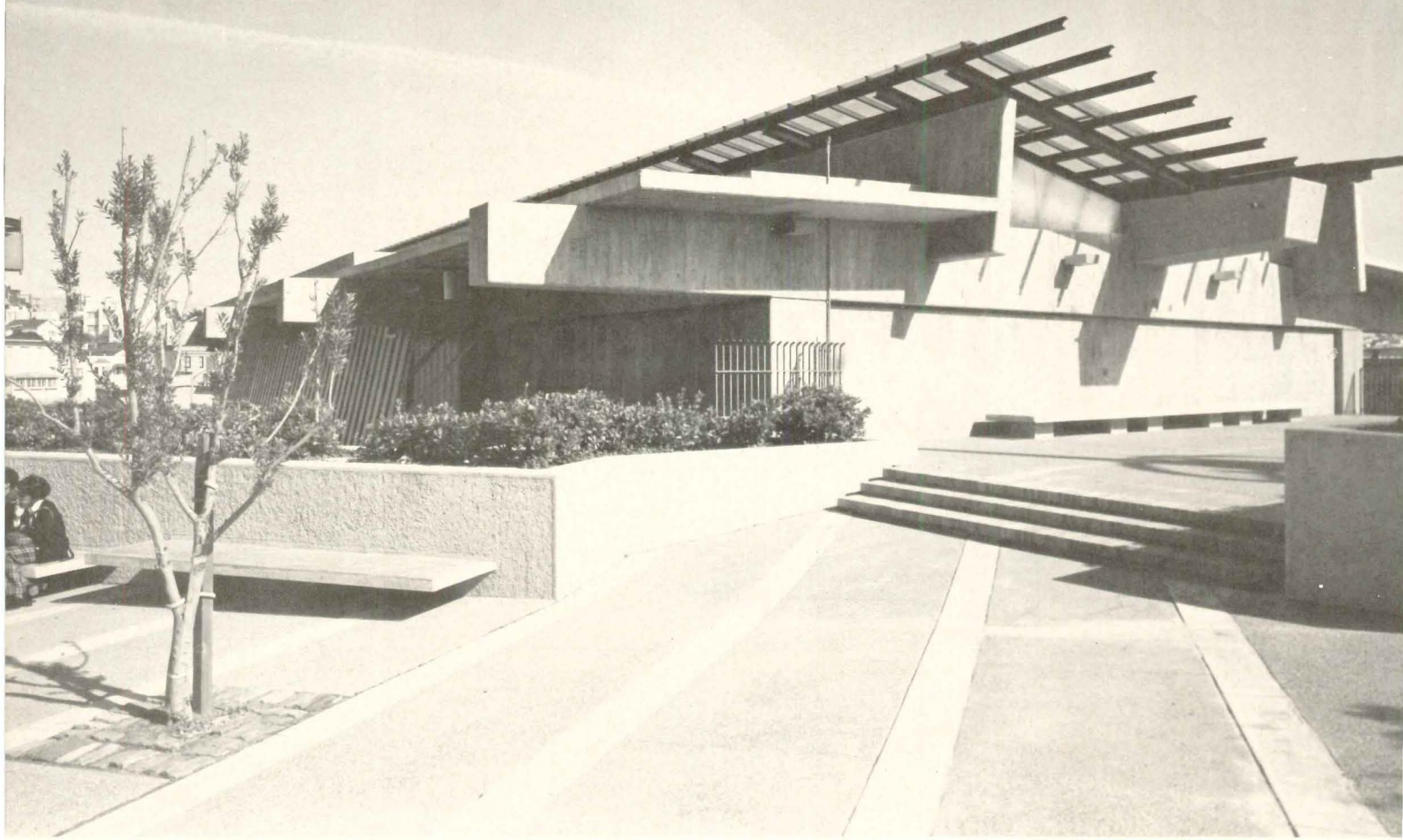
TWO BART STATIONS

1 Glen Park Station, San Francisco

Glen Park is not one of the important stops on BART (Bay Area Rapid Transit) in terms of use, but in terms of design it is superb, important and distinguished not only among BART's own well-designed stations but among rapid transit stations anywhere. Structure and architecture are one in this monumental concept, bold, strong, vigorous and, in skillful and subtle ways, scaled to the human beings who use it. In its own way, for this very different kind of transportation, this station does for rapid transit what the great train stations of the past did for railroading. In its necessarily restrained but highly judicious use of such fine materials as marble, it points out the basic means of achieving quality even in cost-conscious public buildings.

GLEN PARK BART STATION, San Francisco, California. Owner: *San Francisco Bay Area Rapid Transit District*. Architects: *Corlett & Spackman* and *Ernest Born*. Engineers: *Bechtel Corporation—William W. Davis* (supervising), *A.H. Ekornes* (electrical). Engineering consultants to BART: *Parsons Brinkerhoff Tudor Bechtel*. Landscape architect: *Douglas Baylis*. Graphics: *Ernest Born*. Contractors: *Peter Kiewit & Sons Company* (Phase I), *Northwest Construction* (Phase II).

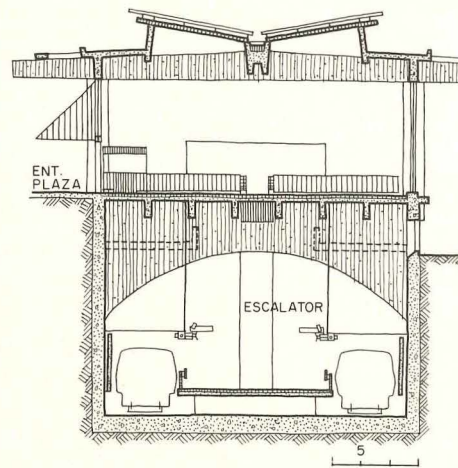






Roger Sturtevant photos





Glen Park is a neighborhood of small houses and flats of nondescript character. The station, a matter of controversy when first presented to the residents, has become a place of civic pride in this modest area, providing it with a handsome building and a landscaped plaza of human scale in a quality it had not known before.

Because patronage at this station was projected to be small, the station was not considered important enough to warrant an inside ticketing installation. Consequently, this is one of the few stations in the system where ticketing takes place outside, making the plaza the "free" area and the entire mezzanine a "paid" area. The walls on both sides of the mezzanine are open for most of their length and, except in the coldest weather, make for a very pleasant climatic transition from outside to the train platform.

The mezzanine, entered directly from the plaza through the turnstiles, is a great and handsome place, bright and open, with daylight from both sides and from a large skylight above. Its spacious proportions are enriched by the carefully selected materials which contribute color and texture to the room. For the most part, the walls, like the structure itself, are of concrete, and at one end a recess over the escalator is flooded with light, a rich accent which animates the whole wall. At the other end, against a panel of dark green stone, Ernest Born has designed a fine mural of marble—100 pieces, few of which are cut at right angles, in warm brown and red-brown tones, make it up—which gives elegance and richness to the room in a manner transit facilities have not enjoyed since the great days of the railroads.

The dramatic volume of the station—one of the deepest on the system—unfolds at the escalator wells, where the full height (60 feet) of the structure is visible. During the day, daylight from the skylights, one over the mezzanine, another over the end escalator, pours in to the lower platform, an extraordinary sight in a subway.

The walls along the tracks are not furred to provide drainage for inevitable seepage. Instead, they are left as poured, and Montana panels of slate are hung on them to mask the seepage as it drips down behind.





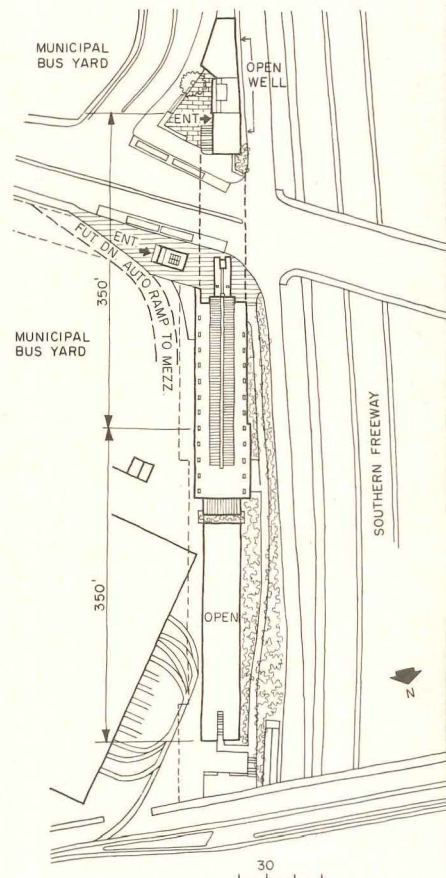
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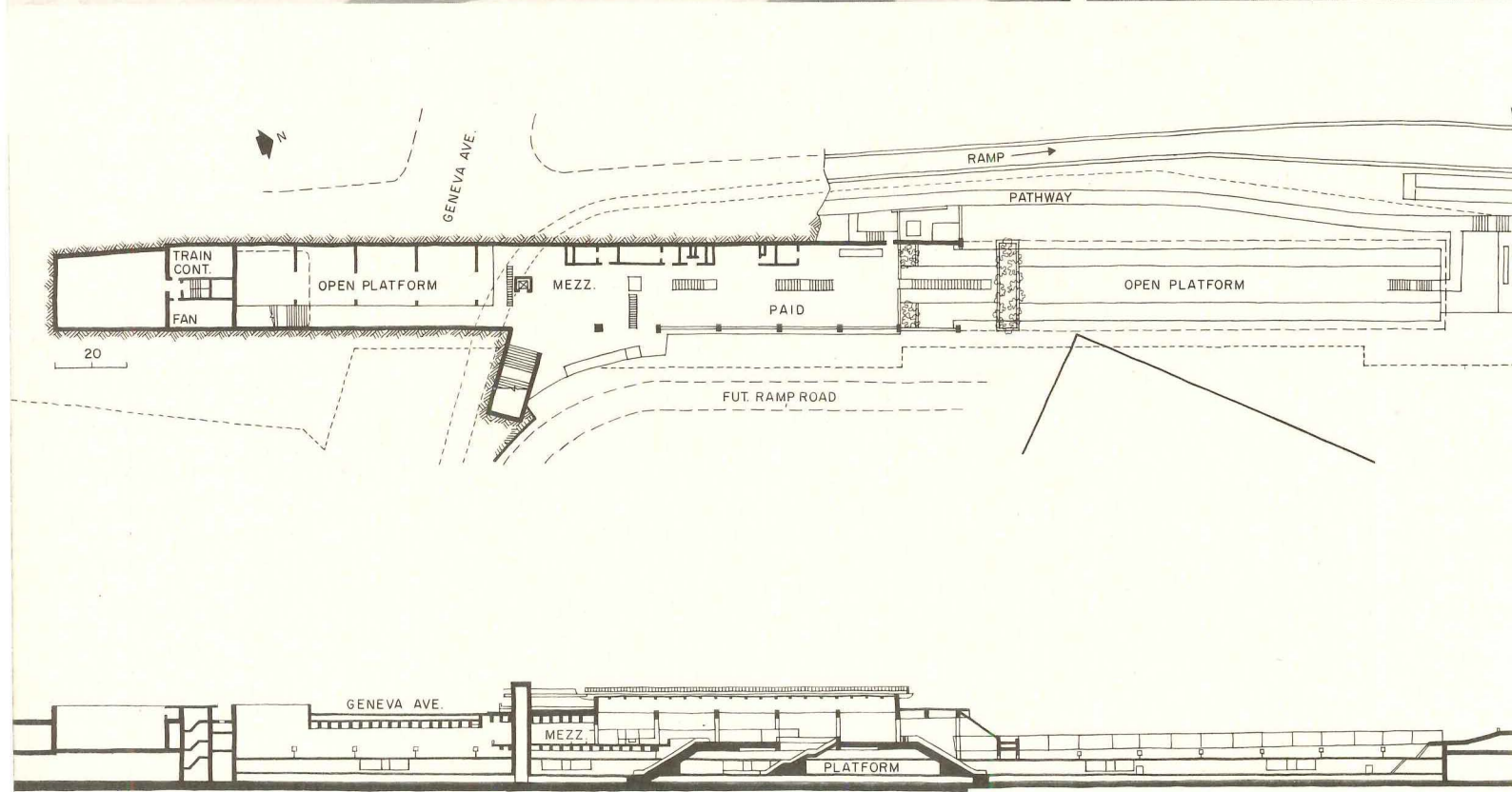
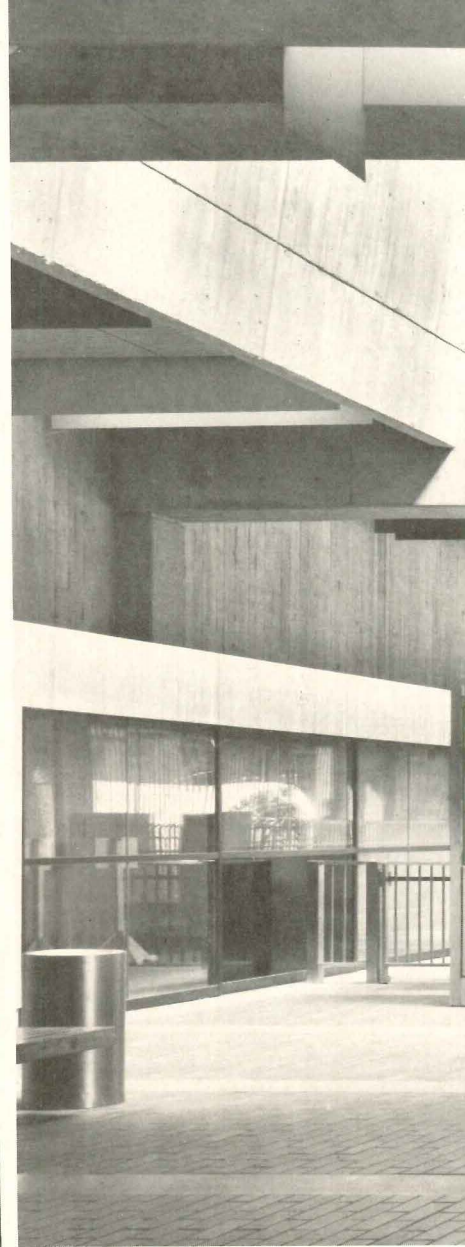
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Balboa Park Station, San Francisco

Balboa Park station on the San Francisco line of BART (Bay Area Rapid Transit) is entirely different from Glen Park station, but, since both were designed by the same architects, the quality is similar. Where conditions of site and solution are atypical, particularly in regard to entrance, mezzanine and platform, at Balboa Park they are typical for the station section—here the mezzanine is a true mezzanine. The character of the station and its platform is unusual and appropriate to its location in an almost suburban neighborhood. It is smaller and more intimate—if such a word can describe a subway station—than Glen Park, and in no way attempts the grandeur of that station. But it has drama, too, and great spatial variety, and here, too, the architecture is integral with the structure.

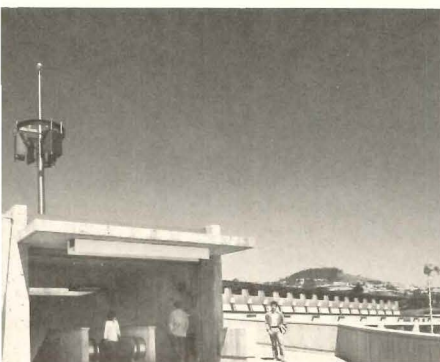
BALBOA PARK BART STATION, San Francisco, California. Owner: *San Francisco Bay Area Rapid Transit District*. Architects: *Corlett & Spackman and Ernest Born*. Engineers: *PBQ&D—Theodore O. Blaschke (project manager); William J. Armento (structural project engineer); Imants Kaupe, Richard E. Mitchell (job engineers)*. Engineering consultants to BART: *Parson Brinkerhoff Tudor Bechtel*. Graphics: *Ernest Born*. Contractors: *Gordon H. Ball Enterprises, Homer J. Olsen, Inc. (Phase I); Northwest Construction Company (Phase II)*.

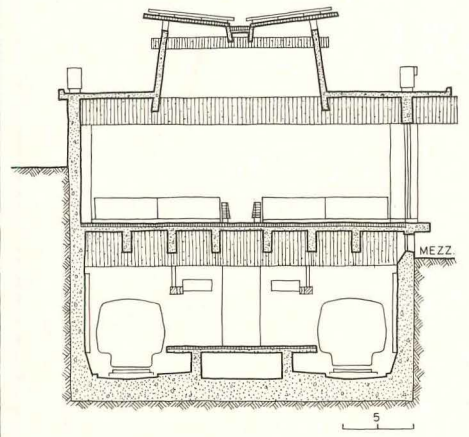






Roger Sturtevant photos



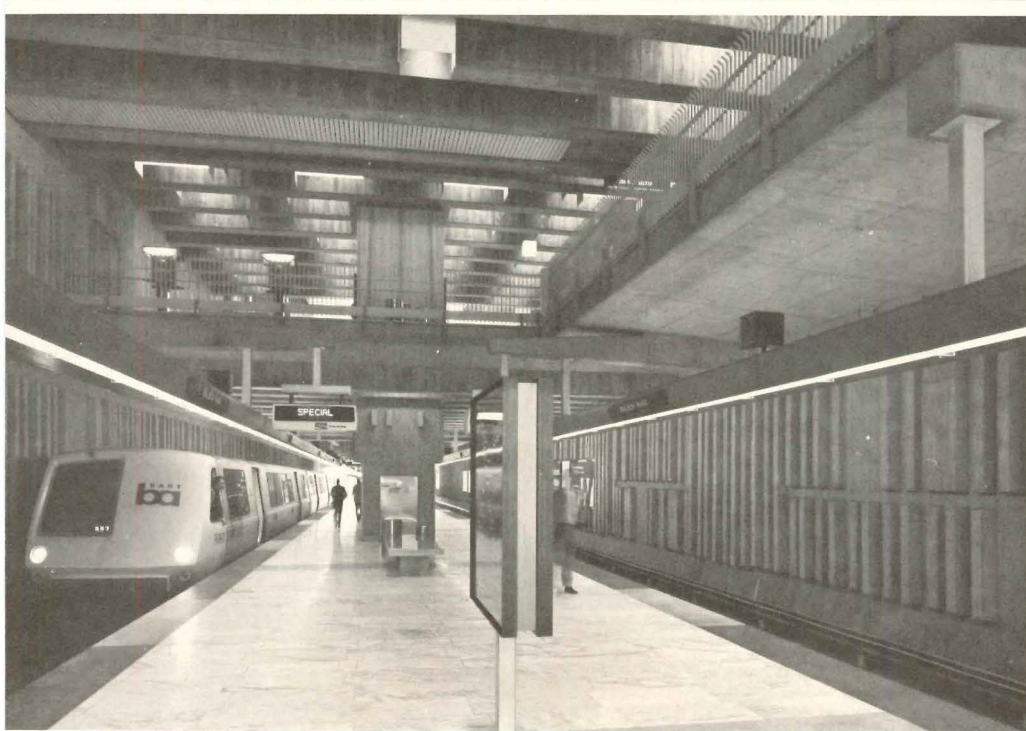


Balboa Park is the next to last station on the San Francisco BART line. It is situated in a residential neighborhood not unlike that of Glen Park and the station is consequently low in profile. Its plazas—there are two, because there is an entrance across a busy thoroughfare from the principal entrance—are smaller and, in general, the station is designed as a public place of appropriate scale for the neighborhood. At the same time it provides the area with a focal point.

The station design benefited from a decision, fairly late in the design process, not to provide bus parking for the city's buses on the station roof. As a result, the platform areas could be, and are, opened at both ends to light and air, making the station an unusual half-indoors, half-outdoors solution. The station itself, containing the mezzanine with its ticketing and information installations, is semi-enclosed: the east wall is open, as is the end where the escalator runs under a glazed screen the width of the station. In the mezzanine space, the concrete structure is clear, the verticals and horizontals of columns and beams and the plain and textured surfaces, with added variety from the play of light and shadow on them, giving a vitality quite unexpected in a station.

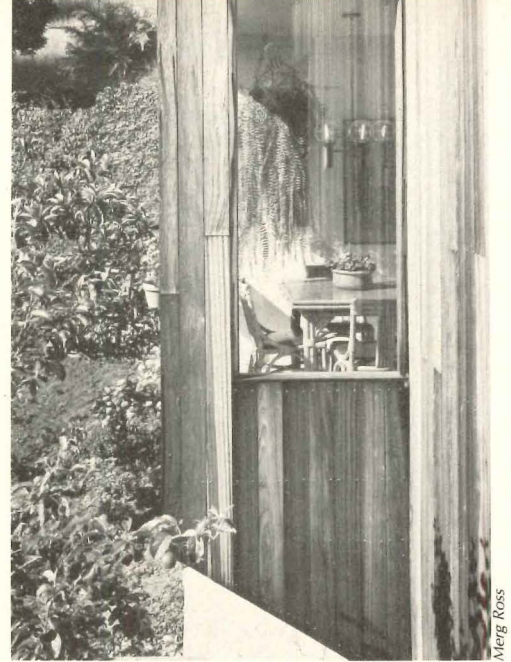
The platform level also uses concrete with surprising versatility, and to unusually handsome effect, with plain and textured surfaces and a track wall made up of panels of precast concrete of apparently infinite variety, which in actuality consist of five patterns repeated eight times. The design allows for placement of the commercial ads which BART elected to permit on these walls. So placed and controlled, the ads are pleasant breaks of color.

One of the important technological contributions of the design of Glen Park and Balboa Park stations to the BART systems is the overhead conduit for power lines, for the trains, down-lighting for the edge of the platform, illumination for the advertisements, for the trainway, for the directional signs, and for the communication system with the trains. Some of these lines are usually carried under the platform, but by putting them overhead and carrying them all in one conduit a real problem in other stations was solved with great neatness.

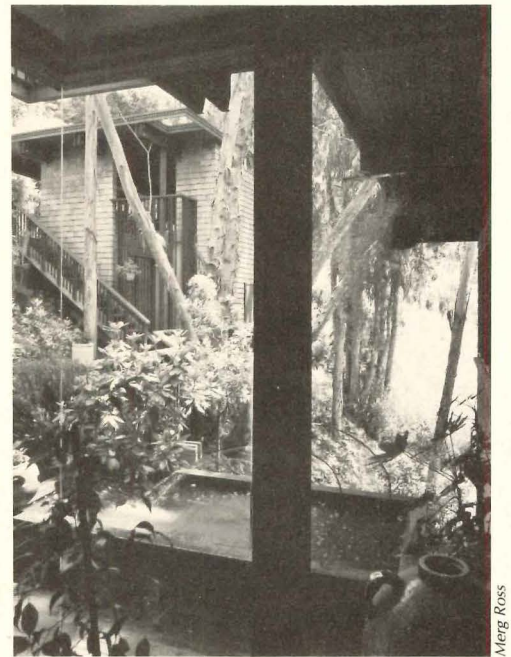


THREE HOUSES IN THE BAY AREA

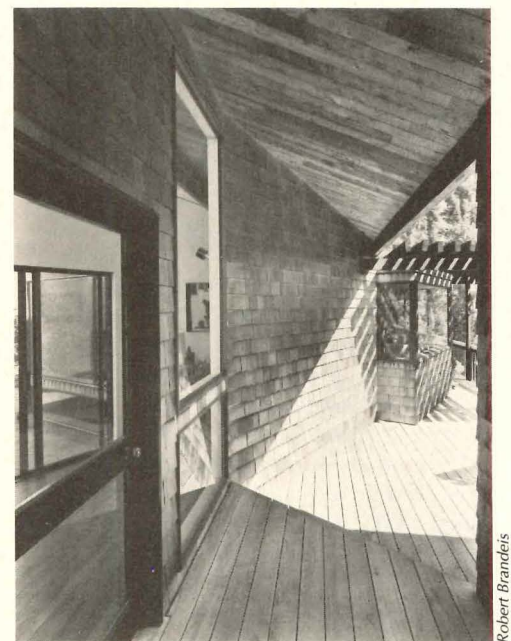
Is there a Bay Area "Style"? If the use of a locally available material is general, if a similar approach is used for common problems, if complete individuality in design solution constitutes "style"—well then, yes, there must be a "Bay Area Style." But it goes against all definitions of style for such basic elements of design to be the hallmarks of a Style. The architects whose work occasioned the label did not believe they were working in a Style, but rather that they were working with conditions and constraints specific to the area and with a client's program, and expressing these in their own individual ways. Yet the myth of a Bay Area "style" persists—and has, ever since 1947 when Lewis Mumford, in his "Skyline" column in the *New Yorker* magazine, remarked on the "native and humane form of modernism one might call the Bay Region style, a free yet unobtrusive expression of the terrain, the climate and the way of life on the Coast." Mumford never meant to imply anything so formal and strict as a Style, and he subsequently called it "an unfortunate slip." Nevertheless, his words created a furore on the East Coast, and became an international dispute, to the indignation of then practicing architects in the Bay Area. Only a few of those architects are left now, but younger architects, with their own design ideas, some natives of the area, some from other parts of the country (like so many of their predecessors), today continue the tradition—now almost 100 years old—of design as a simple and entirely individual response to the conditions of the site and the climate; to the local customs, and to the locally available materials. The three houses on the following pages show how free from dogma and how varied is the personal expression of Bay Area residential architecture despite similar site conditions, over-all similarity of climate, and the ever-recurring use of wood.—*Elisabeth Kendall Thompson*



Merg Ross

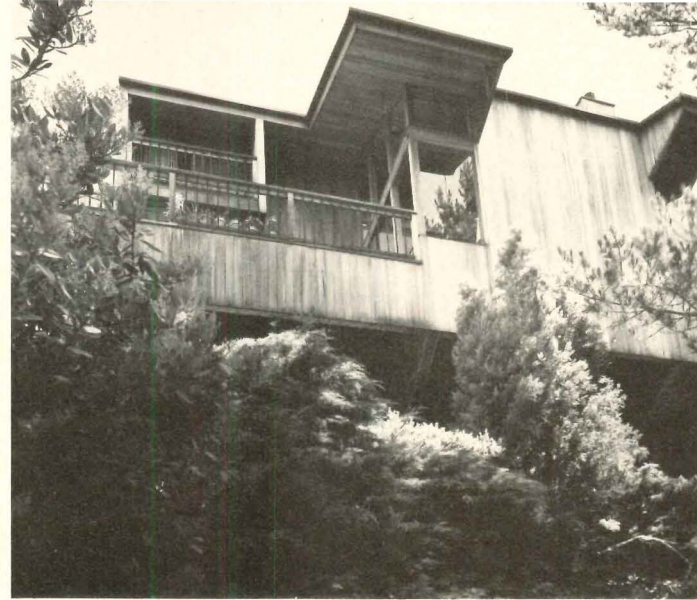
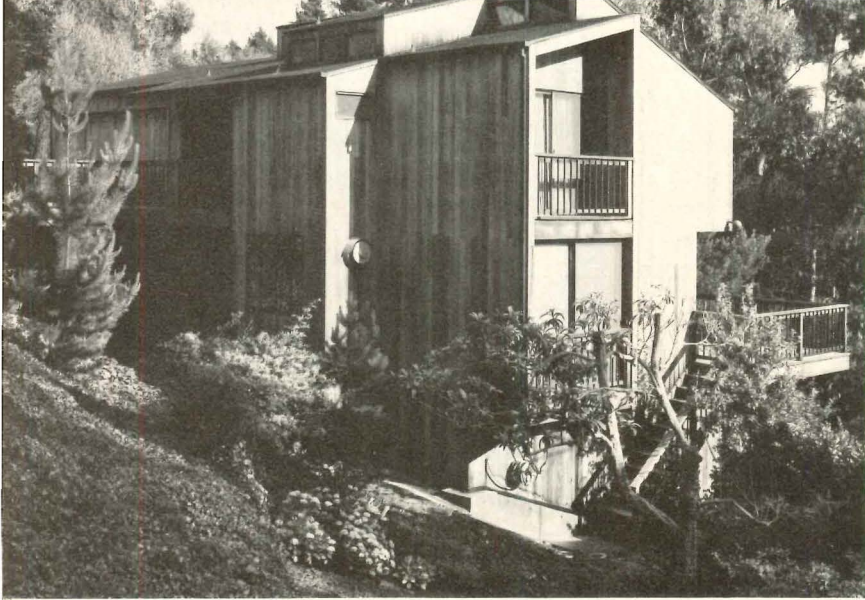


Merg Ross



Robert Brandeis

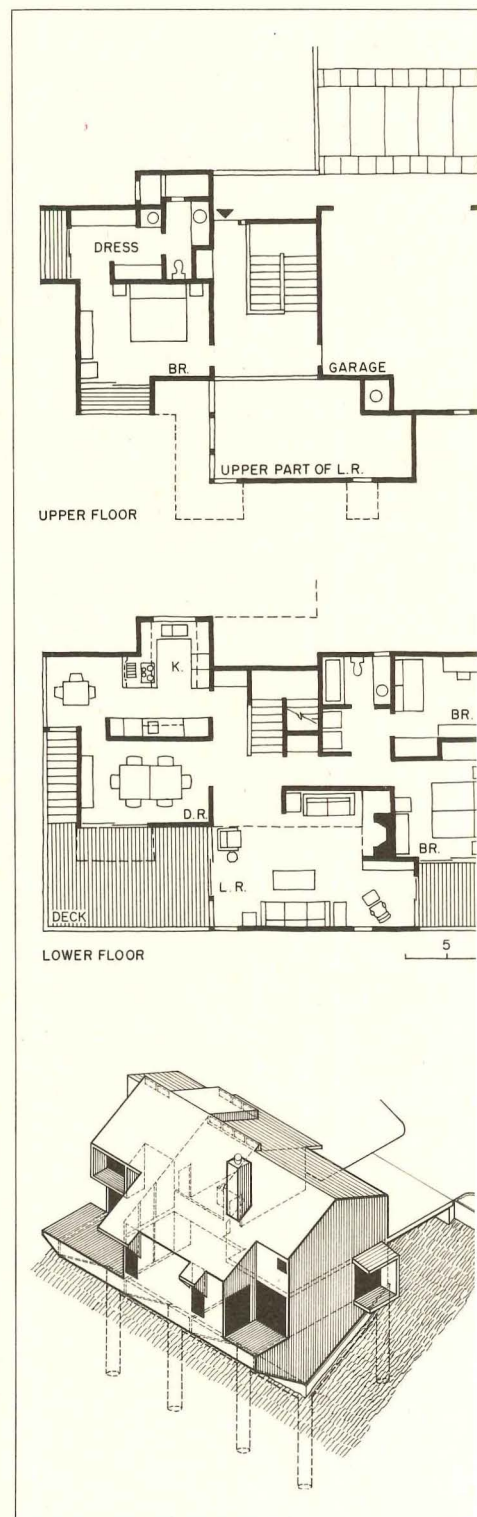
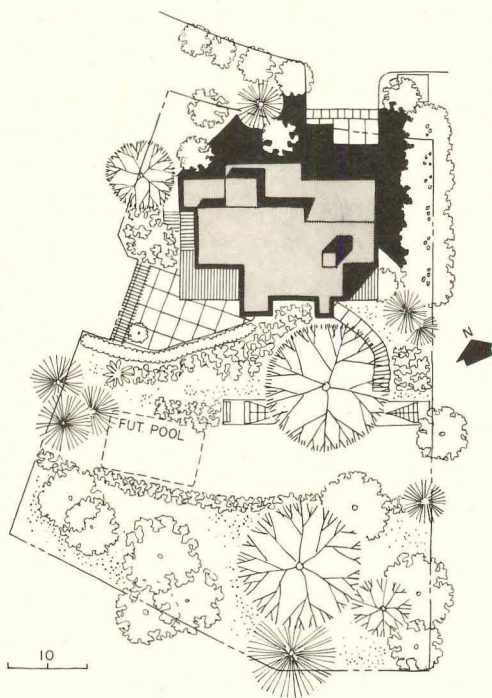
1. Geddes house, Oakland, California.
Donald Geddes, architect
2. Gale house, Belvedere, California
Daniel Gale, architect
3. Romano house, Kentfield, California
Esherick Homsey Dodge & Davis, architects

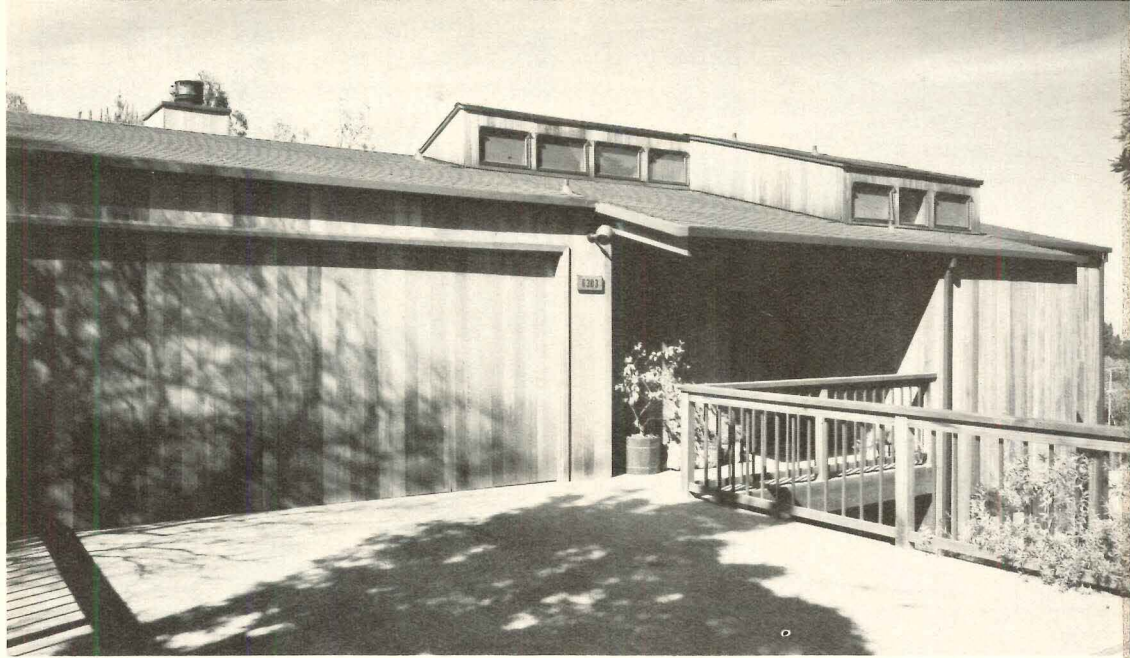


A DIFFICULT SITE BUT WITH TREES AND VIEWS TO BAY

Eight concrete piers support this house clear of the steep slope of the hill on which it stands, much as *pilotis* support the buildings of the clearly defined International Style. But this house is no more a part of that style than it is of a mythical Bay Area Style. It relates very strongly, nevertheless, to the site, for not only is the hillside very steep, posing special problems for construction, but its two top strata are unstable, making the independent structure an eminently practical solution. (The piers are drilled five feet into bedrock and are connected by concrete grade beams to form a rigid frame for the 48- by 32-foot platform on which the house is built.) This solution also preserves most of the vegetation on the site, and the house seems to grow out of the site. The exterior is of redwood board, applied vertically and shiplapped, and redwood is also used as panelling in the library at one end of the living room and on the sloping ceilings. A broad bridge, which serves as both entrance walk and driveway, connects the house to the street. Only the master bedroom suite is on the entry level; the main rooms are all on the floor below. From the two-story living room and the decks at each end are splendid Bay views.

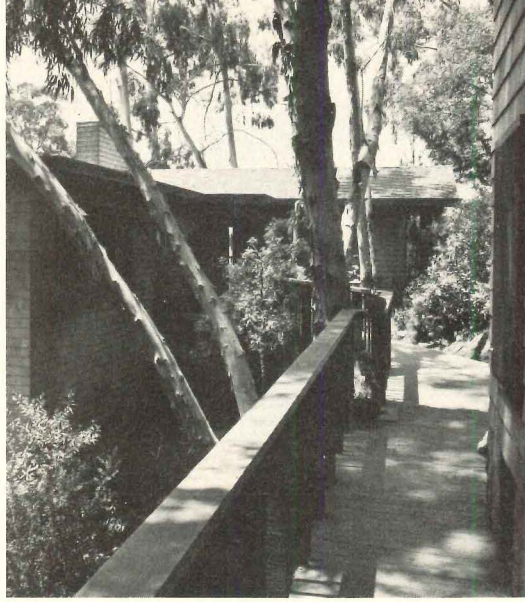
RESIDENCE FOR MR. & MRS. DONALD C. GEDDES, Oakland, California.
Architect: *Donald C. Geddes*. Structural engineer: *Peter C. Tardos*. Contractor: *Ronson Construction Co.*





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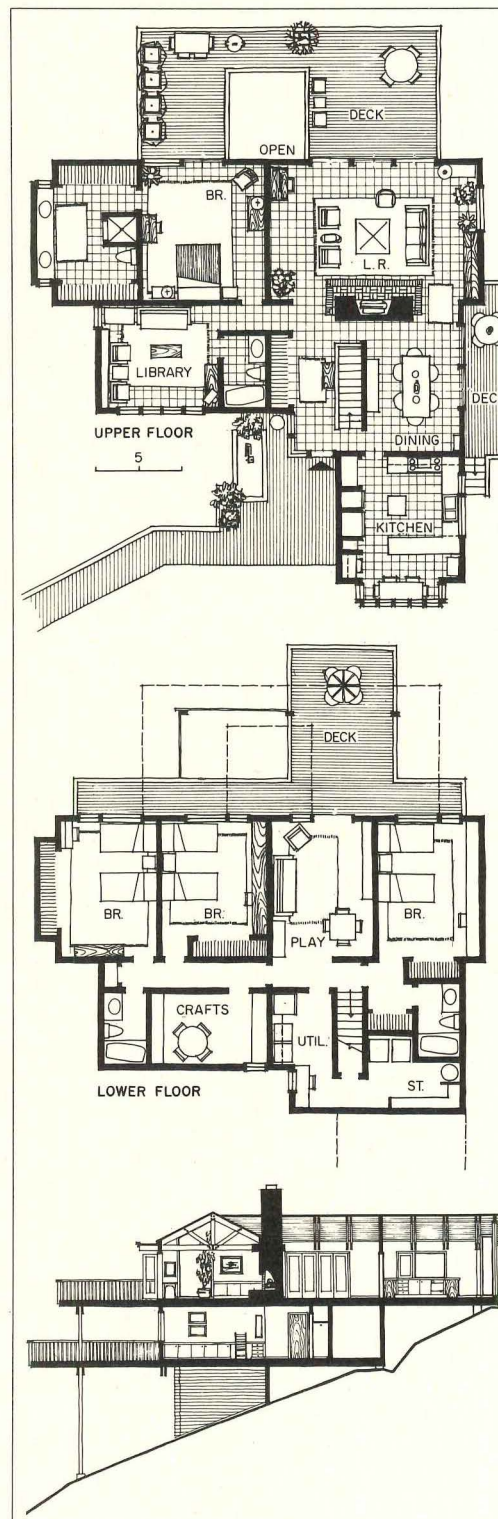
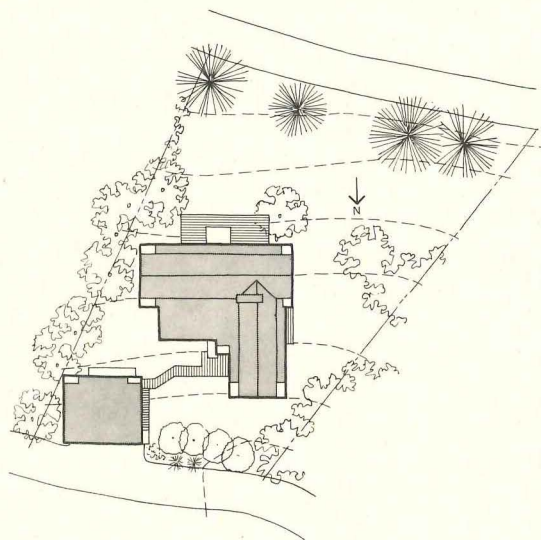


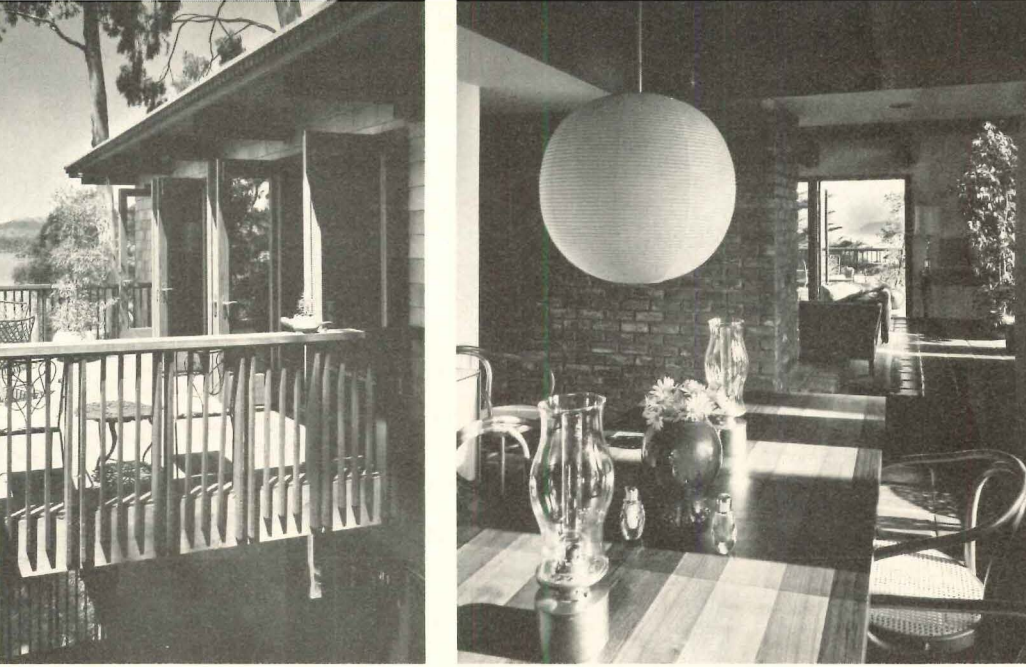


ROMANTIC HOUSE ON DRAMATIC SITE WITH WIDE VIEWS

Site, views, and materials all determined the design of this house, whose quiet, romantic look contrasts with its dramatic positioning on the 40-degree slope of a hillside in Belvedere, a quasi-island in San Francisco Bay. The site is full of trees—eucalyptus, cypress, toyon, acacia—and the house, designed by the architect for himself and his family is set among them, downhill from the street to which it connects by bridge and a long flight of steps. It is tied to the site at three places—where the main floor begins, where the lower floor takes off, and near the end of the projecting lower deck. The view from the south and west is spectacular, including Richardson Bay, the Golden Gate Bridge, the town of Sausalito, and the many varieties of trees on this and adjacent properties. The living room and master bedroom open onto a large deck facing south, and the dining room, on the west, has its own small deck for outdoor eating. Children's bedrooms, playroom and crafts room are on the floor below, with a deck and balcony for outdoor activity onto which the bedrooms and playroom open. Later, when the children are gone, the upper floor can function alone. Landscaping is natural, for the most part, but is supplemented by plants and shrubs in pots.

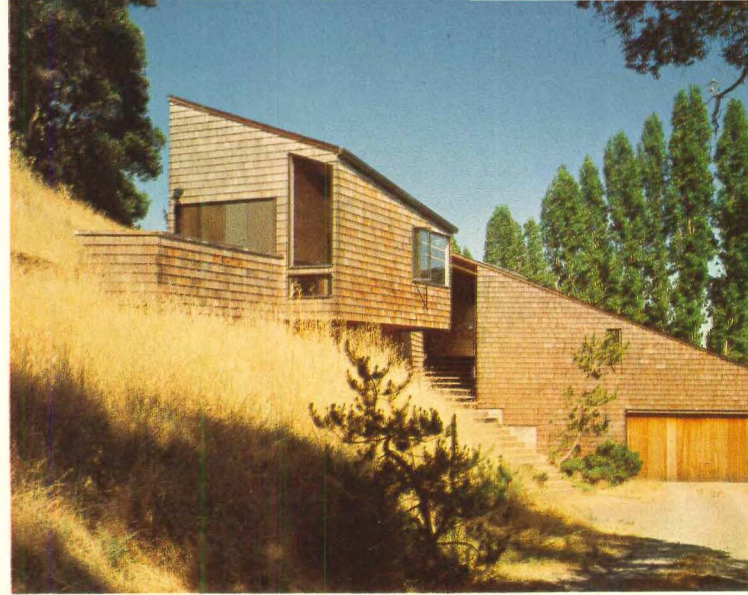
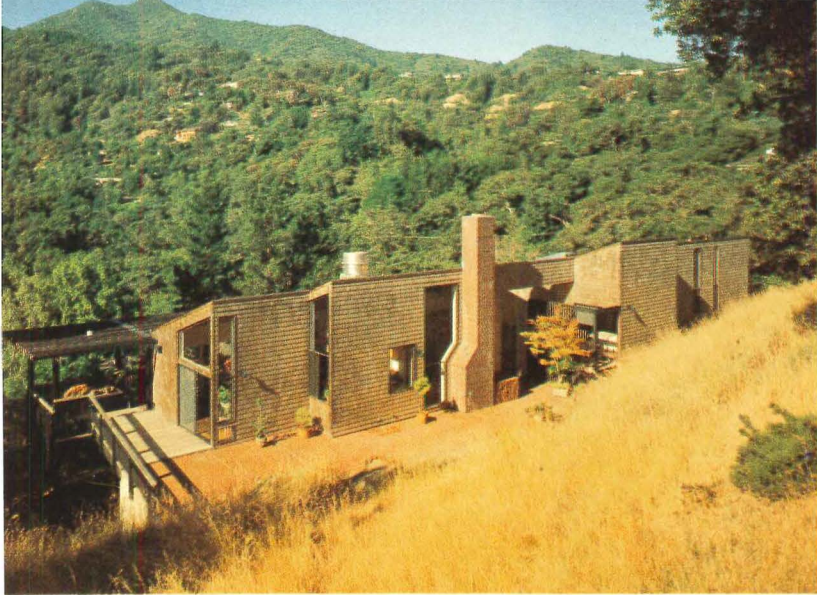
RESIDENCE FOR MR. & MRS. DANIEL B. GALE, Belvedere, California. Architect: *Daniel B. Gale*. Contractors: *Ireland, Robinson & Hadley*.





Merg Ross photos

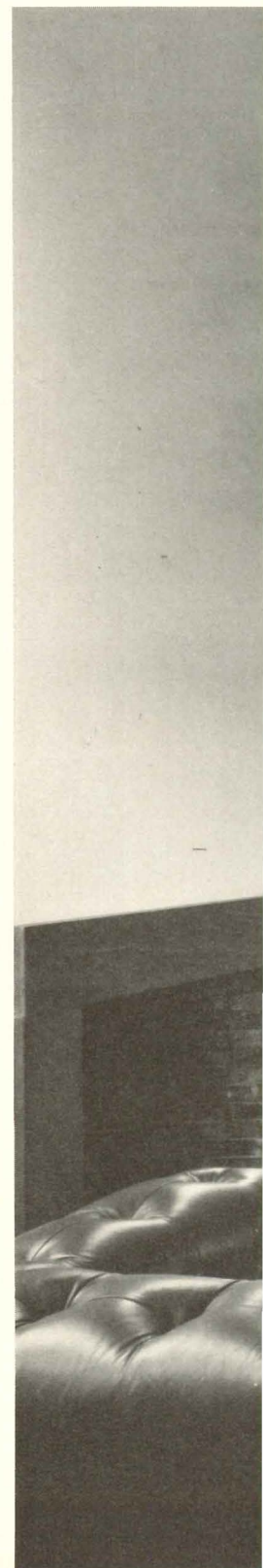
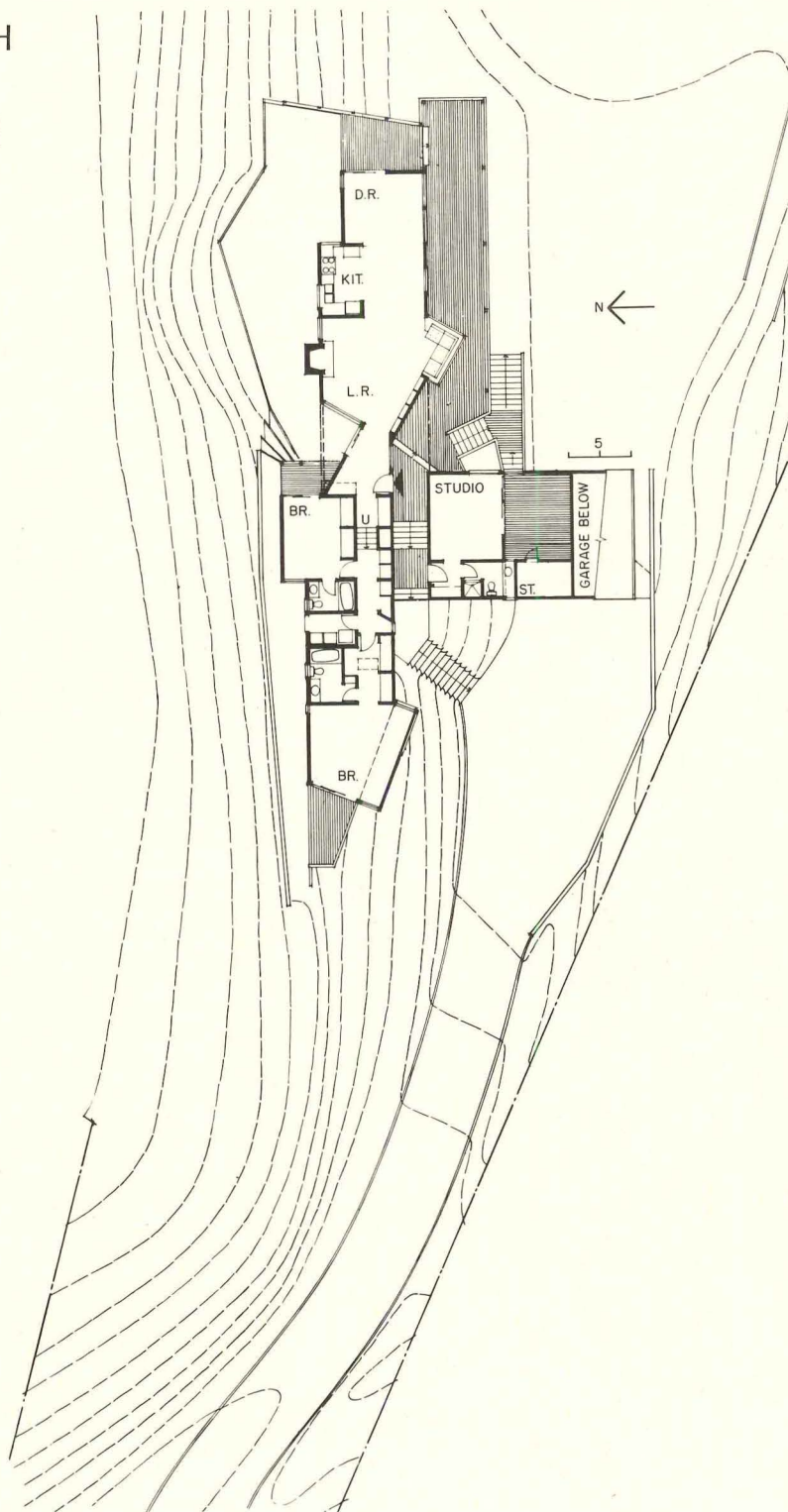


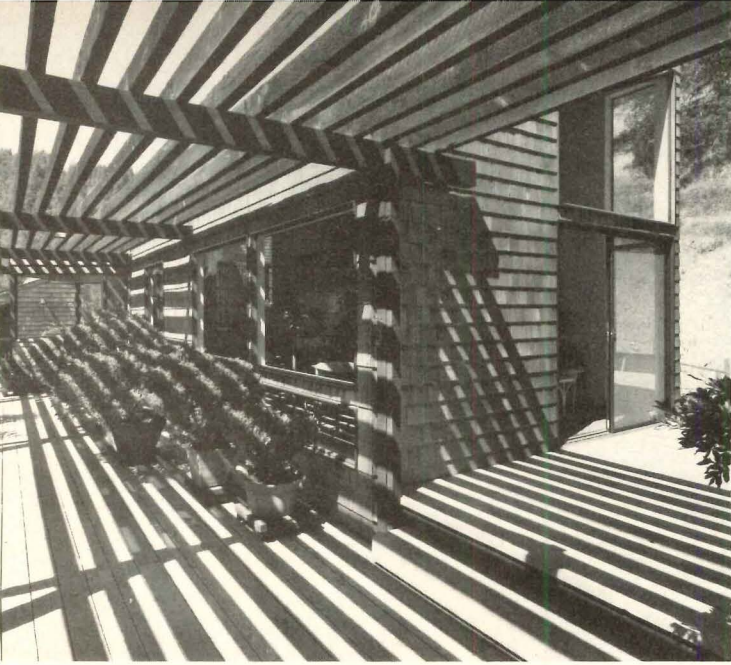


A SMALL HOUSE WITH SPECIAL QUALITIES OF LIGHT AND SPACE

Is there a Bay Area "Style"? This house should answer the question, for it clearly says that there are Bay Area houses and Bay Area architects, but that the only trait common to the residential work of the area is that each house is an individually conceived design into which are woven all that makes for design: site, climate, views, clients' interests, clients' needs—and architect's skill. In this house, basically simple, there are qualities far from simple to attain which give it a distinction beyond the aspiration of most small houses. It has a plainness like that of Shaker houses, and a clarity, timeless but characteristic of the work of its architect, Joseph Esherick. Set on a steep hillside which had been badly guarded by a previous owner, the house is T-shaped, with the cross bar containing all the rooms but the studio (which also acts as a third bedroom). The quality of light in the houses he designs is important to Joe Esherick: he speaks of designing light, not windows, and here he has provided the principal spaces with unusual and beautiful light, changing through the day and through the seasons, since light is reflected from the hill behind the house, its color influenced by the color of the grass, green in spring, later buckskin.

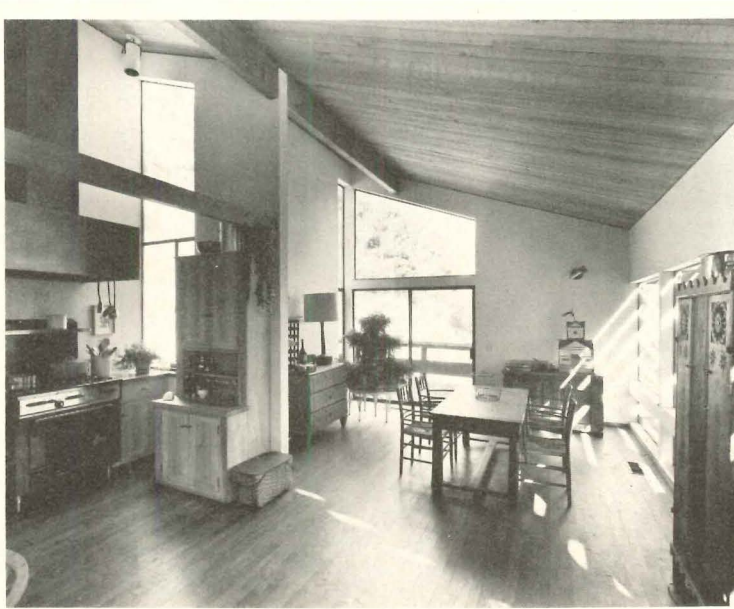
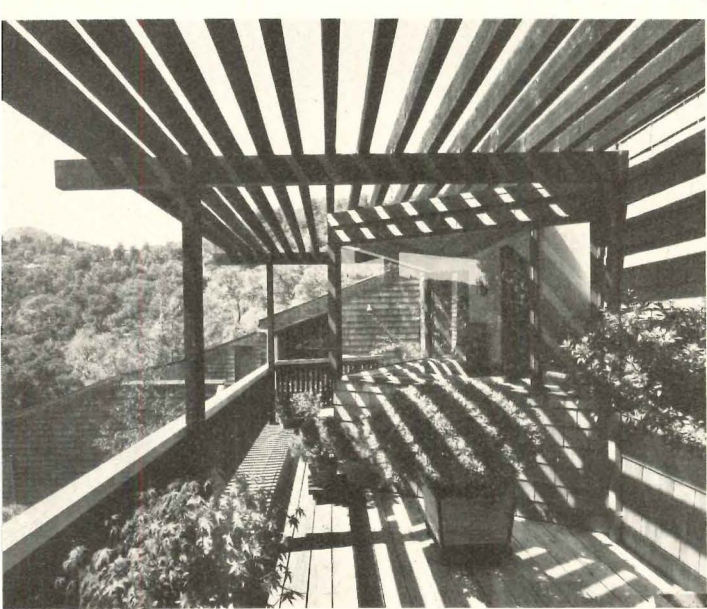
RESIDENCE FOR MR. & MRS. DANIEL ROMANO, Kentfield, California. Architects: *Esherick Homsey Dodge and Davis*. Contractor: *Skaggs Construction Company*.





Robert Brandeis photos





The principal rooms are designed as one space, and the kitchen, which the clients wanted at the "center of things" is at the mid-point between living and dining rooms. Each has its own character, with different views, different light and different qualities. The trellis and the small windows on the southwest side protect from the very hot summer sun, and the large windows and the set-in bay on the opposite side give balance to the light without glare in this big space.





Gerald Allen

The Pacific coast at the Sea Ranch

SEA RANCH: A SECOND LOOK

Charles Moore, Gerald Allen and Donlyn Lyndon

Because of their interest in the creation of truly livable towns and the place of houses in them, architects Charles Moore, Lyndon and RECORD associate editor Donlyn Lyndon have made a careful study of Sea Ranch for their book "The Place of Houses" published this month by Holt, Rinehart and Winston. Their analysis follows, may in the words of its authors "seem appropriately harsh; it is certainly tinged with disappointment. Let us first note that in many ways the Sea Ranch is a successful place, fun to be in and much of the magic of the site is still there. But let us admit that with each new building that is built, the magic has diminished a little. What went wrong?"

In 1965, a new second-home community along the California coast a hundred miles north of San Francisco. It was widely acclaimed for its ecologically sound architecture and for its concern in planning the organic environment. Because the Sea Ranch is so impressively full of good intentions, because it has had a great deal of success, because the influence it has had is abundantly abominated for a number of valid reasons, and because we designed part of it, we analyze it here to develop our notion of a livable community and the place of houses in it. Unlike other towns which we have studied, the Sea Ranch presents particularly modern problems, unrequited hopes and failures.

The intentions were splendid: Oceanic Properties, the real estate subsidiary of one of the Hawaiian "Big Five" companies, Castle & Cooke, bought 5,000 acres along ten spectacular miles of coast well past the San Francisco metropolitan and vacation areas. Oceanic was especially able to plan a community which it could be developed slowly and "properly"

without the usually frantic developers' concern for instant profits.

The Oceanic Properties vice president in charge of the project, Alfred Boeke, hired as landscape architect the firm of Lawrence Halprin and Associates, whose geographer made exhaustive and very helpful studies of the local ecology and problems of wind, weather, and site. To make architectural prototypes for development based on these studies, Joseph Esherick was retained to design clustered houses and a store. We, then the firm of Charles Moore, Lyndon, Turnbull, Whitaker, were asked to plan for even tighter clustering of houses in condominiums along the shore. Because our work as architects had been primarily residential, the Sea Ranch was a welcome chance for us to develop ideas we had been putting to use in individual houses.

These ideas began with the premise that the architect particularizes. He discerns special patterns of human activity, and organizes movement. He develops a clarifying pattern, a design to which the whole process of building is subjected. Within this pattern there must be a controlling image that gives people the chance to know where they are—in space, in time, and in the order of things. People must have something to be in.

Thus the fundamental principle of architecture is territorial. The architect assembles physical materials from which the observer creates not just an image of a building but of "place."

All this implies that there be distinctions between "inside" and "outside." The modulation from one to the other is, and always has been, one of the primary elements of the architect's art.

For some time we had been specially concerned with making several degrees of "inside," marking first a place in the landscape,

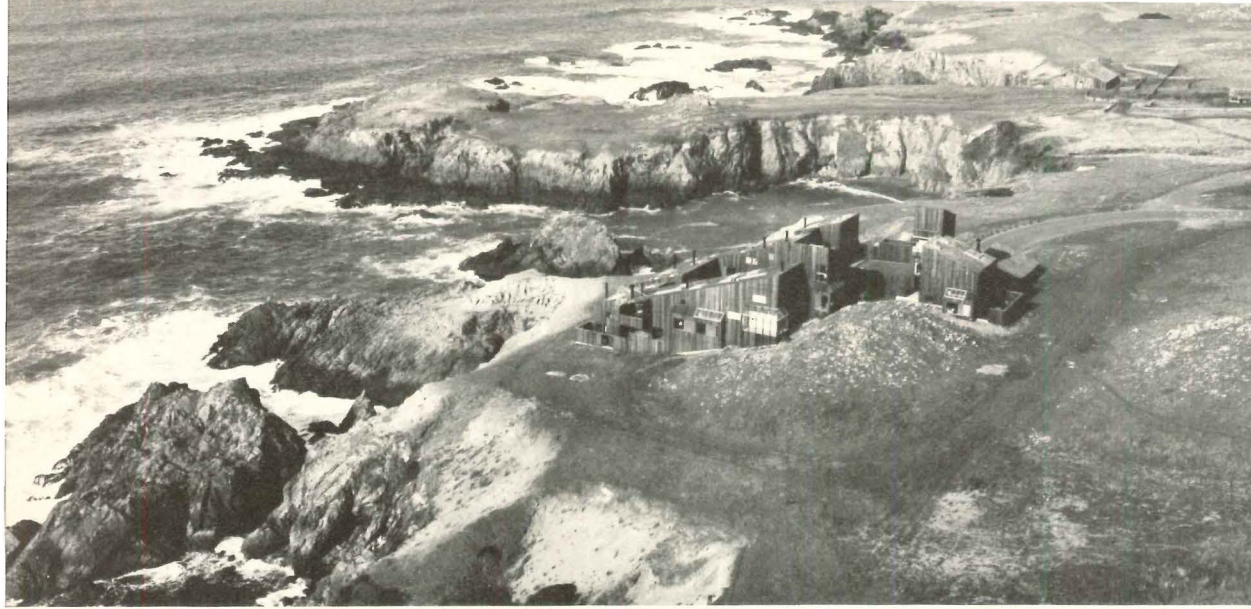
then progressively segregating places outdoors and in, so that the user could be continually aware of his location, from the altogether natural and unprotected outside to the sheltered, secluded, and protected inside.

The Sea Ranch was built on a wild exposed coast. Before Oceanic's arrival, the landscape was grand and very simple. The top of bluffs along the shore form a coastal plain only a few hundred yards wide (Figure 1). Beyond that there is a ridge of low hills. The entire site was originally covered with redwood and bishop pine, but had been logged in the 1890's on the seaward slope. When we began work, the upper areas were covered with 70-year-old second growth, but the treeless land from below the crest to the edge of the bluff had been extensively grazed by sheep.

The most arresting features of the landscape were the fifty-year-old belts of Monterey cypress introduced perpendicular to the coast at irregular intervals for wind protection. The cool wind from the northeast is an almost constant factor here, though the place is relatively free from the fog in which most of California's north coast is often shrouded.

The major problem for human habitation was to get out of the wind and into sunlight. The absence of places to do this (except for the cypress hedgerows) lent an air of splendid desolation to the site, as it does indeed to the whole north coast.

The isolation and the haunting beauty of the land made development an awesome proposition. Houses which merged politely into the land would seem to provide little sense of security on this wild coast. Houses which stood out too strongly would emasculate those very astringencies which made the land special. What we and Esherick thought was needed was a limited partnership—not a mar-



Sports Illustrated photo by Marvin E. Newman © Time, Inc.

2. Condominium by Moore, Lyndon, Turnbull and Whitaker, 1966

riage—between the buildings and the land. Then we developed ways of building that we thought would be responsive to the particulars of the site and climate.

Our own structure was made of heavy wood frames with windows big enough to let in the sunshine (but never so high that the salt spray couldn't be washed off) and skylights overhead, with rough wood enclosures surrounding smooth ones to multiply the implications of "inside." Any landscaped outdoors was walled into inclusion as a part of the "inside," so as not to impinge on the wild landscape (in a partnership one must be very careful of whose is what). It leaves the wild landscape, right up to the walls of the houses, unspoiled, and uncluttered with lawn chairs or flower beds.

The site chosen for the condominium was a grassy, windswept field bordering a rocky shore where the waves break high against the cliffs (Figure 2). It is a place at once barren, rugged, and grand. Because the condominium was big (ten times the size of a house), we were able to match the building to the large scale of the site. Limited to the design of small individual houses, Esherick made architecture recede into the landscape.

Our designs and Esherick's were not at all coordinated. We were eager, in fact, to keep our responses to the accumulating environmental data as independent as we could, so as to avoid a contrived "style." But as it turned out, the conditions were so stringent that Esherick's houses and our original condominium developed an idiom surprisingly similar, of shed roofs to deflect the wind with no overhangs for the wind to flutter—and with generous windows punched low in walls of vertical redwood boards.

All this was in the narrow sense functional. The Sea Ranch condominium was not meant to look "like" anything in particular, though of course it did look like all sorts of things. People recognized similarities between the condominium and old buildings on mining and timbering sites. Since we have been enthu-

siasts for barns and country industrial structures, we were pleased, though the resemblance was not intentional. But we were at odds with critics who, for some reason, considered such resemblance unwarranted.

The condominium building was the initial attempt to make a community. It consists of ten great rooms with tower, courts, bays, and solariums (Figure 5), ranged around two common courtyards—a first layer of "inside." Like the coves it overlooks on either side, its inner courtyard is surrounded by forms which slope to the sea, countered by an occasional projection (Figure 5). At once castle, compound, and promontory, it is a concentration of dwellings bunched together in the teeth of the wind.

Inside each dwelling there is a powerful need for further domestication, for another layer of shelter and a sense of being yet farther "inside," though not out of sight of the crashing surf. Every dwelling is composed of a single great room (Figure 3), and almost every one of these contains two little houses, one of them a simple four-posted shelter covering a hearth and supporting a bedchamber on top. The other is almost a miniature house which contains a kitchen below, a bath and dressing room above, and sometimes a sleeping loft above that. The outer structure of the encompassing room is built of large rough pieces of wood visibly deployed as in a barn to stiffen the structure against elements. The little houses inside are made of smooth wood, and generally painted, so that they seem miniature, something between toy houses and giant cabinets. Around the periphery, bays reach out to special views or to provide extra places for sitting or sleeping, conceptually "outside" the envelope of the house, bracingly close to the windy outdoors (Figure 4).

Each of the dwellings is different, to suit its particular position on the site or to provide auxiliary sleeping rooms or galleries or solariums (Figure 5). Unit 9, for instance, has a small wooden entry and eating court and a glass-walled porch outside the great room on the south and a long bay that hangs out over the

cliff on the west and north. The kitchen/house cabinet has been painted in five shades of blue to distinguish it from the rough exposed wood framing and wall surfaces around. A ladder up its side from the second floor leads to a loft above the bathroom, from which an agile can supervise the scene below.

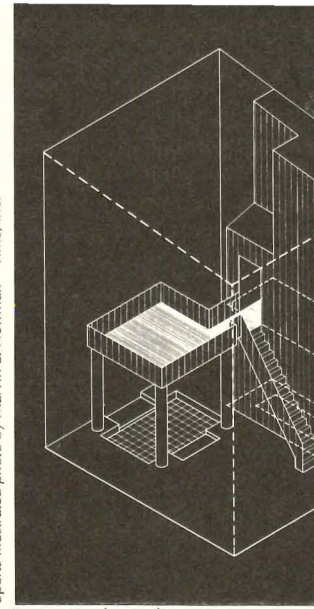
The entire place becomes a large, but measurable foil to the limitless Pacific horizon outside. At floor level you can examine buildings; you can move about within the room which is peopled with columns and posts, then stroll out in bays with views of the outdoors or inside. You will always be next to tactile elements of the room's structure, or protected beyond its boundaries, conscious at once of the overwhelming outdoors and the sheltered room within.

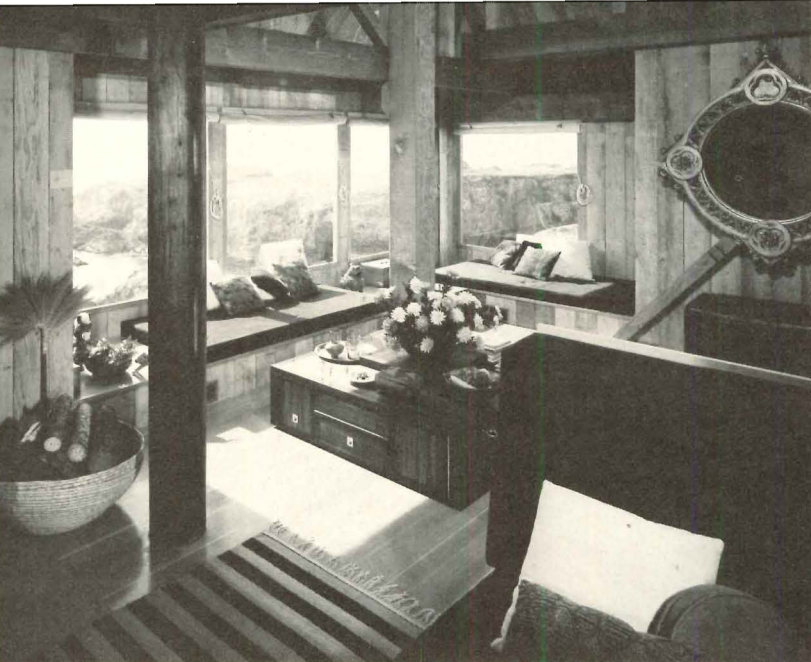
The land planning for the Sea Ranch was carried on by Halprin's landscape designer, who wanted to maintain the brooding quality of the site even though they knew that the lonely sweep of coast must eventually be carved into parcels which could be bought and sold.

In the forest, the problems were really surmountable; handsome roads were slipped in among the trees, sites with some forest canopy or a view were selected, lot lines were drawn around them, and houses built. Automatically these houses have merged their sites with the forest close around them.

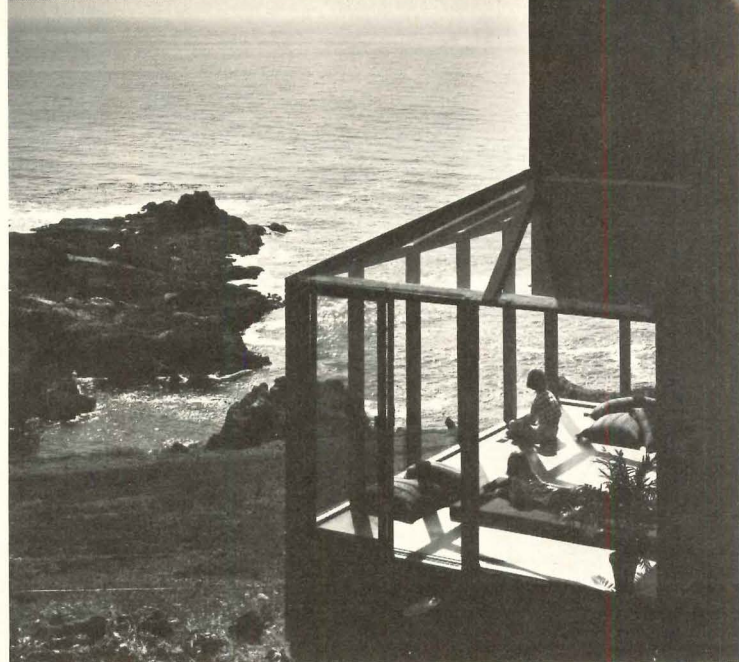
In the meadows, on the other hand, the problems were far more difficult. Land close to the water was so valuable it had to be sold, though it was clear to everyone that the sense of openness of the meadows between hedgerows had to be preserved. The market did not think it would be possible to build more houses in the right place near hedgerows with the kind of care that had been lavished on the Esherick clusters. But in order to exercise some control, the developer sold it that more than half the meadowland remained in common ownership. Much of the other half marked for sale was placed in a "private restricted zone" which cannot be

3. Typical condominium unit





Day window and living room in condominium



5. Solarium in condominium

n. This left only about one-fourth of the lowland available for building and, in the meadows, the attempt was made to have the building sites relate to the hedgerows.

Another aspect of the land planning which received careful initial attention from consultants was a set of design restrictions. The phrase rankled, but there seemed to be no point in making a booklet full of the information about the site which we had found useful. The only rigid proscription was against reflective surfaces and bright colors (and we were later sorry even for those). We did not like restrictions that would back the designer on a set scheme; what we wanted was something that would encourage a rich multiplicity of images, each of them closely dependent on the land. We did not get it.

A look at the place seven years later is instructive: the care lavished on it by so many people makes it worth our attention, and its successes and failures should give some clues as to the present-day place of houses.

The land is still beautiful as one drives up the coast from San Francisco. The chapel of the Russian settlement at Fort Ross which had been skillfully restored in the 1950's, had spoiled eloquently of the power over the mind exercised by a small outpost at the lonely edge of the world; it had had a strong hold on us when the Sea Ranch was starting. Now it has been burned to the ground by vandals, and in a wholesale manner of the seventies the state is king of restoring an entire Russian village. After Fort Ross the coast is wooded and the road winding, and it is some time before we spot (because we know where to look) the silhouette of our condominium, "like a large wooden rock," as one of our friends had put it when we get closer, though, we note that the condominium is under way hard built. Its architect appears to be unfriendly, at least to the scale of the "wooden rock" on the hill, and, since he has suppressed the hillock by a building all jagged and frilly, and it is so large for so petulant a structure. The original site plan had arranged con-

dominiums like the first down the whole narrow stretch of coast in careful relation to one another and to the land. This building seems to be ignoring the plan and the intentions behind it (as well as the view itself). It turns out that the condominium program was delayed and did not continue past the first building because the salesmen on the site could make their 6 per cent fees much more quickly by selling vacant lots for single-family houses on vacant land, without more investment by Oceanic Properties and without the trouble and complexity of showing dwellings already built. They pressed for five years to delay condominium construction, and the present work is going on only because a contractor bought some land and brought his architects from the ski country to fashion this chalet. The residents are angry. They are also powerless.

Adjoining the condominiums, just past the gate, is a lodge which has swallowed up the original 1965 Esherick store. It is handsomely built in what is by now the Sea Ranch vernacular. But it doesn't seem quite right, probably because it is not observing that meticulous *quid pro quo* with the wild environment that the first building had; its parking lot sprawls, and it even has little lawns making inroads into the flammable high grass. The trouble, probably, is that it is too much in the Sea Ranch image, a vernacular based on loneliness. Even on the parking lot side, where many people move, it is still mute, as if it faced the empty fields. From a distance, nevertheless, its sizable bulk sits easily on the ground.

Look, however, at that excrescence on the grassy slopes above the meadow (Figure 6). It had long been evident that buildings there would destroy the shape of the land, but new in-house land planning, pressed harder and harder by a desire for early profit, has been concerned more with salable images of suburbia than with the preservation of the lonely meadows of the past.

But that house on the hill! It is pea green and flares out beyond its foundation, lurching over the grass it shadows. It is hard to classify

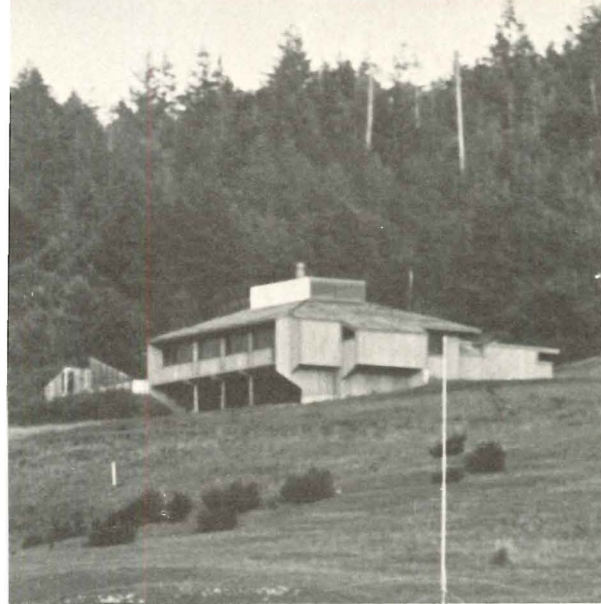
its relation to the land: it isn't merging with anything or surrounding anything, or enfronting anything. It seems to be at once claiming the land and kicking it. These hills seem large at first, but how vulnerable they turn out to be, and how easily they are destroyed. And how ill-armed the design committee must be if its "restrictions" can't stop this!

The next surprises come at the first meadow where the Esherick houses are. These have weathered in seven years, and although some of the sod roofs have lost their grass, others have gained wildflowers and the whole group has come to seem an inevitable part of the landscape, as "natural" (and yet as much formed by the hand of man) as the hedgerows themselves. They fit so well because they respond so precisely to the landscape that they add to it, as the hedgerows do. They have not been regimented, like soldiers lined up for inspection. They respect their circumstances individually, but in concert as well, with the kind of general agreement about intentions that informs the design of fine old towns that we know and admire.

Across this same meadow, however, the early planning decisions have not been so fully vindicated. A row of houses crowds forward, away from the hedgerows, to see beyond the present or future neighbors to the ocean. They stand so far from the trees that they lose their protection from the wind, and they also lose the chance to look like a part of the hedgerow. They seem, too, to be attending to the rhythms of altogether disparate drummers.

Three shed-roofed houses in another corner of the meadow look rather like the Esherick group, but where the sheds of the Esherick houses all faced the same way, into the prevailing northwest wind, the roofs of these houses face in different directions, in response to the lot lines or to some other consideration of the drawing board rather than to those of the place.

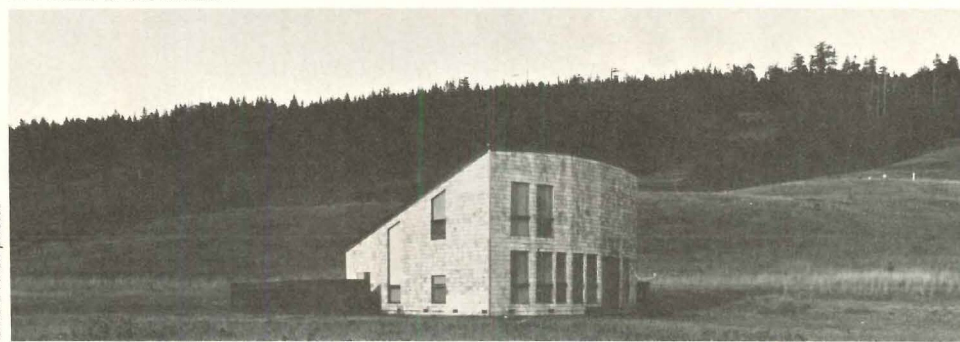
Farther north along the coast, the confusion of purpose is even more apparent. Here, on more recently developed land, the hedge-



6. House on a hill



7. House in the meadow



8. House in the meadow

Gerald Allen photos

rows are farther apart, and the wide meadows more crisscrossed with rows of house sites. A remarkably consistent building idiom has developed, partly, one supposes, from examples already set and partly from the pressures of the restrictions and the architectural committee. Vertical redwood board siding and shingled shed roofs create an apparent consistency of style, but show no evidence of agreement about purpose. And the relations between the houses, or between the houses and landscape, is no more apparent than the order of the dots on the salesman's map that show which lots have been sold. Even distinguished houses sit aimlessly on the meadow, unsupported by the neighboring landscape or the neighboring building forms.

The efforts to achieve a suburban subjugation of the landscape under lawns and bushes are mercifully few. The most popular reaction to the site is conquest by sheer show, making an object on the land that screams for attention as a shape, and not as a place to live in; the relationship of these houses with the land seems less like partnership and more like rape (Figures 6, 7, 8). But even when careful attempts are made to build forms sympathetic to the land, single-family houses are seldom massive enough to seem more than tiny bumps on the landscape. A great virtue of the condominium format is the possibility for dwellings to come together into a partnership with the land which individually they are too puny to achieve.

This appraisal of the Sea Ranch may seem inappropriately harsh; it certainly is tinged with disappointment. Let us first note that in many ways the Sea Ranch *is* a successful place, fun to be in, and much of the magic of the site is still there. But let us also admit that with each new building that is built the special magic is diminished a little. What went wrong?

For one thing, most of the decisions were not made on the spot, and this is often characteristic of our times. Even at the beginning, when Oceanic Properties vice president Boeke

and others were often on the site, important choices were made in Honolulu by accountants with an eye on the cash flow, and by a board of directors deeply concerned with macadamia nuts. And since the Sea Ranch is mainly a second-home community, people and their architects met elsewhere to develop together their fantasies, quite independent of the spirit of the place. Those same media-driven winds which blew the "Sea Ranch idiom" abroad and made it famous also blew uncaring versions of Swiss chalets and split-levels to this splendid brooding coast. With the owners of the land in Hawaii and the buyers in San Francisco, the salesmen, having only a transient interest in the place, forced a premature packaging of homesites for quick and easy sale.

But we guessed wrong, too, we who planned together to make this place special. We sought a partnership of buildings with this vast landscape which required more size and presence than most houses have, and more care in the arrangements than most people working somewhere else chose to give. Some towns are handsome because the centuries show directly. In others, equally beautiful, many houses merge, behind high hedges and walls, and leave the theme-making to a relatively few buildings of public orientation and distinction. At the Sea Ranch, houses merge into the forest with great success; in the meadows, however, there was a need for houses to set up partnerships with the land forms and with each other. This turned out to be very difficult to achieve. Most of the houses on the meadow or the grassy slope are reduced to laying claim to their patch of turf. These houses are the least successful, and having said that, we have in all honesty to admit that it is in this way that most people build houses everywhere—one by one, without any relationship to each other. What, then, are the chances for a person who wants a good house, and what, in the late twentieth century, is the place of houses?

The Sea Ranch shows some of the ways in

which houses contribute to the creation of a memorable place. Our theory of the place, advanced here as a pragmatic device to help one decide what decisions to make, has to begin from a single point of view. To understand the legitimate purpose of architecture is to lay special claim to parts of the world ("sides") and to set them off from the rest ("other sides"), has turned about on us. We have overbuilt, and often built so badly that instead of having what, for instance, the Middle Ages had (where most of what was built was secure and everything outside the walls scary), we have now made a world in which the most beautiful things are what we have built for ourselves while unravaged and unspoiled nature, in contrast, looks good.

What we have built does scare us. Most of it has no message for us. We can't claim it as our own, and we can't comfortably inhabit it. Thus the legitimate search for roots has become frantic, as people seek to anchor themselves in an increasingly bland and undifferentiated geography.

The failure of our surroundings to establish where and who we are seems to us to require a search for the habitable—both the physically habitable, where we can be comfortable and live our lives, and the metaphorically habitable, where we can go beyond where we actually are to wherever our imaginations transport us. Establishing a territory for habitation, physical and metaphorical, is the primary basis of architecture, and therefore of habitable building.

So far we have tried to show two things: A house is in delicate balance with its surroundings, and they with it. A good house is a thing made of many parts economically and meaningfully assembled. It is not just of the materials from which it is made but of the intangible rhythms, spirits, and dreams of people's lives. Its site is only a piece of the real world, yet this place is reduced to seem like an entire world. In its parts it accommodates important human activities, and in sum it expresses an attitude toward life.

AIRPORTS

News about the distress of U.S.-owned international airlines and the over-extended investment by both international and domestic carriers in jumbo aircraft has overshadowed the fact that the air transport industry as a whole is weathering these adversities and showing signs of recovery. In the first eight months of 1974, domestic trunk lines show a four per cent increase in revenue passenger miles with an eight per cent decrease in available seat miles. Building construction at U.S. airports held at about \$48 million in the first six months of 1974. The cost and functional efficiency of these buildings are primary concerns of airlines, architects and consultants in a concerted drive to improve service and profit.

Airlines provide technical resources for design of the apron-terminal complex

■ These stringent times have brought about some modification of the competitive attitudes of airlines in their approaches to terminal facilities. The heyday of the spectacular one-airline terminal has been followed by more cooperative and concerted attention to the realities of air travel and the functional efficiency of terminal facilities.

Each of the major U.S. carriers maintains a department of facilities manned by architects and engineers who analyze facilities requirements in terms of projected schedules. These in-house professionals must adapt to the ambiguities of their roles; first, as designers and/or commissioners of design by outside professionals of the spaces they will occupy as tenants of the airport authority; second, as professional advisors (and company protagonists) to the airport owning authority and its own commissioned architects and other consultants.

Where whole new airport terminals are to be built, a technical committee is formed of the in-house professional personnel of the tenant airlines. This provides an opportunity to pool the resources and experience of the airlines and to speak with one voice to the owning authority and its architects and consultants.

This concerted action by the professional and technical personnel of the airlines has been brought into focus at another level through action of the Federal Aviation Administration of the Department of Transportation. The Ralph M. Parsons Co., with the Air Transport Association, were commissioned to prepare a report analyzing concepts of the apron-terminal complex. The report (issued in September 1973 and available through the National Technical Information Service, Springfield, Virginia 22151) gives the planning background of the apron-terminal complex in relation to the airport master plan and to forecasts of activity in the various categories of air traffic. The characteristics of basic airport

layouts and the options of terminal configuration (see charts, next page) are supported by detailed descriptions of major functional areas and approaches to the process of evaluation from the standpoint of both operating efficiency and cost effectiveness.

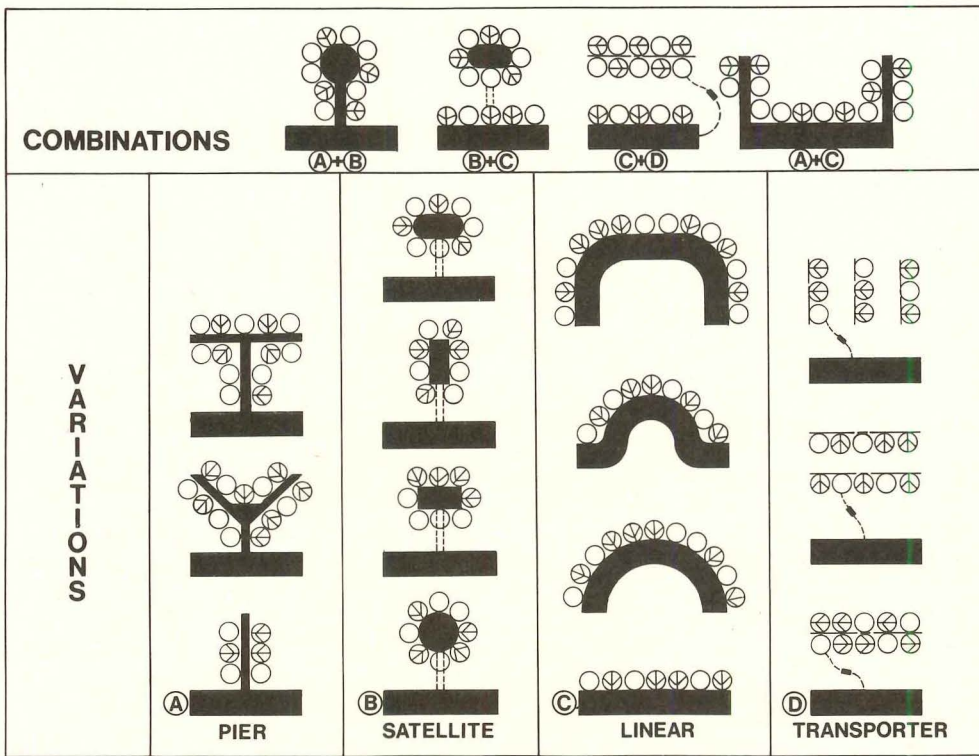
The content of this ten-chapter document draws heavily upon a prior study developed by a six-member team of the Air Transport Association consisting of American Airlines, Allegheny, Delta, Eastern, TWA and United. This study is another example of the technical resources of airlines upon which architects, engineers and consultants increasingly rely.

An airlines executive states the case for cooperative action

Following is an extract of a paper by O. W. Hullet, vice president for properties, facilities and communications for American Airlines, Inc. It was originally delivered to the Airport Operators Council International at Dallas in October, 1973.

MR. HULLET: As a first and fundamental step, it is essential that any program for terminal development must be participated in fully by those groups most responsible for the ultimate outcome—the airlines, the airports and the consultants.

With very few exceptions, those who are involved approach the problem of airport design responsibly and professionally. The best intentions are often frustrated, however, by the problems inherent in terminal development work. The airlines may have difficulty in determining what data the consultants need in order to draw lines on paper. Traffic and equipment forecasts change in the middle of the job, due to economic uncertainty, fleet revisions, competition and scheduling strategy. Local and city officials are sometimes understandably reluctant to compromise programs or make continuing changes as user inputs are made.



LAYOUT		
APRON-TERMINAL RELATIONSHIPS	SINGLE OR CLOSELY PLACED PARALLEL RUNWAYS; LIMITING APRON TERMINAL ON ONE SIDE	RUNWAYS WITH INTERSECTING AXES; LIMITING APRON TERMINAL ON TWO SIDES
GROUND-ACCESS CHARACTERISTICS	ACCESS FROM SINGLE POINT USING ONE-WAY LOOP ROAD	ACCESS FROM SINGLE POINT USING ONE-WAY LOOP ROAD
APRON-TERMINAL EXPANSION	RUNWAY AND ROADWAY LIMIT EXPANSION TO TWO DIRECTIONS	RUNWAY AND ROADWAY LIMIT EXPANSION TO TWO DIRECTIONS
AIRCRAFT CAPACITY	USUALLY (BUT NOT LIMITED TO) SMALL OR MEDIUM VOLUMES	SMALL, MEDIUM, OR LARGE VOLUMES
Basic airport layouts		

Despite these frustrations, it is necessary to maintain a cooperative approach and arrive at an airport development and design program that best fits the needs of the community and the airport users.

It is particularly important that the architects and other consultants respect the nature of the client relationships which are peculiar to airport terminal projects. While the airport authority engages the consultants, administers the program, and mails the checks, the airlines and the concessionaires underwrite a substantial portion—in some cases all—the funds for paying the bills.

Since these funds must come from earnings in a highly competitive industry, and because of rate regulatory policies by which the cost of excess facilities at a specific airport can not be passed along to the consumer, it is not surprising that airline managements feel they should have (and are preparing to play) a clear role in terminal development decisions.

- The first major objective is to develop a *sound planning base*. This must begin with realistic forecasts. The lack of valid forecasts has been one of the major contributing factors in the industry's failure to accurately predict needs and is a major cause of the credibility gap that exists between the airlines and the airport authorities involved.

The penalty for our inability to forecast has been severe. The aircraft that were purchased for a market that did not materialize resulted in the empty seats noted in rising seat-miles/passenger-miles ratios and is a major factor in the slump in airline profitability.

- The next point I would like to emphasize is to *phase construction consistent with need*. It is possible to predict with some degree of success specific terminal needs during the next two to five years. Beyond this is hazardous with respect to both quantity and technology. Rather than building in one program for our

long-term needs, we should master-plan facilities for incremental expansion and phase construction to meet our predictable near-term needs.

- Next, we need to determine *what can be afforded*. Too often this goes without attention until the end of the design phase when it is noted, to everyone's surprise, that the project is not financially feasible, and all parties must return to the drawing boards.

The determination of what can be afforded is not an easy matter. But it is certainly possible to establish a range within which an acceptable cost may be found. By working backward on the cost-per-passenger-boarded formula, the amount of funds which are available for debt service and tenant occupancy costs can be determined for a range of unit boarding costs. The successful application of this approach was demonstrated at Cincinnati (see article page 136) in 1970 following a series of failures. It led to a sound expansion program which was supported by the airport authority and the airlines.

- An area in which we can all benefit is that of *maximizing facility sharing*. The airlines have trended toward exclusive and separate facilities with the advent of jet aircraft. There is no justification for gates to go unused in one part of the terminal while new ones are being constructed in another part. The joint use of gates where two or more airlines utilize the same or adjoining facilities can lead to economies in space and operations. Where aircraft schedules result in a peaking situation in which facilities with only marginal utilization are called for, we should examine our schedule patterns.

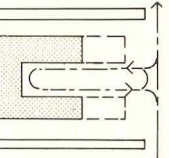
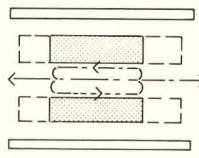
A significant cost difference has been noted in adapting existing facilities to new aircraft types emphasizing the need for flexible design. Costs have ranged from as low as \$200,000 to as high as \$1.5 million for a wide-

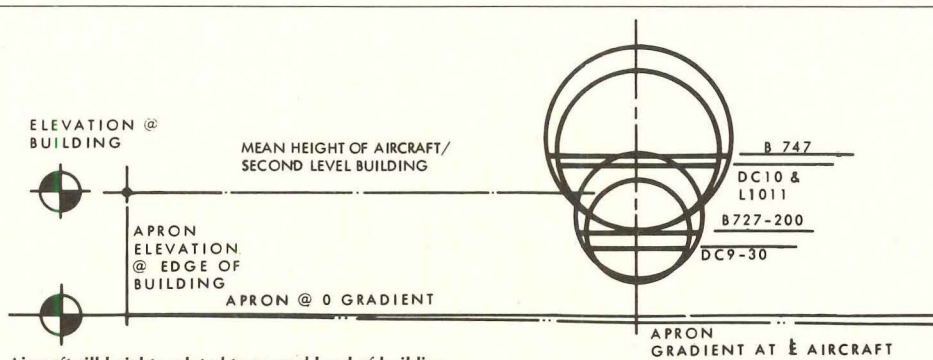
body aircraft gate. That certain designs offer greater flexibility for adaptation to the generation of wide body aircraft which were not predicted—or at least were not designed for several years ago—emphasizes the value of establishing flexibility as an objective. Some of the problems encountered which limit flexibility and must be considered in new terminal design are illustrated in accompanying diagrams (above and right).

- The next objective is to *select functional, economical design vs. monumental design*. This objective seemingly should not require statement, however, the construction of monumental terminals can be a key factor in terminal development costs. The differential in construction costs may vary by as much as 5:1 depending upon the degree of luxury in the design. It is highly questionable whether such terminals impress the frequent airport user of today who is interested primarily in spending as little as possible at the airport as possible and with the least inconvenience in getting his ticket or his baggage going on his way.

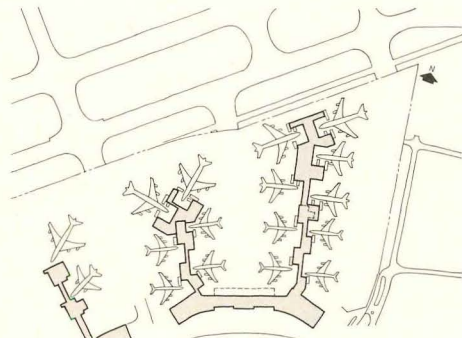
It is not my intention to suggest that all terminals should look alike or to discourage the development of attractive buildings which project the airlines' or the communities' individuality. There are many exceptional terminal buildings in this country which are attractive and deserving of civic pride, yet which are functional and economical.

An example of where we have been able to apply some of the foregoing principles including the one just named is that of the South Terminal at Boston (RECORD, ARCHITECTURAL RECORD, November 1970) which is to be shared by American Airlines, Allegheny, National and Northwest. The conclusion of a redesign in which unproductive space and costly construction features were eliminated from the original proposal project was bid at a cost of \$39.8 million compared to an earlier low bid of approximately

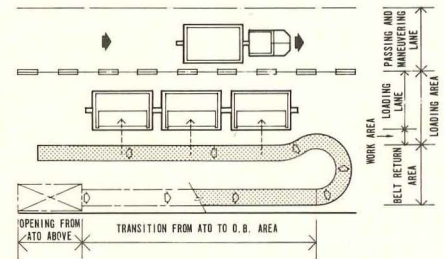
	
CLOSELY SPACED PARALLEL RUNWAYS WITH INTERSECTING TAXIWAYS AND APRON TERMINAL ON THREE SIDES	WIDELY SPACED PARALLEL RUNWAYS WITH NO INTERSECTING CROSSWIND RUNWAYS; LIMITING APRON TERMINAL ON TWO SIDES, EXCEPT AS LIMITED BY TAXIWAYS
ACCESS FROM SINGLE POINT USING ONE-WAY LOOP ROAD	POSSIBLE ACCESS FROM TWO POINTS USING TWO-WAY AXIAL ROAD WITH ONE-WAY LOOP ROADS SERVING EACH APRON-TERMINAL AREA
ROADWAY AND ROADWAY LIMIT EXPANSION TO TWO DIRECTIONS	RUNWAYS LIMIT EXPANSION TO TWO DIRECTIONS
SMALL OR LARGE VOLUMES	MEDIUM OR LARGE VOLUMES



Aircraft sill heights related to second level of building



Clearance constraint of fixed nose pockets



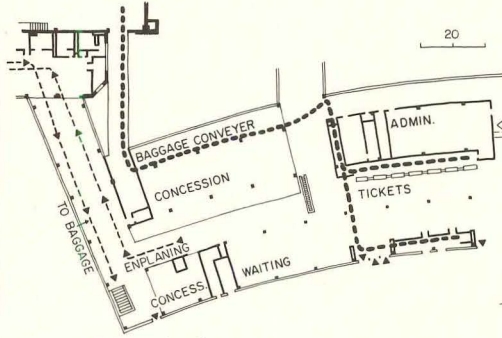
Tight turns in bag rooms

million. Yet, the number of aircraft gates at the terminal and the automobile parking spaces contained in the revised program were essentially unchanged. This dramatic reduction was achieved through careful examination of requirements by the carriers and adoption of more functional and less costly design. It did not have been possible, however, without the complete support and cooperation of the Port Authority and the architects (John Carl Becke & Associates and Desmond & Lord), the engineers (Lev Zetlin Associates, John R. Loring & Associates and Congdon, Mey & Towle) and the construction consultant (Turner Construction Company) all of whom actively participated in the objective to reduce the project scope.

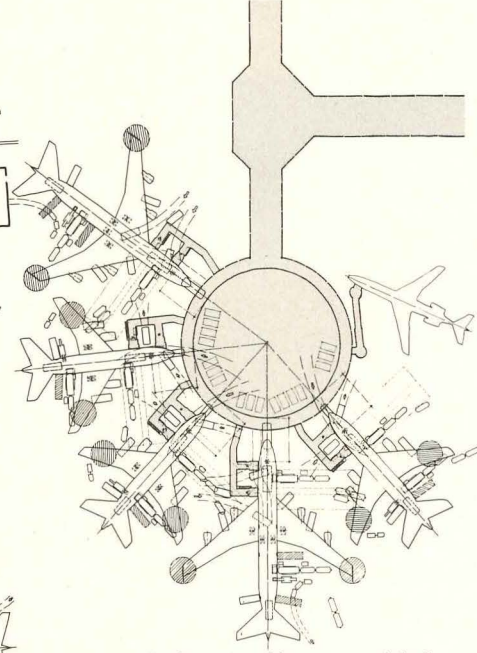
The final point I would like to make is that I should evaluate our design with certain criteria in mind before we start driving nails. Some ratios that may prove helpful are:
 Airline space to total
 Rentable space to total
 Public space to total
 Estimated cost per square foot
 Cost per boarded passenger.

The key criterion, assuming the terminal planning with respect to gates and passengers has been well done, is percentage revenue producing space—both airline and nonairline spaces—to the total building area. A terminal bargain that costs \$35 per square foot but gains only 30 per cent productive space. In a review of 20 terminals at which American Airlines operates, it appears that a goal of 50 per cent space is certainly attainable and achievable.

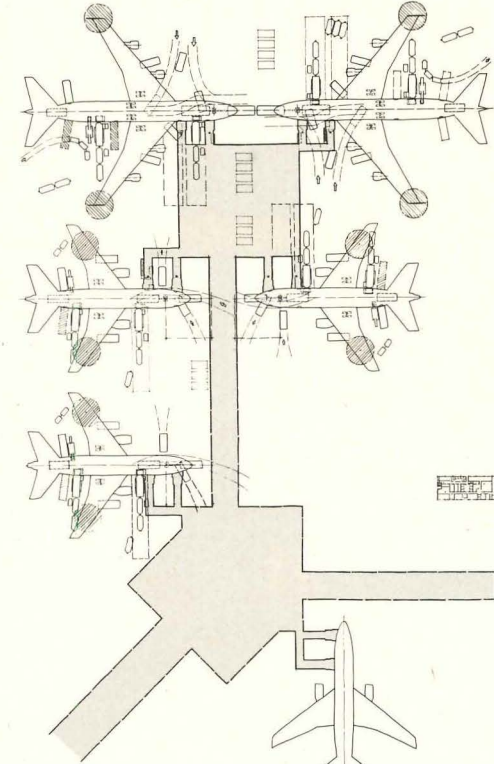
In summary, the terminal planning process is one in which we all have a stake and requires our joint best efforts to ensure that we provide facilities that are functional, economical and provide the best conduit between the way and the airplane.



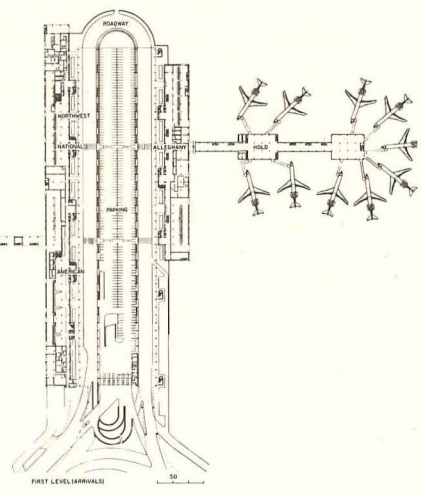
Bag conveyor right of way



Equipment problems at round dock



Preferred arrangement, rectangular



Docking at Logan in Boston

■ The basic concept for the two new terminals at the Cincinnati Airport is a first-generation offspring of ideas developed in the cooperative airlines effort previously described. Architects Heery & Heery developed the design and the structural system described in detail in RECORD, June 1973.

During design and construction, Heery & Heery remained in constant consultation with the major commercial carriers involved and it was at his suggestion that the following comment by Gordon Webb, director of properties and planning for Delta Airlines, Cincinnati's major tenant, was solicited. The content is in major support of similar comment provided by Walter Hart, director of facilities planning for American Airlines and Richard Lambec of TWA.

Mr. Webb observed that the Greater Cincinnati Airport is a prime example of coopera-

tion among the airlines, the airport sponsor and the architects in producing a facility that can satisfy the needs of all.

"For the Greater Cincinnati Airport," said Mr. Webb, "the three groups determined what would best fit the traffic pattern and the existing airport master plan. From this close consultation, Heery & Heery was able to design a terminal which was built, for the first time, on a systems module concept. The airport which resulted is inexpensive, permits easy expansion and is extremely functional, as well as being an attractive structure.

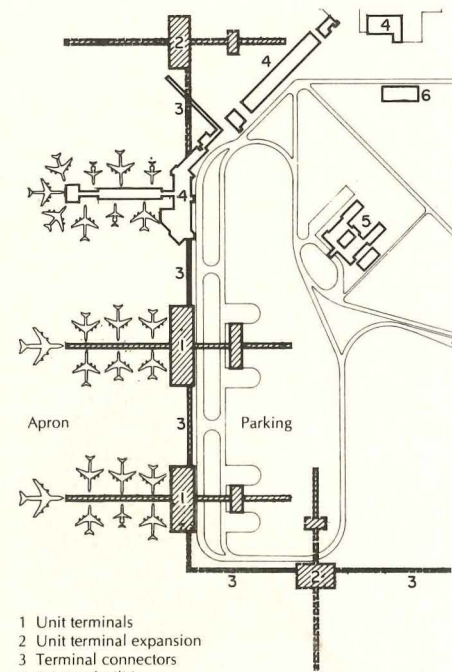
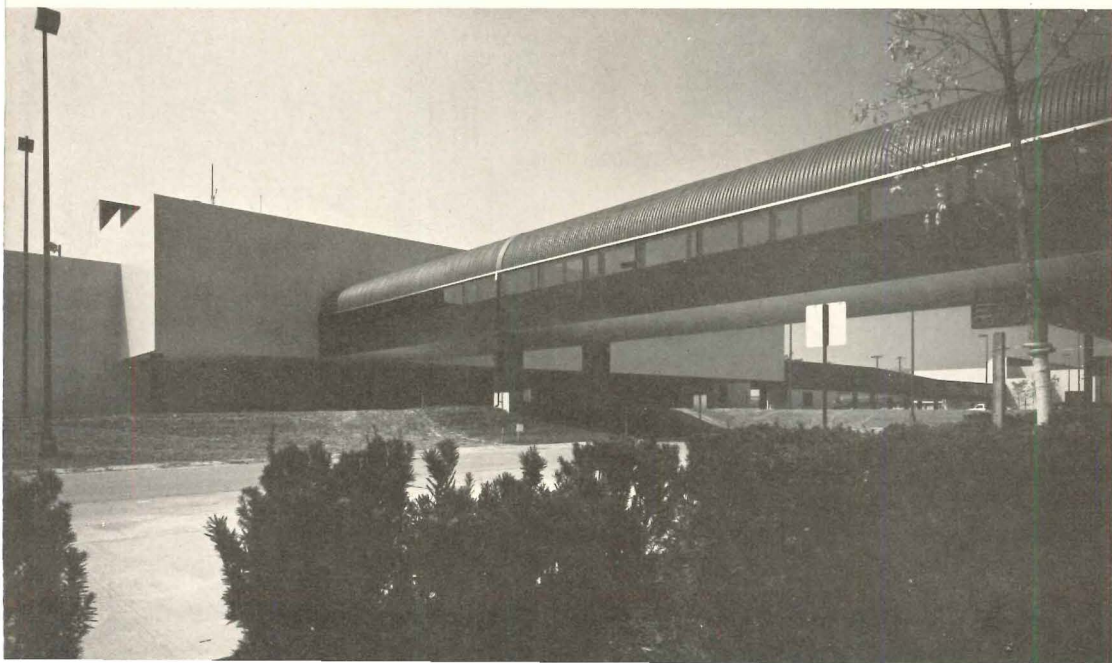
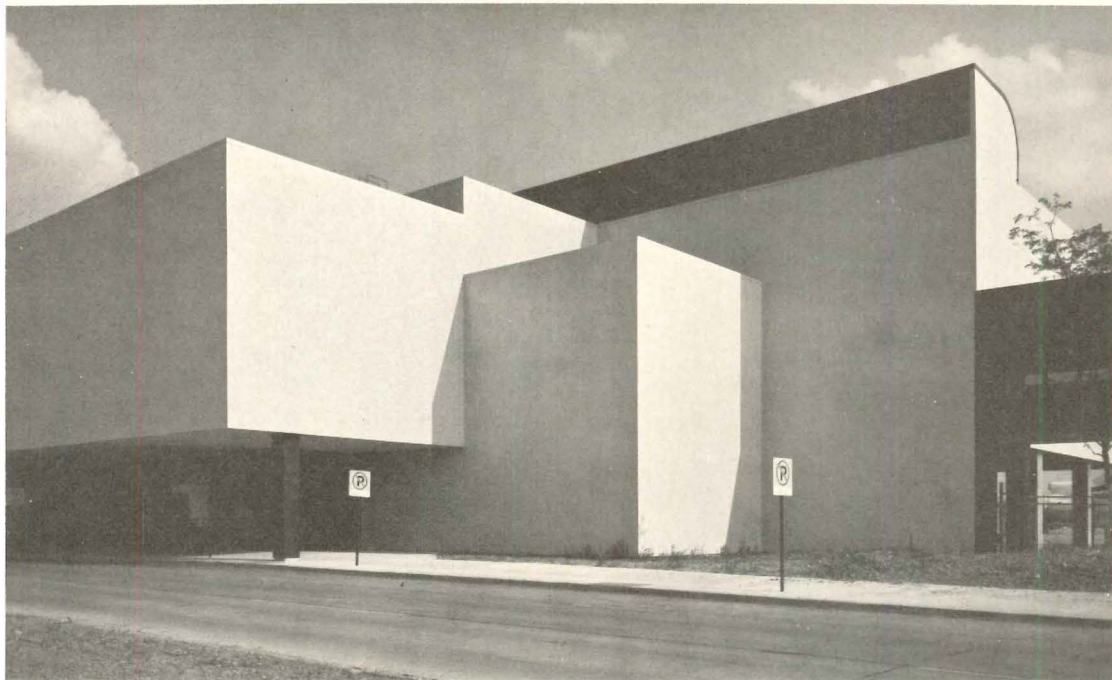
"The Greater Cincinnati Airport is still the exception to the rule, however. Almost every week there are groups in Cincinnati studying the new modular idea and how it works; and this type of construction, based on function and flexibility rather than on civic pride, will become increasingly popular. The concept

and model were presented last year to the Airport Operators Council International at its convention in Frankfurt, Germany. As a consequence, delegations are coming from all over the world to consider adopting at least some part of the Cincinnati approach.

"Three major areas of innovation at Cincinnati are the large central hold rooms, separate baggage claim buildings and the unusual ticketing flexibility. The central hold rooms for each airline eliminate the need for separate passenger areas on the concourse at each gate. They are less expensive to build and provide for easier expansion. Security problems are minimized by having segregated areas in each of the hold rooms for those who have already cleared security.

"The baggage claim buildings, located across the street from the terminals in the parking lots, are reached by over-the-road

Exhibit A: completed Cincinnati terminals translate technical input into architectural reality



- 1 Unit terminals
- 2 Unit terminal expansion
- 3 Terminal connectors
- 4 Existing facilities
- 5 Hotel
- 6 Post office

It was the structural system and management of the phased construction that enabled the terminals to be delivered well within the schedule and one million dollars under budget. The saving was used further to enlarge the complex, and The Kenton County Airport Board was able to contribute \$136,000 to a local citizens' "savemurals" committee. The 14 murals were relocated from the historic Union railroad terminal, which they had been designed in the 1910s by the German artist Winold Young. The committee was able to raise \$400,000 with the help of donations from the Southern Railway and other companies represented in the murals.

es. They ease congestion in the terminals and allow passengers swifter access to ground transportation.

The airport design also provides much flexibility and expansion capabilities in the area of ticketing. There are three separate ticketing locations for each airline: at the baggage claim building (if passengers check in their bags are transported to the terminal on an underground conveyor belt), at the conventional ticket counters in the terminals, and at the hold rooms for those coming from an out-of-town concourse to make connections. These ticketing stations cut walking distances to about half of those in most other large airports. The walking distances for local boarding are shorter than for transferring from one carrier to another, and are one of the advantages of the Heery & Heery design.

"The Greater Cincinnati Airport is a new concept in terminal design not only because of these features, however. Perhaps its outstanding contribution is the module systems approach taken by the architects. Because of this, the airport was built in less than one-half the time terminals usually take; and the fast-track bidding employed meant that the savings which accrued from avoiding escalating labor and materials costs were fantastic.

"This airport is an impressive example of what can be accomplished in terms of cost savings and functional advances when architects, sponsors and airlines work together."

GREATER CINCINNATI AIRPORT: Major tenants: American Airlines, Trans World Airlines, Delta Air Lines. Architects, engineers and construction consultants: *Heery & Heery*. General contractor: *Dugan & Meyers*. Lighting consultants: *Jules G. Horton Lighting Design, Inc.*



ibitt and Ron Forth photo



■The in-house architectural and engineering resources of the Port Authority of New York and New Jersey include a formidable array of architects and engineers who have specialized in huge metropolitan airports over the years. The redevelopment program for the Newark Airport was described in an article in *RECORD* August 1968, based on a paper by John P. Veerling, the Authority's project manager, presented at the joint conference of AOCI and ASCE in Houston, April 13, 1967. The time lapse between concept and completion must be taken into account in any judgment of the scheme. Further, as Mr. Veerling now observes, it is still premature to be very definite about the absolutes of one configuration or another—not only because the state of the art is still in development, but also because what is suitable for, say, a wide-open, promotion-minded, regional airport like Dallas-Fort

Worth is inappropriate for a "staid old community" like Newark.

In its time, and on its severely restricted site within a dense metropolitan area, the bi-level access to three multi-airline terminals represented an advanced concept. Whatever critics may now say about the Newark concept and configuration, it represents the coordinated experience of a truly sophisticated owner. The input of experience not only of this owner but also of the user airlines was reinforced by an exceptional (for this owner) array of outside architects and consultants in graphics, lighting, etc.

Shells of the two terminals now completed were designed in-house by Port Authority staff under project director Veerling. The staff included architects, site planners and engineers of every specialty. The design work of the staff, however, ended with the shell con-

struction. All interior design and engineering for occupancy by the airlines was the work of a separate architect for each of the two terminals completed thus far.

The first A-E firm commissioned was Abbott Merkt & Company for the interior finish and mechanical arrangements of terminal 1 (second in line on the elliptical approach way). Solutions of baggage handling systems and apron relationships, ticketing and waiting spaces, holding rooms and concessions areas among the special tasks of this commission. The extent of interior work for this terminal which was to house four different airlines exceeds the usual implications of interior design. It extends into hvac systems, plumbing, fire protection, flight announcement systems, pneumatic tube systems, fuel pits and drainage facilities; a whole array of activity calling for extended research and communication

Newark: where a sophisticated owner mustered talent from all sources



the Port Authority and the airline tenants. The commission for interiors of similar type for terminal A (first on the roadway) was awarded to The Grad Partnership. It would be fair to draw comparisons of the problems and construction schedules of the two terminals since a great deal of general preliminary work of defining the scope and setting up lines of communication was done during the planning of terminal B. It is interesting, however, that the interiors for terminal A (first to be completed) were put in place on a multiple contract basis with Tishman Construction Company as construction managers. Terminal A was executed in a single contract with general contractor Frank Briscoe Co. But the detailed job records of cost and schedule, if they were available, would not be likely to support any easy assumption of superiority of one method over the other. For example, the more

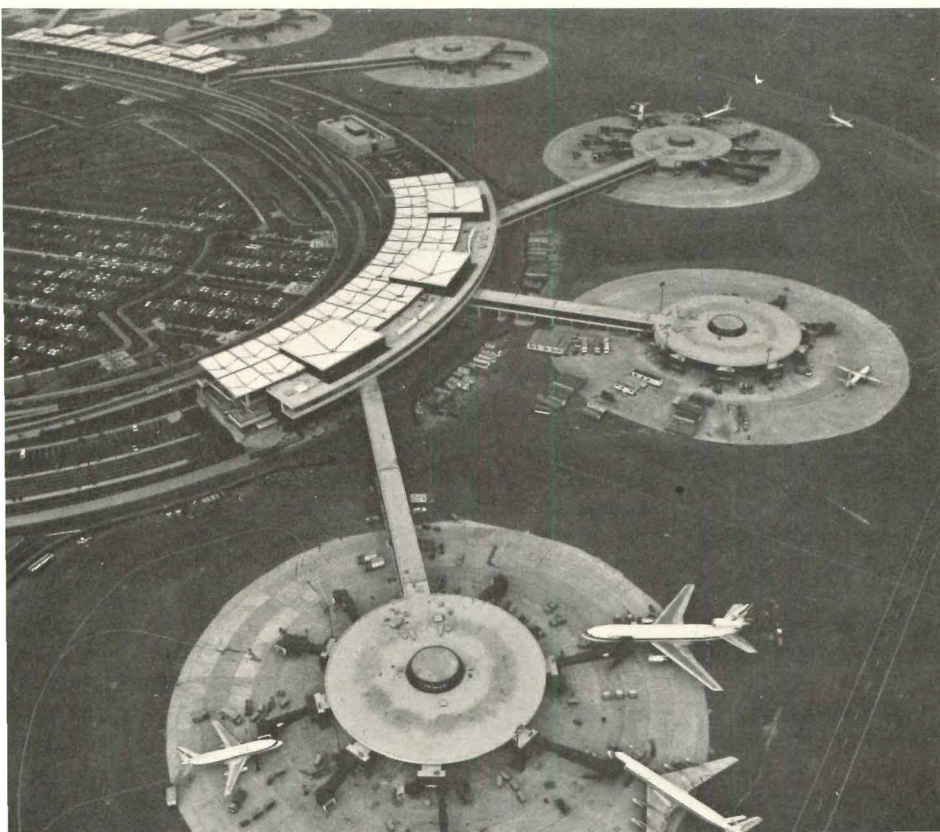
difficult site logistics at terminal B, and the mid-design expansion of one of its satellite structures must be entered into any assessment based on schedules.

Howard Grill, Abbott Merk's officer-in-charge of the terminal B interiors project, writes as follows: "Terminal B was the first terminal building to be designed. AMC started work in February 1968. At that time, the Port Authority was completing their foundation work for the buildings. The superstructure construction had not yet begun.

"Since we were the first, the task of reviewing the Ports' shell design was ours. Thus any agreements, modifications to the shell and Building Code interpretations which we worked out were also applicable to the other similar terminals in the new airport. Early in our design we reviewed the shell and suggested modifications. For example: the original

Port design contemplated the use of exit corridors across the baggage areas in the terminal. This would have resulted in obstructing the movement of baggage carts, a severe limitation. AMC suggested that auxiliary stairs be constructed to the arrivals-level sidewalk in lieu of the corridors. This was accepted by the Port who then added the stairs to all three terminals (A and C as well as B). Other similar modifications resulting from early AMC studies included the relocation of the truck dock in order to generate additional baggage area space and the provision for four conveyor rights-of-way per connector building instead of the original two.

"AMC provided a limited construction management service to the airlines. During the design period, prior to construction, AMC held biweekly meetings with the designated representatives of the airlines to secure airline input,



Plans and sections of the Newark Airport redevelopment program can be found in the first article describing this project in RECORD, August 1968. The photos left show the general plan and layering of the new terminal. The photos above and below show the sculptural ambience of the exterior and some of the disciplined graphics system by Architectural Graphics, Inc., as described in the text.



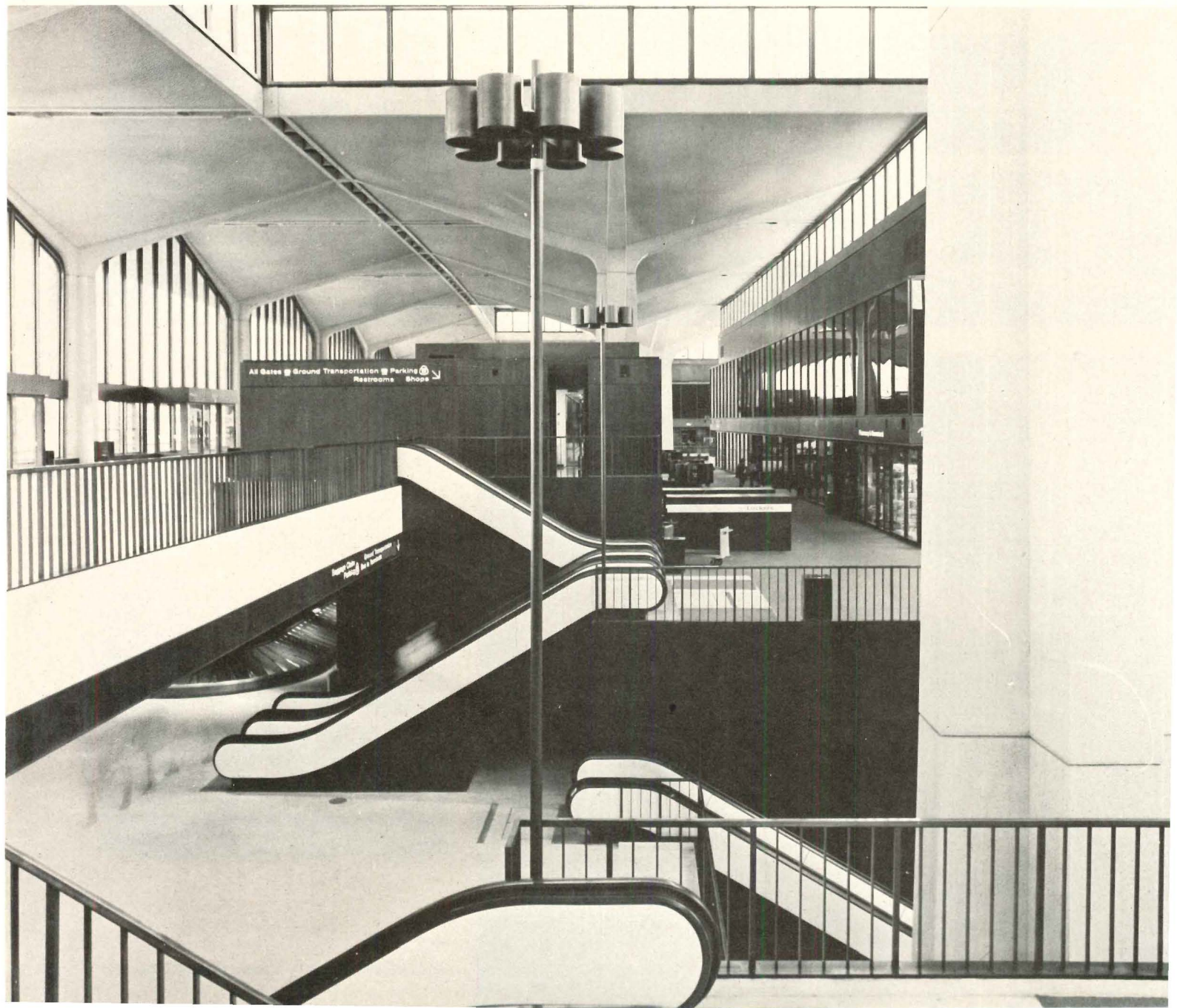
establish design criteria and review progress in the preliminary and working drawings and specifications."

Howard Grad, senior partner, and Joseph D. Bavaro, senior associate of The Grad Partnership similarly coordinated the input of five tenant airlines with the Tishman management program to achieve "a genuine design uniformity" in terminal A.

The graphics program proposed by Architectural Graphics Inc. for use in sorting out the highway approaches to the airport and the signage within the buildings is described in a written report prepared for the Port Authority. The report contains criteria and recommendations about the alphabet, colors, symbols, and a special section on distribution flow patterns, methods of sign fabrication and the general background of graphics coordination. Jane Doggett, AGA's president and principal-

in-charge of concept and design of graphics systems, has this to say in the foreword of her guidelines:

"The fundamental objective is to guide each passenger to his destination—the airline ticket counter, the gate, the baggage claim, the parking lot, etc.—by the most efficient means possible. Because of the multiplicity of destinations, currents and cross-currents of vehicular traffic and pedestrian traffic, it was essential to structure a graphics system which will encompass the total airport environment. The graphics system begins with the roadway signage where the public is given graphic identity of Newark Airport 'country' and the three terminal areas therein. The objective is to extend this system into the terminals' interiors so that there is a continuous 'thread' of graphics communication beginning at the roadway turnoff from I-95, for example, and leading the





Photos left and above: Gil Amiága

passenger to his departure gate where he steps onto his plane. For an airport of this scope, the input of a graphics system is not the mere labeling of fixed areas and facilities, but more important, it is a visual network of signs in logical sequence which create a pattern for each major traffic flow. The key to achieving excellent graphics flow is to maintain consistency and continuity of the components—alphabet, colors, symbols and semantics.”

Jane Doggett has further observed that at Newark graphics design was put to a functional test by tough traffic engineering tenets applied by sometimes doubting traffic planners. “We had to *prove* that AGA’s approach is for visual effect not as an end unto itself but as a means to an end: traffic flow and control and special airport design identity. By the completion of the program we and the engineers were actually able to use the words ‘graphics

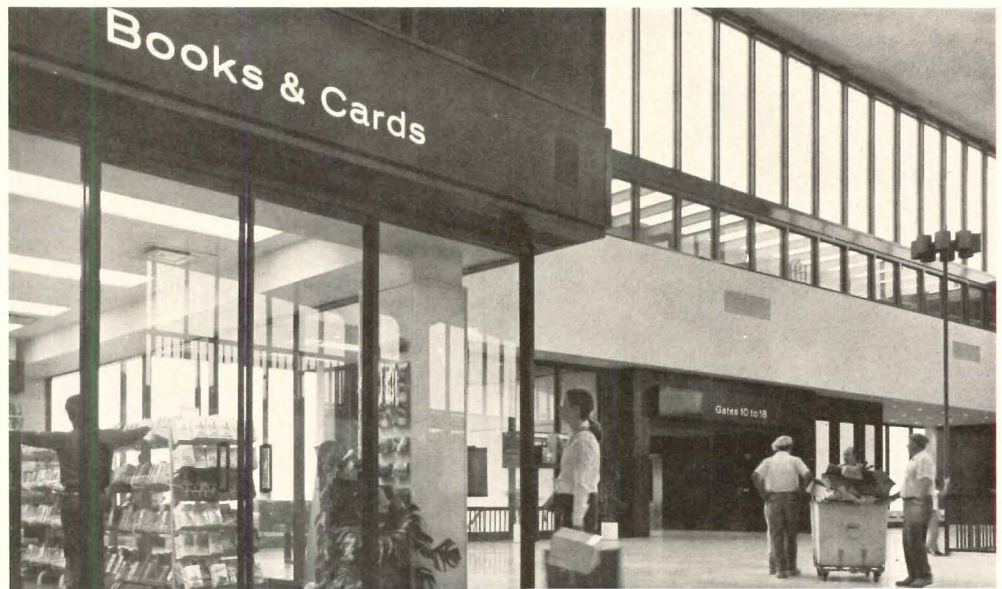
design’ and ‘functional factors’ as equal values in defining the sign system.”

So travelers through Newark Airport, whatever their frustrations, are never the victims of indifference or incompetence on the part of terminal designers.

NEWARK AIRPORT, New Jersey. Terminal A interiors, architects: *The Grad Partnership*; construction management: *Tishman Construction Company*. Terminal B interiors, architects: *Abbott, Merkt & Company*; general contractor: *Frank Briscoe Company*. Over-all central terminal area design, terminal superstructures and construction supervision: Port Authority staff: project director, *J. P. Veerling*; site planner, *F. Nilsson*; architects, *S. Wander, G. Ralph*; engineers, *E. Fasullo* (structural), *D. Goldberg* (electrical), *N. Lesser* (mechanical), *H. Schmerl* (civil), *F. Winter* (construction); airport manager, *J. Vanacore*. Outside consultants: *Architectural Graphics, Inc.* (graphics); *Henry Wald* (lighting).



Interiors of the Newark terminals were separate commissions from the terminal shell itself and involve considerably more in planning and engineering than is usual in interior design. For example, each of the tenant airlines retained the option to select a different baggage handling system, so that the architects and engineers were involved in evaluating and engineering these systems as well as fuel handling, lighting, communications and other matters. The Port Authority in-house architects were also responsible for ancillary structures such as the Toll Plaza, above, a central heating plant and service buildings which retain a consistent and quite attractive vocabulary. Terminal A interiors at right; terminal B, left and above.



■ The master plan for Toronto International Airport prepared in 1957 by the firm then known as John B. Parkin Associates (succeeded now, with much the same airport planning personnel, by Searle Wilbee Rowland) called for four aeroquays to handle aircraft carrying 100-150 passengers. The first aeroquay, the central power plant and the administration building were completed in 1964.

The aeroquay was designed according to the best available projections of passenger volumes and of aircraft dimensions, and in the first few years of its operation the terminal functioned successfully up to its designed capacity. With the advent of jumbo jets, curb space for landside vehicles proved inadequate and difficulty arose in expanding the processing areas to meet the needs of the larger aircraft. For these reasons, the original concept for the Toronto International Airport was al-

tered and a linear terminal was developed rather than a second aeroquay.

The second air terminal at Toronto International Airport, designed to double the airport's passenger handling capability, was completed in 1972. The new terminal is two stories in height, plus mechanical penthouse, just over 3000 feet long, and is located south-east of Aeroquay No. 1.

Modular in concept, the terminal was built in two stages. Stage 1, which provides four modules, each of which can accommodate a 400-passenger aircraft, houses all regular public amenities, such as restaurants, cocktail bars, as well as other related airport facilities and offices. All Air Canada flights in addition to Air Mexico and Air Jamaica Charters use this terminal. With emphasis on decentralization, each module contains facilities for ticketing, customs, baggage and passenger pro-

cessing. Decentralized services reduce curbside-to-aircraft distances.

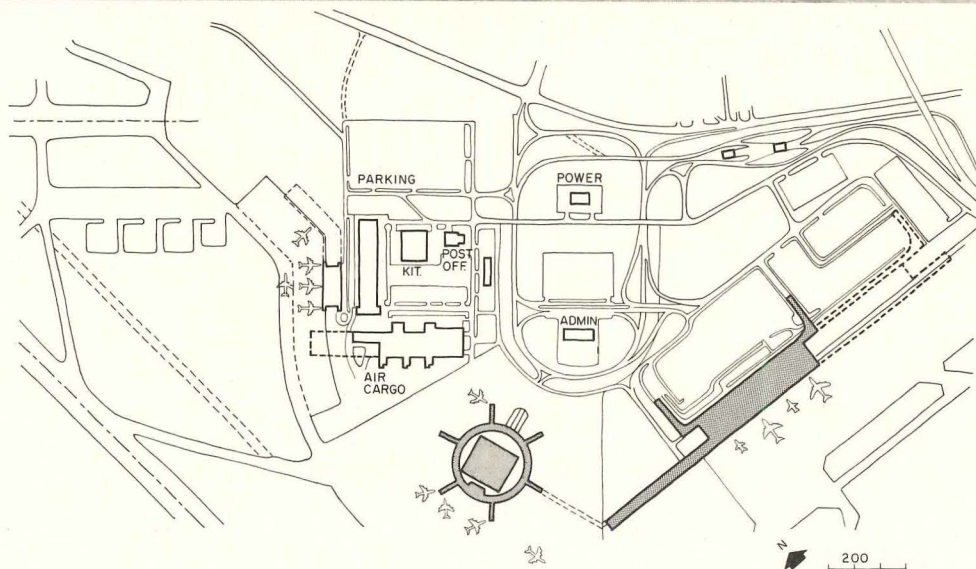
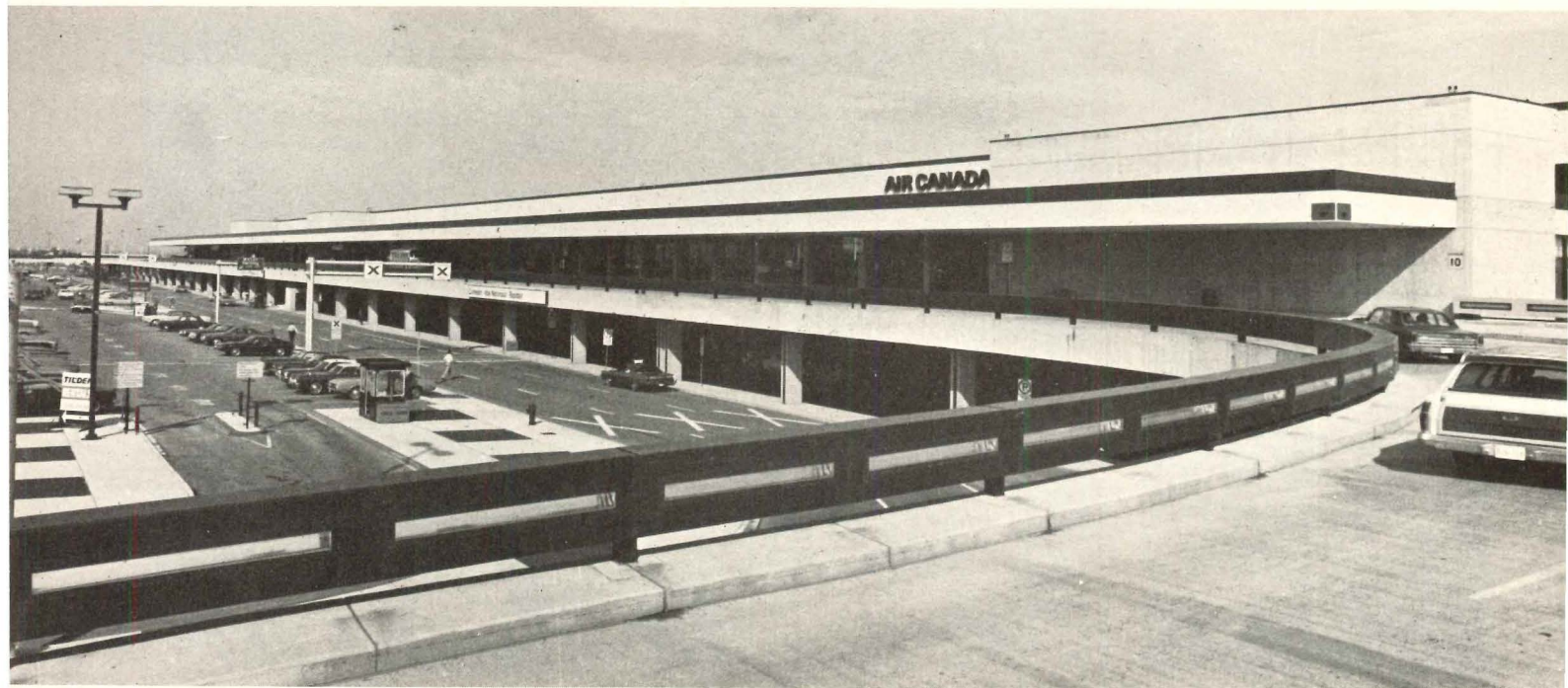
The second stage added a section to the southwest end of the building which is used for Air Canada's fleet for domestic services. Stage 2 is connected to the existing Terminal 1 by a 600-foot underground tunnel installed with moving sidewalks which facilitate passenger movement between the two terminals.

Terminal 2 adds 16 wide bodied gate positions to the airport's aircraft handling ability.

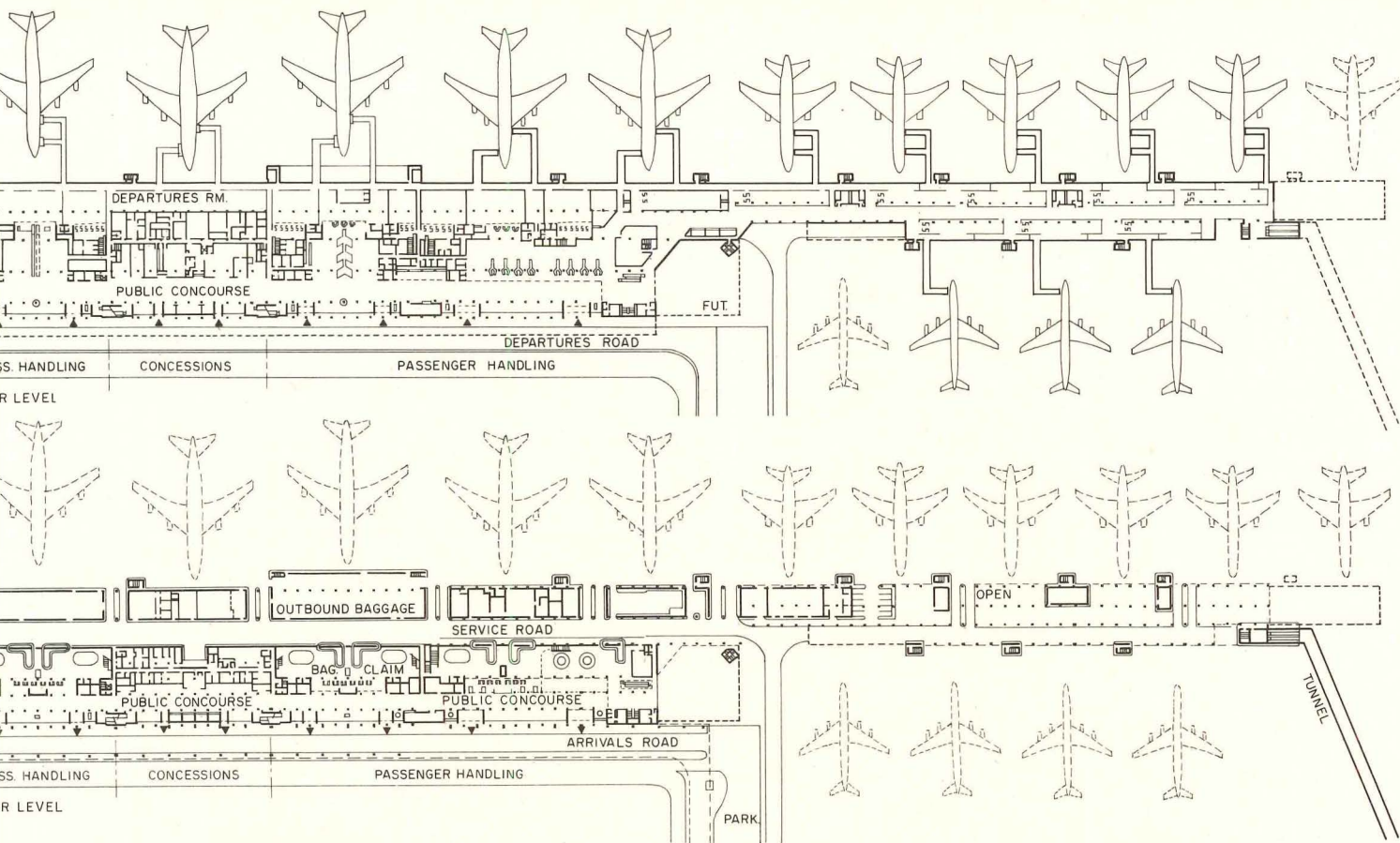
The building has a steel frame with concrete block infill. The floors and roof are suspended deck with concrete topping. The exterior is clad in asbestos board paneling.

The interior finishes, chosen for their economic and durable qualities, are white painted walls, acoustic tile ceilings and exposed concrete floors. The interior is enriched with color accent lighting and supergraphics indicating

Toronto: where straight line and circle demonstrate the evolution of docking and other concepts



The two-level roadway, above, shows the new terminal as departure (up) and arrival roadways. The round structure, Aeroquay No. 1 in the drawing, left and foreground of photo opposite, was completed in 1964, and the layout of its apron traffic and possible congestion are visible in the photo. The straight line concept of the new terminal known as Terminal 2, is shown in photos and plans opposite. The modular plan will permit additional sections to be added to the long terminal as traffic increases.



public amenities. A contemporary sign system of pictographs eliminates the need to have every sign in three languages.

Terminal 1, known as the Aeroquay, was designed in 1957 to handle airlines carrying 100 to 125 passengers with an expected capacity of 3.2 million passengers annually. During the sixties, DC-8's, 707's and other bigger jets were introduced into the market, carrying as many as 175 passengers each. This generated 25 to 50 per cent more passenger traffic with each aircraft, bringing in a total of 6 million passengers to Toronto Airport in 1969, thus putting an enormous strain on parking, customs, restaurants, taxis and on the surrounding road systems. With the arrival of the 747 in the early 60's, Terminal One could not cope with the resulting increase in traffic.

Congestion occurring at all major airports has not arisen from the increased number of

passengers alone, but from the unexpectedly fast turn around time now possible with large aircraft, this means the airport is handling larger crowds at more frequent intervals for longer and longer periods.

The number of passengers processed per year is no longer as important as the number that can be processed per minute. Each passenger expects to park, check his baggage, go through customs, find his gate and his seat in the shortest possible time. By decentralizing the facilities, as in Stage 1 of Terminal 2, congestion is greatly reduced. Baggage is checked on the sidewalk or just inside the door, and ticketing and customs, instead of being centralized for the whole airport, is situated to service each individual aircraft.

TORONTO INTERNATIONAL AIRPORT, Ontario, Canada. Architects, engineers and planners: *Searle Wilbee Rowland.*



management program for airport terminal development

Arnold W. Thompson, president, Arnold Thompson Associates, Inc., Airport Consultants
subsidiary of Lester B. Knight & Associates, Inc.

The development of new airport passenger terminals is usually difficult and frequently frustrating. In addition to environmental problems, other major hurdles include decisions on need, agreement on functional approach, and method of successfully financing the facility. As a result of these elements, the airport terminal development problem must be viewed as a management problem as well as a technical one.

Facility development of any kind is usually based on the forecast of demand. For a commercial passenger airport, this is largely based on projections of passenger traffic which, in turn, is translated into data about aircraft operations, peak hour gate requirements, terminal facility requirements, ground access routes, estimates of capital investment, maintenance and operation, and prospective revenue. Other related aviation forecasts, such as cargo, business and general aviation activity and military operations, relate to over-all airport development and have virtually no influence on terminal design but they do influence terminal financing.

Aviation demand forecasts are prepared by aircraft manufacturers such as Douglas, Boeing and Lockheed; the Federal Aviation Administration; the scheduled airlines or their own trade association, the Air Transport Association of America; airport organizations such as the Airport Operators Council International; airport consultants and other interested parties. The diversity of this list is indicative of the complex purposes that sometimes exist. In most instances, the controversy on forecast stems from the rate of growth rather than the potential for a given area. Since rate of growth can indicate the year when new facilities are required, this is the central issue that emerges. Examples of this are reflected in the contro-

versy for the proposed new airport in St. Louis where the question of the year of need has been greatly debated. Another area that creates some uncertainty is the translation of the passenger volumes into quantities of space. This problem can usually be overcome by discussion with the various users and normally gets resolved at the time the financing is raised. One of the last official documents translating traffic into need is now some 20 years old and was prepared by the Civil Aeronautics Agency in 1954. Each airline has its methodology for converting passenger traffic into space requirements, and airport consultants have proprietary models for this purpose as well.

During the last few years of the airline recession, the growth rate in the United States for domestic travel has declined from a peak of over 18 per cent per year in 1968 to almost a no-growth situation in the early 1970's. There are communities which are experiencing growth in excess of the national averages. This would include such cities as Charlotte, North Carolina, where traffic in August of 1974 registered an 11 per cent increase over the previous year. Another city having phenomenal growth is Orlando, Florida, due to the influx of visitors to Disney World and the associated economic development that has resulted.

When it is recognized that it takes from four to five years to design and construct a new terminal and that that terminal must have at least five years' growth built in, the importance of forecasting is self-evident. Recognizing the usual problems of escalation of costs is one thing, but providing a program that can adjust to such crises as the recent energy shortage and the extraordinary interest rates is another matter completely. Since a major airport investment such as a terminal building must today be financially self-sustaining, a new ter-

terminal program must have enough flexibility to adjust to the functional and financial exigencies that will occur during its development.

To accomplish this requires a new management approach to airport facility development that can react quickly enough to adjust to change. The approach must be such that financial information regarding the project, whether it comes from a functional change or a radical change in the interest rates or in the reduction of user needs, can be acted upon to prevent erosion of the program itself. The instances where airport terminal programs have been rearranged, rescheduled and under-financed are unfortunately prevalent in the United States. The prospect of a community going out for a supplemental bond issue on a project that has become out of control is embarrassing and in some instances has raised the threat of Grand Jury investigation. It is absolutely essential in today's volatile money market that management controls be applied to maintain a project on budget and on time.

Airport management that is staffed sufficiently with financially and technically sophisticated personnel can accomplish this—provided its decisions are free of politics. It must also be recognized that, except for some of the largest cities which have had experience in projects in excess of \$100 million, most of the medium-size cities have not handled programs of this magnitude. In these instances, airport management requires staff assistance from a consultant experienced in airport finance and terminal development.

The project management must have sufficient authority to schedule, change and, if necessary, recommend cancellation of certain aspects of the project in order to maintain financial integrity. This must be monitored on a day-to-day basis and requires the use of computers to maintain up-to-date information.

The project management staff must provide direction to the professional firms working on the project: architects, engineers, landscape architects and other special consultants. In addition, it must be the first point of contact for all user groups, the airlines and concessionaires. The third area of responsibility lies with the financial community from which funds are borrowed and in some instances grants are received. The project management team, normally working with the financial director for the community, would be the point of contact with bond houses, bond counsel and with any users whose faith and credit might be involved in any program. The purpose of this diverse contact is to provide one central point where all technical, design, financial and management decisions can be brought into focus.

An example where this approach is being utilized is in Charlotte, North Carolina. The Douglas Municipal Airport in Charlotte is emerging from a modest \$25 million investment to a facility which will require an additional \$125 million over the next five years. The community has a City Manager form of government that is extremely well run, as reflected in the AAA bond rating that it enjoys. The airport manager, R. C. Birmingham, Jr., while in the process of managing the existing airport and coordinating the efforts of the community for other aviation developments, is

SCHEDULE A
CHARLOTTE - DOUGLAS MUNICIPAL AIRPORT
DEVELOPMENT PROGRAM
(CONSTRUCTION, ESCALATION, FEES & CONTINGENCIES)

ITEMS	START DATE	COST OR ESTIMATE	FAA PARTICIPATION	FAA FUNDING REQUIRED	CITY'S SHARE	CITY FUNDING REQUIREMENTS
PHASE I (900A) 68 PLAN	-	\$ 11,789,000	\$ 5,894,000	FUNDED	\$ 5,895,000	FUNDED
FIELD IMPROVEMENT	-	1,442,000	888,000	FUNDED	554,000	FUNDED
WAY 18R/36L - SITE WORK	-	7,152,000	5,364,000	FUNDED	1,788,000	FUNDED
PAVING, FENCING, PARKING LOT	-	918,000	388,000	388,000	530,000	FUNDED
WAY 18R/36L - PAVING	1-1-75	10,039,000	7,529,000	7,529,000	2,510,000	FUNDED
WAY 18L/36R - PAVEMENT	1-1-75	94,000	71,000	71,000	23,000	FUNDED
PHASE II (250A) '73 EXPANSION	-	4,293,000	3,220,000	3,220,000	1,073,000	FUNDED
TERMINAL PLANNING	1-1-75	1,000,000	-	-	1,000,000	1,000,000
WAY 18L/36R, STR./T/W'S	1-1-76	1,767,000	1,293,000	1,293,000	474,000	474,000
TERMINAL PLANNING	1-1-76	1,000,000	-	-	1,000,000	1,000,000
PAVING WORK, T/W'S, LIGHTING, VORTAC	1-1-76	15,208,000	10,008,000	10,008,000	5,200,000	5,200,000
TERMINAL CONSTRUCTION	1-1-77	26,228,000	-	-	26,228,000	26,228,000
FINISHINGS, LANDSCAPE, SIGNS, ETC.	1-1-77	7,130,000	-	-	7,130,000	7,130,000
LAND & EASEMENTS	-	22,000,000	16,500,000	16,500,000	5,500,000	5,500,000
LAND, ROADS, LIGHTING, ETC.	7-1-78	13,370,000	8,160,000	8,160,000	5,210,000	5,210,000
PAVING	7-1-79	128,000	-	-	128,000	128,000
CONTINGENCY	-	3,130,000	-	-	3,130,000	3,130,000
TOTALS		\$126,688,000	\$59,315,000	\$47,169,000	\$67,373,000	\$55,000,000

now faced with a major development program much larger than his staff is geared to handle. Even with rapid personnel expansion, the level of activity and the experience required places great stress on the city. To accommodate this, they have selected the project management approach to accomplish their objective. The project management team will be, in essence, a resident, supplemental staff drawing from highly experienced people to accomplish the city's objectives. Since the present terminal is undersized even for its current level of activity—and in keeping with the five-year growth projection referred to previously—the terminal development program will provide triple the space of the present facilities within the next five years.

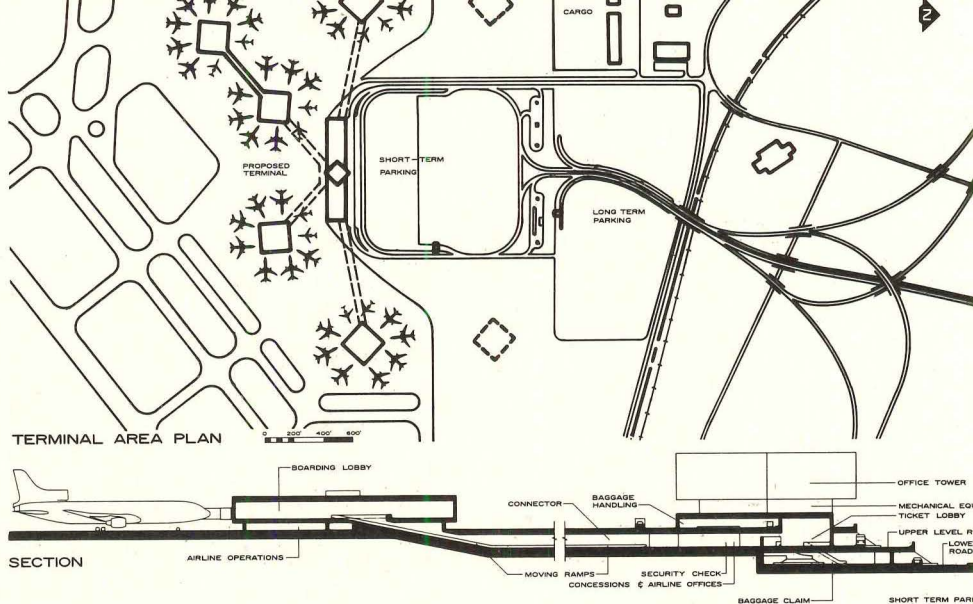
While the terminal building itself is a major focus of attention, an extensive program of airfield development is under way, including a new widely spaced 10,000-foot parallel runway, now under construction, and procurement of land and air rights that must be secured both for the development of the airport and to insure its compatibility with the community. Since all of these elements involve capital cost, the terminal financial program must accommodate over 72 elements in addition to the terminal itself. This does not include the coordination with Federal and State agencies which, in turn, have extensive financial impact on the facility. The chart headed "Schedule A" reflects an analysis of the staging and funding required for the Charlotte terminal airport development program.

The sources available for the funding of this project include grants from the Federal Aviation Administration to the extent available, from the State of North Carolina and from operating revenues at the airport. Other borrowings in the nature of general obligation bonds or revenue bond financing will be determined by the money market conditions at the time of the need for the funds.

In order to determine the viability of the airport program including the new terminal, a financial plan recognizing either of the financing options was prepared. Analysis has indicated that the financial program can be tailored to the proposed development program with either general obligation or revenue bonds as the form of financing. This analysis indicated that, from all reasonable projections including escalation, capitalized interest, maintenance and operating costs and reasonable expected revenues, the City of Charlotte can afford this project and is proceeding along these lines.

The project management team must accomplish the following:

1. The scale of the building program and, in general, the functional concept must be adhered to in order to meet the schedule and to stay within the present budget.
2. The schedule for the project, which includes projected escalation and timing of cash flow, must be adhered to, or if it is altered, the financial program must be changed to accommodate it.
3. The cash flow required for all the elements of the project must be scrupulously monitored to prevent last minute emergency borrowings or supplemental bond issues



which can play havoc with the integrity of the program.

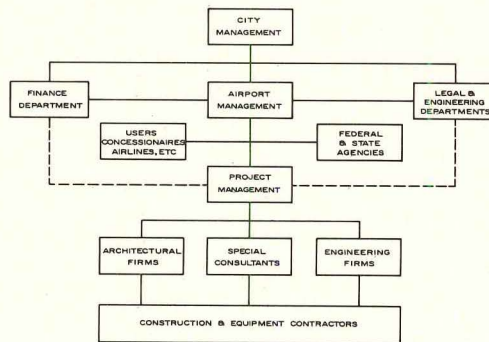
In Charlotte, the project management organization is now being developed. The resident project management staff who will assist the airport manager, Mr. Birmingham, will be housed at the airport and will have access to the users, the funding agencies and the professional design firms working on the project. So far, these firms include A. G. Odell and Associates, architects, and Talbert, Cox and Associates, civil engineers. Arnold Thompson Associates remains in a consultant capacity.

After construction is under way, there will be an indirect relationship with the contractors but this will remain the fundamental responsibility of the professional firms working on various elements of the airport. The proposed management organization for this project is shown in the chart on this page.

The resident project manager will be responsible for establishing the CPM schedule and for directing all of the diverse design activities. He will also have available to him financial advisors who can interpret the impact of program changes and can translate them into rental cost data or other useful criteria for this purpose.

A special "Fastcost" computer program takes into account the various elements of cost and provides data for a ready analysis and for approvals. It can project, for five- and ten-year intervals, costs and revenues in terms of annual rental and fees per passenger and for various numbers of gates and/or area allocations per gate.

In an airport terminal project, there is normally



TYPICAL AIRPORT PROJECT MANAGEMENT ORGANIZATION

ally a great variety of interests and directions. It is not unusual for modest-size terminals to have numerous change orders which have resulted from changes of opinion, procedure, and, in recent days, changes in the financial position of the airlines on a day-to-day basis.

To attack this most difficult problem, it is proposed that the airport project management group meet on a scheduled basis with the various users, financial institutions, designers and contractors. At these meetings, when a change is proposed, for whatever reason, a printout regarding the financial implications will be made immediately available for review. The representatives at the meeting will be required to establish their levels of authority for the approval of such changes that may result. Should the level of authority be lacking at the progress meeting, the implications of the change and the approval of the change must be brought to the attention of the proper level of management for approval. It is imperative that such matters as the cost of redesigning some element be reflected in the decision-making process. It is the hope that this will prevent grossly unnecessary and wasteful design detours and will also recognize the cost of starting and stopping of design or construction.

A project of this magnitude represents a significant challenge to a city such as Charlotte. Airport manager Birmingham has been insistent that the entire program must have visibility from the start. The airport has a reputation of financial and management integrity that it must maintain. Of equal importance to the success of this program is the realization that the current airport development program must serve as the history for even larger programs in the future.

In a community such as Charlotte, which is emerging as one of the population and economic centers of the Southeast, the airport could be expected to double in size within the next 15 years. The current program therefore is only a stepping-stone to an extensive capital program that will require imagination to accomplish and a successful track record to finance. The project management approach, recognizing this as a management problem, is the procedure the City has selected to meet its commitments to future generations.

The human dimension in airport design

Marvin H. Mills, senior architect, Eastern Airlines

The in-house airline architect is both captivated and liberated. He does not have his own office but he does have a working relationship with the airline industry which enables him to exercise his expertise on a realistic basis. The in-house facilities architect has a special role at airports. He is usually an intermediary between the airport authority's consultant architect and the client airline. He is the technical contact to the consultant as well as the protector of the carrier's interests.

Yet, beyond this, he has a special role as guardian of the public interest. His intimate knowledge of the function of his airline enables him to serve the public as a professional. He is ethically responsible for helping to create the public spaces of a high architectural character. His very existence seems not to have been appreciated by Robert Sommer in his article in the *New York Times* in the Travel and Recreation Section on March 3, 1974 entitled: "Our airports are Sociofugal, not Sociopetal, and it's an Outrage." Had he interviewed some of the airline architects A-E's he might have arrived at a different analysis of the proper design criteria for airports. Sommer's contribution lies in having underscored the question of the human response to airports as a design problem.

His biting remarks served a purpose by focusing on the design problem as not merely the logistics of moving planes, people, baggage and cars but also a problem of how to treat people as people while solving the logistics problems.

The heart of Sommer's argument is that airports are places that generate alienation—that whereas people need tender loving care, a place to make friends, relief from the rigidity of a mechanized existence, they are instead subjected to the manipulation of different forces which provide them with a sense of these things and instead make of their flight experience, especially their preparation for departure, a surrealist nightmare.

While I sympathize with his plea, I find fault with both his premise and his analysis. It is not reasonable to expect airports by themselves to provide a social or therapeutic function. Sommer is upset that people do not talk to one another on planes and in departure lounges. He could have cited the commuter trains or the subways. I have ridden the trains for years and have rarely spoken to a fellow commuter, let alone made his friendship. To a certain extent, we all treasure our privacy and appreciate the opportunity not to have to make conversation or to be pleasant. One does not engage in spontaneous conversation any more frequently in these mass commutation areas than at the airports. Nor are the more proliferation of subways any more conducive to making friends. Having used the subways for some 30 years, I can recall only a few times having spoken to strangers on the trains and platforms other than to ask a direction.

Nor is the purpose of moving masses of people one of improving one's social contacts. The airport, like Corbusier's "machine a habiter" is an instrument, except instead of hous-

ing people it is used for moving people. Like any modern machine (including Corbu's), it creates new freedom for people, in this case by giving them vastly increased mobility. If, in the process it gives them a human environment, then the architect has succeeded. If the airport works poorly and aggravates the alienation by condemning passengers to regimentation, unwarranted delays, oppressive surroundings, noise and confusion, then the architect has failed.

The Futurist movement in art and architecture of the 1920's in Italy extolled the machine, energy and speed—in their day, the automobile—as symbolic of the modern age.

However one might disagree with the views or politics of these protagonists, they were right in the assumption that speed on a scale previously unknown to man was symbolic of the excitement and freedom of the new era. That is why the airport needs no special device like movies, play areas for children or other diversions. The child does not have to be specially amused, as Sommer believes. Just being there and flying is an exhilarating mode of participation. The airport is backdrop to flight.

Every building must decide whether it should call attention to itself or be purposefully bland. The Solomon R. Guggenheim Museum by Frank Lloyd Wright perhaps calls unnecessary attention to itself. The Barcelona Pavilion by Mies van der Rohe in 1932 required no other product but itself. But the Municipal Building opposite the City Hall in Boston was purposefully designed to act as backdrop to the main attraction, the City Hall.

Airport terminals need not be any more self-centered than the City Hall. They can be modest, functional and economical so long as they provide the backdrop to flight, the drama of moving along a moving sidewalk, of watching the apron activity through a departure

room window or seeing a blanket of clouds and a setting sun from the plane window.

The problem of providing drama at airports is not in their mechanical systems but in the invisibility of those systems. There is a beauty to the silent workings of the computerized reservation systems. Instant information on seats and flights is provided at the push of a button. Baggage systems, in spite of all their delays and malfunctions, lift the burden from the arms of passengers. The planes themselves, designed basically for aerodynamic considerations, epitomize modern architecture.

Modernity need not mean sterility. The airport should be designed to be as friendly, reassuring and well-organized as possible. Clarity or organization of spaces must be achieved to counterbalance the inevitable confusion and anxiety of the situation.

Departure rooms should be designed to give special consideration to the seating arrangement. It may be true that most airlines arrange their seating in a regimented manner. This is the easy way out. Our classrooms are guilty of the same misguided sense of order. But with a little thought it is possible to arrange chairs so that there is a maximum of diversity, some place for everyone. For those who want a conversation grouping and for those who prefer their privacy there should be different arrangements. Note the seating arrangement planned for the new Eastern departure area in the Syracuse Airport expanded concourse in the drawing, next page. The same principle of concern for the individual was reflected in the all-class lounge for Eastern at the Puerto Rico airport, below. There the curved drapery provides warmth, texture and color for conversation groups arranged around a unifying coffee table. At the same time, there are various other seating choices.

Far from being sterile, an effort was made to use black ceramic floor tiles, rich carpeting and bright colored chairs to create an ambience in keeping with the Caribbean culture. There is an area set aside for small children and their mothers. The receptionist is given a



EAL-designed lounge—San Juan Airport.

key position at the entry to afford a measure of control of people entering as well as people in the room.

One must appreciate the extent to which maintenance problems affect the design of airports. For example, one should choose a carpet pattern that conceals cigarette burns. Regardless of income level, there is a heedless urge to flick the cigarette ashes on to the carpet or even grind it out into the carpet in spite of the prevalence of carefully placed ashtrays. Ashtrays set into tables must be securely anchored or they have a strange tendency to walk away.

Mr. Sommer noted that chairs are often bolted together in groups of three or more. He ridiculed the idea that anyone would want to steal chairs. Yet, they *are* stolen—especially when the departure area is newly furnished. But the real advantage is in maintenance of a planned arrangement undisturbed by either the cleaning staff or the waiting passengers. If they are bolted together, there is less possibility of their being randomly redistributed.

And, yes, seats are provided with arm rests to discourage sleeping. While this sounds inhuman, one must consider that to do otherwise would be to convert these areas into dormitories with people putting their feet on the upholstery and using the area even if they had no flight to catch. A disagreeable environment would readily be created to the annoyance of most of the passengers. Perhaps the best solution to this problem is at Frankfurt Airport in Germany, where a series of semi-reclining chairs is available near the departure area for passengers who wish to stretch out. It is the nearest thing to providing a bed, yet retaining individual chairs.

Sommer criticizes the fact that many airports are designed to pull people through their concession areas so as to encourage them to spend their money while depriving the concourse area of needed amenities. It is true that the airport is a commercial enterprise. Unlike the public school system, it usually has to pay for itself. The airport is no different from other parts of our free-enterprise economy. Further, accessible concessions are neither anathema nor compulsory to passengers. The most-crowded car on the commuter train is usually the bar car. Naturally, the commercial areas should be kept as far as possible within the bounds of good taste. The architectural consultant and the facilities architect have this responsibility to the public, which transcends the pressures that may be forced on them to sell a product rather than create a human space.

But the architect is beset by countervailing forces. U.S. carriers are fragmented into several trunk lines and many smaller lines. The resulting competition creates a great deal of confusion as attempts at unified design of terminals are distorted to suit each carrier's needs and public image. Their expressed needs are constantly being changed as each airline tries to anticipate its projected situation ten or even twenty years in the future.

But, on the other hand, the competition can be healthy. Each carrier competes in service for the passenger market. Federal regulations tend to standardize and determine ticket cost, safety regulations and routes. Thus every

attempt is made by each airline to satisfy the customer's demands for prompt and efficient handling of baggage, adequate departure areas, reduced walking distances, auto parking facilities and pleasant decor. The tendency to manipulate the passenger commercially is minimized by this overriding need to outdo the competition. The passenger must be treated so well that he will come back. That he is often not treated this well generates even more internal criticism within the company than public criticism. No one wants to alienate the potential customer.

An underlying problem that all architects face, including airport architects, is the general corruption of taste. People have been barraged so long with cheap commercialism and gimmicky design that they do not always expect or respond to elegance. The supergraphics and out-size signage that some airlines use behind their ticket counters are often offensive to sophisticated taste. But prior conditioning of the

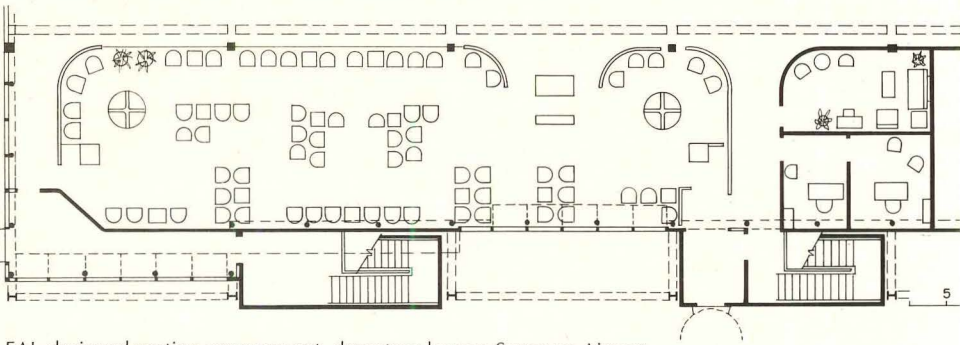
public seems to have conditioned them to accept the most crass signage and decor. And purveyors, as clients, confuse clamor with class and blatancy with impact.

This driving down of the public taste is a general problem. By and large the airports at least as well as other centers of transportation. Perhaps because airports are newest on the scene, much more is expected of them; and because people have anxieties about making their plane due to schedule changes, weather conditions, transportation problems from the city to the airport, etc., the threshold of tolerance is lower. Therefore, a seeming or actual flaw in the system results in an adverse public reaction.

These many considerations of the public reactions to airports must be an essential dimension in airport design. The real and complex logistic problems must, in the end, be translated into spaces that are an uplifting human environment.



AAL public space, San Juan Airport, designer Rudolph Horowitz, architect



EAL-designed seating arrangement, departure lounge Syracuse Airport. Building architect, MacKnight-Karmmsee-French.



EAL-designed lounge, Logan Airport, Boston. Building architects: Minoru Yamasaki & Associates and Desmond & Lord Associates.

Novel approaches to some special hvac-system problems



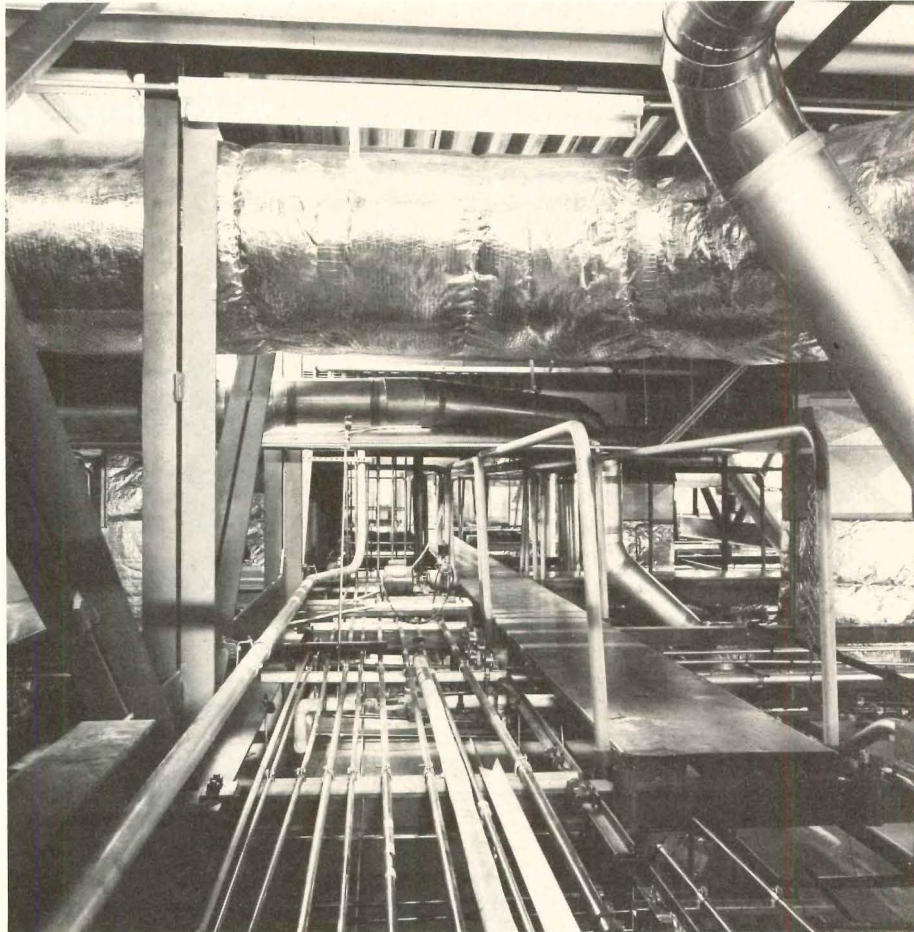
Art Hupy

Two electronics plants require different types of flexibility

Tektronix, Incorporated, an Oregon manufacturer of cathode-ray-oscilloscopes, needed people-oriented flexibility for its new Electronic Devices Building, and machine-oriented flexibility for its new Mechanical Products Building. In response, the architects, Wolff Zimmer Gunsul Frasca, and their engineers, Nortec, Inc., took two different approaches to the design of the mechanical systems and of the structures.

For the Electronic Devices Building, in which large numbers of people work in a highly controlled environment on the construction of integrated circuits, two interstitial floors were provided for three working floors. Because constant change and modification in this facility was anticipated, the supporting systems had to be dynamic as well. To facilitate easy removal and installation of large instruments and equipment on the working levels, the architects designed the continuous glazing at the working levels for easy removal of the glazed framed units. Likewise, for access to the mechanical levels, the exterior metal panels also are removable. And the overhangs serve as convenient working platforms.

The Mechanical Products Building, with activities ranging from clean-laboratory space to very heavy metal- and plastic-forming processes, required flexibility of a different sort. The architects' charge was to provide a space that would accommodate completely unknown processes in the future without incurring premature or excessive capital costs. The issues that required resolution were: 1) The building had to provide for heavy equipment such as punch presses which implied on-grade bearing. On the other hand, there were certain wet processes that required low-slab drainage. The location of these operations and processes could not be established prior to construction;



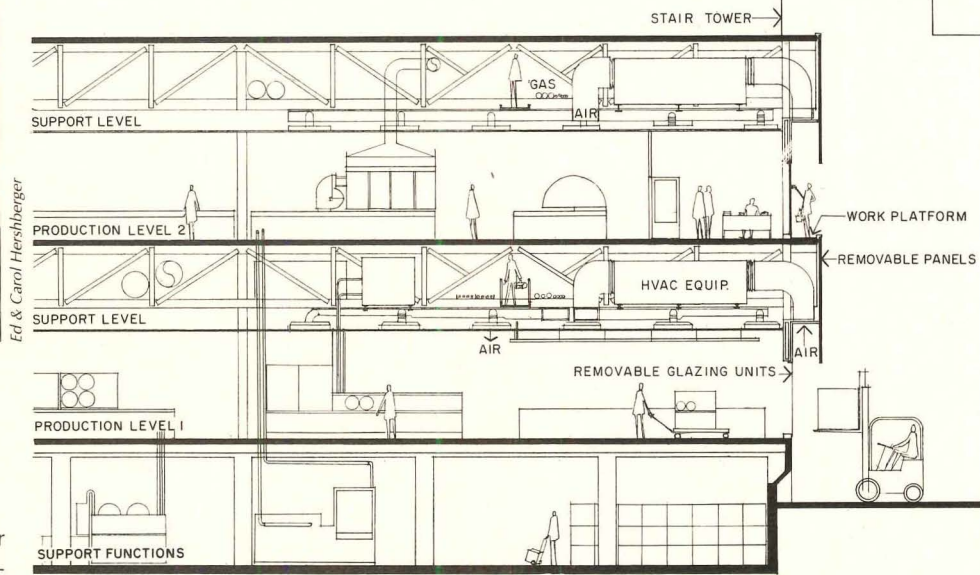
Interstitial spaces make it easy to modify mechanicals to suit production changes.



Ed & Carol Hershberger photos



Flexibility for people was required here.



Removable glazing and exterior panels allow new production or mechanical equipment to be easily bro

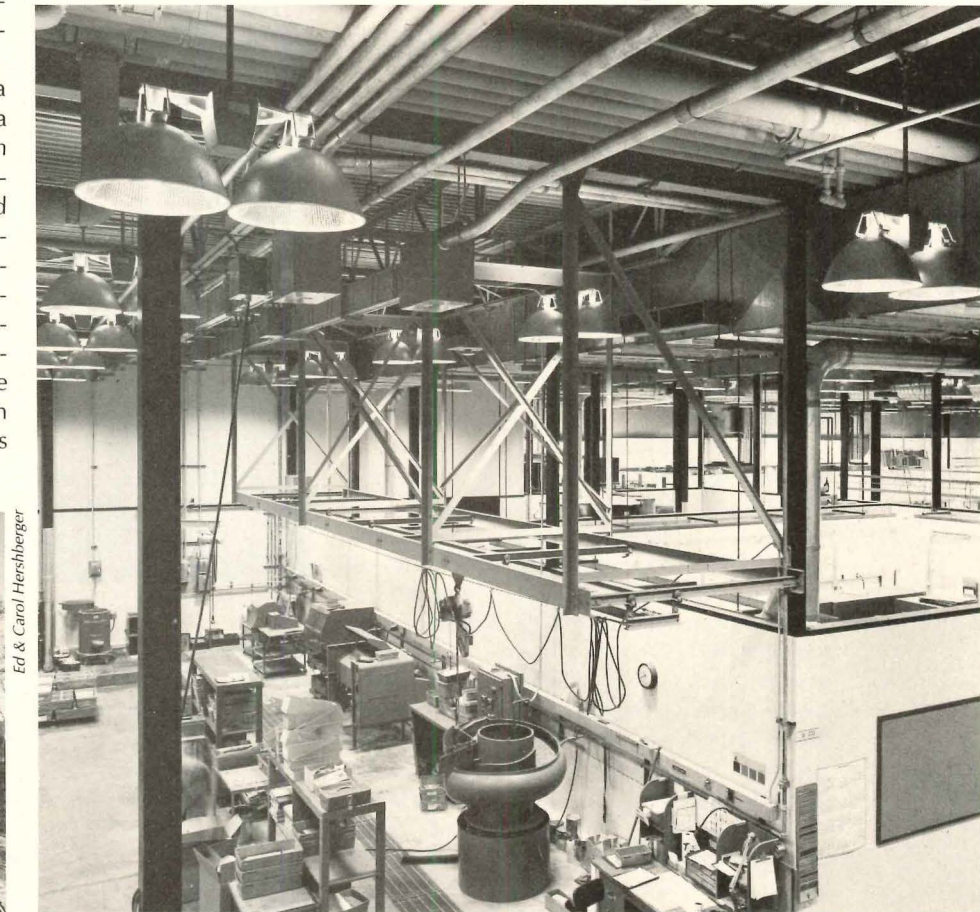
2) future offices and laboratories requiring air conditioning and exhaust had to be anticipated; 3) no determination could be made as to what extent processes might be automated in the future.

The design solution was a light-steel-frame, high-bay industrial building, uncommon in the electronics field. The unrestricted height made it possible to preserve a layer of space below the ceiling plane for future conveyor systems or other forms of automated production.

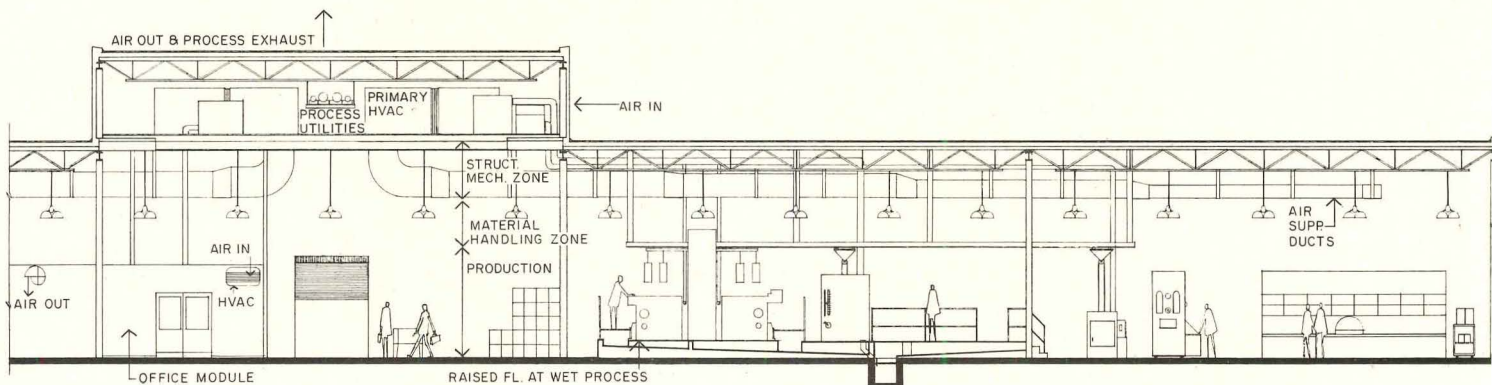
The mechanical solution consisted of a series of large air-handling units located in a monitor above the ceiling plane. This system provides thermal conditioning for the entire facility, and is sized to accommodate anticipated exhaust systems. If the capabilities of this system are exceeded in the future, the only addition needed will be that of make-up air for exhaust. If closed spaces such as offices or laboratories are added, fan equipment is provided for ventilation only which relies on the in-building air system for supply air rather than on ductwork connections to the main systems in the monitor.



Flexibility for machines was required here.



High-bay building has a materials-handling "layer" for easy changes. Mechanical equipment is on the





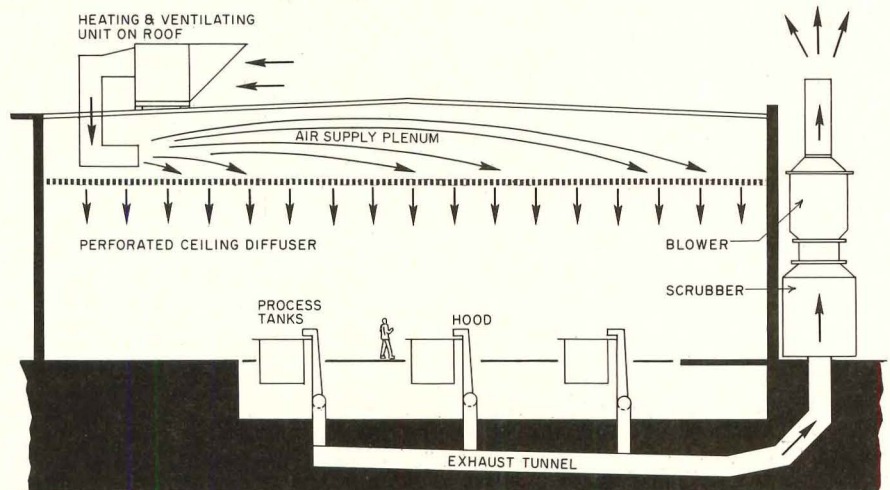
draftless air-supply system designed for high air changes

A large portion of the Navy's Aircraft Accessories Overhaul Shop at North Island Naval Air Station in San Diego is devoted to metal finishing operations that require effective removal of noxious fumes. Both the process engineering and the building design were performed by Daniel, Mann, Johnson & Mendenhall, making it possible for the firm to integrate the process and the control system into the design in an effective and architecturally pleasing manner.

The processes, which included chemical cleaning, anodizing, electroplating, painting and plasma spraying, dictated air supply rates as high as 62 cfm per sq ft (in comparison, normal air conditioning uses only 1 to 2 cfm per sq ft). To avoid drafts, a suspended perforated metal ceiling was used to form an air supply plenum and serve as an air diffuser covering the entire ceiling. Air handlers on the roof deliver tempered air to the plenum. With this design, the size and expensive ductwork was eliminated, and, further, a finished ceiling was provided.

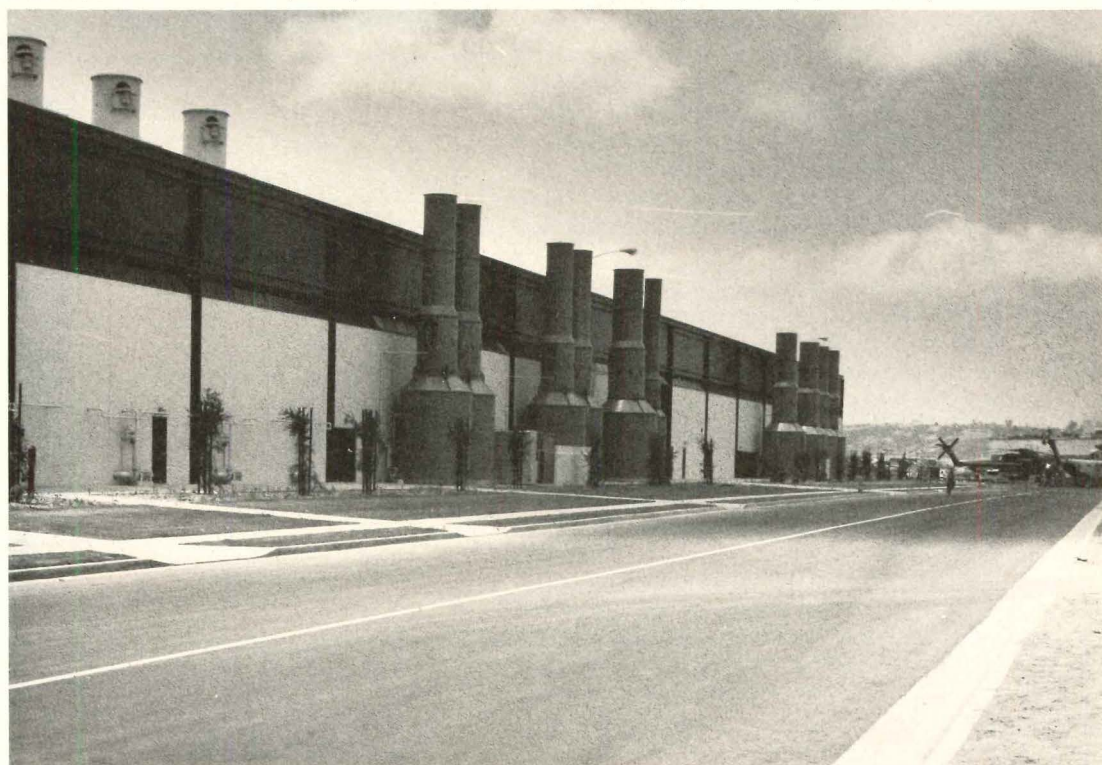
The processing tanks require many utility and piping services, and to provide space for these, the tanks were placed in a pit, but extending above the operating floor. Utilities and the collector exhaust ducts were arranged for easy access for maintenance. The main exhaust ducts were actually tunnels crossing the pit floor and running to the side of the building, then rising into the bottom of scrubbers prior to discharging the fumes into the atmosphere.

Because the building is in a prominent location on the air base, special enclosures made of fiberglass-bonded resin, with an integral orange pigment, were fabricated for the exhaust-air scrubbers to give them a neat appearance. Vertical air scrubbers were located over the tunnel risers, with in-line centrifugal fans at the top of the risers, and stacks extending above the roof.



The entire ceiling is a diffuser to avoid drafts.

The scrubbers were set inside specially-fabricated plastic enclosures to organize the equipment neatly.





Honeywell photos

Console controls and monitors 65 buildings.



Automation control center in the Health Sciences building now handles a 10-building complex.

A major university saves energy via an automated control network

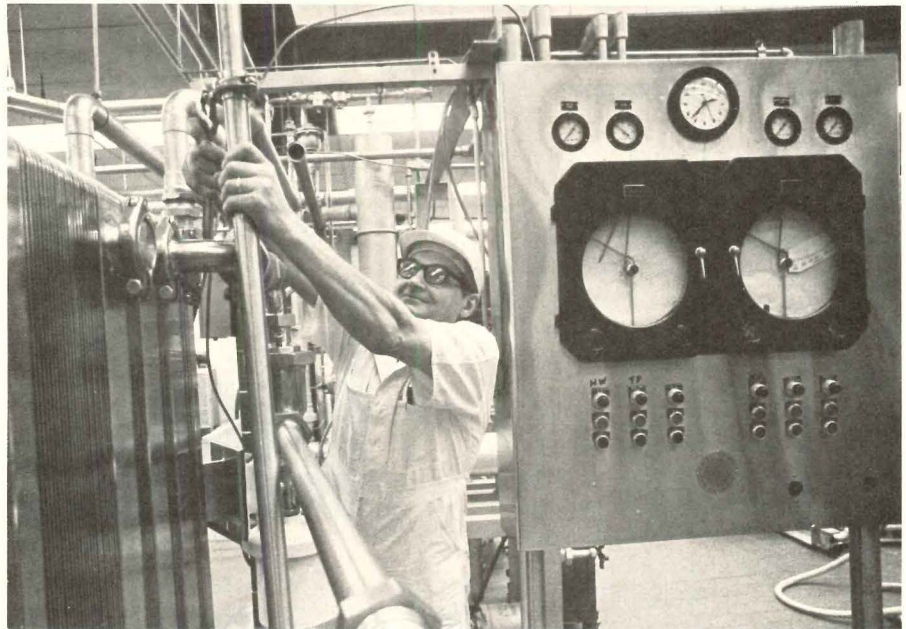
An automated control network at the University of Minnesota, monitoring some 2000 check-points in 65 buildings, is estimated by its physical plant director to be saving a half-million dollars a year in operating costs, not to say the energy to heat and light a small city.

By employing digital pulse transmission, only a pair of leased telephone lines is required for the automation control console to check, correlate and control systems in buildings as near as 200 ft apart and as far as 200 miles away.

The University had installed a hard-wired automation system a decade earlier in its 10-building medical complex, and five years ago, a desk-sized console in the Shops building. But because of the involved and expensive station-to-station wiring, this latter hook-up was limited to 16 buildings on the Minneapolis campus. Both of these systems will be gradually phased into the over-all master system. A third automation system, started in 1965, that handles four buildings on the University's west bank, also will be absorbed into the master system.

The automation system includes an "electronic calender" that automatically starts up systems in each building at a preset time and shuts them down later, reflecting actual building use. Even on below-zero days, heating in many buildings can be turned off at 1 P.M. not to be started again until 4 A.M.

In monitoring the thousands of check-points, the automation console flashes an immediate warning if any of them go off-normal. An alarm printer gives a permanent record of all off-normal conditions. A second printer provides a summary of all critical points on all campuses, enabling the operator to pinpoint problems before they become serious. Further, efficiencies of equipment can be checked, and maintenance conducted more effectively.

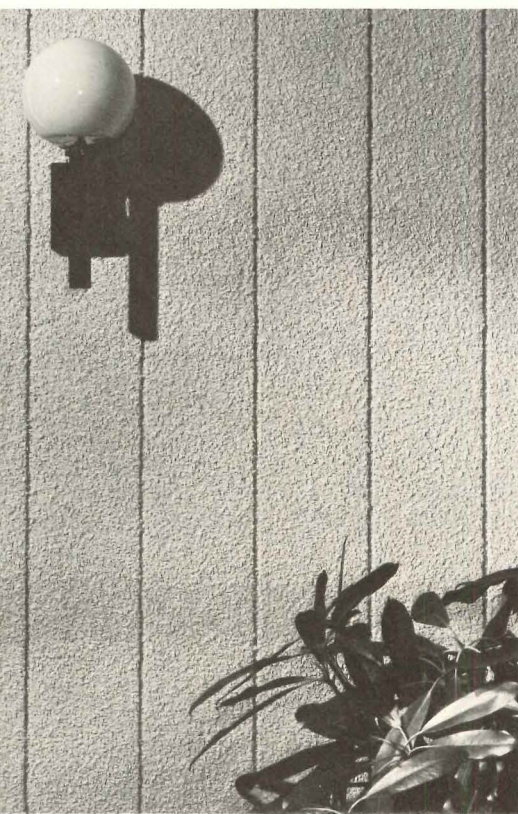


Pasteurizer is monitored by the console 10 miles away.



Steam plant is just a half-mile away.

For more information, circle item numbers on Reader Service Inquiry Card, pages 231-232.

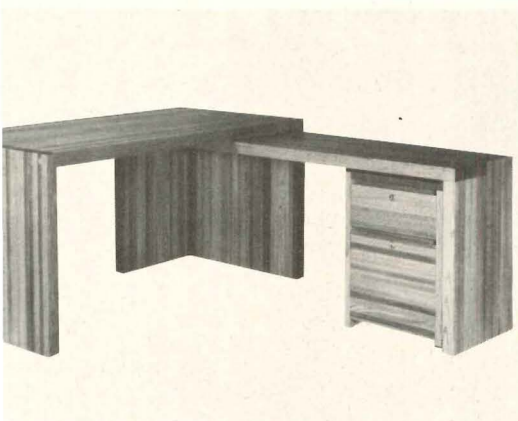


Aggregate surface on exterior plywood

and nails like wood. "Shadow Line," one new *Sanspray* panels, a aggregate - on - plywood siding line. Available in tones including white oak, the product shown

features $\frac{3}{8}$ -in. deep grooves $\frac{1}{4}$ -in. wide, 8 in. on center. Ship-lapped edges are offered on the panels, available in 4 by 8 ft and 9 by 10 ft sizes. ■ U.S. Plywood, New York City.

Circle 300 on inquiry card



Block furniture for the office

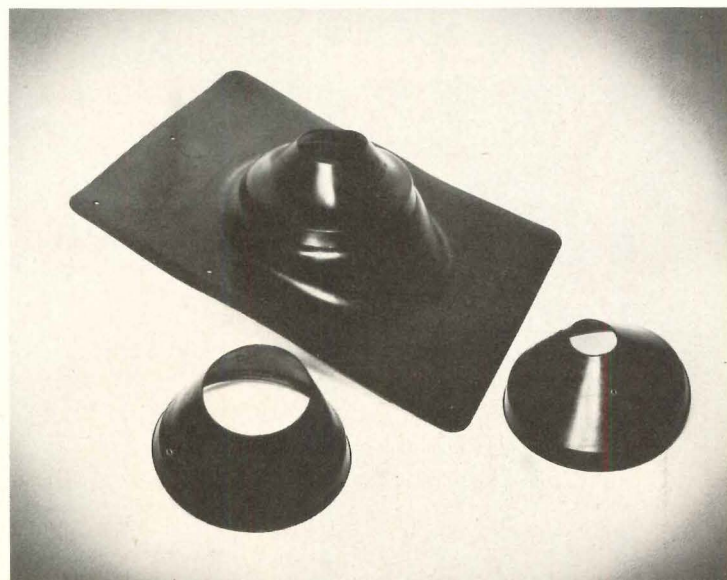
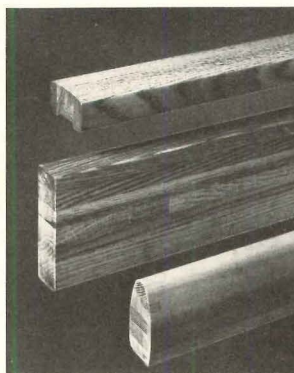
of butcherblock office represented here by a desk also includes credenzas, and coordinated accessories. ■ Thompson Mfg. Co., Chester, N.H.

Circle 301 on inquiry card

Acrylic/wood handrails

Acrylic/wood is a pre-finished product composed of natural hardwood impregnated throughout with acrylic plastic and hardened by irradiation. The result is said to be the look of wood with greater indentation and abrasion resistance than conventionally treated hardwoods. Laminated handrails are available in four shapes and three wood types: oak, walnut and ash. ■ Julius Blum & Co., Carlstadt, N.J.

Circle 302 on inquiry card

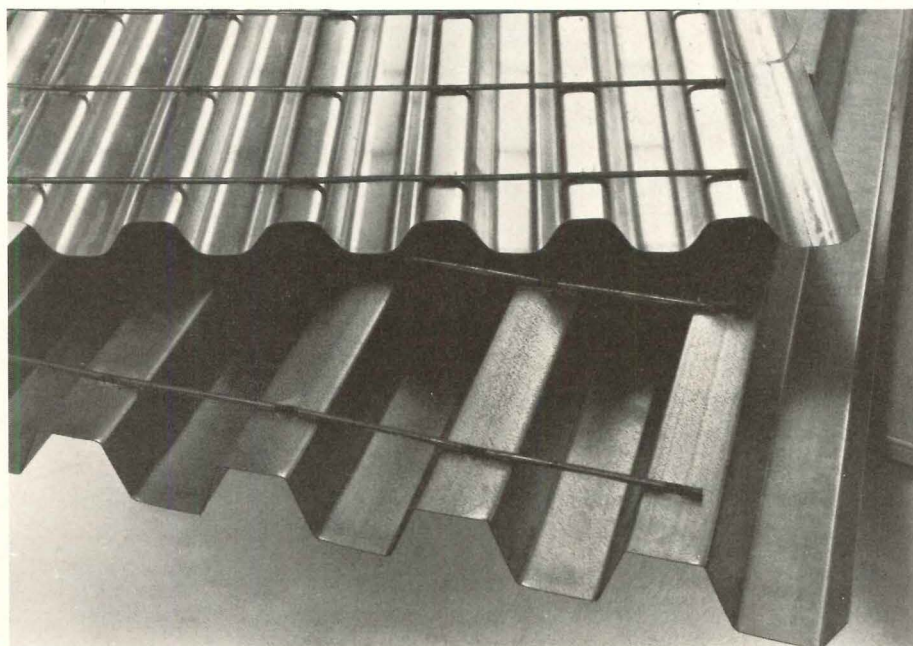


Thermoplastic snap-fit roof flashings and collars

These thermoplastic bases are universal and accept three sizes of neoprene collars: 1½ to 2 in., 3 in. and 4 in. The snap-fit flashings are recommended for use in residential, commercial and industrial applications. They are lightweight and said to with-

stand extreme sunlight, rain and other adverse weather conditions. Made of a flexible, polyolefin composition, they have been tested over a period equivalent to 50 years. ■ Genova, Inc., Davison, Mich.

Circle 303 on inquiry card



Composite structural deck for floor construction reinforces concrete

The new deck shown here is *Tensibond*, with shop-welded cold-drawn deformed wires across the surface of a corrugated steel sheet to provide a strong structural section for

forming wet concrete. Sheets are available with or without a zinc coating, and can be supplied in 24, 22 or 20 gauge high-strength, full hard carbon steel. The wirespacing across the

sheet is designed to run from 3 to 8 in., in 1-in. increments. ■ Wheeling Corrugating Co., Wheeling, W. Va.

Circle 304 on inquiry card
more products on page 175

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Over sixty non-destructible designs in mercury vapor,
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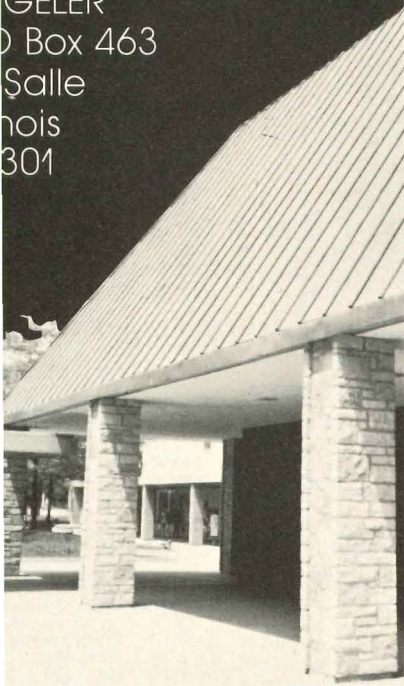
For more data, circle 67 on inquiry card

For more information, circle item numbers on Reader Service Inquiry card, pages 231-232.

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For more data, circle 68 on inquiry card

MOVABLE PARTITIONS / A new catalog describes new features including surface patterns and accessories available. The gypsum panels for the partitions come in 27 colors and five patterns of prefinished vinyl as well as in plain ready-to-decorate panels. ■ U.S. Gypsum Co., Chicago, Ill.

Circle 401 on inquiry card

SOUTHERN PINE GUIDE / "The Southern Pine Use Guide," for architects, engineers and others, has been revised and expanded and is available for distribution. The 16-page technical bulletin has added information on the uses of Southern Pine by size and grade, data on poles and piles, information on types and retentions of preservative treatments and a set of condensed span tables. Still covered by the publication are data on lumber standards, seasoning requirements and stress grades. ■ Southern Forest Products Assn., New Orleans, La.

Circle 402 on inquiry card

VERTICAL CONVEYORS / Selective vertical conveyors for the flow of information, communications and materials from any floor in multi-storied structures are described in a new brochure, which shows typical system layouts and provides installation requirements, operating capacities, and component specifications. ■ American Chain & Cable Co., Inc., Bridgeport, Conn.

Circle 403 on inquiry card

VINYL WALLCOVERING / Products are sampled in a four-page brochure displaying two degrees of stipple finishes. Available in 54-inch widths, these medium duty vinyl wall coverings are produced in a wide selection of new colors said to answer a variety of institutional decorating needs. ■ B.F. Goodrich General Products, Marietta, Ohio.

Circle 404 on inquiry card

ALARM EQUIPMENT / This 96-page catalog describes and offers over 450 intrusion and fire-alarm products. Many are UL-listed. The alarm equipment offered ranges from relatively simple kits with instructions to ultrasonic, radar, and infrared intrusion detectors. Stockroom supplies also are available. A general alarm-system discussion is followed by notes on how to apply the many detector options. ■ Mountain West Alarm Supply Co., Phoenix, Ariz.

Circle 405 on inquiry card

BRIDGE DECK MEMBRANE / A bridge deck membrane waterproofing system described in a four-page brochure is a liquid-applied PVC elastomeric waterproofing system. WABO-4000 becomes a positive waterproofing agent for resurfacing when used on a Portland cement concrete deck, together with a 65-lb asphalt roll roofing. Methods of application are pictured in the brochure. ■ Watson Bowman Associates Inc., Buffalo, N.Y.

Circle 406 on inquiry card

CARPET MAINTENANCE / A folder designed to clear up the confusion which may surround the maintenance of commercial and institutional carpets, details the ways in which professional maintenance service may be utilized for the complete job, in conjunction with an internal staff, for periodic counseling and general supervision, or for "trouble shooting" when the need arises. ■ Carpet Technical Service Institute, Malvern, Pa.

Circle 407 on inquiry card

ACRYLIC/WOOD / *Permagrain* is discussed in a new designer's product brochure. Patterns are shown with additional emphasis on larger scaled ar-

rangements achieved with the use of pickets and bands, and the use of tile patterns of differing color. There is a section on technical data, flame-resistant additives, and new matching handrails. ■ ARCO Chemical Co., Philadelphia, Pa.

Circle 408 on inquiry card

PLYWOOD DIRECTORY / "Where to Buy Hardwood Plywood & Veneer" is a buyer's directory listing the various types of hardwood plywood products and veneer, as well as the species, sizes and other information helpful in specifying hardwood plywood and veneer. ■ Hardwood Plywood Manufacturers Assn., Arlington, Va.

Circle 409 on inquiry card

PLASTIC ENCLOSURES / A data sheet describing rip-proof, nylon-reinforced plastic fabric for building enclosures describes how waterproof, mildew-proof *Griffolyn* is handled. It is available in several sizes and colors. ■ Griffolyn Co., Inc., Houston, Texas.

Circle 410 on inquiry card

PLANT PLANNING / A brochure describing how to plan a new plant describes templates of all internal facilities, concept planning sheets, grids, and accessories. The brochure provides step-by-step instructions to coordinate the equipment and utilities layout with the building design early in the planning stage to foster effective communication between architects, engineers, consultants and contractors. ■ Plan Print Co., Chalfont, Pa.

Circle 411 on inquiry card

ASHRAE WORKBOOK / An educational supplement to the ASHRAE *Handbook of Fundamentals* has been issued. The subject matter may be studied as a whole or in sections that reflect the many aspects of the environmental control field. ■ ASHRAE, New York, N.Y.

Circle 412 on inquiry card

STEEL BATHTUBS / The report outlines new product features of manufacturers of steel bathtubs, sinks and lavatories as well as the economic advantages. Featured in the four-page report are photos depicting some of the latest styles, models and features of steel plumbingware products. ■ American Iron and Steel Institute, Washington, D.C.

Circle 413 on inquiry card

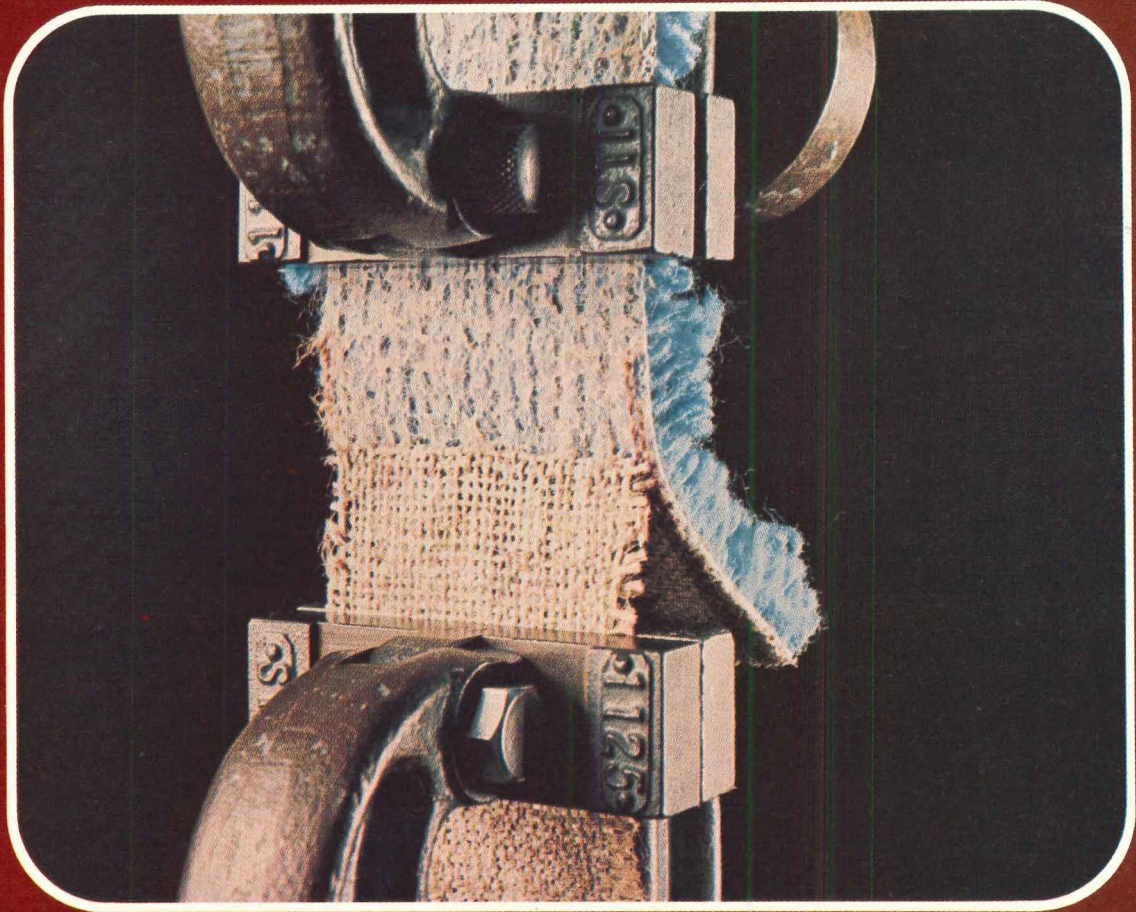
CARPET BACKING / A new brochure describes a conductive carpet backing which is said to provide low-cost permanent protection against static electricity in all types of carpeting. Available as either primary or secondary backing, the new product, named *Statex II*, can be used alone or in conjunction with currently available antistatic materials to improve efficiency and reduce costs. A sample is included in the brochure, which claims up to 75 per cent cost reductions over existing conductive face fibers. ■ K&S Laboratories, Waltham, Mass.

Circle 414 on inquiry card

WATER-TOWER CONTROLLER / The brochure describes the *Tower Controller*, a complete water-quality control package designed to control pH, dissolved solids, and corrosion in cooling-tower systems. The four-page bulletin includes application diagrams, specifications, operating characteristics and available models. ■ Magna Corp., Santa Fe Springs, Calif.

Circle 415 on inquiry card

METAL ROOF SYSTEM / The roof system is designed with standing-seam, interlocking rib aluminized more literature on page 181



A Carpet that passes our Delamination Performance test is ready for service in any restaurant or hotel.

Carpets that cover hotel or restaurant floors have to stand up to a steady onslaught of traffic. To make sure that carpets of Dow Badische fibers and yarns can take anything the service personnel—or guests—dish out, we performance-test them in our lab first.

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For more data, circle 69 on inquiry card

ALL FURNITURE / Heavy-duty, laminated wood furniture for indoor and outdoor applications features seats and benches of varying widths in lengths of 4 to 8 ft and includes a complete assortment of outdoor accessories ranging from planters to trash receptacles. The basic components of the seats and benches are laminated boards 3 in. thick and 9 in. wide. The indoor furniture is made of yellow pine in 1½ in. laminations; outdoor furniture, of cedar in ¾ in. laminations. ■ Game Time, Inc., Litchfield, Mich.



Circle 305 on inquiry card

Z-FURRING / ASI Z-furring members, spaced 24 in. on center, are first used to secure rigid insulation panels. One panel is applied as each Z-furring section is attached to the wall. Z-furring members provide a base for a wide variety of interior wall materials without the use of adhesives. Thus, adhesive failure is said to be eliminated. When insulation panels are secured, gypsum panels are placed over the insulation and screw attached to the Z-furring flanges. The system is recommended for either gypsum drywall or

and plaster. Conventional finishing completes installation. ■ Allied Structural Industries, Dearborn, Mich.

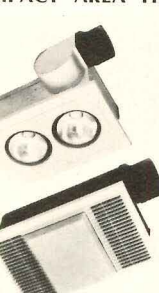
Circle 306 on inquiry card

ASPHALT SHINGLE / Heavy-duty asphalt roof shingles offer the character of split shakes according to the company. They are self-sealing, forming a one-piece roof and carry a 20-year guarantee. Six color blends are available. Sierra shingles are classified UL Class C fire resistant, and carry the UL fire resistant label. ■ The Flintkote Co., East Rutherford, N.J.



Circle 307 in inquiry card

COMPACT AREA HEATERS / The units feature matte-white molded plastic grilles, motors with a seal lubrication system, centrifugal blower wheels and a two motor system for individual control of heating and ventilation. Rugged, plastic damper/duct connectors are said to make installation fast and foolproof. A self-closing damper prevents back-drafts and rattles and the longer collar makes hanging to ductwork easy. UL listing is offered. Johnson City, Tenn.



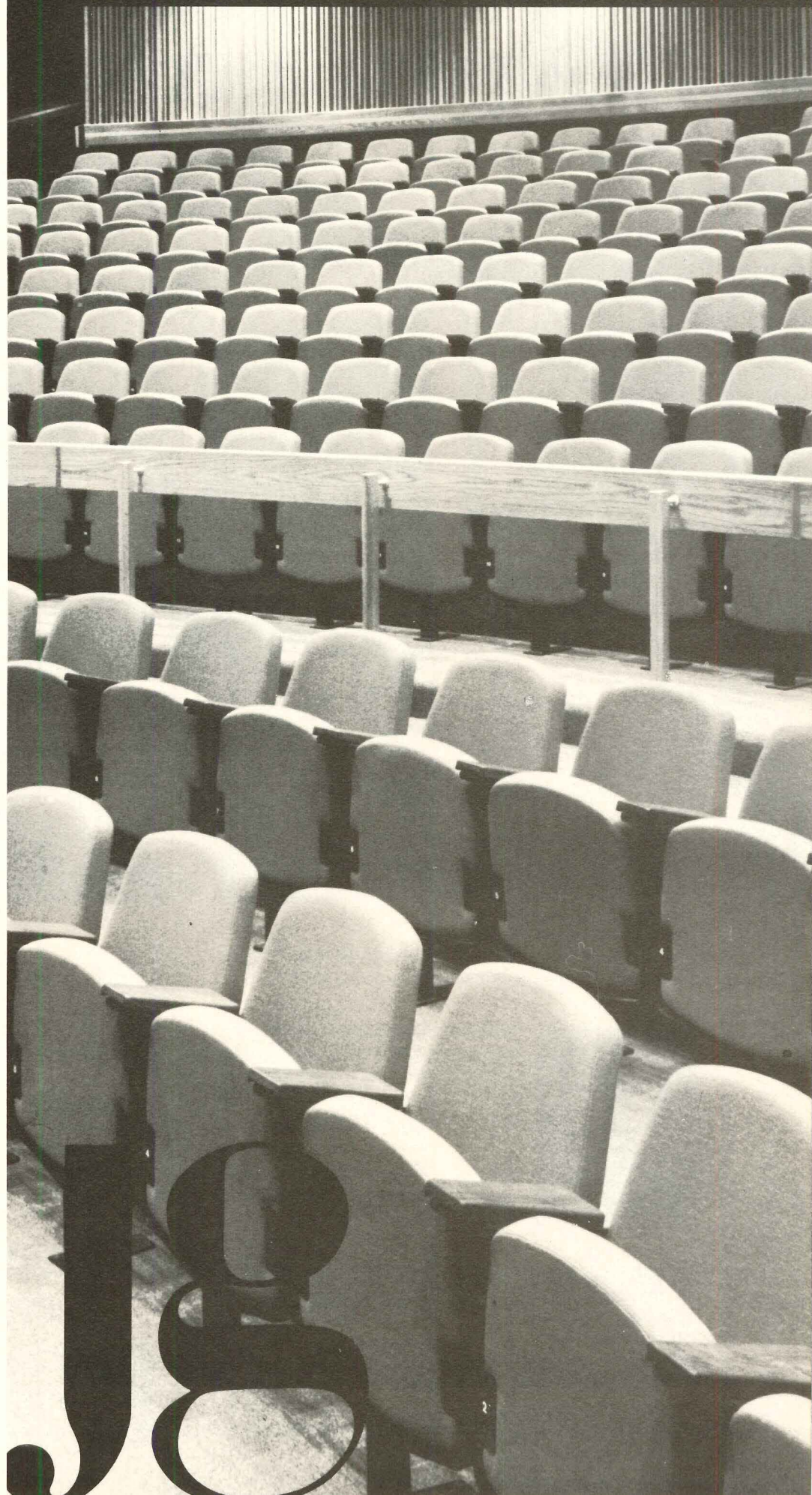
Circle 308 on inquiry card

more products on page 177

62-63

Auditorium seat designed by Peter Dickinson
 Installed at the Jennie King Mellon Library,
 Chatham College
 Johnstone, McMillin and Assoc., architects,
 Pittsburgh, Pa.
 Kilham, Beder and Chu, Consulting architects
 for design, NYC.

JG Furniture Company, Inc. 121 Park Avenue
 Quakertown, Pa. 18951

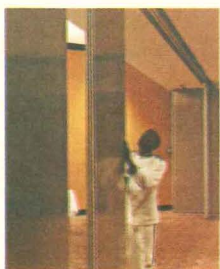


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With Kwik-Wall systems, large areas can be divided easily into smaller rooms in minutes. Kwik-Wall's solid construction makes each divided area a truly private room.

Choose the exact finish to complement any decor from a selection of over 1500 designer facings.

Operable Kwik-Wall glides smoothly on ceiling-mounted tracks and provides a wide variety of installation and stacking arrangements. Available in 1 3/4", 2 1/4" and 3" panel thicknesses.

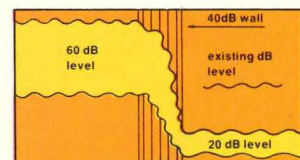
Portable Kwik-Wall requires no tracks. Each panel stays in place with spring-loaded pressure and panels can be stored anywhere. Available in 1 3/4" and 2 1/4" thicknesses.

For more data, circle 71 on inquiry card



Soft ceiling applications, too. Two of Kwik-Wall's portable models have been designed to interface with suspended ceilings. Top rail interlocks with ceiling grid, holding panel firmly in place.

Sound-retarding privacy. Kwik-Wall features two models of acoustically-rated partitions. STC ratings up to 46. Meticulously engineered frame, core, facing and seals dampen and absorb sound.



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Address _____

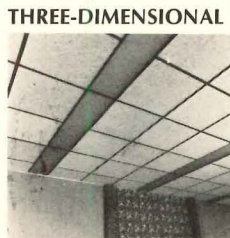
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State _____ Zip _____



SILICONIZED ROOF / A self-healing, cold flow material said to be unaffected by submersion, the siliconized system can be applied over damp surfaces. As the material is applied, it displaces moisture, penetrating the old roofing material bonding tightly to create a monolithic new roof surface. After loose gravel has been swept from the roof, the new system is applied by spray or brush and then topped with a layer of gravel. ■ The Monroe Co., Cleveland, Ohio.

Circle 309 on inquiry card



THREE-DIMENSIONAL CEILING / A new suspended ceiling system called *Tonico* features 2-by-2-ft panels and grid system. Once the grid is installed, the 5/8-in. thick panels with 3/8-in. recessed edges, are dropped into place. The end result is a three-dimensional ceiling effect. Grid is available in black or white finish. ■ Gold Bond Building Products, National Gypsum Co., Buffalo, N.Y.

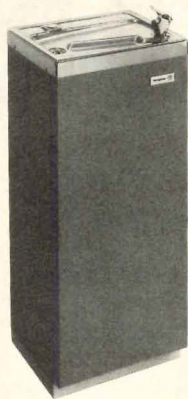
Circle 310 on inquiry card



CEMENT MODIFIER / An acrylic emulsion specially designed for modifying Portland cement mortars provides mortar wet strength, slower mortar timeset, and long pot life, according to the company. In addition, these mortars are said to have excellent adhesion to a variety of substrates, including concrete and masonry, brick, wood, metals and glass. ■ Rohm and Haas Co., Philadelphia, Pa.

Circle 311 on inquiry card

EXPLOSION-PROOF WATER COOLER / An electric water cooler designed expressly for use in potentially explosive atmospheres has been added to the company's line. All electric parts are contained in UL-listed vapor and airtight enclosures for safety in applications such as laboratories, factories, etc. Unit has a corrosion-free stainless base and built-in pressure regulator assures an even flow at pressures from 20 to 100 lbs per sq in. ■ Westinghouse Electric Corp., Pittsburgh, Pa.



Circle 312 on inquiry card

How to ship small packages in a big hurry.

DELTA'S DASH

DELTA AIRLINES SPECIAL HANDLING

On DASH shipments Delta guarantees delivery on the flight or routing you specify between most Delta cities.

Packages accepted up to 50 lbs. with length plus width plus height not to exceed 90" total, with only one dimension exceeding 30"

Deliver to Delta's ticket counter or airport air freight terminal at least 30 minutes prior to scheduled departure time. Shipments may be picked up at either location 30 minutes after flight arrival.

Delta's exclusive "Dashboard" control procedure insures constant tracking of your shipment from delivery to pick-up.

DASH charges are nominal. Check Delta reservations for charges between specific points. Pay in cash, by company check, most general-purpose credit cards, special credit arrangements or on government shipments by GBL. **DELTA**
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Dallas-Los Angeles	\$26.25
San Francisco-Atlanta	\$31.50
Philadelphia-Houston	\$26.25
New York-Tampa	\$26.25

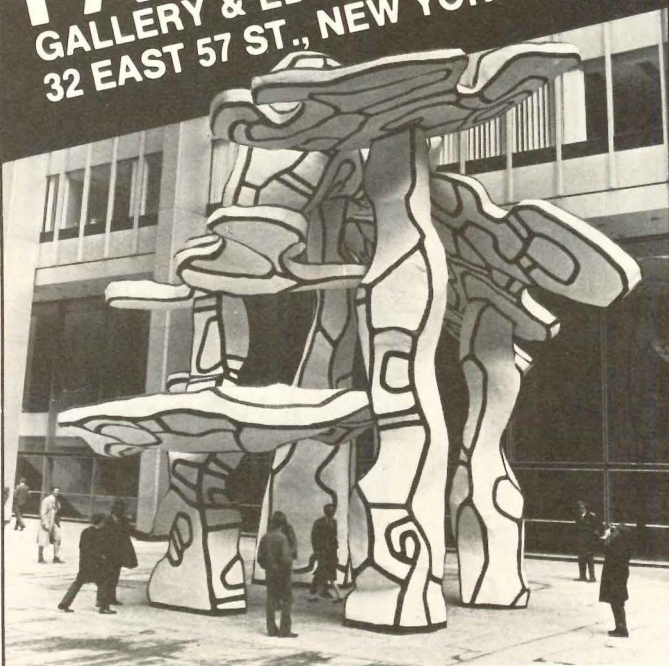
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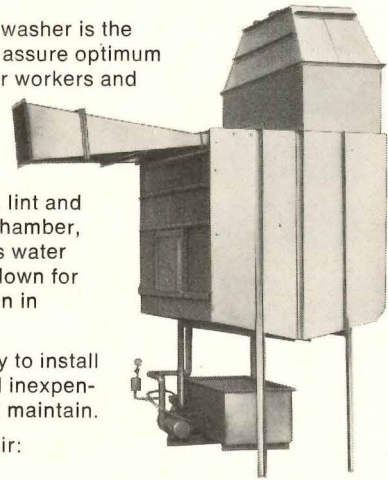
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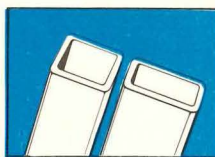
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Look at the aesthetics and structure/ability of Regal Welded Steel Tubing



1" square thru
 12" x 8" rectangle.
 .083 thru .500 wall

Our clean-lined, smooth squares and rectangles assure better appearance and give you basic design advantages.

Higher strength-to-weight ratios let you use lighter structural columns and beams, trusses, mullions, and stairways. Also provide handsome concealment of conduit, pipe, etc.

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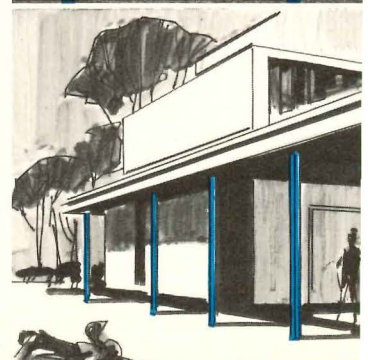
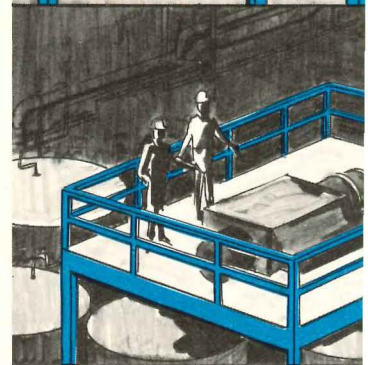
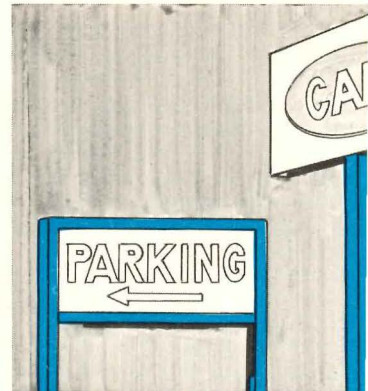
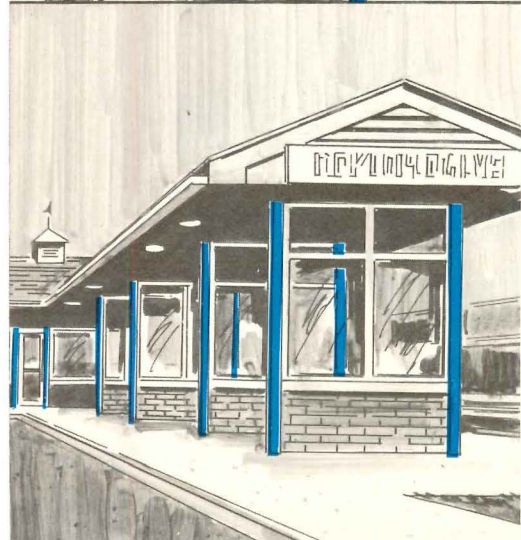
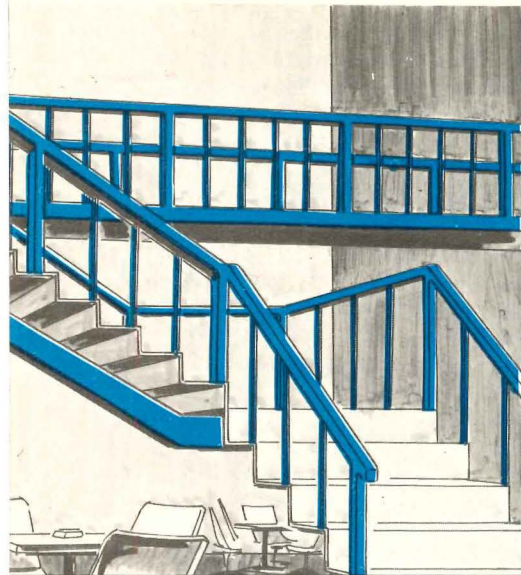
These are only a few of the cost-saving advantages of Regal structural steel tubing. Learn more about how Regal structural steel tubing can save you time and costs. Write for our new catalog, free on request. Or contact your steel service center.

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The Thoroughbreds.

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Producing the Textolite pattern that looks so much like Moroccan leather that you'd think it was born that way. We did it by design. By creating the textured look and feel of real leather. And we did it with color, too. Actually, three of them. Including three very new colors that add richness and character to everything they touch. Palomino Moroccan. We've unbridled the grain and given it tones of saddle brown with light-catching highlights.

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We've put all our artistry and ingenuity into all ten Thoroughbreds. And, as always, breeding will tell.

So don't spare the horses. Right now, sample these and the more than 120 other distinctive Textolite solids, abstracts and woodgrains in our full-

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Palomino



Burnished



Blanco

GENERAL  ELECTRIC

Want to save on electrical installations?



NECA study reveals opinions of design professionals.

The National Electrical Contractors Association (NECA) recently completed a study to find out how electrical contractors can help maintain high performance on projects requiring complex electrical system installations. On a question involving project planning, most participants agreed: the professional electrical contractor should have a role as a preconstruction consultant.

Reasons? The electrical contractor is an important member of the building team. And his specialized knowledge, applied early in the project, can be very valuable in assuring overall coordination of the electrical job. Skilled at project scheduling and expediting electrical work, his knowledge of product applications, code requirements, and his installation expertise can help

avoid costly potential problems and delays later in the project.

That's why many construction industry professionals involve electrical subcontractors in preconstruction planning: to make sure the job gets done—efficiently, economically, accurately, profitably. For more information on how you can benefit from the study, mail this coupon today.



National Electrical
Contractors Association, Inc.
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Please send a free copy of the NECA Preconstruction Conference Handbook, explaining how I can save time, headaches and money through preconstruction planning.

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Architectural Record Book

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steel panels to assure positive weathertightness. Also described in this new brochure are design loads, insulating characteristics, purlin supports and roof openings for HVAC equipment. ■ Armco Building Systems, Middletown, Ohio.

Circle 416 on inquiry card

MODULAR BOILER / A 130-page, illustrated engineering manual on modular boilers enables specifiers to match heating or hot-water requirements to modular boiler equipment with greater ease and accuracy than has been possible. Detailed step-by-step procedures, charts, tables and pertinent photographs support the technical discussion. ■ Slant/Fin Corp., Greenvale, N.Y.

Circle 417 on inquiry card

SPECIAL FLOORING / A catalog offers a selection of OSHA-safety mats, stair treads, bumpers, non-slip products and flooring. Detailed architectural specifications and illustrations are included. The catalog has been expanded to include protection for truck docks, but also marine docks, yachts, and protection for corridors. ■ American Floor Products Co., Rockville, Md.

Circle 418 on inquiry card

STEEL STRUCTURAL FRAMING / A 24-page catalog covering the components of *Speed-Steel* lightweight structural framing system describes joists; nailable double studs; screw cee, screw, and channel studs; V-bar bridging; and unpunched channel, track, and bridging. In addition to dimensional data, load tables, fire tests and rating data, specifications and information on the attachment of collateral material are also given. ■ Keene Corp., Vienna, W. Va.

Circle 419 on inquiry card

OUTDOOR LIGHTING / A 12-page booklet describes architectural, designer-oriented, large-area lighting systems. The brochure provides scaled-grid sketching space and dimensional information, as well as full specification and ordering information for the series. ■ Holophane Div., Johns-Manville, Denver, Colo.

Circle 420 on inquiry card

ELECTRIC UNIT HEATER / A guide to the design of electric unit-heater systems is written specifically to aid designers of industrial and commercial heating systems using electric unit heaters as the prime source of heat for space conditioning. ■ Markel Electric Products, Buffalo, N.Y.

Circle 421 on inquiry card

INSULATION / A new six-page brochure covers the properties of silicone treated perlite loose-fill insulation, as well as "U" values for insulated and uninsulated cavity-wall systems, block-wall systems and concrete-block wall construction. In addition, tables and graphs cover thermal conductance and thermal resistance of perlite loose-fill insulation of different thicknesses and densities. ■ Perlite Institute, Inc., New York, N.Y.

Circle 422 on inquiry card

DOWNLIGHTING / A 28-page catalog features downlights available in the low- to medium-price range. This includes most wattages, sizes, and types for most applications. ■ Lightolier, Jersey City, N.J.

Circle 423 on inquiry card

FACTORY-BUILT FIREPLACES / Answers to a dozen most frequently asked questions on these fireplaces are covered in a new brochure. These questions cover longevity of factory-built units, installations, sizes, and construction. ■ Heatilator, Mount Pleasant, Iowa

Circle 424 on inquiry card



Stop noise from leaping over sound-rated walls with ACOUSTILEAD®

Even sound-rated walls won't keep an office quiet unless you plug the leak in the plenum barrier—the space between a hung ceiling and the slab above. All it takes is a curtain of Acoustilead— $\frac{3}{4}$ " thick sheet lead.

Nothing else stifles noise so effectively with so little weight or thickness. Acoustilead doesn't just strain noise like porous materials. It stops noise effectively because it's limp and dense.

Acoustilead is easy to install. Cuts with scissors or knife. Crimps around ducts and vents for an airtight seal.

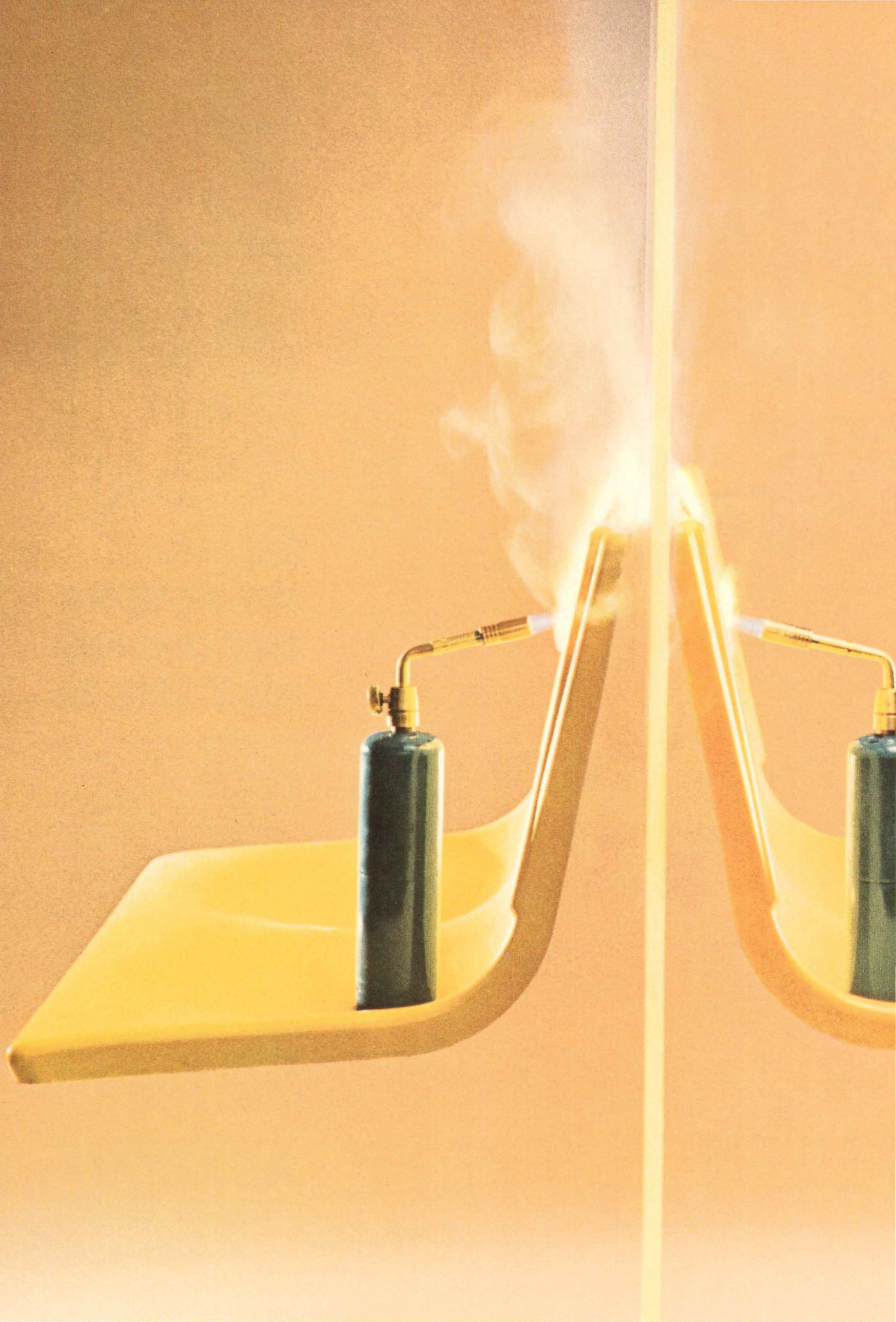
For our how-to booklet on plenum barriers, or the name of an Acoustilead distributor near you, write Sound Attenuation Department, Asarco, 120 Broadway, New York, New York 10005.

75 Years of Progress in Metals

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American Smelting and Refining Company
FEDERATED METALS DIVISION

For more data, circle 72 on inquiry card



These fire-retardant seats prove a point about Alcoa hydrated alumina.

There's less smoke.

Both of these FRP seats are fire retardant, as indicated by comparable Limiting Oxygen Indices of 26. But the one with Alcoa® hydrated alumina filler does more than stop fire. It helps reduce smoke. Which means far less smoke to obscure exits and windows.

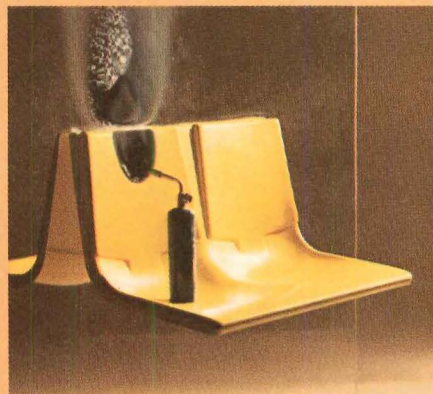
Up to now, the common approach in making these seats fire retardant would have been to use halogenated resin and antimony oxide. But that would have meant that these seats would typically produce voluminous smoke when exposed to flame—as the seat on the left.

Now... there's hydrated alumina. It retards the fire because it absorbs heat to help keep plastic below its kindling point. If the flame isn't removed, it evolves from hydrated alumina and dilutes combustible gases. So the mechanism by which it retards the fire isn't dependent on generating char

and smoke. Hydrated alumina is nontoxic. The only gas it can liberate is harmless steam.

It's simple and it works... with polyesters, epoxies, phenolics and many other resins. It's also inexpensive. It can be used in previously unfilled systems to replace some of the resin, so there's less resin to volatilize and produce smoke. It can even help reduce smoke in halogenated resins. And Alcoa hydrated alumina is available in several grades, in quantity, from three manufacturing locations in the United States.

For our new hydrated alumina bulletin, write Aluminum Company of America, 478-L Alcoa Building, Pittsburgh, PA 15219.

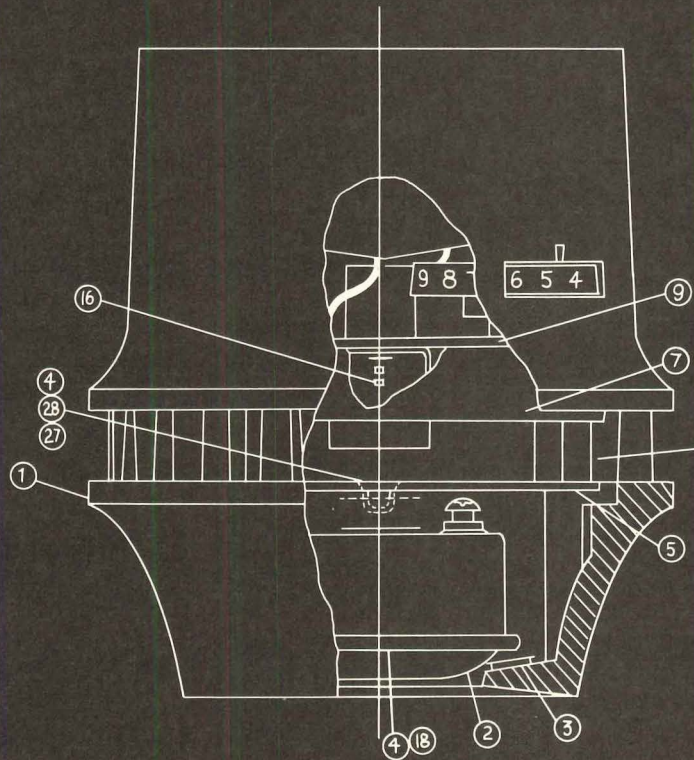
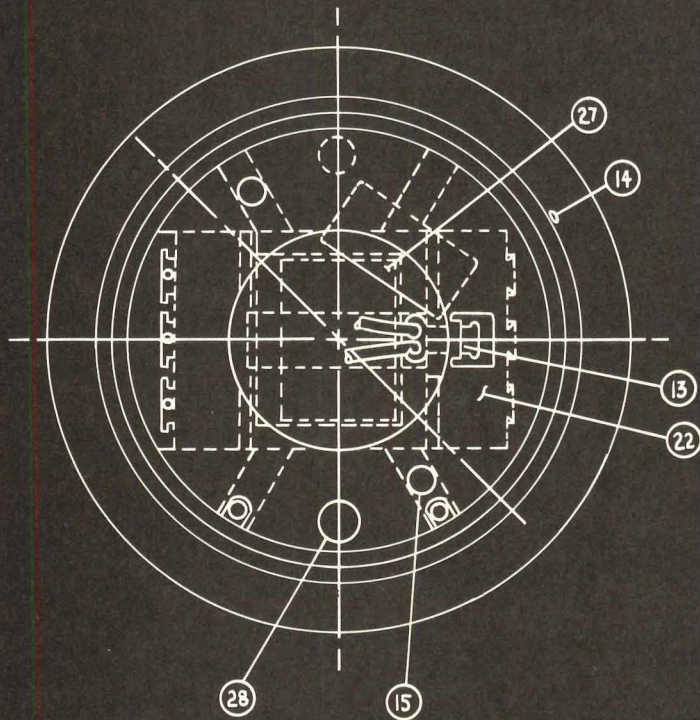


When the 2000 F torches are removed, both fire-retardant benches stop burning. The facing bench achieved its fire retardancy by the addition of Alcoa hydrated alumina filler. The bench made with the more expensive, chlorinated resin and antimony oxide, on the other side of the acrylic sheet, derived its fire retardancy at the expense of smoke generation, producing much heavier deposits.

Alcoa thanks American Seating and Cincinnati Milacron, Molded Plastics Division, for their considerable assistance in preparing materials for this demonstration. Initially, Cincinnati Milacron prepared panels which were subjected to the Fenimore Martin LOI Test (ASTM G-2863-70T) to establish equivalent fire retardancy. They then used American Seating molds to produce the seats tested with the pre-established formulations: 50 parts chlorinated polyester resin and 2.5 parts antimony oxide plus 50 parts simple mineral filler (plus fiberglass) for one, and 47 parts general-purpose polyester resin plus 53 parts Alcoa hydrated alumina (plus fiberglass) for the other. It was felt that it was much fairer to compare 2 filled systems rather than one unfilled (which would generate considerably more smoke than shown) and one hydrate filled.

Change for the better
with Alcoa Aluminas

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SMOKEGARD 770
PLATE NO. 1**

THE SOLUTION

To latest Building Code Requirements
For Smoke Detection Our New A. C. Powered, Low Cost
SMOKEGARD 770

SMOKEGARD 770. We've done it again — produced a new ionization smoke detector with architects, specifiers and contractors in mind. Specifically designed for new construction projects where early warning smoke detection is required.

This rugged detector features the reliability and long life of the ionization principle of smoke detection. Easy to install. Attach the adaptor plate to a standard electrical outlet box, connect two pre-stripped power wires and twist into place.

Now in planning, specifying and construction, the **Model 770-Solution** to building code requirements for both single and multi-family housing. Our new **COMPETITIVELY PRICED** Model 770 offers the



same outstanding performance as our time-proven battery-powered SmokeGard Model 700.

For additional information on these or other early warning detectors, write STATITROL, the leading U.S. manufacturer of ionization detectors to meet residential, commercial and industrial requirements.



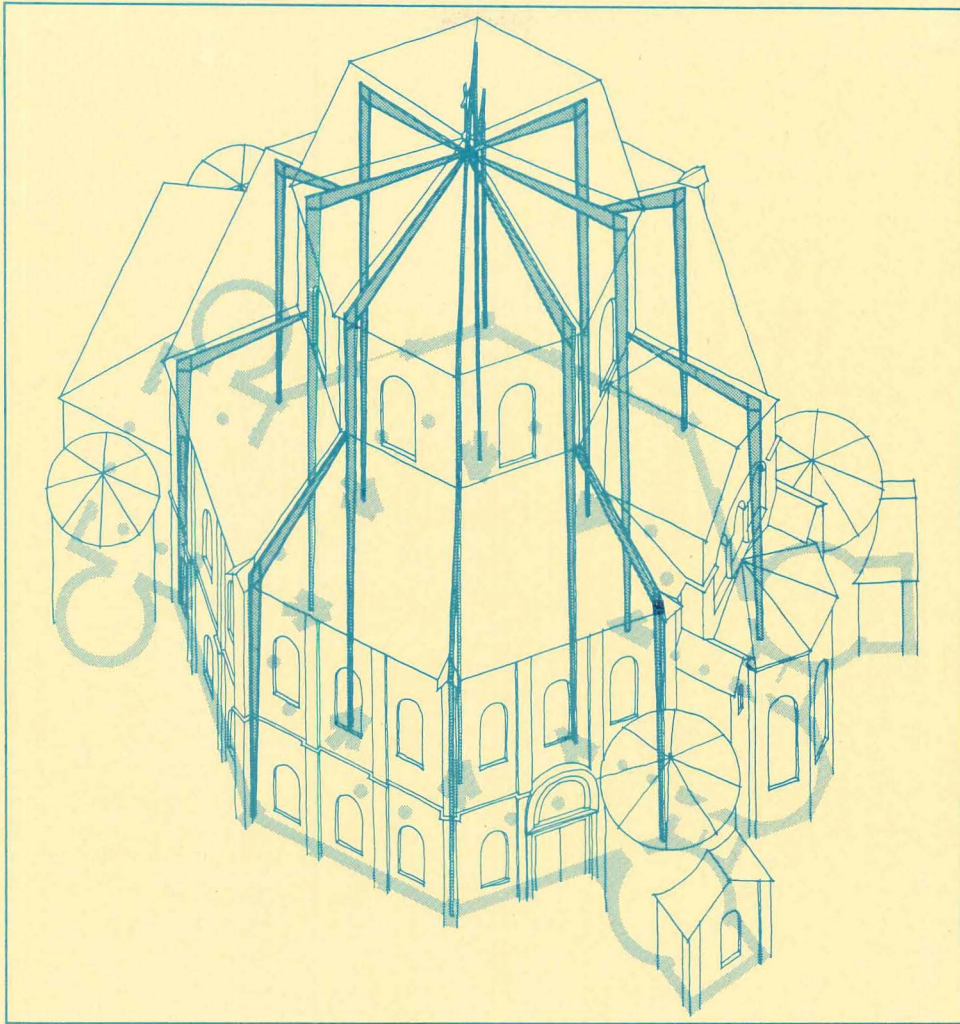
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BETTER FIRE DEFENSE PRODUCTS...WORLDWIDE

For more data, circle 79 on inquiry card

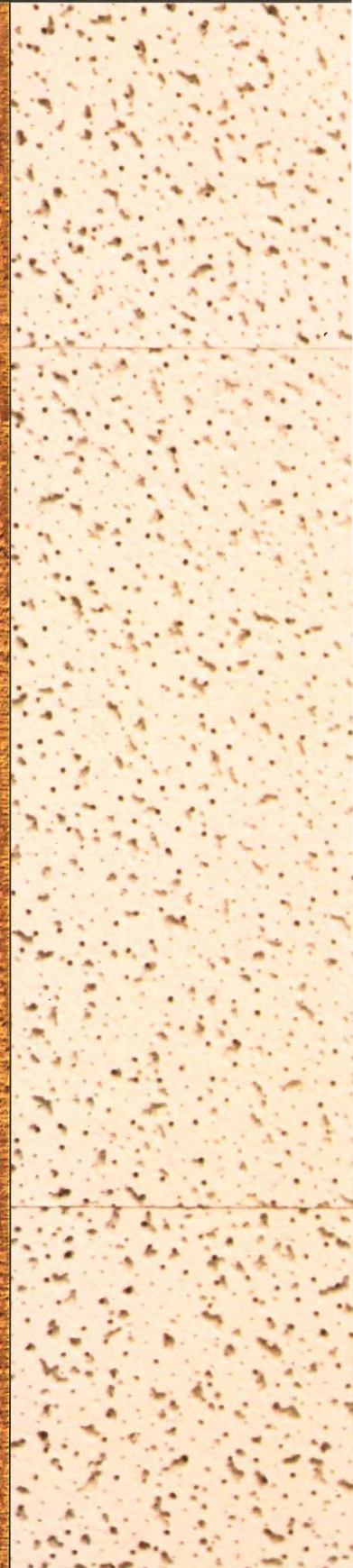


San Vitale at Ravenna. The Emperor Justinian built a lot of churches in his time, including San Vitale. He was a patron of architecture. We'd like to think that if Star had been around in 526 A.D. he might have looked favorably on us. Perhaps the quick, exact construction of Star's computer-designed, pre-engineered steel components would have caught his eye. Maybe the wide-range and flexibility of the Star System itself. Or the compatibility of Star components with other building materials. Hopefully he would have agreed with us that Star has a place in the minds of both classical and modern architects.

With Star in his court, Justinian could have saved money to build even more churches. Or have more mosaics designed. Surely that would have tickled his Byzantine fancy.

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Buildings
There's a place for us.

For more information about Star Building Systems, write: Star Manufacturing Company, Dept. ARY4, Box 94910, Oklahoma City, Oklahoma 73109. Or see the Star catalog in Sweet's Architectural and Industrial Construction/Renovation Catalog File, Section 13.7.



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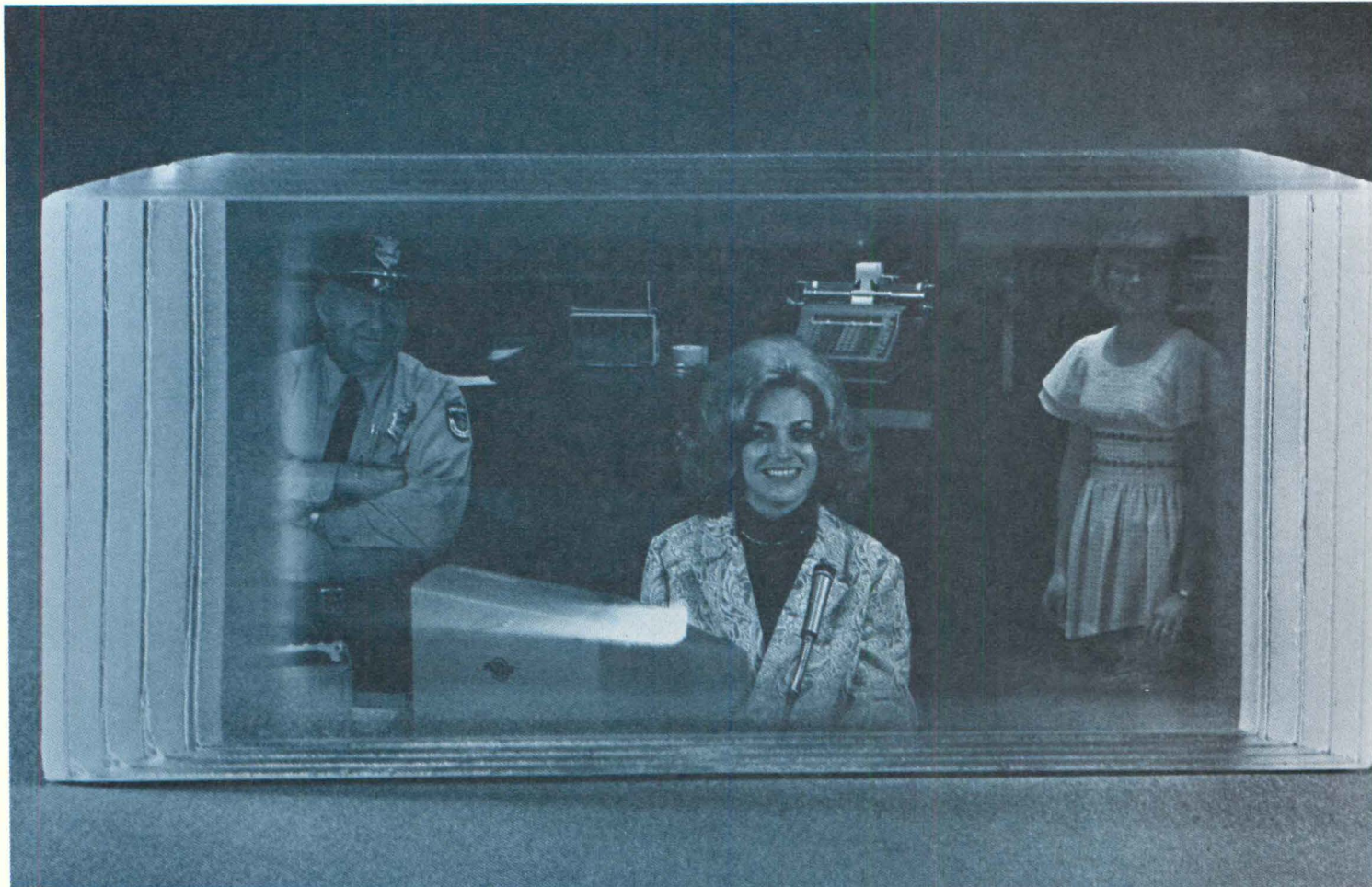
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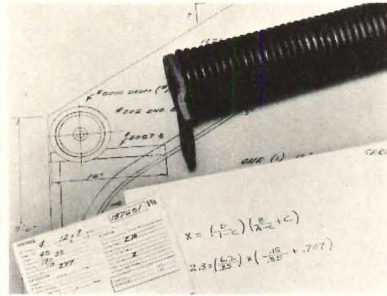
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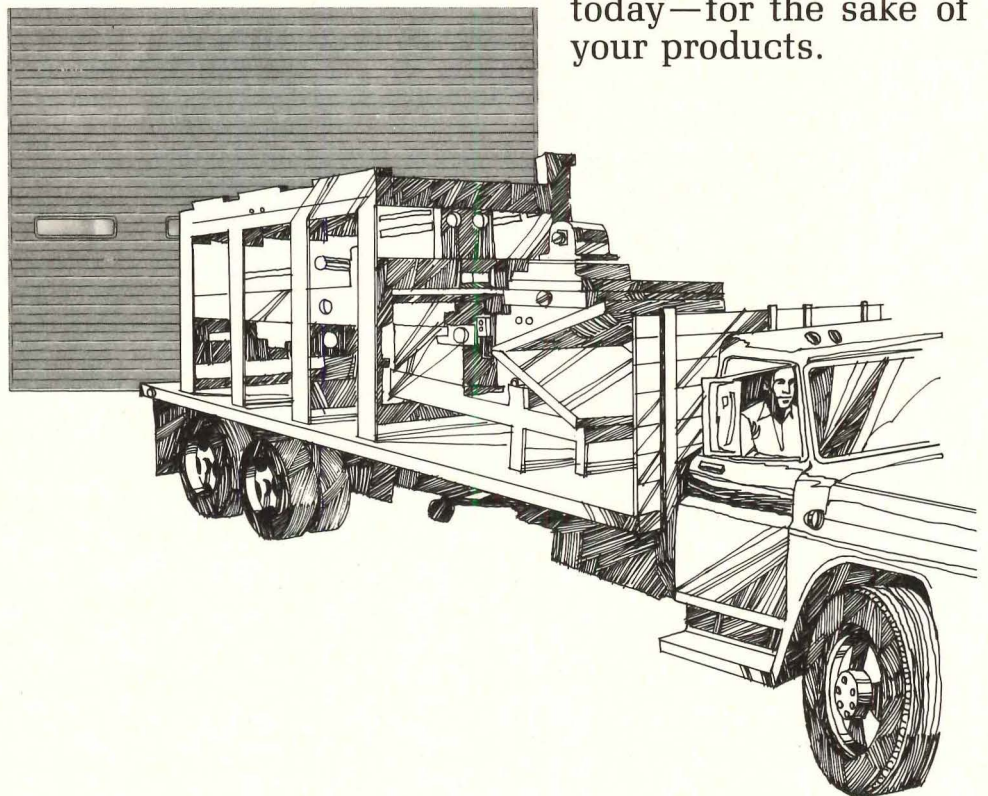
Nature of Business

If It's Worth Manufacturing, The Building Deserves A Raynor Garage Door

Raynor offers one of the widest selections of garage door styles and sizes — in steel, aluminum, fiberglass or wood. This means you can job-match Raynor doors to your production facilities. Whether you manufacture small parts or huge industrial machinery, there's a Raynor garage door that's right for your needs. Every Raynor door has custom features, and they're yours at "stock" prices. Springs are custom wound and tested, all hardware is custom made just for



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Bally Walk-Ins belong wherever the race is on for fast spectator feeding



Bally Walk-In Coolers and Freezers belong everywhere mass feeding takes place. They can be assembled in any size for indoor or outdoor use from standard panels insulated with four inches of foamed-in-place urethane, UL 25 low flame spread rated and Factory Mutual research approved. Choice of stainless steel, aluminum or galvanized. Easy to enlarge . . . easy to relocate. Refrigeration systems from 35°F. cooling to minus

40°F. freezing. Subject to fast depreciation and investment tax credit. (Ask your accountant.) Write for 28-page book and urethane sample. **Bally Case & Cooler, Inc., Bally, Penna. 19503.**



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New Trimbrook™ Urinal clears cigarette butts so custodians don't have to.

Strong siphon jet action keeps urinal clean and clears cigarette and cigar butts and other small solids. Quietly. Your client will thank you for saving him custodial time and maintenance costs. More efficient than the traditional wash-out type that flushes only liquid waste. But costs no more. Modesty shield designed in. Flushes with a minimum working pressure of 15 psi. The best keeps getting better.

Part of a complete line of commercial and institutional fixtures and fittings. Write for details. American-Standard, P. O. Box 2003, New Brunswick, N.J. 08903.

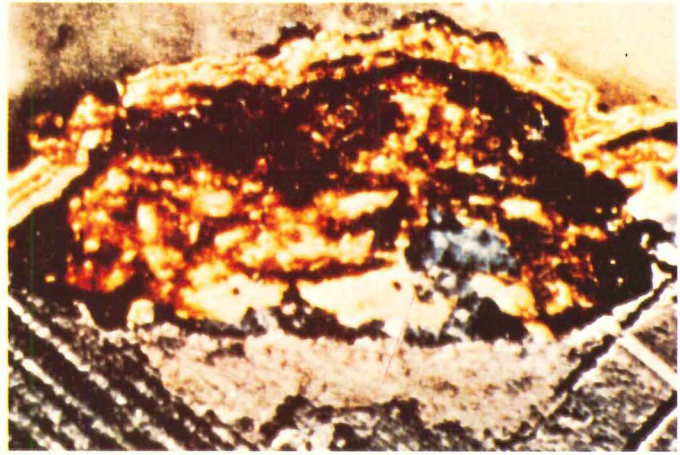


Shown with Sloan Royal valve 186-11.

 **AMERICAN
STANDARD**
PLUMBING / HEATING

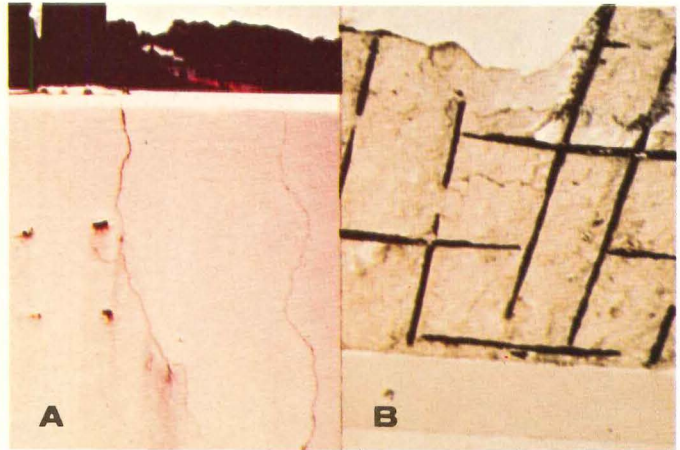
CONCRETE FAILURE

CAUSE



This magnification shows how rust expands as steel corrodes.

EFFECT



The rusting of ungalvanized reinforcing bar creates a pressure which can crack and spall concrete. Photo A shows a portion of the facade of the Charleston, S.C. Post Office which has been cracked and stained by subsurface rust expanding and "bleeding" through. Photo B shows the underside of a veranda roof in Bermuda where rebar corrosion caused a large section of concrete to fall off.

PREVENTION

If you would like to know more about this subject, write on your letterhead for our new booklet "Galvanized Reinforcing Bar — Undercover protection for concrete."

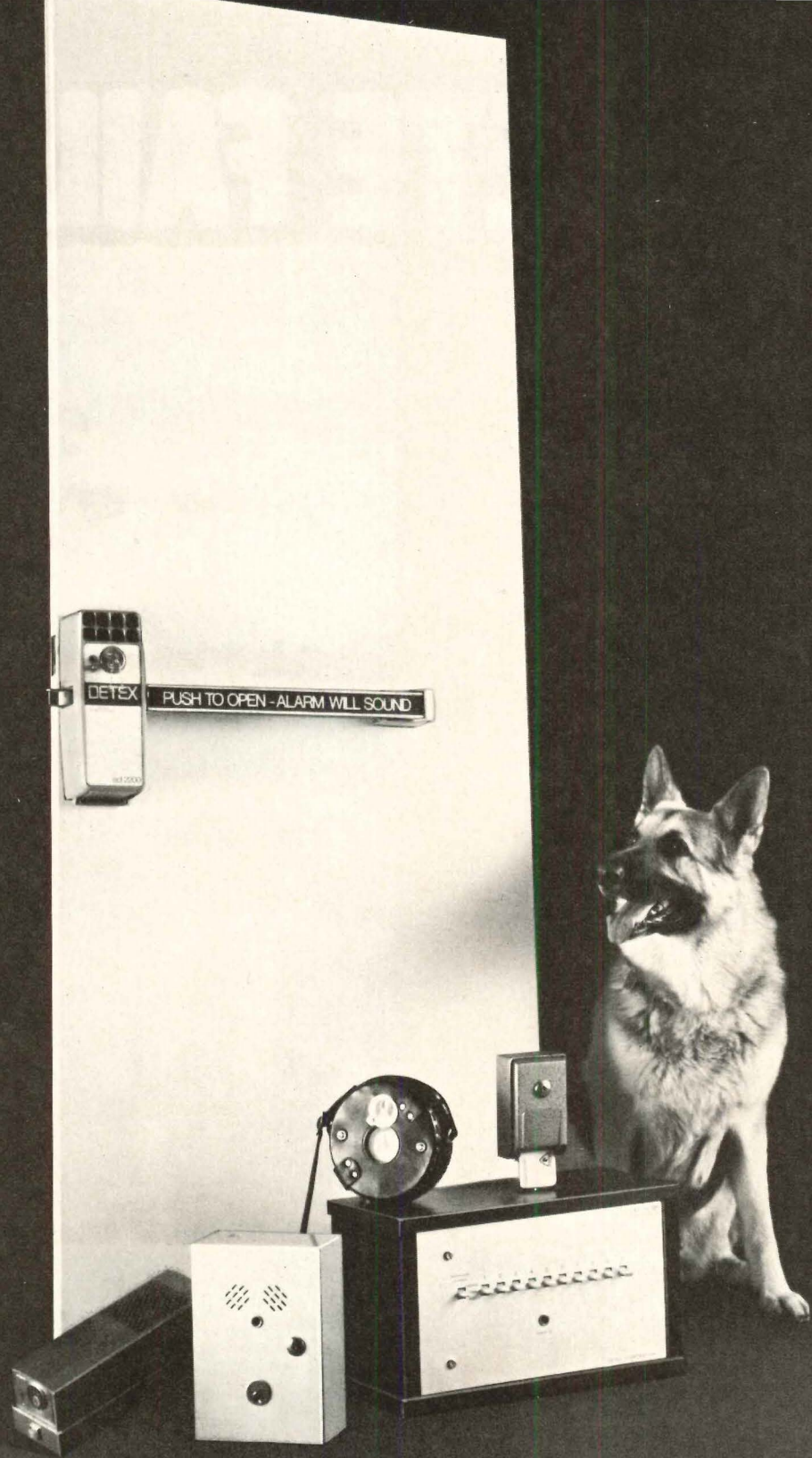
ST. JOE
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Galvanizing — the metallurgical bonding of zinc *into* steel — has proven its ability to protect rebar against rust before, during and after installation. This is recognized in the revision of General Services Administration guide specification PBS4-0344.01 as follows: When concrete cover on exterior surfaces is less than 1½ inches... reinforcing bars and mesh shall be zinc coated... in accordance with ASTM A-123.

ZN-640



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whole buildings—even entire complexes. Included are exit alarms, exit control locks, entry controls, watchclocks, and remote indicating panels. Employed individually, Detex products serve your localized security needs. (And the price won't bite.) Send for information on Detex security systems and components to protect your interests. Detex Corporation • 4147 N. Ravenswood Ave. • Chicago, Ill. 60613 • (312) 348-3377



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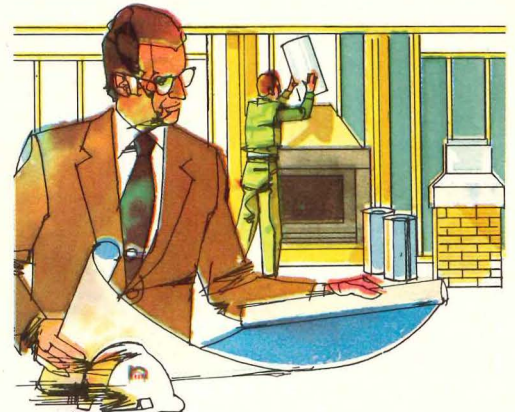
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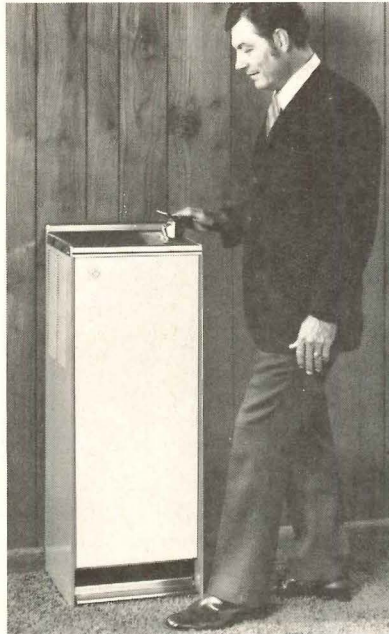
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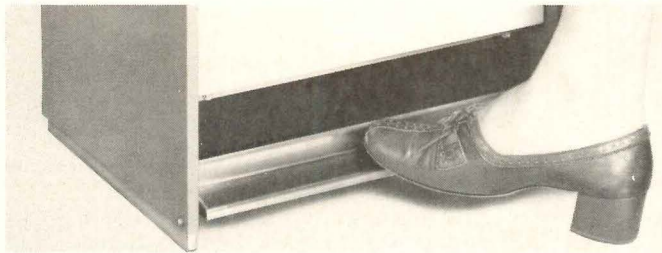
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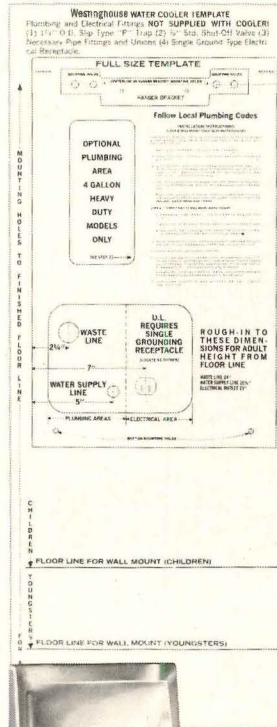
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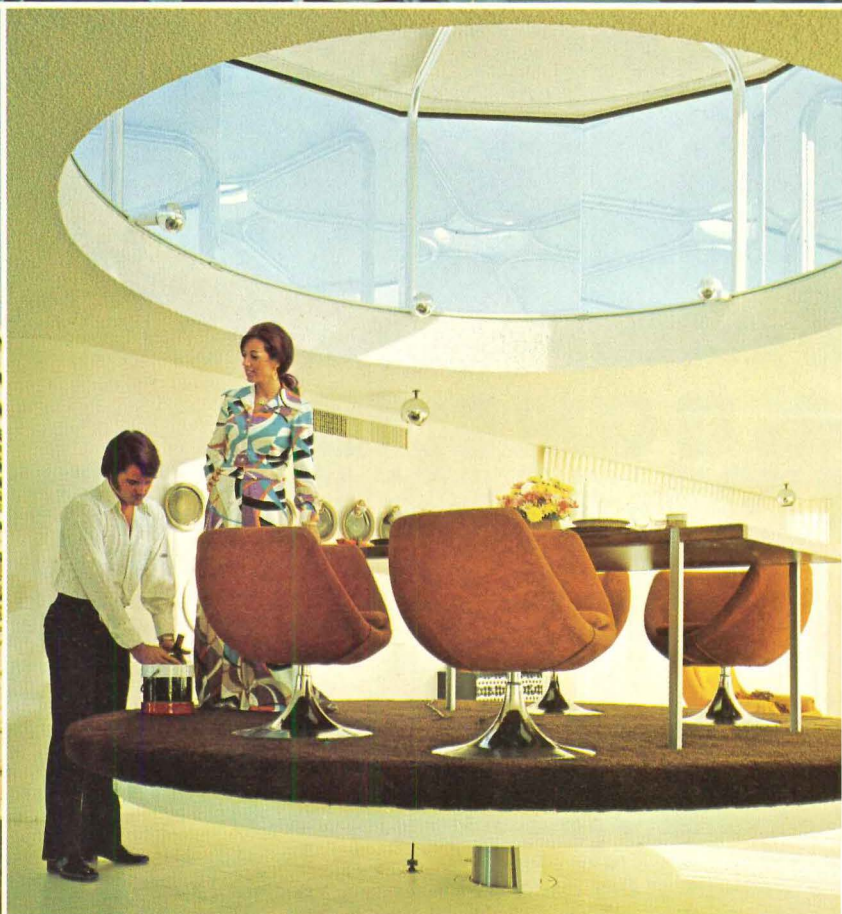
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Palm Desert, Calif., residence. Architect: George Ritter, A.I.A.

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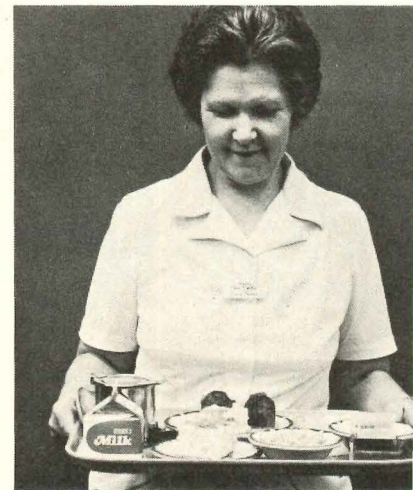
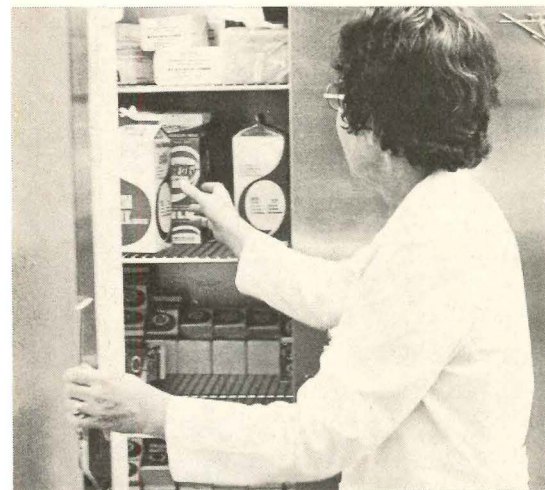
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Union-Tribune Building, San Diego, California.
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Architect: Fred Livingstone, A.I.A.



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They're a symbol of your careful thought and planning. And an indication of the quality that makes your work a worthwhile investment for the client. That's why so many architects specify wood panel entrance doors. But there's no reason to stop there.

Panel doors add character to every room.
Good doors are like good furniture — they bring

character to each room. No matter what the decor, carefully sculptured wood panel doors will enhance the beauty of any room. Not only at the front entrance, but all through the house.

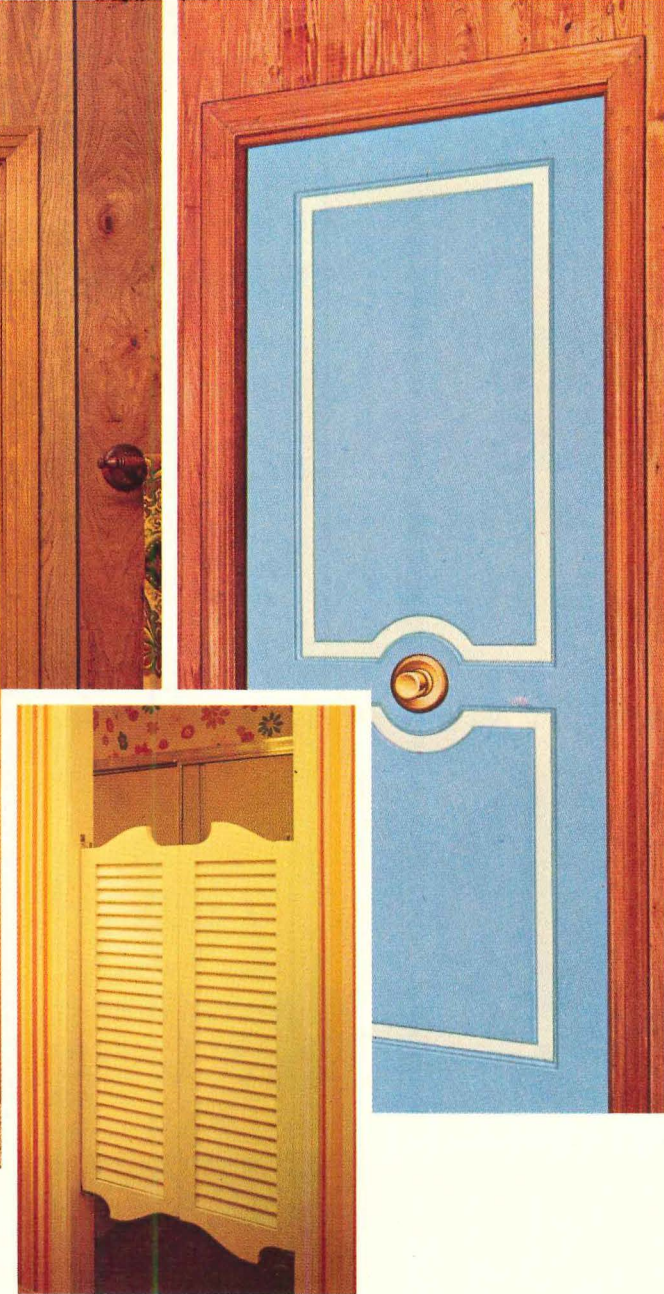
For instance, French doors can change a dining room from just a place to eat into an elegant dining experience. With deep sculptured bi-fold doors, a closet becomes a design accent instead of a hole in the wall. Swinging cafe doors give kitchens a light, perky touch. Even the utility room brightens up with an attractive (and practical) louver door.

And, of course, sliding wood patio doors do an excellent job of tying indoors and outdoors together. (Their greater insulation quality means less heat loss than with metal patio doors, too. That's an important consideration with the current need for energy conservation.)

Wood panel doors keep a design theme going.
Whether you're designing traditional, colonial, Spanish, modern or something else, you'll find the right wood panel doors.

They help you keep the design theme going from the front door to every room. The panel and louver doors pictured here are just a few examples of the dozens of types and styles that you can use to tie every room into the total design.

Consumers prefer wood panel doors.
In three major surveys conducted in 1968, 1970 and



1972, consumers in 39 states reported what they want most in doors, what kind of door they prefer — wood panel or flush — and why. The results clearly indicate that preference for flush doors has fallen while panel door preference is increasing.

% who prefer panel or flush doors for exteriors						
	Front, Main Entrance			Rear, Other Entrance		
	1968	1970	1972	1968	1970	1972
Panel Doors	59%	64%	63%	54%	54%	62%
Flush Doors	36	26	28	33	26	24
No Preference	5	10	9	13	20	14

% who prefer panel or flush doors for interiors			
	1968	1970	1972
	Panel Doors	31%	32%
Flush Doors	60	47	49
No Preference	9	21	17

Wood panel doors meet consumer needs. And yours. Before you specify the doors in your next project, consider the facts. Our research shows that consumers say appearance and durability are the qualities they want most from their doors. And they rate panel doors better than flush doors in both instances.

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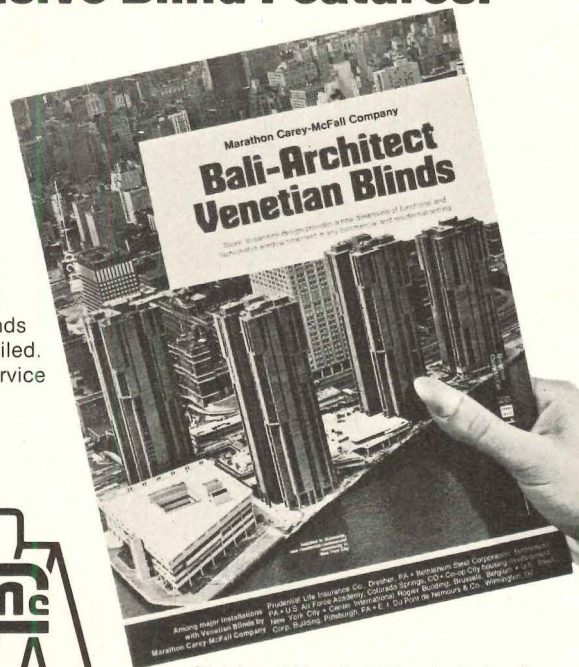
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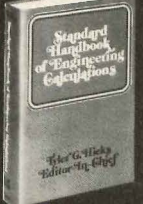
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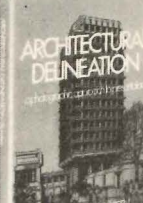
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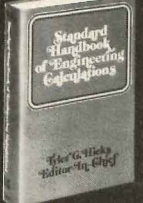
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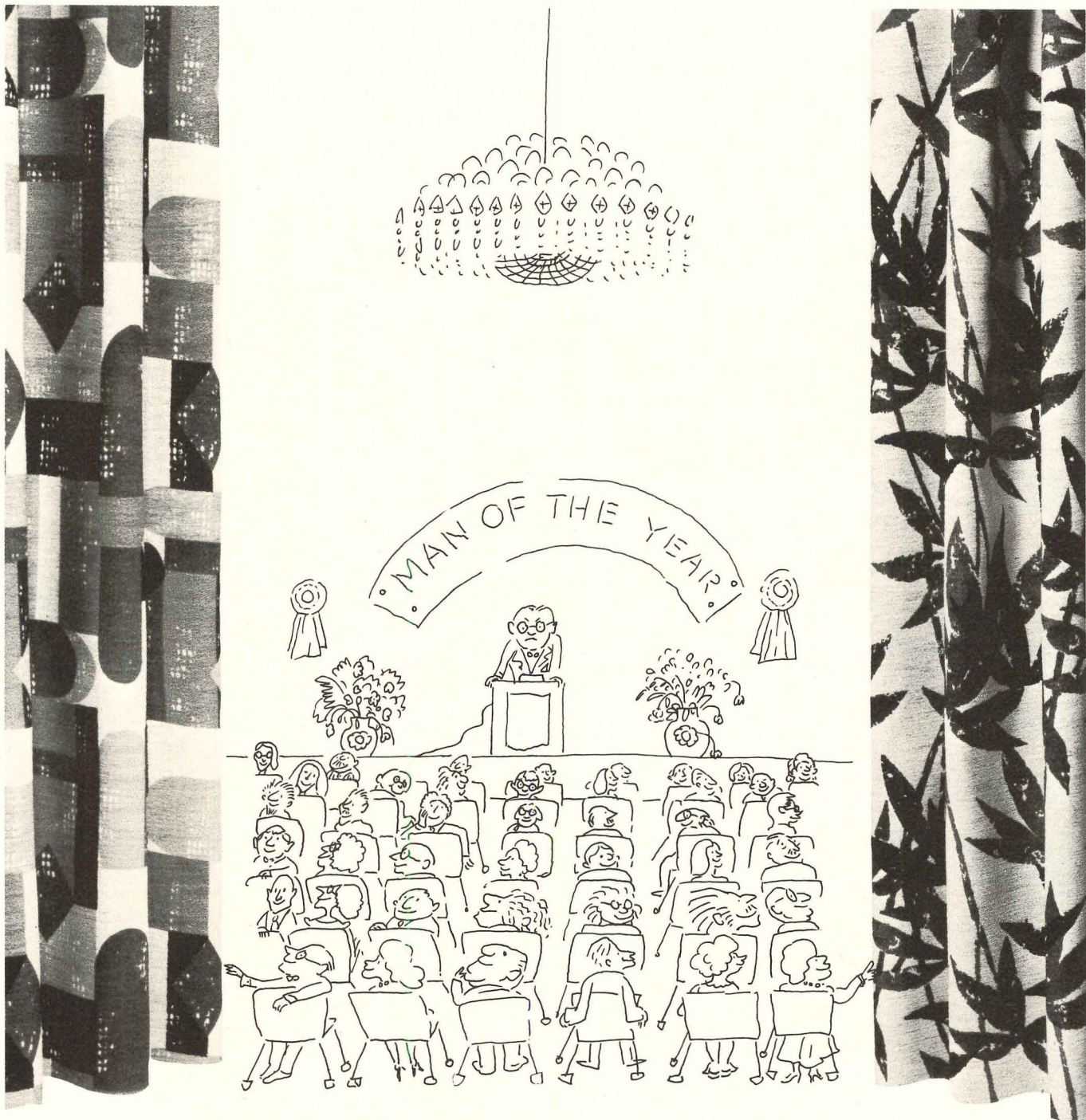
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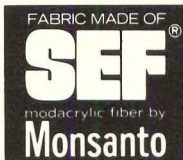
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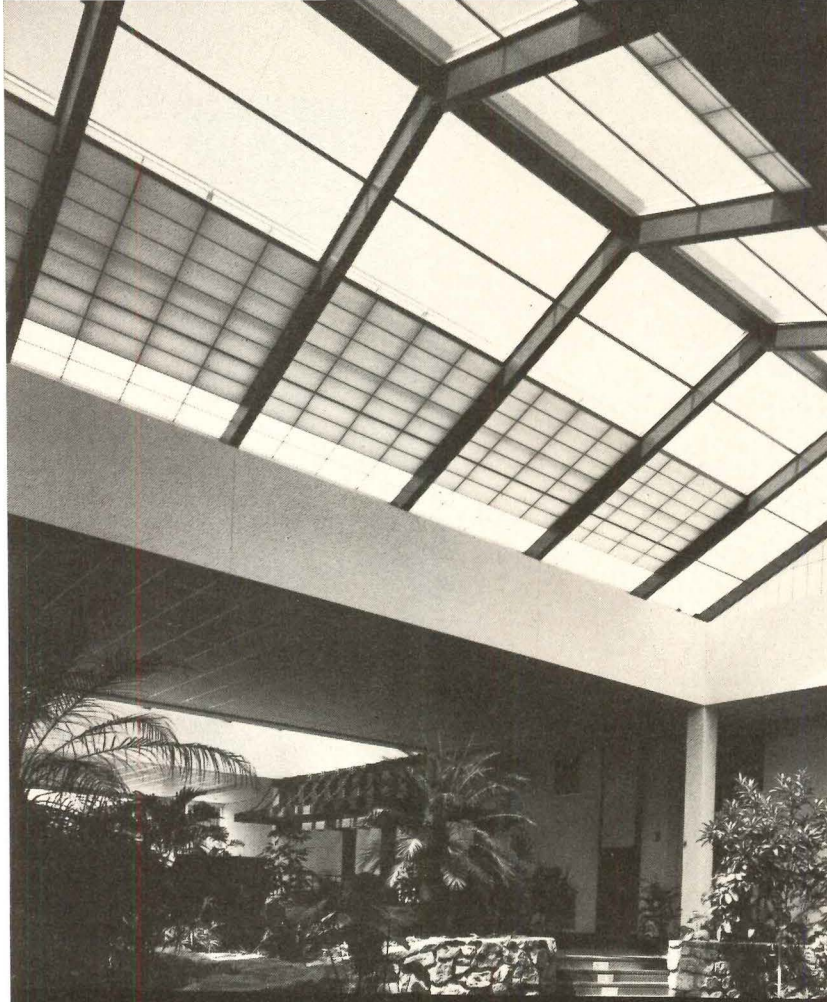
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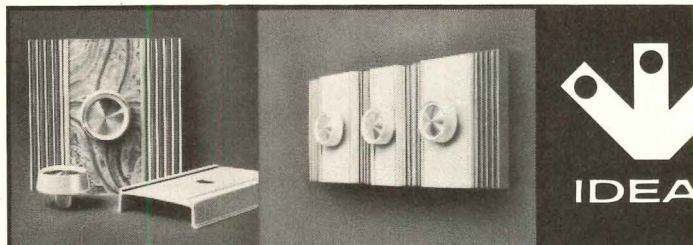
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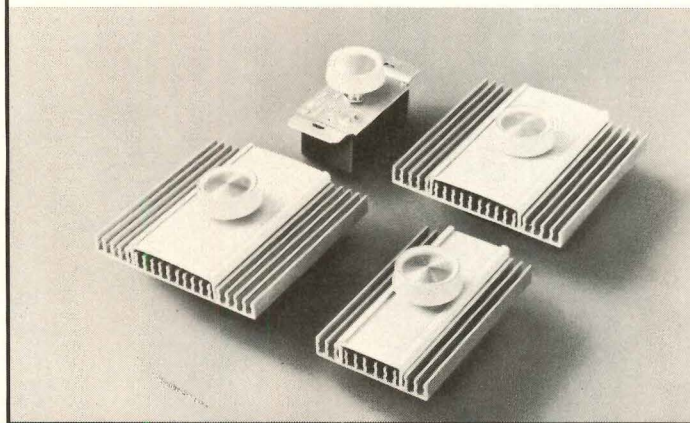
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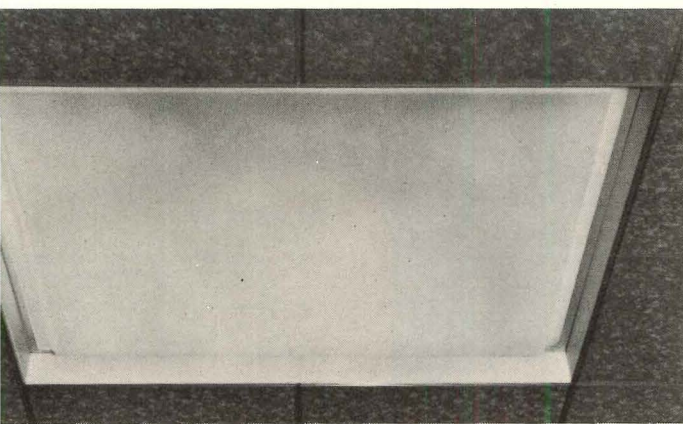
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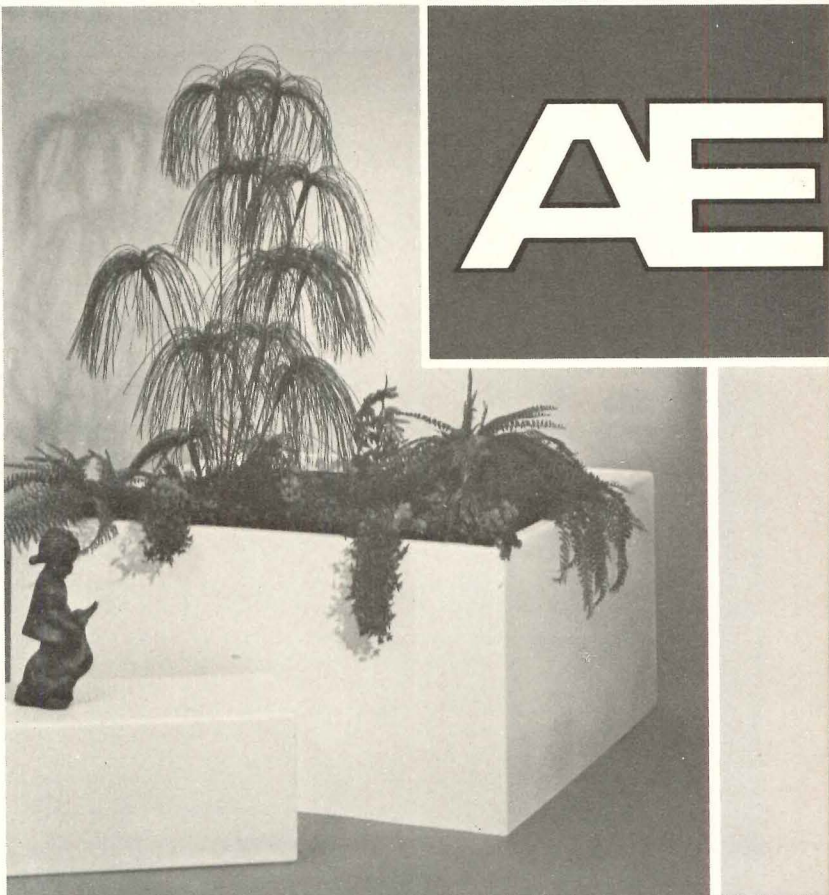
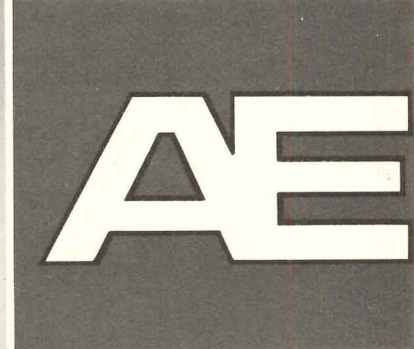
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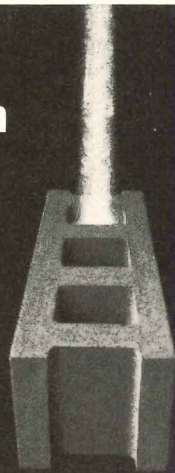
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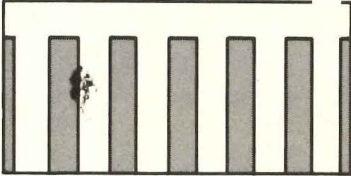
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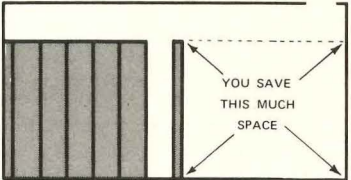
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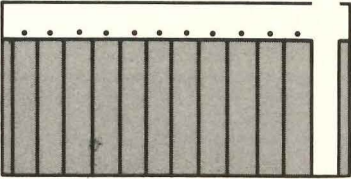
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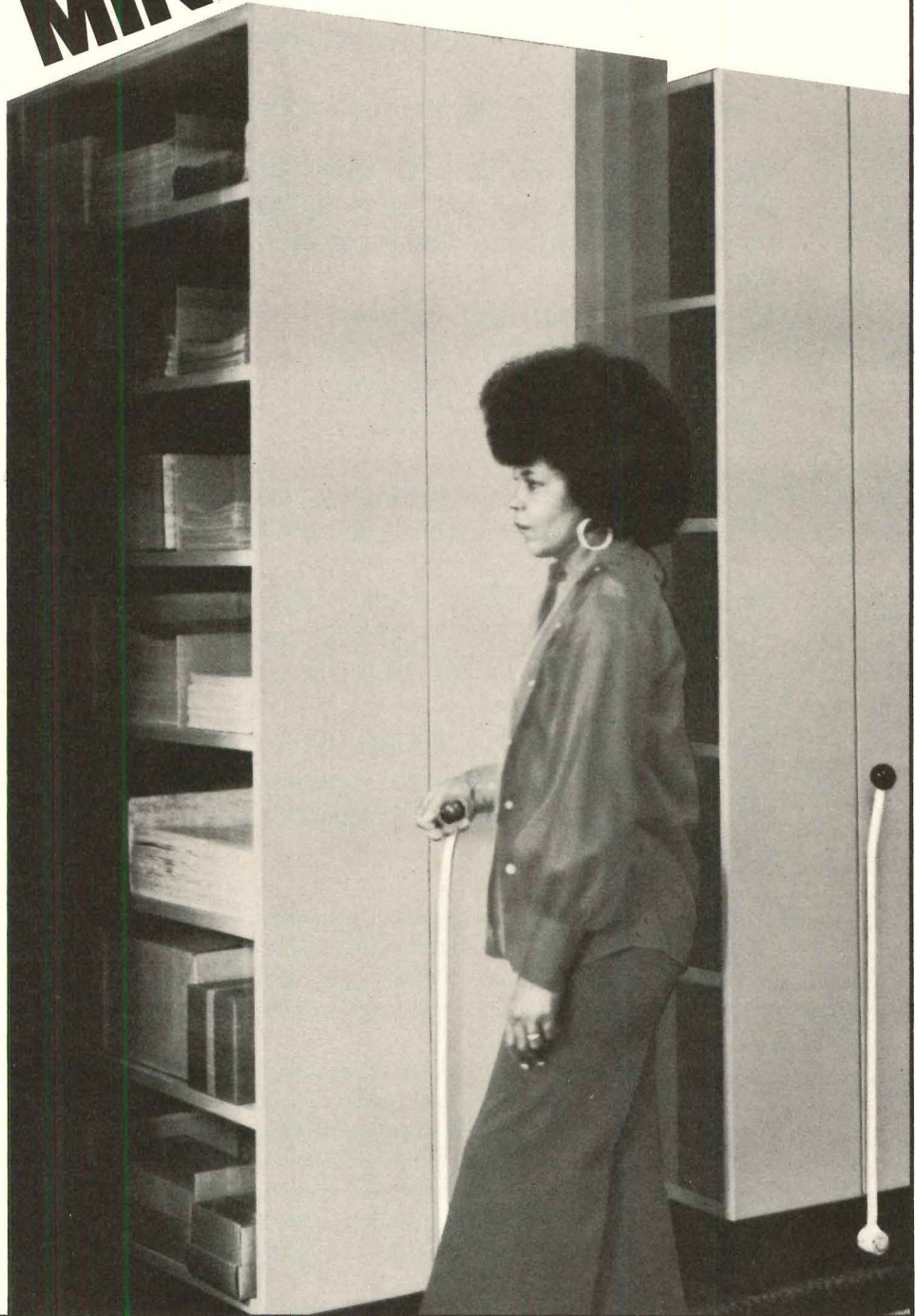
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A change in course And a final plea—to you—for help

A message from The International Architectural Foundation, Inc.:

The change in course: In lieu of an international design competition conducted simultaneously for three cities in the developing world, all efforts will be concentrated at this time on generating creative plans for a 3,500-person neighborhood in the heart of Manila.

The reason: This change results from the recent visit of our professional advisor to the Philippines, where an intensive effort is underway to ameliorate the sordid living conditions of over 200,000 squatters in the Tondo Foreshore area. Philippines authorities have expressed hope that The IAF Competition for the design of a neighborhood in Dagat-dagatan, a relocated area near the Tondo, will generate ideas that ultimately will benefit *all* inhabitants in that area—as well as contributing to solutions in other developing countries.

A tremendous challenge and opportunity!

We need your help now. To open the Competition by year end, we need approximately \$100,000 more than has been pledged to date. To achieve this goal, we are inviting contributions from individuals as well as institutions and establishing four categories of donors:

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This is your opportunity to be associated publicly with this unique effort to bring the skills of architects the world over to bear on the problems of the urban poor.

Please send us your check today, payable to The International Architectural Foundation, Inc. Your gift will be used exclusively for purposes of the Competition. For additional information see Editorial, pages 13 and 14 of this issue; or telephone Blake Hughes, 212/997-4685.

Our sincere thanks to Hellmuth, Obata & Kassabaum, Inc., and The Austin Company, who have pledged their generous support in company with: The Graham Foundation, The International Development Research Centre (Canada), the Johns-Manville Fund, and The Asia Foundation.

Problems of excessive population growth, unemployment, environmental decay, disease, alienation and urban squalor are all interrelated—rooted in ignorance and disability, breeding despair and desperation. Nowhere are these ugly problems more clearly focused than in the urban slums of the developing world. Nowhere is there a greater need for human solidarity and creative contributions.

The International Design Competition is a modest means to these ends and aims to

- alert architects and planners to the gravity of the accelerating urban crisis in developing countries;
- increase the fund of talent and expertise available for planning human habitations;
- involve architects and planners in the design of a demonstration project in a major city of the developing world;
- contribute to the success of the important United Nations Conference-Exhibition on Human Settlements (Vancouver, 1976);
- act as a catalyst for further contributions by individuals, institutions, organizations, and governments to the solution of the multi-faceted problems of housing the urban poor.

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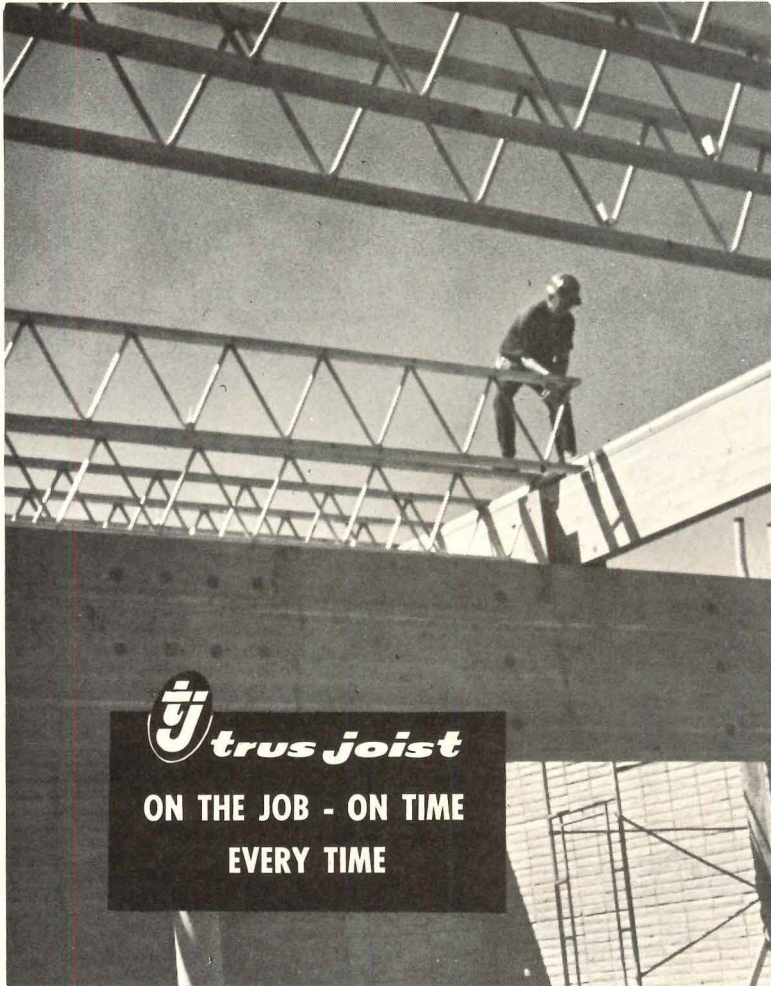
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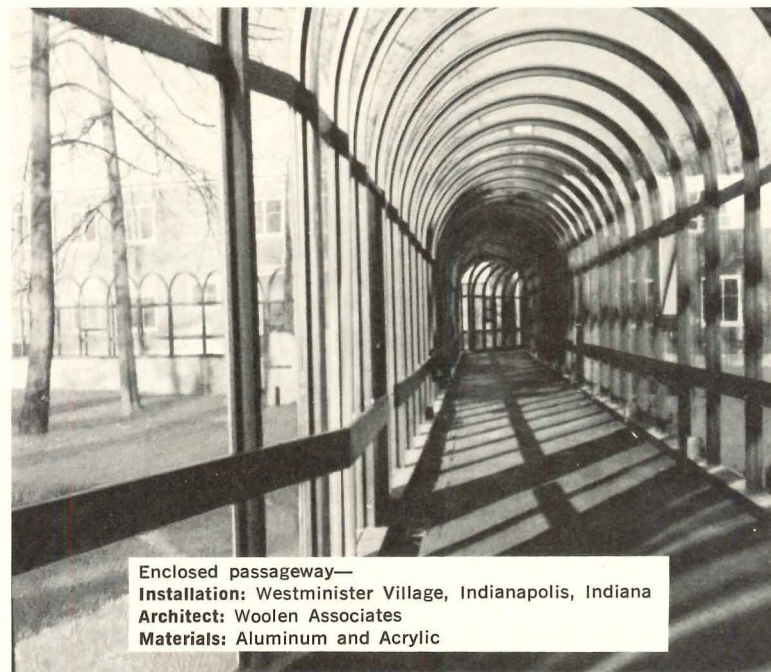
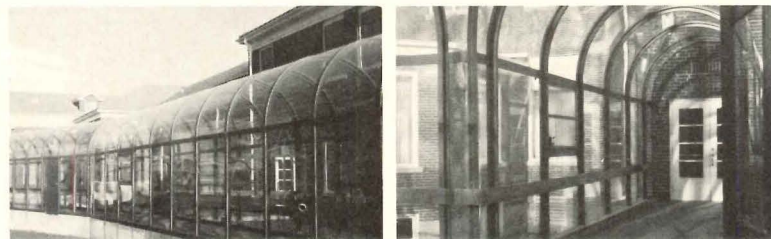
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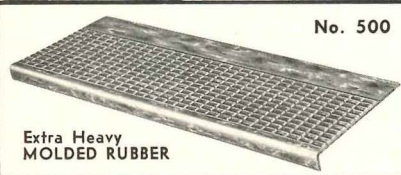
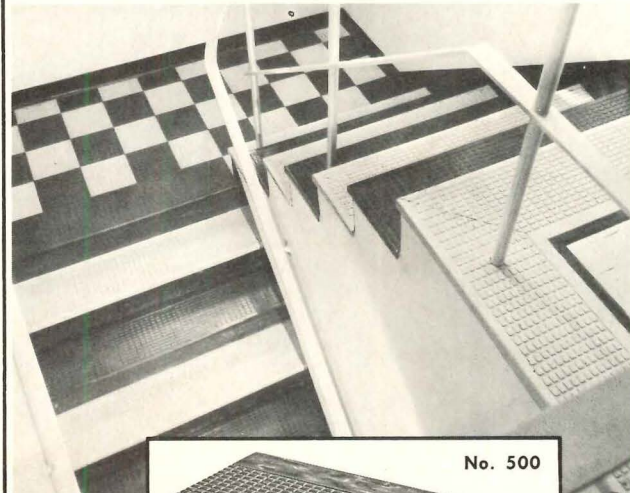
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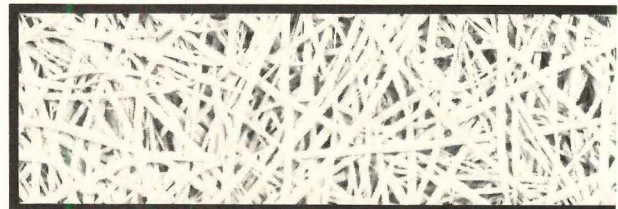
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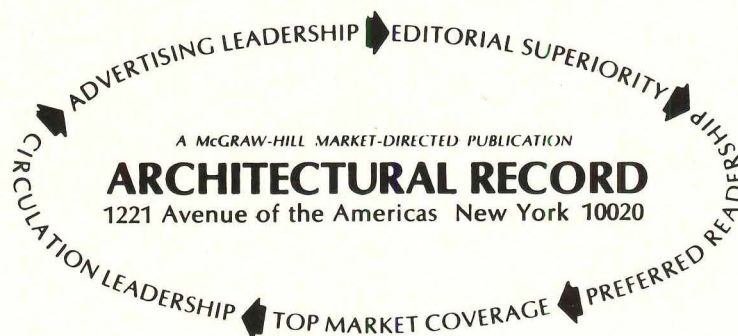
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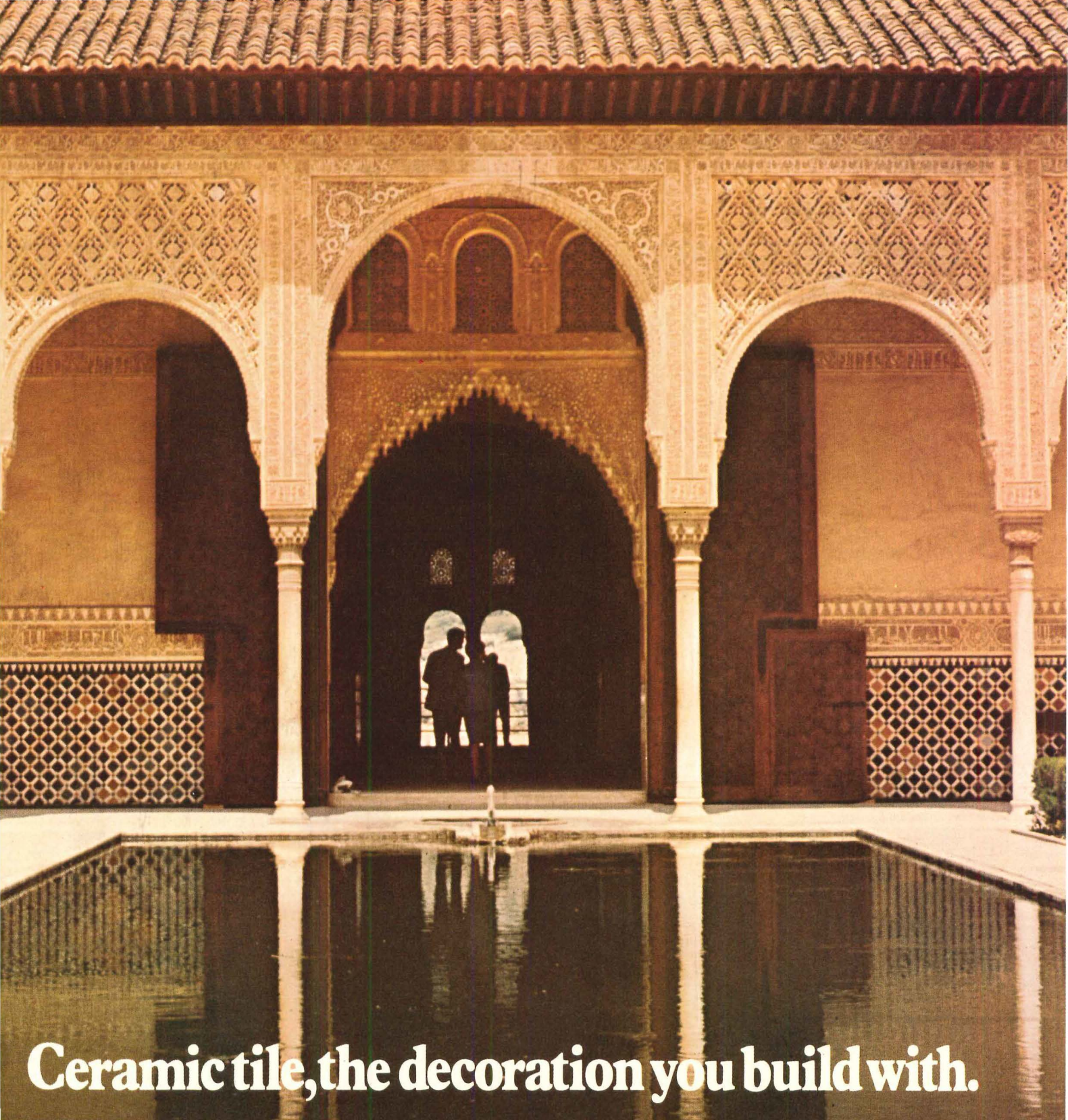
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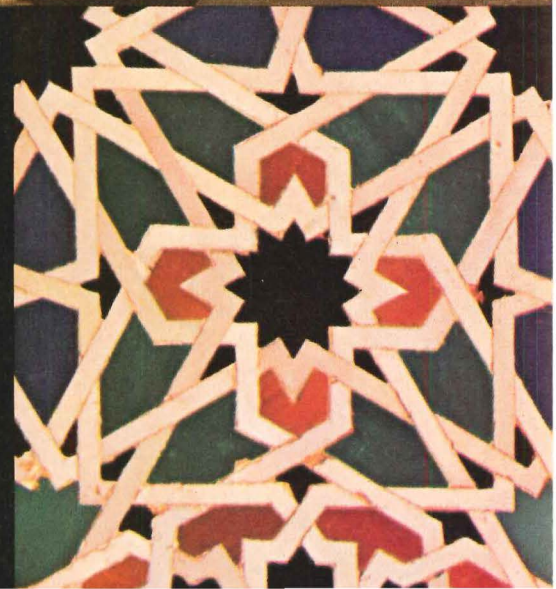
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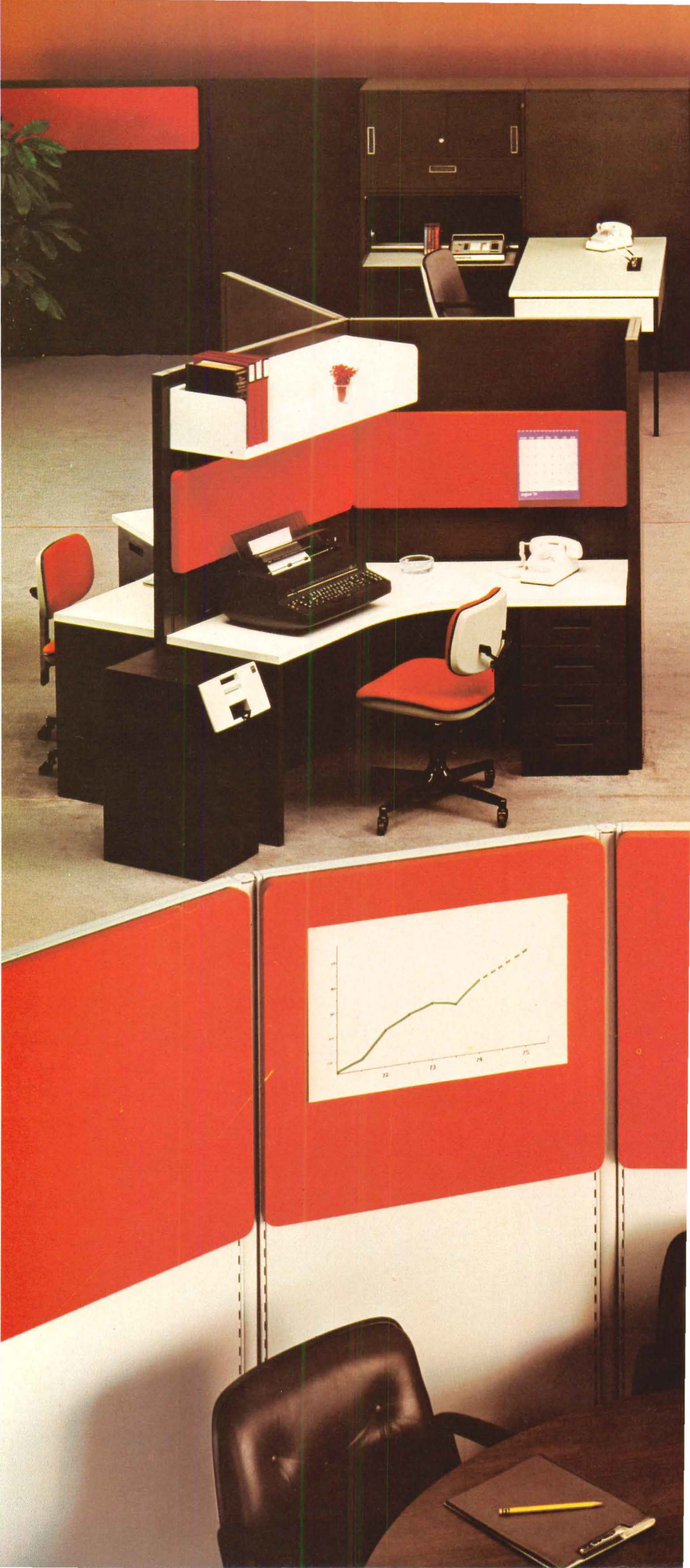
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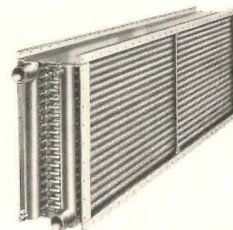
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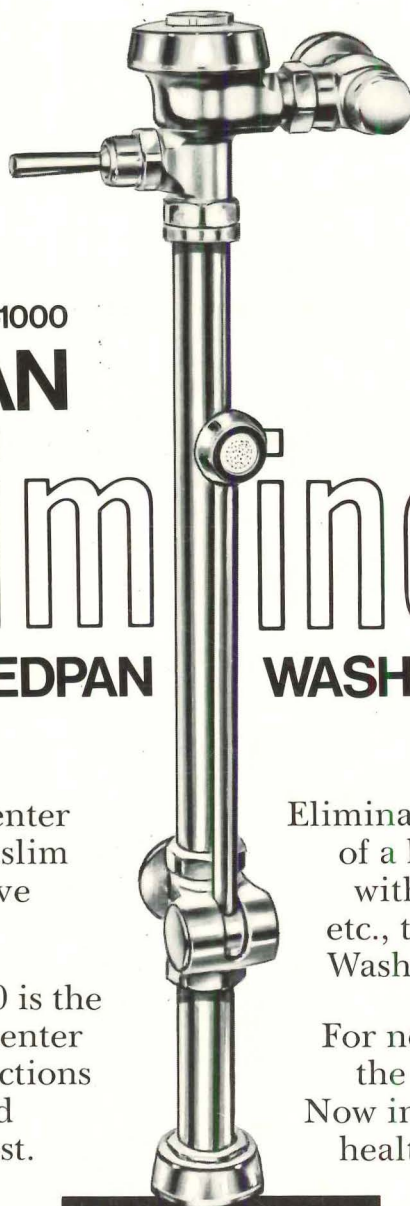
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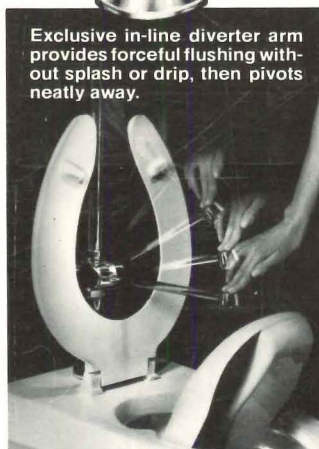
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