

ATRIUM, HYATT REGENCY HOTEL, HOUSTON

HAMILTON PLACE THEATER: SOLVING THE MULTI-PURPOSE PROBLEMS

FIVE CURRENT PROJECTS FROM THE OFFICE OF HUGH JACOBSEN

BUILDING TYPES STUDY: CONVENTION HOTELS

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ARCHITECTURAL RECORD

MAY 1974 **5** A MCGRAW-HILL PUBLICATION THREE DOLLARS PER COPY

Letter to a reader

For people in publishing there is a special poignancy in the death of a respected magazine. I suppose it is because such a magazine has achieved personality. I expect that my own feeling about it is akin to a maritime man's when a fine ship, for all the loving care lavished upon it, and for all the dependable services it has performed in fair weather and foul, disappears beneath the waves or is sold and ignominiously broken up for scrap.

Thus, the fall of the magazine named *Architectural Forum* has saddened me no less than four times in the last ten years: first in 1964 when folded by Time, Inc., then in 1969 when abandoned by Urban America, again in 1972 when sold by Whitney Publications and now in 1974 with suspension of publication in March.

It is not the loss of a name that saddens me. What is a name but a label that can be soaked off and reapplied anywhere if in someone's opinion the goodwill warrants? What disturbs me is the breakup of the entire publishing team behind the name—the dashing of its ideas, intentions and hopes and the loss of another valuable viewpoint and professional service.

As a matter of fact, though the *Forum* insisted on its lineage in its promotion, there was not the slightest kinship between the old Time, Inc. *Forum* and the Billboard one—not a publisher, not an editor, not a salesman in common! And not even an editorial, circulation or marketing policy!

To illustrate: the original *Forum* stated that its editorial mission was "to bring together around the central art and science of architecture all the major influences which will build America in the years ahead." Reflecting this "building team" concept, subscriptions were solicited from such disparate groups as builders and contractors, financiers, realtors, school board members, hospital administrators, management personnel of all types of owning organizations, etc.

As the publisher, Joseph C. Hazen, Jr. wrote in his last issue, "magazine readership increased 10-fold to 64,000—a gain that unfortunately did not provide economic success." As circulation soared and editors sought to serve the limited common denominator interests of all kinds of building professionals as well as building amateurs, the support of architects and engineers waned—and so did the investments of advertisers.

Ten years later in 1974 *Architectural*

Forum had a totally different editorial mission which it stated as follows: "to serve principally U.S. registered architects and in so doing to be both selective and critical, presenting buildings in the context of their environment and relate their materials, their structural concepts, their equipment, their designs to the architect's professional responsibility."

This is not the time or place for post mortems, but in my opinion the lack of economic success in this instance (only seven ad pages in March and six scheduled for April!) cannot be blamed on that editorial mission or the editorial product.

The *Forum* was a handsome magazine, professionally edited, highly respected and well read—with great integrity (it never postured, strutted or sought to gimmick its way to success). Two recent Jesse H. Neal Editorial Achievement Awards to its editor Bill Marlin and Two Certificates of Merit attest to the editorial quality of the *Forum* that is no more.

Our sympathy goes out to all the *Forum* team and especially to Bill Marlin and his fine staff and to Charles Whitney whose long illness tragically weakened his hold on the helm.

Best,
Blake Hughes, publisher

Calendar

MAY

9-10 Seminar on How the Architect and Engineer Can Profit as Builder-Developer, Atlanta. Sponsored by Architectural Record. Contact MCI, 505 Park Avenue, New York, New York 10022. Phone (212) 759-5830.

9-11 Energy standards and environmental controls on housing and land development seminar, Americana Hotel, New York City. Contact: BNA-HDR Seminar Secretary, 1231 25th Street, N.W., Washington, D.C. 20037.

10-11 Seminar on documenting architectural and environmental heritage, Americana Hotel, Bal Harbour, Florida. Contact Architecture Department, University of Miami, Coral Gables, Florida 33124.

13-14 Seminar on How the Architect and Engineer Can Profit as Builder-Developer, Los Angeles. Sponsored by Architectural Record. Contact MCI, 505 Park Avenue, New York, New York 10022. Phone (212) 759-5830.

17-23 Annual convention, National Architectural Secretaries Association, Washington, D.C. Contact Mrs. Terry L. Peck, AIA/ASA, 1735 New York Av-

enue, N.W., Washington, D.C. 20006. **19-23** AIA national convention, Sheraton Park Hotel, Washington, D.C. Contact The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006.

26-June 1 FIP/PCI Congress, New York Hilton and Waldorf-Astoria, New York City. Contact the Prestressed Concrete Institute, 20 North Wacker Drive, Chicago, Illinois 60606.

29-31 Workshop-seminar on industrialized building, University of Illinois at Urbana-Champaign. Contact Professor Samuel T. Lanford, 106 Architecture Building, Urbana, Illinois.

JUNE

5-7 Pacific Coast Builders Conference, Fairmont Hotel, San Francisco. Contact PCBC, Suite 1247, Russ Building, 235 Montgomery Street, San Francisco, California 94104.

6-7 Seminar on How to Market Professional Design Services, Chicago. Sponsored by Architectural Record. Contact Building Industry Development Services, Suite 104, 1301 20th Street, N. W., Washington, D.C. 20036.

14-15 Seminar on How the Architect and Engineer Can Profit as Builder-Developer, Houston. Sponsored by Architectural Record. Contact MCI, 505 Park Avenue, New York, New York 10022. Phone (212) 759-5830.

17-28 Study program in Management in the Construction Industry, Massachusetts Institute of Technology, Contact the Department of Civil Engineering, Room 1-382, MIT, Cambridge, Massachusetts 02139.

17-20 Conference of the American Society for Engineering Education, Rensselaer Polytechnic Institute, Troy, New York. Contact C. A. Eckert at the Society, Suite 400, One Dupont Circle, Washington, D.C. 20036.

17-21 Course in Energy: Resources, Conversion and Utilization, University of California at Berkeley. Contact Continuing Education in Engineering, University of California Extension, Berkeley California 94720.

19-21 NEOCON, contract furnishings market, The Merchandise Mart, Chicago, Illinois 60654.

24-25 International symposium on metrication, Shoreham and Sheraton Park Hotels, Washington, D.C. Contact ASTM, 1916 Race Street, Philadelphia, Pennsylvania 19103.

27-29 International Bicycle/Pedestrian Planning and Design Seminar, Hotel Metropole, London, England. Contact MAUDEP, Box 722, Church Street Station, New York, New York 10008.

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

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Quotations on reprints of articles available. Every possible effort will be made to return material submitted by possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage.

EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: 1221 Avenue of the Americas, New York, N.Y. 10020. Other Editorial Offices: 425 Battery Street, San Francisco, Cal. 94111; 1249 National Press Building, Washington, D.C. 20004.

PUBLICATION OFFICE: 1221 Avenue of the Americas, New York, New York 10020. Second class postage paid at New York, New York 10001 and at additional mailing offices.

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SUBSCRIPTIONS: Subscriptions solicited only from architects and engineers. Position, firm connection, and type of firm must be indicated on subscription orders.

CHANGE OF ADDRESS or subscription service letters should be forwarded to Fulfillment Manager, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, N.J. 08520. Provide old and new addresses, zip code or postal zone number. If possible, attach issue address label. Annual subscription prices: U.S., U.S. possessions and Canada: \$10.00 for architects, engineers and other individuals in the fields served, all others \$22.00. Other countries: \$25.00 to architects, engineers; others \$35.00. Single copies \$3.00. GUARANTEE: Publisher agrees to refund that part of subscription price applying to unfulfilled part of subscription if service is unsatisfactory.

ASSOCIATED SERVICES / McGraw-Hill Information Systems Co.: Sweet's Catalog Files (Architectural, Light Construction, Interior Design, Industrial Construction, Plant Engineering, Canadian Construction), Dodge Building Cost Services, Dodge Reports and Bulletins, Dodge/SCAN Microfilm Systems, Dodge Management Control Service, Dodge Construction Statistics, Dodge regional construction newspapers (Chicago, Denver, Los Angeles, San Francisco).

THIS ISSUE is published in national and separate editions. Additional pages of separate edition numbered or allowed for as follows: Western Section 32-1 through 32-4. POSTMASTER: Please send form 3579 to Fulfillment Manager, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, N.J. 08520.



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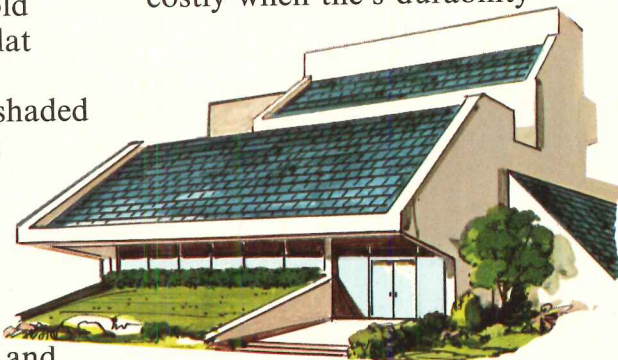
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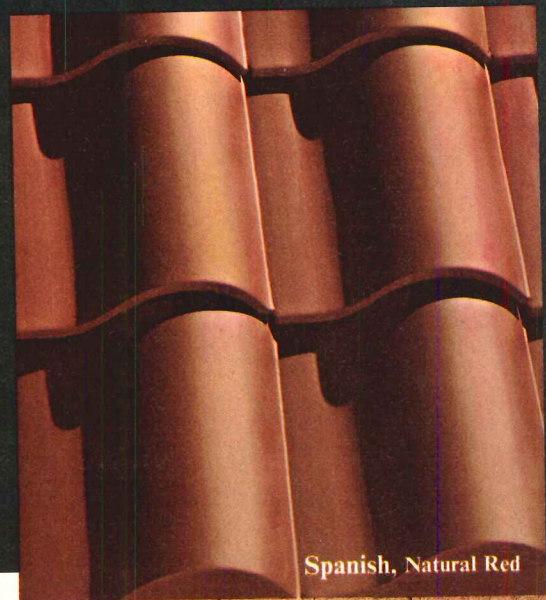
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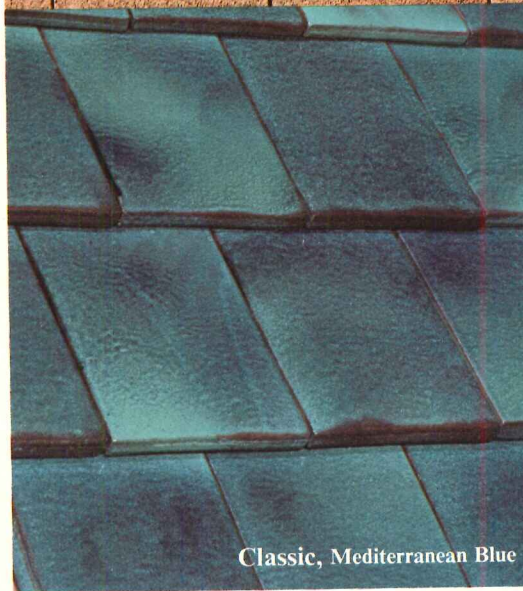
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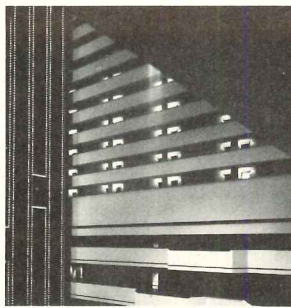
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Architects: JVIII
Photographer: Julius Shulman

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too much, too fast?

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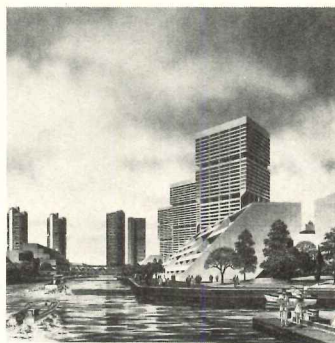
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national interest.

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Grand Ole Opry has a new home.
Los Angeles City Hall saved
from wrecker. Contractors seek
an end to retainage. Frank Lloyd
Wright Week announced in Los Angeles.
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available. AIA elects 73 Fellows
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rejects international airport.

39 Buildings in the news

AIA Honor Awards. Children's
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Puerto Rico (below).



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ARCHITECTURAL BUSINESS

65 Job satisfaction: key to reduced A/E employee turnover

Getting down to fundamentals in both
organizational method and psychological
background, this rather scholarly review
by H. Maynard Blumer, coordinator of
quality control for Guirey, Srnka, Arnold
& Sprinkle, summarizes pertinent matter
from scientific and practice literature to
come up with his own practical
suggestions for increasing job satisfaction
and reducing turnover in architectural and
engineering firms of all sizes.

69 Construction management

Project purchasing strategy is seen by
Charles B. Thomsen, president of CM
Associates, not only as a tool for building
cost control but also as an on-course
guidance system for keeping the
design-bid-construct process as a whole
strictly on targets of quality, cost and time.

71 Building costs

This spring a supplement to the Dodge
Digest of Building Costs and
Specifications adds case histories of costs
on 17 selected building projects
previously reported during construction.

73 Building activity

Signs of the times imply that construction
labor in 1974 may be reaching the end of
a relatively peaceful era, according to
economist Jim Carlson.

FEATURES

111 Hamilton Place: a multi-purpose theater that succeeds

Hamilton, Ontario's new performing arts center, by Trevor P. Garwood-Jones, provides facilities for three performances, numerous meetings and one full-scale rehearsal to occur at the same time—all centering on a big multi-purpose theater that achieves surprisingly good acoustics by surprisingly simple means.

117 Five current projects from the office of Hugh Jacobsen

Housing for the Pennsylvania Avenue Development Corporation in Washington; resort development for Half Moon Bay, Antigua, West Indies; three collegiate buildings, two in Greece and one in Egypt.

123 Back to the box

Houses conceived as works of sculpture cost more as a rule than do those contained within a rectangle and often require specially designed cabinet work in order to function efficiently. Boxes can cost a lot less to construct and furnish, but they require meticulous design of the kind which architect Robert L. Rotner has lavished upon four low-cost houses in the Hamptons.

133 Suburban office buildings

Two striking and imaginative designs that, while projecting strong images, remain considerate of their locales: North Carolina Blue Cross and Blue Shield Headquarters in Durham, by Odell Associates, Inc.; and Heublin Corporate Headquarters, Farmington, Connecticut, by Russell Gibson von Dohlen Inc.

141 Pedagogical analogy:

Learning the principles of architectural design through product design.

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145 The convention hotel: an American hybrid in hotel design

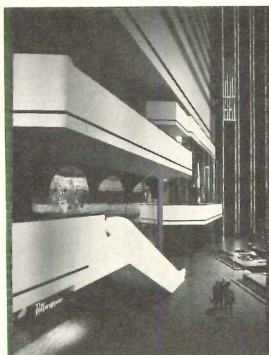
Currently ranging from 200 to 2000 rooms, the American convention hotel is seen by many expert in its design as the most prevalent type of hostelry in the coming years. Usually the nucleus for downtown renewal, the convention hotel has to be all things to all people, all the time. How it can be designed to meet this goal functionally and esthetically is the subject of this article.

146 The economics that affect hotel design and operation
by William B. Tabler

148 The planning process
by Alan H. Lapidus

It is the same for most hotels, regardless of size.

152 Hyatt Regency, Houston
The nucleus of a booming convention business. Joint venture architects: Koetter Tharp & Cowell; Caudill Rowlett Scott; and Neuhaus + Taylor.



Julius Schulman

ARCHITECTURAL ENGINEERING

161 Steel space trusses are prefabricated to cut construction costs

Engineers Hirsch & Gray designed three-dimensional trusses for shop fabrication and field assembly with only bolted connections—which cut costs and construction time, and minimized construction errors. A variety of configurations are shown from case examples in this two-part article.

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NEXT MONTH IN RECORD

Building Types Study: public administration buildings

A collection of public buildings that are not only distinguished in themselves but also illustrate a variety of processes for achieving good design in the public sector.

New life for old barns

One of the best ways to live in the country, on weekends and vacations or all-year round, is to inhabit a remodeled barn. Architect Stanley Tigerman has a way with old barns. For the Vollen and Frog Hollow barns, Tigerman started with the foundations and the timber frame of each and added complex interior levels, stairs and new exterior skins. Each of the barns has become a unique family house, difficult to equal without a fine old barn as skeleton.

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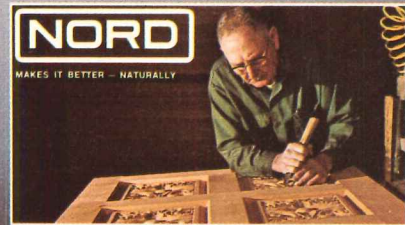
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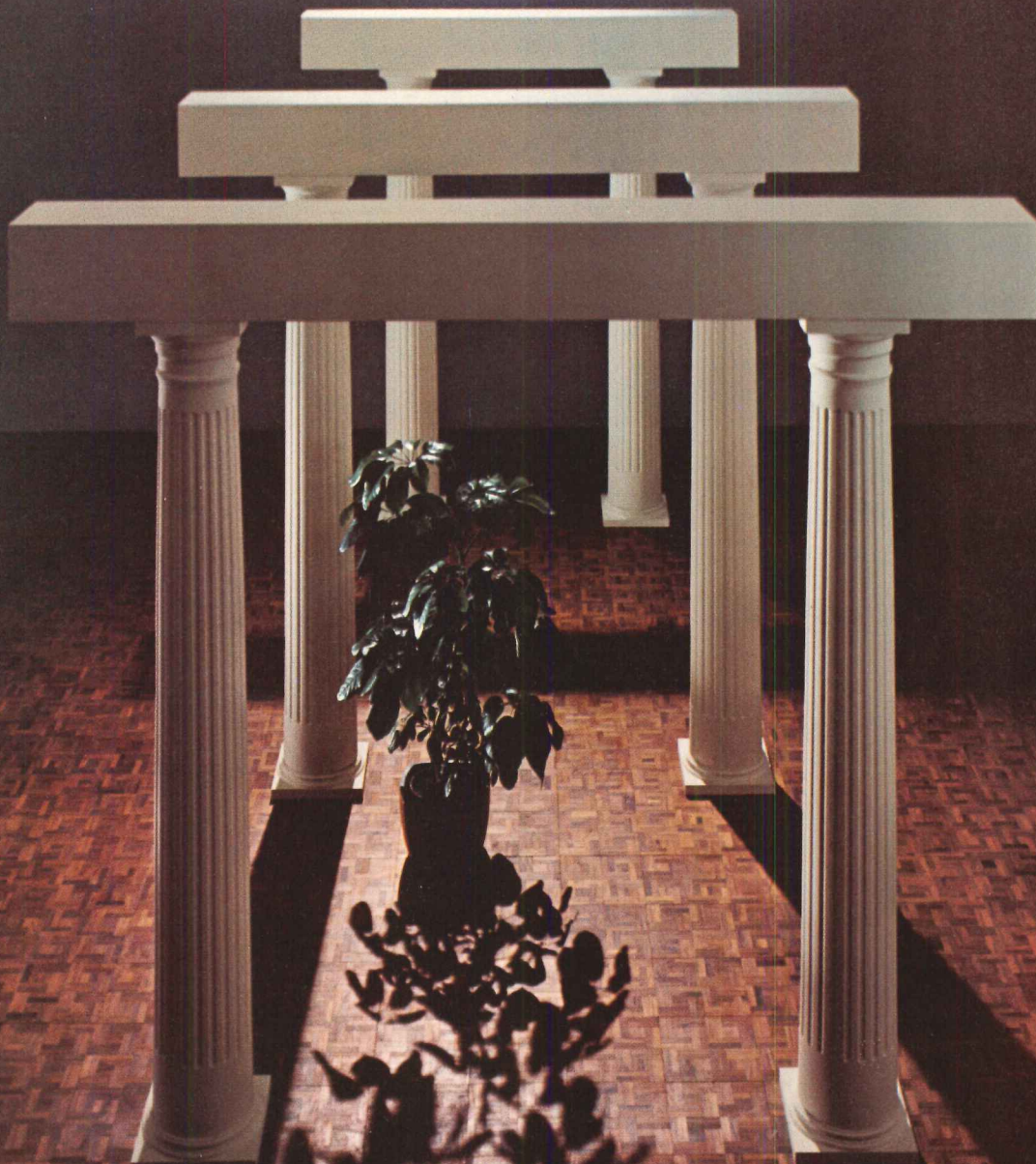
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For more information on Nord stock wood columns, and the name of the distributor nearest you, write "columns" on your letterhead and mail it to E. A. Nord Company, Everett, WA 98206.



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Energy conservation standards: too much, too fast?

Let me say one thing right away, before I make a whole collection of people mad:

There ain't no one around here but us old believers in conserving energy. Back in October 1971—two and a half years ago, long before energy conservation had become a household word, long before anyone dreamed we'd have lines at gas stations much less today's shortage-induced and mind-boggling fuel prices—RECORD held a Round Table on "Energy Conservation through Higher Quality Building." Way back then, long before anyone was considering the problem very seriously, we wrote (in the summary to the Round Table report, RECORD, January 1972):

"It is clear that there is much that architects and engineers can do to conserve energy in buildings. The need is not for new technology. . . . We know how to cut heat loss and solar load; and manufacturers—with a little turn-around time—could at modest extra cost produce equipment that uses appreciably less power.

"But as clear as it is that much can be done by architects and engineers—and by manufacturers—to conserve great amounts of energy, it is also apparent that they cannot accomplish much until their clients acknowledge the seriousness of the problem and become willing to explore the over-all economics of building—operating costs as well as first costs—more comprehensively than they are accustomed to. For the present economic, financing and taxation framework that we now work within clearly favors lower first cost in building; and that exacts a high price in operating costs over the life of the building. Much of that high price is in unnecessary power use; indeed unconscionable power waste.

"To be realistic in a realistic world: Nothing is going to happen without incentives . . ."

Well, that was two and a half years ago.

Today, the incentives to conserve energy are upon us—and they're starting to hurt

The simplest and purest form of that incentive has been visited upon the automakers—people stopped buying behemoths overnight, and we now see on television the spectacle of earnest announcers describing as "our gas-saving economy model, two inches shorter than The Big," the same car that last year was hailed as "the longest and lowest and most powerful in the mid-price range."

Well, the building industry is a little more sophisticated, a little less emotional, and generally more sensible than that, but as standards for energy conservation in buildings emerge they're beginning to alarm architects and engineers, and building-materials manufacturers alike. Which means that—over a cause in which *everyone* believes, energy conservation—we're building up adversary positions. And that's bad news. That delays what everyone knows has to happen—a commitment to stop *wasting* energy. And the adversaries—the Federal government on one side, and the professions and the big manufacturers on the other side—are the wrong adversaries. For they both believe in energy conservation.

The standards are coming from the Federal government, and sound like they'll be tough

. . . and the concern of most architects, engineers, and manufacturers who have been involved with the standards development under work is that—under pressure to "do something"—the standards are being developed too quickly, with inadequate industry consultation, and are gaining somehow "force of law" even though they are preliminary.

For example, as most everyone knows by now, the National Bureau of Standards prepared a draft proposal for specific technical guidelines on energy conservation measures at the request of the National Council of States on Building Codes and Standards.

Though this was merely a draft proposal, when it was sent to several hundred interested parties (including AIA, engineering groups, and involved corporations) for comment, the proposals stirred up a hornet's nest of criticism and concern—mostly on the ground that the guidelines were in the nature of "prescriptive regulations" and that the necessary testing to meet the regulations would be most difficult if not impossible. The criticism was perhaps unfair—the material submitted for comment was clearly labeled "draft proposal"—but the reaction focused attention on three things: the industry's concern that the proposals were not realistic; that prescriptive rather than performance codes become the law; and that state governments—like the Feds under great pressure to do something—would adopt the proposal before all the criticism is in and argued over.

More recently, the General Services Administration has sent up, in trial balloon form,

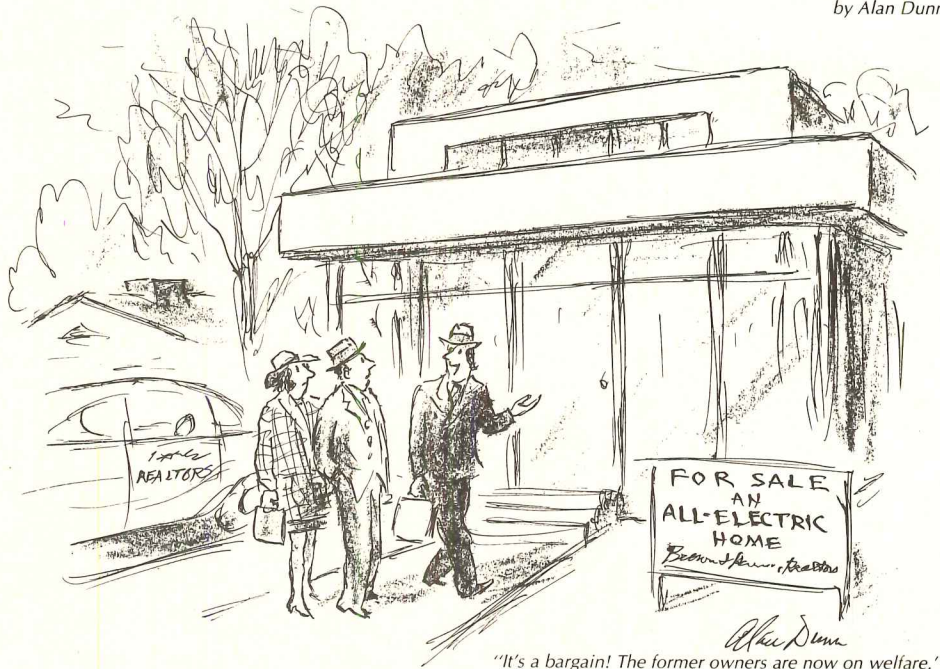
"Energy Conservation Design Guidelines." These guidelines, developed jointly by GSA with Dubin-Mindell-Bloome Associates (the engineers are developing the prototypical energy-saving building in Manchester, New Hampshire), the AIA Research Corporation headed by John Eberhard, and architects Heery and Heery. These guidelines point clearly to a performance-type standard—and hooray for that! For surely, in this difficult business of making substantial cuts in energy use in building, architects and engineers must be given options and trade-offs in the way they accomplish the goal. Again—and this is important—the GSA Guidelines are in preliminary form. But again, a controversy has built up over the standard suggested. The GSA document now in circulation gives detailed suggestions and checklists of, to quote, "various methods that can be utilized by architects, engineers, and GSA to reduce energy consumption for new buildings by an order of 20 to 40 per cent over current practice." It points out, as mentioned above, that the methods "are purposely constructed in a combination of guidelines and performance terms in order to permit architects and engineers the greatest latitude of design, and to encourage innovation in design responsive to energy conserving principles." So far fine—no one can or is arguing. But the storm brews over the GSA conclusion that "it is important that conservation goals be firmly established even though subject to change as new information is developed (and) therefore these guidelines are based on methods which, if utilized, will make it possible to meet an energy goal of 55,000 Btu/gross square foot/year of energy input at the building boundary regardless of location within the country."

55,000 and fight? The question is can we substantiate that figure, meet it, measure it?

The 55,000 number was established, GSA reports, by AIA Research Corporation and Dubin-Mindell-Bloome Associates based primarily on extensive studies preceding the design of the Manchester project. And this criteria was set for Federal office buildings only. But...

A lot of responsible architects, engineers, and manufacturers—recognizing that this criteria is still in proposal, but afraid it will be cast in bronze prematurely—are asking:

- Is 55,000 Btu/gsf/year really reasonable? If the goal is a 20 to 40 per cent reduction, the 55,000 figure appears to assume that current "wasteful" practice achieves an energy consumption level of 70,000 to 90,000—and this seems to many responsible people an awfully low estimate of current practice.
- What happens for other building types? Might a GSA standard for office buildings become somehow a broad industry standard—something like the reverse of the way Federal Minimum Property Standards became maximums for a great deal of housing construction?
- How do you measure a building's performance—how do you meter it? And what do you do if a building, despite the best efforts of all concerned, fails to measure up?
- And even if the standard is fair and reasonable, is it fair and reasonable to enforce it under



"It's a bargain! The former owners are now on welfare."

what is acknowledged by all to be a "hurry up procedure"?

The glass manufacturers, for example, are deeply concerned by what they feel, with justification, is an "unquestionably negative" view on glass. The guidelines, without suggesting a specific reduction, do pretty clearly point to reduction of window area as the most desirable of window treatments to reduce energy consumption, and without much emphasis on the fact that glass is far from a single product. The glass industry argues accurately that glass can be a commodity product with a commodity performance at a commodity price—or it can be a high-quality, high-performance product at a higher price; a product that can meet stringent standards under the "life-cycle" rules that the GSA has so wisely adopted (and which private developers need to adopt as soon as possible). Criticism directed at the glass industry for the "wastefulness" of glass boxes is surely unfair to the industry—for what it was asked to do by architects and clients (including the Federal government) for a long time was to manufacture a product to "skin" a building as inexpensively as possible; and they did it with great success. If what architects and clients (including the Federal government) now wants is an energy-conserving product, that same glass industry, under the new rules, can supply that product, though of course not at the same price. There are also considerations, for those who see an easy way out by "cutting down on all that glass," of how people feel.

Windows are not just for looking out of—they represent an important human relationship to the outdoors—even if the outdoors is just the building across the street. People just don't like not being able "to see out." And that feeling, carried to an extreme in the name of energy conservation, could well result in strong employee dissatisfaction and slower rentals of income-producing buildings.

Finally, on glass, there are considerations of natural light vs. artificial (energy-consuming) light which are surely important, if not yet well codified.

In short, it seems important not to condemn or damage an industry for doing what everybody has been asking it to do, especially when it can, and happily will, switch to the new ballgame given a fair chance.

It's just as Stanley Gilman (then ASHRAE president) said at that Round Table two and a half years ago: "The trend has been to emphasize low initial cost . . . and ignore operating costs. The manufacturer has had no choice but to follow this trend if he expected to stay in business . . . Manufacturers have millions of dollars of tooling and production equipment invested (in producing for lowest first cost) that cannot be done away with overnight. Industry momentum has been in the direction of lowest initial cost and not toward energy conservation. It will take a considerable educational effort, and considerable time, to turn this around."

And it seems to me that architects, engineers, manufacturers and clients—long under real pressure to do one thing—now need time to do something else, even when that something else is energy conservation. I think no one can argue that we must stop the waste, but I think that we must take the time—though with all deliberate haste—to do the job right.

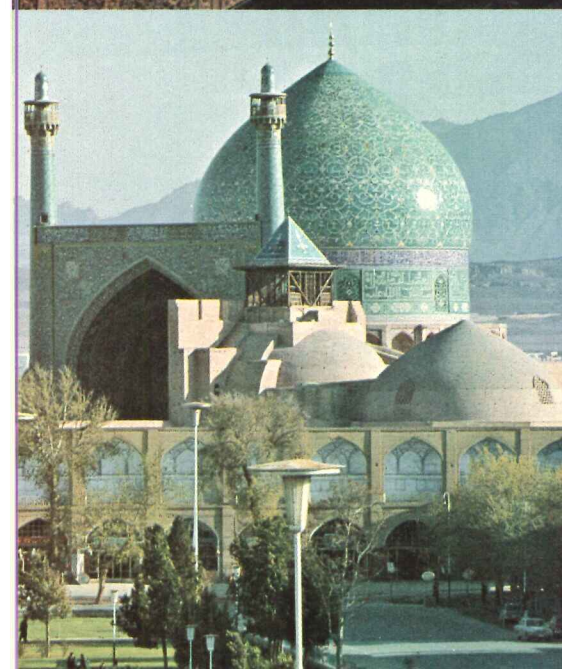
—Walter F. Wagner Jr.

NEOCON 6 opens June 19 at Chicago's Merchandise Mart

The sixth annual conference on contract interiors will be held at Chicago's Merchandise Mart June 19-21, 1974. As in past years, interior designers, architects, and other design professionals will get together to exchange information and views on challenging subjects of important mutual concern. The three-day program includes 20 sessions, some of them concurrent, and numerous prominent speakers. Stuart Udall, former Secretary of the Interior, will speak at the final session on "Energy Gluttons: Glass & Steel Dinosaurs." For information, call 800-621-3902.



Ceramic tile, the decoration you build with.



The Mosque of Sheikh Lotfollah, Isfahan, Iran. 1601-1618. By Muhammad Rida ibn Ustad for Shah 'Abbas I.

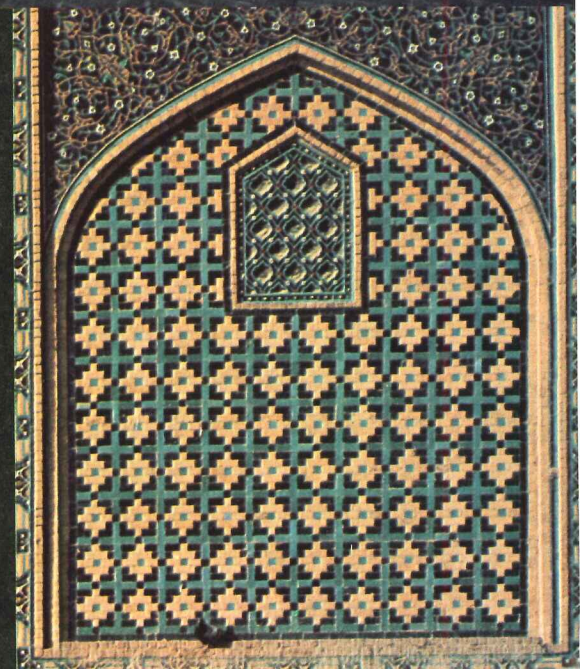
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Photographs courtesy of H.C. Seherr-Thoss, *Design and Color in Islamic Architecture*. For more data, circle 11 on inquiry card



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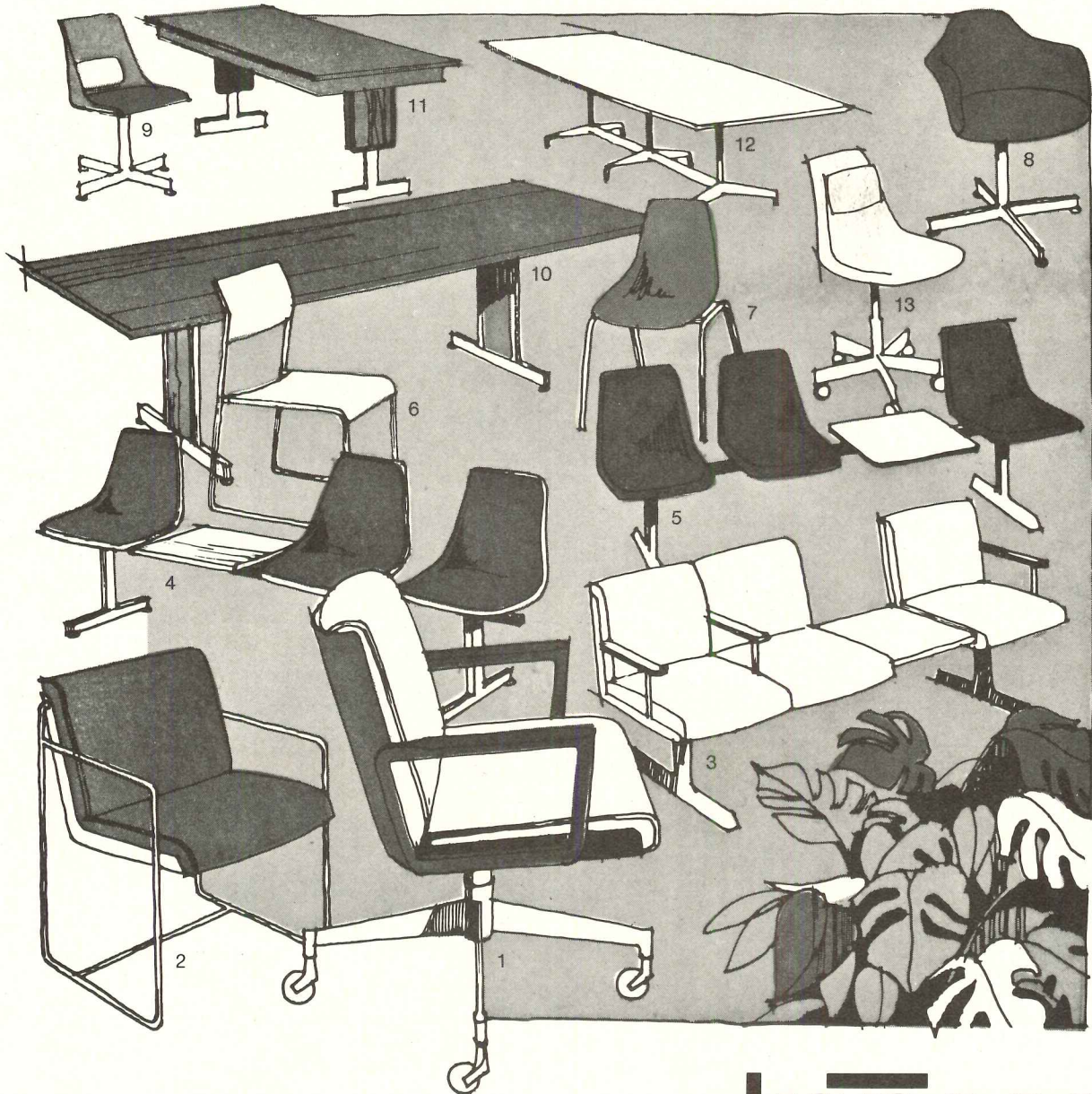
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4,5. Modular Seating: 2 to 5-places or larger; fiberglass or poly shells; some upholstered. 4 base styles. CIRCLE 17
6. Poly Stack Chairs: Sled base model stacks 40 high to clear 80" doorway. Stacking side, arm and tablet arm models. CIRCLE 18

7,8,9. Fiberglass Seating: Arm, side, pedestal base chairs; tablet arm models. CIRCLE 19
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Three blind concepts. See how they work.



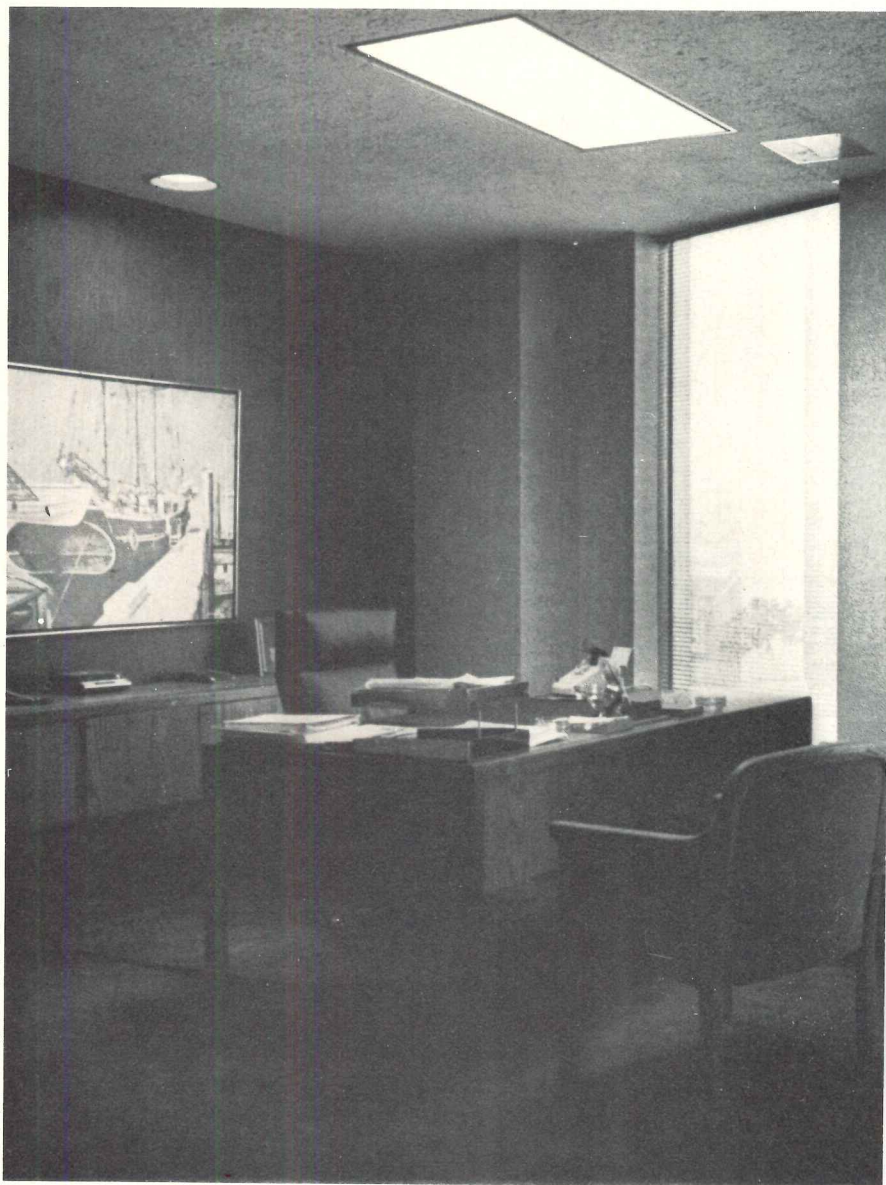
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ARCHITECT: EDWARD DURRELL STONE.



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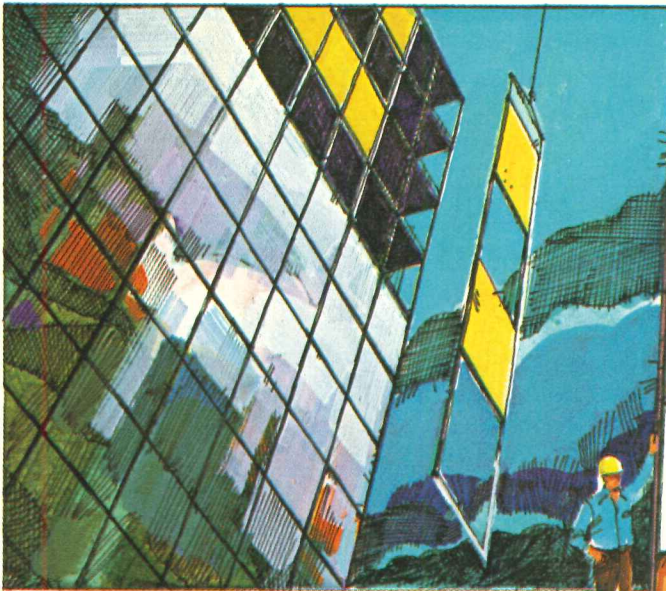
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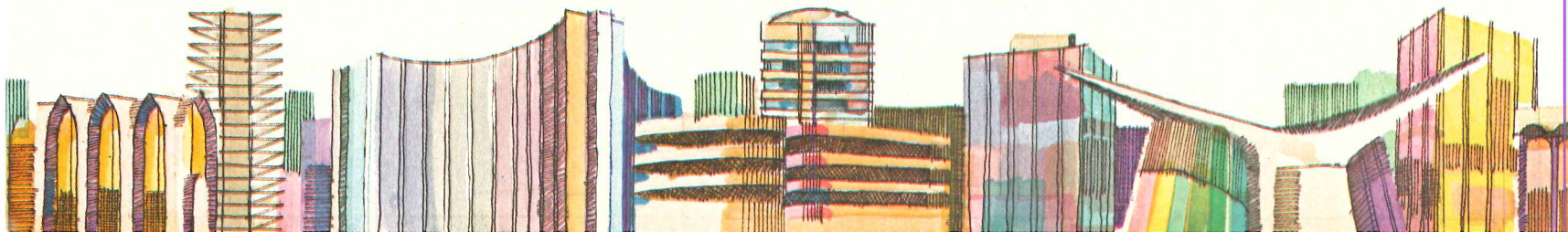
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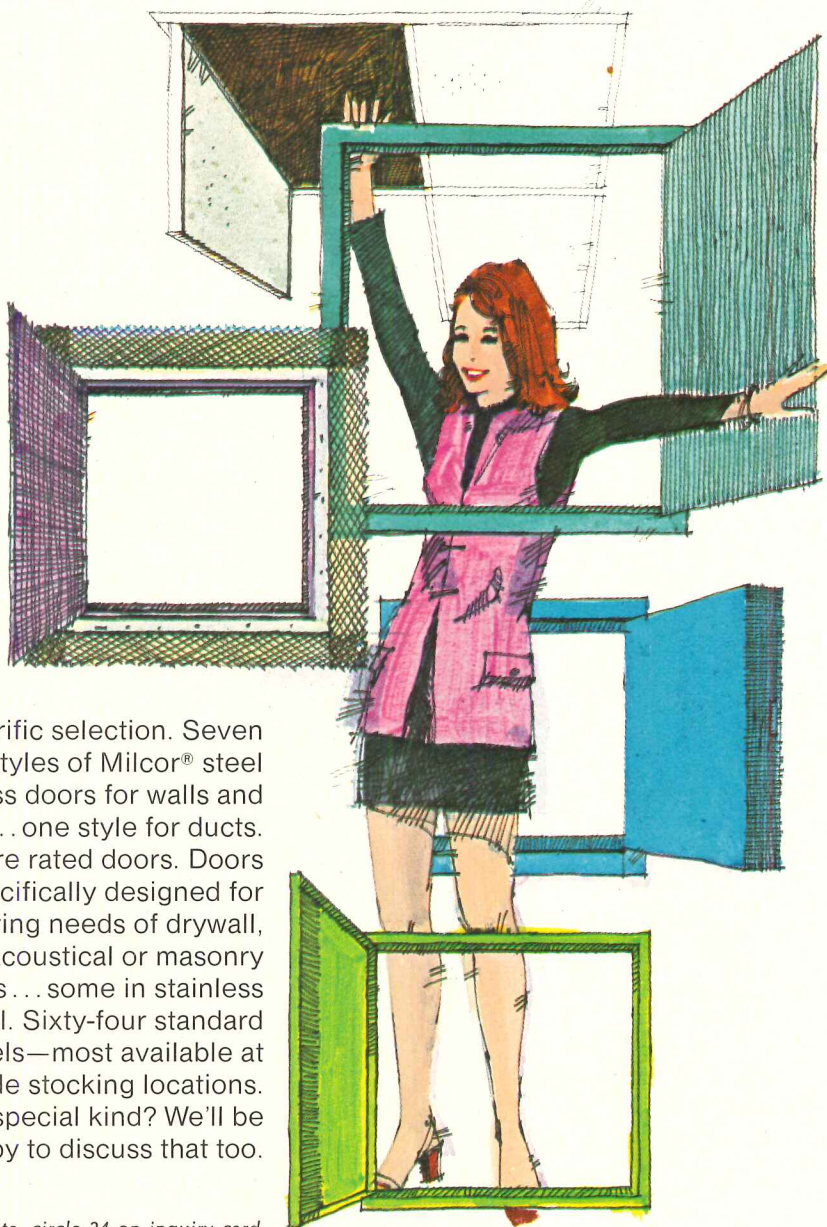


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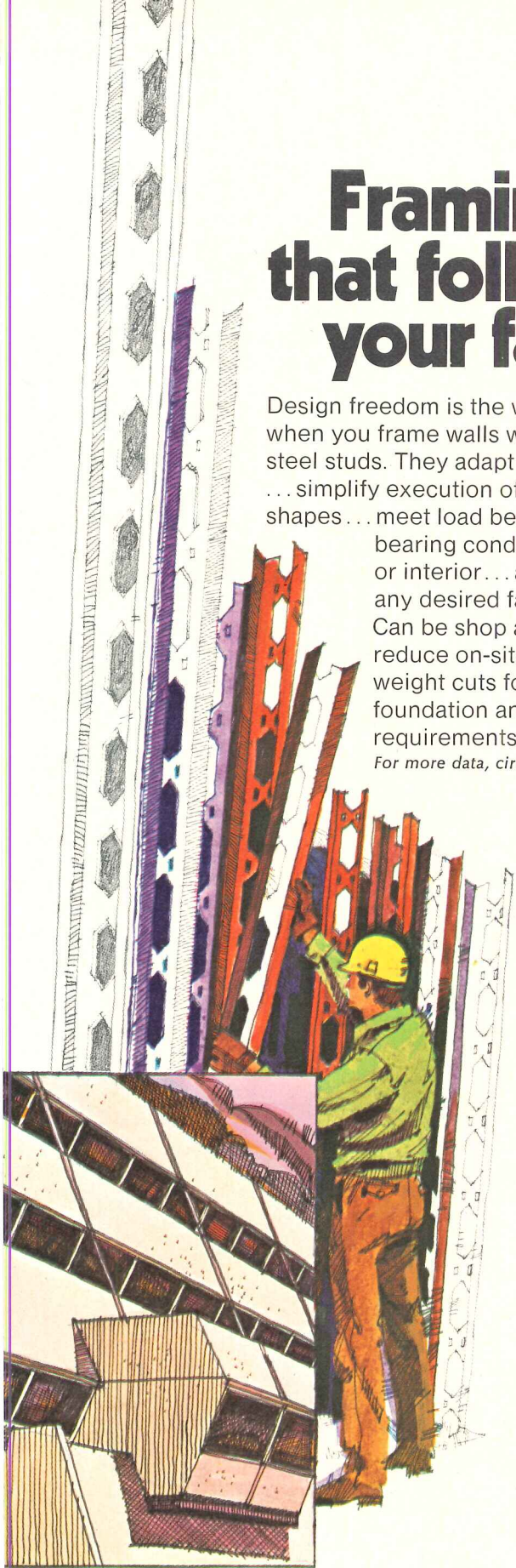
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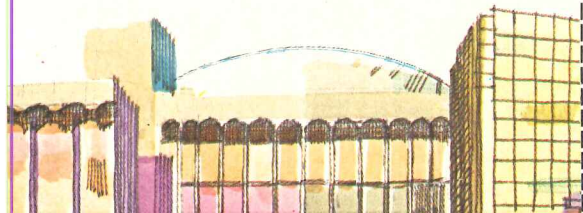
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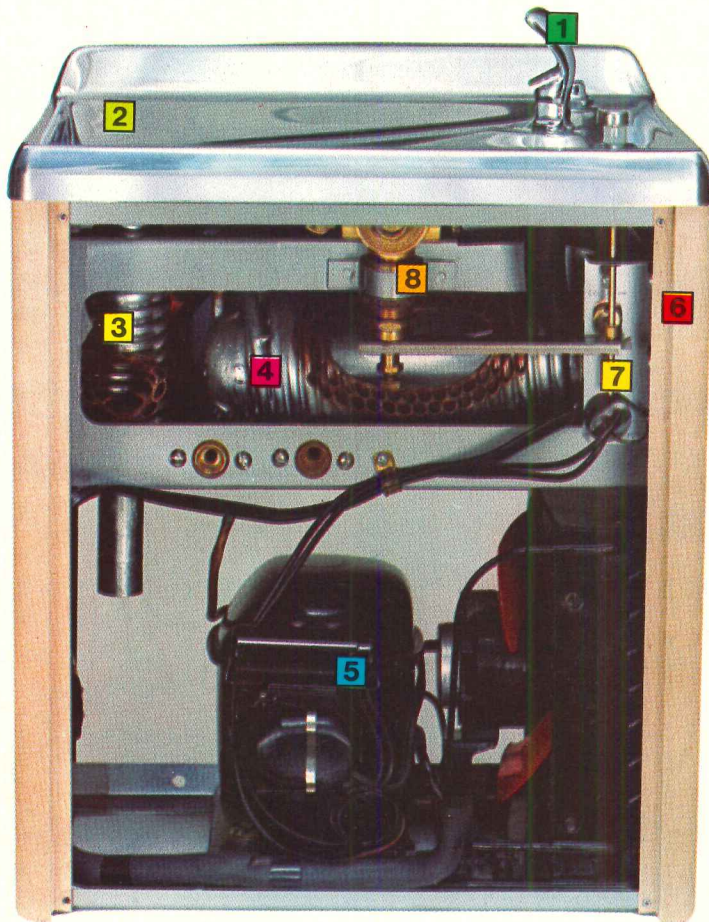
Additional information is detailed in *Sweet's Architectural Catalog File*, reference 9.29/Du. For samples, see *Sweet's Interior Design File*. Or write Du Pont, Pneumacel Marketing, Christina Site, Wilmington, Del. 19898.

*Pneumacel is the generic term for pneumatic cellular polymeric cushioning material.



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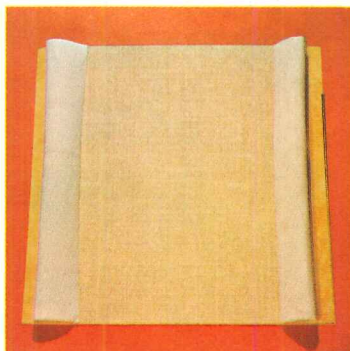


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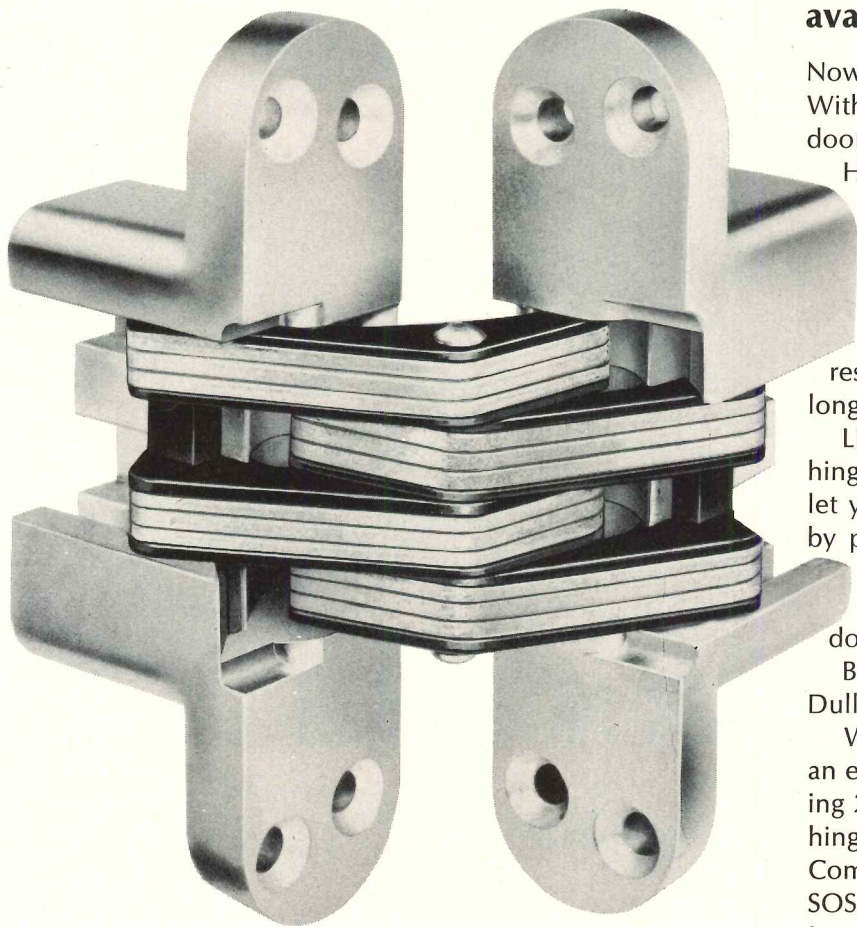
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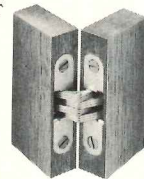
Hinge Models 218 and 220 now have nylon links and bushings at all wear points (Patent Pending). The molybdenum disulfide-reinforced nylon is visible in the black areas in the open hinge shown at left.

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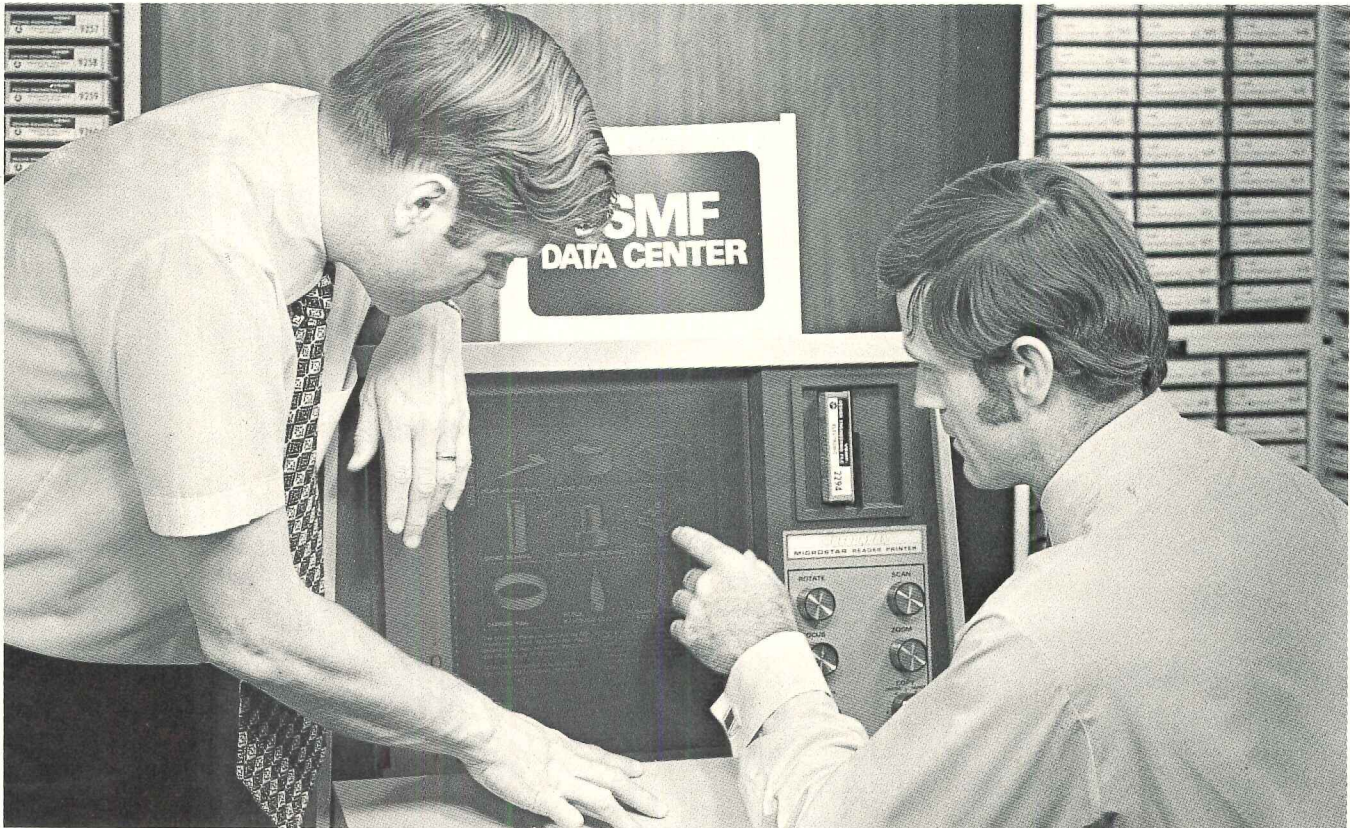
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"To the 325,000 Californians we insure, the Zenith Center Building is Zenith National Insurance Company.

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Color Consistency. Batch-to-batch, year-to-year, you know you can count on Fluropon colors to be consistent. Damaged panels can be replaced without showing; future additions will match existing buildings even if added years from now.

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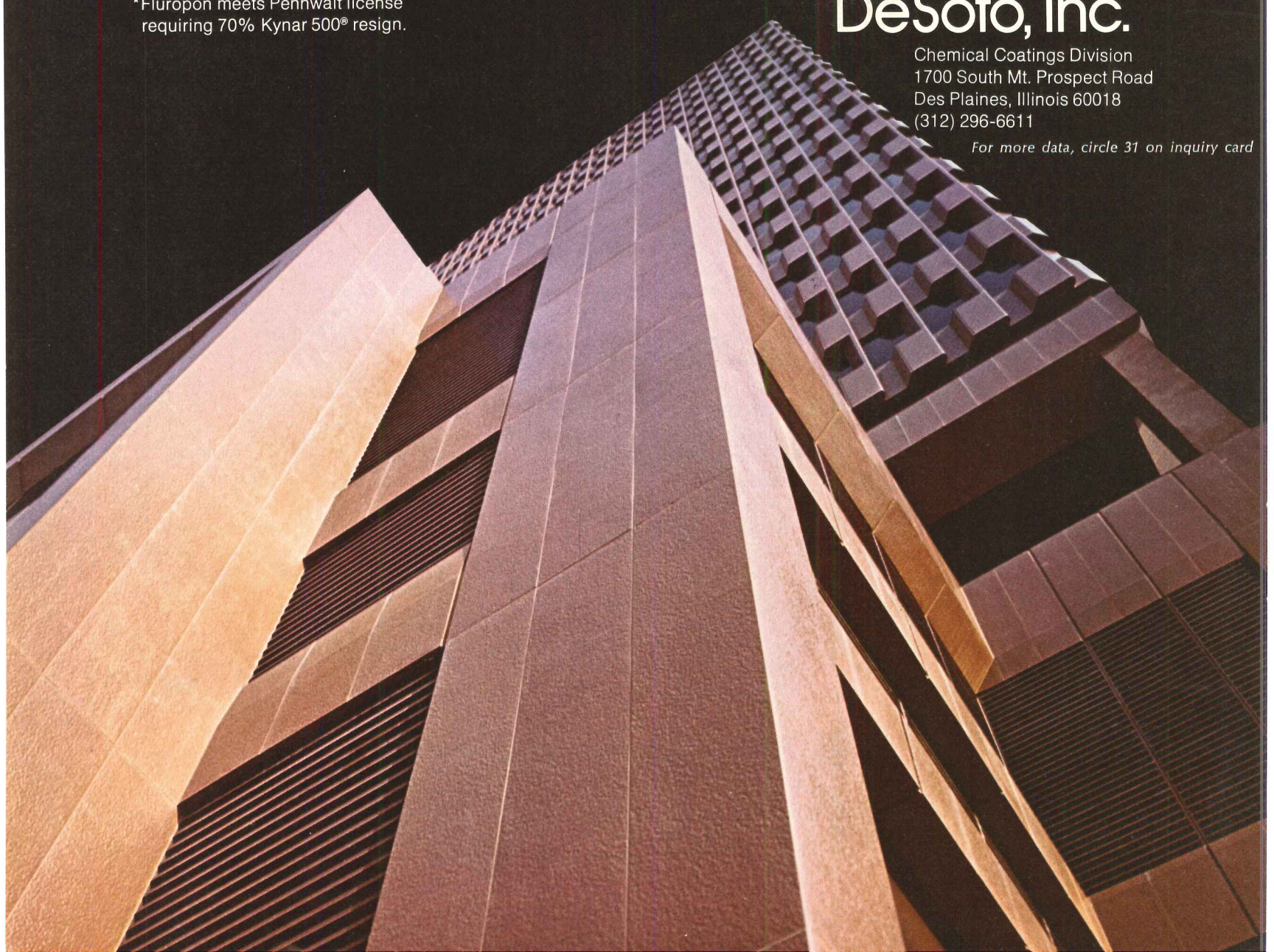
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Construction contracts rebounded sharply in February, resulting in a 21 per cent advance in the Dodge Index, according to McGraw-Hill Information Systems Company. After a two-month plunge, the latest month's activity lifted the index of contract value to 187, from January's 155. The index uses 1967 as its 100 base. The dollar value of construction work initiated in February totaled \$6,610,062,000, three per cent below the amount contracted in the same month of 1973.

HUD Secretary Lynn says he would recommend a veto if the House adopts the Senate-passed housing bill. In an interview, James Lynn expressed confidence that the House would develop a substantially different approach to the Senate-approved Omnibus housing bill that would provide \$10.4 billion for housing and community development. Secretary Lynn's major objections to the bill are: a mandated spending of funds allotted for subsidized housing construction; a distribution of community development funds that he said is slanted toward those already participating in existing programs; and the continuation of a categorical grant concept as distinguished from block grants to the states. The Senate passed the housing bill on March 11.

The American Subcontractors Association has called for continuation of wage controls in construction. Urging a temporary continuation of controls, the ASA pointed out that wages have been stabilized in the construction industry over the last three years by controls, and that lifting of wage controls in the construction industry at this time could return the industry to an unstable, inflationary wage spiral.

Seattle contractors and architects see a need for continued wage controls. With trade union agreements expiring there in mid-year, unions are already reported to have strike sanctions to strengthen demands for a 15 per cent wage increase. In California all basic craft contracts are open for renewal this spring and demands will possibly be for 10 to 20 per cent pay increases. However, rising construction prices do not seem to be dampening the enthusiasm for building in San Francisco, according to John R. Levikow, president, Northern California Chapter, AIA.

An AIA group, including RECORD editor Walter Wagner, has just returned from a three-week China tour. The delegation visited as guests of the Architectural Society of the People's Republic of China, and AIA expects a return visit by Chinese architects to the United States. Headed by former AIA president Max O. Urbahn, the delegation included Harry Weese, James J. Foley, Samuel T. Hurst, William Marshall Jr., Walter A. Meisen, Robert P. Madison, I. M. Pei, Archibald C. Rogers, Daniel Schwartzman, William L. Slayton, John Carl Warnecke, George M. White and Sidney Nyhus.

The Joint Economic Committee of Congress has called for immediate action to provide low-income housing, holding that the problem cannot await Congressional consideration of the Administration's shelter proposals. The committee recommends using existing authority under the Section 235 program to find housing for 300,000 families.

NAHB president Lewis Cenko predicts a slow upward movement of housing production, based on the housing starts annual rate rise of 22.5 per cent in February over January. He was cautiously optimistic, however.

Soul City in North Carolina will begin construction immediately, according to Floyd B. McKissick, president of the Soul City Company. The rural planned community (RECORD, December 1973) has received final approval of the Federal government's guarantee of bonds valued at \$14 million, while another \$11.7 million from Federal, state, local and private sources will be released for use as a result of the guarantee. The first money will be used for construction of a regional water system and to build an industrial plant and health maintenance organization.

Although the metrification bill has been approved for debate in Congress, no action is being taken. The House Rules Committee has allowed the bill to come to the floor for debate, but major objections of labor groups have caused the House to defer action.

A House subcommittee has begun hearings on the Unified Transportation Assistance Program, an Administration proposal that would combine highway and transit programs in urbanized areas, bringing relief to many large city transit systems, according to supporters.

The AIA board of directors has approved a statement calling for limits on private political contributions. In its spring session, the board committed the Institute to a policy closely aligned to the mixed system of public financing developed by Common Cause, combining public funds with small private contributions.

Major contract furnishings and flooring markets are scheduled for Chicago, June 19-21. NEOCON, the National Exposition of Contract Interior Furnishings will feature two million square feet of non-residential furnishings, and seminars which are said to focus on vital issues in the contract industry. (See item Editorial, page 14.) Further information can be obtained from The Merchandise Mart, Suite 830, Chicago, Ill. 60654.

Research delves into pollution effects on stone

In the geology lab at the University of Louisville, the weather conditions are appalling. Temperatures soar and plummet. Noxious gases hiss and bubble. Where it is not arid, it is humid. Pollution is everywhere. Conditions could hardly be worse, which is just where Lal Gauri wants them.

What Dr. Gauri is finding out should have considerable influence on how we proceed to preserve and restore the buildings and monuments, public and private, that have so far survived pollution, age, indifference and exploitation, according to Universal Restoration Incorporated, a Washington, D. C. firm specializing in architectural restoration.

The laboratory in Louisville is, then, a scientific battleground where a struggle against erosion of the architectural past is conducted by a small group of scientists.

"Basically, we are doing two things," said Dr. Gauri. "We are testing different kinds of stone, and we are experimenting with materials, mainly

resins and petrochemicals, to protect the stone from weathering elements.

"The main thing is to keep water from contact with the stone in depth or on the surface. Water is the culprit because gases can't work to erode the stone if there is no water."

Matching core samples are taken from the stone and these samples, some impregnated with preservative chemicals, some not, are subjected to a furious battering. The impregnation is called diffusion, a process by which the surface is soaked with a polymer, or plastic, compound until the compound has reached a depth of about an inch below the surface.

As these systematic tests are being carried out on a variety of stone samples, experiments are also being conducted on the plastic compounds themselves, and on other substances such as fiberglass. These include not only strength and durability but color and cost, fire resistance and smoke production.

Airport in Florence, Italy causes concern

The fragile artistic environment of Florence, Italy may be sacrificed to improved air service for the Tuscany region, according to local opponents of a proposed international airport.

Two years ago, funds were appropriated for construction of an airport, which could only be located in a spot eight miles from the center of the historic city. According to a study by the University of Florence, the noise from jet aircraft would make normal living impossible for 150,000 persons residing in apartments and villas on the left bank of the Arno River.

It is further claimed that fumes from airplane fuel mix

readily with water in the air (see item on decomposition research on this page) to form sulphur dioxide, held responsible for extensive damage to the bronze horses on St. Mark's Basilica in Venice.

Airport opponents are currently being supported by actions of the regional council which voted to put off plans for construction until better economic times. The council voted that \$13 million destined for the new airport be used for improvements at the Pisa airport—which presently serves Florence—and for the building of a rapid train that would connect the two in 40 minutes.

Los Angeles sponsors Frank Lloyd Wright week

Los Angeles Mayor Tom Bradley is declaring June 1 to 8 as "Frank Lloyd Wright Week in Los Angeles," as part of events to mark the 105th anniversary of Mr. Wright's birth on June 8th.

The observance begins with a Frank Lloyd Wright retrospective (May 28 thru June 7) at ARCO Plaza Level C in downtown Los Angeles. The exhibit will include photos by Julius Shulman, Frank Lloyd Wright fabric design cuts done for Schumacher, and special slides and films. Some FLLW furniture will also be shown.

A reception is planned for the evening of May 29th to include Mayor Bradley, Mr.

Wright's son and grandson, and his granddaughter, actress Anne Baxter.

A Frank Lloyd Wright House/ Grounds/ Gallery tour on June 8 and 9 includes: Hollyhock House, Freeman House, Storer House, Millard House, Ennis House, Sturges House and Comsky Gallery.

This joint-venture fundraising program is sponsored by two Los Angeles groups: the Cultural Heritage Foundation and the Southern California Chapter, Architectural Secretaries Association. Funds raised will aid architectural students at Cal Poly in San Luis Obispo, and other student activities.



Gordon H. Schenck

Grand Ole Opry moves into new home by Welton Becket and Associates

The Grand Ole Opry has a new house to call home. Designed by Welton Becket and Associates, the \$15 million Opry House represents the world's largest radio and television broadcasting studio. It is the focal point of the \$40-million Opryland, U.S.A., a 369-acre complex devoted to entertain-

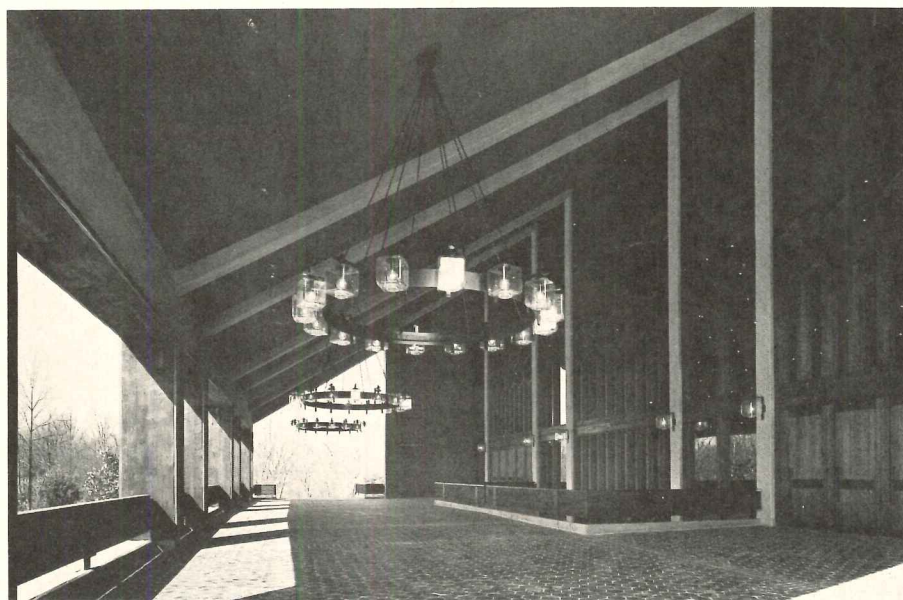
ment, recreation, broadcasting,

and convention activities. Opryland, which opened last year is 10 miles northeast of downtown Nashville.

To create a warm, rustic appearance for the Opry House, the Becket firm selected brick for the walls; placed rusticated wood panels, handrails, and trim at the entrance and feature

points; designated board form-

finished concrete for the roof beams and columns; and designed a sloping, concrete-shingled tile roof. Inside the 45,000-square-foot auditorium, the balcony seats approximately 2400 persons and the orchestra 2000 on contoured, wooden "pews" upholstered in persimmon "carpeting" to facilitate acoustics.



Gordon H. Schenck

Seventy-three Fellows will be honored at AIA convention in Washington

The American Institute of Architects has announced that 73 members have been elected to the College of Fellows, a lifetime honor bestowed for outstanding contribution to the profession.

Advancement of the new Fellows brings the total membership of the College of Fellows to over 1,000. Formal investiture will be held in ceremonies on May 20, during the AIA Convention in Washington, D. C.

Selection of the 73 new Fellows was made by a jury composed of the following Fellows of the Institute: George E. Kassabaum, chairman; Edward A. Killingsworth; Mark A. Pfaller; Macon S. Smith; William B. Wiener; Hugh A. Stubbins Jr.; and Robert B. Price, attending alternate.

The new Fellows are: Armand Bartos, MacDonald G. Becket, Herbert Beckhard, George Bissell, Howard T. Blanchard, Elmer E. Botsai, John Bozalis, William R. Brockway, Fred W. Butner, Jr., Mario E. Campioli, Arthur R. Cogswell, Jr., Andrew S. Cohen, John P. Conron, Araldo Alfred Cossutta, Walter H. Costa, Warren W. Cunningham, Natalie G. deBlois, Eugene A. Delmar, David R. Dibner, Rockwell King DuMoulin, Herbert E. Duncan, Jr., Robert E. Entzeroth, Herbert Epstein, Geoffrey W. Fairfax, Howard T. Fisher, Richard W. Fleischman, William L. Fletcher, Richard C. Frank, Rodney F. Friedman, Frank O. Gehry, Harry Abbott Golemon, Ezra Gordon, David Haid, James Wright Hammond, John A. Holabird, Jr., Granville

Warner Hurley, William R. Jenkins, Matt Lawrence Jorgensen, James T. Lendrum, H. Mather Lippincott, Jr., Robert Price Madison, Clinton Marr, Jr., David A. McKinley, Jr., Louis A. McMillen, William H. Metcalf, Jr., Gary L. Michael, Harvin C. Moore, Julian Neski, P. Murff O'Neal, Jr., William T. Priestley, William Ryder Reed, Walter John Richardson, James S. Rossant, Herman O. Ruhnau, Lloyd Anthony Ruocco, Stanley Salzman, Nathaniel W. Sample, Charles M. Sappenfield, James A. Scheeler, Robert J. Schultz, David M. Scott, Frank Slavsky, Hamilton P. Smith, Charles B. Soule, Rolland D. Thompson, Roy N. Thorshov, Danforth W. Toan, Richard L. Tully, Morris D. Verger, Ben Weese, Helge Westermann, Kenneth D. Wheeler, John M. Woodbridge.

Women architecture students meet in St. Louis

March 29-31 more than 300 women architectural students from all over the country gathered at Washington University, St. Louis, in what is believed to have been the first national symposium on the "Role of Women In Architecture." Several points emerged that received approval from observers and participants.

First, women students feel a definite need to talk to women architects, and share in their family and professional experiences.

Second, important lines of communication can be opened up by such meetings between male and female students with faculty and architects.

David M. Bowen, a registered architect from Indianapolis, and a member of the AIA's Personnel Practices Committee, who attended, said: "Most of the sessions were very good. I was very impressed. Let's face it, there is discrimination against women in our profession as in other professions. I'm sure what took place in St. Louis and at a similar meeting later in Oregon will receive consideration at the national AIA meeting in Washington in May."

Hannah Roth, W.U. graduate student, who served as chair-lady of the symposium, said, "Our goal was to create meaningful dialogue; meet role models; deepen self awareness and examine our profession and stimulate ongoing organizations. We met those goals."

Dr. Constantine Michaelides, dean of W.U.'s School of Architecture, who strongly supported the symposium, was warm in his praise. "The fact that the students put this all together, including the financing (estimated cost \$4500) and attracted nearly 300 from all over the country, attested to the quality of the program. We are proud of them."

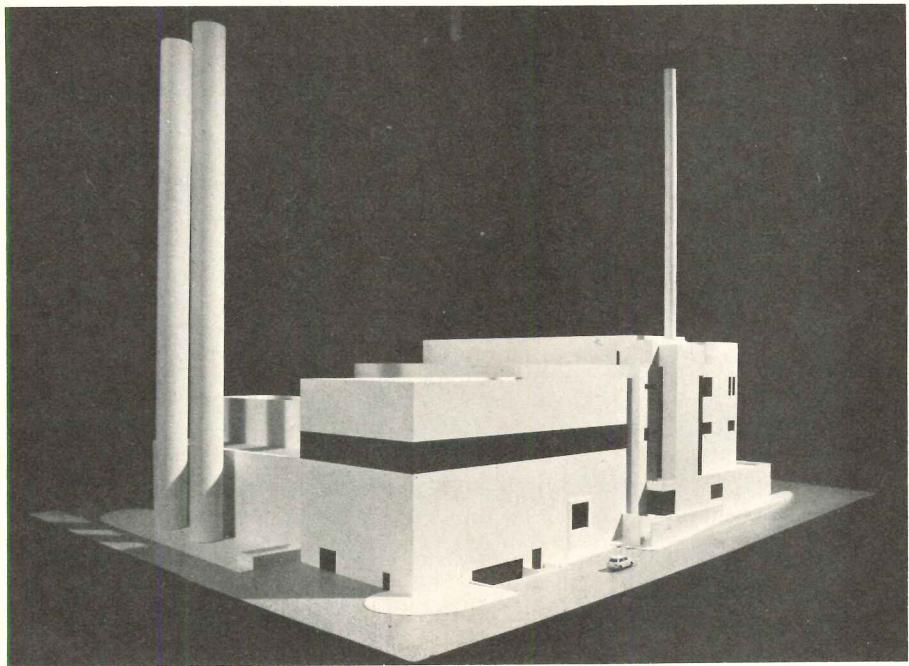
Prominent women speakers disagreed strongly on the subject of discrimination.

Gertrude Kerbis (below top) Chicago architect for 29 years, and the 10th woman accepted as a Fellow in the AIA, said, "If 'profession' means placing your standards above personal self-interest, women today are the only true professionals in architecture . . . for they are the least paid and the least rewarded."

At some workshops, the talk concentrated on personal problems of wife-husband relationships, such as how do you share home responsibilities and still have a career?

Hannah Roth and her committee, flatly rejected that the symposium was put together to support any kind of women's lib movement.

Among other participants at the symposium were: Bradley Soule (top right); Mary Lou Drosden (lower left), St. Louis architect; and Lois Langhorst (lower right), professor of architecture at the University of North Carolina.



Roger Park

Total energy plant will be constructed in Leeds, England

The United Leeds Hospitals in England will build a generation station complex to supply electrical power, steam, hot water and air conditioning requirements for the New General Infirmary and Medical/Dental Schools.

Designers of the whole complex, including the generation station, are Building Design Partnership, Preston Group.

The station is based on the total energy principle using either natural gas or fuel oil to provide all energy needs at a very high efficiency. This is the first time that this principle has been

applied to a hospital in Great Britain.

Building Design Partnership undertook an economic feasibility study which showed that on-site generation of electricity with full heat recovery, refrigeration plant and supplementary boiler plant was economically viable.

Ultimately the station will have six dual-fuel engine/generators, with waste heat boilers plus jacket and lubricating oil heat recovery systems, six steam boilers with dual-fuel burners, 17.58 MW (5,000 tons R) of refrigeration plant and six air

compressors and driers. The complex also contains a maintenance store, works department, and a large laundry.

For United States applications, HUD has released a report called "Economic Evaluation of Total Energy," which is meant to be a screening tool to indicate the relative economic feasibility of total energy systems for residential developments throughout the contiguous United States. Copies are available. Ask for Report No. HUD-DSC-2, Department of Housing and Urban Development, Washington, D.C.



Barbara Clark McClintic

Tenant satisfaction in mixed income housing depends, in part, on design

Good design and construction approaches, as well as effective management, are seen in a "Social Audit" commissioned by the Massachusetts Housing Finance Agency (MHFA) as vital to tenant satisfaction in mixed-income housing developments.

A report on the study is described as the first comprehensive, scientific review of mixed-income housing.

It states in part: "income mix 'works' or does not 'work' according to whether the mix occurs in well-designed, well-constructed, well-managed developments. These latter factors are the crucial determinants of

(tenant) satisfaction. Income mix and racial mix are in themselves of no particular relevance. . . ."

Discussing tenant "satisfaction" factors, the report states: by ranking the 16 early MHFA developments according to the tenants' level of over-all satisfaction, the study shows that several developments with less satisfied tenants could be classified as "traditional subsidized" housing. These developments, are located in poorer communities and exhibit less successful design, construction and management.

The key factor is the atti-

tude of the developer that he is building a "traditional 236," all-subsidized development, uncompetitive in the market.

By contrast, says the report, the superior developments achieve a startlingly high level of tenant satisfaction as a direct function of the developer's intention to create housing that will compete successfully in the open market.

However, it is emphasized that while these "superior" developments produce more satisfaction for tenants, they are not meeting the same magnitude of social needs as the "traditional subsidized" developments.

Covent Garden market building sought by British Architectural group

The British Architectural Association has put forward a plan to make use of the central Covent Garden market building after the market moves to its new site later this year.

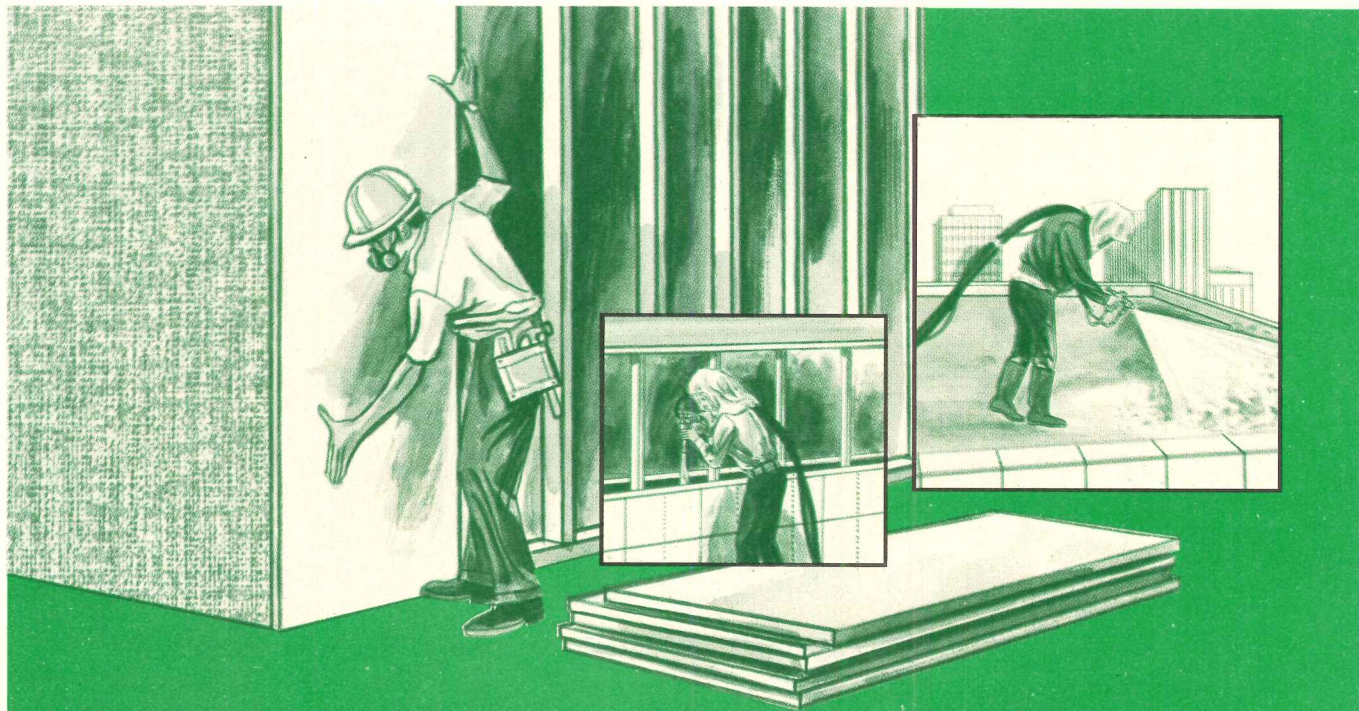
The Association would like to move its school, now situated in Bedford Square, London, to

the old market building, since the Association has to find a new home by 1976.

The only snag in the proposal is that the Greater London Council, expected to purchase the four-story brick landmark built in 1828, said they do not want any single user to predom-

inate in the market building after it is renovated.

At any rate, the Architectural Association is not the only prospective tenant seeking approval. At least a dozen others have expressed an interest in occupying a portion of the property.



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Contractors seek end to retainage system

Construction bids nationally would be reduced by as much as 15 per cent, with a potential savings of \$3.7 billion, if contracts followed the format now being used by the U.S. General Services Administration in a dozen projects bid in a no-retainage test program.

This is the finding of a national survey conducted by the American Subcontractors Association (ASA), whose results have been announced at the organization's third national convention in New Orleans.

Tabulated response from 1200 subcontractors across the country showed that: 86 per cent said that the current retention system is not an effective means of getting subcontractors to return to a job to complete punch list items; 100 per cent of subcontractors would complete punch list items if final payment was guaranteed on a stipulated basis, contingent upon completion of the project; 76 per cent of the subs would submit lower bids if retainage clauses were eliminated; 95 per cent said that on projects on which they would refrain from bidding because of retention, they would alter their decision and bid if the retention provision were withdrawn.

An ASA official said, "this archaic system which compels building subcontractors to wait so long to be paid for completed work, necessarily elevates cost and reduces competition. Other industries work on a net, two per cent, 10 day basis.

"The construction industry also is the only one that provides 100 per cent payment and performance bonds in order to ensure proper job completion. This unique double insurance program costs billions."

GSA energy guides may be a first

GSA is calling its recently-released "Energy Conservation Design Guidelines for Office Buildings" the first comprehensive criteria ever printed for the construction industry.

The text was prepared for the independent Federal agency by Dubin-Mindell-Bloome Associates, in cooperation with the American Institute of Architects Research Corporation and Heery & Heery, architects. It is explained that the guides will not supplant any operating standards previously issued, but will make it possible for energy conservation programs to be implemented during emergency periods.



Photo Lang

Architecture of Los Angeles on tour in Europe

The achievements of the city of Los Angeles, as reflected in its buildings and architecture have been gathered together by art collector Mrs. Beata Inaya in an architectural exhibit, "The Three Worlds of Los Angeles" that will be displayed in major European cities in 1974. The exhibit opened in March at the American Cultural Center, Paris. Of special interest are photographs of what has been happening in the Watts area since 1965.

The "Three Worlds" consists of private residences de-

signed by John Lautner; new commercial high-rise office buildings (shown) and apartments, industrial facilities and public buildings designed by Daniel, Mann, Johnson, & Mendenhall (DMJM).

The third world is the world of Watts and features the achievements of black architects John D. Williams, Carey K. Jenkins, Robert Kennard and Arthur H. Silvers. These gentlemen have contributed to the re-building of Watts as well as to the progress of south Los Angeles County.



Brunner Prize awarded Hardy, Holzman & Pfeiffer

Hugh Hardy (center) with Malcolm Holzman (left) and Norman Pfeiffer (right) are winners of the Brunner Prize of The National Institute of Arts and Letters, given annually to an architect who has made a contribution to architecture as an art.

The prize, established by the widow of Arnold W. Brunner, architect and former treasurer of the Institute, was first given in 1955. Among its distinguished recipients have been Louis I. Kahn, I.M. Pei and Gor-

don Bunshaft. This is the first time that a team of three architects has won this award.

Hardy, Holzman and Pfeiffer, noted for their innovative projects in education, and in the visual and performing arts, have also been honored with three awards for their project MUSE, a remodeled one-time pool hall which they transformed into the first neighborhood store front museum and community center in New York City.

Barbara Lamb



Los Angeles city hall saved by new product

One of Los Angeles' best-known architectural landmarks—City Hall—has been saved from the scrap heap by what is said to be the largest masonry structural repair job ever attempted, to correct 11 miles of exterior wall cracks resulting from the 1971 San Fernando earthquake. The solution was to inject the walls with a material developed especially for the project—a structural ceramic foam.

VTN Corporation, an Irvine, California architect-engineer firm called on the job after the quake, found wall cracks from the fifth to the twenty-sixth floors, some large enough to see through. VTN project manager Ronald Galetti asked Delta Plastics Company, Santa Fe Springs, California, to develop something that could be pumped into the walls in a one-step operation. The product developed was *Epiceram FR 450*, a fast-setting, flame resistant and odorless compound.

A specially-designed pump, placed inside City Hall near the exterior-face work platform, held foam ingredients in heated individual feed pots. The materials were pumped simultaneously through separate lines, also heated, to the mixing head of the injection gun. The composite fluid was blended in the mixing head and pumped into the wall through grommet-fitted drilled holes; the holes were patched over with a sand and cement mixture and the patch was painted to match the existing terra cotta color.

City Hall, 28 stories and 545 feet high, was designed by John C. Austin, Albert C. Martin, Sr., and John Parkinson. Completed in 1928 at a cost of \$9.7 million, it was Los Angeles' tallest building for decades.

The San Fernando earthquake, although centered some nine miles north of City Hall, caused nearly \$5 million worth of damage to it, including 65,000 sq ft of cracked exterior.

Private money could be tapped for housing

A novel proposal for tapping private investment money for housing, commercial and industrial development in inner city areas was put out for discussion last month by the Federal National Mortgage Association.

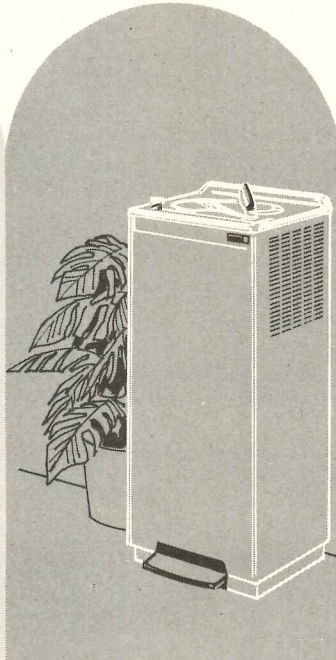
Under terms of the skeletal bill draft, local governments could issue revenue bonds which could be exchanged for mortgages held by savings and loan associations, commercial banks and other financial institutions. The institutions, in turn,

could sell the bonds to the public and the proceeds would be used for inner city development.

FNMA admitted that the new proposal would be highly controversial but stressed that the central city housing problems had been discussed for decades but remained almost as severe as ever and needed active solutions directed at home seekers who cannot qualify for subsidies, or afford suitable shelter.



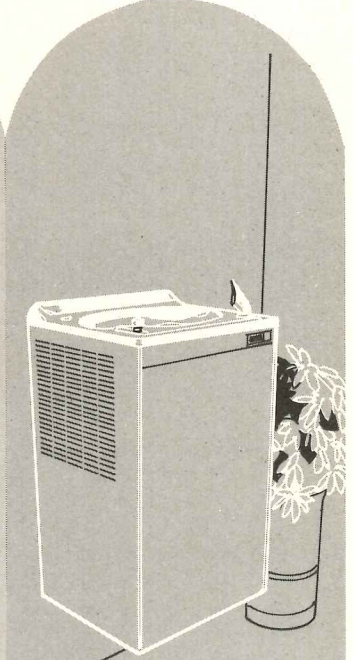
Three models of fully recessed water coolers in 8 to 12 gallon per hour capacities. In satin finish stainless steel or in bronzetone finish. Model shown EFR-8A.



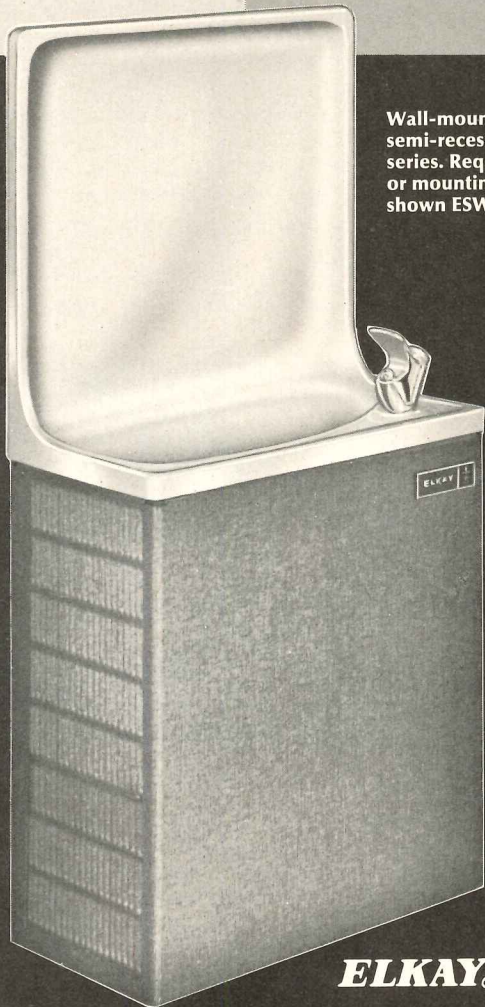
Self contained floor models in 4 to 20 gallon per hour capacities. Panels available in stainless steel, 9 vinyl decorator colors and two in baked enamel. Model shown EF-8.



Space-ette series. The ideal water cooler where space is limited. Capacities are 3, 5 or 8 gallons per hour. Also in floor models. Model shown W-701-5.



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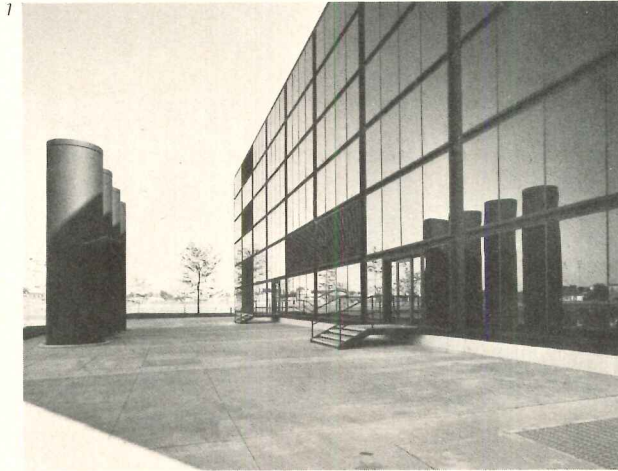
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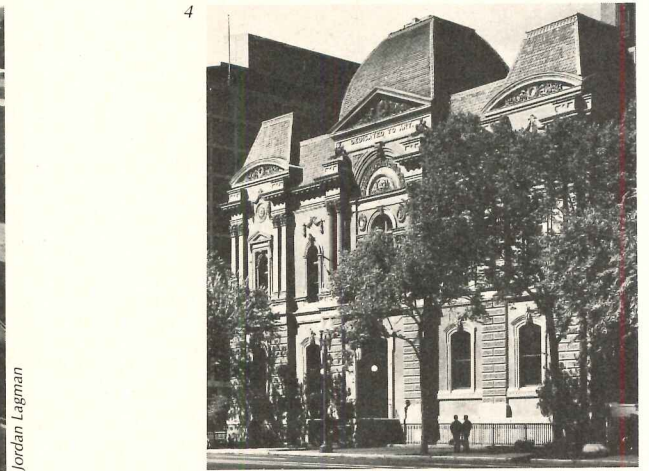
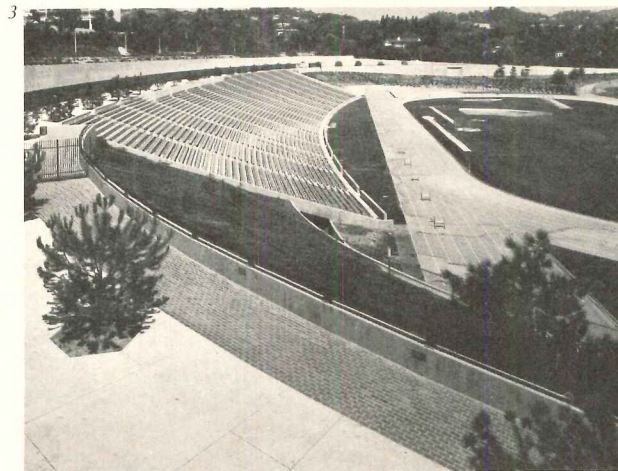
AIA announces eight 1974 Honor Awards

At ceremonies during the 1974 AIA convention this month, eight buildings will be honored with the nation's highest awards for architectural excellence. Representing eight different building types, the projects were praised by the jury for their "highly motivated and committed design intent" as "structures in support of architecture—structures of process rather than styles." The 1974 winners are: 1) Illinois Bell Telephone Equipment Building, Northbrook, Ill., by Holabird & Root; 2) Twin Parks Northeast Housing (RECORD, July 1973), Bronx, N.Y., by Richard Meier & Associates; 3) Multi-purpose Track and Field Stadium, University of California, Los Angeles, by Daniel L. Dworsky & Associates; 4) Renwick Gallery, Smithsonian Institution, (RECORD, July 1972), Washington, D.C., by Hugh Newell Jacobsen (interiors) and John Carl Warnecke & Associates (exterior); 5) North Carolina National Bank (RECORD, June 1973), Charlotte, N.C., by Wolf Associates; 6) MDRT Foundation Hall (RECORD, October 1972), American College of Life Underwriters, Bryn Mawr, Pa., by Mitchell/Giurgola Associates; 7) Paul Mellon Center for the Arts, (RECORD, January 1973) The Choate School, Wallingford, Conn., by I. M. Pei & Partners; and 8) Morgan Residence (RECORD HOUSES, Mid-May 1974), Atlantic Beach, Fla., by William Morgan Architects.

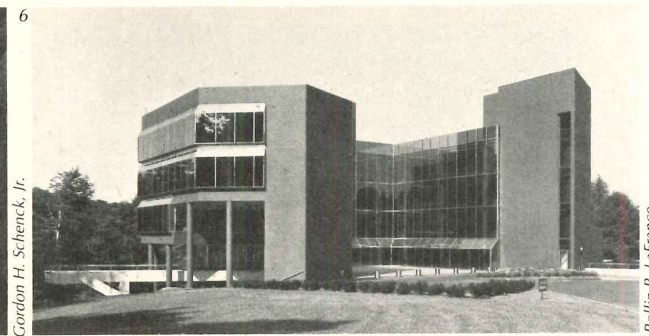
Janis O. Lazda



Ezra Stoller © ESTO

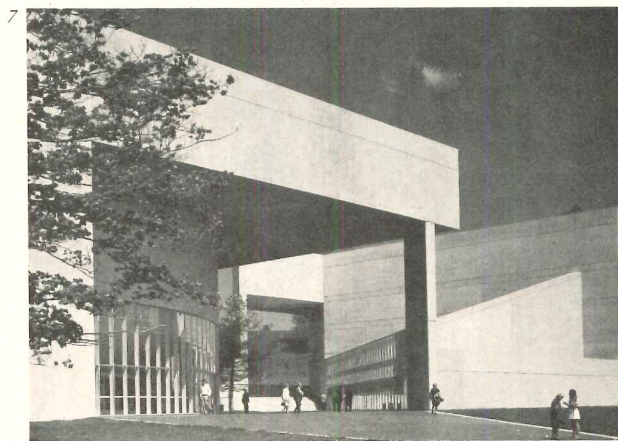


Jordan Lagman



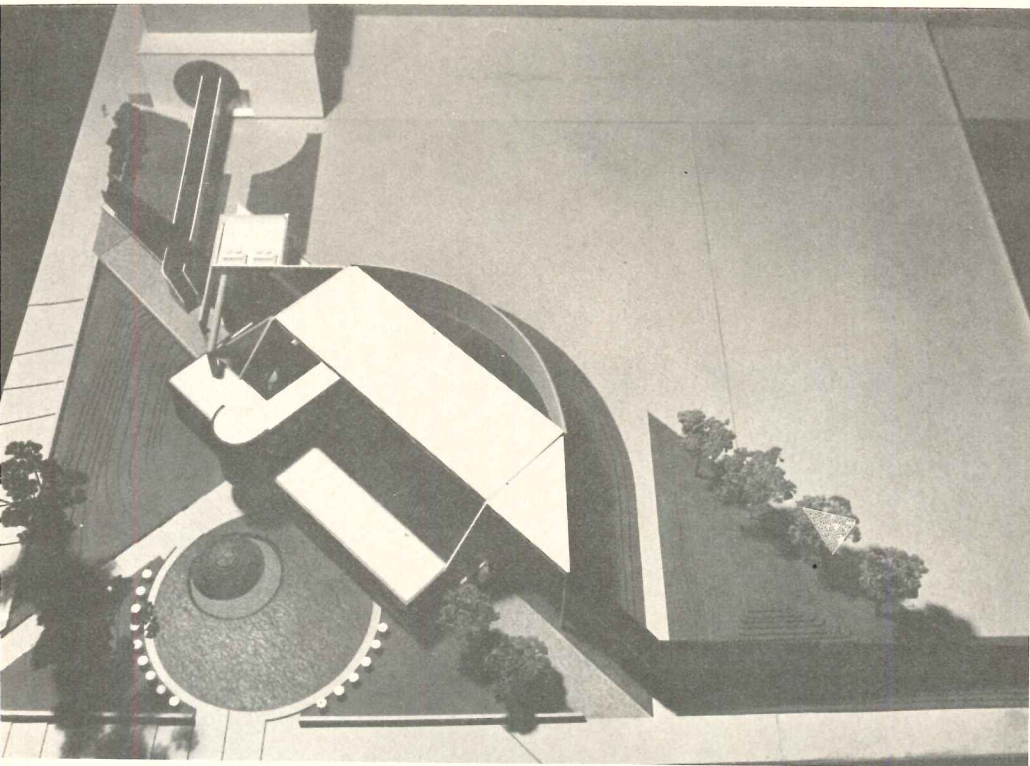
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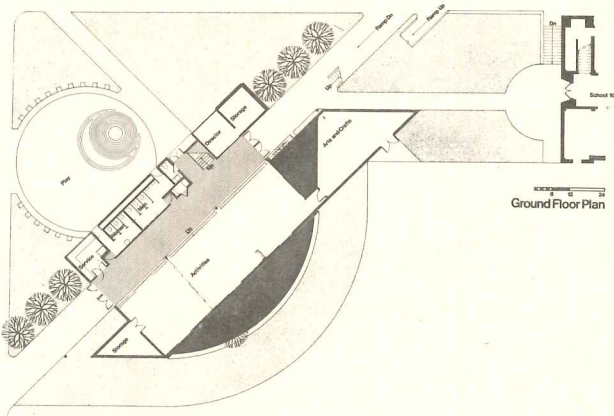
Nathaniel Lieberman





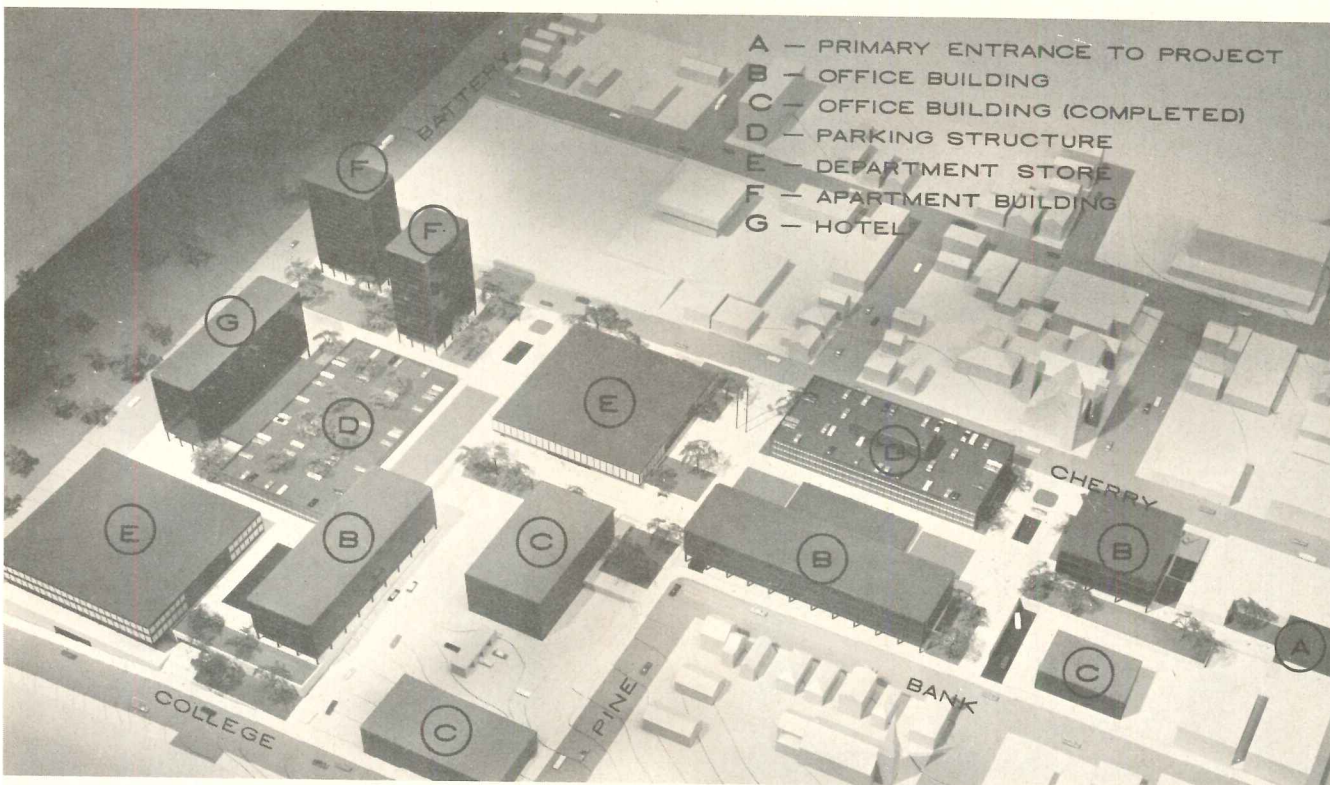
A new recreation spot for inner Baltimore

Under the auspices of the Department of Recreation and Parks, a new recreation center and athletic field facility will be one of the initial efforts in revitalizing a dense city neighborhood. The complex is the work of Designbank and includes a 7000-sq-ft multi-use building designed with exposed structure and systems so that the building itself is play equipment and a learning experience in construction.



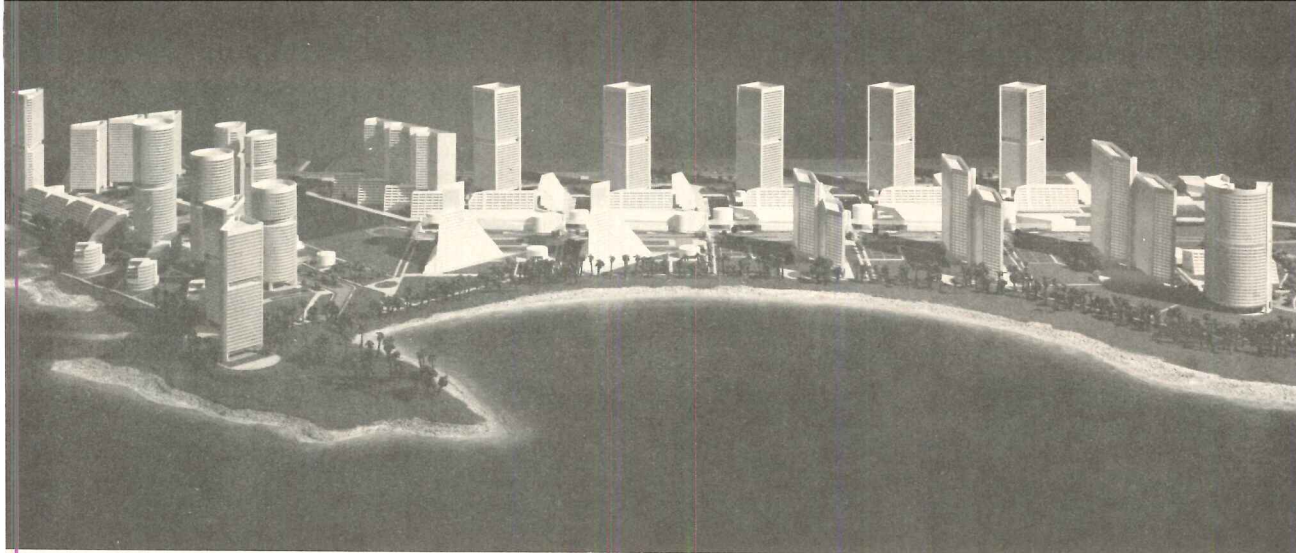
Health sciences center, library in New York

The Augustus Long Library and Health Sciences Center for Columbia University is under construction, using the fast track method. Warner Burns Toan Lunde are the architects for the 18-story tower which will have a weathered steel exterior, with brick and reflective glass. The multi-use facility will provide instructional and research space, plus library space for over 400,000 volumes for the College of Physicians and Surgeons.



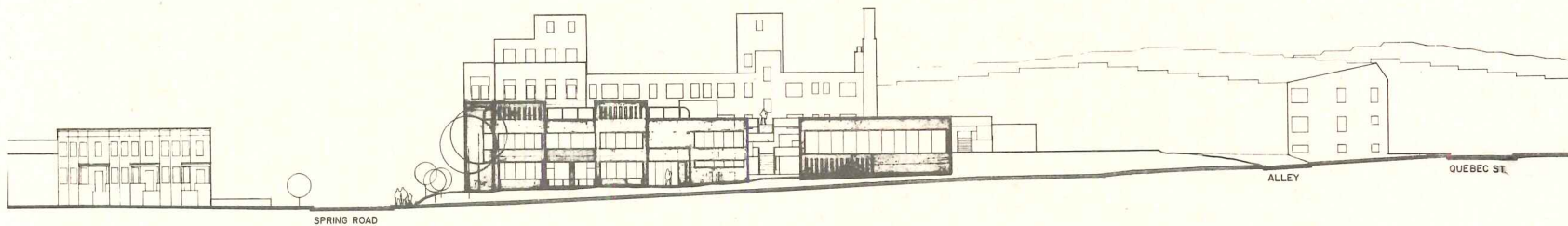
Burlington, Vermont downtown scheme

Faced with the problems of a declining downtown, Burlington, Vermont called upon the Office of Mies van der Rohe, and Freeman, French, Freeman to revitalize the area with a mix of new offices, apartments, shopping and hotel space with parking facilities in common. The site is a 17-acre central space to be called Burlington Square which will extend to a planned lakefront (Lake Champlain) park. An all-weather below-plaza pedestrian mall will include shopping and entertainment and be lighted by light courts and clerestory structures. A stepped plaza or series of terraces will conform to the 80-foot slope of the site. Construction on the project is expected to start in June.



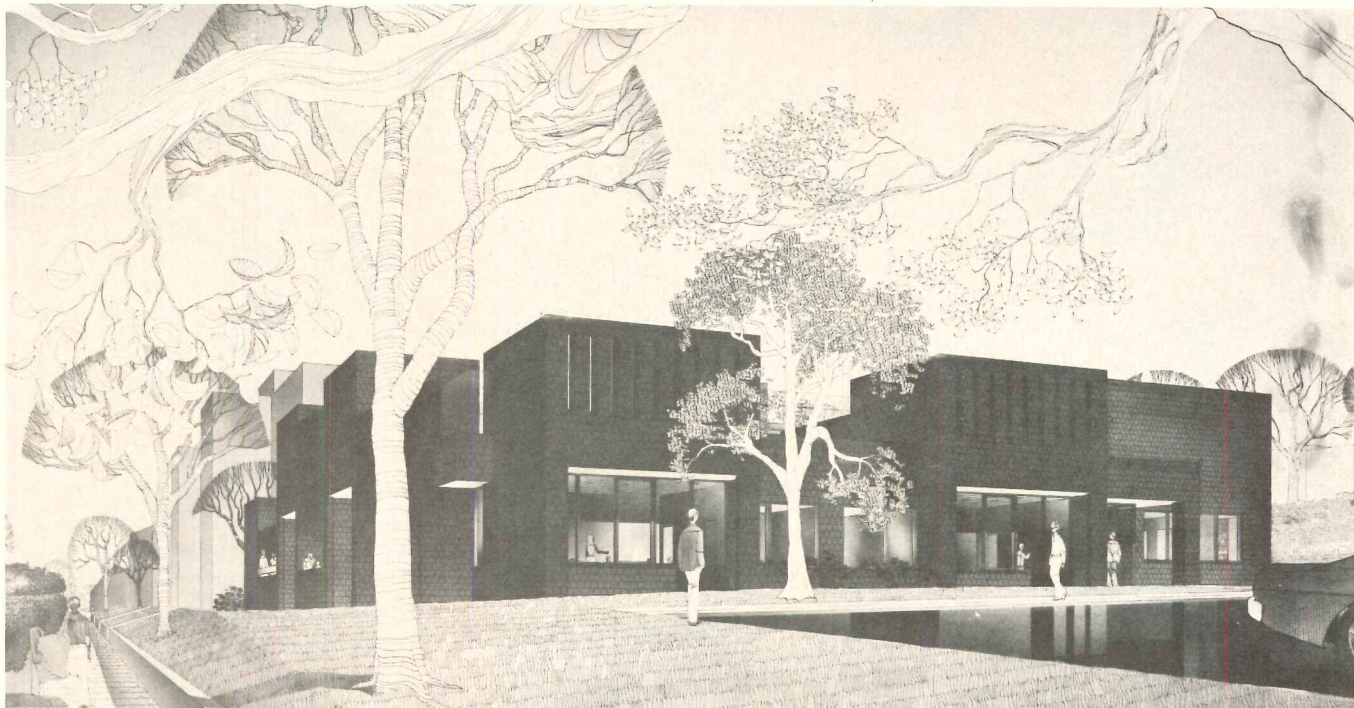
New community planned for Puerto Rico

William L. Pereira Associates has just completed a master plan and urban design concept for a new community to be located on 1300 acres, eight miles from the center of San Juan. The site is one of the last large, privately-owned parcels suitable for development in the metropolitan area. Vacía Talega, as the community will be known, will be the first and largest planned community on the island, and the first to implement new planning guides there.



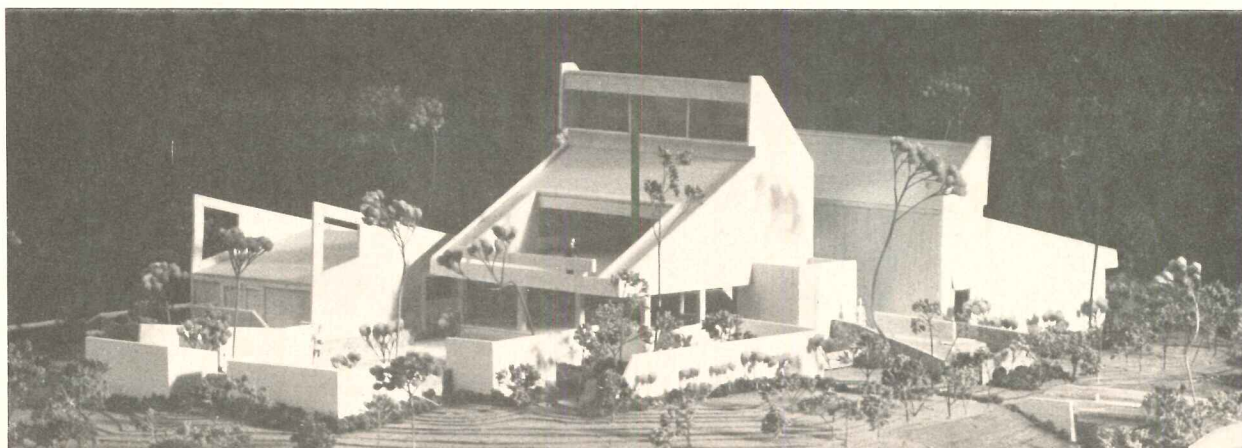
Children's unit for mental health center in Washington, D.C.

Facilities for short-term residential and day care treatment of emotionally disturbed children will be provided in this building designed by Mariana & Associates. The new building will share the site of an existing adult treatment center housed in a converted home for the elderly. Mitigating the negative community image of the present structure is one of the design objectives the architects hope to achieve with the children's unit. Scale, massing and materials will reflect the neighborhood row house context. Classrooms in the plan are defined as "houses" whose walls continue above the roof to create shaded seating areas. The "windows" of these rest areas are slots in the masonry, echoing a common railing detail of the local row house vernacular. The first building stage will be completed in 1975.



Hospitality center for Connecticut campers

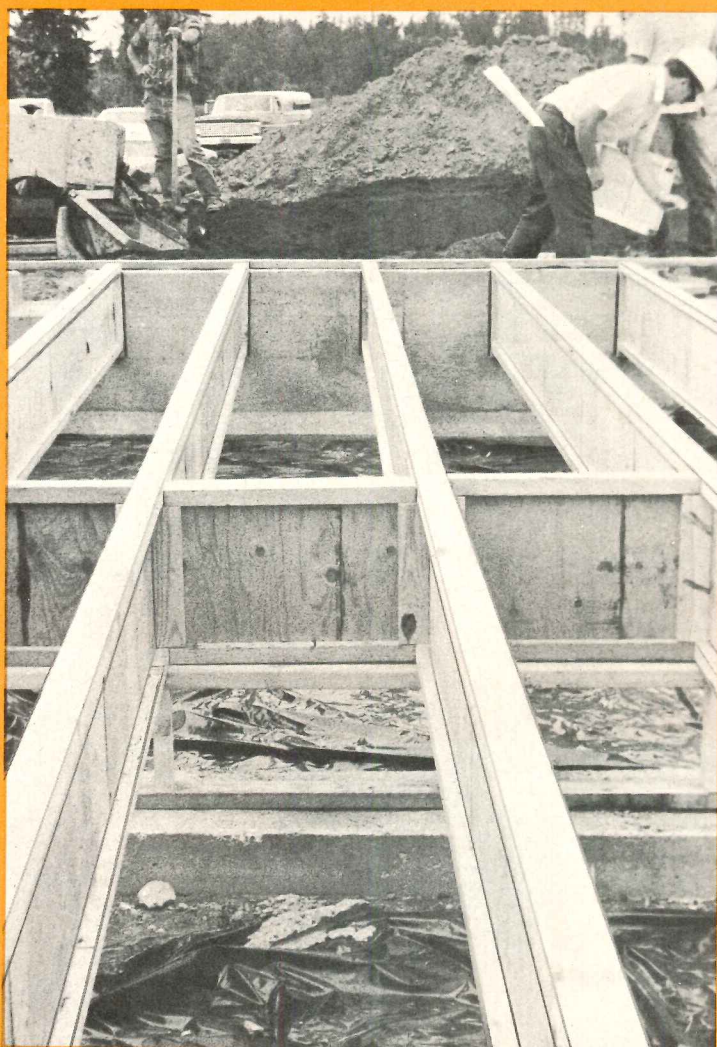
J. Glenn Hughes Associates are the architects for this hospitality center to be located at a campground in Tolland, Connecticut. It is expected to be completed this month. The building has been designed with a wood deck with a sunken fireplace, registration facilities, adults' and children's recreation, grocery store, toilets, laundry, first aid room and outdoor swimming pool.



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Architects chided on responsibilities

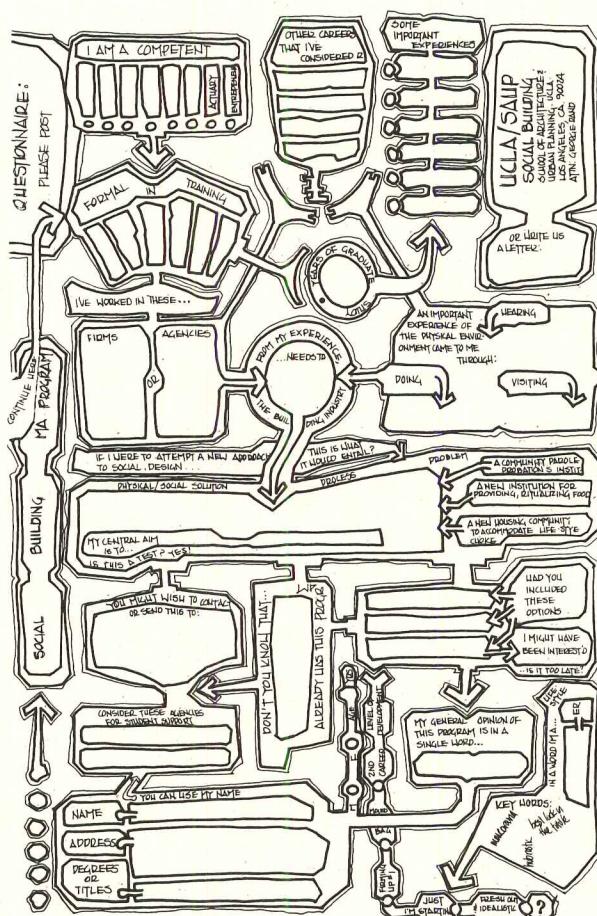
This month, architects attending the AIA national convention in Washington, D.C. will take up the subject of "humane architecture" and how it may be best achieved. One viewpoint was recently expressed by William Houseman in *The Environment Monthly*, which he edits. We are reprinting part of his editorial with his permission, not because we entirely agree but because it expresses an opinion felt by some who would like to see the profession spend less time creating "performance specifications" for ordering national growth, and get back to the task of designing buildings.—Ed.

What's with architecture? Is the "Mother Art" leading the way, dragging her heels, or just getting along by going along?

To be sure, all sensitive souls crave the millenium. But for architects to make it a performance specification to reshuffle poor blacks and Puerto Ricans outward from the inner city and affluent whites inward from the suburbs—that is not just a case of professional overreaching; it is sheer political fantasy.

Would it not be more helpful if architects decided collectively to stop doing some of the measurable things that are hurting the environment instead of tilting with windmills? Should they not turn down the client who wants to put a senseless industrial park in a corn field? Should they not stop lauding the engineering mentality which orders the erection of buildings taller than the tallest, for the lowliest of motives?

The point would seem to be, not that lofty social and moral aspirations are to be despised by any profession, but that no profession can hope to adopt as its performance specifications a set of objectives which society at large is manifestly unwilling to see adopted. That, it seems to us, is the ultimate denial of what professionalism is all about. There is a key word in the architect's own



lexicon that counsels against the unattainable; it's "feasibility."

Wouldn't it be great to say that architecture as it is practiced today is the Mother Art? And that its practitioners are the generalists who are designing the "humane environment" to which the 1974 AIA Convention will address itself? Heck, wouldn't it be great just to know that qualified architects—i.e., licensed architects—design all of the buildings that go up in this country.

It is inconceivable that an unlicensed physician should remove your appendix, or an unlicensed dentist your wisdom tooth, or an unlicensed lawyer your tort. Those professions wouldn't stand for it. Yet our physical environment, the biggest single business in the world, is largely prescribed by planning and zoning boards comprised for the most part of the garden-variety laymen who

read blueprints upside down that are produced by civil engineers and draftsmen who consider a humane environment one that does not fall on you when you open the door.

And the architectural profession watches all of this happen.

A humane environment starts with shelter. But by and large architects do not design shelter. We were reading a book the other day titled the *Athens Charter* describing the covenants arrived at in the early 1940's by a group of the world's distinguished architects. Le Corbusier was the spiritual heavyweight of the group, and it was his predominant imperative, over 30 years ago, that no challenge is more vital to the architect than providing the world's people with humane habitation. Most of the world's people are still waiting.

It appears that the brightest and the best of the young stu-

dents, interns and practitioners hate the "star" system. And while their ardor for the self-enobling mission of "advocacy" work in the nation's ghettos has cooled, their conception of the profession as an instrument for abetting social change has not. The byzantine configuration (shown) for example has a sophomoric look about it. Yet it is anything but sophomoric even though it was drawn by students of UCLA's School of Architecture and Planning. It raises questions that could only come from one profession. Indeed, the words and phrases would constitute a shocking professional breach anywhere else. Words and phrases such as "Social design," "I am a competent?," "fresh out and idealistic," etc. Actually, the chart is a UCLA questionnaire sent out in connection with an innovative "social building" program. What it hopes to lure is "a small number of energetic, intelligent, entrepreneurially inclined, work-weathered students to help develop a new experimental program in Social Building. The students, the covering release emphasizes, will shape the program.

We don't know whether this is any way to run a railroad or a profession, but it could yield a reassuring clue to the question we posed at the beginning. Is the Mother Art leading the way, dragging its heels, or just getting along by going along?

Recent UIA activities include India trip

From the International Union of Architects (UIA) in Paris, these items:

■ Twenty members of the UIA Council, presided over by Georgui Orlov, were received in February in New Delhi by, among others, the president of the Indian Institute of Architects. During five work sessions, the group examined a number of topics including UIA contributions to the 1976 Vancouver conference-exposition on human settlements, sponsored by the United Nations Environment Program. During their stay, the

Council also met with V. V. Giri, president of the Indian Republic and several ministers who confirmed the importance of the architect in their country. During their stay, Council members visited the architectural schools of New Delhi and Chandigarh.

■ The European regional bureau of WHO, the World Health Organization, in cooperation with the Federal Republic of Germany, convoked a seminar in Stuttgart, last December, on the sanitary aspects of urban development. The conclusion reached was that problems in the European region at present can only be met by a total interdisciplinary approach to planning. The seminar dealt with the relationships between different systems of sanitary administration and of urban planning in towns of average population (up to one million people) in the European region of WHO.

Architects propose San Juan rezoning

A proposal for rezoning the Condado, San Juan's tourist hotel strip which also contains some of the city's highest cost condominiums and private homes, has been prepared by two architects at their own expense.

Federico Montilla and Russell Latimer will present the plan, which has received the personal endorsement of Condado Association president Queenie Valdes de Adsuar, to Governor Rafael Hernandez Colon. The Condado Association, founded in 1972, seeks to prevent deterioration in the Condado, where trashy advertising signs and the like have made the area look cheap.

The architects recommend that an elevated highway and a boardwalk bordering Condado Lagoon be built, that space be left for businesses on the ground floor of all new construction and that the Condado be rezoned by the Government as was done when the restoration of old San Juan was carried out by the Institute of Puerto Rican Culture.

Waving the vinyl flag

PLASTICS AND ARCHITECTURE, by Arthur Quarmby: Praeger Publishers, New York, 1974, 208 pages, illus. \$20.00.

Writing a book about plastics is a difficult task for two reasons. First, developments happen so quickly that the book is likely to be out-of-date before it is in print. Second, the materials can take on so many forms and characteristics. It is able to span vast distances with a single sheet while, at the same time, it is capable of holding your dentures on. It can be lightweight like wood, strong like steel, and moldable like concrete, while looking like any one of these.

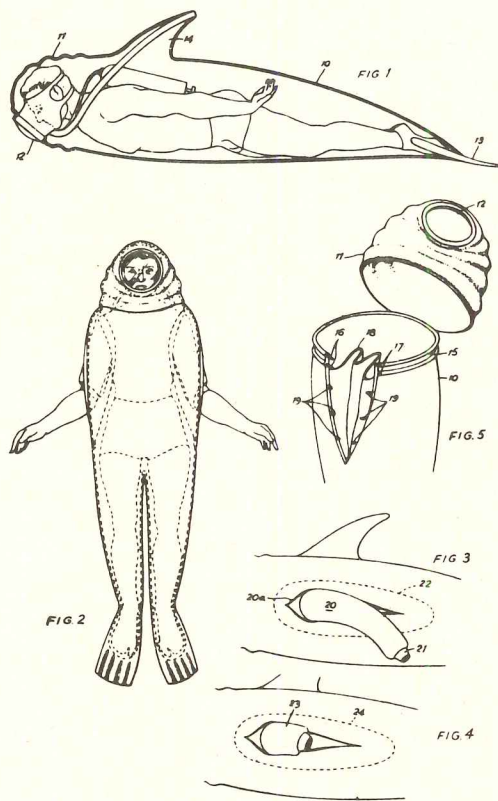
The obvious way to limit the scope is to describe the history of plastics and then to speculate about the future. *Plastics and Architecture*, by Arthur Quarmby, is excellent on the first count because of the considerable experience of the author in working with various forms of the material. In speculating about the future, however, he has (like so many others in the last decade) relied on the images of Archigram and their contemporaries, rather than developing independent, fresher, and perhaps more realistic alternatives. It is difficult, for instance, to distinguish portions of this book from *The Anthropods*, *Urban Structures for the Future*, *Archigram*, *Experiments in Architecture* and many articles by Rayner Banham and others.

Because there are so few books specifically on plastics, it is difficult not to make comparisons, particularly since the jacket of this one claims it is the first such book for architects. It is not. But where this book lacks in depth of analysis or case studies it makes up for in quantity of illustrations. Inflatables, shells, components and sculptural applications are sections well supported by good quality photographs and captions.

It is important to note that the title of Quarmby's book is *Plastics and Architecture* (as opposed to plastics *in* architecture). This choice gives Quarmby license to talk about either subject, even when the connection is tenuous. He often does digress, and these digressions are either interesting little anecdotes (like the man that made himself a plastic suit in the form of a porpoise, so he could swim like that mammal) or rebukes against architects and educators for our lack of adventure and exploration in the use of plastics. This waving of the vinyl flag appears whenever the text seems to get technical or whenever the author is at a loss to explain why some magnificent use of plastics was not universally accepted. "We design out of habit, we do not think, we do not question." One would assume, then, that the

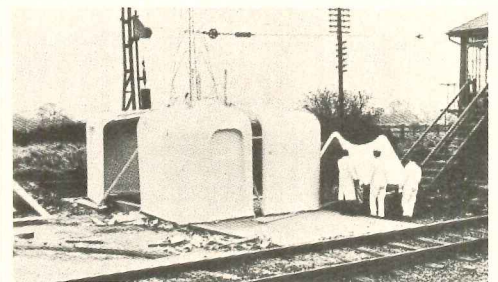
absence of the total plastic building is due to the lack of imagination and education of the architect. I think not.

First of all, as Quarmby admits, plastics are not cheap, and, as he says, most plastic techniques "will remain beyond our reach until we succeed in organizing the gigantic market for building into viable units." The problem is therefore at least partially political and social. Secondly, those of us who have



tried diligently to use plastics as a structural and space enclosing material and have still met with little success even on a small scale are convinced that the problems remain somewhat technical. Fire is the single most critical issue when working with plastics as a total building material, but astonishingly, it is scarcely mentioned in this book. Although this is partially a chemist's problem (additives) or a manufacturer's problem (coatings) there are still many architectural and planning concepts which can alleviate the difficulties, and these should have been suggested in this book. These possibilities include holding rooms on each floor of high-rise buildings, and outside elevators for emergency access, or zoning structures with fire breaks for lower density situations.

Quarmby discusses how he sees the restructuring of a profession as a result of the eventual adoption of plastics. Some architects will design components, and others will inter-

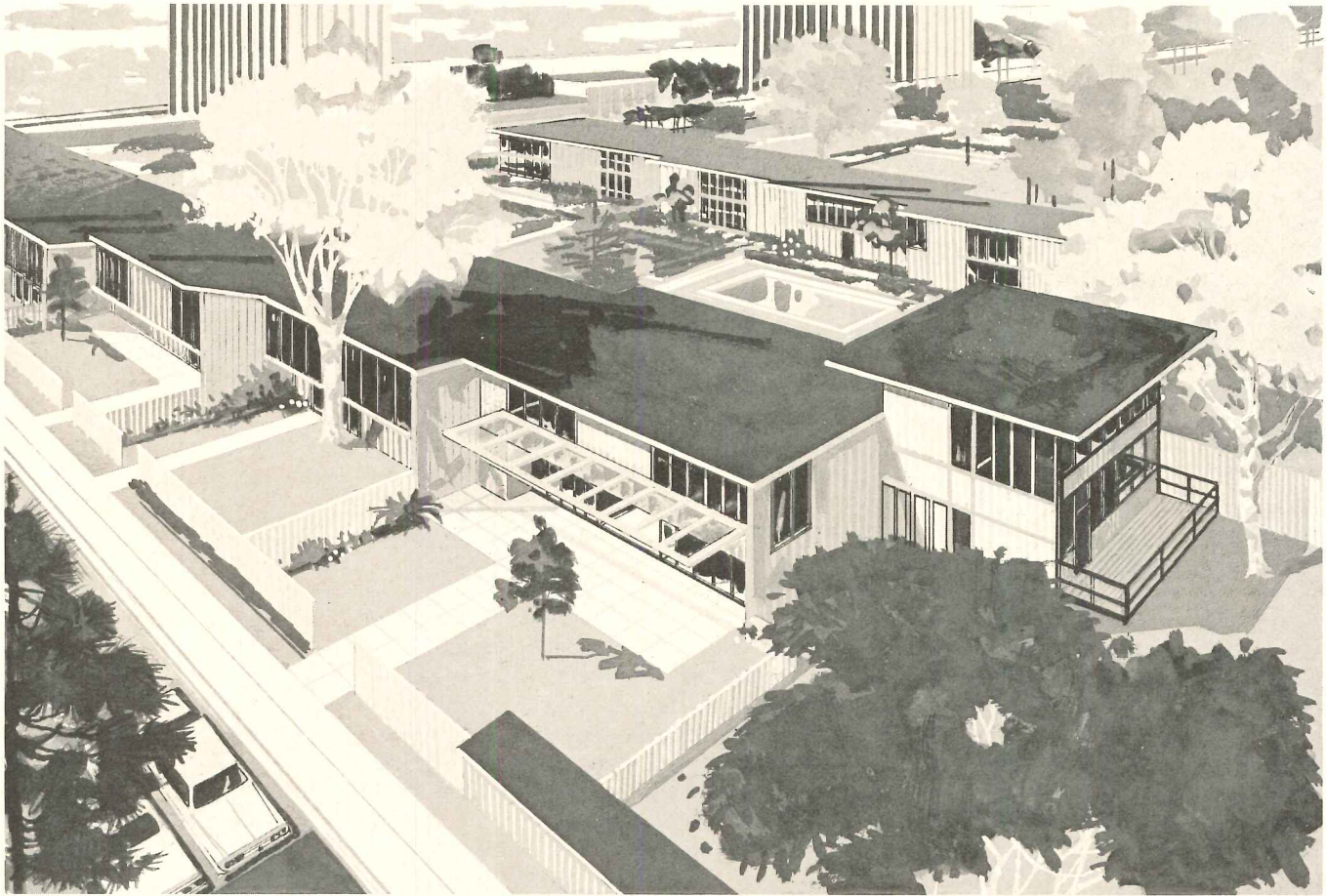


pret these parts into buildings. However, when using plastic components for structure and enclosure, the molding process and the desirability (without huge production runs) of limiting the number of molds leads to houses of fixed geometry and limited architectural expression. The architect of the system becomes the architect of the individual building. These fixed geometries are generally round or saucer-shaped, using only one pie-shaped mold. They have informal plans, they are easy to erect with only one standard joining condition, and they are most appropriate for emergency shelter and vacation homes where fire codes and user needs are not as restrictive as in the general market.

It is Quarmby himself who found a way to overcome some of the problems of limited size and geometry of these buildings and his switch houses for the British railway. For some reason (perhaps modesty) he does not go into great depth on the actual design process or evolution of the form of this system. In the switch houses Quarmby uses three concepts not yet in general use. First, through the molding process he eliminates the critical connections (both from weatherproofing and structural standpoint) of the ceiling to wall. He also uses a double curved surface on the component to increase its strength, and finally he allows for variation in building size by additions of identical components. The House of the Future at Disneyland used single pieces to eliminate the critical connections, but these had a variable section calling for two molds in order to make the great cantilever. The Disneyland house could not be expanded and was not completely enclosed by the use of its plastic component panels. The railway switch houses, with single mold elements and integral windows in these panels, enclosed the entire space. Why Quarmby decided not to go all the way and use a "c" shaped component which included the floor as well, what kinds of transit problems were incurred, what kinds of mold designs are all unexplained questions.

Quarmby sees a great potential in these buildings by combining the interior equipment

continued on page 46



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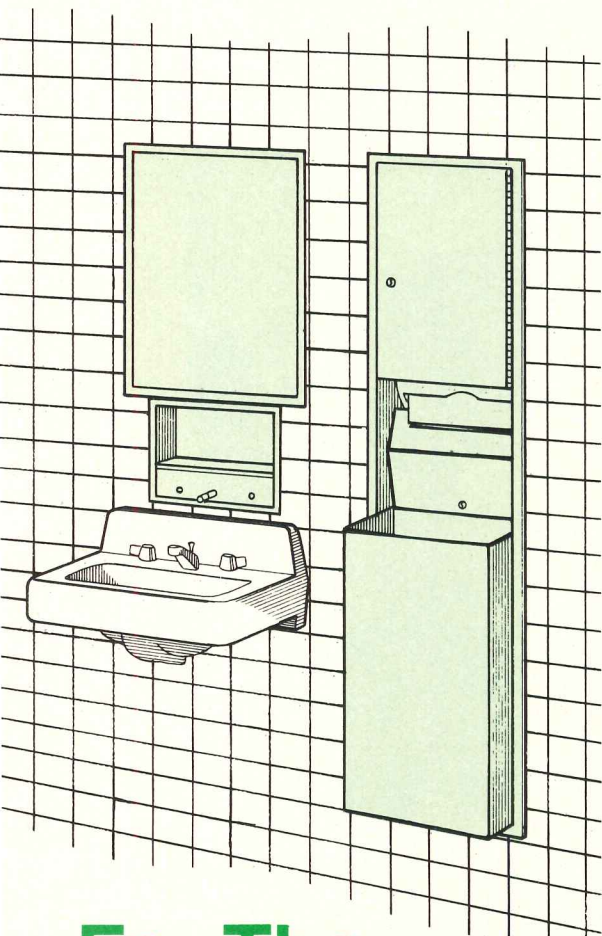
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REQUIRED READING *continued from page 44*

with the enclosure skin. "... If we could have built-in permanent finishes for the interior—there are so many more interesting ways of developing personality than by changing the wallpaper or buying a new carpet." I agree that all our present enclosures, plastic or otherwise, are virtually the same, and that traditional furniture has given only choice of style not options in environmental design. Yet there are a number of developments (most of which are in plastics) contributing to the increase of alternatives, and all of these are overlooked by Quarmby. The most obvious are the Italian domestic landscapes in general, and the work of the late Joe Colombo in particular. Although these solutions are meant to be independent of the shell, they are nevertheless multifunctional equipment capable of having immense spatial implications within the enclosure. Similarly the work of Severino (whose *Equipotential Space* parallels many of Quarmby's attitudes) shows a highly developed approach of coordinating a spatial enclosure and three dimensional interior (functional objects). Another possibility, also not discussed, is the potential for three-dimensional elements to clip on to existing enclosures. In this way specialized equipment or simple space additions could be easily applied to the dwelling. Because of its molding and three dimensional potential, plastic is the perfect material for this use.

On the other hand, the extent of Quarmby's historical analysis and research is truly impressive. The development of the plastics industry occurred at what seems to have been the perfect time. The post-war European countries needed to rebuild, thereby establishing a huge market. They needed to rebuild quickly and looked to industrialized methods. They had vast shortages of building materials and looked to synthetics and plastics. And many needed a new soft edge esthetic to counteract what was regarded as the sterility of the modern movement. Unfortunately the opposite situation from today existed then. The desire was there but the technology was not up to it. Now it appears that the technology is that in spite of any real experiments in its use, the industry continues to grow enormously. The all-plastic house is a reality. Look at a mobile home. Most of the interior and exterior finishes are plastic as well as the baths and much of the hardware, even though it may look Georgian.

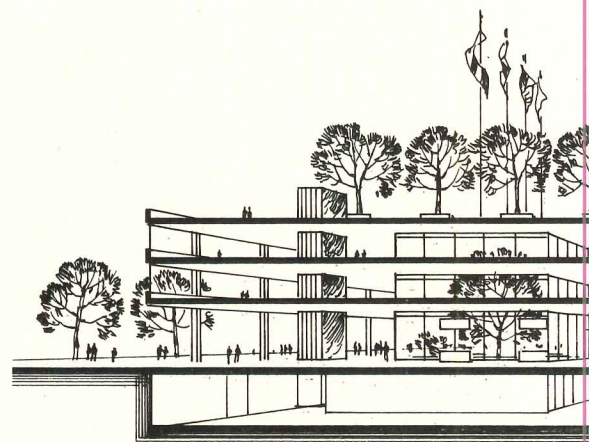
Many of the real problems that are retarding any experimentation are glossed over by Quarmby and some realistic not-so-distant solutions should be suggested. Esthetic acceptability, fire, maintenance, availability of a petroleum-based material are only a few that get minor attention.

Quarmby is thoroughly knowledgeable in this field, speaks with authority, and his motivation is simple and clear. "Many of us are still driven on by the complete certainty that the logical applications of plastics materials and technology can, and one day will, produce an industry of building capable of curing the housing ills of the world." I hope he's right.

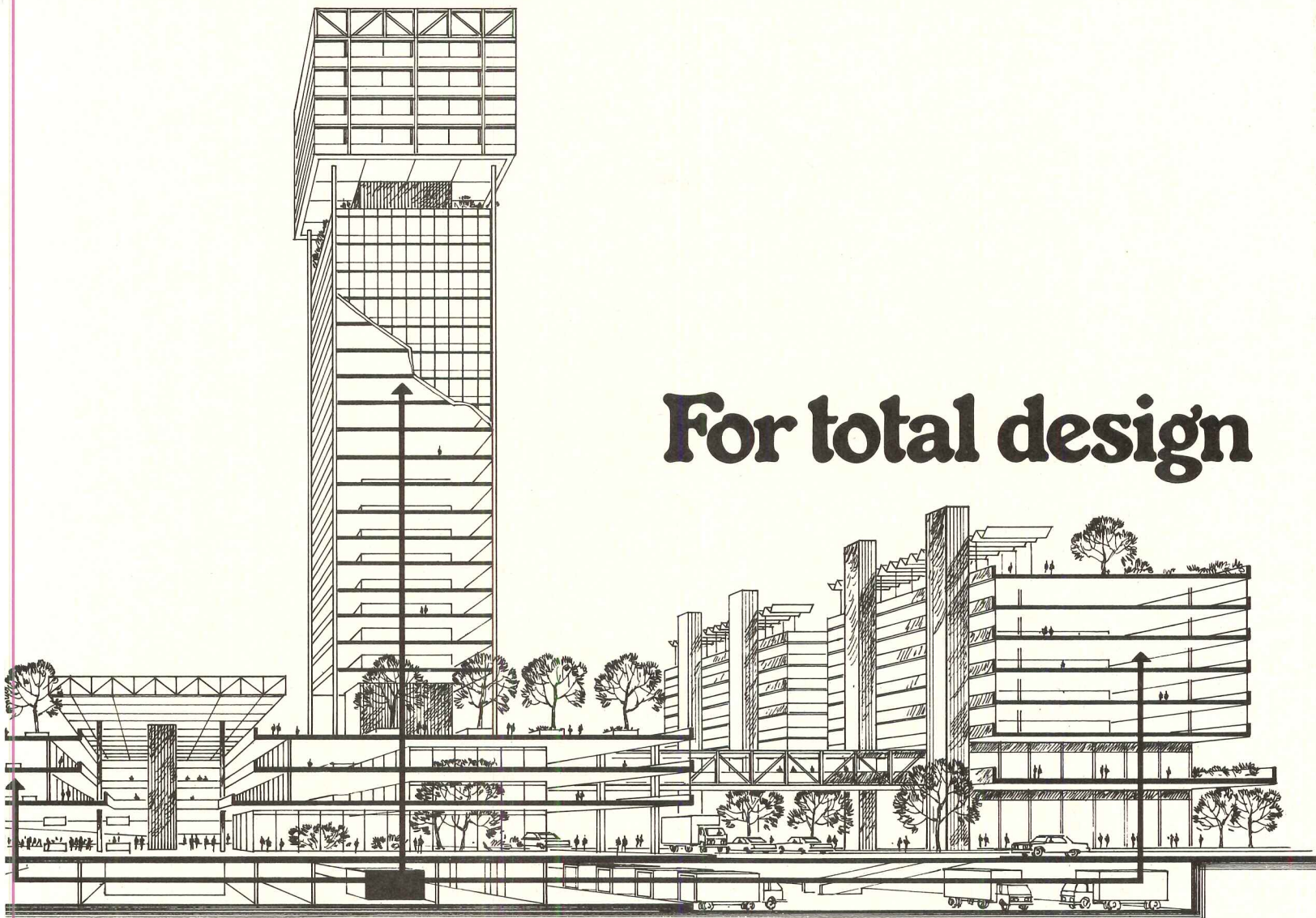
—Sam Davis

Mr. Davis is an architect who teaches at the University of California at Berkeley.

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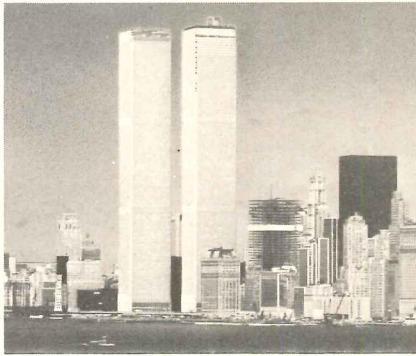
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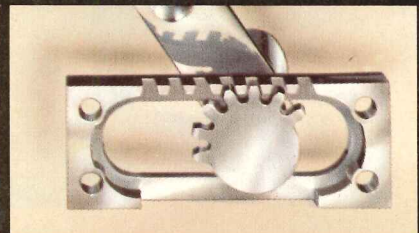
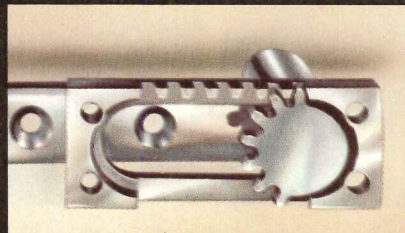
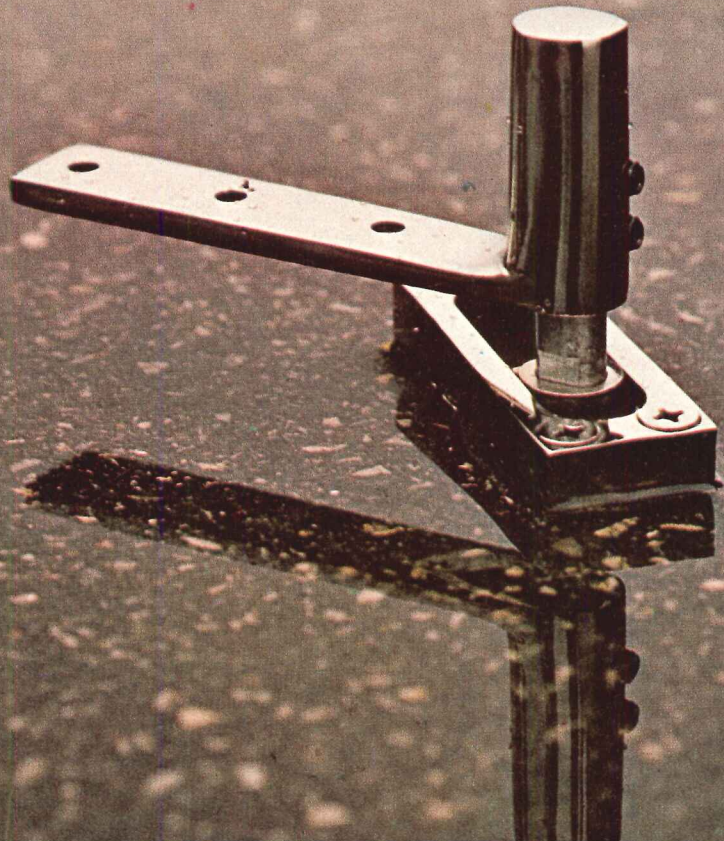
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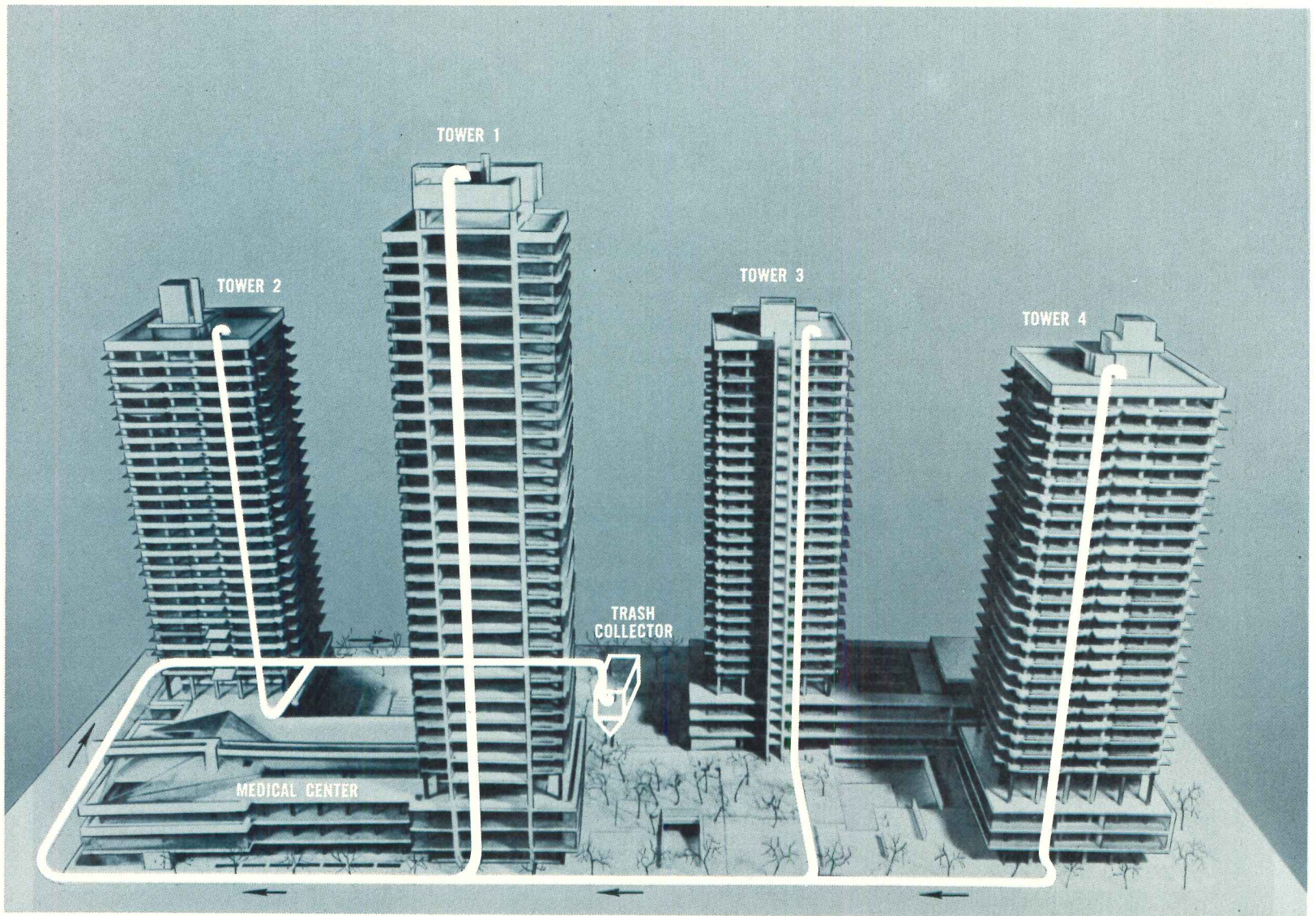
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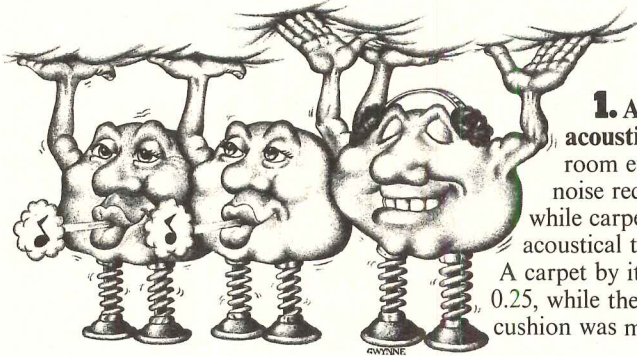
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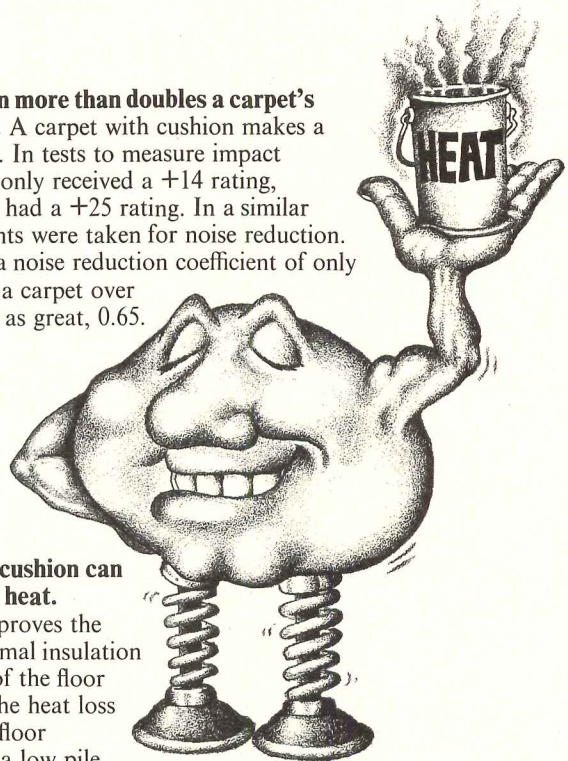
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Before you pull the padding out from under another rug, read this.

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.

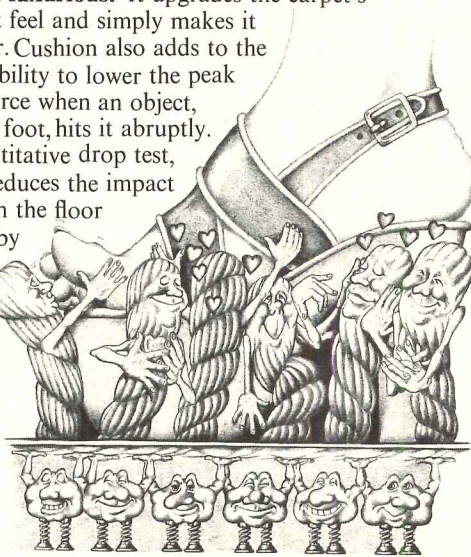


1. A carpet cushion more than doubles a carpet's acoustical properties. A carpet with cushion makes a room even more quiet. In tests to measure impact noise reduction, carpet only received a +14 rating, while carpet over cushion had a +25 rating. In a similar acoustical test measurements were taken for 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.

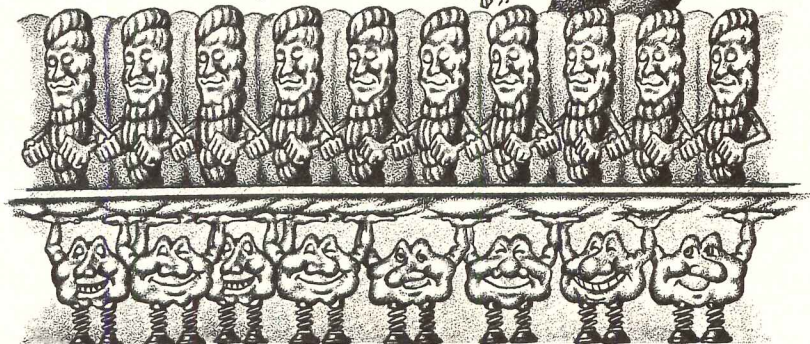
2. Separate cushion makes a carpet seem thicker and more luxurious. It upgrades the carpet's underfoot feel and simply makes it feel better. Cushion also adds to the carpet's ability to lower the peak impact force when an object, such as a foot, hits it abruptly. In a quantitative drop test, cushion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

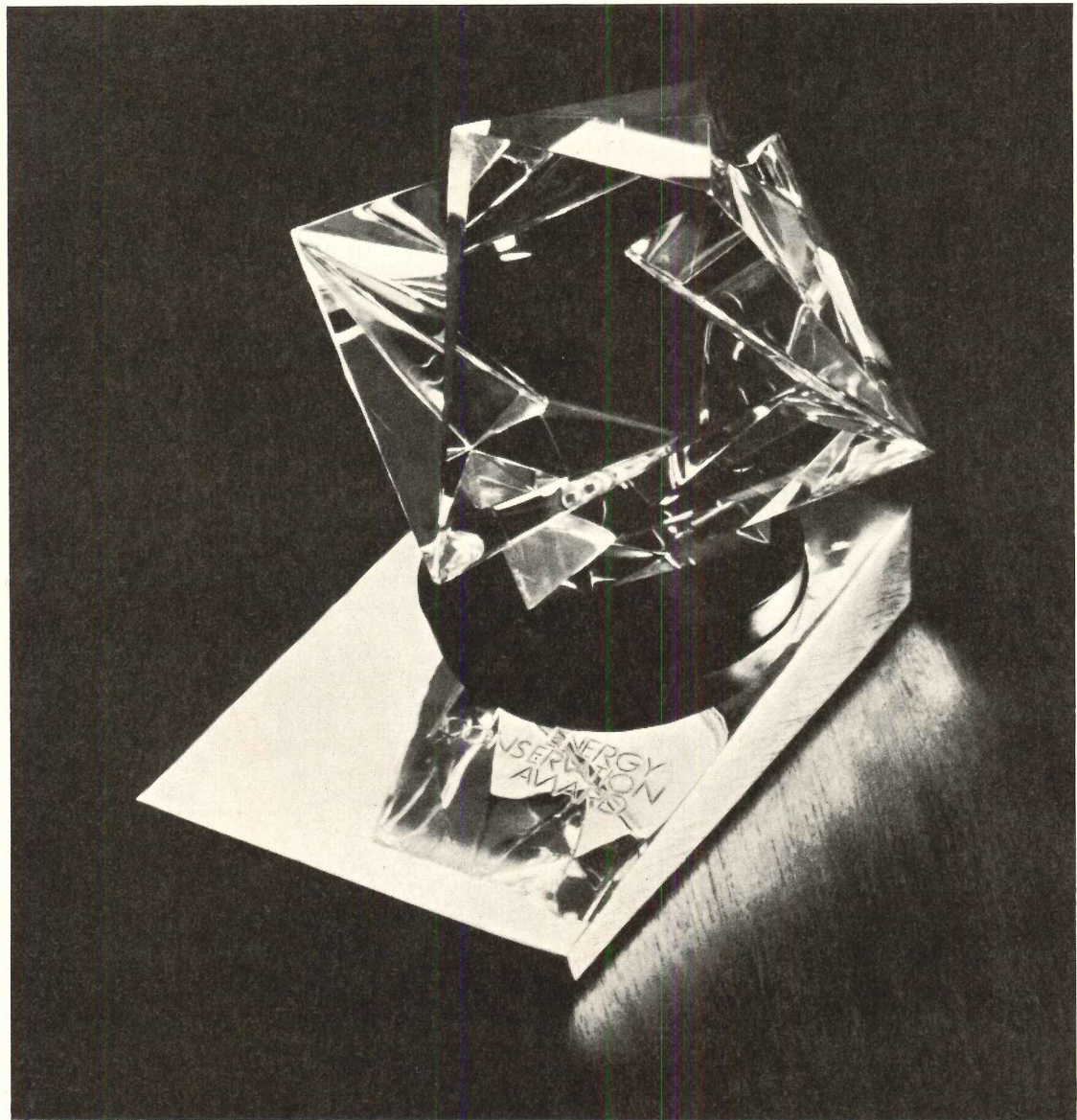


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**Owens-Corning announces
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The Owens-Corning 1974 Energy Conservation Award.
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This year, the whole world is watching.

Show our Awards Jury a building design that doesn't waste energy—and you could win one of the Energy Conservation Awards Owens-Corning will present for 1974.

The Awards Jury will be looking for three things: Creativity. Originality. And most important of all—designs that save energy.

Too many buildings waste fuel and contribute to environmental pollution.

By continuing the Energy Conservation Awards Program we initiated in 1972, Owens-Corning hopes to stimulate even more new ways to conserve energy. And it will let us honor the architects and engineers who do the best job of designing buildings and mechanical systems that conserve fuel.

Who can enter

Any registered architect or professional engineer practicing in the U.S. is eligible. As an individual. Or in a team. But to qualify, your entry must be a commissioned building project—in the design process, under construction, or a completed structure.

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Four entry categories

A winner will be selected in each of these categories:

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The Awards

Winning architects and/or engineers will receive the Steuben Crystal sculpture "Triangles." Owners or clients associated with winning entries will receive other Steuben Crystal awards.

The Awards Jury for 1974

Eight outstanding professionals in architecture and engineering will serve as the Awards Jury to select the winners.

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Send for entry details now

Completed entries must be submitted by August 31, 1974. Winners will be selected and notified in early September.

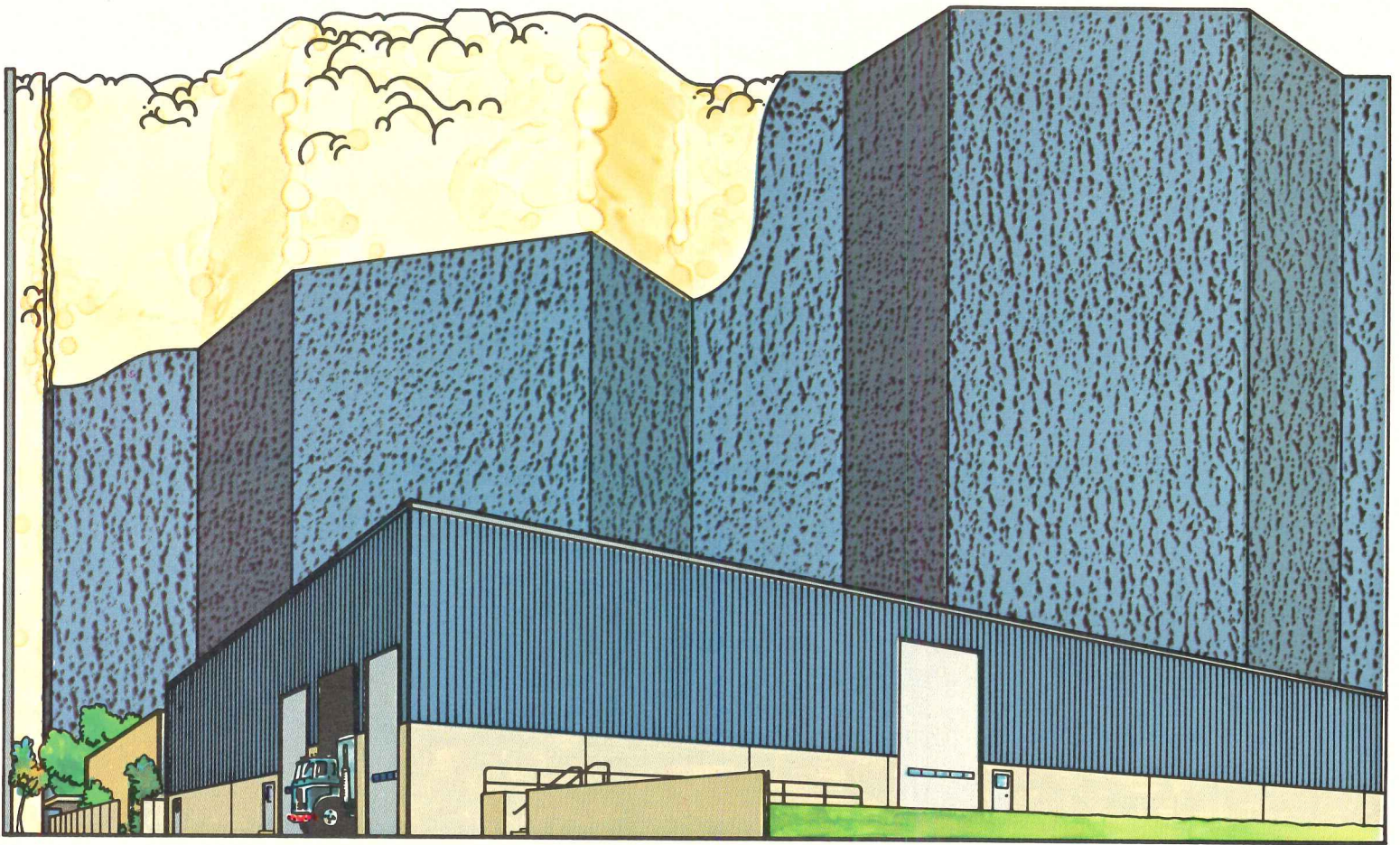
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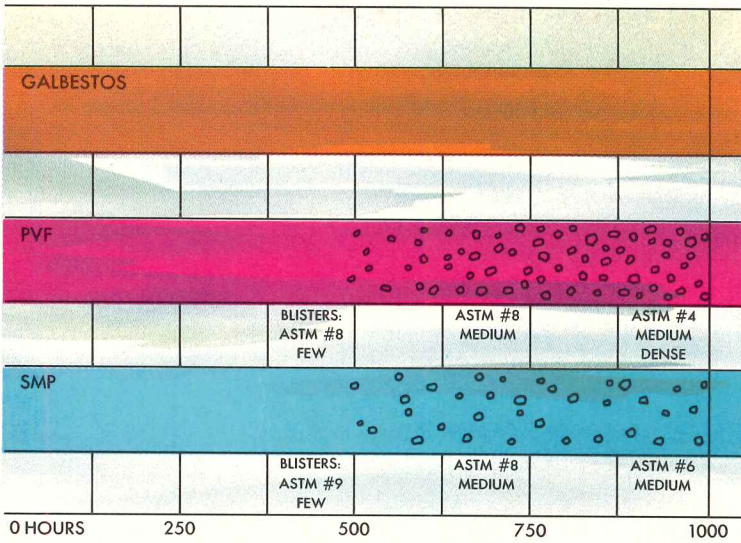
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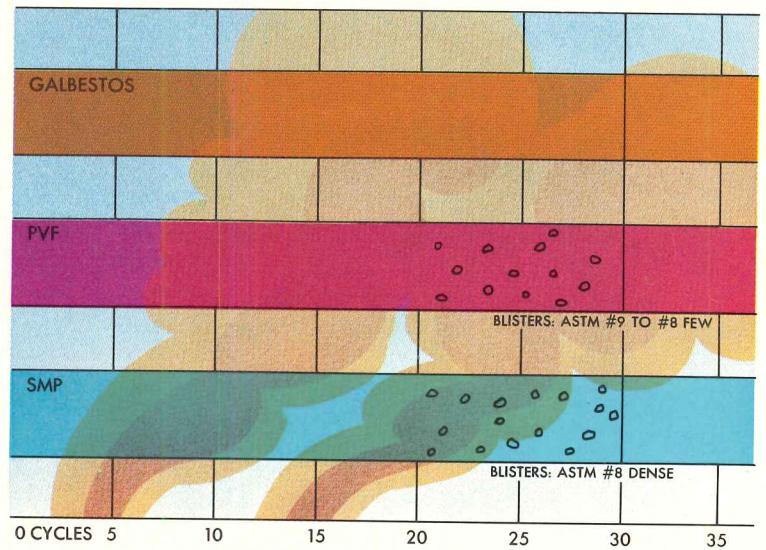


COATING SYSTEM INTEGRITY TEST RESULTS



ASTM B-117-64 SALT FOG TEST PROCEDURE: Samples continuously exposed to 5% salt fog at 95° for 1000 hours. Results: PVF2 showed few #8 blisters at 500 hours, medium dense #4 blisters at 1000 hours; SMP showed ASTM #9 few blisters at 500 hours, #8 medium blisters at 750 hours, medium #6 blisters at 1000 hours; no blisters on Galbestos. Significance: Galbestos resists corrosion and other forms of environmental attack. Galbestos coating system has superior film continuity and integrity.

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KESTERNICH TEST PROCEDURE: Expose panels to a specified number of cycles, each consisting of 8 hours in enclosed cabinet holding 2 liters distilled water and 2 liters each of dry sulphur dioxide (SO2) and dry carbon dioxide (CO2) at 104°F (40°C), followed by 16 hours of drying at ambient temperature. Results: After 20 cycle PVF2 showed blistering ASTM #8 to #9 few, SMP showed blistering ASTM #8 dense. No blisters on Galbestos. Significance: Galbestos has superior resistance to the airborne pollutants, sulphur dioxide and carbon dioxide.

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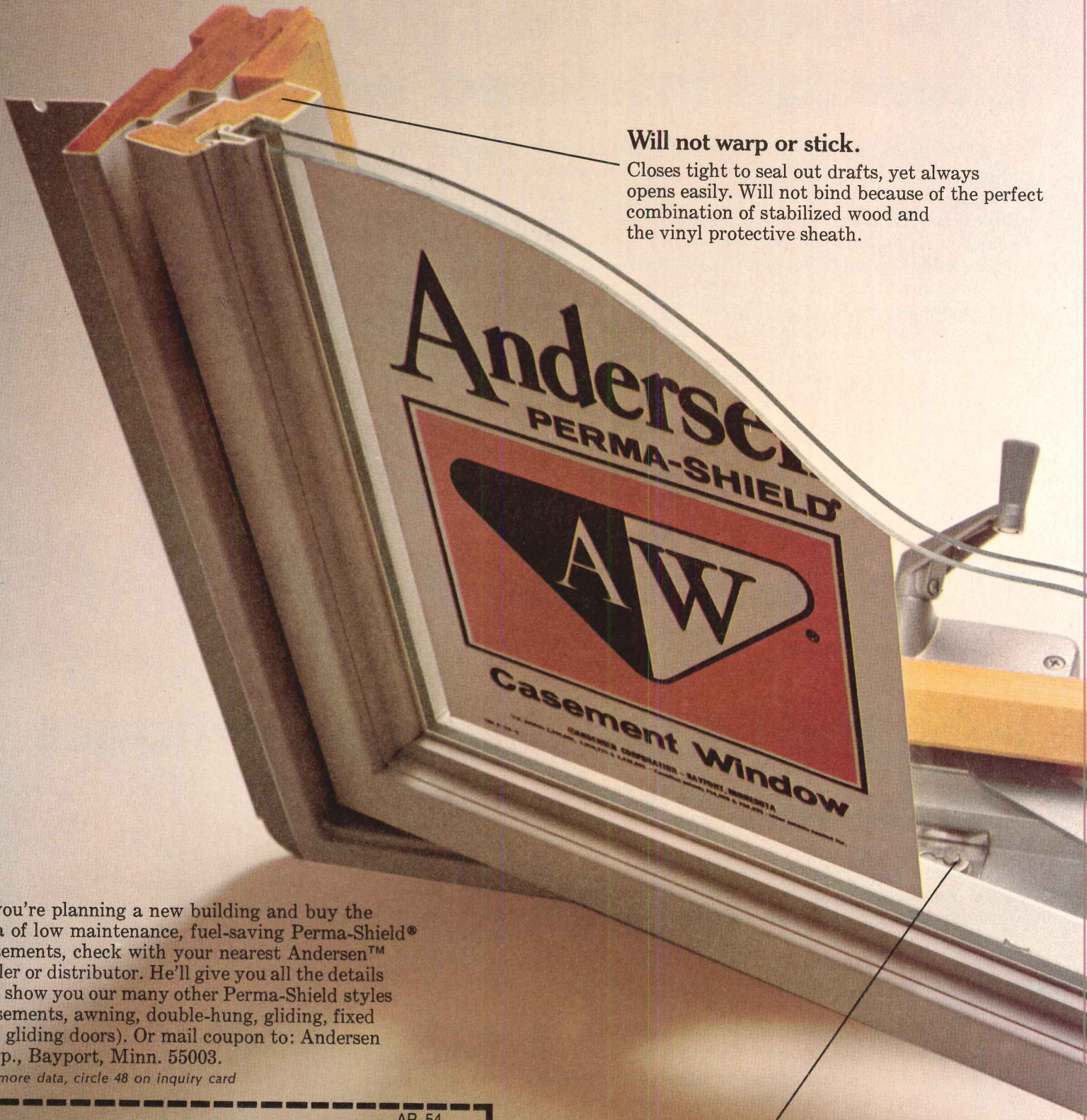
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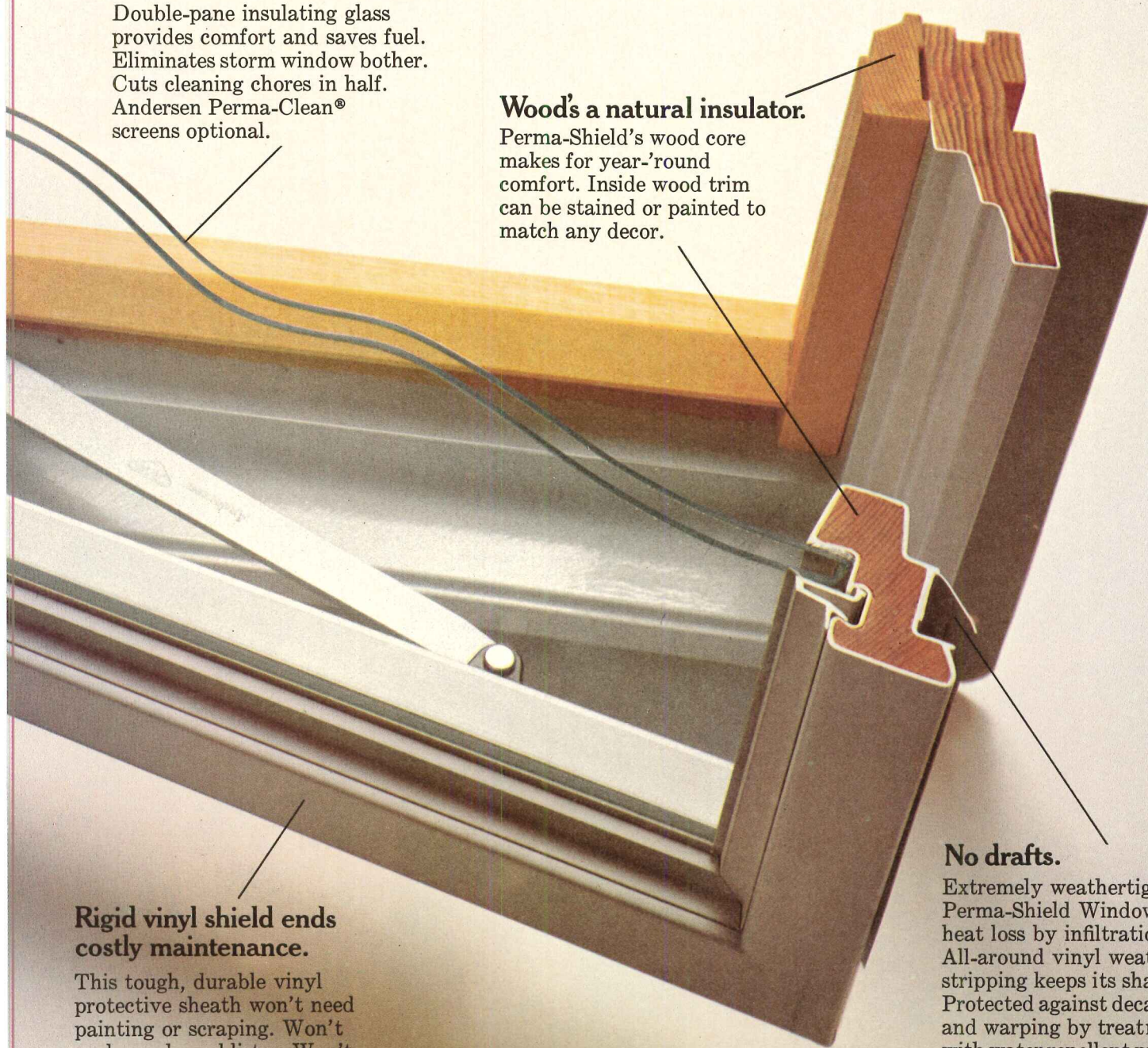
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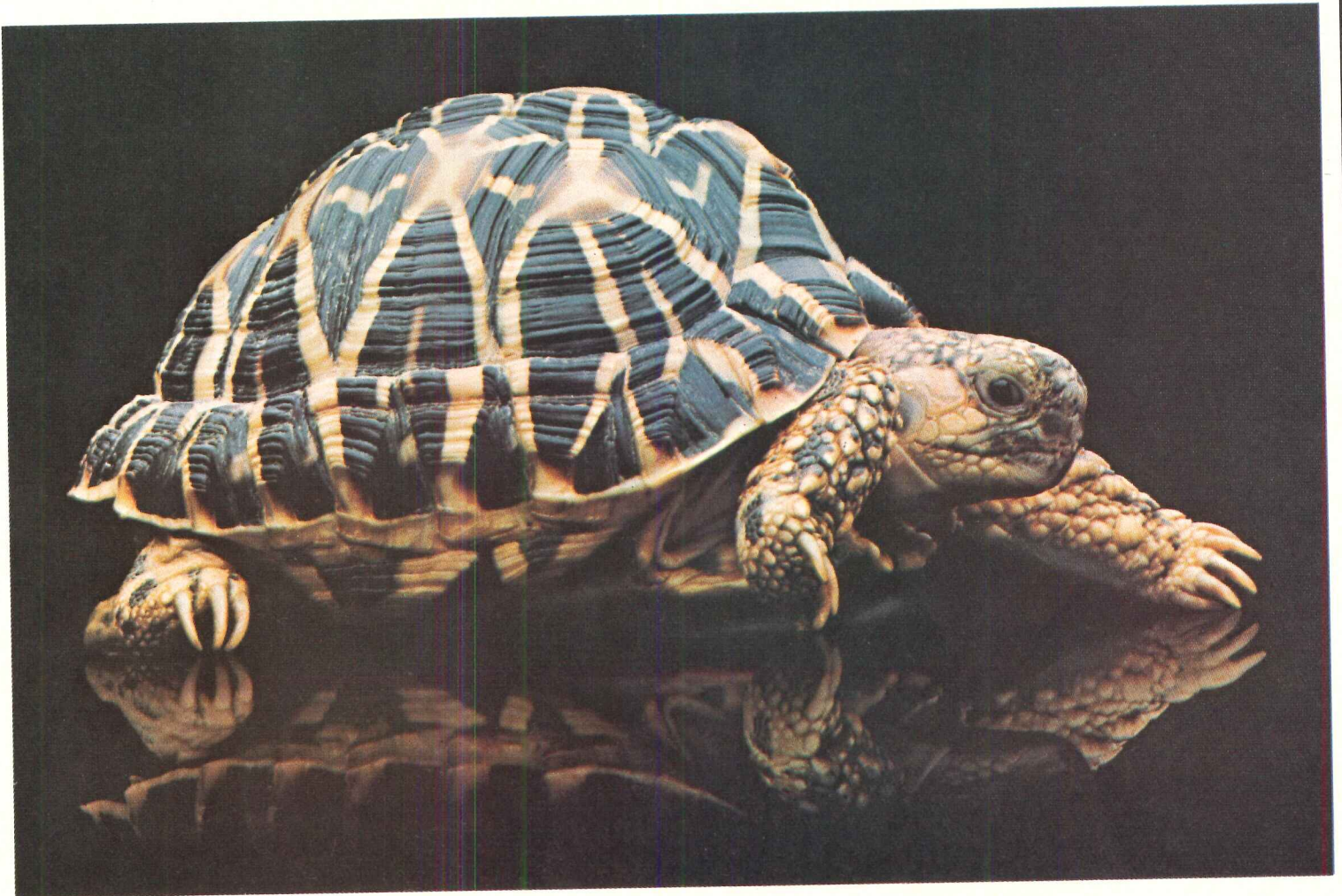
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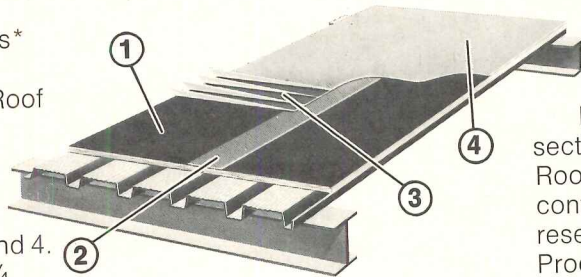
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Job satisfaction: key to reduced A/E employee turnover

Turnover of architectural professional employees is a major management problem which consumes significant time for orientation and training of replacement employees. This time could better serve the practice and the employee if diverted to job enrichment and improved product. An examination of the three basic architectural staff organization systems in terms of professional employee desires will reveal how to increase job satisfaction at all levels in order to reduce employee turnover.

To discover job enrichments desired and job dissatisfactions that should be eliminated, the very nature of the architectural professional must be explored. Very few studies dealing specifically with architectural employees have been made. In order to use published studies which are available, it is assumed that the architectural professional's attitude toward his work and his needs is similar in most basic ways to those of engineers and scientists or other professional employees. Notable among periodicals that have published papers in this area are the *Administrative Science Quarterly* and *The California Management Review*. Key articles found in these periodicals, and a few other publications which contributed to ideas set forth here, are appended as a list for recommended reading about the creative and research professional as an employee and related special management problems.

From a survey of the published studies, the following facts and developed assumptions, believed applicable to architectural employee work satisfactions, attitudes, needs, and dissatisfactions, are enumerated for consideration in evaluation of work assignments:

1. "The creative atmosphere should be free from external pressure. A person is not likely to be creative if too much hangs on a successful outcome of his search activities, for he will have a strong tendency to accept the first satisfactory solution whether or not it seems novel or best possible. Thus he needs indulgence in time and resources and particularly in organizational evaluations of his activities." (Thompson, reference 1)

2. "In the innovative organization, professional orientations and loyalties will be stronger relative to organizational or bureaucratic ones. Esteem striving will tend to replace status striving. There will be less control by superiors and more by self and peers. Power and influence will be much more broadly dispersed." (1)

3. "The dispersal of power is important because concentrated power often prevents

imaginative solutions of problems. When power meets power, problem solving is necessarily called into play. . . . Dispersed power, paradoxically, can make resources more readily available to support innovative projects because it makes possible a large number and variety of supporters and sponsors." (1)

4. "Heterogeneous team membership was associated more frequently with superior success in all aspects of group performance." (Smith, reference 2)

5. "In practically every group surveyed, there was strong evidence of frustration and generalized dissatisfaction." (Johnson and Hill, reference 3)

6. "It was found that the average professional employee works 35 per cent of the time on tasks which he feels are beneath his capabilities." (3)

7. "In a recent survey of 622 engineers and scientists, the following feelings were expressed:

72 per cent thought management misused their talents.

80 per cent felt they were underpaid compared with other groups.

Most felt management got an unfair share of recognition.

76 per cent thought management tried to manipulate people for their own purpose." (3)

8. "Need for Esteem. The prime determinants of professional behavior are to be found in his need for love, esteem, and self-actualization." (3)

9. "The need for self-esteem assumes the form of a desire for independence, freedom of action, self-control, and confidence in one's ability to perform successfully. The need for group esteem manifests itself in recognition by others that the professional has achieved these desires." (3)

10. "The professional worker's need for self-actualization is a desire to utilize his capabilities to the fullest extent. He wants a challenging, creative job, one that requires the abilities he possesses and provides an opportunity for self-development." (3)

11. "Salary affects the engineer's motivation considerably. While not always the overriding factor in his motivational make-up, it plays a major role in his job satisfaction and should not be underrated. In addition to its practical aspects, salary is for him a highly important symbol of status and recognition." (Reeser, reference 4)

These findings show that many causes of

job dissatisfaction center around inappropriate work assignments and suggest that to give an employee a project to do on his own would yield maximum satisfaction. This would be the simplest form of vertical staff organization, which will be discussed later. Even if this form is possible, it should be noted that there would surely be a significant proportion of tasks required that would be well beneath his capabilities, and therefore a source of dissatisfaction.

William Wayne Caudill, well-known Houston architect and professor of architecture at Rice University, wrote, "How to get highly creative people to work together in efficient team play is the most pressing problem of architectural management." (5)

Three management organizations reflecting work flow and task assignments are suggested in *The American Institute of Architects' Architect's Handbook of Professional Practice*: horizontal, vertical, and combination. (6) It is suggested that staff capabilities will be a determining factor in the selection of an appropriate system for a particular office. Caudill outlines a philosophy dubbed "Troika," a system to structure architectural teams, to control team efforts, and to promote product quality through the identification of three "think/action" disciplines or tasks—design, management, and technology. An examination of these three organizations, and the application of Caudill's philosophy to them for evaluation in terms of job satisfactions and dissatisfactions, should reveal which organizations and task assignment system will be most effective in combating employee turnover.

Vertical staff organization. Under this organization, each project is assigned to a project team under a project architect. The project architect would remain assigned to the project through all its phases from programming through construction documents, bidding administration, and construction contract administration of the job.

The satisfaction of the project architect is virtually assured in this staff organization, provided it is a meaningful project, an adequate team is provided to eliminate his working beneath his capabilities, and management is tolerant of his decisions and not over-restrictive of his expenditure of time and resources; and, most important, provided he is a well-rounded generalist.

Management, on the other hand, feels reservations toward the vertical organization. The project architect will tend to possess "his project." It will become his design, and potentially

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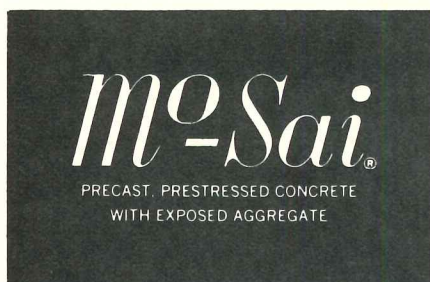
Carroll Gartin Justice Building / Architects: John L. Turner and Associates / General Contractor: M. T. Reed Construction Company
Walter Sillers State Office Building / Architects: Barlow & Plunkett with Associated Architectural Firms, Bigg, Weir, Neal & Chastain, R. W. Naef & Associates, and Charles G. Mitchell & Associates
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his client. Management carries the responsibilities and liabilities of the firm. They want controlling influences, and they want to assure the quality of the product and the continuity of the firm.

Job satisfaction for other team members is not as easily achieved, particularly in light of the esteem vested in the project architect. Caudill's philosophies suggest the recognition of special talents and the creation of team positions, all of which require special types of "creative thinkers."

Caudill's "Troika" suggests the project architect's task be split vertically into three "think/action" disciplines, with each discipline assigned to a project-architect/caliber person whose long suit tends to lie in one of the three discipline areas; design, management, and technology. This heterogeneous team membership should yield what Clagett G. Smith observed as being "associated more frequently with superior success in all aspects of group performance." Victor A. Thompson's supposition on the merits of dispersal of power (see assumption 3 above) supports Caudill's "Troika" as conducive to imaginative solutions and supportive to innovation. Keith Davis's organization pluralism (7) is a less sophisticated form of multiple vertical organization, which lends validity to the "Troika" concept.

Caudill next doubles the opportunities for individuals to identify their talents within his "Troika" by introducing "two kinds of thinkers—the idea people and the developers. Idea people come up with the ideas. Developers see those ideas reach fruition. Idea people are not usually organizers (but there are exceptions). They often lack the necessary follow-through, and would rather explore other newer ideas than develop the old ones. The developer has a single-mindedness and determination to carry out the ideas. He likes to 'wrap up packages.' Developers are rather more rigid and often are quite dogmatic. They give stability to the team."

By multiplying the three think/action disciplines by the two kinds of thinkers, there are six classes of task/talent team members who are needed, and with which the employee can personally identify. This multiplication of specific talents needed on the team can again be extended when the five to seven phases of the project are considered. Breakdown and identification of tasks in this manner will show the minor or short-term members of the team the significance of the need for their particular talent at a given moment in the life of a project, and the importance of their unique contribution to the quality and success of the project.

Horizontal staff organization. Under this organization each project passes from one department or specialist to another at each phase of the project. Each specialist or department contributes its effort at the proper time and place under the direction of the project architect or project manager.

Most of the job enrichments described under vertical staff organization are possible under the horizontal organization. However, in this structure the specialists or departments

relate to the phase and tend to dominate the task assignment, whereas in the vertical organization the tasks relate more strongly to the project, with more opportunity for a team member to work on the same project in multiple phases. The horizontal organization is desirable if the firm is specialist-oriented and so staffed. Generalists have limited opportunities for satisfaction in this organization whether they are in the early stages of their careers or they are senior architects.

Management tends to favor the horizontal staff organization because it appears to require less training and seems to offer greater control. Conversely employees tend to receive a lower level of job satisfaction, with the staff-acknowledged and self-satisfied specialist being an exception to the rule.

Combination staff organization. Under this structure, two interpretations are found. In one, both horizontal and vertical organizations are employed on different projects within a firm at the same time in order to fully utilize staff talents. In the second, the combination staff is a vertical organization which utilizes selected specialists or departments; for example, a design department with a head designer who does all preliminary designs in the office or a specifications department with a chief specifications writer who writes all specifications for every project. This second interpretation is very common because management feels that with this system it has maximum control and protection where they are most concerned. However, this system probably produces more job dissatisfaction than any other.

Certainly the potential dissatisfactions are easily identified. For example, most young professionals want an opportunity to do preliminary design. This is the most glamorous task in the business, the task of highest esteem. If they observe that it is performed by a specialist and their turn is not likely to come, dissatisfaction is certain. They complain they are being exploited by management and are required to work beneath their capability. The senior generalists are complaining they do not have full control of their projects when a senior design architect controls their design and a senior specifying architect controls material selection and construction techniques.

Caudill introduces another aspect of his "Troika" to inject management quality control influences through a participation management form which parallels the thoughts of Victor A. Thompson, as quoted earlier with respect to "Variety of Supporters and Sponsors." The Caudill concept appoints a sponsor for each of the three think-action disciplines. The sponsor is selected for his special commitment to the particular discipline (design, management, or technology). "A sponsor is charged with: serving as patron of his assigned discipline; causing activities such as open forums and seminars which generate new thought in the assumed discipline; using his influence to promote advancement within his discipline; initiating procedures leading to proficiencies; encouraging research and advising individuals to delve; using his influence as a high-level

member of the firm to improve quality."

The "Troika Sponsor" concept attempts to provide for management those features that it seeks in the combination organization through less autocratic management techniques. It also provides the teachers or critics that give unity and continuity to practice philosophies. As a multiplier for the talents of the sponsors, it provides self-improvement of the employees, adding greatly to their job satisfaction.

It is difficult to state final conclusions and recommendations for the architectural employee turnover problem from this limited study of published resources, and obviously much work and many specific surveys need to be conducted in this area. There are, however, clear indications that turnover rates that may average 30 per year are significant enough to warrant experimentation in job enrichment and aggressive efforts to eliminate job dissatisfaction by whatever means.

The Caudill philosophy appears to offer many opportunities to enrich tasks which the standard organization structures do not enhance, through its identification of multiple disciplines and types of "thinkers" for particular tasks. A key to generating satisfaction in each of these categories is recognition that each is a special type of creative, thinking, design talent. The vertical staff organization appears to offer fewer opportunities to develop dissatisfactions and is most adaptable to the Caudill philosophy. Although the vertical staff organization and the Caudill philosophy will require more training per employee to assure management control of the product, it appears that a resultant increase in job satisfaction at all levels would ultimately reduce training costs through reduced turnover. Improved product, increased effectiveness, and similar resultant effects of more satisfaction should also contribute ultimately to monetary savings, which can be reflected in increased rewards for all members of the team, thereby adding another remedy to combat employee turnover.

H. Maynard Blumer
coordinator of quality control
Guirey, Srnka, Arnold & Sprinkle

Reading sources

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Project purchasing strategy: CM tool for cost control

This is the third article in an intermittent series prepared by the staff of the Houston-based firm, CM Associates. (See "Overview" September 1973, and "Budgeting," February 1974.) This month, Charles B. Thomsen looks at buying as an alternative to taking bids.

The bid opening is the "high noon" for architects and their clients. How the prices come in determines very quickly whether a project can progress or if it's "back to the drawing boards" for the building team.

The traditional process is hard to control

In the traditional process, all the plans and specifications are done, the project put out for bids, and the contractors given three to four weeks to figure out their prices. Everybody gets nervous; no subcontractor will expose his price until two or three hours before bid opening for fear other subs will undercut him. The job really winds up being bid in the last few hours before the opening. If the bids are high (as they frequently are in this poker-game atmosphere), then, indeed, it *can* be back to the drawing boards and a costly delay, possibly even termination, of the project.

Nothing about the process is very business-like or predictable, even though millions of dollars are usually on the line. No company spending millions in operating costs each year would think of operating this way. There would be a well-trained staff in a well organized purchasing department to manage the firm's buying on a daily basis to keep it within a pre-determined budget.

That's precisely the manner in which construction management treats the buying-out of a project—businesslike and analytically. Instead of waiting for completed drawings and specifications before starting the purchasing of a project on a sink-or-swim basis, the Construction Manager takes it a little bit at a time. The structure may be bought first, then the foundation, perhaps the carpet—all depending upon the strategy established. And as these items are purchased, he checks them against the budget.

Any control system requires feedback. We couldn't hit the moon, or even drive a car without on-course correction. In cost control, some feedback comes from estimating, but the only hard numbers come from the actual purchase prices. They tell the Construction Manager gradually, not in one killing blow, whether the project is on course financially. And the earlier they come in, the better. If the project is over

the budget, the Construction Manager has time to recommend adjustments and the individual prices tell him where to adjust. He can either negotiate the high prices lower, suggest changes in the scope of work within a certain area, or look ahead to upcoming contracts to reduce the average.

Purchasing strategy is a management control

Construction management gives the owner someone who can manage the numerous, specialized contractors who will do the actual work, not as someone selling the building to the owner (the General Contractor's traditional role) but as the owner's agent buying the building for him.

One of the biggest advantages in buying a project contract by contract is that it facilitates communication between the building team and the contractors. By sitting down with the contractors and detailing the scope and nature of the work, the building team can eliminate contingency pricing. If the contractor know exactly what is expected of him, he won't feel the need to protect himself by padding his bid. He and the building team can work together to determine where economies lie.

The contractor's role changes under construction management. Subcontractors become prime contractors in most cases. Instead of obscuring their bids in a general contractor's lump sum bid, they bid directly to the owner through the Construction Manager. As a result, each contract is open to immediate scrutiny. If it's out of line, there's no question as to where the overage is coming from. Furthermore, because the sub is now a prime contractor bent on getting the job for himself, a building project has its best opportunity for eliciting all of the low bids, not just some of them. Most general contractors enjoy the loyalty of a few subs who will help them bid low by giving them better prices than those given to other generals. But no general has all the subs in his camp. So, each general is getting only some of the best prices—and that means that the owner isn't going to get the lowest set of prices no matter which general he chooses. Under construction management, however, the sub has one card to play with one construction manager, so he's got to throw out his best one.

Budgeting and estimating: prelude to buying

Control of building costs is initially dependent upon skillful budgeting and estimating. Knowing what the job is worth before you sit down at the table with the people you're trying to

buy it from is essential to getting a fair price. But it would be short-sighted, indeed, to assume that the budget/estimate is inviolable. The day-to-day market fluctuations that typify the construction industry (especially in today's erratic economy) make such an eventuality far from automatic. The only guarantee is that guy who will put his name on the line and say, "I'll build it for this price." And that is why management is so important in the purchasing aspect of the building process. Since there are no guarantees and automatics when it comes to someone else's price, there had better be a lot of preparation prior to asking for it.

The successful buying out of a project revolves primarily about the following activities: 1) making a thorough analysis of market conditions, both national and local; 2) establishing a contract strategy; and 3) responding to the feedback generated by the contract-by-contract purchasing sequence. The second point, contract strategy, is a product of the market analysis and determines the scope of work in each contract (and therefore, the number of contracts), the sequence in which they're bid, and the type of contract (competitive bid or negotiation).

Market analysis is critical. On a national level, we are entering an age of random scarcity—not just in energy but in materials as well. No longer can a building team assume that all the construction materials it has specified will be available when needed. The construction manager has to look at the national market and anticipate where the shortages are going to occur and react in time to prevent disaster from befalling the construction timetable. He must be able to respond to less predictable shortages with alternate solutions.

At the local scene he has to determine how things normally are done and who does them best, whether the labor market is lean or fat, how local labor jurisdiction will affect his contracts, what the bonding capacity of the local contractors is, and he must gin up interest in the project. This means going into the area and dealing with contractors face to face and establishing credibility. Once he's familiar with the local market, he can begin to establish a contract strategy.

The scope of work in each of the contracts will be determined by local custom. For example, in some parts of the country sheetrocking, taping and floating, and painting are all part of the same contract. In other parts, the painting is a separate contract. Knowing the scope of work per contract will tell the con-

struction manager how many contracts he's going to have. He can then decide how each one will be bought.

The Construction Manager has several ways to contract for work, but generally speaking, they break down into variations of competitive bidding and negotiation.

Competitive bidding is a valid but over-used method. Essentially, a competitively bid fixed price is asking for risk insurance; a contractor is selling a building he hasn't yet bought. Operating under this contract, he knows that every cent saved is 100 per cent profit for him. So, only when product quality is easily definable, bidders' contingencies are minimal, and real competition exists—only then is competitive bidding a wise choice.

This last point can't be made strongly

enough. If a market is saturated, competition won't exist. And even if it isn't a construction manager is going to have to beat the bushes to stir up as much competition as he can, if he expects to get a fair price. On one of our recently completed jobs, we experienced a striking example of what non-competitiveness vs. competitiveness can do to a bid. The price on the exterior skin came in 50 per cent over our estimate. There had been only one bidder. We discovered that a provision in the specifications inadvertently had prevented all but the one contractor from bidding. So, we rewrote the specs, ginned up competition, and got the skin right on our estimate—and, from the same contractor with the same product who'd been 50 per cent over on the first go-round.

Pre-qualification can be used to advan-

tage in competitive bidding. It doesn't eliminate the inflexibility of a fixed price, but since it selects a few organizations with good records in the kind of product or performance needed, it does limit bidding to reputable contractors.

When it comes to negotiated contracts, there is a considerably wider field of contracting strategies to choose from.

The "time and materials plus fee" contract requires no maximum guaranteed price and permits the architect and client to involve the contractors from the start. But absolute integrity is required on the part of the contractor (whether general or subs). When a contractor is working elsewhere on a competitive contract that is suffering losses, his inclination is to put his most productive people on that job, which shifts the burden to his time-and-material-plus-fee job.

When it's known what is wanted, who should do it, and what it is worth (and this is critically important), then it's sensible to negotiate a "fixed price contract." When a contractor is given business because of a good reputation, he often feels a moral commitment to do his best (both in terms of cost and performance) due to the consideration given his firm. And obviously, he's looking ahead to the possibility of future business.

Since working drawings are the basic contract document, it is impractical to assume an iron clad, lump sum contract prior to their completion. However, it is possible to begin construction before their completion. At the end of design development most project decisions are made and the data are there for contractors to prepare a pretty good estimate of costs. Frequently, at this point the contractor is told he'll receive cost reimbursement plus a stipulated profit in return for a guaranteed ceiling on the ultimate price.

Any saving the contractor generates is divided between the owner and the contractor. This "negotiated guaranteed maximum price with incentives and unit prices" can create risks for the contractor, however, who may attempt to offset them by setting the ceiling higher than it should be. And as the guarantee is given on incomplete documents, it may be difficult to enforce and manage with the changes that always occur after the contract is formed. (See RECORD, April, 1974, page 71.)

Under "two-stage negotiation" the schematic design is developed and several potential contractors are selected to review the work. One is selected based on his estimated price and/or demonstrated ability to collaborate with the architect, but a contract isn't signed, only a letter of intent. The contractor works with the architect in developing final drawings and specs within the lowest possible price. If the contractor's DD price is maintained or reduced, a contract is signed. If not, the owner has the option to negotiate with the other contractors. Two-stage allows costs to be identified early and permits the contractor to add his construction knowledge during design. On the other hand, in order to be selected, he may state an overly optimistic price, thinking he won't be held to it.

continued on page 192

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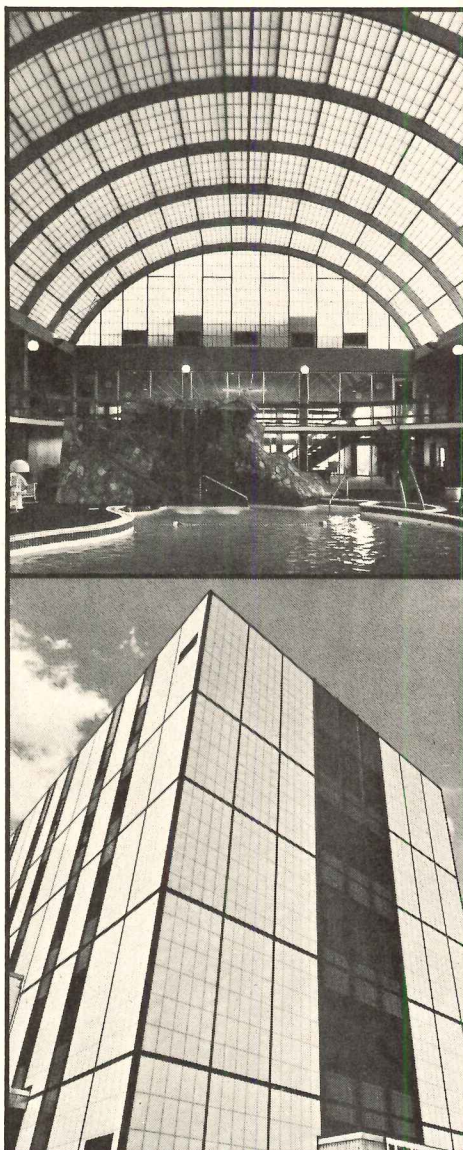
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Dodge supplement adds case histories

The April, 1974 supplement of the *F.W. Dodge Digest of Building Costs and Specifications* features building cost case histories of 17 selected building projects in addition to the current cost and specification data usually provided.

The case histories are final costs for building projects previously reported in the *Digest* during their construction. Access to this type of information enables architects, contractors, construction engineers or appraisers to compare the contract award prices of a project with the final costs, and to use the case history as a guideline for projecting trends in costs of similar construction projects.

A typical case history will include a photograph of the project, and a reproduction of the bid prices originally reported in the *Digest*. Other items included are the number of stories above grade, fireproof or non-fireproof construction, basement or no basement, cost analysis of building systems, special project features that affect costs and percentage of union versus non-union labor.

The April edition of the *Digest* will also include 1,148 new project listings, and completely updated city-by-city indexes and codes, which enable the subscriber to calculate listings from the bid time to current time and from one location to another. The user can then adjust the costs to his city, no matter when that project was awarded or where it was constructed.

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

INDEXES: May 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	457.2	429.3	447.7	437.0	+11.38
Atlanta	7.5	562.9	530.7	550.8	538.8	+ 7.51
Baltimore	8.6	526.1	494.6	513.3	499.7	+16.84
Birmingham	7.1	411.7	382.9	397.2	392.8	+ 9.11
Boston	8.9	462.0	436.5	458.2	445.1	+ 9.92
Buffalo	9.0	506.1	475.2	498.1	483.3	+10.02
Chicago	8.3	522.5	496.7	504.2	497.5	+10.50
Cincinnati	8.6	491.8	462.7	477.6	466.9	+12.56
Cleveland	9.0	498.2	468.7	487.9	475.4	+12.26
Columbus, Ohio	8.1	475.6	446.6	464.9	454.5	+10.39
Dallas	7.7	458.7	444.2	447.3	439.1	+11.38
Denver	7.9	482.3	453.7	473.1	459.9	+10.84
Detroit	9.7	525.2	501.3	533.8	512.3	+12.09
Houston	7.1	416.9	391.4	404.2	398.2	+ 9.17
Indianapolis	7.6	411.0	385.9	401.1	393.0	+ 9.58
Kansas City	8.3	442.2	417.8	432.9	421.4	+12.34
Los Angeles	8.4	526.6	481.4	511.2	500.5	+13.44
Louisville	7.6	457.4	429.4	445.5	436.8	+12.33
Memphis	8.1	463.2	435.5	446.5	439.2	+21.00
Miami	7.8	474.2	451.7	460.6	451.3	+11.59
Milwaukee	8.2	510.3	479.2	500.2	486.0	+11.91
Minneapolis	8.5	475.8	447.7	466.5	456.9	+ 9.07
Newark	8.5	435.1	408.6	426.8	418.6	+ 7.63
New Orleans	7.4	444.1	419.2	437.2	427.9	+14.48
New York	10.0	509.8	474.0	497.4	485.5	+ 9.67
Philadelphia	8.9	502.1	478.4	497.0	483.5	+ 7.92
Phoenix (1947 = 100)	7.9	264.2	248.1	255.1	250.8	+11.38
Pittsburgh	8.7	449.5	422.9	443.8	430.6	+ 9.19
St. Louis	8.4	465.6	439.5	458.4	448.8	+ 7.21
San Antonio (1960 = 100)	7.4	174.3	163.7	169.3	165.4	+15.86
San Diego (1960 = 100)	8.4	192.7	181.0	188.6	184.8	+16.72
San Francisco	9.2	662.5	605.5	656.5	635.5	+ 6.71
Seattle	8.5	450.1	402.8	443.7	427.6	+12.70
Washington, D.C.	7.9	436.7	410.1	425.2	414.9	+12.32

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	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973 (Quarterly)				1974 (Quarterly)			
										1st	2nd	3rd	4th	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			
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			
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			
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			
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			
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			
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			
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			
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			
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			
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			
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			
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			
Minneapolis	282.4	285.0	289.4	300.2	309.4	331.0	361.1	417.1	412.9	430.6	432.2	455.1	456.1	469.7			
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			
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			
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			
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			
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			
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			
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			

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.

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Construction labor in 1974: the end of peaceful relations?

Three facts are portentous for the year ahead:

- Average hourly earnings of workers in contract construction rose at a *slower* rate last year than the average price of construction materials. This is the first time that has happened in at least 15 years—and probably the first time ever.
- The unemployment rate in contract construction, fairly high in 1971 and 1972, began to drop last year, and has continued to trace a downward pattern so far in 1974.
- The number of workers represented in labor contracts that expire this year will be the highest total ever.

Are these facts telling us that 1974 will be the year when construction labor, a relative "good guy" in the industry these past few years, dons the black hat again? And, if so, what does this mean for the industry as a whole?

Let's look for a minute at what's generally recognized as the most recent "black hat" period for construction labor, the years 1968, 1969, and 1970, in order to gain some sense of the impact labor strife has had on the industry as a whole.

The unemployment rate in contract construction, steady for the most part during the early and middle sixties, dropped sharply in 1967, and continued steadily downward through both 1968 and 1969. This was the period you'll recall, when contracts for nonresidential building, pushed on by an overheated war economy, were growing in excess of 10 per cent a year, on the average. Unemployment for skilled laborers in construction, a statistic that generally averages well above the rate for the economy in general, hit a low of two per cent at one point in 1969, significantly below the comparable rate for the economy as a whole.

The low levels of unemployment in the industry acted as a catalyst, triggering a series of unusually stringent labor demands. 1969, the year when construction unemployment rates hit bottom, was marked by a wave of strikes that saw more than 19 million man-days of worker idleness, while in 1968, the idleness figure was closer to 9 million mandays. By contrast, the years from 1960 to 1967 experienced, on the average, only 4 million mandays lost due to strike activity.

And, the basic issue, was money. Eighty-six per cent of the idle man-days in construction during 1970, for instance, were due to disputes involving general wage changes.

By contrast, only a little more than a third of the man-days idle in all of manufacturing that year were because of disputes over general wage changes. Despite the fact that many contractors fought the unions right down to the strike stage and beyond, the demand for new construction was so acute that others were able to pass the increases on. As a result, wages soared through the roof. Average hourly earnings in the industry jumped more than seven per cent in 1968, nearly nine per cent in 1969, and 9.5 per cent in 1970. Gains in hourly earnings for the 1960-1967 period, on the other hand, averaged 4.5 per cent.

These conditions led to the creation of the Construction Industry Stabilization Committee (CISC) in March, 1971. Since that time, both construction wage gains and man-days lost due to strike activity have declined significantly. Time lost due to strike activity has averaged between seven and eight million man-years since then, well below the 1969 peak of 19 million. Similarly, increases in construction hourly earnings averaged 6.5 per cent in both 1972 and 1973, as against the nine per cent average of the previous three years. Translated into real take home pay (average weekly earnings deflated by the consumer price index.), that represents an average gain of one-and-a-half per cent a year for 1972 and 1973, with the high side of the average coming in 1972.

Although the CISC can claim credit for some portion of these successes, clearly, there were other factors at work as well. It is extremely doubtful that the CISC would have been nearly as successful, for instance, if the construction unemployment rate in the past three years had been closer to the six-to-seven per cent average of the 1968-to-1970 period, than the nine-to-ten per cent figure it actually did record.

This brings us to 1974, where, as we've seen:

- Workers involved in contracts that expire during the year are at an all-time peak.
- Unemployment in construction has edged down slightly below nine per cent in recent months.
- Wage gains are barely keeping up with inflation.

Ironically, the record contract expiration total comes largely as a result of CISC policies. Construction unions, operating under CISC guidelines since early 1971, have opted for contracts with shorter expiration dates to retain the maximum flexibility for renegotiation once

the guidelines were lifted. The absolute number of contract expirations is not necessarily the most important factor, though.

The key variable here, it seems, is the unemployment rate. Low rates of unemployment in the industry—a condition of tight labor supply—have been, historically, closely associated with periods of excessive labor demands and strike activity. This is especially true in recent years (like the 1968-1970 period) when labor contract negotiations have centered more on the basic economic issue of higher wages, than on other matters. In earlier years, issues tended, often as not, to be more ideological. Jurisdictional disputes and agitation for union recognition were more frequent causes of strikes in earlier periods than is currently the case. These were not issues that correlated highly with conditions of labor scarcity—if anything, the opposite was more to the point.

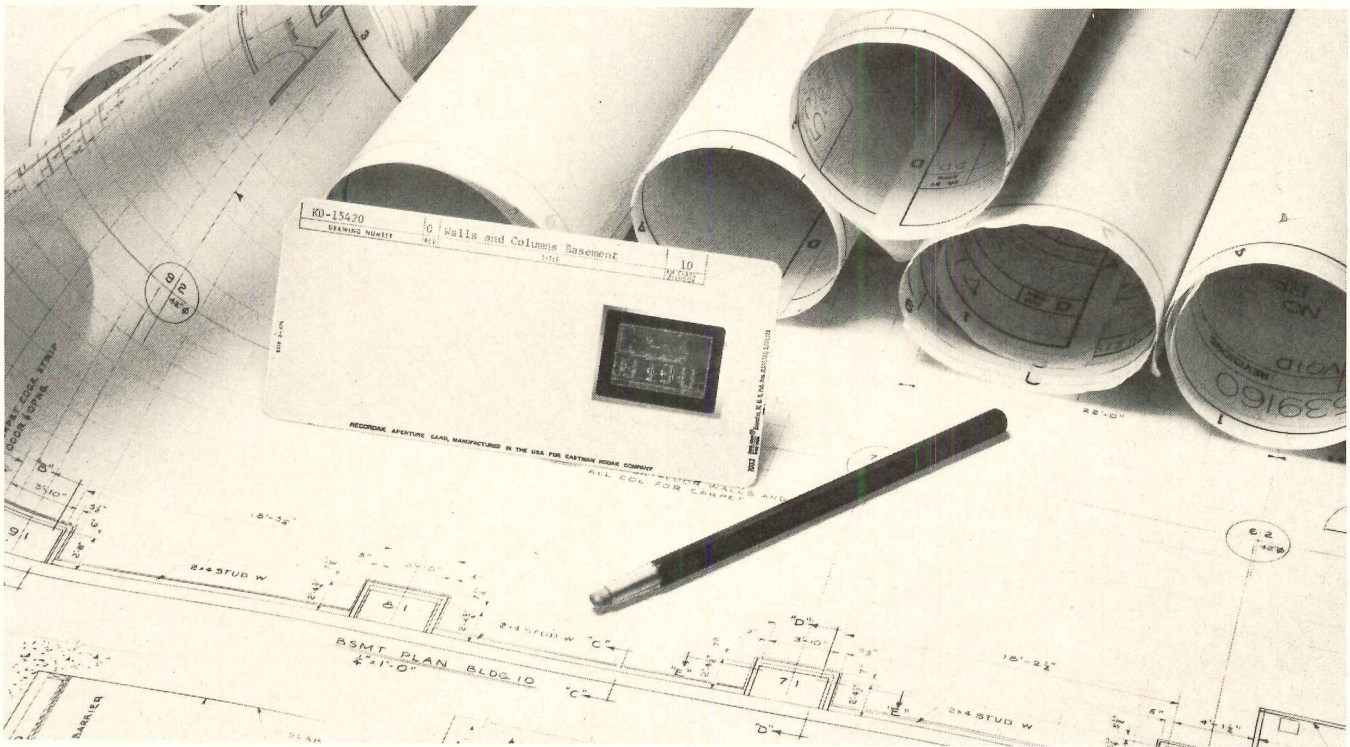
While it's true that the unemployment rate has been trending downward this year, construction labor is nowhere near as scarce as it was in the 1968-1970 period. Nor, considering the trends that we anticipate in construction activity this year (see last month's article), is it going to get that scarce.

Even so, this does not appear to be the time for a programmed phase-out of CISC. While wage gains in the industry still have a slight edge on the consumer price index, it's nowhere near the edge that construction labor has been used to. In this regard, some form of higher wage demands are virtually a certainty this year. The contractor, then, will be faced with cost pressure from *both* the labor and materials sides, something he has rarely had to contend with. In this situation he is apt to be more reluctant to agree to labor demands than otherwise. Strikes in 1974 are likely to be more prevalent than last year.

Are we going to return to the peak rates of strike activity experienced in the late sixties? That's doubtful. The unemployment rate will still be somewhat of a constraint here. Also, excessive gains cannot be justified from the standpoint of productivity. And, the increasing acceptance of nonunion labor into the industry is serving to mitigate demands. While asking for a wage package in excess of productivity gains has never caused construction labor unusual worry, the growing number of nonunion workers willing to do the job for lower wages certainly has.

James E. Carlson, manager, economic research
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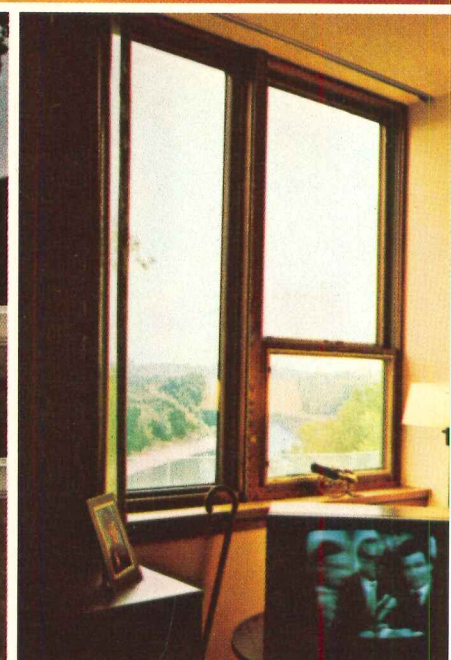
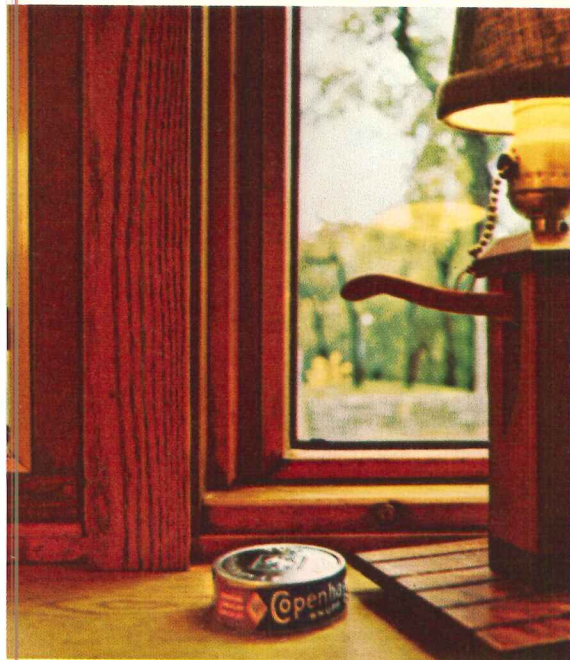
Inside, the unspoiled beauty of a carefully-crafted wood window.

Wood windows are known for their warmth. Visually. And because of their natural insulating value. And in designing the Pella Clad Wood Window, we left both of those properties unchanged. The exterior aluminum skin does not penetrate the frame or sash (b). Nor is it visible anywhere on the inside of the window. We recognized the need for a weather-resistant, low maintenance window. But seeing no reason to compromise the natural warmth of a wood window, we very carefully avoided doing just that.



(b)

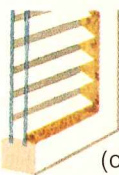
**At the Minnesota Veterans Home,
this Pella Clad window system
adds a warm touch,
inside and out.**



Architect: S. C. Smiley & Associates Builder: Arkay Construction Company Windows: Pella Clad Fixed Units and Contemporary Double-Hung

In between, the built-in flexibility of Pella's exclusive Double Glazing System.

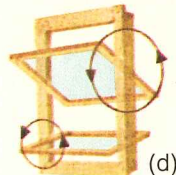
The removable inside storm panel gives you any number of interesting options. Like using our unique Slimshade® (c) to control sunlight, privacy and solar heat gain and loss. Housed between the panes, this fully adjustable blind remains virtually dust-free. The system also accommodates our snap-in wood muntins, and the selective use of privacy panels. But flexibility is not the system's only strong point. The 13/16" air space between the panes does a better job of insulating than welded insulating glass.



(c)

Afterward, the ease of washing a counterbalanced, pivoting sash double-hung window.

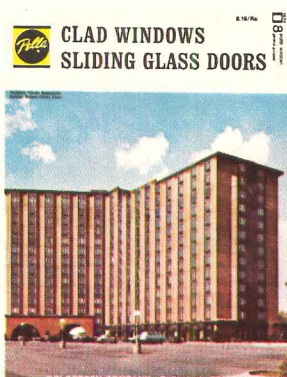
Window cleaning is another maintenance factor that must be considered. And here again, Pella design makes an easy job of it. Our Double-Hung Window has a spring-loaded, vinyl jamb liner which allows the sash to pivot. So the outside surfaces can be washed from inside the building. And because each sash pivots at its center point (d), the weight of the sash is counterbalanced. Which makes the whole job just that much easier. Reglazing can also be accomplished from inside, along with sash removal.



(d)



For more detailed information, send for your free copy of our 24-page, full-color brochure on Pella Clad Windows & Sliding Glass Doors. See us in Sweet's Architectural File. Or look in the Yellow Pages, under "windows", for the phone number of your Pella Distributor.



Please send me your 24-page brochure on Pella Clad Windows & Sliding Glass Doors. I am specifically interested in: Double-Hung Windows, Casement Windows, Awning Windows, Sliding Glass Doors, Wood Folding Doors.

Name _____
 Firm _____
 Address _____
 City _____ State _____ ZIP _____
 Telephone _____

Mail to: Pella Windows & Doors, 100 Main St., Pella, Iowa 50219 Dept. T31E
 Also Available Throughout Canada



If one athletic surface were right for everyone, we wouldn't make three.

We confess. Not all athletic surfaces are created equal. Nor for the same purpose. Not even ours.

But then not all gymnasiums or sports facilities are created alike. Nor for the same purpose. Some are used only for championship basketball. Others must be shared by basketball players, ROTC drill teams and PTA spaghetti suppers.

That's why we make a variety of surfaces.

Take UCLA (which isn't easy to do). The Bruins play on nothing less than Robbins Maple.

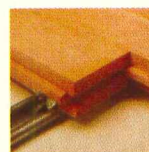
But even in hard maple we give you a choice. Because we make a variety of maple floor systems.

Some for better cushioning. Others for rebound characteristics. And still others for dimensional stability. Most squash and handball experts, for instance, prefer LOCK-TITE for its incredible stability and lightning fast service. And they like Robbins edge-grain hardwood on the walls.

We've even got a fast cure for people who are always running late. Robbins PROTURF.[®] The original, multi-purpose synthetic that pours over concrete or asphalt. This exceptionally fast track can give sprinters some of the best times of their lives. And it scores well in other sports, too.

Then there's SPORT-TRED,[®] a rough-tough, competitively-priced vinyl. SPORT-TRED[®] performs well for all indoor sports, and it withstands the abuse of school carnivals and drill teams.

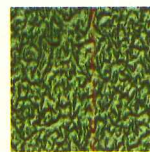
Ask Robbins. The choice athletic surfaces for choosy people.



LOCK-TITE



PROTURF



SPORT-TRED

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BOX 16902 / MEMPHIS, TENNESSEE 38116

For more data, circle 58 on inquiry card

One stop and you're set to take on any job in town!

The gas shortage. Suddenly, another good reason to make just one stop for fixtures, fittings and parts.

The place to stop—your American-Standard distributor. You name it. He's got it. Beautifully-styled fittings for the bath, shower, lavatory and kitchen. Hard-working fittings for stores, offices, factories, schools and hospitals.

From prestigious Aquarian single levers to economy-minded Colony fittings, he's got what it takes to make every job an American-Standard quality job all the way.

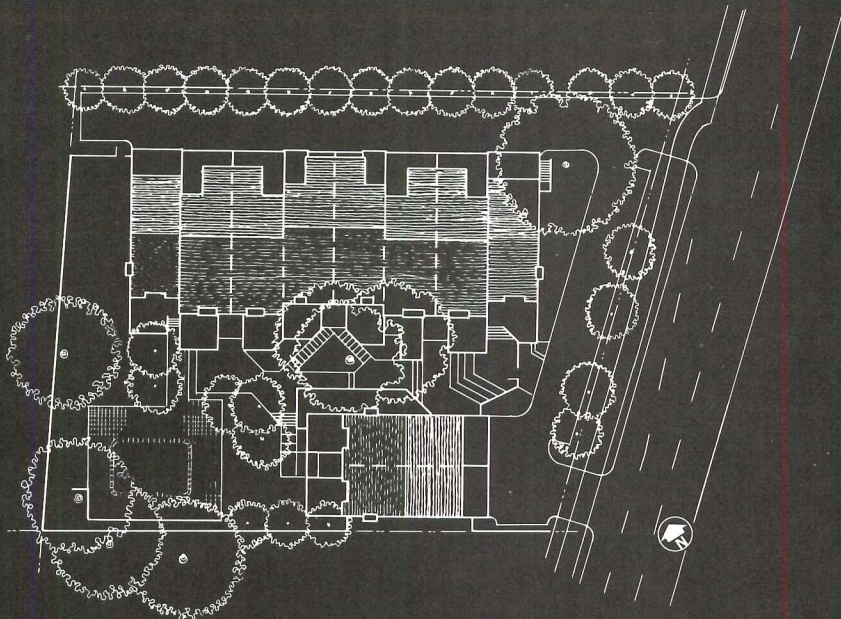
We've got 173 more fittings to show you. Plus parts!



All product names are trademarks of American-Standard.

 **AMERICAN
STANDARD**
PLUMBING / HEATING

For more data, circle 164 on inquiry card



Red cedar addresses vest pocket condominiums.



White Oak Townhouses, Menlo Park, California. Frank L. Hope and Associates, Architects.

These California townhouses are prototypes for a series of multi-unit housing projects on vest-pocket sites. Red cedar helped solve the problem of emphasizing each compact unit's individuality.

Their warmth and texture help each unit become a home while maintaining continuity over the structure's staggered planes.

Next time you need to solve a problem like this, consider the material with texture, warmth, durability and superior insulative properties. Let red cedar address itself to the problem.

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-graded quality. Insist on them.

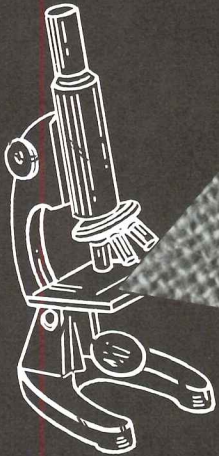
Red Cedar Shingle & Handsplit Shake Bureau

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

For more data, circle 165 on inquiry card

ARCHITECTURAL RECORD May 1974 80C

Jute carpet backing... a "microscopic thicket"



(Close-up
photo
magnified
20 times)

Entangles adhesive and makes carpet glue-down really work

Only Jute among no-pad carpet backings can make that claim. Because only Jute has the interstices and fibrous pores that accept and retain adhesive, bonding carpets securely to any subfloor or old hard-surface flooring.

Specify Jute backing to realize the many benefits of no-pad carpet glue-down. Among them are seam security under heaviest traffic, easy mobility for casters and wheels, lower cost than same carpet plus padding or cushion-backed carpet with equal pile.

- Jute, over twice as thick as other no-pad backings, prevents cracks in old flooring from being felt or outlined.
- When carpet is rolled out, some floor adhesive penetrates Jute to the primary backing, for additional tuft bind and delamination protection.

- Jute's thickness doubles seam sealing area.
- Jute's dimensional stability is essential for floor cut-outs.
- Jute facilitates clean carpet removal, intact for re-installation.
- Jute works with all standard multi-purpose and release adhesives.
- Jute helps qualified carpets meet fire safety codes.

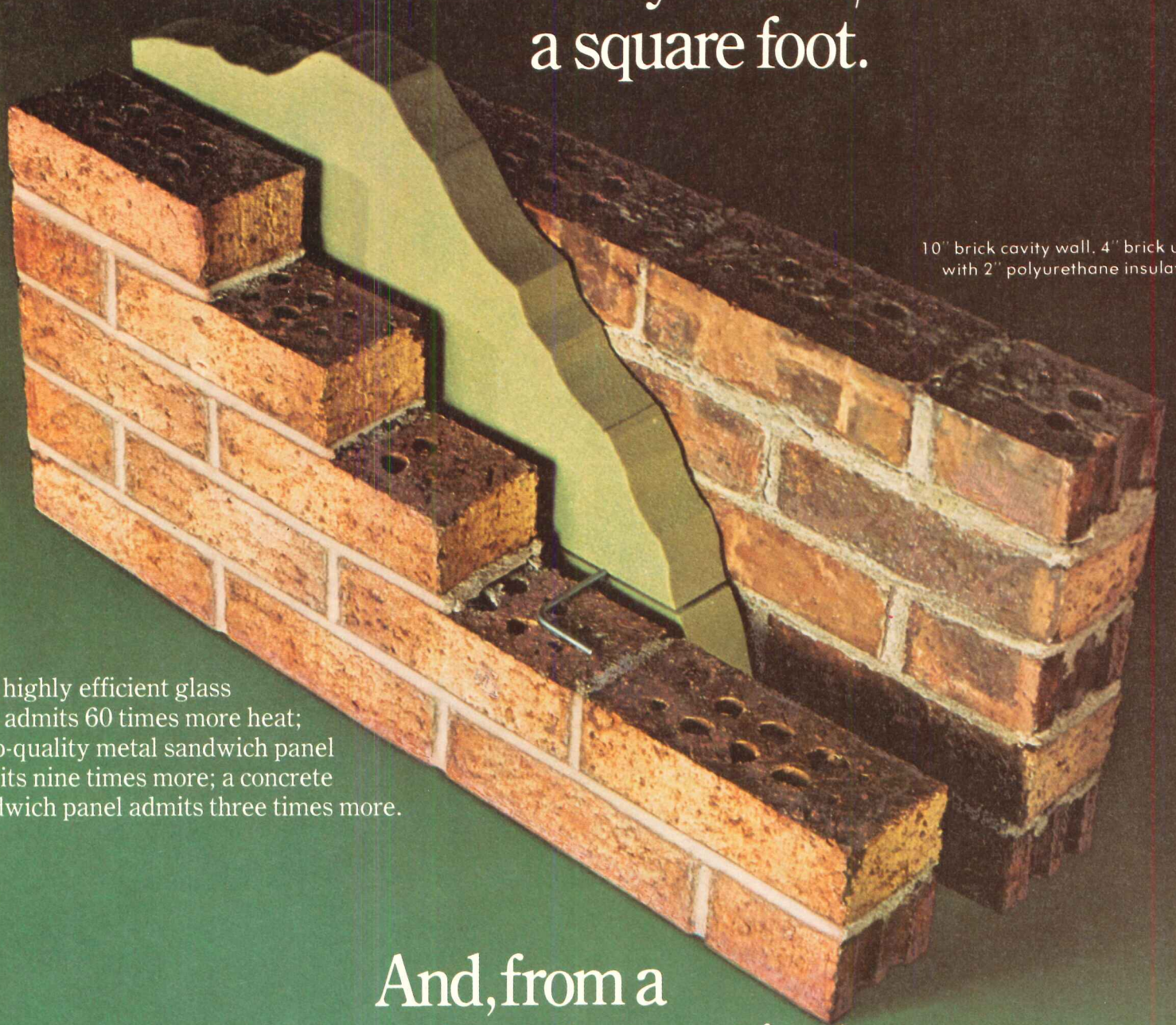
WRITE FOR ARCHITECTURAL GUIDE SPECIFICATION & CASE HISTORIES

Latter includes 8-year record at Ford Motor Co.

JUTE CARPET BACKING COUNCIL, INC.

American Industries, Inc. • Bemis Co., Inc. • BMT Commodity Corp. • C. G. Trading Corp. • Cosmic International, Inc. • D and C Trading Co., Inc. • Delca International Corp. • Dennard & Pritchard Co., Ltd. • A. de Swaan, Inc. • Gillespie & Co. of N. Y., Inc. • Guthrie Industries, Inc. • Hanson & Orth, Inc. • O. G. Innes Corp. • Jute Industries Div., Sidlaw Industries Ltd. • Multiproducts Trading and Manufacturing, Inc. • R. L. Pritchard & Co. • Stein, Hall & Co., Inc. • White Lamb Finlay Inc. • Willcox Enterprises, Inc. • WLF Inc.

When it's 95° outside,
this brick cavity wall gains heat
at the rate of only .72 Btu/h
a square foot.



10" brick cavity wall. 4" brick units
with 2" polyurethane insulation.

A highly efficient glass
wall admits 60 times more heat;
a top-quality metal sandwich panel
admits nine times more; a concrete
sandwich panel admits three times more.

And, from a
design point-of-view, it's also a
more interesting square foot.

With a U value of only .06, brick
cavity walls provide the most efficient
barrier against solar heat gain in
buildings. A 10,000-square-foot brick
cavity wall gains only 7,200 Btu/h
under summer design conditions,
compared to 440,000 Btu/h for a
double-glazed reflective glass wall.

Brick solves energy conservation

problems inexpensively. In most areas,
a brick cavity wall can be installed
for \$4.50 to \$7.50 a square foot. Price
includes finished interior walls.

If the cavity wall doesn't meet
your design needs, other brick walls
will. All offer similar energy
conservation and none will shatter
your project's budget.

Brick Institute of America, 1750 Old Meadow Road, McLean, Virginia 22101

For informative booklet comparing energy conservation
characteristics of brick with competing systems, please
fill out and mail coupon to:

Brick Institute of America, Dept. EC AR
1750 Old Meadow Road, McLean, Virginia 22101

Name _____

Title _____

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City _____

State _____ Zip _____



**BERLIN STEEL
WAS IN BUSINESS
SEVENTY THREE
YEARS BEFORE
THEY SPECIFIED
JOIST GIRDERS
FOR THE FIRST
TIME. ELEVEN DAYS
LATER, THEY DID
IT AGAIN.**

Joist Girders. The advantages they had over I-beams were more than enough for Berlin Steel to specify them for the Sage-Allen Department Store they were building in West Hartford, Connecticut. So much



Joist girders have a simple span design. Which explains why ponding calculations are easier. And why design time is shortened.

more, that eleven days later they specified them again. Only this time for National Plastics and Plating Supply Co. in Plymouth, Connecticut.

Where did Berlin Steel learn about those advantages? From meeting with Vulcraft. The people who knew as



Joist girders need fewer foundations and columns. Which means less work for you and larger bay areas for your clients.

much about joist girders as Berlin did about steel fabricating.

And the first thing the Vulcraft engineers did was show Berlin Steel

why joist girders are easier to specify and erect. By explaining that the simple span design of joist girders make ponding calculations easy. And shorten design time.

By telling them about the larger bay areas possible with joist girders. And by talking about the fewer foundations and columns needed with joist girders than with I-beams.

Then came the subject of the advantages joist girders offer after they're erected.

And to explain that topic Vulcraft talked about the modified Warren truss configuration used in joist girders. And that it gave joist girders a high strength to weight ratio.



Joist girders have a modified Warren truss configuration using hot rolled double angle sections for top and bottom chords and single and double angle sections for web members. What that means is a high strength to weight ratio.

They mentioned further, that bar joist erection was faster. Because top chord panel points show joist location, eliminating a lot of measuring.

Finally, the matter of ducts, pipes and conduits came up. And Vulcraft explained how these things go right through a joist girder. Something no one can say about an I-beam.

What it all added up to for Berlin Steel was a change. A change from I-beams to another roof-framing system. A roof-framing system that was more economical and easier to erect



Joist girders have top chord panel points that show joist location. Which makes a lot of measuring unnecessary.

for anything over 10,000 square feet.

It wasn't surprising to Vulcraft, though. Because architects and engineers all over the country are discovering the advantages joist girders have over I-beams.



Joist girders already have spaces for pipes, conduits, and ducts to run through. So you don't have to cut them yourself.

If you'd like more information about how joist girders can work for you, send for Vulcraft's Joist Girder Specification Guide. Just contact your local Vulcraft sales office. Or write P.O. Box 17656, Charlotte, N.C. 28211. Or call (704) 366-7000. You'll find a few things even Berlin Steel didn't know. Until they asked.

VULCRAFT

Sage-Allen Department Store, West Hartford, Connecticut; Architect: Associated Architects, Farmington, Connecticut / General Contractor: Bartlett-Brainard & Eacott, Inc., Bloomfield, Connecticut / Consulting Engineer: Hallisey Engineering Associates, Inc., Hartford / Steel Fabricator: Berlin Steel Construction Company, Inc., Berlin, Connecticut. National Plastics and Plating Supply Co., Plymouth, Connecticut; Architect: Andrew C. Rossetti, Bristol, Connecticut / General Contractor: S. Carpenter Construction Co., Bristol / Consulting Engineer: Hallisey Engineering Associates, Inc. / Steel Fabricator: Berlin Steel Construction Co., Inc.



Be a stickler when you specify fence.

A bad chain link fence and a good one look a lot alike. For maybe a couple of years.

How can you be sure you're getting a good one? Well, it helps to deal with a good firm to start with. Someone who'll stand by the finished job. But it's very important to know what goes into a good fence...and specifying it.

Take line posts. If they're pipe, they can trap water and corrode at ground level...weakening that part of the fence. But H-posts (see illustration) are solid steel beams. The only posts *designed specifically for fence*. They're stronger than the pipe you usually get, and there's no way they can corrode from within. If you don't put details like this...or lock loops, or box-beam terminal posts...into your specs, you won't get them.

Fortunately, we've made it as easy to specify a good fence as a bad one.

For a complete set of specifications—specs that can be used as is—return the coupon below. They're nonrestrictive. They don't even mention our name. But it's no coincidence that CYCLONE Fence meets them in every way. It lasts longer. Looks better. Takes less maintenance than any other chain link fence.

And CYCLONE Fence is local and convenient, with sales and supply points in 32 areas around the country.

CYCLONE Fence. Engineered and erected by U.S. Steel Supply.



CYCLONE Fence, USS Supply Division
Box 86 (USS C266)
Pittsburgh, Pa. 15230

Teach me how to be a stickler. Send me a set of your specifications for chain link fence.

Name _____

Title _____

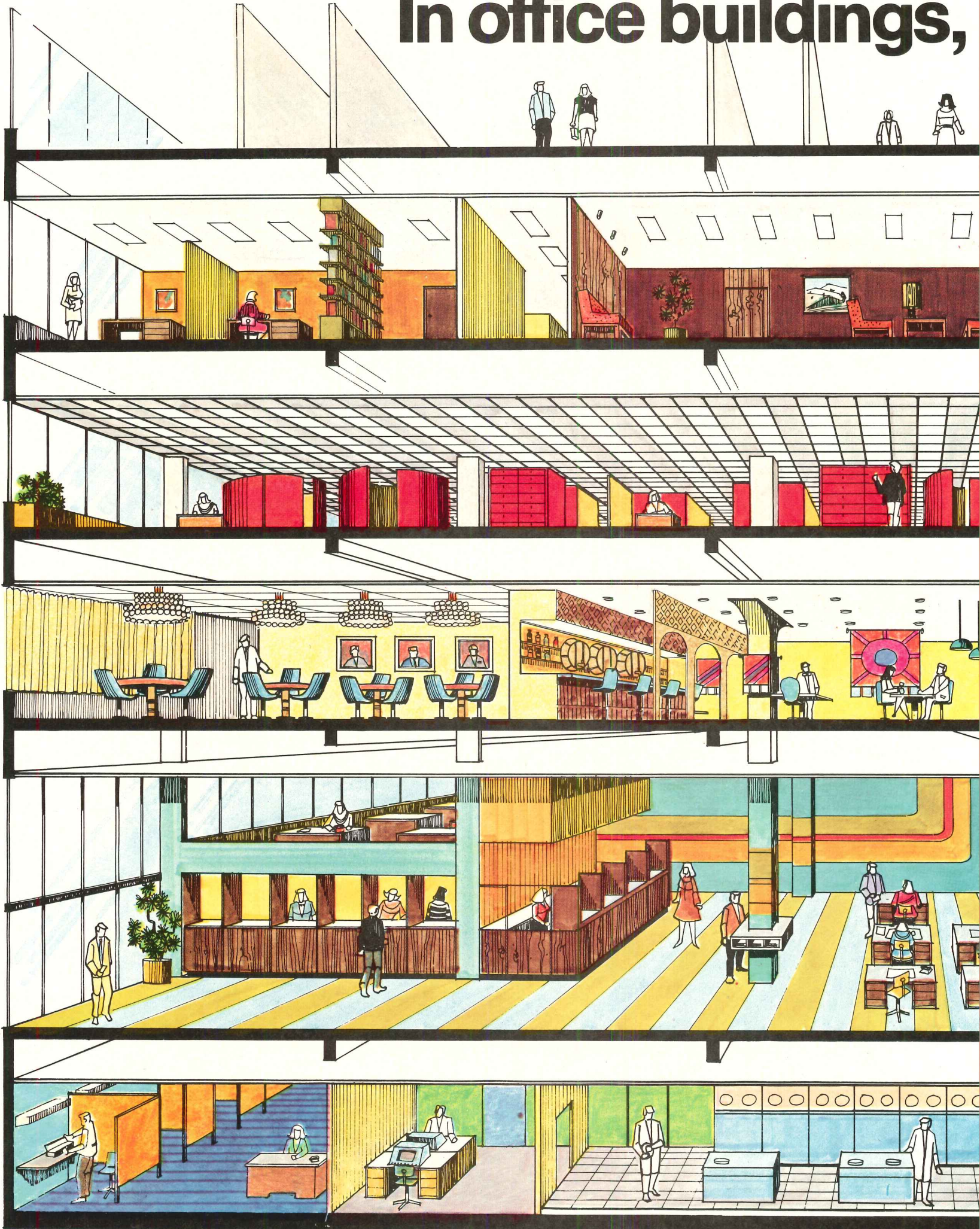
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Address _____

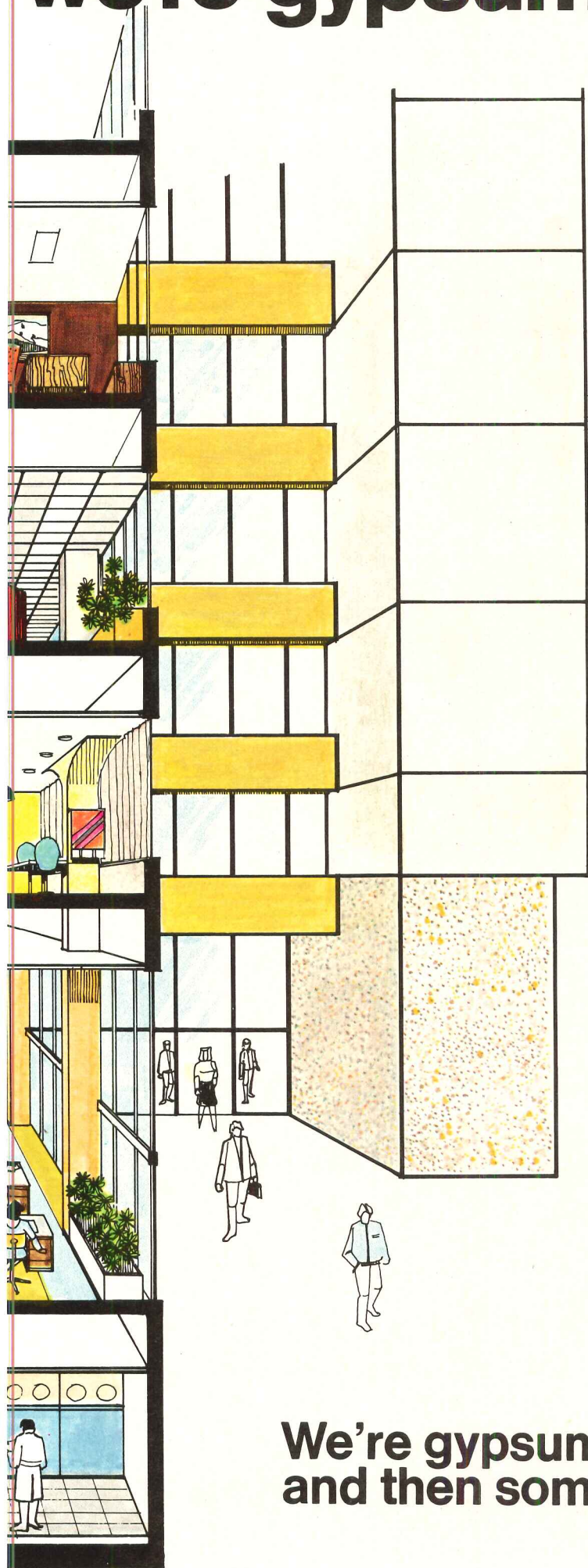
City _____ State _____ Zip _____

USS and CYCLONE are registered trademarks.

In office buildings,



we're gypsum, and then some.



At Gold Bond, we've never been content to produce merely gypsum. While our basic gypsum products include sheathing, wallboard, joint treatment and lath and plaster, our other products are anything but basic. Today we offer a host of products from lime, mineral fibers, metal and other materials, as well as gypsum. All proven in the largest independent sound and fire research facility of its kind. Ours.

At Gold Bond today, we're gypsum and then some. For example:

Gold Bond in the Executive Suite. Good-looking, noncombustible **Solitude**[®] acoustical ceiling panels stifle sound. In ventilating or nonventilating panels, they're made of high-density mineral fiber. For walls, choose from the many patterns of **Durasan**[®] vinyl-surfaced gypsum wallboard such as new cork patterns or woodgrains. Rugged Durasan panels look good in place and stay good looking.

Gold Bond in the Landscaped Office. Landscape with Durasan in **Contempo-Wall**[®] partitions. They can be mounted, demounted and re-mounted overnight, yet they look permanent. Or design with **Tectum**[®] just as you would with wood. Cut, fit, nail, glue or fasten. For ceilings, consider **Tectum Tonic**[®] panels with recessed edges to drop into a fire-rated grid system.

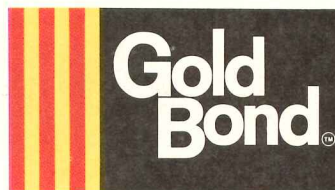
Gold Bond at Lunch. In the executive dining room, for good acoustics plus a new dimension in texture, Tectum ceiling tile is varied by 1-inch, 1½-inch and 2-inch levels. Over cafeteria grills and food preparation areas, specify **Humiguard**[®] ceiling panels. Attractive, yet safe and scrubbable. Walls are economical, easy-to-maintain, vinyl-surfaced Durasan gypsum wallboard.

The Gold Bond Entry. For the look of exposed aggregate at panel construction price, consider **Mineral Fiber Flat Sheets** as a substrate. Dimensionally stable, these sheets have a smooth, flat surface, an excellent base for epoxy-set aggregates or textured coatings. The rugged wall is Tectum, which can be painted without losing its good sound-absorbing and insulating qualities. For counter fronts, there's Durasan. Its vinyl surface wipes clean, resists scuffs and stains.

Gold Bond in Special Design. Like our **Metal-edge Corewall**[®], concealed in the elevator enclosure. It cuts installation costs and occupies less than half the space required by typical 8-inch shaft enclosure material. More than meets positive and negative air pressures in high-speed elevator shafts. Suitable for stairwells and other vertical chases. Special wall and ceiling designs use **Gypsum Wallboard** in a variety of systems which are fire-rated, reduce sound and control temperature. For colorful accents, **Plasti-Clad**[®] Panels are available in a range of lasting beautiful colors.

Gold Bond has a product for nearly every wall and ceiling application in nearly every kind of building. For detailed information, see Sweet's Architectural File, or write Gold Bond Building Products, Division of National Gypsum Company, Dept. AR-54GE, Buffalo, New York 14225.

We're gypsum, and then some.





Celotex ceilings combine

Next time someone says you must sacrifice overhead beauty if you want a functional ceiling—or vice versa—you can answer with one word.

The word is Celotex. And it makes the very notion of an either/or choice between looks and utility seem old-fashioned.

Start with that name, and

you can choose a ceiling system with wide design possibilities. Without giving up beauty. Perhaps a non-directional patterned Celotex ceiling tile for a monolithic effect; or a Celotex reveal-edge lay-in panel for a bold contrast; or a design tile for that special interior.

The same reliable name will help you satisfy noise control requirements, because Celotex ceiling products can deliver Noise Reduction Coefficients to .90.

Time rated ceiling assemblies? You can get U.L. time ratings of one, two or three hours with Celotex.



beauty and performance.

Where the plan calls for complete environmental control, check Celotex Vari-Tec™ systems—sound control, lighting and air handling all provided for in one beautiful, integrated ceiling system.

Which brings you back to where we started: beauty. Your Celotex ceiling can be beautiful as well as functional. Our success

in delivering this valuable combination has made Celotex as popular with architects as with contractors, building owners and managers.

Consult the Celotex Acoustical System catalog. You'll find it in Sweet's Architectural and Industrial Construction Files. Or,

contact your Celotex commercial ceilings representative.

Celotex™

BUILDING PRODUCTS
The Celotex Corporation, Tampa, Florida 33622

a **JIM Walter** company

For more data, circle 63 on inquiry card

How to budget high-rise comfort into low-rise plans.



Plan on Carrier's Modu-Pac air conditioning to put a sophisticated

system into your small building designs. It's simple. Costs less. And fits in without getting in the way of your building's appearance.

Start with the source.

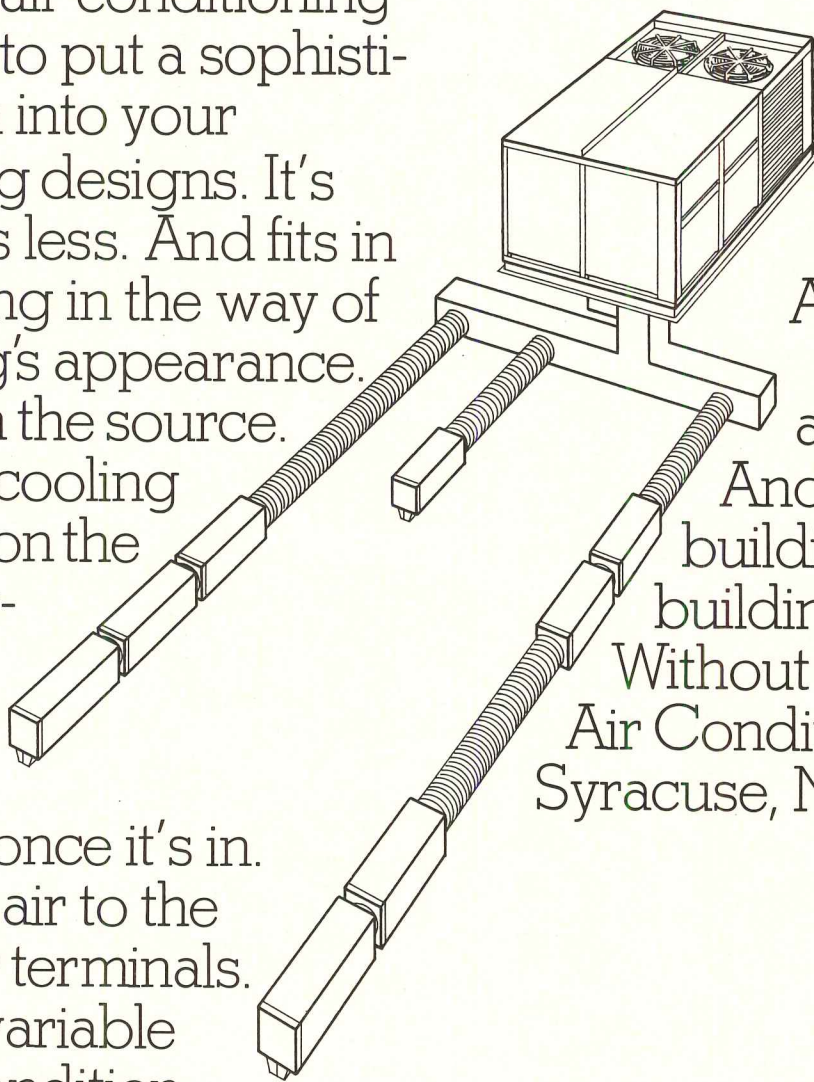
Our rooftop cooling unit. Sits low on the roof. Factory-packaged to save time going in, save energy once it's in.

Supplies air to the Moduline® air terminals. Our unique variable volume air conditioning units that hide in the ceiling. Have snap-in controls that make any Moduline a control center. Cools only when it has to — to save energy.

The whole system is pre-packaged and pre-set at the factory to eliminate costly mistakes and client complaints.

Ask your Carrier representative about Modu-Pac. And give your small building design a big building attraction.

Without the cost. Carrier Air Conditioning Division. Syracuse, N.Y. 13201.

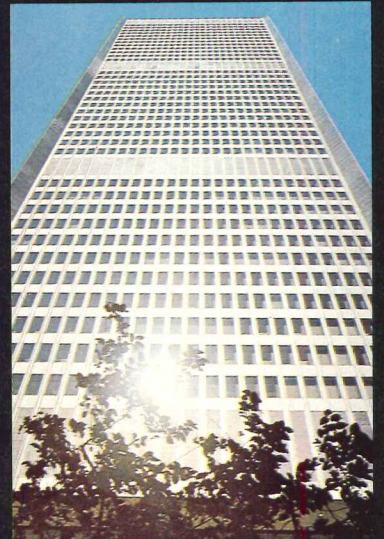


Carrier
Air Conditioning
Division



Carrier

Keep the change.



**Kalcolor[®]
aluminum brings
lasting value to beautifully
changing scenes.**

Each day you can see Kalcolor aluminum reflect the change of the hour. Coolness at dawn. Richness at noon. Warmth at sunset. This is the unique character of Kalcolor aluminum. And you will see it harmonize well with other materials and colors.

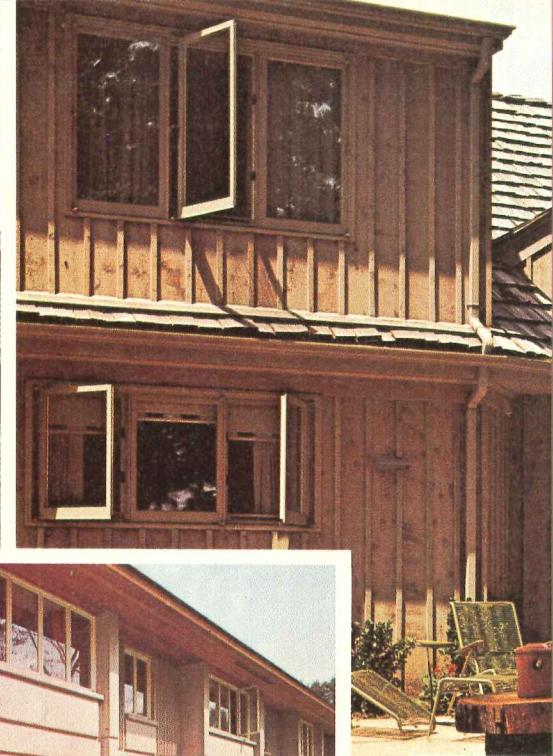
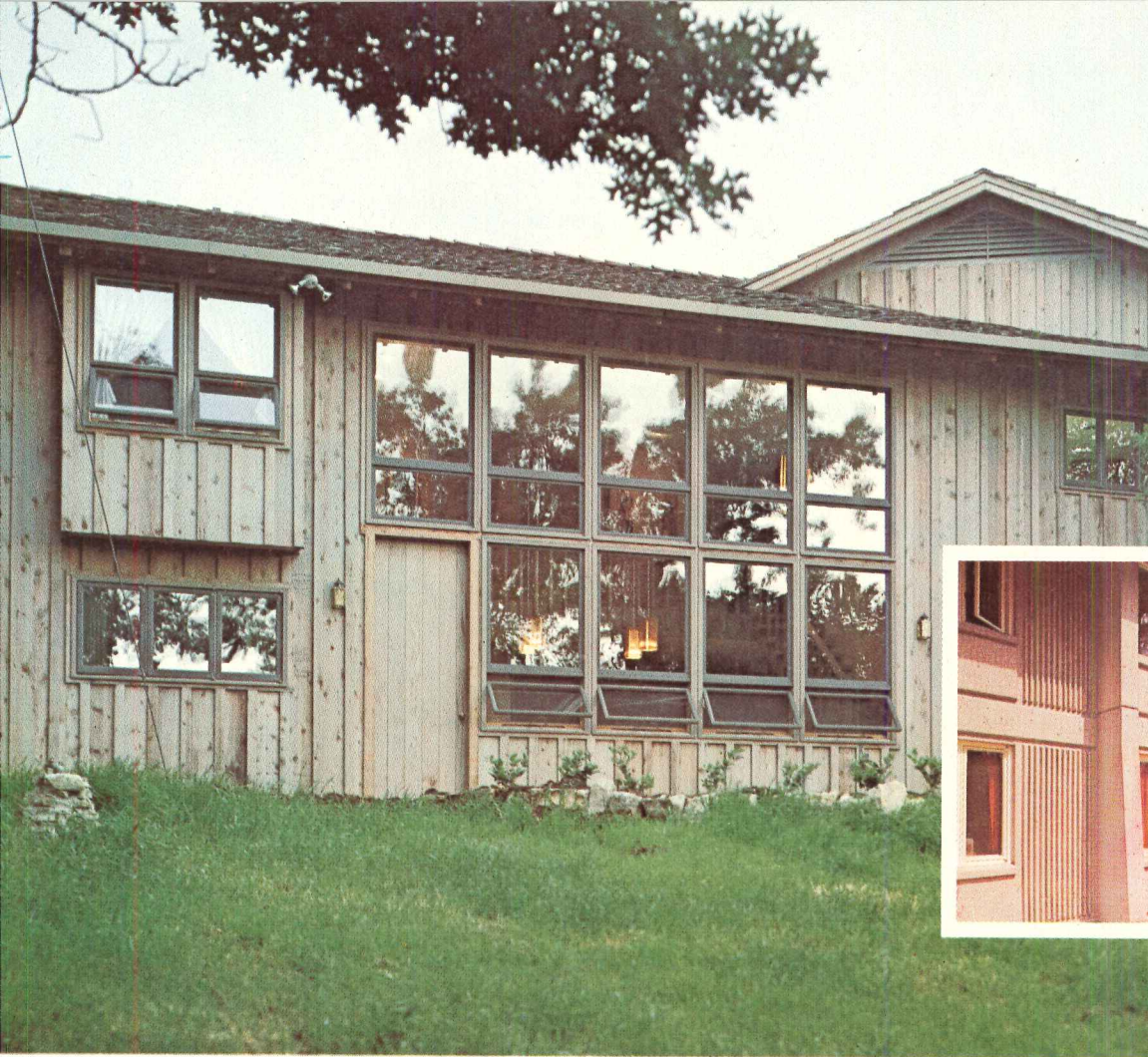
Yet the extremely hard, smooth, dense surface of Kalcolor aluminum will keep its own freshness virtually unchanging. It will bring lasting value to your new horizon. In Gold. Champagne. Ambers.

Bronze. Three shades of gray. Black. Each color is an integral, inorganic part of the anodized coating—color fast, and enduring.

Our new catalog—"Aluminum in Architecture"—will show you the complete selection of colors you can specify in Kalcolor sheet, extrusions and castings for both exterior and interior design.

Write for your copy: Room 2142, Kaiser Center, Oakland, California 94604.

**KAISER
ALUMINUM**



Wood windows: a beautiful way to conserve energy.

The energy crisis has finally hit home. Every home in the country. So the homebuyer of the 70's is giving higher priority than ever to housing that does the best job of conserving energy. And because windows often occupy 30-70% of an outer wall, homebuyers are looking carefully at the insulation they provide.

A window should insulate.

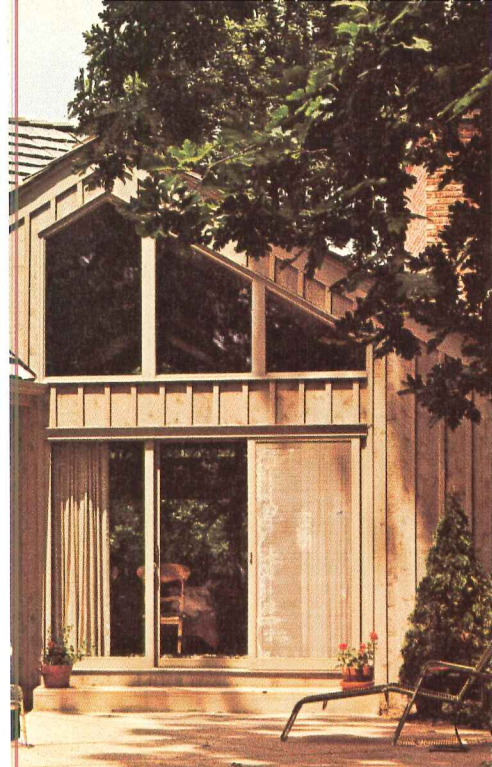
That's the most important thing consumers look for in a window. It was true before anybody was talking about the energy crisis. And it's truer still today. We've spent five years and \$40,000 studying consumers' homebuying plans and preferences. And every time, our research showed that they give the highest priority to a window's insulation capability (and the lowest priority to its initial cost).

Factors Most Important in Window Selection

	1968	1970	1972
Most Important	Insulation	Insulation	Insulation
Next Most Important	Durability	Durability	Durability
Least Important	Initial cost	Initial cost	Initial cost

Wood windows keep the warm in. And that translates into savings.

After a house is fully insulated, you can cut the remaining heat loss by 30% — just by choosing wood windows with insulating glass. That translates into important heating bill savings. And regardless of fuel prices, the savings add up year after year.



In a 16-window Chicago test home, the savings ranged from \$88.40 to \$124.25 last winter, depending on the type of fuel.

Home Heating Cost Comparison

Type of Window	Gas	Oil	Electric
Single glass in aluminum sash*	\$289.50	\$348.68	\$406.91
Single glass in wood sash	260.59	313.85	366.29
Insulating glass in aluminum sash*	225.59	271.70	317.08
Insulating glass in wood sash	201.10	242.21	282.66
Annual savings with insulating glass in wood over single glass in aluminum	88.40	106.47	124.25

*Without a specific thermal barrier
 Figures based on insulation manual developed by National Association of Home Builders Research Foundation. 1,400 sq. ft. home, fully insulated, 6600 degree days.

Wood windows are rated best for insulation quality. Just ask a consumer how he rates wood versus metal windows. We did. And our research showed that 54% rate wood windows as excellent insulators, while only 44% say the same about metal windows.

%Rating Insulation Quality Very Good	1968	1970	1972
Wood Windows	47%	50%	54%
Metal Windows	45	41	44

You can help beat the energy crisis.

Don't wait for your clients to ask for wood windows. Specify them. And then use that savings in energy consumption as an important example of the long-term value of the homes you design.

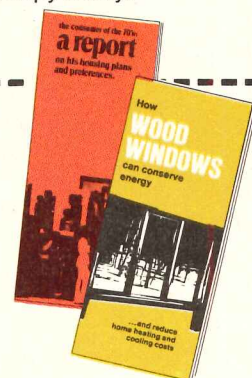
Our new brochure tells how wood windows reduce home heating costs. It includes a step-by-step explanation of how window insulation works, and a detailed report of actual test results from homes all over the country. Write for your own free copy today. We'll also send you a copy of the latest findings from our consumer research.



Mail to:

Ponderosa Pine Woodwork

Dept. A-1
 1500 Yeon Building, Portland, Oregon 97204.
 A member of the American Wood Council.
 Send me my copy of your research report.



NAME _____

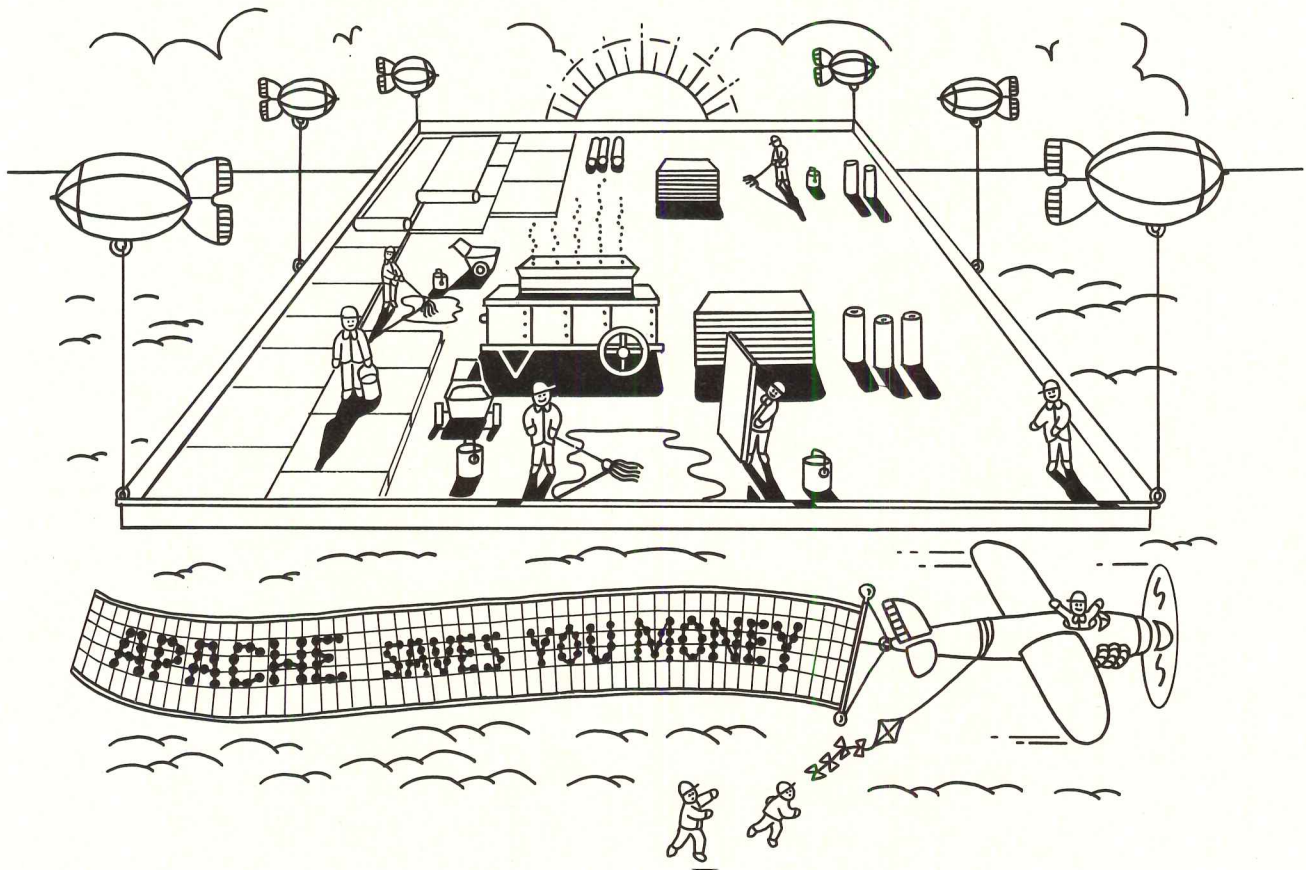
POSITION _____

ORGANIZATION _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

On some buildings, starting with the roof will save you money.



We make roofing insulation panels with urethane foam—panels which can save you money in two ways.

First, installation costs. Both manufacturing processes and experience help us to produce reliable, dimensionally stable insulating panels that go down fast and easy, and cut handling time 30% to 50%.

Second, life-cycle costs. That's because Apache foam panels have extremely high insulation values that won't deteriorate over the years (no wicking, no creeping, no buckling). And, their integrally bonded skins resist wind uplift beyond 170 mph (better than any fibrous insulation). Consequently, when we analyzed the savings recently on one relatively small building (a 20,000 square foot professional building in Pennsyl-

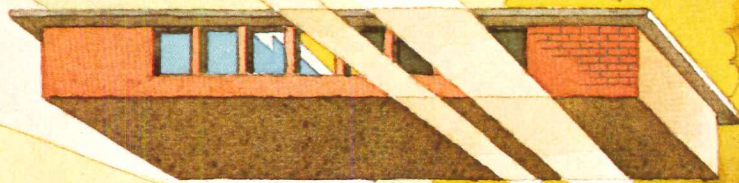
vania), the architects and engineers came up with more than \$38,000 savings in two areas—lower installation plus predictably lower heating and cooling costs.

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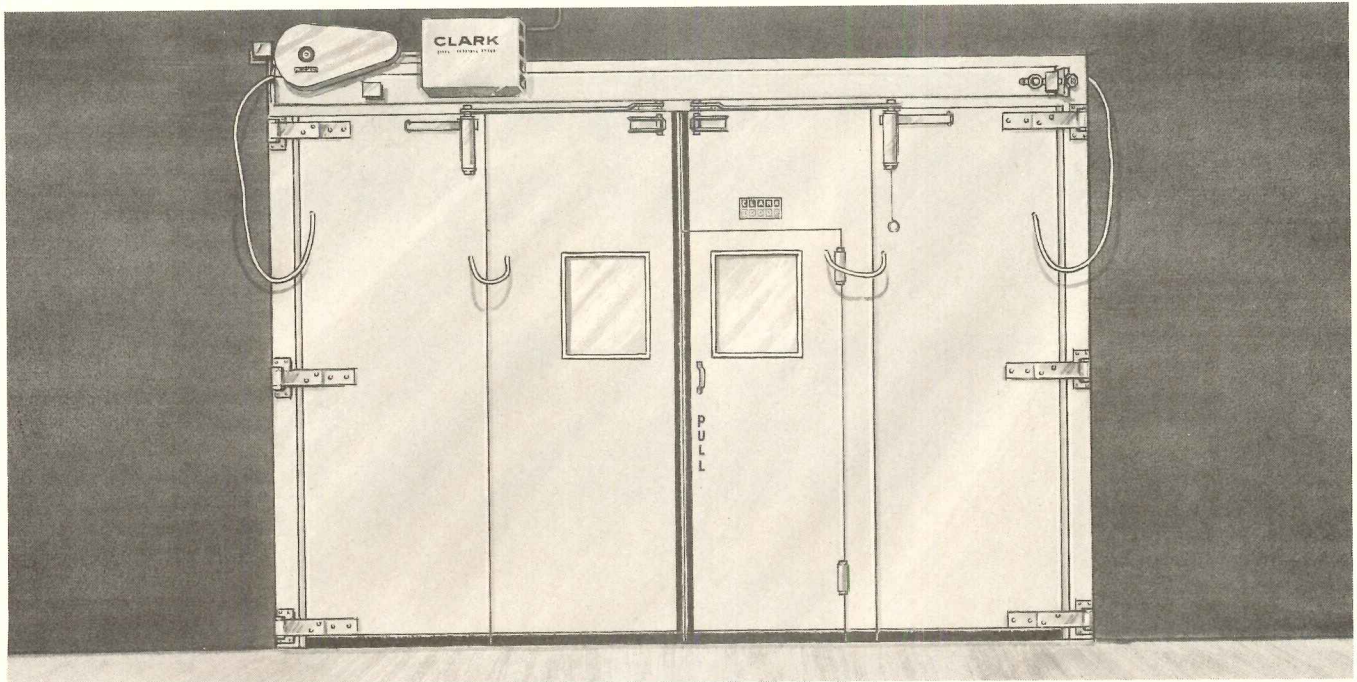
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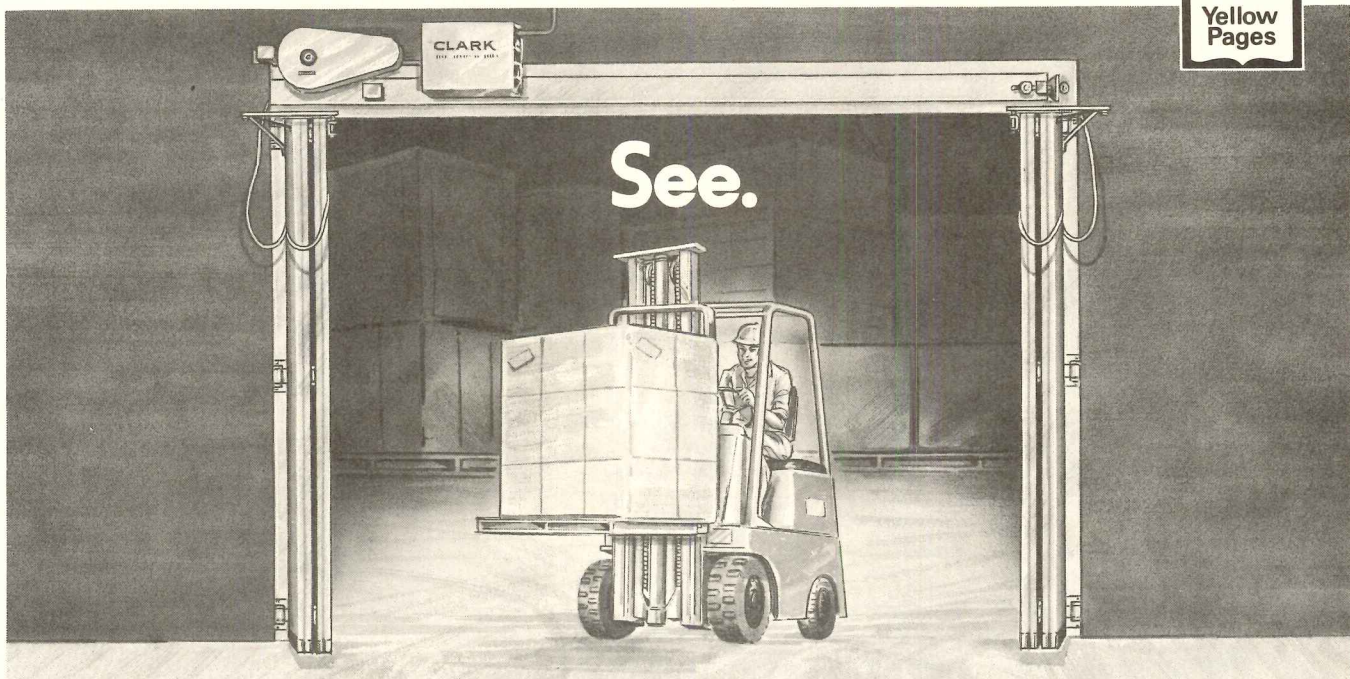
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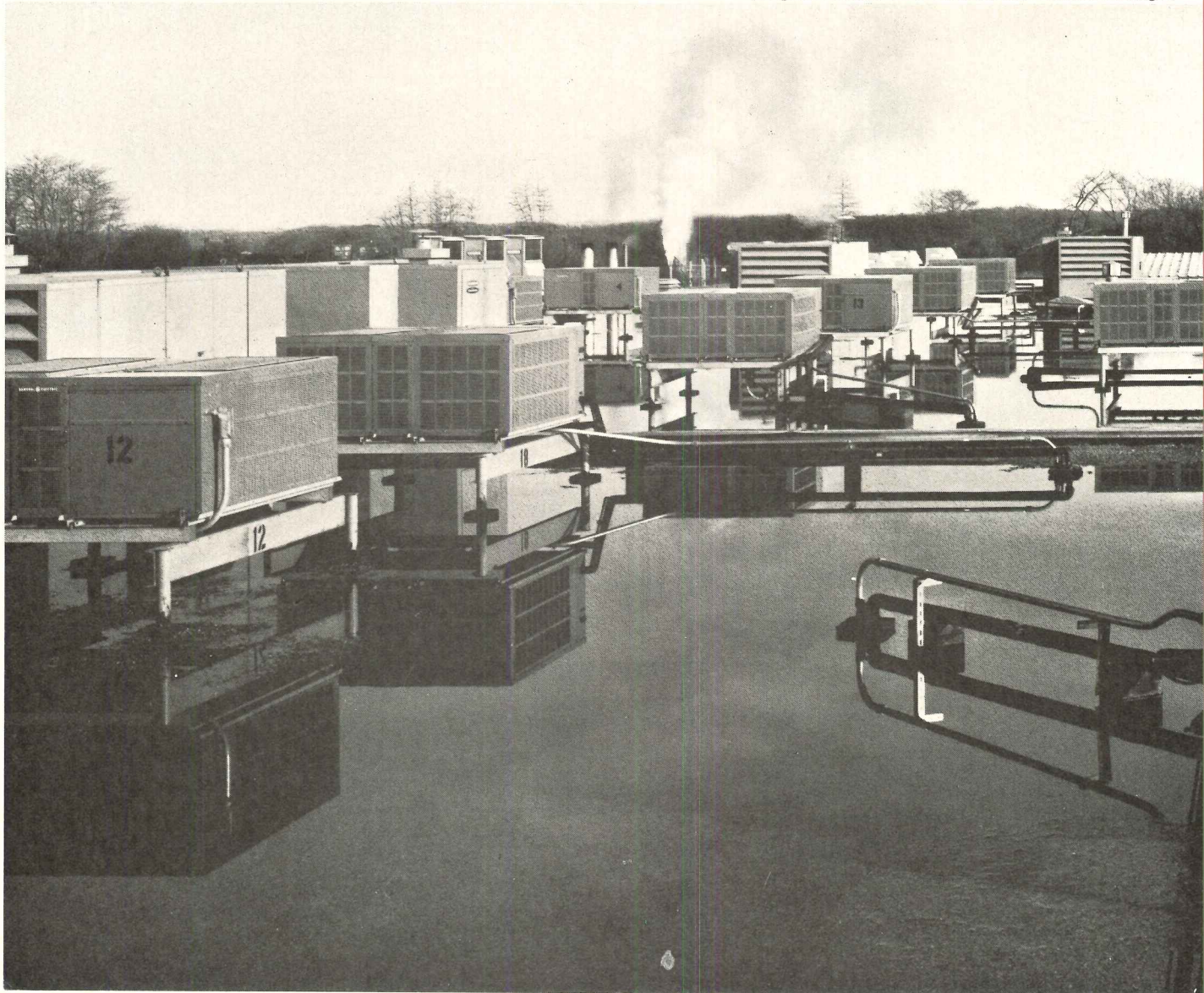
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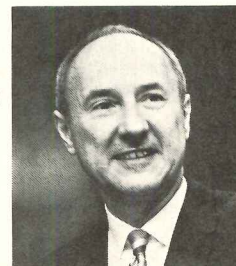
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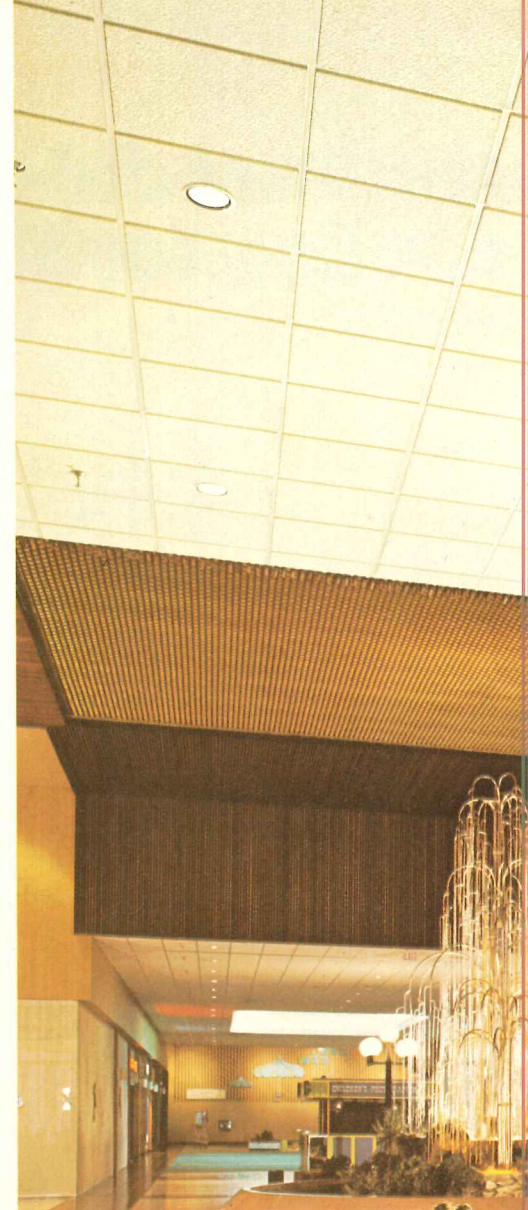
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First Federal Savings & Loan Assn. of Danville, Martinsville, Virginia. Architect: Calvert, Louis & Smith. Acoustical Contractor: J. W. Squire Co. Banking area ceiling: Conwed 12" x 12" Rock Face Ceiling Tile.



Fort Wayne Elementary School, Fort Wayne, Indiana. Architect: Cole Matson & Matott. Acoustical Contractor: C. N. Parker Co. Lobby and Corridor area ceiling: Conwed 24" x 48" Rock Face Ceiling Panels.

Indianapolis 500 Hospitality Suite, Indianapolis, Indiana. Engineers: Fink, Roberts and Petrie, Inc. Acoustical Contractor: Perry Acoustics. Ceiling: Conwed Rock Face 24" x 24" Reveal Ceiling Panels.





Cloverleaf Mall, Richmond, Virginia. Architect: Carneal and Johnston. Acoustical Contractor: Consolidated Tile Co. Ceiling: Conwed Rock Face 24" x 24" Reveal Panels.

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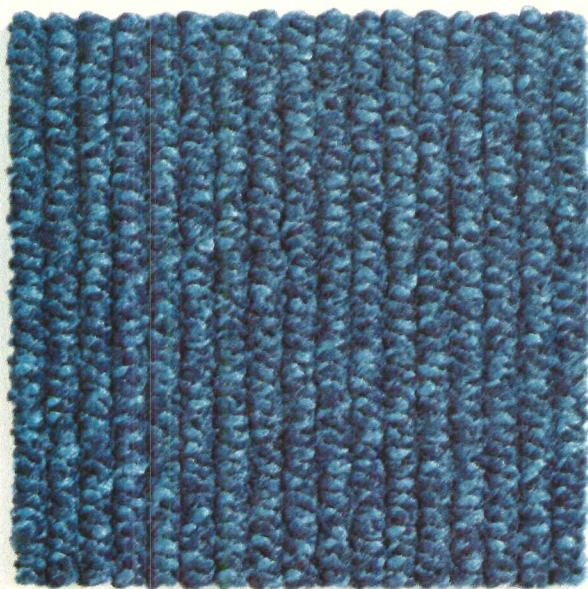
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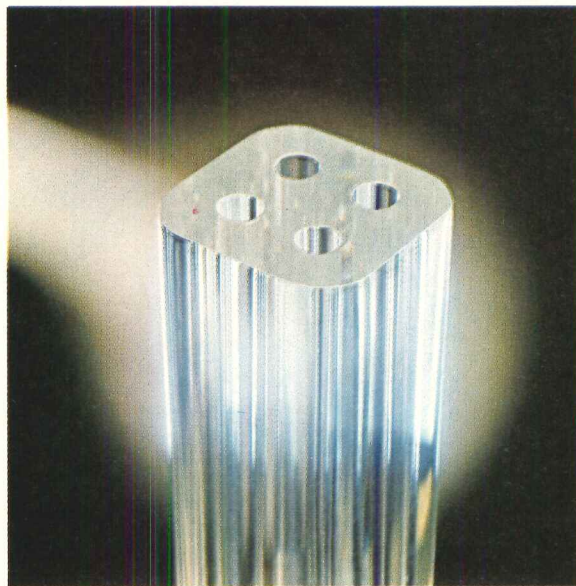


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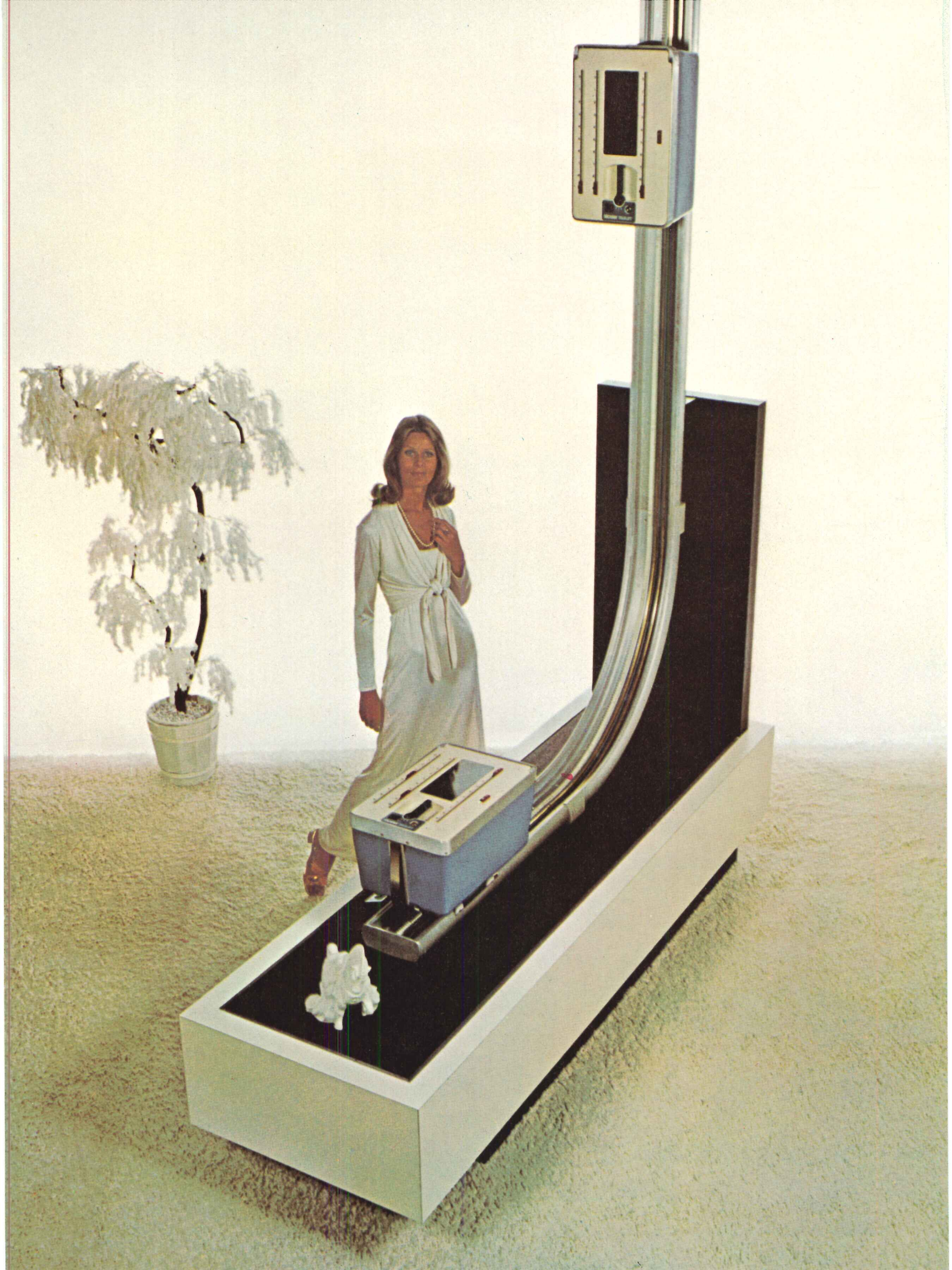
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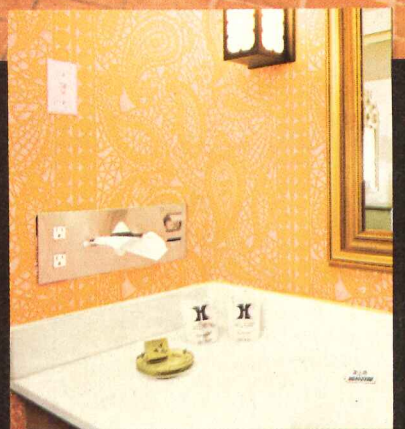
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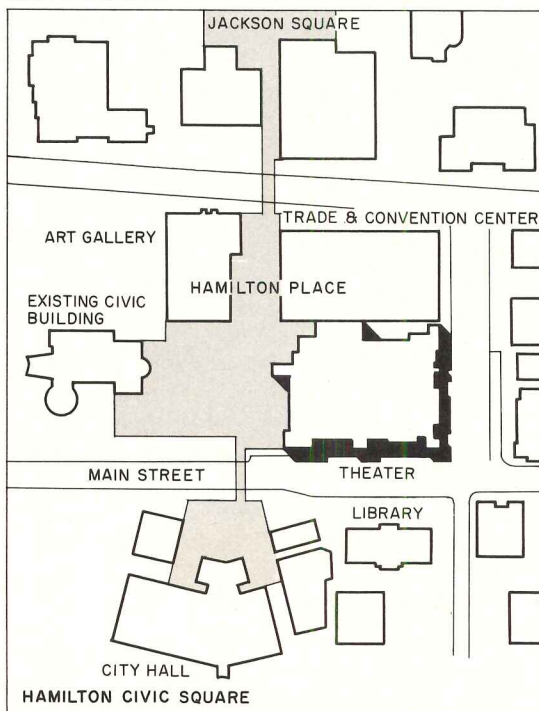
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HAMILTON PLACE



Dolisco

A multi-purpose theater that succeeds where others have failed



The lack of construction funds to adequately house growing cultural activities is a common plight of governments in newer cities. A single multi-purpose theater has usually been the most that could be provided to house the diverse needs of a wide range of performing-arts. Such facilities have not always been artistic successes and—possibly as an outcome—have not received all of the public support that might be required.

A large part of the problem has involved acoustics. The requirements for symphonic music are usually incompatible with intelligible speech. They are achieved by a large room volume and hard sound-reflecting surfaces. The orchestra stage is ideally located within the audience chamber, without the separation provided by the traditional proscenium required by most plays. All the performing arts activities between the two extremes have their own special requirements, and complete acoustic satisfaction in multi-use theaters has been rare.

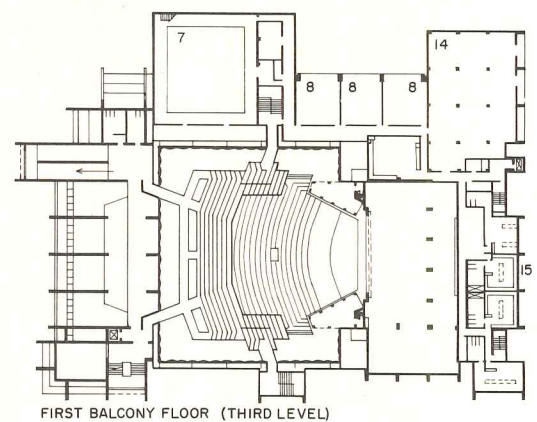
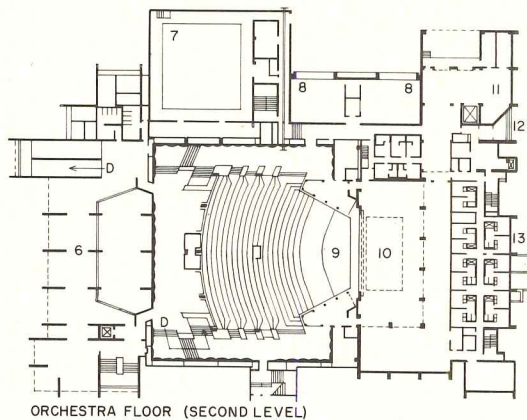
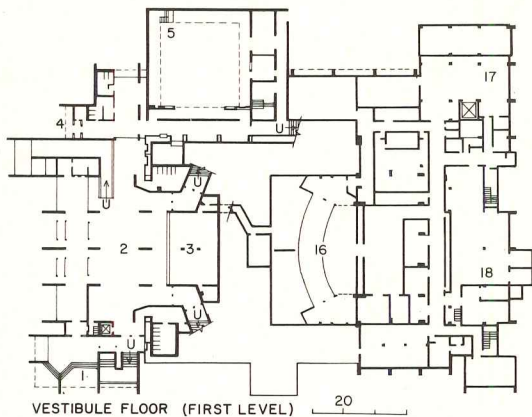
But new problem-solving techniques are appearing. The Edwin Performing Arts Hall at the University of Akron is capable of mechanical adjustment of the auditorium volume and shape (RECORD, March 1974, pages 143-148). By contrast, Hamilton Place's 2,000 to 2,200-seat main hall relies on a few and relatively-simple means to solve acoustic adaptability problems. This Hamilton, Ontario, multi-use facility's success is due to the originality of planning in a fixed-room volume. There have been well-received performances of almost every kind: speeches, opera, musicals, rock shows, a full range of orchestras, plays and pop singers. The enthusiastic support of the city's citizens assures an on-going and lively program of varied presentations. A major part of this happy situation is due to the work of architect Trevor Garwood-Jones.

Hamilton has many heavy industries and—until recently—one of the more-visible diversions for residents has been the success of the local football team, the Tigercats. New dimensions are emerging. The theater building shown here, is part of Hamilton Civic Square, a development meant to give a new co-ordinated focus to the downtown area previously centered immediately to the east. Architect Ron Thom is advisor for the multi-block area, which will be linked by raised walkways and plazas from the existing City Hall (and handsome older library) at the south end to a new "Jackson Square," a multi-use area at the north end (see plan, left). A new art gallery and trade center are being designed—in the theater block—by Garwood-Jones. Planning of the theater has included the considerations of butting directly against the future high-rise trade and convention center to the north (the two buildings will share a service drive between them) and a second-floor-level plaza to the west. Parking for 800 cars will be provided under the plaza and art gallery.

—Charles Hoyt



- | | | |
|-------------------------------|-----------------------------|-------------------------|
| 1 Main entrance | 7 Upper part studio theater | 13 Dressing rooms |
| 2 Lower lobby | 8 Meetings | 14 Mechanical equipment |
| 3 Coats | 9 Orchestra stage | 15 Dressing & chorus |
| 4 Ancillary facility entrance | 10 Drama stage | 16 Lifts |
| 5 Studio theater | 11 Receiving | 17 Workshop |
| 6 Upper lobby | 12 Office & entrance | 18 Mechanical |



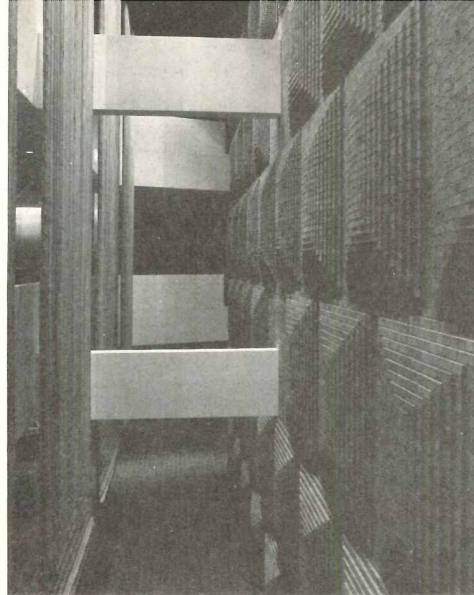
Enthusiastic reactions by Hamilton Place's users and performing arts critics (including *The Times of London*) indicate success of the auditorium. Garwood-Jones had limited theater experience when he began this difficult commission, and he cites an open mind as a benefit. His one pre-conception was "not in any way to compromise acoustics." A two-continent study of theaters ensued. Acoustics consultant Russell Johnson began work early in the design process, and determined options available in shaping the auditorium. The approach has produced technological and visual dividends in a building utilizing concepts never previously tried at this scale.

The designers began by establishing the optimum acoustics for each of the performing arts to be displayed. Spatial characteristics were determined according to desired sound characteristics and the theater design recommendations of theater consultant Vincent Piacentini of Bolt, Beranek and Newman. For concerts, the main hall has a much bigger volume that required merely to enclose the area, because the plan (opposite page) has been enlarged by incorporating parts of the lobby and the usually separate side corridors. The ceiling of the auditorium is the same height as that of the stage, and sound-reflecting brick walls are uninterrupted for their full height, since the balconies are suspended in the room. The optimum conditions for the long reverberation time generally required for symphonic music thus are achieved. To adjust the hall for speech, 18 velour banners can be lowered in front of the brick walls to provide acoustical absorption. (These are also raised in place of the dramatic effect of a stage curtain at the beginning of concerts.) The configuration of these walls is intended to break-up the echo-producing effect of the reflected sound waves of speech and to direct music to the listener. The relation of walls, balconies and banners can be seen in the top photo, right. The hall is square in order to reduce the distance between the farthest audience seats and the stage (less than 90 feet for concerts).

A major concern is the location of the sound source. Most drama continues to demand the comforts of a traditional stage: proscenium, fly loft, the marshalling areas and a curtain. Temporary concert enclosures in such locations either are cumbersome, or, if of flimsy construction, they dissipate sound into the stage area. Hamilton Place has two stages; one is forward and allows concerts to be played within the hall itself. The other allows drama to be performed behind a proscenium. The concert stage is surrounded by permanent (but adjustable) cedar panels reflecting sound to the listeners. This is not a totally new solution, since Hammel, Green and Abrahamson produced a similar concept for a 1,000-seat auditorium in St. Joseph, Michigan (RECORD, December 1964), but the application is new at this scale—and it works.

There is some apparent duplication of building volume to enclose the tandem stages, but a total \$9.7 million construction cost here certainly beats that of two theaters of comparable sound qualities. The concert stage is a two lift arrangement on which—for a majority of performances—the hall's capacity can be increased by anywhere from 90 to 224 seats. These seats are not the usual make-shift variety; they are seemingly permanent, and they rise to audience level on motor-powered wagons, which are ordinarily stored under the main floor. When the concerts occur, the proscenium stage is completely sealed from the audience chamber by a fire curtain and an eight-ton cedar wall (seen in the center photo, right) which drops from the fly loft and provides acoustic reflection to the audience. The stage house is available for rehearsals and set construction; and the costs of setting up and striking some sets, and of erecting and dismantling a temporary orchestra enclosure, are minimized. The resulting flexibility was demonstrated in the first month of the new hall's daily use, when there were 13 different productions.

The systems for amplified sound are innovative here—although opera, chamber and symphony orchestras, choral groups and organs do not traditionally use electronic support. The control panel is in the box in the center of the audience (photo, opposite). Every two seats are provided with a floor-mounted speaker and large speakers "bounce" sound from the brick walls surrounding the audience.

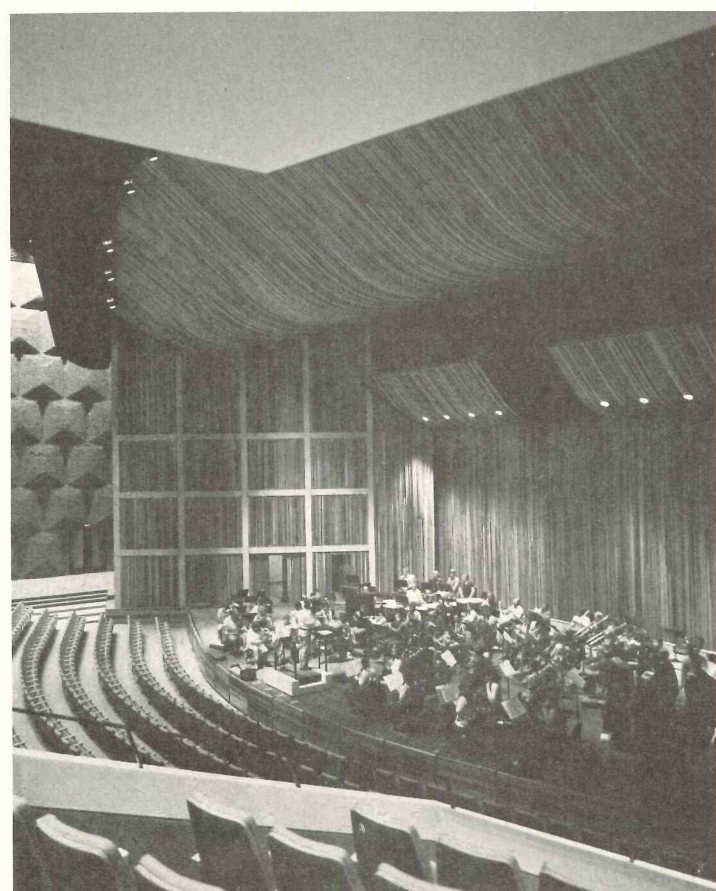


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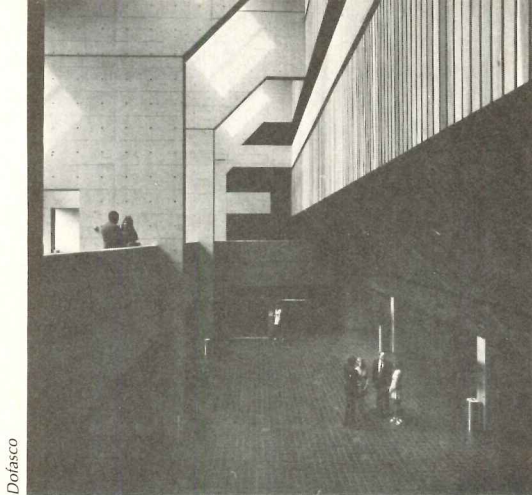
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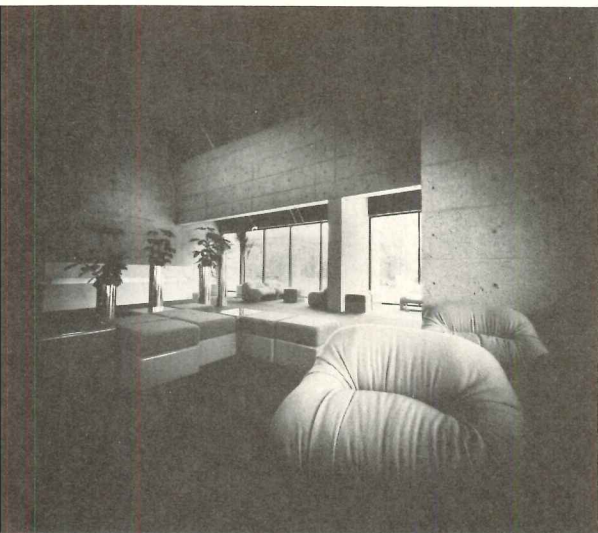
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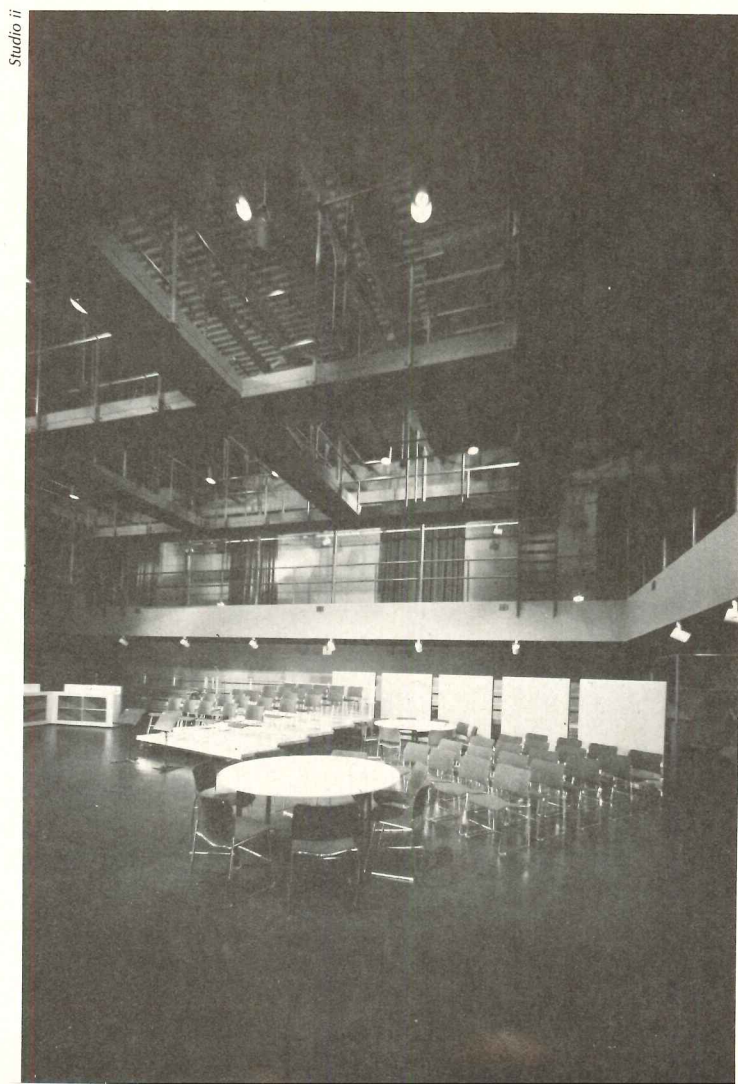


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Studio II

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to this success
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good auditorium**



Studio II

The complete facilities at Hamilton Place allow three performances, numerous meetings and one full-scale rehearsal to occur at the same time. A smaller Studio Theater takes the pressure off of the main hall for rehearsals and smaller productions, played to a maximum of 350 viewers, without the costs and complications of running the bigger facility. This room has inherent advantages over the main hall for unconventional presentations including theater-in-the-round. There is a flexible relationship between the movable stage and the audience. TV and cinema are filmed here. Two adjacent meeting rooms are each designed to alternate as a small recital hall or a green room. Public circulation to all of the functions outside of the main hall is routed through a separate entrance and corridor north of the main lobby. The many simultaneous activities are provided with extensive backup facilities including dressing rooms, work shops mechanical spaces, storage and offices; these are contained in a four-story element of the building located behind the stage.

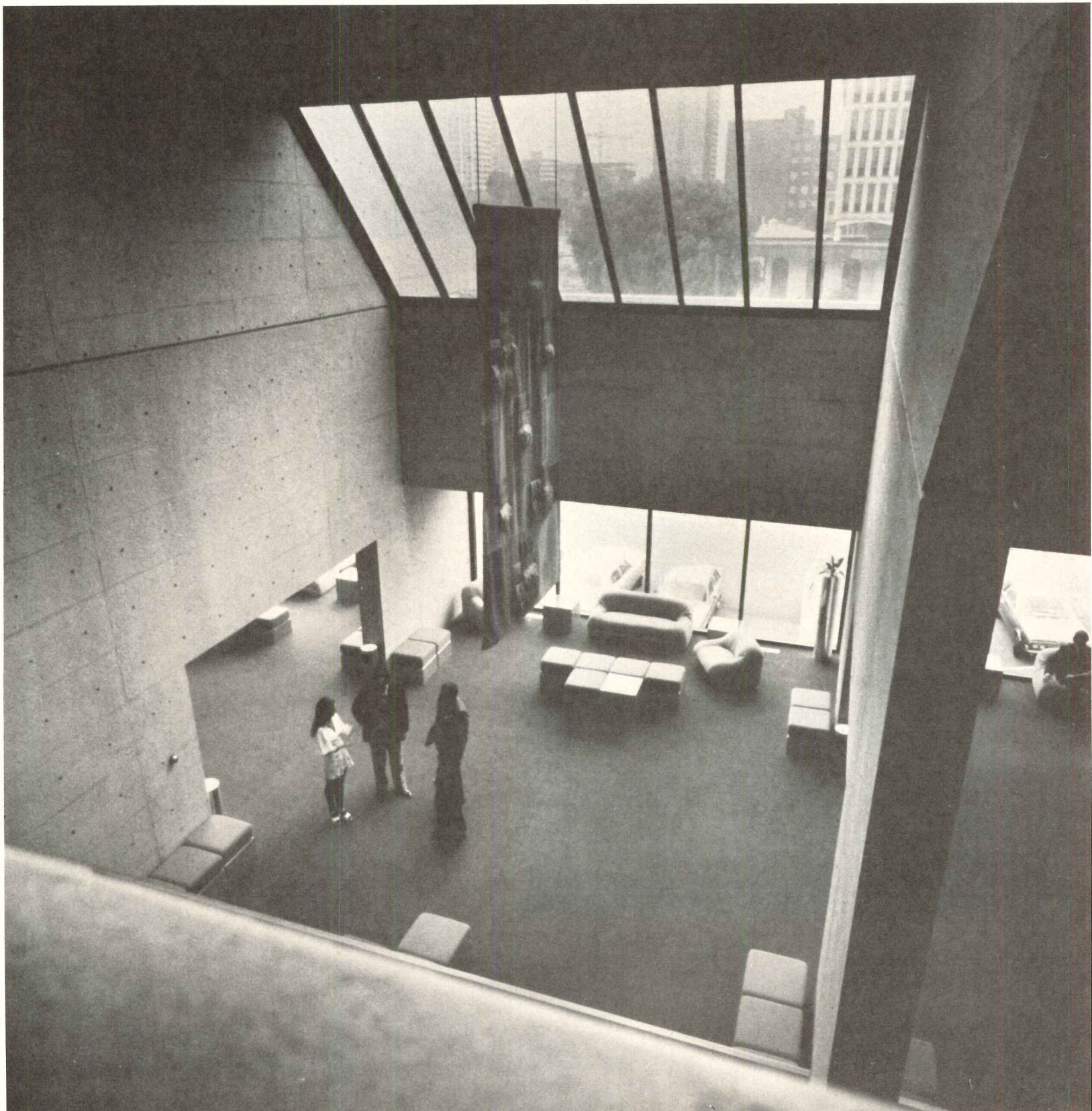
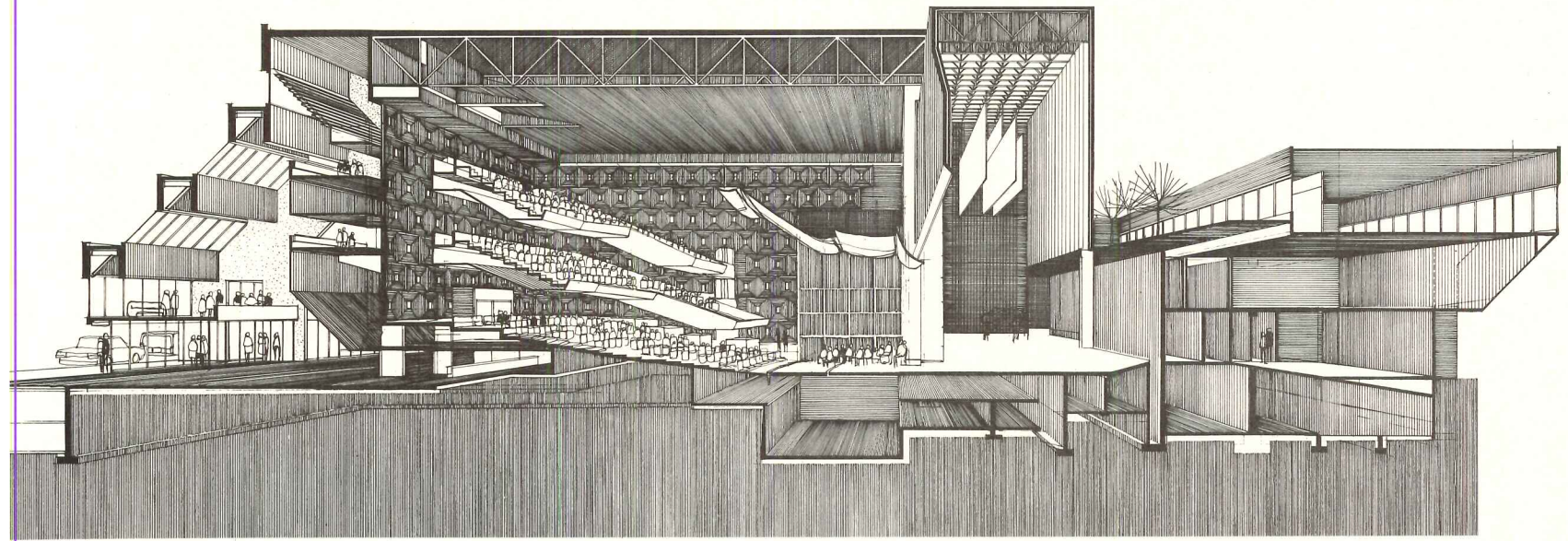
The main lobby is multi-level space rising to the full height of the main hall. The street-level entrance will eventually be supplemented by an orchestra entrance level connection to the planned plaza over the street to the west. The architect purposely avoided the large impersonal void that has come to characterize some lobbies in theaters of this size. Part of the lobby space is contained within the audience chambers. The outer portion is divided by the heavy concrete buttresses that give stability to the structure of the main hall. The resulting spaces have a more intimate character while maintaining functional and visual unification. The orchestra entrance level is conceived as a series of brightly-furnished lounges which overlook the tile-floored lobby below, and are overlooked by the balcony crossovers. A stepped roof admits light by means of sloping clearstory windows, and the lobby's glass walls reveal the internal activity to the busy street outside. Public participation is thus encouraged.

Another part of Hamilton Place's acoustic success is the result of the building's structure. Despite the main hall's proximity to a major truck route on Main Street, there are no audible sounds within the room from passing trucks, other activities within the building or the mechanical systems. There are really five separate structures that comprise the total building. Each has its own foundation and is independently enclosed and buffered by air-space separations. The main hall consists of two chambers—one within the other—separated by a three-and-one-half foot air space between walls and the depth of the trusses between roof and ceiling.

The separation of the five building elements allows the utilization of two types of structures. The original plans called for an all-concrete construction, but it was subsequently determined that the main hall could be built more quickly with steel framing, and that the cost savings would approach a half-million dollars. The remainder of the building was built of poured concrete, which is generally exposed on the interior and exterior. The resulting structural dichotomy has been expressed by brick-wall cladding inside and outside the main hall. Another economy was realized by the hanging of the upper balcony from the main-hall roof trusses. The result has been visually daring, and the cost of extensive separate foundations was saved (the lower balcony is doubly cantilevered over columns on relatively small foundations).

Construction was started with most of the planning in sketch form. The current tendency to emphasize speed of construction is making the "fast tracking" process more common, but—especially in a building of this intricacy—the perils are well known. It is a credit to the owners, architect and contractor that there is a high level of workmanship here, and that the September, 1974 opening was an event without "a hitch." The managers have yet to find what they would call "even a medium scale defect." The largest problem seems to be the parking of all of the patrons' buses; it was never anticipated that so many would arrive by the busload.

This performing arts theater is the first in Canada to realize a profit in its first year, and the reason is due primarily to an attendance average of 85 per cent of capacity at all performances. Concerts are



sold out far in advance—especially those of the Hamilton Philharmonic which is currently conducting three concert series and uses meeting rooms for pre-performance lectures. Assistant manager Larry Russell, says that there was a wide range of performance types, in the first months, to determine those that would be the most popular, but “we don’t know too much more today than when we started.” Every type of performance has been a success. The management knows “a lot” about running a theater. Many shows are bought as a package to be presented by the theater management (other theater owners only rent their auditorium to entrepreneurs). Management offices are located on the top floor of the building element behind the stage house, and they include the board of directors’ meeting room shown below. A specially built table is covered with white plastic laminate. Windows of the offices can be seen on the rear of the building (photo, right).

Income is also realized from rental—to local corporations, theatrical groups and TV stations—of the many meeting rooms and the two smaller theaters, during the times when these facilities would be normally idle. The main lobby is operated as a night club for theatergoers after performances. The policy has produced revenue to the owners, provides a highly visible active night life for the downtown’s main street, and contributes to Hamilton Place’s vitality.

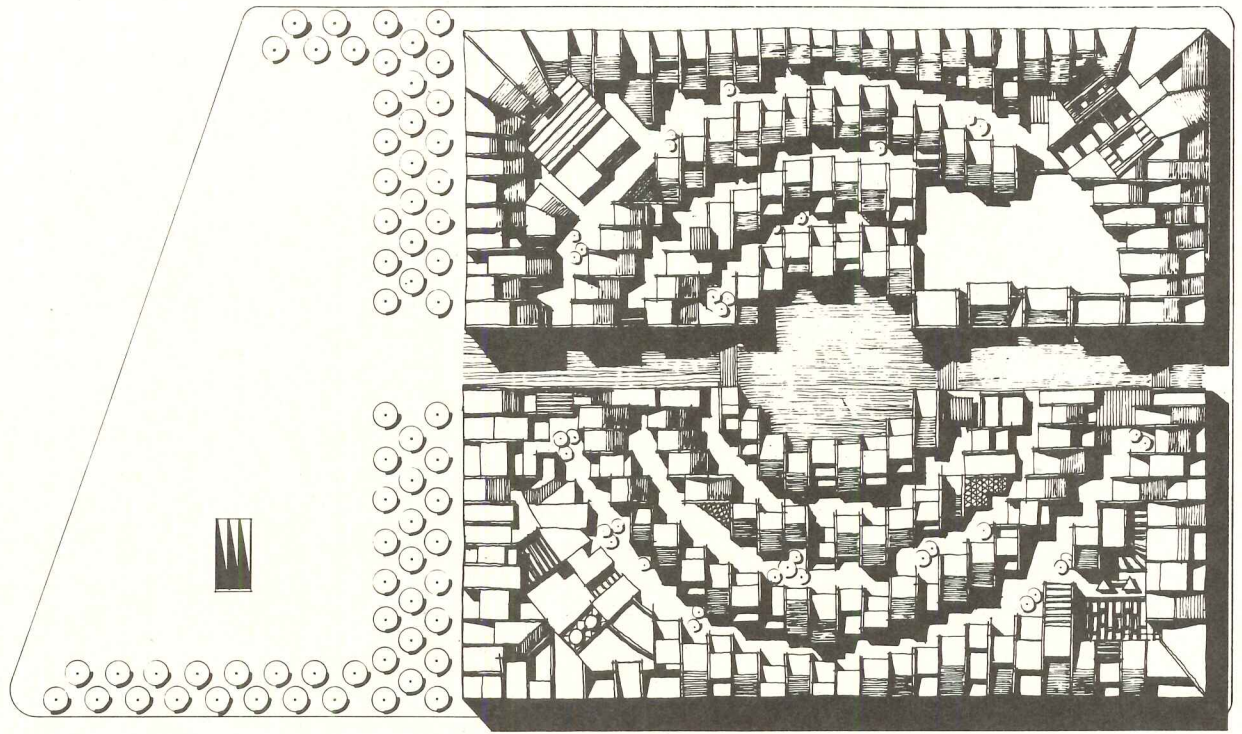
HAMILTON PLACE, Hamilton, Ontario. Owner: *City of Hamilton*. Architects: *Trevor P. Garwood-Jones—associate-in-charge, B. Harry Lennard*. Engineers: *Omen Lee & Associates Ltd., SNC Filer Ltd., Canaly Otter Ltd.* (structural); *Quist & Associates Ltd., Keith Associates, Ltd.*, (mechanical/electrical). Consultants: *Russell Johnson Associates* (acoustics); *Hanscomb Roy Associates* (cost); *Bolt, Beranek & Newman, Inc.*—project manager; *Vincent Piacentini* (theater). General contractor: *Frid Construction Company*.



Bochler Studio

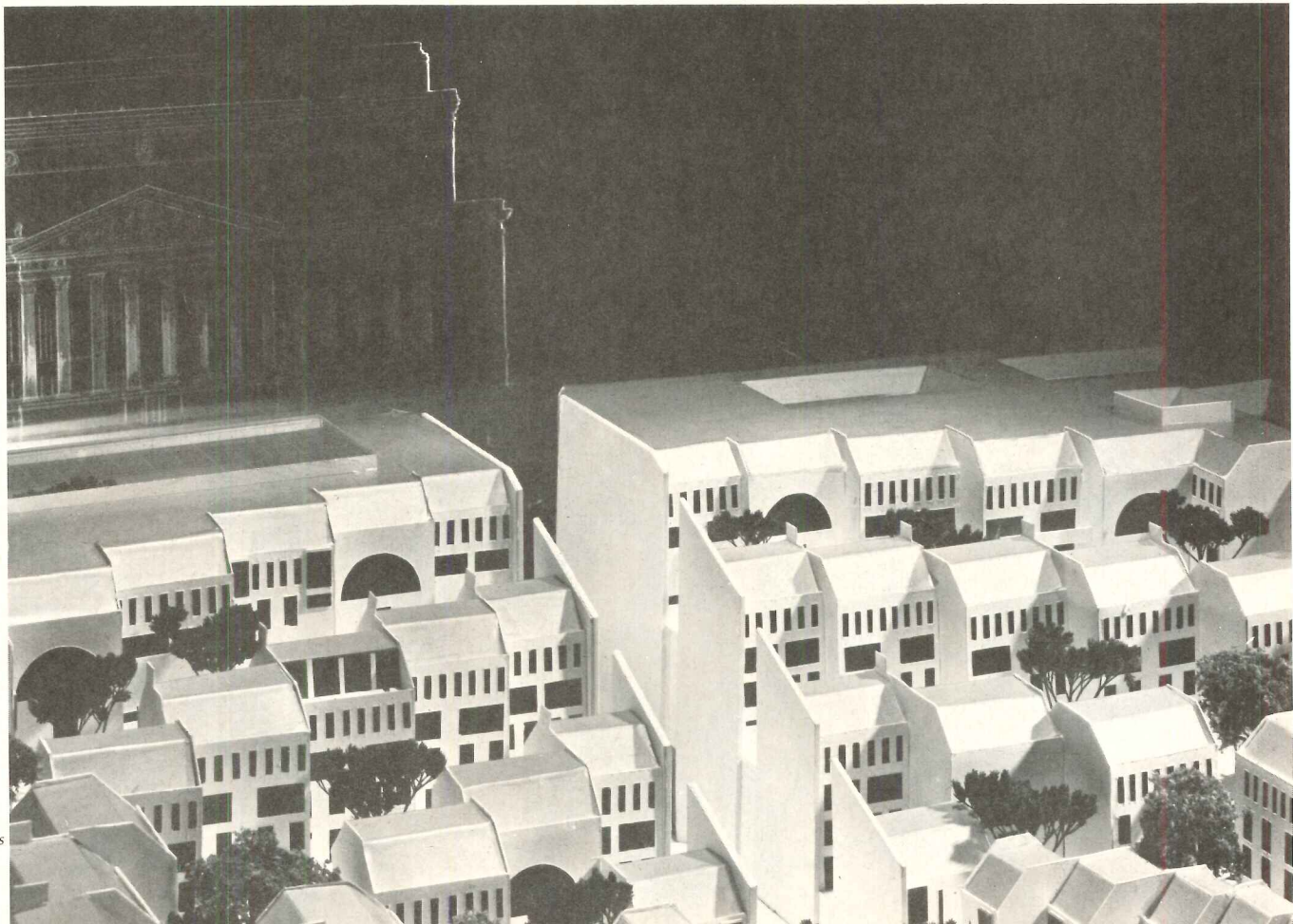


Studio II

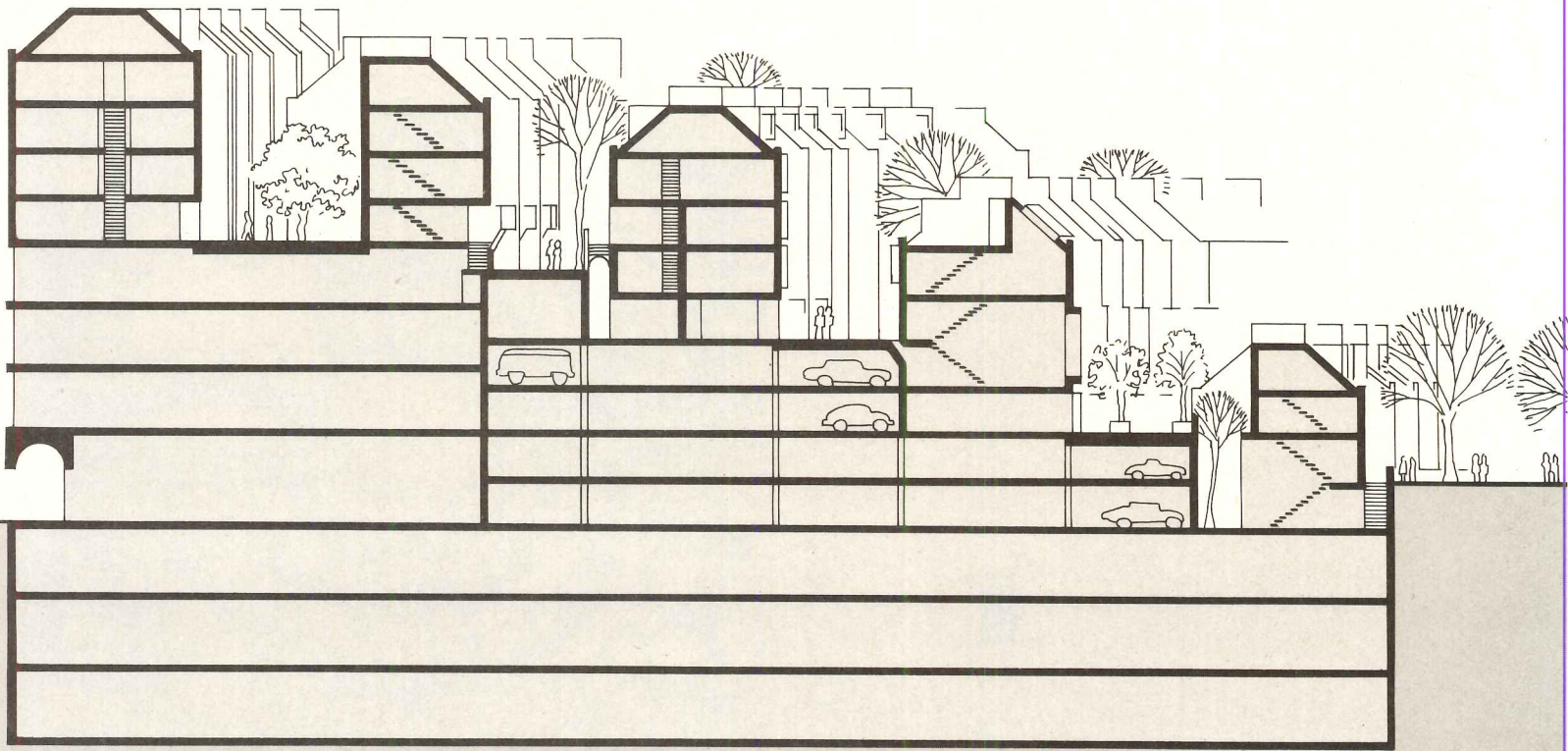


FIVE CURRENT PROJECTS FROM THE OFFICE OF HUGH JACOBSEN

The office of Hugh Jacobsen has over the past years made for itself an enviable reputation for designing houses and for restoring historic buildings with unusual finesse. Many of the results have been seen in the pages of Record (most recently in Mid-May 1973, pages 54-57, and in August 1973, pages 134-135), and so it is a pleasure to present now, by contrast, a portfolio of current work, different in mode and scale from what has been seen before. Jacobsen's housing for the Pennsylvania Avenue Development Corporation (partial site plan above, model photo below) represents a major addition to a major (and still controversial) plan for the national capital, and indeed all of the projects shown on the following pages seem to spring from fundamental concerns of planning—whether at the scale of city, college campus, or resort community.



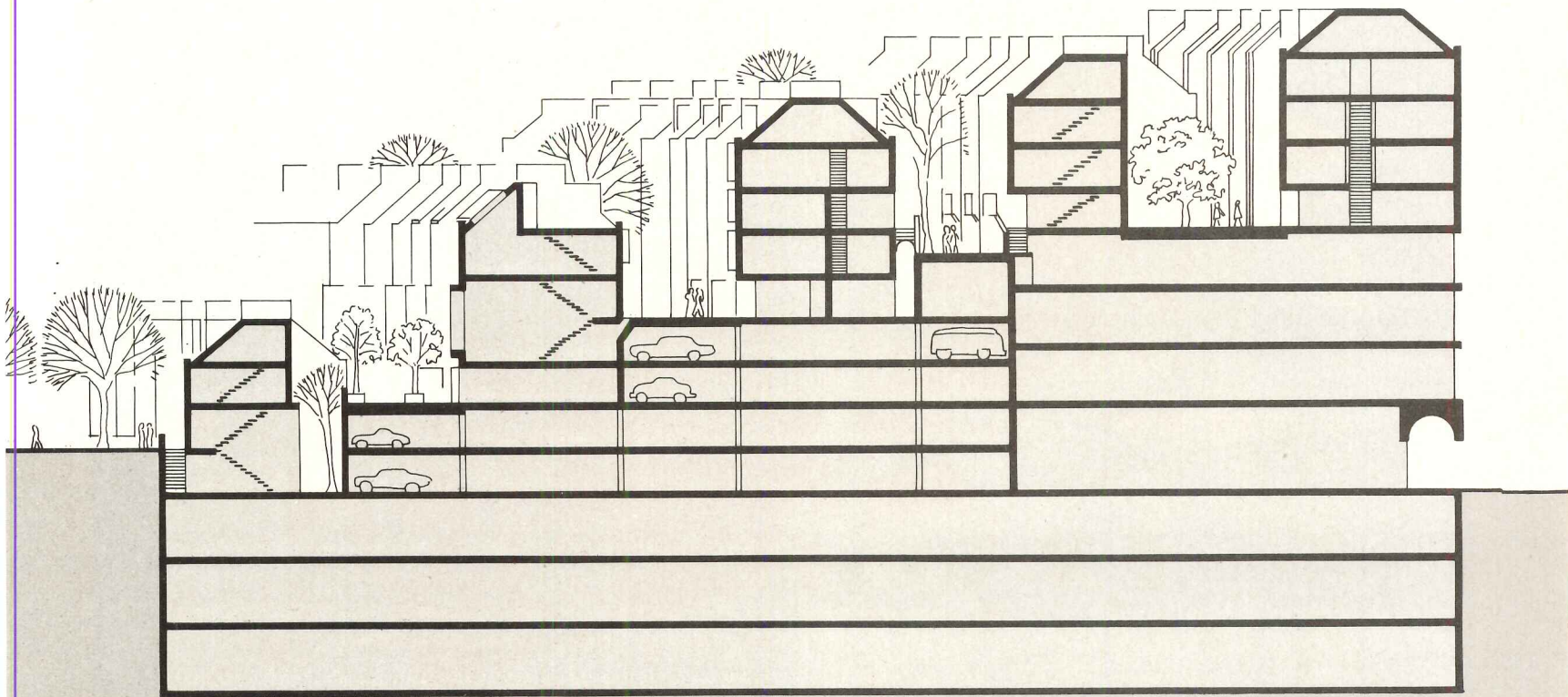
Robert Lautman photos



HOUSING FOR PENNSYLVANIA AVENUE IN WASHINGTON

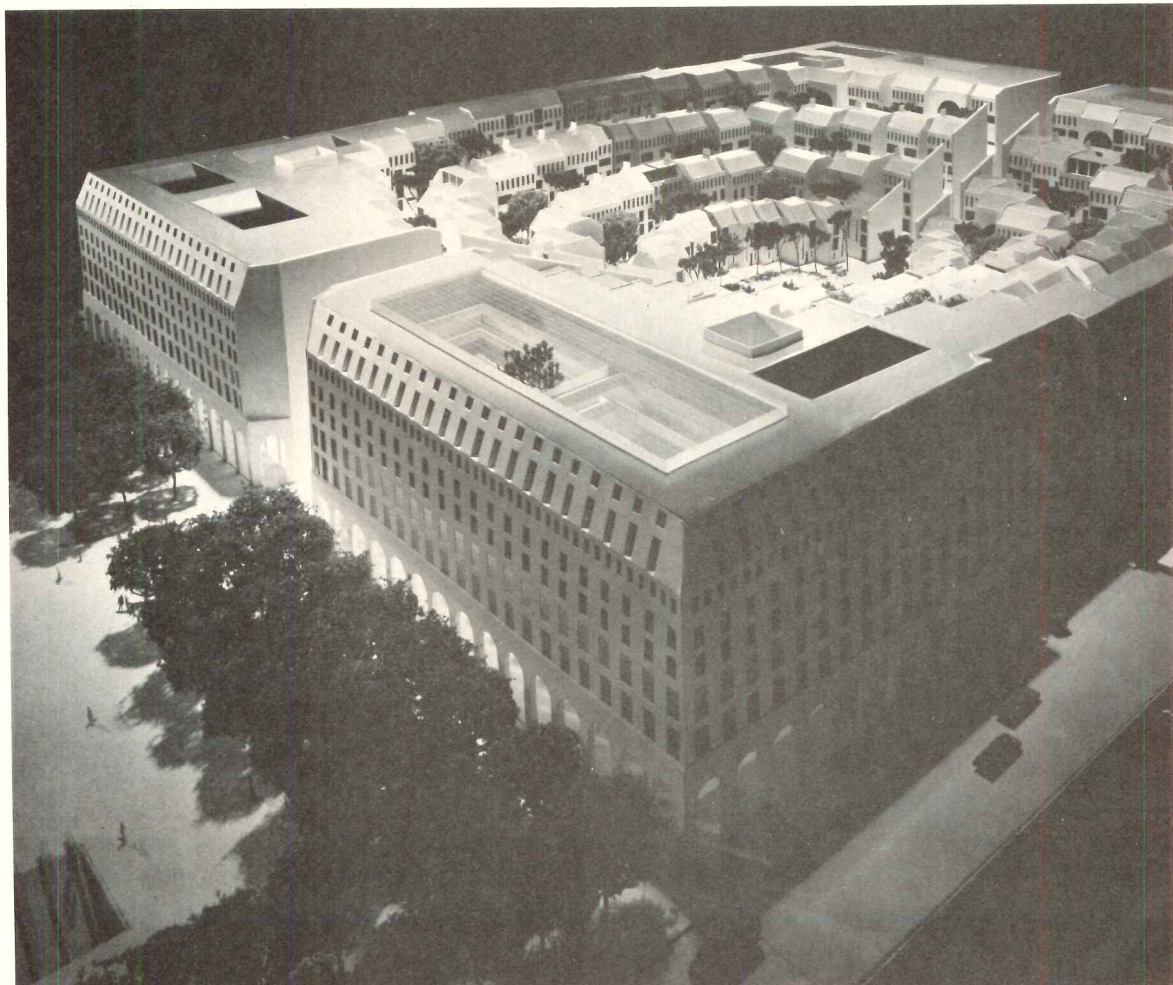
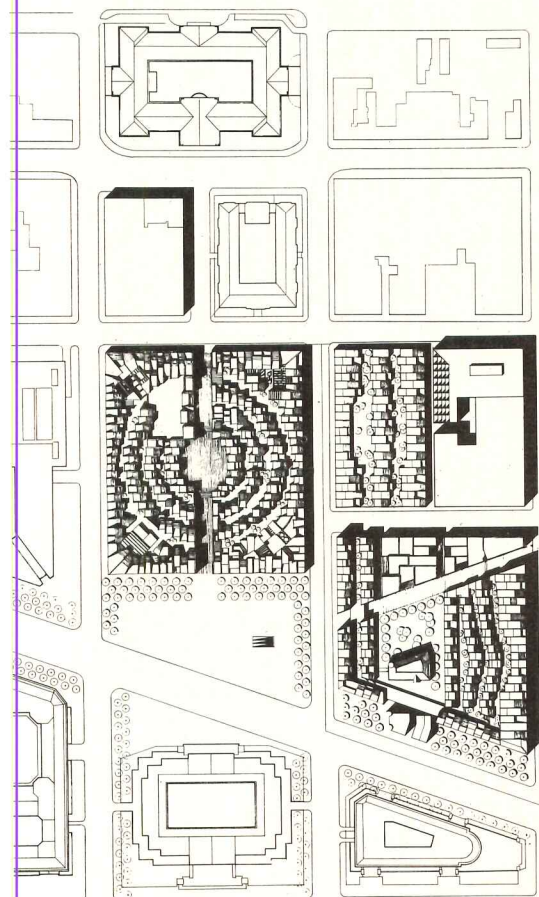
Hugh Jacobsen's housing scheme for the Pennsylvania Avenue Development Corporation (site plan, below center) will occupy a prominent parcel of land consisting of parts of two city blocks and one entire block, close by the new FBI building. The design for this entire block illustrates most clearly the concept of the whole (site plan on the previous page). On the avenue side (photo, below right), the building faces across a large plaza the National Archives, an edifice of monumental size and scale, and, on the opposite side, it opens to a vista of the older and more delicately scaled National Portrait Gallery, one block away. The housing block is conceived from the outside as a single mass composed in accordance with the adjacent buildings on Pennsylvania Avenue in general, and with the National

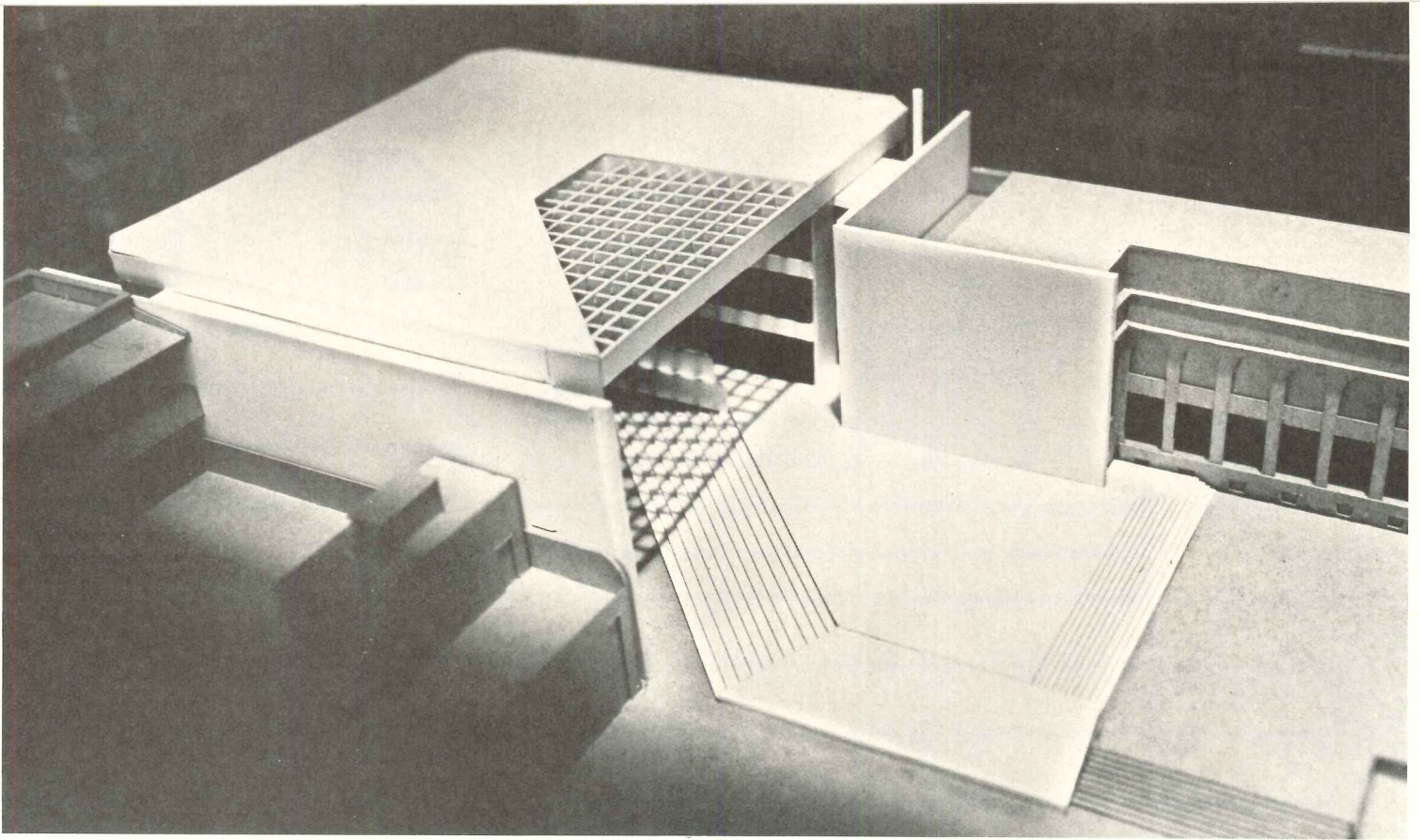




Archives in particular. Through its center a narrow slit is made on the axis between the latter building and the portrait gallery. On the inside, however, both scale and function change radically to provide a collection of houses terraced around an open central space (drawing, below left). As an example of a structure which attempts to have it both/and in a controversial and monumental plan which has seemed to want it all-or-nothing, the Pennsylvania Avenue housing is worth watching as the final marriage bonds between monumental and domestic are achieved.

PENNSYLVANIA AVENUE HOUSING, Washington, D.C. Architectural consultant to the Pennsylvania Avenue Development Corporation: *Hugh Newell Jacobsen*.

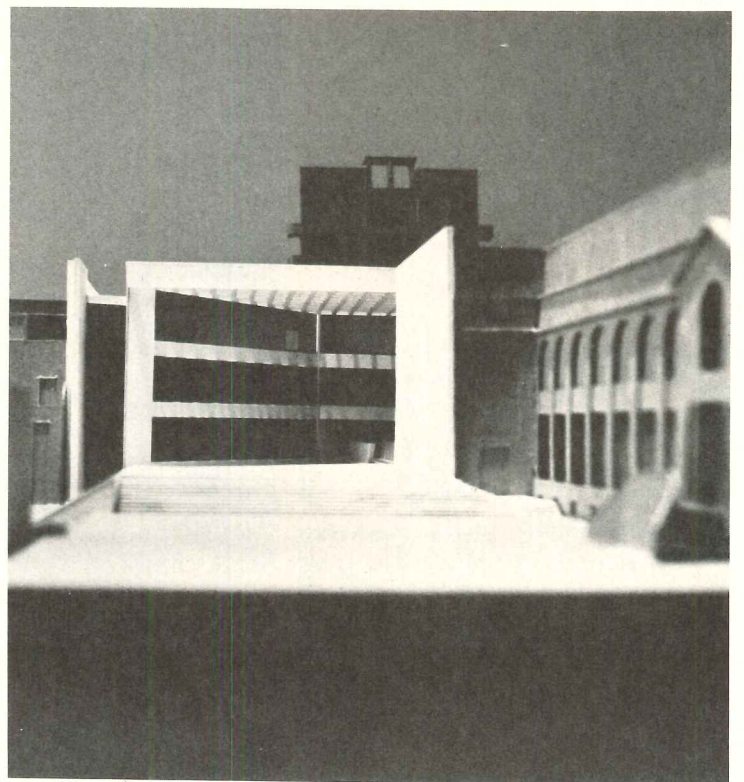
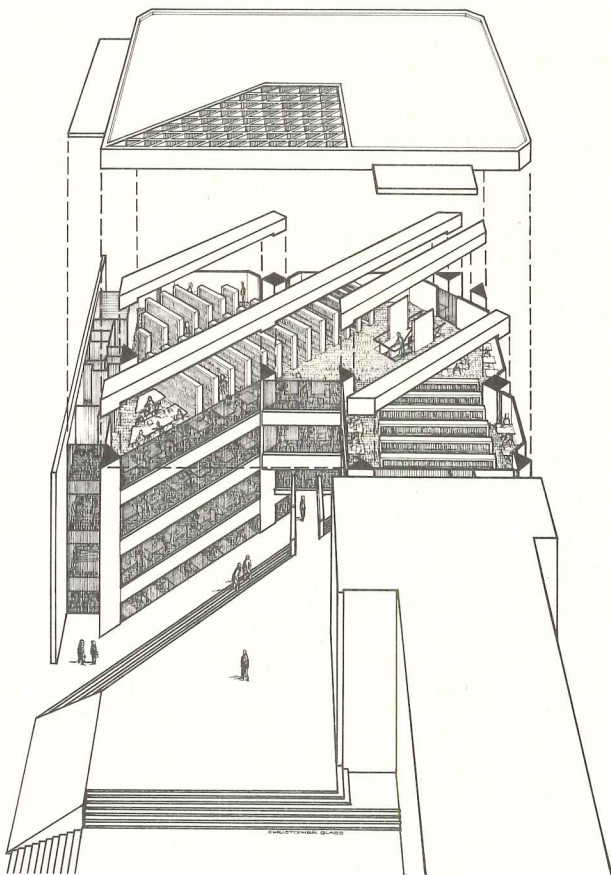


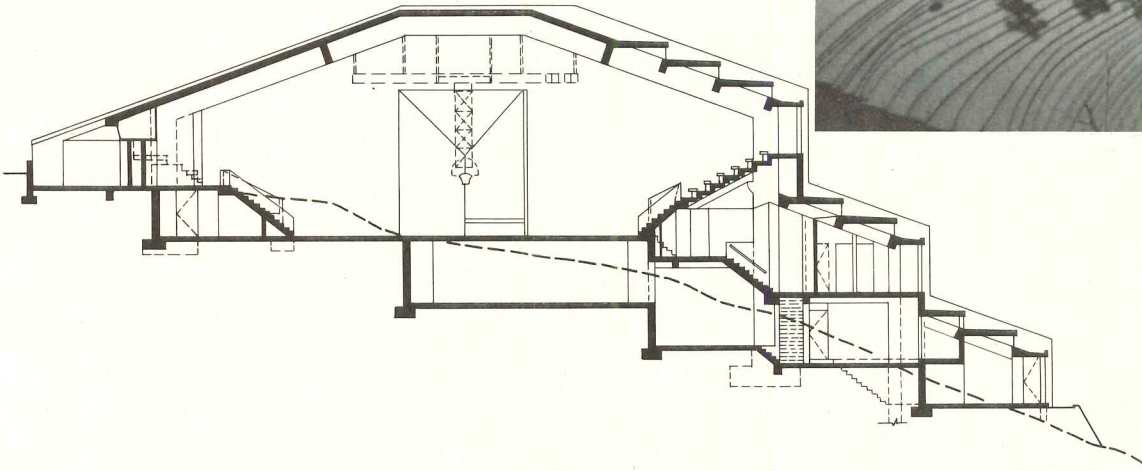
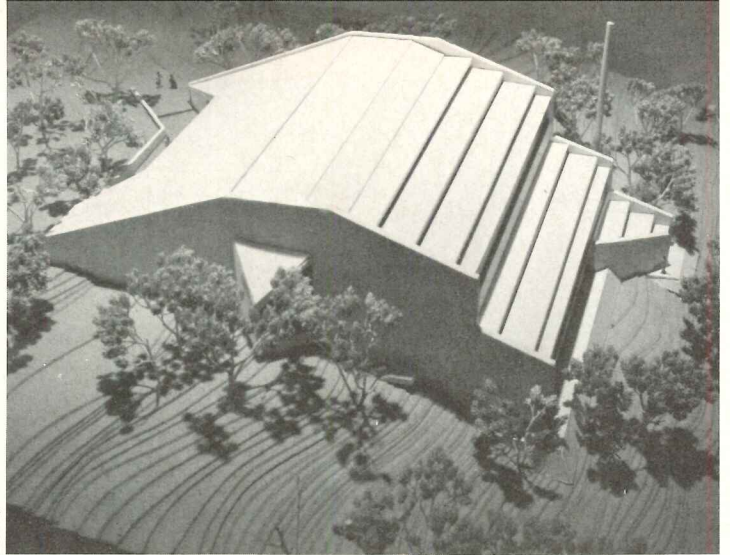


LIBRARY FOR THE AMERICAN UNIVERSITY IN CAIRO

This library building, square in plan, will stand at the intersection of two streets in Cairo, and, since it abuts two college buildings (actually joining one), it will help make an interior courtyard for this part of the campus (photo above). It also provides a controlled entranceway for the interior open space through a diagonal pathway inward from the street corner; on one side of the pathway wide steps lead up to an open plaza, covering a new kitchen for the adjacent building. Inside the library, long beams span the walls on the diagonal, providing complete flexibility of layout.

LIBRARY FOR THE AMERICAN UNIVERSITY IN CAIRO. Architect: *Hugh Newell Jacobsen*. Engineers: *Kraas & Mok* (structural); *Gamze, Korobkin, Caloger, Inc.* (mechanical). Consultant: *Dr. Cecil Byrd* (library).

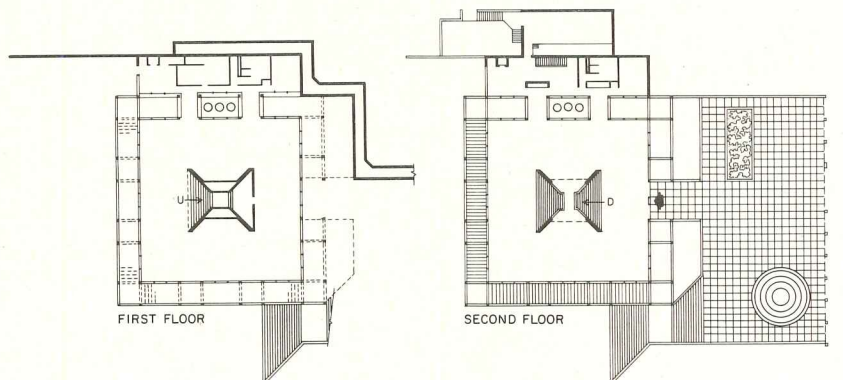
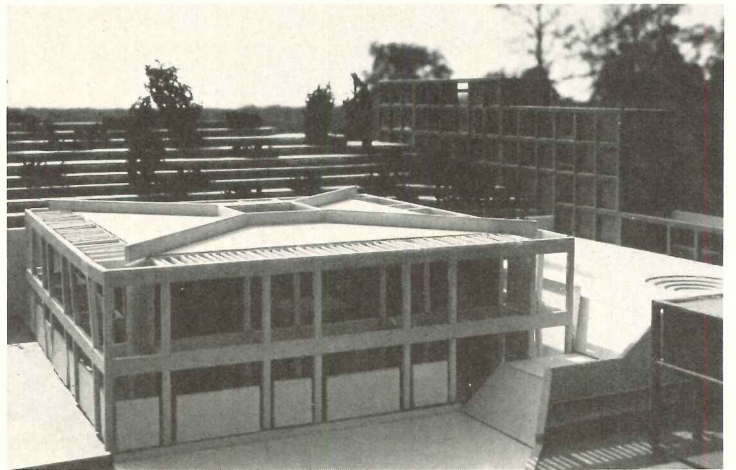
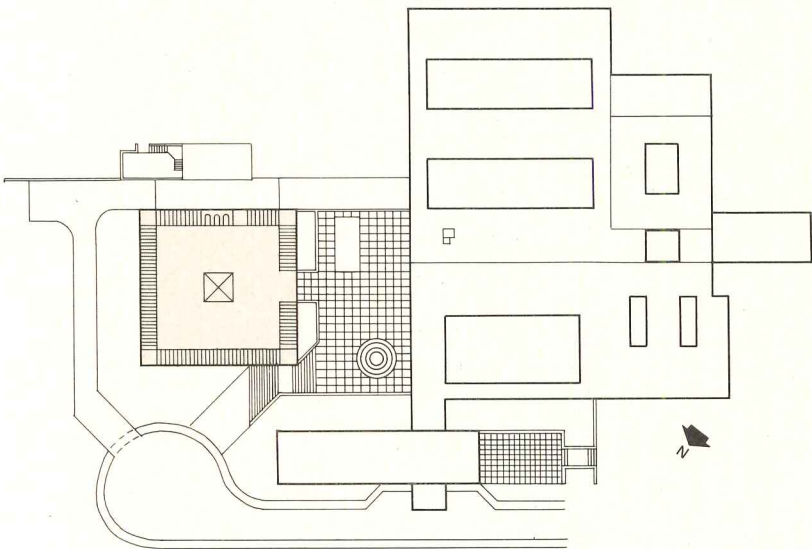


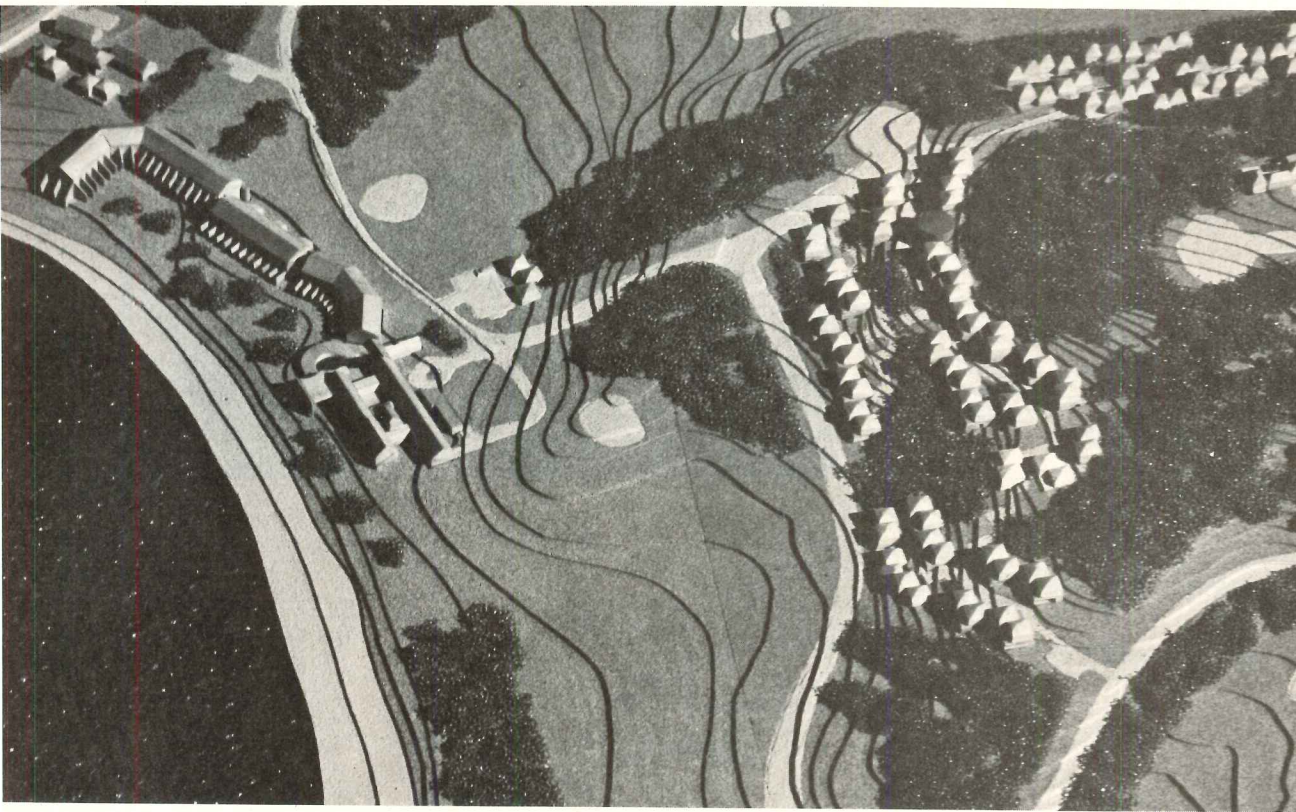


TWO SCHOOL BUILDINGS IN GREECE

The "gymnasium" for Anatolia College (above) is a multi-use building on the brow of a hill; it opens up in the direction of Thessaloniki and the Aegean beyond, while also maintaining a modest profile from the campus side. The library for Pierce College, (below), like the one in Cairo, is square in plan with a virtually column-free interior; on its entrance side it helps to form an open plaza.

"GYMNATORIUM" FOR ANATOLIA COLLEGE, Thessaloniki. Architect: *Hugh Newell Jacobsen*. Associate architect: *Environmental Design Company, Ltd.* Engineers: *Kraas & Mok* (structural); *Dubin, Mindell, Bloom & Associates* (mechanical). LIBRARY FOR PIERCE COLLEGE, Athens. Architect: *Hugh Newell Jacobsen*. Associate architect: *Environmental Design Company, Ltd.* Engineers: *Kraas & Mok* (structural); *Elias & Nicolas Cavoulacos* (mechanical). Consultant: *Dr. Cecil Byrd* (library).

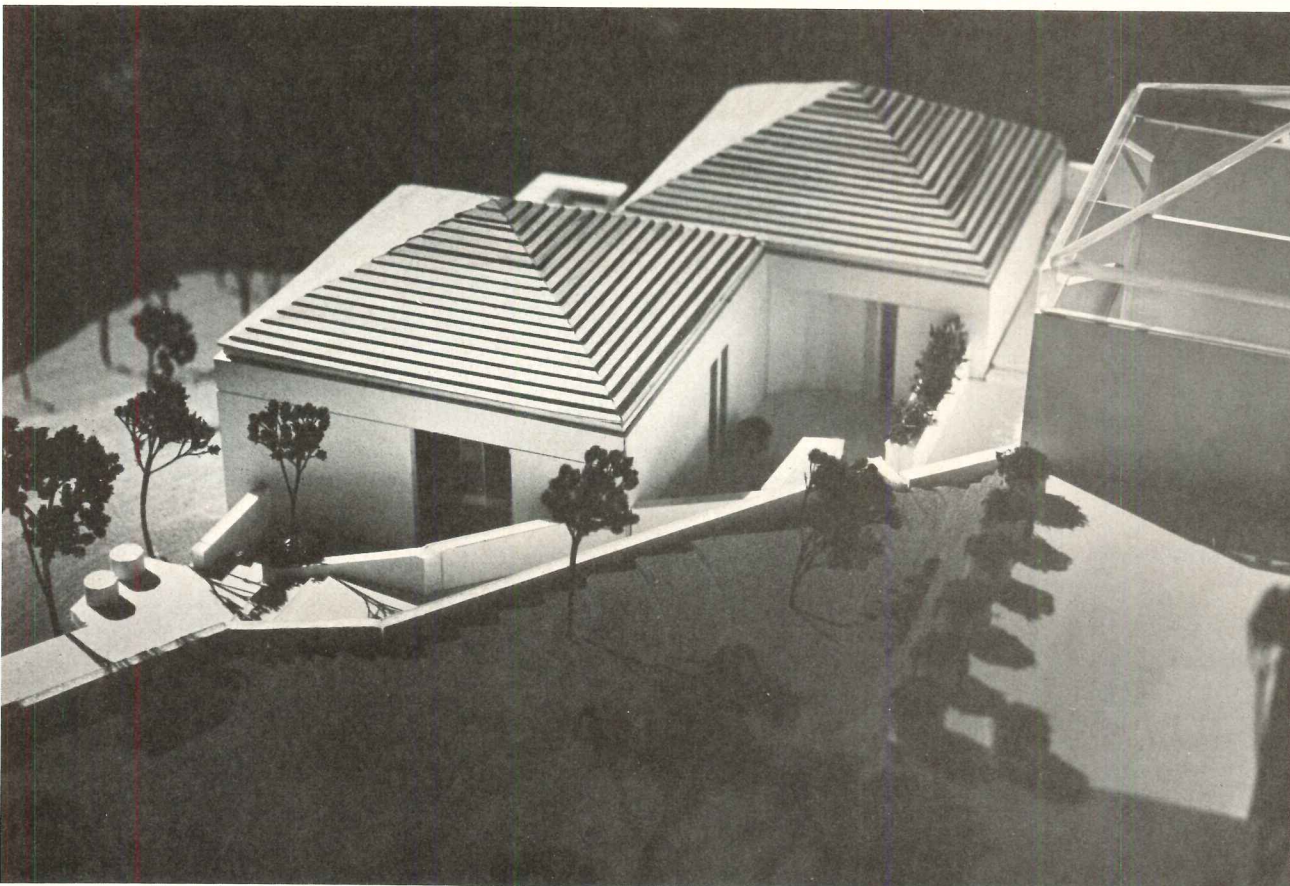




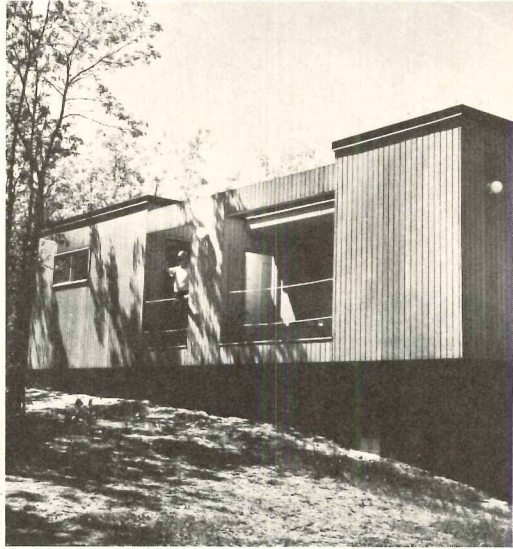
HALF MOON BAY HOTEL AND GOLF CLUB

Hugh Jacobsen's designs for Half Moon Bay, a resort in Antigua, began with the remodeling and extension of an existing hotel (seen in the model photo above, nearest the water) and has further developed into major landplanning for the entire resort and virtually total control of all its visual elements, including graphics, signage and even a special selection of resort clothes. In his effort to respect the spectacular site, the architect has arranged the new housing (photo below) into small-scale linear clusters.

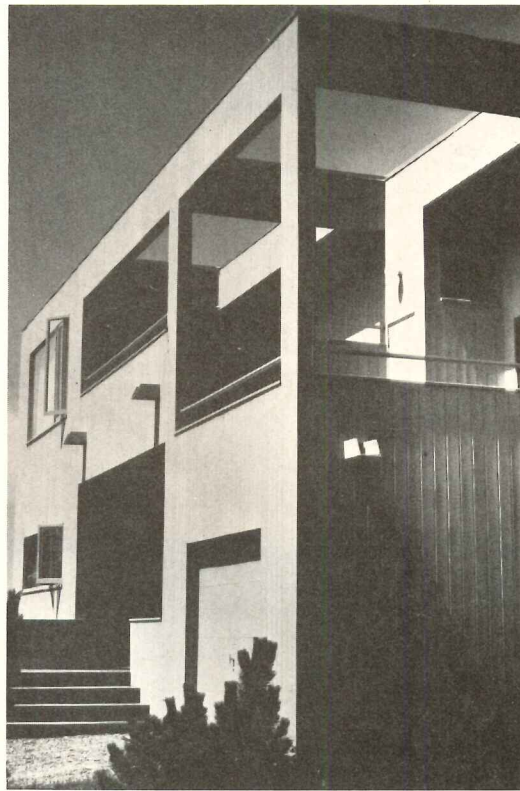
HALF MOON BAY HOTEL AND GOLF CLUB, St. Johns, Antigua, West Indies.
Architect: *Hugh Newell Jacobsen*. Engineers: *Kraas & Mok* (structural);
Dubin, Mindell, Bloom & Associates (mechanical).



BOXES ARE BACK: FOUR LOW-COST HOUSES IN THE HAMPTONS



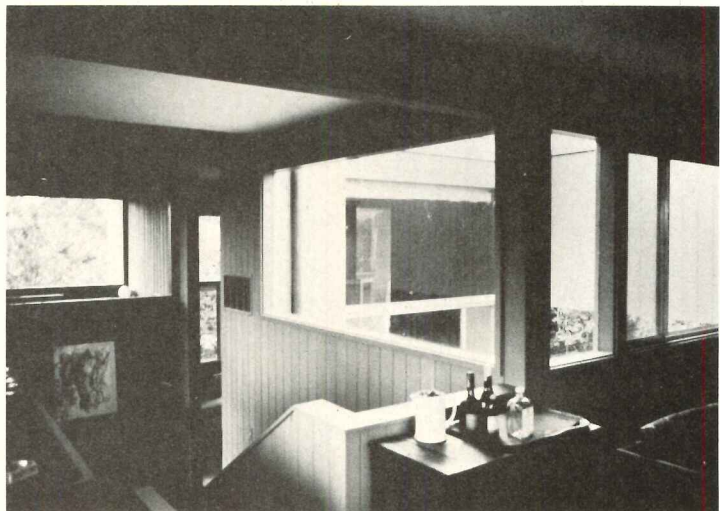
Mildred F. Schmetz



Robert L. Rotner



Robert L. Rotner



Robert L. Rotner

Every architect knows (but some deny) that the cheapest way to build a house is to construct a flat-roofed box. Not everyone, however, wants to live in one. "Less is less!" is the nostalgic cry, and builders and architects respond with sloping roofs and eaves, turrets, dormers, cupolas, widow's walks, finials, barge boards, verandas, projecting wings, bay windows, oriels, fanlights, stone chimneys, or approximations of all these things—forms which delight the eye, warm the heart and make a house a home. Unhappily, the addition of even a few of these grace notes costs money, and unless the client has a lot of it, important things get skimmed—like space.

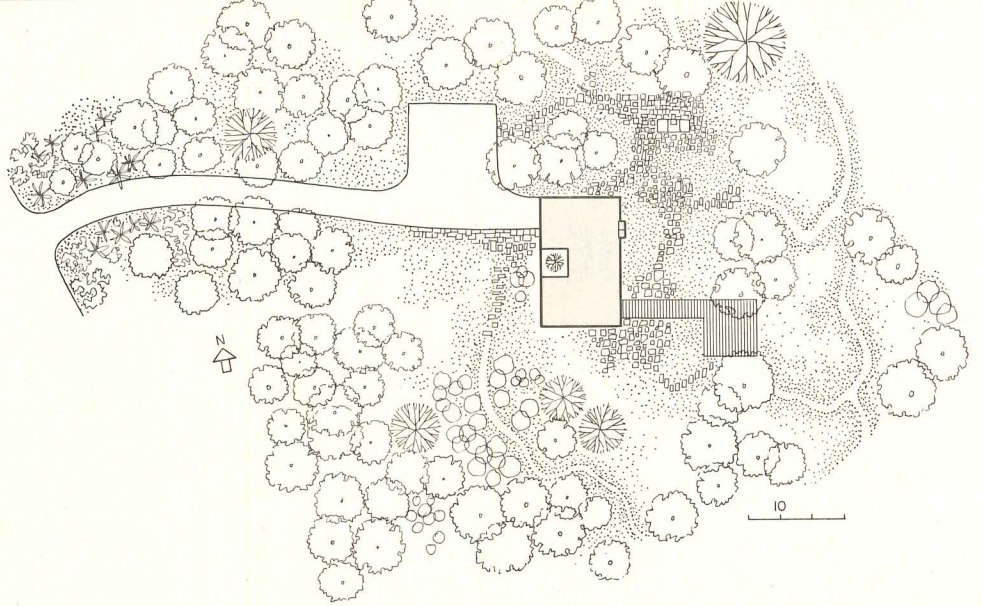
More unfortunately, it takes a lot of nerve to build a simple box anywhere, but particularly in the Hamptons. Famous for 19th century houses which combine all the joyous ornaments just enumerated and more, the Hamptons are also recognized as the birthplace of the Corbu Revival style, now being practiced by both highly skilled and notoriously unskilled hands. Although the real Corbu perpetrated many a modest-priced box, his current followers do not. For those of us who can't afford a 19th century house at one extreme, or a virtuoso performance by one of the best Corbu Revivalists at the other, there should be a better middle ground than exists in the Hamptons.

The four houses shown on the following pages are almost anachronistic on the eastern tip of Long Island, and this is too bad. There should be more like them. Designed by architect Robert L. Rotner, they are straightforward, economical to build, easy to furnish and sensitively oriented. Although from the exterior they may appear to be rigidly confined within their rectilinear perimeters, they are remarkably spacious within—both horizontally and vertically. This spatial complexity has been achieved by varying the floor heights, and by the use of interpenetrating decks or porches.

For purposes of comparison, the plans and sections of all four houses are shown at the same scale. The cost figures given are capital construction costs, including the complete house with all built-ins, cabinet work, kitchen and laundry appliances and interior finishes. Also included in these costs are the driveway, water and sewage mains and grading. The square foot costs are based upon the square footage of inhabited space—that is the space which is heated, ventilated, and in the Leader house, air conditioned. The cost figures do not include land costs, planting, furniture or the architect's fees. The structural engineer for all four houses was N. H. Bettigole.

—Mildred F. Schmetz

A TREE-TOP HOUSE WITH A VIEW OF SAG HARBOR, LONG ISLAND



Robert L. Rotner



Architect Rotner's client, Robert Leader, wanted to sit on his terrace in the early evening and gaze upon the church spires of the village. At night he hoped to see the lights of the town. His heavily wooded site, however, offered no vistas, and it soon became clear that the living quarters of the house should perch in the treetops. To find the best elevation for town viewing, Rotner and Leader climbed a few trees and decided the higher the better.

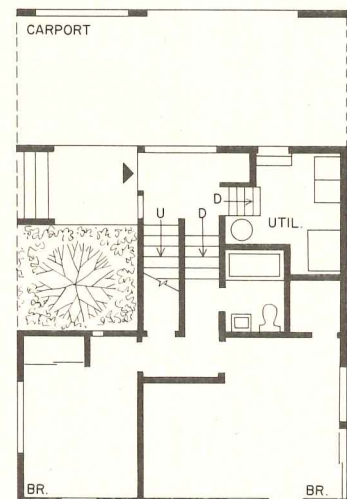
To achieve as much elevation as possible, the house was designed on four levels as the section indicates. Five steps down from the entrance level are the bedrooms and garage and eleven steps up are the kitchen-dining area and the library. Opening off the dining area is a bridge leading to a small dining terrace (opposite page, right). At the top of the last flight of stairs is the living room which at one end overlooks the kitchen so that the owner, who cooks, remains in touch with his guests. From the master bedroom at grade, a path leads to

a gazebo roofed by the dining terrace.

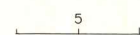
The house has been designed for a bachelor with resale value in mind. It is essentially a three-bedroom, two-bathroom house suitable for a small family, but the bedrooms are so located that one serves Leader conveniently as a combined library and guest bedroom and the other as a combined office and guest bedroom.

The scheme provides a lot of privacy for a house so small. The sleeping areas are neither underneath nor adjacent to the living room, allowing those who choose peace and quiet to get away from a party. The extended porch with gazebo below economically increases the dimensions of the house and intensifies its relationship to the outdoors.

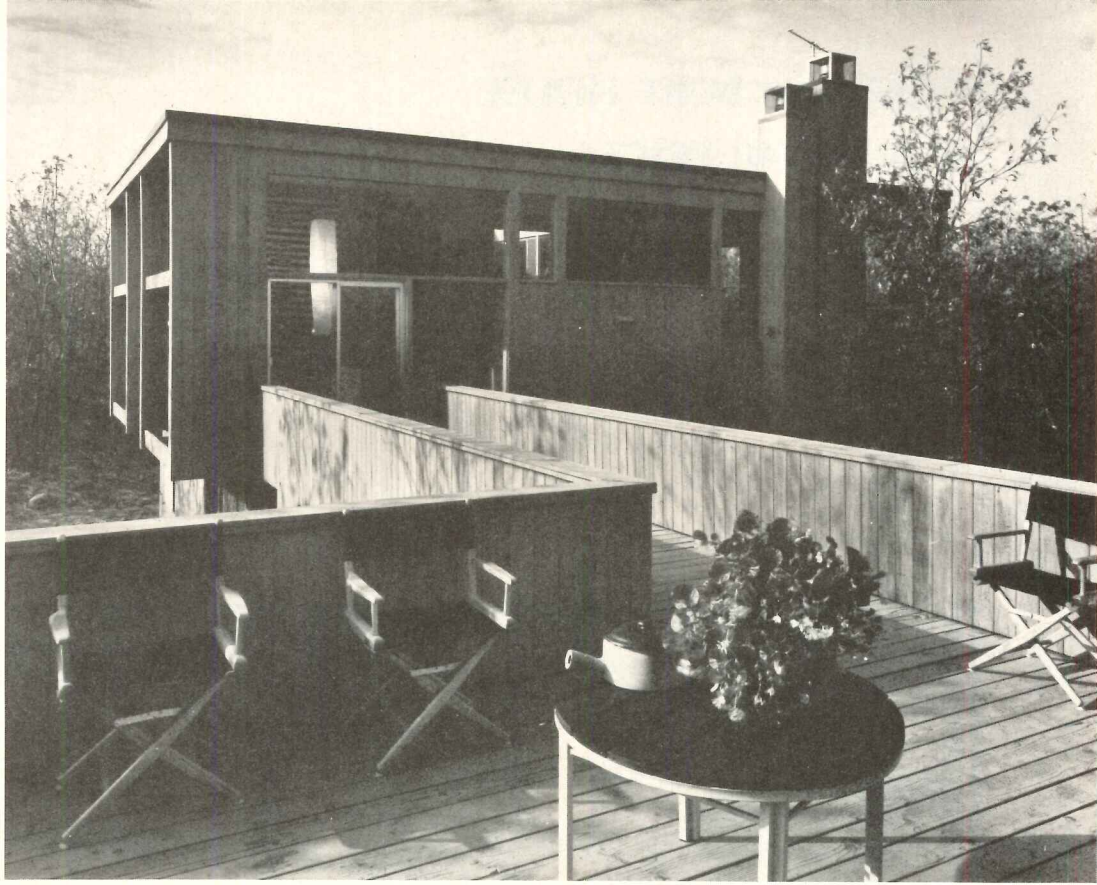
The house is of wood frame construction with tongue and groove cedar on plywood sheathing. It was built by Hal Young General Construction Co. for approximately \$26 per square foot in 1970-71, for a total of \$52,000.



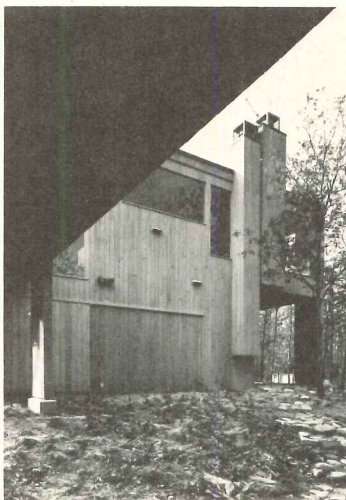
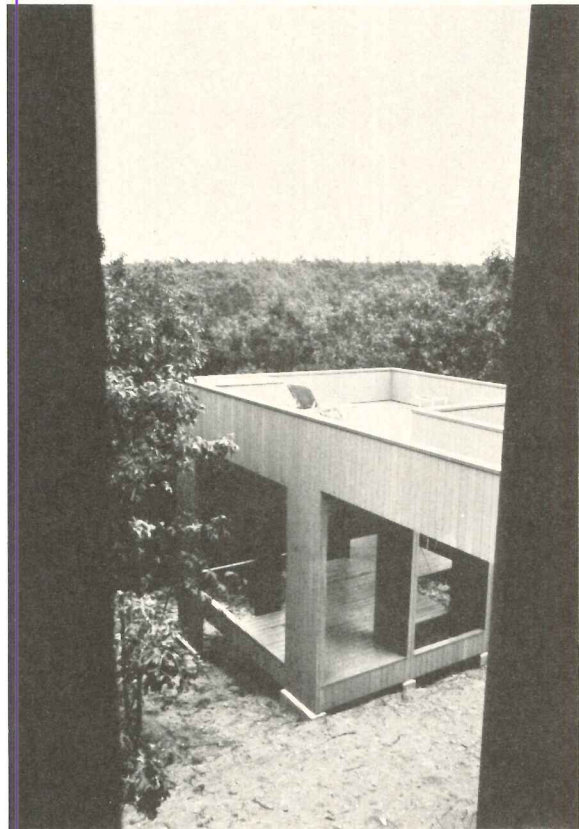
LOWER LEVELS



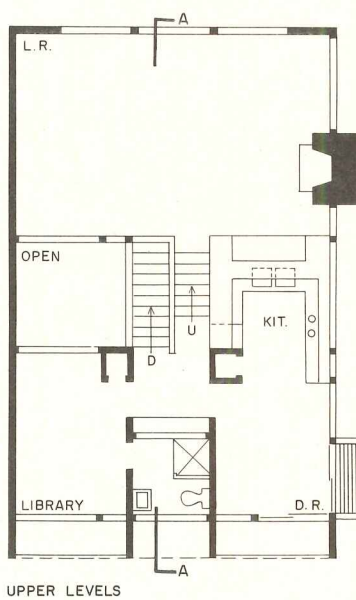
James Brett photos except where noted



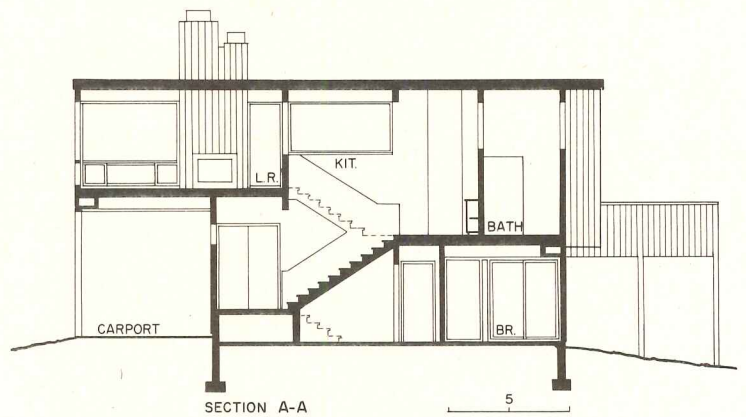
Robert L. Rotner



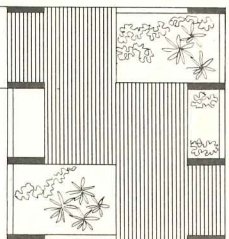
Robert L. Rotner



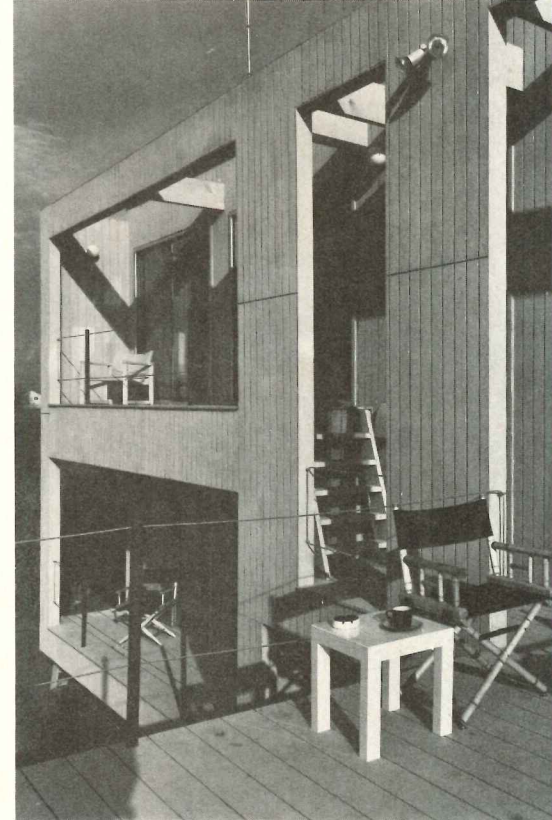
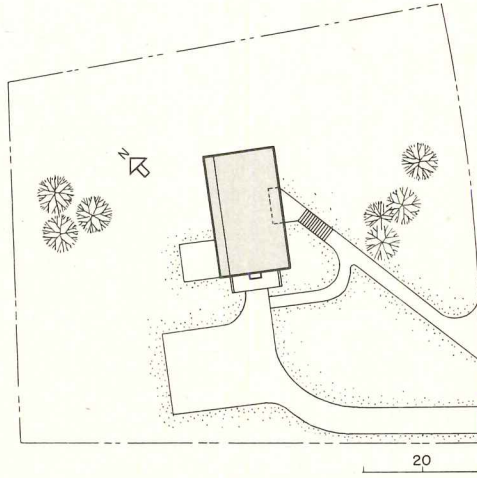
UPPER LEVELS



SECTION A-A



A CUSTOM-BUILT HOUSE AT A PREFAB PRICE



The client, Joseph P. Burke, hoping to build a weekend house on a low budget, had investigated builder and prefab houses before he engaged Rotner. Through strict economy of space and materials, the architect was able to keep the costs down to approximately \$21 per square foot (1970-71) for a total of \$34,000.

The house on a one-half-acre site in Watermill, Long Island overlooks a lake. Because of the high water table, only the garage is at grade. The utility room and first floor bedroom and bath are five steps up, the living room, terrace and kitchen are at midpoint and high enough for a view, and two additional bedrooms are at the top level, one of which overlooks the kitchen and serves as a study.

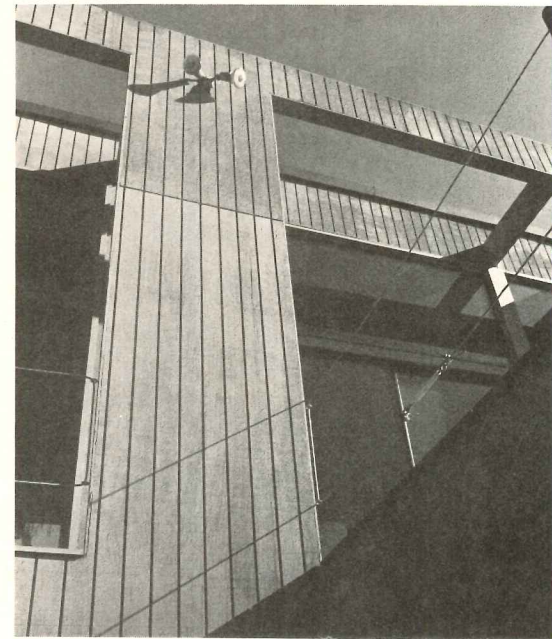
The three masonry walls of the garage carry most of the house. The floor joists of the kitchen and living room are laid on the two parallel bearing walls of the garage and the bedrooms are stacked vertically. As the section indicates, the kitchen and living rooms share a

12-foot ceiling. A secondary wall on the lake side (above right) serves as a *bris soleil* and frames the views. The principal entrance is inset and reached by a flight of stairs (opposite page, right). The window above lights the stairway and entrance hall.

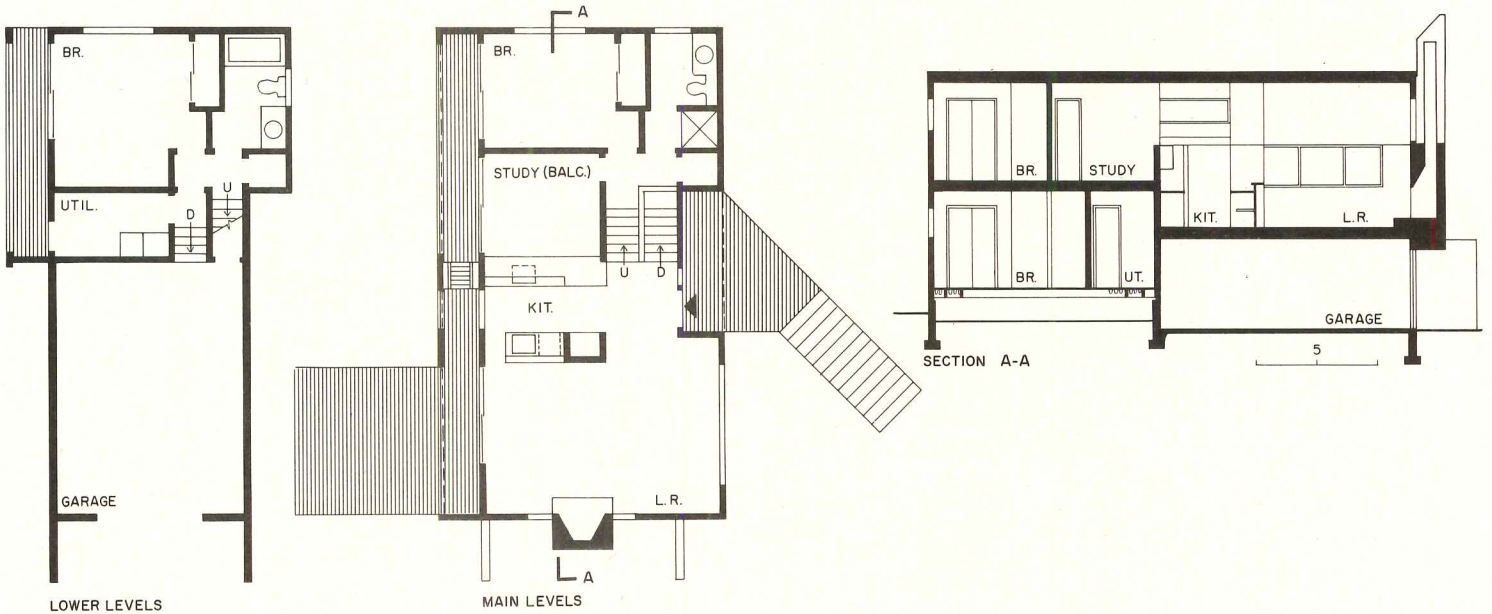
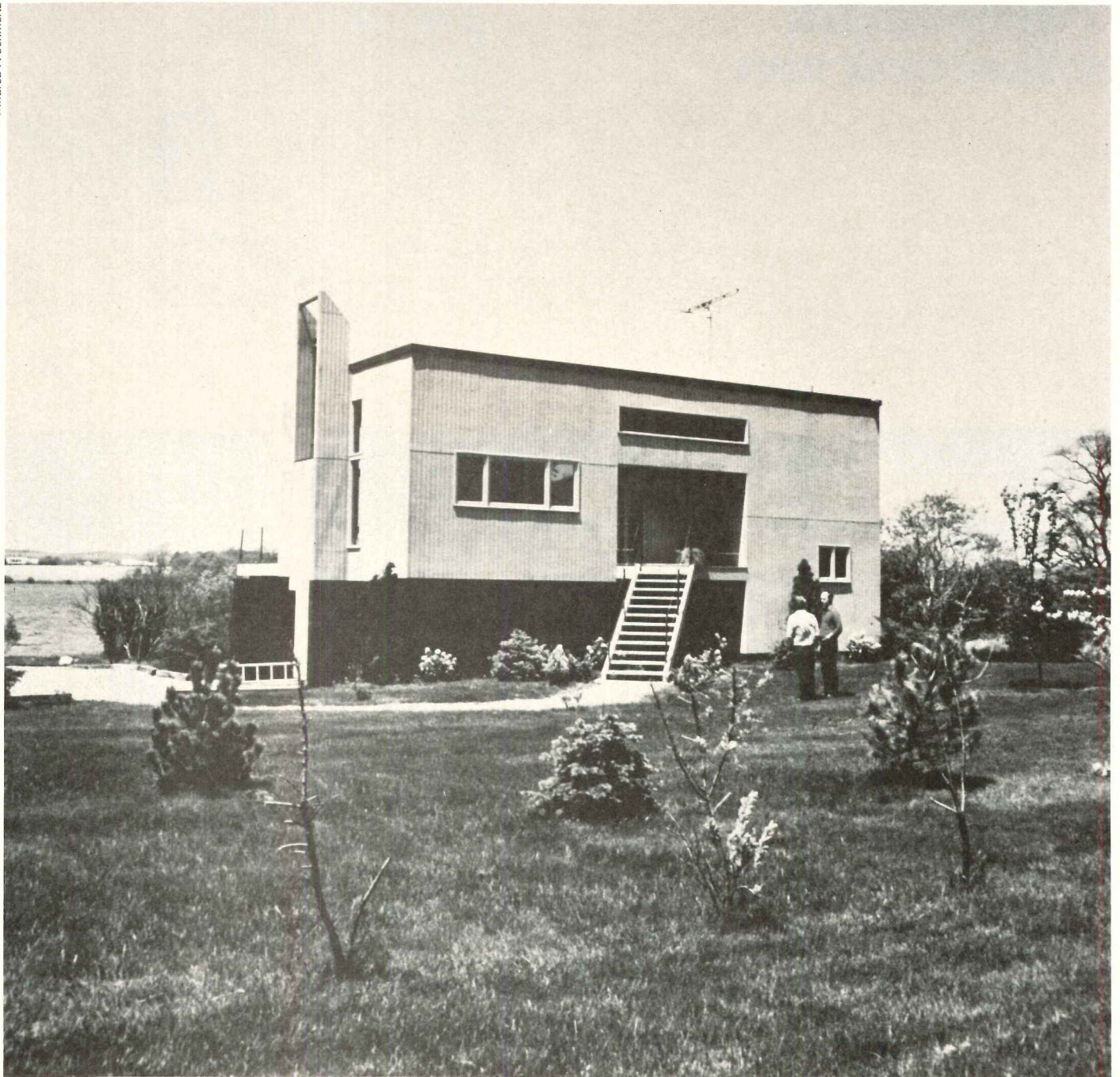
Economies include a prefab chimney and fireplace, stock windows, conventional framing sheathed on the exterior and interior with one layer of grooved plywood and simple metal post and cable railings. Since the decks project over open space they didn't require flashing or waterproofing. Built-ins were done by carpenters on the site, rather than by cabinet shops. The single expensive item in the construction was the use of insulated glass throughout.

The Burke house was designed primarily for a bachelor. The two additional sleeping areas on the top level and the additional bath assures that it can go on the market as a family house. Contractors were Sag Hill Builders, Inc.

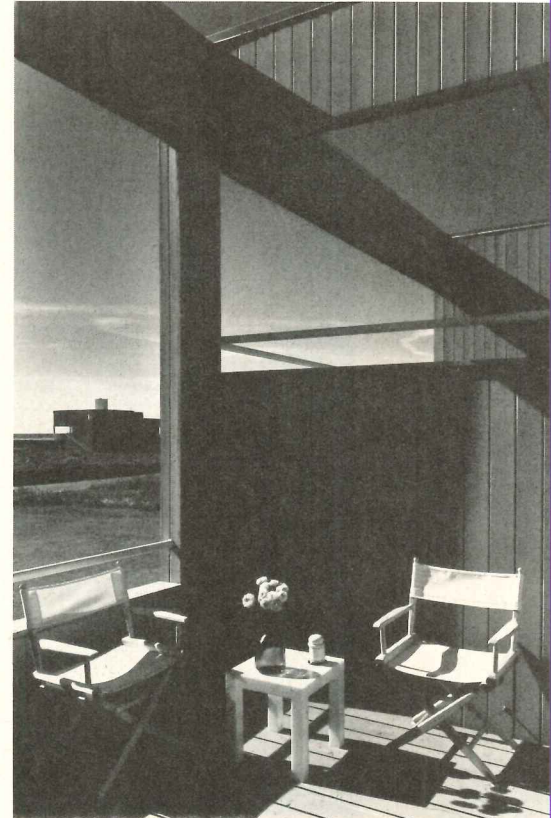
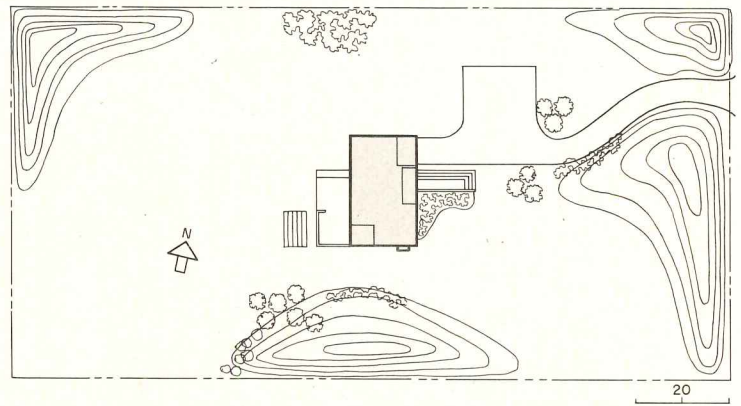
Robert L. Rotner



Mildred F. Schmeitz



A PERFORATED BOX FOR A FAMILY OF THREE



Client Sol de Swaan owns a full acre site in the rapidly disappearing Bridgehampton, Long Island potato fields. Although it doesn't front on the ocean, it has an ocean view. De Swaan's budget was \$55,000 and his house cost approximately \$26 per square foot in 1972-73. It is almost identical in size and materials to the Robert Leader house, but quite different spatially, because of differences in family requirements and site.

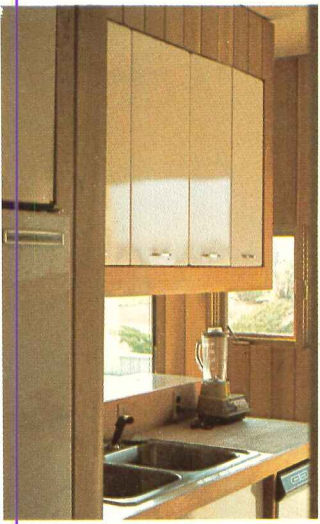
Unlike the Leader and Burke houses which are bachelor residences primarily, although they can be transformed for family use, the de Swaan house was designed from the beginning for a young family with one child. And unlike the Leader house, which is hidden in the woods, the de Swaan house is highly visible from all four sides and demands by its placement to be treated as a work of sculpture in the round. As such, it is highly successful, even though basically it is merely a humble box as the photo (opposite page) indicates.

The view from the living room is to the rear, over the potato fields and the terrace deck is located on this side. The house has four additional decks—one at the entrance and three which adjoin upstairs bedrooms. Each deck has several exposures and two overlook the ocean; all are partially shaded.

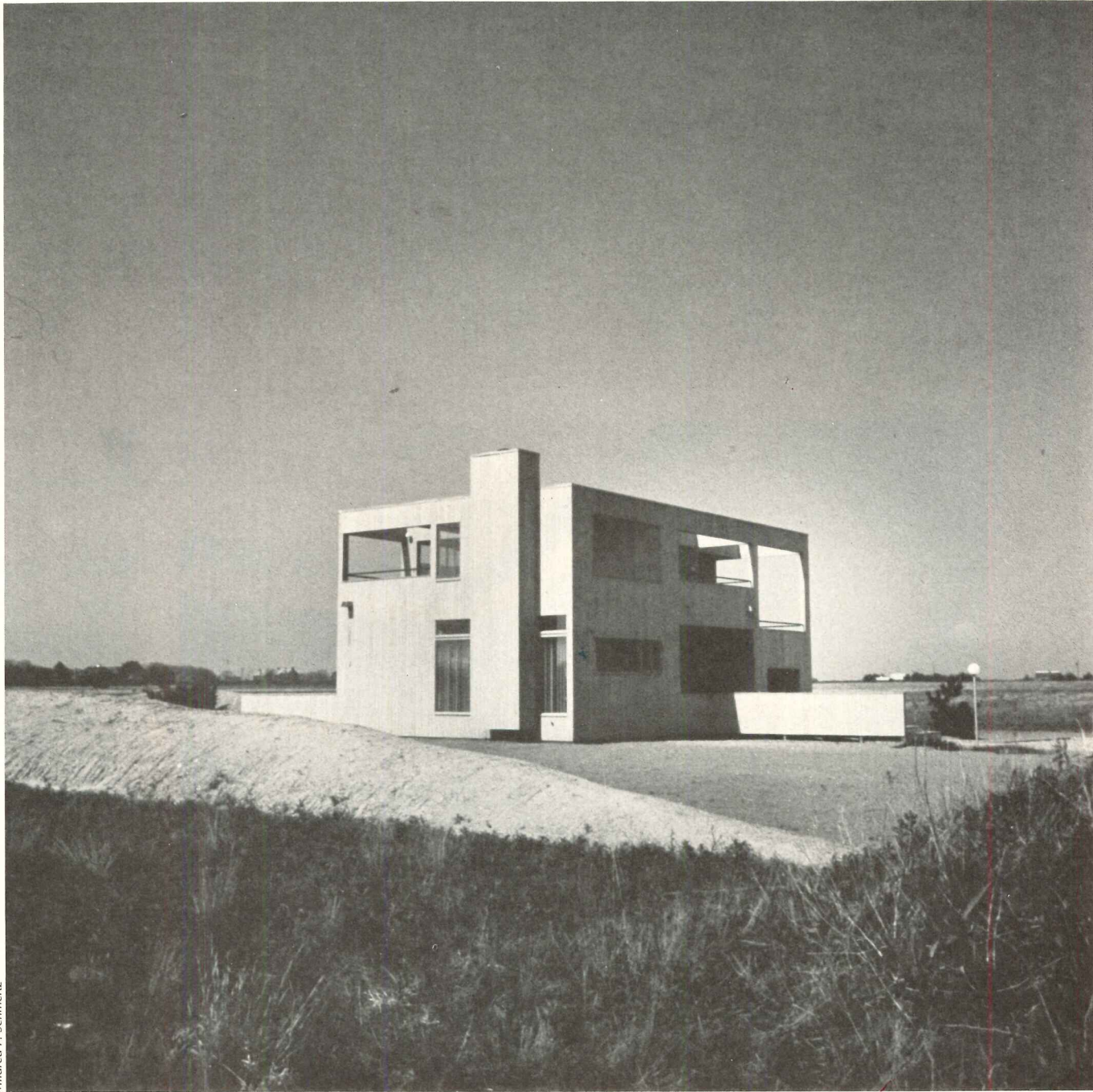
The garage is at grade and four steps above is the living-dining and utility area. Bedrooms, bathrooms, storage and decks occupy the remaining two levels as can be seen in the plans and sections.

The house is finished with red cedar tongue and groove siding over plywood sheathing on the exterior and the identical siding is used throughout the interiors. In all of his houses, architect Rotner uses standard metal kitchen cabinets framed in wood (see detail opposite page top) giving his kitchen installations a custom look. The interior furnishings of this house were selected by the architect. The contractor was Sag Hill Builders, Inc.

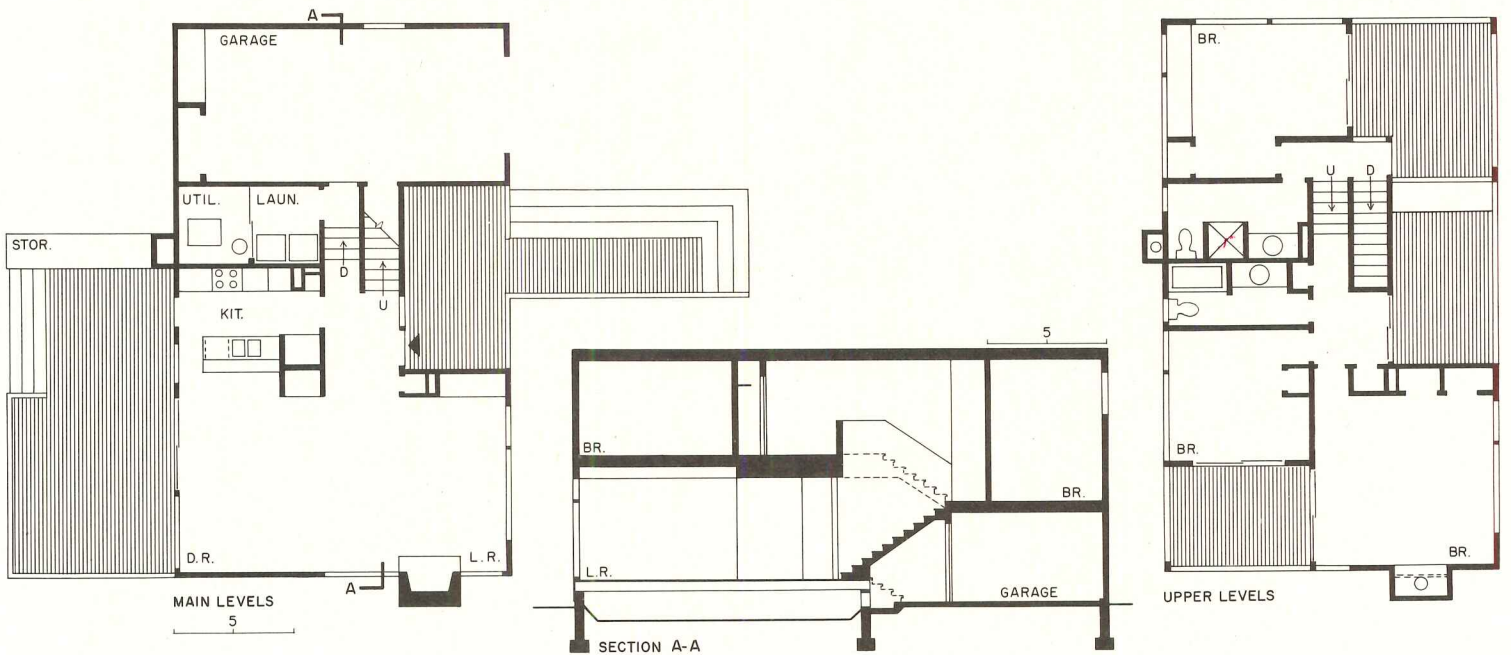




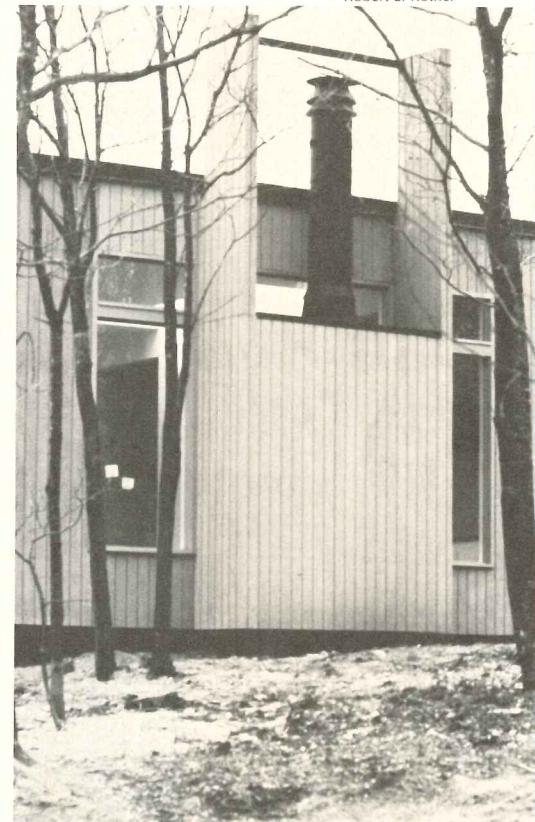
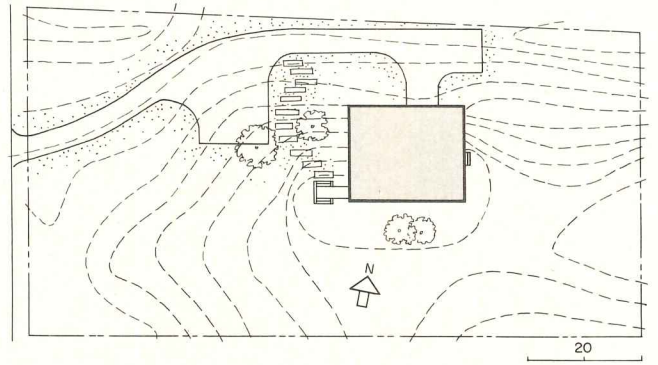
Robert L. Rotner



Mildred F. Schmeitz



A HOUSE BUILT ON SPECULATION TO PLEASE THE AVERAGE SECOND HOME BUYER



Robert L. Rotner

Architect Rotner's client for this house was Robert Leader, who built it on a lot adjoining his own house to protect the view. Like the Burke house, the cost was kept to approximately \$21 per square foot and the total came to \$41,200.

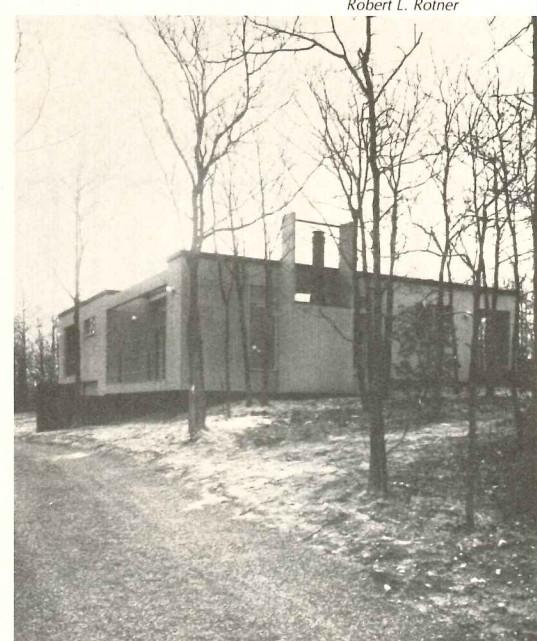
The object was to design a house that could meet the non-specialized requirements of the small family or couple seeking a vacation house. No special built-ins were called for. The rooms were to be conventionally shaped and easy to furnish with basic pieces. In brief, what was wanted was a house without idiosyncracies—a "sensible" house. One last requirement was that the house be kept as low as possible, so it wouldn't impinge upon Leader's vision. How to build such a house on a small budget, within the modern idiom, and still give it character?

Rotner used the simplest means available to him. He put the dining room, kitchen and three bedrooms all on one level, three steps

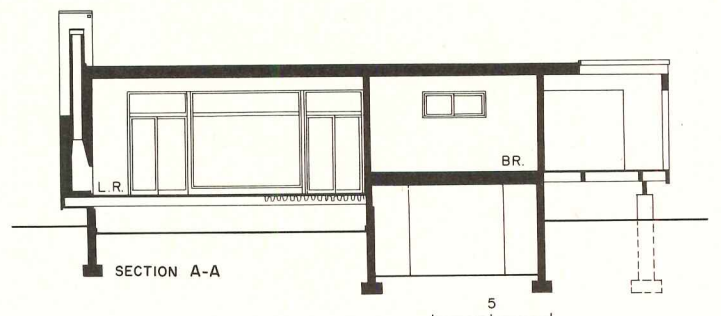
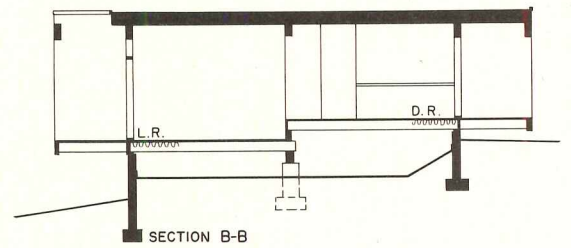
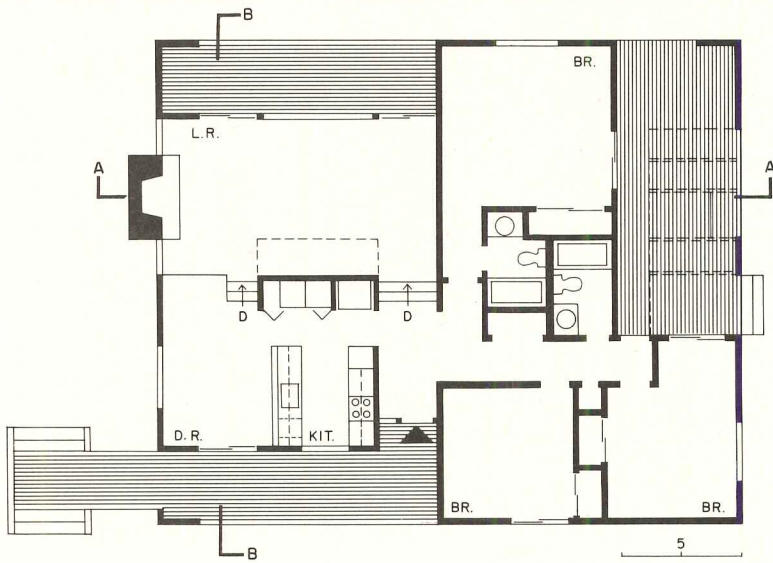
above the living room, tucking the garage under the bedroom wing. The living room is a pleasant shape, with a carefully studied ratio of wall space to window allowing easy and straightforward placement of furniture. Throughout the house the placement of windows and doors allows the rooms to be furnished without special problems.

In orienting the house and in the placement of decks, much attention was given to light. The living room faces north opening upon a deck, with windows to the west as well. The entrance porch is to the south (opposite page, top), and a deck serving all three bedrooms is to the east (above left). On sunny mornings this deck is ideal for breakfast.

As in the Burke house, costs were pared by using single-layer wood frame construction, grooved plywood sheets being used on the exterior. Unlike the other three houses, however, the exterior finish was not carried indoors, wall board painted white being used instead. Other



Robert L. Rotner





economies include standard windows and a prefabricated fireplace and chimney.

Although the furniture in the living room (above) is temporary, and the angle from which the photograph was taken makes the room appear narrower than it is, it can be seen as a simple, carefully detailed and comfortable space. The skylight which illuminates the continuous wall will enhance the room regardless of how it will be furnished in the future. The steps just visible at the rear of the photo lead to the small dining area (right). This space has also been studied with care. The window and dining room table belong together, as they do in all carefully worked out houses. Since this window faces west, early summer evening meals can be enjoyed in the setting sun.

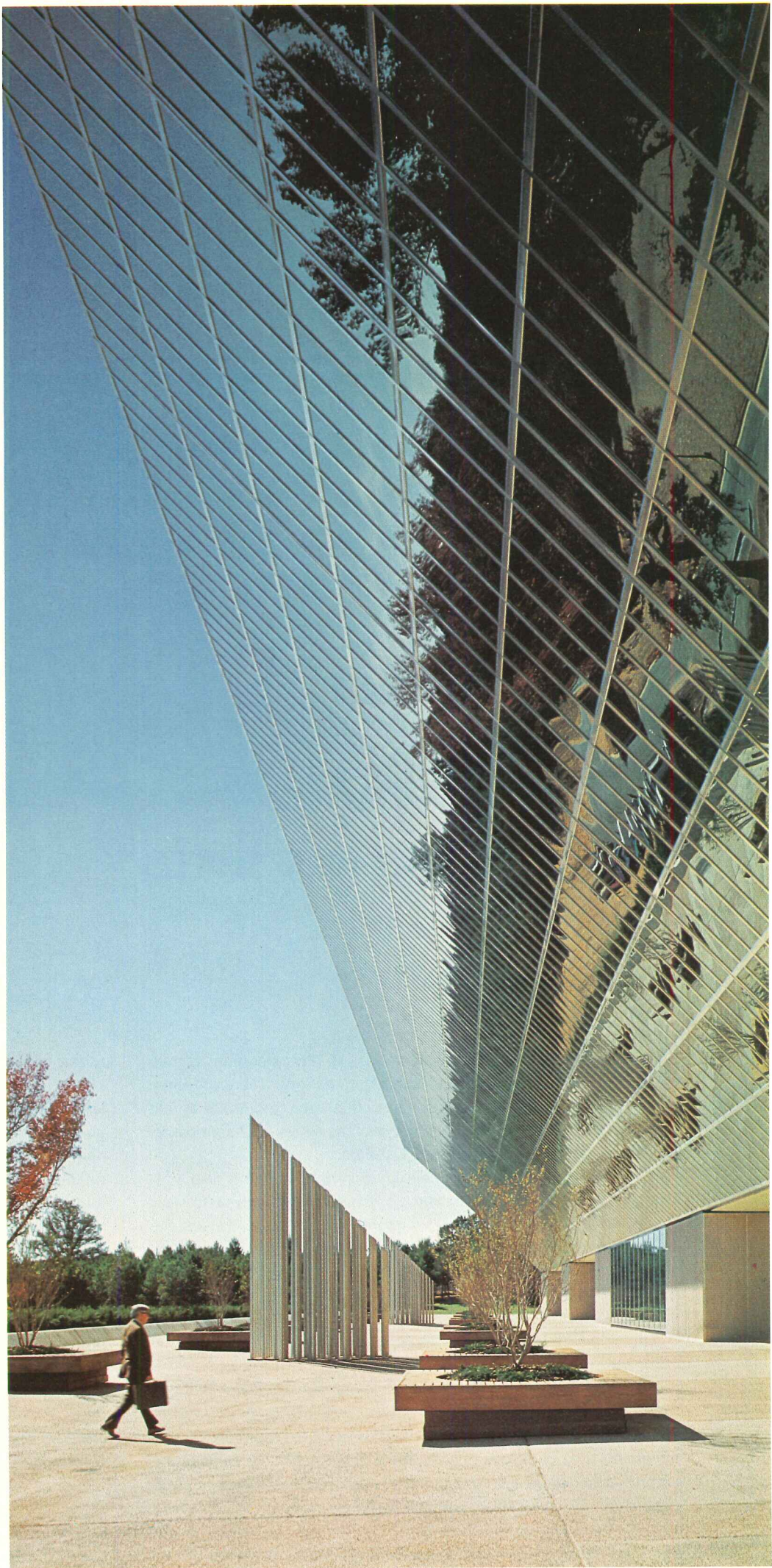
Although at the time the house was completed, it was a buyer's rather than a seller's market, up until the time he finally sold it Leader received a number of good offers attesting to the appeal of the house.

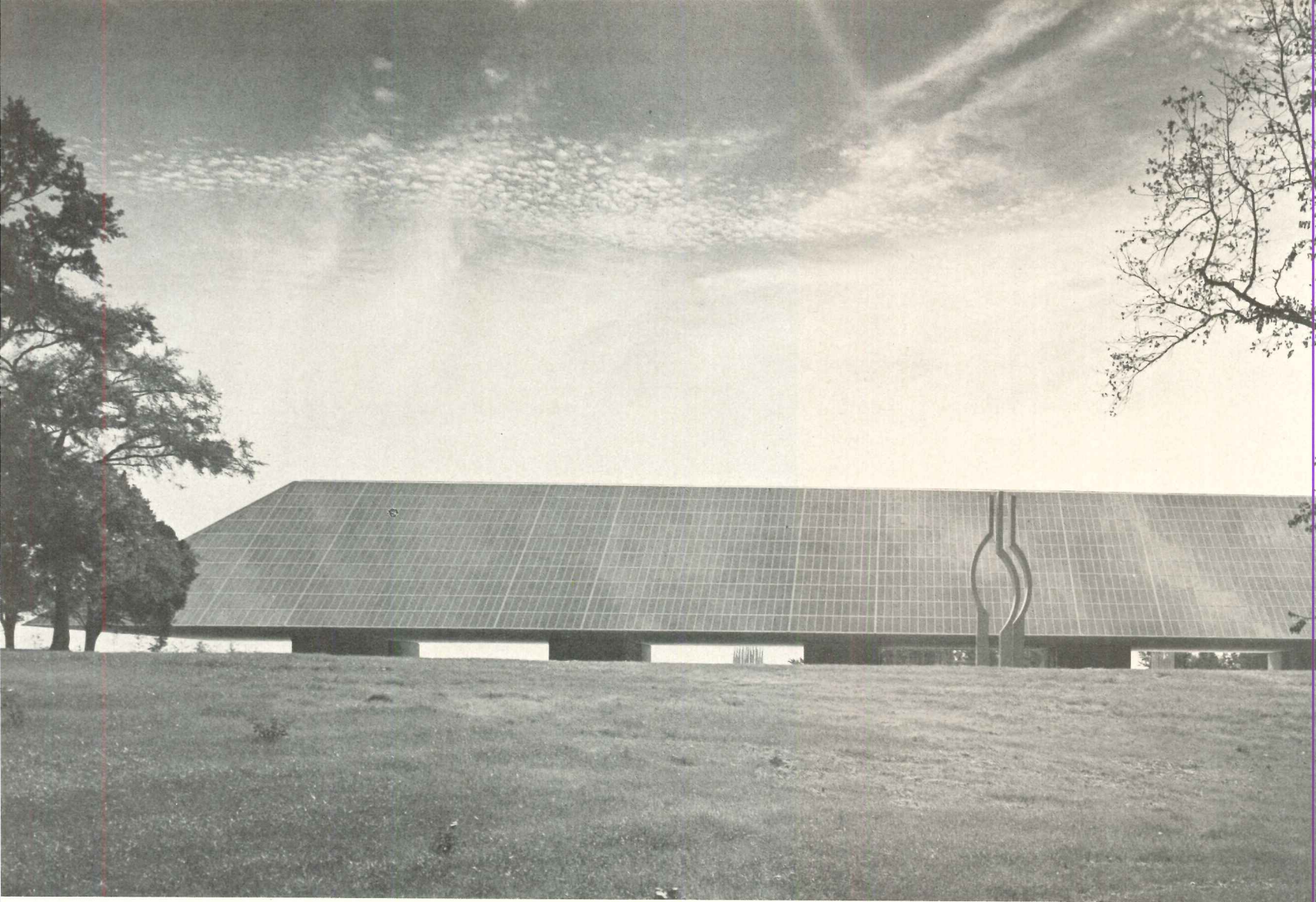


SUBURBAN OFFICE BUILDINGS

The following two projects bear obvious similarities. The striking designs are considerate of the rural landscape, while utilizing bold concepts to convey a desired message about the owners to the car-borne public on nearby major highways. Both have floors which relate like treads on a stair. But the design concepts are really very different, and indicate a range of possibilities to cope with varying programs and achieve individual and successful results.—Charles Hoyt

North Carolina Blue Cross and Blue Shield





BLUE CROSS AND BLUE SHIELD

This regional headquarters houses the day-to-day operations of two recently consolidated health insurance corporations. There are three phases planned, and this—the first—has a floor area of 225,000 square feet and accommodates 1000 employees. The site is a 39-acre parcel of countryside near Durham, North Carolina.

Architects Odell Associates designed a building that is also a literal sign, reflecting in its mirrored glass surfaces the corporate seals (projected by the tops of the rod sculptures seen on page 133) and the pleasant surrounding woodlands. A third of the headquarters volume contains backup services, mechanical equipment and storage, and this is accommodated below grade (see section). The offices for operations visually float, at the highly visible crest of a hill, in a three-dimensional rhomboid which has its long sides exposed to major highways on the north and south.

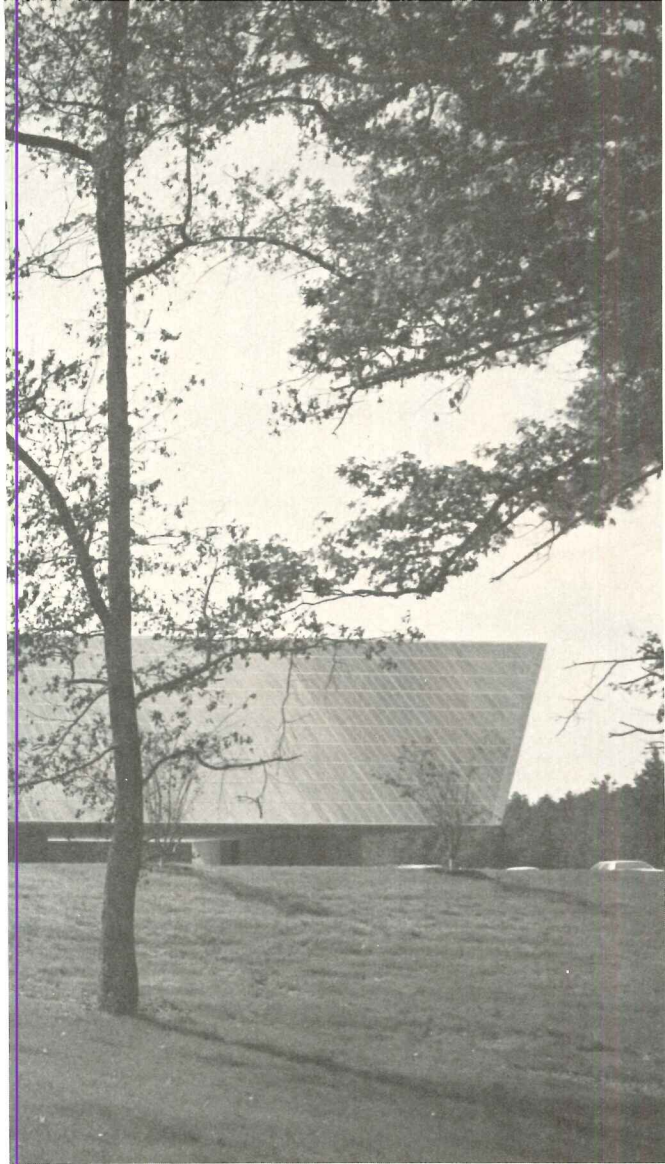
The slope of these exterior walls is more than an "eye-catching" design. It roughly parallels the sun's rays, and reduces the direct energy gain by half of that in a vertical, glass-enclosed building (despite the greater area of exposure). Coupled with the reflective value of the chrome-plated glass, the conditions here reduce the required air coolant compensation for solar heat gain by 90 per cent.

The headquarters has the internal functioning of a vertical building. Mechanical and electrical risers and elevators can go straight up

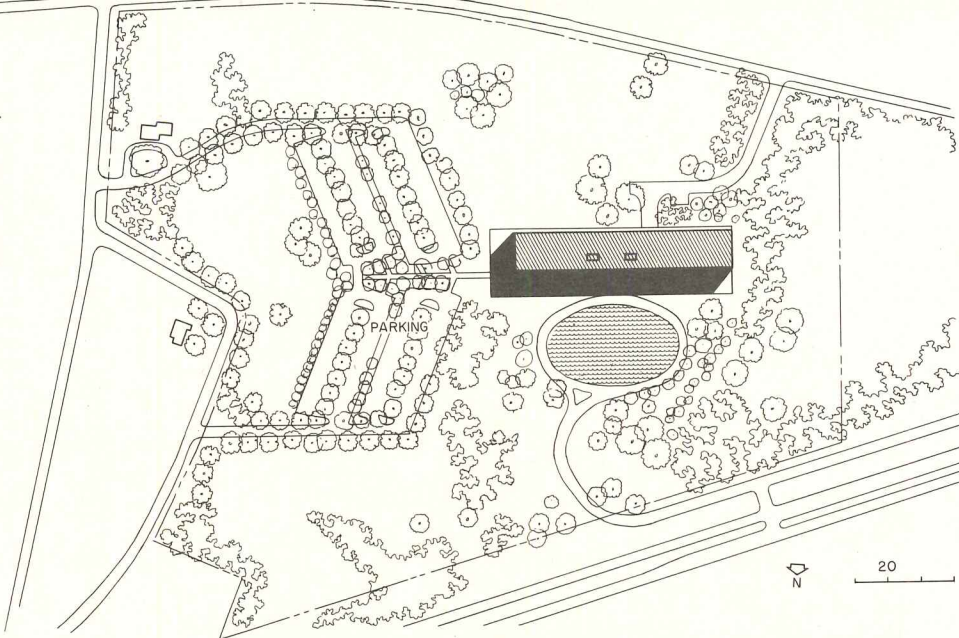
to the top, and the areas of the various floors remain constant. The clients required a large percentage of open-plan work areas. There are few "enclosed" offices, and possible problem of partition to sloping glass junctures did not apply here. There was a preliminary worry about the possibility of the building's shape concentrating wind forces on the open ground floor, but wind tunnel tests proved the worry unfounded.

In the steel structural system, groups of columns define mechanical risers, stairs and elevators and are braced together to provide the building's lateral support. Sixty-two-foot distances between the groups are spanned by deep beams. The cantilevered volumes of the building are supported by series of triangular rigid frames, with a maximum projection of 50 feet, and with a height equal to the three stories. There are two types of frames as the building ends required a special condition. The outer edges of each floor are supported by tensile or compressive members depending on the side of the building. Large floor areas are free of columns and accommodate the flexible planning. The construction cost was 9.3 million dollars.

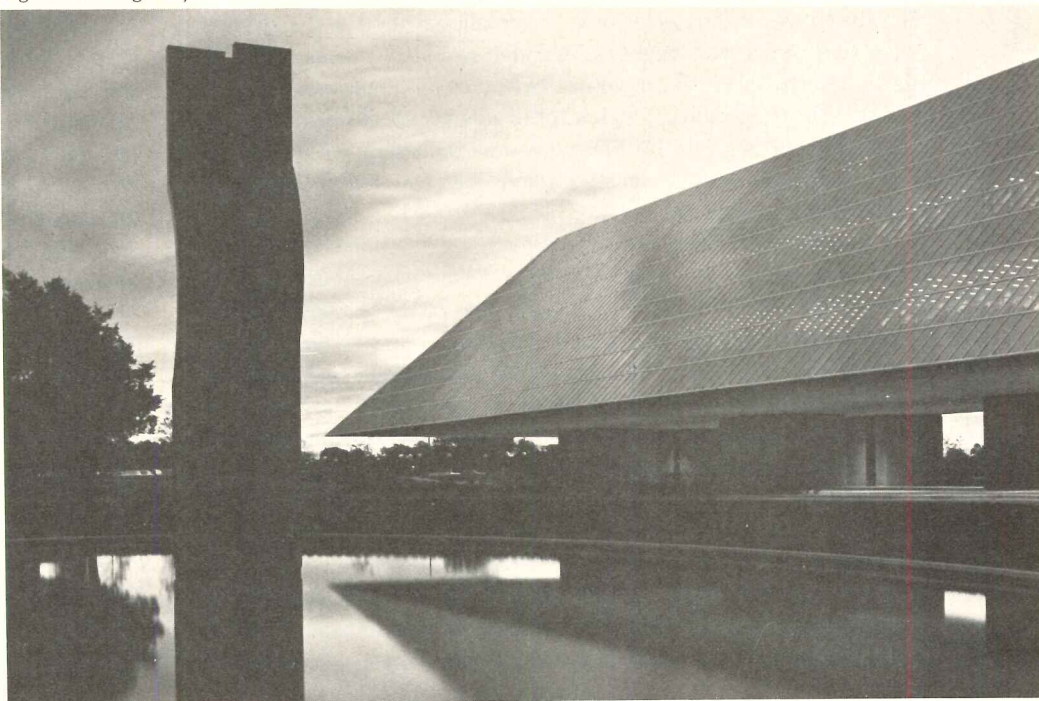
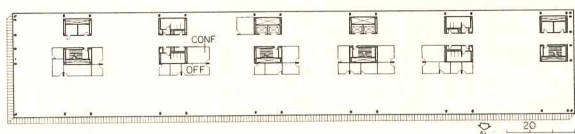
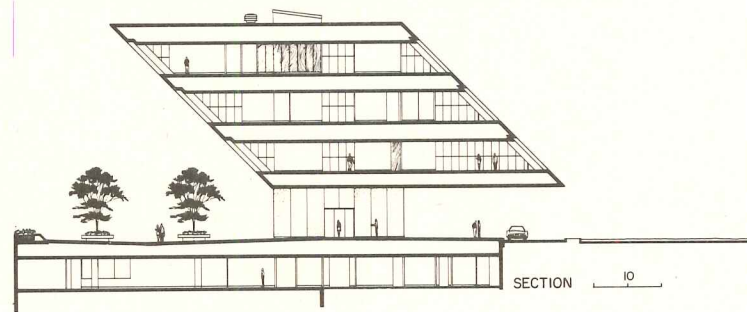
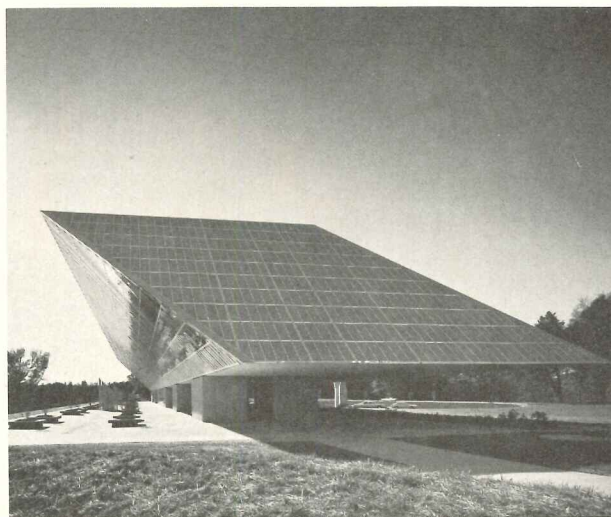
NORTH CAROLINA BLUE CROSS AND BLUE SHIELD HEADQUARTERS BUILDING, Durham, North Carolina. Architects and engineers: *Odell Associates, Inc.* General contractor: *Nello L. Teer Company.*

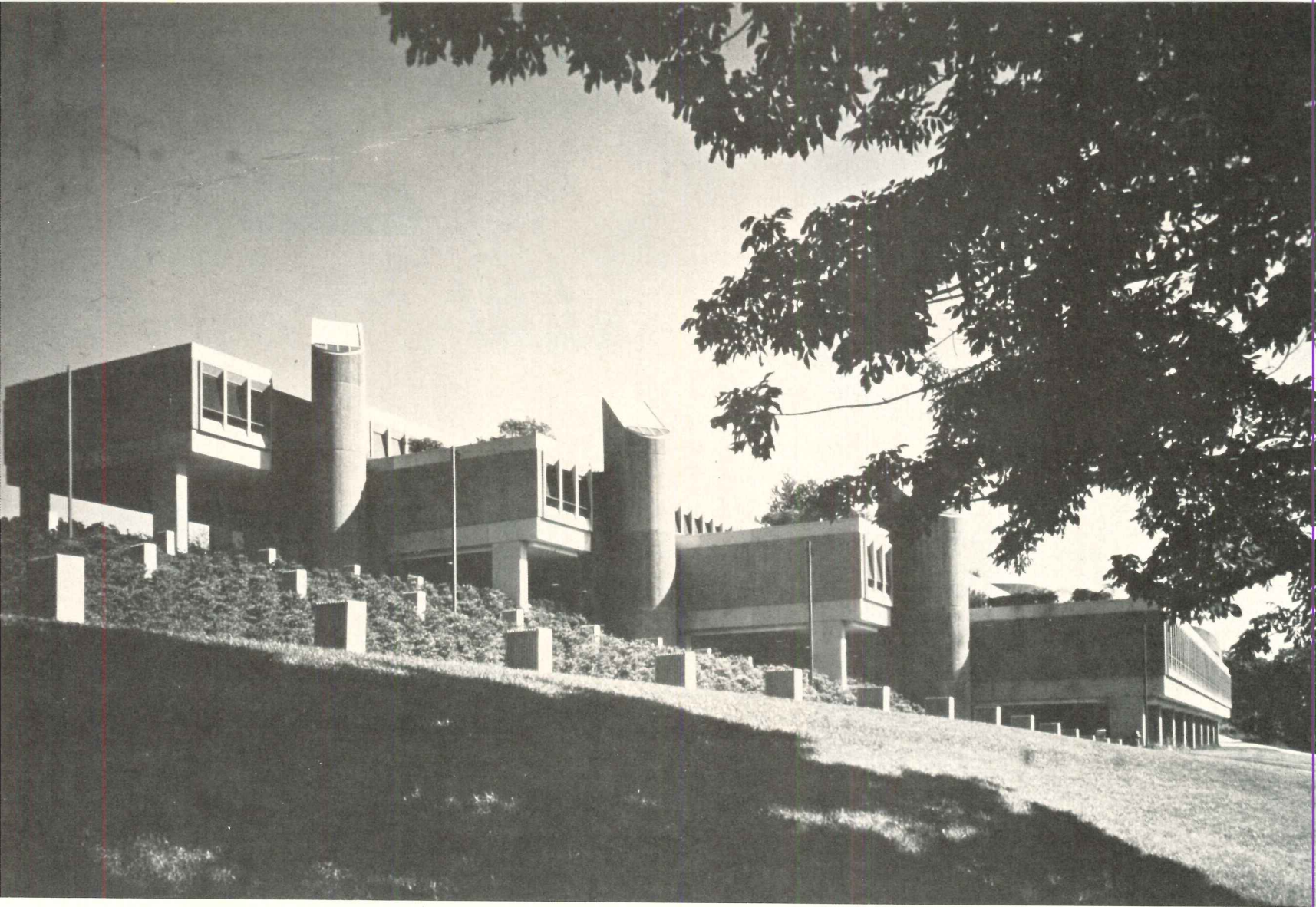


Gordon Scherck photos



Design here is meant to convey a forward-looking image, and it has advantages in reduced solar heat gain for a fully glazed building as well. Walls parallel the sun's rays. Open floor planning facilitates the relation of the angled surfaces to the work areas. Structural members stand free inside of the glass and are covered in white vinyl tubes (below, left). Other careful attention to detailing has included special elevator cabs, and a glazing support system that contains a double drain arrangement within the members to assure that water stays outside. The soffit above the open ground floor was to have been polished aluminum to complete the reflective-building enclosure, but this finish had to be replaced by cement plaster. Open parking is to the west of the building. The main vehicular entrance is on the major highway to the south and a service road enters the site from the north. Many existing trees were maintained and provide screening from the highways.





HEUBLEIN

The executive headquarters of an international food and beverage marketing corporation might be expected to reflect success by large size, but there are more important credentials for a management staff of less than 100 persons: a high level of amenity speaks eloquently of substantial pursuits. The 75,000-square-foot building is located on 20 acres of wooded hillside, facing a major highway and distant views of Hartford, Connecticut.

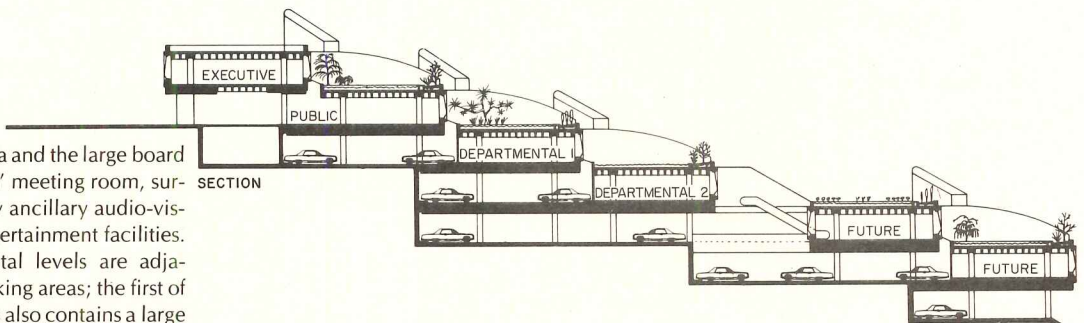
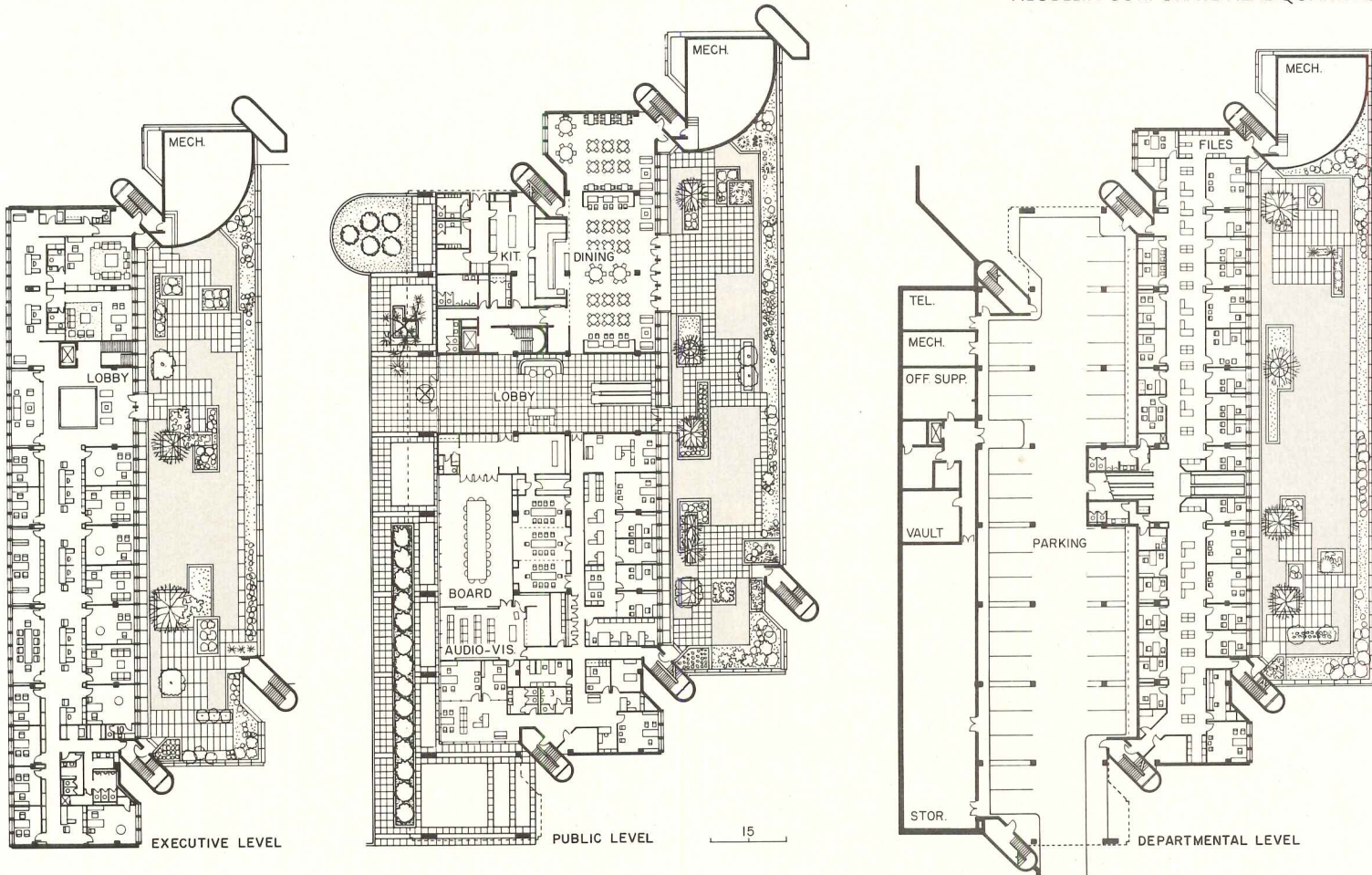
A stair-like-building form was determined after three other alternatives (including a thin tower) had been studied by architects, Russell Gibson von Dohlen. It provides an agreeable image of respect for the terrain by conforming to the natural contours, while asserting its presence by a decisive form. It has a sensible lack of visual conflict with the massive University Medical Center nearby. From the interior, it also provides eye-level views of the surrounding trees, while the projecting roofs screen the highway below.

The relation of floors has a number of interesting functional consequences. The segmented structure allows for non-disruptive expansion that is planned to continue in repetitive increments down the hillside. Covered parking (49,000 square feet) is distributed so that many workers walk directly from car to desk (see section). Vertical access is gained by a continuous line of escalators as elevators are functionally unfeasible (except between the upper two levels).

An integral part of the building's total amenity is the imaginative interior design by ISD Incorporated, which began at an early stage of over-all planning. ISD executive vice-president, Louis Beal, states that the first consideration was reinforcement of a visual relationship to the site; the means are found in the use of natural color, numerous plants and transparent partitions between windowed offices and interior spaces (initial resistance by the office occupants has quieted). A second consideration is apparent in the affluent character here which speaks far better than building size for the corporate image.

The structure is a steel frame, encased in concrete, and the exposed waffle-slab ceilings have a smooth finish. Incandescent and fluorescent lighting are combined for general illumination. Costs for a greater-than-normal foundation area are somewhat offset by reduced individual column loads.

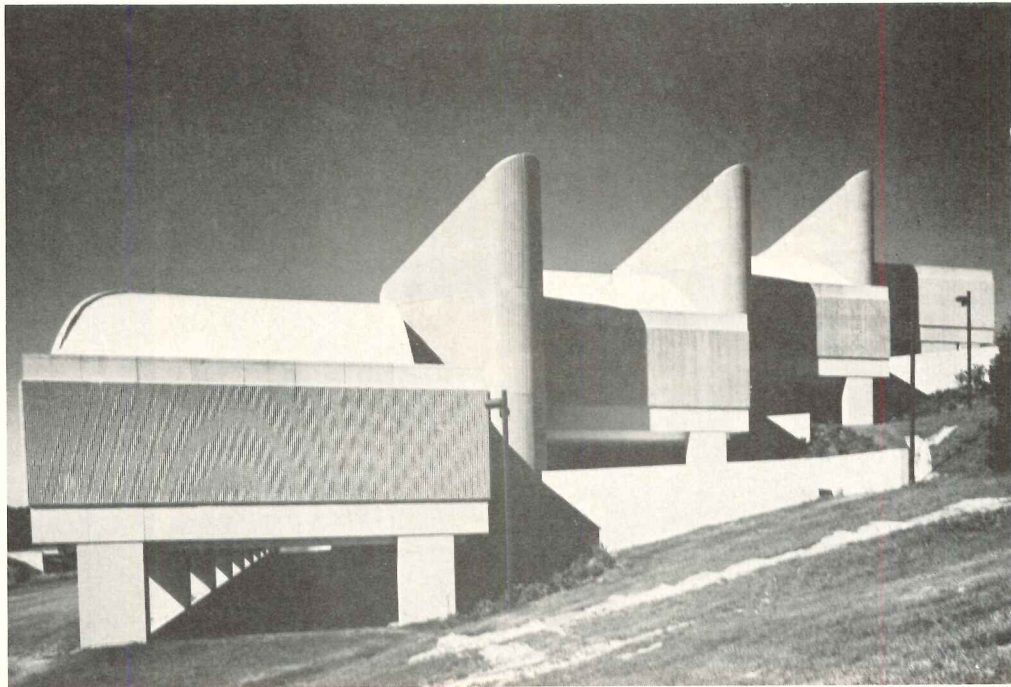
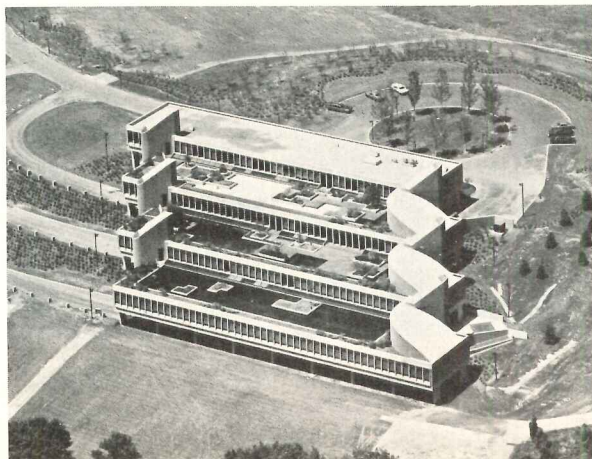
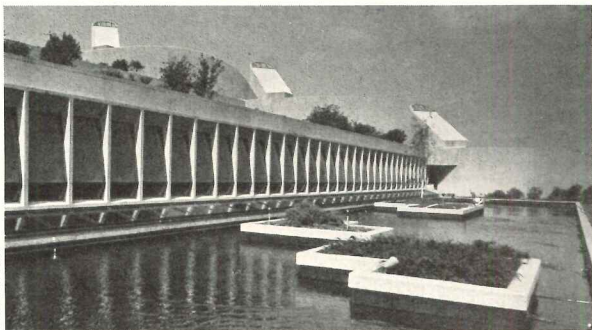
HEUBLEIN CORPORATE HEADQUARTERS, Farmington, Connecticut. Owner: Corporate Acres. Architect: Russell Gibson von Dohlen Inc.—partner-in-charge: Charles Bellingrath; project architect: Steven Turner; designer: Harry Russell. Engineers: Loomis and Loomis Inc. (structural); Donovan Hammick & Erlandson Associates Inc. (mechanical/electrical). Consultants: Ralph Gibson (acoustics); Sylvan Shemitz and Associates, Inc. (lighting); Currier Anderson and Geda, Inc. (landscape); ISD Incorporated—officer-in-charge: Louis Beal; chief designer: Joseph Rosen (interior). Construction manager: Lockwood Greene Engineers, Inc.



The stair-like relation of floors produces the ambiance of a one-story building on each rooftop garden (below), while presenting the impressive view (opposite) from the highway. Covered parking is reached by curving roads which follow the hillside contours (bottom). The executive level is the highest floor located above the public entrance level. The latter contains

the cafeteria and the large board of directors' meeting room, surrounded by ancillary audio-visual and entertainment facilities. Departmental levels are adjacent to parking areas; the first of these levels also contains a large central utility area. Mechanical equipment is contained in the angled-roof spaces of each floor. Exterior walls are poured-in-place and precast concrete.

Robert Ficks



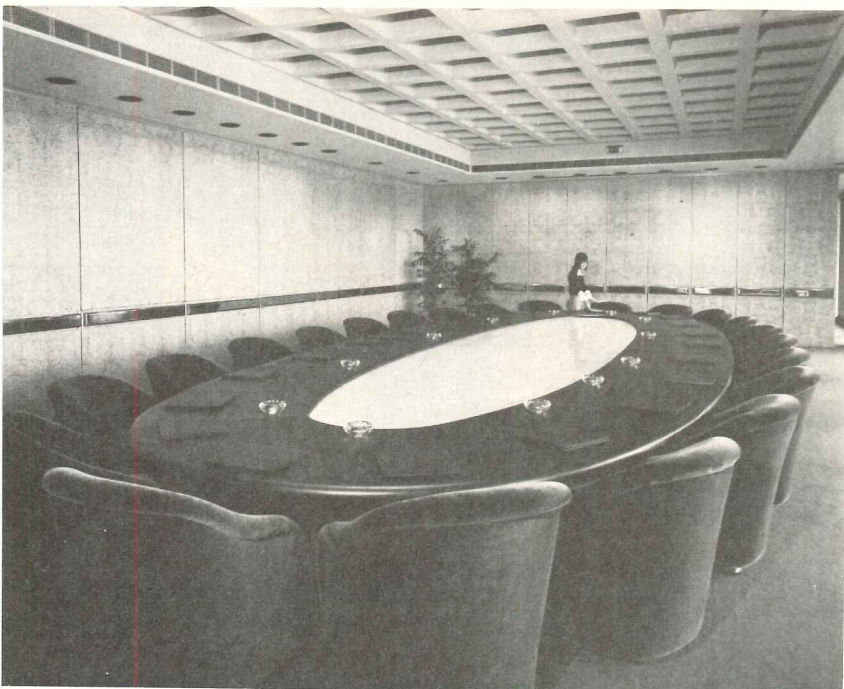


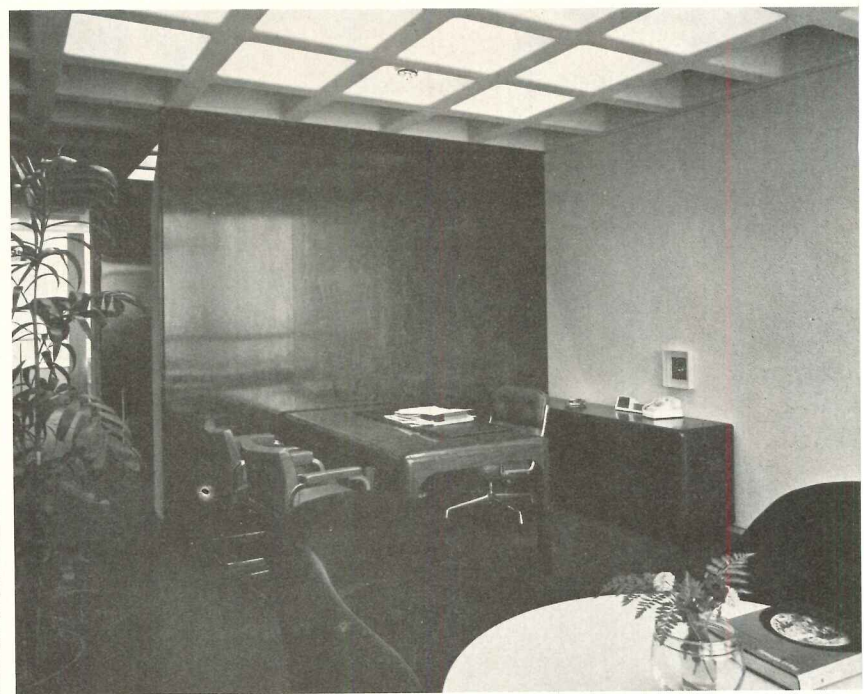
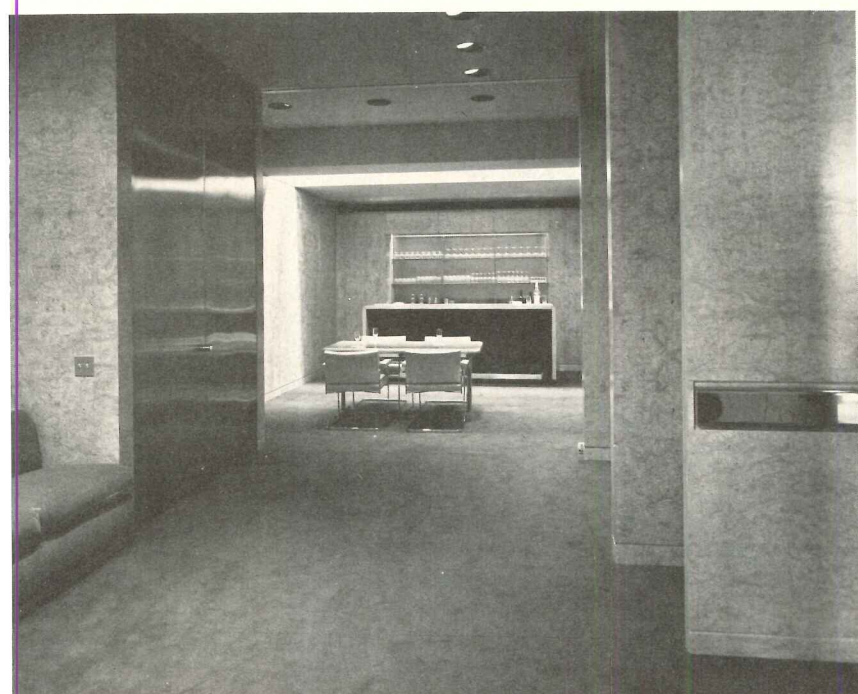
HEUBLEIN CORPORATE HEADQUARTERS

Charles N. Pratt

The main lobby (above, right) is entered under a ceiling opened to the executive floor above. An on-going art acquisition program will include a large sculpture for this location. Escalators to the lower levels and a distant view over a roof-top garden are straight ahead. On the executive floor (above) tinted glass partitions separate secretarial offices, and filing cabinets and duct enclosures, were designed to compliment angled window profiles (below) seen through glass partitions, which bring views to building interiors. The board of directors' meeting room has an ancillary entertainment facility panelled in burl oak. Exposed concrete ceilings contain recessed lighting for general illumination.

Charles N. Pratt



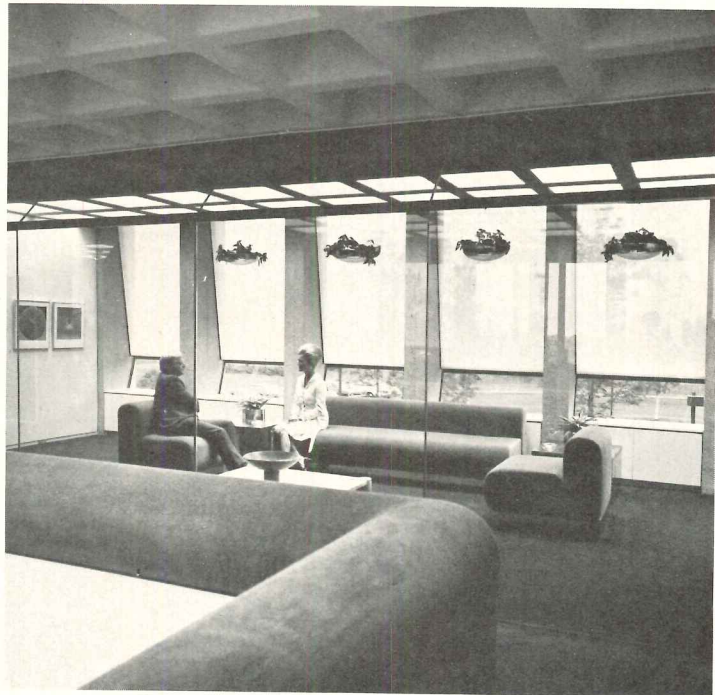




HEUBLEIN CORPORATE HEADQUARTERS

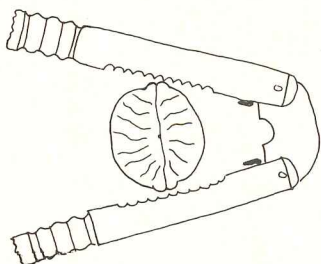
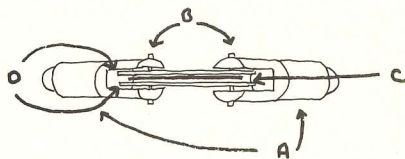
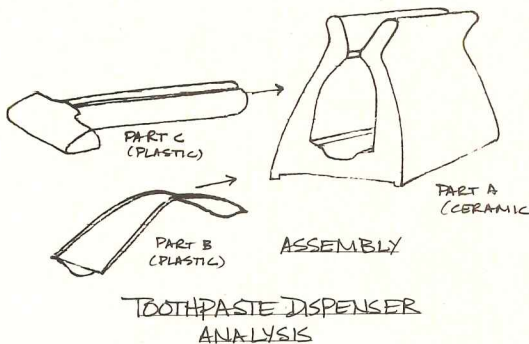
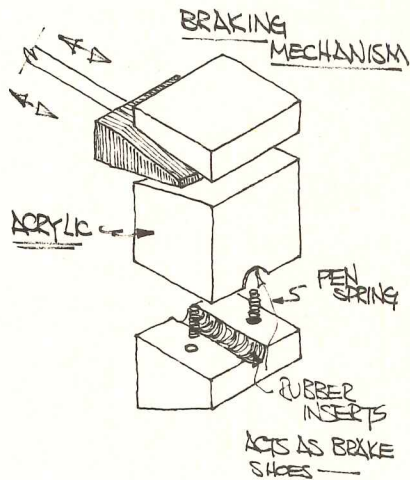
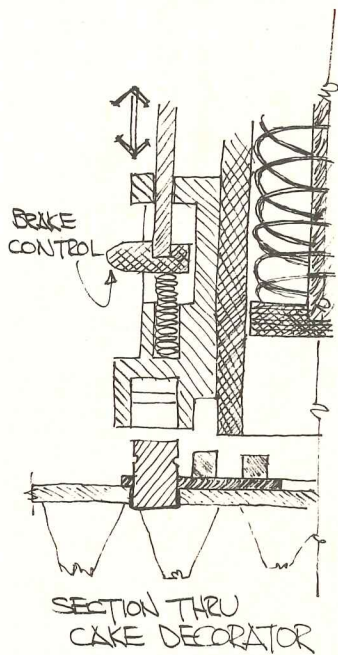
Charles N. Pratt

Office of chairman Stuart Watson (above) is designed to accommodate a low-level seating area for meetings. The cafeteria on the floor below contains brightly colored furniture and specially woven wall hangings. Window blinds were designed to operate in conformance to the angled profiles of the glazing. Plants in hanging containers will eventually trail down.



PEDAGOGICAL ANALOGY

or
How beginning students at Berkeley learn the principles of design by redesigning familiar household objects



"Environmental Design 3" at the University of California at Berkeley is a ten-week course being taught to students who are beginning their study of architecture, landscape architecture or design. The introductory problem, which takes three weeks, deals with devices and objects that in most cases are only tangentially related to the scale and kinds of materials the students will learn to manipulate later on in their education and in their careers. But by the analogy of small to large and humble to great, the redesign of familiar, handy tools reveals a clear and orderly process (or "methodology," to use the buzz-word) relevant to any design problem. The procedural realms here involve "analysis," "problem definition," "solution generation" (i.e., designing the new device), "solution implementation" (i.e., making it), "evaluation" and—last but not least—"presentation." The entire exercise is intended to demonstrate the perils of failure as well as the exhilaration of success, and, judging from some of the results shown on the following pages, it also seems capable of stimulating a lot of creative energy—as well as a few giggles.

Sam Davis, an architect who teaches the course, describes how it works: "First the students are asked to find a household object that performs some familiar function. Then they analyze the objects they've picked, giving careful consideration to two major relationships: that of the individual parts to the whole object, and of the object to the person who uses it. The analysis is done in drawings.

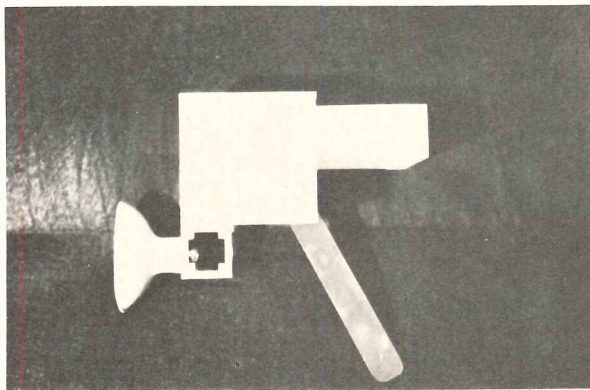
"The student must then write a new program for an object that will perform the function of the original, but avoid its disadvantages or inconveniences. The program has to be written in terms of *performance* specifications, avoiding all solution-oriented statements. This requirement is intended to help the student abstract form and function, and thereby to open up the problem to new ideas.

"At this point the student thinks that his program will be exchanged with another student who will design a new object from it. This deviousness on the instructor's part keeps the student from jumping the gun and designing the object first, then writing the new program. After all of the programs have been presented to the class and accepted, the students are told that they don't have to swap.

"Students can add new statements to their programs if they think they are necessary or desirable characteristics for the new object. These statements become the real determinants of form, and the new objects evolve from them.

"All this takes about a week. The second week is for the 'solution generation,' and the last week is for making a working prototype of the new object in the shop, and also for making a package for the object designed to promote its best features."

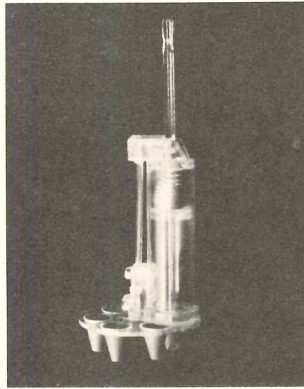
Some of the results of this design problem are shown on the following pages, with brief descriptions of the original object that was analyzed, the major program statements which determined the form of the new object, and the new object itself.—Gerald Allen



José Gutierrez

SOAP DISH

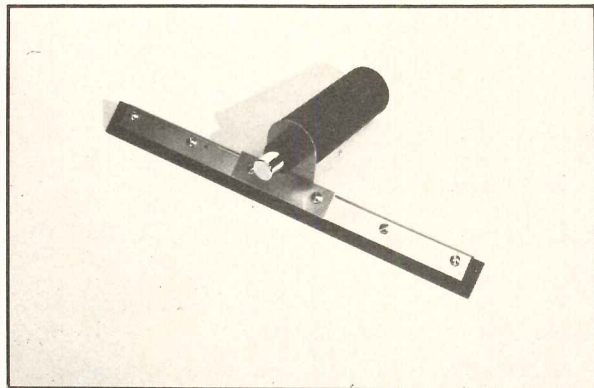
The *original object* was a molded plastic dish with spikes in the bottom to hold the soap. The *new program* called for a way to get soap into greasy hands without touching the dish and dirtying it. The *new device* is mounted on the wall with a suction cup, and it has a lever that can be operated by leaning against it and that opens a trap door. The surface on which the soap is sitting then disappears into a box, and the soap falls into the hand. Each time the door is opened it is cleaned of soap deposits.



Peter Braun

CAKE DECORATOR

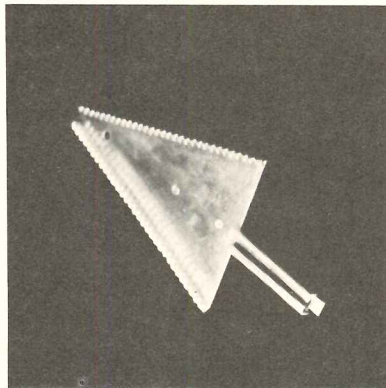
The *original object* was a metal piston-type decorator with screw-on tips. The *new program* called for an easier way of changing tips and also for a way of writing more accurately (to operate the original object you had to use two hands). The *new device* has a rotating disc with different tips attached, so that no removal is necessary. It also has a spring-loaded cylinder which is released by a finger so you can hold the decorator like a pencil, release the frosting and write—all with one hand.



Nestor Regino

WINDOW WASHER

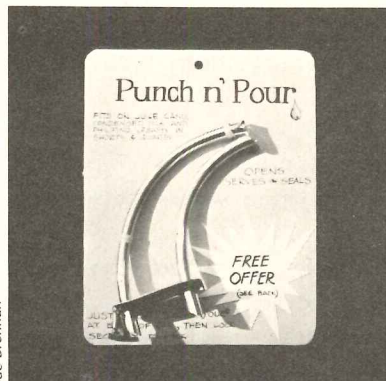
The *original object* was a simple window squeegee. The *new program* called for being able to dispense a cleaning liquid without bending over or using two hands. The *new device* is an atomizer (refillable) attached to a squeegee; the atomizer is also the handle.



Paul Chan

JAR TOP OPENER

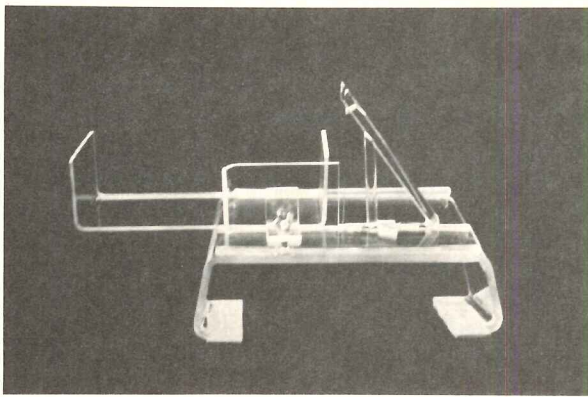
The *original object* was a two-part adjustable metal device. The *new program* called for the elimination of moving parts. The *new device* relies on geometry to adjust itself to different size jar tops and to hold the tops securely. Because of its shape and its serrated edge the opener holds more tightly as you apply pressure.



Sue Brennan

MILK CAN OPENER AND COVER

The *original object* was a round cap with two hollow spikes on the bottom. It punched holes in the top of a can and also sealed, but it only fit one size. The *new program* called for a top that would fit different size cans. The *new device* consists of two tubes in the form of a large handle; their ends are covered by a hinged cap that opens as you pour but closes in the upright position. At the base is a spring which is stretched over the can to tighten the pourer to any size.



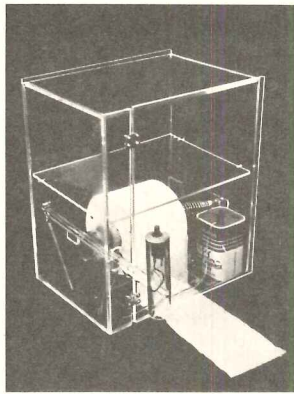
Al Ainsworth

CHEESE SLICER

The *original object* was a wire stretched between a handle shaped like a slingshot. The *new program* called for slicing and stacking in one motion and for variations in the thickness of slices.

The *new device* is like a table saw. There is an adjustable guide for different thicknesses and a sliding holder for the cheese.

The table is angled so that as the cheese slice clears the cutting wire it falls flat on top of the previous slice.



Neil Munn

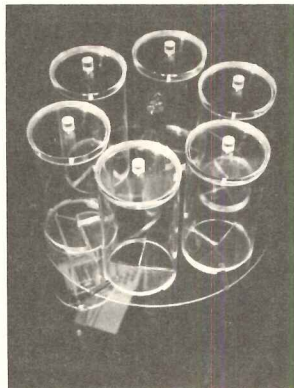
TOILET PAPER DISPENSER

The *original object* was a common ring-type dispenser.

The *new program* called for dispensing a measured amount and cutting it to avoid waste.

The *new device* which was meant to fit discreetly into a bathroom got to be huge. It is battery powered and operated by a button; when the button is released the desired amount of paper falls out of the container.

This and the following device illustrate the dangers of over-design, where esthetics, construction techniques and sheer exuberance get in the way of the program, which is ignored, or achieved only by excessive effort, thus making the cure worse than the disease.



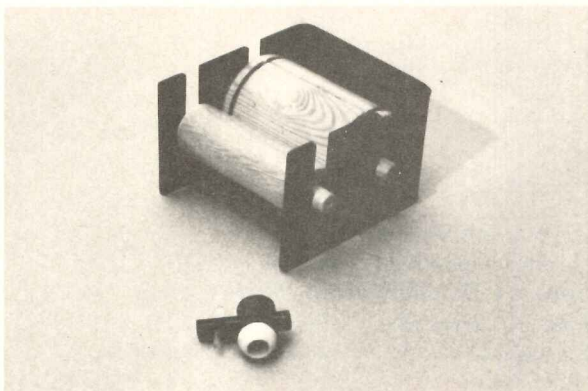
Randy Blackwood

NUT CHOPPER

The *original object* was made of two containers separated by a chopper; nuts were stored in the bottom container. For chopping the device was turned upside down, sending the nuts through the chopper and into the second container, which could then be opened to deposit the pieces of nuts on a cake.

The *new program* called for storage of several different kinds of nuts.

The *new device* works of the same principle as the original, but has a "lazy Susan" for additional containers. The problem is that a cake will not fit under it, so the chopped nuts must be loaded into another container before sprinkling.



Janis Takahashi

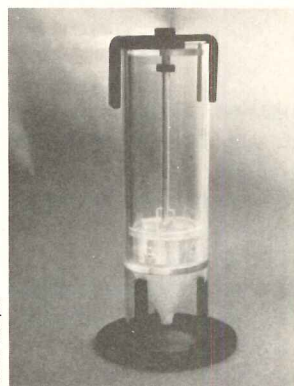
TOOTHPASTE DISPENSER

The *original object* was a ceramic device; you insert the end of the toothpaste and roll it up with a key, thus keeping it neat without wasting toothpaste. But you must use two hands.

The *new program* called for use with a single hand, so the brush could be held in the other hand.

The *new device* is a set of rollers, a plastic bracket for them, a weight (not shown) and a valve to replace the cap on the end of the toothpaste tube.

When you open the valve, the weight, which is attached to one roller, draws the tube between both rollers, producing pressure and pushing out the toothpaste. The device is mounted on the bathroom wall, and you need only put the brush under the valve and turn it on. The tube winds itself onto one roller as it is emptied.



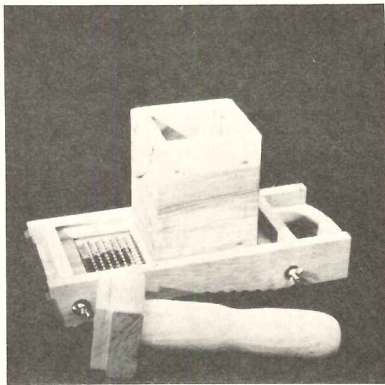
David Cooper

SUGAR DISPENSER

The *original object* was a common glass container.

The *new program* called for dispensing a tablespoon at a time with one hand.

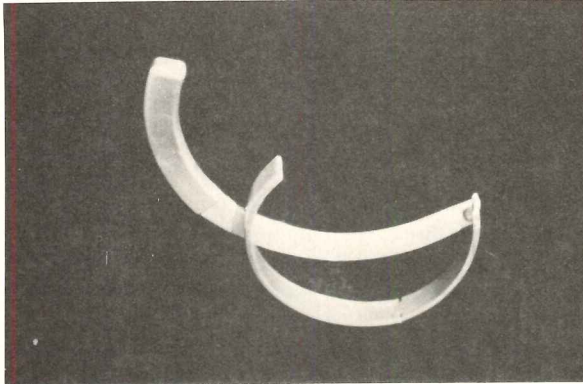
The *new device* is a cylinder which empties into a number of tablespoon-size containers at its base; but it didn't meet the program, because it got too large to be held in one hand.



Dennis Anderson

CHEESE GRATER

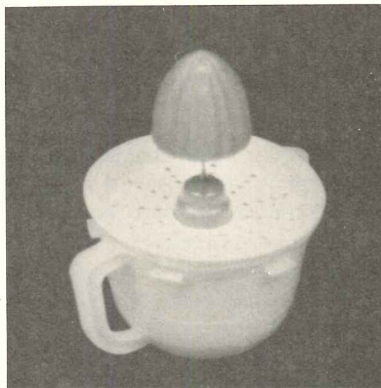
The *original object* was a sheet of metal with grating holes in it; it was later incorporated into the new design. The *new program* called for a way of attaching the grater to a bowl so that it wouldn't touch the food and also wouldn't risk grating the grater's knuckles. The *new device* is a wooden holder with a serrated bottom to fit snugly over different size bowls without slipping. The grate is mounted in the holder and can be replaced with different types. On top of the holder is a sliding box where you put in the cheese. A plunger with a handle fits inside the box to press down the cheese, and the handle is used to push the box back and forth.



Robert Gornan

JAR TOP OPENER

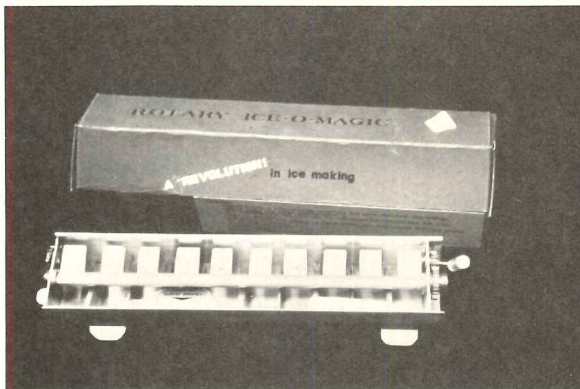
The *original object* was the same as for the design on page 142. The *new program* called for less effort and for self-adjustment. The *new device*, like the version of page 142, relies on geometry, and it embodies the principle of an oil filter remover. The sliding metal strap conforms to the size of the top as it is tightened.



Wendy Price

JUICER

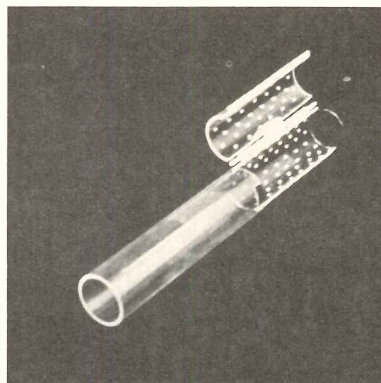
The *original object* was a single-piece, pressed-metal squeezer. The *new program* called for less effort, a way for measuring and a way to allow for more or less pulp. The *new device* uses a ratchet mechanism with an orange-shape top. When you press the orange down the force turns the top, and the juice flows through two perforated discs (to adjust the size of the holes) into a measuring cup.



Dan Abrams

ICE TRAY

The *original object* was a common compartmented tray. The *new program* called for a cleaner and simpler operation. The *new device* has the ice inside a half-cylindrical tray. Above is a flap operated from the end of the tray by a lever which, when turned, slides the cubes out. The prototype is made of aluminum, but *teflon* or another non-stick surface would be preferable.



Lisa Reitzes

TEA STEEPER

The *original design* was a small metal acorn-shape object which hung from a chain inside the teapot. It had small holes for the liquid to circulate, and a screw top for filling. The *new program* called for a way of making the tea more or less strong by stirring, and also for being able to see how strong the tea was without pouring it out. The *new device* is a glass rod about ten inches long and an inch in diameter. The bottom has small holes, so when the rod is placed in the pot as a stirrer the tea flows into the water; when the rod is withdrawn you can see how strong the tea is.

CONVENTION HOTELS

An American hybrid in hotel design

It has been said that the Grand Hotel originated in this country in the nineteenth century, and not in Europe as commonly thought. Whether this is accurate or not, the Grand Hotel has attained perhaps its most grandiose, efficient and complex state in the American convention hotel, the predominate type of hotel being built here today, according to hotel architect Alan Lapidus.

The American expertise in this type of hotel design has even become an export item, with many U.S. architects being asked to work in Europe and elsewhere, to reproduce our marvel of efficiency.

Often a cornerstone in urban renewal concepts, the convention hotel is akin to the economic revitalization of many U.S. cities, which vie intensely for lucrative convention business, using the only bait that counts, space—bedrooms and millions of square feet of exhibit floor, etc.

The architects charged with pulling together the immense complexities and spaces of a convention hotel into a coherent, manageable, comfortable and gracious building have their work cut out. When it is done well, as in the Houston Hyatt Regency shown below, everyone profits.—C. E. H.



DEVELOPING A HOTEL: CLIENTS AND FINANCES HAVE CHANGED by William B. Tabler

In the 28 years he has practiced as principal in the firm that bears his name, William B. Tabler has been closely involved in the planning and design of over 150 hotels around the world, operated by major hotel corporations: Statler, Hilton, Inter-Continental, Stouffer, Sheraton, Sonesta, Americana and others. Because of his particular perspective on hotels, he has delivered three talks to students at the University of Massachusetts hotel school, the most recent being last December. The article here is an edited version of that talk, one that deals with a changing hotel client and changing financial climate for hotel development.—[Ed.]

To be sure, there has been some slowdown in the economy. But for any business, the telephone and mails are no substitute for face-to-face selling, face-to-face problem-solving—and businessmen are going to continue to criss-cross the country and need hotels to stay in. What's more, in today's business climate, more and more industry and trade group meetings are absolutely essential; and we see more and more hotels near airports and in the major convention or airport-hub cities built for this purpose.

Hotel companies do not build anymore; they manage

There is a pattern developing and that is the pattern of hotel companies—including the great old names—not to build hotels, but rather simply to manage hotels built by others. In most of the attractive resort areas in this country, the development of hotels is being handled by the real estate interests—people of firms like Laurence Rockefeller's; the Aga Khan, who has projects in Sardinia and North, West, and East Africa; Moshe Mayer, an Israeli entrepreneur; and Olin Corporation, which is planning a chain of lodges in East Africa. A similar pattern is developing in major commercial centers—except here hotels are being used as catalysts for commercial growth. For example, in Kansas City, Hallmark is developing a new industrial and commercial center (RECORD, October 1973) around their plant, and they built the hotel which is being operated for them by Western International. Similarly, the much-talked about Regency Hyatt in Atlanta was built by the architect as part of his downtown renewal program, and taken over by Hyatt fairly late in the game. One other example is the development of hotels as a catalyst to land sales in the area. Often a real estate developer with a large tract will build a hotel to make the land around it more valuable than it was before. If you look at Figure 1, this page, the breakdown of costs of a typical hotel, certain costs are fixed. One of the variable costs is the building itself, which means that the more the land costs, the more the developer is apt to cut from the cost of the building.

To get the business, architects must cut their own costs

Like hotel-keeping, architecture is being subjected to assaults from all sides, mostly because of costs. Many clients, including developers of hotels, are deeply concerned about the high cost of building.

Architects are trying and learning a variety of new techniques to reduce their costs and thus the fee they must charge; to remain competitive against foreign architects (who sometimes seem to be less costly, but who do not provide the same services; see Figure 2), and against the proliferating groups of designer-builders in the construction industry who try to persuade clients that they "can do it cheaper."

Don't misunderstand—I understand that we cannot return to the days of the Grand Hotels. But that does not mean we are doomed to mediocrity. We can build—within reasonable budgets—hotels that have style, that are appropriate to the cities in which they are located, that offer something special.

Conventionally, it takes a year to design a building of the scale of a hotel; but with experience and the efficiencies of computer drafting and spec writing we're able to get that time down to four months. (See Figure 3.)

Not every building can be designed that fast by every architect—but for our firm, experienced over many years in hotel design, that time frame is par for the course. With a construction time of one to two years, depending on the size and complexity of the project, we can get a hotel open for business in under two years from the decision to study the project. Initially, we prepare for a fee the mortgage package for the developer to take to banks and investors. It will take us one to two months to develop the package: program, schematics, memorandum specifications, cost estimate and rendering.

The point is that in any profession, architecture or hotel-keeping, you have to begin by making use of every labor- and cost-saving technique that's available. But most good architects use these efficiencies for what they are—tools of the trade; and do not mistake them for the end results of good architecture.

The financing of hotels is these days done pretty much by cut-and-dried formula

Within the tough-to-change economic parameters are some other facts of financial life that make it more difficult than it used to be to create a fine hotel. You don't need to be an experienced architect or developer to know that mortgage money is harder to get than ever. The conventional 60 per cent mortgage is a thing of the past. That was the old rule: if the hotel man put up 40 per cent of the hotel cost, the banks would lend the other 60 per cent.

Now that the hotel companies have stopped building, it is often the developer of the downtown renewal, or the land speculator,

Figure 1

	Underdeveloped areas	Developed areas	Overdeveloped areas
Land	1%	10%	20%
Site	5	1½	1
Building (construction)	60	50	40
Furniture, fixtures & equipment	15	15	15
Fees	5	5	5
Finance tax	10	10	10
Operating equipment	1	1½	2
Pre-opening	1	4	4
Inventory	1	1½	1½
Working capital	1	1½	1½
	100%	100%	100%

Figure 2

Fees	(European)	(Tabler)
Architectural	5-6%	5%
Structural	1-2	Incl.
Mechanical	2-2½	Incl.
Quantity surveyor	2-2½	
Total	10-13%	5%
Additional services		
Continuous field representative	1-1½%	1%
Project management	2-5	1

Figure 3

Mortgage package	1 to 2 months
Preliminaries	1 to 2 months
Working drawings	2 to 4 months
	TOTAL 4 to 8 months
Construction	1 to 2 years

Figure 4

Room cost:	\$1000 X room rate
Areas	Convention hotel area per room (450 sq ft BR + 250 sq ft Pub. & Serv. = 700 sq ft/Rm)
	Holiday Inn area per room (450 sq ft BR + 100 sq ft Pub. & Serv. = 550 sq ft/Rm.)
	Bedroom net area 50 per cent (225 sq ft of 450 sq ft)
	Banquet room net area (10 sq ft/person)
	Coffee shop net area (15 sq ft/person)
	Lounge-bar net area (20 sq ft/person)
	Dining room net area (20 sq ft/person)
Feasibility	Cost/sq ft X Rm/sq ft = Rm cost X 2 ÷ 1000 = Rm rate (example: \$200/sq ft X 70 sq ft = \$14,000 X 2 ÷ 1000 = \$28)

who comes up with the equity money—and with different kinds of strings attached than the old hotel operator, whose goal was a good hotel, not a successful land speculation. That's one piece of bad news. Another:

The bank that takes the mortgage, even at today's very high interest rates, wants a piece of the action. In other words, today's smart and aggressive bankers don't just want to loan money in return for interest payments. Having decided that a project will be very successful, they demand, in return for the loan of the money, participation in its success.

The variable mortgage rate is another nice deal for the banker, and not such a good deal for the hotel man. A variable mortgage rate is one in which the interest rate charged on the outstanding portion of the loan is allowed to change with the prevailing market rate. This sounds fair—but it would never work to the advantage of the hotel owner.

One new financing scheme that works is the condominium hotel. This is a relatively new technique, used by developers of housing projects as well as hotel developers. Essentially—and this, of course, drastically reduces both the equity money needed by the developer, and the mortgage—individual rooms in a hotel are sold each to a different owner. He has the use of the room when he wishes, and on other occasions it is rented by the hotel manager to transients.

This is most common in resort areas, but recently, this financing technique has been used to build hotels in convention cities. Here, the purchaser of rooms or suites may be a company that regularly makes a major presentation at trade shows in that city; or which needs a suite for visitors in its headquarters city; or needs a good address in major cities like New York or Chicago or Los Angeles.

What's needed in the financing of hotels is more imagination

One of the many problems of the hotel industry is that there are too few new ideas. The "wunderkind" of the hotel business these days is Trammell Crow, the young Texan who had the nerve to back a young Atlanta architect named John Portman who wanted to build a hotel with a 21-story atrium court—an idea which clearly was extravagant and inefficient and against all the rules of hotel development, except that it worked. Trammell Crow comes up with a new wrinkle per week; one of his newest is persuading cities that they need a hotel and should finance the hotel with municipal revenue bonds at low interest, much as states give industries free land and a big tax break if they locate their new plant in the state. He's also good at finding men with land and persuading them to put in the land as equity if he builds a hotel there, a cost advantage (no land cost) which puts him in a very favorable position to profit from a new hotel.

The reason we need new imagination, new leadership, new concepts is that the only thing that has allowed the industry to keep going under the old ideas is inflation. As I mentioned earlier, construction costs are going up at a rate far in excess of general cost increases; one per cent per month is not uncommon. (For a breakdown of current costs and workable space allocations, see Figure 4.) The rate of inflation has been helping hotel construction. By the time a hotel is complete and ready for occupancy, room rates that would have been too steep at groundbreaking time have become reasonable. When John Portman's 2000-room Times Square hotel opens, rooms will probably rent for \$70 a night. It sounds unreasonable, but it may not be in three or four years.

Room rates may be \$100 per day by 1980

There have been estimates that hotel room rates will double by 1980. And this estimate is made by one of the brightest men in the field, Stephen W. Brener of Helmsley-Spear, the New York City-based realtor. Mr. Brener feels we have reached the end of the line in using inflation to get convention hotels built. In fact, he sees a complete halt in construction of this building type, unless new financing means, coupled with supportive tax measures, are developed soon. Instead, Mr. Brener predicts more non-convention, luxury hotels will be built, with room rates probably reaching \$100 per day by the 1980's. Personal incomes may have gone up some, but surely they will not have doubled. This means that to attract people, we will have to offer something better. And that something better begins with good design.

One example is the Century Plaza Hotel (RECORD, August 1966) in Los Angeles designed by Minoru Yamasaki. The handsome garden behind this hotel forms its own environment, a quiet spot in the center of a rapidly developing area, and creates a view for half the rooms in the hotel.

Now this is not to say that special gardens or multi-story atriums are an essential part of the environment of the hotel of the future. Two or three hotels with atriums have a special appeal; when there are 200 of them an atrium will be nothing special. What we need are more fresh ideas for hotel environments. Unfortunately, developers may be reluctant to invest in extraordinary design as costs soar. Several developers of one lovely new hotel have recently suffered severe losses on it.

Where else do we begin when we try to do something better? Oddly enough, another hope is energy conservation. It's pretty hard to find anything good about the energy and fuel shortages with which we all have just begun to struggle. But many architects see in the energy problems that face us some better opportunities for design, for the reason that we think

the energy crisis will make clear to many clients some basic engineering and cost analysis ideas which we have understood for some time.

We have, in recent years, forgotten some old truths of designing buildings: sun shading; siting of buildings so that the solar load is minimized. A typical rectangular hotel consumes perhaps a third more energy in air conditioning costs if its windows face east and west than it would with a north-south orientation. We've been saving too much money in our equipment and materials—because owners predictably (and this is notably true of hotel developers) keep pressing for lower, lower, lower first costs. As a result, our engineers have been pressed to specify lower-quality (and therefore cheaper) air conditioners, clear (and cheaper) glass where heat-absorbent or reflective glass should be used to cut solar load. We've been forced, by owner pressure, to skimp on insulation, and on sun shading (perhaps in the form of fins, or deep insets of the window).

The new factor—the new hope I see that from this present crisis may come better hotels—is life-cycle costing. It does cost more in first costs to use better glass, more efficient mechanical systems, to add as a design element some form of sun shading. But in the interests of conservation and because fuel and electric power are clearly going to become much more expensive very quickly, the whole cost equation of lower first costs vs. lower operating costs is changing.

Closely related is the question of appropriateness of a hotel to its city. The Plaza in New York with its 19th century ornateness, its plaza out front, its views of Central Park, seems somehow just right for New York.

Hotels like that do something that few new hotels do. These hotels reinforce the uniqueness of the city where they are. San Francisco is a city of not just great physical beauty, but of great spaces: in the Palace Hotel's Garden Court, the rotunda of City Hall, the crystalline lobby of the Crown Zellerbach building, and the court of the old City of Paris store. The 17-story lobby of the new Hyatt Regency San Francisco, by John Portman, is therefore in a tradition of great spaces, as RECORD editor Betty Thompson said in the September 1973 issue, page 145. These are great people spaces.

Let me repeat a phrase I used earlier: I think that—at a time when more and more hotels (like more and more aspects of our life) are becoming standardized—we need more and more hotels that reinforce the character of the city in which they are built.

That takes good architects, and it takes good clients; clients who honor the character of the place where they want to build. Must our highest goal be the lowest common denominator? We must bring the hotel industry back from dullness and sameness.

thumb is to tighten the service circulation. Eliminate long passages; wandering employees are an inefficiency.

In Atlanta, we have designed something special for room service because it is a big convention hotel; in convention hotels, you are going to get a big run on room service. So we developed what we call a flying kitchen; the idea was taken from an airline galley. In this case, we put the galley in a large elevator. There is no limit to the elevator size you can build; hoisting machinery is basically the same. To make a bigger cab and shaft adds practically no extra expense. Of course, elevators are always trailing their cables so you can put anything in the cab; we are installing warming ovens and chillers.

We have a standard airline type menu for breakfast, lunch and dinner. When room service gets the call, it is transmitted to an auto-writer terminal in the elevator. A constantly revolving crew of waiters can deliver the order within ten minutes to any room.

Know what employees are doing, where and when

Depending on the class of service provided, figure on approximately one and a quarter to one and a half employees per guest room, including one maid for every 13-14 rooms. When you plan, you have to not only know how many employees the hotel will use but when they're doing what they do. Maids are trooping in the morning and should be through

by mid-afternoon. The majority of dining room staff come on at night.

When a hotel starts to get sizable, remember the number of service elevators and what they are used for. There is usually heavy use for room service first thing in the morning. The maids also want to use the elevators in the morning. Part of the problem can be solved by having the maids charge their room carts the night before (each maid has her own cart). Therefore a service room on each floor capable of taking one cart for each 13 rooms should be provided for night storage.

The carts could also be brought down at night when the service elevators are empty, brought to housekeeping and charged. If carts are charged in the basement laundry and kept there overnight, you need a bigger holding area in the laundry and less on each floor.

Regardless, the carts must be left under absolute security or the towels and sheets will walk away. So if the cart room is on each floor, it has to be locked independent of the service elevator. You also need linen and trash chutes in the service area on each floor.

We recommend using one passenger elevator for service in the morning. This is a key-operated elevator with a two-way door that can connect to the service area; in the morning when there is a heavy run on room service generally there is not a run on passenger elevator service.

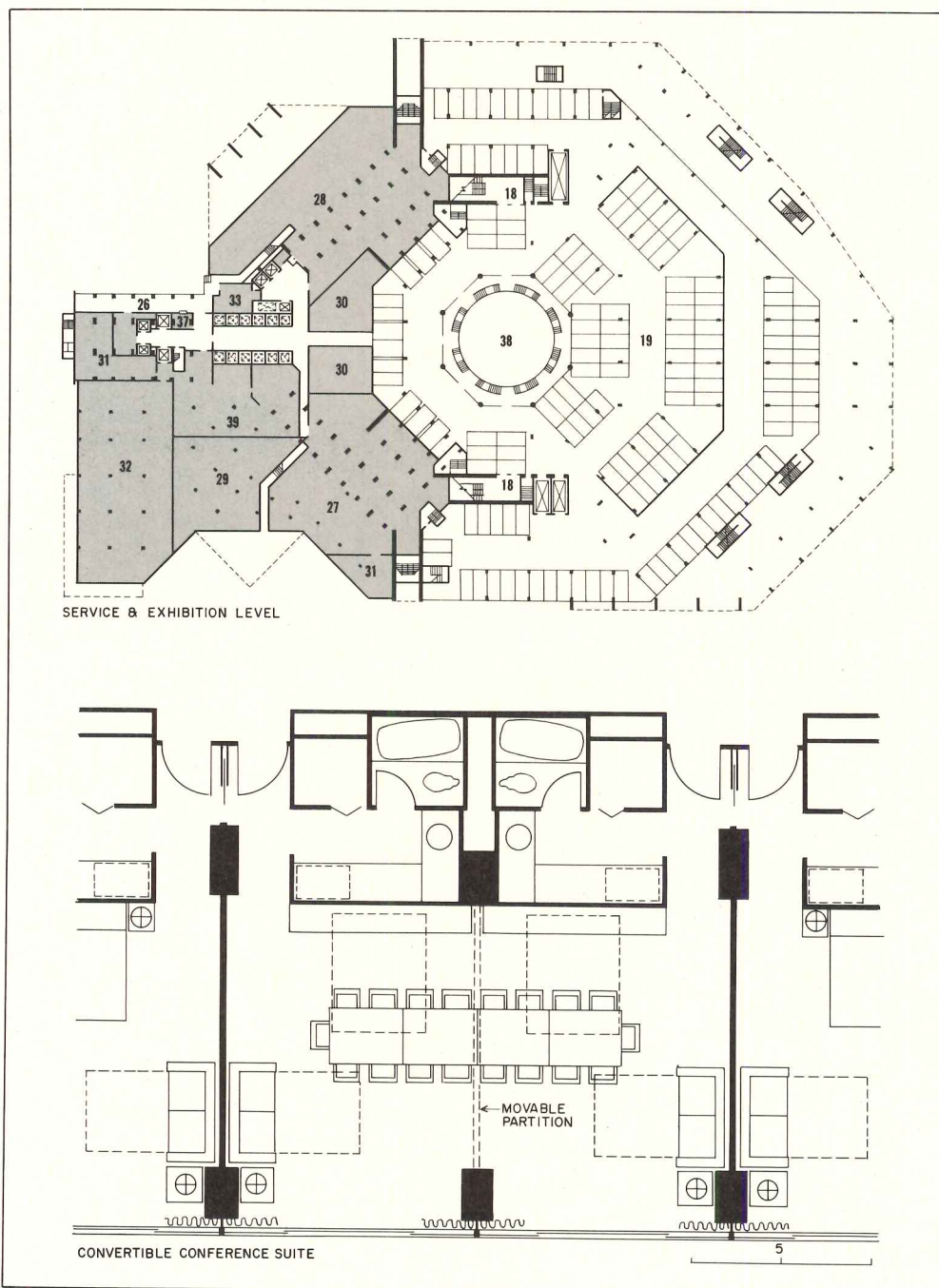
Parking space can do double-duty if planned well

We took a portion of the parking garage in Atlanta, and applied electrical juncture boxes on the columns; we also ran lines for hot and cold water to fan coil units with cut-off valves so they will not run off the plant normally. When an exhibition space is needed, the hotel will paint the space, turn the valves so the fan coil units provide heating and air conditioning, and plug in spot lights. On that level are the loading docks, so heavy equipment can be brought right to the exhibit floor, through folding walls near the elevators.

Plan the rooms for business meetings

There is an enormous need for conference space in convention hotels. For the Phoenix of Atlanta, we found a way to provide the conference space, without sacrificing bedrooms.

On the second floor only, we paired rooms making the common wall a sliding partition (see plan); thus, we have ten conference suites, 18 by 27 ft 6 in. On the wall where we would normally place the double bed, we will install an updated version of the old pull-down bed, in a handsome paneled wall unit. With the bed stored and the partition open, the hotel can rent the room during the day for meetings. Extra storage is provided on this floor for chairs and conference tables.



Make the most of ceremonial spaces, less of the rooms

When we do a hotel, we first separate the ceremonial spaces from the rest and concentrate on these. In other words, a room is a room. We try to make it as good, efficient and comfortable as possible, but I consider it idiocy to spend money on the rooms. Anything spent on the rooms is a repeat cost, so if you have 400 rooms and use a \$100 detail in each, you have—for even a little hotel—a big extra expense you don't need.

In the Charleston project, we did not have the money for the kind of multi-story ceremonial lobby used in Atlanta, and we had only 400 rooms, so we took another ceremonial space: the cocktail lounge-restaurant. People

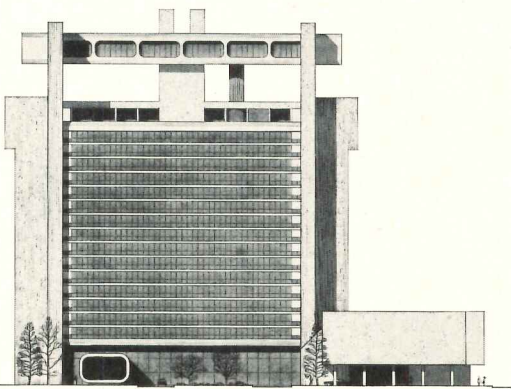
can see this landmark all over the city of Charleston. It is visible; we wanted to pull that out and say this is "special." It is held aloft by the stair towers and mechanical tower, and connected to the top floor of the hotel by a glass elevator. It's a \$200,000 premium we're spending, not very much divided by 400.

The cost is tremendous to put in a separate kitchen and restaurant such as this. It has to be very successful—if they're successful they work. When I designed the restaurant, I also designed the menu. I have to know exactly what will be served there, because that determines the kitchen. When I showed this to the client, I said it was going to be a broiling kitchen. There are no huge steam kettles, tremendous ovens, or extensive ranges. There is

one line of broilers, so the restaurant will serve steaks, chops, lobster tails; with a radar range, fowl can be offered. Vegetables and basic soups that are prepared downstairs can be brought up and held.

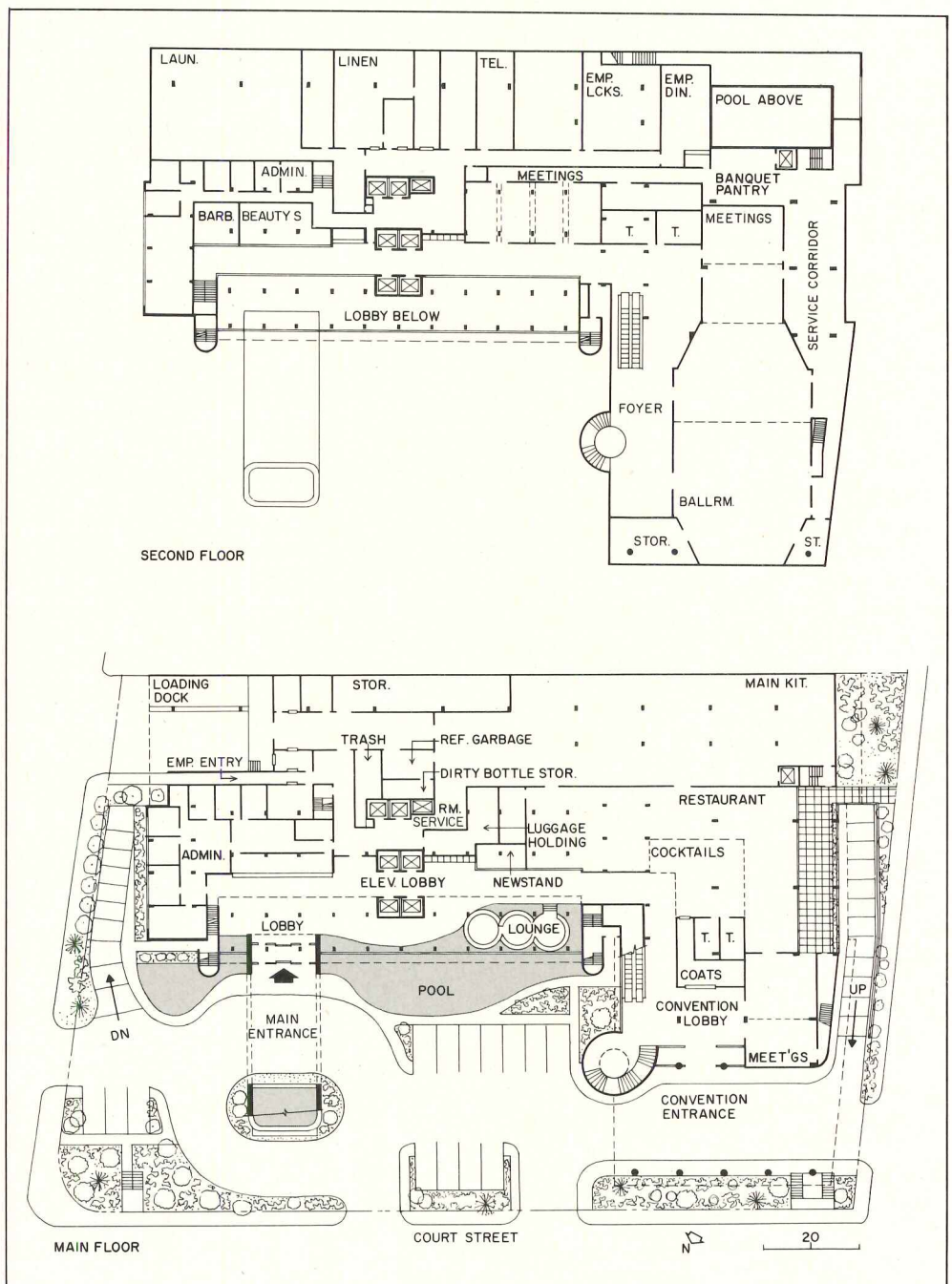
But as I said, there is a cost for remoting a separate kitchen and dishwashing operation. The client cannot have an inexpensive restaurant on top. What usually pays for it is the liquor. The hotel will probably break even on the food, even with outrageous prices, but everyone will go to a restaurant like this for a drink, and liquor is the high profit item.

The guests will be a certain captive trade within the hotel, but if the developer can also have some kind of magnet to attract outsiders, he can make back his investment.



Traffic well-defined in small convention hotel

This small convention hotel proposed for Charleston, West Virginia is part of a major downtown renewal project, as are many new convention hotels being built today. As the plans at the right show, vehicular traffic for the hotel and convention businesses is separated, but interconnected. Inside, service circulation is tight, and designed—as all hotels should be—so that staff never cross public spaces in the performance of their duties. In the Charleston hotel, there is a straight line from receiving, with no other way out of the kitchen for employees and goods, than what is intended. Security and efficiency cannot be overemphasized in planning a hotel. Note the large service hall outside the convention hall. The size is sufficient to accommodate large rolling electric carts used during banquets. Dishes prepared in the main kitchen on the floor below are placed in the carts, which are plugged in near the ballroom doors for easy access by waiters.



HOUSTON'S HYATT REGENCY: COHERENT EXPRESSION OF MULTI-USE SPACE

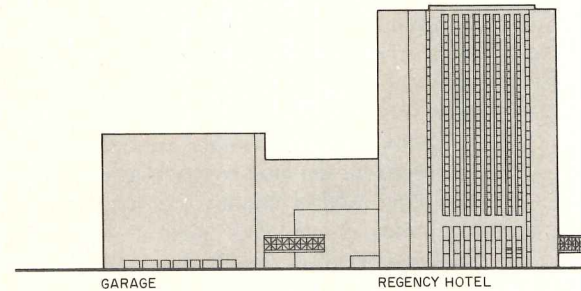
Located in the heart of Houston's business district, the 30-story, 1,020-room Hyatt Regency Hotel can be justly credited with enhancing the city's flourishing convention business.

Developed by a joint venture client, the hotel was also designed by a joint venture: JVIII, consisting of three firms: Koetter Tharp & Cowell; Caudill Rowlett Scott; and Neuhaus & Taylor. The client consists of The Houston National Company, a subsidiary of Tenneco Realty, Incorporated, and the PIC Realty Corporation, a subsidiary of The Prudential Life Insurance Company. Together, these joint ventures are responsible for a complex including the Hyatt hotel, a 15-story public parking garage and a 47-story office building (below, extreme left) known as 1100 Milam. Linked on three

levels, the buildings are related in color—a bronze tone—to the near-by Tenneco building; the complex is in this way further distinguished from the rest of the light-colored downtown buildings such as One Shell Plaza (SOM) shown extreme right, page 153.

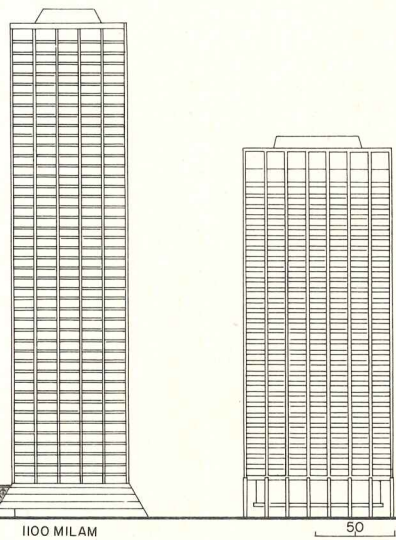
There is also a functional connection between the buildings in that the parking garage accommodates central mechanical services in its penthouse, providing the entire complex with hot and chilled water. This realized some economies, and speeded construction.

With a second-stage office tower planned, it is clear that the hotel—at the convergence of major circulation patterns—is the prominent service center, as well as the most likely oasis, for a growing business community.

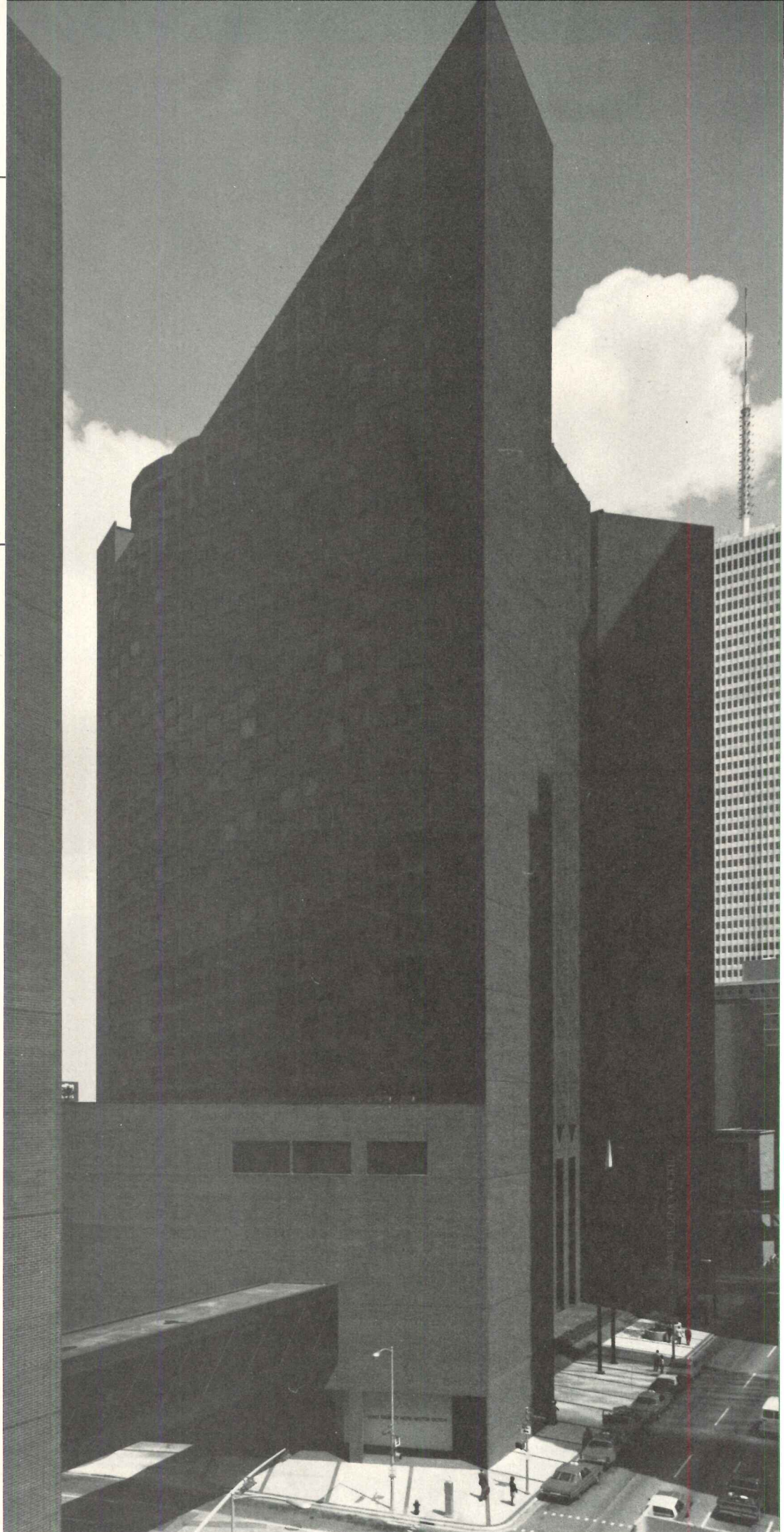
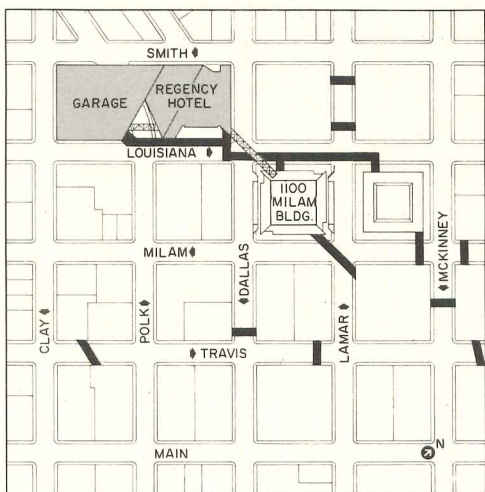


Julius Shulman





Reinforcing the relationship between the hotel and its business neighbors is its connection physically by underground and overhead linkages in the downtown center. A tunnel already existed between the Tenneco building and the hotel site; it was later extended to the garage. The skywalk system (one level above grade) reflects a decision of the building owners to protect people from weather without forcing them into burrows beneath the ground. The bridges also have the advantage of being about half the price of tunnel construction. The strong three-way interlacing of buildings exposes them to every form of traffic, an important factor in their commercial success. The buildings thus are related by circulation routes and by colors and materials. The brick paving of the hotel lobby floor is taken up by inlaid brick strips to break up the concrete surface of the parking garage. The office building's ground floor will be paved in the same brick.





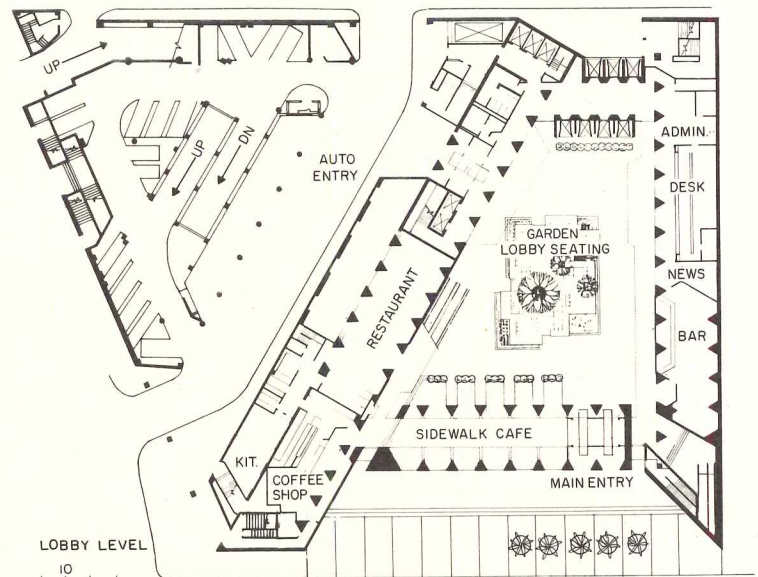
In a city where cars prevail and outdoor spaces are bland and even hostile because of climate conditions, the soaring, light, 30-story atrium of the Houston Hyatt Regency is more than a trademark; it is a much needed amenity, more so than in a city such as San Francisco, where one almost reluctantly leaves the outdoors for the handsome, but artificial environment of the San Francisco Hyatt Regency (RECORD, September 1973, page 145).

In contrast to downtown Houston, this hotel's park-like lobby attracts; it contains trees up to 40 feet high, and colorful flowers border a conversation pit recessed 18 inches into the main floor. Seating arrangements for groups or people alone are supported on teakwood decking. Natural light is admitted through two

skylights (photo, below right), and through a 55-foot high clear glass wall running between the columns on the main entrance side of the building (extreme left).

The triangular floor plan (below) with elevators at the apex shows how pedestrian and vehicular traffic is separated, with pedestrian access oriented to the office structures. Auto traffic to the hotel can discharge passengers and proceed either on its way or to the garage where parking is provided for 2700 cars. Below grade parking is provided for another 300 cars.

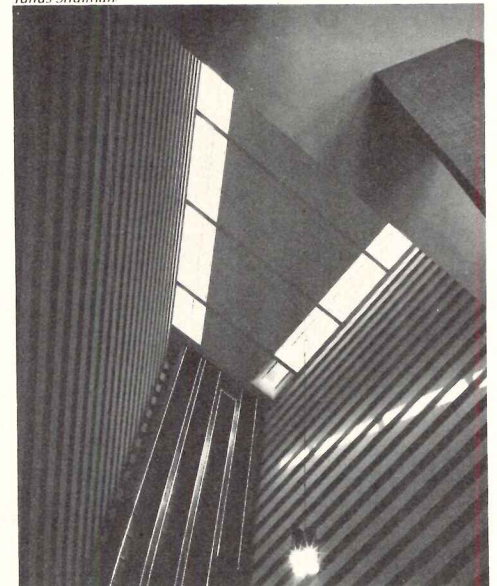
The elevator lobby is served by two lines of glass-sided cabs, four overlooking the atrium and three providing views of the city. Shafts are lined with rows of clear lamps.



Alexandre Georges



Julius Shulman



Alexandre Georges

Served by two glass elevators with views outside the building, the "Spindletop" revolving cocktail lounge (photo and plan, below top) does offer an excellent view of the city, unhampered by buildings too close at hand. Subdued lighting and deep hues were selected to enhance the nighttime view of Houston. Meals are not offered here, but a small kitchen is available for sandwich preparation. Restrooms, reached by stairs, are located one level below.

In contrast to the low-keyed intimacy of the rooftop lounge is the 30,000-sq-ft ballroom (bottom photo) on the third level (plan). Reached by escalators from the ground floor, it will accommodate 2000 persons. The setting can only be described as electric, with red

plush walls and carpeting combining with a ceiling treatment of projecting sonotubes electrostatically sprayed with red fuzz to give a velvet-like appearance.

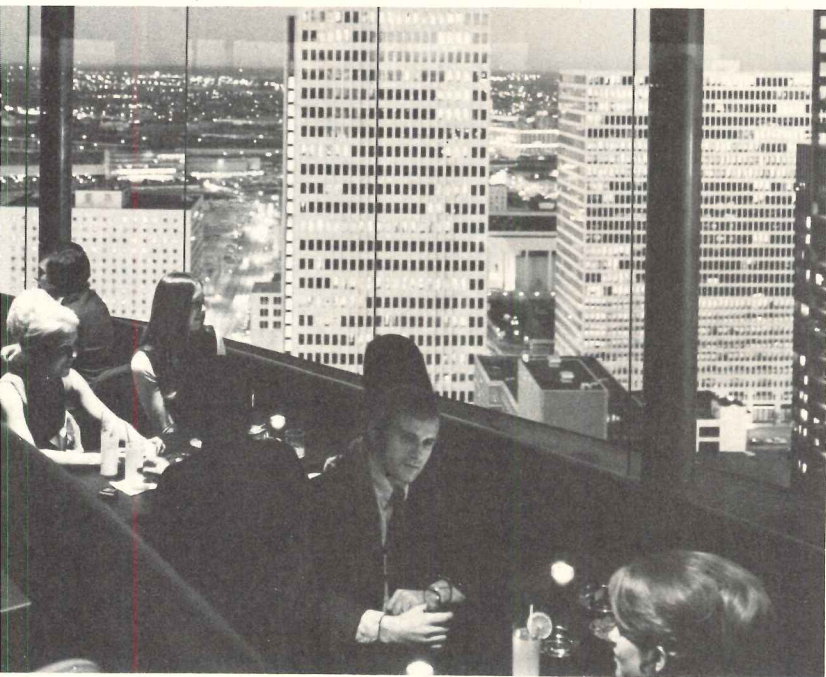
Movable walls can divide the space into three smaller rooms for minor functions, and a staging kitchen is provided adjacent to the ballroom, and just above the banquet portion of the main kitchen.

Available for closed-circuit television or stage productions, the ballroom can also supplement the hotel's 30,000-sq-ft exhibit space converted from the below-grade parking garage. Displays brought to the ballroom are conveyed in a 24-ft-long freight elevator opening directly to a large service corridor on the perimeter of the main room. The elevator will

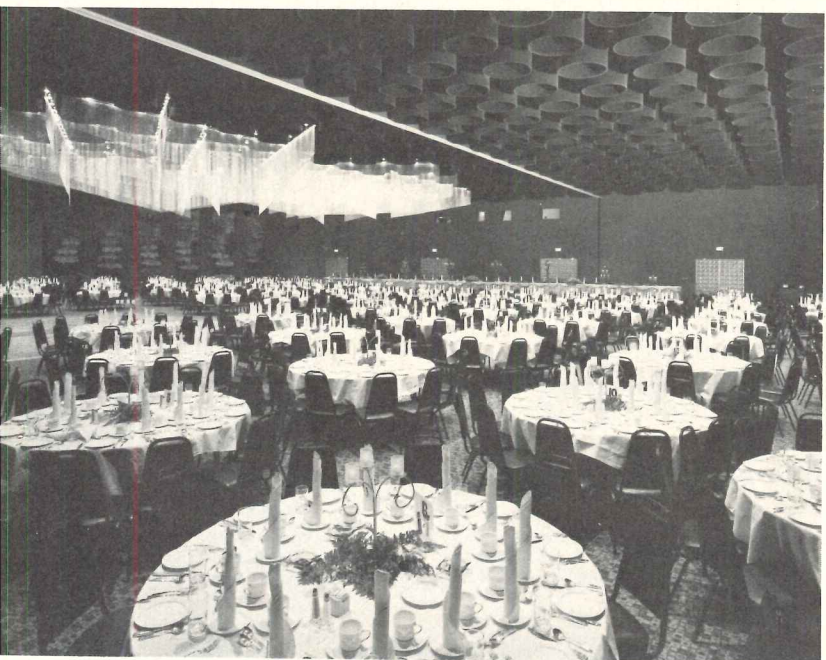
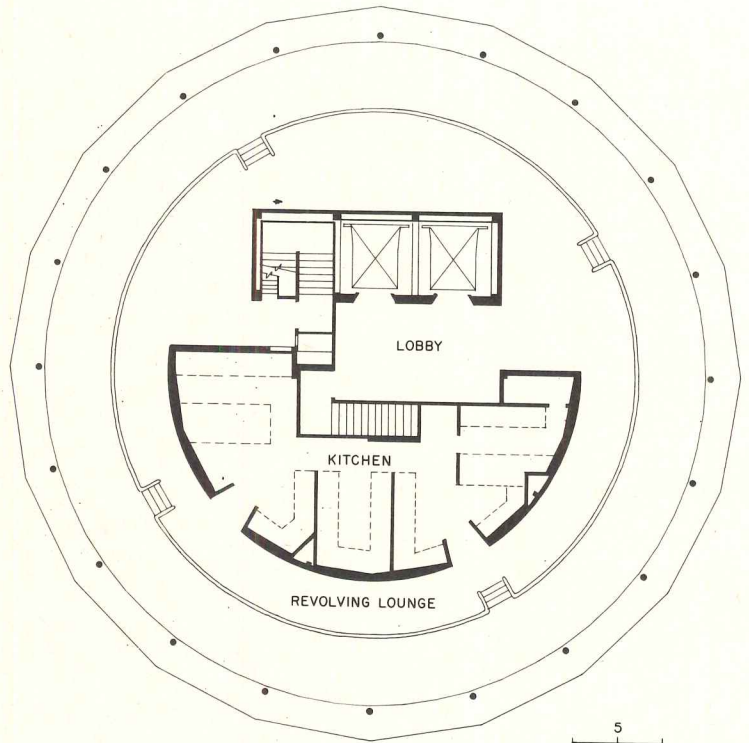
accommodate panel trucks and hearses, common exhibits for the auto shows booked into the hotel. The architects say that without this exhibit potential, the hotel would have to turn down many of the large shows that come to Houston.

Numerous meeting rooms, essential to convention hotels, are provided on levels three and four, with the area on the fourth level surrounding the ballroom devoted to the management office requirements.

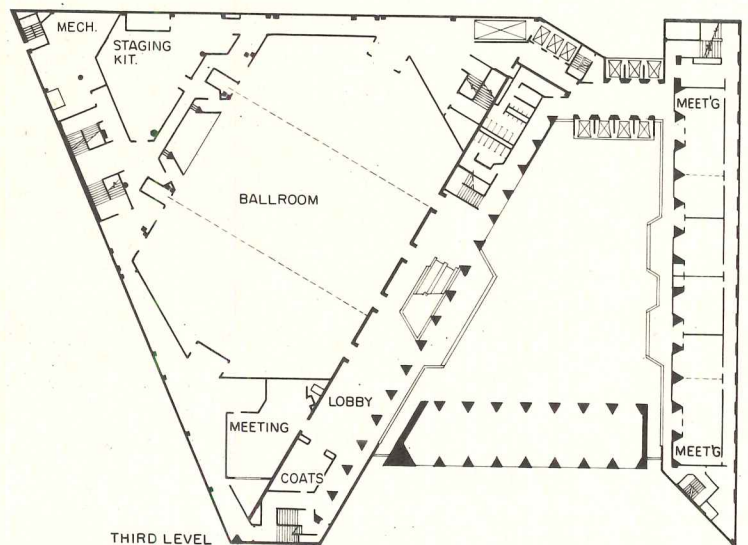
Among the many restaurants in the hotel is the ground floor sidewalk cafe (color photo, right), defined by pairs of bricked triangular columns along the main entrance elevation (see extreme left photo on page 154). Overlooking the street, the cafe opens into the



Alexandre Georges



Alexandre Georges



atrium with projecting fingers (photo right); it is recessed to the 18-inch level of the atrium's conversation area, reinforcing its kinship to the "park." Trees filter the morning sun in the restaurant, which is furnished in butcher block tables set with brightly colored service.

The interiors of this hotel are integral to the building concept, according to Charles Lawrence of CRS and Marc Tucker of Neuhaus + Taylor, who said, "we agreed early in the design process that the interiors should be an extension of the building design."

This is the first Hyatt Regency Hotel to be totally designed by one group. JVIII had responsibility for all interiors, including the guest rooms, which seem to be rarely within the province of hotel architects.



Julius Shulman photos



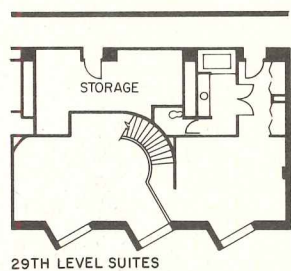
Since many informal meetings take place in a convention hotel's guest rooms, advantage has been taken in this hotel of angled window bays to create seating groups facing away from the hottest rays of the sun. Guest rooms begin at the sixth level, with the typical layout shown below in the plan.

At this particular floor, rooms on one side of the building open to a wide terrace containing the swimming pool. Cabana guest rooms on the terrace side of the building are screened from the pool area, developing their own private outdoor space with access to the larger public terrace.

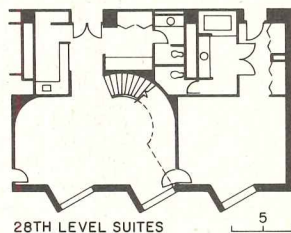
The color scheme in the rooms is basically vivid yellow and orange upholstery used with dark carpeting and light walls. In the

bathrooms, marble counters double as bars. Contemporary room cabinetry features real wood used in the vertical planes, with plastic laminate on the horizontals. The architects designed the room interiors.

HYATT REGENCY HOTEL, Houston, Texas. Architects: *JVIII*, a joint venture of: Koetter, Tharp & Cowell; Caudill Rowlett Scott; Neuhaus + Taylor—partner-in-charge: Charles R. Sikes, Jr., Neuhaus + Taylor; project manager: A. William Modrall, Jr., Koetter, Tharp & Cowell; director of design: Charles E. Lawrence, Caudill Rowlett Scott; director of interiors: Marcus R. Tucker, Neuhaus + Taylor. Engineers: Walter P. Moore & Associates (structural), Chenault & Brady (mechanical). Consultants: William C. Lam & Associates (lighting), Dubose Gallery (art). General contractor: W. S. Bellows.

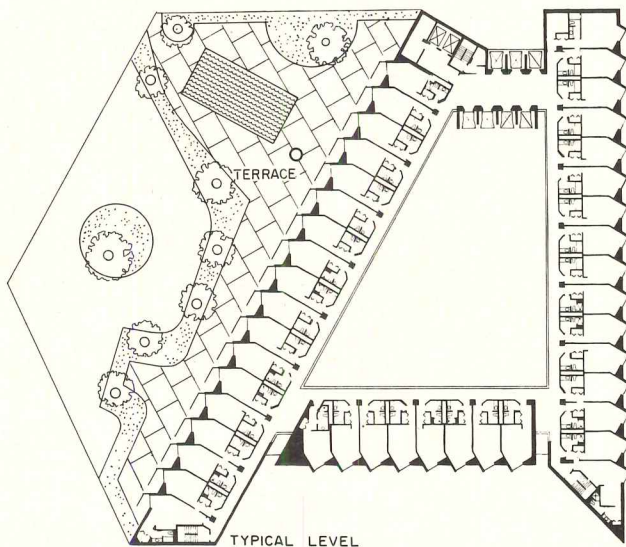


29TH LEVEL SUITES



28TH LEVEL SUITES

The two top floors of the hotel are given over to suites, with two grand suites (see plans, left) with double-story living rooms (photo below). Architect Alan Lapidus says, truth be known, suites are not that expensive to build, and they are very useful in selling a convention. Since the cardinal rule on all hotels is that all rooms must be individually "keyed," the suites of the Houston Hyatt Regency contain bedrooms which can be separated for individual use. Guest rooms usually have to serve daytime business purposes, so they should be planned to function as living rooms, with dressing and bathing well hidden.



TYPICAL LEVEL



Alexandre Georges

Prefabricated space trusses that are both rational and form-giving

Structural engineers Hirsch & Gray of San Francisco have designed a series of space-truss structures for several California architects that are straightforward and pragmatic, but at the same time evoke an esthetic response. Because the buildings have had a variety of shapes, the truss configurations have varied also. This two-part article discusses the logic of the designs and shows the results in three of the buildings.

The primary problem in the assembly of large-span, multi-member space structures has been to find some simple, inexpensive and repetitive way to connect many members into and through a typical joint. The approach developed by structural engineers Hirsch & Gray is to shop fabricate three-dimensional truss units, to ship them to the site, and finally to field bolt them together to form the completed structure. This approach permits the tailoring of individual members and connections to meet the actual forces imposed upon them, and also eases the geometric constraints. Field connections, made by bolting at the nodal intersections of units, can be easily varied as to number, size and type of bolt to suit individual load-transfer requirements. Detailing methods typically employ field connections across low-stress surfaces, with as much stress transfer as possible between units being taken in direct bearing between members.

Benefits of shop prefabrication of large units include minimization of field erection time, and less possibility of error in the field fit due to the greater tolerance control in the shop. Three-dimensional units—designed to be stable in themselves—provide inherent stability for the partially completed structure, requiring only minimal temporary shoring. Also, shop welding is less expensive and more dependable than field welding.

All the structures described in this article and Part 2 to follow, were analyzed with the aid of computers, whose capabilities made practical the computation of stress conditions in these highly indeterminate structures under a wide variety of loading conditions.

The example shown on these four pages is the roof structure for the base lodge for a completely new ski area at Kirkwood Meadows (see RECORD, January 1974) at an elevation of 7800 ft above sea level in the California Sierra Nevada range. The architects, Bull Field Volkman Stockwell, wanted an expression for this new ski complex that would have its own unique identity—enhancing the glamour and

excitement of skiing. The severe snow load in this area required a roof structure that could support a design live load of 250 lb per sq ft—well over 3 million pounds for the entire roof. Furthermore, the site is some 100 miles from the nearest major city, and is covered with snow from late November to early July, leaving only four months' field time for construction.

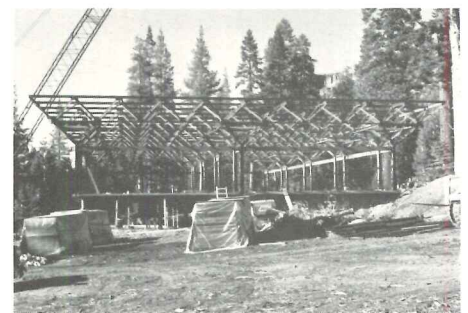
Faced with these problems, the engineers sought a structure that could be fabricated mainly off site in a material and configuration that would satisfy both architectural and structural demands. The steel roof truss design shown here met these criteria.

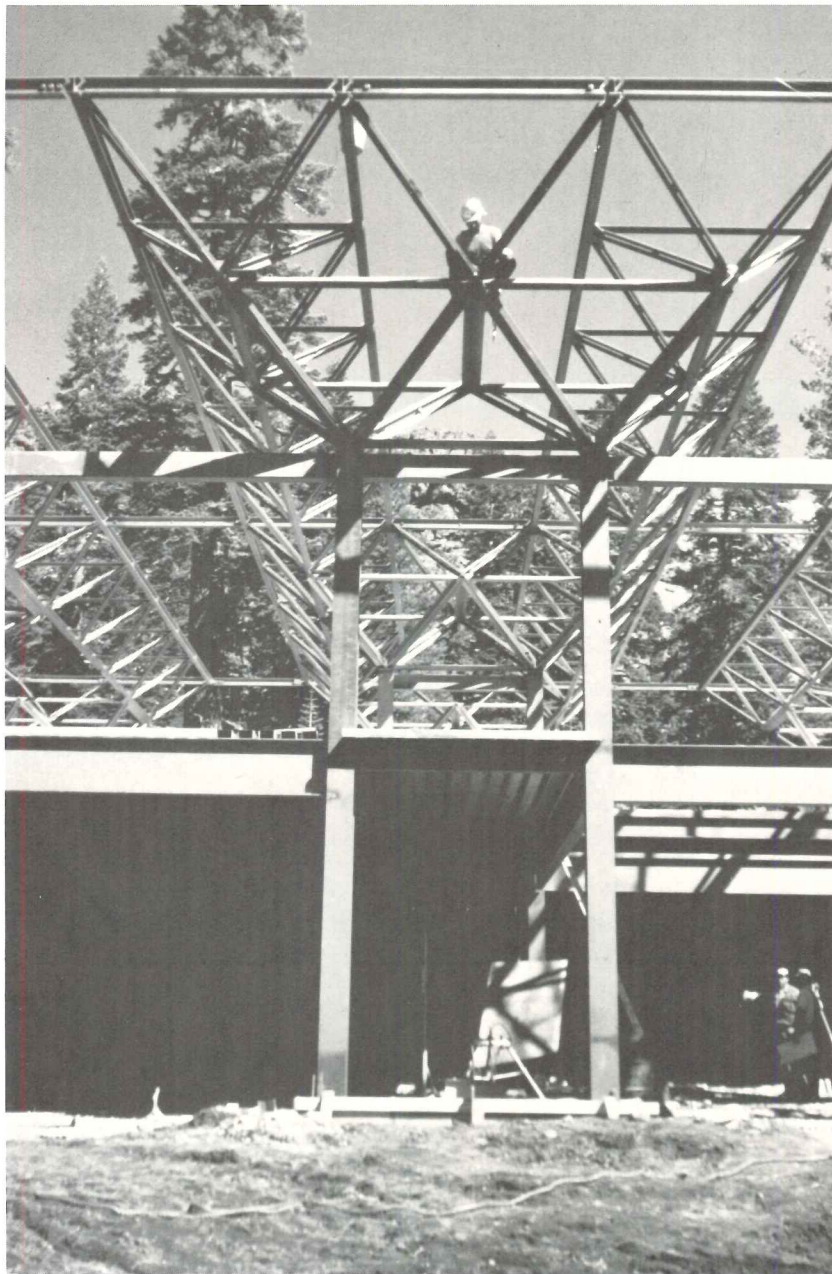
The 8-ft-wide trusses are spaced 16 ft on center. This skipping minimizes material and the total number of connection points, and allows an interesting rhythm to be developed at the supports. The support "trees" are paired columns, 8 ft on center, linked in a prefabricate rigid frame unit for transverse stability—with a typical two-bay truss unit on top, turned at right angles to the main span trusses and supporting them.

Because of the pressures of time, design and fabrication took place almost simultaneously. The entire shop fabrication took four weeks from time of first mock-up and approval to shipment. Shipment and erection of the truss units on the previously erected columns took only two days—exclusive of final placement and tightening of all the field bolts. This was accomplished despite the fabricator's great concern that the required tolerances for bolt holes and general fit were too severe.

At a structural weight of 10 lb per sq ft, the load to weight ratio of the completed structure, designed to carry the high snow load cited earlier, is 25:1.

In designing space structures such as this one, the engineer must take care to simplify geometry, detailing and connections—repeating detail types as much as possible. Hirsch & Gray believe that if the truss system can be designed easily, it also can be built easily. They point out that attention should be paid to shipping dimensions and erection crane capacities as they might affect prefabricated module proportions and over-all size. The engineer also must think about how to minimize field shoring, and, *very importantly*, about the stability of the partially completed structure. Finally, Hirsch & Gray emphasize that the structural engineer must work closely with the architect and the owner to interpret architectural requirements and esthetic intent in practical structural forms.



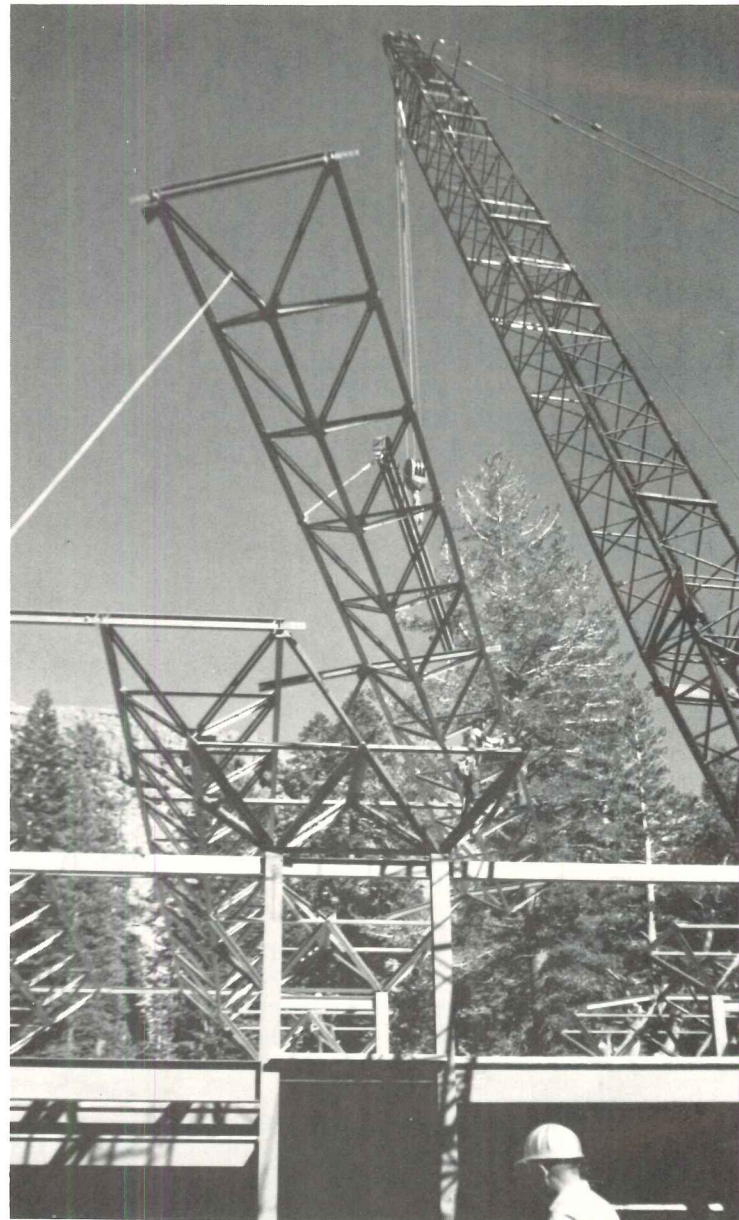


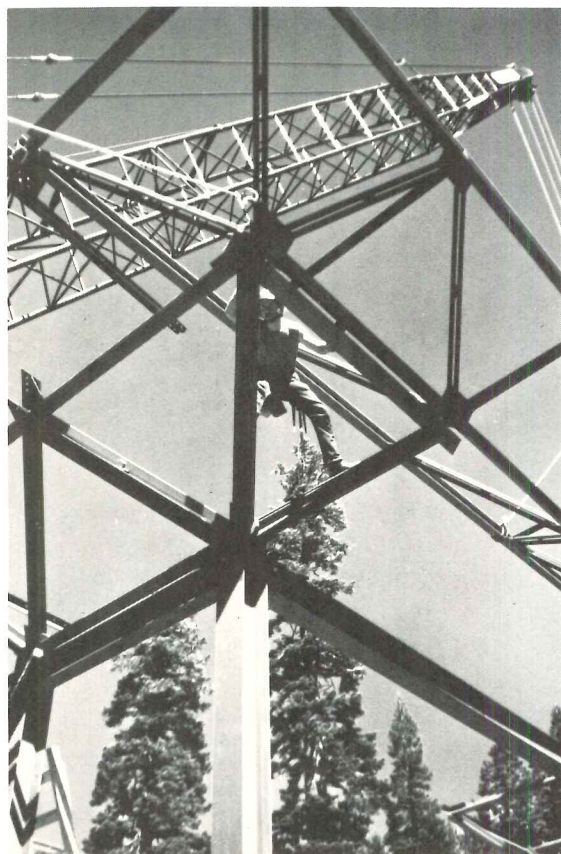
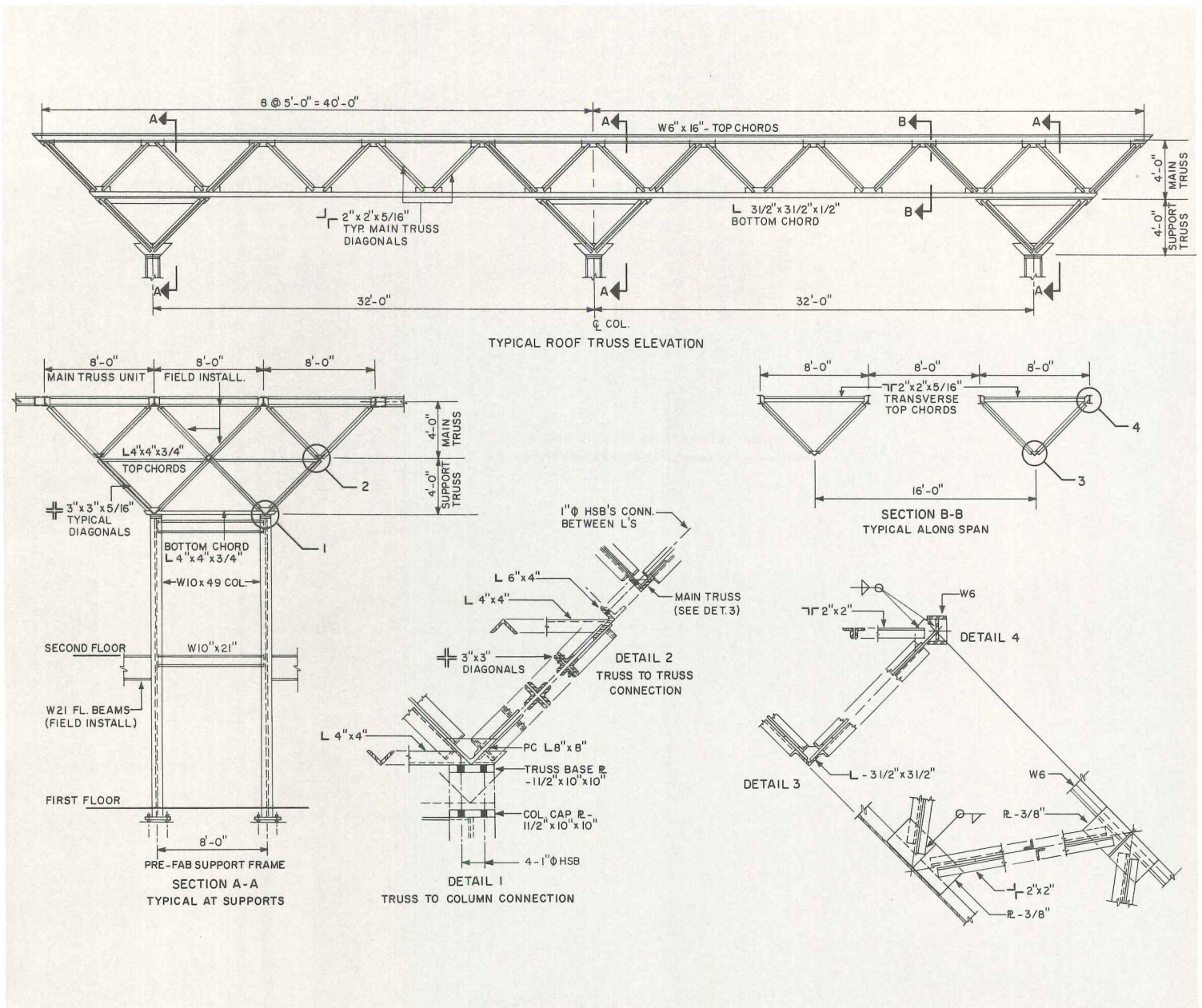
There are four space trusses (as the one above) comprising the roof structure for the lodge. All connections between the column frames, the support trusses, and the main-span trusses are made in the field using high-strength bolts. The 8-ft gap between top chords of the main trusses is spanned by 16-gage corrugated metal decking, 3-in. deep.



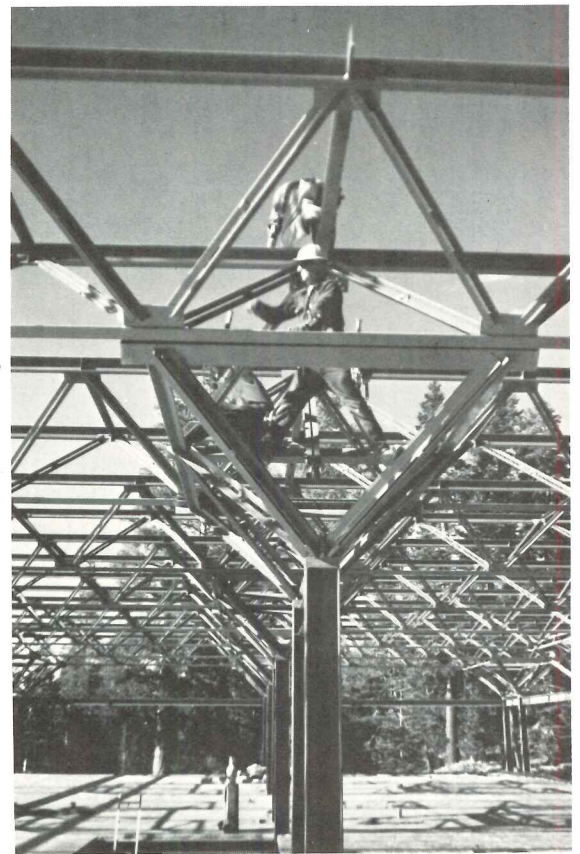
Decision to use a space-truss roof system for Kirkwood Meadow lodge in the ski country of California's Sierra Nevada range was a natural outgrowth of design and construction considerations. These included: the doubtful availability of laminated timbers, a four-month construction season, a site 100 miles from the nearest city, a design snow load of 250 lb per sq ft, a very short design time, and the architect's intent to use the revealed structure as image. The prefabricated steel semi-space trusses took advantage of the long-established shop fabrication capabilities of the steel industry, and permitted shipment by road over two mountain passes.

The system employs 80-ft-long units (below) that span 40 ft from column to column, supported by inverted pyramids atop a column frame.



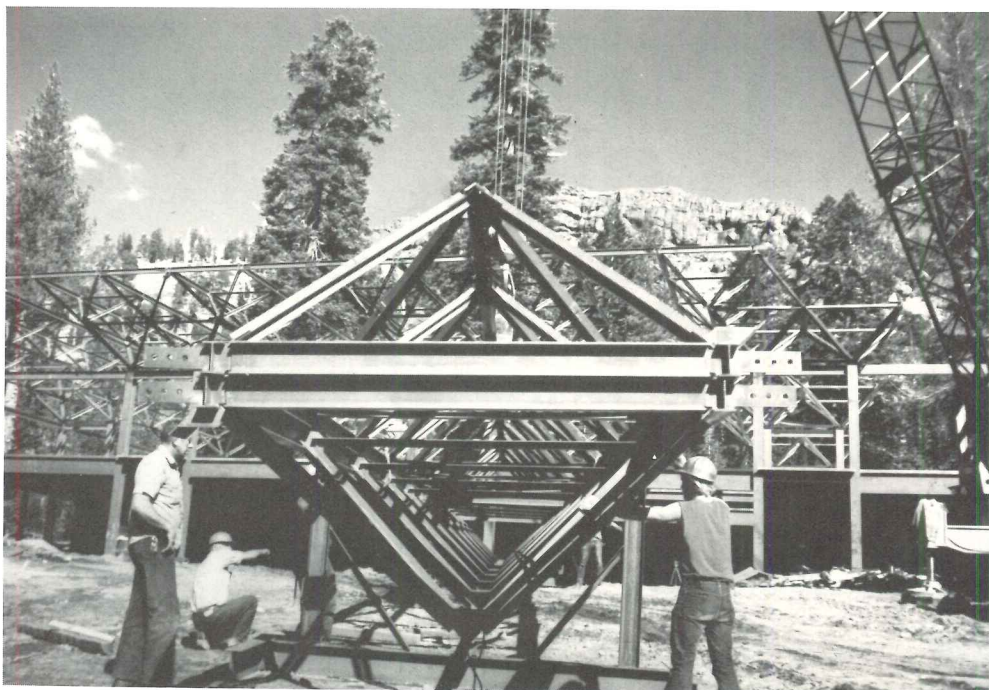
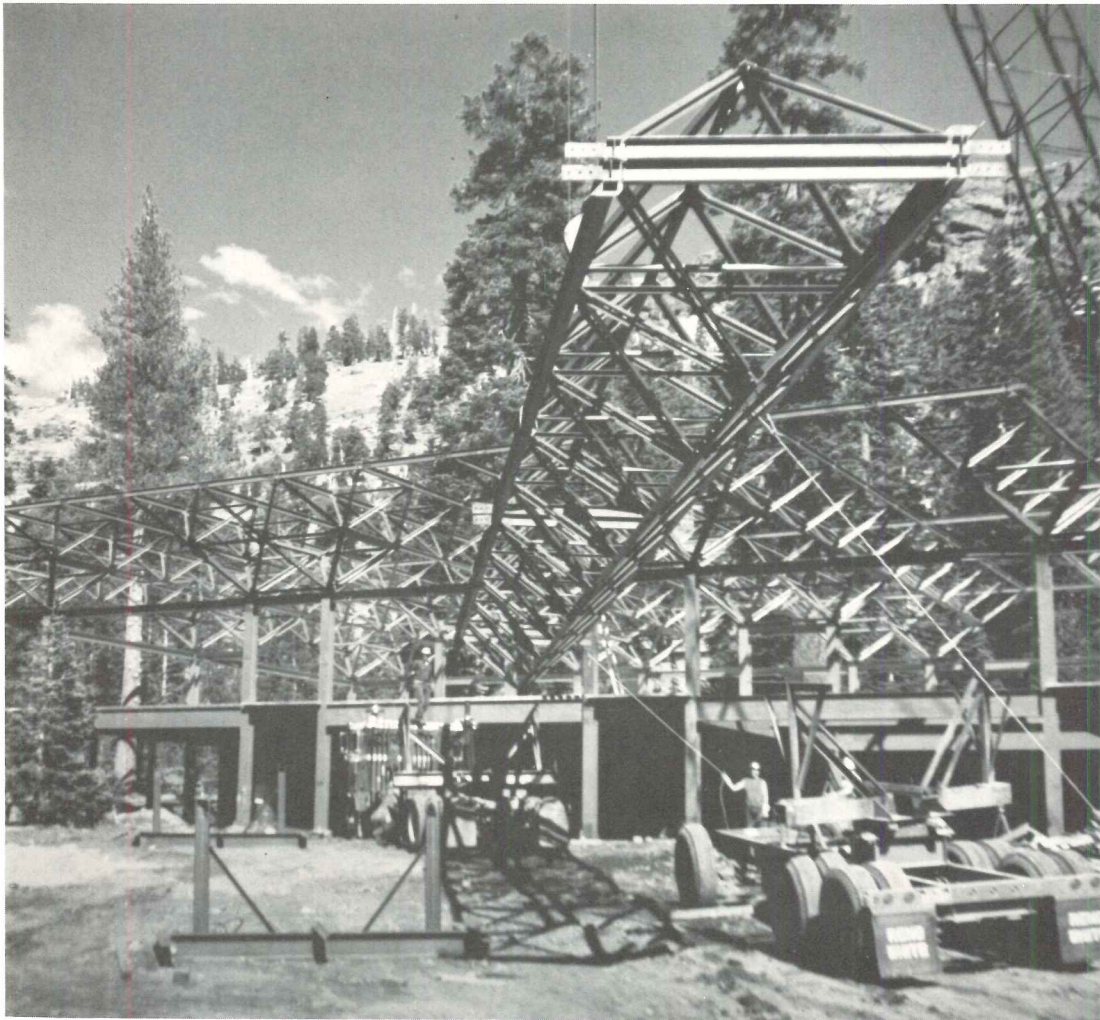


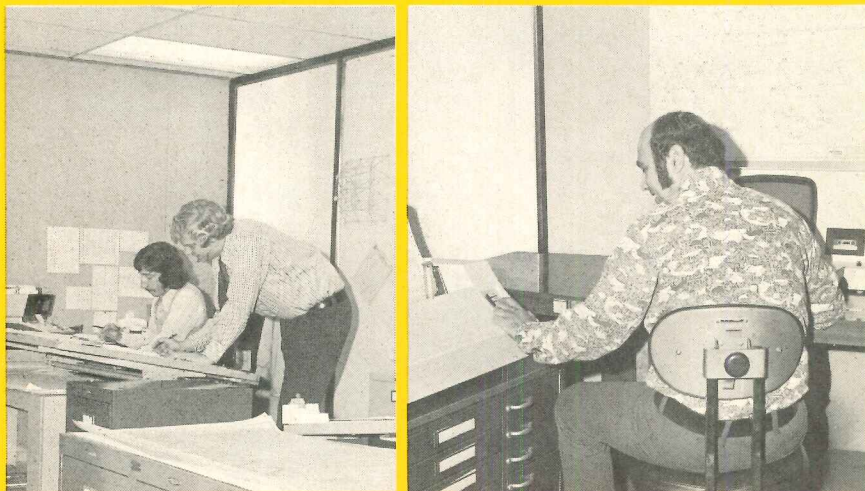
Despite the intricate weblike appearance of the trusses, they have a right-angle geometry, permitting simple jiggling for shop fit and assembly. Also, the planes of the bottom chord and that of the webs coincide, providing planar alignment for connections. The diagonal web members are doubled angles arranged in a star pattern for equal radius of gyration about both axes, and to emphasize the characteristic shapes of steel construction, the slenderness of the members, and the over-all pattern. In regions of high web shear, the angles are quadrupled. The top chords are wide-flange sections, sized for both local bending due to transverse loading between panel points, and direct compression from truss action.



Shipment and erection of the truss units on the previously erected columns took only two days, except for the final tightening of the field bolts. The trusses were stacked in pairs to form their own carriage, using a steerable trailer for support in shipment by truck from the fabricator's plant 100 miles away in Nevada.

Once at the site, these units were set by crane atop "tree" supports and bolted, and were joined at the top chords by means of flanges visible in the photos below.





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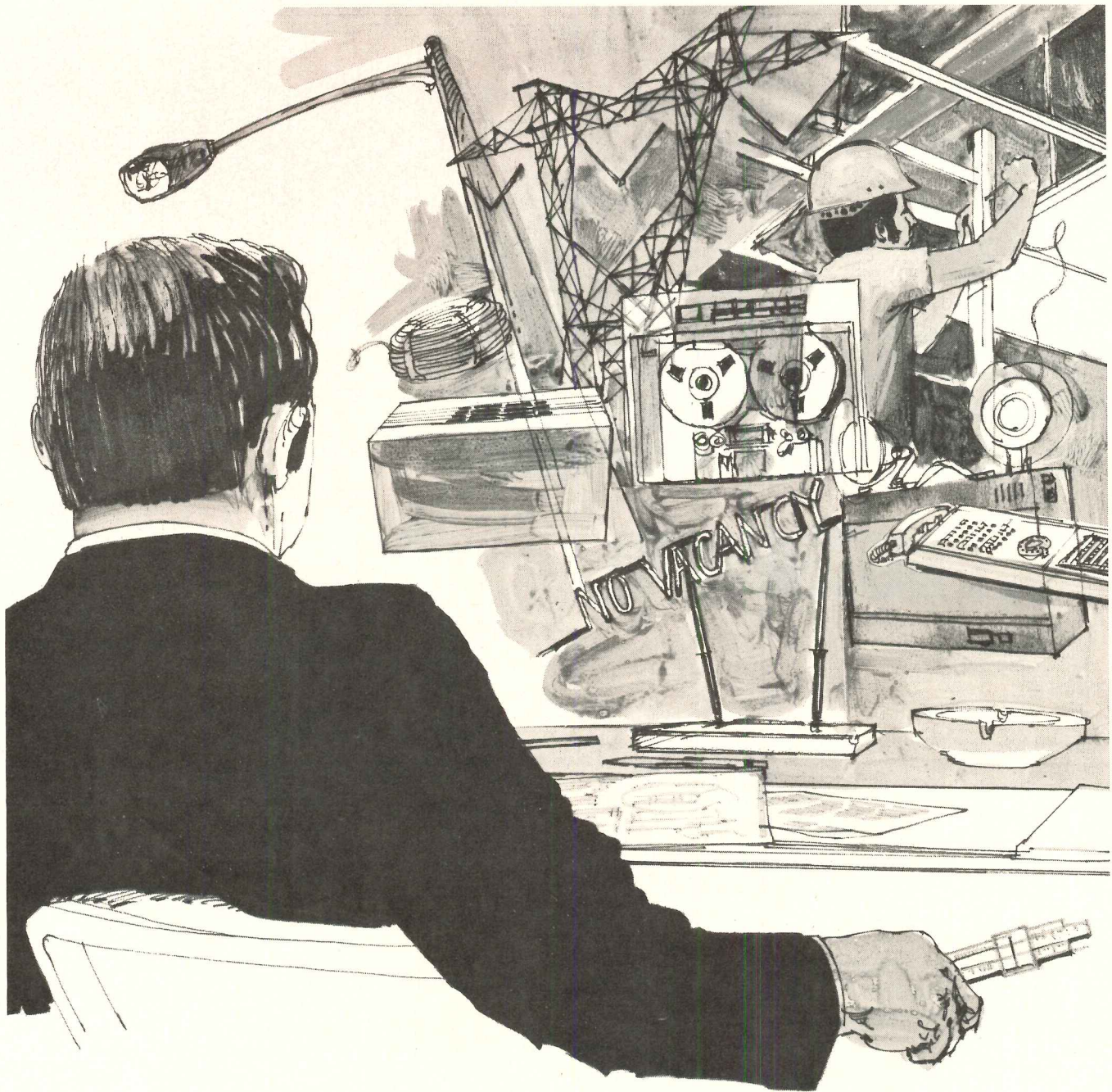


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UNDERCOUNTER EQUIPMENT / A line of modular metal undercounter equipment for use in financial institutions, municipalities, hotels/motels, finance and utility companies is now available. Units are available in either the 38½ in. high or 31¼ in. high series. Both series are available in 18¼ in. and 22½ in. depths. All components are constructed of steel with anodized satin finish aluminum flush pulls; units are finished in 16 standard colors. Two-tone and special matching colors are also available. ■ Security Corp., Irvine, Cal.



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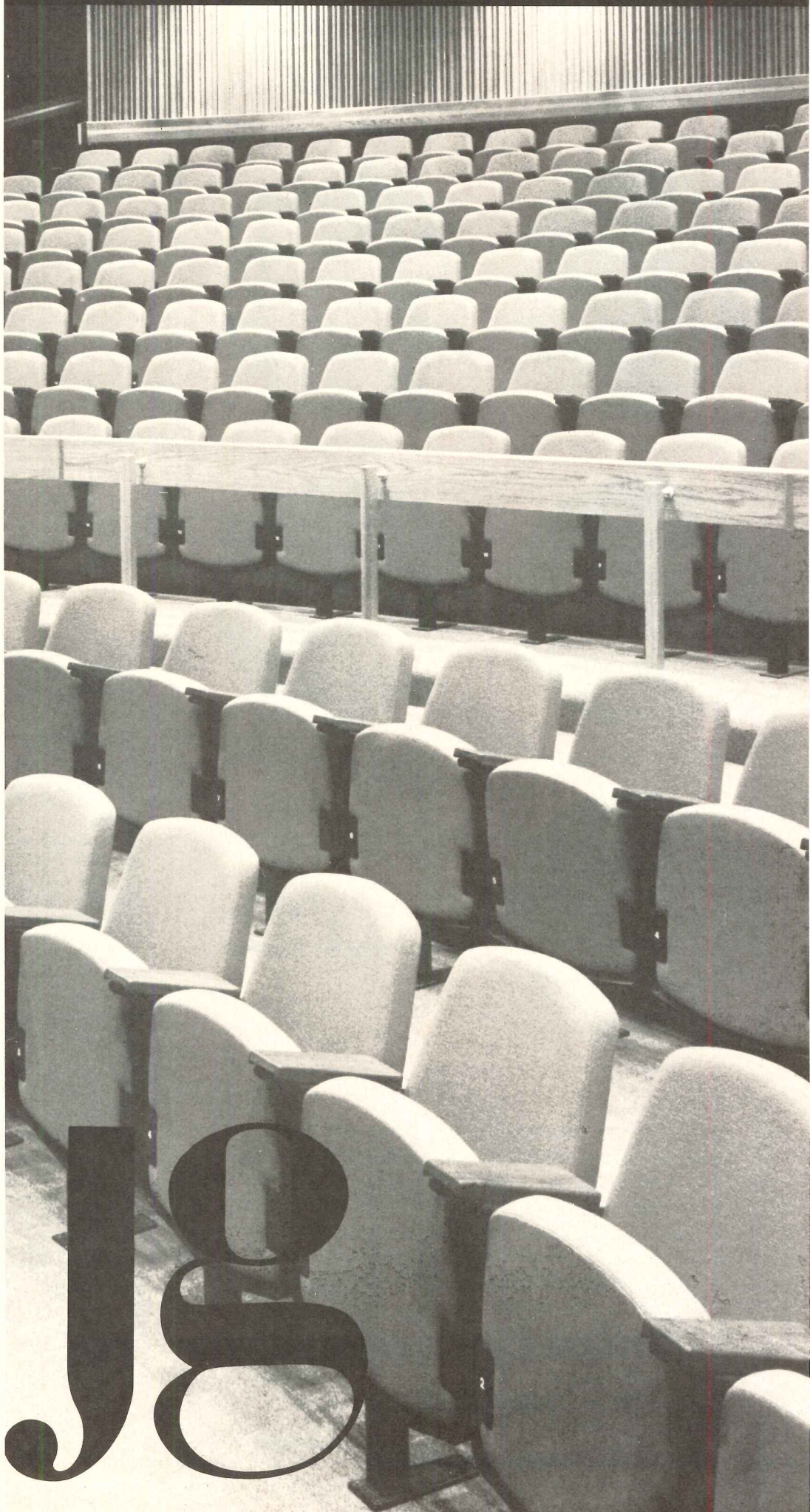
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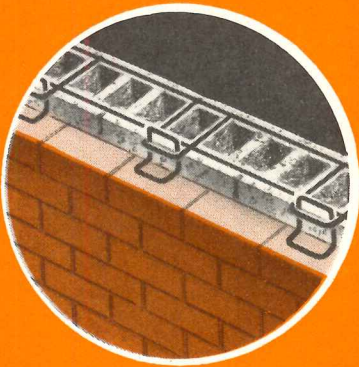


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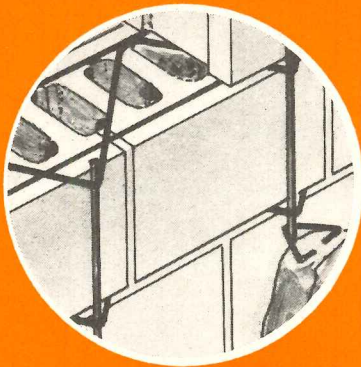
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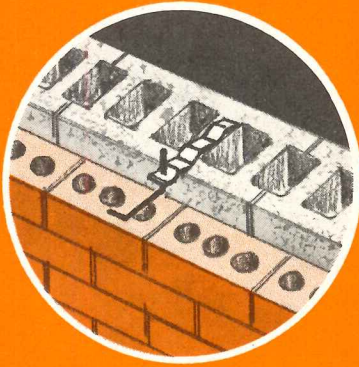
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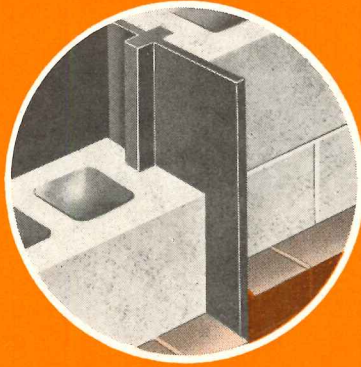
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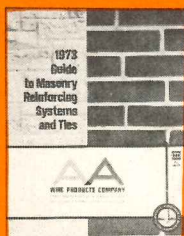


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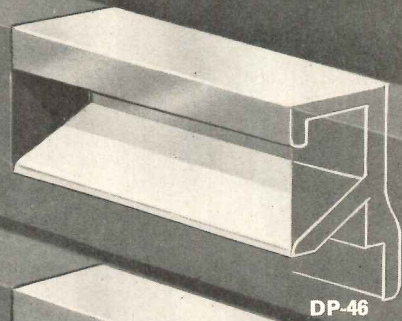
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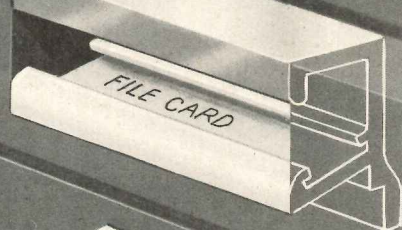
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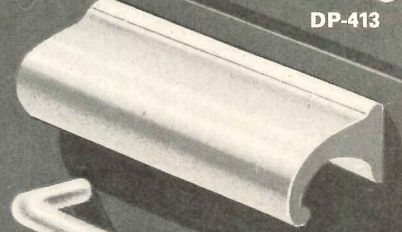
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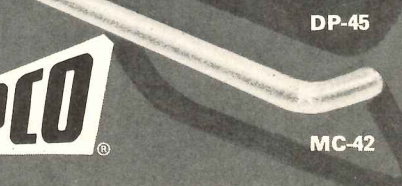
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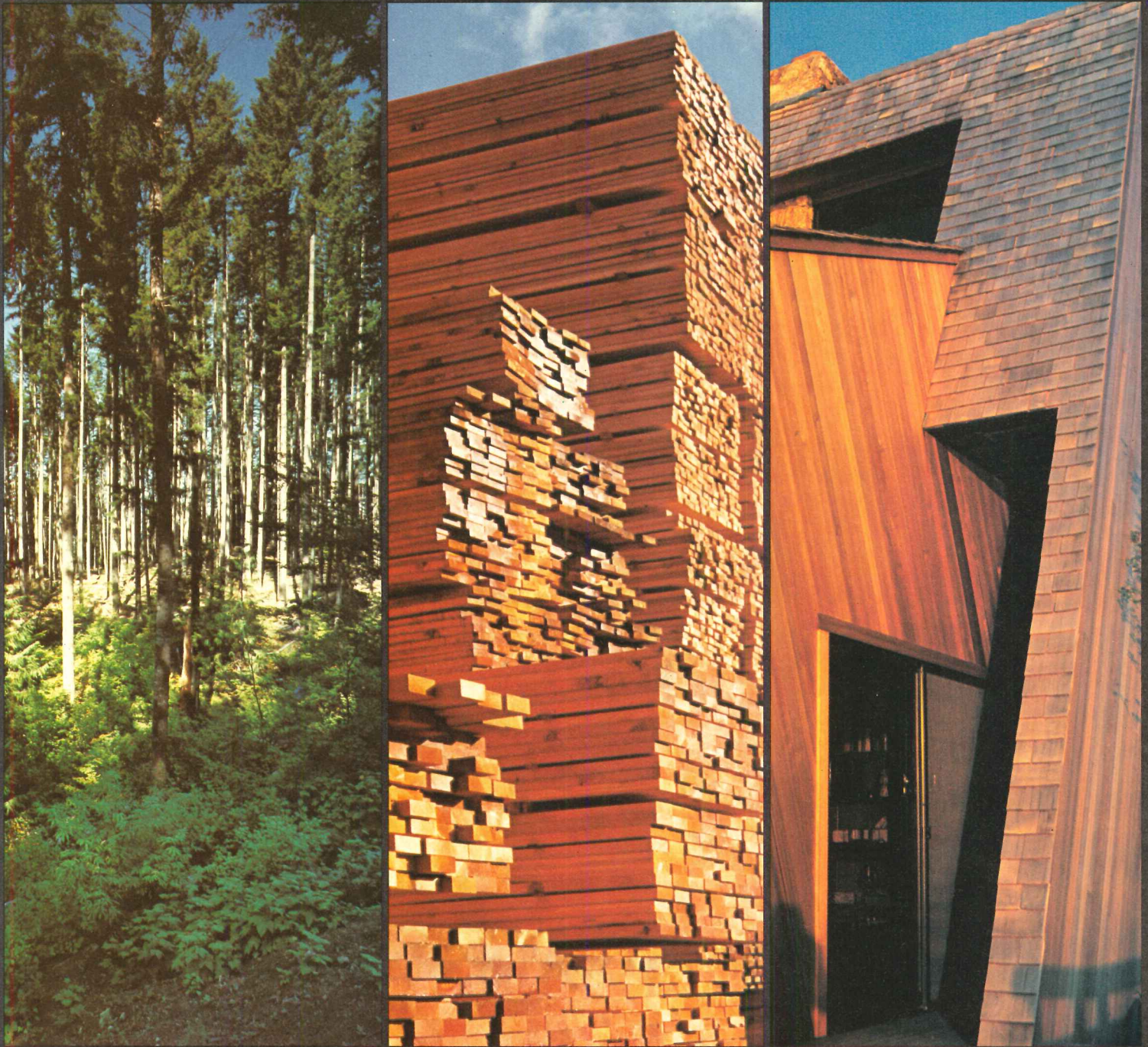
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TENNIS COURT SURFACES / The brochure explains application procedures and requirements and tells how to select the proper finish system for a variety of recreational surfaces. It also features many photographs of actual installations of *Plexipaver*, the 100 per cent acrylic color-in-depth surface system for asphalt and concrete courts. ■ California Products Corp., Cambridge, Mass.

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GROUND PROTECTIVE EQUIPMENT / The company has issued a new descriptive four-page data sheet on its ground protective equipment. The *Type TP-GLR* test panel indicates when a ground fault is present, indicates control power is available, provides a relay reset switch and permits testing the ground fault system with or without tripping the circuit protective device. Complete electrical, mechanical, and installation information is presented according to the company. ■ Federal Pacific Electric, Newark, N.J.

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WATERPROOFING / A waterproofing and damp-proofing systems manual for building owners and contractors covers membrane systems for waterproofing slabs, foundations, promenade decks and plaza areas and selection and application of materials and systems. ■ The Celotex Corp., Tampa, Fla.

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GENERAL-PURPOSE FLOORING / A full-color brochure describing tough, durable flooring systems for sports and recreation, and for business and industrial use, is available from the company. An advanced urethane technology is a common element in both types of surfacings. ■ 3M Co., St. Paul, Minn.

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VINYL PARTITION SWATCHES / Handy 8- by 10-in. swatch cards featuring actual samples of vinyl surfaces available on the company's partitions, have been developed for architects, designers, and others involved in specifying office interiors. Suitable for insertion into three-ring binders, the swatch cards carry textured samples of four woodgrain reproductions, five accent colors, and six decorator colors. The fire-resistant vinyl coverings are available in widths up to 62 in. on hardboard, particleboard, gypsum board, and acoustical board. ■ Marlite Partition Systems, Dover, Ohio.

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SPORTS EQUIPMENT / A sports and physical education equipment catalog featuring a new aluminum basketball backboard with a lifetime guarantee also describes a large family of indoor/outdoor climbers, an eight-unit obstacle course, swings, slides and seesaws for physical fitness training and playground installation. Contained as well are benches, bleacher seating, picnic tables and bicycle racks for general recreational use. ■ SportsPlay Products, St. Louis,

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TO NEMA AND ANSI WIRING / A comprehensive guide to the NEMA and ANSI requirements for light blade and locking electrical wiring devices has been prepared for architects and consulting engineers, among others. Since *Spec-eez* uses both NEMA and ANSI—approved configurations, it can assure designers for electrical safety. Consistent with the NEMA or ANSI configurations, there will be no misconnections between electrical outlets and equipment accessories. ■ Bryant Electric,

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Tornado damage can be catastrophic in populated areas. Wind velocities may reach 200 mph or higher, creating a loading well beyond "normal" structural limits. The partial vacuum at the funnel's core can result in "explosive" loadings even greater than those produced by wind pressure. And windborne debris constitutes a serious hazard to life and property.

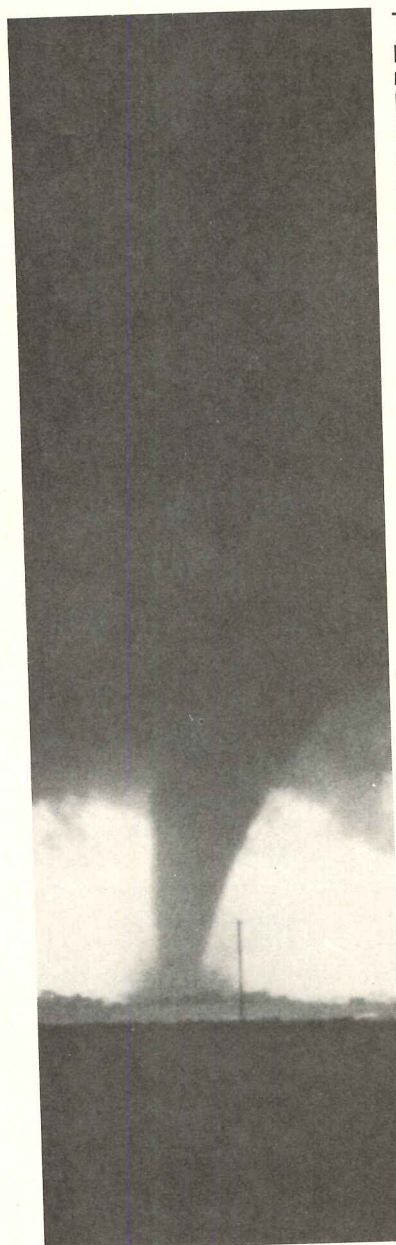
Fortunately, reinforced concrete offers a practical solution to tornado protection. In the Plains States, where incidence of tornadoes is high, new structures have been built and existing buildings redesigned with the built-in protection of reinforced concrete. These structures include schools, hospitals, power plants, and industrial buildings.

Many designs have been employed. For example, an 11-inch reinforced concrete slab forms the floor above the tornado-shelter area in a school building. Walls of 12-inch reinforced concrete have been used to provide protection at ground-floor levels. Reinforced concrete construction of walls and roof, with baffled concrete doorways afford protection against tornadic winds, flying debris, and pressure differentials.

And the inherent strength of reinforced concrete can protect against all types of catastrophic loadings, such as blast loadings, hurricanes, earthquakes.

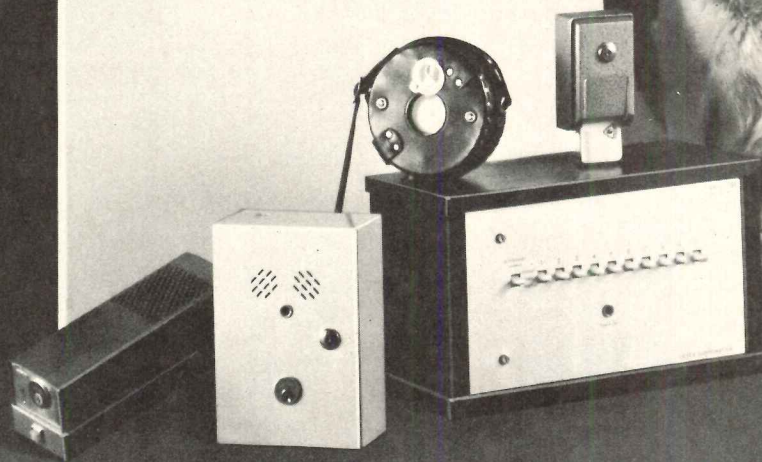
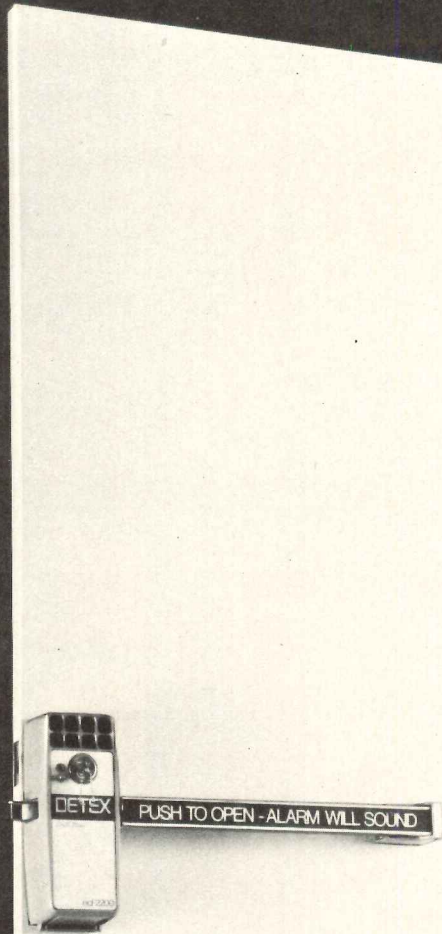
Tornadoes have been reported in all of the 50 states. It's well to remember that protection against their devastating effects is readily available. Reinforced concrete provides that protection, plus economy, easy availability of materials, on-time construction schedules, and maximum design freedom.

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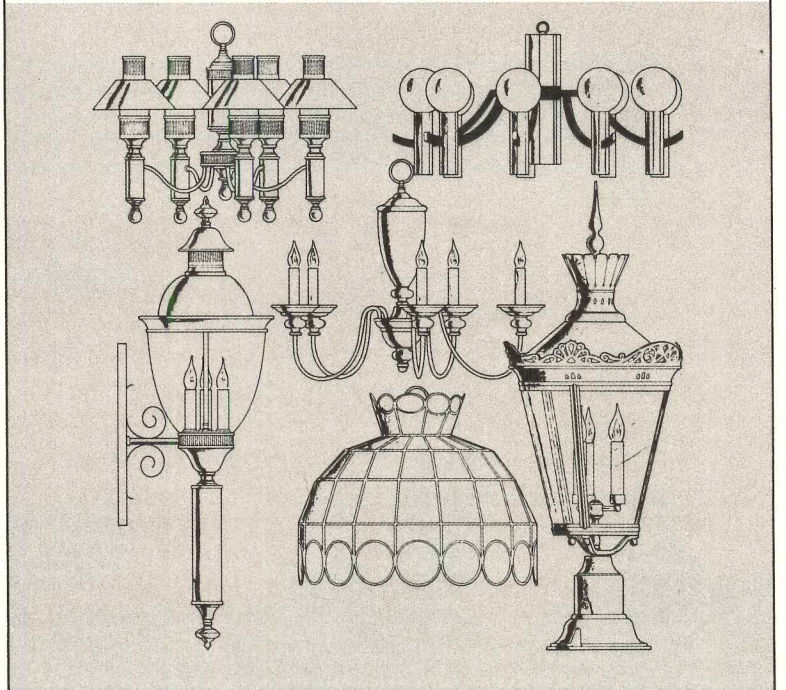
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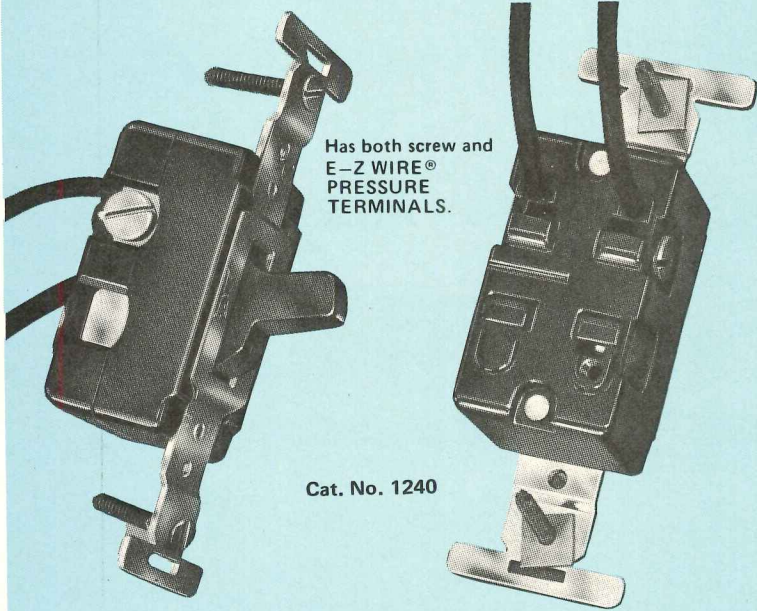
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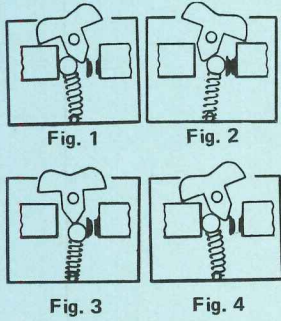


Fig. 1. switch in "off" position (contacts open). As switch lever is rotated, actuating ball compresses the coil spring, but ball must pass pivot point of lever before it can close the contact. As it passes the pivot point it has maximum momentum and closes the contact points positively and rapidly. All independent of hand action (Fig. 2.). As the switch lever is rotated in the opposite direction, Fig. 3, the ball is depressed and slowly releases some spring tension on the contact arm, permitting the contact points to open enough to break the arc slowly. Then as the ball passes the pivot point it completes the cycle (Fig.4.).

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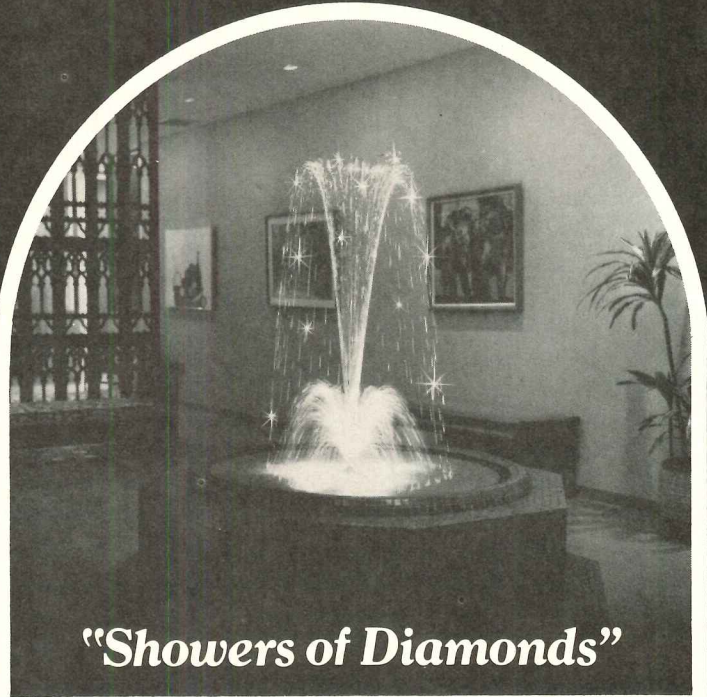
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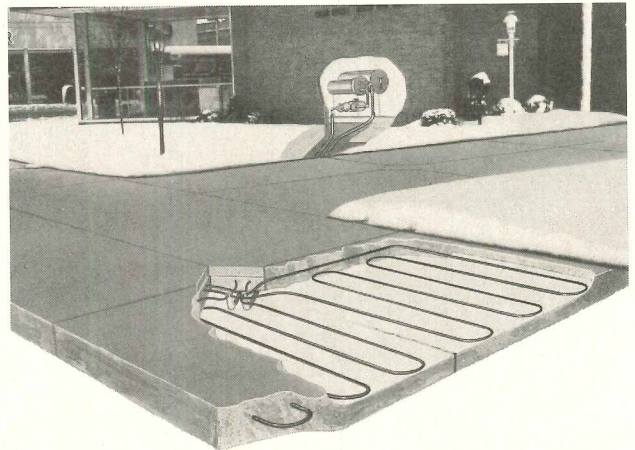
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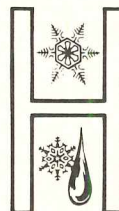
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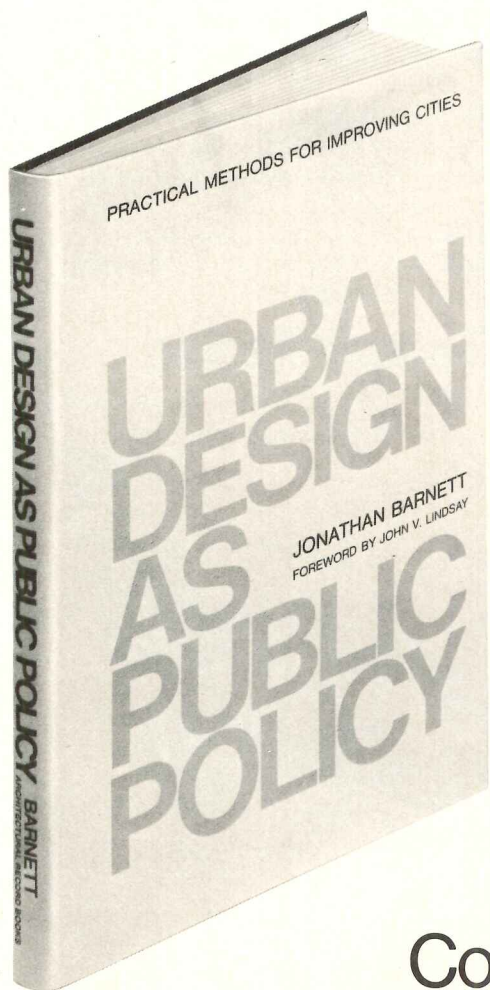
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—From the forward by
Mayor John V. Lindsay

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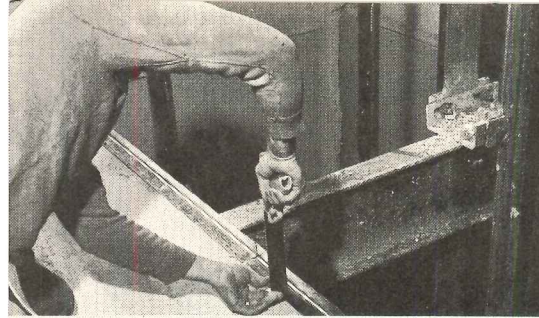
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Another 14% to run the fans, elevators and various office machines.

About 7% to heat it.

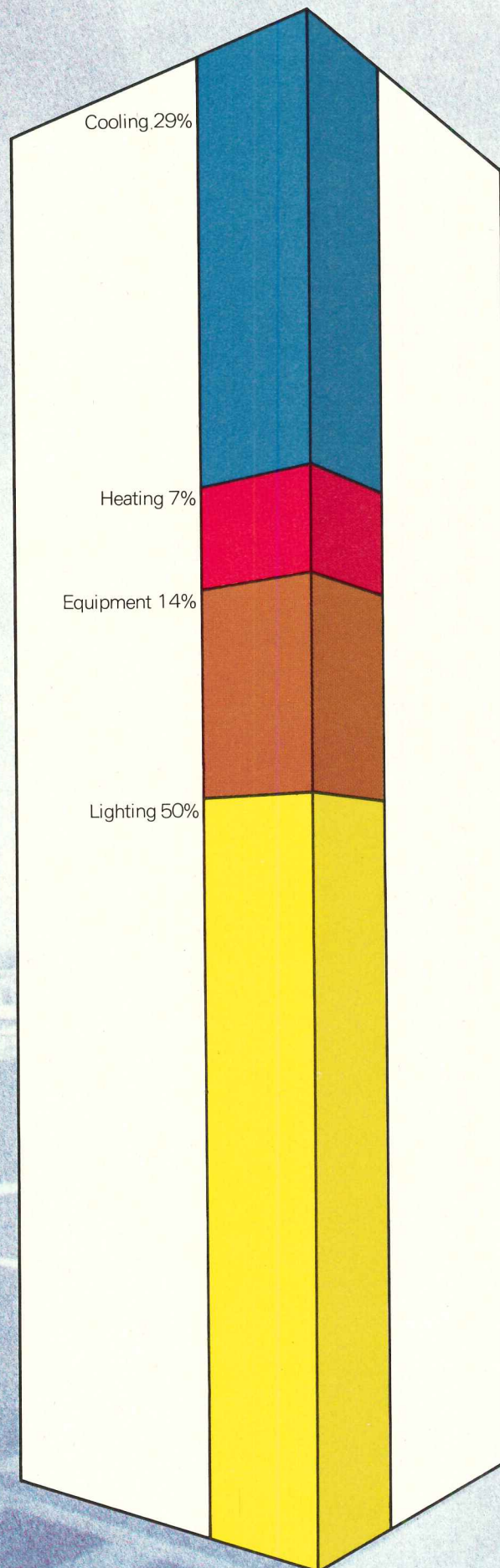
And because it's Dallas, 29% to cool it.

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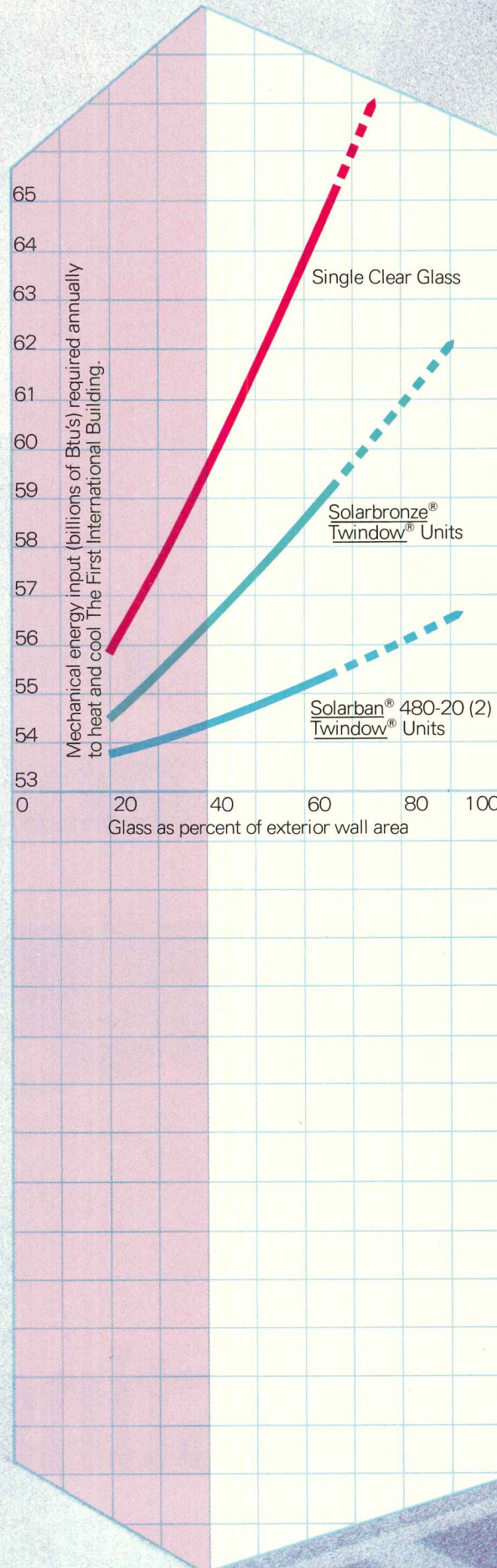
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PPG: a Concern for the Future

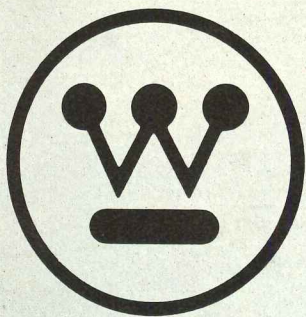
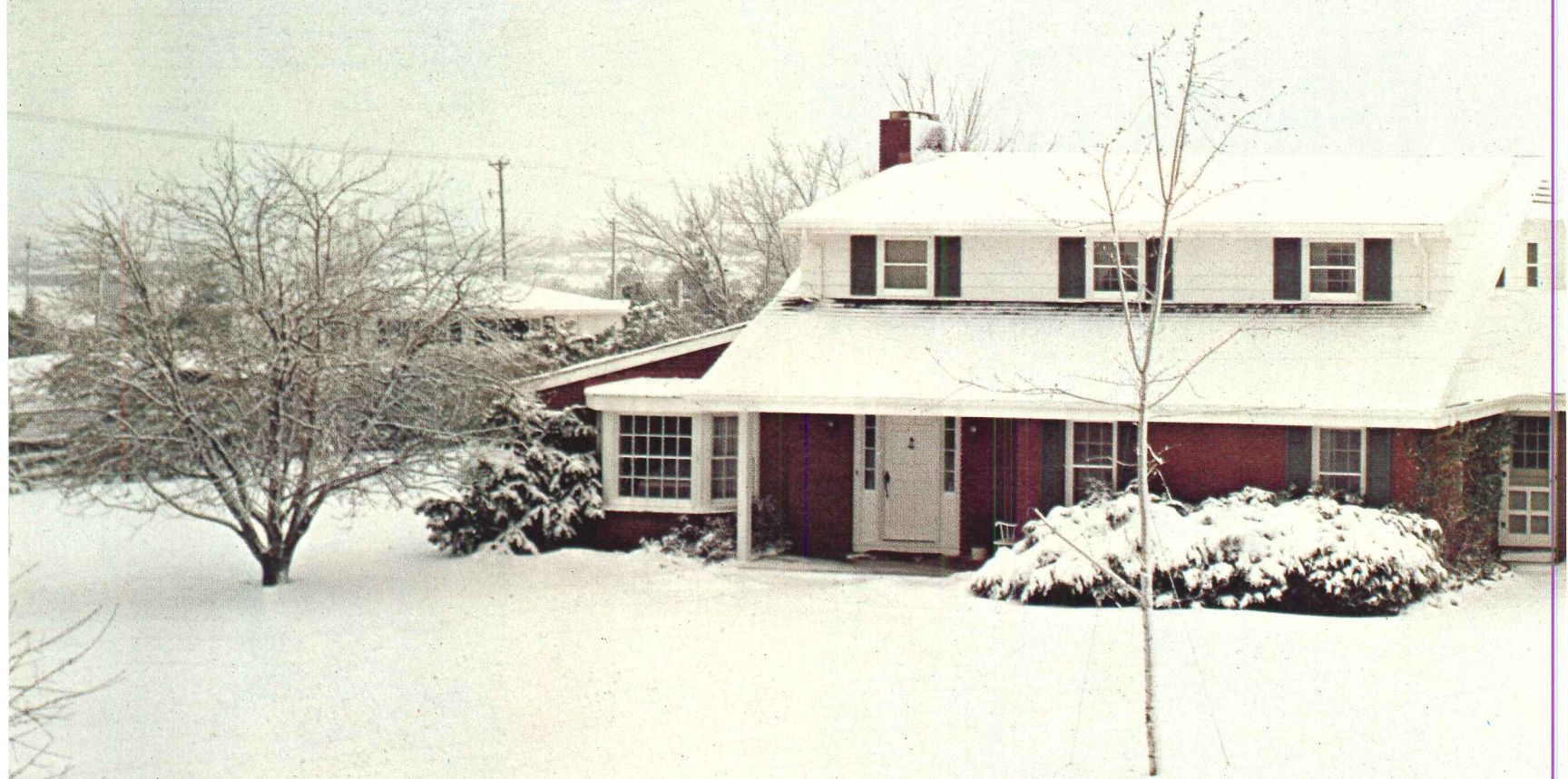


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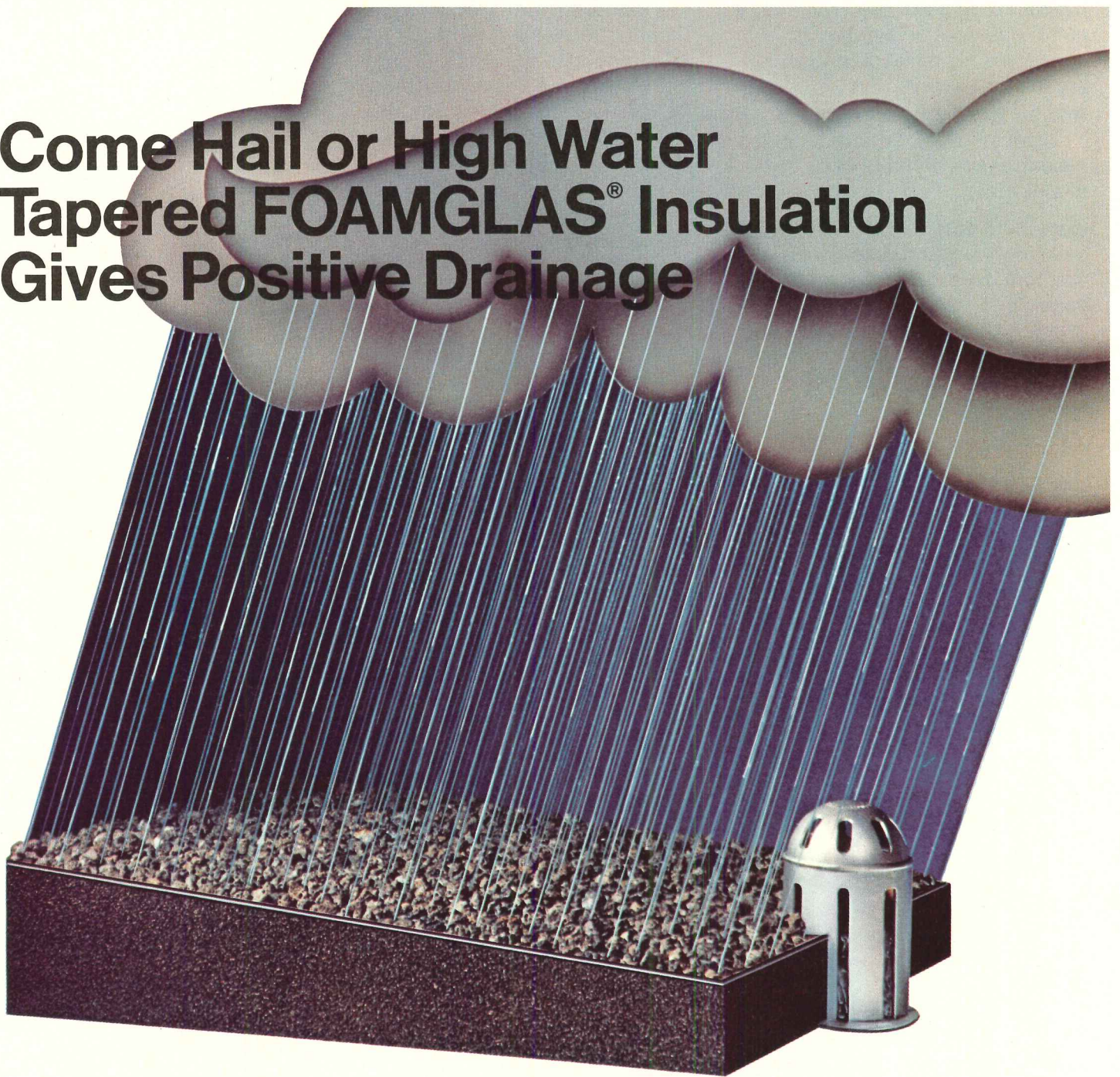
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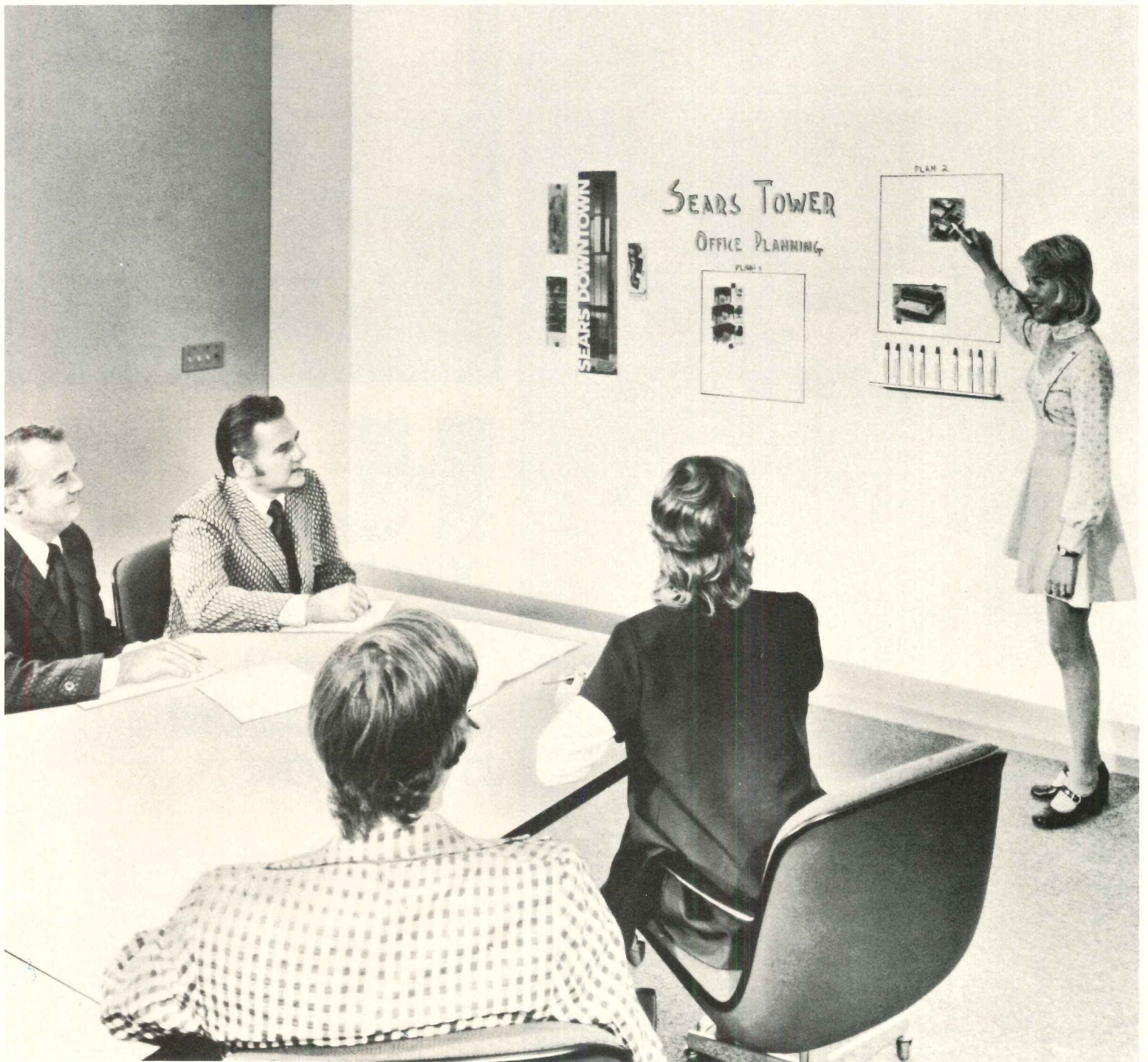
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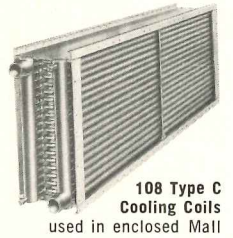


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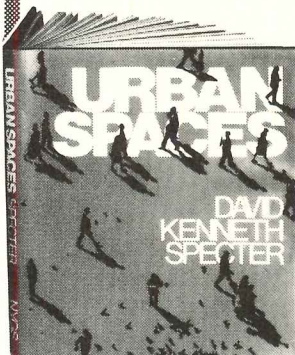
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by David Kenneth Specter, A.I.A.
foreword by Walter McQuade

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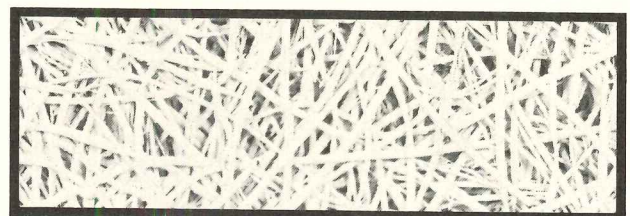
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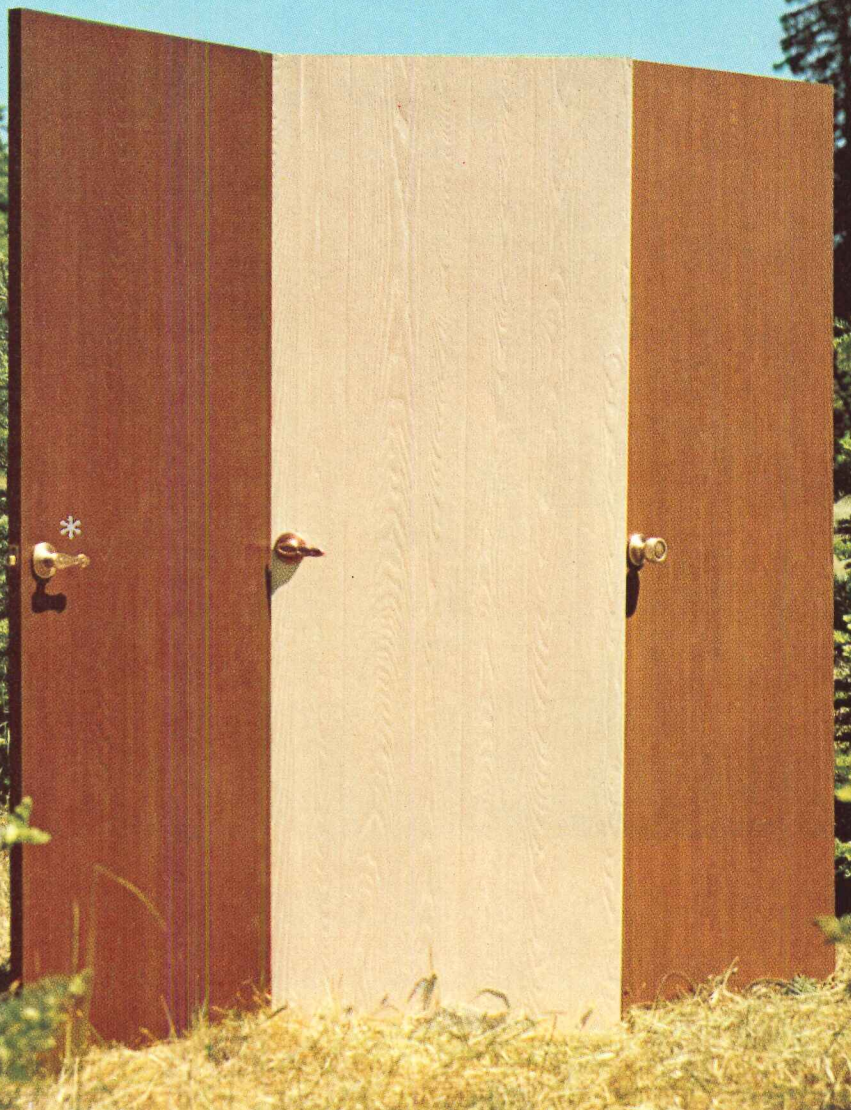
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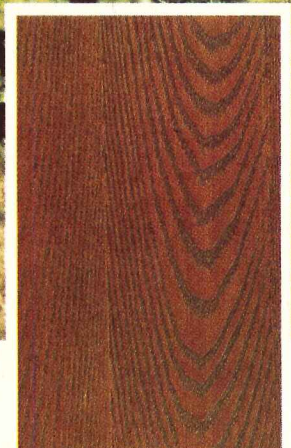


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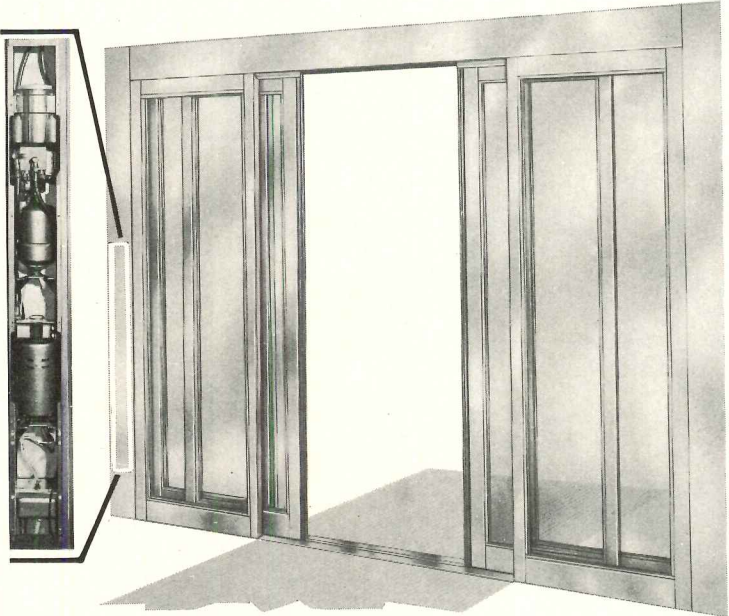
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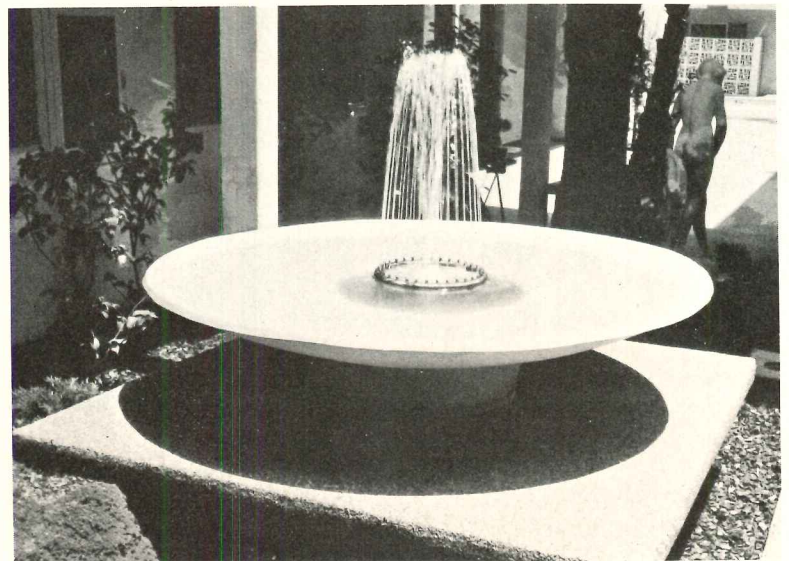
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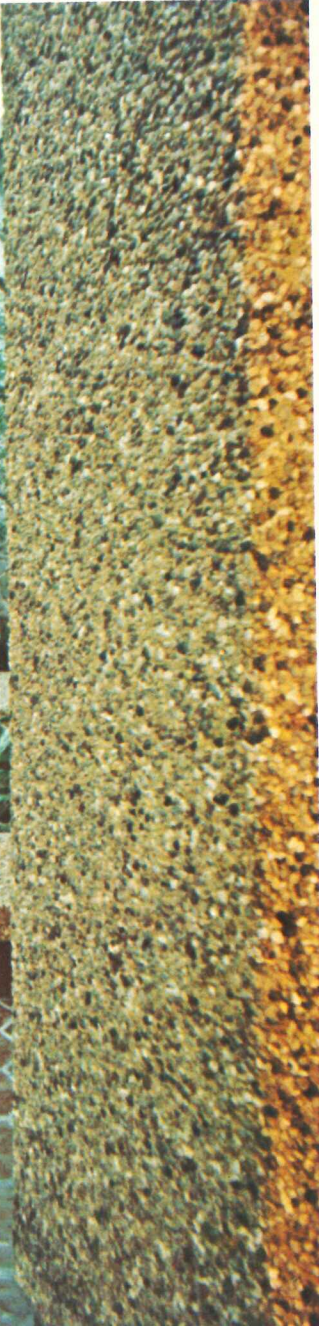
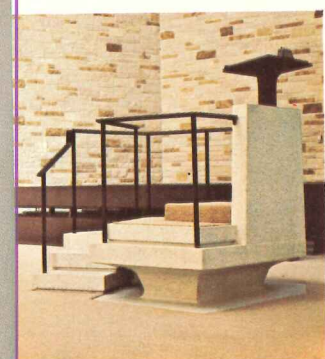
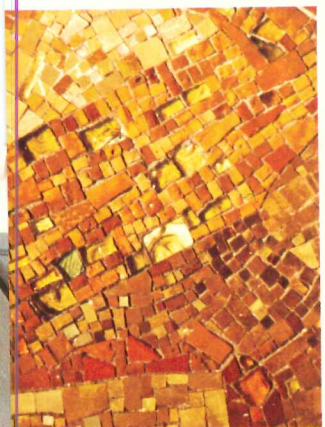
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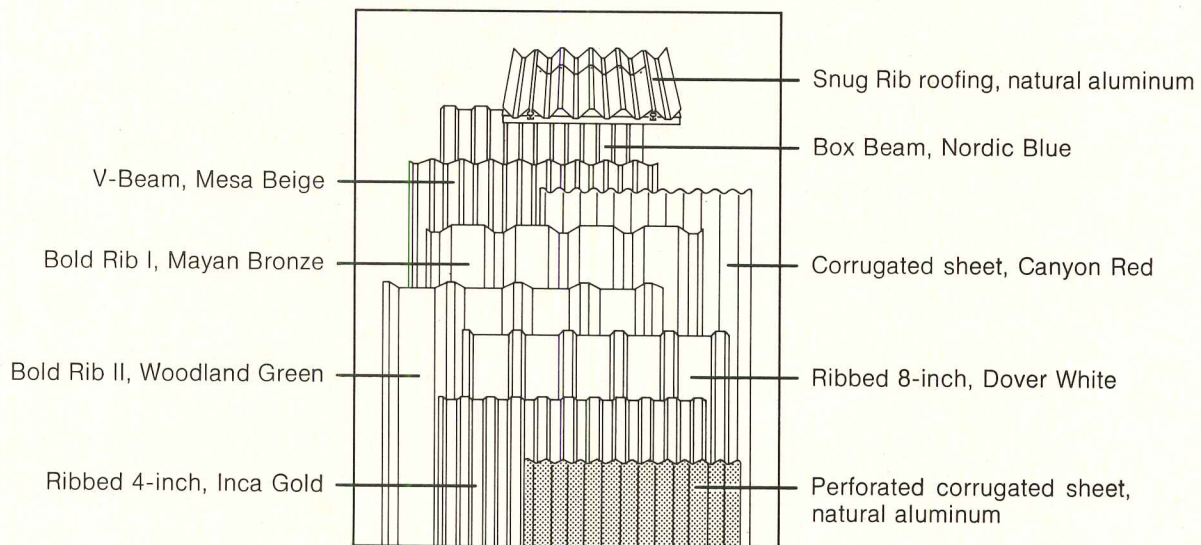
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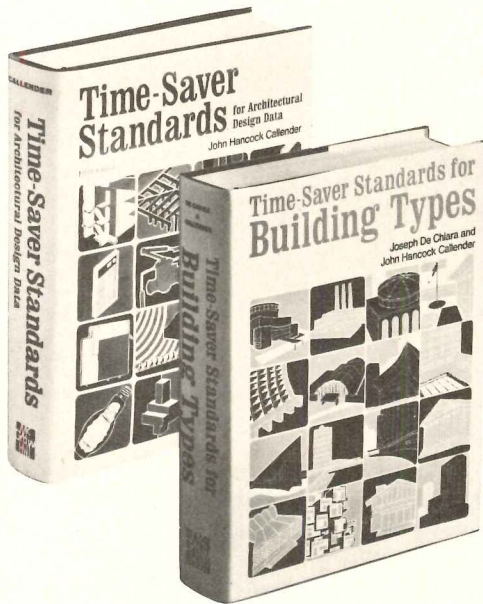


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By John Hancock Callender
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An Architectural Record Book
Edited by Barclay F. Gordon, Assoc. Ed.,
Architectural Record
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CAMPUS PLANNING AND DESIGN

An Architectural Record Book
Edited by Mildred F. Schmertz, A.I.A.,
Senior Editor, Architectural Record
264 pp., 9" x 12", 710 illus.

If you're taking on a project in campus development or expansion, you'll find this a really practical and rewarding source of information and inspiration. Each chapter is based on feature articles from Architectural Record and prefaced by an introduction highlighting special problems and solutions explored therein—designing the single building—designing the campus library—single building or complex designed as part of campus master plan—architecture giving the campus the unity of a

single building—campus performing art centers—designing campus interiors.

HOW TO MARKET PROFESSIONAL DESIGN SERVICES

By Gerre L. Jones, Marketing and
Public Relations Consultant
368 pp., 35 illus.

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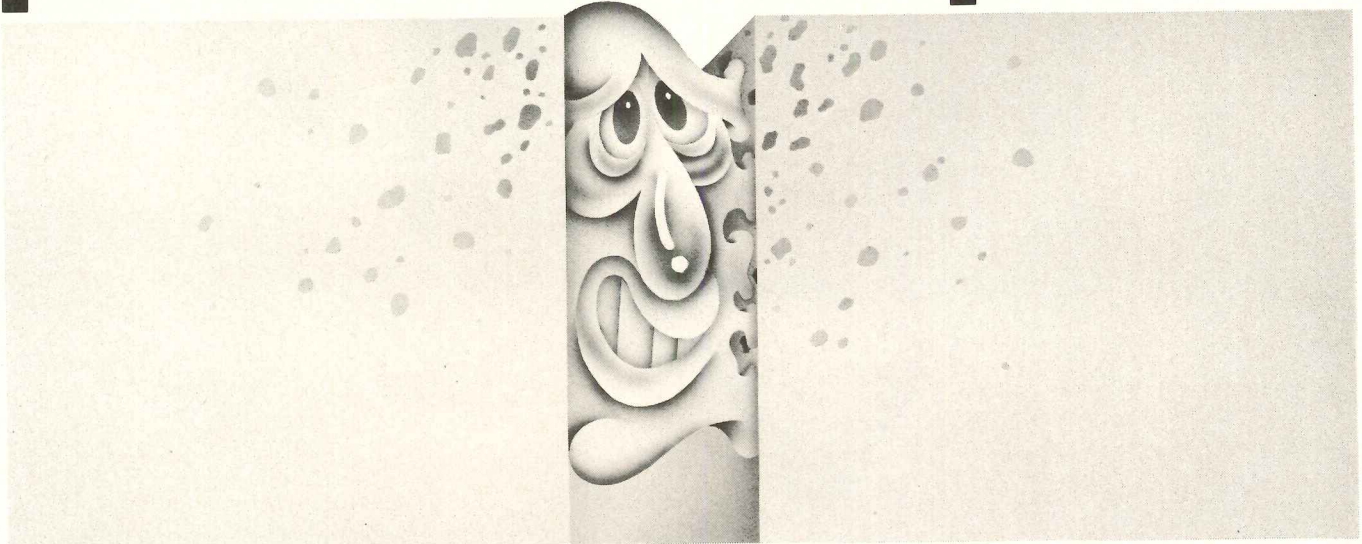


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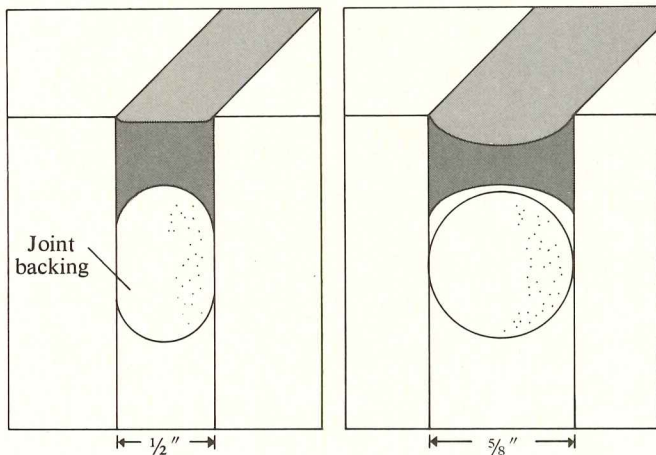
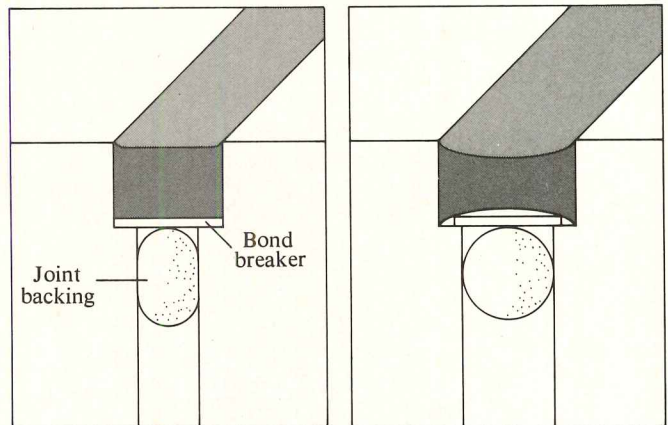
How to avoid sealant problems when you design precast concrete panels.



Obviously, you don't want sealant-adhesive failure in the joints between precast panels. And certainly we — Tremco — don't want it. So here's a brief guide to potential problem areas and tips on how to avoid them.

Let's start with design. When you're designing a joint, be sure it's wide enough to allow the sealant to move within its capabilities. If the joint is found to be too small on-site, it will have to be saw-cut to sufficient width — a costly procedure. A good rule of thumb is to design 1/2-inch wide joints for panels up to 15 feet, 5/8-inch or wider, for longer panels. An even better rule of thumb is to consult your Tremco man while you're in the design stage.

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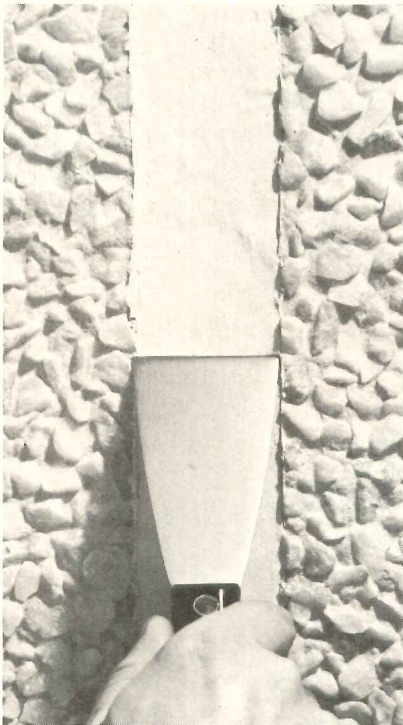
Form release agents: friend and foe. Form release agents are a necessity, but they can also create major problems for sealants.

The same action that prevents adhesion between the panel and the form can impair adhesion of the sealant bead to the joint interface. This could happen weeks or months after caulking, depending on the type of sealant,

the type of release agent and the amount of joint movement.

Some release agents are less troublesome than others. However, you can only be sure of good sealant adhesion if two things are done. First, the joint interface should be thoroughly cleaned the same time as the panel face, when it is removed from the form.

Second, be sure the joint interface is cleaned just before caulking. Your Tremco man can help you find the most economical way to get this done.

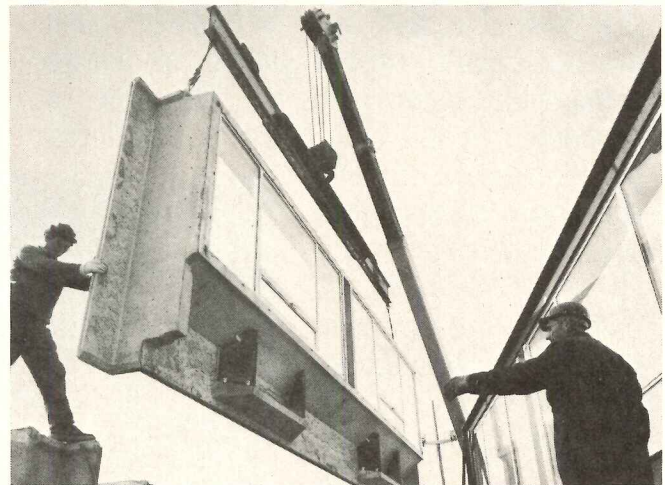


Don't take a powder. Another common problem that affects sealant adhesion is laitance on the joint interface. A frequent cause of this powdery surface condition is the use of retarder on exposed aggregate panels. A slight change in joint design can often help prevent the retarder from migrating to the joint face.

However, it's a good idea to specify that high pressure water spray be used on the joint surface as well as the face of the panel, during the

process of exposing the aggregate. Even then, though laitance has been successfully removed, the joint has to be thoroughly cleaned just before caulking. Since each case is different, your best bet is still to talk to your Tremco man and use DYmeric.

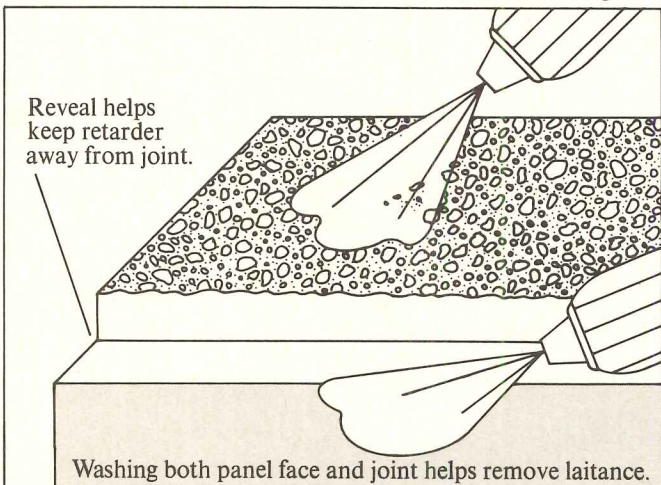
Waterproofing woes. While Tremco makes clear waterproofing coatings for masonry panels, we want to warn you that ours, like all the others, can cause sealant failure when they're improperly used.



Our advice is to caulk first, then waterproof. But sometimes specifications call for waterproofing at the factory, to protect the panels during transit and storage. If so, the joint should be protected from overspray. Your best bet, as always, is thorough cleaning of the joint interfaces just prior to caulking. Your Tremco man can help you decide on the right cleaning method for specific circumstances.

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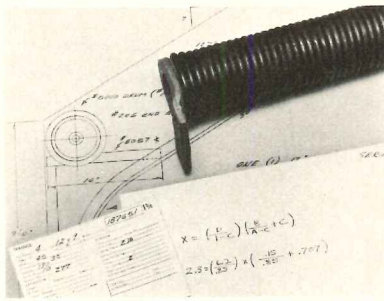
So talk to Tremco first. And you won't have joint sealing problems later. For help, contact your Tremco rep. Or Tremco, Cleveland, Ohio 44104. Toronto, Ontario M4H 1G7.



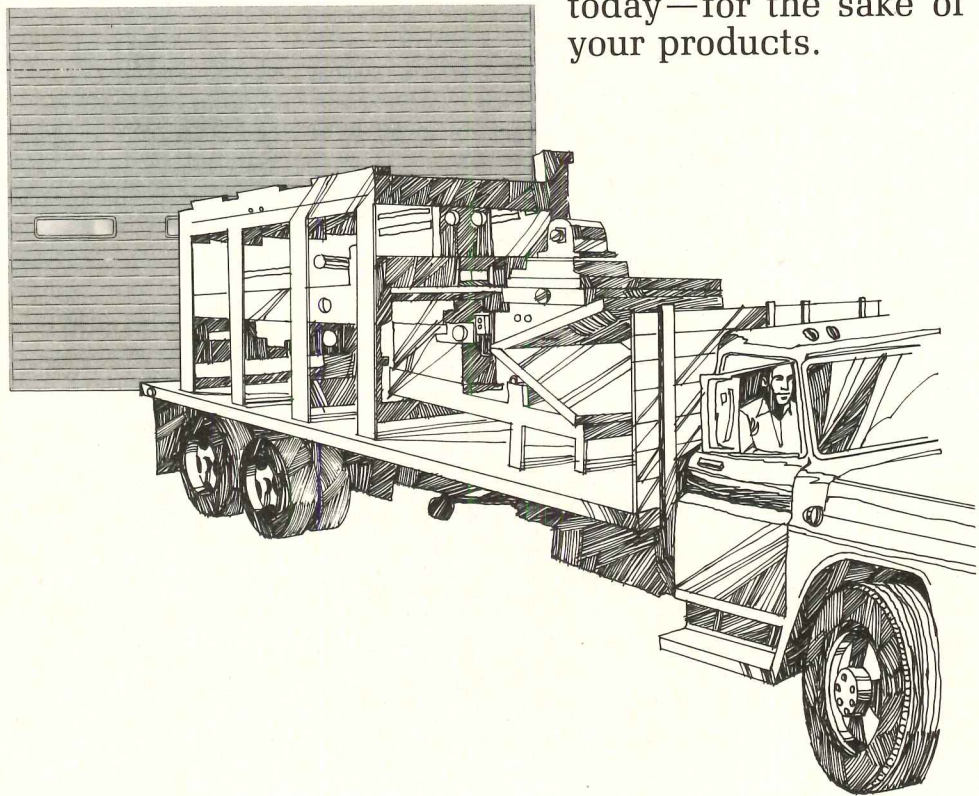
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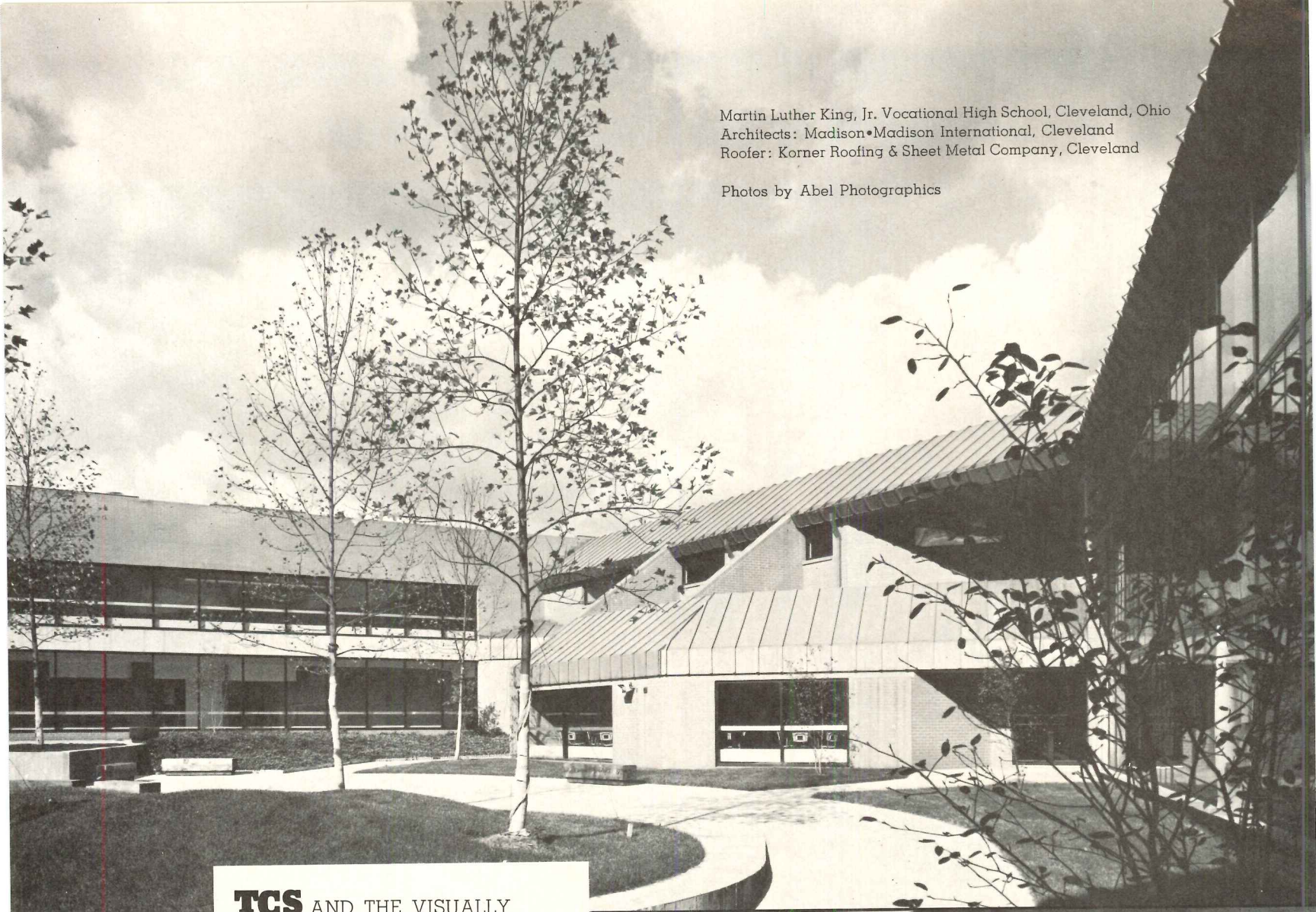


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7. NO SHAKE OR RATTLE. These assemblies offer unusual rigidity; the solid "feel" of permanent walls.

8. NEW DOOR FRAME. Self-mortising, reversible DELTA door frame accommodates any hinge location, no need to specify rights or lefts.

Compare these superior partition systems point for point with other "movables" as well as permanent walls. You'll find ULTRAWALL truly "ultra" in every way. Get specifics from your U.S.G. Technical Representative. Or write to us at 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. AR-54.

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ARCHITECTURAL RECORD

PRESENTS

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A series of two-day PROFESSIONAL MARKETING WORKSHOPS® produced for ARCHITECTURAL RECORD by the Continuing Education Division of Building Industry Development Services, Washington, D.C.

- Understanding marketing fundamentals
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- Planning for change, expansion and professional growth
- Evaluating existing and potential markets
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"Up to now, the design professional traditionally has had to learn selling techniques essentially by experience, through trial and error, and with no real standards against which to measure the degree of his successes and failures."

from HOW TO MARKET PROFESSIONAL DESIGN SERVICES
a McGraw-Hill book by Gerre L. Jones

These workshops are *not* for the design professional who believes that his client acquisition activities have reached a stage of perfection—or for the firm that, for whatever reasons, is satisfied that it has more clients and contracts than it can comfortably handle over the next 3 to 6 years.

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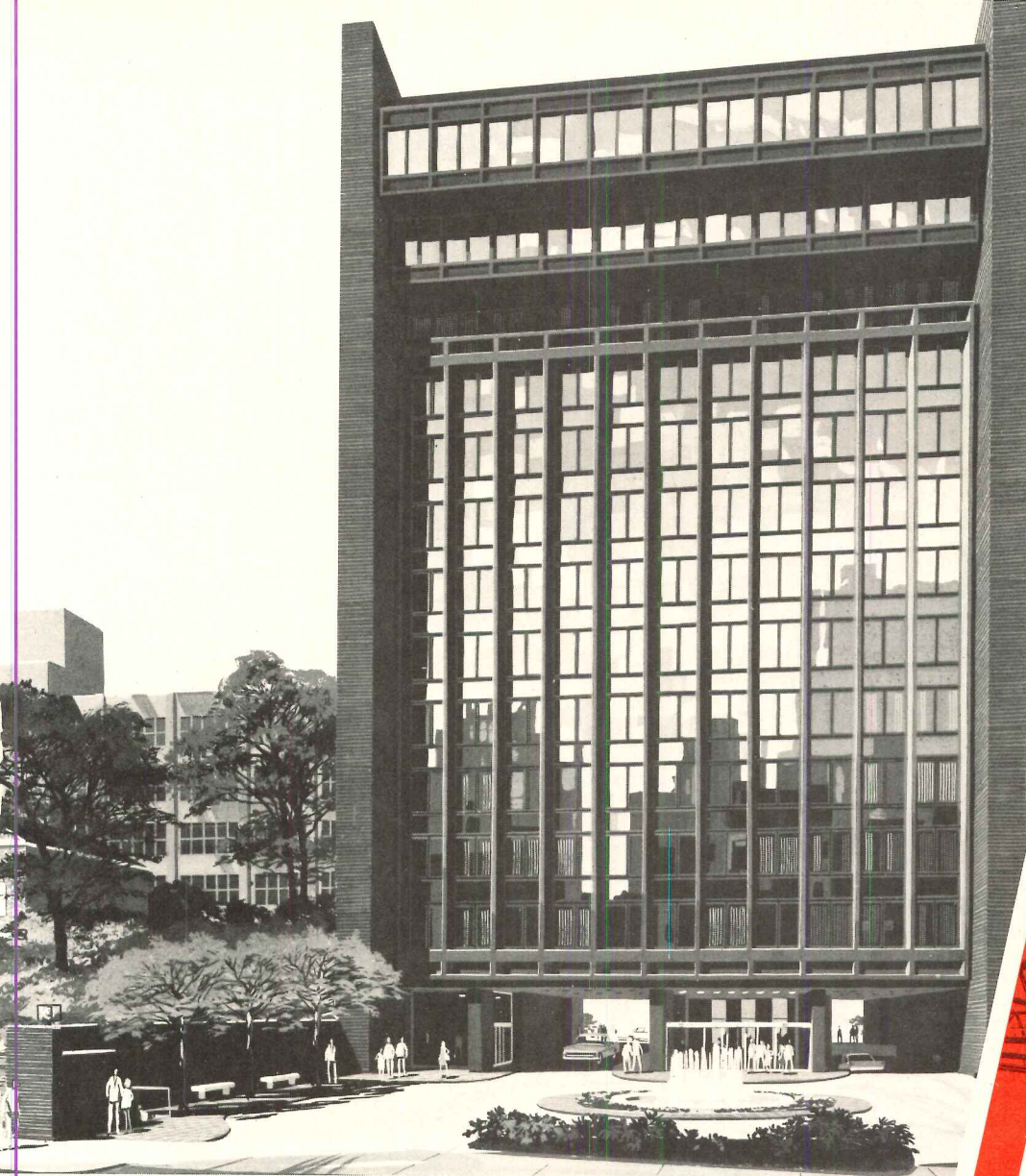
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<input type="checkbox"/> Houston, Texas	November	4- 5
<input type="checkbox"/> Phoenix, Arizona	December	5- 6

Dates and locations of workshops in other areas for 1975-1976 will be announced.



*Why steel joists
were the
right answer to
this building need*



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Kalikow Realty's Professional Building in New York City provides attractive and efficient office facilities for the medical profession. The 14-story structure, designed by architects Liebman-Liebman & Associates, also includes a 66,000 square foot, 3-level underground garage.

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Economy is just one of many advantages offered by open web steel joists, the versatile structural members that lend themselves so well to virtually every type of building design and construction. For detailed information, send coupon today for new combined Specifications and Load Tables which encompass Open Web Steel Joists, Longspan Steel Joists and Deep Longspan Steel Joists.



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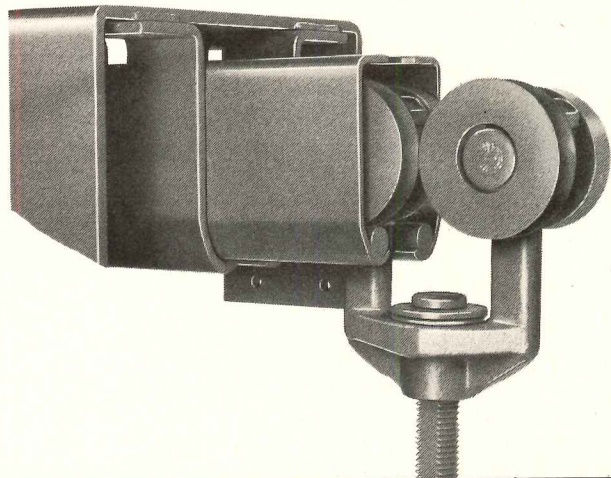
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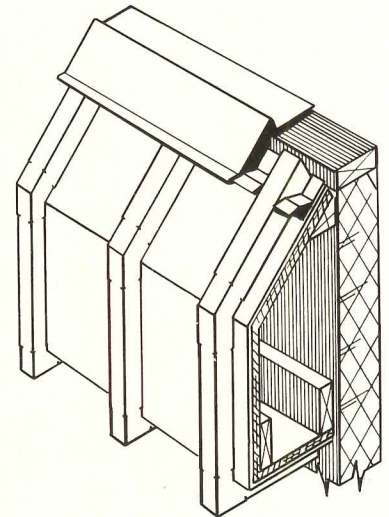
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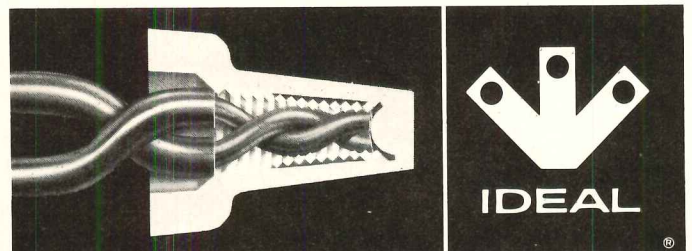
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RED

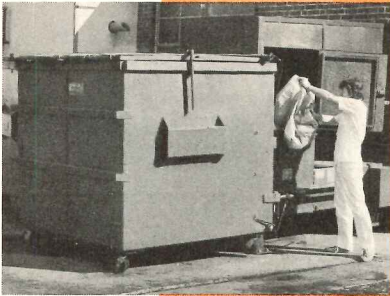
GRAY

BLUE

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◆ For more data, circle 167 on inquiry card

WASTE DISPOSAL... Big Volume or Small Dempster Wrote the Book on REFUSE PACKERS



Small Dempster Refuse Packer saves space and packs into many types and sizes of refuse containers.



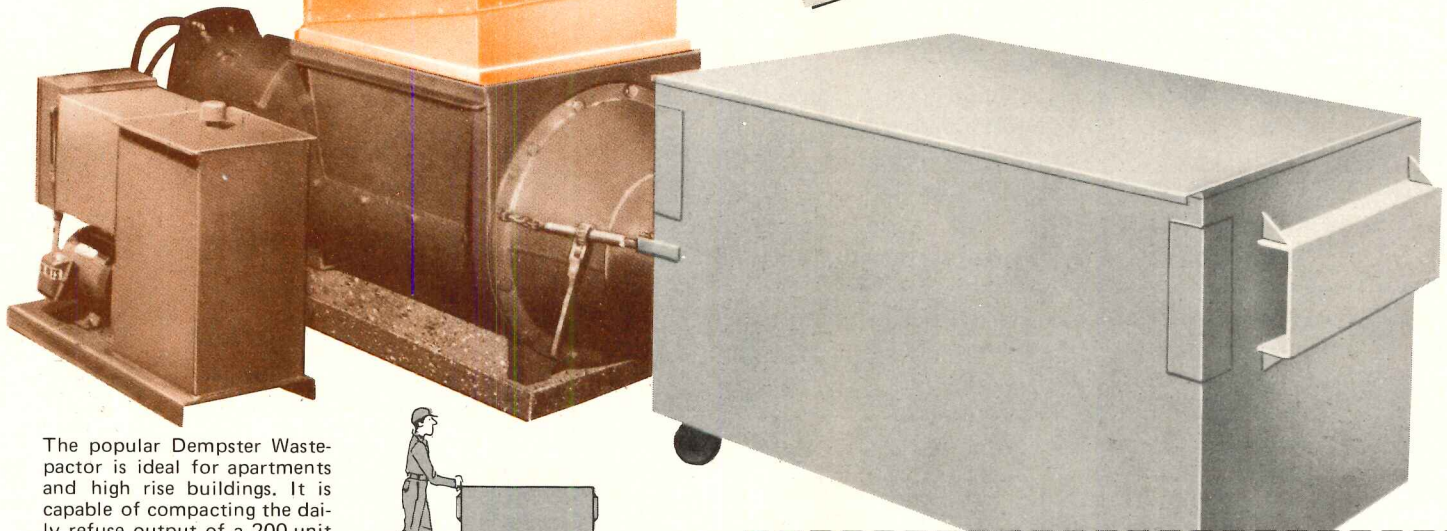
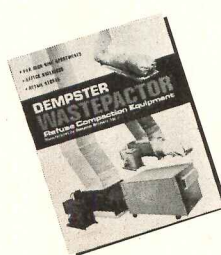
Through-the-wall loading into a Dempster Packer provides a convenient, all-weather refuse disposal system.

Whatever the installation, Dempster can give you a choice of models with varying packing capacities so you can pick the packer that is best for your application, refuse volume, and type of material.

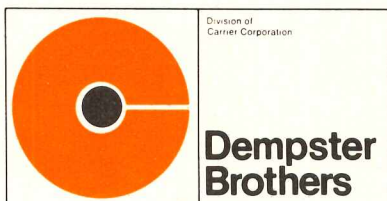
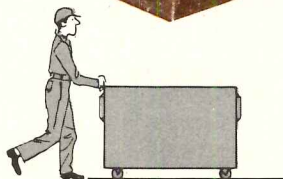
Dempster has the know-how to help you set up your stationary packer as a component in a total system . . . as simple or as exotic as your needs and economics dictate.

Your nearby Dempster Refuse Consultant helped write the book. He is a walking, talking encyclopedia on the subject of refuse handling and his counsel could save you hours of work. Write today for his name or for the name of a well-equipped private hauler who provides dependable service near you.

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The popular Dempster Waste-pactor is ideal for apartments and high rise buildings. It is capable of compacting the daily refuse output of a 200 unit apartment complex into a one cubic yard container.



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- Yes . . . I would like Dempster to help me plan a packer installation. (please check)
- Please send information and literature on Dempster Waste-pactor.
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 - Please send name of Dempster Refuse Consultant.
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Al Kaline— the ALL-STAR Tiger— durable, dependable— just like our *Aquapon*[®] and *Pitt-Glaze*[®] Coatings

When Al Kaline of the Detroit Tigers steps to the plate or slides for home, you know this veteran American League All-Star will give you everything he's got. Al's well respected and he earned his reputation as one of baseball's most durable players—one of its toughest competitors.

Just think of the punishment tough professional athletes like Al Kaline give a team locker room. The tromping of cleats, the mud and cinders, steaming hot water from the showers—day in, day out, all season long give any wall or floor coating a good going over.

Pittsburgh Paints has a durable duo that can meet this kind of punishment head-on, not only in locker rooms, but in all hard-use industrial and commercial areas—such as corridors, kitchens, machine shops, laboratories, and the like.

For the concrete block walls, there's *Pitt-Glaze* Coating, the Polyester-epoxy that looks and feels like tile.

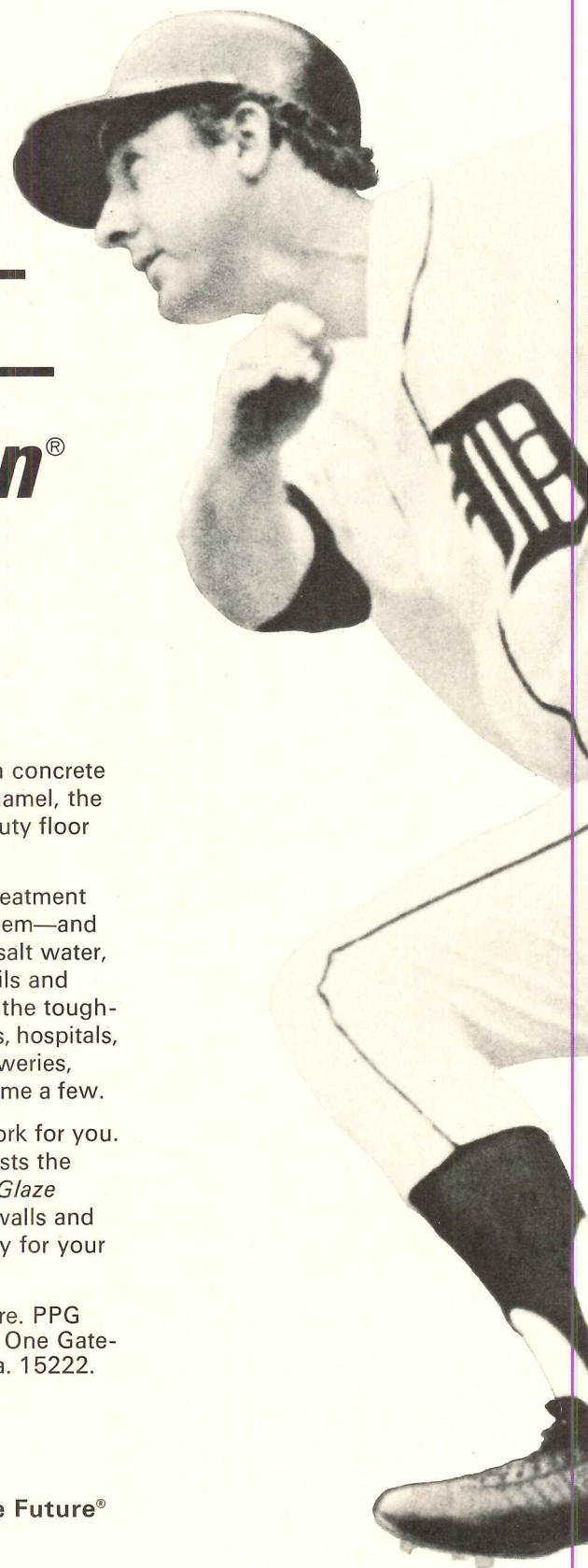
And for heavy-duty use on concrete floors, there's *Aquapon* Enamel, the Polyamide-epoxy heavy-duty floor coating.

Both can take the kind of treatment the "pros" can throw at them—and more. They're resistant to salt water, alkalis, acids, plus many oils and chemicals. Both can meet the toughest requirements of schools, hospitals, motels, hotels, dairies, breweries, and industrial plants, to name a few.

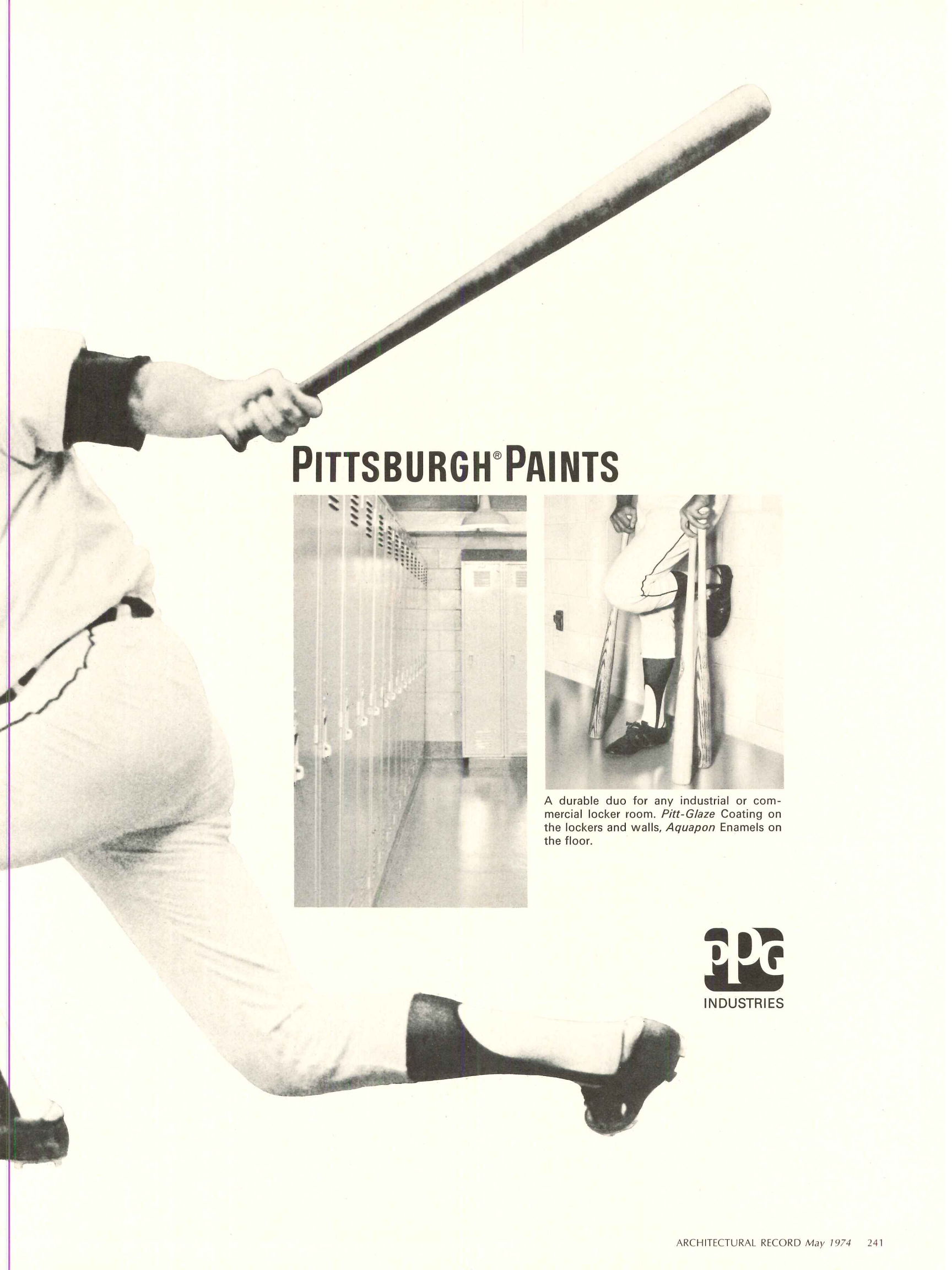
Put this durable duo to work for you. Give your maintenance costs the one-two punch with *Pitt-Glaze* Polyester-epoxy for your walls and *Aquapon* Polyamide-epoxy for your floors.

Write for complete literature. PPG Industries, Inc., Dept. AR, One Gateway Center, Pittsburgh, Pa. 15222.

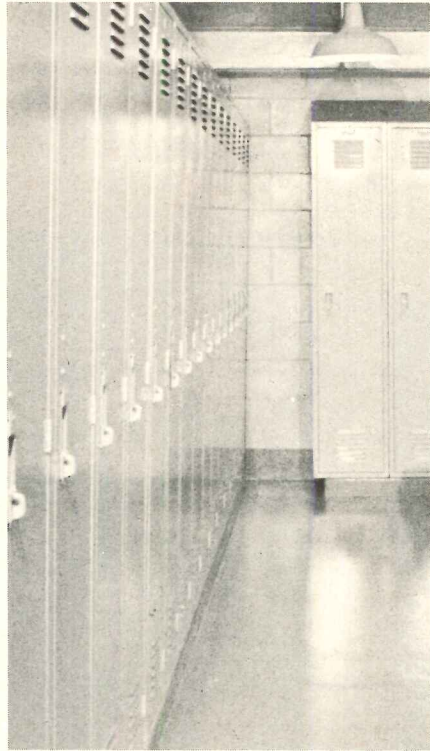
PPG: a Concern for the Future[®]



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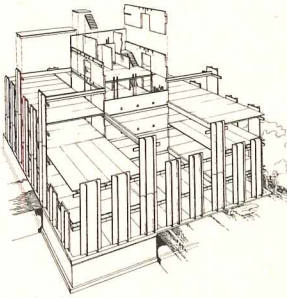


PITTSBURGH® PAINTS



A durable duo for any industrial or commercial locker room. *Pitt-Glaze* Coating on the lockers and walls, *Aquapon* Enamels on the floor.

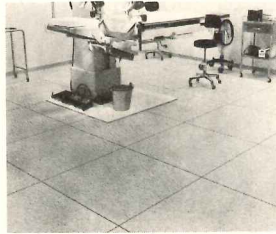
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INDUSTRIES



CHOICE OF MICRO-SQUARED™ OR SEAMLESS conductive flooring for hospital operating rooms is now offered by Vinyl Plastics, Inc. Every Conductile® 12" x 12" tile is Micro-Squared to a tolerance of ±.002" to assure uniformity. Seamless floors are seam-welded. Both systems are installed with conductive adhesive and provide positive sterile floor capabilities. A modern, subtle pattern in four pastel colors and two new dark tones provides design flexibility. For complete information send for your 1974 Conductile Catalog.

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VANTAGE-SPACE MULTI-STORY OFFICE BUILDINGS . . . are now available through Precast Systems, Inc. member/affiliates from coast to coast and in Canada. The system features a fire-resistant precast service core, precast concrete floors and load-bearing walls, column-free space for greater flexibility in planning, an excellent ratio of rentable floor area to total floor area, fast construction, reduced operating costs and attractive appearance. Write Precast Systems, Inc., Dept. AR 74, 10400 West Higgins Road, Rosemont (Chicago), Ill. 60018. Telephone: 312/298-5570.



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PORTABLE SOLID WASTE AND REFUSE COMPACTORS and systems from The Tony Team, Inc. includes four sizes and great versatility. Pollution Packer™ compactors bale, bag and box all types of wastes and refuse, wet or dry. Machine capacities range from .8 C. Y. to 4½ C. Y. of loose wastes at 10 to 1 compaction ratio . . . operate on low amperage, 110-V60 cycle service. For hospitals, hotels, schools, colleges, restaurants, office and apartment bldgs. Simple adaptation to chute-type disposal systems. Spec sheets and literature available from: The Tony Team, Inc., 7399 Bush Lake Road, Mpls., Minn. 55435.



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SEND FOR A COMPLETE, DETAILED CATALOG of "Record Impressions." A convenient service offering reprints of Building Type Studies, Interiors and Special Reports. Offered are more than 30 items including back issues of Record Houses 1968 and 1970; Product Reports '73 and the practical reference guide, "Air Conditioning: A New Interpretation."

Address your request to: Record Impressions, Architectural Record, 1221 Avenue of the Americas, New York, New York 10020, Attn: Joseph R. Wunk

Haws Dual Use Water Cooler for Wheelchair Users and Foot Traffic.

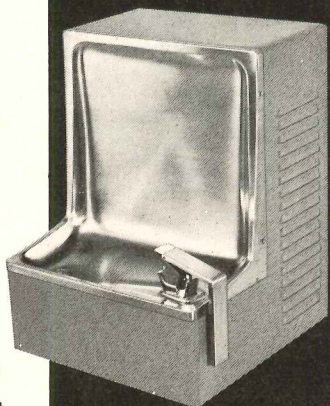
Haws HWC-6 water cooler is designed particularly for persons in wheelchairs, yet it effectively provides service to foot traffic.

It extends out from the wall and is mounted at a convenient height from the floor so that a person can easily wheel up to it. Compound-action bubbler valve actuates cooler from a push on the side or top, making it easy to operate by handicapped persons. Simple installation requires no wall recess.

Model HWC-6 helps you comply with public law 90-480.

Available in stainless steel at extra cost. Write for detailed information.

Haws Drinking Faucet Co., 4th and Page St., Berkeley, Ca. 94710.

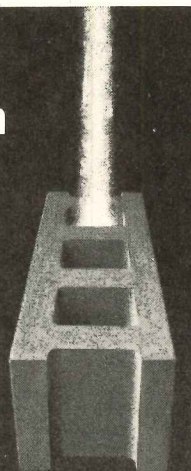


WATER COOLERS

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Space age insulation for masonry walls available now!

For space age insulation in cavity wall construction, specify Permalite perlite. It's the material used more than any other in cryogenic installations to insulate rocket and other exotic fuels stored at temperatures as low as -400 degrees F.



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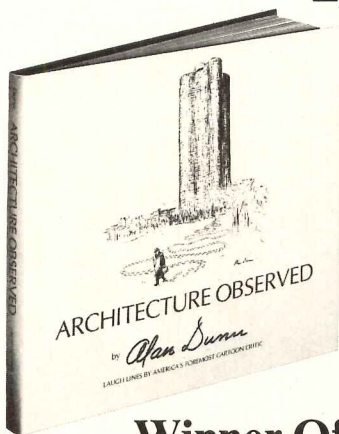


A subsidiary of General Refractories Company

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“Dunn Has Cleared The Air For Us By His Laughter.”

—Lewis Mumford



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Observed

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You and your friends will enjoy this sparkling collection of cartoons by a man universally recognized as America's funniest, most amiable and most incisive commentator on the foibles of American Architecture, its practitioners, and a sometimes baffled public.

Always in the avant garde of ideas and trends, Alan Dunn is one of the most knowledgeable and effective critics of architecture today. In this role he consistently and wittily reminds us that architecture is for people and language is for communication; if he notes any tendency towards excesses in architectural fads, cliches, or obscure jargon, he quickly brings us laughingly back to reality.

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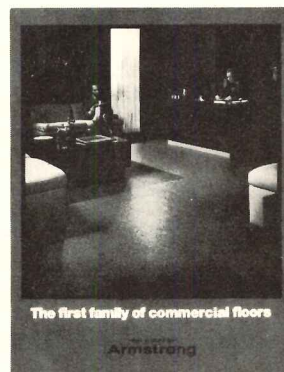
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Address your request to: Record Impressions, Architectural Record,
1221 Avenue of the Americas, New York, New York 10020, Att:
Joseph R. Wunk

If you understood lumens-per-watt the way you understand miles-per-gallon, you might just scrap your company's present lighting system.

The "lumen" and the "watt" may not be as familiar to you as the "mile" and the "gallon." But the principle is exactly the same.

And if more American businessmen realized that, more American businesses would be saving money on lighting.

The lumen-per-watt. It's simpler than it sounds.

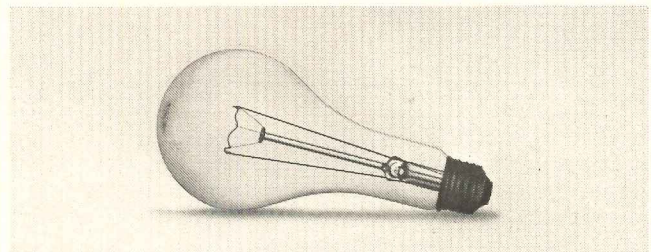
A lumen is nothing more than a unit of light. A lamp that gives 100 lumens is giving twice as much light as a lamp that gives 50 lumens.

A watt is a unit of electrical power. How much electricity it takes a fan or a toaster or a light bulb to do its job. Something that uses 100 watts is using twice as much electricity as something that uses 50 watts.

Now, it doesn't take a degree in engineering to figure out that the lamp that gives the most lumens-per-watt is the most efficient lamp. Just like the car that gives the most miles-per-gallon is the most efficient car.

And that's about all the fancy, technical language you're going to need to start evaluating your company's lighting system.

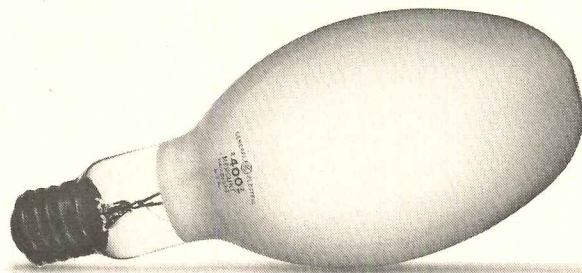
Some light bulbs you've heard of... and some we're pretty sure you haven't.



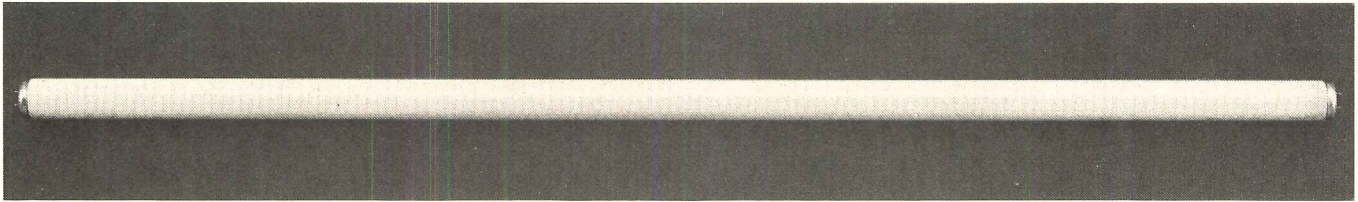
**The incandescent light bulb.
About 10 to 23 lumens-per-watt.**

The incandescent light bulb. A very flexible lamp that can be used almost anywhere. Nevertheless, an incandescent bulb is usually the least efficient lamp you can buy. Only 10 to 23 lumens-per-watt. (Efficiency increases as wattage goes up.)

The mercury lamp. A definite improvement. On the average, one 100-watt mercury lamp gives as much light as two 100-watt incandescent light bulbs. (Higher wattage mercury lamps are even more efficient.)



**The mercury lamp.
About 42 to 63 lumens-per-watt.**



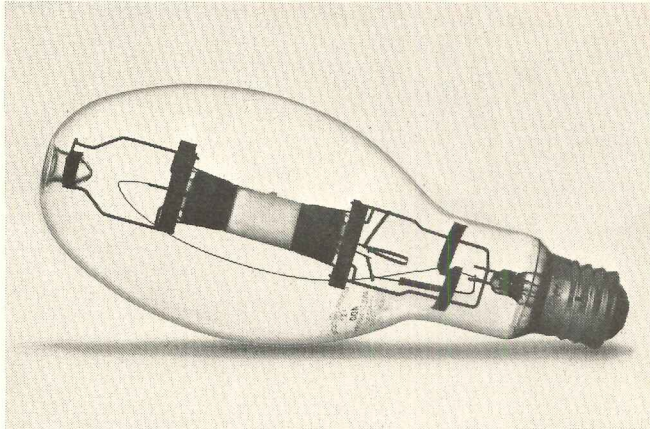
**The fluorescent lamp.
About 55 to 83 lumens-per-watt.**

The fluorescent lamp. It's used a lot. It could be used a lot more, especially in place of incandescent bulbs. Typically, one four-foot, 40-watt fluorescent lamp gives as much light as a 150-watt incandescent light bulb... for about 1/3 the electricity.

three 1,000-watt mercury lamps. Or, six 1,000-watt incandescent light bulbs.

So what's our point?
Simply this.

Your company can probably get the light it needs more efficiently.



**The Multi-Vapor® lamp.
About 85 to 100 lumens-per-watt.**

The Multi-Vapor® lamp. Often used to light glamorous places like baseball and football stadiums. Also used in slightly less glamorous places like parking lots, factory buildings and warehouses. It's the second most efficient lamp we make. A single 1,000-watt Multi-Vapor lamp gives nearly as much light as four 1,000-watt incandescent lamps. (In other words, the same light for about 1/4 the electricity.)

Right now, your company may be using too many lamps near the top of this list and not enough near the bottom.

If you were using some of the newer, more efficient lamp types, you might be able to get the same amount of light you're getting now for substantially less electricity.

It won't be free.

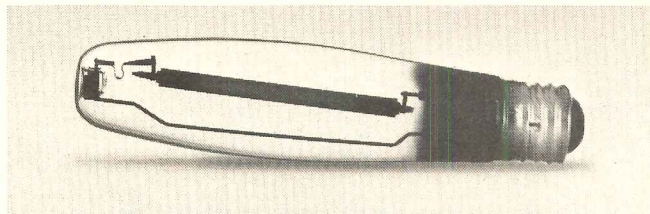
Updating your company's lighting system to make it more efficient will cost you money. Usually, it requires new fixtures and ballasts. And, generally speaking, the more efficient lamp types are also more expensive. But before you let this discourage you, remember this. When you save electricity, you're not only saving energy. You're also saving money. In fact, the money you save in the first couple of years of operation can often pay for the cost of a new Lucalox lighting system.

Something that is free.

One thing we can give you for free is more information.

If this ad has even partly interested you in updating your company's lighting system, we ask you to take one small, but important next step. Find out more. Call your local GE lamp representative.

Or write us. General Electric Lamp Business Division, Dept. C-406, Nela Park, Cleveland, Ohio 44112.



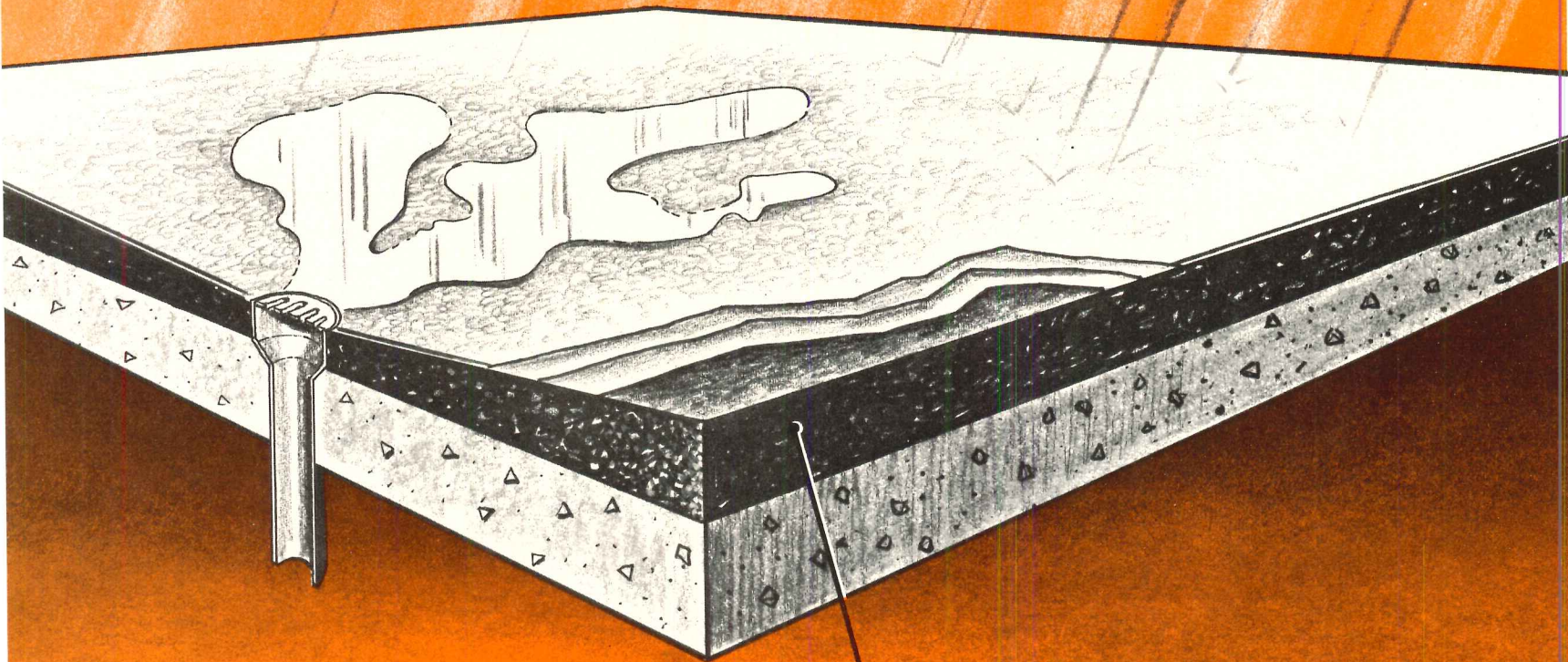
**The Lucalox® lamp.
About 102 to 140 lumens-per-watt.**

The Lucalox® lamp. The high-pressure sodium vapor lamp is the most efficient lamp we make. To equal the light of one 1,000-watt Lucalox lamp, it would take

**We can help
make every watt count.**

GENERAL  ELECTRIC

For more data, circle 150 on inquiry card




All-weather Crete[®]
INSULATION

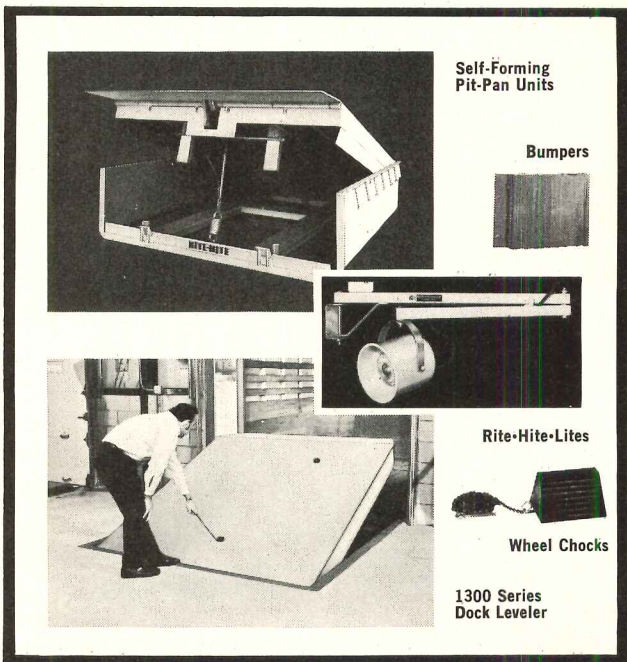
How to achieve slope to drains when you insulate the roof deck!

Few things deteriorate a roof and cause leaks faster than ponding water. That's why roofing experts, architects and engineers unanimously agree that roof decks should slope to drains. The efficient, economical way to accomplish this is with All-weather Crete Insulation! This unique material not only provides the finest insulating value ($K=.40$) of any poured fill insulation, but it can be positively sloped to drains, all in the same operation. All-weather Crete is applied hot and dry (even in freezing temperatures) and compacted to form a smooth, seamless, sloped to drain deck which is ready for roofing immediately - no curing is necessary. It speeds construction!

No wonder All-weather Crete is also a top choice for plazas where slope to drains is critical. Compare the life/cycle costs of All-weather Crete with other methods. None can surpass it in the thousands of dollars saved through energy conservation and roof life longevity. Get the facts - contact your local All-weather Crete applicator or Silbrico Corporation, 6300 River Rd., Hodgkins, Ill. 60525, (312) 735-3322.



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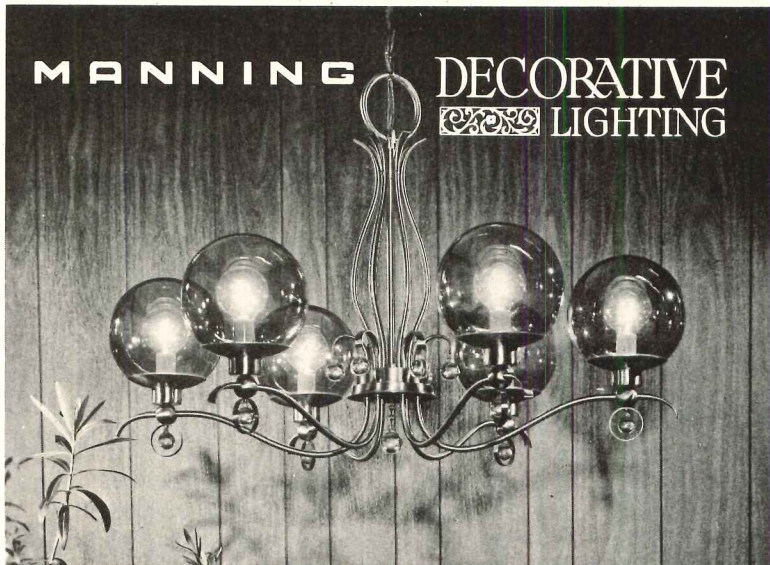
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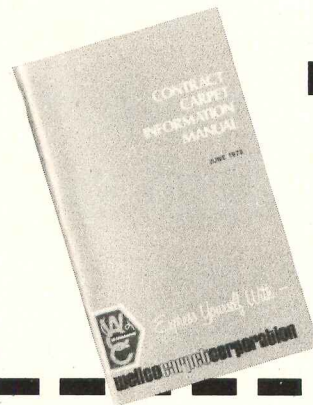
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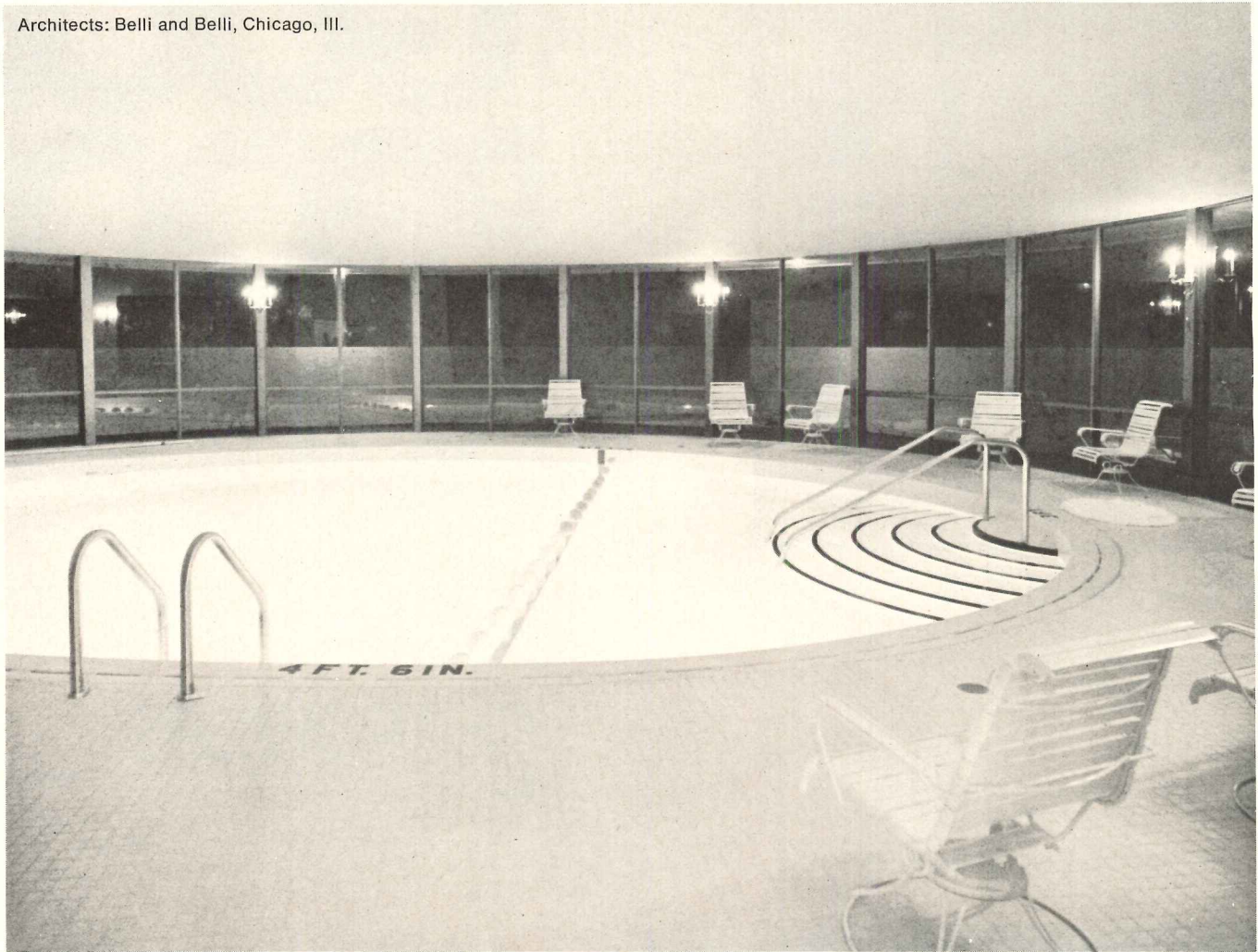
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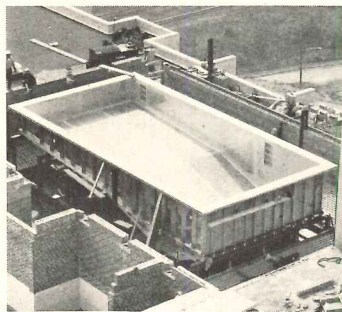


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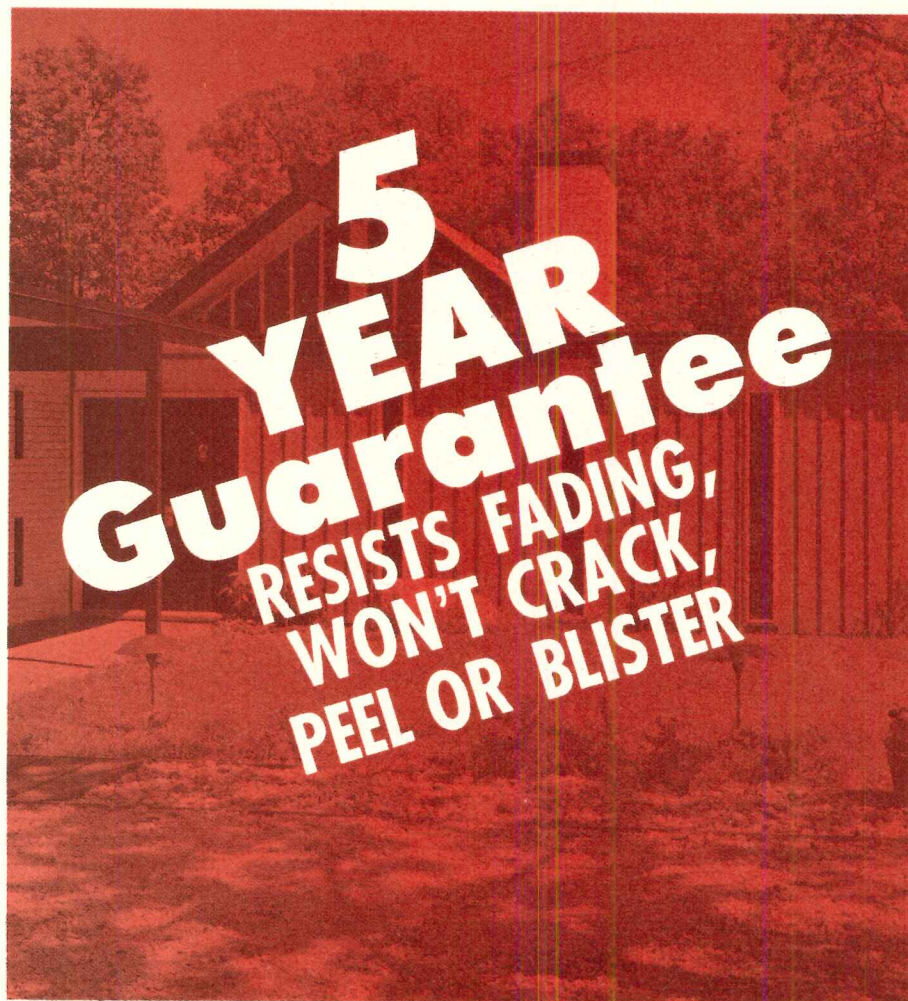


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