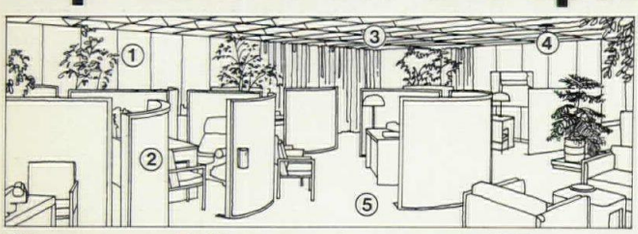
TENT STRUCTURE DRAWN BY COMPUTER FOR INTERAMA AMPHITHEATER, MIAMI, FLORIDA

A NEW CONVENTION CENTER—AND NEW IMAGE—FOR ACAPULCO
CORRECTIONAL INSTITUTIONS DESIGNED TO MEET NEW PRISON REFORMS
TWO UNIVERSITY BUILDINGS BY WOLF ASSOCIATES ARCHITECTS
BUILDING TYPES STUDY: MEDICAL FACILITIES
FULL CONTENTS ON PAGES 10 AND 11

ARCHITECTURAL RECORD

FEBRUARY 1975 2 A McGRAW-HILL PUBLICATION · THREE DOLLARS PER COPY

New from Armstrong. The first pre-engineered package of products for the open plan office.



It combines acoustical and visual privacy, air distribution, and quality lighting, with good looks, too.

Until now, you've had to deal with as many as five or six different suppliers to put together the various elements required for a successful open office plan.

Now, Armstrong offers a complete product package that functions well, looks as good as it works, and provides, for the first time, a *single-source responsibility.*

1. Soundsoak™ Wall Panels*

These panels are made of an acoustically efficient mineral fiberboard mated to a soft modacrylic fabric. They can be easily installed on interior walls and other flat surfaces and make a substantial contribution to the control of reflected sound.

Available in a wide choice of modern colors, Armstrong Soundsoak Panels are decorative as well as functional. They're 30" wide and available in either nine- or ten-foot heights.

2. Soundsoak Divider Screens

Screens are an indispensable element in efficient open office planning. They provide effective separation of work

*Patent pending

stations, contribute to acoustical and visual privacy, and add splashes of color to the room. Freestanding and easy to move, they are covered with a tufted-nylon fabric in a wide choice of colors which coordinate with the wall panels. Both curved and straight types are available in five-foot width, and there is a choice of a five- or six-foot height. All models offer a trim selection of either walnut-finished wood or bronze anodized aluminum.

3. C-60/30 Luminaire Ceiling System

The most important factor in open planning is acoustical privacy, and the ceiling is the key element in achieving that privacy. The Armstrong C-60/30 Luminaire Integrated Ceiling System provides not only acoustical efficiency but also other important open plan environmental factors such as quality lighting and draft-free air distribution.

In the 100%-vaulted configuration, using a special 1" Classic Open Plan ceiling board, the C-60/30 System complies with the GSA PBS-C.1 performance specifications for a Speech-Privacy Potential of 60**.

4. Sound-Masking System

The Armstrong open plan package includes a completely integrated and matched electronic sound system that introduces into the working area sound of the proper intensity and frequency content to help attain the desired level of speech privacy. The system can be "tuned" to provide evenly distributed, nondisturbing background sound to any open plan space.

5. Armstrong Floors

To complete the open plan visual package, Armstrong offers a selection of flooring materials. If carpet is your choice, there is a wide range of colorful Armstrong Commercial Carpets that will add warmth and quiet to any open plan.

Where the practicality of resilient floors is called for, Armstrong Quiet Zone® Vinyl Corlon® is the answer. Thanks to its generous foam-cushion backing, it's both quiet and comfortable.

That's the Armstrong five-in-one open plan package. For more information, mail this coupon to Armstrong, 4210 Rock St., Lancaster, Pa. 17604. In Canada, write Armstrong Cork Canada, P.O. Box 919, Montreal 101, Quebec. *For more data, circle 1 on inquiry card*

**at 10' 6" interzone distance

Please send me your 16-page brochure and complete information on the Armstrong package of open plan products.

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Company_____

Address_____

City_____ State_____ Zip_____

FROM THE INDOOR WORLD® OF

Armstrong

There's a lot more to Quiet Zone than meets the eye—or the ear. When you first see it, Armstrong Quiet Zone looks like a modern, attractive Armstrong Vinyl Corlon® floor. But when you walk on it, and feel its comfort, and listen to your footsteps, you might think it's carpet.

Because underneath, Quiet Zone is unlike any floor you've probably ever seen. A thick backing of Cushioncord® vinyl foam muffles footsteps and the clatter of dropped objects. It also cushions feet, for more walking and standing comfort.

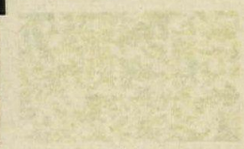
You know how important quietness and comfort are. You know how important good design is. And you know how important practicality is.

Quiet Zone is all of that. Its rugged, heavy-duty vinyl surface resists scuffs and stains. Maintenance is simple and economical. And Quiet Zone is available in two handsome patterns, which are richly textured to help disguise traffic marks and subfloor irregularities.

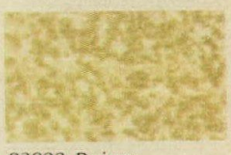
Install Quiet Zone. Listen to it work. More information? Please mail the coupon.

Shh. Quiet Zone™ at work. You know it's vinyl, but you might think it's carpet.

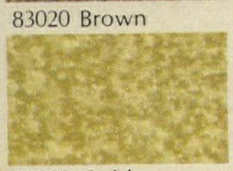
83020 Brown



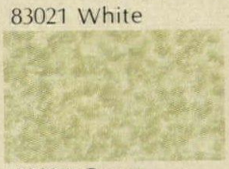
83021 White



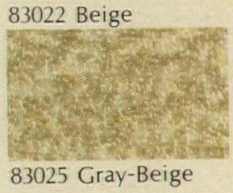
83022 Beige



83023 Gold



83024 Green



83025 Gray-Beige

The Quiet Zone pattern illustrated here is called Grand Central.

For more information, send this coupon to Armstrong, 311 Rock St., Lancaster, Pa. 17604.

Name_____

Company_____

Address_____

City_____ State_____ Zip_____

FROM THE INDOOR WORLD® OF

Armstrong

For more data, circle 2 on inquiry card

Letters to the editor

I have just read your article on Harvard Square and the Kennedy Library in the December issue of RECORD.

My congratulations in having managed to get across in one article the real complexities of the issues. I also congratulate the magazine for venturing into this kind of article which goes beyond the individual building.

Theodore Monacelli, AIA
Monacelli Associates
Cambridge, Massachusetts

I should like to receive tear sheets of your special study "Conservation in the Context of Change" which appeared in the December 1974 issue of RECORD.

I found the published material both useful and enlightening; I feel sure that having easy reference through tear sheets will further this Agency's own work in preservation and rehabilitation.

Stanley M. Sherman, Chief
Urban Design
District of Columbia
Redevelopment Land Agency

I have just quickly scanned the December 1974 issue of RECORD. I am extremely impressed with the hard-biting and realistic approach to a problem-area which has too often fostered an excess in sentimental and unfeasible solutions. The living proof of the absolute necessity for American cities to achieve a "continuum of development" is already evidenced in Boston; Philadelphia; Portland, Oregon; Seattle, Columbus, Indiana and many other large and small municipalities.

Keith Mikelson,
Principal city planner
Land Use Division
Community and
Development Dept.
Detroit

We think the December issue of RECORD is very good.

And it comes in time to help us with our Federal adaptive use paper—and plotting.

Lois Craig
Staff director
Federal Architecture Project
Washington, D.C.

"The Sea Ranch—a Second Look," excerpted from the book *The Place of Houses* by Charles Moore, Gerald Allen and Donlyn Lyndon (RECORD, Nov. 1974, pp. 129-132) is thought provoking and implies the need for a response from those of us who now, ten years later, are responsible for carrying on the community development and management programs for the Ranch. . . .

It becomes painfully clear as one works with the design review process that, regardless of how hard we may try to expose the owners and their design partners to the philosophy of the Ranch, sensitivity and understanding the Sea Ranch "concept" cannot be legislated into the consciousness of some owner/designer combinations. Nor, in some cases, can it be impressed there during the review process. The action of rejecting plans is fraught with tension for reviewer and reviewee, and the Committee usually finds itself dealing with a situation in which the proposer has expended time, money and long-held dreams in the project presented. The situation is never comfortable, but, in spite of Charles Moore's concerns to the contrary, many plans have been rejected and the rejections have been sustained over vigorous protests and occasional threats of legal action.

In 1972 and again in 1973 The Sea Ranch Association sponsored annual seminars for those owners planning to build. The context dealt with the philosophy of the Ranch, the history of the design efforts expressing it, design activity and the design review process, the construction/contractor process, and the financing of home construction. On each occasion, attendance exceeded two hundred persons, and until the present hiatus in building activity resulting from the Coastal Conservation Zone Act, the seminars were looked upon as a function to be repeated annually.

In 1972, and again now in 1974, the Association's Board of Directors has authorized and financed The Sea Ranch Design Awards program utilizing the services of a distinguished jury. Increasingly, architectural designs were displaying the egocentricity of the designers. By contrast, our locally-held goal, just as Charles Moore and his associates indicated, was for structures which were a part of the land and thus would be relatively inconspicuous in the larger landscape. The three houses pictured in the RECORD excerpt are among the relatively small proportion which can be pointed to as either contrived or as being largely lacking in this design consciousness, understanding and sensitivity. One does not notice the many more successful structures, which are after all what we're all about!

George W. Wickstead FASLA, AIP
Planning and
development director
The Sea Ranch Association

Calendar

FEBRUARY

11-13 Contract Marketplace-New York, an exhibition of contract furniture and accessories, Americana Hotel, New York City. Contact: Contract Marketplace, Ltd., P.O. Box 908, Larchmont, N.Y. 10538.

21-23 National Home Improvement Council annual convention, Houston Oaks Hotel, Houston. Contact: Irwin Rosenberg, convention director, P.O. Box 13037, Pittsburgh, Pa. 15243.

28-March 5 Fifty-sixth Annual Convention of the Associated General Contractors of America, Sheraton Waikiki Hotel, Honolulu. Contact: Richard T. Haas, AGC, 1957 E Street, N.W., Washington, D.C. 20006.

MARCH

5-8 Fifth Annual Historic Preservation Seminar of the San Antonio (Tex.) Conservation Society. Contact: Mrs. R. Jean Osborne, seminar chairperson, 511 Paseo de la Villita, San Antonio, Tex. 78205.

6-7 How to Market Professional Design Services seminar, New York City. Contact: Building Industry Development Services, Suite 104, 1301 20th Street, N.W., Washington, D.C. 20036.

9-14 Value analysis workshop, Denver. Sponsored by the AIA, and the American Consulting Engineers Council, with cooperation from the General Services Administration and the Environmental Protection Agency. Contact: Marshall Purnell, AIA, 1735 New York Avenue, N.W., Washington, D.C. 20006.

10-11 Third National Flame Retardance of Plastics Conference, Sheraton Park Hotel, Washington, D.C. Sponsored by the New York University School of Continuing Education. Contact: Miss Heidi Kaplan, New York Management Center, 360 Lexington Avenue, New York, N.Y. 10017.

23-27 Nineteenth Annual Teachers' Seminar, University of Nebraska School of Architecture, Lincoln. Theme: "Women and Minorities in Environmental Design." Sponsored by the Association of Collegiate Schools of Architecture, Inc. Contact: ACSA, 1735 New York Avenue, N.W., Washington, D.C. 20006.

24-April 20 "Creative Collaboration 1975," an exhibit of crafts and sculpture designed for architectural settings. Blaffer Gallery, Fine Arts Center, University of Houston. Sponsored by the Women's Auxiliary, AIA, Houston Chapter. Contact: Mrs. Patti Everett, 2415 Addison, Houston, Tex. 77025.

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

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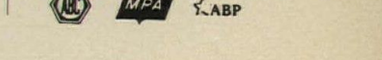

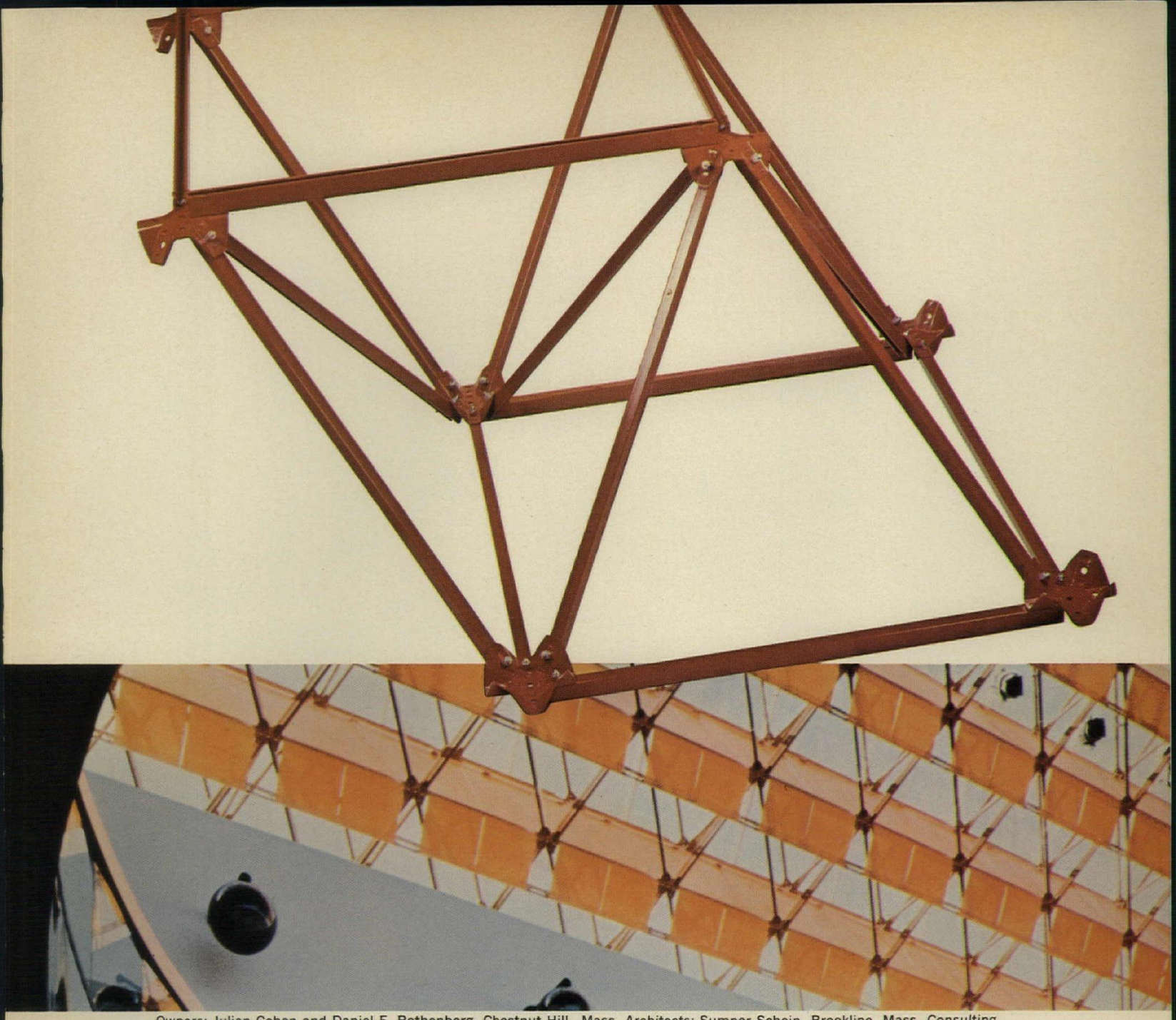

Owners: Julian Cohen and Daniel E. Rothenberg, Chestnut Hill, Mass. *Architects:* Sumner Schein, Brookline, Mass. *Consulting Architects:* Pietro Belluschi and Jung Brannen, Boston, Mass. *General Contractor:* Barkan Construction Co., Chestnut Hill.

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UNISTRUT CORPORATION

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Going places together with AMARLITE

the entrance that protects people from injury and forced entry problems.

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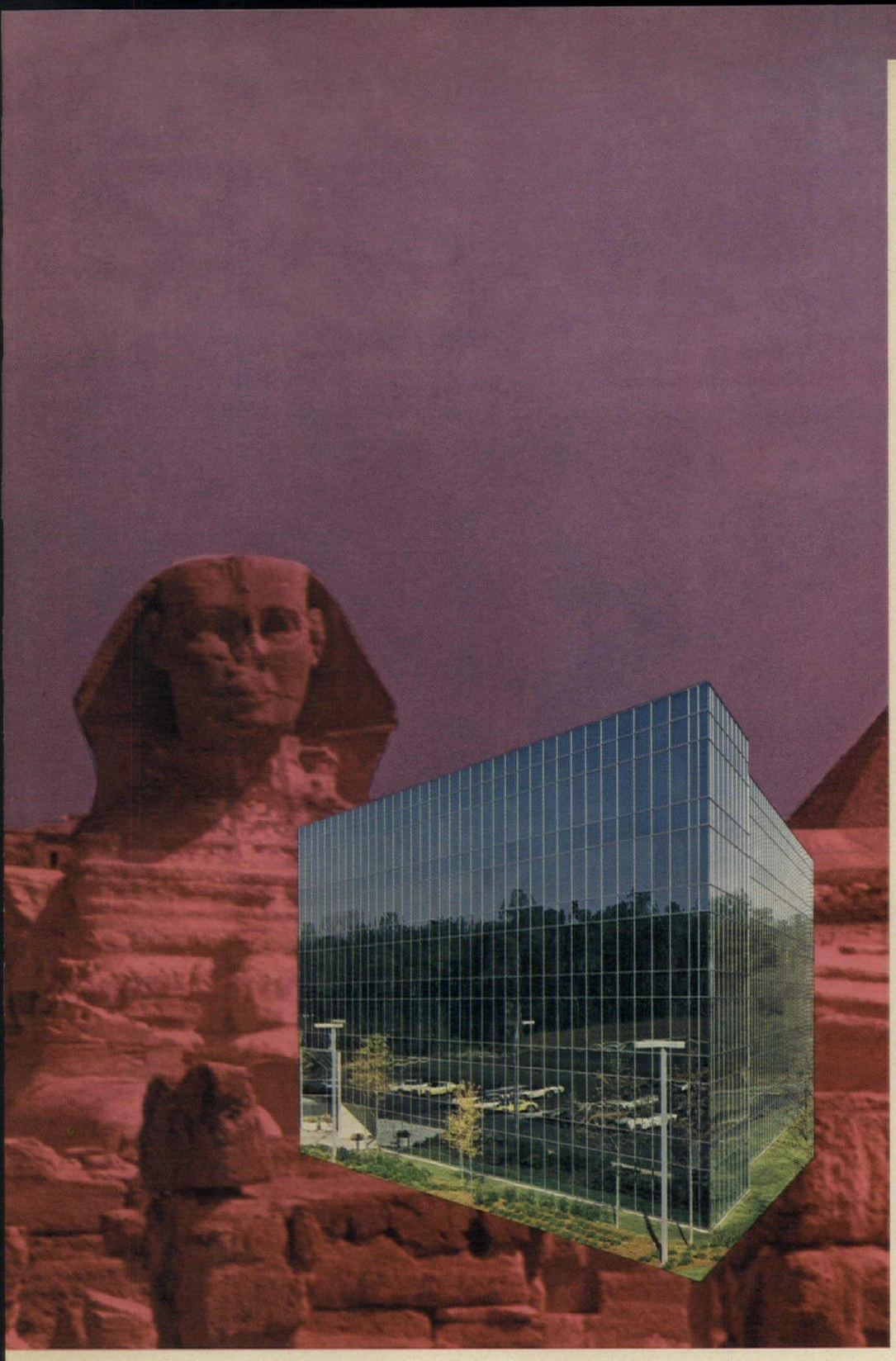

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2. Entries must be postmarked before December 31, 1975.
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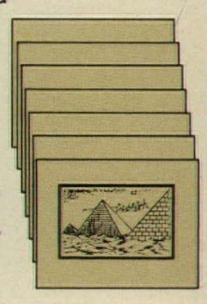
FREE! Drawings of 7 Wonders of the Ancient World. Suitable for framing. *



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the wall system that protects people from nature and conserves energy.

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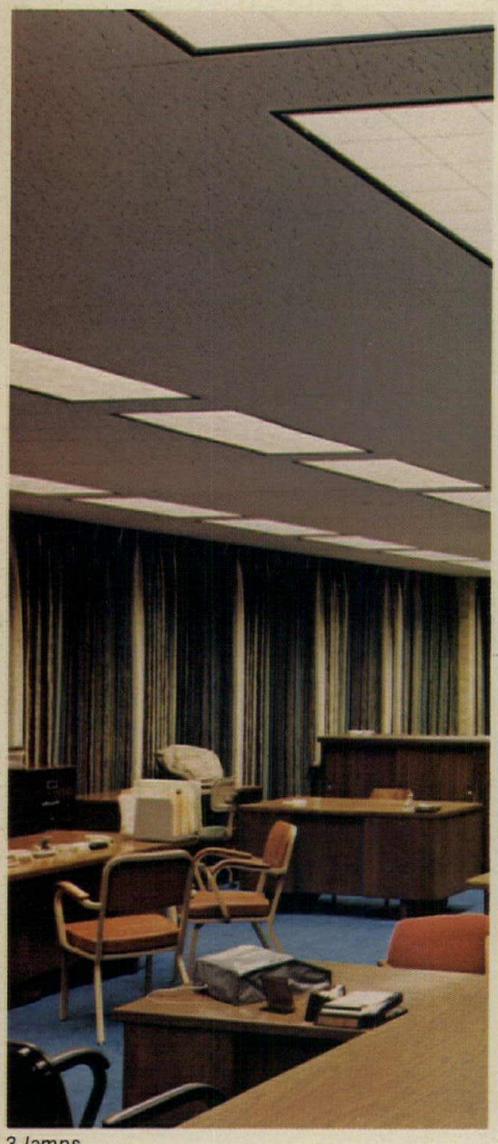
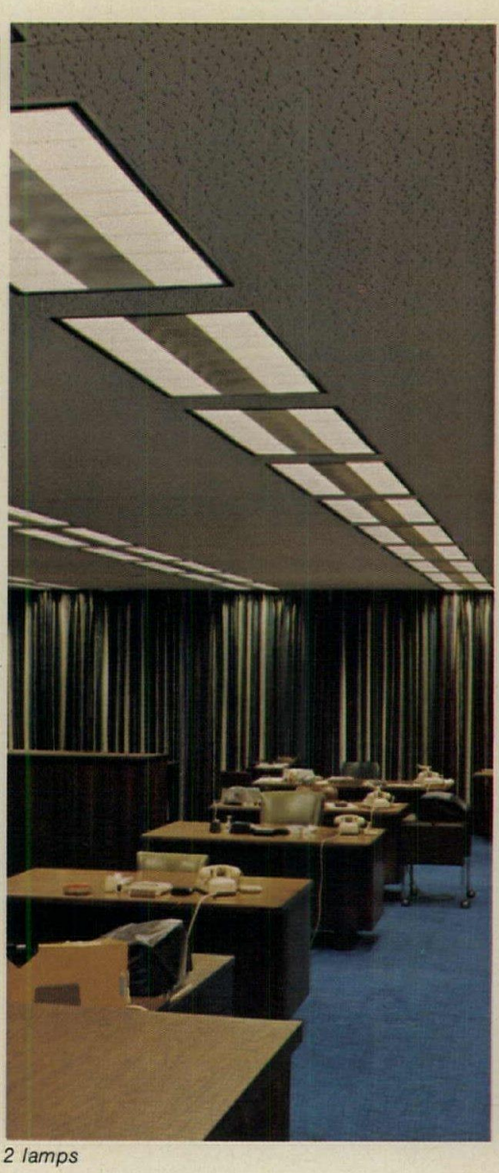
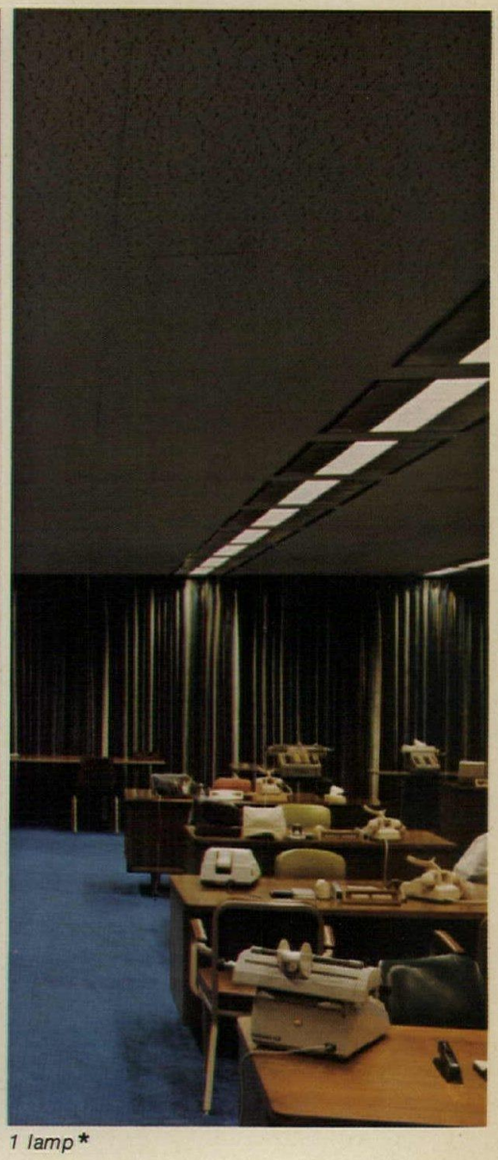


3 lamps



2 lamps



*1 lamp**

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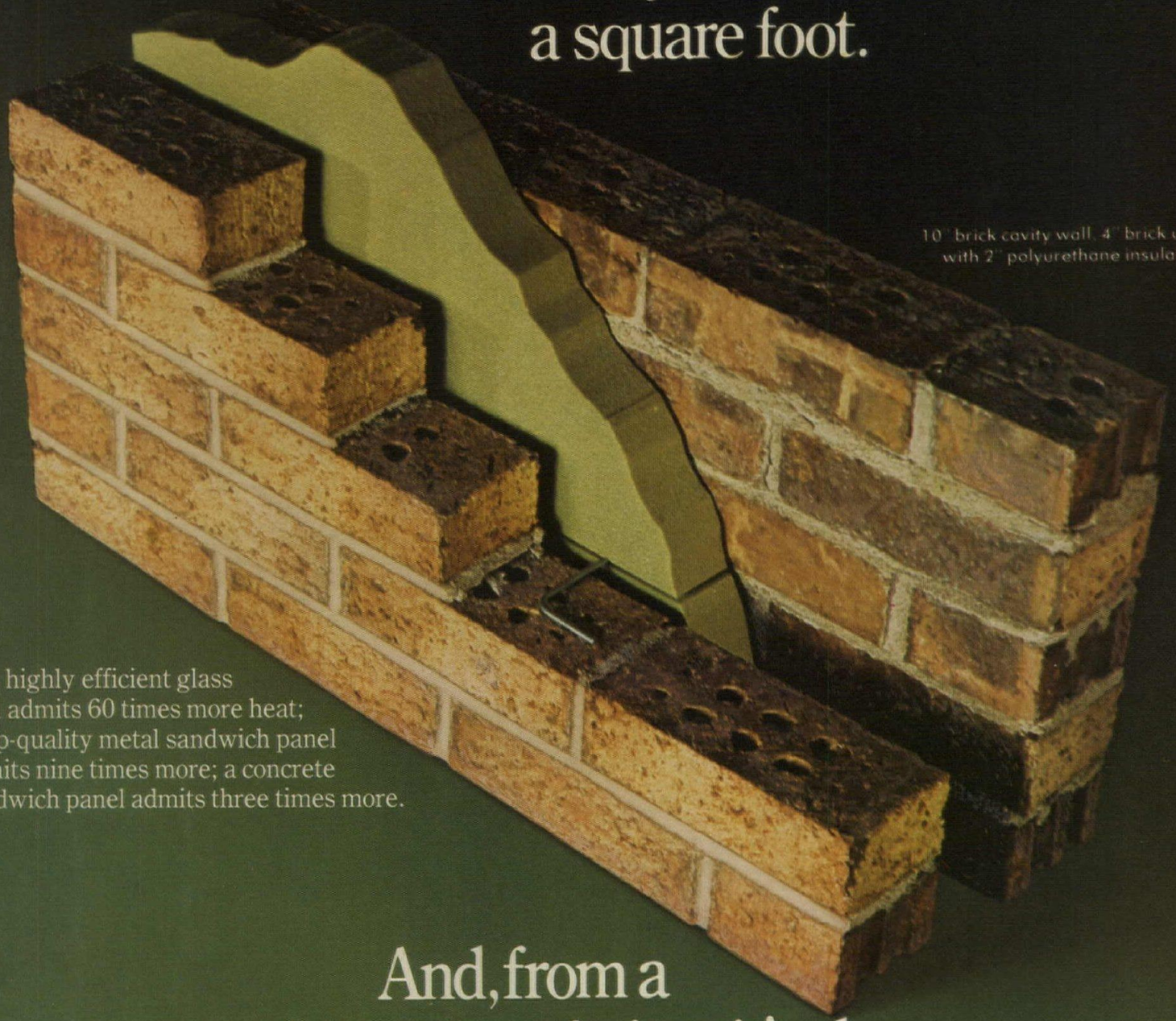
When it's 95 outside, this brick cavity wall gains heat at the rate of only .72 Btu/h a square foot.



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.

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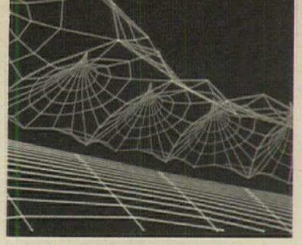
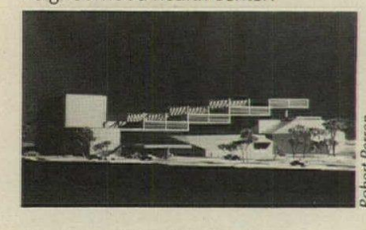


Cover: Proposed scheme for Interama amphitheater, Miami, Florida drawn by computer

THE RECORD REPORTS



Robert Perron

ARCHITECTURAL BUSINESS

FEATURES

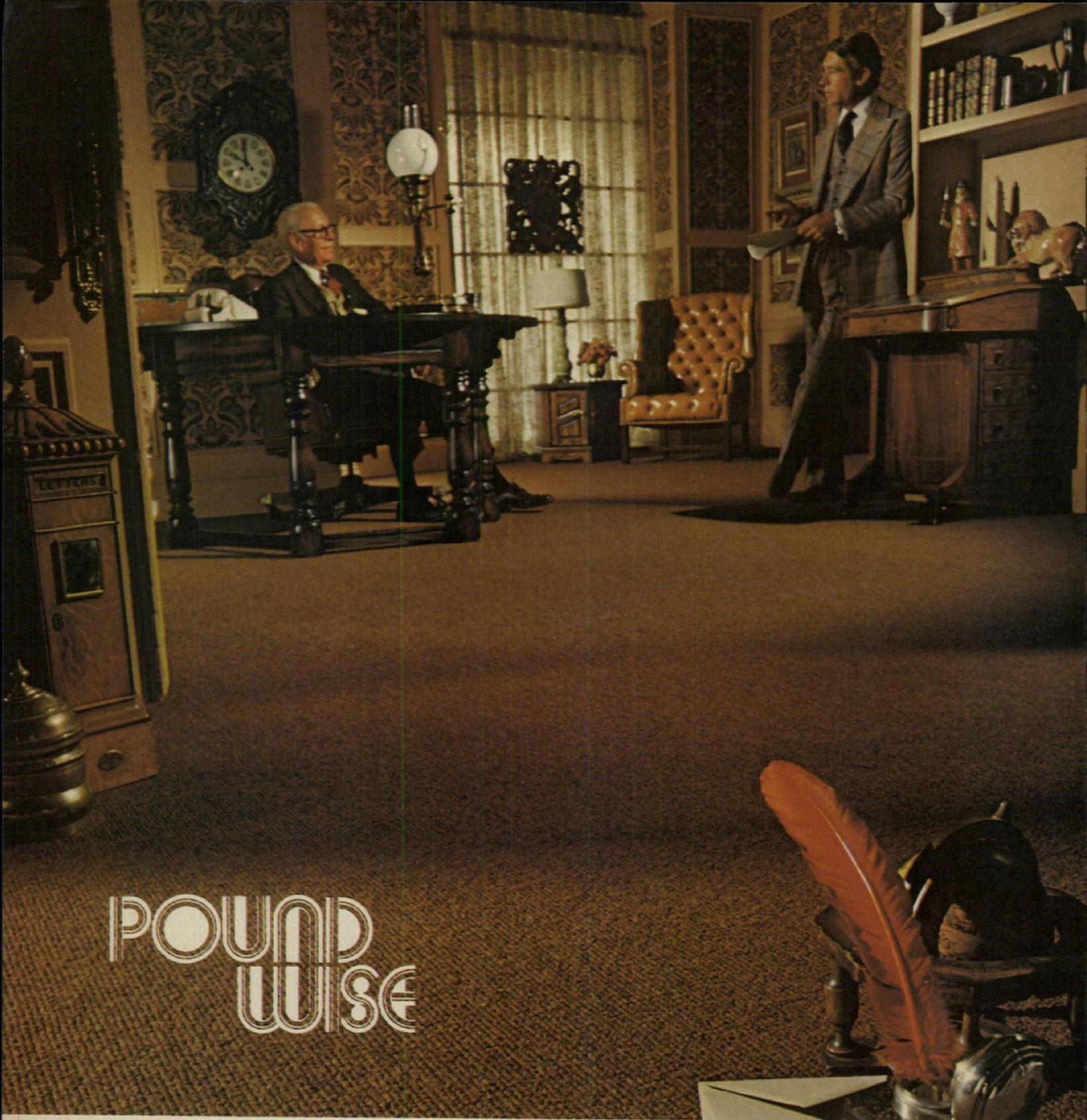
BUILDING TYPES STUDY 471

ARCHITECTURAL ENGINEERING

NEXT MONTH IN RECORD

Building Types Study: Low-density housing

The March 1975 Building Types Study will be the first in a two-part series on housing design; it focuses on low-density, mainly suburban housing, giving a large variety of recent projects and completed buildings. Its purpose is to identify some of the basic assumptions that architects have about how housing should be designed, to see how these succeed (or don't succeed) in practice, and to compare recent housing with alternative design principles by residential communities of the past.



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Chick Marshall takes a positive stand—and some positive actions—as AIA moves into 1975

"What a swell time to start your term as president of the American Institute of Architects," says William Marshall, Jr. of Norfolk, Virginia.

But it doesn't seem to faze him. Chick, in his year as president-elect (and chairman of the planning committee) had already made plans for some switches in emphasis of AIA programs and budgeting (see below). "And about the time we finished that planning, the recession really began to devastate the profession." Chick's response—well developed though he has been in office scarcely a month—is "an overlay of new priorities to our planning and budgeting.

"We've restudied priorities and restudied the budget. We have put aside some money that we planned to spend—into a 'hold pattern' to make sure that in bad times like this all our planned spending is prudent.

"And we've set up new programs to see if we can find ways to help architects weather the recession. I don't know," says Chick, "whether there is anything that we can do to influence the economic factors that are hurting architects . . . anything we can do in our self-interest without being irresponsible or hurting others. But it's sure a good time to find out."

Clearly and happily, Chick's attitude is an activist one, not a bean-counting one. "This is no time to panic. And it's no time to retract. It seems more important than ever that the AIA be active in helping the individual professional."

The first emergency action was the "Economic Slowdown Charette"

On January 6th and 7th, Marshall chaired an extraordinary meeting of architects, economists, and other advisors "to try to discover whether there were programs we could initiate at headquarters that would have a significant and immediate impact on the profession."

Chick set up this meeting on very short notice so that its recommendations could be discussed at Grassroots meetings in late January and February. A number of specific actions were recommended for the national, state and local levels. Items:

- The Charette pointed up the fact that, while there is clear evidence that a great proportion of the profession is being hard hit by the recession, there are no supportable facts and statistics with which the AIA can approach the Congress and the White House—in the interest of stirring up work or arguing for the release of impounded funds. Thus, the AIA will immediately (and by the time you read this) have initiated a thorough survey of all firms asking for accurate data. Questions will include work load and work ahead as of January 1st, 1975, compared with the first of 1974; and will ask for a comparison of employees on both dates.
- The Charette recommended, and Marshall will initiate, a joint effort by as many segments of the building industry (including labor) as possible to mount a campaign designed to push for release of impounded funds by the President, and to devise new incentives to spur construction. It is hoped this coalition "will help to resolve such problems as real and artificial material and labor shortages, productivity, restricted equity capital and regressive tax policies which reward the debtor, penalize the saver, and thus deprive the mortgage and construction loan market of the funds necessary for growth and development."
- Because so much Federal money is now flowing to the states and cities in the form of revenue sharing ($4.5 billion) and community development grants ($2.5 billion), AIA will promptly prepare a document listing as many valid ways as possible that these funds can be used to improve the environment and quality of living. This document is intended for use by component officials and individual architects in person-to-person contact with state and local officials who are in a position to initiate planning or building projects.
- AIA headquarters will make an immediate study of the best way to conduct a "Build Now" campaign ("Prices will never get lower; the market will never be so competitive") directed at not just public but private decision-makers.
- Further, a major effort will be made to disseminate to appropriate officials—on national, state, and local levels—a newly completed report on "Policies and Economics of Urban Rebuilding," the work of a task force growing from the Institute's continuing efforts towards establishing a national growth policy. This report, not yet released, proposes new institutional structures for a coordinated attack on "dis-investment in our cities."

These national initiatives will be fully explained at Grassroots, with these further recommendations for action at the state and local level:

That each component hold its own Economic Slowdown Charette, and make every ef-

fort to improve and increase their liaison with state and local officials (especially in housing agencies) to urge a renewal of planning and construction effort—especially through (again) revenue sharing and community development block grants.

Finally, in suggesting individual action by the architect, the Charette suggested that professionals express their interest, willingness and (one hopes) expertise in "areas of work beyond the traditional."

On this page in December, I argued that architects could effectively look for more opportunities in rehabilitation, restoration, or remodeling—"new life for old buildings"—and press harder for interiors work.

The Charette's suggestions for individual action range further, and include efforts to become involved in more planning activities in their cities and towns, in redesign for energy conservation in older building, in feasibility studies for urban rehab, in consulting work with lenders, in estimating, in space-management studies, in environmental impact statements, in research, in energy and conservation, in post-occupancy evaluation, and in construction management work.

Marshall's 1975 plans include continuation of priority national programs . . .

For several years, of course, the AIA has been developing strong and effective initiatives on the national level. One thinks of:

- the Institute's greatly expanded role in testifying on national legislation and, more generally, the highly effective liaison programs with Congress and Federal agencies;
- the Task Force on National Growth Policy (now effectively enlarged to include many other groups in a National Forum). While it was a bitter disappointment when the House refused (by a narrow 204 to 211 vote) to support the proposed Land Use Planning Act which AIA has supported strongly, it and other supporters look forward to renewed efforts this year;
- the deeply detailed study of energy conservation which resulted last spring in AIA's thoughtful "Energy and the Built Environment: A Gap in Current Strategies"; and a continuing well-manned effort to focus Government interest primarily on conservation rather than primarily on investment in new energy sources;
- AIA's timely research into the economics of urban rebuilding. This study was reported to the board last month, and a published report is expected soon. This is, of course, exactly the kind of effort which is not only part of architect's responsibility to the public—it is the kind of effort which can result in productive work of the sort **architects** do well.

But primarily, the basic push in 1975 will be at the state and local level

"Long before we became involved in 'emergency overlays'," says Chick, "and despite our national concerns, I had felt strongly that our major effort should be to expand activities and strengthen productivity at the component level." Reason: Again, the concept of revenue sharing, and the Community Development Act—programs which, of course, tend to disperse the decision-making, and make it more possible for architects—as informed citizens—to play a role in determining how the money might be spent. So . . .

"What was, and still is planned for 1975," says Marshall, "is a kind of AIA revenue sharing. We think we've learned how to be effective on the national level; and we're going to try by a combination of staff and local effort to be equally effective at the state and local level." Specific programs to strengthen two-way communications between AIA headquarters and Grassroots were outlined in his introduction to the 1975 Program and Budget, and include:

New AIA component programs and expanded services to state and local chapters. This year's AIA budget anticipates "increased travel funding for staff-assistance visits (to help components on particular projects of local or state interest), expanded support for and utilization of the Council of Architectural Component Executives, increased funding for component workshops, clearinghouses at the Institute for state legislation and component programs, preparation of a new component data book, a new task force to study associate membership, and direct technical assistance to components regarding state government affairs."

A much larger effort is planned at the local level in public relations—an effort that grew from very strong Grassroots interest.

Another effort in the cause of stronger local chapters is CMDC—Component/Member Delivery and Communications System. This in-house study was completed in the late months of 1974, analyzes existing AIA mechanisms and activities such as Grassroots, the national convention, component workshops, and staff visits, and is intended to make maximum use of these events with particular sensitivity to component problems.

Next: "A new generation of service systems for architectural firms is projected for new and continued development in 1975." This includes a construction cost control system (MASTERCOST), a life-cycle cost system (more and more required by clients), and fee calculation.

Further, "Great emphasis will be given to . . . helping components create a strong, effective, and well-staffed state component—in every state. This effort will be led by the national officers and directors and staffed by a new deputy administrator for component services."

Chick Marshall does not—alas for the journalist—have the same style with words as his predecessor. (I mean who else but Arch Rogers could describe today's conditions as "an economic hermaphrodite [half boom and half bust]." But it is perfectly clear that Chick Marshall does have (happily for the architect) an extraordinary sense of commitment and mission to the profession and to the cause of architecture. Which shows through in the introduction to his year-end report as president-elect:

"In 1975 we will enter the last quarter of the 20th century in an atmosphere supercharged by traumatic alterations of many of our traditional values and assumptions. Having accepted—even anticipated—life in an era of rapid and dramatic change, we have now witnessed drastic swings in economic and political patterns which challenge belief. The violence of these events has caused us to question our ability to even comprehend, much less control, the forces at work.

"Events in which the architectural profession itself has been sometimes embroiled strike at the foundations of our moral convictions. Cheap food, energy, and fuel appear to have vanished overnight. Many believe these will never again be available at similar levels of relative economy. And, with all of this, has come an intensified realization that we occupy a finite planet and that we are approaching its limits.

"Surprisingly, we survive. And, it is possible to perceive a growing national pride in our resiliency and the underlying character and strength it implies.

"The architectural profession appears to have now an opportunity, unique in modern times, to participate in efforts to stabilize and improve our society. We have been early contributors—and are increasingly acknowledged as leaders—in creating a built environment without violating nature.

"So, as we begin the last quarter of the century, as architects, we can and should inaugurate a *new* commitment, a commitment to help make the next 25 years the period in which man ordered the complexities of civilization and produced the mechanisms for a truly humane way of life—a way of life responsive to the spiritual, material, and social needs of man and providing a broad diversity of economically viable alternatives for each of us."

Which is, come to think of it, not just careful thought, but pretty stylish writing.

—Walter F. Wagner, Jr.

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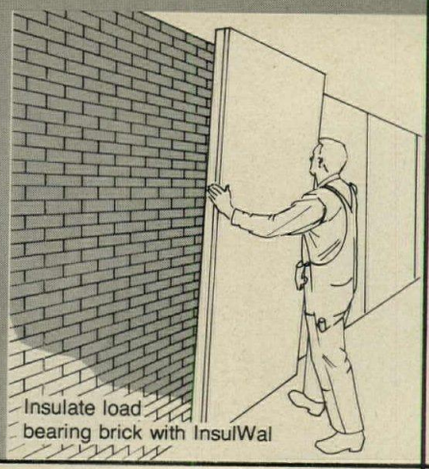

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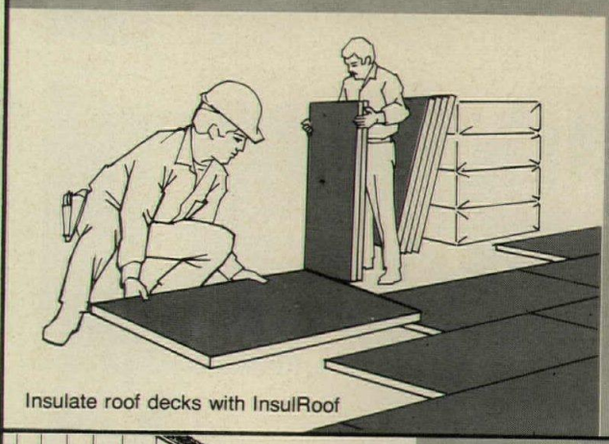

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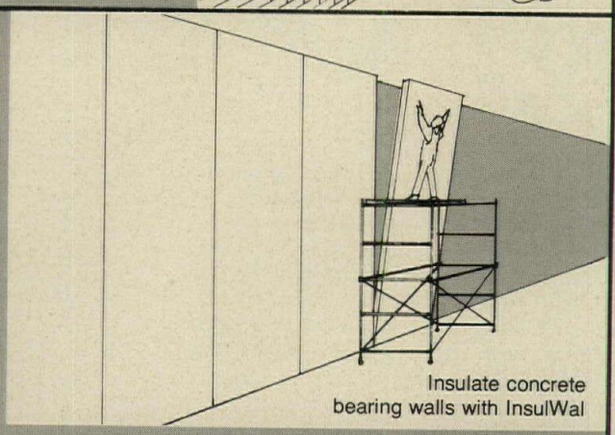

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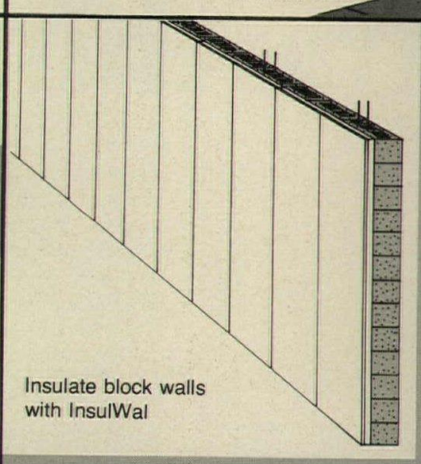

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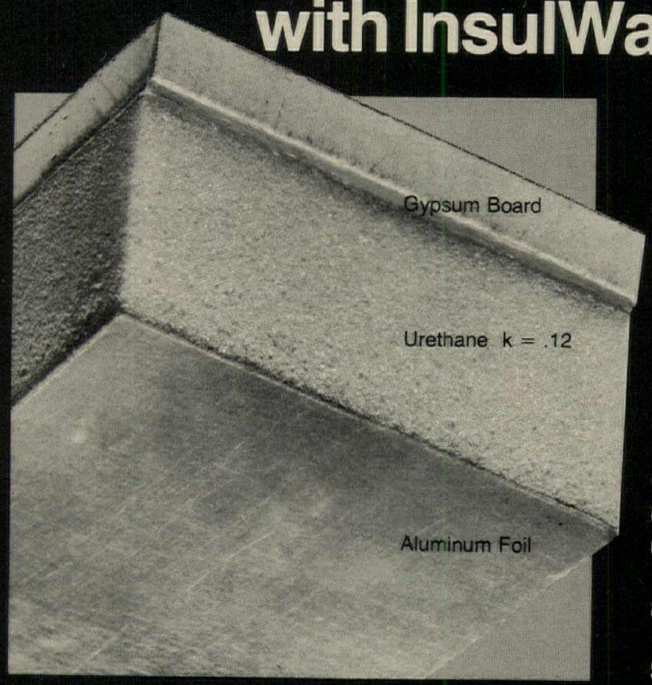

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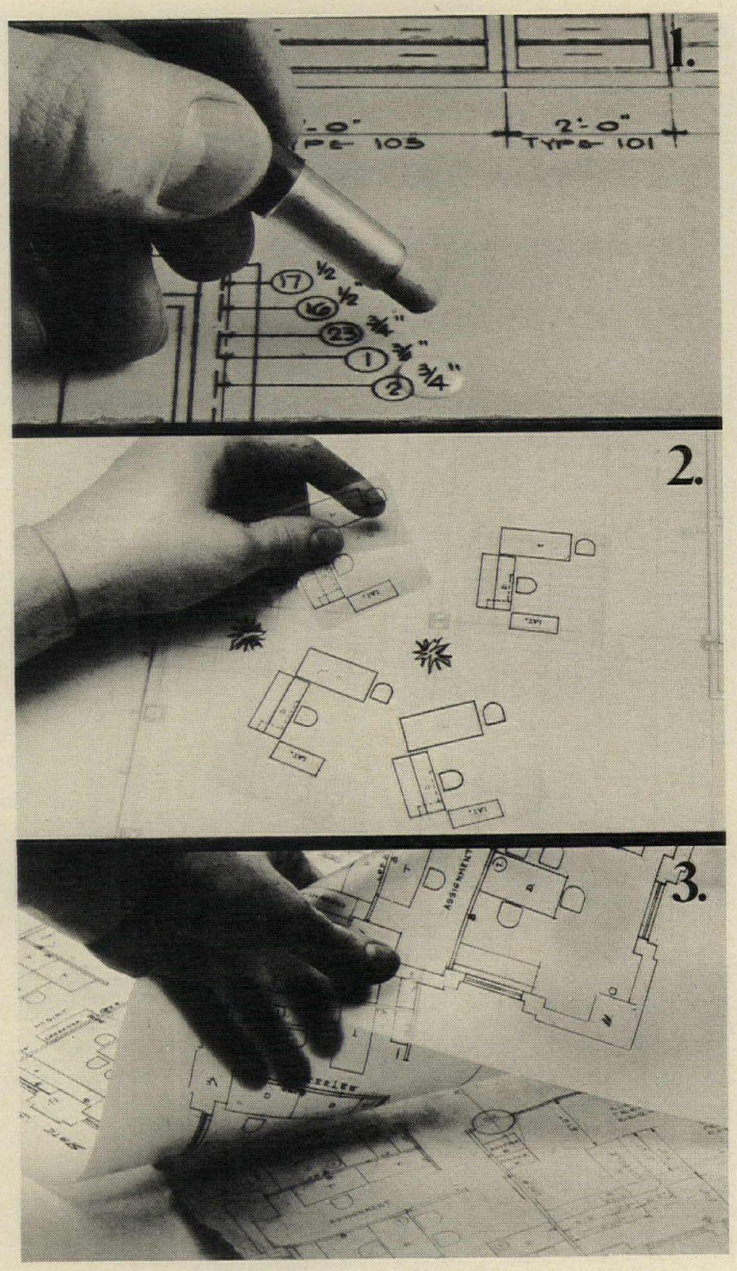

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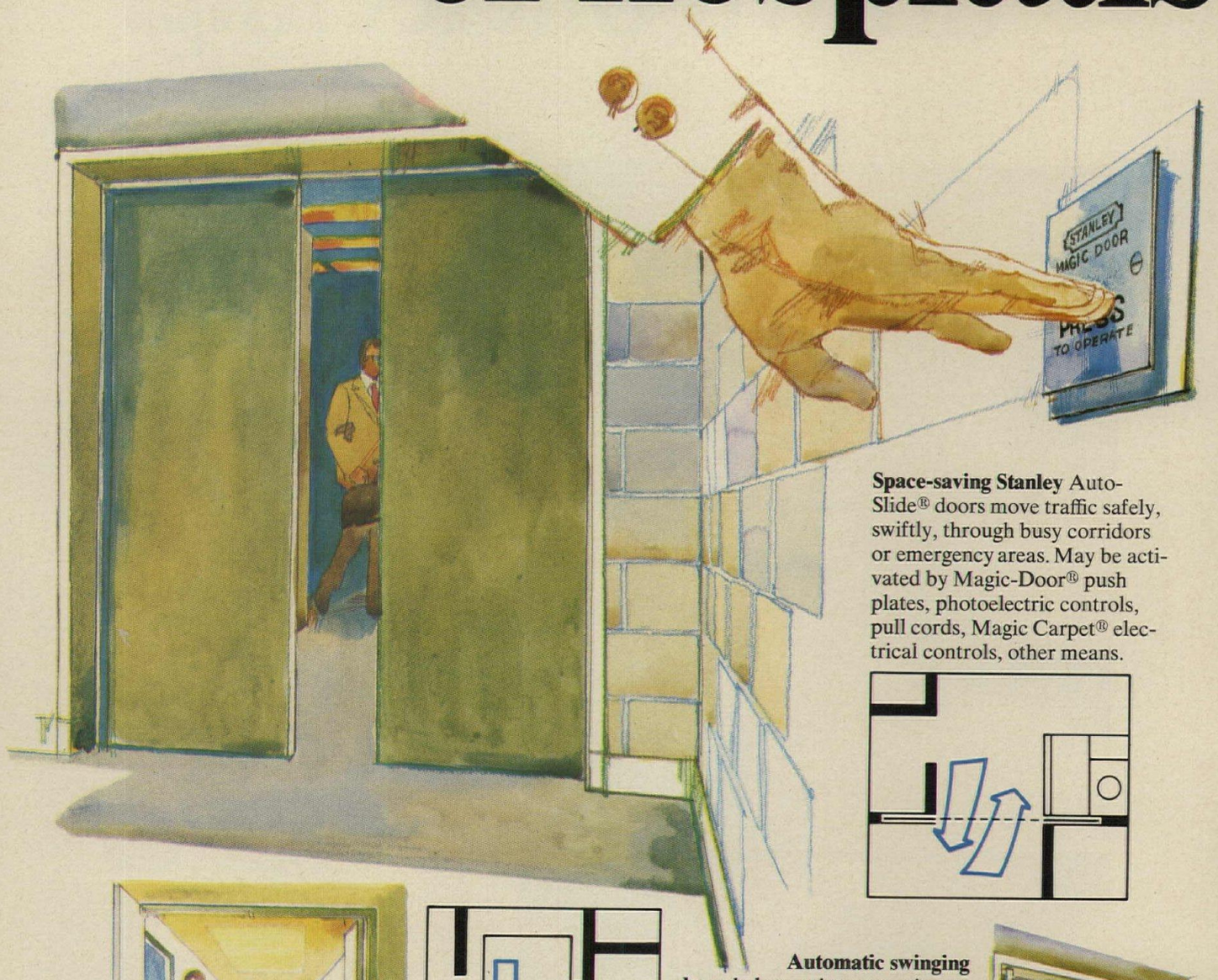

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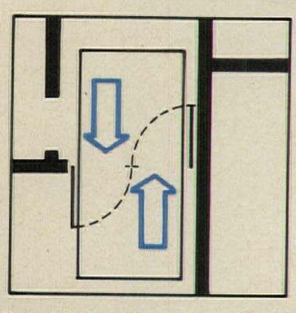

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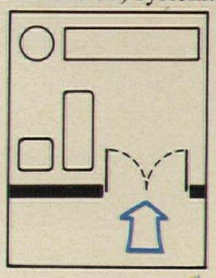

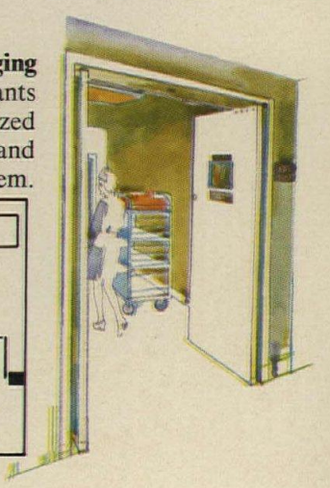

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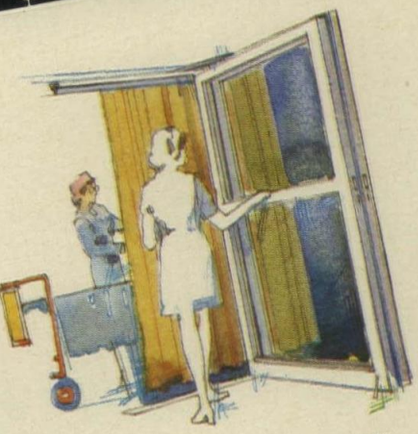

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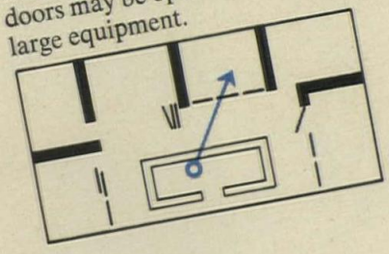

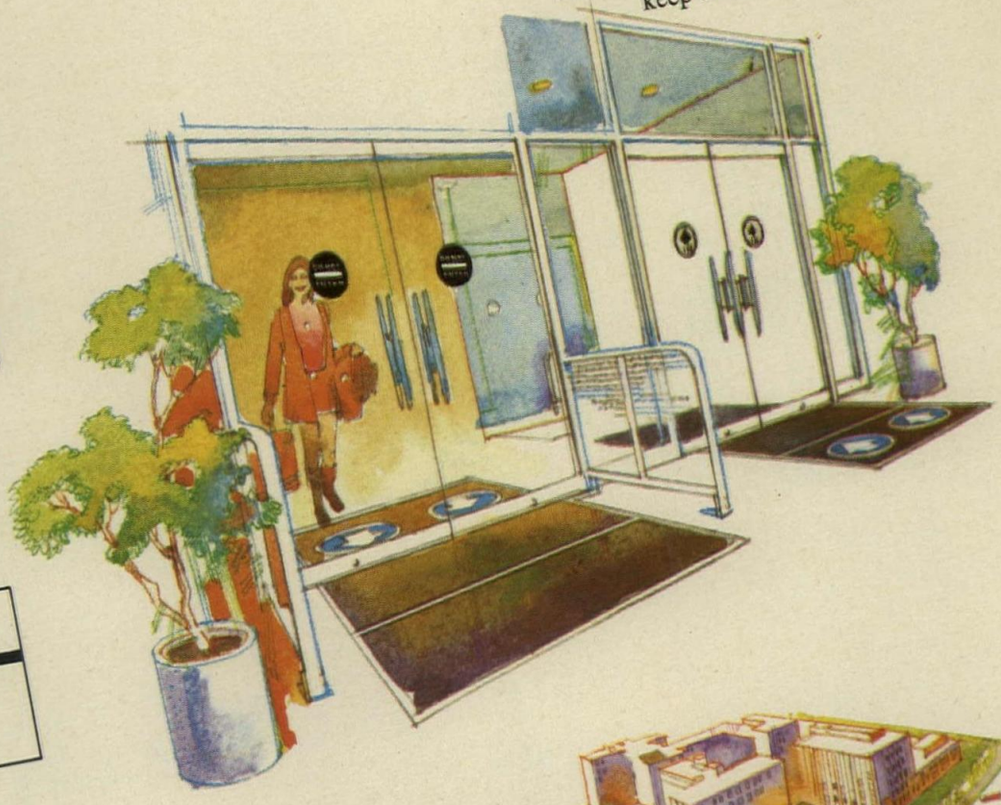

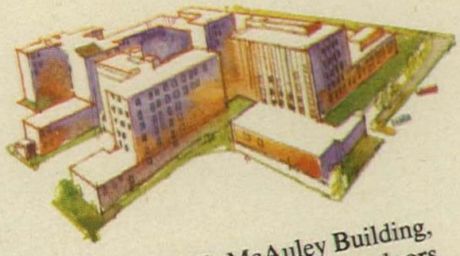

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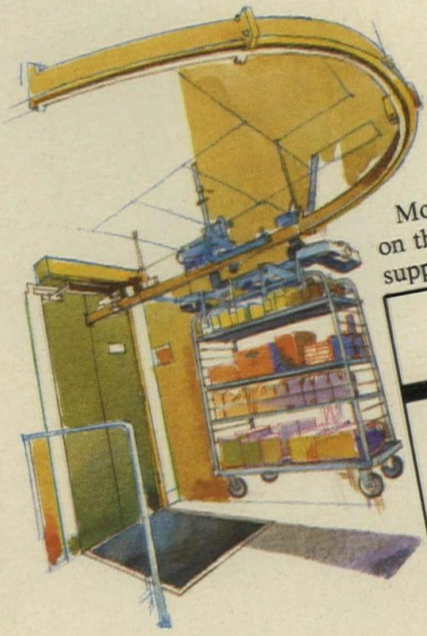

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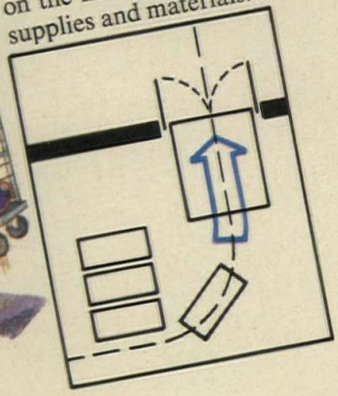

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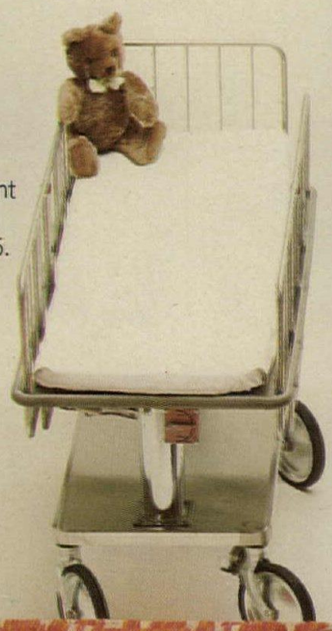

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Katzenbach and Warren is the only authorized maker of Williamsburg® Wallpaper Reproductions—each, in design and colorway, a faithful reproduction of original antique documents in the Williamsburg collection. In addition, the company offers a wide range of traditional and contemporary roller-printed wallpapers, cork laminate papers and woven textures imported from the Orient. **Contact** Charles Salembier, New York (212) 759-5410.

Selig is a leading maker and importer of classic contemporary upholstered furniture. Of current interest are several new lines of chrome and glass chairs, tables and étagerés. In addition, the company markets SleepOver convertible sofas. **Contact** Bob Wexler, Leominster, Mass. (617) 537-9111.

t Simmons.

Moreddi imported and domestic avant-guarde furniture represents the finest in new design and new materials. Chairs, tables, lamps and accessories all have a distinctive contemporary appeal that makes a strong design statement in residential and institutional use. **Contact** Ed Frank, Ridgefield, N.J. (201) 941-0220.

Artisan House creates works of art for interiors and exteriors of private residences and institutions. In bronze, brass, steel, stone and aluminum. Each piece is of gallery-original quality, offered in limited multiples. For table top collections, decorative wall sculptures or large free-standing exhibits. **Contact** Curt Freiler, Los Angeles (213) 664-1111.

Greeff domestic and imported fabrics hold a position of design prestige. In addition to traditional and contemporary fabrics for draperies, and upholstery, the company offers coordinated wall coverings, carpeting, area rugs and Beautyrest Masterpiece bedding. The E.C. Carter division distributes curtains, sheers and casements of exquisite beauty and variety. **Contact** Dick Johann, Port Chester, N.Y. (914) 939-6200.

Debu/Flair markets an extensive collection of upholstered sofas, chairs and convertibles, notable among them the outstanding KT Furniture group. Their styling and striking fabric selections make them a handsome addition to home or institution. **Contact** Bob Schnair, Los Angeles (213) 637-0101.

Bloomcraft brings together a handsome assemblage of fabrics, bedspreads, decorative pillows, draperies, casements and imported sheers at attractive prices. An excellent source for a completely coordinated scheme. **Contact** Don Beittel, New York (212) 683-8900.

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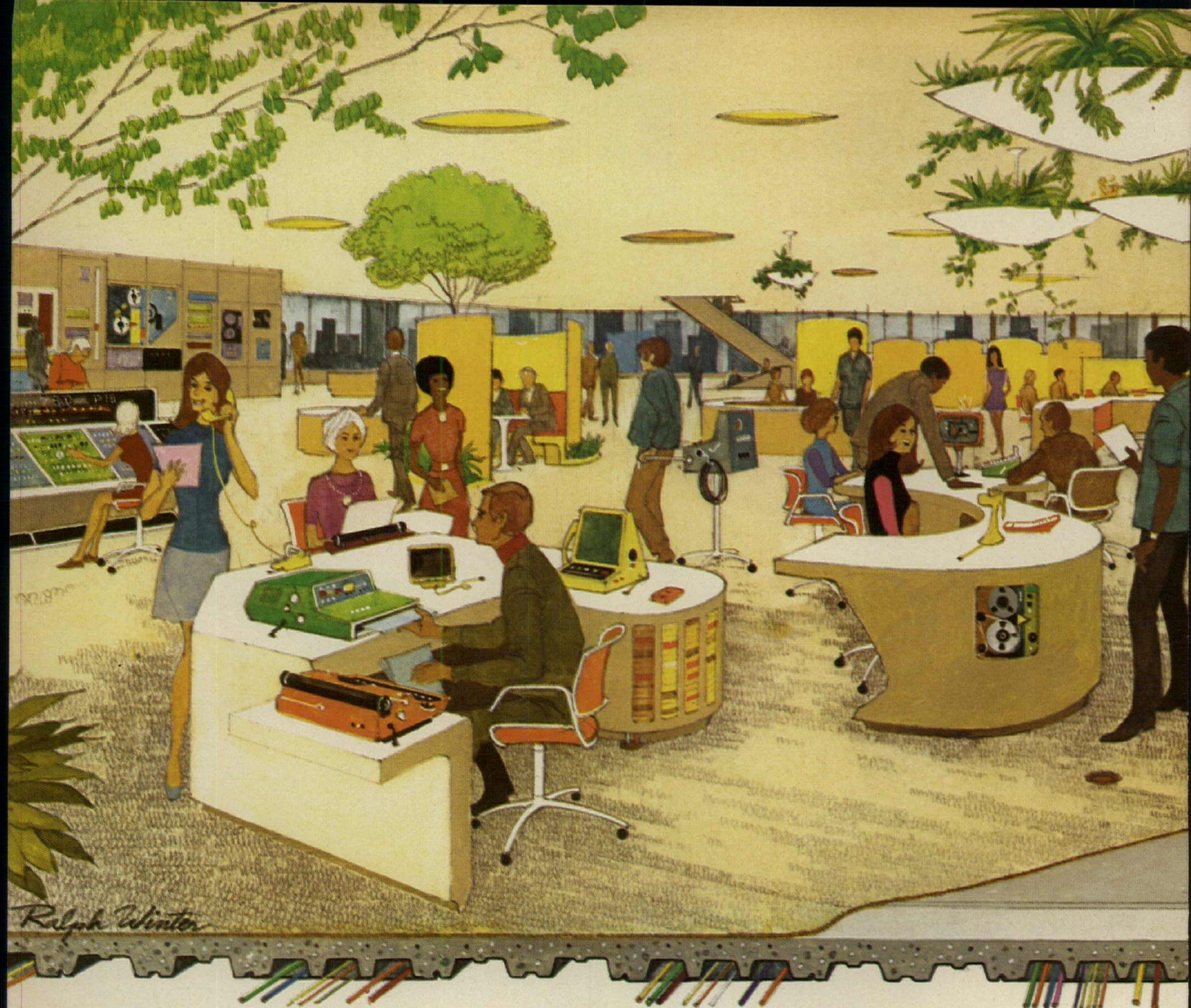

The year: 2005/ The N-R-G Flor™: 1975

We're not talking about all those fancy gadgets—the technological advances we expect by the year 2005. Yes, Inryco® N-R-G-Flor—for complete energy distribution—will have adequate capacity to provide for them . . . but that's not new. Here's what is: long-term flexibility to meet changing requirements . . . economically.

Over a period of 30 years, this hypothetical office area will have seen a dozen or more major changes in its layout. Hundreds of individual work stations will have been relocated, maybe several times. And every relocation will have meant another revision in the supply pattern for power and communications services.

Traditional methods would have required costly coring of the slab and the installation of an insert each time a new power or communications outlet was needed. During 30 years this would have cost many thousands of dollars and caused considerable nuisance.

Inryco N-R-G-Flor saves these thousands and minimizes work-interruptions by placing low-cost "preset" inserts on any practical module across the entire floor area during construction. Both power and communications services are available at these locations throughout the life of the building. Activation is simple enough not to require highly skilled workmen or specialized tools.

There are many other features that can't be dealt with here: the Railway Bottomless Trench that insures ample future capacity, the savings possible with composite beam design, the fast construction, the design assistance we can give . . . and the single-source responsibility that simplifies your job.

We'd like to give you more facts about N-R-G-Flor, so we've prepared an informational kit that tells all about it. To get yours, simply fill out and mail the coupon. Send it in today.

Both power and telephone service are available at each location. Flush service fittings give access to recessed outlets in preset inserts installed over cells. Center cell carries power lines. Two outer cells carry telephone and other communications.

Inryco Celluflor® panels, placed on architectural module, serve as the secondary feeder, carrying power and signal lines from trench duct to preset inserts. Inryco fluted panels are used between Celluflor panels for economy.

Shear connectors, welded through deck to structural frame, allow slab and beam to act compositely. Hi-Bond® lugs in deck webs allow deck to act compositely with concrete fill.

Preset inserts are installed over deck holes pre-punched in any predetermined modular pattern. Some inserts are activated in the initial layout. Others can be activated at any time during the life of the building.

When service is no longer needed, because of office changes, the "self-abandoning" service fitting can be turned to the closed position.

Non-activated inserts can be located through carpet or tile. Concrete over top hole cover is easily broken up and the cover removed for access.

Rail-Way™ Bottomless Trench Duct, the primary feeder, runs across floor deck, carrying power and communications lines from the service closet. Wires enter cells through pre-punched holes in the deck.

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Monumental ceilings can cause monumental headaches.

So many things have to work together just right: the ceiling panels, the lighting fixtures, the air diffusers, the acoustical insulation, the subcontractors. Especially the subcontractors.

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Enter the Alcan Planar® Ceiling System. A total system. Complete and uncomplicated. Because you can specify the panels, the fixtures, everything, from one source. From Alcan. You can even specify polywrapped acoustical blankets for pools or food processing plants.

Everything is worked into our ceiling system, so you'll have fewer limitations to work around. Just light-weight, durable, maintenance-free Alcan aluminum that gives you the freedom to execute a monumental idea. Beautifully. And the silicon polyester finish of the Alcan Planar Ceiling lets you carry a total design concept through to exterior soffit treatments.

If you want less to put up with, you ought to look at our Planar Ceiling System. Write for details to Alcan Aluminum. Dept. IA. Box 511. Warren, Ohio 44482. Or check specification information in *Sweet's Catalogue*, Section 13.5.

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THE RECORD REPORTS

Future construction contracts totaled $6.18 billion in November 1974 declining 20 per cent from one year ago, according to the F. W. Dodge Division of McGraw-Hill Information Systems Company. Most of the drop was concentrated in housing and electric power facilities. A strong level of nonresidential building was a small bright part of the report, however, with these contracts totaling $2.6 billion for industrial, institutional and other projects. By the end of the 11-month period reported, the value of 1974 contracts for all types of new construction reached $85.9 billion, 8 per cent less than the comparable 1973 period.

Initial steps to activate the new National Institute of Building Sciences are underway, with nominations for the Institute's board of directors being prepared for submission to President Ford for his final selection. When the board is confirmed by the Senate, the new organization will take effect, charged with evaluating and recommending on the use of new technology in housing and building regulations.

The National Society of Professional Engineers has lost its antitrust case with the Justice Department. In U. S. District Court in December, NSPE was found guilty of price-fixing in maintaining a fee schedule which prohibits members from bidding competitively. NSPE is expected to appeal to the Supreme Court. Details on page 34.

The biennial White House report on national growth, submitted in December, is much criticized. The report, available from HUD, carries no recommendations. It is said to pose the multiple problems nicely, but fails to outline a definitive course of action. Details are on page 34.

Executive-branch support of competitive bidding by architects again threatens Federal selection rules. In a recent letter submitted to Congress, the Office of Management and Budget (in the Executive Branch) reiterated the Administration's strong support of legislation that would establish competitive bidding procedures for procurement of A-E services by the Federal government. It is expected that bills on this subject will be introduced in this Congress in an attempt to undermine the Brooks bill, which protects the traditional selection process.

Housing activity promises to climb slowly in 1975, according to the Mortgage Bankers Association of America. Director of Economics John M. Wetmore recently stated, "The low point will be reached sometime during the winter, probably not much below the 990,000 annual rate of housing starts recorded for November 1974. During 1975, housing will again play a role in leading the economy out of a recession."

An environmental study concludes the Kennedy Library would have "negligible impact" on Cambridge, Mass. The 600-page study draft by C. E. Maguire, Inc., a consulting firm, states that the library by I. M. Pei and Partners (RECORD, December 1974, page 98) would have an insignificant impact in such areas as parking, air and noise pollution, and vehicular and pedestrian traffic. A public hearing on the draft report is scheduled in Cambridge during the week of February 10; citizens' groups are expected to address the matter in court. The library has been delayed for 10 years during a prolonged controversy over site selection.

Developers are not building to meet the demand for apartments in major markets, according to the Society of Real Estate Appraisers. Experts in the field are predicting permits to build rental units will be at the lowest level since 1960-61. Contributing to the apartment squeeze is the high rate of rental units being converted to condominiums. According to some developers, rents may triple over the next three years, eclipsing price rises in fuel, food and utilities.

Leon N. Weiner of Wilmington, Del., has been elected president of the National Housing Conference, Inc., a public lobby group for better housing and community development. Mr. Weiner is past president of the National Association of Home Builders, and was appointed by President Johnson as a member of the Kaiser Commission for Urban Housing.

The Red Cedar Shingle & Handsplit Shake Bureau has announced the deadline for its 1975 awards program is May 26, 1975. Co-sponsored by the AIA, the program is open to architects in the United States and Canada who have completed a project—using cedar shingles and/or shakes—after January 1, 1970. For further information, contact the Bureau at 1143 Washington Building, Seattle, Wash. 98101.

Ralph Monroe Parsons, founder of the Ralph M. Parsons Company, died December 20, 1974, in San Marino, Cal. He was 78 years of age. Mr. Parsons was the founder of an engineering-construction firm operating in 30 countries, and was a force in creating the AID-industry program to assist underdeveloped nations.

Nicholas Satterlee, 59, a Washington, D.C., architect specializing in rehabilitation, died November 16, 1974. Mr. Satterlee was well known for his work in rehabilitating historic landmarks, especially in Washington, and his work included plans for the old Executive Office Building and Logan Circle, both as yet to be started. He was past president of the Washington Chapter, AIA, and a Fellow in the Institute, as well as chairman of the awards jury for the Committee for a More Beautiful Capital.

White House report on growth held disappointing

The long overdue biennial White House report on national growth and development was submitted to Congress in December, stating in nearly 50 pages the dimensions of troublesome issues and concern over the impact of future growth on the quality of American life.

For those who read it through carefully, however, it evoked no feeling of a firm Administration policy on the subject; in short, it posed the multiple problems nicely but failed to outline a definitive course of action to meet them head-on.

This report, available from HUD, carries no recommendations so designated, but lists conclusions which insist the Domestic Council (now headed by Nelson Rockefeller) at the White House continues to search for ways in which the executive branch can improve policy and coordination.

Here is one sentence from the summary of these conclusions:

"There appears to be a growing awareness that just as there is a need for better coordination of legislation by the executive branch, Congress should continue its efforts toward developing, by whatever mechanisms it judges suitable, procedures affording a more coordinated Congressional approach to consideration of legislation which involves assessing relative priorities of policies and the interrelationships of programs, especially in view of potential impact of patterns of growth."

Much of the report runs in this vein.

After concluding that planning is only a first step toward action, it says the time has arrived for Federal assistance programs to give increased attention to supporting the basic capacity of local officials to develop community programs and implement and evaluate them. Toward this end, it states there must be a Federal policy to improve and expand public sector skills in budgeting and finance, information systems, public program administration, and the techniques of economic growth analysis.

Describing influences on local decisions, the report explains that in fiscal 1973 Federal outlays totaled more than $215 billion, affecting state and local growth patterns. There are seven major activities at the Federal level with an effect on growth; procurement of goods and services, direct and indirect Federal construction of public works, location and employment levels of Federal installations, grants and loans, taxation, credit and regulations.

The White House feels that in the broadest sense there is a need for re-adjustments rather than fundamental changes in local, state and Federal policies related to growth. There appears to be no great demand, it adds, for massive programs to relocate business or induce large population shifts. But noted was "a strong and persistent public demand to raise the quality of life of people where they live now."

Livable, safe inner city neighborhoods; more orderly, lower cost new developments in suburban areas, and adequate, well-serviced rural communities are public preferences characterized as the driving forces behind the growth issues of the 1970's.

A HUD spokesman told newsmen at a briefing on the report that it doesn't say we should have no growth policy but that if and when one comes, it will have developed over a long period of time and as a result of many issues.

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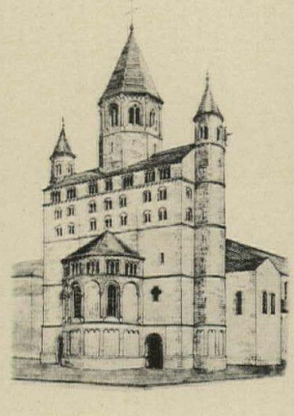


Belgium town votes on how to renovate cathedral

The small Belgian city of Nivelles, 20 miles south of Brussels, recently took a novel step in letting the townspeople have an active say in how the city's chief landmark should look. The question was what the town should do with a bombed out 12th century cathedral which originally had a squat, Romanesque spire replaced in the 19th century by a gothic tower. Should the town replace the familar gothic tower or reconstruct the original Romanesque spire more in keeping with the rest of the building?

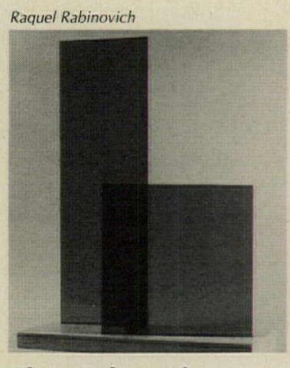
The Nivelles Cathedral (shown above in a 1970 photo) was heavily damaged by German bombs in 1940, and since the end of the war the city fathers, with the help of national architectural experts, have been trying to solve this problem with little success. Finally last year they hit upon the idea of letting the citizens decide in a local referendum.

Despite fears that interest would not be high enough to get people out to vote in large numbers, an astounding 61 per cent of the city's residents turned up, opting for the more horizontal, Romanesque spire (lower right) by a margin of 50 to 39 per cent. The others voted for holding an international design contest for a contemporary tower.

The architects for the winning Romanesque design, and the others as well, were Maurice Ladriare and Simon Brigote, both from Nivelles. Work on the lower part of the cathedral is in progress now, having begun in 1971. Construction of the spire must await completion of other work as well as formal approval of the city's decision by national authorities in charge of historical monuments, though it is considered certain they will approve the choice of the townspeople.

In any case, city authorities say the work will continue in an uninterrupted manner, with construction of the tower most likely beginning in late 1976.

Raquel Rabinovich



Glass sculpture in New York's SoHo

The Susan Caldwell Gallery, 383 West Broadway, New York City, is showing sculpture by Raquel Rabinovich through February 25.

The large-scale sculptures, one of which is shown here, are constructed of ⅜-in.-thick gray plate glass. The one shown measures 8 feet high by 6 feet wide, and is 3 feet deep.

Ms. Rabinovich is represented in public collections.

Engineers lose court case over fee schedule

The National Society of Professional Engineers lost its case in U. S. District Court in December when Judge Lewis Smith, Jr. issued a 16-page ruling which found the 69,000-member organization guilty of Federal antitrust law violation. NSPE was expected to appeal.

The Justice Department began its suit two years ago, accusing NSPE, and other design organizations, of price fixing actions encouraged by their codes of ethics. Government lawyers argued during the NSPE trial that the Society's fee schedule provisions served to keep its members from bidding competitively.

Following the court ruling, Leslie C. Gates, NSPE president, issued a statement. He said, "We are naturally disappointed that Judge Smith has found that NSPE's opposition to competitive bidding for engineering services is in conflct with the antitrust law. However, we remain of the firm view that our position is supported by reason and sound public considerations, and we will carry these convictions forward through an appeal of the decision to the Supreme Court."

Lawyers will specialize in liability cases

The legal profession took a first step toward formal specialization within its ranks in November as a group of 22 lawyers from nine states established the American Board of Professional Liability Attorneys, with its headquarters in Detroit.

Of particular significance to the medical and architect/engineering professions, the national organization will certify attorneys it deems competent to represent plaintiffs and defendants in professional liability trials. Medical malpractice suits account for 90 per cent of such cases; suits brought against architects and engineers are the second most numerous.

"Unhappily, nationwide it still remains the general rule that a law school degree and a successfully passed bar exam are the only criteria for declaring a person competent to practice in nearly any aspect of the law," explained ABPLA president Lawrence S. Charfoos, who specializes in medical malpractice litigation. "The facts are that lawyers do specialize, yet the general public all too often must rely on luck in retaining an attorney adequately trained to handle particular legal needs."

ABPLA, which grew out of discussions between physicians and attorneys at a joint American Medical Association-American Bar Association conference last summer, expects to immediately certify some 200 to 500 attorneys who have at least 10 years legal experience and have tried a minimum of 10 professional liability cases before juries. Lawyers not meeting these qualifications may gain certification through a comprehensive screening process.

AIA looks back, ahead on Federal legislation

Attempting to set a priority on the importance of Federal legislation to architects and engineers becomes frustrating when the diversity of practice is considered; but organized architects, through the American Institute of Architects, do put more emphasis on some bills than others, guided by the decisions of the AIA board.

Last year great interest centered on land use and urban development, interest stimulated by the personal concern of AIA past-president Archibald Rogers, who brought the issues to a new focus in the National Forum on Growth Policy. It was a bitter disappointment during the summer when the House of Representatives refused to vote a rule for the proposed Land Use Planning Act which AIA had supported so strongly. Proponents of land use planning came close—vote on the rule was 204 for, 211 against. And without a rule there could be no debate on the bill.

Now, AIA and those others who worked so strenuously for a statute that would at least guide the country into a new land use policy, are looking forward to renewed efforts this year. A new bill has been introduced and others will follow; a totally new complexion in the 94th Congress which convened January 14 was thought to be a plus for this legislation but the National Growth and Development report (see item, page 34) transmitted to Congress by the White House late in December held little hope that strong backing from the Administration could be expected.

A bill that did pass, omnibus housing, contained a section setting in motion the formation of a new National Institute of Building Sciences (see Perspectives, page 14), a highly significant development for architects and engineers. Congress felt the time had come for establishing a non-Federal entity as an authoritative national source to make findings and advise with respect to use of building science and technology in achieving nationally acceptable standards and other technical provisions for use in all building regulations.

Other sections of the bill, the Housing and Community Development Act of 1974, delighted architects insofar as they provide large sums of shared revenue (block grants) which local authorities can use to carry out planned development. The first session of the 94th Congress is not expected to consider housing matters anywhere near the scope of those covered in the omnibus measure.

Energy was, of course, one of the larger subjects tackled by the 93rd Congress and it is sure to be around this year and next for Congressional decisions of importance to architects. High on the priority list within this subject category was the Solar Heating and Cooling Demonstration Act of 1974. This calls for speeding the development of new solar technologies and their application to residential, commercial and industrial structures. (See item, this page.)

Other energy bills handled by the 93rd and signed into law include the Solar Energy, Research, Development and Demonstration Act; the Geothermal Energy Research, Development, and Demonstration Act of 1974, and the important legislation creating a new Energy Research and Development Administration (RECORD, January 1975, page 35) which, in time, will coordinate much of this activity including a major portion of that previously delegated to the former Atomic Energy Commission. There will certainly be continuing pressure in this Congress for still more energy-related legislation, much of it centered on research and development.

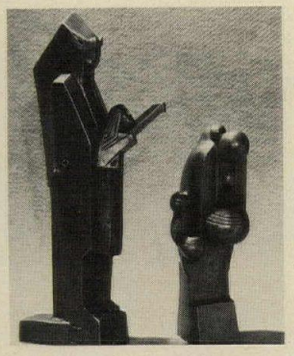
Congress did its work in the health policy, planning and resources development field, sending President Ford a bill authorizing substantial sums for construction and rehabilitation of health facilities. (Not signed at this writing.)

New laws, coming with the fiscal year 1975 half gone, provide vast sums for military construction around the world and for civil works projects. The Army Corps of Engineers gets just over $1.7 billion for allocation within its civil works program and separate military construction appropriations legislation provided just over $3 billion after Congress had authorized in excess of $2.98 billion for the widely scattered construction projects.

Passage of the Magnuson-Moss consumer warranties bill alerted designers to a new concept in product warranties and guarantees and the monitoring role of the Federal Trade Commission. While holding great significance for the product manufacturer, this measure means much for the product specifier as well since it covers most of the materials, components and subsystems.

Another important 1974 Act concerned fire prevention and control and resulted in the establishment, within the Commerce Department, of a new National Fire and Prevention Control Administration. Part of this effort is creation of a Fire Research Center to perform and support research on all aspects of fire. The significance of this to the design profession is illustrated in a newly approved AIA report, "Educating the Architect: Fire and Life Safety." In fact, of the 90 recommendations to Congress carried in the "America Burning" report of the National Commission on Fire Prevention and Control, 38 were suggested by testimony given the Commission by AIA.

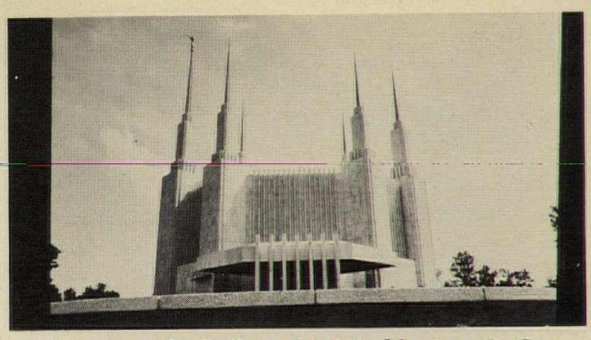
A listing of items in the 1975 legislative program of AIA carries four entries under Education and Research, 17 under Environment and Design, one under Institute Affairs and 13 under Professional Practice headings. That totals 35 specific subjects in which the AIA will show an active interest during this year. Alphabetically, the list ranges from Architectural Education and Training to the West Front of the U.S. Capitol.



FLLW sculpture offered in limited edition

A special edition of the Frank Lloyd Wright Indian Memorial Sculptures "Nakoma-Warrior" and "Nakomis-Woman" has been cast and is being offered through selected galleries. When Frank Lloyd Wright conceived these two sculptures 50 years ago, he cast a limited edition in terra cotta; some pairs were glazed black, while others were neutral matte-bisque. The two original models, inscribed with the architect's initials, have been chosen for this casting in bronze.

The Frank Lloyd Wright Foundation and Hubbard Associates are now making this edition, limited to 500 numbered pairs, available to the general public, galleries, museums and private collections. For further information, contact Hubbard Associates, Airport Business Center, Box 10152, Aspen, Colo. 81611.



Mormon temple dedicated in Washington, D. C.

Washington, D.C.'s newest monument is the nine-level, $15 million Temple of The Church of Jesus Christ of Latter-Day Saints, located near the Capital Beltway, and opened in November, 1974.

The marble-clad building was designed by a team of four Mormon architects from Salt Lake City: Harold K. Beecher, Henry P. Fetzer, Fred I. Markham and Keith W. Wilcox. According to a fact sheet, the Temple is meant to provide immediate recognition as a Mormon Temple by bringing to mind the famous profile of the Salt Lake City church, without being a literal copy. It is the tallest Mormon temple in the United States.

AIA Research Corporation assigns solar contracts

AIA/RC has subcontracted with eight architectural firms and two schools of architecture to develop housing design concepts incorporating the use of solar heating/cooling systems.

AIA/RC and its subcontractors are assisting the Department of Housing and Urban Development and the National Bureau of Standards to respond to the general objectives of the Solar Heating and Cooling Demonstration Act of 1974 (RECORD, January 1974, page 35). The subcontractors will prepare solar design concepts for single-family, low-rise multi-family, and mobile homes, and the designs will be included in a document for use by HUD and other Federal agencies, researchers, designers, builders, home owners, and the general public concerned with incorporating solar heating/cooling in houses and apartments.

The ten subcontractors, chosen from more than 350 firms and 30 schools submitting preliminary proposals, are: Community Design Associates, Cos Cob, Conn.; Donald Watson, AIA, Guilford, Conn.; Giffels Associates, Detroit, Mich.; Joint Venture, Denver, Colo.; Massdesign, Cambridge, Mass.; RTL, Inc., Paramount, Cal.; The Architects Taos of Taos, N.M.; and Total Environmental Action, Harrisville, N.H. The two schools are the School of Architecture and Environmental Studies of the University of Detroit, and the College of Architecture of Arizona State University.

Each subcontractor will develop conceptual housing designs modified for or adapted to either different solar systems or different climatic regions.

Comprehensive solar heating predicted by 1990

In calling for proposals (accepted until last January 22) for the solar heating and cooling of buildings, the National Science Foundation said it expects that by the mid-1980's a substantial portion of the increase in energy demands may be met by the application of solar energy. Research on the applications of solar energy to buildings is expected to reach the Foundation's Phase 2 proof-of-concept stage during the year.

In a general background statement accompanying the RFP, the Foundation said it anticipates that solar heating and cooling systems can become competitive in most regions of the country by 1985-1990.

Retrofit is said to be an economically attractive option now for large installations of solar energy systems on existing buildings. For most residential applications, however, new construction incorporating systems from the outset will probably provide the market in the near term.

NSF believes that a national proof-of-concept experimental program spanning five years, involving both single-family residences and larger buildings, is necessary to advance solar heating and cooling applications. The agency will be supporting experiments in the application of this type of energy to water heating and to the heating and cooling of buildings in its program.

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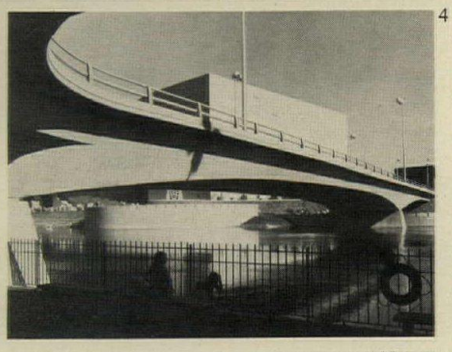

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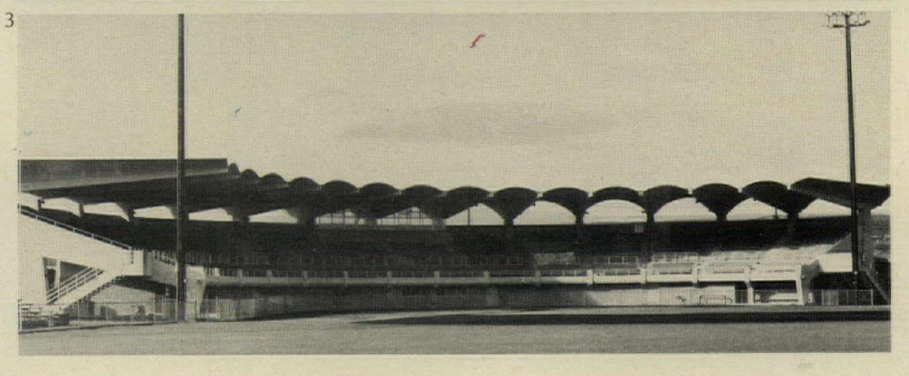

Nineteen selected for 1974 Prestressed Concrete Institute awards

Nineteen winners in the 1974 Prestressed Concrete Institute Awards Program were recently recognized for excellence in architectural and engineering design using precast and prestressed concrete. Equivalent top awards were granted to the winning entries: three housing units, a laboratory and research center, library, medical building, among others.

Jurors were: Archibald C. Rogers, chairman; John C. Harkness, The Architects Collaborative; Waldo G. Bowman, past-president of the American Society of Civil Engineers; Allan F. Duffus, president of the Royal Architectural Institute of Canada; J. Raymond Carroll, P.E., vice president of the National Society of Professional Engineers; and Charles S. Matlock, chairman, Committee on Bridges, American Association of State Highway and Transportation Officials.

This year's winners are: Edith Abbott Memorial Library, Grand Island, Neb.—Stanley J. How and Associates, architects; Crown Center Hotel (1), Kansas City, Mo.—Harry Weese & Associates, architect/engineer; The George Brown College of Applied Arts and Technology, Casa Loma Campus, Toronto—Fairfield & DuBois, and Alan R. Moody, architects; Harvard University Undergraduate Science Center and Chilled Water Plant, Cambridge, Mass.—Sert, Jackson and Associates, Inc., architects; Atlantic Oceanographic & Meteorological Laboratories (2), Miami—Ferendino/Grafton/Spills/Candela, architects; Regency Hyatt House Hotel, San Francisco—John Portman & Associates, architect/engineer; Baylor University Medical Center Parking Building, Dallas, Tex.—Harwood K. Smith & Partner, Inc., architects; Industrial Indemnity Company Office Building, San Diego, Cal.—Deems/Lewis & Partners, architects; Honolulu Park Grandstand (3), Hilo, Hawaii—Richard S. Matsunaga & Associates, Inc., architects; Charlotte Civic Center, Charlotte, N.C.—Odell Associates Inc., architects; Outpatient Clinics Building & Parking Garage, University of California Medical Center, San Francisco—Reid & Tarics Associates, architect/engineer; Laura Spelman Rockefeller Hall, Princeton University, Princeton, N.J.—I. M. Pei & Partners, architects; Ohio Bell Northeast Data Center—Dalton-Dalton-Little-Newport, architect/engineer; Santiam River Bridge, Linn County, Ore.—Oregon State Highway Division, Bridge Section, engineer, architect, and owner; Mission Valley Viaduct, San Diego, Cal.—California Division of Highways, Office of Structures, engineer, architect and owner; Washington Street-Stevens Street Couplet Bridge and Underpass(4), Spokane, Wash.—Culler, Gale, Martell, Ericson, architects; Gulf Intracoastal Waterway Bridge, Corpus Christi, Tex.—Texas Highway Department, Bridge Division, engineer, architect and owner; Reconstruction of the upper level of the Board Street Bridge over Genessee River, Rochester, N.Y.—Berger, Lehman Associates, engineers; Bridge No. 4, Q.E.W./Hwy. 20, Niagara Falls, Ont.—B.S. Richardson and L.N. Francis, engineers.

Proposed glass safety standards submitted

The Consumer Safety Glazing Committee has prepared proposed safety standards for architectural glass, eliminating windows, window glass and storm windows from the list of products which would be covered by such standards.

The risk-of-injury subcommittee said it found nothing to substantiate that an unreasonable risk exists for glass of that type. This leaves six categories of glass that would be included under the safety performance requirements submitted in the committee's December 13 preliminary draft: storm doors or combination doors, entrance/exit doors, bathtub enclosures, shower doors and enclosures, fixed glazed panels and sidelites, and patio/sliding doors.

It is proposed that the standards become effective 180 days after publication in the Federal Register. Application would then be to the types of glass listed above when they are used in permanent or temporary residences, recreation or school buildings, mobile homes, public buildings, and "other buildings or parts thereof" occupied by consumers.

The standards have been prepared under an agreement with the Consumer Product Safety Commission, an independent Federal agency. The subcommittee urges CPSC to revise its methods for making in-depth investigations. The proposals cover test equipment and procedures, certification and labeling as well as providing a scope and application section.

HUD will study U.S. housing condition

The Housing and Urban Development Department and the Bureau of the Census have launched a new effort to find out more about the condition of shelter in the United States and report the results annually.

Based on an expanded national sample, the survey will call on existing data to supplement new information and for the first time will handle data on the condition of housing amenities and their relation to motives for moving, etc. Householders will be asked to judge the adequacy of their public services.

The first such census was conducted in the late summer and early fall of 1973, covering almost 60,000 units. The second survey of the national sample began last August. An increment of newly completed units will be added each year and the continuing national counts will include an additional 16,000 rural units. Altogether, 76,000 units will be surveyed nationally each year.

HUD claims that virtually nothing is known now about how much housing in this country needs rehabilitation, or how the supply of suburban rental units compares with that in the central city and the difference in rent levels between the two types. The survey also will seek answers to these other "unknowns"; how much housing costs of urban and rural families change year to year, what the key neighborhood services are that influence residents to move, and how much those who move manage to improve their living conditions.

The Department expects the information will be widely used by all levels of government.

Senate action would redirect health funds

Apparently convinced there is an overabundance of hospital beds in many locations of the country, the Senate has passed a new health facilities assistance program which would channel funds to areas of proven specific need and withhold them from those places where an over-supply of facilities is proven. The measure was passed 65 to 18 after lengthy debate and covers health planning programs as well as construction and rehabilitation assistance.

Under Title II of the Senate-passed bill, the Secretary of Health, Education and Welfare is authorized to make grants to public or private non-profit entities to meet costs of projects for: 1) construction or modernization of outpatient facilities; or 2) modernization of facilities that will serve a medically under-served population which, without the modernization of such facilities, would be so designated. The HEW Secretary would determine the amount of the grant, but it could not exceed 75 per cent of the cost.

A "tremendous need" for modernization of existing facilities is recognized; Hill-Burton state plans show more than 167,000 general hospital beds and nearly 233,000 long-term beds in need of modernization. Also, some 2800 public health centers, outpatient facilities and rehabilitation facilities need reworking. Over one-third of the nation's general hospitals and long-term care facilities now need remodeling or replacement, according to Federal estimates.

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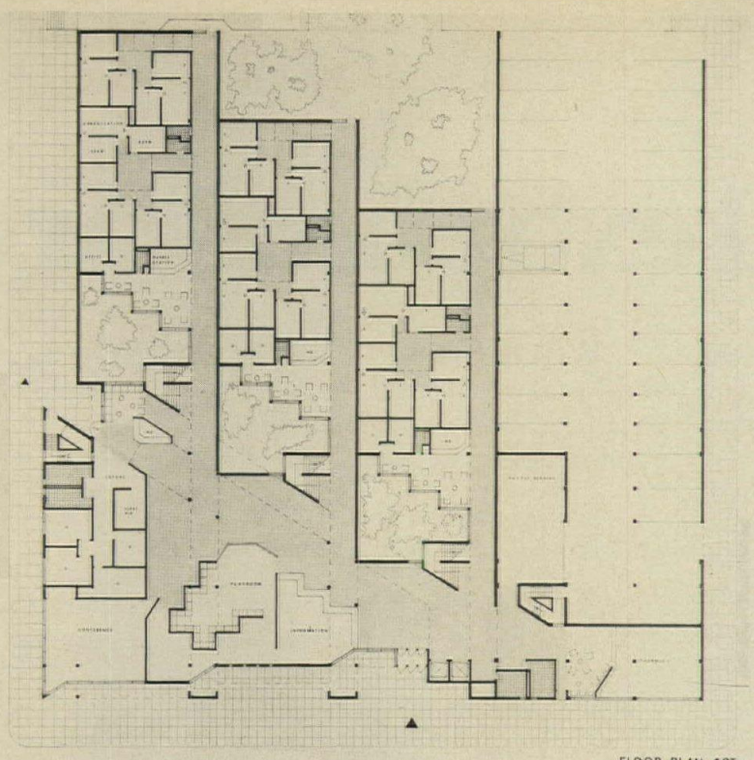
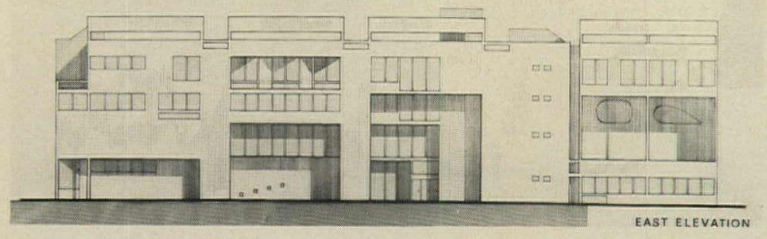
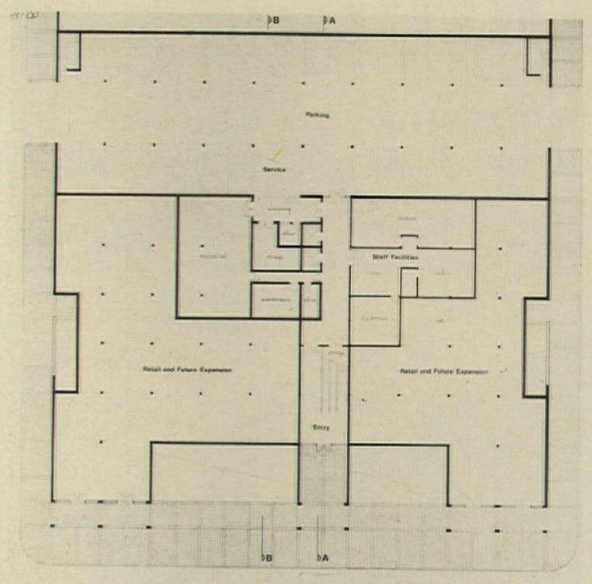


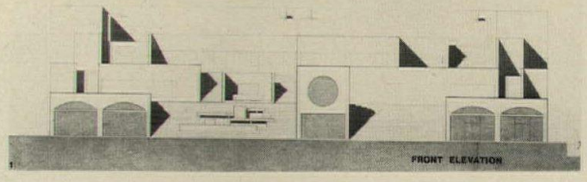
FLOOR PLAN 1ST



EAST ELEVATION



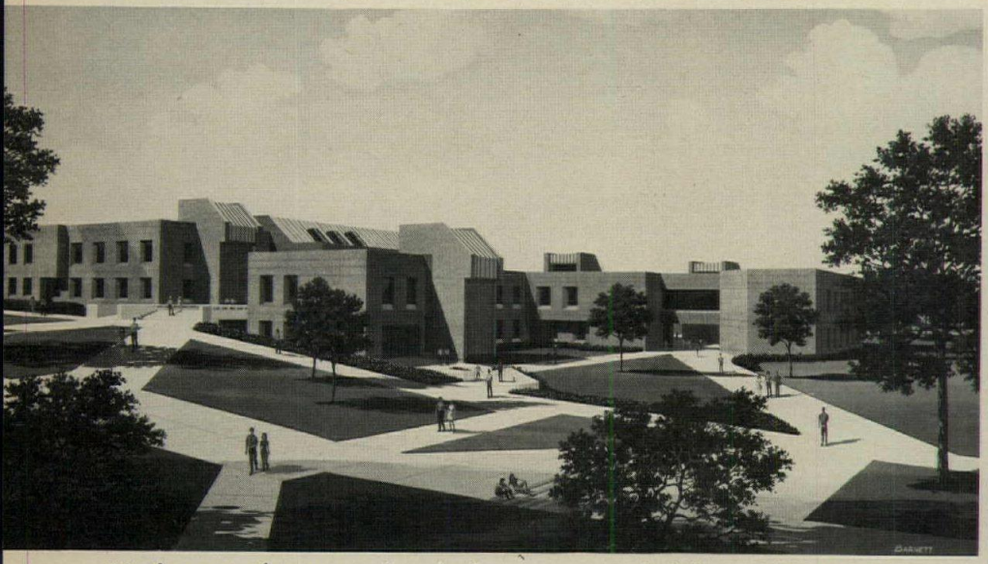
GROUND FLOOR PLAN

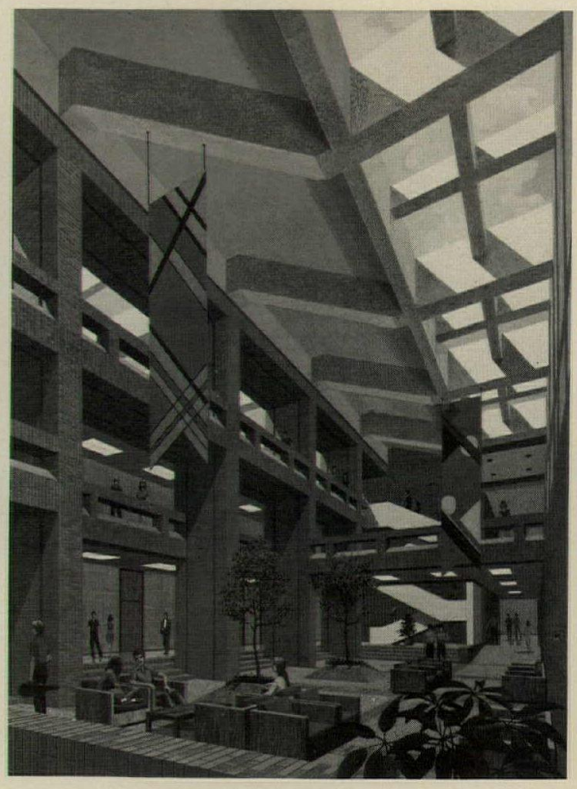


FRONT ELEVATION

The National Institute for Architectural Education announces two first prize winners . . .

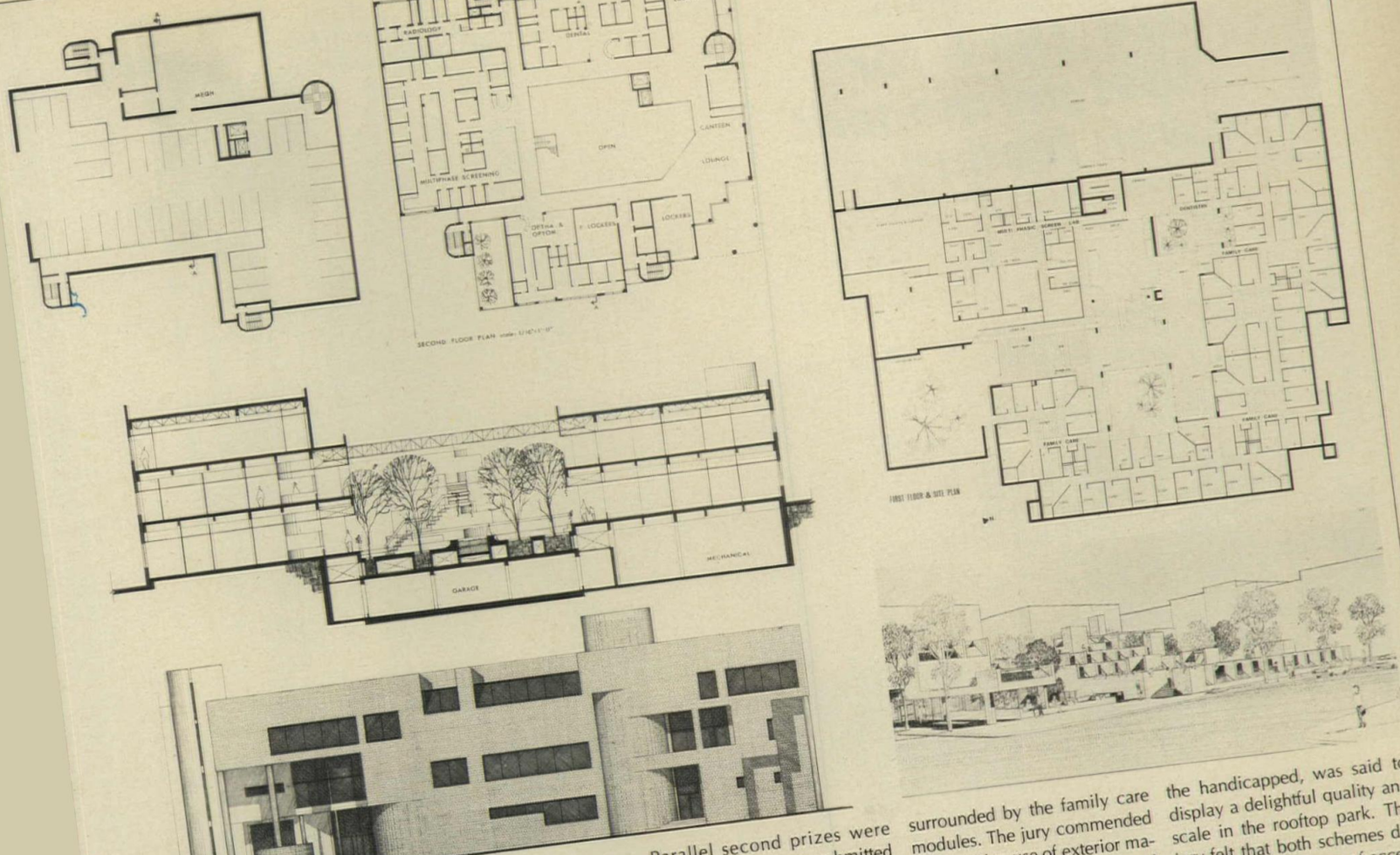
The annual Hirons Prize for architects who are non-students under the age of 35 has been awarded equally to Martin Cooperman of Little Neck, N.Y. and H. Preston Crum of New York City. Mr. Cooperman, responding to the program for a hypothetical neighborhood health center, submitted a design (left) with two controlled entrances from opposite streets connected by a diagonal interior street the full height of the building. Family care modules open from this path. Mr. Crum's design (right) features non-programmed retail stores included on the street level, related to general community use. Stepped roofs form plazas.





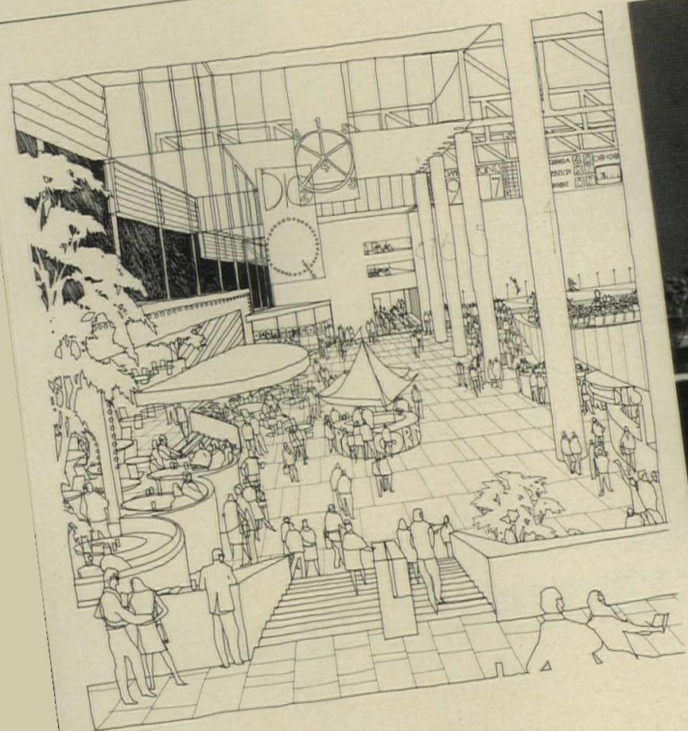
Music center for state university incorporates rehabilitated dormitories

This Music Center for North Texas State University in Denton, Texas includes a main facility (above), located near the center of the campus and surrounding and incorporating existing music buildings. The first phase of the two-phase project includes 100,000 square feet for instruction, while the second phase will provide a theater and a 1000-seat performance hall. Iconoplex Inc. designed the project, including a student commons area (right), and the rehabilitation of two near-by dormitories for use as music practice buildings. Ultimately, the center will provide a physical plant for a maximum enrollment of 1500 music students.



. . . and two second prize winners in a design competition for a health center

Parallel second prizes were awarded to designs submitted by Michael Coleman of Groton, Conn. and James Charnisky of Boston. Mr. Coleman's solution (left) contained a single entry leading to an enclosed atrium surrounded by the family care modules. The jury commended the sensitive use of exterior materials, and the articulation and scale of the exterior itself. Mr. Charnisky's design (right), although deemed undesirable for the handicapped, was said to display a delightful quality and scale in the rooftop park. The jury felt that both schemes did not achieve the clarity of access present in the first prize design shown left.



Festive environment sought for Connecticut jai alai facility

This 4800-seat, 150,000-square-foot jai alai facility—under construction in Milford, Conn.—follows the contour of its rocky, sloping site which provides a natural shape for the grandstand. Herbert S. Newman designed the building to include a 300-seat restaurant, cocktail lounges, concession stands (left), betting lobbies and administrative areas, with parking for 1400 cars. The grandstand area is spanned by exposed steel trusses foot cantilever ov access street and ning parallel to th Exterior walls a concrete, as are 4 columns.

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Housing specialists confer in Israel

An urgent call for large-scale international financing of housing was sounded at the recent (December 17-20, 1974) International Conference on Housing for the Emerging Nations, held in Tel Aviv, Israel, under the sponsorship of the International Technical Cooperation Center. The voice was that of Heinz Umrath, the Dutch chairman of the ITCC Council and secretary of the Amsterdam-based International Housing Committee of the International Confederation of Free Trade Unions.

The idea is not entirely new, but to date it has not been seriously implemented. In 1972 the UN General Assembly proposed to establish "an international fund or financial institution" that would provide seed capital and technical assistance for housing and the improvement of living conditions in many countries. This, Dr. Umrath pointed out, has not found a positive response. Instead, the UN Environmental Program proposed a voluntary and financially limited "International Habitat and Human Settlements Foundation" which would spend $4 million over four years, while the developing countries called for an initial allocation of $5 million and a target of $250 million over five years. At the least, said Dr. Umrath, the UN Conference-Exhibition on Human Settlements, which will take place in Vancouver, Canada, in the Spring of 1976, should establish the proposed International Fund for Human Settlements.

The ITCC housing conference, backed by the Association of Engineers and Architects in Israel, drew an attendance of about 1300.

One interesting highlight of the Tel Aviv conference concerned the popular notion that industrialized systems building (ISB) can and should be applied widely in developing countries. It received "a discouraging prognosis" from Professor W. Paul Strassmann of Michigan State University. He said: "The combination that allows the use of ISB—willing occupants, high construction wages, low equipment and financing cost, and great land scarcity—is not likely to prevail in many parts of the world, particularly not in developing countries."

Probably the most authoritative information on the progress of housing development in recently established nations is the data offered by Israel about itself. Housing Minister Avraham Offer announced a governmental policy of resisting "permanent social segregation." The rich and the poor, he said, would have to live together in one neighborhood.

Israel's present population of 3,400,000, Mr. Offer continued, represents about 880,000 families, of which 760,000 reside in urban communities. There are about 900,000 housing units, and of these, only 182,000 were built before the establishment of the State in 1948. In other words, three-quarters of all dwellings in Israel were built in the last generation.

The question of population was picked up by Moshe Safdie, the Canadian/Israeli architect, designer of the Montreal Expo "Habitat." Despite the building of new towns and other efforts of the government to distribute population throughout the country, he pointed out, there has been a disproportionally large growth of the Israel coastal regions and, thus, a failure of the dispersal experiment. "Dispersal," he said, "cannot be achieved as long as the qualities of life offered are not comparable to the metropolitan city." Mr. Safdie emphasized the need for the standards of environment and for establishing, particularly in the developing countries, an environmental code ("Environmental Bill of Rights") similar in its approach to a building code. One purpose of such a code would be to control residential densities in urbanizing areas.

Finally, Israel's desire to house people equally is commendable, but it creates "intolerable burdens" in more ways than one. This is the opinion of Dr. Hans Kampffmeyer, Secretary General of the West German Society for Housing, Town Building and Regional Planning, and head of an international committee of experts on social planning. "As a socialist it pains me to criticize equality; as a town planner I know uniformity is the enemy of good living," said Mr. Kampffmeyer.

In Israel, a country he first visited 10 years ago, he was struck by the bleak uniformity of the towns. "This need not necessarily be so, even if the funds for construction come from central sources. Indeed, the kibbutzim, also supported from central funds, have found a way to be different."—*from a report by Samuel R. Mozes, Director of the Bureau of Urban Affairs, New York State Division of Housing and Community Renewal. He also serves as chairman of the International Planning Liaison Committee of the New York Metropolitan Chapter, American Institute of Planners. Part II of this report will be published next month.*

Oil-rich Middle East: the next big client?

Iran, with an estimated oil revenue of $102.2 billion by the end of its Fifth Development Plan (ending March 20, 1978) is expected to have a balance of payments surplus of over $17.5 billion, and with an average GNP growth rate of 26 per cent, this developing nation is more than ever a potential consumer of goods and services from more highly developed countries.

Not the least of the required services is building expertise. Iran, during its Fifth Development Plan, has allocated $3.2 billion for state building projects and another $3.4 billion for housing units. These figures do not include an additional allocation of $164.1 million for construction of recreation centers, hotels, etc., and $1.37 billion for expanding highways, airports and harbors.

The Fifth Development Plan, in short, calls for development in almost every field of activity in Iran: regional development, agricultural and stock-breeding, development of water, industry, mining, petroleum, gas, electricity/nuclear power resources, transport/communications, rural/urban development, housing, education, arts and culture, health, sanitation, physical culture (sports complexes, playgrounds) and family planning.

What are the Middle East potentials for U.S. architects and engineers? According to the May 16, 1974 issue of *Engineering News-Record,* of the top 500 (in billings) design firms in the U.S., 51 had jobs in Iran, Iraq, Kuwait, Lebanon, Saudi Arabia and the United Arab Emirates.

The engineering, architectural firm of DeLeuw, Cather International, Inc., Chicago, ranked fifteenth in the ENR report, currently has about $3 million worth of billings in the Middle East, but aims to increase this figure at an annual rate of 15 per cent, according to executive vice president Henry Johnson. He says the firm maintains an office in Beirut, Lebanon which employs 60 people.

The firm's most recent jobs in the Middle East have been designing an expressway system for Kuwait City, and work on a new town project in Iran. On the Kuwait job, which consists of 34 miles of four- and six-lane expressway, the client was the Kuwait ministry of public works. An engineer with DeLeuw, Cather said about a year and a half remains on that contract. On the Iran job, characterized as a small one, the firm served as a subcontractor to Perkins & Will, Chicago.

"That is no part of the world for amateurs", says Johnson. He stressed the importance of doing extensive homework in the areas of exchange control (of currency), method of payment, and budgeting.

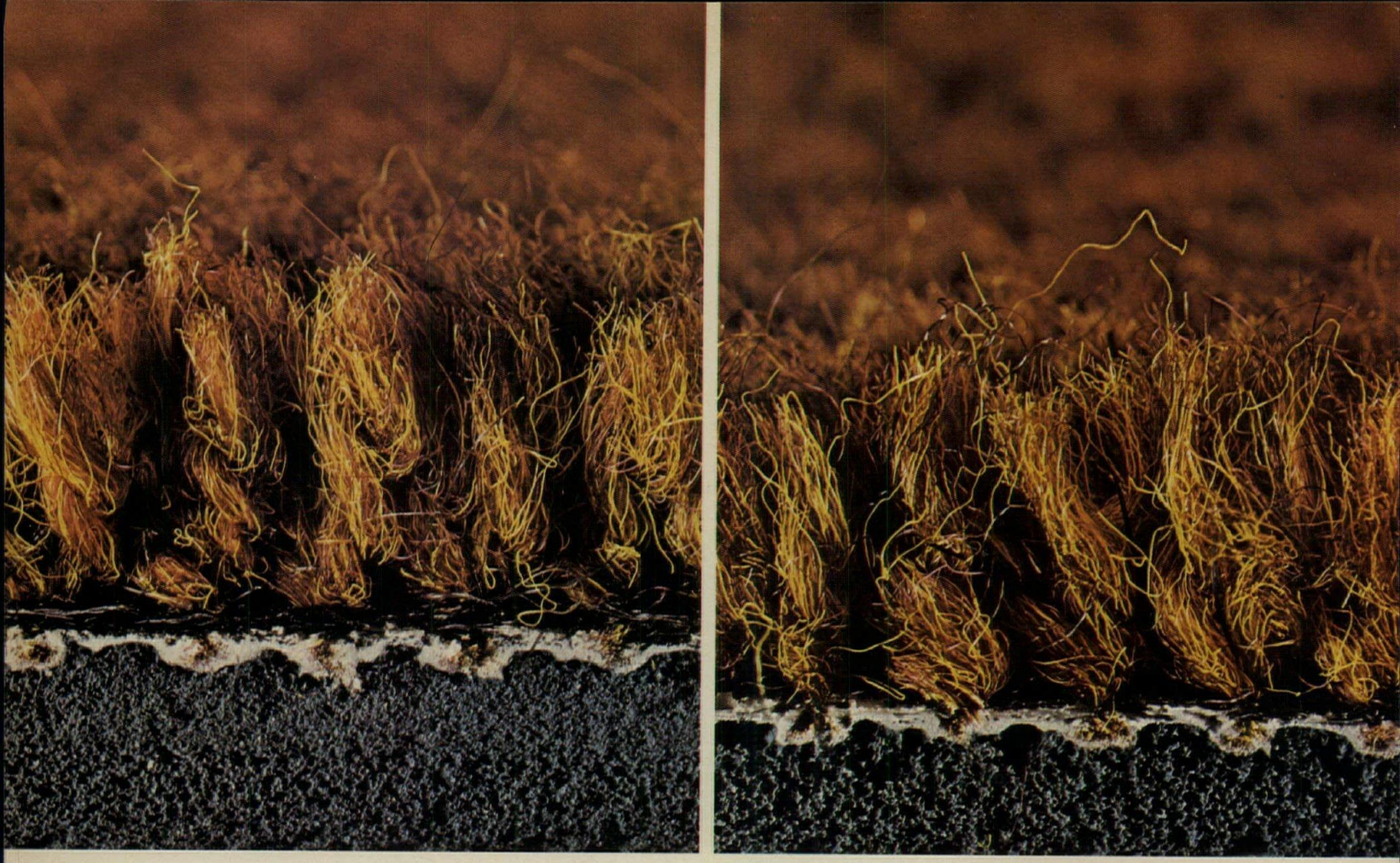
Iranian Minister of Housing and Town Planning, Jaber Ansari said that the government is determined to encourage a large-scale housing construction program during this Fifth Plan, and he added that the target is 810,000 housing units, of which 200,000 are planned for completion by March 1976. Of this number, 80,000 units are to be constructed by government agencies and the balance by local private sector and foreign companies in joint ventures. Iran is said to offer good joint venture opportunities, allowing foreign investors up to 50 per cent participation shares.

Iranian law does not permit large-scale ownership of property by non-Iranians, but joint-venture investment is permitted in the building of housing units for sale. France has already agreed to construct 200,000 units in Iran, and Danish firms are expected to build large numbers of apartment houses in Tehran and the provinces. Italy, West Germany and Yugoslavia have submitted proposals, and Britain's United Kingdom Group (UKHG), coordinated and financed by the Orion Bank and Allied Medical Group has bid for the construction of 12 hospitals costing $240 million.

The European building proposals, if accepted, would result in projects financed and operated by Iran.

The persons most helpful to American architects in Iran's building projects are: Minister of Housing and Town Planning, Jaber Ansari; Minister of State and Director of Plan and Budget Organization, Abdol Majid Majidi, for registering firm names for large government construction projects; Civil Aviation Director, Hushang Arbabi, for airport construction; Minister of Social Welfare, Dr. Skeikhol-Eslamzadeh, for hospital construction projects; Minister of Energy, Iraj Vahidi, for works related to nuclear power station construction; and Minister of Roads and Transport, Javad Shahrestani.

The government has not published a detailed list of its building program requirements, but has announced that it welcomes offers from foreign countries to speed its construction target dates. Will the government accept proposals from anyone? Yes, if the firm is qualified and financially sound. Most reputable foreign construction firms register with the Plan Organisation which grades them and includes them on an international list for bids.



Both carpets cost the same. But 68% of the people we asked preferred the one on the left, thanks to high-density foam.

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Urban design: Contact sport or ivory tower?

URBAN DESIGN AS PUBLIC POLICY, *by Jonathan Barnett; New York, Architectural Record Books, 1973, 200 pages, illustrations, $15.00.*

THE FUTURE OF THE CITY, *by Peter Wolf; New York, Whitney Library of Design, 1973, 207 pages, illustrations, $20.50.*

Reviewed by Raymond Gindroz and David Lewis

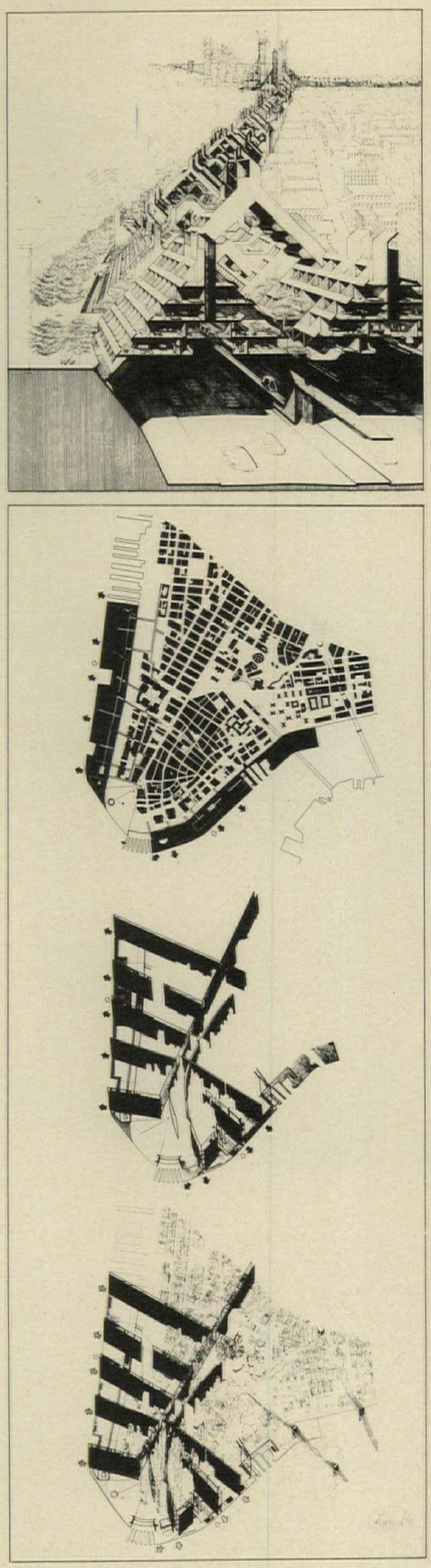
How, one wonders, can two books on the same subject, illustrating so many of the same projects and written by two professionals working in the same city be such worlds apart?

Jonathan Barnett's book is written directly from his experience as the Director of Urban Design for the New York City Planning Department. It is autobiographical in the sense that the book describes with candor and razor-sharp clarity the day-to-day struggles that go on in the planning department of any major city that is dedicated to getting things built; the conflicts, negotiations, frustrations, crises, triumphs.

At one level the book takes us on a fascinating odyssey within Lindsay's administration. It follows the course of Barnett's urban design team from its first days when these clean-shaven young architects and lawyers were naive enough (good God!) to confront a major developer and his architects with the inherited cultural and social values of the city, to the final days when experience had provided them with the actual techniques with which to insist on the comprehensive values and care for detail with which to create better cities.

But at another level it is these techniques themselves which emerge as important, not just for New York, but for cities across the country. Each project which Barnett describes, each series of impassioned battles and patient negotiations, necessitates political, legal, economic, and design inventions which not only make the projects themselves realizable in New York, but are the very stuff of urban design in every major city in the United States. Not for nothing is his book sub-titled, "practical methods for improving cities."

Because the book is autobiographical it focuses almost entirely on the role of the Urban Design Group in the many battles and negotiations it describes. We wondered while reading the book about the role and creative input of the developers, architects, and politicians who were on the other side. It would be useful to have an account by someone from the private sector who dealt with the Urban Design Group.



Peter Wolf is Chairman of the Institute for Architecture and Urban Studies, an organization which did some work with the Urban Design Group. His book, *The Future of the City,* however, takes a very different view of urban design. From it you'd never believe that the problems, the issues, and in some cases even the projects were the same. Although Peter Wolf's book is useful as a picture history book of current formalism for urban design, there is next to nothing in his pages about the tough realities of getting projects built that Barnett writes about.

If you want a book that sets out contemporary urban issues under neat chapter headings and then shows that contemporary architects and urban designers have all the answers (O what fools we are not to rush out and build them), then this is for you. Take as a case in point Paul Rudolph's Lower Manhattan Expressway. This design, Mr. Wolf tells us, "is perhaps the most complete and complex ever undertaken for an urban freeway."

In cross-section the design is a diagrammatic statement for treating the interface between urban communities and a major expressway. However, as it is presented in the book it is a complete urban environment ready for implementation.

Well, maybe we have some screws loose, but as a recommendation for an urban environment it appears to us to be incredibly limited in its vocabulary and horrendous in its inhumanity. We can't help wondering how much of the design would be left if it were subjected to the community and political processes Jonathan Barnett talks about; if the citizens, the white-collar lawyers and corporation men, the Jews, the Puerto Ricans, and the blacks, who live in those areas shown so vaguely on each side of the expressway corridor and who would be expected to use it and make it part of their everyday city, were to be truly enfranchised in the process of designing this major infrastructural element driving its way through their inherited environment; and if the new inhabitants were allowed a chance to demonstrate the intricacies of their need in contrast with the repetitive trapezoid pigeonholes which they are offered in the design; and if the economic, political, legal, and technical obstacles of getting the project done were to be really faced up to.

Yet surely these processes are the very stuff of urban design. Peter Wolf obviously thinks not. He say, "Why has the opportunity

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Mr. Gindroz and Mr. Lewis are partners in the firm of Urban Design Associates in Pittsburgh; Mr. Gindroz is a Critic in Urban Design at Yale, and Mr. Lewis has been Professor of Architecture at Carnegie-Mellon University.

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for (the) well-planned use of such urban space generally failed to be realized? The answer does not lie in flawed concepts or weak planning. Rather, the problem occurs in economic and social barriers to implementation." This, it seems to us, is the basic weakness of the book. We find ourselves on the side of H. L. Mencken: "There's a solution to every problem; simple, quick, and wrong."

From the Wolf book one deduces that the urban designer is the creator of seminal design ideas for which the political, social, and economic structure of cities must then be modified to accept. In his conclusion he says, "New concepts are scarcely needed. If nothing else, this book should make it clear that many available and promising concepts . . . already exist. Intense focus on public, private, and most of all joint public-private procedures, mechanisms, and processes must now occur. . ." The result is a recipe-book of formal concepts waiting for the right political, economic, and social situation to come along.

Jonathan Barnett's book is based on an utterly different set of concepts for the role of an urban designer:

- To be effective in improving the quality of urban environments, designers must find new roles—i.e. participate directly in the political, economic and social processes through which public policy is determined;
- Urban design must be viewed as a vehicle for developing and defining policies and negotiating implementation;
- Urban designers must be responsive to situations as they unfold. The design process is in effect as a structured dialogue with participants reflecting every facet of the problem. Urban design is therefore *situationist.* Each situation requires a unique response. An example of this approach (which is in sharp contrast with the discussion of the Rudolph expressway design) is found in Barnett's chapter entitled, "Neighborhood planning and community participation." When the Urban Design Group began work on the first prototype vest-pocket housing project in the Bronx, they presented their design concepts at a community meeting. The meeting was a violent one with a number of warring factions attacking the plans from many different viewpoints. By the end of the meeting the planners were told to take their prototypes and go. After the meeting the planners began to learn more about the community and by so doing, came to understand why the meeting had gone the way it had. As they worked with a variety of citizens' groups, politicians, and community leaders, they developed design proposals in response to the real concerns of people living in that community rather than to the formulae of an abstract theory. The Twin Parks development which grew from this process combines new housing construction with community facilities and the rehabilitation of existing sound housing to provide a structure for renewal as well as to simply provide housing. This chapter ends with an evaluation of the Twin Parks development: both its successes and failures.

The concept of carefully threading new housing and community facilities into an existing community which developed in the Twin Parks project was applied and further developed in the Urban Design Group's work for housing at Coney Island. The concept changed in response to the very specific and unique needs of the Coney Island community.

The most striking aspect of this design approach and of Barnett's book is that it is keenly situationist. In project after project he reveals the Achilles' heel of studio formalism through painful reconception and redesign in the light of unfolding political and economic complexities. His book opens with two key premises:

- We start with the assumption that we cannot afford to write off our cities, nor can we afford to indulge in escapist fantasies.
- Cities are created by a continuous (and complex) decision-making process; and it is by participating in these day-to-day decisions that designers make a useful contribution to the future of the city.

Indeed as the book moves forward it becomes clear very quickly that there is no need for designers to find themselves like rudderless mariners at the mercy of hostile currents, but rather within every situation there are currents to be identified, understood, and sailed with.

Barnett's personal penny dropped when he realized, in his first confrontation as an official of the Lindsay administration over the design of an office tower in the theater district of New York City, that zoning is not just a regulation, but through its precise legal and political definitions it is a crucial tool in the hands of urban designers as well as lawyers and politicians in shaping and correlating the complexities of urban environments. In simple and impeccable prose, the book lays before us a whole series of similar tools: tools to do with economics, bureaucratic processes, community participation. And in project after project, in careful sequence, Barnett shows how he and his team painfully learned the nature of these tools, how they can be used and modified and reshaped for the benefit of the city and its citizens, in dialogue with sensitive and exploratory design.

Perhaps the most telling chapter, "Designing cities without designing buildings," deals exclusively with how regulations impose environmental shape by telling developers and their designers what they may or may not do. Starting with the fairly simple examples of the setbacks regulations which give New York its distinctive skyline, Barnett goes on to the important concept of incentive zoning which allows trade-offs to the developer who provides a socially needed amenity or respects a historic monument. (Barnett uses as examples the new theaters which this kind of zoning was responsible for in the otherwise doomed historic theater district of New York, and the preservation of Grand Central Station.) He then proceeds through the most important analysis in his book, a description of the negative spaces, and urban design criteria, arising from the evolution of the plan for Lower Manhattan.

It is a long time since we have come across a book of such pivotal importance in design theory. We recommend to everyone involved in urban issues in every major U.S. city—whether he is a developer, politician, lawyer, planner, architect, or citizen—Barnett's view that urban design is an art which belongs to the people rather than to the priests.

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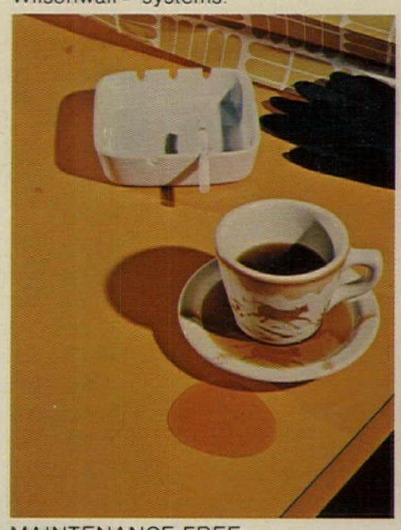

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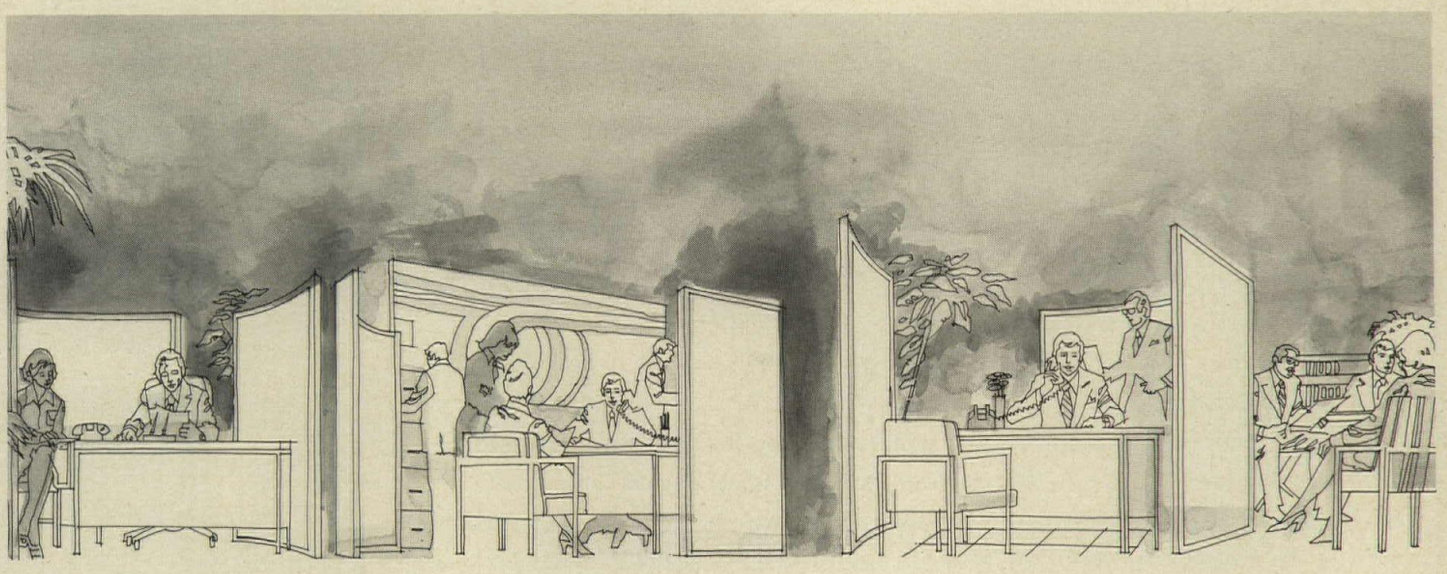

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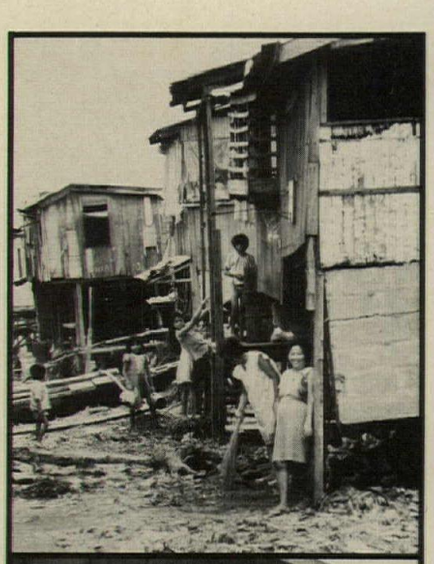
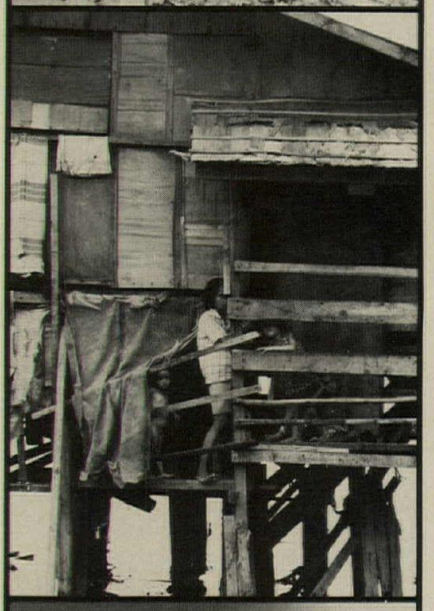
You are invited to enter

The international design competition of developing countries

A one-stage international architectural competition for the design of a self-help housing community in a developing nation has been announced by The International Architectural Foundation, a nonprofit corporation created by two of the world's leading architectural magazines, ARCHITECTURAL RECORD and L'ARCHITECTURE D'AUJOURD'HUI. The Foundation is closely associated with the United Nations Environment Programme, and its competition is a project conceived in conjunction with Habitat '76, the major UN Conference-Exposition on Human Settlements to be held in Vancouver, B.C. (Canada) May 31-June 11, 1976. Habitat '76 will be a large-scale international meeting concerned with the accelerating urban crisis in the developing countries and will include official representatives and technical experts from member states of the United Nations.





The design problem

The site for the competition project, which will provide housing and community facilities for approximately 3,500 to 5,000 people, is located in Dagat-dagaton, in the metropolitan area of Manila, Philippines. Typical of urban growth problems throughout much of the developing world, the area has been receiving heavy in-migration of population. Extensive studies of this area (photos, right) have produced the body of data and preparatory planning that led to the selection of this site for the competition.

In addition to the generous grants from the contributors listed on the opposite page, funds to meet all cash awards and certain other competition expenses have been guaranteed by the Philippine Government, and local public agencies have provided assurance that the project will be built and the winning architect commissioned. The competition conditions will be approved in their final form by the Philippine Institute of Architects (the local section of the International Union of Architects) and members of the jury.

The competition addresses the world-wide problem of housing in the context of rapid urbanization, and seeks solutions that will be widely applicable throughout the developing world. It assumes a high degree of self-help in the realization of the community. Advanced measures to minimize environmental impact will be specified in the competition conditions. Thus the competition deals with the entire question of human habitat and its future, and the competitors must resolve the highly practical aspects of a specific problem and a particular location.

The winning designs will be widely publicized throughout the world, particularly in the architectural press, and will be exhibited in Vancouver during Habitat '76.

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Second award	$15,000
Third award	$10,000
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**Possibility exists for commissioning of additional entrants because competition site is part of larger site which will eventually accommodate neighborhoods for 100,000 to 140,000 people.*

Qualifications for entering Competition

Anyone qualified to practice architecture in his own country, or any design team (including students) with such a qualified architect, can enter the Competition, to be conducted under the regulations of the International Union of Architects.

How to enter

Complete registration application at bottom of page, and remit $25 (U.S.) payable to The International Architectural Foundation, Inc., to Gutheim/Seelig/Erickson. Documents and complete program will be mailed to you promptly. First date on which conditions will be posted: March 1, 1975. Closing date for registration: postmark May 15, 1975. Last date for designs: postmark October 15, 1975.

Jury for the Competition

Balkrishna Vithaldas Doshi, architect (India)
Eric Lyons, FRIBA (Great Britain)
Moshe Safdie, PQAA (Canada)
Mildred F. Schmertz, AIA (U.S.A.)
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Professional advisor

Arthur Erickson, FRAIC, Vancouver, B.C., Canada

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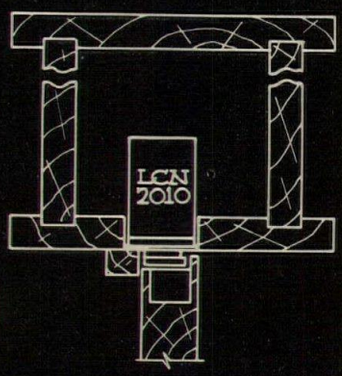

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OFFICE NOTES

New offices, office changes

Lorenzi, Dodds & Gunnill Inc., a Pittsburgh-based firm, have recently opened an office in the St. Charles Building in St. Charles, Md.

Shand, Morahan & Company, Inc. have announced their relocation to 801 Davis Street, Evanston, Ill.

Wallace, Floyd, Ellenzweig Inc. have changed their name to **Wallace, Floyd, Ellenzweig, Moore, Inc.**

Don Reiman Architect has opened new offices at 1133 Pleasantville Road, Briarcliff Manor, N.Y.

Ladd & Kelsey have announced their merger with Stewart Woodard & Associates. The new firm will be known as **Ladd, Kelsey, Woodard** and its offices are located in Newport Center, Newport Beach, Cal.

The partnership of Searle Wilbe & Rowland is now known as **Neish Owen Rowland & Roy** located at 40 University Avenue, Toronto, Canada M5J 2G3.

Carl Steere Myrus, AIA, has announced the reorganization of his firm as **The Myrus Associates** now located at 111 Brampton Road in Syracuse, N.Y.

Ammann & Whitney are in new offices at Two World Trade Center, New York City.

Walter Richardson Associates are now known as **Richardson•Nagy•Martin,** 230 East 17th Street, Costa Mesa, Cal.

Wilscam & Mullins, Inc., an Omaha architectural and engineering firm, have opened their first branch office in Redwood Falls, Minn.

Peter Kampf formerly of Marquis and Stoller, has opened his own architectural practice under the name of **Peter Kampf and Associates,** Pier 33, The Embarcadero, San Francisco, Cal.

The Mithun Associates Architects have moved to 2000 112th Avenue N.E., Bellevue, Wash.

Charles Nolan, Jr., Joel Stout, and Sam Pool have formed the architectural firm of **Nolan, Stout, Pool, P.A., AIA,** formerly Charles E. Nolan, Jr., and Associates. Offices are at P.O. Box 1788, Alamogordo, N. M.

The partnership of Craig Zeidler Strong/Architects is known as the **Zeidler Partnership/Architects** with office addresses and telephone numbers remaining the same.

Gordon P. Rogers, AIA, Edward Hammarskjold, AIA and Charles W. Scurlock, AIA have associated to form the firm of **Rogers/Hammarskjold/Scurlock/AIA,** 521 South Riverview Drive, Kalamazoo, Mich.

New associates, promotions

John Carl Warnecke, FAIA, has announced on behalf of the firm that **A. Eugene Kohn, AIA** has been named president of John Carl Warnecke & Associates.

Correction

The firm of Patty Berkebile Nelson Associates of Kansas City was accidentally and regrettably dropped from the credits for the River Quay project in Kansas City, described in RECORD on page 86, December 1974 issue.

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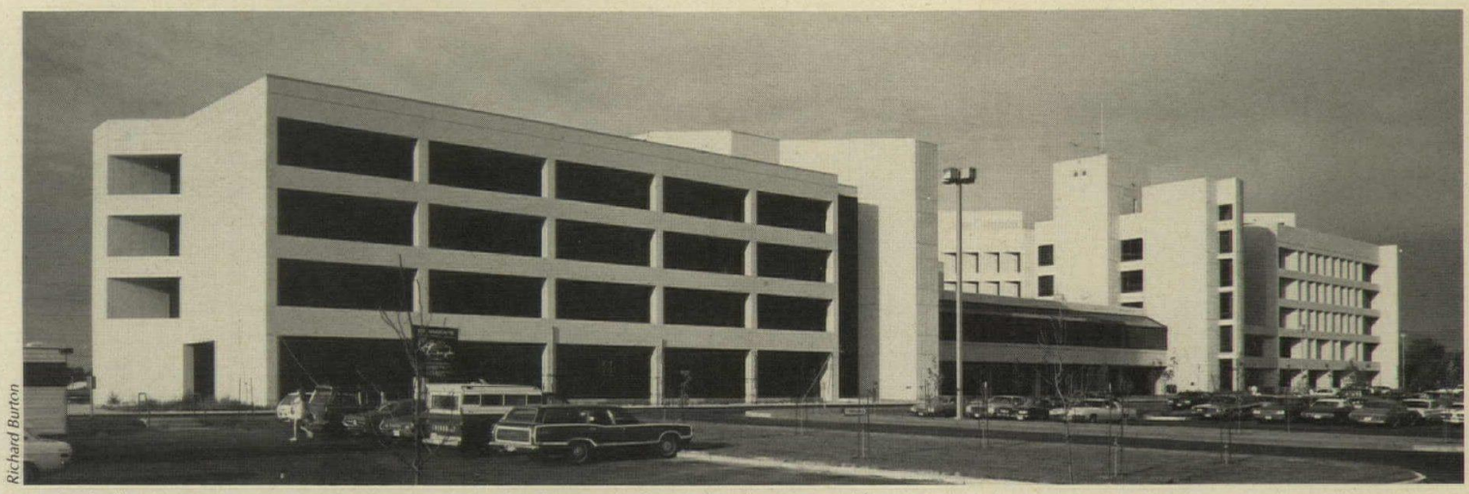
The hospital-affiliated medical office building



Richard Burton

Medical office building annex to St. Mark's Hospital, Salt Lake City. Architects: Kaplan/McLaughlin.

One of the most active (and abused) building types in health-related construction gets honest evaluation here. Author James Diaz is a partner at Kaplan/McLaughlin, architects of San Francisco—and has worked on a number of medical office buildings as well as being the architect member of several AHA Institutes on the subject. He was assisted on the article by one of his partners, Herbert McLaughlin, who has been the developer of four commercial office buildings for which Kaplan/ McLaughlin were architects.

A hospital-affiilated and connected medical office building can benefit all concerned in the health care process. The patient benefits because it is easier for the physician to attend him as an inpatient, and as an outpatient he can gain from the easy use of extensive and sophisticated hospital facilities. Further, there are studies which indicate that lengths of stay are shorter for patients of doctors in an affiliated medical office building. The hospital benefits from increasing doctor commitment, predictability of workloads and ancilliary income, and the physician saves time and, therefore, can increase his productivity.

While there may be a number of advantages to hospital-affiilated office buildings, their development has recently slowed, due to familiar factors of increased costs of money and construction to which the rental market has not yet adjusted. However, this situation will undoubtedly change and a real spurt in construction should occur.

The architect's involvement in these projects can cover a wide range of opportunities—and problems. For this is a uniquely complex building type. This article ranges quite far across the scope of problems in planning medical office buildings since knowledge in this area can help the architect avoid unreal projects—and perhaps help him get one started—hopefully on an expeditious and profitable basis for all concerned. Having made the decision to undertake an attached office building, the hospital is faced with an array of interdependent alternatives. Who will own the land and the building? Where will it be located? How will the construction be financed? What are acceptable rents and/or subsidies? Who will be eligible for tenancy? Are there any tax advantages in various types of ownership? And finally, where is this information available?

Advantages of a medical office building

There are now approximately 600 hospital-affiliated medical office buildings, as well as thousands of others, near hospitals, which are privately owned. A recent survey of more than 100 hospitals reports an average yearly net income of $4,556 for ambulatory services per physician with offices on campus. Two-thirds of the hospitals reported average per-tenant net income over $5,000.

The most recent survey shows that the average stay for patients of doctors on campus is 6.85 days, whereas it is 7.94 days for patients of physicians located away from the hospital. This efficiency allows an increase of 15 per cent in the total number of admissions for a given number of beds and a more intense and profitable utilization of surgery, radiology and laboratory. The seventh day in the hospital rarely requires these services.

Who plans—and who owns?

The need for a medical office building may be perceived initially by either the hospital or the medical staff. In most cases the hospital takes the lead in planning, on occasion a third party developer is involved.

At first glance, the developer might seem an unnecessary added burden, his profit serving only to increase rents. In actuality, any complex building enterprise, especially one involving a non-captive tenancy and complicated problems of marketing and ownership requires someone in the developer role. While this person can be a member of the hospital administrative staff, generally such individuals are overloaded with other work and lack the requisite skills to move a project rapidly. When construction escalation runs at over one per cent per month (and a 40-physician building with ground floor commercial tenants can cost as much as $3 million), a developer who can reduce planning and construction time by six months has more than paid for his normal profit or fee—and developers are generally willing to work on either basis.

The following overriding issues must be resolved before the project is launched: 1) hospital subsidy; 2) ownership; and 3) the degree of control that the hospital wishes to exercise in management. While increases in occupancy and revenue from all services may justify a subsidy, the question is, how much? Federal reimbursement programs cannot be expected to absorb losses.

Any profits that may accrue from the medical office building are exempt from Federal taxation under IRS ruling 69-463 and 69-464. But some prospective professional and com-

mercial tenants may be precluded from leasing, either because they are not members of the hospital staff or because they are not "substantially related" activities. Local real estate taxes must be paid in almost all instances.

Many doctors are eager to own a piece of a medical office building to gain depreciation advantages. However, they have more dramatic opportunities in this area, such as apartment buildings, cattle, etc. which are infinitely more liquid forms of investment. If this is a concern, however, they should look at ownership in a not-for-profit structure. The tenants then benefit from taking the depreciation of their individual suites as a tax write-off.

Options for physician ownership also include general and limited partnerships and the building condominium. Currently, it is difficult to organize a doctor-condominium. However, there is the attractive arrangement of a hospital-owned-and-developed building with a condominium option that may be exercised by physicians after they have leased space in the building for some time and when such financing becomes more feasible.

General and limited partnerships are not normally recommended. They place severe strains on a medical staff because liability must be shared equally and all members must be willing to accept majority rule. Under the leasing and condominium alternatives each physician may accept, or reject rules and leave the building independently.

The issue of ownership and therefore hospital control of the building must be considered in light of its possible effect on the secondary goals of a medical office building, especially in the future.

By controlling the tenancy permitted in the building, the hospital may wish to hold space available for specialties not yet on the staff, to recruit additional physicians by offering office space immediately, to maintain a balance of specialties representing a cross-section of the hospital staff and to allow physicians to leave the building upon retiring from the medical staff.

There is also the possibility that with a national health program there may be advantages in reorganizing the hospital medical staff as one group of tenants, thereby obviating the need for individual leases.

The hospital enjoys complete control over the building only through ownership. However, it is possible for the hospital to retain many safeguards through the lease of land and/or the building. Having sold the land for the building, the hospital can exercise only those controls that can be incorporated into restrictive covenants.

Ground rules for getting started

After a project manager has been designated, a committee of physicians interested in the building should be formed taking care to include some doctors who do not plan to lease space. The project manager and the physicians should become familiar with the goals for the building, organizational alternatives and available financing.

A brief questionnaire should be sent to all members of the medical staff asking about interest in the building, present rent, how much space might be leased, present lease expiration, form of ownership preferred and services desired in the building.

This must be followed with a more intensive combined market and marketing effort when additional information is available concerning the size of the building, its shape and location, the projected opening date, the estimated rent and any capital expenses that may be required from tenants.

Rules of thumb for sizing a medical office building in relationship to the size of the medical staff are unreliable and vary. All physicians will not be able to enter the building immediately, but maintaining vacant space after a one or two year fill-up period is extremely costly. In the extraordinary instance of a hospital without any neighboring private office buildings, a hospital-owned medical office building for 25 per cent of the active staff is a sensible goal.

Obviously hospital land is valuable, particularly close to the hospital where the medical office building has the potential of blocking future growth. It therefore makes sense to wait on starting new construction until a sizeable project is feasible. In the interim, and increasingly as a long-term option, existing space in the hospital can be used. Hospitals obsolesce rapidly and when space becomes inefficient for its original use it can often be converted to offices relatively easily. Office layouts do not obsolesce rapidly and generally allow flexibility. For instance, old single corridor designs for nursing units or schools of nursing, dormitories, etc. can be converted to any number of larger or smaller offices and some convenient exit arrangement can be made.

This option is often overlooked and can be a very opportune (and profitable) way for a hospital to start the development of a larger and permanent medical office building. The physicians who have been using such space often become great salesmen for the concept of a new medical office building.

Equally important in getting started is a review of the hospital's present financing, debt service and penalties that may be required to refinance or to remove encumbrances from the site for the medical office building itself. Some publicly-owned hospitals find themselves in the dilemma that their charters or local regulations preclude them from building and owning the building, allowing the private practice of medicine on public property or selling land to a third party. Finally, care should be taken to comply with any state licensing regulations or comprehensive health planning approvals that may apply locally.

The hospital and/or developer must be prepared to move rapidly if the initial response is favorable. The market is very limited and easily swayed, for instance, by the opinions of one or two influential doctors who may have been turned off by a small tactical blunder or a simple misunderstanding. The hospital/developer must move decisively for fear of losing credibility.

The keys to a successful marketing program include: sufficient written data and complete descriptions (through drawings) of all alternatives under consideration for design, ownership and operation, information that has been pre-tested by a representative group of physicians before it is distributed as a proposal and, subsequent interviews with each prospective tenant to elicit additional information and to clarify the proposal.

Given the close and lasting relationship between the hospital and its staff, whether the project is hospital-owned-and-developed or assigned to a third party, all information including projected profits and losses should be made public and all physicians given like consideration and costs.

What you should know about financing the medical office building

In the near future there may be sweeping changes on a Federal level that will profoundly affect the doctor-hospital-patient relationship and require ownership and therefore, financing changes. Short-term construction capital is usually available from local banking sources. A medical office building with nearly any type of ownership may be financed through a conventional mortgage loan, with a term of 25 to 30 years. It is the least complicated and fastest form of financing, reasonably flexible to meet unique requirements and future changes and available from many local, regional, and national sources.

Mortgage loans for condominiums are not easily found in today's market, however, they show great promise in the future. Their major drawback is the complexity in breaking down one loan into forty smaller ones. Local sources like banks and savings institutions are better geared to these smaller loans, but perhaps may not be capable of assuming over-all responsibility for the project. Hybrids of this type of financing are now being developed to overcome some of these limitations.

Taxable bonds are alternatives open to both hospital and privately owned buildings. They are relatively simple and applicable to small projects. However, their term is usually 15 years and they must compete with other taxable investments.

Tax-exempt bond alternatives are open only to non-profit publicly owned institutions. They are more complicated and have higher initial costs, however, their terms vary from 25 to 40 years and their interest rates are lower.

In most states, hospitals may finance facilities by establishing an "authority," and the concept may sometimes be extended to hospital-based medical practice facilities.

Revenue Ruling 63-20 of the Internal Revenue Service allows hospitals to issue tax-exempt bonds "on behalf of" the town or city to which the entire project must be deeded after the bonds have been paid. The process might be extended to medical practice facilities if a favorable ruling could be obtained from an IRS district office.

FHA-insured mortgage loans for health facilities are available under the Section 242 Program. They can be extended to medical office buildings but are time-consuming and unfamiliar. Similar state programs might be construed to apply to hospital-owned medical office buildings.

While HEW has recently accepted the "office building occupancy" classification for outpatient facilities, there are HEW limitations

which will make the cost of buildings higher and require more area for circulation than is normally found in commercially developed medical office buildings. To compete effectively, the additional space will have to be subsidized. HEW parking requirements can be excessive when compared with privately-owned medical office buildings. Relief can be obtained, however, through a study that will justify lower parking needs.

The architect's role can be expanded

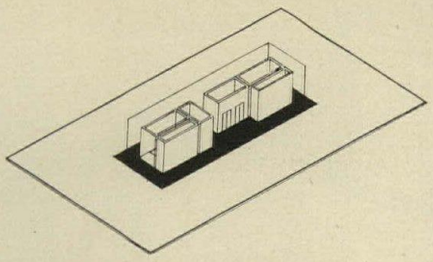
If the architect has previous experience, he may wish to accept the additional work of representing the owner-developer as a consultant in the marketing, organization and financing aspects of the project. The architect may also become the owner-developer or otherwise have a vested interest in the project. However, customary architectural fees do not allow for the tremendous effort that must go into developing a medical building and the fee should reflect any of these additional services undertaken.

There are many building types on which the architect can cut his development teeth. Medical office buildings are among the most complex and an architect should approach involvement with great care. There are a very few experienced consultants in the field who will "package" a medical office building under a variety of fee and ownership arrangements. Generally their involvement is to the advantage of owner and the architect. Leases are small and usually difficult to negotiate. The hospital restricts marketing, and doctors are generally not used to paying the rents which a contemporary, unsubsidized building demands. Typically, annual rents in a new Type I downtown building must be $12.00 per square foot plus parking or $10.00 per square foot in a wood frame suburban structure. Such rents are generally double the rates in most older buildings. Physicians will listen to reason—and the reduced travel time and efficiency gained from being connected to a hospital will more than pay for the $25 above their old rents per day that a new building can represent—but sale of this concept can be difficult.

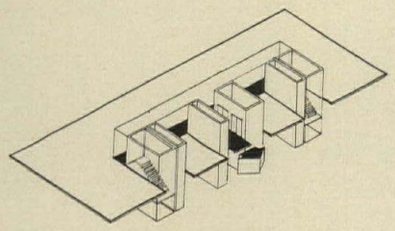
The architect is well advised to place some insulation between himself and the tenants in the form of the owner's project manager. This includes programming and design. It is also important that the building have strong management after construction. Doctors are accustomed to demanding a high level of service generally. They are particularly used to demanding a very high level of service on all fronts from their hospital.

If the hospital manages the building it is subject to these demands, and accustomed to being very responsive. Hospital administration may not be accustomed to building management and the architect can become involved in work which is normally the province of management. Therefore, strong management of a very explicit system for acceptance of space and extra services should be set up.

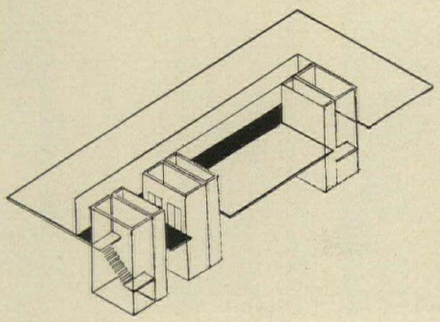
The design of the building shell is quite straightforward. Fees should be comparable to a commercial office building shell. The design

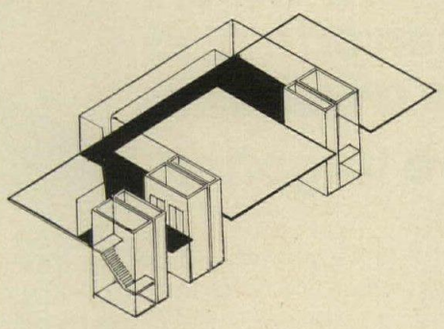


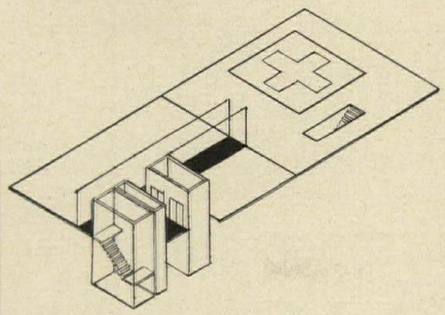
Central core, about 80 per cent efficient



Exterior core, 84 per cent efficient







Expansible, exterior end location

of physicians' suites is, however, usually extremely time-consuming. Planning is very detailed, often including considerable casework, and doctors are often demanding clients. A standard construction documents' fee for a full floor commercial office building use might be $.50 per square foot. A physician's suite is more appropriately $1.50 per square foot. The architect should not be expected to include developing and financing in his fee, but these should be considered separate because of their scope.

Owner's needs and professional balance can affect tenant requirements

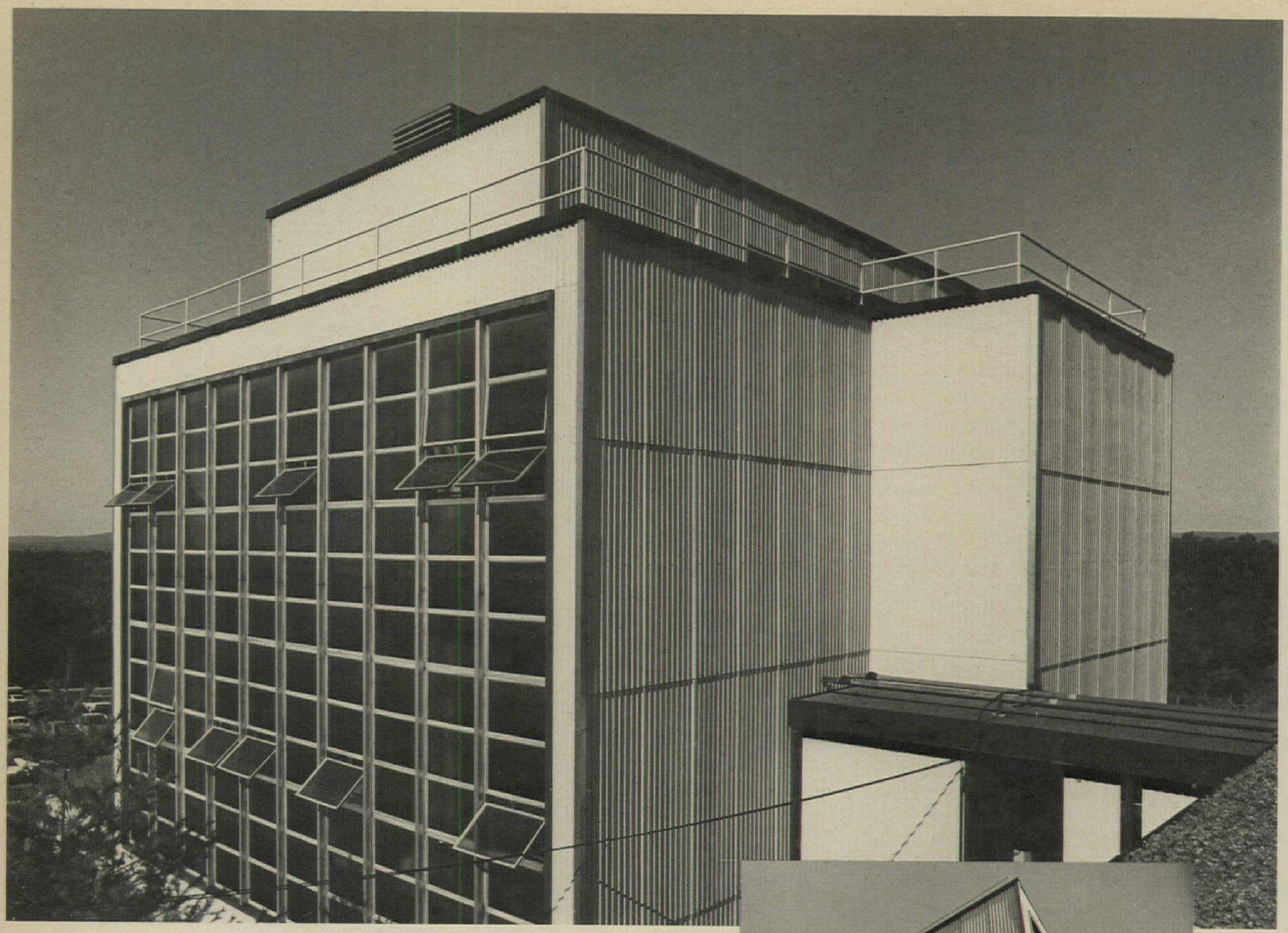
Usually membership on the hospital staff is the only requirement for tenancy. It presupposes that the physicians will practice within the moral and professional standards of the staff and the hospital.

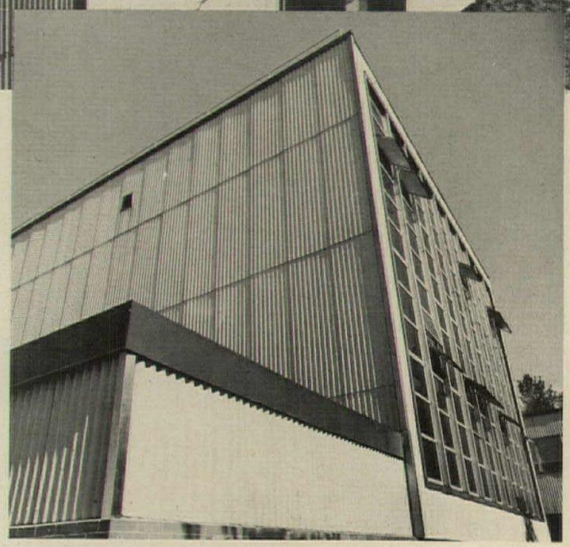
Although a representative mix of specialties is important to the success of a building, applications should be accepted on a first come, first served basis. As the building fills up, it may be necessary to withhold some spaces (although there may be a waiting list) because of the necessity to recruit additional physicians to round out specialties in the building.

In a hospital-owned building only certain restrictions are acceptable to most physicians and can be enforced to eliminate competition with hospital diagnostic departments. For example, a physician can be allowed to provide X-ray and laboratory services for his private non-hospitalized patients, but not be allowed to sell these services to the patients of other tenants. Conversely, the hospital has the obligation to provide outpatient diagnostic services quickly and efficiently for the patients of tenants who do not provide services privately, as well as for those of other staff physicians who practice elsewhere. The hospital must be especially careful to avoid any favoritism toward tenant physicians in admissions, surgical schedules, etc.

Ideally, the tenants will represent all of the specialties at the hospital in proportion to their numbers on the staff. It is helpful to estimate that each tenant will take approximately 1,000 square feet of rentable space. This varies from urban to suburban locations, between parts of the country and among specialties. Psychiatrists are at the low end, at perhaps 400 square feet, and physicians with several technicians or physician-assistants take the most space, in a very few instances as much as 2,000 square feet per doctor.

Space may also be set aside for commercial tenants, such as a coffee shop, pharmacy, medical equipment supplier and optometrist, who will benefit from being in the building. The hospital may also lease space for clerical departments, classrooms, storage, motel-type rooms and small outpatient departments. If the local comprehensive planning agency will allow this type of expansion, under a certificate of need, it is an economical way to relieve crowding inside the hospital, since medical office building construction is inevitably cheaper than any space in the hospital itself due to differing code restrictions, and normally, construction techniques. Hospital ad-





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ministrative space in the medical office building also allows later expansion.

Modular office planning assures future flexibility and change

There is surprisingly little major change in a medical office building, and premiums for movable partition systems are not justified. The latter may also create acoustical separation problems, which are most troublesome.

The greatest concern for flexibility is for the possible future growth of any given office suite. By insisting on certain plan relationships between adjacent suites it will be possible to merge two or more suites as the need arises. Offices can normally expand successfully by taking similar adjacent space for additional offices, exam rooms, treatment rooms, clerical work areas and waiting space. Some partitions may have to be removed and relocated, and adjustments will have to be made to the electrical and mechanical systems.

A second major source for change is the introduction of new equipment and attendant space requirements. A totally unexpected need like a new X-ray machine cannot be anticipated everywhere and the extensive remodeling of one or two rooms may be required. Fortunately, very few rooms in the medical office building must be maintained in operation during those changes.

Physicians rarely find physical or functional obsolescence reason enough to remodel extensively or move. The forces of relocation include changing referral patterns, newer buildings, prestige, real estate speculation, new partnerships and a need for additional adjacent space which may not be available.

More and faster change can be expected as new health delivery systems evolve, but the basic module of a physician, exam rooms, a nurse's work area, storage spaces and special treatment rooms will remain constant. Clerical and waiting space may be redistributed and/or concentrated at one point on each floor of the building. Large-scale change, requiring extensive remodeling of an entire floor will occur rarely.

Anticipate and charge for any tenant improvements

It is customary for an owner to provide suites that are finished to a common standard. Amenities which surpass the basic standard are specifically requested and paid for by each individual tenant. It is customary to establish the building standard improvements at a level which allows a very economical move in. Most tenants will wish to improve above that level. A typical standard per 1000 square feet of leased space includes the following: 130 linear feet of interior partitions, 30 linear feet of fixed partitions, 10 doors, 6 plumbing fixtures, 24 lighting fixtures, 2 HVAC zones. Special items and improvements, like lead lining, plaster traps, X-ray processors, light-proof doors, special lighting controls and special plumbing fixtures, cannot be estimated with any certainty in advance. Most of them will be billed to the tenant and will not affect the owner's building cost.

Two major tenant improvement construction options are available. One is to contract for a building shell and later the tenant contracts, individually, for each suite. This is the normal way in which shopping centers are developed. The process requires the least investment by the owner-developer and passes on the cost of all interior improvements to tenants. The cost of these improvements is not estimated in advance since the needs and standards of each tenant will vary.

In medical office buildings this approach is not recommended. Since the basic finishes and quantities of materials for the entire building can be estimated quite closely it is possible to obtain bids on a completed building with tenant work items on a unit price basis. Escalation formulas and a termination date for the unit prices should be established. Such a deadline will also tend to fill the building more quickly if tenants know that they will pay a premium for late involvement or tardy decision making.

Design implications of medical office building function

The spaces within a medical office building are uniformly small, with the exception of large waiting and office areas. Therefore, there is little to be gained by bays larger than 20 by 25 feet. An interstitial space concept is also unwarranted since the HVAC system is simple and requires fewer and smaller ducts than a hospital. A floor-to-floor height of 12 feet is attainable in a concrete beam slab system with 8-foot ceiling height standards in tenant spaces. Adherence to a rigid modular ceiling design is impossible, and a modular all-glass window-wall system is difficult. Doctors are very space- and rent-conscious. Natural modules for spaces are not as regular as in an office building so that matching partitions with mullions and providing minimal square footage is difficult. Small high windows are desirable to provide additional wall space for equipment and furniture.

Floors should have at least 11,000 square feet of rentable area. Preferably all partitions will extend beyond the suspended ceiling to avoid the transmission of sound through the tracks. Demising partitions should go to the slab and be filled with sound attenuating material. Partitions between exam and consultation rooms should be soundproofed.

Each suite should have its own thermostatic control, and examination rooms should have additional radiant heat for unclothed patients. The system should be designed to operate efficiently when only portions of the building will be completed and occupied.

The basic building finishes normally include painted walls, sheet vinyl floors in toilets and wet areas, vinyl asbestos tile floors and a 2-by-4-foot lay-in acoustical tile ceiling system with recessed fluorescent light fixtures.

Casework may be omitted and provided by the tenant, or may be provided under an allowance basis. There are many new options for wall component systems and as many physicians who want to make their own arrangements for design and purchase. If strict limits are set on delivery dates and cooperation with the plumbing trades established, then the deletion of casework from the basic suite finishes is recommended.

The most common floor plan for medical office buildings is the familiar office building with a core of elevators, stairs and shafts at the center. The depth of the space is approximately 25 feet along two sides of the core, leaving larger spaces at the two ends.

A net-to-gross efficiency of 80 per cent is attainable, but increasing it further by making the sides much deeper than 25 or 30 feet is not productive. To attain 81 per cent efficiency each floor should have about 11,000 square feet of rentable space.

Future expansion requires additional floors or a second building, and the connection to the hospital must be by a bridge or tunnel. It is difficult to have the two buildings touch without losing windows at one end and the "end" spaces may not be large enough for group practices, depending upon local exit code interpretations.

A second and more efficient scheme is a single corridor arrangement with the elevators, shafts, and stairways along one side. In a floor of 11,000 square feet of rentable area an efficiency of 84 per cent is feasible without creating inefficient, unrentable space.

This floor allows much greater flexibility for future expansions since the elevators are on on outside wall.

A third common prototype places the elevators and stairs at one end of the single corridor, requiring slightly more corridor on each floor and reducing the efficiency of the plan to approximately 83 per cent. However, the advantages of this scheme outweigh the lost rentable space because the building can expand in three directions, the roof may be used for a helistop and the corridor may be in various zones depending upon the needs of each floor of the building.

Ideally, a large building will be connected to the hospital on three levels: a public level for patients entering the hospital for ambulatory services; an upper level for physicians moving quickly to patient care floors; and a lower level for services and supplies. With a helistop on the roof of the medical office building, elevator service should be provided to surgery, radiology and emergency.

Office suites are most efficiently planned when the available space is squarish in shape. Suites of less than 700 square feet are difficult to plan in a depth of more than 30 feet, and suites over 2000 square feet become narrow and long at a depth of 30 feet. Offices of 3,000 and 4,000 square feet need to be planned like hospital departments and are usually most efficient if 40 or 50 feet deep. Sometimes, however, there will be a strong preference for windows and a less efficient, strung-out suite.

All of the above indicates that producing a medical office building is a difficult task—particularly one with a sense of architectural quality and especially so at a large scale. Small medical office buildings can have their exterior custom designed and scale works with the architect. Multi-story buildings, whose basic design is set before suite layouts are finished tend to appear as blockhouses due to the size and placement of windows. One approach which seems to work is the articulation of stair masses and developing a truly flexible recessed window wall, difficult but possible.

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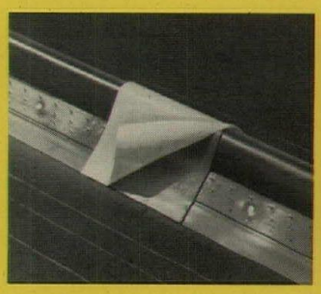

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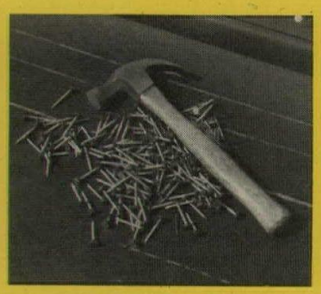

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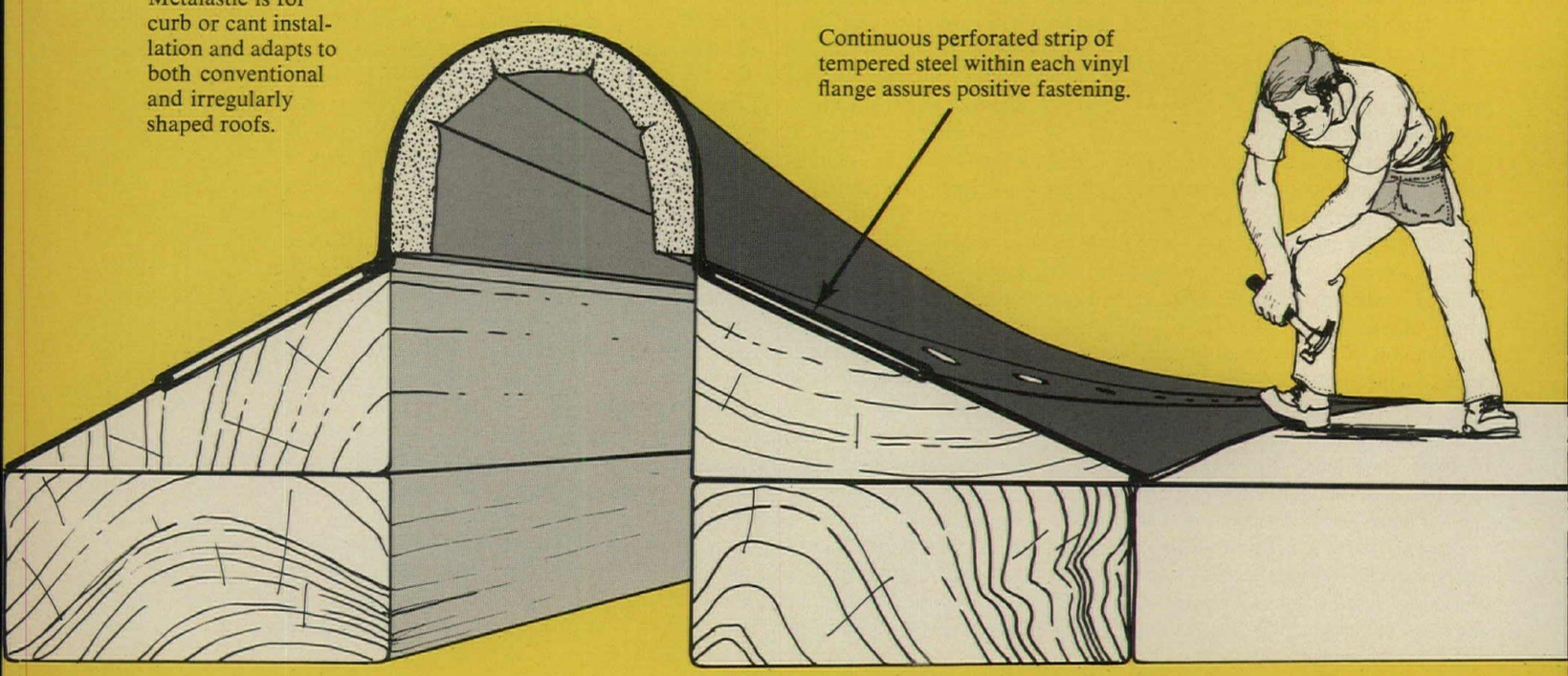

Dodge pricing manual is expanded

The 1975 edition of the *Dodge Manual for Building Construction Pricing and Scheduling* has been expanded by nearly 15 per cent over the previous edition. Now available from McGraw-Hill Information Systems Company, the *Dodge Manual* includes, 1,100 more items of work. Also expanded are its geographical indexes, which provide cost adjustments for 96 cities in the U.S. and eight in Canada.

The new edition also gives up-to-date information on cost of equipment now demanded by Occupational Safety and Hazards Act requirements, such as fencing, safety nets and scaffolding, for protection of both work crews and the public. In addition to labor, material and total unit costs, the Manual includes data on the size and make-up of the crew used to calculate the cost of an item, and the average productivity of the crew. Data also cover a varied range of items from engineering and consultants' fees to post-tensioned concrete. Organized according to the U.C.I. format, the book includes a comprehensive subject index. A feature of the 1975 *Dodge Manual* is the Dodge Manual Computer Estimating Service.

The 1975 *Dodge Manual* is prepared with field-gathered cost data from the computers of Wood & Tower, Inc., Princeton, N.J., a leading consulting firm in construction cost estimating and management. The price of the computer-generated *Dodge Manual* is $17.95.

John H. Farley, senior editor
Dodge Building Cost Services

INDEXES: February 1975 — 1941=100.00 (except as noted)

Metropolitan area	Cost differential	Current Indexes: non-res.	residential	masonry	steel	% change last 12 months
U.S. Average	8.3	475.6	446.5	466.7	455.3	+ 8.52
Atlanta	7.5	583.0	549.7	571.6	560.8	+ 5.44
Baltimore	8.6	544.4	511.9	532.7	518.2	+12.24
Birmingham	7.2	427.6	397.8	413.0	409.2	+ 4.61
Boston	8.7	469.5	443.6	466.6	452.8	+ 5.52
Buffalo	9.1	526.2	494.2	518.5	504.1	+10.08
Chicago	8.3	538.0	511.6	519.3	511.8	+ 4.02
Cincinnati	8.6	507.6	477.7	495.8	483.3	+ 8.03
Cleveland	9.0	517.6	487.1	506.1	494.5	+10.10
Columbus, Ohio	8.2	501.4	470.9	492.9	480.1	+10.64
Dallas	7.8	483.2	467.9	473.4	464.6	+ 9.37
Denver	8.2	516.6	486.1	506.7	493.1	+10.50
Detroit	9.7	545.6	519.9	555.6	532.7	+ 7.41
Houston	7.1	431.6	405.4	418.6	412.8	+ 8.61
Indianapolis	7.7	430.5	404.4	421.4	411.8	+ 8.21
Kansas City	8.2	451.6	426.8	444.2	430.9	+ 9.49
Los Angeles	8.4	545.5	498.8	531.6	520.0	+ 5.36
Louisville	7.6	470.7	442.1	459.0	449.8	+ 7.69
Memphis	8.3	488.8	459.1	470.3	463.5	+12.60
Miami	7.8	492.3	469.2	477.3	467.7	+ 8.43
Milwaukee	8.2	524.6	492.7	514.2	500.1	+ 9.44
Minneapolis	8.6	494.9	465.7	485.7	477.1	+ 7.00
Newark	8.8	466.6	438.2	459.0	448.5	+11.01
New Orleans	7.2	448.8	423.7	443.1	432.8	+ 5.01
New York	10.0	528.2	491.2	515.8	503.0	+ 6.07
Philadelphia	9.0	525.2	500.4	521.3	504.8	+ 6.77
Phoenix (1947 = 100)	7.8	271.8	252.6	262.5	258.1	+ 7.98
Pittsburgh	8.8	471.7	443.8	466.6	452.3	+ 9.57
St. Louis	8.5	483.9	456.8	479.1	467.9	+ 7.19
San Antonio (1960 = 100)	7.6	185.0	173.8	180.9	176.8	+14.73
San Diego (1960 = 100)	8.4	200.2	188.1	196.9	192.0	+10.35
San Francisco	9.2	688.4	629.4	684.2	661.1	+ 6.35
Seattle	8.4	462.8	414.4	458.5	441.5	+ 5.95
Washington, D.C.	8.2	469.6	441.0	459.4	447.9	+15.36

Cost differentials compare current local costs, not indexes, on a scale of 10 based on New York

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) 1st	2nd	3rd	4th	1974 (Quarterly) 1st	2nd	3rd	4th
Atlanta	313.7	321.5	329.8	335.7	353.1	384.0	422.4	459.2	497.7	516.4	518.0	543.8	544.8	555.2	556.7	573.5	575.0
Baltimore	280.6	285.7	280.9	295.8	308.7	322.8	348.8	381.7	420.4	441.8	443.6	474.5	475.5	516.3	517.8	532.8	534.3
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	407.0	419.7	421.2
Boston	252.1	257.8	262.0	265.7	277.1	295.0	328.6	362.0	394.4	414.0	415.6	436.8	437.8	455.1	456.6	461.0	462.5
Chicago	306.6	311.7	320.4	328.4	339.5	356.1	386.1	418.8	444.3	465.3	466.9	507.6	508.6	514.2	515.7	528.1	529.6
Cincinnati	269.5	274.0	278.3	288.2	302.6	325.8	348.5	386.1	410.7	430.4	432.0	461.4	462.4	484.5	486.0	498.6	500.1
Cleveland	283.0	292.3	300.7	303.7	331.5	358.3	380.1	415.6	429.3	436.7	438.3	461.2	462.2	490.3	491.8	508.0	509.5
Dallas	256.4	260.8	266.9	270.4	281.7	308.6	327.1	357.9	386.6	407.3	408.9	435.4	436.4	453.7	455.2	476.4	477.9
Denver	287.3	294.0	297.5	305.1	312.5	339.0	368.1	392.9	415.4	429.5	431.1	460.0	461.0	476.1	477.6	508.5	510.0
Detroit	277.7	284.7	296.9	301.2	316.4	352.9	377.4	409.7	433.1	463.4	465.0	500.0	501.0	519.5	521.0	537.2	538.7
Kansas City	250.5	256.4	261.0	264.3	278.0	295.5	315.3	344.7	367.0	387.7	389.3	404.8	405.8	435.6	437.1	443.4	444.9
Los Angeles	288.2	297.1	302.7	310.1	320.1	344.1	361.9	400.9	424.5	453.3	454.9	503.2	504.2	514.3	515.8	531.3	531.8
Miami	274.4	277.5	284.0	286.1	305.3	392.3	353.2	384.7	406.4	419.0	420.6	446.2	447.2	467.6	469.1	484.6	485.5
Minneapolis	282.4	285.0	289.4	300.2	309.4	331.2	361.1	417.1	412.9	430.6	432.2	455.1	456.1	469.7	471.2	487.1	488.6
New Orleans	240.9	256.3	259.8	267.6	274.2	297.5	318.9	341.8	369.7	382.1	383.7	419.5	420.5	437.5	439.0	440.6	442.1
New York	289.4	297.1	304.0	313.6	321.4	344.5	366.0	395.6	423.1	453.5	455.1	484.3	485.3	497.4	498.9	513.8	515.3
Philadelphia	275.2	280.8	286.6	293.7	301.7	321.0	346.5	374.9	419.5	459.3	460.9	484.1	485.1	495.7	497.2	517.0	518.5
Pittsburgh	263.8	267.0	271.1	275.0	293.8	311.0	327.2	362.1	380.3	406.3	407.9	423.4	424.4	443.7	445.2	464.1	465.6
St. Louis	272.1	280.9	288.3	293.2	304.4	324.7	344.4	375.5	402.5	427.8	429.4	443.2	444.2	458.7	460.2	475.2	476.7
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	648.6	671.0	672.5
Seattle	266.6	268.9	275.0	283.5	292.2	317.8	341.8	358.4	371.5	388.4	390.0	423.4	424.4	437.8	439.3	448.7	450.2

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.

If you've got 85 people coming for dinner, you can't afford to be waiting on refrigeration equipment.

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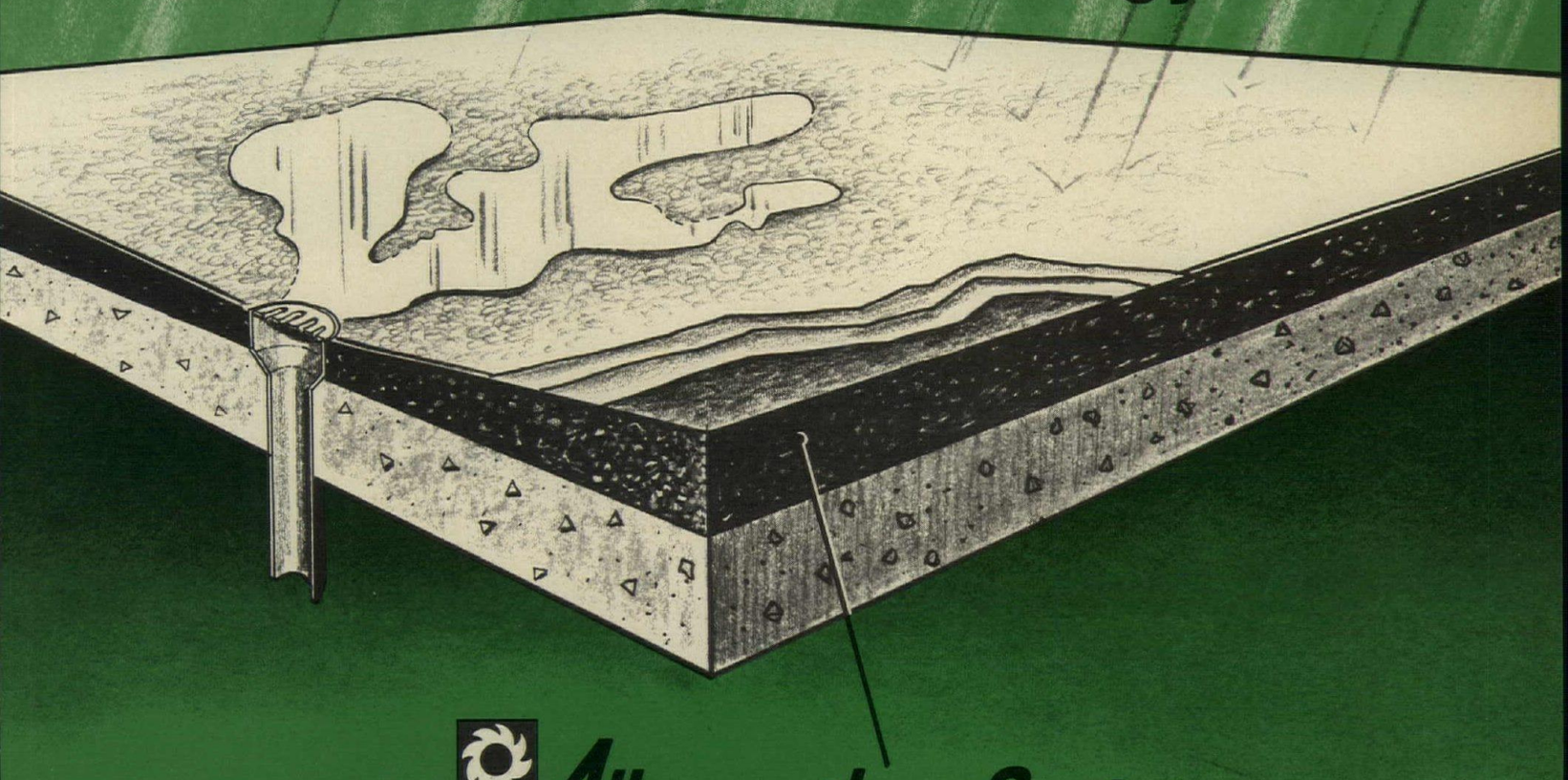

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Up to $134,340* savings in 20 years!

Even though the dollar and thermal savings for every building are different, similar dramatic savings are achieved on every All-weather Crete insulated building. It's important! Many owners are now requesting architects to figure costs for the construction process and also costs on yearly operation. All-weather Crete not only provides exceptional fuel/energy savings, but the added thickness provides positive slope to drains. It is also completely seamless — it is applied dry and it transmits vapors. These are all aids to longer roof life.

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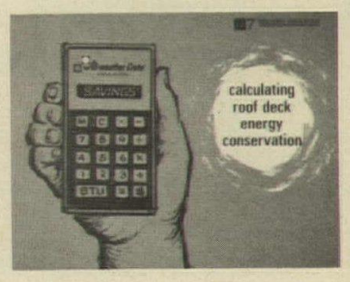
Figure the thermal and cost savings on your next job. Compare insulations. Do this with the technical workbook, "Calculating Roof Deck Energy Conservation". It's free to architects and engineers. Contact Silbrico Corporation.



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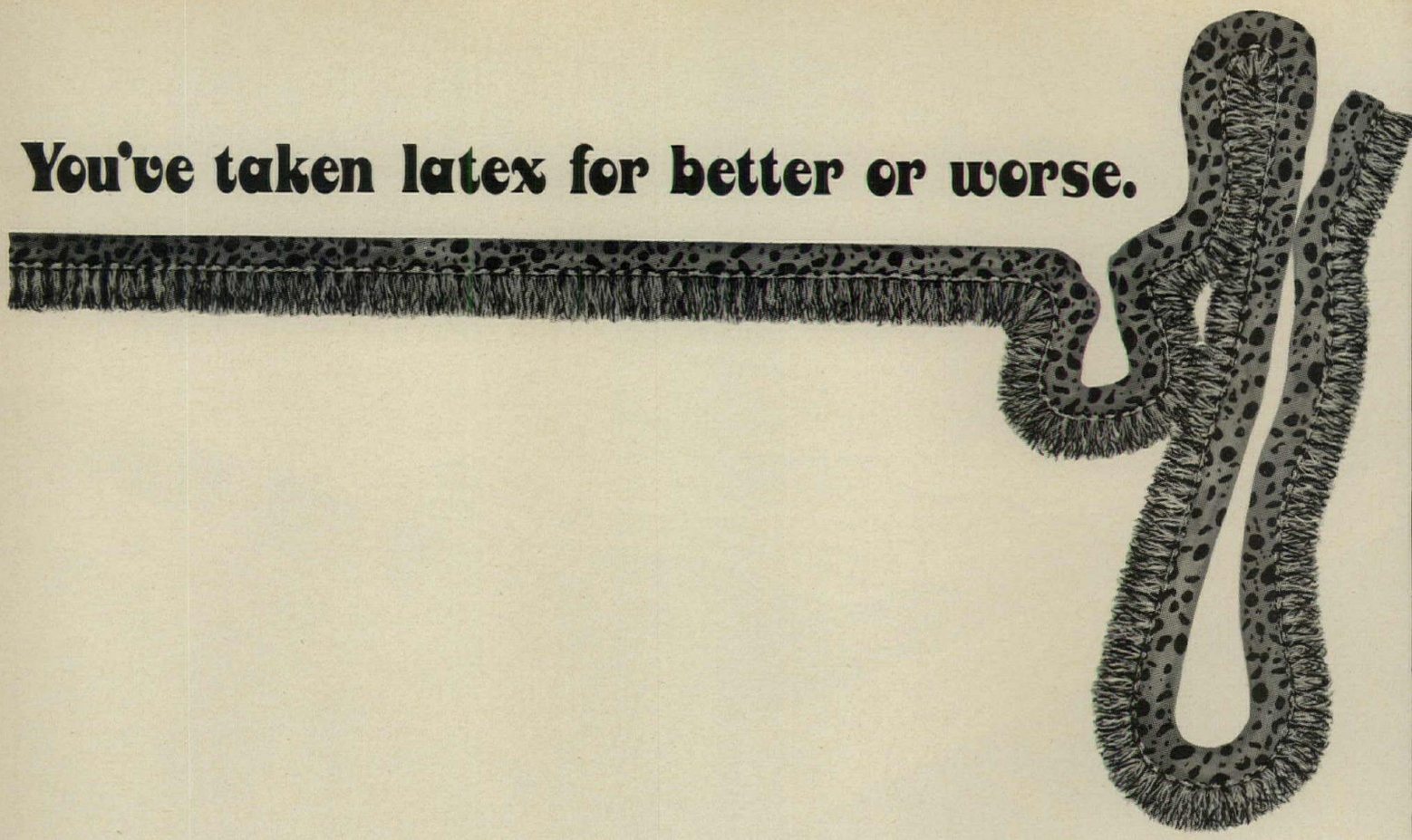

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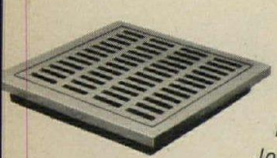
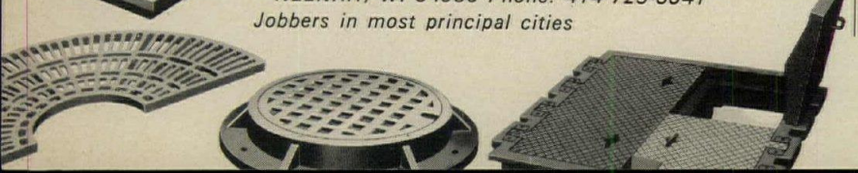
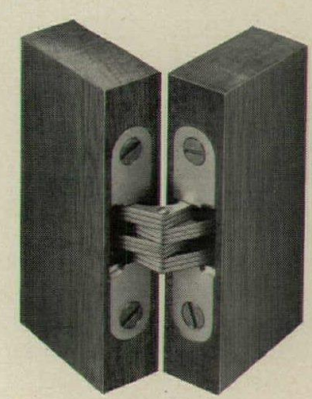
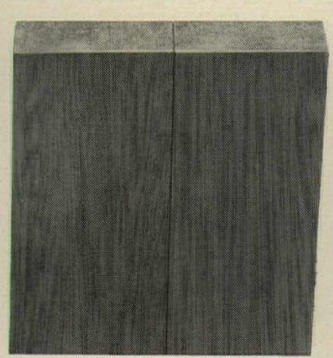




The hinge that hides

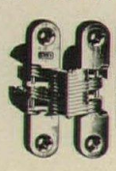


NOW YOU SEE IT



NOW YOU DON'T

The Soss Invisibles—for a custom look for any room! These amazing hinges hide when closed, eliminating unsightly gaps, hinges, and door jambs. They're the perfect hidden touch for doors, doorwalls, storage cabinets, built-in bars, stereos, and TV's. Specify the Soss Invisibles wherever looks matter. See listing in Sweet's or write for catalog: Soss Manufacturing Co., Division of SOS Consolidated, Inc., P.O. Box 8200, Detroit, Mich. 48213.



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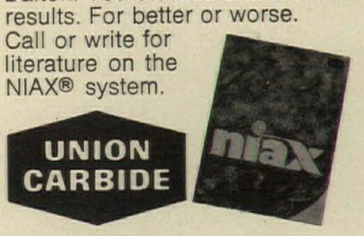

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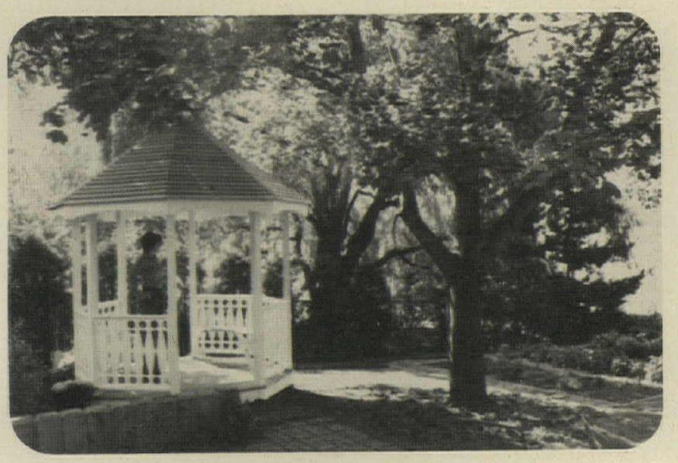

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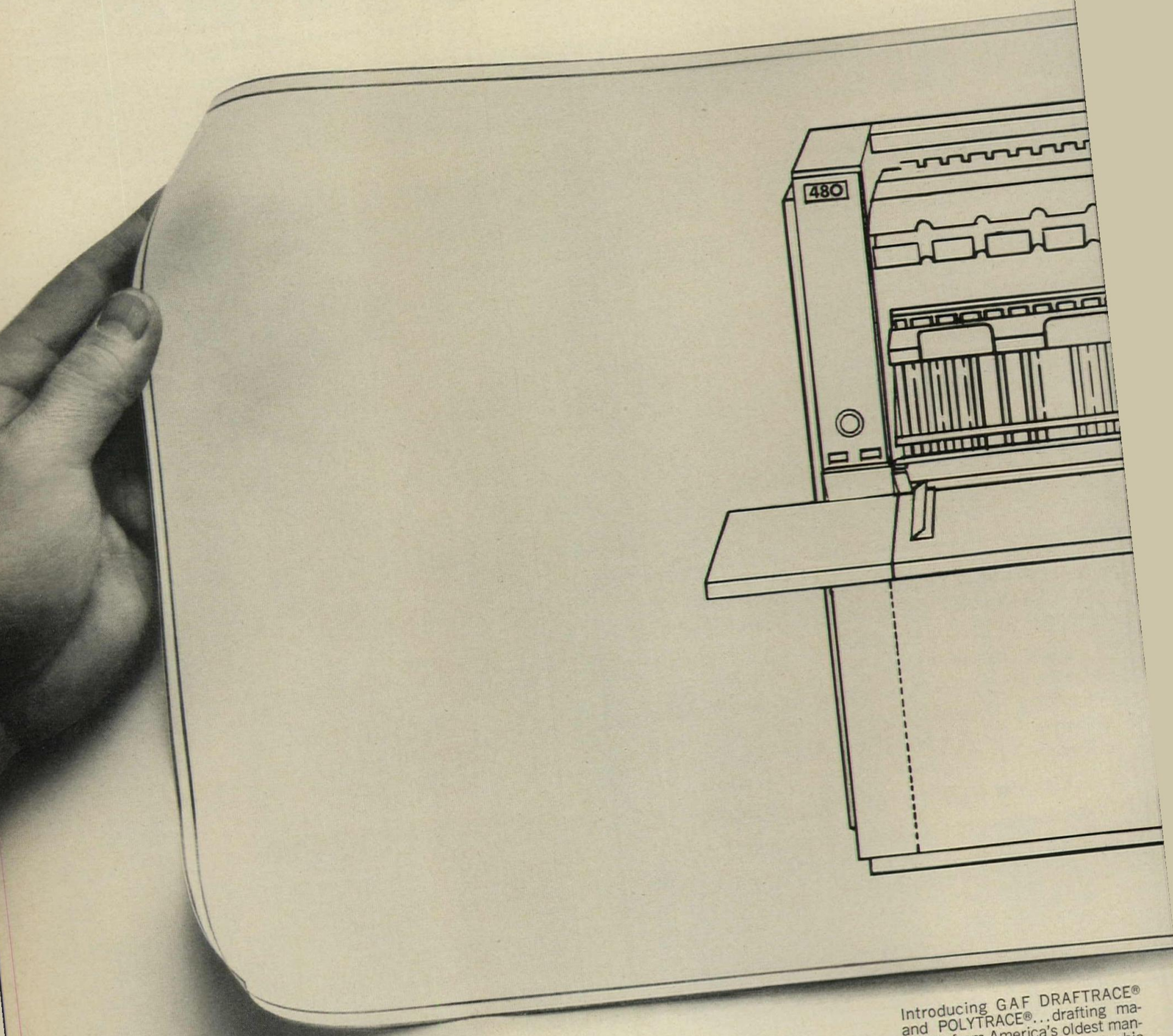
Drawing on vellum?



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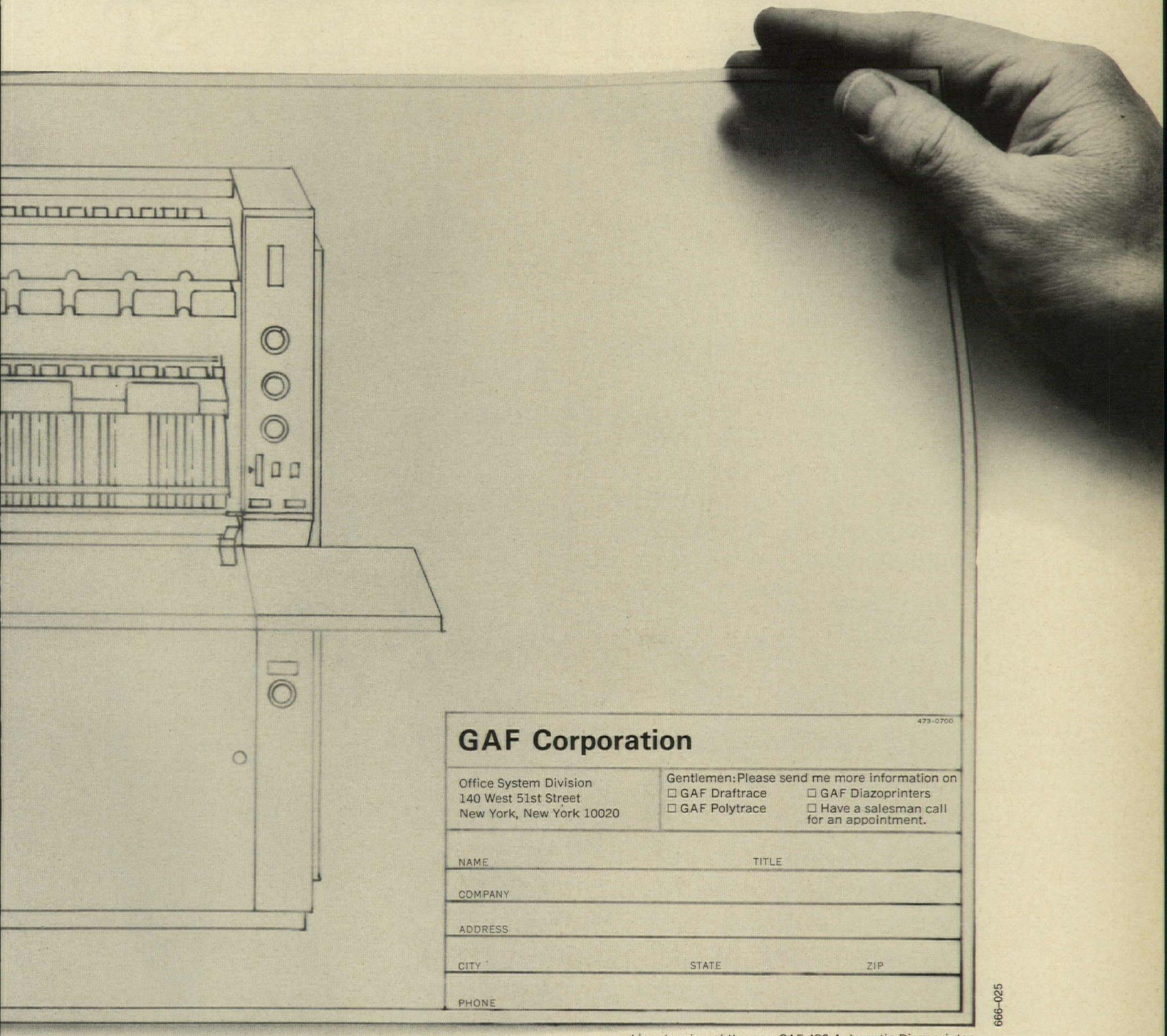

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It's as easy as 1, 2, 3.

1. Bring your small package to United's passenger check-in counter 30 minutes before flight time. Pay the charges.

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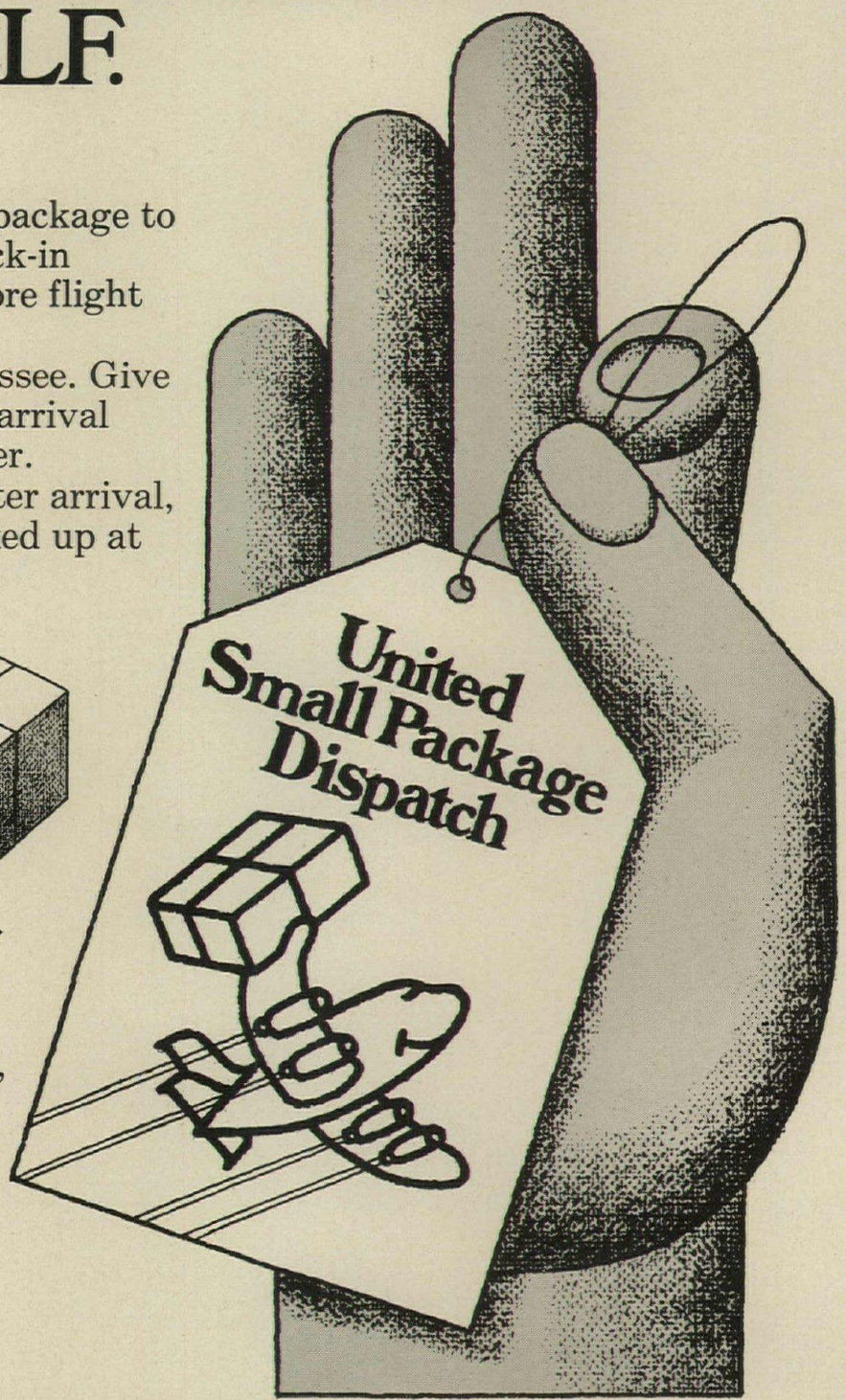
How big is small?

Up to 50 pounds in weight, up to 90 inches in total dimensions (length, plus width, plus height).

What can you ship?

Things like film, computer tape, samples, medicine, advertising material, blueprints . . . or the briefcase you forgot to take on your business trip.



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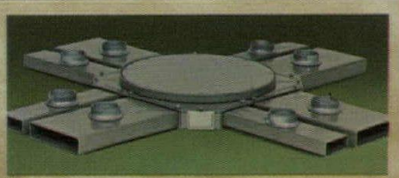
A communication problem isn't a ho-hum affair.

The communications boom isn't a bunch of boring statistics. Fact is, it's more phones and more new equipment than you ever dreamed of. With wires meeting all over the place. So don't get caught napping. Put a Walkerduct Underfloor System in your building specs. It will help keep the income from dropping off.

By running all the communication, power and signal requirements under the floor inside Walkerduct, you've got nothing to worry about. The building is safer, more efficient and able to handle any future needs quickly, easily and neatly. Without tearing up the floor. Without spending a small fortune.

Contact your nearby Walkerman for more information. Or write: Walkerduct, Parkersburg, West Virginia 26101. In Canada: Walkerduct of Canada.



walkerduct® WALKER / PARKERSBURG

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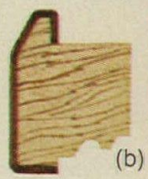
Outside, one of 11 colors available in our low maintenance, acrylic coated aluminum exterior.

Pella Clad Wood Windows overcome, beautifully, two common objections to weather-shielded wood windows. Lack of color choice. And lack of design freedom. In a Pella Clad window, all exterior wood surfaces are covered with an acrylic coated aluminum skin. A well-known and well-respected outside finish. Available in three standard (a) and eight special colors. On our Contemporary and Traditional Double-Hung, Casement, Awning, Fixed and Trapezoidal Windows. And Pella Sliding Glass Doors.

(a)

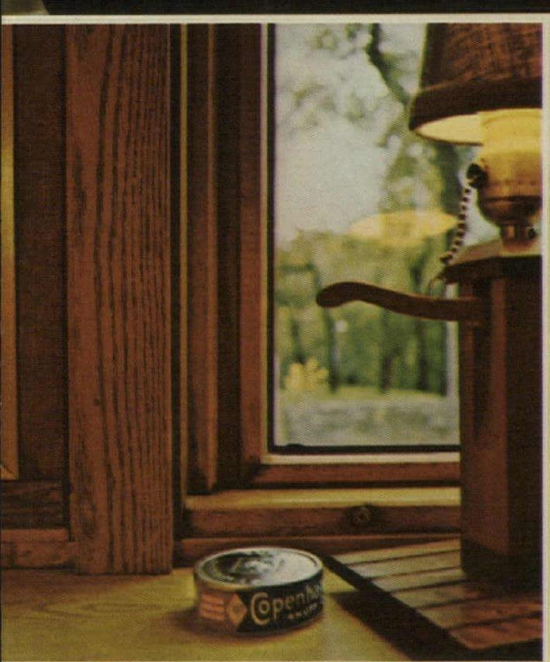
Inside, the unspoiled beauty of a carefully-crafted wood window.

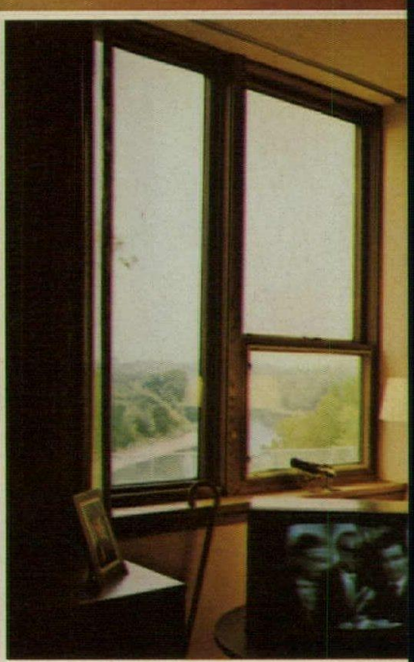
Wood windows are known for their warmth. Visually. And because of their natural insulating value. And in designing the Pella Clad Wood Window, we left both of those properties unchanged. The exterior aluminum skin does not penetrate the frame or sash (b). Nor is it visible anywhere on the inside of the 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.

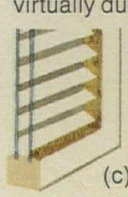




Architect: S. C. Smiley & Associates Builder: Arkay Construction Company Windows: Pella Clad Fixed Units and Contemporary Double-Hung

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

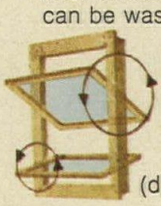
The removable inside storm panel gives you any number of interesting options. Like using our unique Slimshade® (c) to control sunlight, privacy and solar heat gain and loss. Housed between the panes, this fully adjustable blind remains virtually dust-free. The system also accommodates our snap-in wood 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)

Pella®

OUR 50TH YEAR

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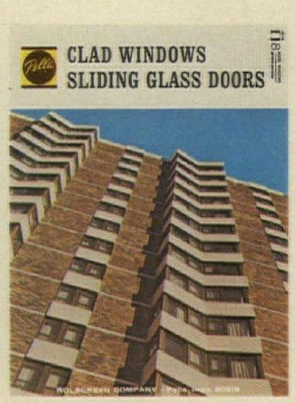

Please send me your 24-page brochure on Pella Clad Windows & Sliding Glass Doors. I am specifically interested in: ☐ Double-Hung Windows, ☐ Casement Windows, ☐ Awning Windows, ☐ Sliding Glass Doors, ☐ Wood Folding Doors.

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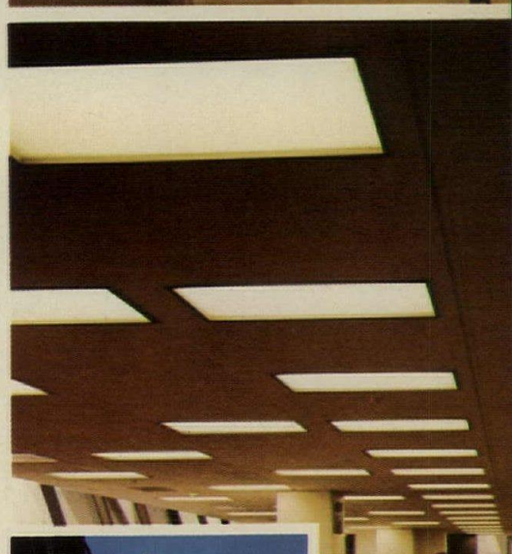
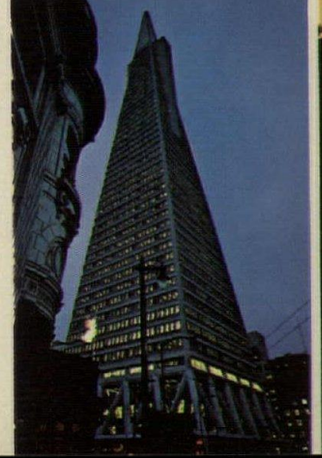
Building codes limit areas of plastic glazing. Approvals for large-area Plexiglas enclosures must be applied for on a special permit basis. Fire safety design considerations must take into account the combustibility of Plexiglas.





Skylight, International Monetary Fund, Washington, D.C. Architect: Vincent G. Kling & Partners, Philadelphia, Pa.

Fenestration, Ingleside Office Building, McLean, Va. Architect: Francis L. Koenig, McLean, Va.

Luminaire Lenses, Transamerica Pyramid, San Francisco, Cal. Architect: William Pereira & Associates, San Francisco, Cal.

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"After 4 years of typical Holiday Inn traffic, carpet would be threadbare.

Tuff-Lite® epoxy terrazzo is doing beautifully with a weekly wet mopping."

Jay King, Chief Engineer, City Line Holiday Inn®-Philadelphia

Ease of maintenance and predictable cost of maintenance were important considerations when City Line Holiday Inn-Philadelphia was in the planning stage. They still are.

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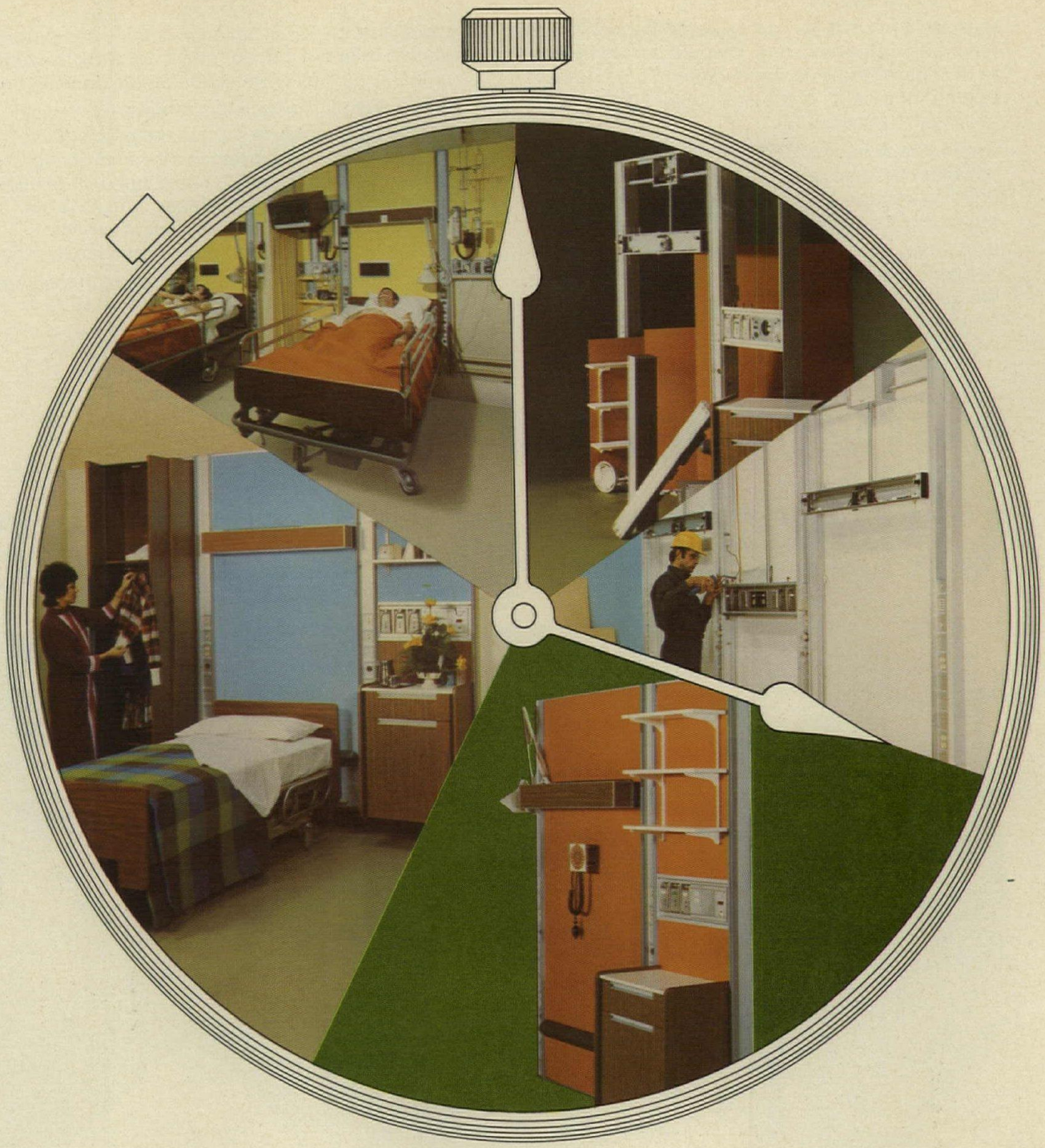

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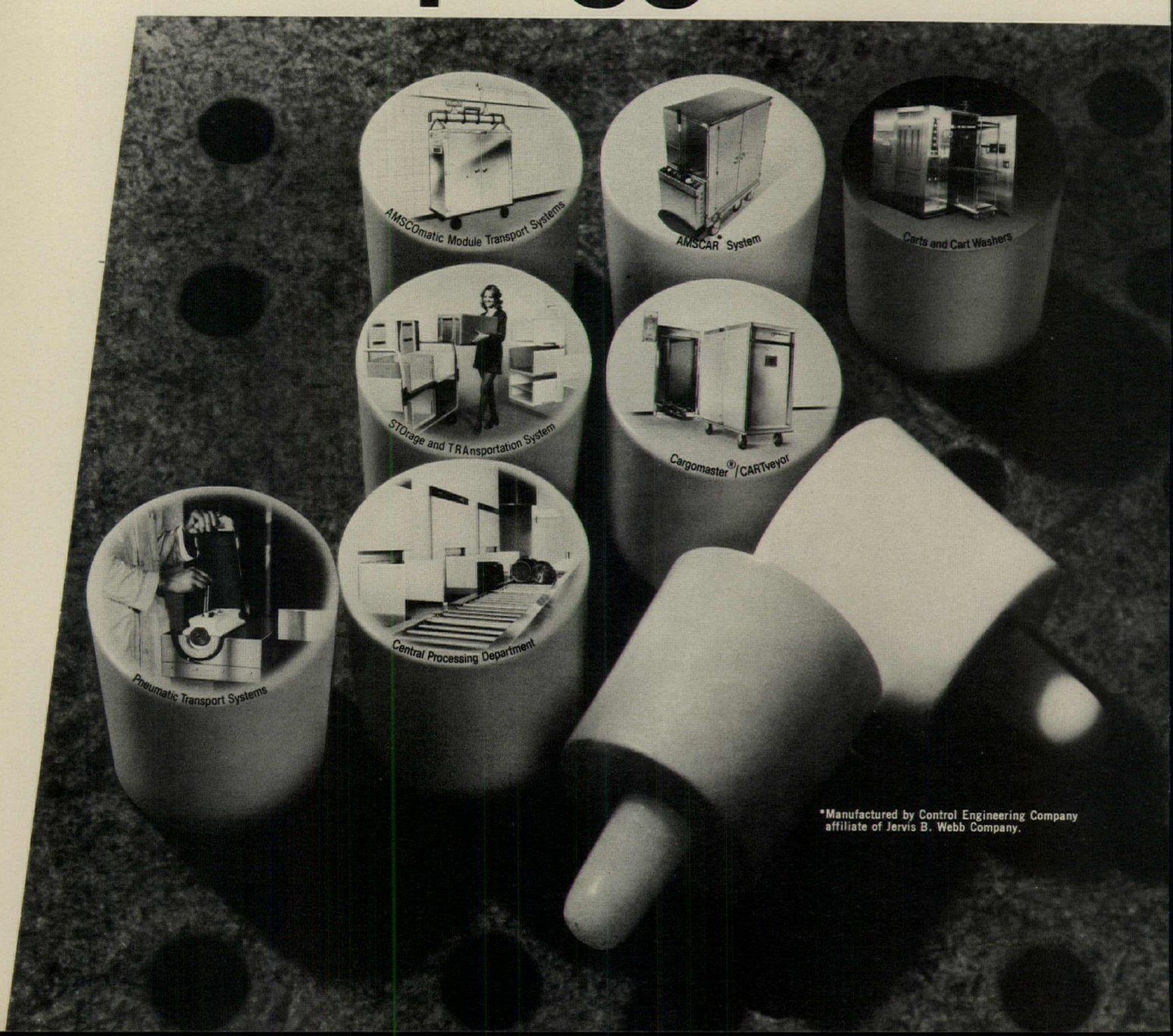

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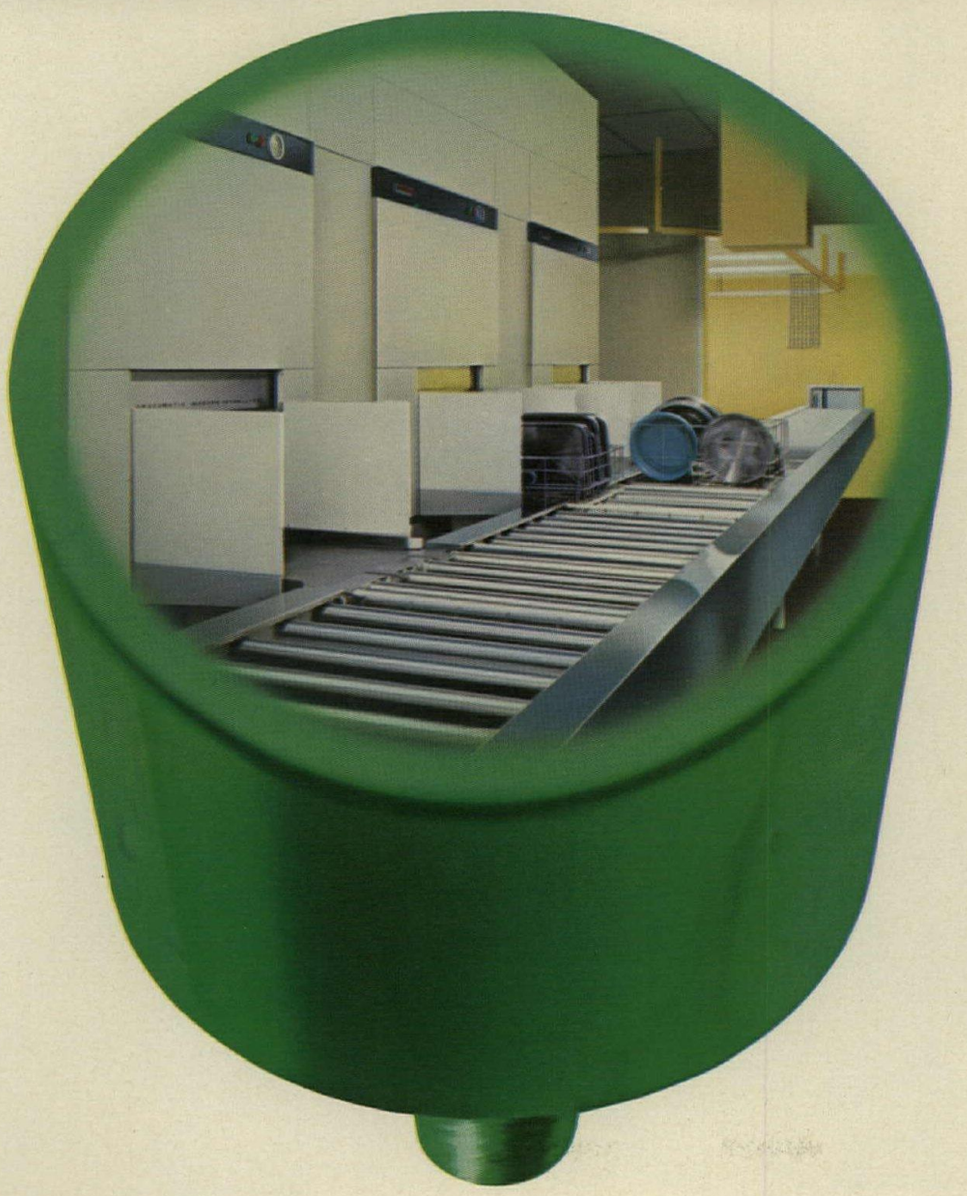

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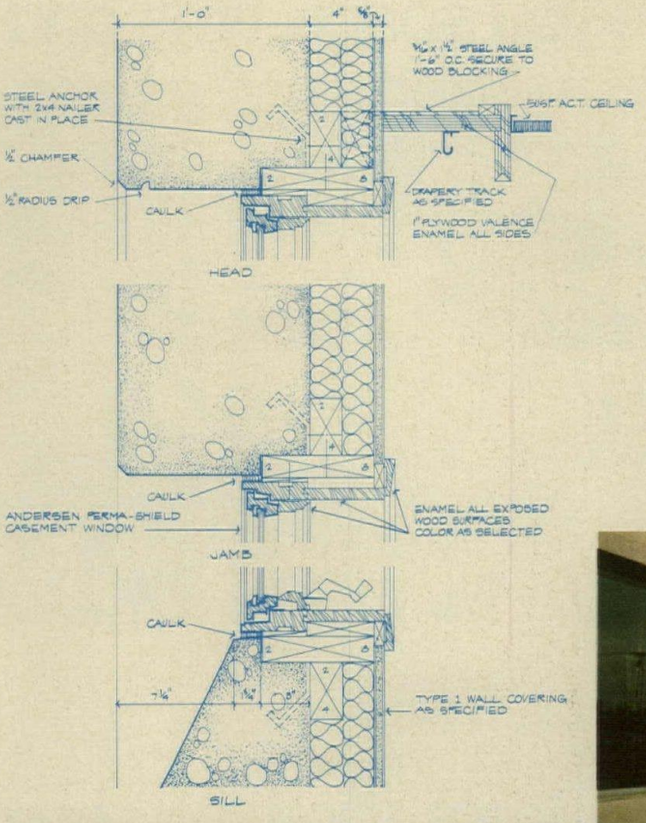

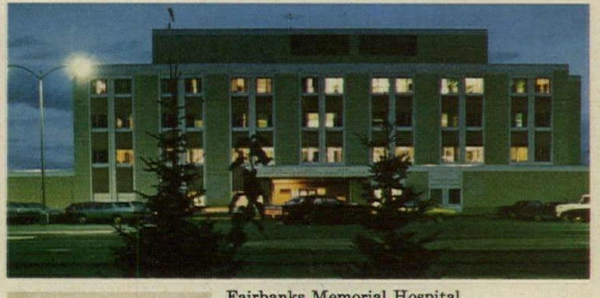

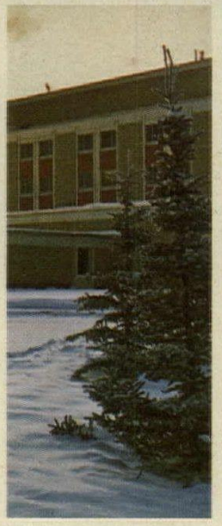

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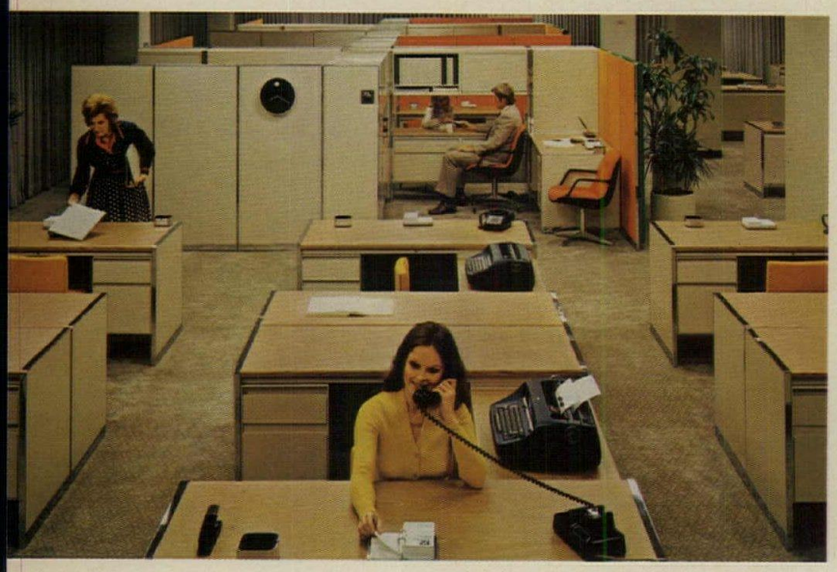

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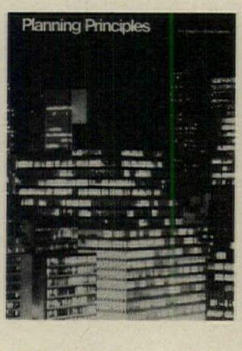

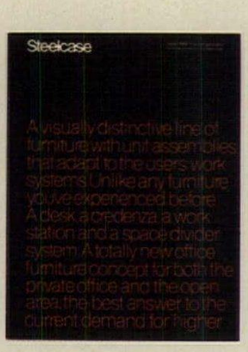

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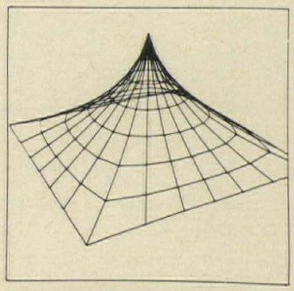
The engineering discipline of tent structures



by Horst Berger, principal
Geiger Berger Associates, P.C.

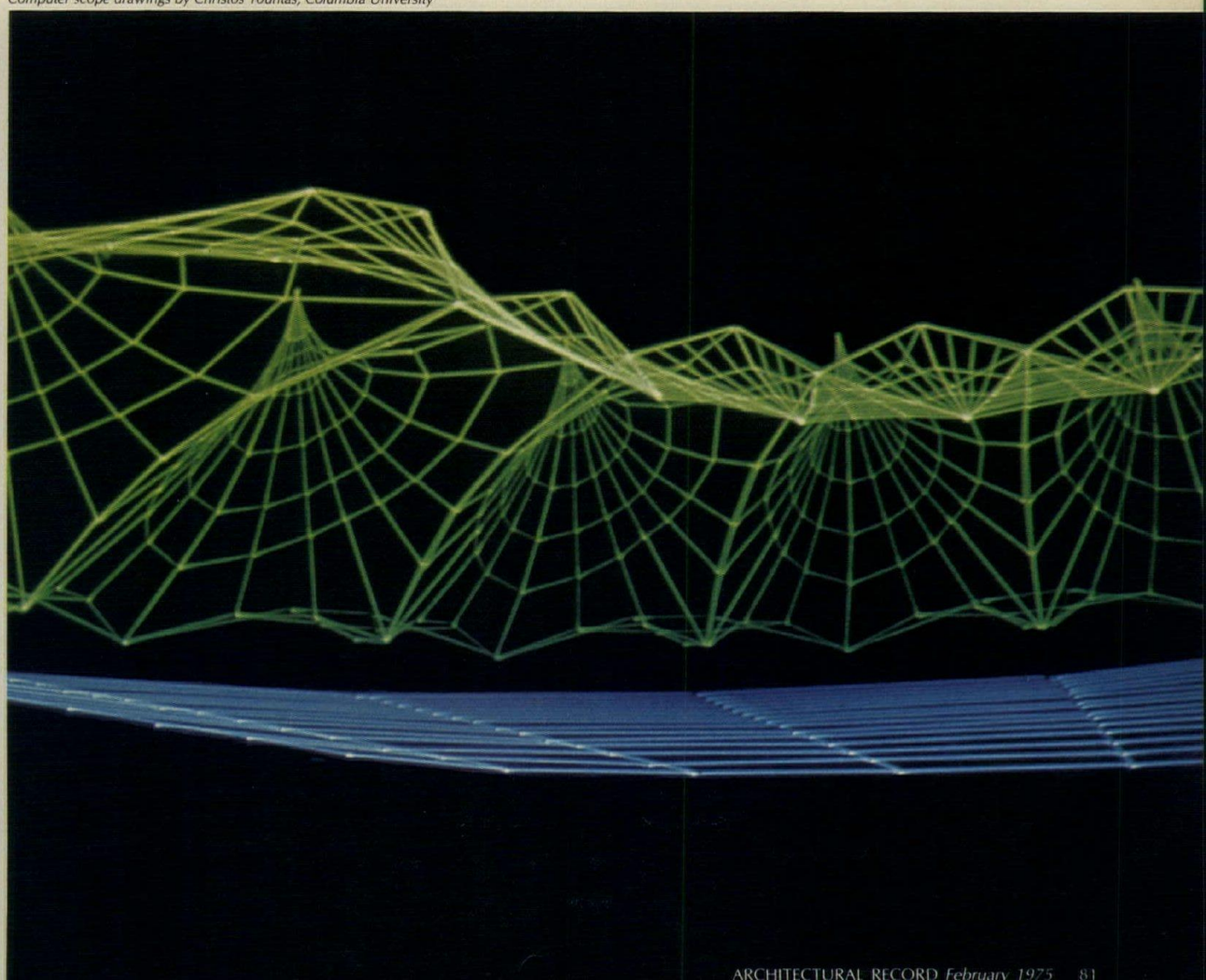
The possibilities of tensile structures are tantalizing to consider: minimal use of materials and stimulating forms to provide shelter.

But there is more to their design than meets the eye. For example, the simple tent roof in the small drawing would not seem to require much mathematics to design. This is not just any garden-variety tent, however. The radial cables are not merely draped, but are prestressed a predetermined amount to give definite form to the structure and to let it withstand wind and snow loads. The engineer had to know what the stresses would be in the fabric so that they were within safe limits, and, furthermore, so that the fabricator could pattern the fabric to the right dimensions.

It follows that there is an engineering discipline that needs to be observed if materials are to work efficiently, and if shapes are to be accurately determined. If shapes are arbitrarily arrived at (either pragmatically or subjectively), then it is difficult, if not impossible, to predict stresses accurately, and the design may have to be over-engineered, or may even fail because of overstress or flutter.

Done correctly, most pole-and-frame-supported tensile structures must be analyzed structurally by mathematical methods, and to do this quickly and accurately, a computer is required. The author of this article, Horst Berger, has developed a mathematical procedure, programmed for computer, that allows him to predict accurately the shapes that result from the prestress forces of self-supporting tensile roofs, and the stresses anywhere in the materials. The evolutionary process of his thinking, and of some of his designs, are the subject of this article. It is clear that the engineering discipline is no barrier to the visual imagination.—R.E.F.

Computer scope drawings by Christos Tountas, Columbia University



This is a computer scope picture (colored by filters) of architect William Morgan's proposed Interama Amphitheater in Miami—a five-module tent. It was drawn by computer—the input being the engineer's predetermined location of points on curves in space (Cartesian coordinates) from an initial assumed shape. Pictures such as these are useful to both architect and engineer. They help the architect explore spaces—what they look like, clearances, etc. They help the engineer visualize flow of forces in complex three-dimensional shapes. The engineer knows in which direction cables of a network must pull for a shape to be stable. A computer picture may tell him that not all his initial assumptions were correct: with the assumed shape, the cable geometry may not result in forces pulling in all the right directions. With Interama, Horst Berger was easily able to modify the geometry where the end wing met the first module in order to get the proper stress flow.

In order to be self-supporting, the surface of tensile structures must curve both up and down

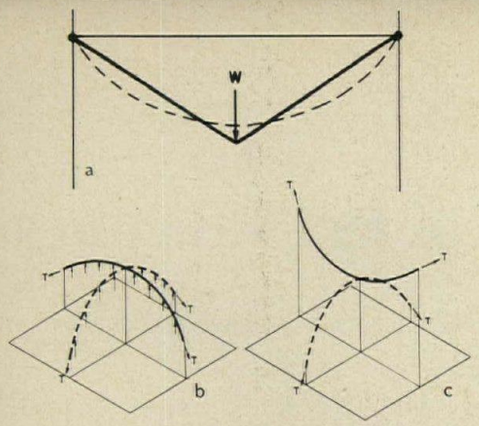


Figure 1: the force discipline of tensile structures

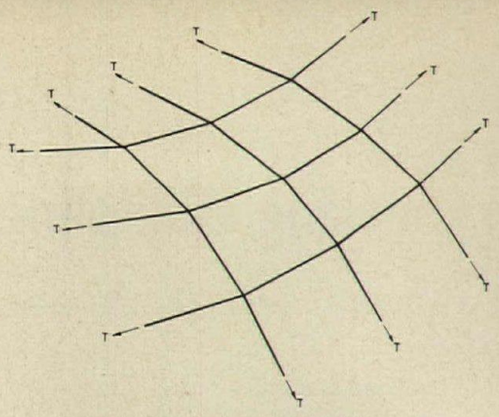


Figure 2: tent structures must be doubly curved

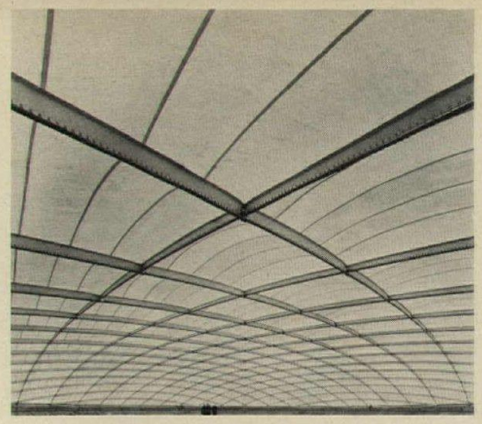


Figure 3: air structures are singly curved

Only in the last 20 years have suspended roof structures been used for substantial buildings. New materials such as fiberglass, plastics, and fabrics of exceptional strength and elasticity led to the now popular air structures. More advanced designs were developed for the international fairs of recent years. The U.S. Pavilion at Osaka, for example, led to permanent, low-profile air structures of fabric and cables, an advance achieved through use of a durable, fire-resistant membrane, simplified construction, and highly improved design methods. The largest of these, for Pontiac Stadium, covers 376,000 sq ft.

For large spans, air-supported buildings remain one of the most efficient applications of modern fabrics and coatings. Where height is desirable or acceptable, and where the interruption of floor space by vertical supports is not objectionable, a series of modular tent structures offers an exciting alternative.

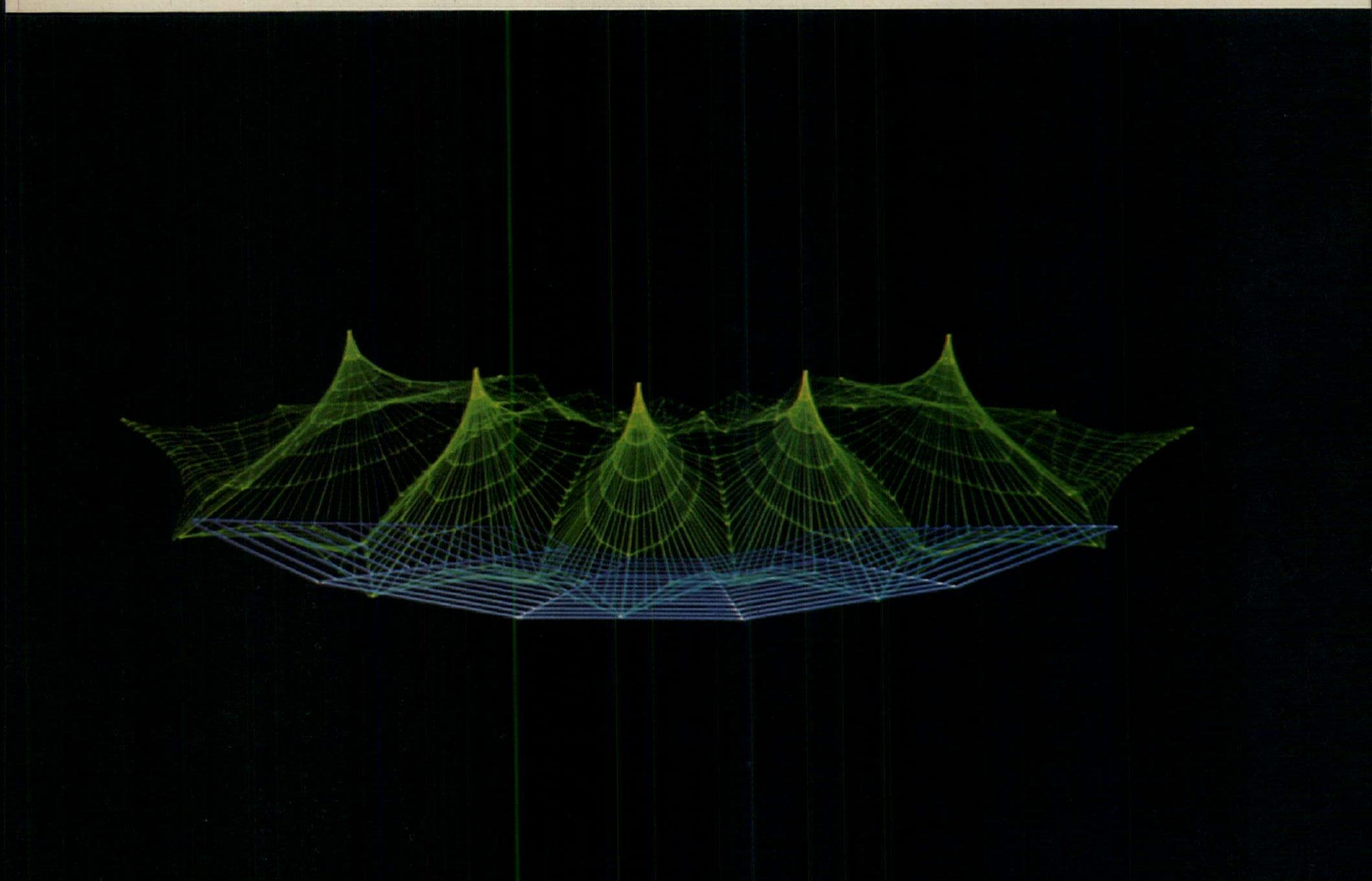
The main obstacle to a breakthrough for self-supported tensile structures lay in the area of design—how to obtain, with ease and accuracy, the exact shape of such structures at given stress patterns and levels. The answer had to be a mathematical modeling of great adaptability which would also permit the designer to find and explore new shapes and combinations of shapes. Such a method was recently developed by the author. This article explains its background and basis.

The behavior of fabric and cables imposes unique structural conditions

The materials used to build tensile structures—fabric and high-strength cables—present two unusual structural conditions: they are extremely light, and, unlike beams, arches or trusses, they have no rigidity.

Further, unlike a beam, an arch or a truss, cables and fabrics have no stiffness. They can therefore carry load only in tension, and they must be kept in tension at all times if they are to remain stable. The stability of a tensile structure must be achieved solely by a combination of shape and prestress.

Unlike a beam, a cable changes its shape when a load is applied (Figure 1a). Any new load case will cause the cable to take on a totally new configuration. A single cable, or a tensile membrane with a single curvature, cannot, therefore, generate a stable structure. If the designer wants to avoid adding weight and stiffening members (as in suspension bridges), he must use other means to provide stability—he must shape and stress tensile networks.



The arrangement of the supports largely determines the shape of tent structures

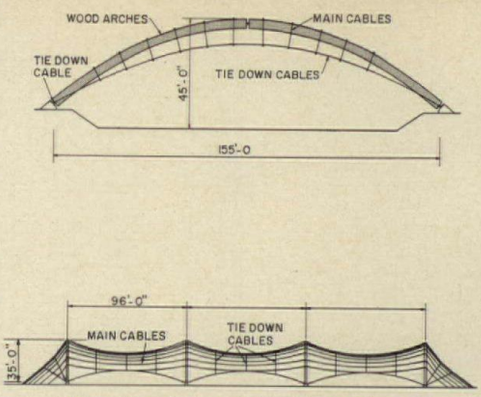


Figure 4: arch-supported tents for tennis courts

Figure 5: a frame-supported tent experiment

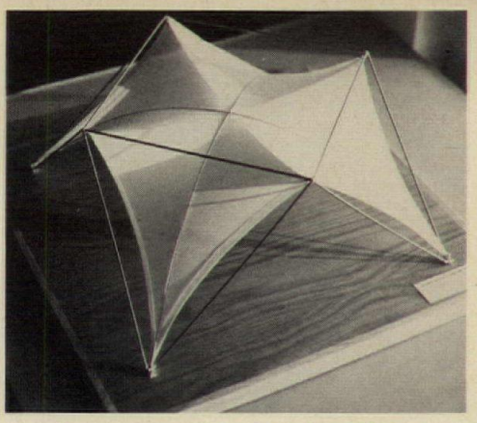


Figure 6: a more sophisticated tent in model form

Curvature, prestress and support system control the shape of tensile structures

The generating principles for shaping lightweight tensile structures are simple, but different conditions determine different shapes for air-supported and for self-supported structures. In an air-supported structure (Figure 1b), an external force (air pressure) acts outward and normal to the membrane surface. The sum of the normal components of the cable forces at a node must therefore act inward and be equal to air pressure. Cable nets or membrane surfaces will, therefore, curve in the same direction—that is, down toward the edges.

The self-supported structure (Figure 1c), on the other hand, has by definition no external force acting on it, because dead weight is negligible. The sum of the normal components of cable forces must therefore be zero, which requires that two intersecting cables, or two main stress lines in a tensile membrane, be of opposite curvature. This is the first and most important principle.

If we now add a superimposed load—let us say, wind pressure—the structure must remain in tension. This requires that the cable net or membrane be under sufficient initial tension—which means it must be prestressed. This is the second principle.

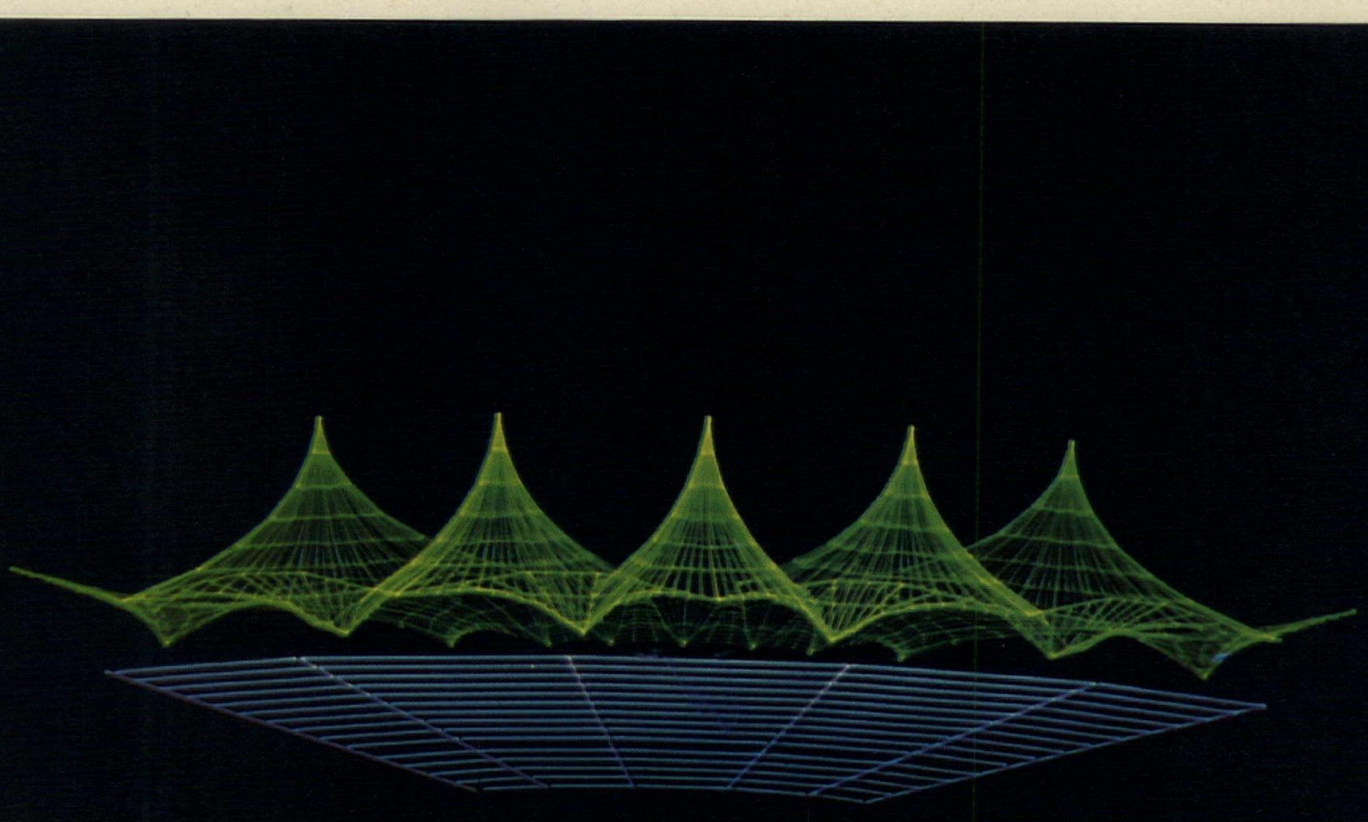
Curvature and prestress must be selected to comply with this principle. The greater the curvature, the lower the prestress required. A portion of any self-supporting tensile structure therefore resembles Figure 2. Any surface configuration that permits two sets of continuous stresslines of opposite curvature is suitable for a self-supporting tensile structure. This leaves only one additional consideration: the support.

Because the two sets of cables in air-supported structures are of equal sign, it follows that they require only one set of supports, usually at the lower end of the structure (Figure 3). Self-supported structures, by contrast, require two sets of supports—one above and one below the tensile structure.

Two types of support are possible: line supports and point supports. The arrangement of the supports largely determines the configuration of the structure.

Figure 4 shows a structure supported on parallel laminated wood arches. The rigid arches form the upper supports, catenary end cables the lower supports, and an orthogonal two-way cable system is stressed between them. The fabric is attached directly to the cable system.

The prestressed fabric dome in Figure 5 is



The two basic shapes are saddle-surface and radial

Stresses can easily be determined for a radial

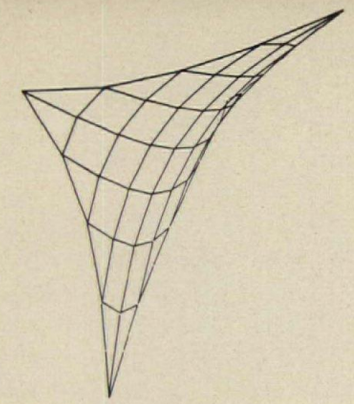


Figure 7: hyperbolic paraboloid, one basic shape

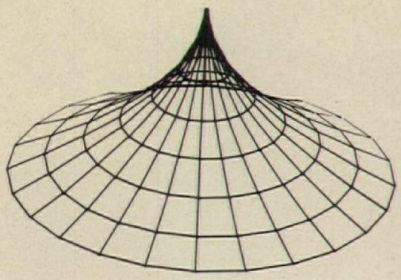


Figure 8: the radial tent, the second basic shape

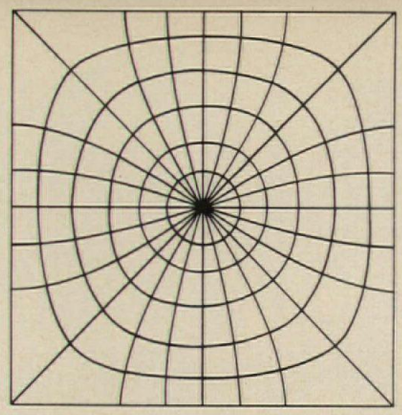


Figure 9: stress lines for a tent with a square base

a more sophisticated structure. The upper supports are still arches, here made of flexible aluminum bands which, when lifted by the center ring, take on the proper dome shape. The tensile membrane is formed by the radial valley cables in one direction and by the fabric in the other. The lower supports are the foundation points. They are interconnected with the arch supports by the triangular system made of aluminum pipes. A tension ring cable at the spring line of the arches equilibrates the arch thrusts. Thus the entire flow of forces is balanced within the system.

The prestressed fabric shelter of Figure 6 goes a step further. The compression members are completely separated from the tensile membrane, and provide four upper and four lower support points interconnected by metal triangles. The lower supports are at the end of the valley cables, and the upper supports are catenary cables spanning the distance between the high points of the triangles. (This ridge cable could, of course, be regarded as part of the tensile membrane, in which case the distinction between line and point disappears.

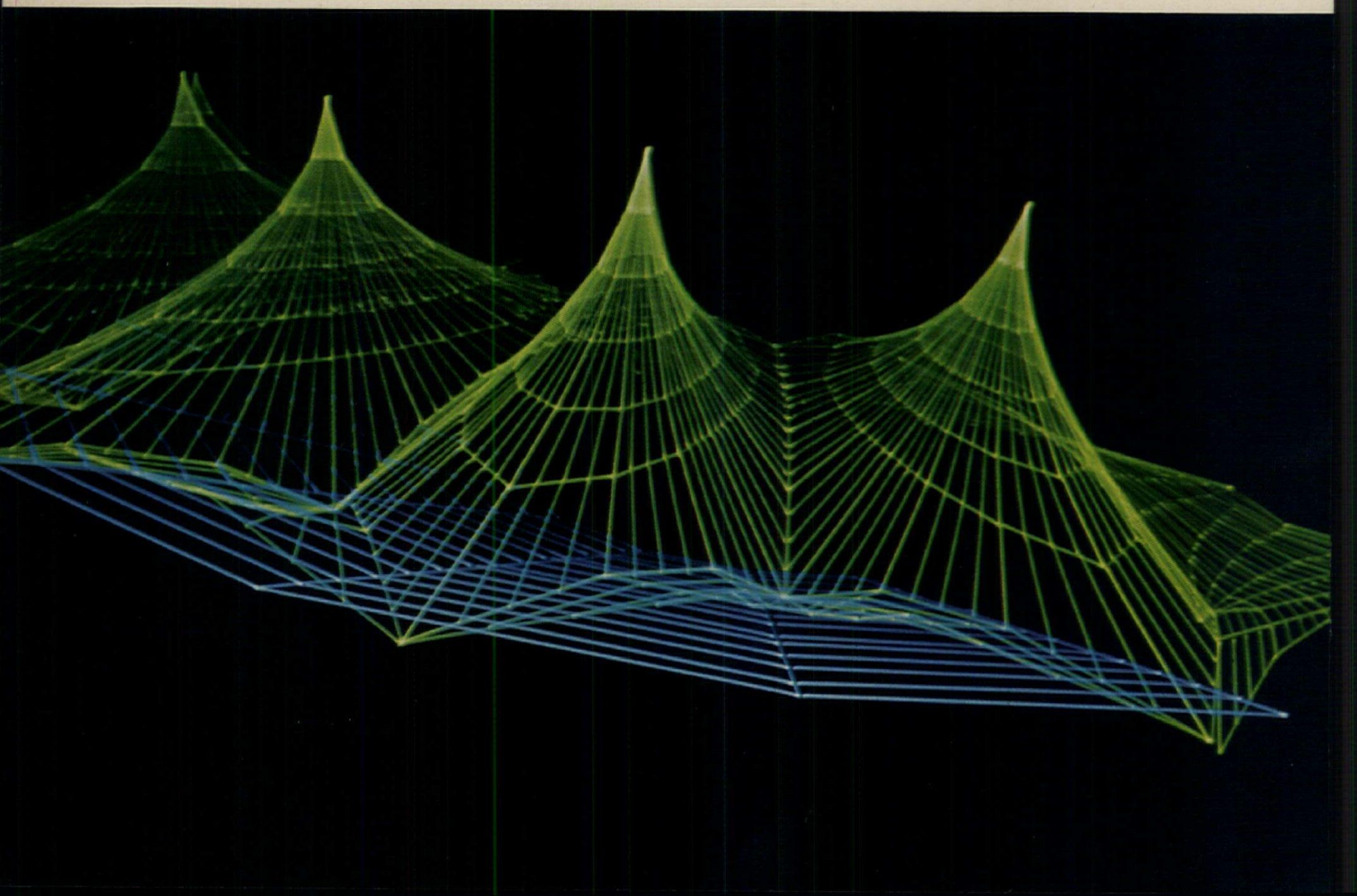
For a larger structure—one requiring more than a single valley cable per bay—each quadrant of the tensile membrane takes on the shape shown in Figure 7. This surface, a hyperbolic paraboloid, is one of the basic shapes that satisfies the requirements of point-supported tensile structures. Most of Frei Otto's tent structures use this surface, shaped by a net of orthogonal cables supported by diagonal edge catenaries.

The other major family of tensile structures derives its shape from one set of cables originating from the point support in a radial pattern, and a second set of cables around the point support, producing a conical shape. The simplest form has a circular base and circular rings (Figure 8); it is easily analyzed and has been used for several major structures.

The design process in reverse: shape derives from applied forces

The configuration of a radial tent with a noncircular boundary would ideally resemble the stress-flow diagram of an elastic membrane with point supports. Figure 9 shows the main stress lines in such membrane, with radial lines curving down to a square base. Because radial cables cannot reasonably be made to curve in the plane of the membrane, a practical layout is achieved by straightening the radial cables and letting the rings form polygons (Figure 10).

To build a roof structure of this type re-



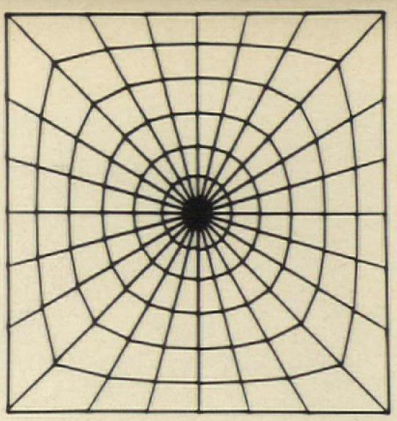


Figure 10: radial cables are straight for practicality

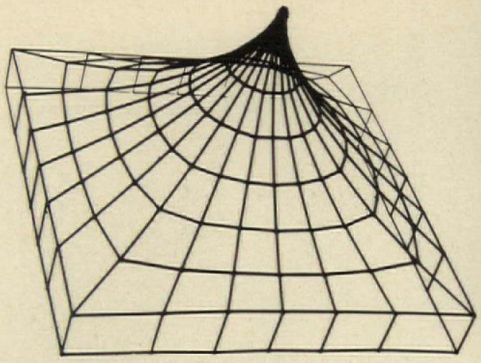


Figure 11: computer perspective of a square tent

Figure 12: a square tent for Great Adventure

quires a design tool that will determine the exact geometry of the roof, with every point of the cable system in equilibrium under a given stress. While a closed mathematical solution—one that gives finite answers in one step—is possible for circular tents, other shapes, such as the square-based tent in Figure 10, require a totally different approach. Such an approach is based on a reversal of the usual design process by predetermining the stresses in a cable-net system and letting the net find its corresponding shape. Figure 11 shows an isometric view of the tent roof designed for Great Adventure Park in New Jersey; this shape was generated by the following process:

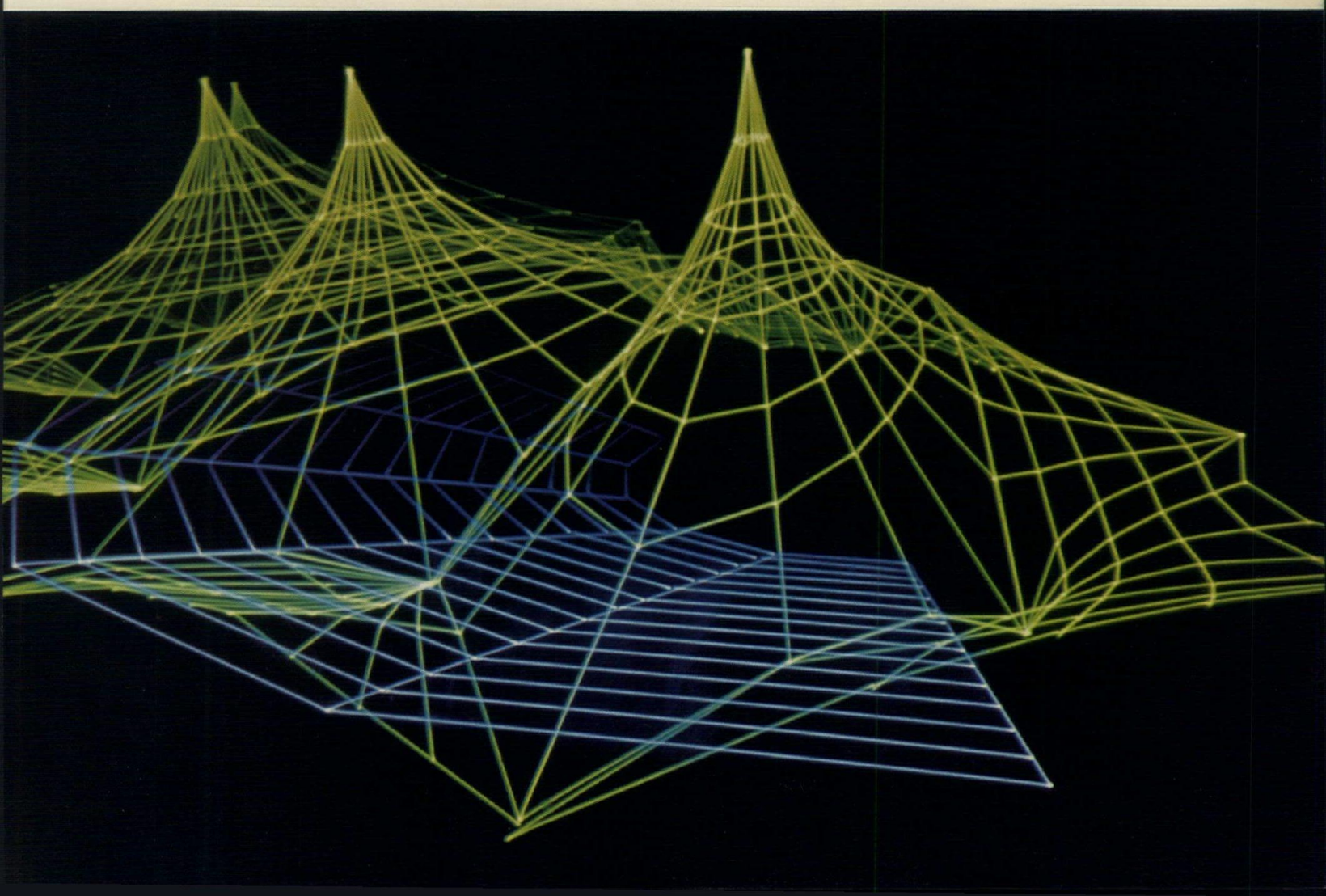
First, the configuration of the radial cables was determined in plan. One requirement of this plan was to place the cables close enough to each other to prevent overstressing the fabric spanning the space between them. Another was that the cables be numerous enough and close enough to produce the appearance of continuous curves rather than flat polygons. Still a third requirement was as much repetition in patterning as possible. A layout of 24 cables, spaced at equal angles of 15 deg, best satisfied these and several other design criteria.

Next, the number and elevation of the rings was established. Since in this structure the function of the ring cables was assumed by the fabric itself, the rings were simply a mathematical tool. As a first step towards producing a structure with fairly uniform fabric stresses, these hypothetical rings were located so that their average spacing was approximately equal. In this case, it was decided that five rings provided sufficiently close spacing for accurate stress analysis and fabric patterning.

Next, a set of compatible forces was adopted. The ratio between radial force and ring force was established so that the structure would take on maximum curvature with sufficient slope in the radial direction to avoid ponding under snow or rain.

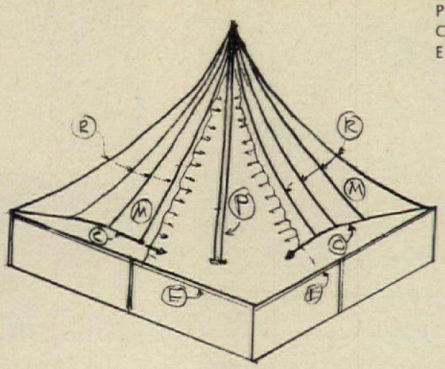
With all of this input established, the final shape under prestress was defined by computer, using an iteration method. This means that, because a set of exact equations cannot be solved for the entire system, simple linear equations were developed for any one point of the net, assuming the rest of the net fixed. The computer then corrected the geometry for one point at a time, moving on to the next one, and repeating this process until the correct geometry of the net was found.

The computer output gave the geometry of the entire structure, all cable forces, cable

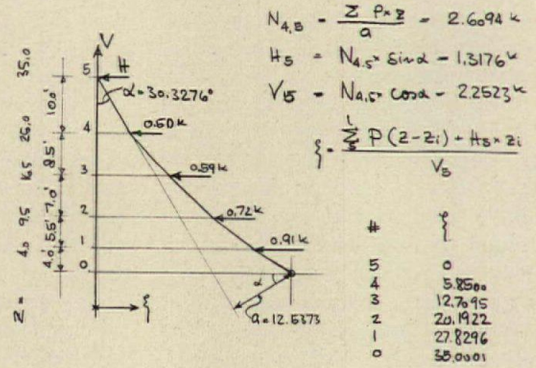


For the square-boundaried radial tents designed for the Great Adventure organization in New Jersey, engineer Horst Berger determined approximate curvature and stresses using simple graphic methods to establish equilibrium of forces between rings and radial cables. The drawing below shows assumed forces and calculated shape for one of the radial cables. During erection, the radial cables were jacked upwards, pulling them outwards. This outward action is restrained by the fabric membrane, creating tension in the ring direction. Berger assumes prestress forces based upon what experience tells him would produce reasonable stresses in cables and fabric. The graphic method does not give finite answers, only approximate ones. For actual design, Berger turned to computer solution. Using a cable net as a mathematical model, he can determine the exact shape of tensile roofs, cable lengths, and stresses. From computer solution, space coordinates are determined, which in turn are used with the computer scope to produce pictures.

R radial cable
M membrane
P pole support
C catenary cable
E edge beam



Shape of Cable #1 $\varphi = 0°$



$$N_{4,B} = \frac{\Sigma P \times Z}{a} = 2.6094\ k$$

$$H_5 = N_{4.5} \times \sin\alpha = 1.3176^k$$

$$V_5 = N_{4.5} \times \cos\alpha = 2.2523^k$$

$$\{ = \frac{\frac{1}{2}\Sigma P(2-z_i) + H_5 \times z_i}{V_5}$$

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4	5.8500
3	12.7095
2	20.1922
1	27.8296
0	35.0001

$V_0 = V_5 = 2.2523\ k$

$H_0 = \Sigma H + P = 4.1376\ k$

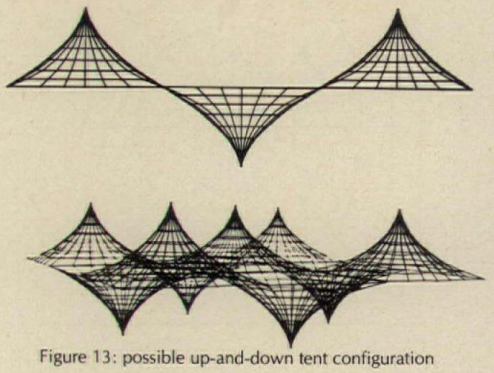
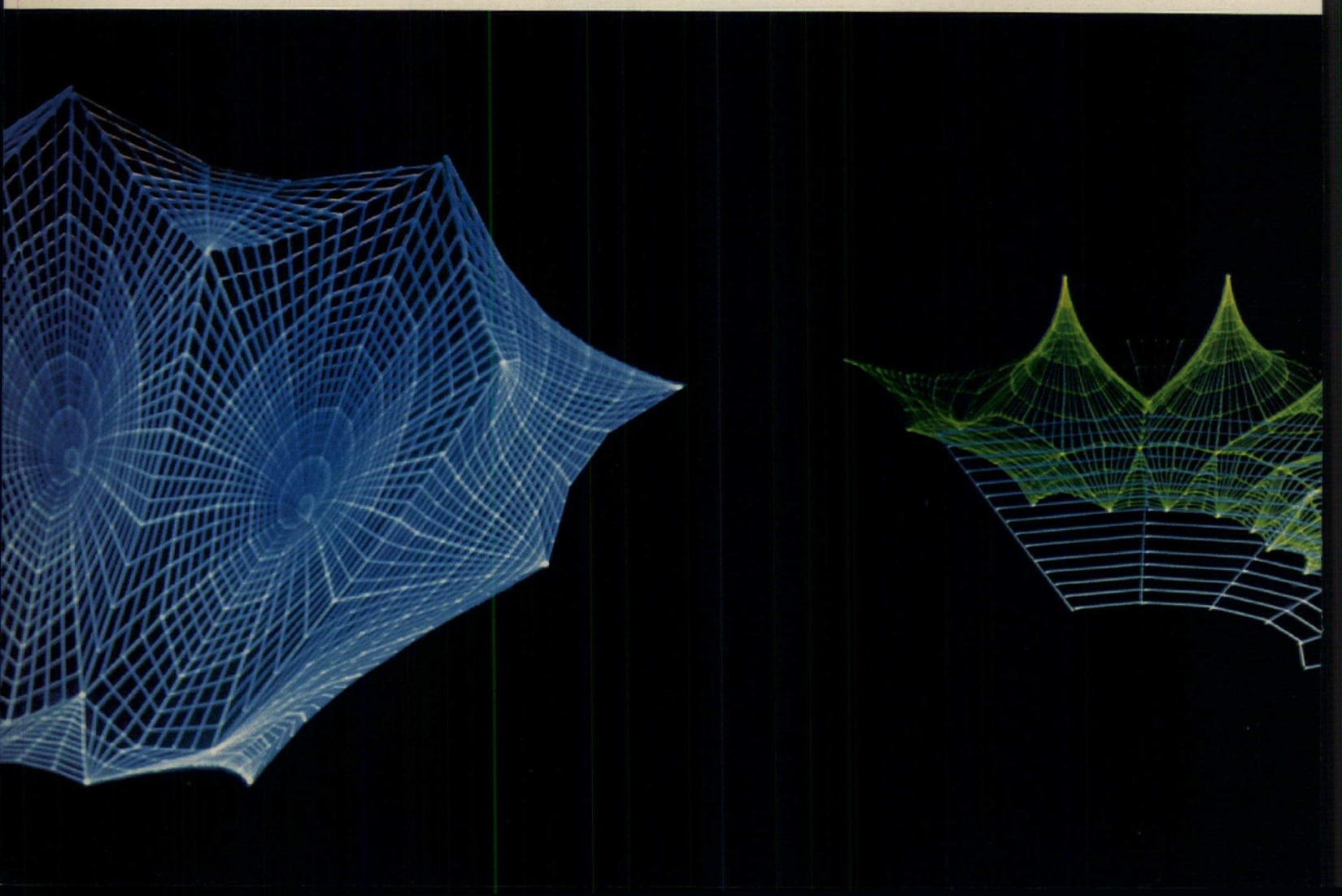


Figure 13: possible up-and-down tent configuration

lengths, and fabric patterns. The geometry and prestress forces were then used as input for the stress analysis under superimposed loads, such as wind and snow. As part of this analysis, the prestress forces can be adjusted so that slackness (loss of tension) is avoided under superimposed loads. Because the shape determined by this process is independent of the prestress level, an adjustment of the prestress level does not require a re-run of the geometry program.

In this case, because of the use of the fabric as the ring system, an additional process of computation was needed to determine the actual fabric stresses in the two-way fabric membrane, which is somewhat more complex than a linear cable system.

Some interesting methods of deriving more complex shapes involve media such as



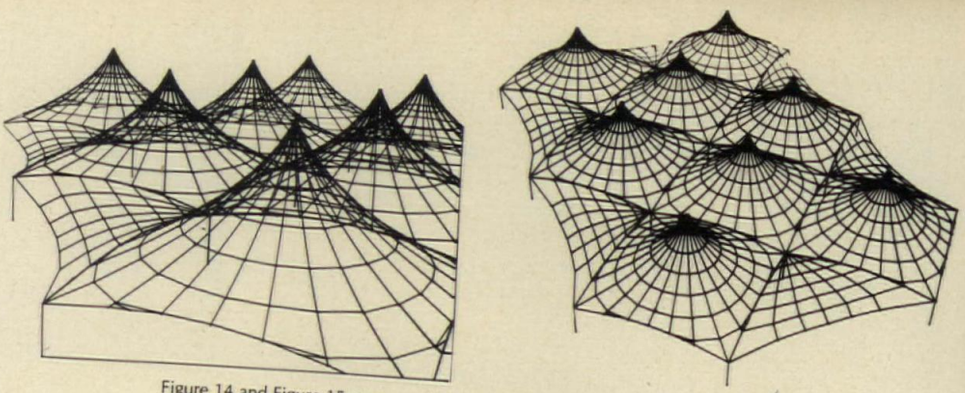


Figure 14 and Figure 15: tent configuration suggested for warehouse application

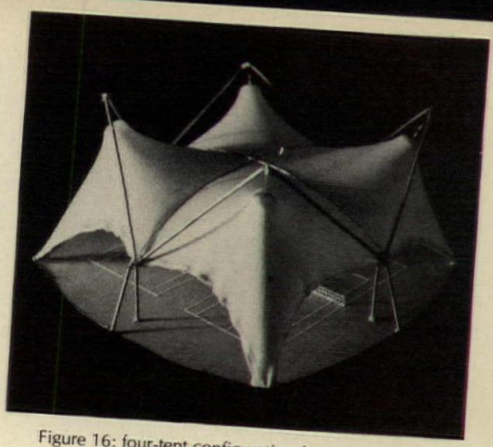


Figure 16: four-tent configuration for tennis courts

soap bubbles, stretched fabrics and other modeling materials. But these methods are time-consuming, their results are approximate, and soap bubbles, at least, bear little resemblance to common construction. A computerized mathematical procedure, like that described, is therefore an indispensable tool for the design of these structures.

In the tents built at Great Adventure (Figure 12), the radial cables are ⅝-in. bridge strand; the function of the ring cables is taken by the fabric, a vinyl-coated polyester with an ultimate strength of 400 lbs per in. The edge beam is a 14WF steel beam. These four tents, erected in the spring of 1974, are permanent buildings, and are designed to withstand full snow and wind loads.

The program used for the Great Adventure tents developed the shape and provided the cable lengths and the patterning dimensions for the fabric. Stressing was performed with jacks at the top of the mast. At the correct prestressing force, the tops of the tents came within ⅛ in. of the design elevation, proving out the accuracy of the design.

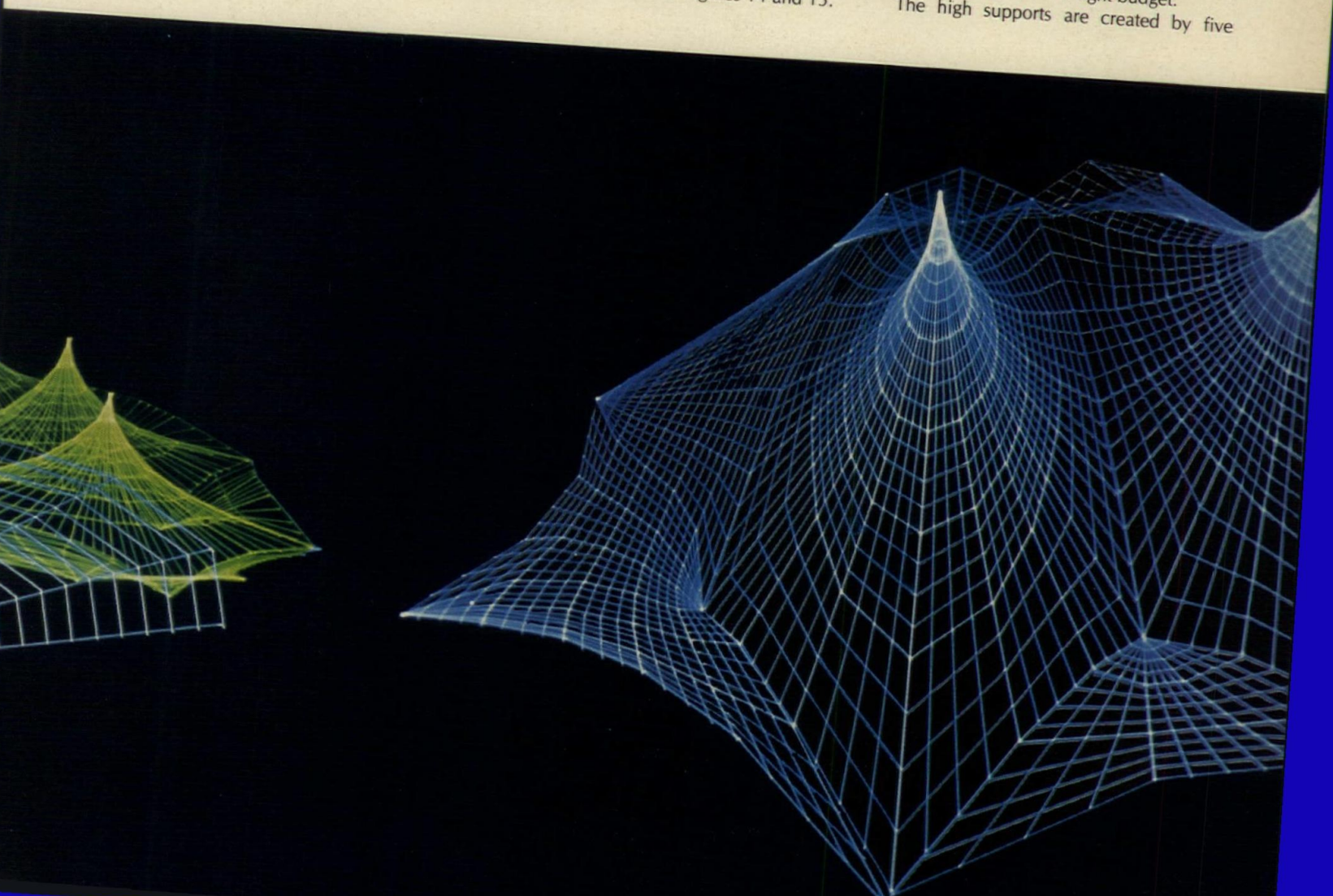
Developed system can be applied to multiple tents of complex form

This design system opens the way to many new shapes. Figure 13 shows a computer scope picture of a structure arrived at by stringing together square tents arranged alternately with high and low support points. The addition of edge catenaries—their shape also found by the same computer operation—permits groupings of multiple tent structures such as the proposed warehouse building illustrated in the computer-scope perspectives of Figures 14 and 15.

The arrangement of four square tents into a roof structure for tennis courts (Figure 16) demonstrates another application of the same principles and design tools. The supports are arranged to achieve as close a balance of prestress conditions as possible.

Several other applications are in various stages of development. The most advanced among them is the roof structure for architect William Morgan's Amphitheater at Interama in Miami (Figures 17, 18 and computer scope drawings at the bottom of these pages). Its function is to protect 6,000 theater seats against sun and rain, while retaining an open view and a natural flow of air. This structure had to be designed to withstand 130 mph hurricane winds and, because this is a commercial enterprise, to stay within a tight budget.

The high supports are created by five



Modular pentagonal tents are massed in a dramatic way for an amphitheater

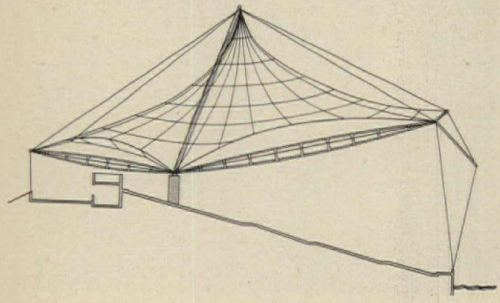


Figure 17: frame and cable supports for Interama

Creative Photographic Service, Inc.

Figure 18: model of Interama Amphitheater

A-frames arranged along an arc. The low supports are identical with the support points of the A-frames. The outer edges have elevations between high and low supports and are held in position by vertical tiedowns, by masts originating from the low supports, and by cables leading to the top of the A-frames (Figure 17). All lateral forces therefore balance out at the low supports, which rest on piers, and the total framework of A-frames, masts and main cables forms a stable support system for the radial tent structure.

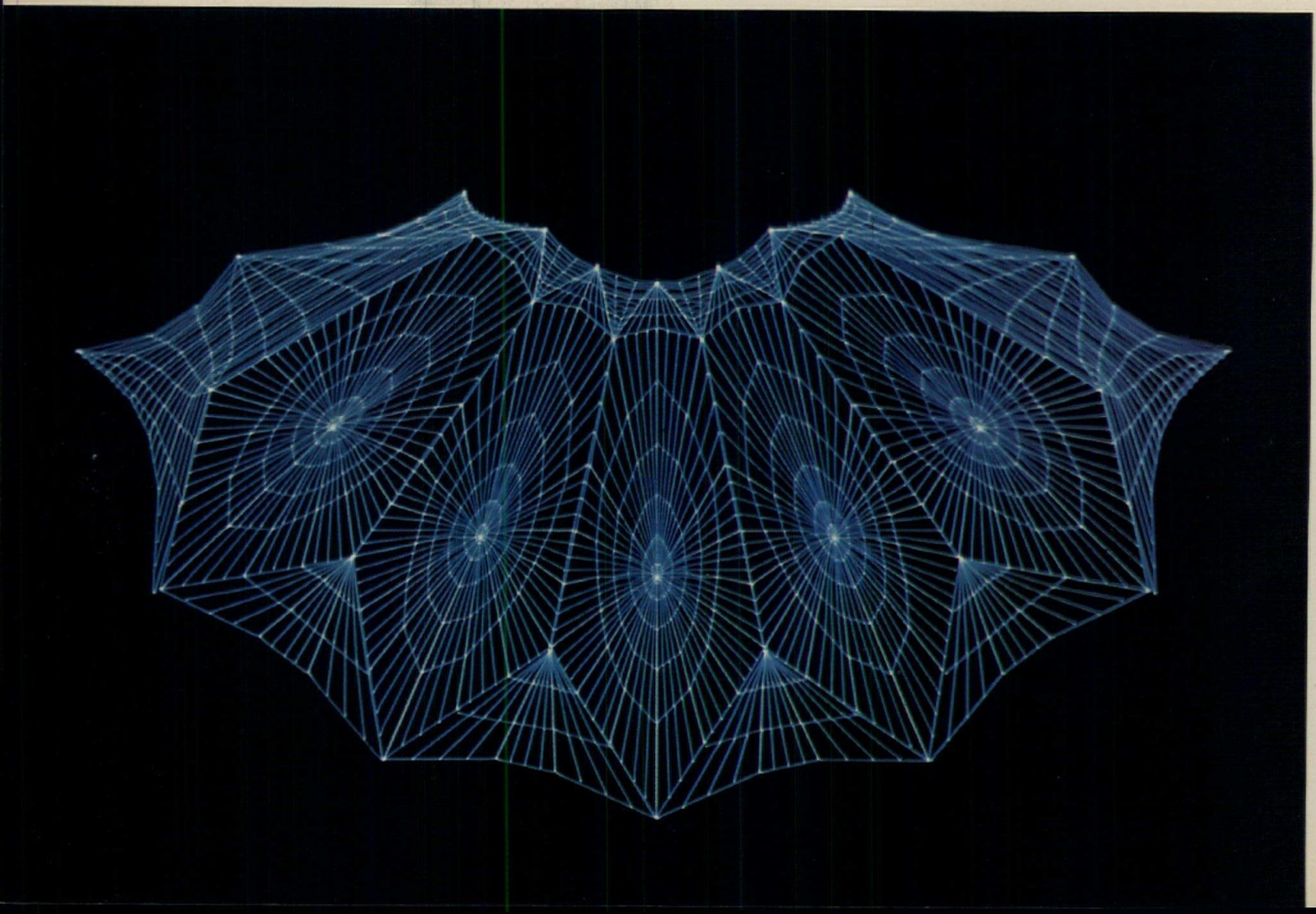
The tent structure has a typical spider-web-like configuration (below). The main module, occurring five times, has a pentagonal shape, and the rear module is close to a triangle. The shape of the side modules—the "wings" at each end—is slightly more complex.

The extreme wind loads along the coast of Florida produce stresses that prohibit the use of fabric for ring forces, and thus require cables in both directions of the net. The computer scope pictures show the actual cable configuration. The fabric is a Teflon-coated fiberglass with a strength of 600 lbs per in., and 8 per cent translucency.

The development of structural designs such as these has brought lightweight tensile structures within a cost range that is highly competitive with other low-cost buildings. The availability of excellent fabrics, some of them highly durable and fire-resistive, makes permanent structures possible. The high translucency of these fabrics eliminates the need for artificial lighting in the daytime, and the tent shape is excellent for natural ventilation.

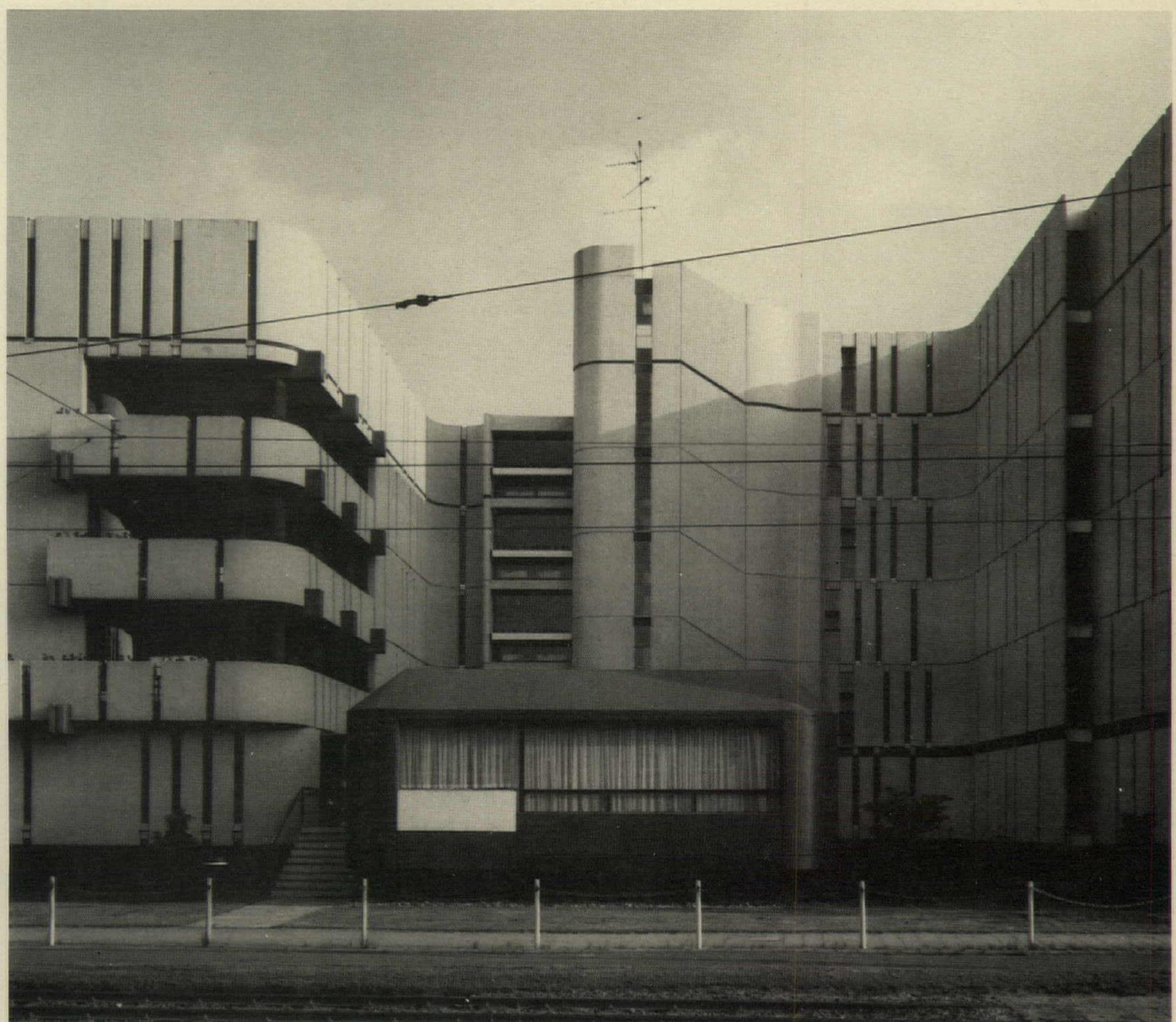
And the complex, flowing surfaces are inherently beautiful.

Figure 3—U.S. PAVILION, OSAKA, JAPAN; Architects: *Lewis Davis, Samuel M. Brody and Alan Schwartzman;* Engineers: *Geiger Berger Associates, P.C.* (structure). *Figure 4*—WILTON TENNIS COURTS; Architect: *A. Robert Faesy, Jr.;* roof structure: *Geiger Berger Associates, P.C. Figure 5*—FLEXIBLE ARCH DOME; Design and engineering: *Geiger Berger Associates, P.C.:* constructed with assistance of students at the Columbia University School of Architecture; patent pending. *Figure 6*—PRESTRESSED FABRIC SHELTER; Design and engineering: *Geiger Berger Associates, P.C.;* patented. *Figure 12*—GREAT ADVENTURE MERCHANDISE BUILDING, NEW JERSEY; Design and engineering: *Geiger Berger Associates, P.C.:* Associate architects; *Hankin and Hyres,* Architects. *Figure 16*—FOUR-POINT TENNIS TENT; Design and engineering: *Geiger Berger Associates, P.C. Figures 17, 18*—AMPHITHEATER FOR INTERAMA, MIAMI; Architect: *William Morgan Architects;* Special consultant, roof design and engineering: *Geiger Berger Associates, P.C.*

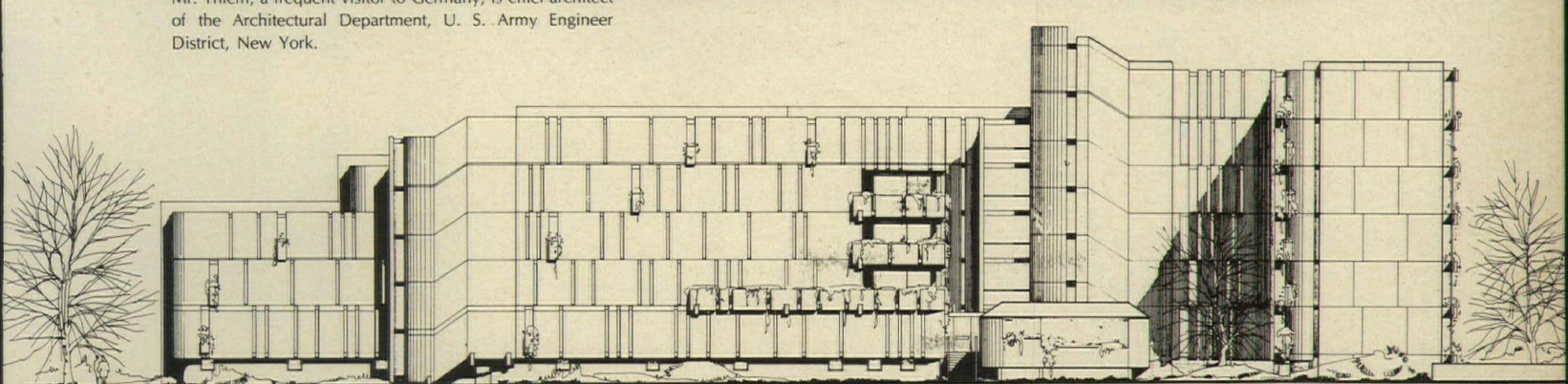


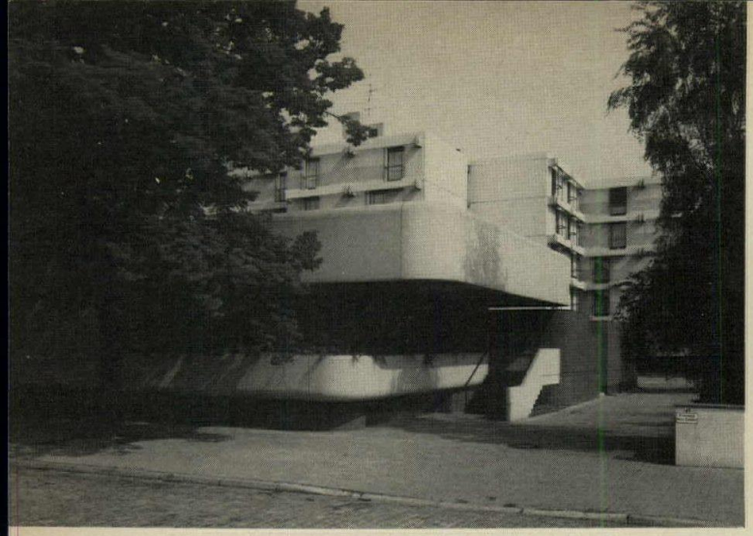
A MIXED-USE PROJECT IN GERMANY: CHURCH/ELDERLY HOUSING/ COMMUNITY CENTER

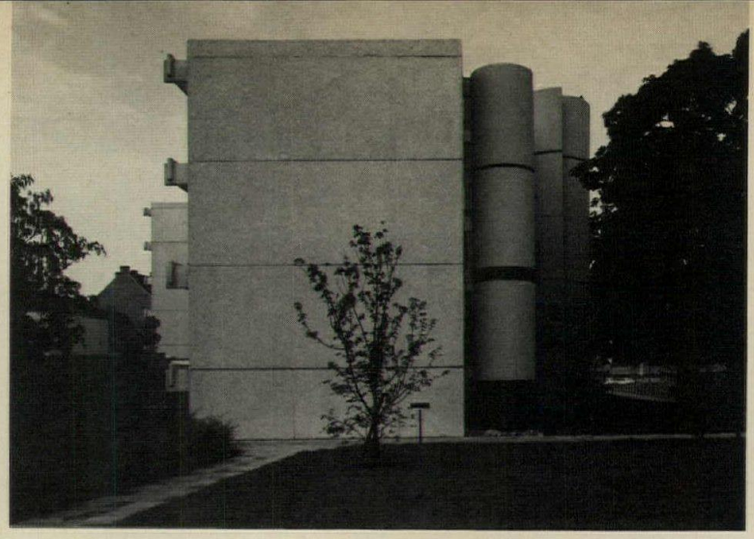
Rarely can separate projects for separate clients be combined into a single and symbiotic unit. But Hannover architect Hans Siegfried Laessig, in consultation with two clients, combined several complex program needs into one thoughtful and forceful combination, giving clients and users more than they expected, and eliminating wasteful duplication of services.—*by Walter Thiem*



Mr. Thiem, a frequent visitor to Germany, is chief architect of the Architectural Department, U. S. Army Engineer District, New York.







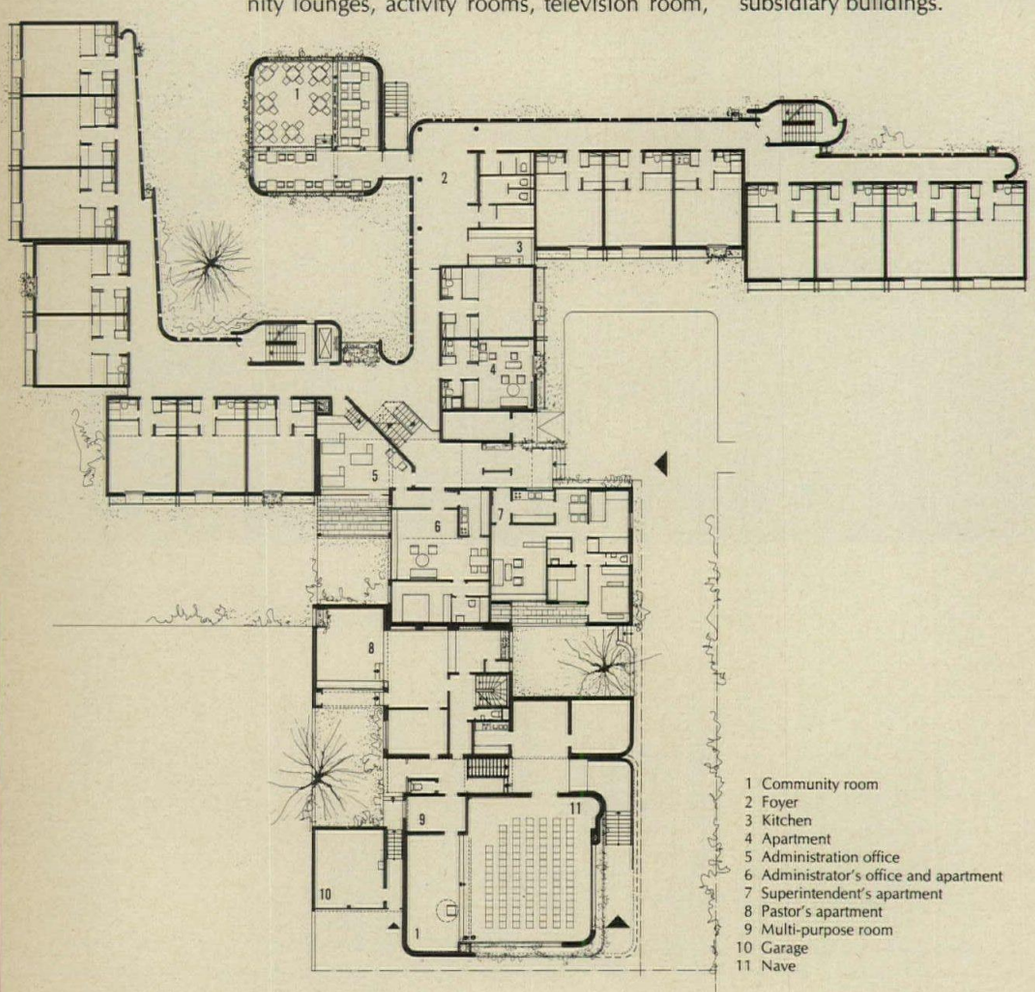
St. Nikolai Stift (a housing foundation) approached architect Laessig to design a home for elderly women in Hannover-Herrenhausen. He had scarcely begun planning when the Reform Church began searching for a meeting point in the area. Good fortune brought these two clients to architect Laessig's office almost simultaneously. The St. Nikolai Stift had already purchased a site in an area with many parks, convenient shopping, and good public transportation. The Reform Church, with Laessig's help and the enthusiasm of the housing foundation, was able to make a favorable acquisition of an adjacent property.

One success of the complex is that it has none of the sometimes doleful character of "the old-age home" and indeed, no "church" character either—and yet it functions superbly as both. The great plus is that the elderly residents have a chance to mix with all ages of the congregation, and the two groups can share far more common facilities such as the community lounges, activity rooms, television room, whirlpool and exercise rooms, and gardens than either could have justified alone.

The 95 apartments (on five floors) are of necessity repetitive—but by dividing the apartments into small groups along staggered corridors, architect Laessig avoided an institutional look.

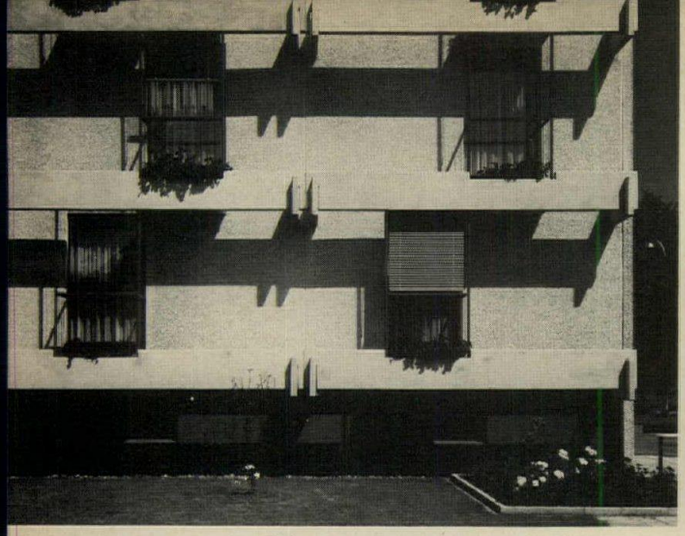
On the north side of the building (top in plan) is a busy and noisy main street. On this side of the building (photos previous page and right, above) the facade is relatively closed, and most apartments are buffered by the corridor. The main lounges are, appropriately, on this busy and vital side. The church and entrance to the complex is from a quiet secondary street (bottom in plan).

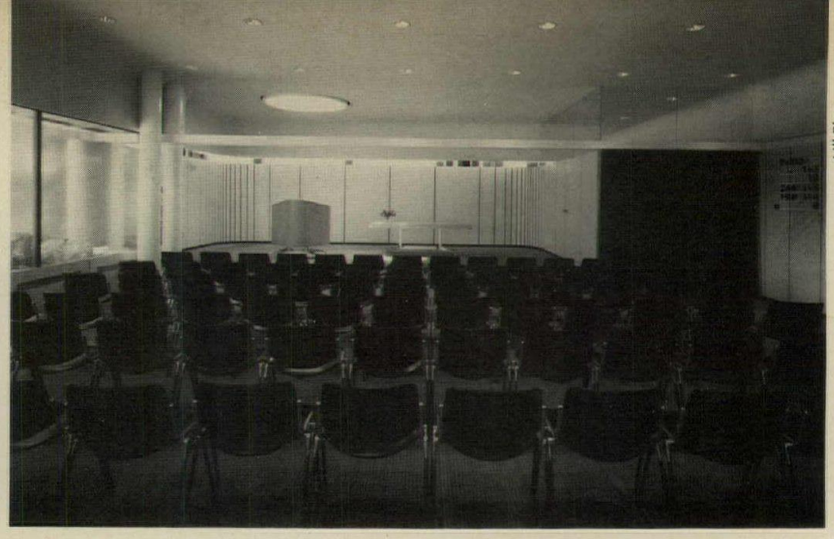
Combining precast concrete panels with poured-in-place concrete for the curved shapes, architect Laessig created a strong but appealing structural character for the building, set off not just by the cheerful blinds and planting, but by bold use of purple and yellow for subsidiary buildings.



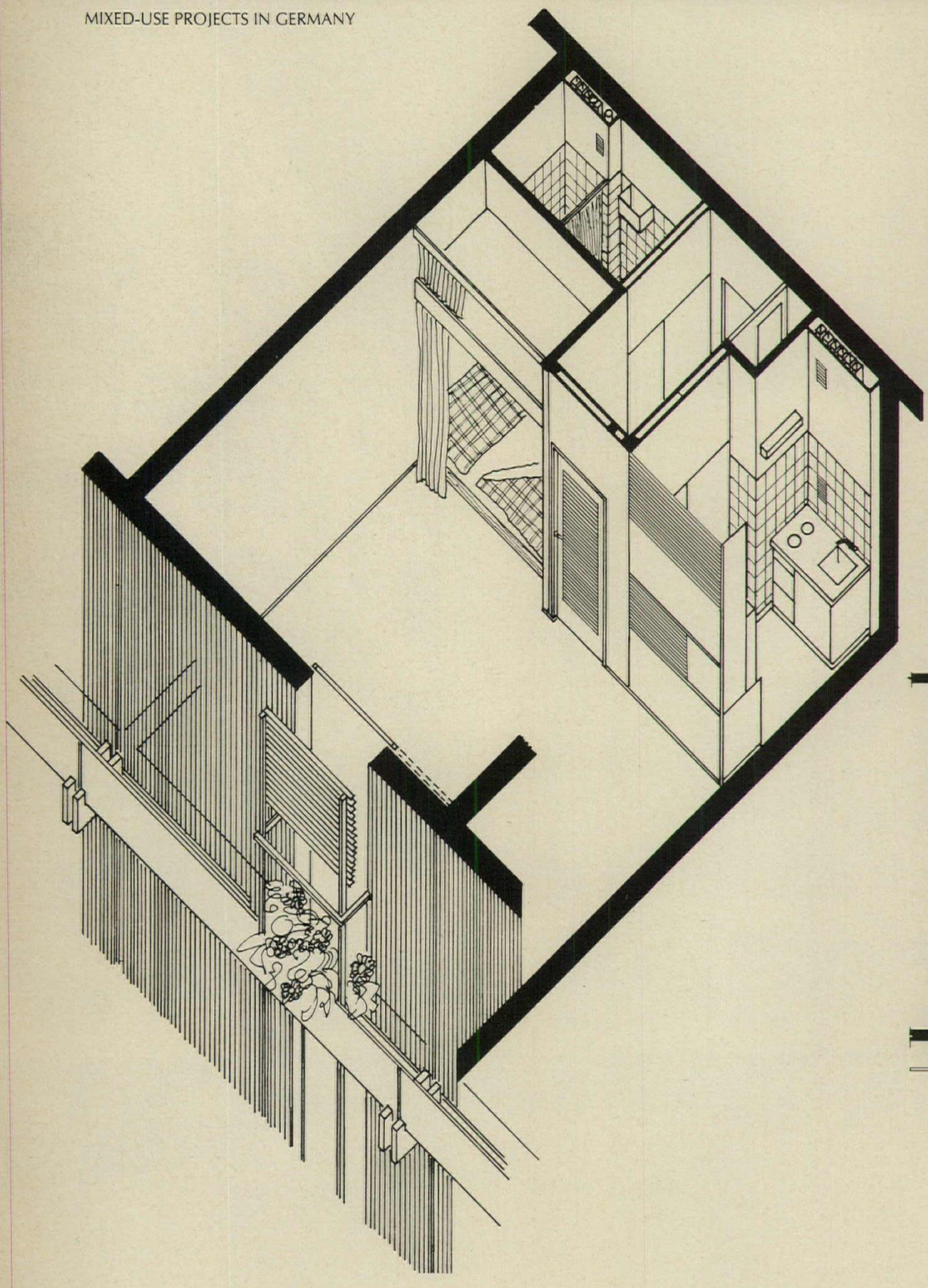
1 Community room
2 Foyer
3 Kitchen
4 Apartment
5 Administration office
6 Administrator's office and apartment
7 Superintendent's apartment
8 Pastor's apartment
9 Multi-purpose room
10 Garage
11 Nave

Lill Photo





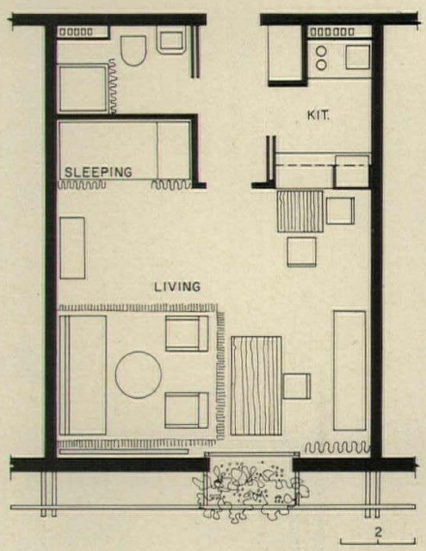
Lill Photos

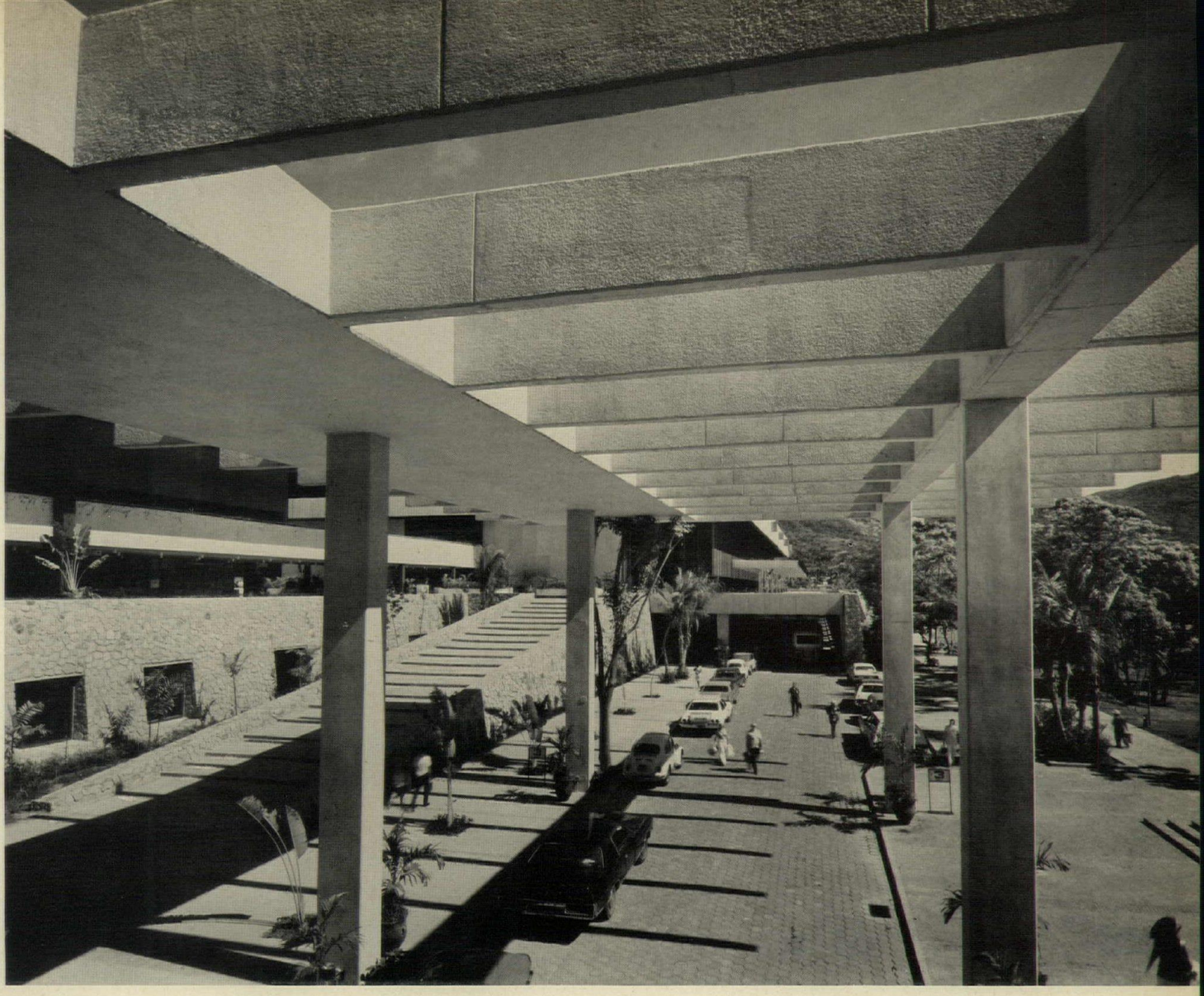


Each of the efficiency apartments is 32 square meters—a little over 15 by 20 feet. Since the units are for elderly women, every design effort was made to minimize the effort of upkeep and cleaning. The bed set into a wall nook, which would probably not seem comfortable to most Americans, has long been common and accepted in Europe. The windows slide for 100-per cent opening, and give to unique planters set at floor level, so residents can have full gardens, easily tended, but not blocking the view of activities outside. The venetian blinds can also be adjusted for shade and/or view—a contemporary version of the bright awnings and cloth panels that give color to many European housing projects.

The photo just above is the church nave, number 11 in plan, on the preceding page.

ST. NIKOLAI STIFT HOUSING, AND COMMUNITY CENTER OF THE PROTESTANT REFORM CHURCH, Hannover-Herrenhausen, Germany. Architect: *Hans Siegfried Laessig.* General contractor: *Betonwerk Niedersachsen.*





CONVENTION CENTER IN ACAPULCO

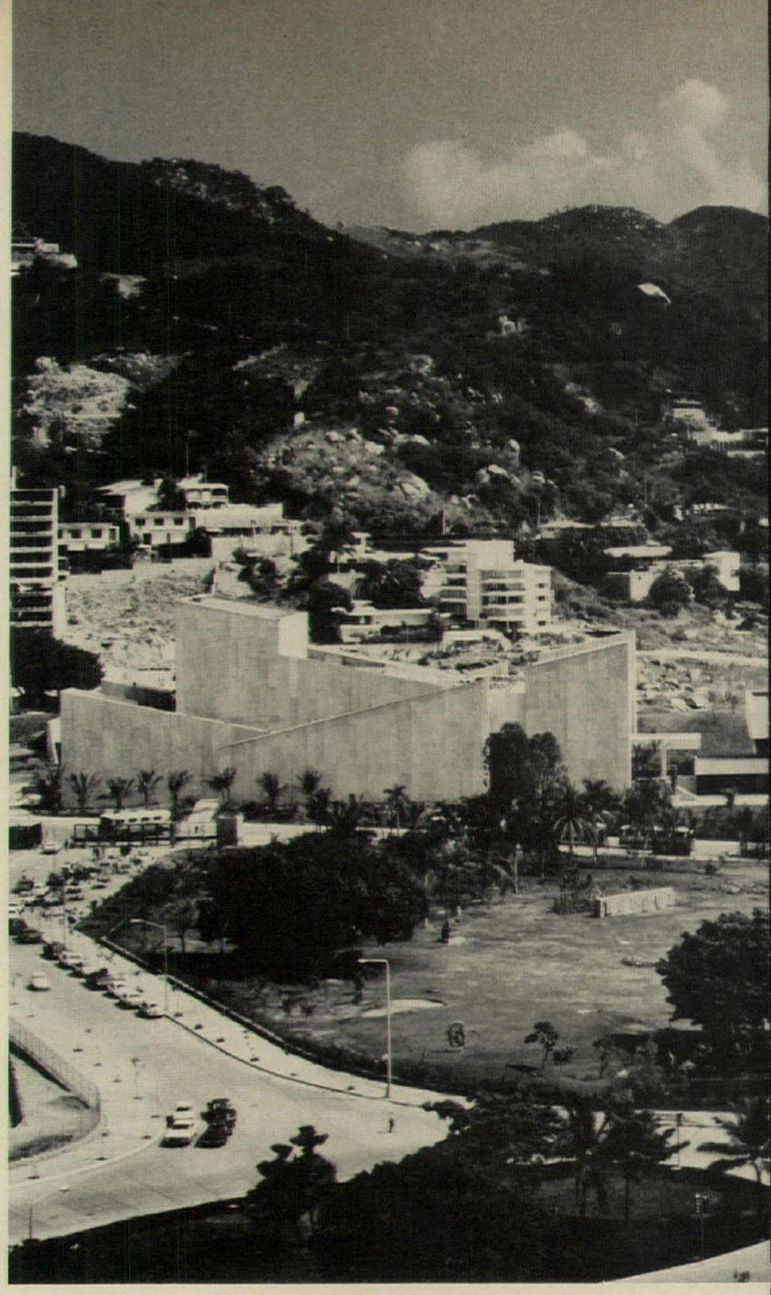
The "wide-open spaces" produced by circulation areas exposed to the breeze and the roofless roof of the entrance (photo, above) are uniquely practical in favored climates. But this Mexican government-sponsored project embodies a concept which may be applicable anywhere: by combining and mixing uses, commercial income can pay for normally unaffordable public amenities. And in Acapulco, the concept has produced the first stage of new development according to a town plan which is designed to recognize a local future of inevitable change. —*Charles Hoyt*

Acapulco has, of course, long been known internationally as a resort for those individuals who could afford it, and its development—up to now—has progressed along a sunny path of minimally controlled expediency. The pressure for growth has produced the congestion and ever-increasing building heights—with a surviving spatter of local character—which has spoiled many less favored towns.

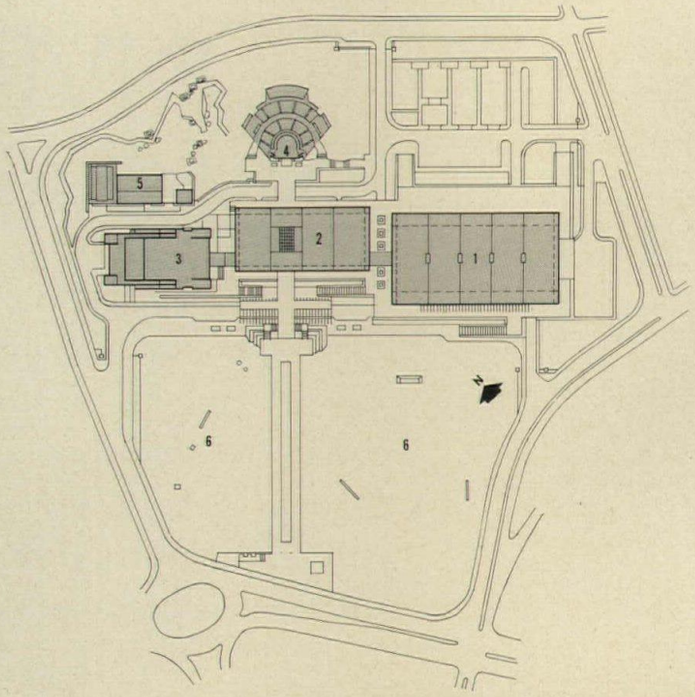
The emphasis is now switching from the individual to the "package-group" tourist. To cope with the adjustment, a new plan has been developed, and its first increment is the Center, which recognizes current needs in a variety of ways:

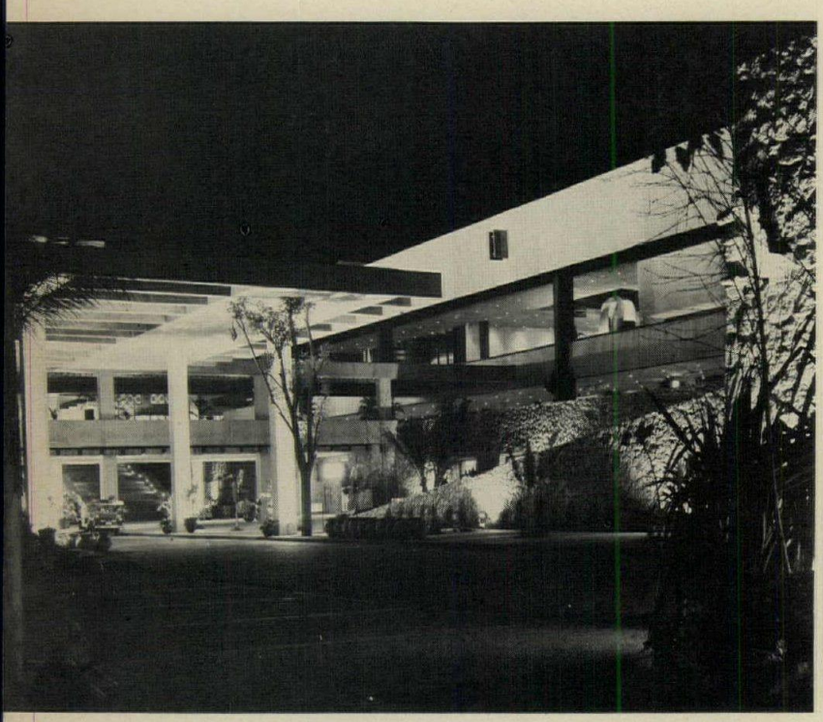
The building will capitalize on the new influx of tourism by providing entertainments and exhibitions for large groups—including those from cruise ships in the harbor, and the economy of the town and the Center will gain a new dimension from commercial groups seeking to house conventions. While the effect on the town of encouraging further groups of tourists may seem debatable, the Mexican Government feels that it is recognizing realities, and is giving the local residents something in return: previously unavailable facilities for local social, cultural and athletic events. The local benefits are accomplished by providing architectural flexibility to accommodate both commercial and the residents' demands in the same spaces.

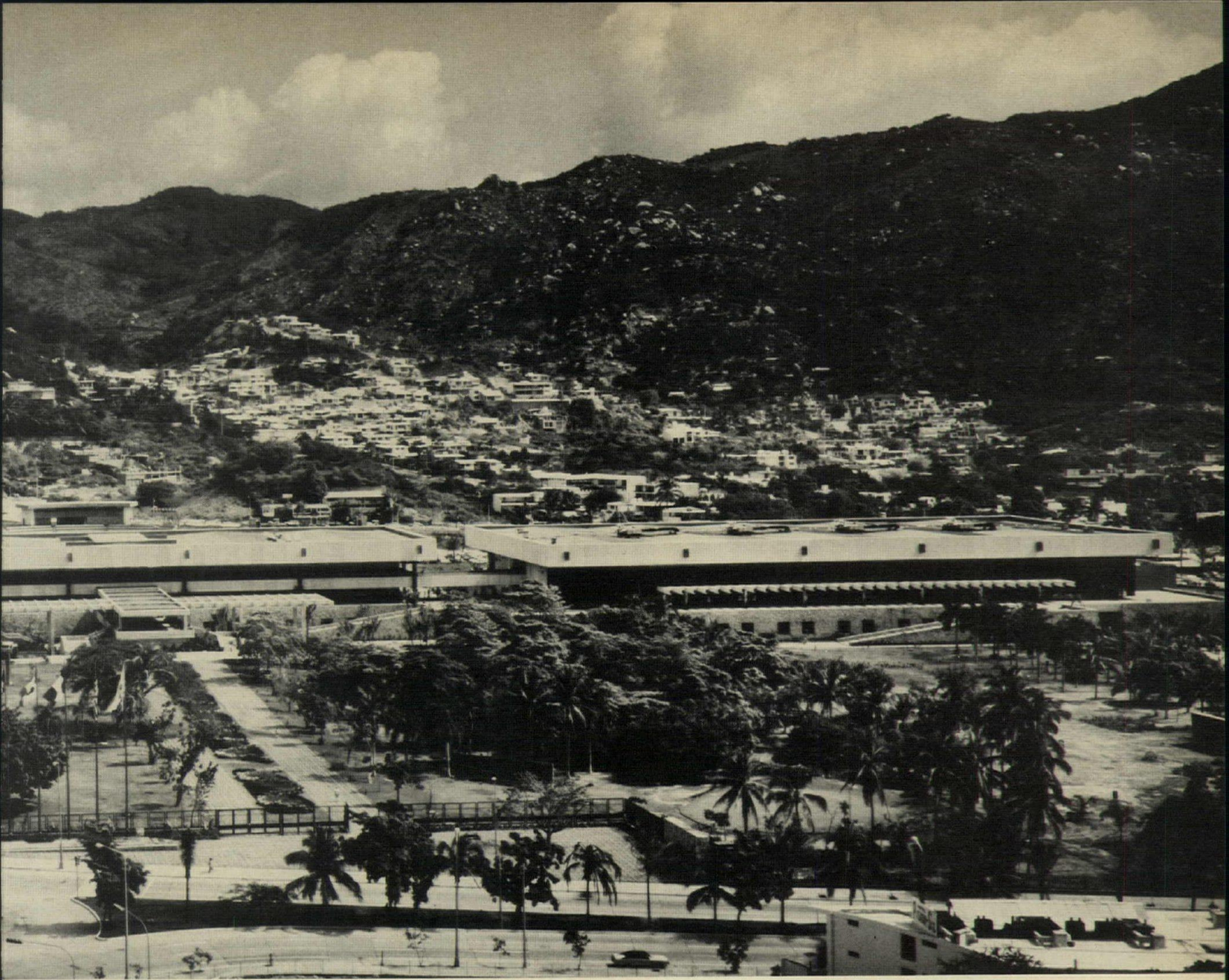
The Center's most important contribution to Acapulco has been the preservation of most of the open greenspace of a 35-acre golf course which once occupied the site and saved it from high-rise encroachment. (It is now developed as an "archeological garden" where reproductions of pre-Columbian sculpture are intended to induce tourists to see the real sites). But the new construction is not unobtrusive. There are actually five buildings joined by roofed circulation terraces comprising over 600,000 square feet of covered floor area. Nearly 15,000 persons can be seated in the various halls at one time. The Main Hall, "Teotihuacan," holds an audience of 7,500 (far right, aerial photo and site plan). Under it there are a parking garage and a second hall, "Cholula," which is over half the size of the one above. The central building houses the main entrance surrounded by administrative offices, ancillary meeting rooms, and service functions which include audio-visual facilities, public restaurants, an infirmary and telephone booths which are specially equipped for international calls. Behind this building is an open-air theater which has 2,400 seats built into the natural terrain, and—to the left—is a slope-roofed theater.



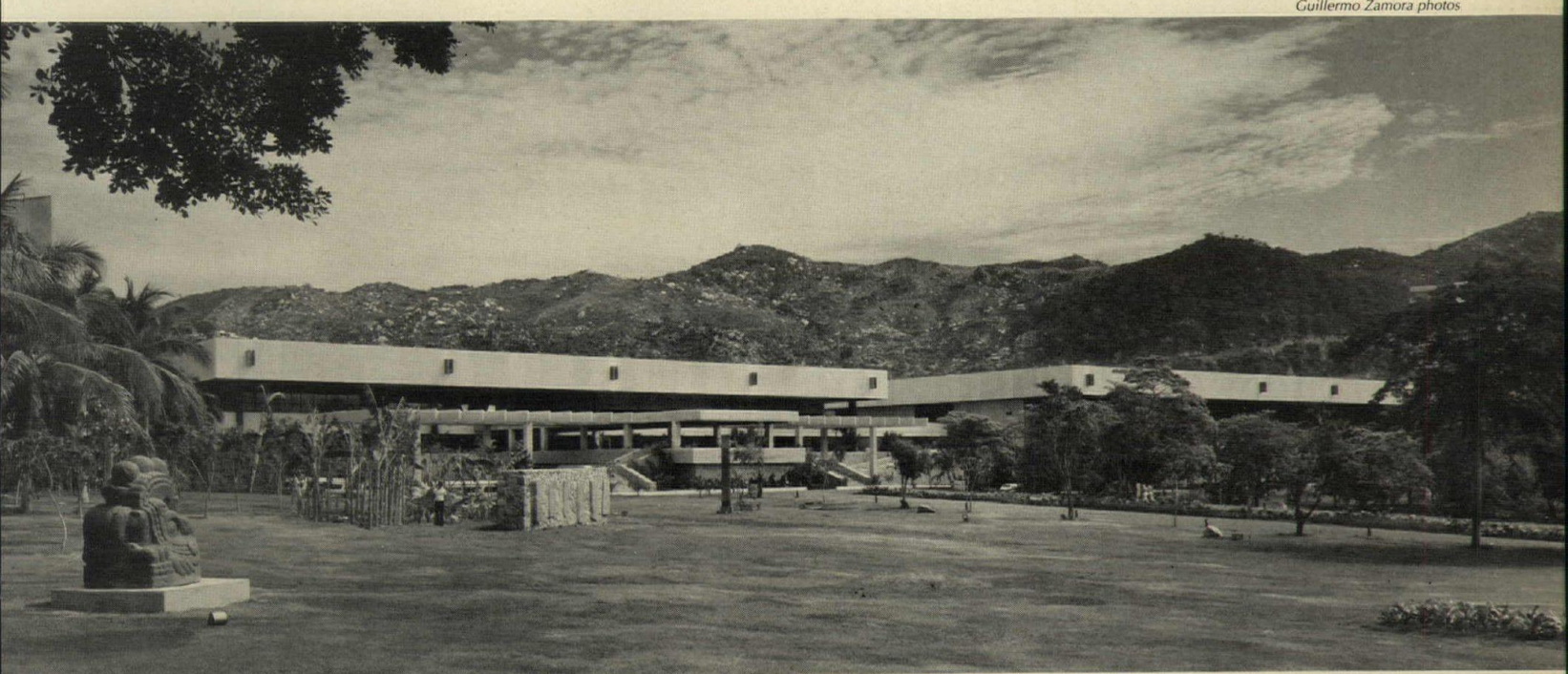
1. Exhibitions and main hall
2. Meeting rooms and convention facilities
3. Theater
4. Outdoor theater
5. Mechanical services
6. Archeological garden







Guillermo Zamora photos



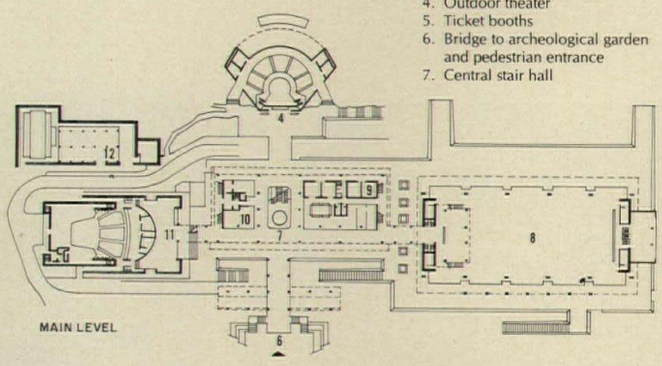
A small exhibition hall located in the central building (photo, right) has the appearance of—and indeed serves the function of—a museum, but its *"objets"* are for sale. This duality of public benefit and commercialism are the key to the way in which all of the Center's facilities become feasible—by making commercial facilities' functions pay for the public amenities. The seating for a large audience in the interior of the Main Hall can be replaced by tables for 3,500 banqueters served from kitchens on the level below, and over 250 booths can be arranged for commercial exhibitions. An exterior terrace, separated by glazed walls, can double the usable square footage and movable partitions can divide the interior space for multiple uses.

Is this architecture indigenous? Its assertive scale may be questionable in relation to the town in which it is built, but—despite an "up-to-date" appearance and construction methods—its form is appropriate to the climate, and its finishes and details are indigenous for its region. The overhanging roofs of the two larger buildings strongly express their sheltering function of keeping out the rain and sun. Local finishes include the painted "Huichol" boards on the ceiling of the exhibition hall, stone sheathing and gray and red marble flooring which has alternating bonds of polished and hammered finish.

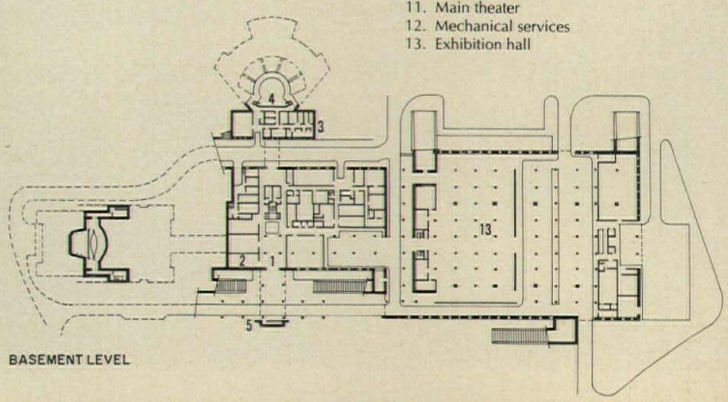
The mammoth project was completed in 13 months from the start of design to completion of construction. Conventional footings support a poured concrete structure to the main (second) floor level which is designed to support enormous live loads. Portions of this floor consist of pre-stressed units cast in the plant while a steel superstructure was erected to support the levels above. Opaque wall sections of the main floors and the fascia of the roof are precast concrete. Decks above the main floor are concrete-filled metal pan forms on steel joists, except the roof of the main hall which consists of steel beams spanning 160 feet between supports and placed on 80-foot centers. These are covered with concrete double T beams.

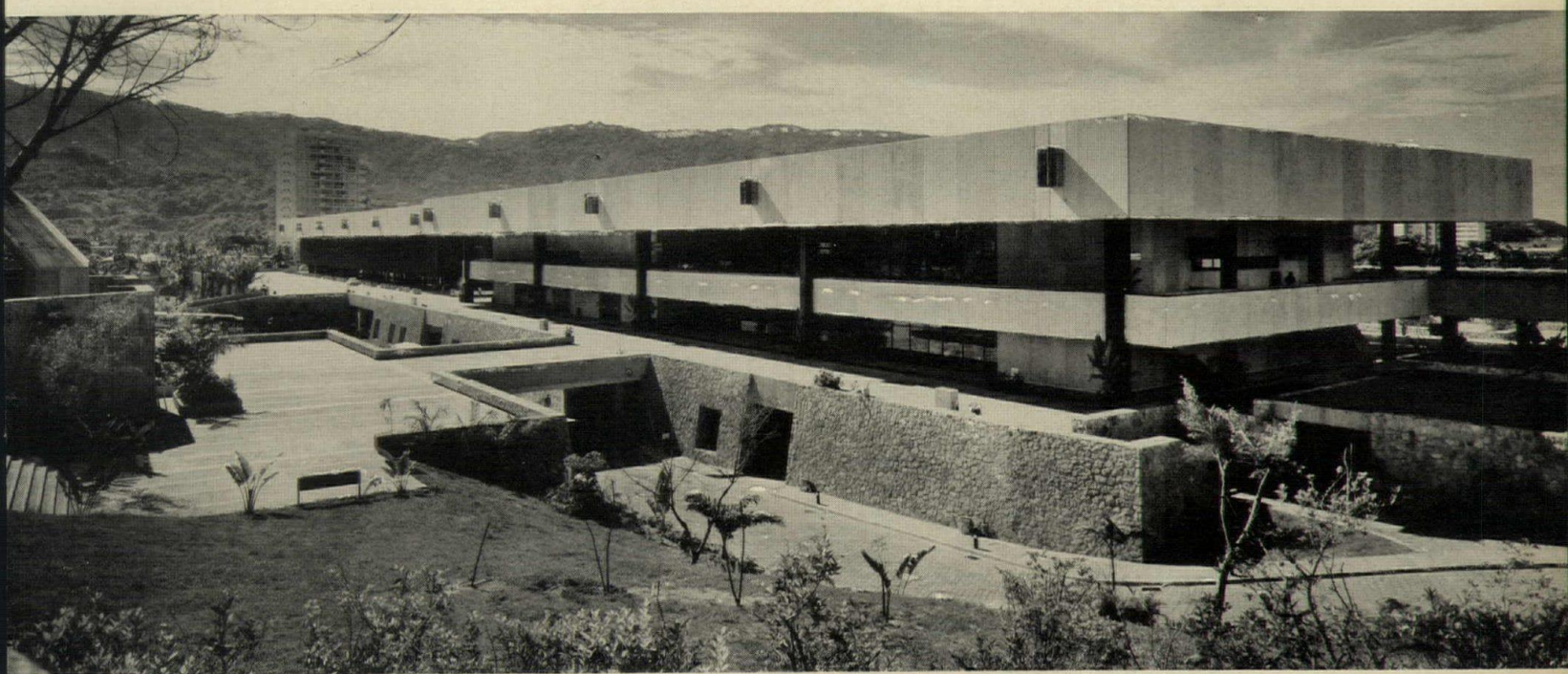
CULTURAL AND CONVENTION CENTER OF ACAPULCO. Architects: *Pedro Moctezuma: general director; V. Martínez, M. Camino, A. Charles and A. Torá, design and construction coordinates; García Formentí, Nenclares y González Pozo, designers.* Engineers: *Colinas de Buen* (structural); *Gutiérrez Tello y Cía* (foundation-soils); *S.I.M.* (mechanical); *Ingeniería Paparelli* (electrical). Consultants: *Fernando Oviedo—Angel Electrónica* (acoustics); *Julio Prieto and Alejandro Prieto* (theater); *Noldi Schreck* (interiors). General contractor: *Constructora Ballesteros.*

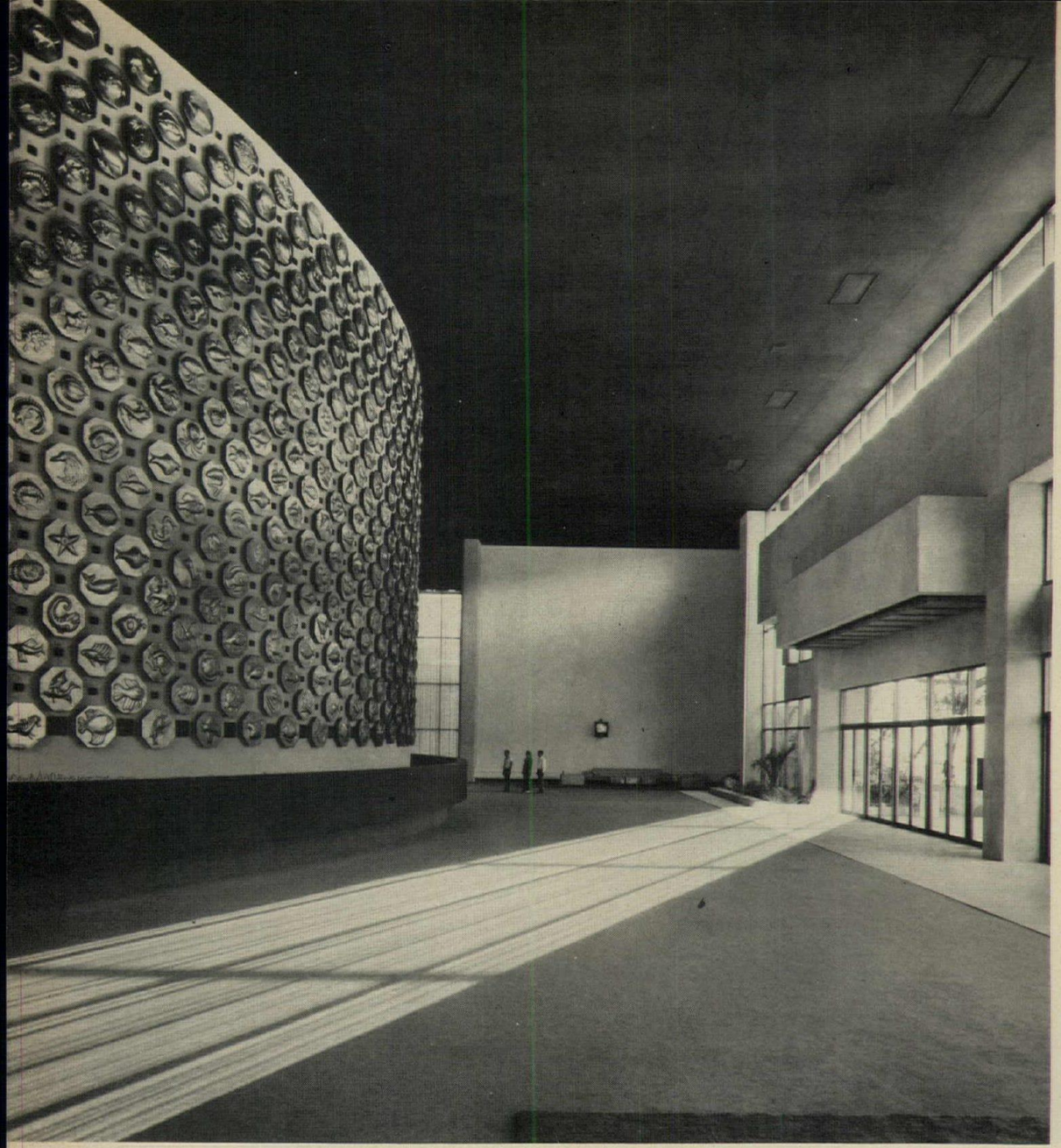
1. Main lobby and sculpture
2. Support facilities
3. Support services—to outdoor theater
4. Outdoor theater
5. Ticket booths
6. Bridge to archeological garden and pedestrian entrance
7. Central stair hall



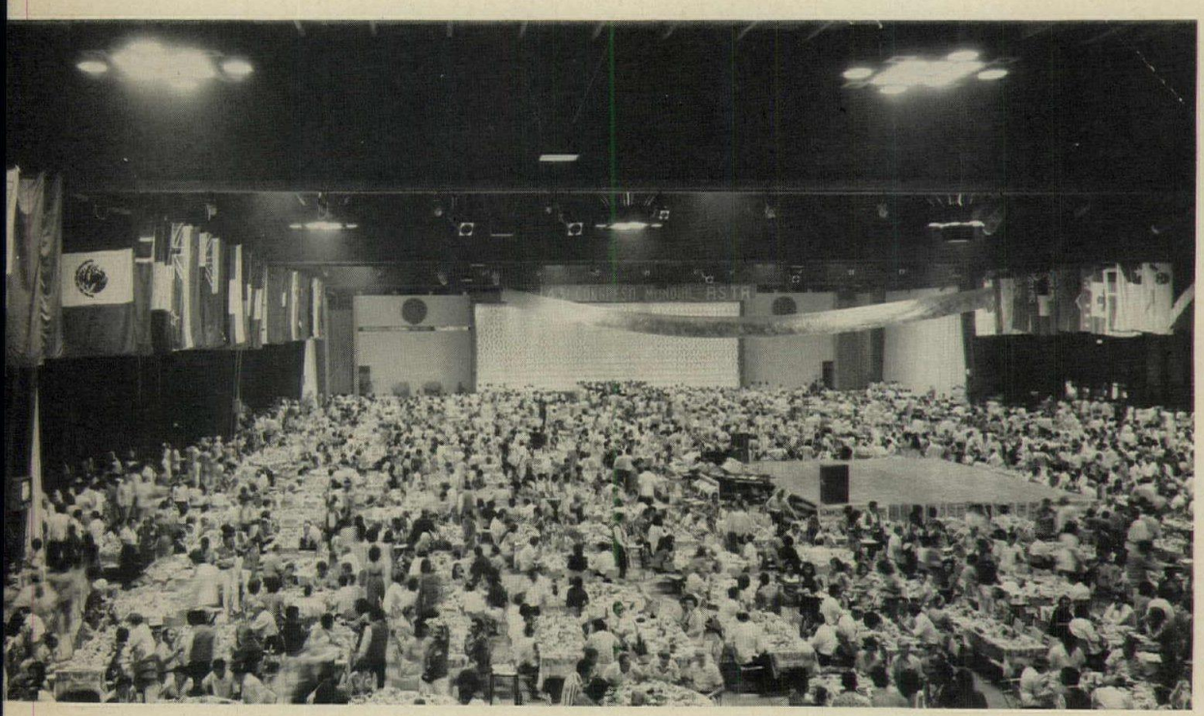
8. Main convention spaces
9. Small lecture rooms
10. Exhibition and sales
11. Main theater
12. Mechanical services
13. Exhibition hall







The lobby of the theater contains a curved wall decorated with copper plaques. In the bottom photo, the main hall is arranged for an evening banquet. The exposed structure is muted by lighting aimed downward. During the day, the two long walls admit low-level light through continuous glazing which allows views of the surrounding terraces and gardens beyond. A large roof-overhang screens the direct sun, while a metal grille and hanging flags provide additional baffling. All of the halls have flat floors to provide flexibility, and site lines for staged presentations are adjusted by movable bleachers.



NEW PRISONS REFLECT NEW REFORMS AND NEW ATTITUDES

The correctional institutions shown here—one for the state of Alaska, the other for the Federal Bureau of Prisons in California—show how penological thinking has changed to allow for a humane environment directed toward real rehabilitation of offenders.

At Eagle River, Alaska, a new and humane environment at the state's South Central Correctional Institute has a significant part in programs aimed at social reintegration

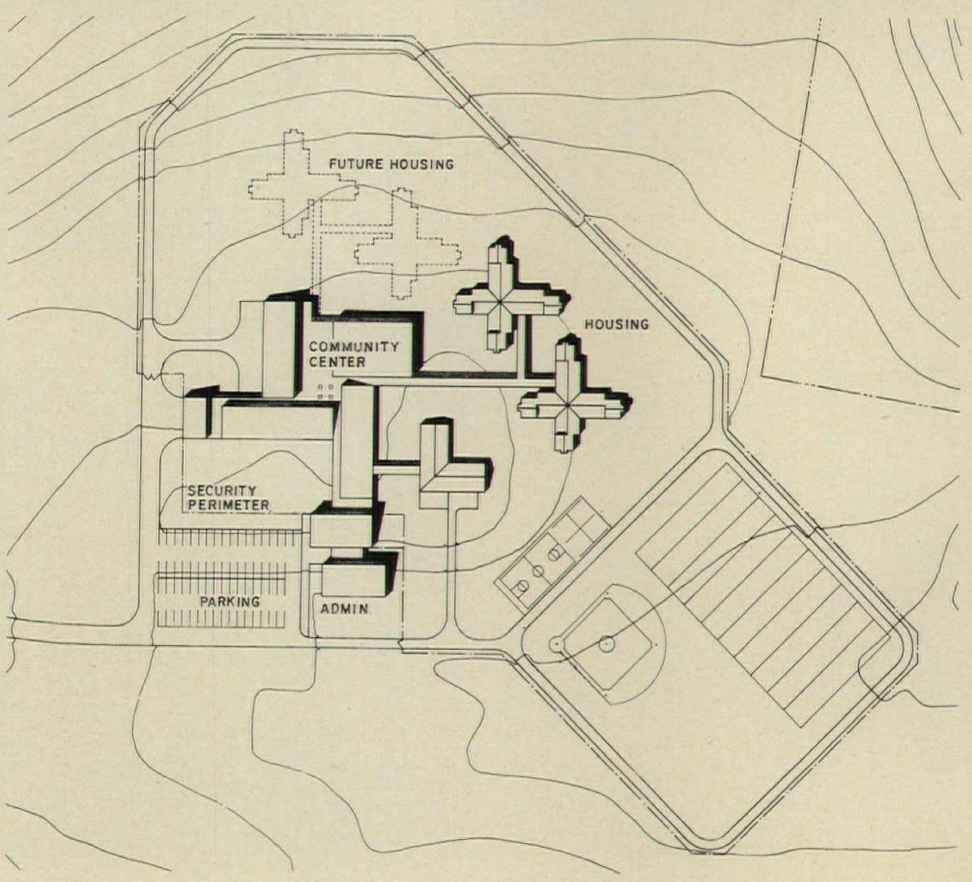
Prison environments have almost never been designed as positive elements of an over-all program directed toward the eventual return of the offender to his community, and indeed, prison programs have not been based in a belief that such reintegration is possible. But slowly, over a good many years, the idea of prison reform has taken hold and now programs and the kind of prison buildings to make them fully implementable are beginning to be provided at both the state and Federal levels.

The new approach to prison treatment focuses on individualized programs of rehabilitation which will enable the offender to recognize and work out, with the help of counsellors, the problems which brought him to the correctional institution. Without minimizing the importance of medical and psychological/psychiatric treatment where needed, this new approach sets the individual on the path of self-responsibility as the first step to his return to the social context of the community. This is no longer a new philosophy of penology, but its implementation is new. Even newer is the recognition that a large part of the program's effectiveness is in the character of the physical environment within which the program takes place. What has happened to bring about this realization is that the dehumanized environment of the old-fashioned kind of prison simply did not lend itself to the methods of the new program, and that if the new program were to succeed, the participants—both inmates and counsellors—needed the physical set-up which would give reality to the principles of privacy and human dignity on which the programs are premised.

Programs of this kind and new buildings designed to make them possible are appropriate for minimum and minimum/medium security institutions. (The problems of other kinds of prisons with different degrees of imprisonment will undoubtedly be influenced by the experience with these lesser-security buildings, particularly as to size and number of inmates.) Increasingly, the preferred location is in or very near a city so that community resources—educational, for instance—can be utilized in the program.

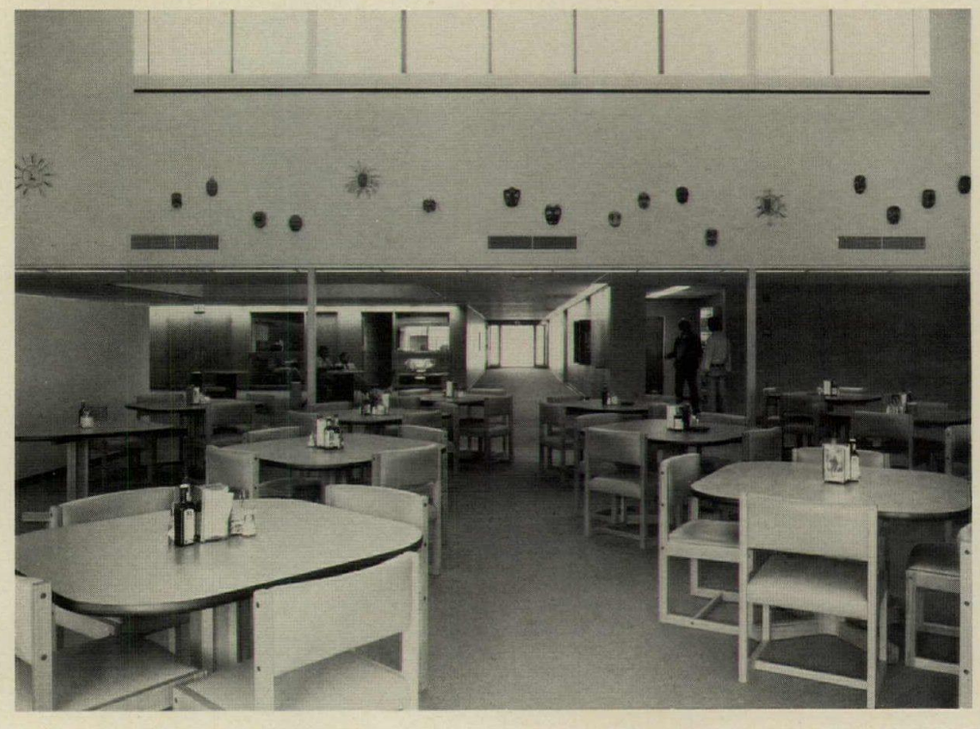
The new kind of environment looks more like a college campus, or a resort complex than a prison, and this may initially cause misunderstanding and criticism. Architects have instinctively felt that environment affects behavior; the proof of their belief may lie in this new kind of prison design.

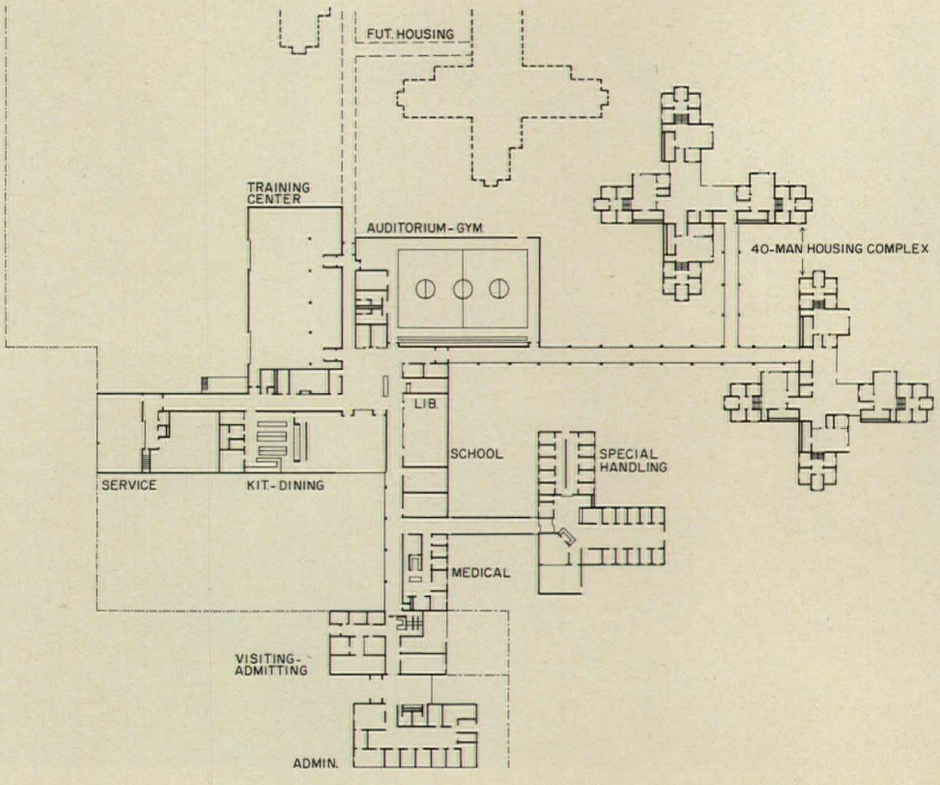
Kiku Obata and Steven Dunham photos



Outstanding among new correctional institutions, the South Central Correctional Institute at Eagle River, Alaska, represents, in its radically different architectural concept, the new approach not only to prison design but to prison programs. The living environment that it provides is as nearly normal as possible, permitting small freedoms within the larger, necessary restrictions of the institution as a whole but providing, along with the counselling system, strong incentives to development by the offender of individual responsibility.

The site—virgin land with a muskeg ground cover and many small-diameter trees—is 13 miles north of Anchorage. The buildings are small and residential in scale and character, and the materials and forms used are non-institutional: wood and plywood siding, pitched and shed roofs, large windows (of security glass), single-story structures (except in the housing units which are split-level). Many of the trees remain, even within the perimeter fence, and the over-all effect is of a small private school or college campus. Covered walks connect the housing units and administration building. Inside the buildings, color is used to enhance the open, light character of the rooms, and goodlooking modern furnishings are used throughout. All sleeping rooms are single, with a living room for each 10-man unit (a number which the staff can handle and counsel), and a quiet room with adjacent counsellor's office. Each housing unit has rooms for 40 men and the staff responsible for custody, counselling, education, work and recreation of the unit's inmate residents. Since each inmate must choose to participate in the system's community reintegration program and some do not immediately do so, a maximum security Special Handling Unit, located between housing and administration, houses them until they either complete their terms or are willing to accept the requirements of the program. The choice is left to the newcomer, located to see and hear the program in action.

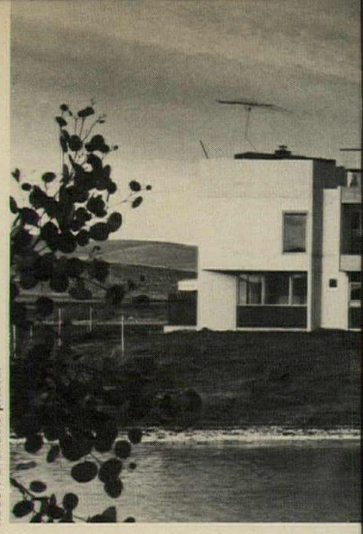




STATE CORRECTIONAL CENTER, Eagle River, Alaska. Architects: *Crittenden, Cassetta & Cannon/Hellmuth Obata Kassabaum—Gyo Obata, Daniel Gale, Kenneth Cannon, William Valentine, Patrick Leamy, project team.* Engineers: *Anderson, Bjornstad, Kane and Pregnoff/Matheu /Beebe* (structural); *Alaska Testing Laboratory* (foundation); *Ayres & Hayakawa and Crews, MacInnes & Hoffman* (mechancial/electrical). Consultants: *Surveys Inc.* (cost); *Flambert & Flambert* (food service). Contractor: *Bachner-Northwest.*

Alaska's problems, like its size and small population, are not the same as those of other states and major U.S. cities: 59 per cent of its convictions are for some form of public nuisance, but violent crimes also figure in its statistics. At Eagle River, most types of crimes are represented; here each man can be treated for two years (preferably the last two). The architectural concept of the housing unit is of prime importance in the rehabilitation program, giving inmate and counsellor maximum exposure to each other. Counsellor's office adjoins the quiet room. Staff and inmates eat together in cheerful dining room.

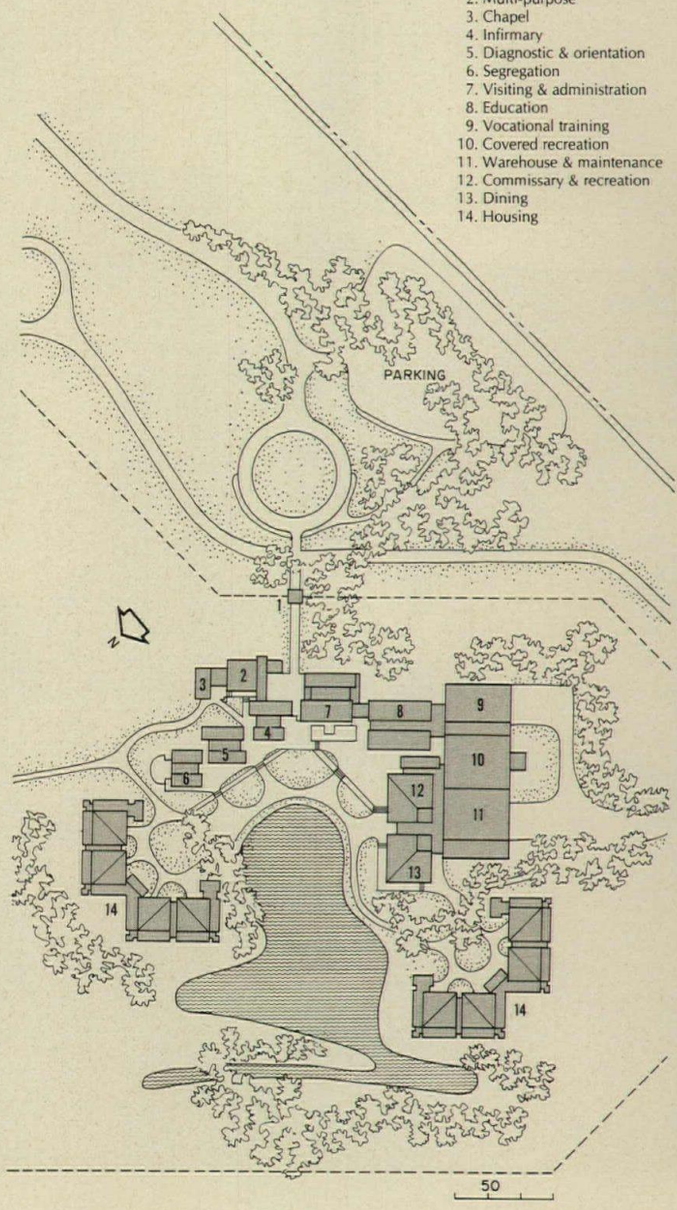
At Pleasanton, California, the Federal Bureau of Prisons demonstrates its new approach toward young offenders with a new kind of correctional center for all kinds of young offenders



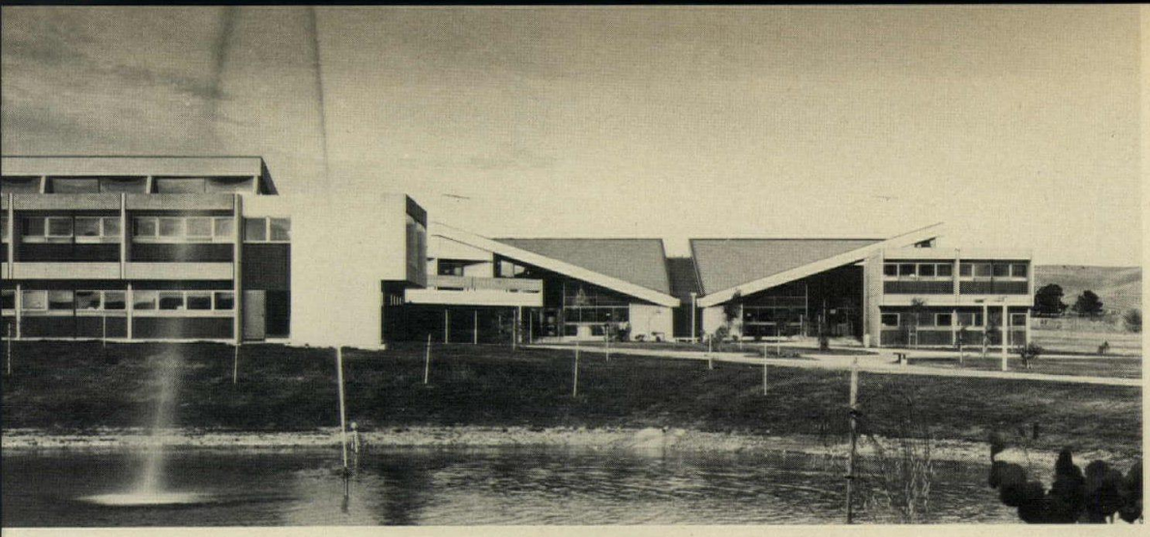
Robert Brandeis photos

The Federal Youth Center at Pleasanton, California, is the first of several regional youth correctional institutions built by the Federal Bureau of Prisons to plans which reflect the reforms in prison programs at this national level. The non-institutional look expresses the program emphasis on community reintegration for the offender and its over-all character indicates the age group to which those who are sent there belong: all are between 18 and 25, and their offenses run the gamut of human frailty. Their youth and their first-time status, however, give them better than average potential for rehabilitation and reintegration.

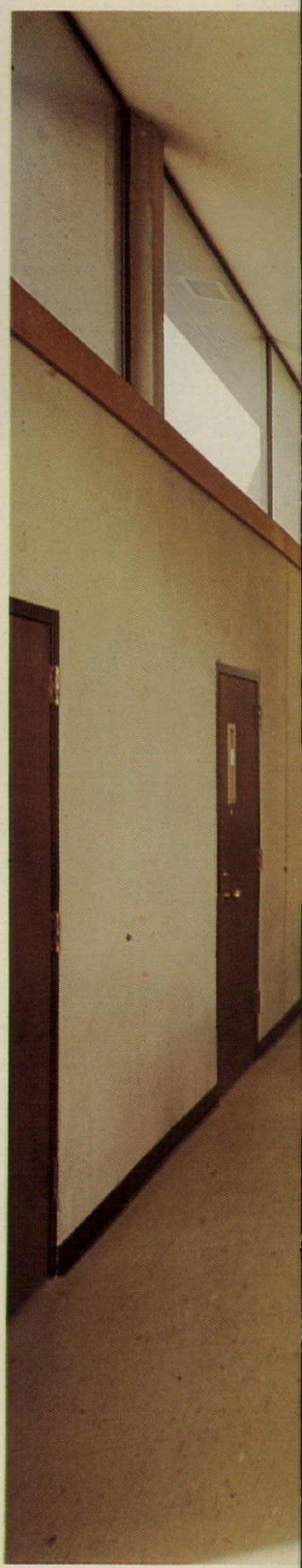
This is a minimum/medium security institution, controlled by perimeter fencing and an electronic detecting system, and television monitors inside, but without the usual conspicuous guard towers. The environment which results from the rehabilitation program and its implications permits, within certain restrictions, more normal living conditions than the old type of prison. This "village" planned around a man-made lake on an almost featureless 87-acre site 30 miles from San Francisco, consists of two 120-person housing units and the necessary core facilities: admission and administration, education and training, dining and recreation. The heart of the "village" and of the program is the 30-person housing sub-unit, where direct contact between counsellor and inmate takes place on a continuing basis, with the counsellor and the program the main deterrents to security problems. Sub-units may be combined to function as a unit for a specific rehabilitation program. Vandalism to date has been minimal, inmates showing an exceptional regard for the buildings and grounds. The materials used are atypical for prisons: wood frame with redwood plywood, built-up roofing and asphalt shingles on the core facilities; reinforced concrete block and precast concrete floor and roof decks. Laminated security glass is used throughout, affording vistas to courts, to lake, and to distant foothills.

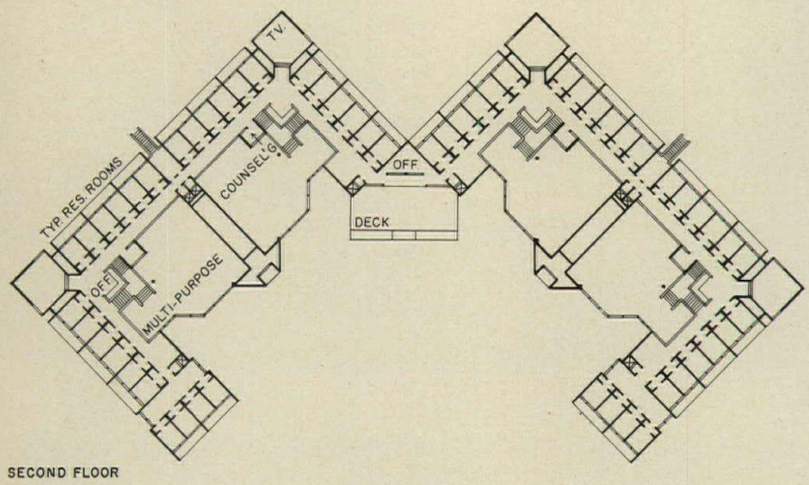


FEDERAL YOUTH CENTER, Pleasanton, California. Architect: *Frank L. Hope & Associates—Edward J. Gee, project architect; Austris J. Vitols, project designer.* Engineers: *Frank L. Hope & Associates* (structural); *Lowney-Kaldveer Associates* (foundation); *Marion, Cerbatos & Tomasi, Inc.* (mechanical/electrical). Landscape architects: *Michael Painter & Associates.* Consultants: *Perini Corp. and URS/Cahill Construction Co.* (construction manager); *The Koch Co.* (cost). Contractors: *Overaa Construction Co.* (foundation); *Johnson & Mape* (shell and finish).

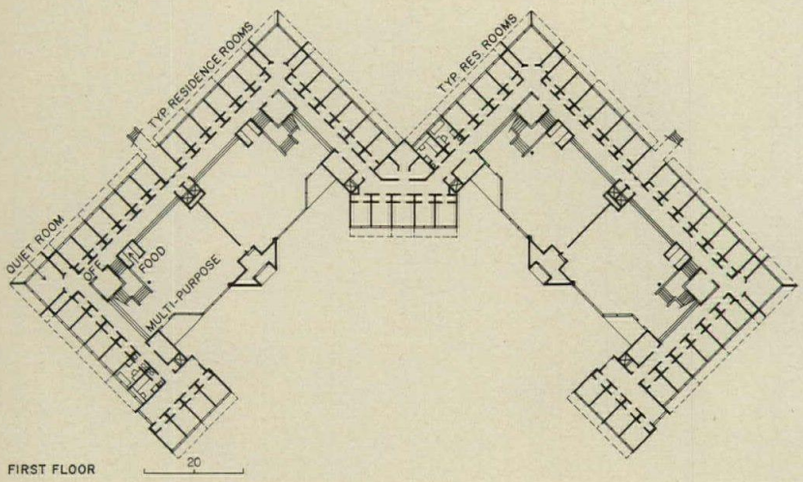


Each feature of the complex is effectively a part of the institution's program, and contributes either subtly or openly to the individual inmate's eventual rehabilitation. The lake, for instance, on which all buildings focus, is man-made, created to heighten the humanizing experience of the place. The site—an old army camp used during World War II, and unused since—is almost completely flat but has a view of the distant foothills. The views from the buildings, whether distant or near, are always of something worth looking at, in contrast to the kind of outlook possible from the old-fashioned prison.





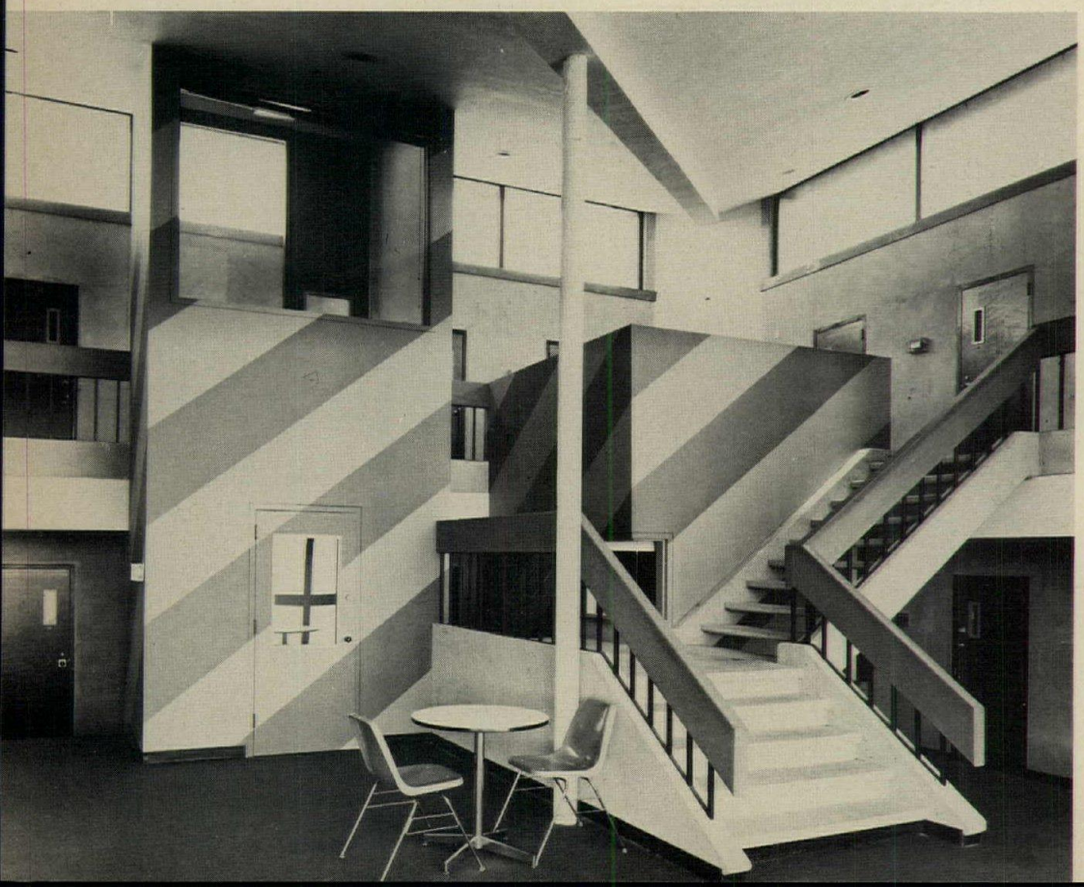
SECOND FLOOR



FIRST FLOOR

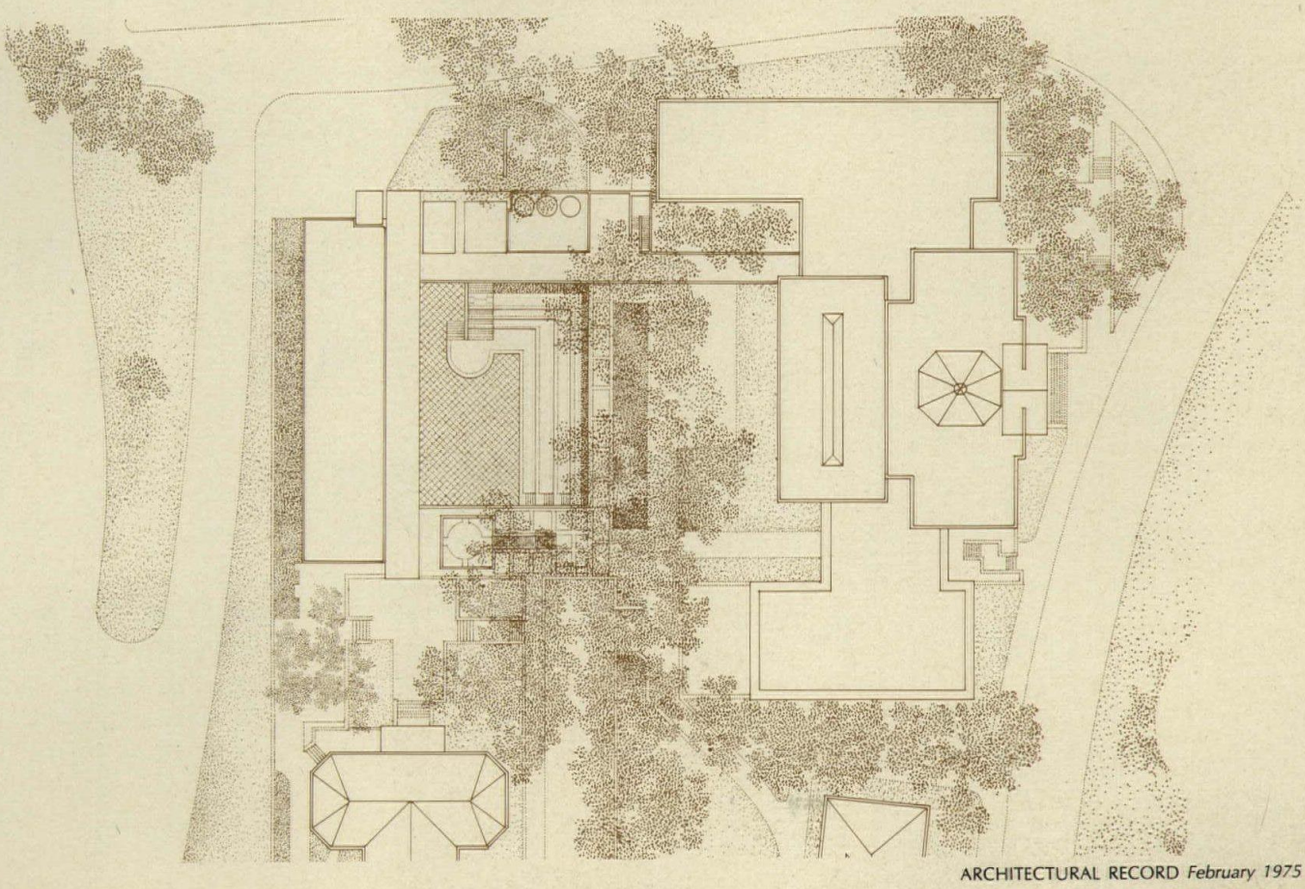
The housing units are designed to promote the sense of community which is so important a part of the reform program, and at the same time to preserve a sense of privacy for the individual. Accordingly there are single rooms for each inmate, arranged on two levels off the day or "living" room. Offices for correctional officers, who are also counsellors are located in each housing unit, and interior surveillance is by television cameras rather than by guards. Two housing units have been built, each consisting of four 30-room sub-units. Additional sub-units can be added. Although the over-all character of the units is residential, it is more in the character of a college dormitory than a private house. Nevertheless, as much as possible, the feeling of individuality and of community is provided in the furnishings, wall-to-wall carpeting, color and in the shape and proportion of the big room itself, with its floor-to-ceiling glass wall (which, in some units, permits a view toward the lake) and the glass-enclosed sally-port (doorway). The "tower" element beside the stairway has a canteen on the first floor and a counselling room on the second.

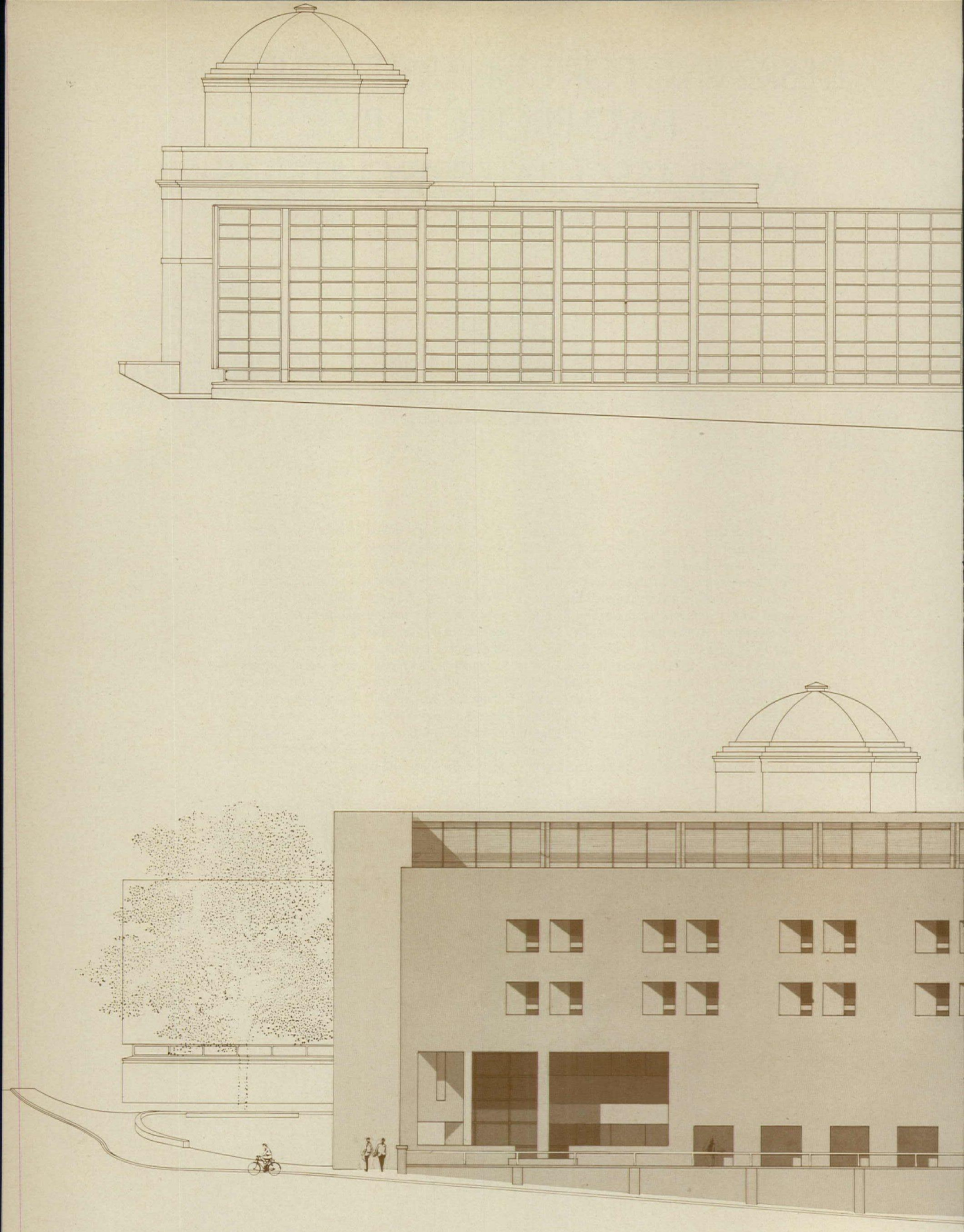
Dining facilities at Pleasanton are informal in character, in keeping with the overall program, and particularly with the "menu-selection" manner of meal service. The appearance is, in fact, that of a high school or college cafeteria, particularly appropriate here, since the "residents" are all between the ages of 18 and 25. Color, with the earth colors predominating, is used throughout the common areas either in super graphics on walls or in the furnishings. The exposed wood ceiling in the dining area accentuates the "outside world" environment which is a constant reminder of the rehabilitation program's goal.

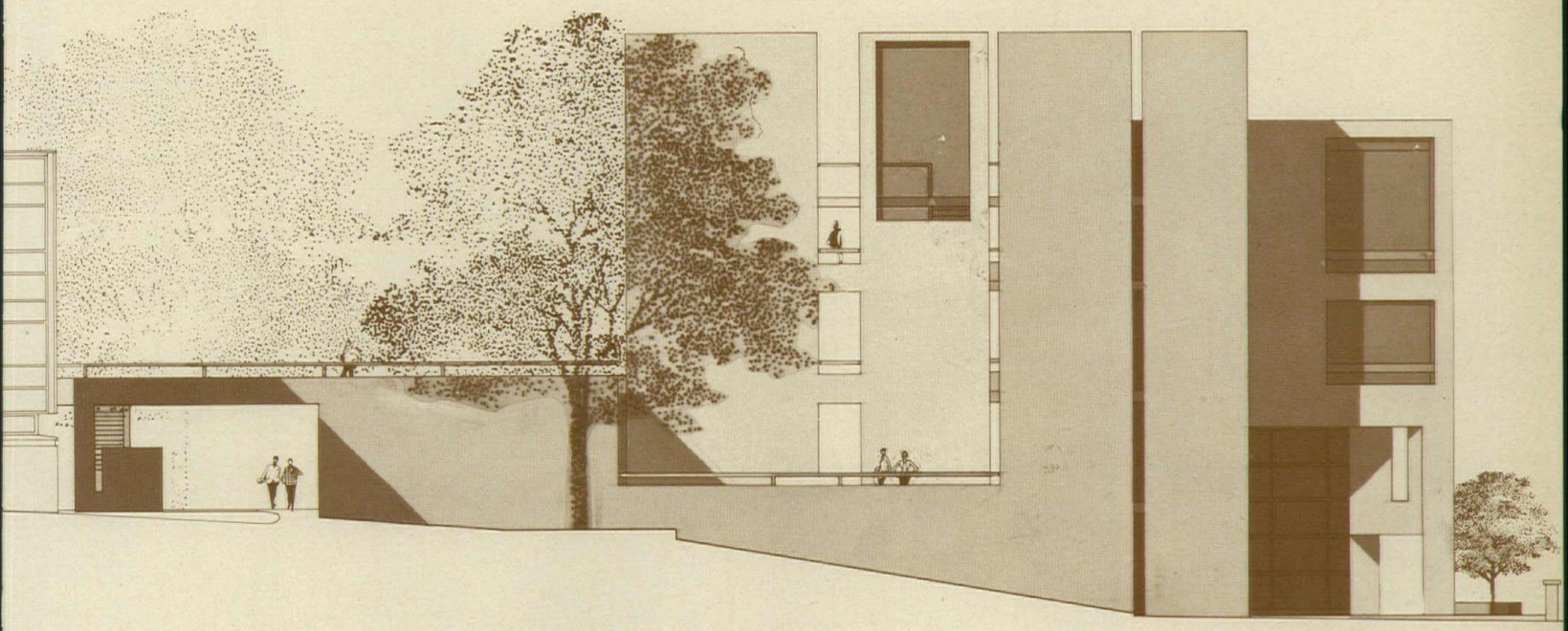


DESIGNING FOR UNIVERSITY CLIENTS: TWO PROJECTS BY WOLF ASSOCIATES ARCHITECTS

Wolf Associates, an energetic architectural firm based in Charlotte, North Carolina, has achieved a solid and enviable reputation for its finely detailed architectural interiors and for a number of small, freestanding buildings designed with a sufficient crispness and flare to call attention to themselves (see RECORD, June 1973, pages 111-120). By contrast, two of Wolf Associates' current projects shown on this and the following pages—an addition to the School of Design at North Carolina State University, and an Office/Classroom building for the University of North Carolina at Charlotte—respond not only to larger and more complex programs, but also to more stringent requirements of context. The firm's designers seem fully to appreciate the obligation that a building has not just to itself but to adjacent buildings, to the landscape, and to the patterns of movement of people. The two buildings shown here are handsomely and carefully designed, but they are also surprisingly modest in appearance. Neither asks particularly loudly for attention, and both make significant gestures of reinforcing the qualities of the places where they will be built. The very modesty of these buildings belies in part the extensive and methodical histories of their design—histories which are recalled in the descriptions that appear on the following pages.





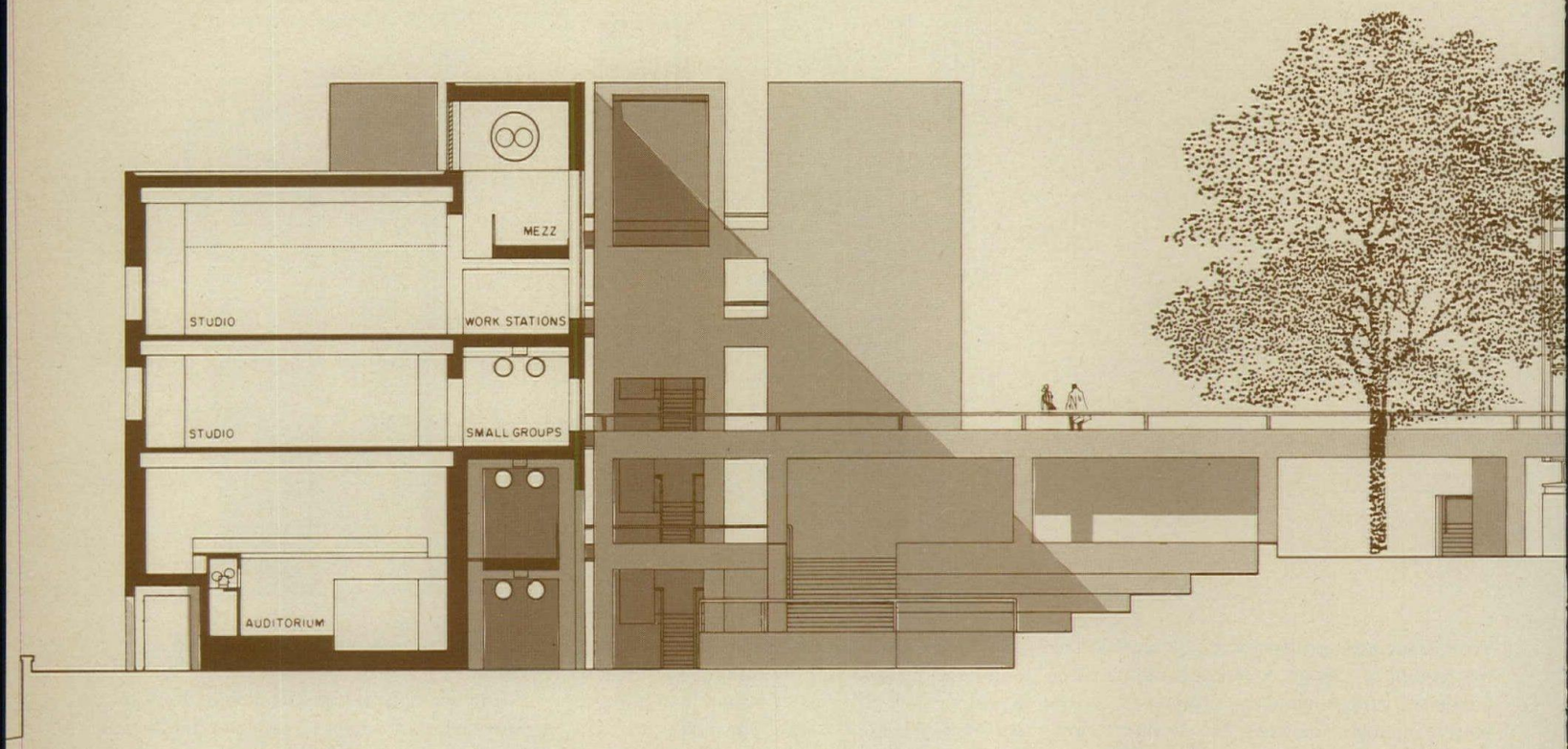


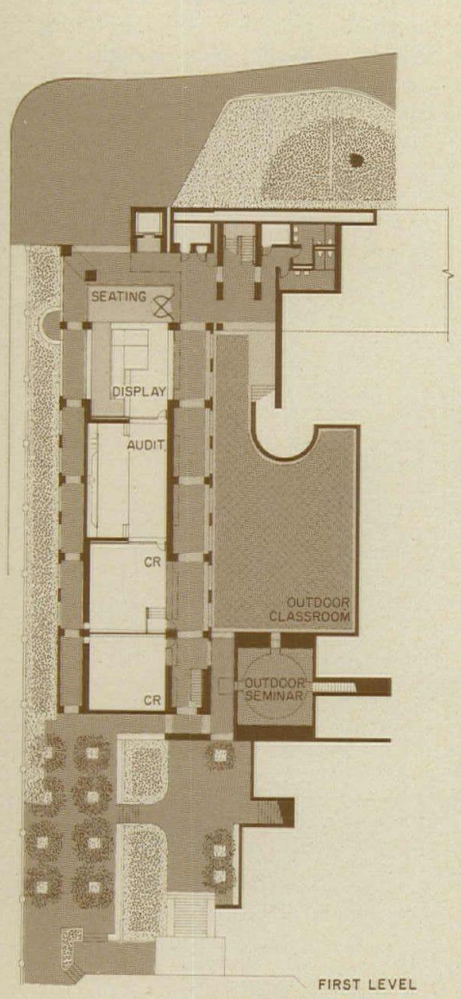
Wolf Associates' project for a new addition to the School of Design at North Carolina State University at Raleigh is the product of an extensive dialogue between the architects and the students and faculty of the school. The dialogue concentrated on three generally distinct areas of concern: those of the new building's place in the over-all plan of the university campus, its interior programmatic requirements, and its "image"—a term used by the architects and their clients to describe what the building might feel like to be in, or be next to, and what well-liked architectural precedents it might recall.

The original School of Design is an early twentieth century neo-classical building known as Brooks Hall; in the mid-1950's and again in the mid-1960's Modern wings were added to the north and south of the original building, and, more recently still, the school expanded into various adjacent buildings on the campus. The students discovered that they liked these latter buildings enormously —"found spaces," they called them—for their qualities of space and light, for their faintly old-fashioned air, and for their irregular disposition, which contrasted sharply with the monotonous regimentation of the Modern additions to Brooks Hall. Thus these "found" spaces became one of the critical ingredients in the stew of images the new addition was called on to develop.

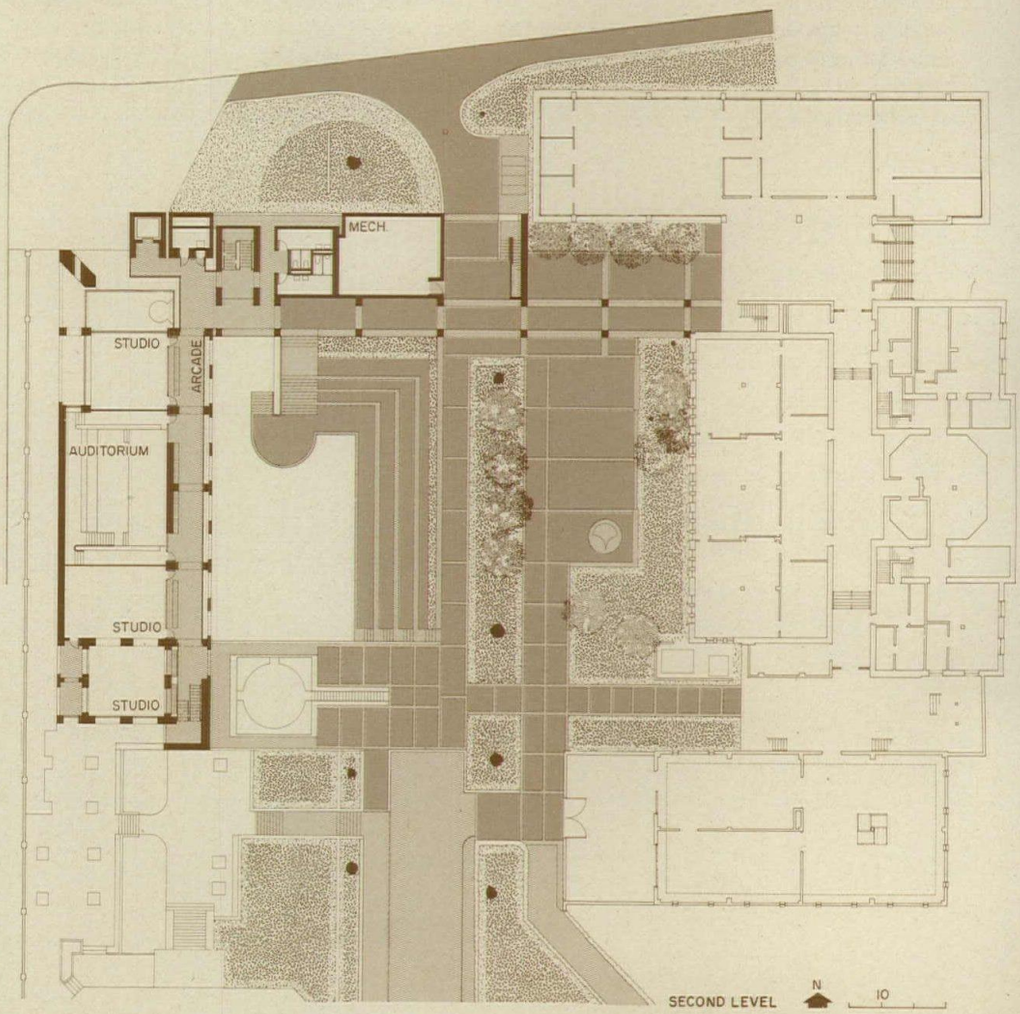
Another critical ingredient was the form and the stylistic trappings of admired buildings from many different times and places. A large assortment of photographs and drawings—mainly of older buildings, it turned out—was assembled, and an attempt was made to discover which images were preferred.

Meanwhile the faculty and students solicited a host of programmatic requirements—some of them random, or conflicting, or sufficiently imagistic to be included in the process described above—and they assigned to each of these a priority. The architects in

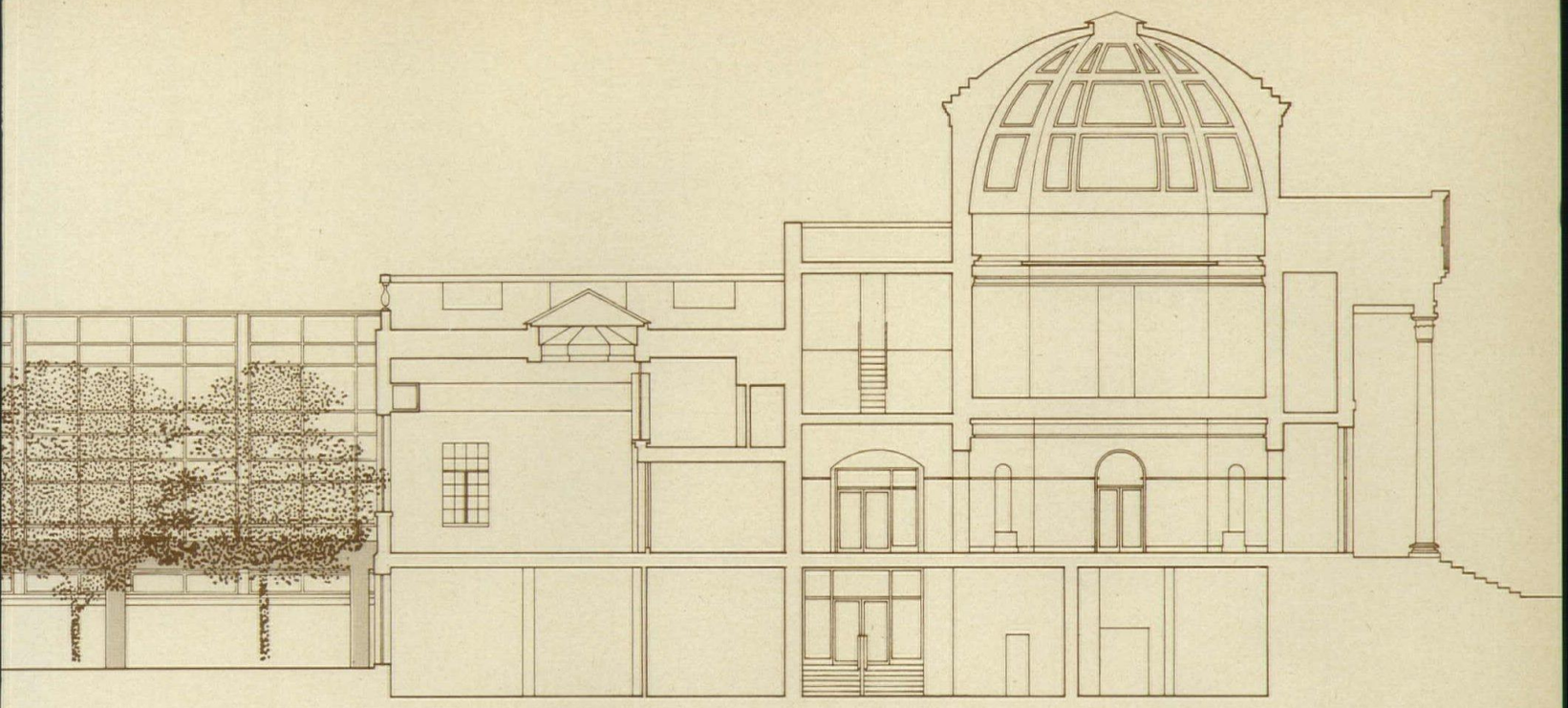




FIRST LEVEL



SECOND LEVEL N 10

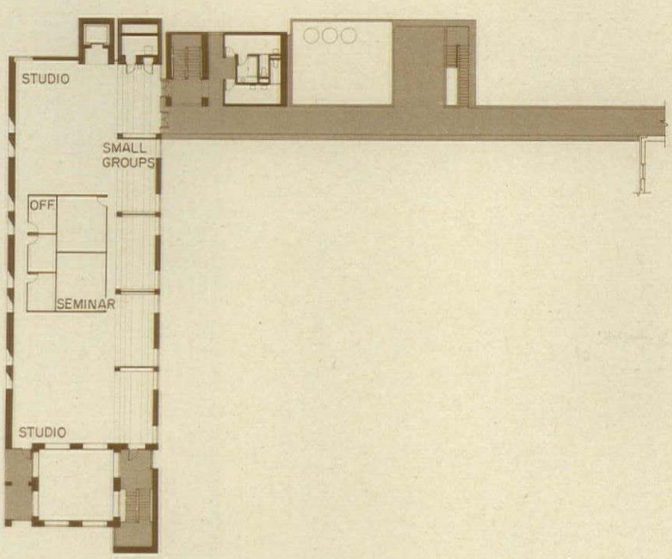


turn converted this collection of wants into an actual square-footage program.

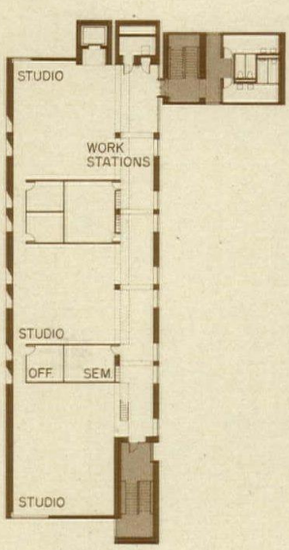
Wolf Associates' first scheme then turned out not to be a new building at all, but an extensively hollowed-out renovation of an older building on the site proposed for the new addition. It was reasoned that the required spaces could be provided in this way, that there would be ample chance to reproduce the "found" spaces the students liked, and the historical image that was desired.

The first scheme, however—like the second and third schemes, which called respectively for the renovation of an adjacent building and for the preservation of only the facade of the building in the first scheme—had to be abandoned because of cost projections and because of predicted difficulties in negotiating such a project through the usual state agencies (though, according to the architects, the climate has changed enough in the year since abandonment that a preservation scheme would fare better now). Thus the final scheme, shown on these pages, is an altogether new building made of precast concrete with a brick skin. Irregularly sized windows, doors and gateways are punched through walls that are apparently thick (to recall older ways of building). On the outside there are different kinds of elevations depending on which side the building is seen from, and on the inside there are different kinds of spaces juxtaposed, as, for instance the small mezzanine and the two-story studio shown in the section above and in the plans below. The siting of the new building rests on the ambiguity of containing the outdoor space between it and the older buildings while remaining open to existing patterns on pedestrian circulation through the site.

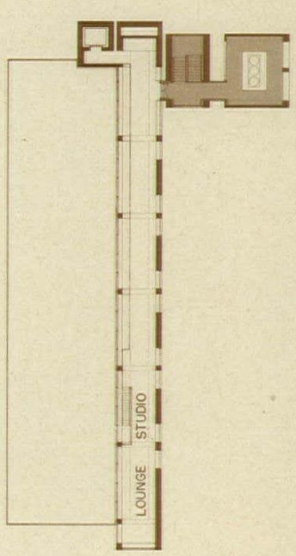
SCHOOL OF DESIGN ADDITION, North Carolina State University, Raleigh, North Carolina. Architects: *Wolf Associates—design team for this project: Marley Carroll, Harold Ogburn, Chaturong Chaisupranond.* Engineers: *Frank B. Hicks Associates* (structural); *Bullard/Austin* (mechanical/electrical).



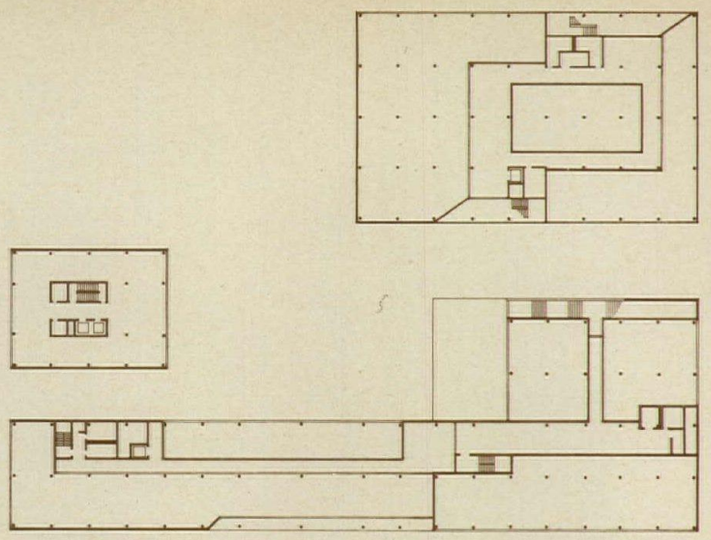
THIRD LEVEL



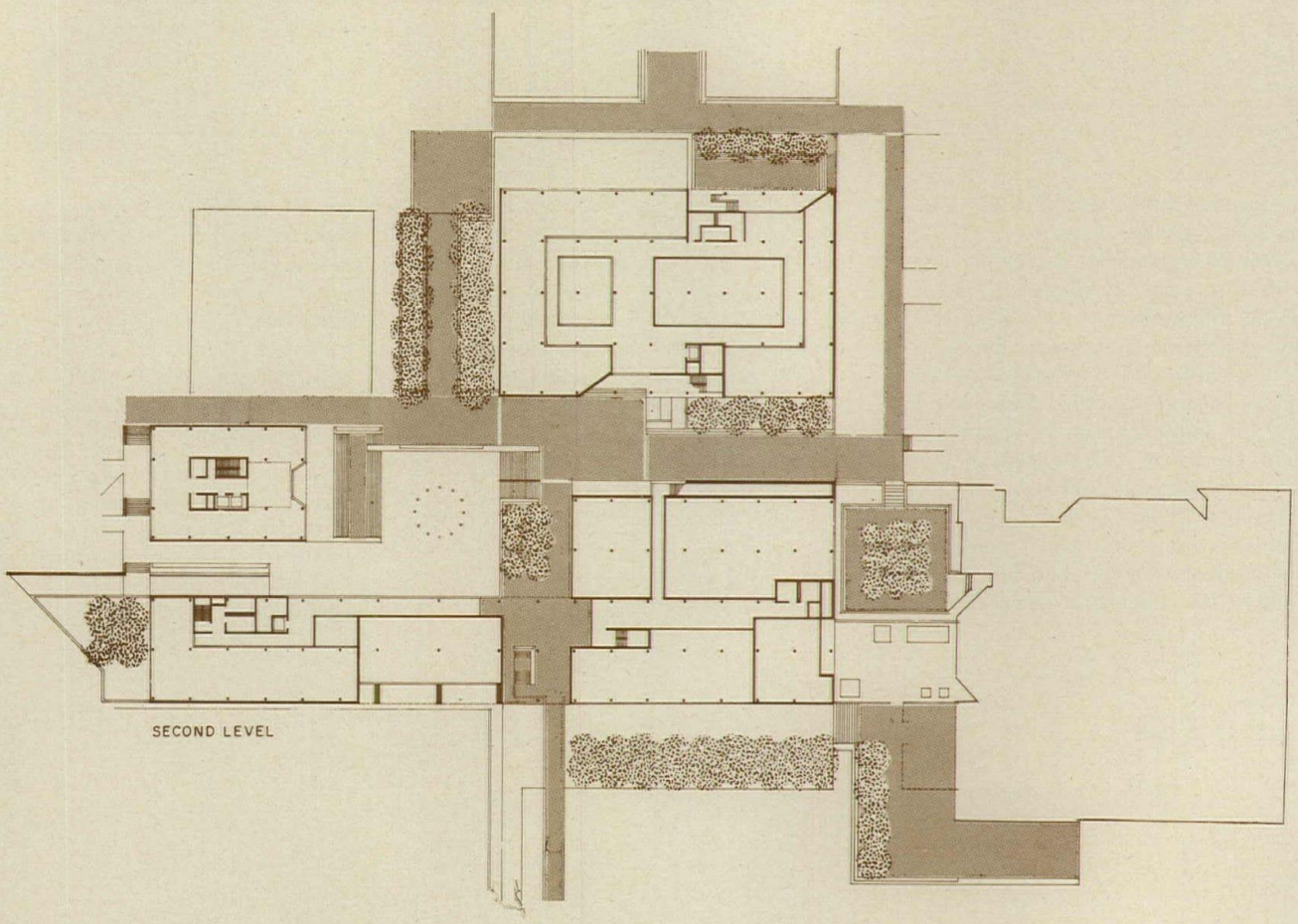
FOURTH LEVEL



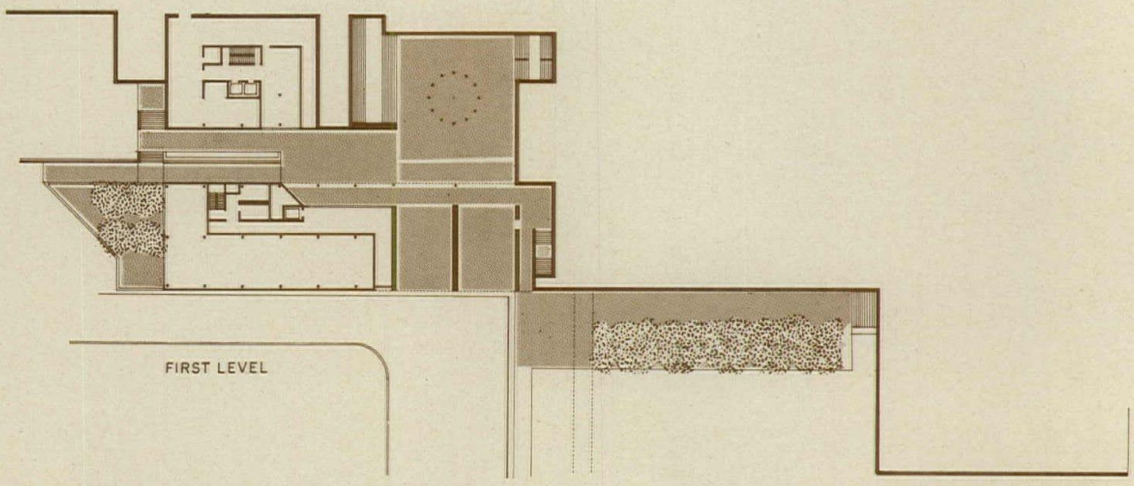
FOURTH LEVEL MEZZANINE



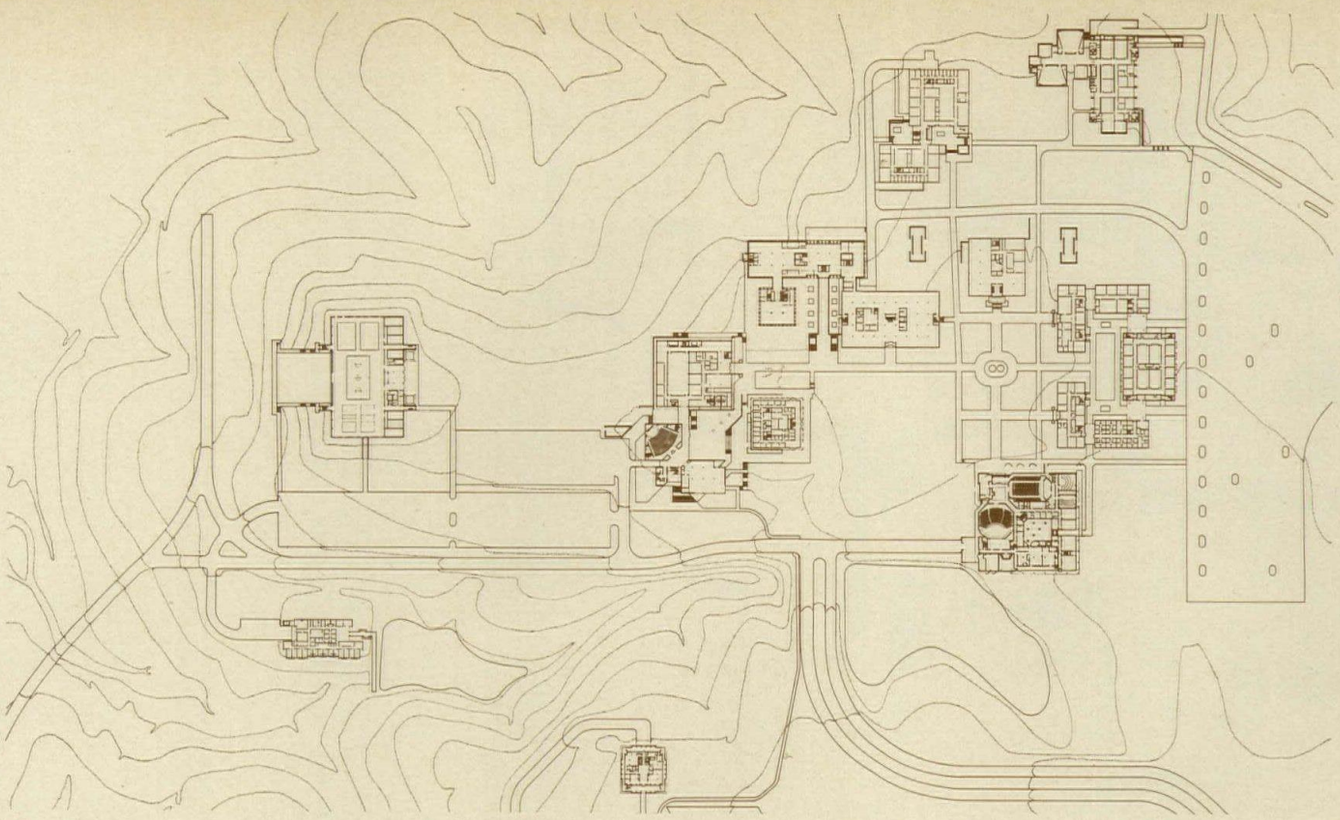
TYPICAL UPPER LEVEL



SECOND LEVEL



FIRST LEVEL



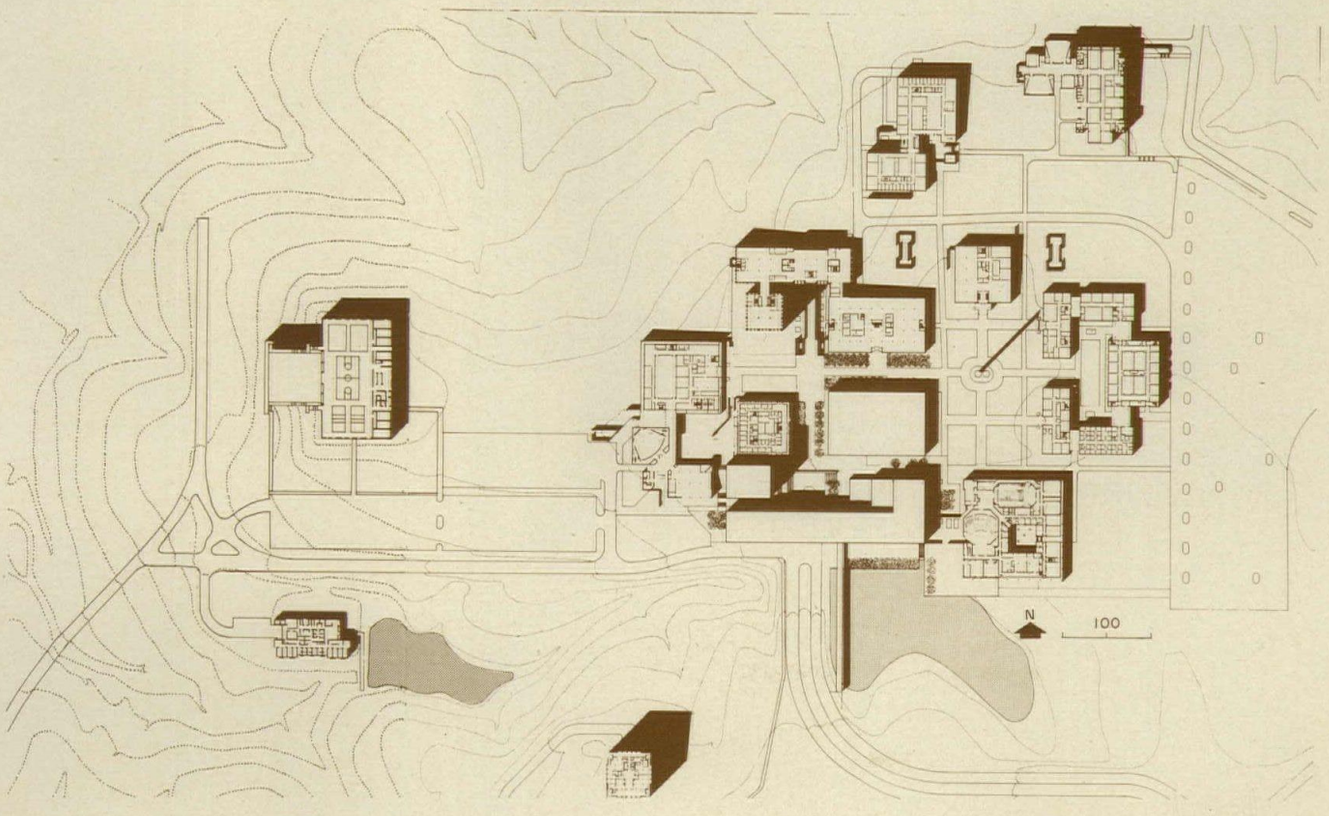
If the building shown on the previous pages is a case of shaping a design to some important physical and imagistic context, then the building shown here is an example of how design can *alter* context.

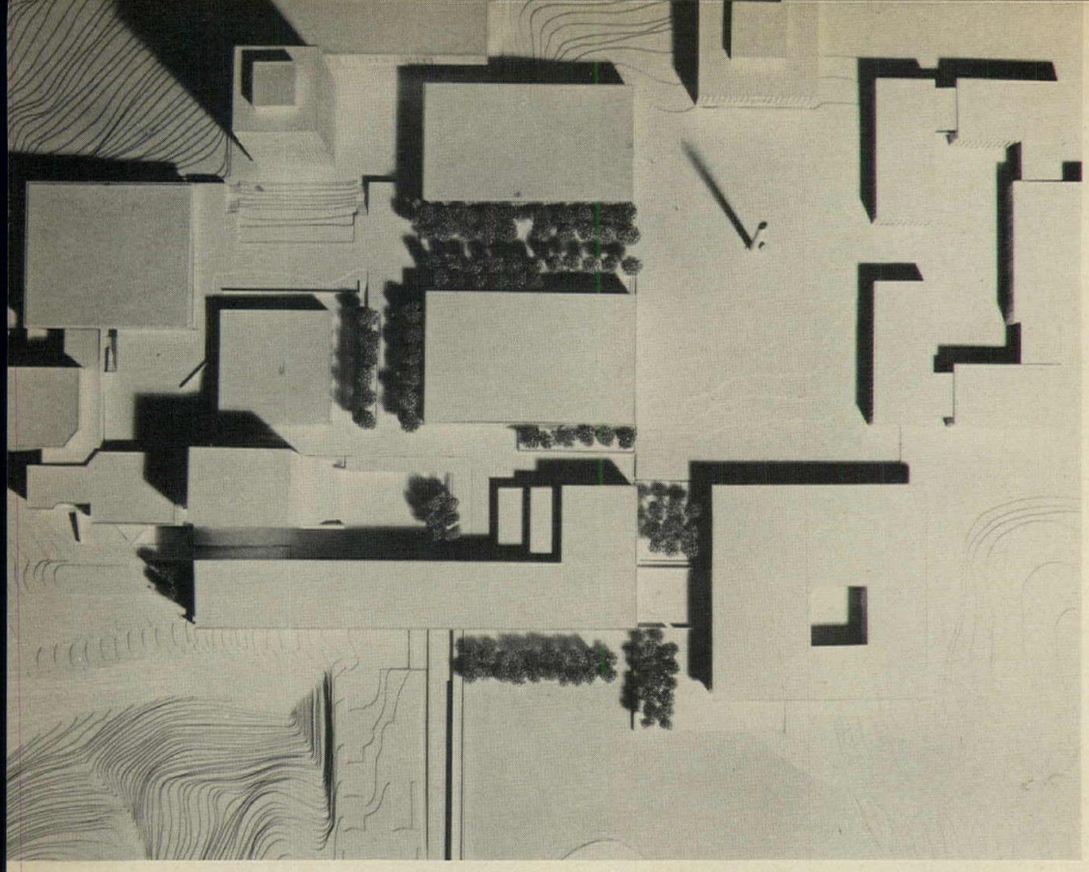
Wolf Associates' office/classroom building for the University of North Carolina at Charlotte will be a major—and perhaps the ultimate—addition to this new campus. The campus planners, CRS Inc, had developed a general masterplan that took notice of the fact that the existing campus was a collection of disparate elements, widely and randomly scattered (site plan above), and they had called for "infill" buildings to give the campus more coherence. At the same time, university officials were projecting that enrollment at the Charlotte campus of the University of North Carolina, like at campuses almost everywhere else, would soon level off, and that the new office-classroom building would be the last major building to be built on the campus—as well as by far the largest.

Thus the new building, by virtue of its size, would make a significant impact on the campus, and, by virtue of the fact that no other large buildings would be built on the campus in the foreseeable future, it would have to do as many things as possible to give order and unity to the whole campus plan.

Wolf Associates began their work—as they frequently do—by preparing a drawing of the entire campus, showing the first-floor plans of all the buildings (above); on this drawing all subsequent designs were overlaid. The drawing below shows the latest design for the office/classroom building, and it is this design, with some further, minor revision, that will be built. The plan drawings on the opposite page show the building in more detail.

In the existing campus plan the entrance is by a two-lane road that curves up past a small lake to roughly the center of the campus (but not to any particular building); it then divides awkwardly and becomes a single-lane

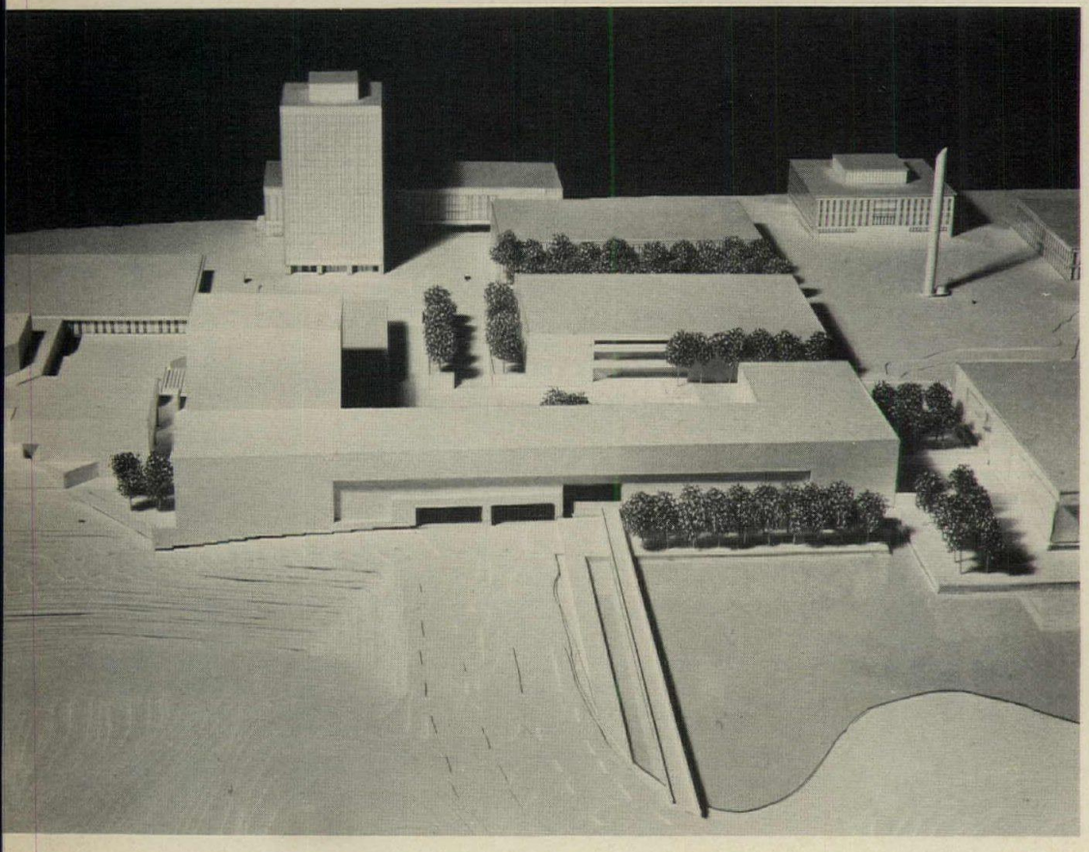




road leading to the left and right. The architects reasoned that if the new office/classroom building were placed at the head of the entrance road the building could itself become a kind of gateway to the campus (photo below). Vehicular traffic is diverted to the left as the two-lane entrance road reaches the building, and pedestrian traffic, on a walkway above the road, penetrates the building through a series of multi-level, open-air places for people to meet and to congregate.

Putting the new building in this particular spot also provided the chance to make more use of the adjacent lake by putting people in closer proximity to it. Its shores are, on the side nearest the new building, tamed and regularized by a terrace planted formally with a grove of trees. On the other side of the new building, too, trees and other landscaping help reinforce the connection between the office/classroom building and the older buildings adjacent to it, and the landscaping itself acts as "infill" (photo above).

OFFICE/CLASSROOM BUILDING, *University of North Carolina at Charlotte, Charlotte, North Carolina.* Architects: *Wolf Associates—design team for this project: Marley Carroll, Junius Judson, Chris Knight, Hadley King.* Engineers: *King/Hudson Associates* (structural); *Bullard Austin Associates* (mechanical/electrical).



MEDICAL FACILITIES

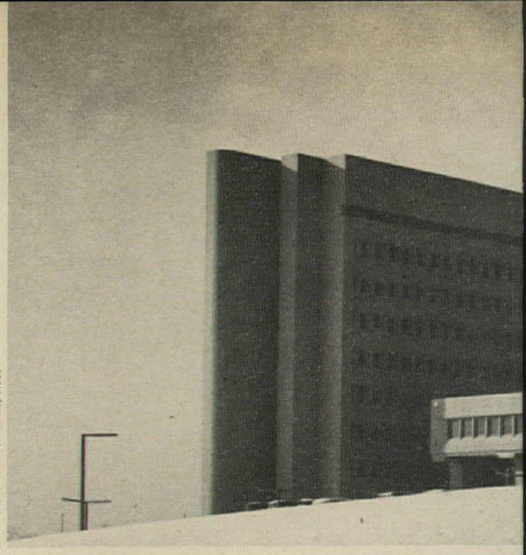
Most prognostications, private and public, indicate a fairly steady dollar volume of construction in new medical facilities—a volume sustained by a relatively few large new projects and a scattering of new community hospitals in growth areas. The character of architectural commissions for medical facilities in the near future will be unevenly distributed among alterations and expansions of existing facilities plus a continuing surge of community-oriented clinics of various kinds. These clinics reflect an increasing emphasis on ambulatory care facilities—as does also the tendency for alteration work to concentrate on expanding outpatient departments. The forces behind some of these trends are various combinations of changing therapy techniques, cost control efforts, and the effects of health maintenance organizations—insurance-supported or other.

Another hospital-oriented building type increasing in dollar volume is the medical office building, attached or adjacent to medical facilities. (An article by James Diaz describing some of the special considerations of this type is in the Architectural Business section of this issue.) Although the demand for acute-care beds seems temporarily over-subscribed in many regions, there is an increasing need for physicians and paramedical personnel, and the continued activity in construction of medical education facilities is in response to this need.

Financing of medical facilities is likely to become somewhat more complex as a result of the "National Health Planning and Development and Health Facilities Assistance Act of 1974" signed by the President on January 4, 1975. Immediate consequences of this act are still unclear as to the amounts of Federal support money that will ensue. It is clear, however, that the well understood, direct-support programs of the Hill-Burton era have come to an end. Policies of the new act are in line with current trends to return more direct control to state and local levels. The new act will impel states not already so organized to develop regional planning and approval commissions which will develop statements of need for various kinds of health facilities and retain some power of approval for proposed facilities. The Federal government will support demographic and other studies by which these state commissions determine needed facilities and will provide funds earmarked for partial support of the construction of those which are non-profit. These funds will be administered and doled out by the states—probably with a diversity of programs that are not likely to simplify the problems of architects in either design or compensation. It may be premature to be either cynical or pessimistic about these programs, but the layering of administration and the power of the Federal Office of Management and Budget to withhold funds in response to Executive economic policy are not likely to result in a quick surge of new Federally-supported medical projects. Current levels, however, will be sustained in the public and non-profit sectors, while some for-profit enterprises will increase.

The sampling of projects on following pages reflects some of the diversity and complexity of these times.—*William B. Foxhall*

UNIVERSITY OF CONNECTICUT BUILDS A CENTER FOR CARE AND TEACHING



Lawrence S. Williams, Inc.

"This is a place in which to achieve, and for progress to take place." That was the comment of a recent visitor to the University of Connecticut Health Center which looms over Interstate 86 in Farmington, Connecticut near Hartford. The comment was brought forth by the lofty, multi-level spaces of the main lobby, the library and the planted courts which serve to give the visitor and user a sense of place and direction. In the building phases now completed, direction is not so easy to discern in the long, curved corridors of office and laboratory spaces, but periodic clues from the outside and a signage system adequate for the regular user make the whole complex an efficient place in which many disciplines can work.

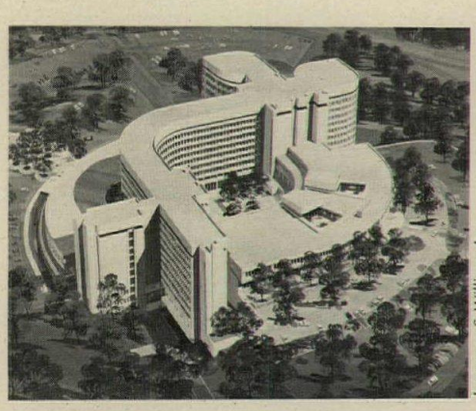
The center is on a 106-acre tract of wooded hills with access roads circuitous enough to generate an academic flavor of approach to an otherwise overwhelming size.

The center houses a combined medical and dental school and one completed 200-bed wing of a hospital with medical and dental outpatient clinics sized to handle some 200,000 visits annually. A 10-story central spine houses comprehensive research activity.

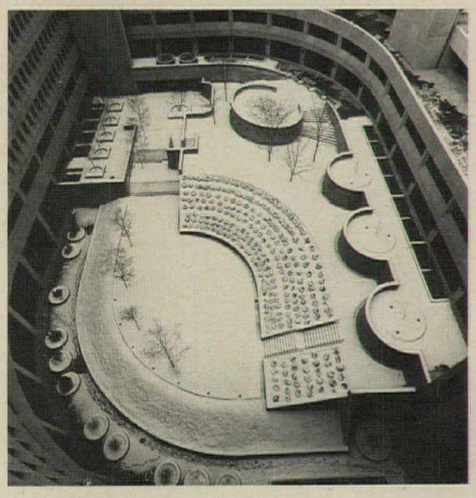
The organizational design thrust of Vincent G. Kling & Partners was to facilitate interrelationships among research, teaching and patient care with planned opportunities for communication and support among the many disciplines involved. The 10-story research building is curved in a great arc terminated at one end by the first-completed of the planned pair of pod-shaped wings (model photo, top right) housing patient care and specialized research facilities. Fronting the bow of the arc is a three-story outpatient building curved in the opposite direction and framing an enclosed central courtyard. Service cores at the connecting points contain elevators, stairways, ductwork and other services. A rectangular, almost windowless annex connected to the research spine opposite one end of the outpatient building houses animal research activities. See plans, next spread.

Outboard of and concentric with the central portion of the research arc is a two-story fan-shaped academic wing (lower photo, opposite) with administrative offices on the ground floor and teaching spaces on the cantilevered upper floor. This wing has direct access to the bi-level library on lower floors of the research arc.

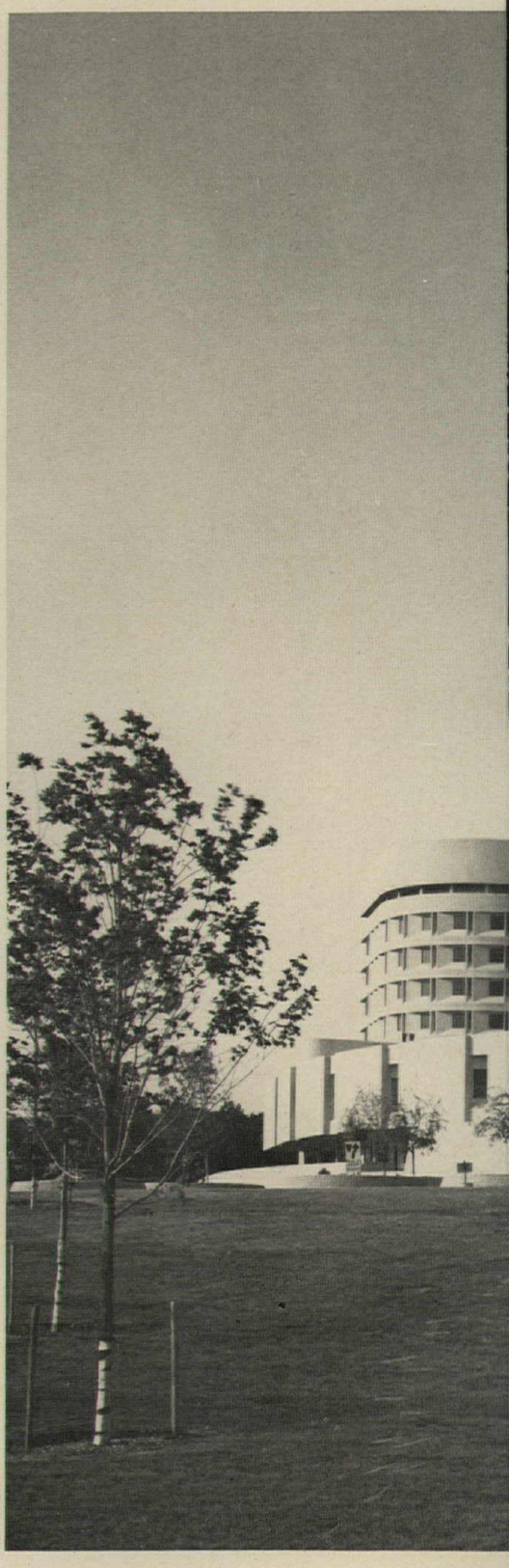
Following are excerpts of the architect's report on the four elements of the design.



Lawrence S. Williams, Inc.



Tom Crane



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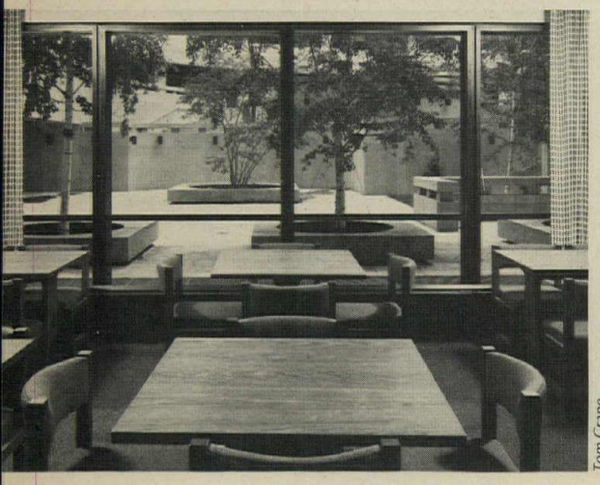


Tom Crane

Research building

It was decided that research, fundamentally involving changing spatial demands and periodic reorganization, is best served by loft-type space on each side of a circulation and services spine. For optimum lab dimensions, a width of 24 feet was selected for this space. Employing throughout a metal partition system with integral service chases and with a curtain-wall module of six feet, complete lateral flexibility is assured.

The various research disciplines are located in the research building according to the facilities they use most frequently. Thus, the basic sciences are generally housed adjacent to the animal tower; the clinical sciences are adjacent to the hospital; and the dental sciences occupy the upper two floors where they are connected by the transportation spines to both the hospital and dental clinics.

An angled window wall panel was developed for the research building which permits individual light control for the unusually wide range of solar orientation. One facet may be blinded while the adjacent window, which is almost perpendicular, remains clear for view, which is spectacular from this hilltop site.

Academic wing

The academic wing is a two-story fan-shaped element as previously described, outside of and concentric with the research building. Teaching space on the upper floor is divided into teaching units each containing laboratory work space, a seminar study area, and audio-visual lecture facilities. These will be used by both medical and dental students in their first two years of identical curricula.

Flanking the main academic entrance on the ground floor are lecture halls accessible to the public. Here also is the major access to the central library which looks out upon small courtyards between the buildings and inward onto the great court at the center.

In-patient tower

A strong philosophy of patient care has dictated a radial arrangement of bedrooms about a completely open circular nurses' station. Hence the pod shape of the tower plan. Optimum surveillance of the patients is possible, but perhaps more important is the sense of security afforded the patient by visual contact with the nurse. Privacy for the patient is provided by draperies at the glass wall of the room, with the option of keeping them open.

Receptionist, doctors' charting area, offices, pantry, medicine preparation area, and extensive storage including linen and sterile supply are all housed in low units at the central station in order to maintain the closest relationship continuously with each patient. Alternate configurations of nursing stations and room access are still under consideration, and a second pod tower for 200 beds is planned, bringing the total bed count to 400.

Out-patient building

Main public access to the complex is at the center of the out-patient department which fans out toward Hartford in a wide three-story arc. All clinics are arranged on each side of a longitudinal service spine, and public circulation is on the periphery. Waiting areas for each clinic open off this outer corridor onto the terraces with a broad view of the countryside. Except for some specialized clinics on the inboard side of the building, all the units are modular for operational flexibility. This requirement is reflected as well by the disposition of all 20 clinics on only two floors of exceptional width and depth.

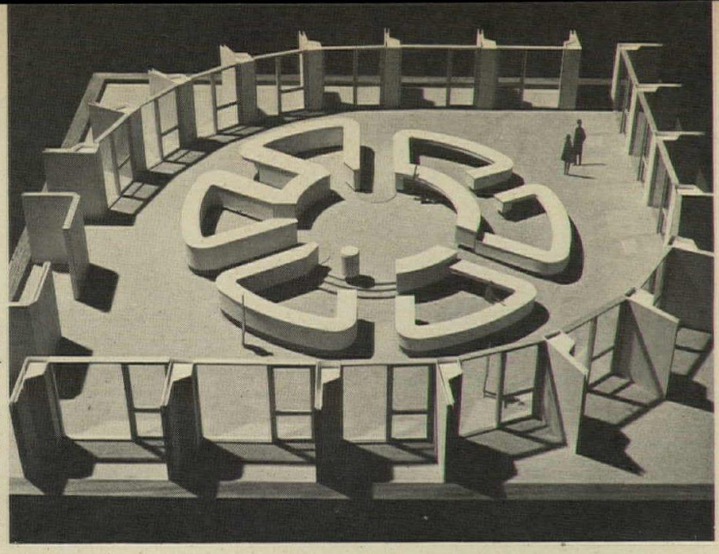
On the top floor are administrative offices and the maternity suite, with its own small courtyard, well removed from immediate contact with the rest of the hospital.

The emergency entrance has been placed at the junction of the outpatient building and the inpatient tower. It is immediately accessible to the X-ray and operating suites as well as to the surgical clinics.

At the main floor level a broad public corridor runs completely around the great courtyard at the heart of the Health Center. Providing a means of orientation for all parts of the complex, the courtyard is landscaped and used as a park—a common ground for visitors, patients, students, and personnel, it is meant to suggest the Health Center's basic unity of endeavor.

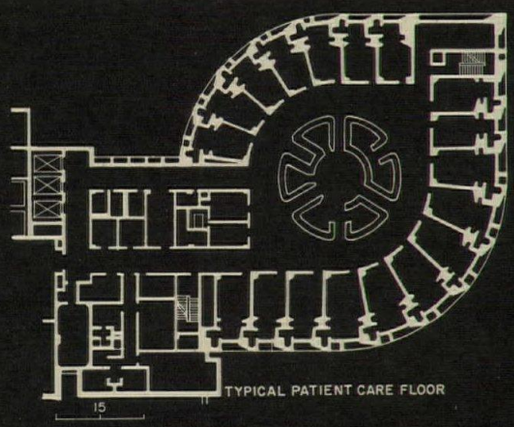
Emphasis has been placed throughout the project on the unbroken continuity of academics, research and patient care.

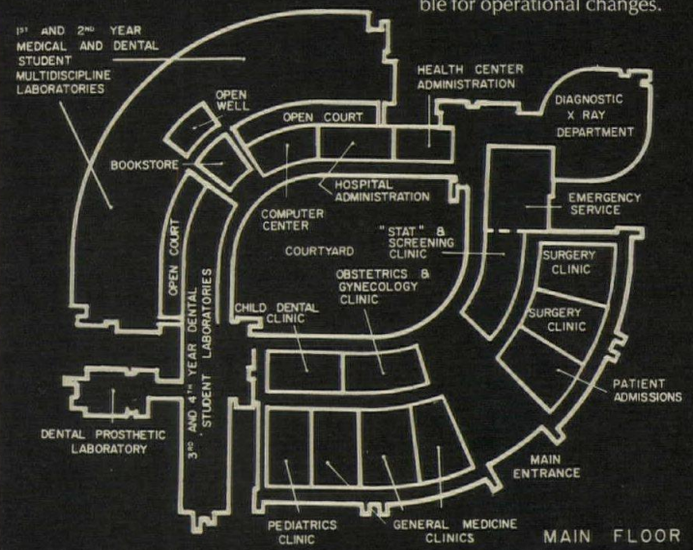
UNIVERSITY OF CONNECTICUT HEALTH CENTER, Farmington, Connecticut. Architects: *Vincent G. Kling & Partners—Lewis Eisenstadt and John Rotkowski, partners-in-charge; Joseph Marzella, design partner; William Reichert and Alvin Holm, project architects.* Engineers: *Severud-Perrone-Sturm-Bandel* (structural); *Meyer, Strong & Jones* (mechanical). General contractors: *Lasker-Goldman Corp.* and the *Kidde/Briscoe Joint Venture.*

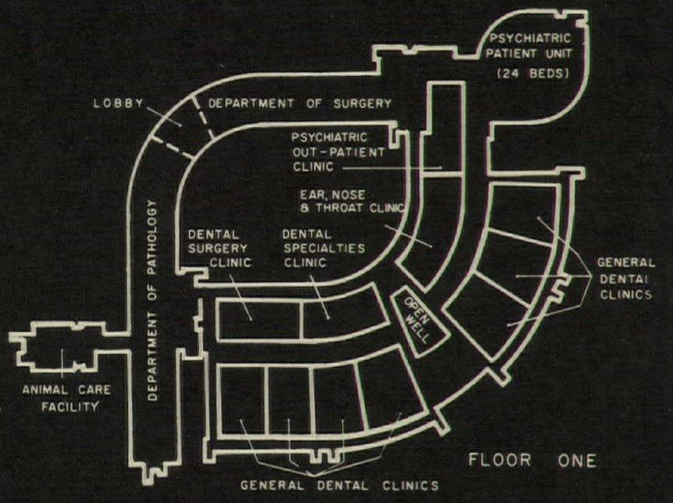


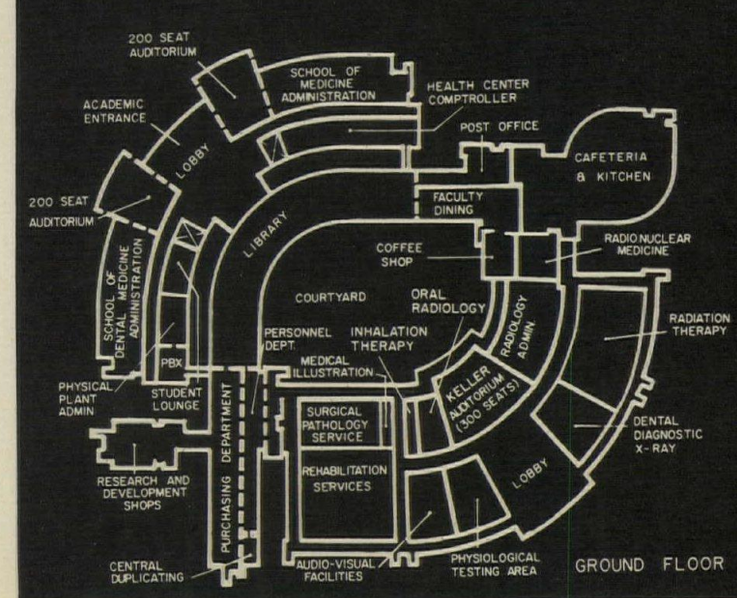
Lawrence S. Williams Inc. photos

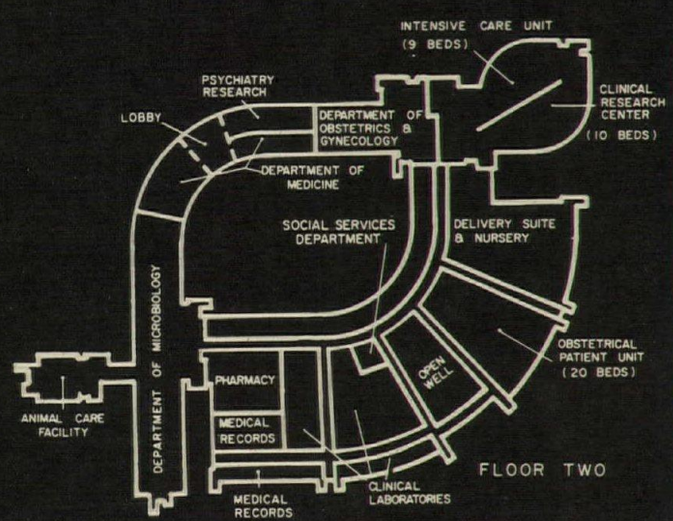
From the main entrance lobby, top, opposite, stairs descend to a ground floor lobby serving a 300-seat auditorium. Other stairs ascend to first floor clinic spaces. Skilled use of wood and stone give a kind of warm majesty to a procession of volume changes topped by the globe-lighted skylight. The library has a different sense of space for study and resources in books and tapes, with reading lounges and AV carrel spaces. Typical nursing space, above and at right, will be efficient and flexible for operational changes.



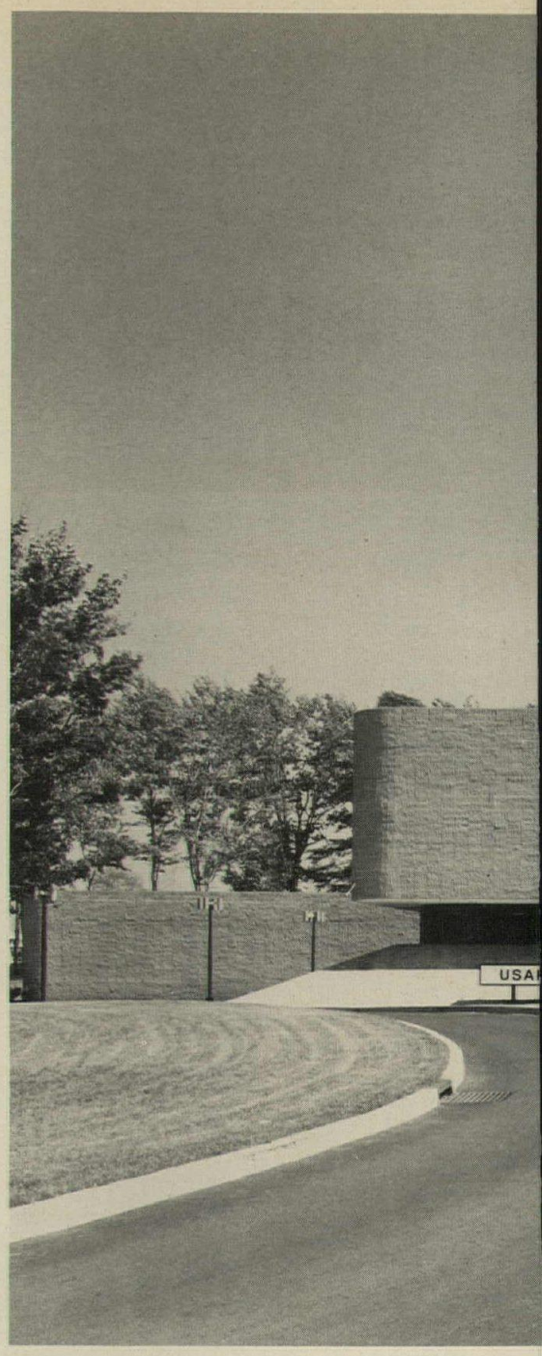








A COMPOSITE GENERAL HOSPITAL DESIGN FOR GRIFFISS AIR FORCE BASE



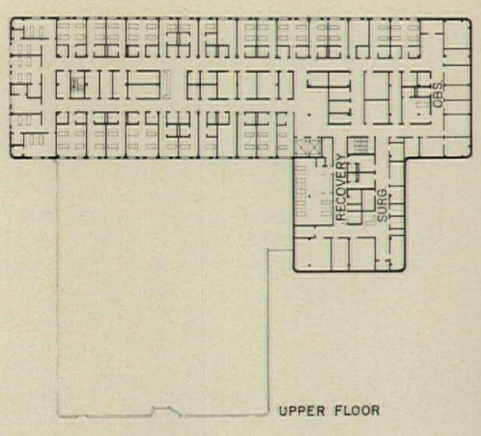
This general health care facility for Air Force personnel and their dependents is called a "composite medical facility" for good reason: 1) It is a basic general hospital of 70 acute-care beds including such family facilities as obstetrical and pediatric departments. 2) It houses testing areas and laboratory facilities for the rigorous programs of health maintenance that are required for the Strategic Air Command. 3) It has a diversified and active outpatient department including a dental service area. All of this takes place within a relatively small 102,800 sq ft, two-story building.

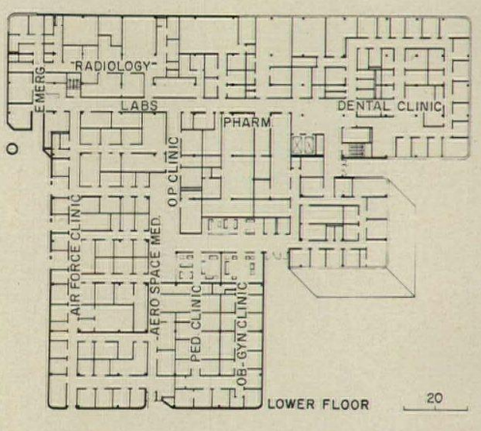
The architects met program and budget constraints on a broad front of interlocking decisions. The budget squeeze, for example, called for low-cost, stock materials, while the northern climate and air-base acoustical problems called for a shell of high density and low glass area. The solution was the selection of split-face concrete block and about a 10 per cent total glass area divided adroitly to serve essential office and bedroom areas, reserving a solid exterior wall shield for surgical and clinical areas. Acoustical and climate demands called for double-glazing in bedroom areas. Here, both cost and esthetic objectives were achieved by the use of textured enclosures for stock double windows.

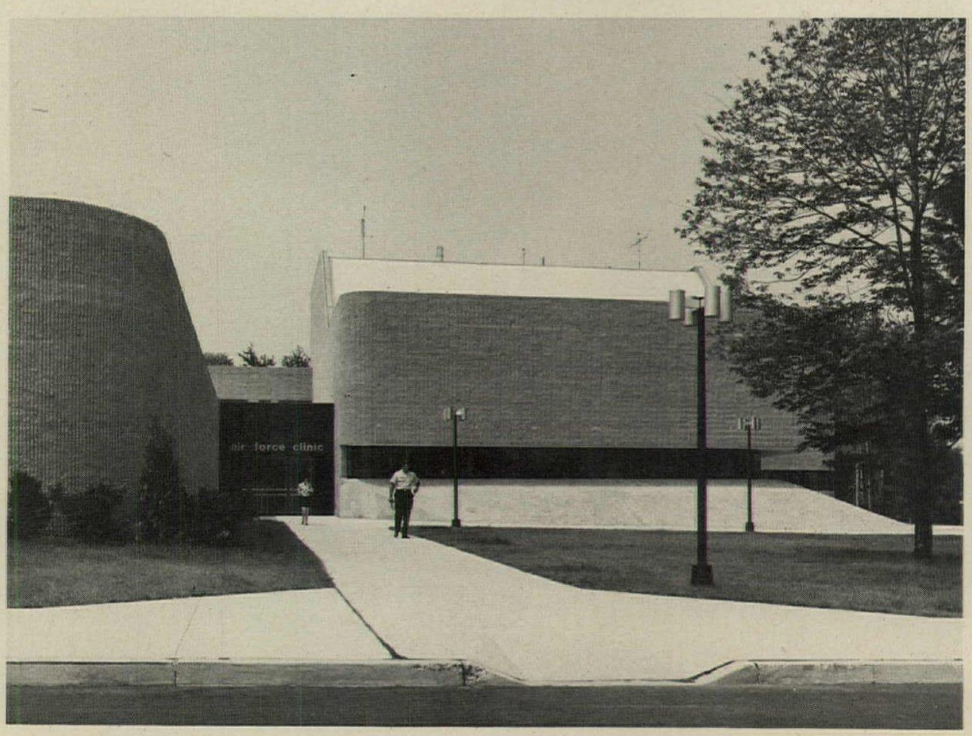
Functional flexibility was achieved in inpatient areas by planning a group of bedrooms so that nursing unit size could shift with changes in loading.

The siting of the building shifted with growth of the plan to preserve natural trees and take advantage of the drop in elevation to provide service access and a separation of mechanical and care levels.

This building came in just under budget, having preserved form and massing suitable to the aerodynamic shapes familiar to its users. Despite their qualms about rounded corners and cantilevers, says Martin Stein, "I think we showed the Navy that good design doesn't cost more."

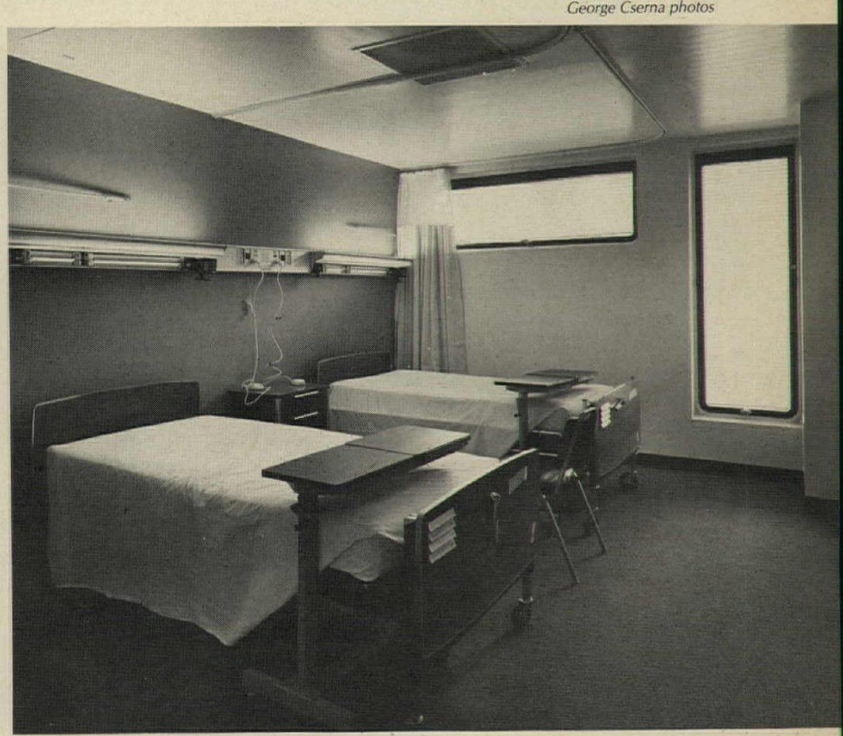




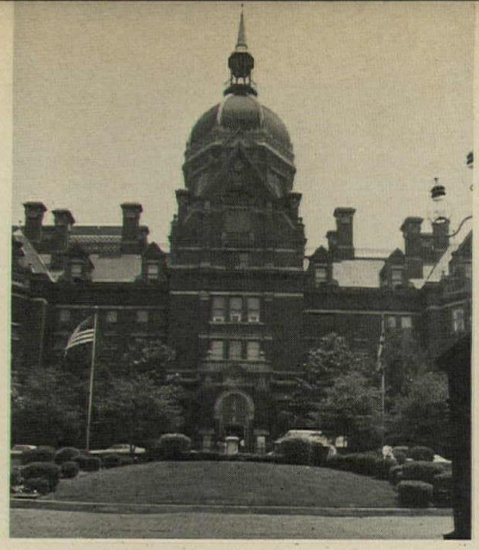


COMPOSITE MEDICAL FACILITY, GRIFFISS AIR FORCE BASE, Rome, New York. *United States Air Force.* Client agency: *Naval Facilities Engineering Command, Northern Division, Philadelphia, Pennsylvania.* Architects: *Max O. Urbahn Associates, Inc.—Philip E. Moyer, partner-in-charge; Martin D. Stein, director of design; Bernard Prainito, project manager; George Ranalli, designer; Louis P. Giacalone, job captain; Roger Swingle, site design.* Consultants: *Dale Engineering Company* (engineering); *Maurice B. Lafiteau Inc.* (food service). General contractor: *Oldfield Construction Co.*

George Cserna photos



JOHNS HOPKINS REDEVELOPMENT ENLISTS ALL DISCIPLINES FOR PLANNING AND DESIGN



In 1970 the administration and trustees of the Johns Hopkins Medical Institutions made three major commitments: 1) that the institutions would remain at the current east Baltimore campus site on about 20 acres; 2) they would limit property acquisition to this defined area; 3) they would initiate a vigorous building program of renewing the Johns Hopkins plant.

As a result, a long-range development plan for the medical institutions (i.e., the Johns Hopkins Hospital, the Medical School, the School of Hygiene, and a future School of Allied Health Services) was completed. The initial implementation of the plan calls for the redevelopment of the Johns Hopkins Hospital to be accomplished over a 6-year period, 1974 to 1980, which embraces the "Hopkins 100" campaign commemorating the 100th anniversary of the institutions in 1976.

Client reorganization centralizes redevelopment building program

Coincident with the commitment to a major building program, high level organizational changes occurred at the institutions. Steven Muller, president of the Johns Hopkins University, also assumed the presidency of the Johns Hopkins Hospital. Robert M. Heyssel, M.D. became executive vice president and director of the hospital. Thus the operating officers of the two institutions have the responsibility and authority not only for the planning and design decisions, relating to the Hospital development, but also for the effective integration of the teaching and research requirements of the institutions into the clinical facility. The project organization for the institutions was established under Richard W. Trompeter, project director, and Theodore Hussey, associate project director, for JHMI. Additionally, the professional committee under Guy McKhann, M.D., consisting of the clinical chiefs and department chairmen, was formed to ensure the full support for the program within the institutions and advocacy of the highest level decision makers. Similarly, the administrative task force, under Robert Wilson, vice president for administration, with the assistant administrators represented, defined the service and support requirements of the hospital. Therefore, the institutions project organization (see diagram, top opposite) not only served to provide input to the project team, but also assumed an advocacy role and communications link to the myriad committees and sub-committees throughout the institutions.

Complexity and schedule call for multi-discipline force

The need for a highly efficient decision-making process was dictated by complexity of the project compounded by constraints of the schedule (chart at top, opposite). The Phase I program includes the development of the Johns Hopkins Regional Cancer Center under a $6.4-million NCI grant. Conditions of the grant provided that the center be under construction within one year (May 1974). The desire on the part of the institutions to achieve maximum integration (physical and functional) of special centers with the core hospital development triggered an intensive planning and design effort to program, master plan, and design all elements of the redevelopment program. To implement the planning/design effort a multi-disciplinary project team was selected. The team consisted of: RTKL Associates Inc., as executive architects for the total program and architects for the hospital redevelopment; Cochran, Stephenson & Donkervoet as architects for the Cancer Center; Henry Adams, Inc., consulting engineers; Westinghouse Health Systems, hospital consultants; Ernst & Ernst, financial consultants; and Turner Construction Company, construction managers. The team was charged with producing within one year:

- An over-all master plan for the Hospital integrating the new construction, current and future modifications, the phasing out of obsolete buildings, and future new construction;
- A general program for the total redevelopment program based on current needs/deficiencies, and new programs;
- A specific program for Phase I based on available financing and phasing constraints;
- Justification for all program elements in terms of patient care demands and coordinated teaching/research needs.
- Exhibition of significant operational improvements and increased functional efficiencies;
- Demonstration of financial feasibility based on life cycle cost justification of design and program elements including anticipated revenues produced by the new construction;
- Rigorous cost control measures to ensure that program and design are at all stages within the established budget;
- Pre-requisite architectural/engineering designs and bid packages for the various program elements to provide for competitive bid requirements for the Cancer Center, while maintaining maximum latitude for packaging the hospital projects (i.e., for single G.C., multiple primes, or negotiated bids) under the construction manager;
- An integrated construction plan interfacing multiple contracts, demolition renovation/new construction, with minimum disruption of hospital operations;
- Total program coordination within the institutions and reviewing agencies, including obtaining Maryland Comprehensive Health Planning Agency approval.

The project team was capable of addressing all tasks concurrently, with necessary trade-offs and refinements being produced at various stages. Essential support and approvals from the joint trustees was obtained at the critical points. The program is on schedule with the pre-requisite broad support from the many faceted institutions. Demolition, site preparation and scheduled construction work is under way.

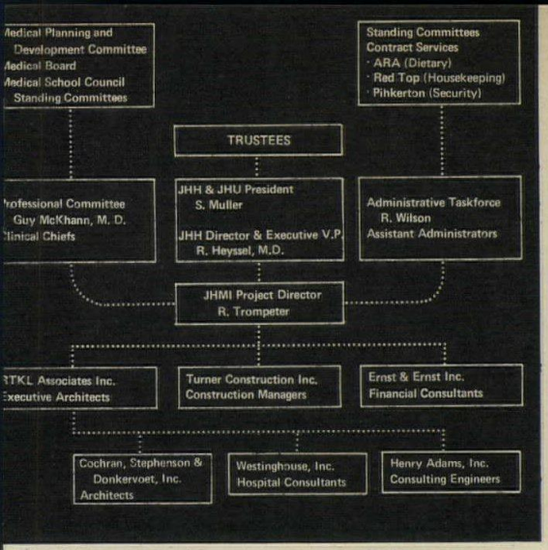
Demography and economics define the program

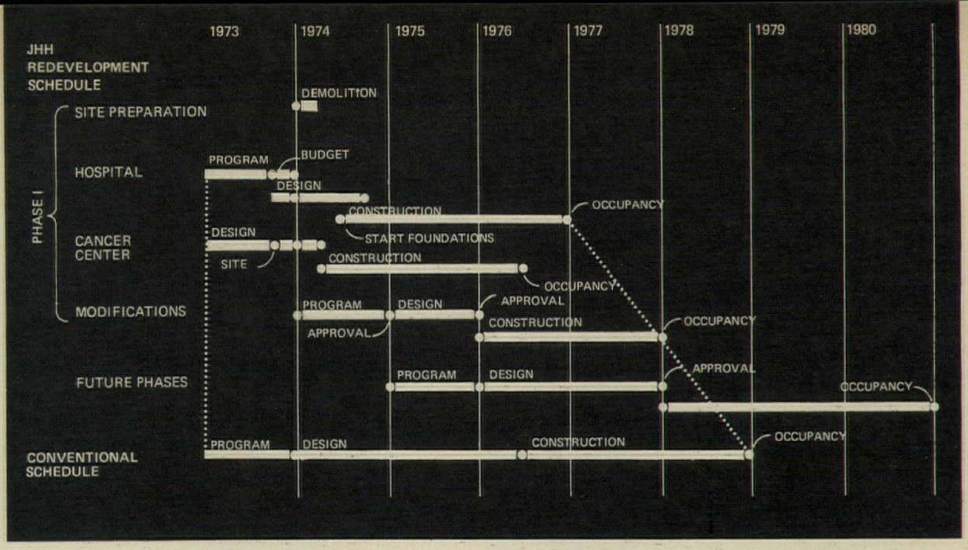
The objectives of the redevelopment program are to maintain the institutions as a center of excellence for patient care, teaching and research, and to eliminate any deficiencies of the hospital due to obsolete or inefficient facilities.

The Phase I program, to be completed by 1977 includes: 180 replacement beds; 60 new Cancer Center beds; new operating rooms and delivery rooms; new diagnostic radiology and radiation therapy areas; new receiving and central materials management areas; new public lobby, admitting and community areas; classrooms and conference rooms in support of clinical activity; research laboratories for the Cancer Center; and renovation of the Halsted and Osler Pavillion accommodating 360 beds.

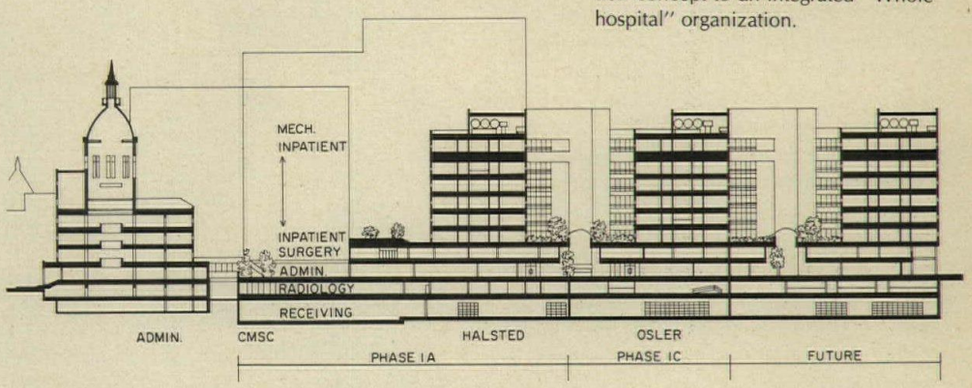
The next increment to be completed by 1980 includes: 180 additional replacement beds; ambulatory surgery center; outpatient facility with diagnostic motel; clinical laboratory renovations; power plant improvements and parking.

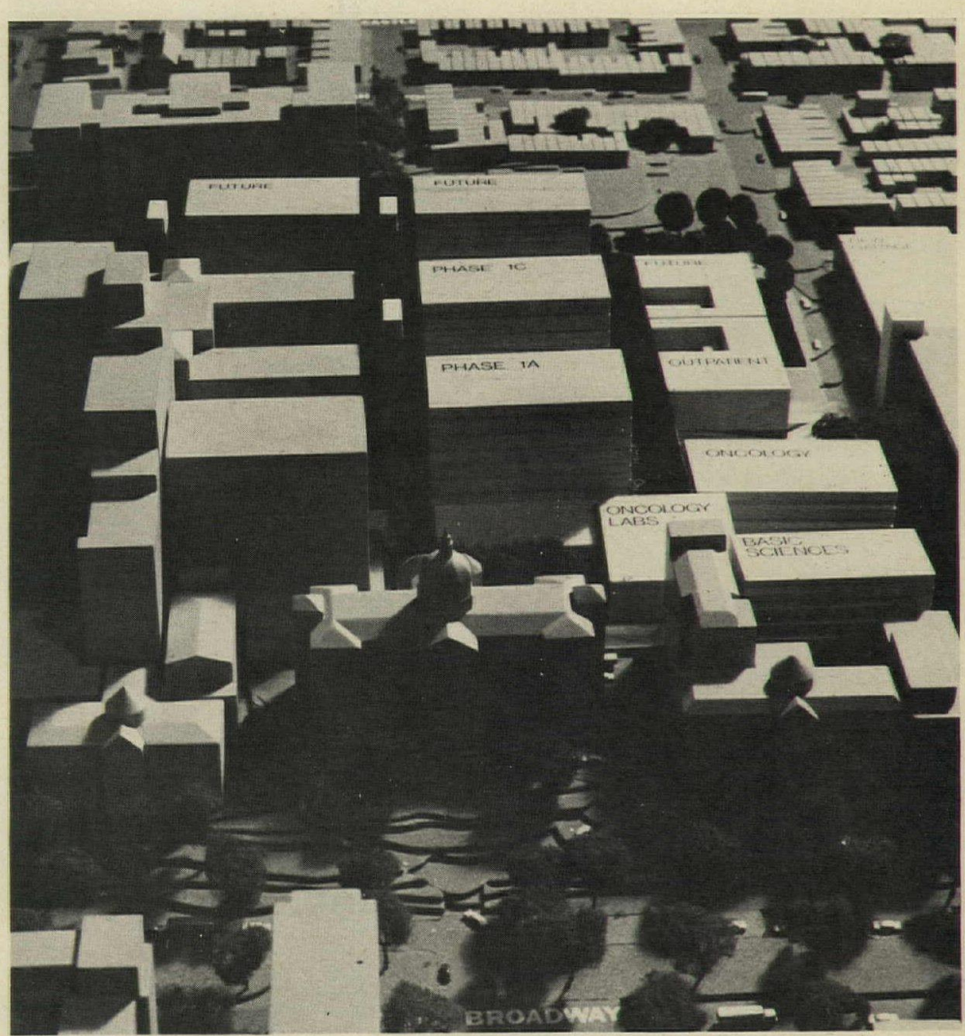
The program was developed after careful analysis of patient origin and other demographic factors as well as workload projections to ensure that projected services and revenues were in line with anticipated debt service. Projections were also made to be sure that workloads and teaching needs were balanced and that anticipated beds needed for teaching could, in fact, be filled at an acceptable occupancy rate approximating 85 per cent. In





Diagrams above show interdiscipline organization for the over-all project and the phased schedule of development. Section and model photo, below, show horizontal layering of transition from the "pavilion" separation concept to an integrated "Whole hospital" organization.





fact, the demographic studies indicated a population decline within the hospital prime service area and Baltimore City, indicating a need for attracting an increasing number of specialty referral patients from the wider metropolitan area. So the facilities provided will provide an improved patient-staff environment. The general trends toward increased outpatient care, reduced lengths of stay and the 85 per cent occupancy rate objective of the hospital also imply an over-all reduction in total hospital beds from about 1100 to about 1000.

Master plan envisions progressive, layered development

The new master plan for the Johns Hopkins Hospital represents a major departure from both previous planning and existing physical organization.

The hospital has been organized on the pavilion concept with individual buildings representing various departments and specialties (i.e., Osler medical pavilion, Halsted surgical pavilion, Woman's Clinic OB/GYN, Wilmer Eye Institute, etc.). The attendant lack of flexibility and interchangeability has handicapped the hospital by limiting its occupancy rate and its ability to utilize special isolated facilities.

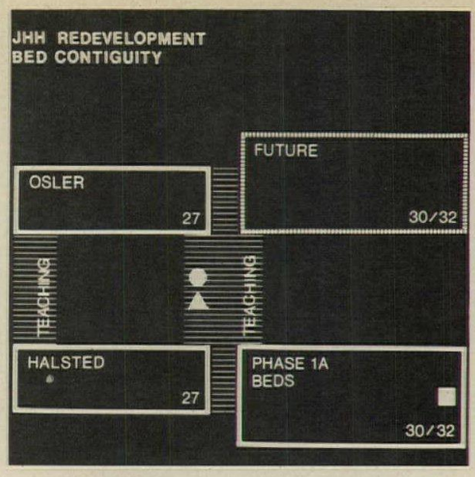
Master plan seeks maximum integration

The master plan goals, then, were to achieve maximum integration of new flexible facilities with existing and/or renovated areas while creating major improvements in services and circulations patterns.

The master plan provides for the incremental redevelopment of the hospital and the relocation and replacement of all clinical departments. The over-all framework is based on a horizontal zoning concept (see section drawings) where each phase is a step by step increment toward new contiguously related activity zones.

For example, in Phase I, at a new subbasement level, a new service zone will provide central receiving and materials management areas. In the next phase there will be a new central sterile processing area at this level. In a future phase, automated horizontal distribution of all major materials and services to vertical service shafts serving all the hospital is projected.

At the next level, the basement, Phase I will provide a new diagnostic and treatment zone that will centralize currently dispersed



functions. In the next phase, centralization of all hospital computer facilities will be housed at this level. And a future expansion of the basement level will provide for replacement of clinical laboratories and physical medicine facilities.

Similarly, at the street level, a new public and community zone will be developed in Phase I with a new hospital entrance. In the next phase, there will be a commercial mall including expanded staff lounges, new outpatient entrance, and outpatient facilities. And so it goes through other levels for technical, surgical and nursing care spaces.

The inpatient levels (3 to 8) in new and renovated patient care areas integrate teaching and conference-room facilities. New inpatient units are closely integrated with the renovated units (Osler and Halsted) as shown in the diagram at top center.

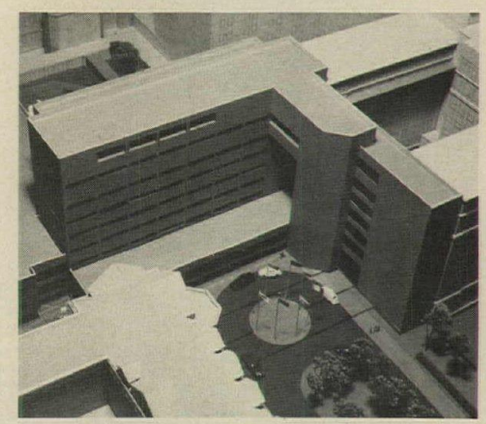
The horizontal organization of beds (120 beds/level) permits major departments (medicine, surgery, OB/GYN) to be organized on one or two levels. Surgery beds are on levels 7 and 8, all within one level of the operating rooms on level 7.

The horizontal organization of beds also greatly facilitates the interchangeability of beds between subspecialties, with improved departmental communications, reduction of need for vertical transportation, and potentials for reducing nursing and administrative staffs for significant operating cost savings.

The master plan serves as a flexible framework offering substantial benefits in terms of response to new programs and new needs. These benefits are achieved without unusual architectural and geometric exertions and excessive first cost penalties.

Site determines phasing of architectural design

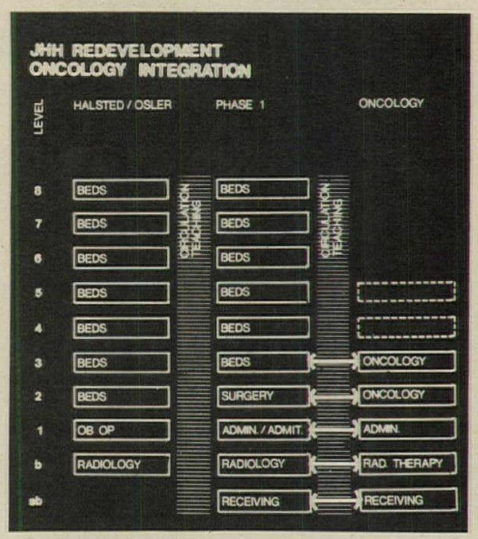
The architectural design of the Phase I project is very much determined by the site available based on vacating existing buildings, and essential relationships (adjacencies and floor-to-floor dimensions) to existing buildings, plus careful analysis and determination of functional relationship to priorities. Decisions on materials underwent considerable philosophic and quantitative investigation. Architecturally, it was determined that brick—as the basic building material to ensure compatibility and harmony with existing buildings—needed to be continued. Significant architectural expression could be gained through sophisticated detailing of brick, glass and steel components.



One of the major concerns of the master plan and the specific design for Phase I is to provide more and useful open spaces as a result of the redevelopment plan.

A major plaza for indoor/outdoor dining and assembly; useful open spaces along the pedestrian access from the parking structure; significant entryways and drop off points for the hospital and the Cancer Center (see model photos); the new barrier-free entrance to the hospital and the Cancer Center illustrate the quality of entrance and convenience contemplated after Phase I (photos, opposite).

The integration of the Cancer Center represented a unique design challenge, inasmuch as the NIH criteria required a separate identifiable building. Nevertheless, all critical adjacencies were achieved, as shown in the diagram, left center.



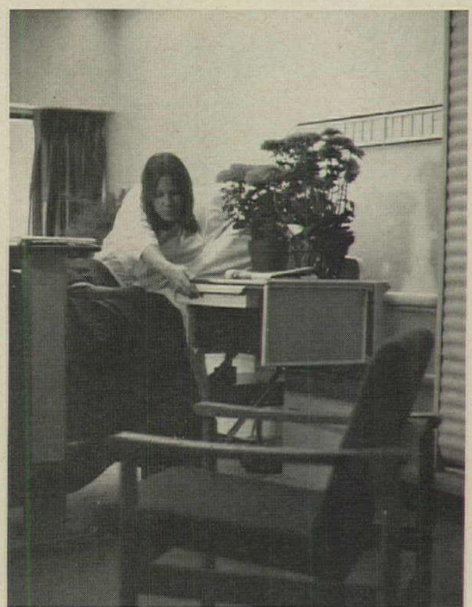
Planned integration prevents rapid obsolescence

The degree of integration with common facilities will preclude the dilemma of the free-standing center which can neither grow nor shrink over time and soon becomes an obsolete facility.

The new patient accommodations are predominantly private rooms to assure that the most acute patient care can be delivered in the new units. The traditional and conservative environment of the institutions will be punctuated with supergraphics, bold signing, accent colors, and modern furnishing.

The improved environment and new facilities by themselves are not enough to maintain the excellence of the institutions, however. That is accomplished by the vigor and enthusiastic participation at all levels of administration, faculty and staff who made possible an impossible planning and design schedule.

—Sandor Csobaji



JOHNS HOPKINS MEDICAL INSTITUTIONS, Baltimore, Maryland. Executive architects for redevelopment program and architects for the hospital: *RTKL Associates, Inc., C.E. Lamb and S.B. Csobaji, principals-in-charge; B.J. Wulff, project architect; V.D. Moorer, project manager; E. Jakmauh, interiors; R.J. Kolker, structural engineer.* Architects for the Regional Cancer Center: *Cochran, Stephenson & Donkervoet, Inc., T.D. Johnson, project architect.* Hospital consultants: *Westinghouse Health Systems.* Consulting engineers: *Henry Adams, Inc.* Construction managers: *Turner Construction Company, F.J. Booth, project manager.*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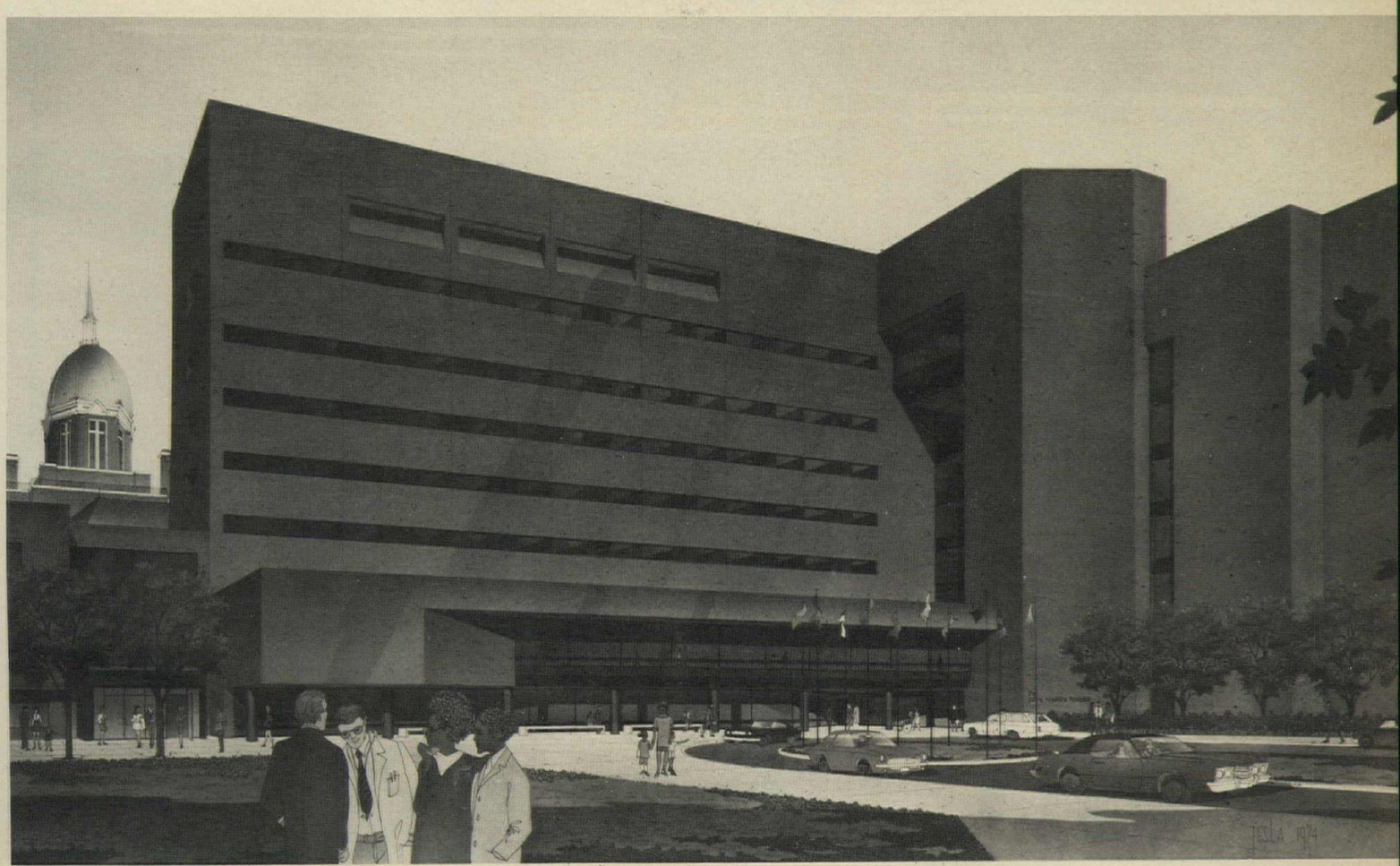


A GUIDANCE CLINIC AT THE CHILDREN'S HOSPITAL OF PHILADELPHIA

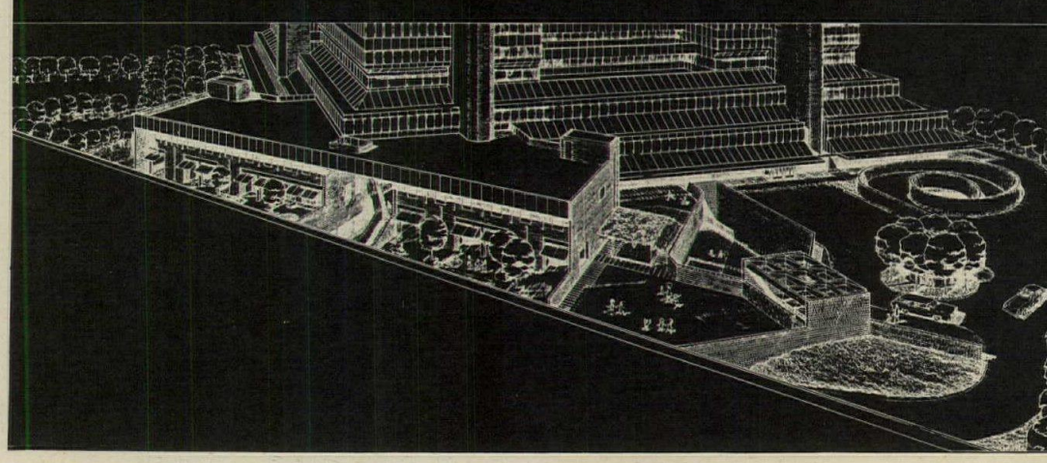
The Philadelphia Children's Mental Health Center, designed to relate to—but to function independently of—the Children's Hospital of Philadelphia, is located on the southwest corner of the 34th and Civic Center Boulevard site. The building (total area: 79,500 sq ft) was designed so that its materials, scale and over-all milieu would relate to children in as intimate—almost residential—feeling as possible; in contrast to the more clinical environment of a general hospital. To help emotionally disturbed children to run and to play and to lead, so to speak, normal lives, all of the major children's services in this facility are related to outdoor play areas. Even though this facility is large in itself and attached to an enormous building, every consideration was given to defining functions as clearly as possible and breaking up the immensity of the project with smaller, more comprehensible parts, each related to a child-scale activity.

The Children's Mental Health Center has its own entrances and driveways along with several outdoor courts and play areas. It has a main, grade-level driveway and "drop off" which allows children or adults to go directly into the school at grade level or to go down some convenient stairs to a courtyard to the nurseries or main entrance and lobby which are one level below grade. Besides this entry, there is a driveway ramp and turn-around, one level below grade which directly serves the main lobby and also the nurseries.

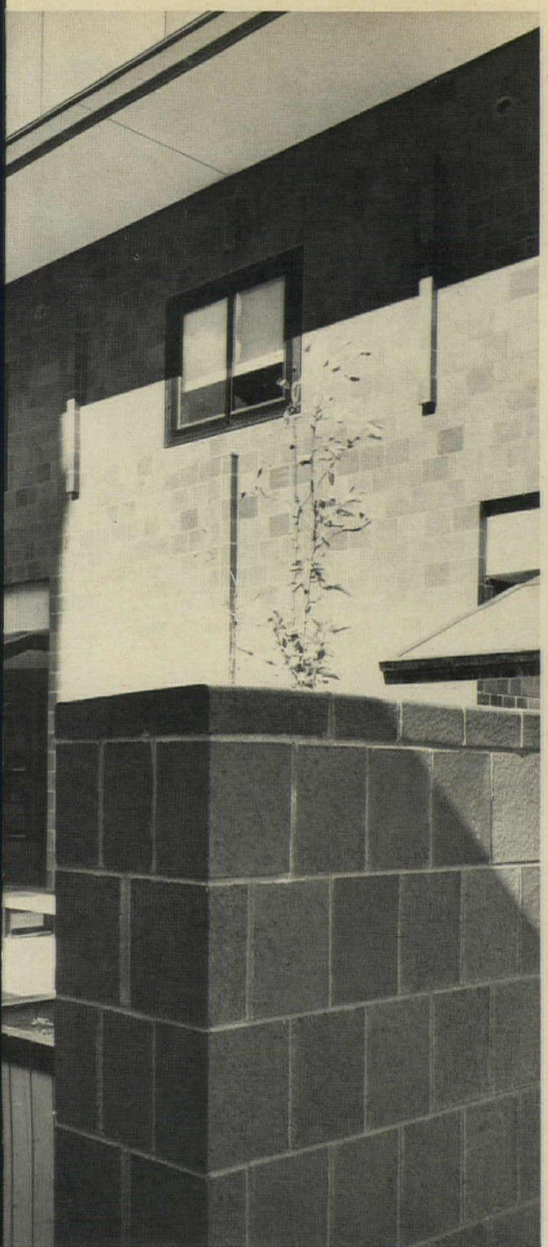
The reason for these different entrances was to separate the very different flows of traffic to the over-all facility and the school, and to give the precious grade-level outdoor areas to the traffic of children instead of cars and parking.

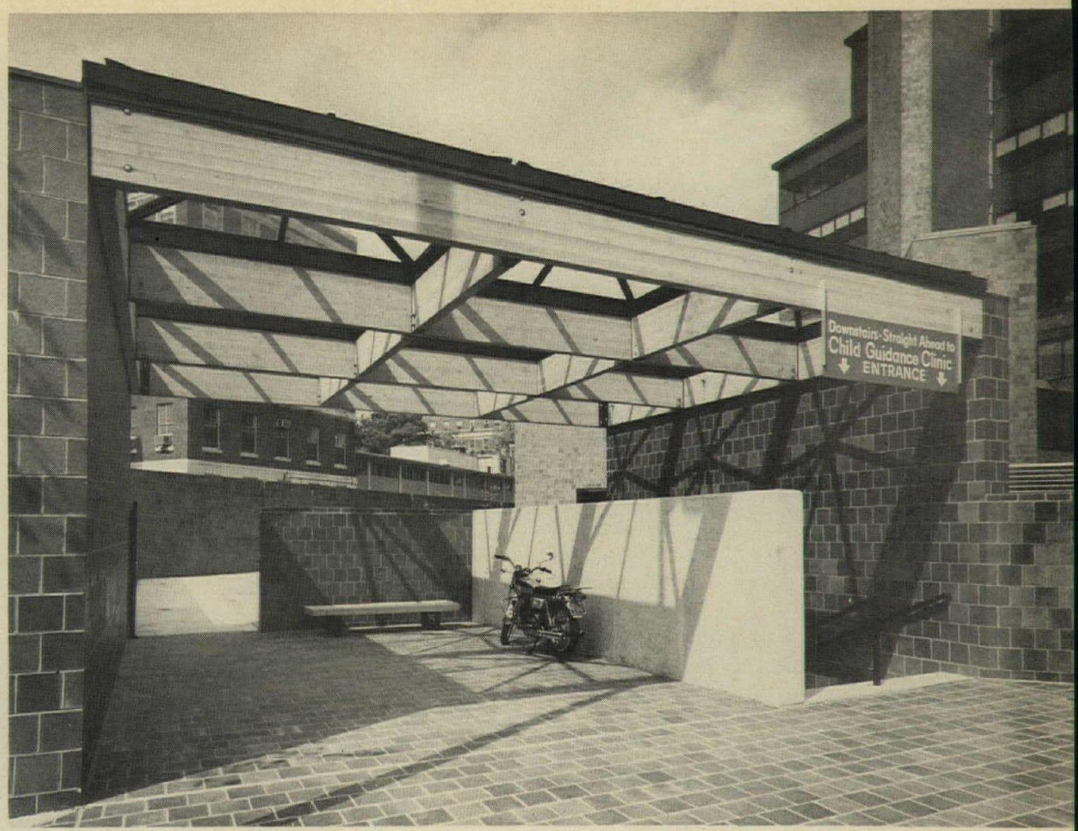
Basically, the four-story facility purposely appears as a two-story building and those two stories which are the first and second floors are for the main children's functions. The first floor at grade level houses the school and has its own entrances for the children, with the main entrance to the facility being one level down below grade; see grade drawings at right.

The second level is the living level for children and two families. These two floors which resemble a standard urban row house layout (the school being the living level and the inpatient being the sleeping level) are sandwiched between the "adult" levels. The lowest level (Level A) under the school provides the main entrance by car, bus or elevator from parking below, and it contains all of the main outpatient consultation rooms.

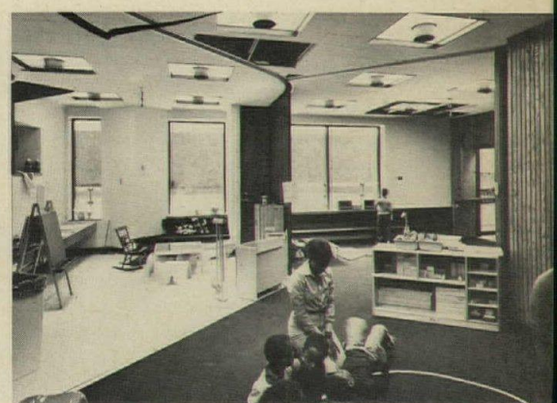


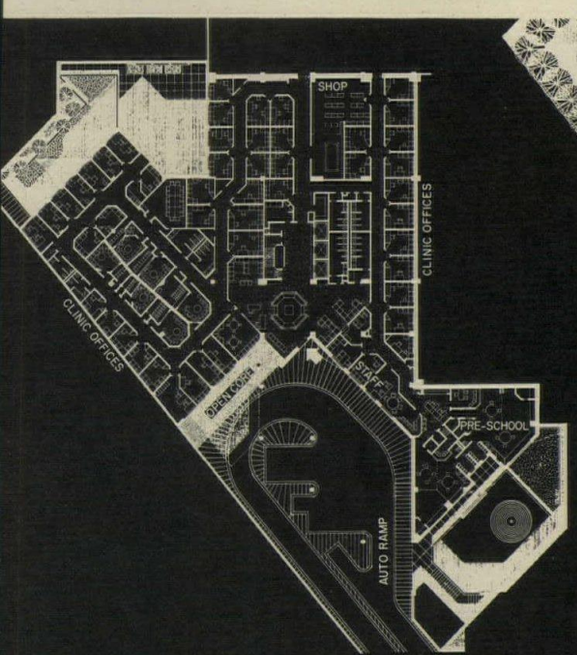
PHILADELPHIA CHILDREN'S MENTAL HEALTH CENTER. Architects: *Office of Bruce Porter Arneill.* Engineers: *A.W. Lookup Company* (structural); *Leonard Weger Associates, Inc.* (mechanical). Consultants: *Sylvan R. Shemitz & Associates* (lighting); *Robert A. Hansen Associates* (acoustical); *Louis Audette* (TV); *Office of Dan Kiley* (landscape); *Raymond Doernberg* (interiors). General contractors: *Baltimore Contractors, Inc.*

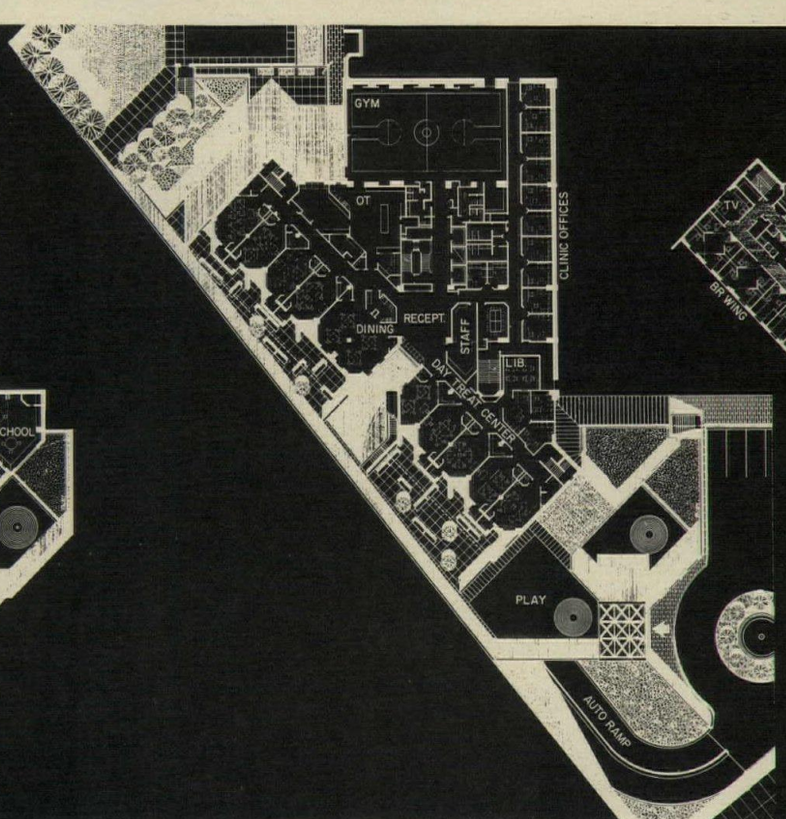


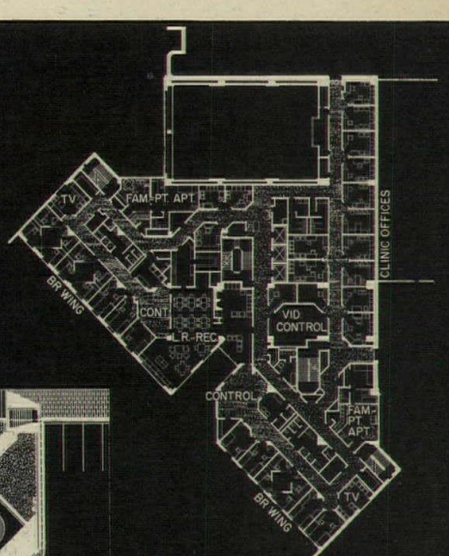


Maris/Semel photos

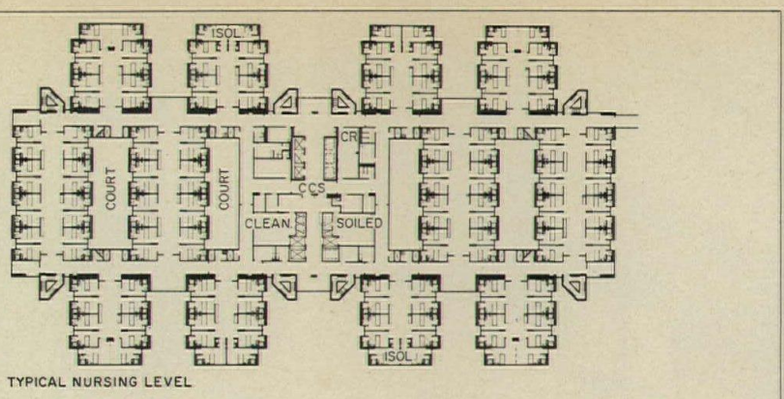




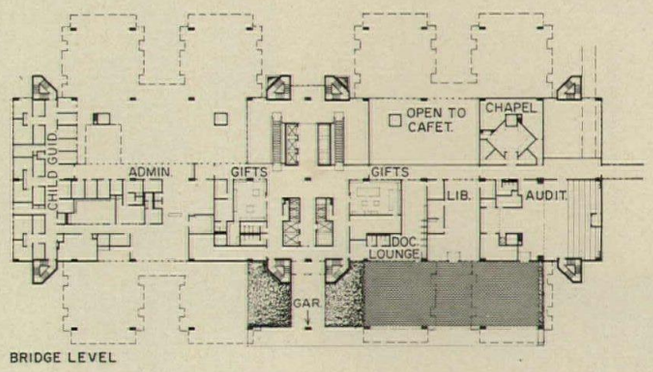




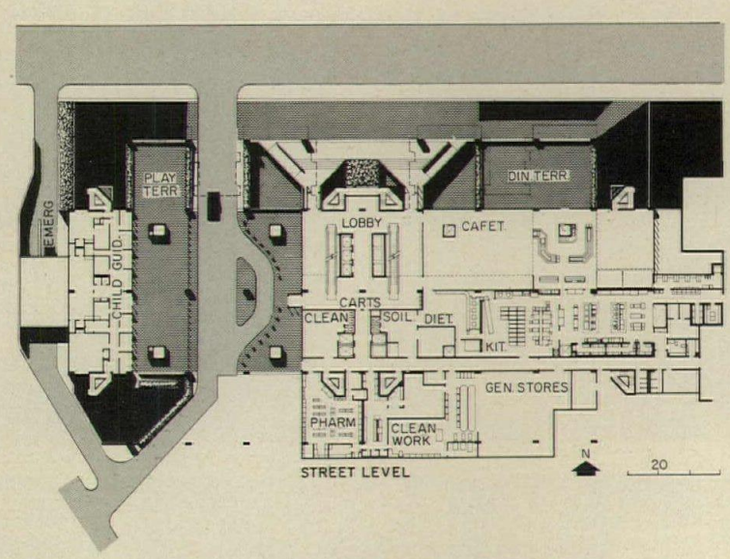
NORTON-CHILDREN'S HOSPITALS UNITE FOR COMMUNITY CARE AND TEACHING SERVICES AT THE UNIVERSITY OF LOUISVILLE



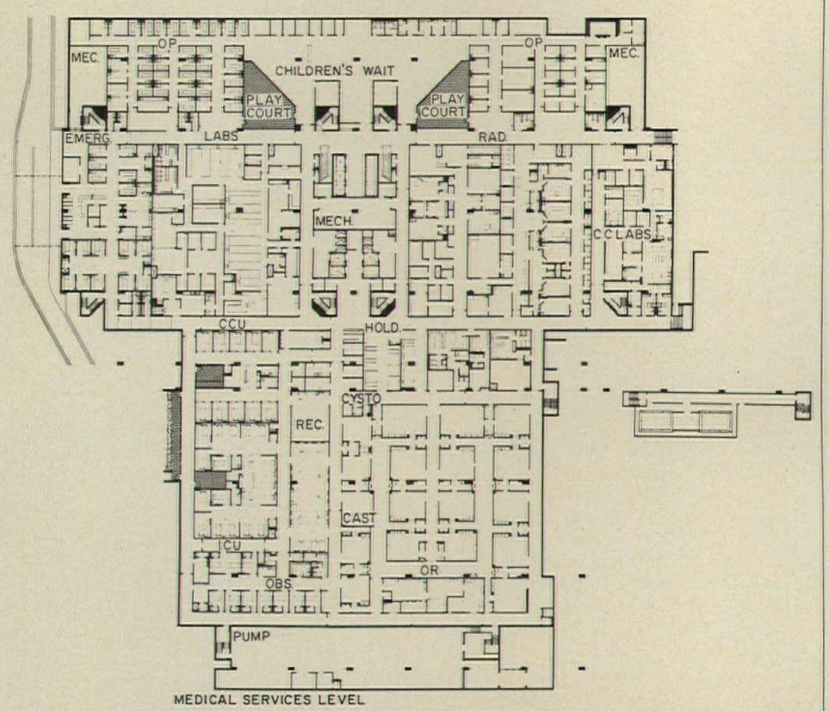
TYPICAL NURSING LEVEL



BRIDGE LEVEL



STREET LEVEL



MEDICAL SERVICES LEVEL

Architecture for hospitals is different, says James Falick, senior vice president, Caudill Rowlett Scott, not because of the complexity of the building, but because there are so many people involved in very intense working relationships that extend over a longer period of time than in almost any other building type. The team that works together also differs from those of other building types. The architect is one of many professionals on this team; he contributes his professional knowledge just as he depends on the client team to contribute theirs. And because the client is used to multi-discipline team work, the health facility team truly operates as one.

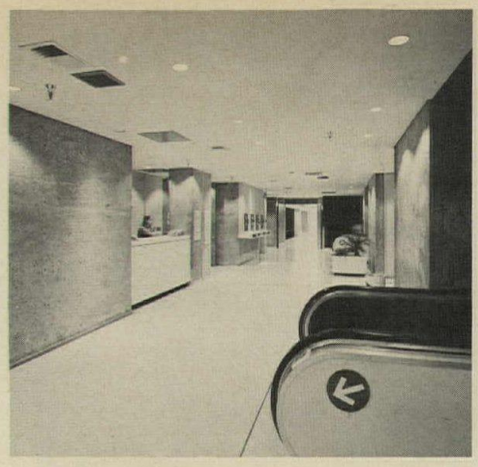
Norton-Children's Hospitals is an example of this process that has lasted over six years and involved two client hospitals, a medical center and medical school, community and state agencies and hundreds of people. It's not that Norton-Children's is a textbook example of client involvement. Rather it's a good example of what does happen over time and what CRS as architects, learned from it. Here is Mr. Falick's report:

In 1967 the John N. Norton Memorial Infirmary and Children's Hospital agreed to a joint development and building program in the University of Louisville Medical Center. From the beginning this was a consolidation of facilities and some services rather than a merger, since neither wanted to relinquish its carefully established reputation and identity.

While they share common problems of crowded, poorly organized and obsolete facilities, the character and scope of the two institutions was, and still is, quite different. Children's is a major pediatric center for the region whose services concentrate on emergency, outpatient and short-term acutely ill patients—with a heavy load of poor neighborhood families. Norton, on the other hand, was an adult-oriented general hospital and more a "carriage trade" facility within a series of aged buildings (built between 1902 and 1932).

The original idea was for Norton to build a satellite hospital in the Medical Center and gradually de-emphasize the main hospital. There was, and is, very little open or available land at the Medical Center and competition for any of it is keen. Children's administrator, the late Frederic R. Veeder, suggested that Norton build adjacent to Children's on land occupied by the School of Nursing, with the future possibility of "knocking a hole through the wall" and sharing some facilities. The more the idea


Norton-Children's Hospitals



was discussed, the better it sounded and the two hospitals decided to seek professional advice from A.T. Kearney & Company, Inc., of Chicago. Kearney's Richard Johnson (now with the Tribrook Group) and his staff reported back that affiliation would serve the best interests of both hospitals. A Joint Development Committee of three persons from each board was given the task of implementing the consolidation, commissioning the architects and initiating the fund-raising campaign. The quality of that committee can be seen by the following two examples. During one programming session, we tacked up a card which said "Be THE Children's Hospitals vs. a Children's Hospital" and talked about what this would mean in terms of additional services, space and money. Satisfying that goal would add about $5 million to the project. They looked at each other, talked (but never had to vote) and said, "The." At our next meeting a month later, another card was tacked up which said "Develop and Satisfy a Commitment to Future Educational Programs." The committee had already talked about the need to satisfy the medical school's requirements, but at this point we had to again point out that they were talking about a $5 million budget increase. Again they looked at each other, talked and said, "Okay, let's do it—but don't bring back any more cards next month."

The planning involved three communities: the two hospitals, the Louisville Medical Center community including other hospitals and medical school faculty, and the greater community of citizens whose support was necessary to effect the program and who would be using the new hospitals. More than 150 professional and hospital-related personnel were involved at various points in the process. Because we essentially lived in Louisville, this direct people involvement for many hours each day reduced the programming and review process from a typical 12-14 months to four months. We were fortunate to find a strong local associate, Nolan & Nolan, Inc., who worked as a part of the team from the early programming stages on.

The result is a hospital that is unique in several ways: the provision of a community interface zone; the organization of the medical service level; and the nursing level diagram. The primary design response in terms of relating to the community is a three-story zone that visually links hospital spaces with outdoor areas both on the street and parking sides. By visually opening up outpatient and public areas to the community, the design recognizes that the way a hospital on an urban site can reflect preventive as well as the acute aspects of health care is to show normal non-acute activities. Easy visibility through courts that open up the ground level waiting and circulation, the street level waiting, lobbies and cafeteria and the bridge level circulation and gift shops maintain the image as one of openness.

The street and bridge levels design furthers the concept of welcome to the community. The bridge level provides entry from the adjoining parking structure and is connected to the street and ground court levels below by escalators. The three stories work as one in terms of vertical and horizontal circulation. The term "bridge level" is derived from the proposed bridge that will link Norton-Children's with the Jewish Hospital directly across Chestnut Street. Norton-Children's master plan allows for similar bridges to eventually link all the buildings in the medical center.

Each nursing floor, designed for flexibility, contains 144 beds, with sub-units of 8, 10 and 16 private rooms with baths. (There are a few two-bed rooms throughout the facility as required by specific specialties.) This allows the flexibility of organizing patients by medical specialty, by degree of illness or treatment mode, and makes it possible to move patients easily within the horizontal "hospital-on-a-floor." Within each sub-unit, rooms are clustered around a central control area containing charting space, stacked carts for linens, equipment, supplies and medication, and a nourishment and utility center. This eliminates the traditional nursing station. Each floor is administered by two coordinator-nurses and a unit manager whose offices are located in a central communication station.

The Norton-Children's design concentrates a medical service zone as a single three-and-a-half acre level. Rather than separating children and adults by floor, as on the nursing levels, pediatric and adult patients share the same vertical and major horizontal circulation patterns. Traffic is separated by being either free-moving public and outpatient traffic or controlled for inpatients, staff and materials movement. The parallel inpatient and public circulation spines feed into all departments.

There is still a way to go before everything at Norton-Children's is perfect and, because it is a new, flexible building, there really should be no stopping point to change and growth. In many ways, use of the building has already evolved beyond where we thought it might at this point. This evolution may just be the best testament to the project's success.

—James Falick

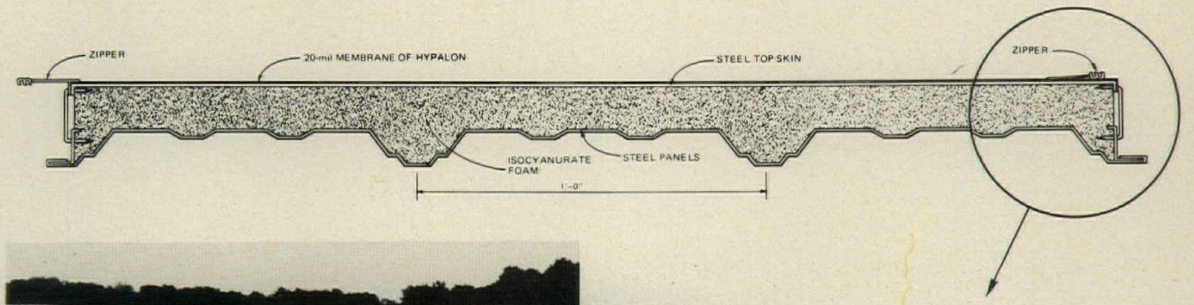
NORTON-CHILDREN'S HOSPITALS, Louisville, Kentucky. Architects: *Caudill Rowlett Scott.* Associate architects: *Nolan and Nolan, Inc.* Hospital consultants: *A.T. Kearney & Associates.* General contractor: *Whittenberg Engineering & Construction.*

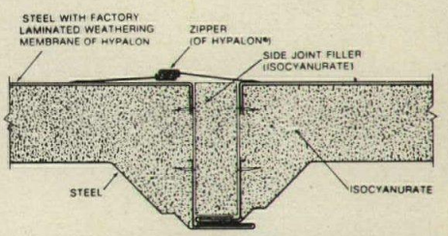
For more information, circle item numbers on Reader Service Inquiry Card, pages 203-204.

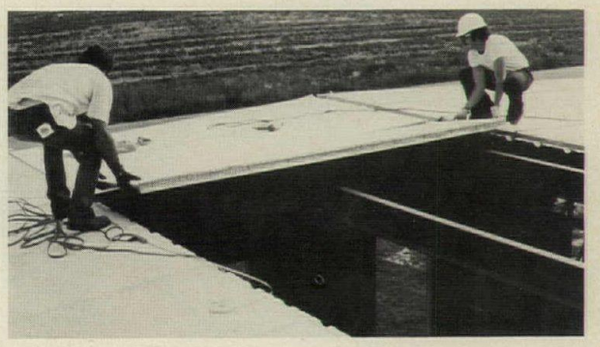
Factory-made roofing zips together

The "Parma" roof system which zips together to form a continuous shield, consists of 3-by-20-ft sandwich panels with a core of isocyanurate insulation between sheets of steel; chlorosulfonated polyethylene (*Hypalon*) is heat-laminated to the top steel sheet, forming a weatherproof membrane. Panels are joined by a *Hypalon* double-zipper, with each zipper acting as an expansion joint between top panel surfaces. When used with the normal 20-ft-long panel, the zipper is capable of transferring over 2000 lbs of lateral load and will resist wind uplift (UL Class 60). The system is recommended for flat or slightly pitched roofs. All-weather installation is claimed and experienced crews are said to be able to install between 100 and 300 sq ft per man-hour. ▪ Uniroyal Inc., Naugatuck, Conn.

Circle 300 on inquiry card



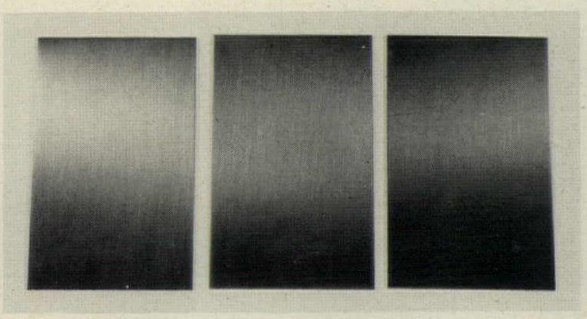




Floodlight features ballast drawer unit

A drawer containing all electrical components of this floodlight slides into the one-piece cast aluminum housing, and connects to power by a quick disconnect plug. The assembly may be used with 100- through 1000-watt metal halide lamps. ▪ McGraw-Edison Co., Racine, Wis.

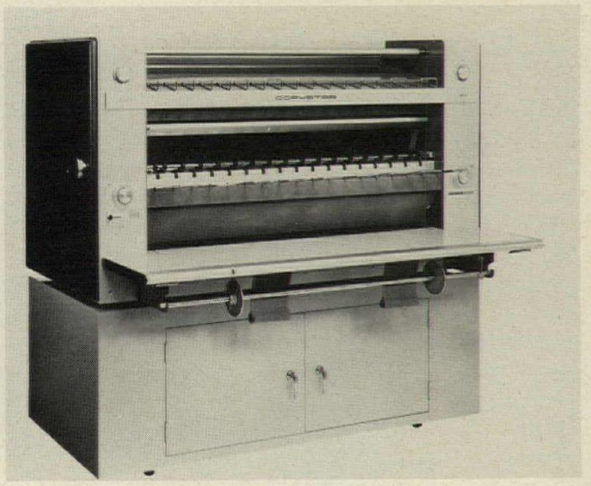
Circle 302 on inquiry card



Bronze tone process developed for stainless steel

Shown are light, medium and dark shades of bronze on stainless steel which may be finished in a range of shades through a controlled oxidation process, causing the color to become an integral part of the surface. The finish is said to resist abrasion, corrosion, fading or other atmospheric conditions. Architectural components—furniture frames, washroom accessories, etc.—are recommended applications. ▪ Allegheny Ludlum Steel Corp., Pittsburgh, Pa.

Circle 301 on inquiry card



Multi-color diazo copier available in two sizes

Suited to black and white printing as well, this ammonia dry process machine can reproduce prints in up to five colors in one pass. Any translucent black and white original with an opaque or semi-opaque image on the front can be used. Two machines are available for prints up to 26 in., and up to 24 in. in width. ▪ Mita Copystar America Inc., Clifton, N.J.

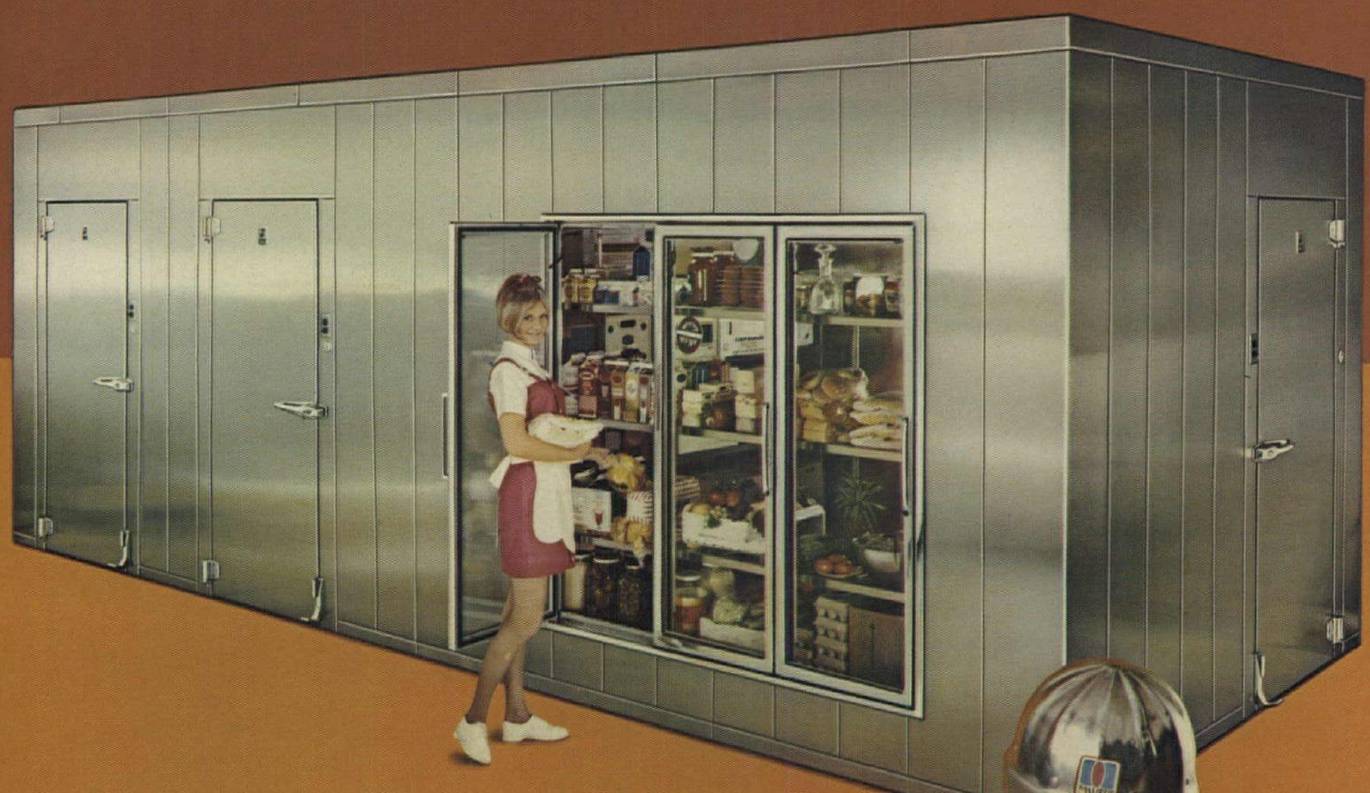
Circle 303 on inquiry card

more products on page 143

◂ *For more data, circle 61 on inquiry card*

Bally belongs

where walk-in refrigeration is a critical requirement



Bally Prefabs are there for faster food at the front counter

Bally Walk-In Coolers and Freezers can be assembled in any size for indoor or outdoor use from standard panels insulated with four inches of foamed-in-place urethane. Choice of stainless steel, galvanized or patterned aluminum. Easy to enlarge . . . easy to relocate. Refrigeration systems from 35°F. cooling to minus 30°F. freezing. Subject to fast depreciation and investment tax credit. (Ask your accountant.) Write for free 28-page book and urethane wall sample. **Bally Case & Cooler, Inc., Bally, Pennsylvania 19503.** Phone: (215) 845-2311.
ADDRESS ALL CORRESPONDENCE TO DEPT. AR-2

Bally

For more information, circle item numbers on Reader Service inquiry card, pages 203-204.

1975 WASHROOM CATALOG / The 48-page, fully-illustrated publication features lines of washroom equipment, grab bars, shelves, bathroom accessories, soap dispensers, mirrors and cabinets. ▪ The Charles Parker Co., Meriden, Conn.

Circle 401 on inquiry card

GLASS WINDOW, DOOR STANDARDS / Standard performance test procedures and application guidelines for "thermalized" windows and sliding glass doors are now available for use by the residential construction industry. Availability of the new standards is said to mark the first time home and apartment owners, builders, architects, manufacturers and government groups (FHA, HUD) will have nationally recognized standards for voluntarily rating thermal performance of these products under various conditions of temperature and humidity throughout the United States. ▪ Architectural Aluminum Manufacturers Assn., Chicago, Ill.

Circle 402 on inquiry card

SNOW GUARDS / The catalog has a complete description and specifications of snow guards suitable for slate roofs, corrugated roofs, tile roofs, or metal and composition roofs. ▪ David Levow, Inc., South Hackensack, N.J.

Circle 403 on inquiry card

PRE-CONDITIONING AIR / A four-page bulletin gives information on the company's *Twin-Cel* energy conservation systems for pre-conditioning and decontaminating outside air. Among the fringe benefits of using the system is bacteria removal on both intake and exhaust air streams. ▪ Kathabar Systems Machinery Div., Midland-Ross Corp., New Brunswick, N.J.

Circle 404 on inquiry card

WEATHERPROOF FURNACE CATALOG / With the introduction of its all new line of gas-fired weatherproof furnaces, the company has issued a 32-page catalog containing complete descriptions of eight sizes ranging from 200,000 to 1,600,000 Btu/hr. Included are condensed specifications, progressive drawings of modules as specified requirements are added with outline dimensions for each, and complete performance tables. Detailed cutaway illustrations point out modular combinations available for these outdoor rooftop or slab installations. ▪ Modine Mfg. Co., Racine, Wis.

Circle 405 on inquiry card

1975 CERAMIC TILE CATALOG / The new 20-page catalog is in full-color and shows more than 160 individual tiles and colors, plus nearly 100 pattern and color combination ideas. Floor and wall tile for residential, commercial and institutional use is categorized in an index for reference. Each page, in addition to showing swatches of the tile, also features specifications, characteristics, applications, color, mounting and trim for each tile. ▪ United States Ceramic Tile Co., Canton, Ohio.

Circle 406 on inquiry card

FOOD SERVICE CATALOG / The 48-page catalog contains illustrations, specifications and detailed information on pans, utensils, buffetware, mobile cafeteria, mobile buffet, food transport equipment and walk-in cooler/freezers. All items are indexed in the rear of the catalog for immediate reference. ▪ The Vollrath Co., Sheboygan, Wis.

Circle 407 on inquiry card

CURTAIN WALLS / A new brochure reviewing the company's line of curtain wall systems has been published. The eight-page, color publication includes specifications, diagrams and other installation details. ▪ Amarlite, Architectural Products Div. of Anaconda Aluminum, Atlanta, Ga.

Circle 408 on inquiry card

GYPSUM BOARD SPECIFICATIONS / Titled, "Recommended Specifications for the Application and Finishing of Gypsum Board," the 16-page publication contains numerous sketches to illustrate correct procedures and details the proper procedures for the application and finishing of gypsum board, including related items and accessories. Other subjects covered are: foil back gypsum board; external corners and arches; application of gypsum board to receive ceramic or plastic wall tile or plastic finished wall panels by adhesive application; exterior application of gypsum board; electric radiant heating systems for gypsum board ceilings; and finishing of gypsum wallboard. ▪ Gypsum Assn., Evanston, Ill.

Circle 409 on inquiry card

LAMINATED STOCK BEAMS / Two pamphlets describing the use of laminated stock beams include one covering Southern pine beams and one featuring Douglas fir beams. Both pamphlets explain advantages of laminated beam construction and present data on stress and dead load values. Load tables show the capacity of such beams in sizes ranging from 3⅛ by 9½ in. to 5⅛ by 21 in. for spans up to 60 ft. ▪ Koppers Co. Inc., Pittsburgh, Pa.

Circle 410 on inquiry card

FORM LINERS / This new literature provides information on vertical and horizontal forming systems, form liners, portable shelters, and chemicals for concrete building. ▪ Symons Corp., Des Plaines, Ill.

Circle 411 on inquiry card

SOUND CONTROL MATERIAL / A two-page data sheet describing a new aluminized *Mylar*-covered acoustic foam in sheets, rolls and custom curtains for sound absorption is available. The material combines aluminized *Mylar* with 1 in.-thick high-density urethane foam for direct application to wall surfaces, ducting and pipes for reportedly excellent sound absorption. ▪ Singer Partitions, Inc., Chicago, Ill.

Circle 412 on inquiry card

COMMERCIAL DUTY BASEBOARD HEATERS / Vinyl wood-grain electric baseboard heaters are featured in a new bulletin which also contains information on commercial duty painted baseboard heaters. Both are available with matching accessory controls, and in either medium watt density (250 watts/ft) or low watt density (187 watts/ft). Both heaters are NEMA-verified and UL-listed. ▪ Emerson Electric Co., St. Louis, Mo.

Circle 413 on inquiry card

ROLLING METAL DOORS / This 1975 catalog presents comprehensive architectural details on a full line of rolling metal doors and fire doors, rolling grilles, rolling shutters and packaged units, rolling fire shutters and sliding grilles. The catalog features the company's new *M58A* solenoid release for rolling fire doors and shutters. This control is said to provide positive closing when activated by smoke or heat detectors, but is not affected by power lapses or failures. It can be furnished for new or existing installations. ▪ Cornell Iron Works, Wilkes-Barre, Pa.

Circle 414 on inquiry card

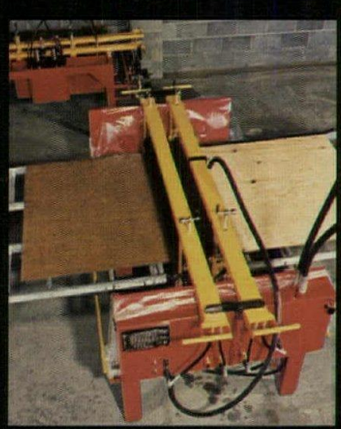
more literature on page 153

Olympic machine-staining:

Kirk, Wallace, McKinley & Associates, Architects.

A beautiful way to save money.

Olympic machine-stained wood is the most economical way to achieve a uniformly-applied stain finish while eliminating virtually all job site problems. There are no weather delays; no painting scaffolds to erect. The Olympic Stainer System assures the highest quality control standards because the stain is actually forced into the wood and allowed to dry naturally. This results in maximum stain penetration with remarkable uniformity—a finish that appears to be as natural as the wood itself. And if the wood shrinks, there is no bare wood exposed. Use Olympic machine-stained wood for new siding, decking, trim and plywood. Choose any Olympic Stain semi-transparent or solid color. For information and the name of the Olympic Machine Stainer nearest you, call your local Olympic Central Warehouse or write:

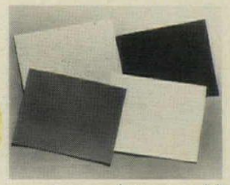


Olympic Stain. A division of COMERCO, INC.
Dept. MS, 1148 N.W. Leary Way,
Seattle, WA 98107. (206) 789-1000.

ROUGH-SAWN CEDAR / Deeply textured, it is finished with a glaze coat that brings out the highlights and shadows, emphasizing the rough-grained effect. It is available in 4 by 8 ft by ¼ in. sections, grooved 8 in. o.c. to show six panels. According to the manufacturer, it is extremely durable, harder than cedar and resistant to dents and marring. The paneling has a two-tone look, with lighter brown highlights and dark brown "grain shadows." ▪ Forest Fiber Products, Inc., Forest Grove, Ore.

Circle 304 on inquiry card

HIGH-ABUSE WALLCOVERING / *Vicrtuf* is a very heavy-gauge, tough and durable wallcovering intended for commercial and industrial areas which are subject to extreme abuse, from scraping and soiling, to downright gouging and tearing blows. Available in four textures, *Vicrtuf* can be ordered in eleven colors. ▪ L.E. Carpenter and Co., Wharton, N.J.



Circle 305 on inquiry card

PRINTER/PLOTTER / An electrostatic printer/plotter that has a resolution of 200 dots/in. vertically and horizontally was designed for scientific and engineering applications requiring 0.2 per cent accuracy in plotting graphics. For printing applications, the *5200* generates 132 characters per line with fixed character spacing on 11-in. wide paper. Both Helvetica Medium and Times Roman type fonts are available as standard. The *5200* prints alphanumeric data at 650 lines/min. and plots graphic material at 1.65 in./sec. ▪ Gould Inc., Newton, Mass.

Circle 306 on inquiry card

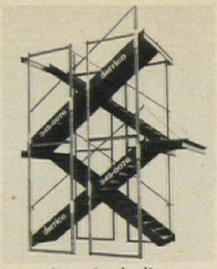
ACRYLIC BATHTUB / Available in white, beige, blue and gold, the unit is 60-by-30-in. and weighs 70 lbs. One-piece construction is said to resist impact, damage, stain and abrasion. The unit's construction is a formed acrylic surface, cast in one piece, backed with reinforced fiberglass and strengthened with a solid base bonded to sump and apron. ▪ Powers Regulator Co., Skokie, Ill.

Circle 307 on inquiry card

CERAMIC TILE COLORS / Five new colors in textured surface *Tuscany* ceramic tile have been introduced: white on white, Juniper, Sapphire, Malt and Honey. Color coordinated grouts are available. Made in a 4¼-by-4½-in. square, 5-in. hexagon, 5½-in. valencia and 1⅜-in. squares, *Tuscany* is suitable for interior residential wall and floor use and commercial wall use. ▪ American Olean Tile Co., Lansdale, Pa.

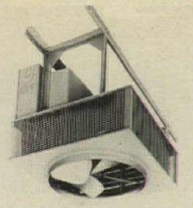
Circle 308 on inquiry card

PRE-ASSEMBLED SCISSORS STAIRS / This stair system is designed for buildings in which the architect has a minimum amount of space for stairways, the crisscross pattern of the scissors taking up less space than other stairs, according to the company. The system is geared for most types of construction, including pre-cast concrete, poured concrete, and steel-frame buildings, and the stairway is built to local and Federal fire code requirements. It can be purchased with or without floor landings. Units are made of lightweight steel. ▪ Derrico Inc., Melrose Park, Ill.



Circle 309 on inquiry card

HEAVY DUTY UNIT HEATER / This line of heavy-duty industrial vertical down-blow electric unit heaters is available from 10 through 50 kw, and 208 to 600 volts. A unique feature of the *1600* series is the "save-a-watt cycle." It automatically turns on the fan when ceiling temperatures in high bay areas reach a predetermined point. The hot stratified air is blown down into work areas, reducing ceiling temperatures, heat losses, and cost of operation. Accessory mounting brackets and a complete line of accessory diffusers are available. ▪ Markel Electric Products, Inc., Buffalo, N.Y.



Circle 310 on inquiry card

More products on page 145

For more data, circle 64 on inquiry card

FUEL BILLS REDUCED ONE THIRD WITH ENERGY-SAVING PANELS

BEFORE

AFTER

PORCELAIN-ON-STEEL PANELS USED TO REPLACE UNNECESSARY GLASS AREAS

Savings of 8¢ per square foot of classroom space are commonplace when old, drafty windows are supplanted with new type aluminum or wood replacement windows and AllianceWall porcelain-on-steel panels. In the process unnecessary glass areas are eliminated and more fuel is conserved.

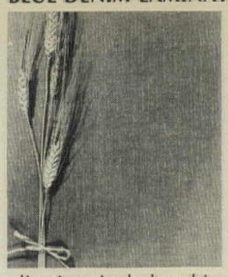
AllianceWall porcelain-on-steel insulated panels are four times as effective as insulated glass in retaining heat and saving fuel. Energy-saving, AllianceWall panels can be used with any aluminum or wooden replacement window system. For complete information, write

AllianceWall®
Corporation
Wyncote, Pa. 19095

Plants in Alliance, Ohio;
Okmulgee, Okla.;
Genk, Belgium;
Odense, Denmark.

For more data, circle 66 on inquiry card

BLUE DENIM LAMINATE / "Blue Denim," a high-pressure plastic laminate with the look and feel of its cloth namesake, is achieved through a special "fabric-like" dimensional finish which retains the benefits of a durable high-pressure plastic laminate. It meets or exceeds all NEMA standards. Applications include cabinets, furniture, accent panels, fixtures and casegoods. ▪ Exxon Chemical Co. U.S.A., Odenton, Md.



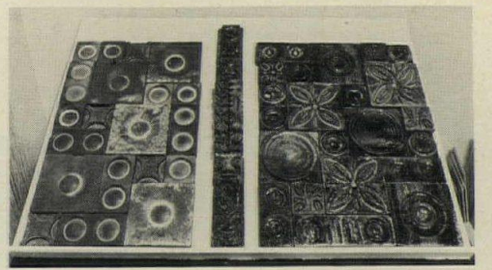
Circle 311 on inquiry card

WOOD, CHROME CHAIRS / Designed by Afra and Tobia Scarpa, all seating is composed of two separate parts—a shell either gel-coated or leather covered, and wood or chrome frames. The shells, stamped in polyester with glass fibers have a high mechanical resistance, a glossy finish and a good chromatic stability. The ashwood carrying structures, available in natural or ebony finish, are said to have extreme elasticity, hardness and durability. The flattened squares and rectangular forms of these carrying structures are bolted to the shells with flush screw details. The chrome carrying structures are highly polished steel curves; arms and base are formed from one bent tube. ▪ Atelier International Ltd., New York City.

Circle 312 on inquiry card

BERBER YARNS / The company has announced introduction of a new berber yarn program for the carpet industry featuring 10 contemporary wool tone colorations. The man-made acrylic berber line will be of prime, consistent quality, has ready and predictable availability, and is non-allergenic, and not susceptible to damage from moths, mildew and other factors. ▪ Dow Badische Co., Williamsburg, Va.

Circle 313 on inquiry card



HAND-CRAFTED CERAMIC TILES / Ceramic tiles from South Africa are offered to American architects and designers in a variety of rectangular shapes and sizes with a weather-resistant high-fired transparent glaze over natural clay. Each piece is hand crafted. Inasmuch as they are produced under controlled factory conditions to maintain consistent standards, they are of uniform quality. The tiles are suited for decorative wall treatments for residential and commercial interiors and exterior applications. ▪ Collectors' Showroom, Chicago, Ill.

Circle 314 on inquiry card

More products on page 147

The Caradco Sculptured Door

Elegance you can afford

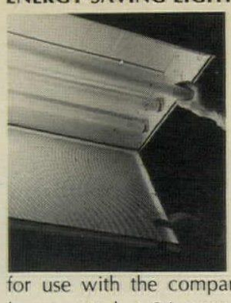
The deep-carved shadow panels are fashioned from one piece, *wood-grained molded faces* that won't split, check, shrink or show paint lines; the proven design that even gives unfurnished rooms a furnished look. The factory prime coat lets you match final finish to any taste, any decor.

Beauty isn't all you get! Your cost for this truly versatile Caradco sculptured door is about midway between a flush and panel door! Yet, you get the features they don't have. You add the lasting impression of Caradco elegance to your homes. Call your Caradco distributor for both passage and bi-fold door styles. Main plant: Dubuque, Iowa 52001/Hainesport Assembly Plant, Hainesport, N.J. 08036.

Caradco Window and Door Division

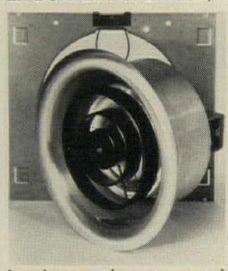
Scovill

ENERGY-SAVING LIGHTING / A new line of lighting fixtures can, according to the company, reduce energy consumption, increase luminaire efficiency, and lower operating costs in schools, office buildings, stores and other commercial structures. The 2-by-4 ft, four-lamp, recessed fixtures are made for use with the company's 40-watt *Econ-O-Watt* lamps, rated at 34 watts to reduce power requirements. The combination of *ECM* recessed fixtures and these fluorescent lamps consumes approximately 11 per cent fewer watts while maintaining more than 98 per cent of the footcandles provided by standard 40-watt lamps and luminaires, according to the company. ▪ Westinghouse Electric Corp., Vicksburg, Miss.



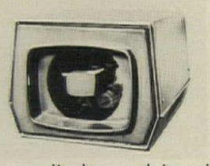
Circle 315 on inquiry card

LIFE SAFETY SPEAKER / This flush-mounted speaker, compatible with recessed lighting, is available for life safety and fire alarm signaling systems as part of the company's temperature-rated "Voice Control" speaker line. Recessed into ceilings or walls with torsion-spring mounting and no visible hardware, the new model *AP-15D-TU* speaker is a UL-listed audible signal, high-efficiency speaker, designed and constructed to meet current National Fire Protection Association specifications. ▪ Atlas Sound, Parsippany, N.J.



Circle 316 on inquiry card

TV PROJECTOR / The model *270A* high resolution, high brightness, large screen monochrome television projector is for use wherever a large screen video presentation is required. It can also be used as a large audience computer display and is said to offer ease of set-up, simple operation and easy maintenance. ▪ Projection Systems, Inc., Passaic, N.J.



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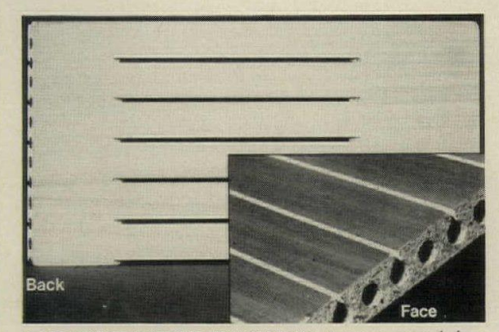


ACOUSTIC WOOD PANELING / At a sound frequency of 175-700, approximately 80 per cent of the sound is absorbed, according to the company. *Trysil's* acoustical properties are provided by numerous circular chambers built into each wood panel to absorb the sound. In addition, *Trysil* is available with a flame-spread rating index of 40. Available in 15 wood veneers including Teak, Walnut, Rosewood, and others, its applications include music rooms, hi-fi equipment, stores, school music departments, residences, offices, etc. ▪ Bangkok Industries, Philadelphia, Pa.

Circle 318 on inquiry card

More products on page 149

The Anyplace Fireplace™ Idea

This bright new concept brings fresh excitement to your greatest single attraction! Because Heatilator® fireplaces go wherever you say. And come in a wide variety of styles to match any decor. So there's no limit to how innovative you can be.

Imagine the impact of a Heatilator fireplace in the master bedroom. Or the kitchen or dining room. Think of the promotional possibilities of the 2 or 3 fireplace family! All within easy reach, because pre-crafting keeps the price low.

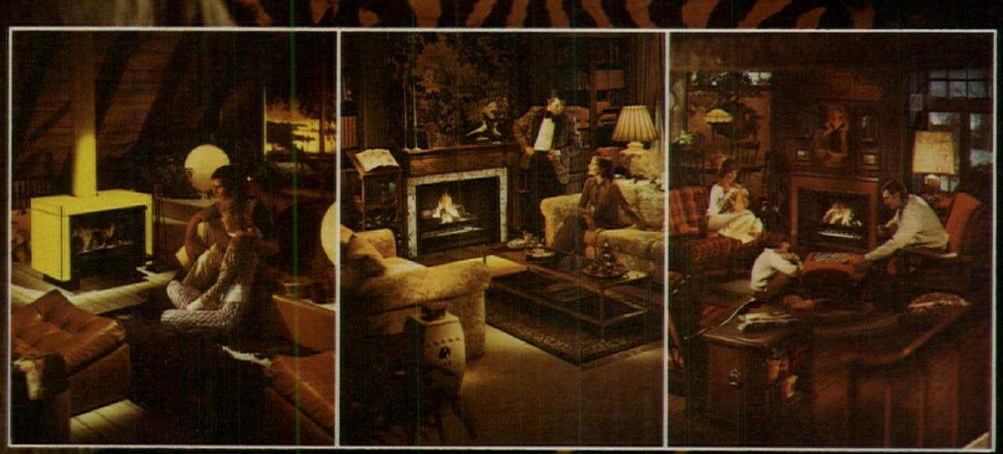
Get with the *Anyplace Fireplace* idea and let your imagination go. Heatilator brand factory-built fireplaces can be installed anywhere, even on a wood floor against combustible walls. No masonry required. Available in any look you want, marble, real brick, wood paneling, even paint, paper or stone. Specify from many attractive builders packages, including woodburning, gas and electric models—built-in, wall-hung and freestanding. Including The *Compatibles*™, new freestanding models in House & Garden colors.

Like some expert help in fireplace planning? Just call your Heatilator fireplace man. He's on your side. Call toll-free 800-553-8905*. Or write: Heatilator Fireplace, A Division of Vega Industries, Inc., 1923 W. Saunders St., Mt. Pleasant, Iowa 52641. (Also available in Canada.)

See Catalog in Sweet's Architectural, Light Construction, and Interior Design Files.

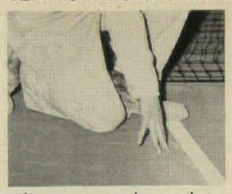
heatilator®

AMERICA'S LEADING FIREPLACE SYSTEMS



*Iowa residents call collect (319) 385-8880

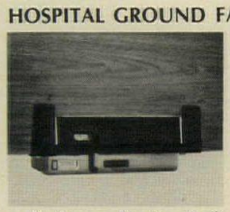
TENNIS COURT SURFACING / "Cushion Kote" is



an acrylic-based material filled with particles of elastomer and polymer resins engineered especially for tennis courts to compress and then spring back with just enough resilience to reduce player fatigue significantly while leaving virtually unaffected ball bounce and other playing qualities. Accelerated aging tests show extremely good aging characteristics, and the coating is easily applied with equally good results to either asphalt or concrete surfaces. ▪ Allied Chemical Corp., Cheshire, Conn.

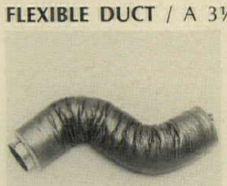
Circle 319 on inquiry card

HOSPITAL GROUND FAULT ISOLATION / A device which isolates hospital patients from the hazards of faulty electrical ground, detects improper grounding in a hospital bed, shuts off power and alerts the nursing staff to pull the wall plug before calling the engineering department. Called the *Automatic Ground Monitor,* this device will be offered as an option on the company's *FRED* hospital bed. ▪ InterRoyal Corp., New York City.



Circle 320 on inquiry card

FLEXIBLE DUCT / A 3½-ft length of flexible duct with built-in connectors has a clamp on one end with an adjustable universal end on the other side. By design, the product is said to significantly reduce installation time and assures air-tight fittings on both ends. The duct has a double-wrap insulation of two ¾-in. layers of fiberglass assuring thermal efficiency. Available in diameters of 4 through 20 in., the duct is designed for low-pressure applications. ▪ General Environment Corp., Glendale, Cal.



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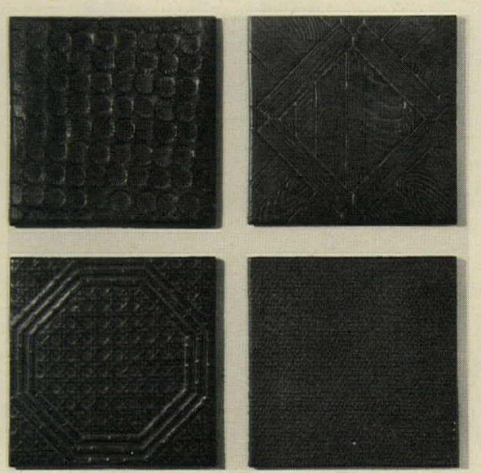


CERAMIC TILE PATTERNS / Five new patterns (four are shown) are available in a 12-by-12-in. cushion edge tile and are offered in brown. The tile, which is suitable for use in interior and exterior floors in all types of residential and commercial applications, is available with an abrasive grain additive fired into the surface for wear resistance and increased coefficient of friction. The cushioned edge of the tile permits slight size differences in the tile to heighten the handcrafted appearance while maintaining dimensional stability. ▪ Interpace, Los Angeles, Cal.

Circle 322 on inquiry card

More products on page 151

Colorstyle doors complement the beauty and charm of San Francisco

Style and beauty plus ruggedness make Ceco steel doors attractive to architects in San Francisco and throughout the country. Ceco doors meet every functional need. Use them as a "package" to accent your design. Ceco doors and frames are prepared for simple erection in minutes. And both are prepared for quick and solid attachment of hardware. Ceco doors and frames are tough and stable—won't warp, swell, shrink or rot. You gain the advantages of durability and trouble-free performance. Our Colorstyle doors have factory-baked quality finishes, kept fresh in poly bags. See Sweet's, or consult your local Ceco office.

CECO steel doors

The Ceco Corporation
5601 West 26th Street • Chicago, Ill. 60650

"The door people"

For more data, circle 74 on inquiry card

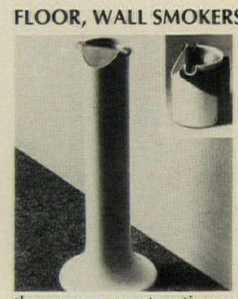
DUAL-FUEL WATER HEATER / A 40-gal residential water heater that operates efficiently with fuel oil or electricity at the flick of a switch, features a 60-gal per hour recovery rate with oil firing and an 18-gal per hour recovery rate as an electric water heater. Oil and electric heating systems are completely independent and can be operated separately or together. Each system is protected by its own safety control to prevent overheating. ▪ Glass-Lined Water Heater Co., Cleveland, Ohio.

Circle 323 on inquiry card

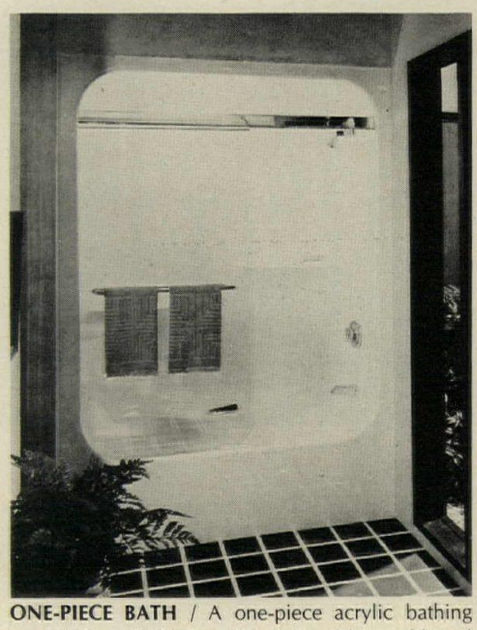
CLOSETS-INTO-SAUNAS / A special door that turns almost any small room into a sauna, the "Solo Door" has everything necessary for a sauna: heater, controls, ventilation, a window and light. It hangs on existing door hinges and runs on household current. ▪ Viking Sauna Co., San Jose, Calif.

Circle 324 on inquiry card

FLOOR, WALL SMOKERS / Designed by Enzo Mari, the standing floor smoker has a base of ABS plastic in black or white. The non-flammable *Melamine* container features a pivoting cast aluminum cigarette receiver. The unit stands 26 in. high and is 10 in. in diameter. The inset shows a wall unit of the same construction with these dimensions: 5½ in. diameter and 6 in. high. ▪ Hank Loewenstein, Inc., Fort Lauderdale, Fla.



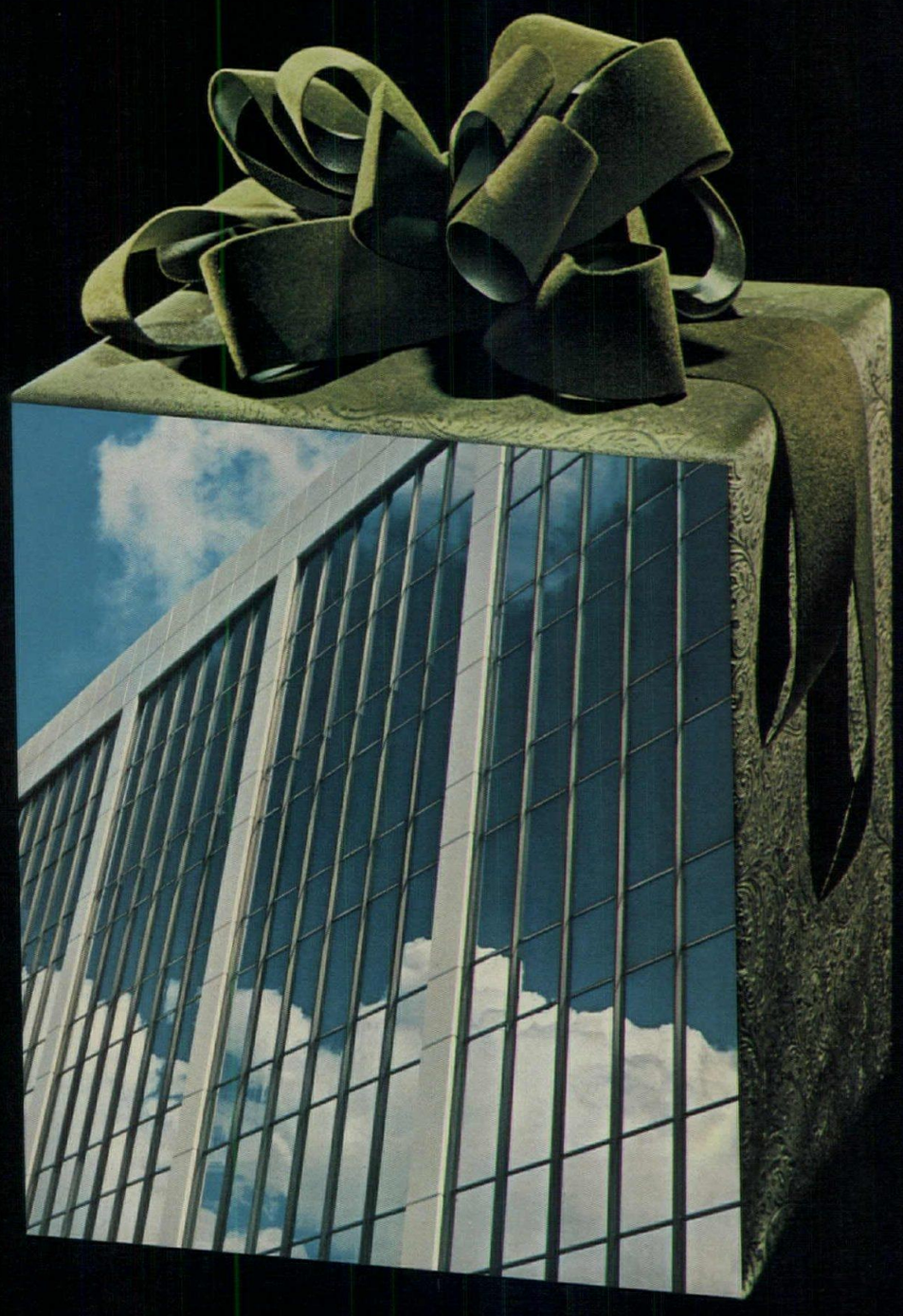
Circle 325 on inquiry card



ONE-PIECE BATH / A one-piece acrylic bathing module is available in white, beige, blue, gold, and avocado. It has a slip-resistant floor with a resilience that provides cushioning against injury from falls. Available as a shower or tub unit, with or without glass doors, the "Fiat" line is constructed of acrylic reinforced with a flame retardant fiberglass and polyester resin backing. Drain openings adapt to standard drains. ▪ Powers Regulator Co., Skokie, Ill.

Circle 326 on inquiry card

A TOTAL ENVIRONMENTAL PACKAGE...PLUS



Anaheim Memorial Hospital, Anaheim, California. Dan Rowland & Assoc.—Archs., Model Glass Co.—Glazier. Product: Tempered Monolithic Chrome Reflective

PLUS...REFLECTIVE DESIGN COLORS—in chrome, bronze, grey and gold. Subtle, subdued colors complement and match the surrounding building materials. LEADERS in the industry.

PLUS...GLASS-LIKE APPEARANCE—without harsh, off-color, or mirror-like reflections.

PLUS...HIGH PERFORMANCES—with outstanding solar control, occupational comfort and lower operating costs. Shading coefficients down to .11 and U factors down to .30.

PLUS...COMPLETE VERSATILITY—insulating, laminated and monolithic to provide thermal control, security and safety.

PLUS...CONVENIENCE—a total glass package for the architect, owner and glazier.

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For more data, circle 77 on inquiry card

OFFICE LITERATURE *continued from page 141*

ENVIRONMENTAL ENCLOSURES / An 8-page, illustrated catalog covers a complete line of environmental enclosures for X-ray, nuclear, radio frequency, audio and sound shielding. Developed for use by hospitals, universities, nuclear and other research facilities, industry, government, and the construction field, these enclosures include both standard and custom designed shielding and accessories, produced with a variety of materials to meet specific user needs. Test data, performance data and references to other product publications are also included in the new catalog. ■ Keene Corp., Ray Proof Div., Norwalk, Conn.

Circle 415 on inquiry card

CURTAIN WALL FIRE TEST / A bulletin summarizing four major fire tests on exterior curtain wall assemblies covers two load-bearing exterior wall assemblies, and two non-load bearing wall assemblies. Each assembly is briefly described and construction details illustrated; all of the assemblies are two-hour rated. ■ Metal Lath/Steel Framing Assn., Chicago.

Circle 416 on inquiry card

FIRE VENTS / The company has announced that its 1975 catalog, now available, gives details, sizes and specifications for horizontal doors, roof scuttles, automatic fire vents, floor and pit doors, ceiling access doors and basement doors. ■ The Bilco Co., New Haven, Conn.

Circle 417 on inquiry card

ENERGY-CONSCIOUS ELEVATOR CONTROL / A four-page brochure details the operating advantages of a solid-state drive for geared elevators operating at speed ranges from 150 to 400 feet per minute; a reduction in energy requirements from 10 to 35 per cent compared to motor-generator systems is claimed. Other performance, economic, installation and safety features are also described. ■ Armor Elevator Co. Inc., Louisville, Ky.

Circle 418 on inquiry card

CONTRACT CARPET / The newest edition of the company's main catalog and the "Contract-Carpet Information Manual" are now available. The 32-page catalog shows the products in use as well as color samples of each quality. Complete architects' specifications are given by product line and a special section in the back offers general information and guidelines. The "Contract Carpet Information Manual" contains 106 pages of general facts about contract carpet. Government requirements, cleaning tips, a glossary of textile terms and installation particulars are included; also a large section on technical information. ■ Wellco Carpet Corp., Calhoun, Ga.

Circle 419 on inquiry card

1975 CERAMIC TILE CATALOG / A 36-page brochure introduces 11 new tile colors and sculptured tile; also shown are residential, institutional, swimming pool and commercial applications of quarry, ceramic mosaic and glazed tile. Trim pieces and bathroom accessories are included, along with architectural specifications for all products. ■ American Olean Tile Co., Lansdale, Pa.

Circle 420 on inquiry card

OUTSIDE STORM LOUVER CATALOG / A 28-page catalog covers a line of extruded aluminum and formed metal outside storm louvers and accessories available in stationary and adjustable models for intake or exhaust applications. The catalog includes a quick selection guide, specification drawings, accessory and installation details and engineering performance data. ■ Lear Siegler, Inc., Tucson, Ariz.

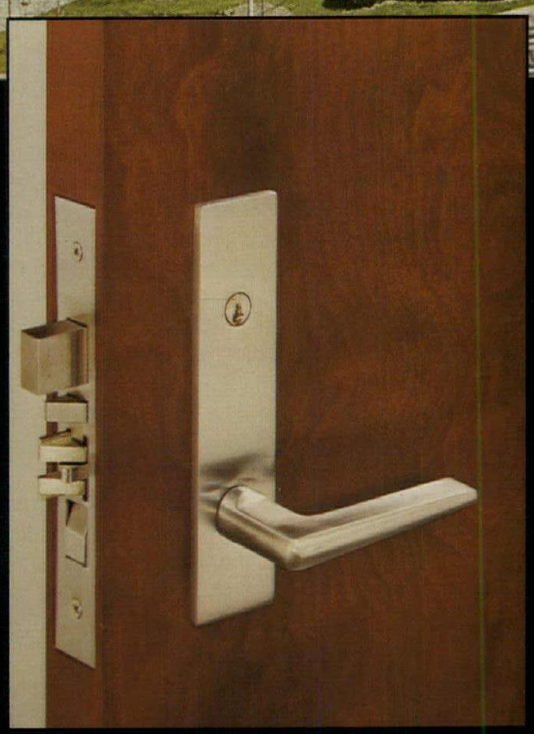
Circle 421 on inquiry card

APPROVED BY COMMITTEE!

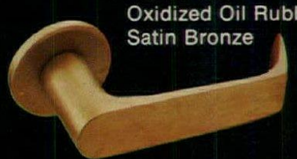
A.I.A. HEADQUARTERS BUILDING,
Washington, D.C. – The Architects Collaborative

Lever handle mortise locks manufactured by the General Lock Company were selected and approved for installation on the prestigious A.I.A. Headquarters Building in Washington, D.C.

Economy, mechanical reliability and long life are integrated with simple straight forward knob and lever designs. Secure your best designs with General and you'll be in good company.

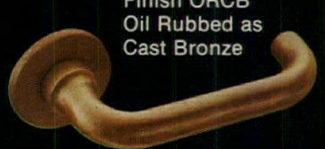


Lever 44
Escutcheon 712
Finish 26D
Satin Chromium



Lever 61
Rose 1422
Finish 10B
Oxidized Oil Rubbed
Satin Bronze

Knob 22
Rose 1422
Finish 26D
Satin Chromium



Lever 19
Rose 1422
Finish ORCB
Oil Rubbed as
Cast Bronze

Knob 42
Rose 1422
Finish ORCB
Oil Rubbed as
Cast Bronze

general lock company

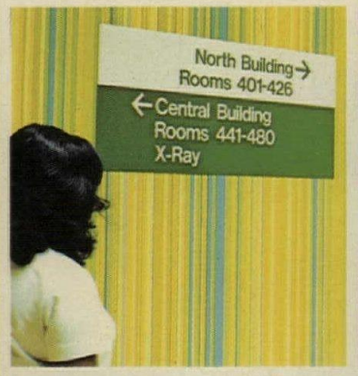
244 West Sheffield, Pontiac, Michigan 48055, (313) 338-7193

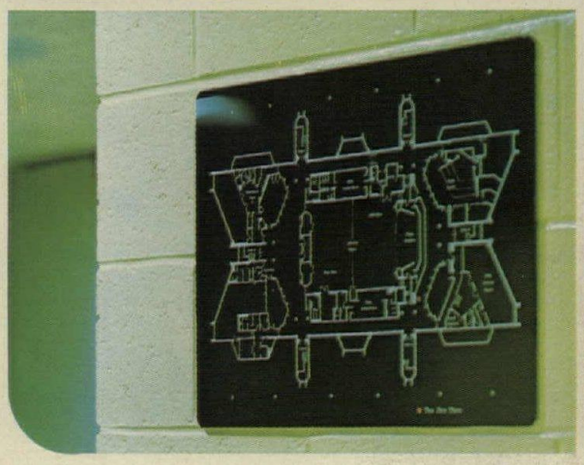
A Division of and Marketed by Schlage Lock Company

For more data, circle 80 on inquiry card

TOTAL SIGNAGE SYSTEMS

INTRODUCING NOMAR—THE SIGNAGE THAT RESISTS EVERYTHING BUT GOOD VISIBILITY





Wind, weather, vandalism, chemicals, solvents, ultra-violet rays—NOMAR fiber reinforced polyester resists damage as no other signage material can.

Reason is that we embed the images into the subsurface of the fiber and plastic where the villains can't get at them. And for crisp visibility and color clarity, we match the light refraction index of the fiberglass mat to that of the polyester resin.

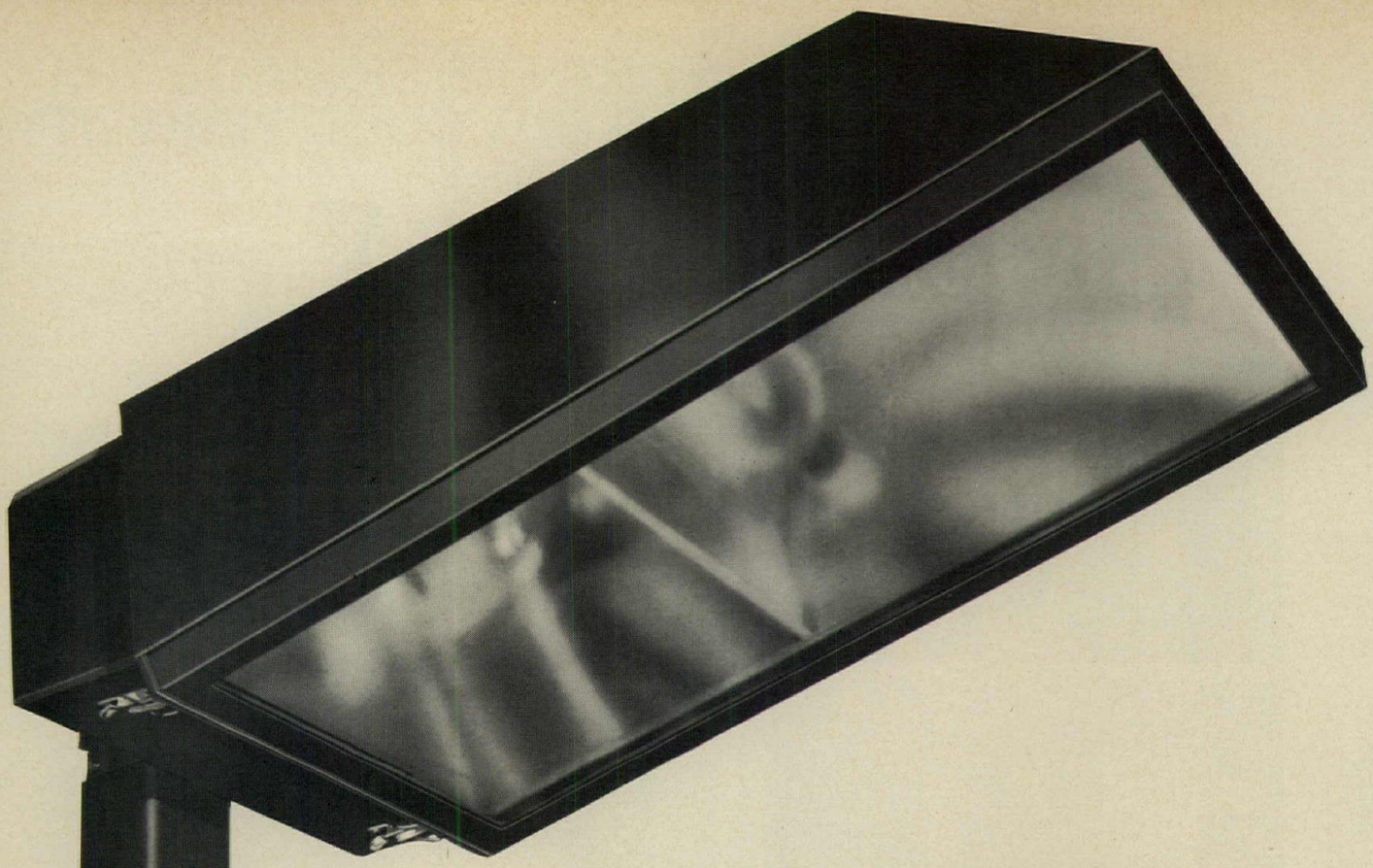
Highly versatile With NOMAR, virtually any image in any printable color can be reproduced from camera-ready art—logos, symbols, maps, photos, supergraphics, etc. Silk screening is the ideal reproduction process, although many other graphic processes may be used.

For interiors or exteriors NOMAR signs can be projected from walls or ceilings with simple hardware. Or surface mounted with tape or adhesives. In post and panel assemblies or in monolithic structures, they are extremely durable, attractive and architecturally compatible. NOMAR signage may be opaque or translucent to permit internal illumination. Maximum dimensions of a standard single sheet are 12 feet by 4 feet. Thicknesses range from 1/32-inch to 1/4-inch.

Matthews. For total identification systems—from design through installation. Write for our comprehensive catalog. Jas. H. Matthews & Co., 1315 West Liberty Avenue, Pittsburgh, Pa. 15226.

For more data, circle 81 on inquiry card

JHM MATTHEWS
Identification Systems



GUTH HAS JUST RE-INVENTED OUTDOOR AREA LIGHTING

. . . to more uniformly illuminate a *larger* area per fixture than conventional systems, *and do it with up to 18% less input wattage!*

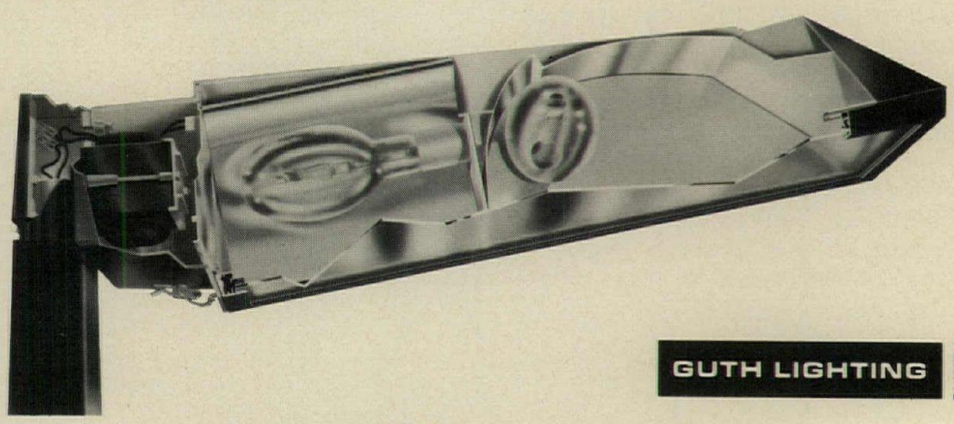
Guth's new "Dual" Area Light is a breakthrough in lighting efficiency.

It is a totally new concept that combines two separate optical systems and two H.I.D. lamps in a single housing. One is designed specifically to "throw" light, the other to "spread" light.

The "Dual" offers double savings. Less power per fixture, and fewer fixtures. Plus better lighting, with less clutter.

The two optical systems are also available separately in single-task luminaires with identical styling for specialized lighting requirements.

For complete information, write Guth Lighting, P.O. Box 7079, St. Louis, Missouri 63177, or call (314) 533-3200.



GUTH LIGHTING SLB SOLA BASIC

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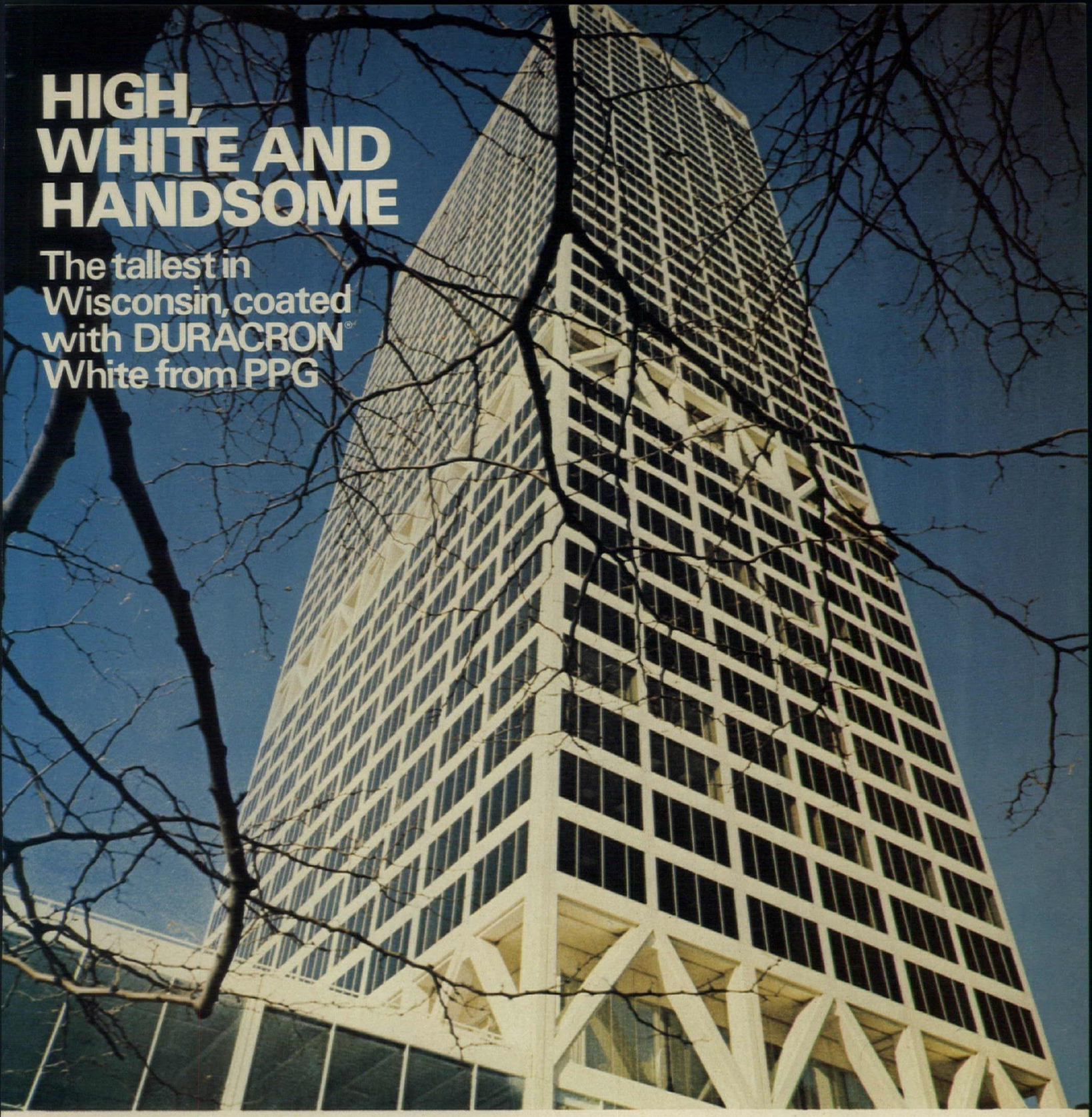

FIRST WISCONSIN CENTER, Milwaukee, Wisconsin. **Developer:** First Wisconsin Development Corporation, Milwaukee, Wisconsin. 3A2
Architects & Engineers: Skidmore, Owings & Merrill, Chicago, Illinois; Fitzhugh Scott Architects/Planners, Inc., Milwaukee, Wisconsin.
Consulting Engineers: Cosentini Associates, Chicago, Illinois. **Extrusion Coater, Fabricator and Erector:** Cupples Product Division, H. H. Robertson Corporation.

The new First Wisconsin Center was planned to be the tallest building in Wisconsin (42 stories). So its developers and architects wanted it to look dramatic, rising clean and bright against the Milwaukee skyline and Lake Michigan's waters.

They specified DURACRON Super 800 white coating from PPG for all the column covers, mullions and spandrels.

The result is a sparkling white tower with beauty that will last for years and years. That's because DURACRON Super 800 extrusion coatings are silicone-fortified acrylic coatings with outstanding durability and color integrity.

For bright new extrusion coatings that last for years, look to PPG. Check Sweet's Architectural or Industrial/Construction Files 9.10/PPG. Or contact the Market Manager, Extrusion Coatings, PPG INDUSTRIES, Inc., Dept. 16W, One Gateway Center, Pittsburgh, Pa. 15222.
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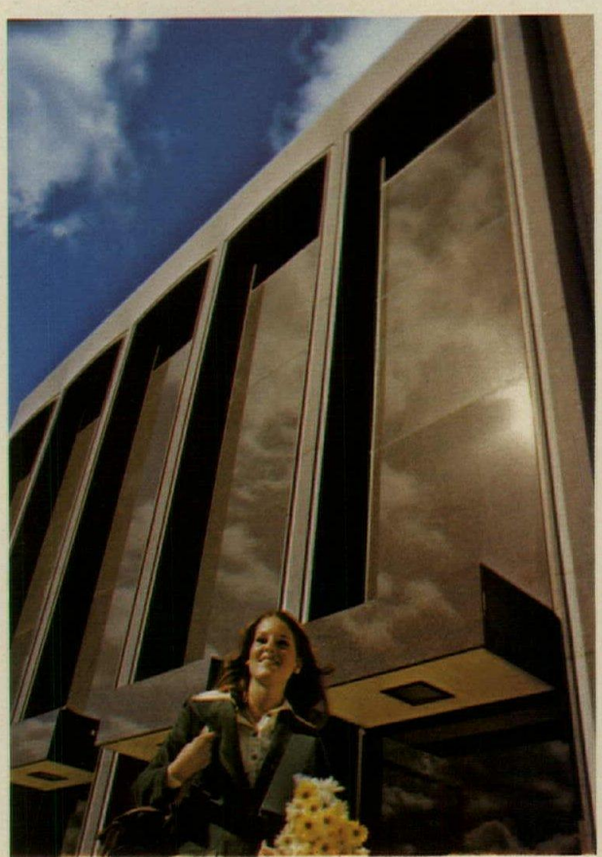

Polished granite has a number of characteristics which make it right for jobs like the Maplewood Mall. On the outside, the rich, natural beauty of the granite takes on a new dimension as it reflects the additional beauty that surrounds it. At the same time, however, it provides an exterior wall surface that resists the corrosive effects of weather as almost no other building material can. It requires virtually no maintenance. And its natural beauty will not fade or deteriorate.

Inside, the granite blends beautifully with its surroundings. And yet remains almost totally untouched by the wear and tear that is commonly associated with high traffic areas.

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Architect: Ralph B. Shimer, AIA Architect

Contractor: Bor-Son Construction Inc.

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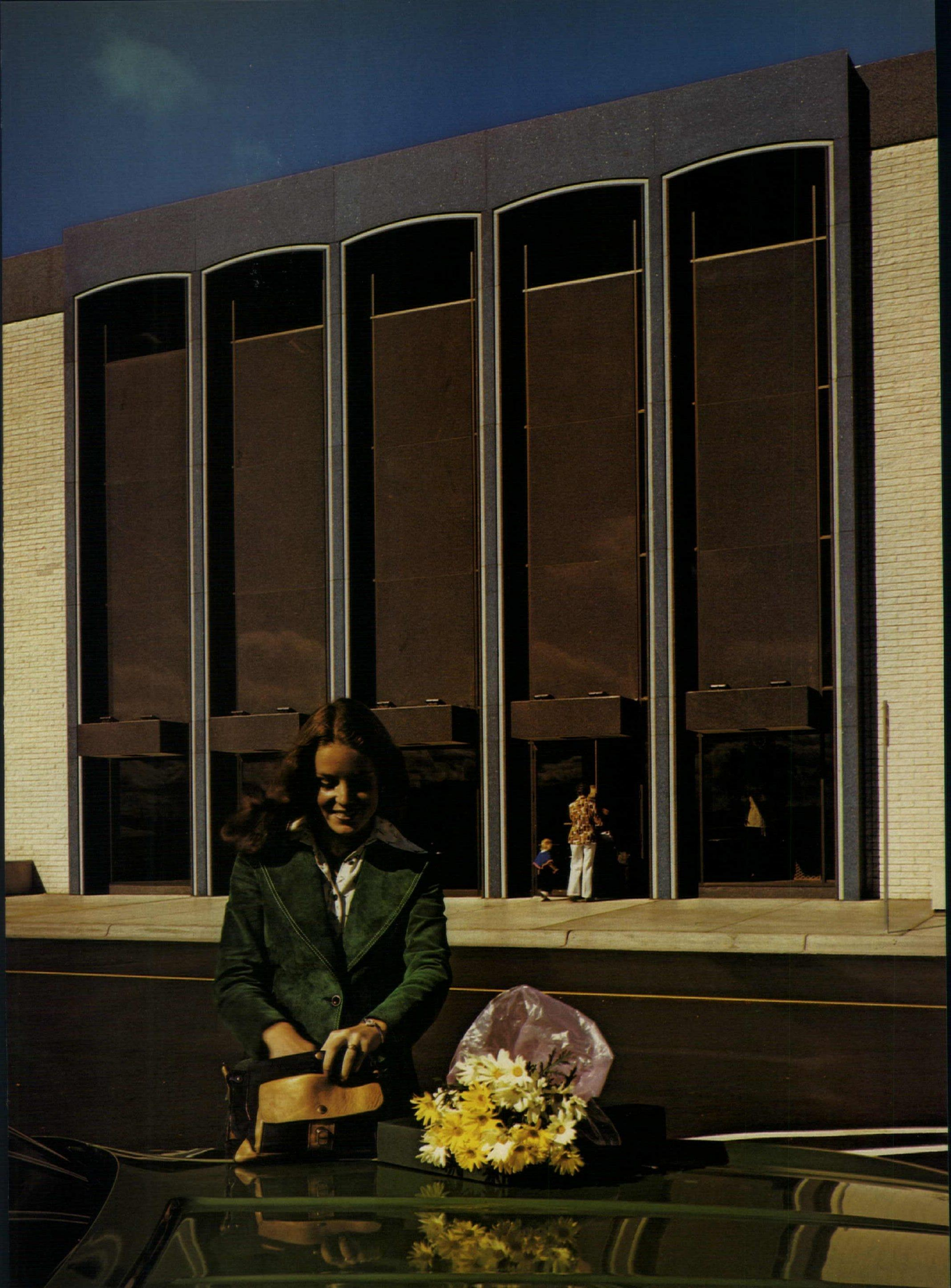
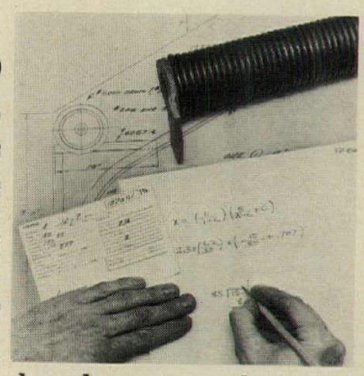


If It's Worth Warehousing, The Building Deserves A Raynor Door



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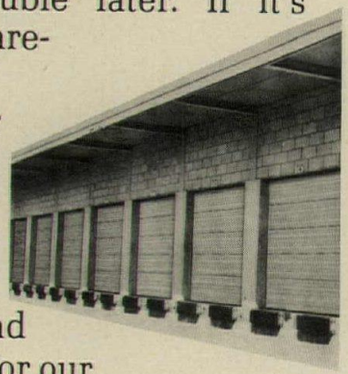

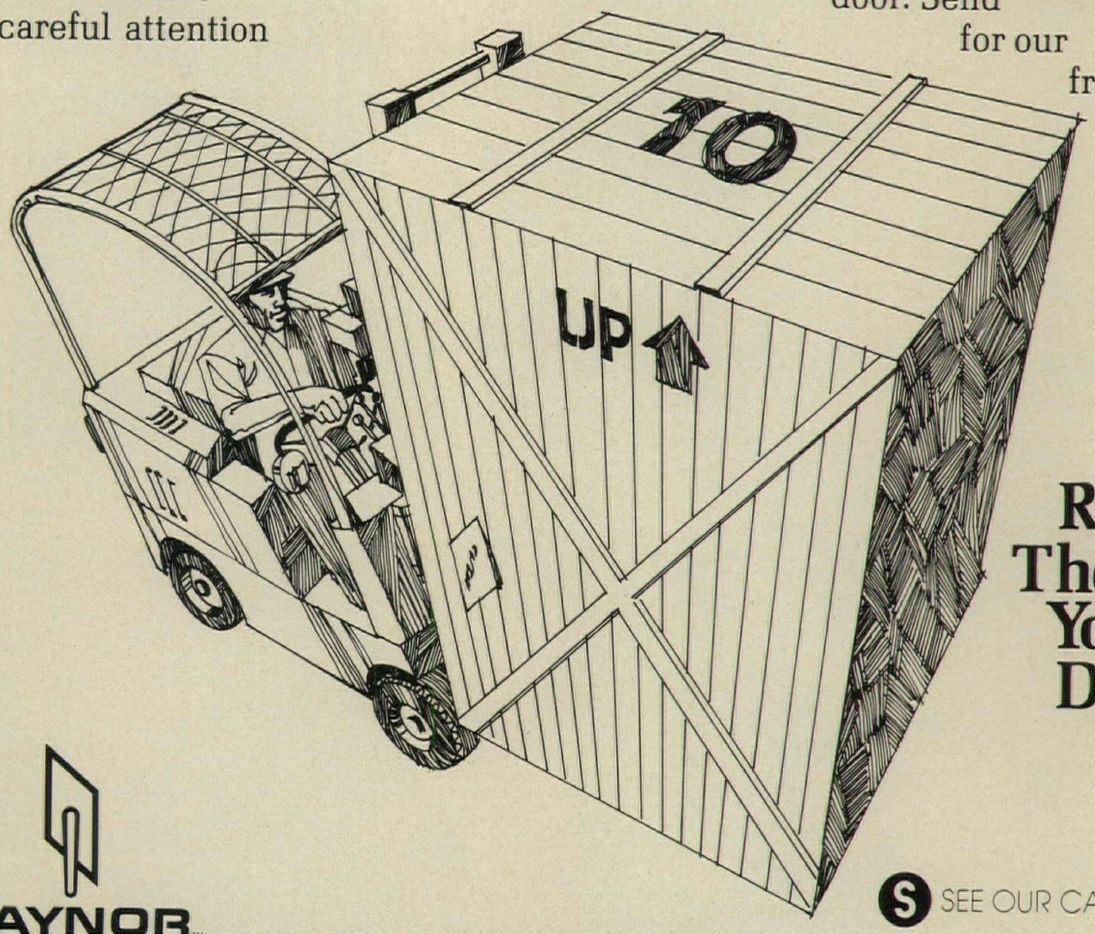

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A J-M roof ... a systems approach to quality.

A quality built-up roof is no better than its component parts. And no better than the techniques used to put them together. That's why it's so important when you specify a roof, to consider every aspect of the system, if you expect true value and lasting protection when the job is done. And that's why a J-M built-up roof makes sense. You benefit from the experience of over 100 years in the roofing business—on J-M quality in a complete line of roofing products built to work together—and on the skills of the J-M team of roofing specialists.

A J-M roof means single-source materials responsibility.

Because J-M makes everything that goes into a built-up roof, you can have Johns-Manville quality all the way—from the deck up. From vapor barrier to top dressing, you're assured of components made to go with each other. And when those materials are applied in accordance with J-M specifications, the result is "from-the-deck-up" dependability. Plus, another important benefit: Clear-cut responsibility for the performance of the materials used in the finished assembly. And that can be a real advantage in case follow-up is needed after the roof is completed.

all together.

J-M Ventsulation® Felt vents entrapped moisture before it can cause roof failure.

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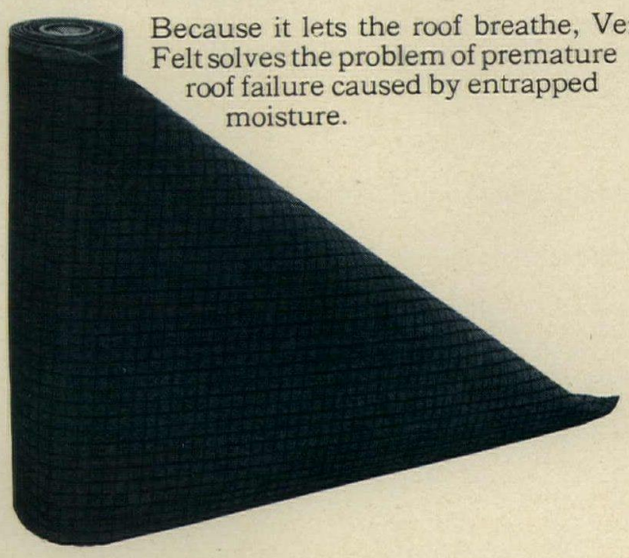
Ventsulation Felt, with its *exclusive* waffle pattern, is designed so that trapped air containing moisture passes harmlessly in all directions through the channels and out into the atmosphere. It provides a built-up roof that breathes. Reduces the possibility of premature failure caused by entrapped moisture-laden air.

Ventsulation can be used on most any type of deck: on nailable or non-nailable surfaces, over lightweight fills, with insulation. It's particularly effective on re-roofing jobs since most old roofs contain a certain amount of moisture.

There's no reason to lose a good roof to entrapped moisture. For details and specifications on J-M Ventsulation Felt, or for assistance of any kind with a built-up roofing problem, contact your J-M District Office. Or contact Dick Ducey at Johns-Manville, Box 5108, Denver, Colorado 80217. (303/770-1000, Ext. 3740.)



Because it lets the roof breathe, Ventsulation Felt solves the problem of premature roof failure caused by entrapped moisture.

The single-source built-up roofing system.

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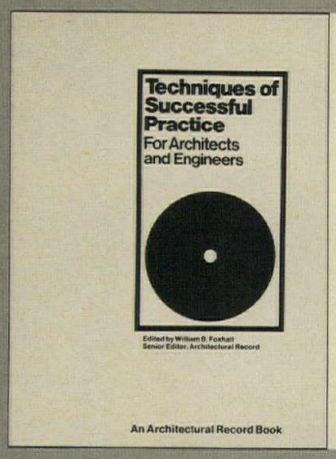

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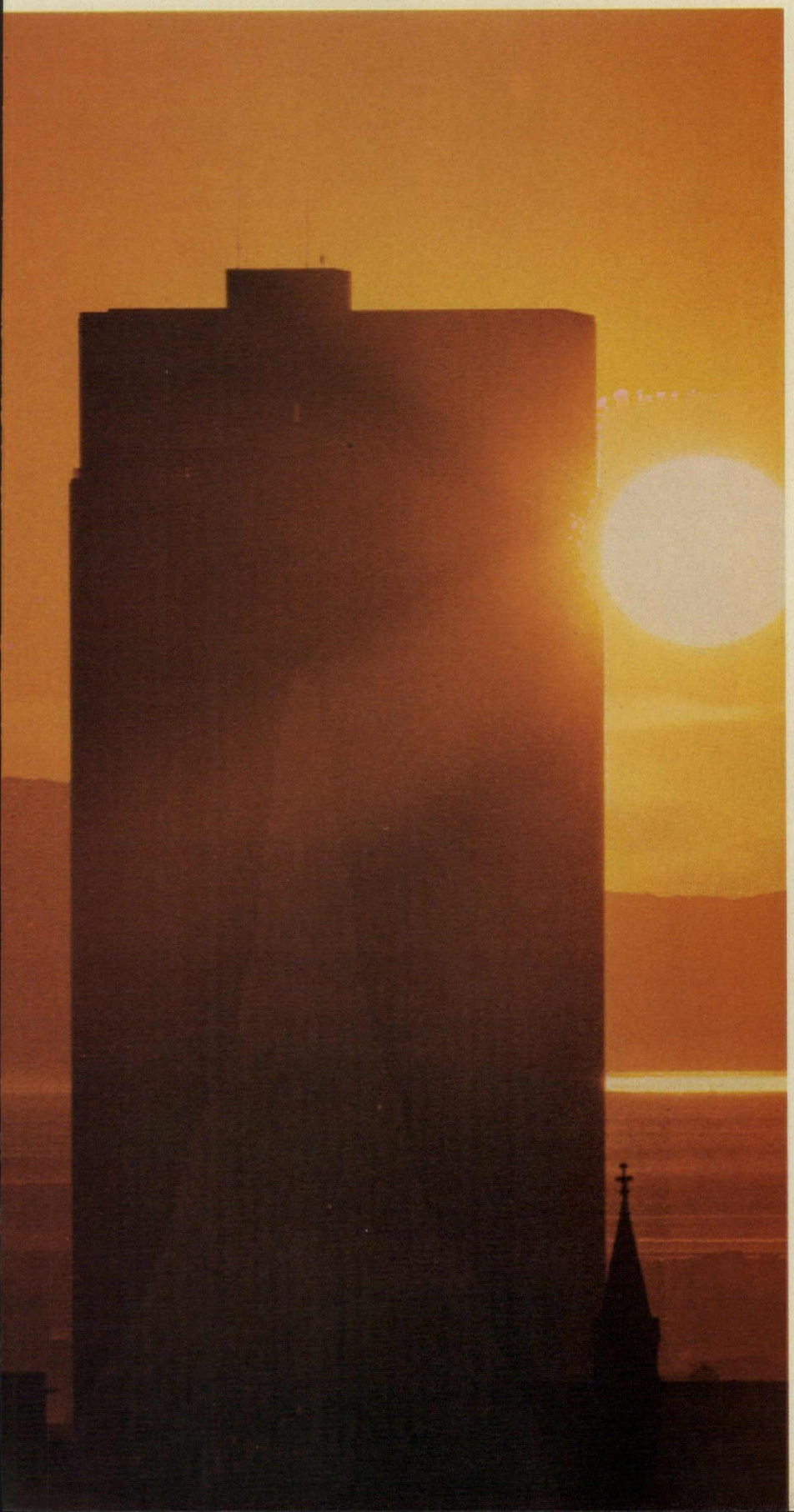

About 15 percent of the nation's annual energy consumption is spent in the operation of commercial buildings. The building's envelope is an important first line of defense against energy consumption. If designed with energy conservation in mind, the "building envelope" — its walls, floors, and roof — can help conserve energy at least five ways:

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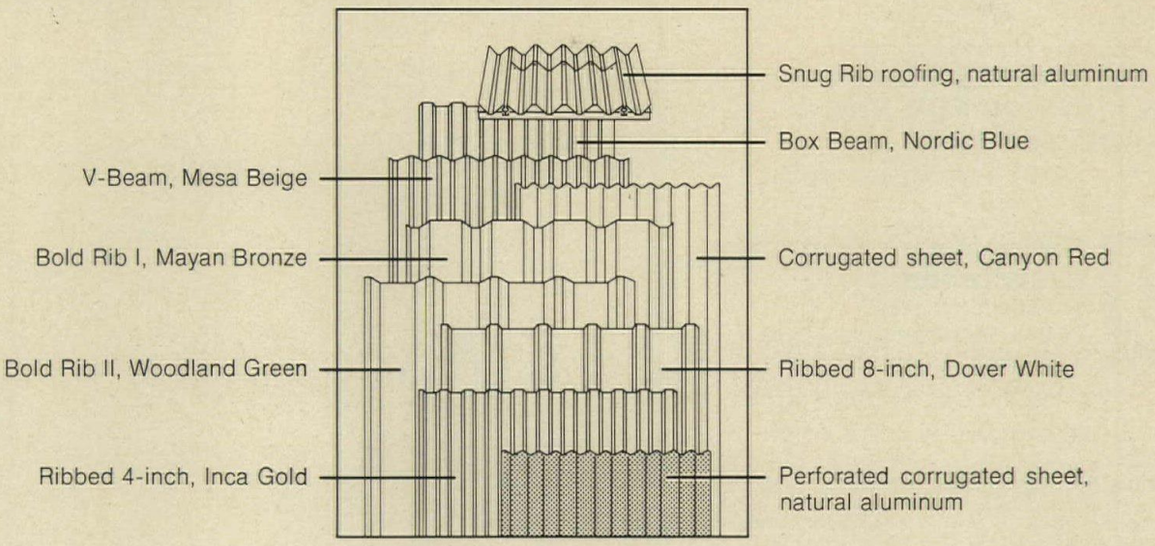

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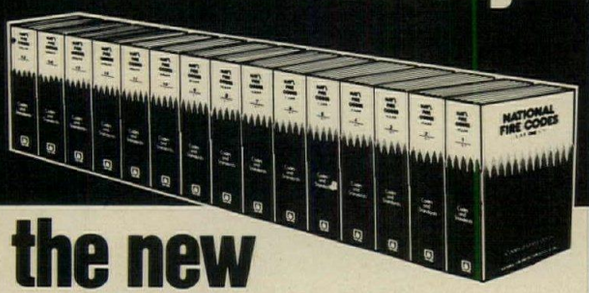

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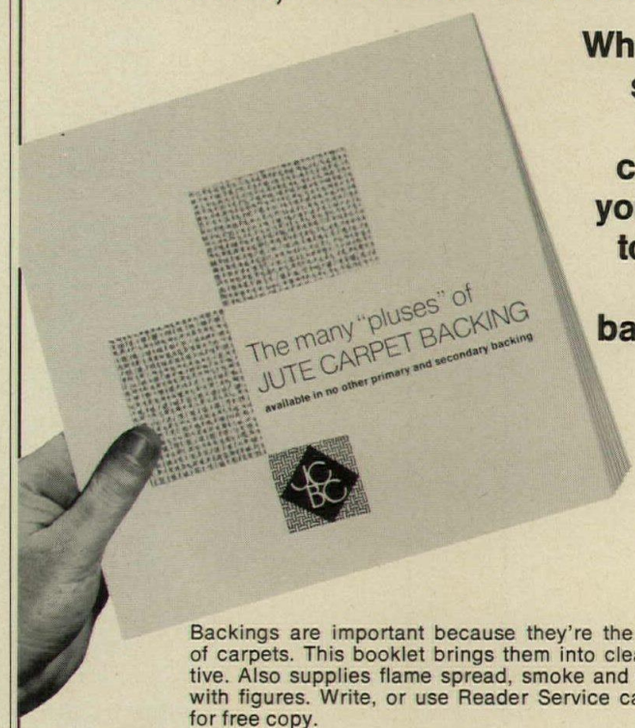

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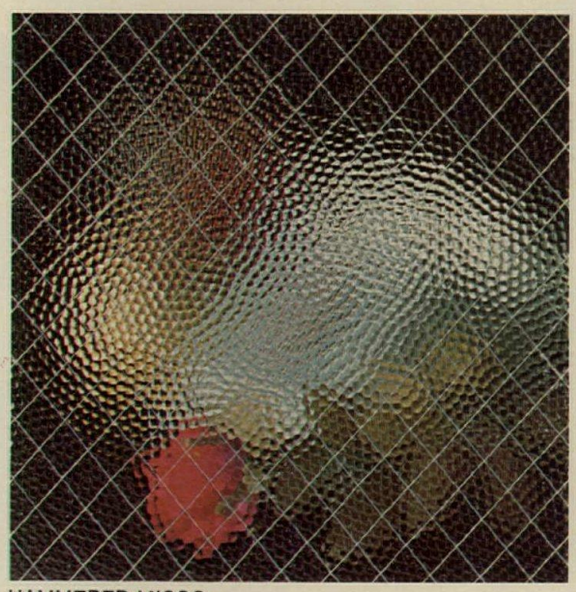

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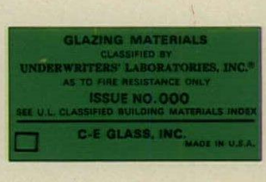

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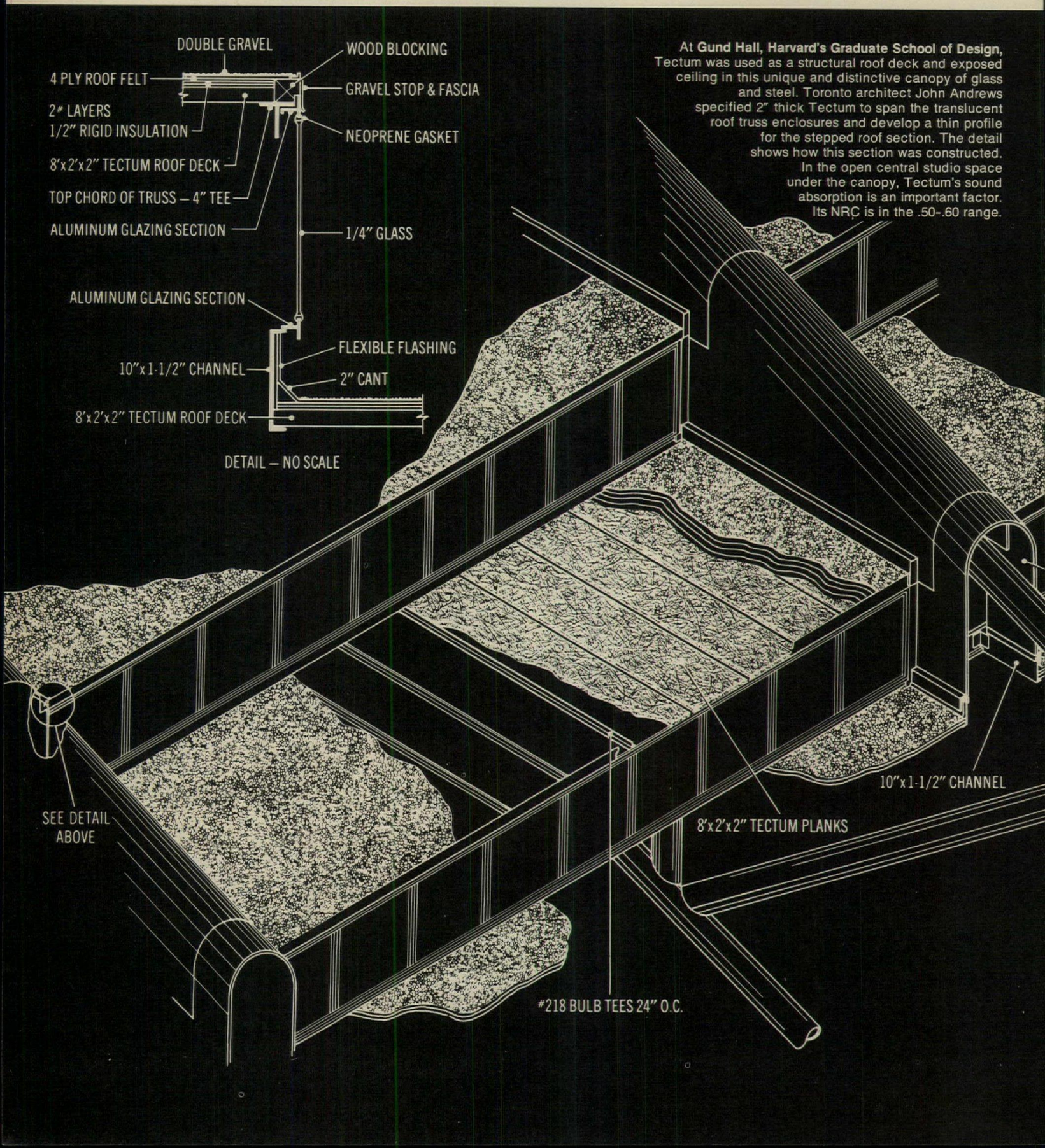
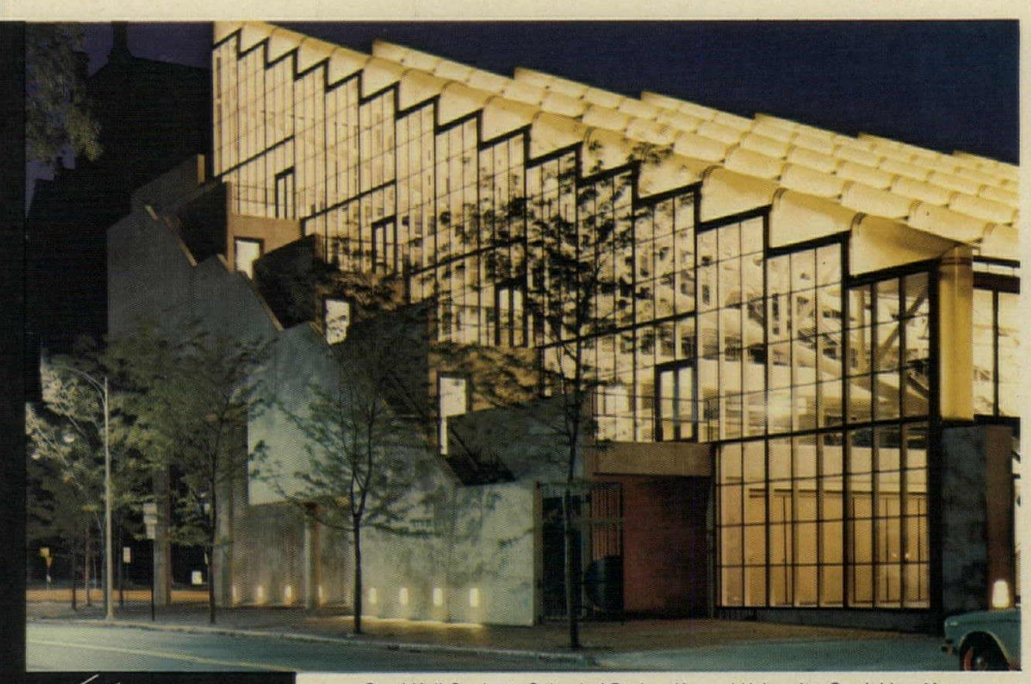
Tectum: decorative, insulating,

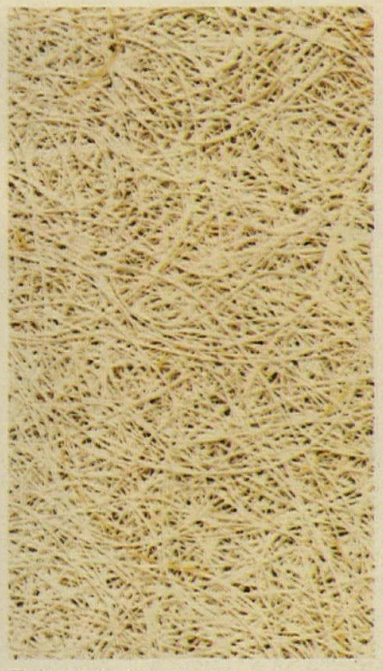


At **Gund Hall, Harvard's Graduate School of Design,** Tectum was used as a structural roof deck and exposed ceiling in this unique and distinctive canopy of glass and steel. Toronto architect John Andrews specified 2" thick Tectum to span the translucent roof truss enclosures and develop a thin profile for the stepped roof section. The detail shows how this section was constructed. In the open central studio space under the canopy, Tectum's sound absorption is an important factor. Its NRC is in the .50-.60 range.

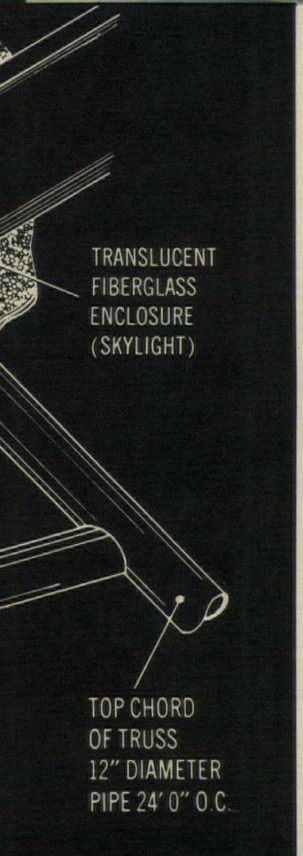
structural, acoustical.



Gund Hall Graduate School of Design, Harvard University, Cambridge, Mass.
Architects: John Andrews, Edward R. Baldwin and John Simpson, Toronto.
Structural Engineers: Le Messurier Associates, Boston.
Tectum Contractor: Bay State Structural Specialties, Boston.



Texture is the thing about Tectum, but not the only thing.



There's no end to the ways you can be constructive with Tectum® Roof Deck. Look at the way it was used in Gund Hall, shown at left. As a structural material, Tectum gives the roof a thin, efficient section, and demonstrates impressive insulating values as well. In the two-inch thickness, resistance to heat transmission is 3.50. With its Noise Reduction Coefficient in the .50-.60 range, it soaks up sound. And with its rugged finish, Tectum looks good exposed.

The reason Tectum is so constructive is because of the way it's put together. An exclusive inorganic binder bonds long wood fibers into a compact sheet under heat and pressure. Like wood, it's easy to cut, shape and install. Tectum has been given an uplift rating of Class 90.

Long Span Tectum Roof Deck

Tectum is also available in Long Span® Tectum. This adaptation allows even greater areas of the exposed Tectum surface to remain unbroken by purlins. Tongue and groove edge of Long Span Tectum is designed for galvanized 16-gauge steel channels. These channels permit spans of up to 6′ for 3″, 5′ for 2½″, and 4′ for 2″ thick Long Span Tectum.

Like other Tectum Roof Deck, Long Span Tectum has factory-applied asphalt felt membrane, and is applicable to flat or pitched roofs with steel, wood or concrete framing.

So for a good-looking way to cut roofing costs, why not cut down on the number of materials you use? With Tectum, or Long Span Tectum.

Tectum is one of the reasons that we're gypsum and then some.

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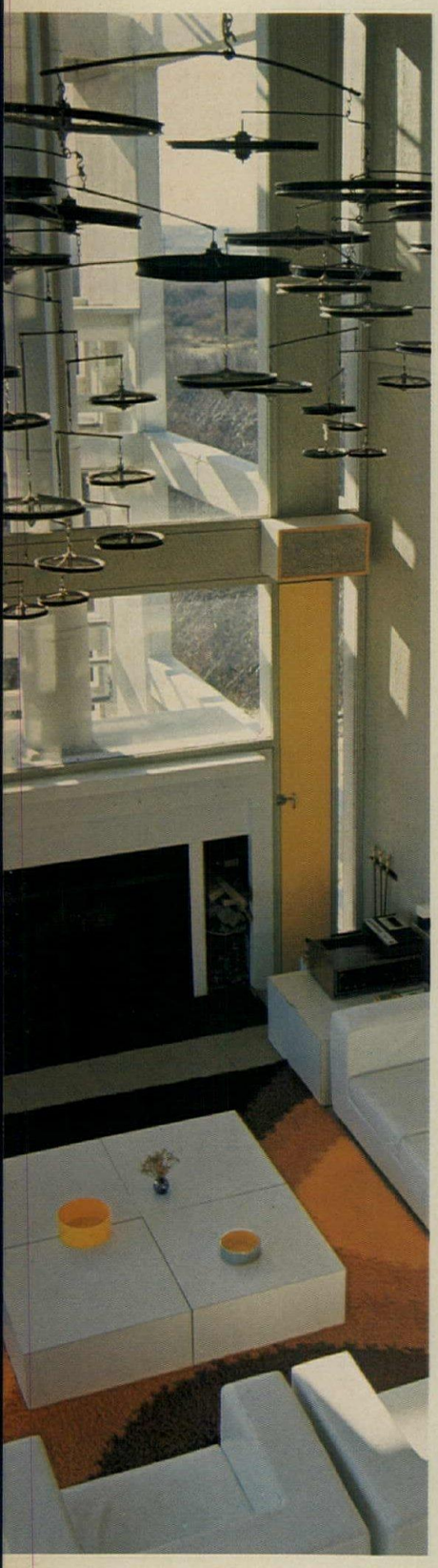

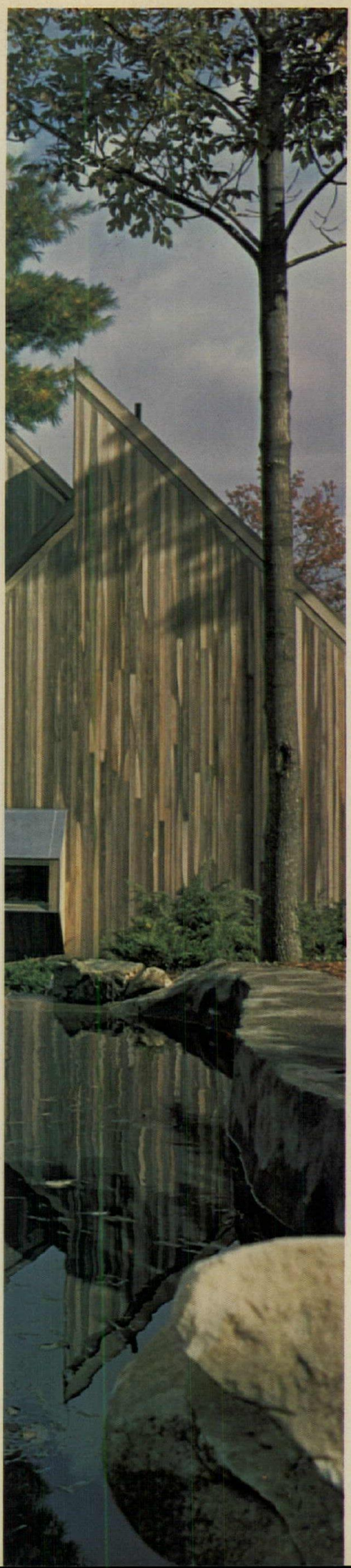

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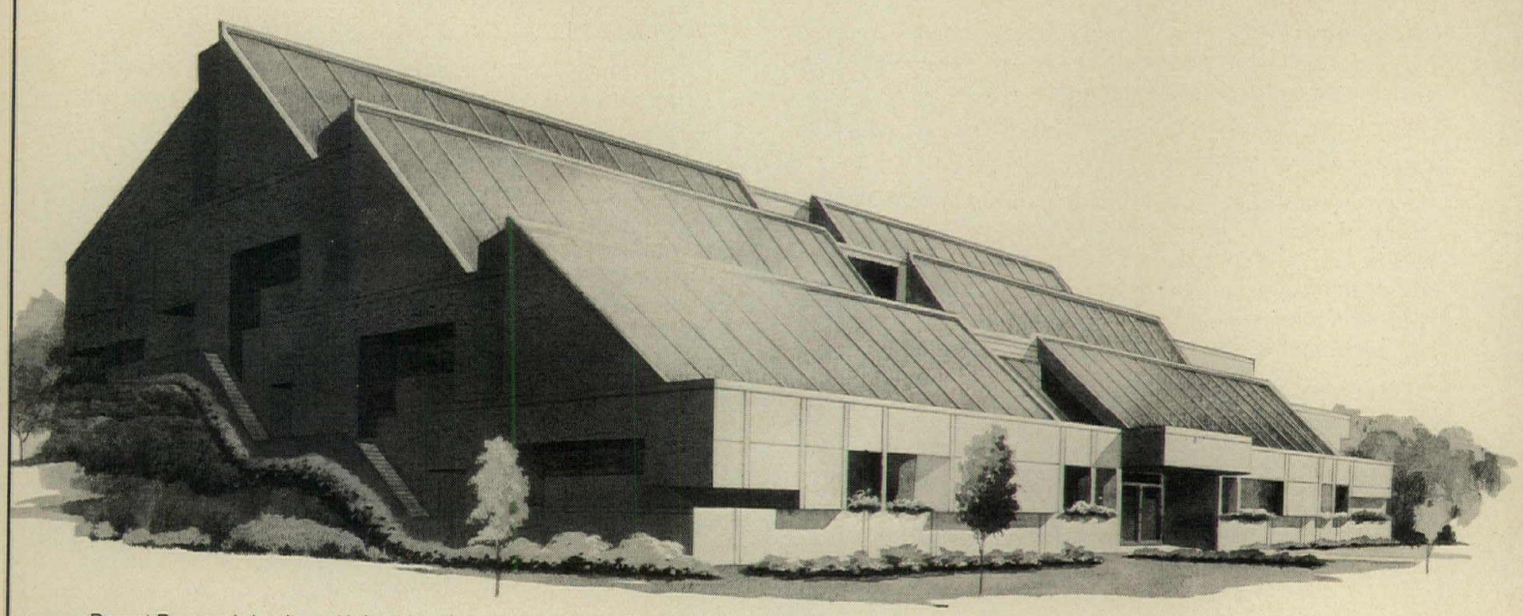
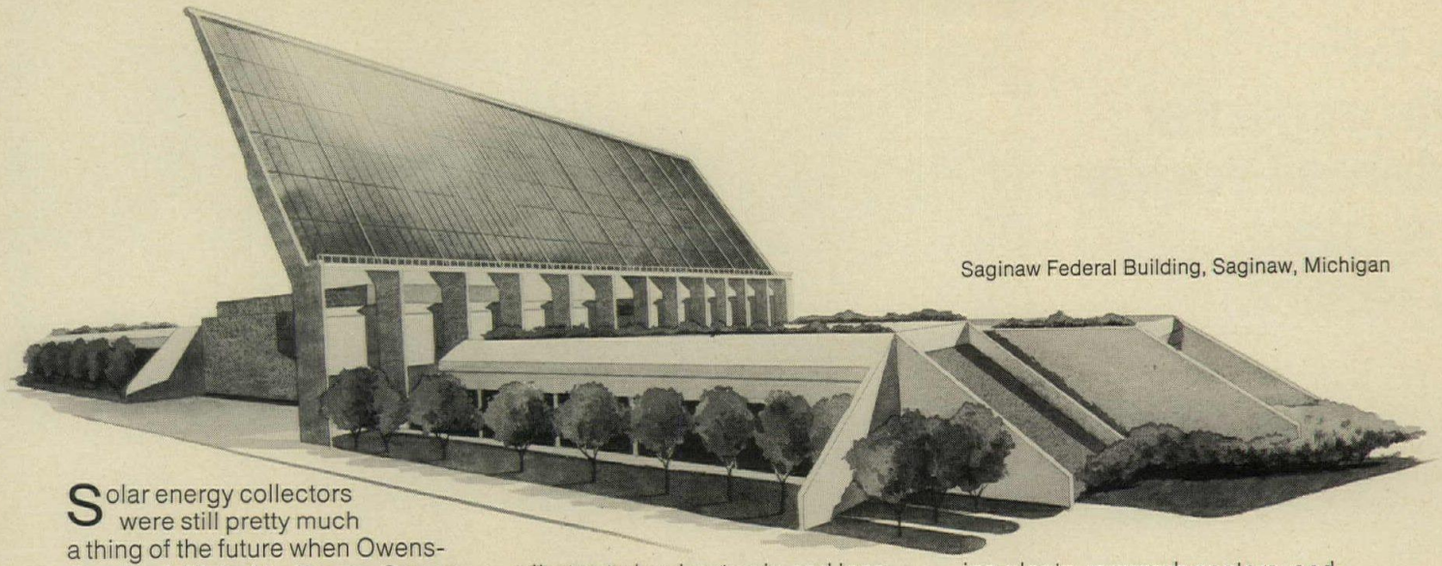
Presenting the 1974 winners of the Owens-Corning Energy Conservation Awards.



Desert Research Institute, University of Nevada Systems, Boulder City, Nevada

*T.M. Reg. O.-C.F.



Saginaw Federal Building, Saginaw, Michigan

Solar energy collectors were still pretty much a thing of the future when Owens-Corning initiated its Energy Conservation Awards Program in 1971.

This year, both our Award Winners—plus two designs receiving honorable mention—rely heavily on the sun for their energy needs.

Look these designs over. They may suggest a way your company can conserve energy and cut fuel costs.

Desert Research Institute, University of Nevada Systems, Boulder City, Nevada

A 4,000 sq. ft. solar collector provides energy for 98% of the heating, 30 tons of cooling, and 96% of the hot water demand in this 8,800 sq. ft. structure. Estimated energy savings: 63,000 KWH annually.

Concrete walls and ceilings act as an insulation envelope that protects against temperature fluctuations and an uneven draw on the energy collector.

Structure is built into a hillside for perimeter shielding from heat and cold. Plant life on exterior walls gives additional shielding.

Design by Jack Miller & Associates, Las Vegas, Nevada, in association with Arthur D. Little, Inc., Cambridge, Mass.

Saginaw Federal Building, Saginaw, Michigan

An 8,000 sq. ft. flat plate solar energy collector provides energy for heating and cooling.

Fenestration is pushed into the earth, and approximately half the roof is landscaped with lawn, shrubs, trees and seating. This contributes to low heat gain and loss.

Design by Smith, Hinchman & Grylls Associates, Inc., Detroit.

Two Honorable Mention Awards

The Owens-Corning Energy Conservation Awards Jury found two other designs worthy of special attention.

Science Museum of Virginia, Richmond, Virginia. Combines a 28,000 sq. ft. solar energy collector with a heat-recovery system for heating and cooling. Expected energy operating cost: $12,000 vs. $50,000 for a conventional heating and cooling system. A saving of 75%.

Mechanical design by Hankins & Anderson, Inc., Consulting Engineers, Richmond, Virginia.

Denver Community College of Denver/North Campus, Westminster, Colorado. Combines a 50,000 sq. ft. solar collector with a heat-pump system to cut fossil fuel requirements by nearly 80%. Insulation maintaining an exterior wall U-value of .065 is used throughout.

Design by A.B.R. Partnership, Denver, Colorado.

How the Awards Program works.

Owens-Corning accepts entries in any of four building design categories:

Institutional—schools and hospitals, for example.

Commercial—office buildings, shopping centers, retail stores and similar structures.

Industrial—including manufacturing plants, research centers, and warehouses.

Governmental—post offices, administrative buildings and military structures, among others.

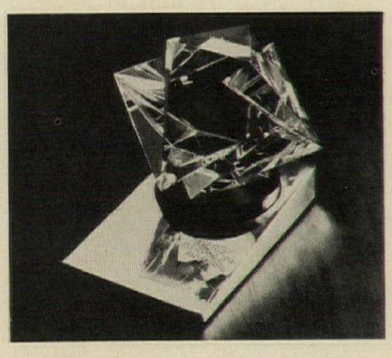
Any registered architect or professional engineer in the U.S. is eligible to enter a design. The only requirement is that the design be a *commissioned* building project. (The use of Fiberglas* insulation—although an excellent way to conserve energy—is not a requirement.)

Winners are selected by a special Awards Jury composed of leading engineers and architects.

Send for free Energy Conservation Awards Program brochure

If you'd like to know more about the winners, or their designs, write for a free brochure giving complete details.

Owens-Corning Fiberglas Corporation, Att. V. G. Meeks, Fiberglas Tower, Toledo, Ohio 43659.



The Owens-Corning Energy Conservation Award: "Triangles," a multi-faceted Steuben Crystal sculpture that captures and reflects light from triangular planes.

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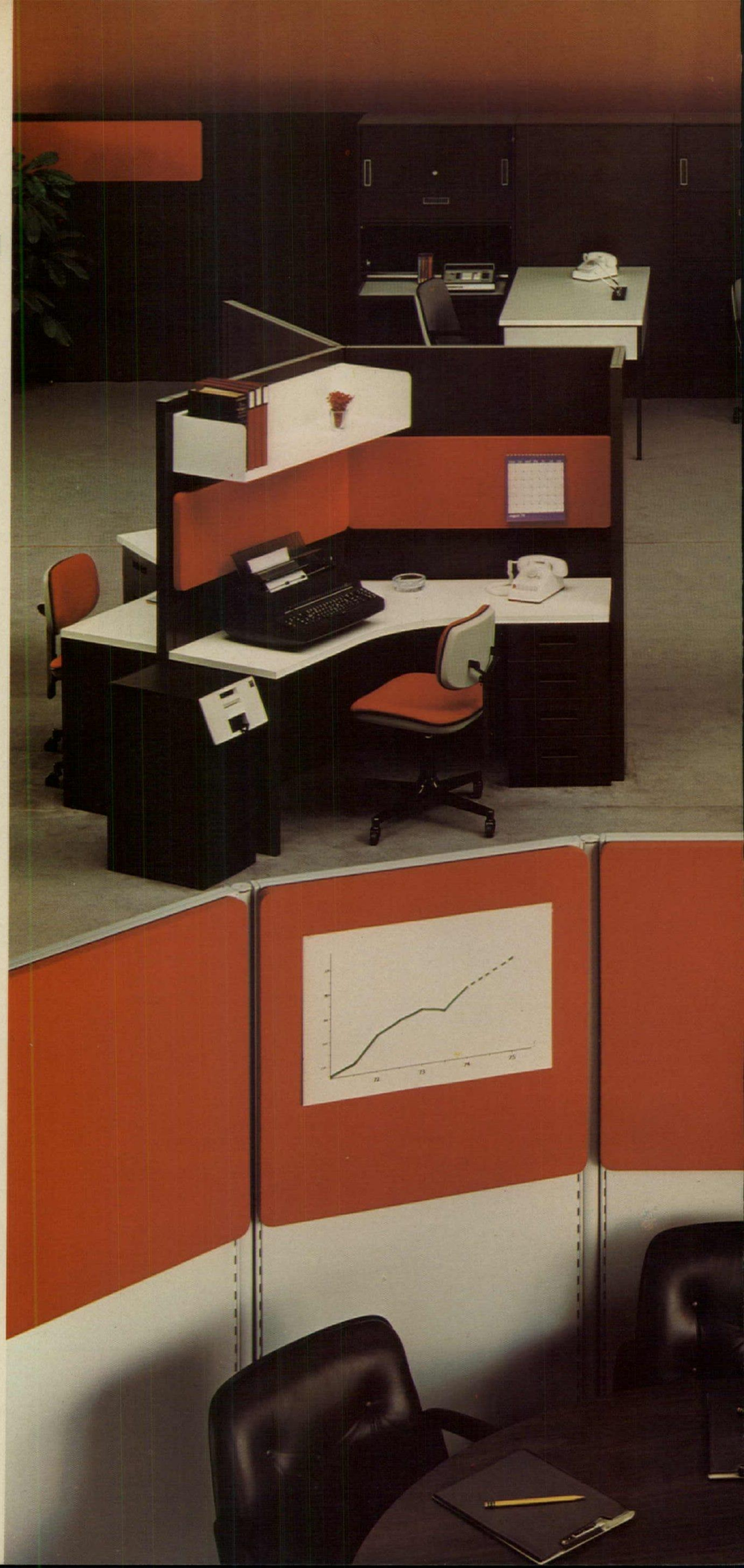
The GF Environmental Systems Program turns plans into reality.



Your most ingenuous plans become realities because the GF Environmental Systems Program gives you so much with which to work.

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The Action Arc

There are Action Arc (120°) worksurfaces, developed for word processing stations and panel-hung tops that can be set at any height.

No matter what your client's business, the GF Environmental Systems Program will meet the needs of that business. (Even when he is working with the tightest of budgets, you can employ ESP with some of the furniture he already has.)

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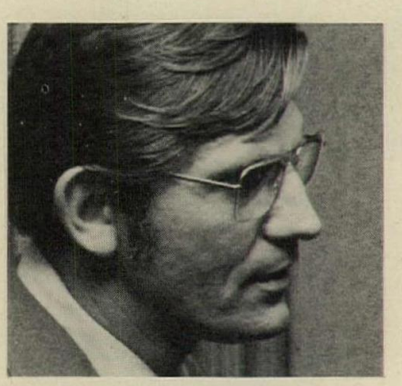
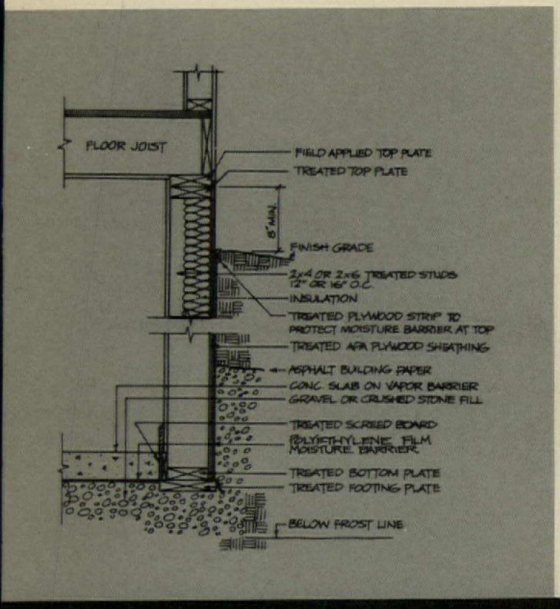


The All-Weather Wood Foundation saved $300 here. But that's peanuts compared to the design freedom it gave Tom Tilsley.



From the street, this Cincinnati home looks like a two-level plywood and stone design — a far cry from its true 4,700 square feet.

But from the rear the house soars up several stories high. Clerestory windows admit walls of natural light, and the view stretches all the way down to the woods and valley below.

The problem: a steep hillside.

The architect: Tom Tilsley of Panciera, Dohme, Tilsley & Co., Cincinnati.

Tilsley ended up using the hillside to his advantage, by designing a combination crawl-space and daylight basement foundation using pressure-treated plywood and framing members.

The All-Weather Wood Foundation not only saved $300 over a concrete foundation, but more important it made a handsome basement space.

"We used the basement for a recreation room, bath and bedroom which gave us a lot more freedom in the upper levels," said Tilsley.

System Details: The 50- by 57-ft. foundation is set on 2x8 pressure-treated wood footing placed over an 8-inch deep gravel footing. The concrete basement floor was poured over a gravel bed with a sump pump installed to provide positive drainage. The panelized AWWF was constructed of pressure-treated half-inch 32/16 C-D interior with exterior glue APA grade-trademarked plywood nailed to pressure-treated 2x6 studs set 16 inches on center.

For more information on the All-Weather Wood Foundation, write to the American Plywood Association, Department AR-025, Tacoma, Washington 98401.

AMERICAN PLYWOOD ASSOCIATION

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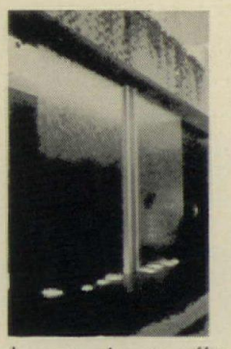
AE/UPDATE

A classified advertising section devoted to helping architects and engineers keep up to date on building product manufacturers.



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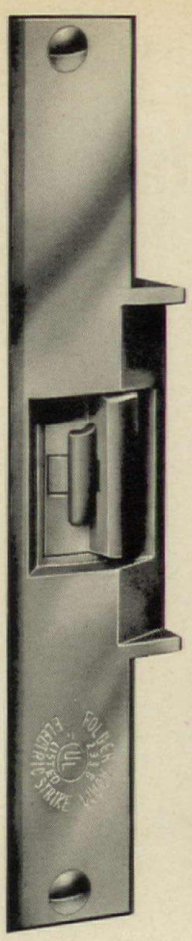

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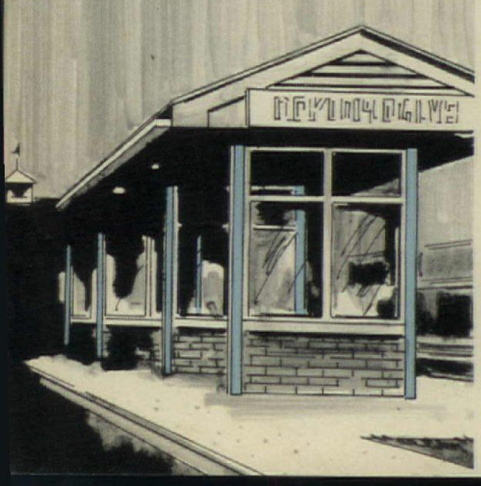

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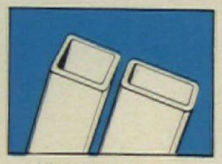

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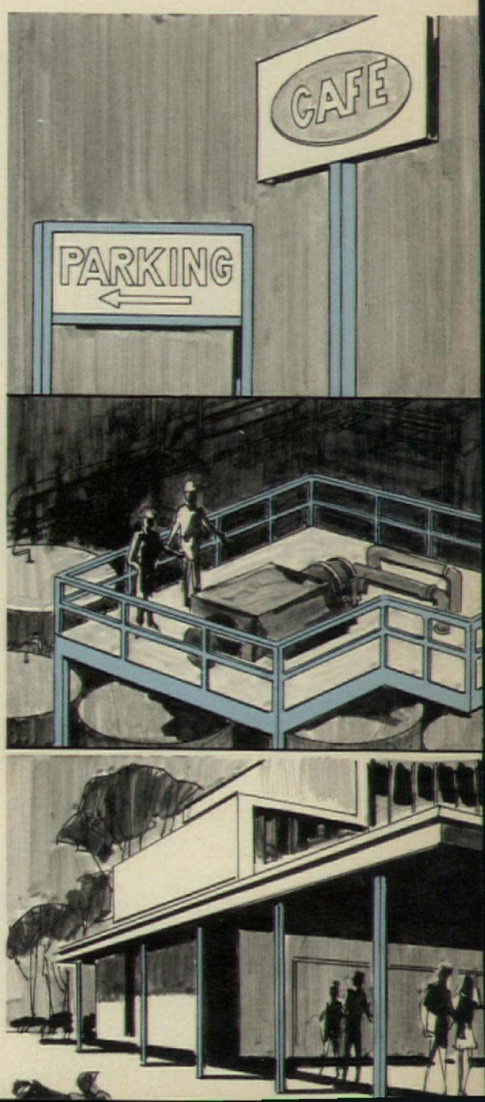

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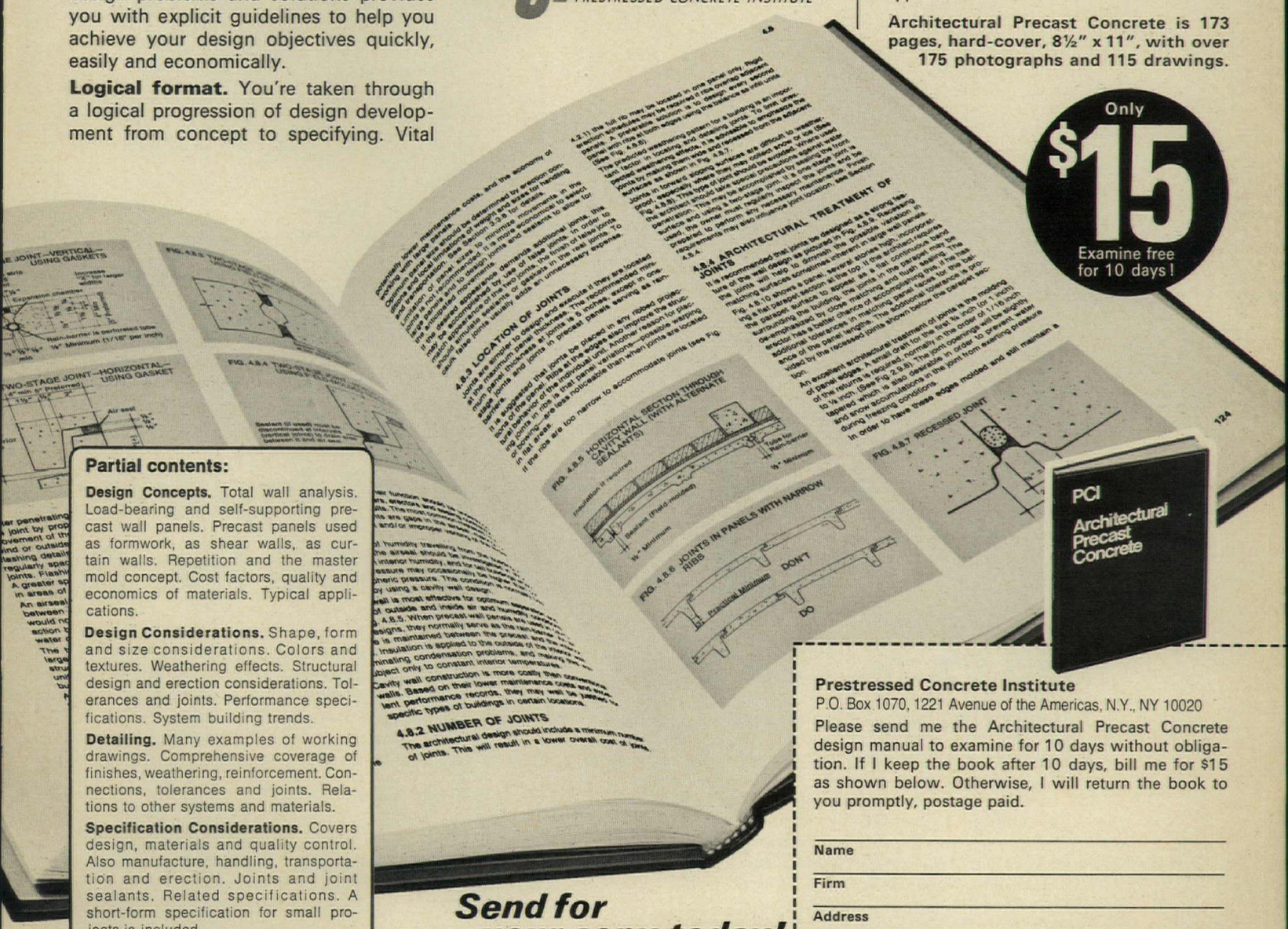

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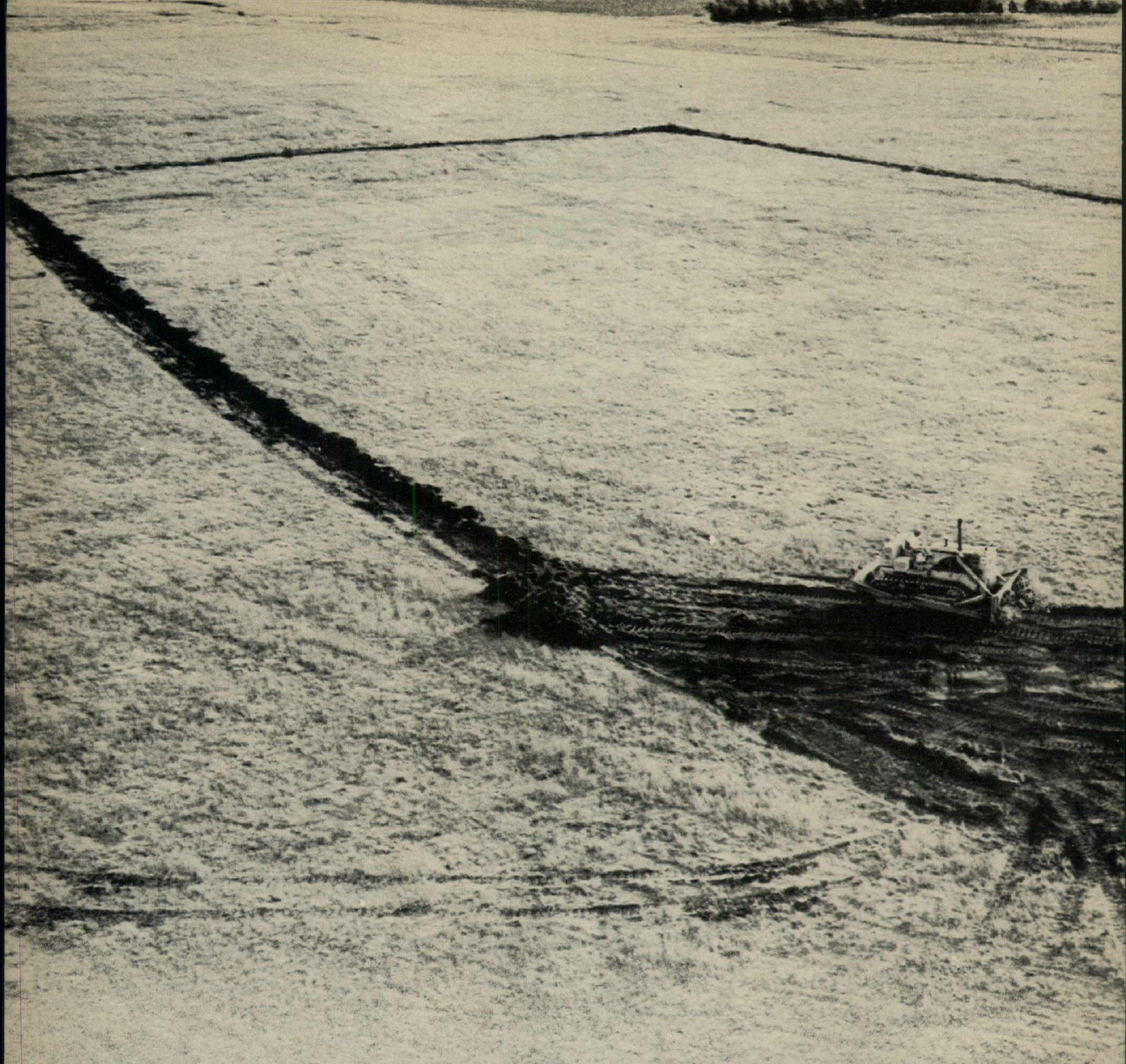

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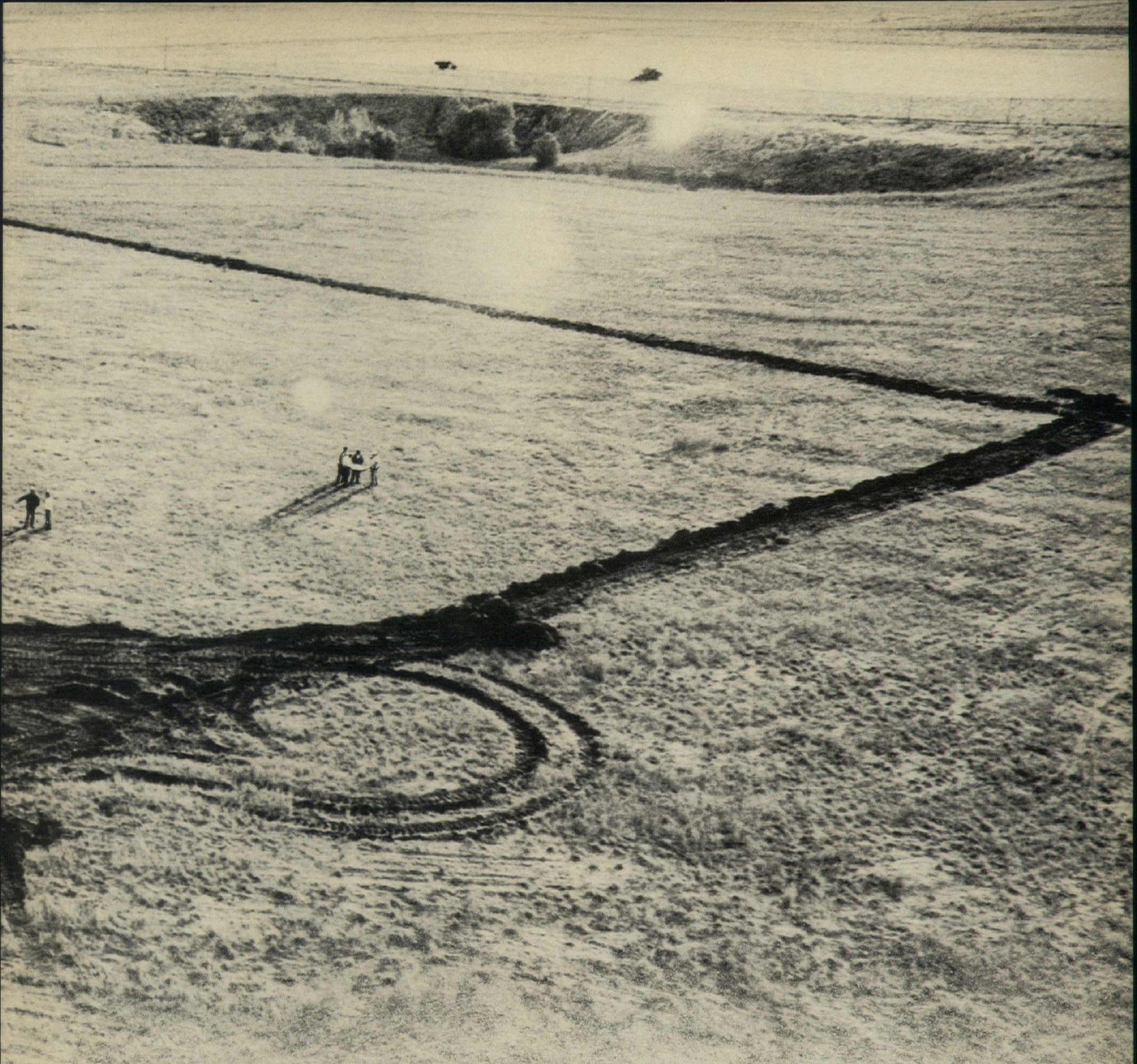

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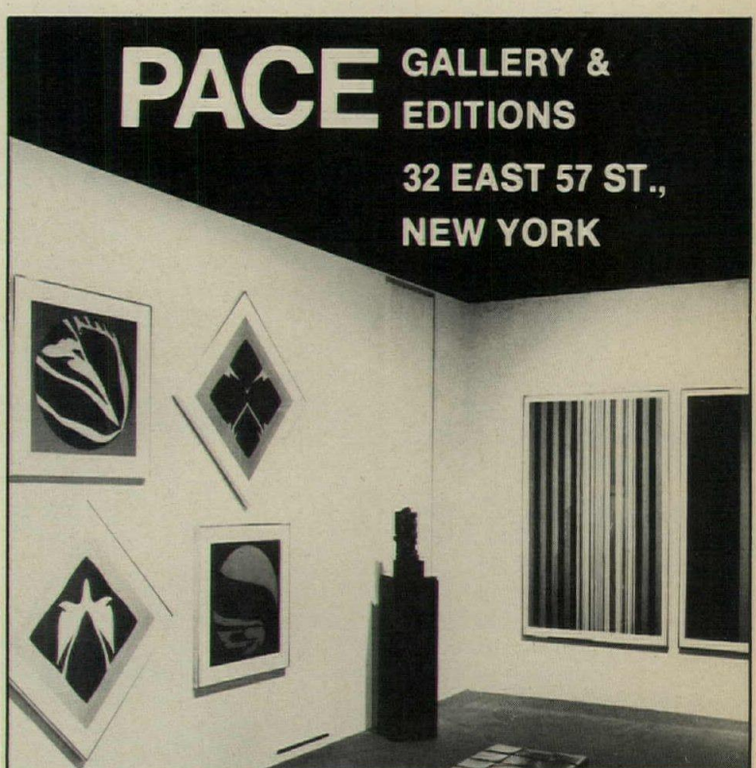

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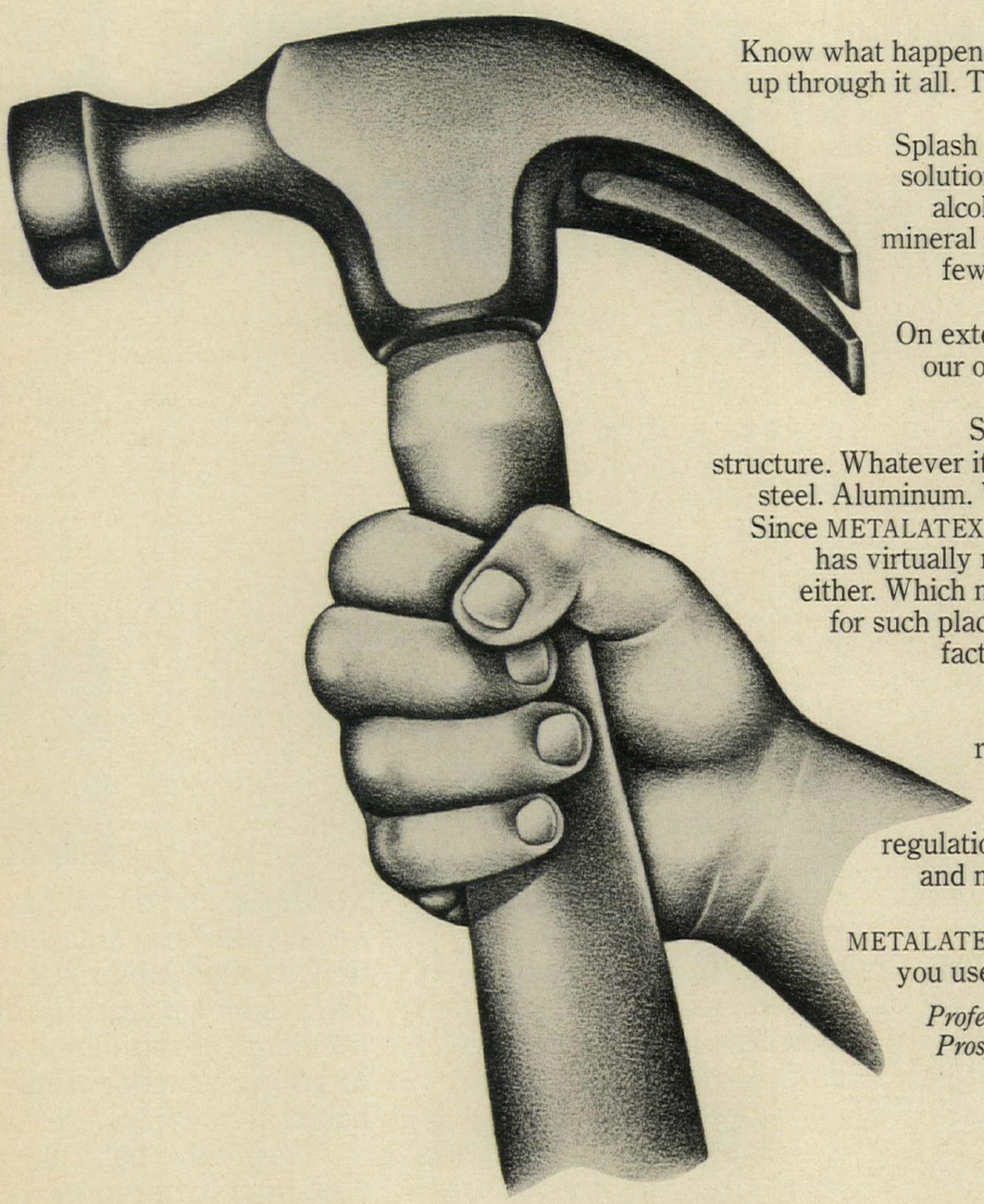

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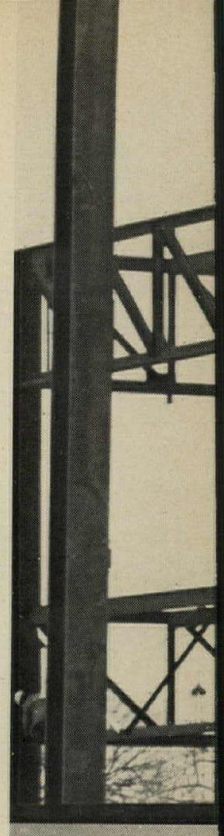
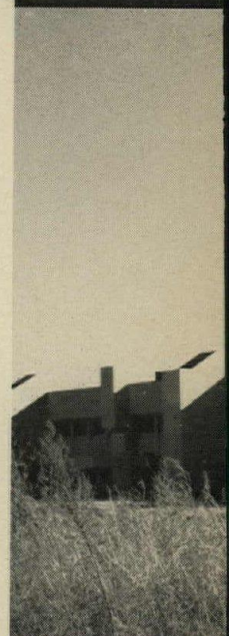




A hospital is a very special kind of building. Through the years it must be able to adapt to many functional changes—to enlarge outpatient areas, to accommodate new equipment or new facilities, or modifications to the mechanical system. These are some of the reasons why steel is proving to be *the* most practical and economical structural framing system for hospitals.

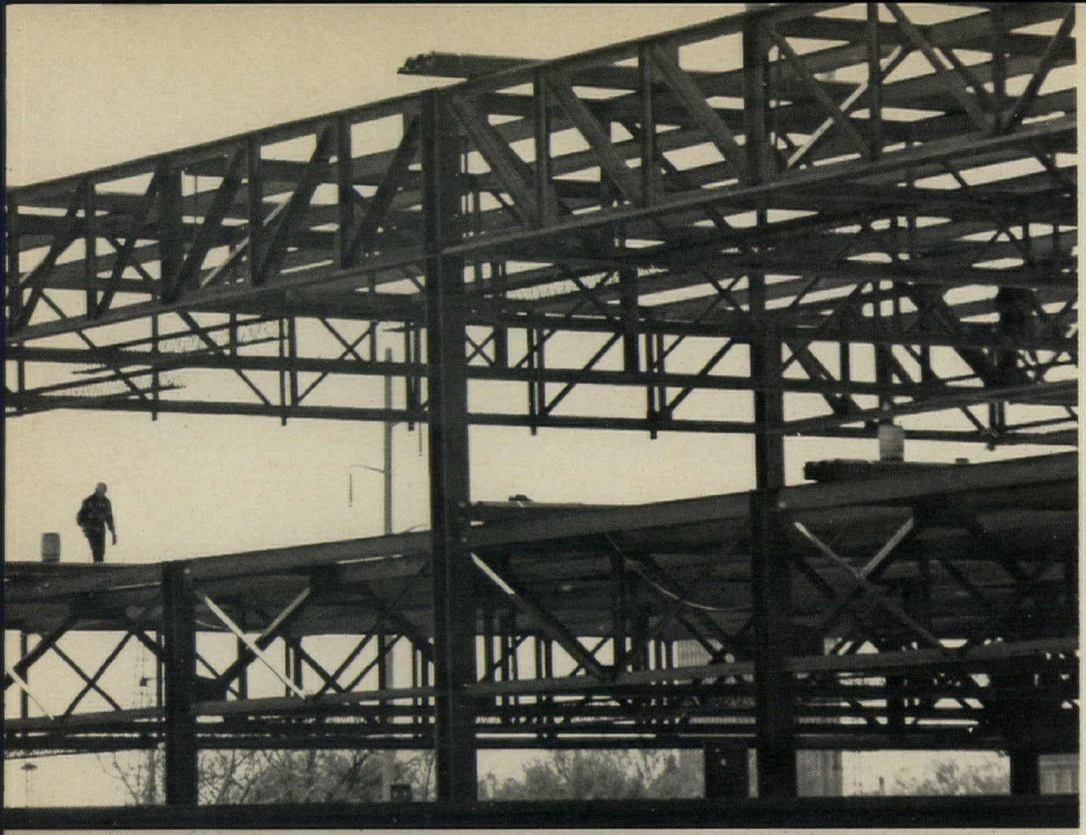
Steel allows sufficient design flexibility to meet the constantly changing needs of medical facilities. Steel frames also mean competitive costs and minimum erection time.

A fine example of imaginative and economical structural steel design is the new 409-bed Presbyterian Hospital in Oklahoma City, Oklahoma. This hospital offers patient care to the general public and a full teaching program for medical students attending the adjacent University of Oklahoma campus.

The new facility consists of two distinct building units: an eight-story NURSING TOWER and a three-story Diagnostic/Treatment Center. Because of the difference in function, the tower requires shorter spans and lower floor-to-floor heights than the necessarily longer spans and deeper trusses of the three-story Center. However, both of these units use a form of interstitial space design.

This technique provides a building framework that is essentially a series of structural sandwiches or full height service levels between patient floors. Within these intermediate spaces (service levels) certain equipment and virtually all mechanical, electrical and communication lines, and distribution and collection systems are housed and maintained. Thus achieving an absolute minimum of servicing interference with normal hospital functions.

The Center has 7′-0″ deep interstitial spaces, while the NURSING TOWER has only 3′-6″ deep spaces: The reason for the deep trusses (where men can work efficiently) is that the *functions* of the Diagnostic/Treatment Center require frequent alteration due to changing



Owner: The Presbyterian Hospital, Inc.

Architect/Engineer: (Including Mechanical and Electrical Engineering) Benham-Blair & Affiliates, Inc., Oklahoma City, Oklahoma.

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modifications and advances in the technology of health care delivery. Conversely, the nursing function is relatively static requiring only limited access to the interstitial spaces—and that is why the height requirement of those levels is less.

The interstitial space design is a developing concept. Over the past 6 years, 35 hospitals and clinics are known to be using this system. They are finding it effective in reducing maintenance and operating costs because of the inherent flexibility of interstitial space design—functions can be modified or replaced at will. We'd like you to know more about structural steel framing for hospitals and other medical facilities—and how it can accommodate long-range needs. For a copy of the Presbyterian Hospital Structural Report (ADUSS 27-6220-01), or for any other information, contact a USS Construction Representative through your nearest U.S. Steel Sales Office, or write: United States Steel, Room C317, 600 Grant Street, Pittsburgh, Pa. 15230

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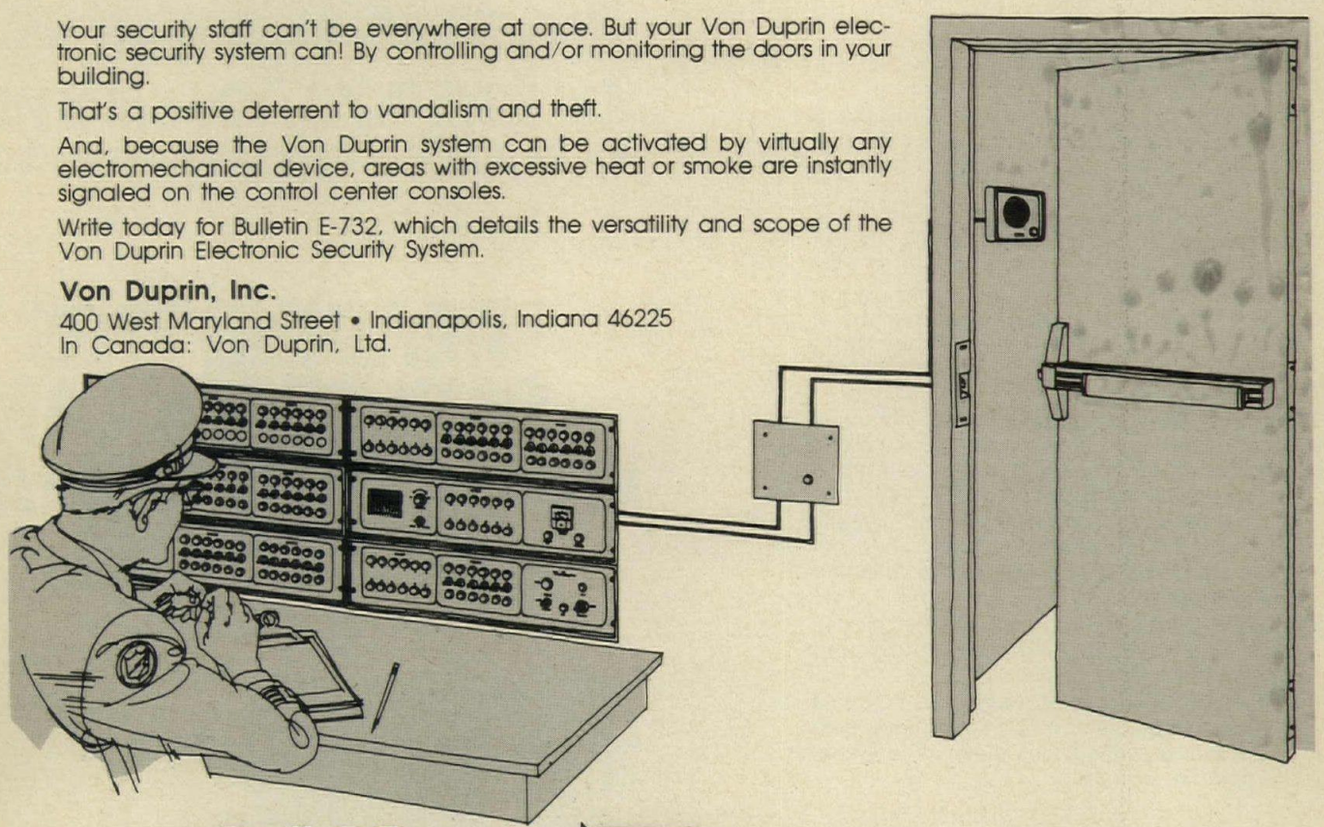

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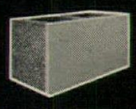

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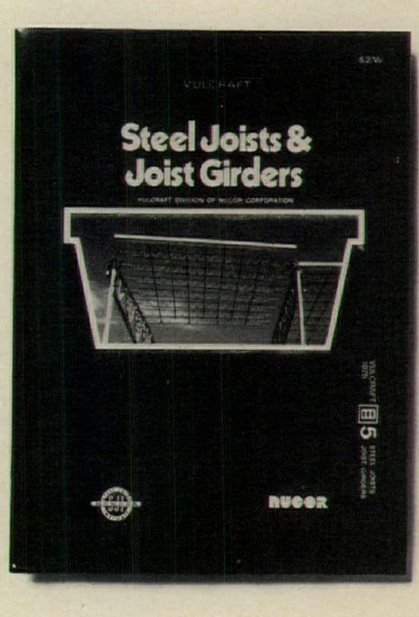

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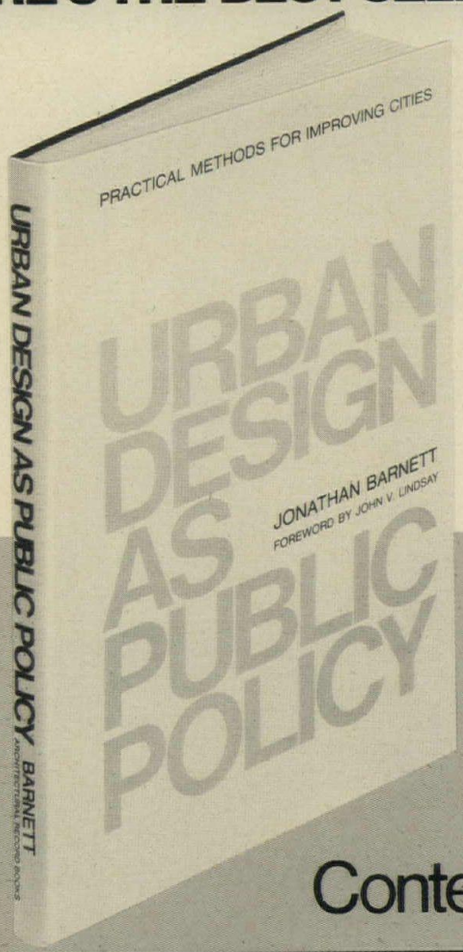

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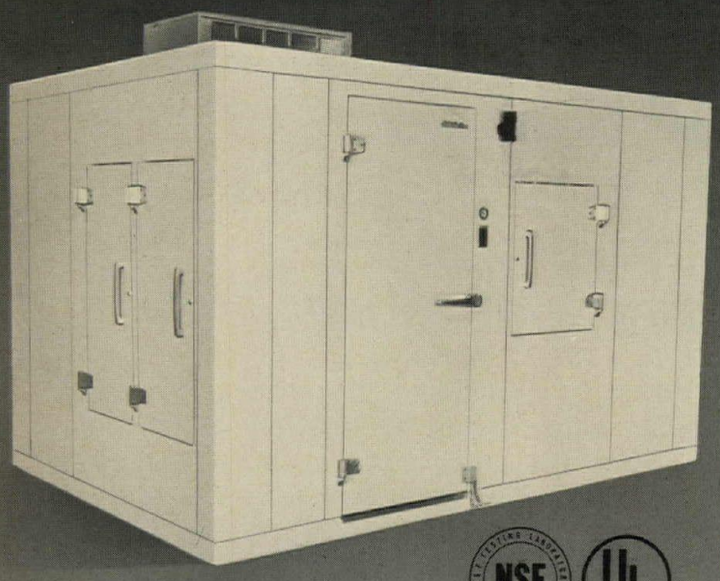

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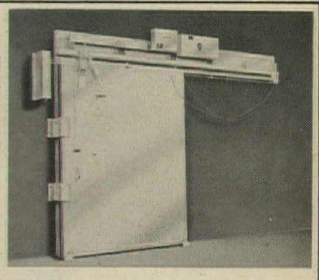

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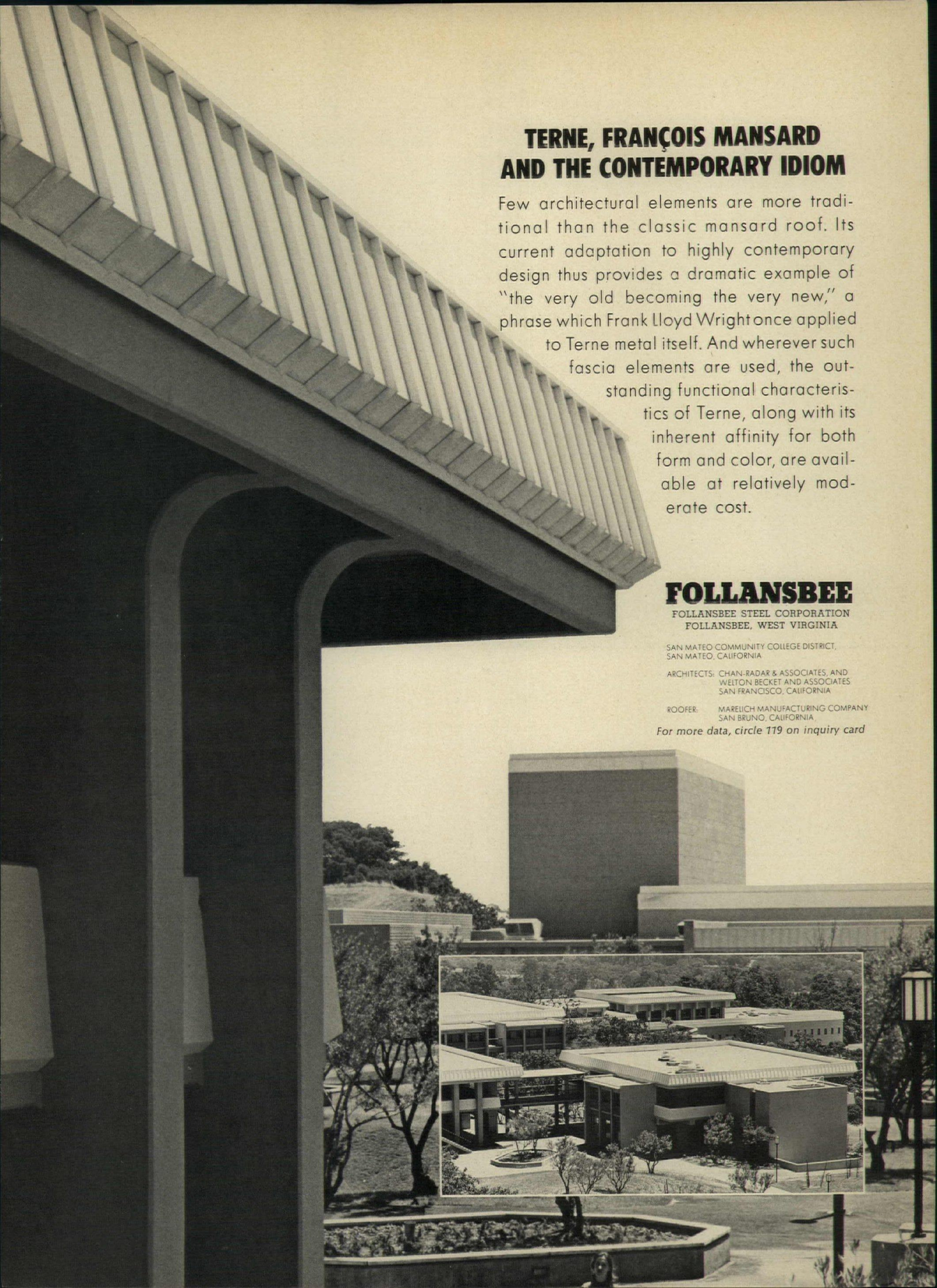

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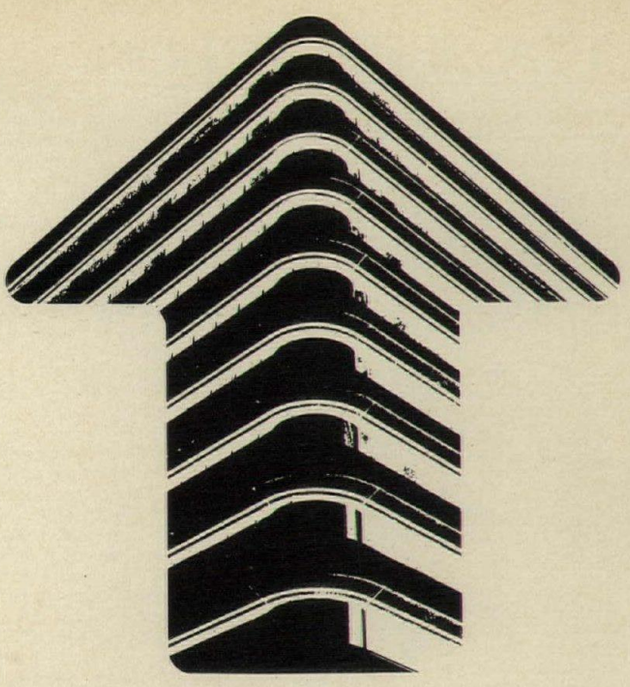

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For our second ENGINEERING FOR ARCHITECTURE issue, to appear in mid-August 1975, we invite all architects, consulting engineers and technical consultant professionals to submit material for inclusion in the section *effective architect-engineer collaboration.* Submissions may relate to structural, civil (such as sitework), mechanical or electrical engineering as well as to technical disciplines such as lighting and acoustics. Examples of noteworthy engineering contributions to building might include—

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