

PAUL RUDOLPH'S CHAPEL FOR TUSKEGEE INSTITUTE

HOUSES: EIGHT REGIONAL VARIATIONS ON VACATION THEMES

BUILDING TYPES STUDY: ARCHITECTURE FOR THE ARTS OF MUSIC, DANCE AND DRAMA

AIR CONDITIONING: IMPLICATIONS OF THE PERFORMANCE SPECIFICATION

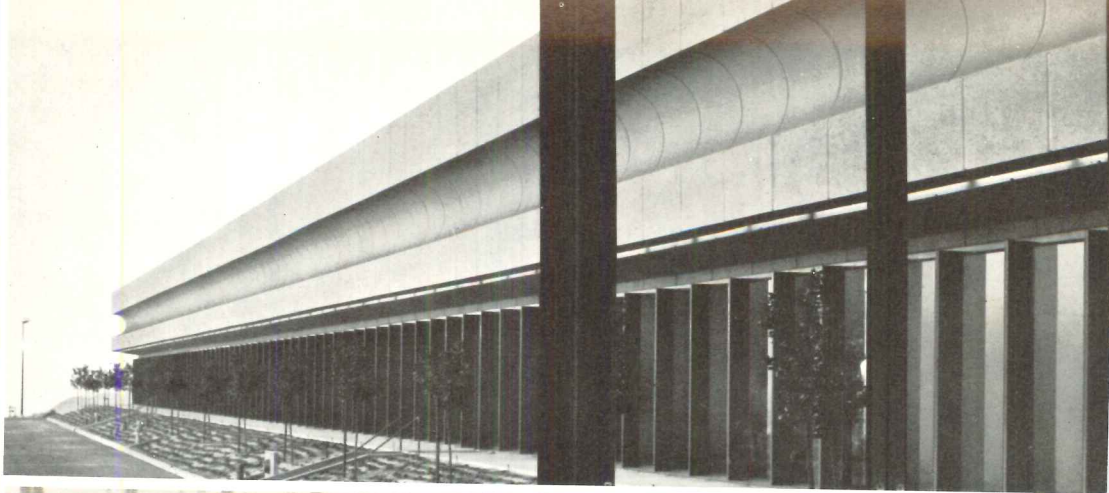
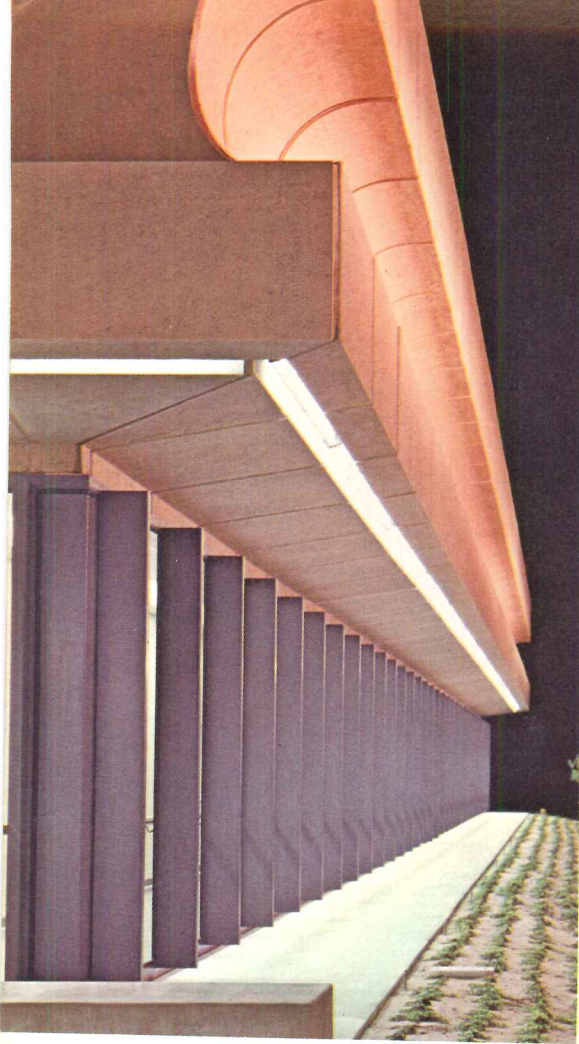
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# ARCHITECTURAL RECORD

NOVEMBER 1969

**11**

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National Cash Register's new Rancho Bernardo facility was designed to be the manufacturing and distribution center of a complete line of NCR data processing equipment. When the current building program is completed, the complex will measure 525,000 square feet . . . 300,000 of which has already been completed and is in use.

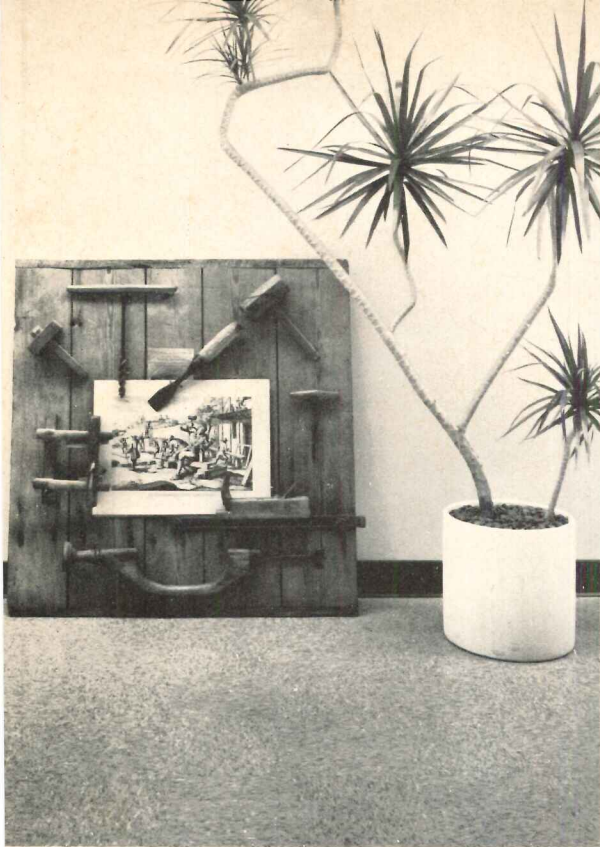
**Architect:** Frank L. Hope and Associates, San Diego, California. **General**

**Contractor:** Ernest W. Hahn, Inc., Los Angeles and San Francisco, California.

**Flooring Contractor:** Tri-Co Floors, Lemon Grove, California.

The architects and designers had to plan a floor around constant movement of people, equipment, and machinery . . . so ruggedness, durability, ease of maintenance, and an outstanding appearance were required. Their choice: Imperial Modern Excelon Tile. 230,000 square feet of it.

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From a budgetary point of view, Imperial Modern Excelon Tile looks expensive, but it's offered at the same low price as all Armstrong Standard  $\frac{1}{8}$ " Excelon Tile.

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**builders.**

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THE Mutual of Omaha BUILDING



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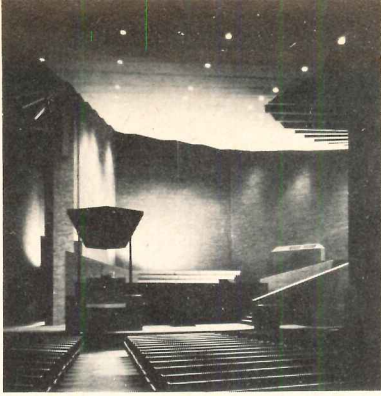
Your building may not require this variety of elevator systems but you can profit by Dover's diversified experience. You can have confidence that the elevators recommended will be those best suited to your building's needs. Contact your local Dover Elevator representative for assistance, or write for catalogs: Dover Corporation, Elevator Division, Dept D-11, P. O. Box 2177, Memphis, Tennessee 38102. In Canada: Dover/Turnbull.



Architect: Houstoun, Albury, Baldwin & H. Maxwell Parish, Miami. Consulting Design Architect: Leo A. Daly Co., Omaha, St. Louis, Seattle, San Francisco, Washington, D. C., Hong Kong. General Contractor: M. R. Harrison Construction Corp., Miami. Elevators installed by: Miami Elevator Company.



For more data, circle 3 on inquiry card



Cover: Chapel for Tuskegee Institute,  
Tuskegee, Alabama  
Architects: Paul Rudolph in collaboration  
with Fry & Welch  
Photographer: © Ezra Stoller (ESTO)

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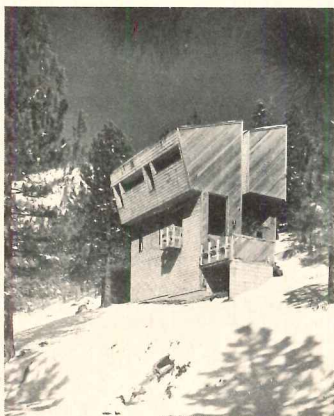
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Douglas M. Simmonds

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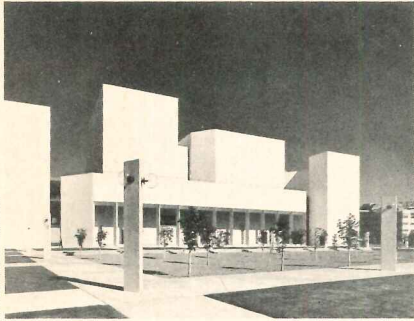
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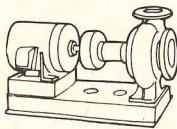
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Balthazar Korab

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## COMING IN THE RECORD

### BUILDING TYPES STUDY: RESORT HOTELS

Next month the resort hotel will be examined: what makes this hotel type work and why midtown commercial, motor and airport hotels are taking on resort characteristics. Particularly, designers need to know what architectural elements might make people want to stay in a particular resort hotel, or come back year after year or tell their friends about it, so the management makes money.

### FOUR RECENTLY COMPLETED BUILDINGS BY PHILIP JOHNSON

The latest finished works of Philip Johnson, to be featured next month, combine a variety of building types realized with Johnson's characteristic finesse and aplomb: a sumptuous residence in Washington, D.C.; a campus-preserving, underground library in Conway, Arkansas; an impressive museum in Bielefeld, West Germany; and a small-scale, image-making radio station in Richmond, Virginia.



McGraw-Hill



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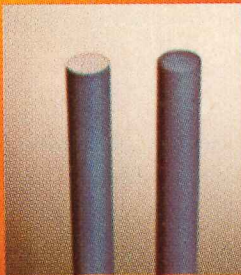


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Standing up to the sun means more than just not fading under it. Because sunlight breaks most fibers down. Causes them to disintegrate. Lose their strength.

But there's one fiber that can take it—the sun and all the rest of Nature's forces. (Along with most man-made problems.) It's Acrilan 2000+®.

This carpet starts with a fiber—Acrilan® acrylic—that's chemically resistant to the sun's ultraviolet rays. And then because there's no dye good enough, we use color pigments. And we add them while it's still a solution.



Solution dyed—color all the way through. Others—color only on surface.

(Before the fiber is a fiber.) That way the color is actually a part of the fiber.

So much so, Monsanto has set 2000 as the minimum rating acceptable on the wet weatherometer test. So no matter how much wear it gets, the color won't wear off.

And even the strongest cleaning agents can't bleach the color out.

Acrilan 2000+. It deserves a place in the sun.



For more data, circle 4 on inquiry card



CREDITS: St. John Bosco Church, Chicago; Architect: Belli & Belli, Chicago; General Contractor: Chell & Anderson, Inc., Chicago; Lathing and Plastering Contractor: William A. Duguid Company, Chicago

## MARBLECRETE PLUS...

*Trinity White*

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The vertically tapered panels of the building's facade are of Marblecrete. Colorado Milky Quartz (#1 and #2 sizes) was gunned into

a  $\frac{3}{8}$ " bedding coat of Trinity White Portland Cement. There are 84 of these panels—each 18 feet tall. To avoid joint lines, three crews of two men each worked simultaneously—at three different levels. The result is a uniform distribution of color and texture that enhances the entire architectural effect.



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## The A.I.A. takes three giant steps in the right direction

The first giant step in the right direction is the appointment of William L. Slayton as executive vice president of the A.I.A. Slayton, who was just named president of Urban America and will leave that prestigious post for his A.I.A. responsibilities, has had a long, varied and effective career (see RECORD, October, and this issue, page 40). Critical to his effectiveness in his new job are the scars and stripes Slayton earned in five years (1961-1966) as the commissioner of the Urban Renewal Administration—an experience which taught him not just what can (and cannot) be done in Washington, but how to get it done and through whom.

Another possible plus to his effectiveness in his new job is the fact that he is not an architect (though he has of course worked very closely with architects in Urban America, the URA, and for a time with I. M. Pei & Partners). As A.I.A. president-elect Robert Hastings pointed out at the press conference announcing Slayton's appointment, the board's choice of a non-architect could make it easier to overcome the present real and imagined obstacles now in the way of bringing together all of the design professions in a meaningful joint effort—both on a philosophical and on a working level—to improve the environment.

The second giant step in the right direction: an official policy statement adopted by the A.I.A. board in Santa Fe last month insisting that in the future A.I.A. programs must be structured to achieve not just "maximum performance in the essential phases of the creative process—decision, design, and delivery" but also (and here's the big new step) "responsible involvement in those areas—the human and physical

sciences, economics, politics, public education—which shape the physical environment and represent constraints in the creative process."

Bob Hastings made it clear at the Slayton press conference that it is now the Board's view that "as professionals we must become involved in the creation of public policy that will lead to the creation of a better environment." And Slayton, who is being given more authority than his predecessors to interpret and carry out policies established by the A.I.A. board, made it clear that present plans call for the A.I.A., working with other design disciplines and organizations, to take a much stronger role in advocating legislation related to environment.

Giant step number three: the implementation of the Chicago convention's student-initiated resolution to raise \$15 million toward the alleviation of urban problems. Few architects came to the convention expecting the emotional impact of the student participation, much less the unanimous passage of a resolution committing the Institute to raise \$15 million and to "establish programs and administration structure for operating and disbursing [those] funds." And fewer still, probably, imagined how resolutely, forthrightly, and effectively that resolution would be implemented.

In a nutshell, the Task Force on Social Responsibility, under the chairmanship of A.I.A. vice president George Rockrise (and building on the base laid by the earlier Task Force on Equal Opportunity under David Yerkes) now has a quite detailed proposal for raising (over the next three years) more than \$16 million—partly in money

and partly in man hours of work volunteered by architects—and a quite-detailed proposal for spending that money and time in ways that will most effectively implement the A.I.A.'s new over-all objective. The A.I.A. board has approved the Task Force's report in principle—and will be asked at its December meeting to approve the proposed budget. If the budget is approved, the Task Force will at once, with the full involvement of the standing committees.

1) Put in motion a program assisting every chapter to establish a Community Design Center.

2) Through existing committees, enlarge the capability of local urban design teams to advise local-action groups and political leaders on social and human needs as well as design.

3) Provide scholarships and other aid to black and other minority students who seem qualified to pursue study in architecture—on both professional and technical levels, including on the job training.

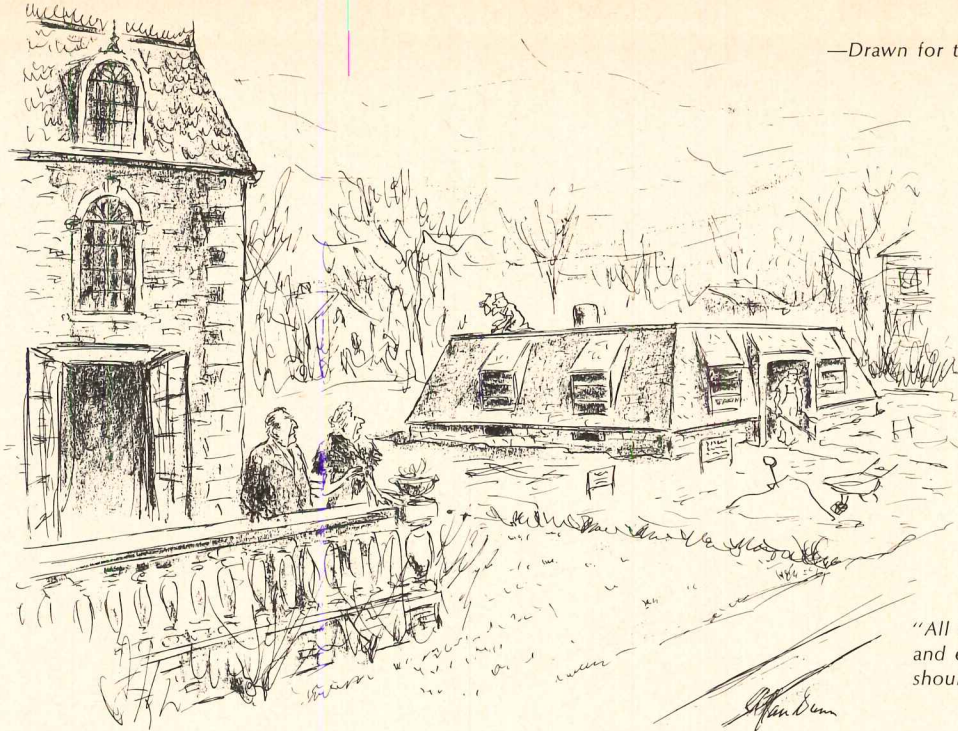
4) Provide funds for improvements leading to full accreditation of predominantly black architecture schools.

(For more details, see Record Reports.)

But it is one thing for the board to approve a program, and the financial and personal effort involved, and another thing for that program and those efforts to succeed.

What that takes is a fourth giant step. And that giant step must be made up of 23,300 individual steps taken by 23,300 individual members of the A.I.A. Every architect needs to decide for himself how important he thinks the Institute's bold new program is . . . and then act on his conviction. The Task Force on Social Responsibility has worked wonders in the few months since the convention in late June. The A.I.A. board has acted strongly and thoughtfully in response. What remains is for individuals to take their stand—not just in helping finance the new program, but in supplying time and effort and good-will.

—Walter F. Wagner, Jr.



"All I say is wait long enough and everything comes back—or should I say down?"

## Now the Breakthrough proposals are in and we can really worry

On this page in the September issue I suggested that with a goal of "a decent home and suitable living environment for every American family" at stake, we ought to think what questions need to be asked on a continuing basis as the program evolves.

One of those questions: "What of design quality? There is little evidence that there is much architectural involvement in the conception of Operation Breakthrough [or] in the proposed evaluation process."

Well, the balloon is up, and we now know that HUD received something like 600 proposals. We now also know something about the evaluation process. And the news sounds pretty bad to me.

The best available information is that the evaluation will be done by an inter-Federal agency board, with a present roster of almost 80. The bulk of the evaluators will be HUD staff, but there will be representatives from the Defense Department, the Commerce Department, the General Services Administration, etc.

The only architects now included are, therefore, departmental employes, and just how many they are and who they are cannot be known because HUD has chosen not to release the composition of the board until *after* contracts are awarded. The inter-agency board "may" call on outside advisers on an ad hoc basis—or it may not. In any event, this information too will be unavailable until after contracts are signed.

I think that the very best you can say about this in-house evaluation procedure is that it is very bad judgment indeed.

If Operation Breakthrough is to succeed (and I repeat that I desperately hope it will while doubting very much that it will)—considering the stakes involved, the investment made by the proposers, and the tax money that is going to be spent—it needs (I guess needed is the word) the best

possible evaluation process. This means evaluation by the best possible architects, planners, sociologists, cost consultants and engineers—not the best architects, planners, sociologists, cost consultants and engineers available on the Civil Service list.

## Here we go on the West Front again

The Senate is now considering a House-passed measure to provide \$2 million for detailed architectural drawings for a 4.5-acre extension of the Capitol Building. The central West Front would be extended, under preliminary plans developed by the Architect of the Capitol, engineer J. George Stewart, by 269,528 square feet of new space for restaurants, toilets, visitor centers, meeting rooms and offices. The cost of this, according to engineer Stewart, will be an estimated \$45 million. Simple division develops a square-foot cost of \$166.95 for the extension.

Now, it is clearly true that restoration and correction of structural weakness is needed. That would cost, according to an estimate prepared by the A.I.A. for Congress after consultation with engineers and restoration architects, about \$10 million.

So, if my logic is correct, we could:

- 1) Make the necessary repairs,
- 2) Have \$35 million left over to build the 269,528 square feet of restaurants, toilets, visitor centers, meeting rooms and offices in some new building. The budget of \$35 million would permit a square-foot cost of \$129.86, which ought to be feasible even in these days of skyrocketing building costs, right?

To be serious about a serious subject:

Since 1955, the A.I.A. has opposed major changes in the Capitol, urging a master plan for Capitol Hill which will protect its historic buildings and provide new buildings (though not exactly along the lines of the Rayburn building) to house needed

growth. It is also worth noting, as A.I.A. vice president Francis Lethbridge pointed out to the Senate Appropriations Committee, that the proposed West Front extension would erase the last visible walls of the original Capitol and alter its "noble terraces." Final note: the assistant architect of the Capitol, architect Mario E. Campioli, has said that he does not think that the Capitol is in immediate danger of falling down as has been prominently suggested by proponents of the extension scheme.

At any rate, the proposed extension seems ridiculous on any grounds—esthetic, cost, or government efficiency. What is clearly needed, as Lethbridge pointed out to the Senate Committee, is a professional study of Congress' needs for space *before* any major buildings—and/or major extensions to the Capitol—are made. Especially at \$166.95 a square foot.

## Let's hear it for two-cent-deposit bottles

One of the great things about Thomas P. F. Hoving—besides being the most innovative and swinging Parks Commissioner New York City ever had, and besides being a fine director of the Metropolitan Museum of Art, and besides always hiring good architects to make alterations and/or additions to parks and museums—is that he is so quotable. Like in a recent interview in the *New York Times*, in which he announced that: "One of the worst things that ever happened to public parks was when they stopped giving you two cents back on the bottle. Almost on the very day the new no-deposit, no-return bottles came out, the parks were knee deep in broken glass. When bottles were worth two cents you didn't smash them against the handball courts."

Extrapolate that one, if you care about conservation and want something to think about.

—W. W.



**inner  
strength**  
ROOFS

from **Keystone**

New physical education building, Graceland College, Lamoni, Ia. Designed to house the college's varsity and intramural athletic programs as well as large public functions. Roughly oval in plan, the end walls are parabolic curves and side walls are formed of two inverse parabolic curves. This column-free structure 305' long, 174' wide and 70' high has space for five basketball, tennis or volleyball courts to operate at the same time within a 6 lane, 1/8 mile track. Floor area is covered with synthetic, resilient athletic surfacing to accommodate all those activities as well as indoor football and baseball practice.

**Architect:**

Shaver & Co., Michigan City, Indiana

**Engineer:**

Bob Campbell & Co., Kansas City, Mo.

**General Contractor:**

Lawhon Construction Co.,

St. Joseph, Missouri

**Construction:**

Keydeck Truss-T subpurlins and mesh reinforcement over steel ribbons with polyurethane roof material.

# Super-light, monolithic roof combines polyurethane foam with Keydeck Truss-T subpurlins

The Graceland College Fieldhouse was constructed during 1968 for a total of \$640,000 or only \$15.90 per sq. ft.; about 25% less than the average cost of similar facilities built at the time.

The structure itself is mostly roof. Three identical parabolic arches support the entire roof structure. The center arch is vertical; the end arches canted at 30°. Their curvature generates the shape of the entire structure.

The welded steel plate arches are 1½' x 2½' tubes with a span of 174', rise 60' and are set atop 10' high reinforced concrete walls.

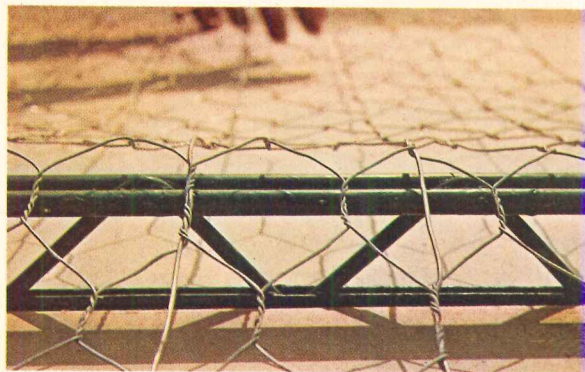
Steel straps 2" x ¾" are draped between the arches and from the end arches to the end walls on 5' centers. Keydeck Truss-T subpurlins serve as tiedowns; they are placed over the straps every 2½'.

More than 5,000 welds connect the Keydeck Truss-T subpurlins to the straps, arches and perimeter walls.

Formboard was placed between the Truss-T's, Keymesh roof deck reinforcement was put in place, and two to three inches of polyurethane was foamed on, followed by three coats of sprayed on synthetic elastomeric roofing.

The entire structure required only 113 tons of structural steel, or only 5.7 lbs. per sq. ft. to cover a clear-span area of 40,800 sq. ft. and enclose a volume of 2,300,000 cu. ft.

Keydeck Truss-T and Bulb-T subpurlins and mesh reinforcement are only a few of the Inner Strength products for roofs, walls and floors available from Keystone Steel & Wire Division of Keystone Consolidated Industries, Inc., Peoria, Illinois 61607.



Open webs of Keydeck subpurlins permit the polyurethane foam to form a monolithic sheet. Keydeck reinforcement rolls out flat and easy.





from **Keystone Steel & Wire**  
Peoria, Illinois 61607

*For more data, circle 7 on inquiry card*

## “Mommy, can we ride some more?”

Every girl loves a Montgomery escalator for its exceptionally gentle, well-mannered ways. The pleasant, confident ride comes from Montgomery's exclusive Two-Steps-Level entry and exit. Girls of *all* ages move more surely onto the tread of Montgomery escalators. After all, the landing area is 100% larger than any other escalator.

We've already made life a little more pleasant for millions of girls with our Two-Steps-Level Montgomery Escalator installations for Bonwit, May, Macy, Penney, Sears, and many other leading retailers. Every girl loves a Montgomery Escalator. See the Yellow Pages for our nearby sales/service office.

# montgomery

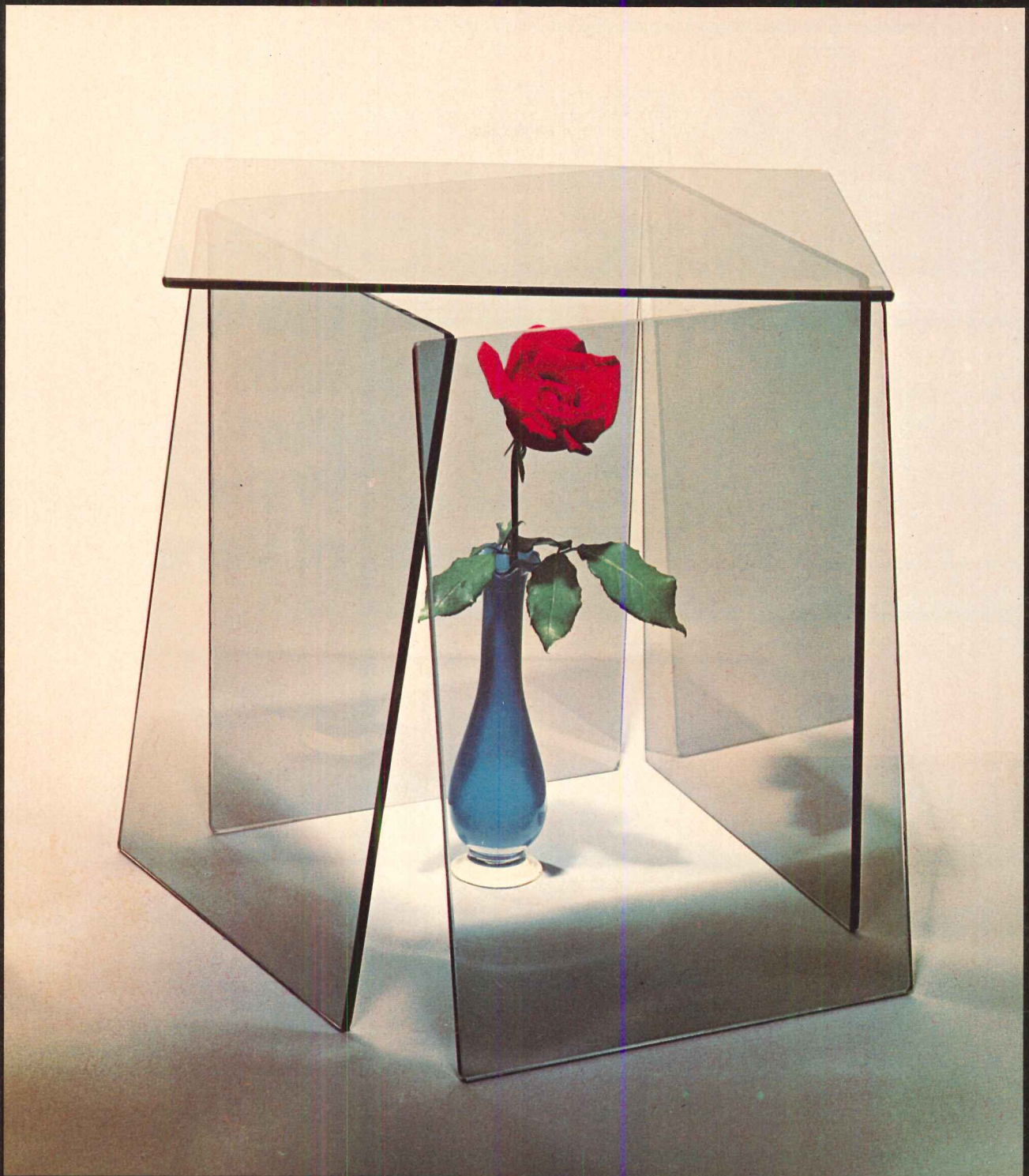
**ELEVATORS/ESCALATORS  
POWER WALKS & RAMPS**

Montgomery Elevator Company, Moline, Illinois 61265  
Montgomery Elevator Co. Ltd., Toronto, Canada  
Offices in principal cities of North America



For more data, circle 8 on inquiry card





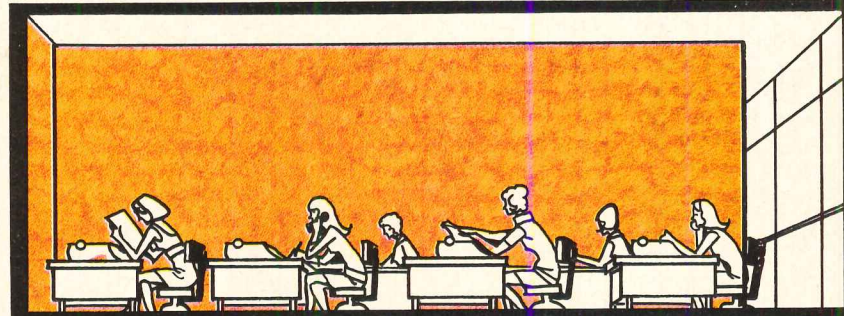
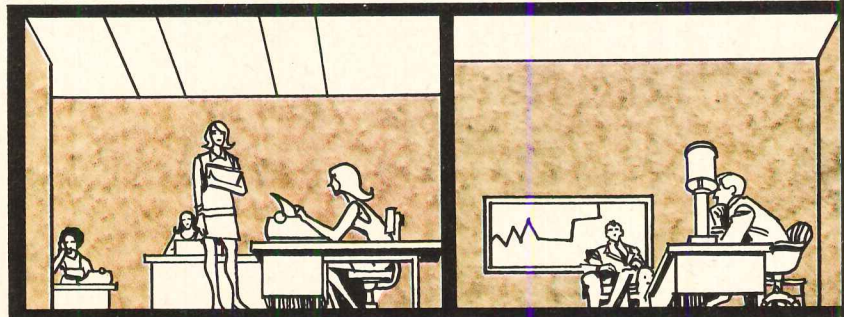
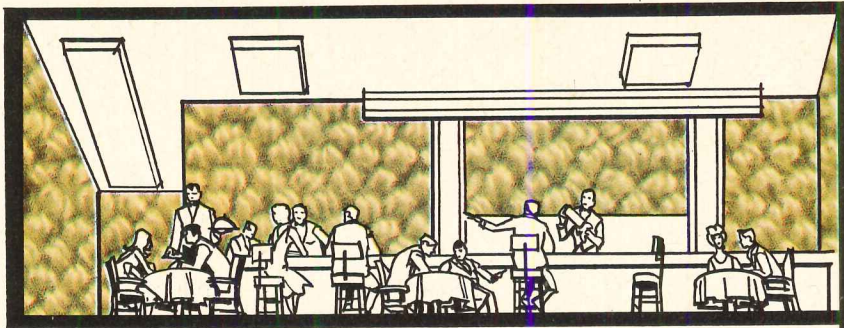
**Glaverbel Grey.  
Blocks Out Everything But the View.**

Makes the inside of a building feel as good as the outside looks.

**Glaverbel**

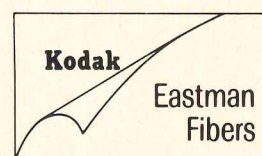
*For further information, contact:*

GLAVERBEL (USA) INC., EMPIRE STATE BUILDING, 350 FIFTH AVENUE, NEW YORK, N.Y. 10001



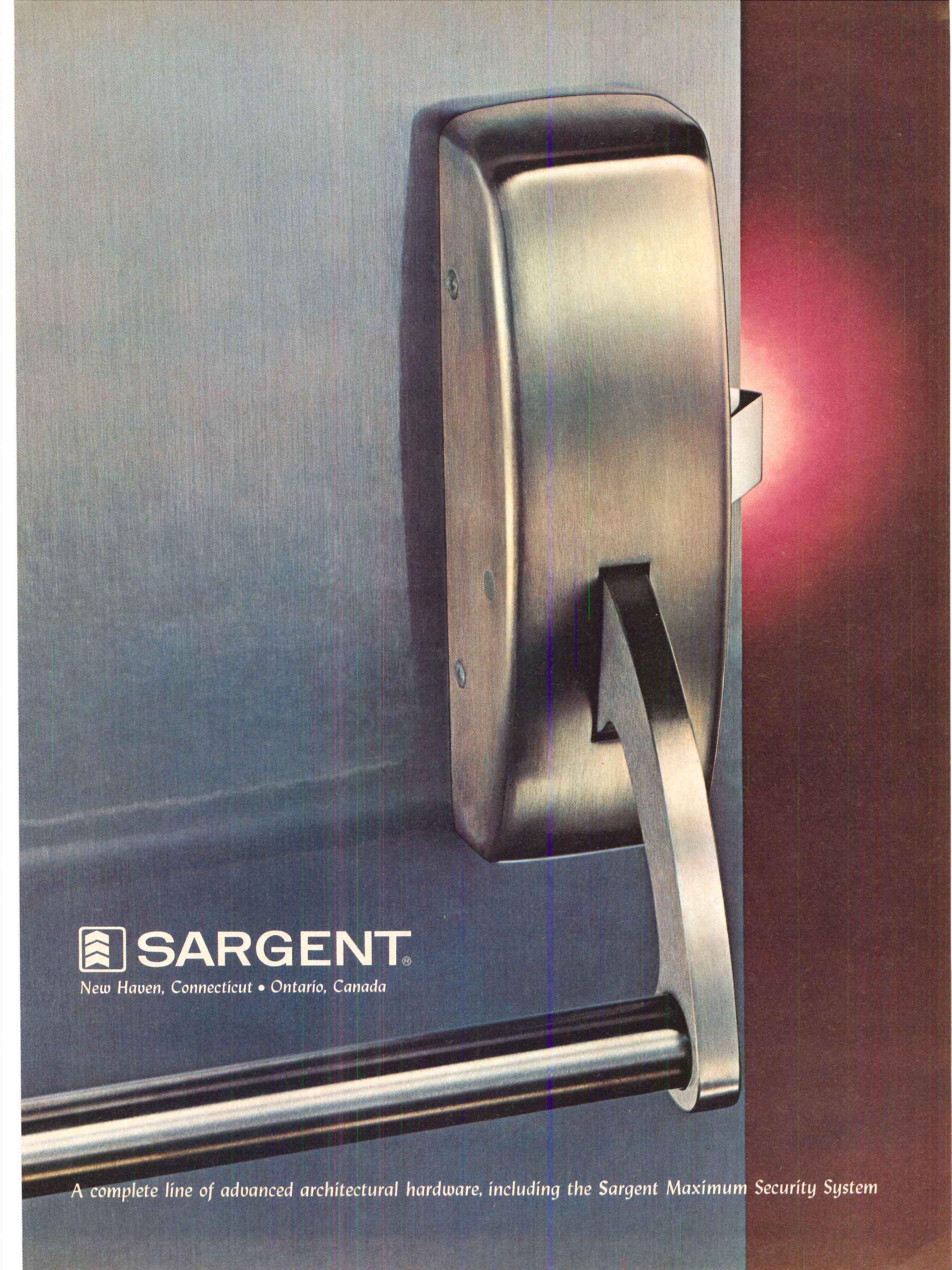
# Hush up the walls with Burlington Wallscaping™ of Verel®

Noise. Is any modern building without it? Now Burlington does something beautifully constructive to muffle it. Wallscaping is a new, pile-textured wall surfacing of 100% Verel modacrylic. It absorbs much of the distracting din in an office, theatre lobby or museum. It's luxurious looking, too, so you can cover walls with imaginative textures and colors. Even hang pictures without leaving marks. Cleaning? Just vacuum it right on the walls. And because Verel is flame-resistant, Wallscaping offers important safety benefits. Check Wallscaping at Lees Carpets Division of Burlington Industries, Inc., Valley Forge Industrial Park, Norristown, Penna. 19401.



EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, 1133 AVENUE OF THE AMERICAS, NEW YORK, N.Y. 10036. Verel is the trademark for Eastman modacrylic fiber.

For more data, circle 10 on inquiry card



 **SARGENT**®

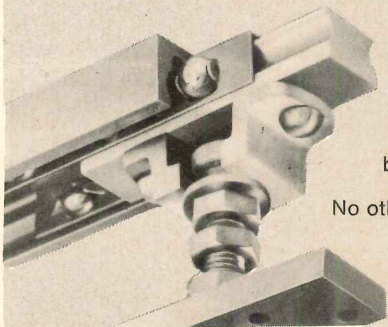
New Haven, Connecticut • Ontario, Canada

*A complete line of advanced architectural hardware, including the Sargent Maximum Security System*



# Wall mover

Grant 5000 Sliding Door Hardware gives her a big hand. Her strength hardly matters. All she has to do is give the wall a slight push and Grant Hardware takes it where it has to go. Continuous ball bearing action glides the wall along its path. Precision fitted parts insure lasting service. No other sliding door hardware made is its equal.



**GRANT®**

**GRANT PULLEY & HARDWARE CORPORATION** 9 High St., W. Nyack, N.Y. 10994/944 Long Beach Ave., Los Angeles, Calif. 90021

*For more data, circle 12 on inquiry card*

## KenCove: the no-shrink, easy-does-it vinyl wall base.

No unsightly shrinkage! Special formulation plus accurate factory cutting and uniform height assure KenCove ends that meet together—and stay together—perfectly. Generous  $\frac{1}{8}$ " thickness helps hide wall irregularities beautifully!

On-the-job corners can be formed quickly and easily, because base and corner are one seamless piece. No more corners that kick off under accidental abuse. KenCove® never needs painting. And it's easy to clean.

Specifications: Colors: 10. Heights: 2½", 4", 6". Lengths: 48' in all heights; 96' rolls in 2½" and 4" heights. KenCove samples? Call your Kentile® Representative.

BROOKLYN, N.Y. 11215

# KENTILE FLOORS







# Spec 30: The 25-year interior

You are looking at something totally unique—not only in appearance and concept, but function as well. Spec-30 is a flexible, 5' x 5' modular system of interior components designed, manufactured and installed entirely by one company—Keene Corporation.

The ceiling materials are manufactured by Keene Sound Control Division. The lighting fixtures, handling both supply and return air distribution, are by Keene Lighting Division. Partitions and doors by Keene Metal Construction Products Division. And all products are interdesigned and installed by Keene Interior Systems Division—with total single-source responsibility.

Architects and owners, recognizing the value of interiors that can be easily and quickly rearranged, over and over, now design entire buildings for modular flexibility. Over-all dimensions, including core configuration and window-mullion spacing, are designed on a 5' x 5' planning module. And even HVAC systems incorporate multiple reheat coils for dividing each floor into many zones—again so that partitions may be rearranged frequently in future years.

Basically, Spec-30 has the same design characteristics as all Keene In-

terior Systems. Each 5' x 5' module contains illumination, air distribution and acoustical control—forming a complete ceiling with all the services needed for its 25 square feet of floor space. The ceiling grid not only structurally supports the ceiling elements, but also provides channels for the movable partition walls. What's more, each 5' length of grid has a capped opening for electrical and phone line routing from above the ceiling into partitions. And to permit frequent wall relocation without damage to floors, Keene partitions do not require shooting or nailing to the floor.

If you're looking for coordinated interior products to match the useful life of the rest of your building's components, please write and tell us your needs. Keene's total capability includes design, delivery and installation of over 8,000 combinations of products to meet every interior system requirement. Keene Corporation, Interior Systems Division, Route 206 Center, Princeton, New Jersey 08540.

**KEENE**  
CORPORATION

**INTERIOR SYSTEMS DIVISION**

**We've just begun to grow.**

*For more data, circle 13 on inquiry card*

# BREAKAGE AND SUNLIGHT... A DISPLAY WINDOW'S TWO WORST ENEMIES!

## Conquer Both Hazards With Protectopane® U-V!

Breakage and sunlight, a display window's two worst enemies, leave store owners vulnerable to property destruction. Breakage can result in expensive window replacement and loss of merchandise; sunlight can fade expensive display material making it worthless for re-sale. Either way, destruction cuts into profits and store owners lose money!

This needless waste can be avoided with Protectopane U-V! This new glass, specially created for store front windows, provides break-through protection and prevents fading due to ultra-violet light!

COMPLETELY TESTED AND APPROVED BY UNDERWRITER'S LABORATORIES!

Protectopane U-V features a clear vinyl interlayer which acts as a repellent to ultra-violet light—lets through only 1% of the ultra-violet rays in the critical region of 380 millimicrons and below; whereas 1/4" clear plate glass transmits about 52% of these harmful rays! Protectopane U-V provides color fast protection for draperies, paint, furniture, clothing and other articles behind the glass.

Protectopane U-V is almost totally impervious to break-through. Repeated heavy blows may break or crack the glass, but will not cause it to easily shatter or fall out.

Provide a double shield against display window property destruction! Write Dearborn today for complete details and specifications on Protectopane U-V!

**DEARBORN GLASS COMPANY**

6600 South Harlem Avenue • Argo, Illinois 60501



When It Comes To Glass — Come To Dearborn!

### Protectopane®

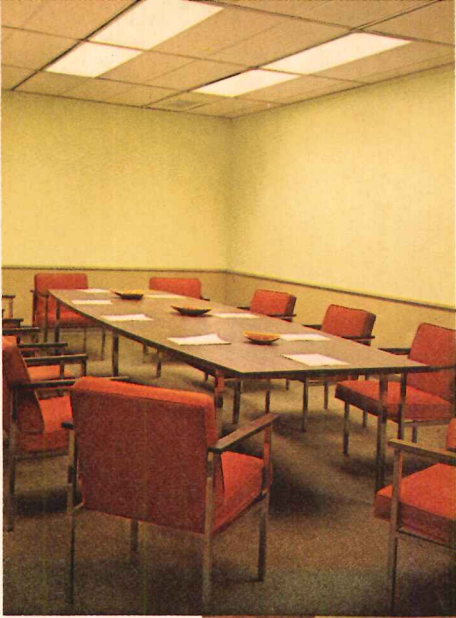


LISTED  
BURGLAR  
RESISTING  
GLASS



For more data, circle 14 on inquiry card





*Lennox presents...*

## **growthability in plant comfort: a case of "micro-climates" flexibility**

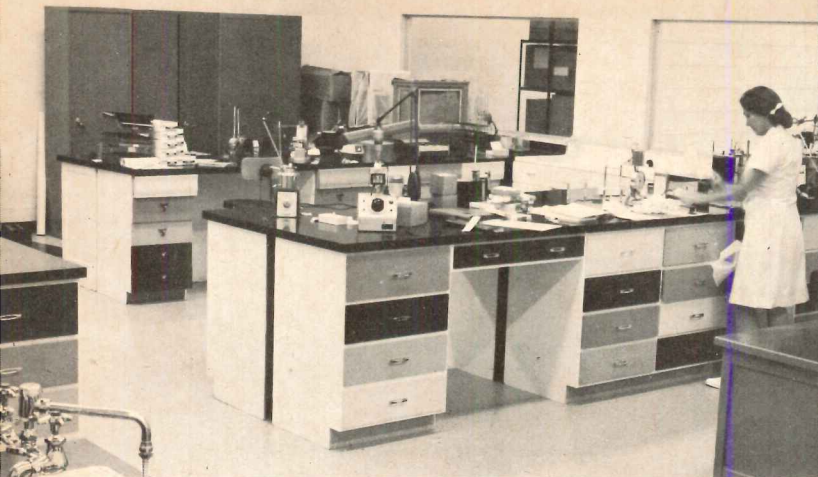
For a manufacturer, growing room is basic in a new building design — for headquarters, branch or expanding complex. One growthability factor is a flexible heating/air conditioning/ventilating system. This is provided easily and economically by the "micro-climates" of Lennox packaged modular systems — add-on comfort zones that can expand with the building.

*continued . . .*



New 200,000 sq. ft. home of Kerr Manufacturing Company, Division of Sybron Corporation, in Romulus, Michigan, near Detroit. Offices and production areas are heated, air conditioned and ventilated by Lennox rooftop equipment. Architects: Robert Geudtner & Associates. General contractor: Butler Manufacturing Company. Mechanical contractor: Commercial Heating & Air Conditioning.

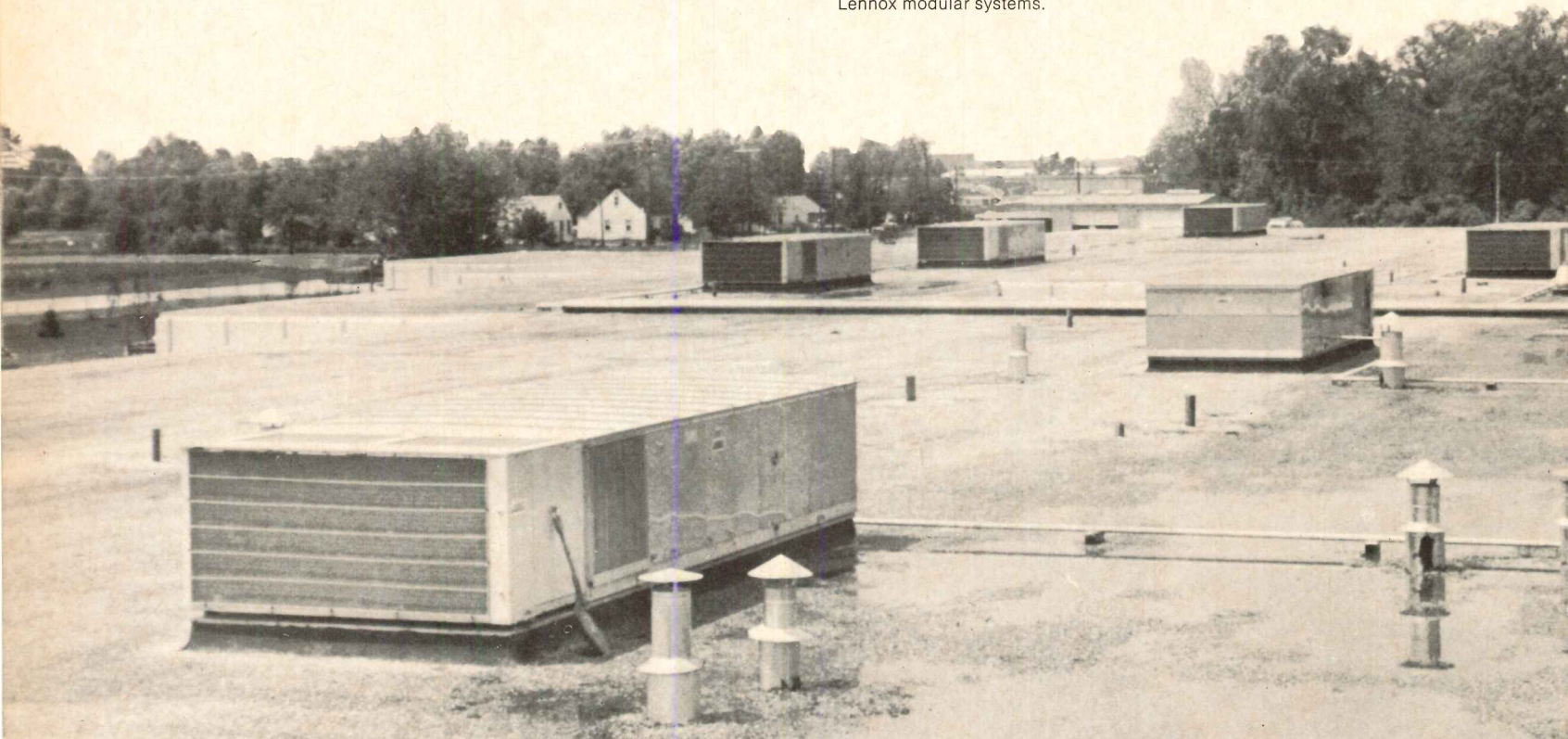




Critical laboratory testing of dental materials—daily routine in Kerr Manufacturing's Chemical Quality Control—calls for accurate temperature control and fresh air ventilation. Both are supplied by Lennox modular systems.



Careful planning is shown by Kerr's data processing room, with underfloor cable space for future equipment. Such rooms are isolated—but with broad expanses of glass for a "wide open" feel. The necessary "micro-climates" are provided by DMS and other Lennox modular systems.



Kerr employee comfort and laboratory-accurate temperature control are both provided by Lennox rooftop DMS units. Eleven such units have a total output of 192 tons of cooling and 5,350,000 Btuh heating. Twenty-three other Lennox modular units supply supplementary heating and make-up air. POWER SAVER™ equipment on DMS units provides free cooling when outdoor temperatures fall below 57°F.

*continued...*

## growthability in plant comfort

The "how to" of facilities expansion often is a major bugaboo for a fast-growing company. But a great deal of those growing pains can be eased by thorough growth planning—not only of the building itself, but of such mechanical systems as heating, cooling and ventilating. These growth needs can only be met completely by such flexibility as that of Lennox modular systems.

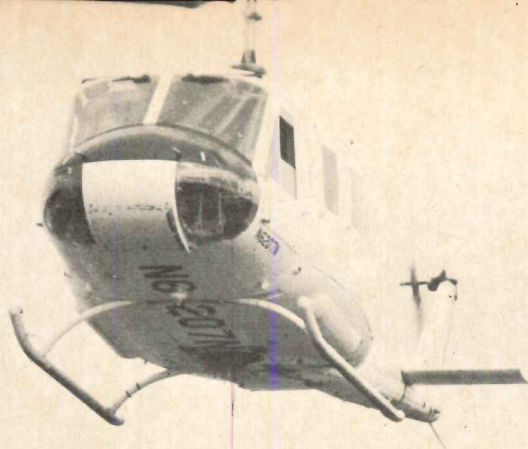
An example of this advanced planning is found in the design of the Kerr Manufacturing Company building. The new home of this 78-year-old dental products manufacturer combines the growthability of Lennox "micro-climates" with that of modular Space-Grid construction by Butler Manufacturing Company. Walls, roof and comfort of the 200,000 square foot building system can be extended to keep pace with company growth—and without interrupting existing facilities.

Kerr's spacious and strikingly appointed cafeteria (center photo, preceding page), allows employees to gather in a relaxed atmosphere. The cafeteria has two separate comfort zones, individually controlled by thermostats mounted on opposite walls. Thus, air freshness and temperature are maintained, regardless of occupancy on either side.

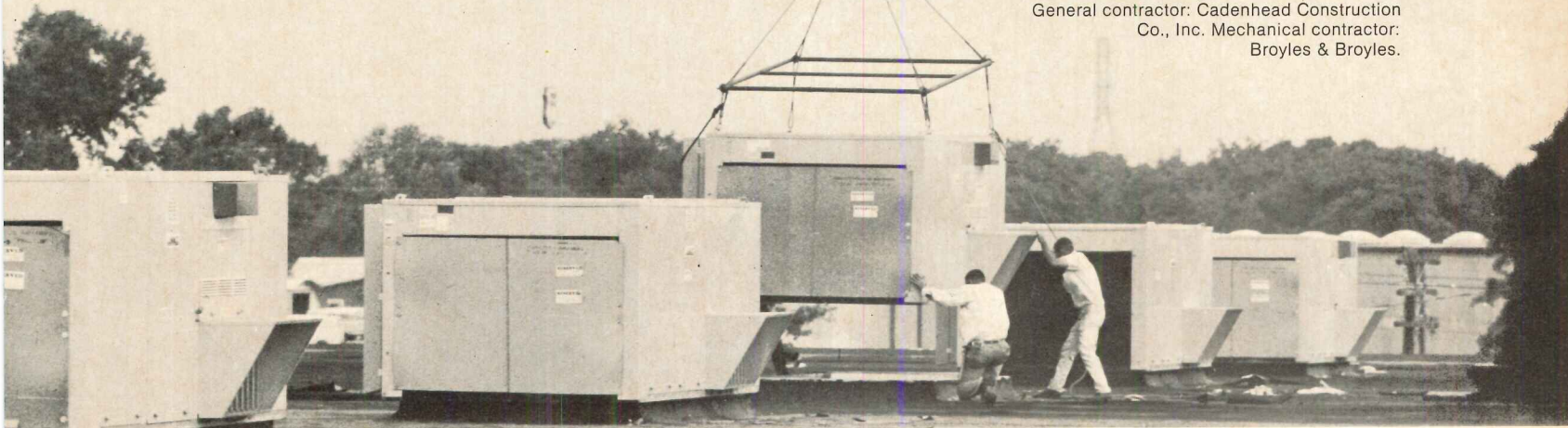
No design restrictions are imposed by Lennox systems. For instance, Lennox Direct Multizone System (DMS) low-profile units can be concealed on the roof with little or no enclosure needed. They never steal valuable floor space. And their light weight allows use of non-loadbearing walls.

Roof-mounting frame reduces on-site labor. And the units are completely assembled, wired and tested at the factory. This is single-source responsibility, single-source savings: Lennox.

Bell Helicopter Company's new Logistics Center at Fort Worth is 209,000 sq. ft. of international customer service. Lennox rooftop modular systems here include both single-zone and multizone heating/air conditioning units. A Bell Model 205A aircraft lifted the units to the rooftop.



Bell's Logistics Center is served by 34 Lennox hidden rooftop units, with a total capacity of 700-plus tons cooling. Architects: Kirk-Voich. Engineers: Yandell & Hiller. General contractor: Cadenhead Construction Co., Inc. Mechanical contractor: Broyles & Broyles.



Lennox units are available for multizone or single-zone control, each compatible with the other. Gas, electric or oil heat source.

When you're planning a plant—or any other building—check first to learn why Lennox should be specified. See Sweet's 29a/Le—or write Lennox Industries Inc., 499 South 12th Avenue, Marshalltown, Iowa 50158.

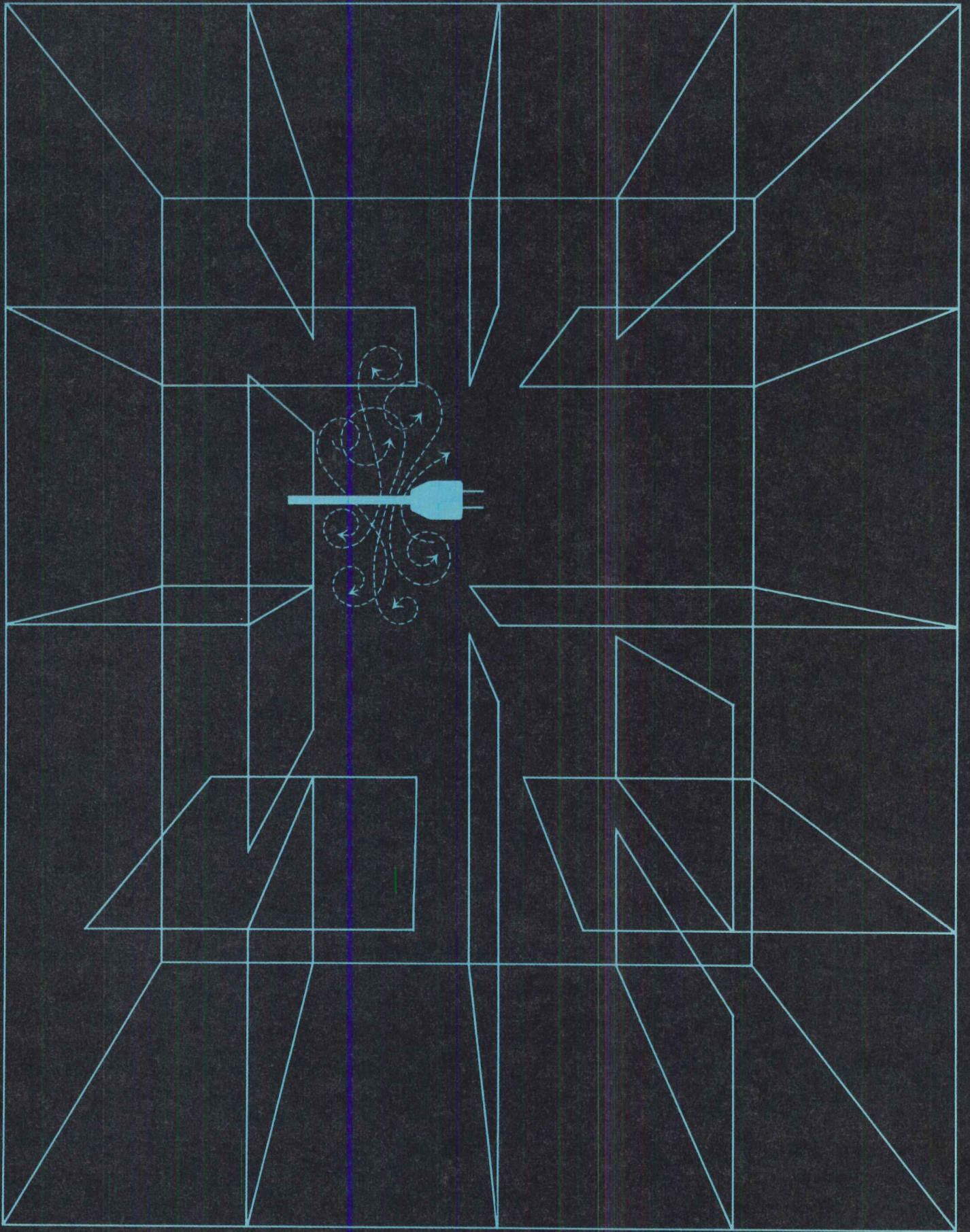
**LENNOX**  
AIR CONDITIONING • HEATING



Tachronic Instruments, Inc., New Ulm, Minnesota, utilizes Lennox DMS for the critical temperature control ( $\pm 1^{\circ}\text{C}$ ) required by their sensitive electronic components. The DMS automatic heating/cooling cycles also control humidity in this 24,000 sq. ft. plant. Engineers: Toltz, King, DuVall, Anderson & Associates, Inc. General contractor: Heymann Construction Co. Mechanical contractor: Osborne Plumbing & Heating.

For more data, circle 15 on inquiry card

# DESIGN



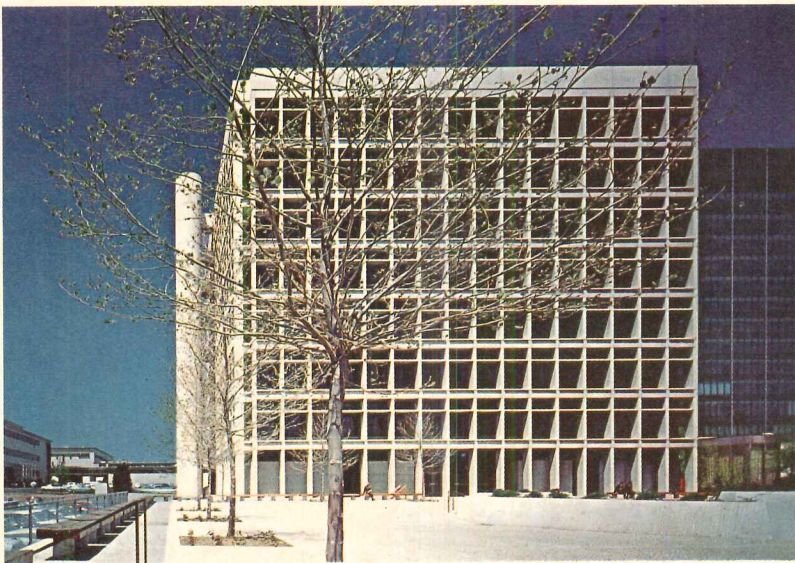
# SPACE

without compromises demanded by mechanical and electrical services

Design cantilevered floors or balconies, waffle ceilings, luminous or exposed ceilings with complete freedom. Eliminate sills at glass walls, include completely movable partitions . . . or add innovations . . . simply by designing A-E Floor into your next job.

A-E Floor contains air distribution channels as well as telephone, electric and signal cells integral with any building frame. This blends mechanical and electric services into a highly efficient structural system.

Learn how this unique floor system gives new flexibility and versatility to architectural design. Get a copy of the A-E FLOOR design brochure from Granco Steel Products Co., 6506 North Broadway, St. Louis, Missouri 63147. (A subsidiary of Granite City Steel.)

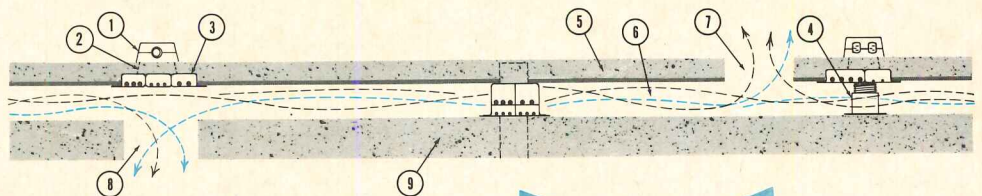


△ L'Enfant Plaza, Washington, D. C. (Office and Retail Center)  
Architect: I. M. Pei & Partners / Structural Engineer: Weiskopf & Pickworth / Mechanical-Electrical Engineer: Syska & Hennessy

#### A-E FLOOR PROJECTS

◁ Hoffman-LaRoche, Nutley, N. J. (Administration Building)  
Architect: Lundquist & Stonehill / Structural Engineer: Goldreich, Page & Thropp / Mechanical Engineer: Abrams & Moses / Electrical Engineer: Gustave P. Weiser

**A-E FLOOR SYSTEM** 1. Single floor fitting for power, telephone, signal service. 2. Preset insert. 3. Steel cells for telephone, electric and signal lines. 4. Vertical support. 5. Floor Slab. 6. Air plenum. 7. Outlet to floor or baseboard diffuser. 8. Outlet to ceiling diffuser. 9. Structural slab.



IMAGINATION IN STEEL

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For more data, circle 17 on inquiry card

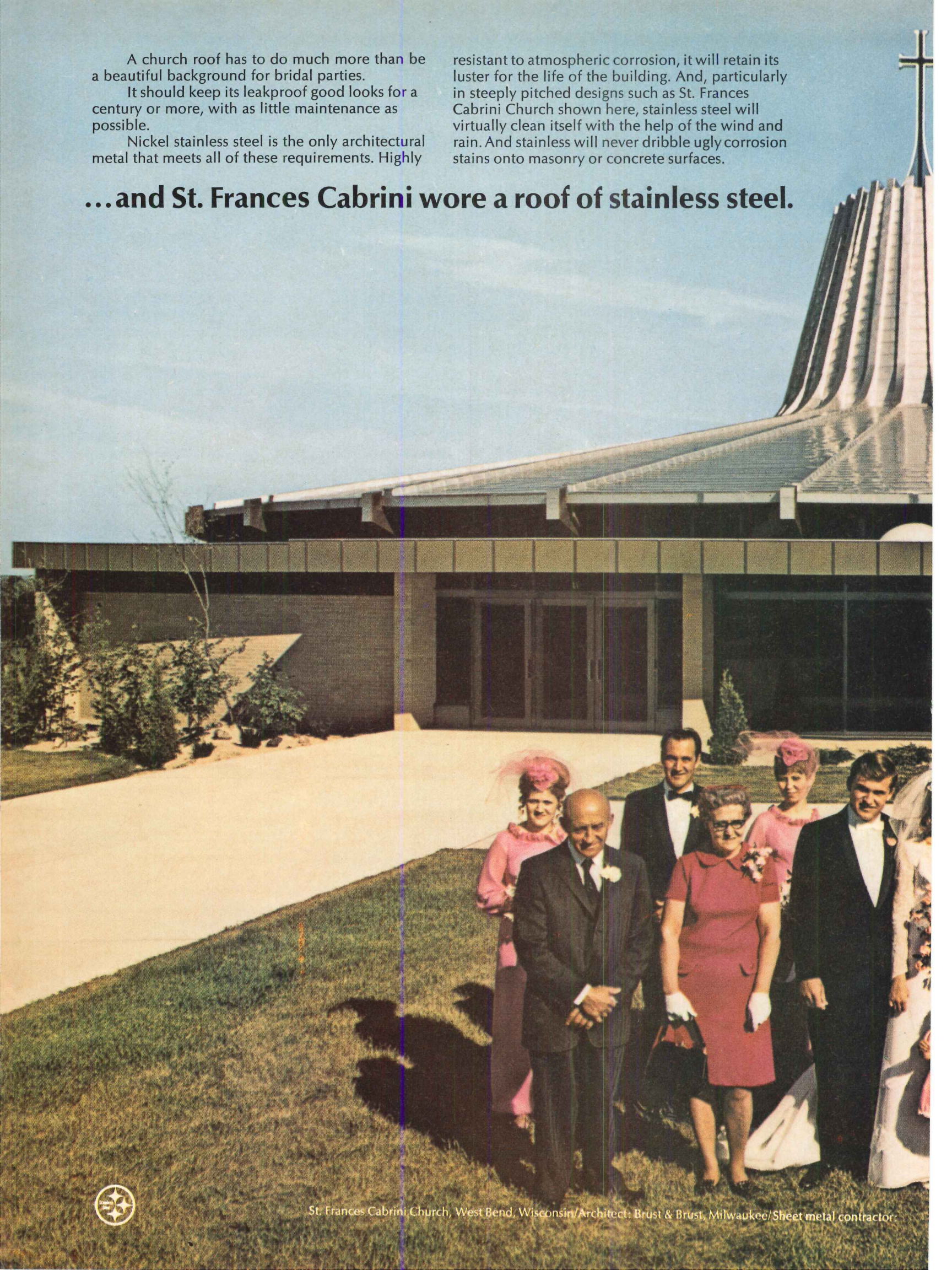
A church roof has to do much more than be a beautiful background for bridal parties.

It should keep its leakproof good looks for a century or more, with as little maintenance as possible.

Nickel stainless steel is the only architectural metal that meets all of these requirements. Highly

resistant to atmospheric corrosion, it will retain its luster for the life of the building. And, particularly in steeply pitched designs such as St. Frances Cabrini Church shown here, stainless steel will virtually clean itself with the help of the wind and rain. And stainless will never dribble ugly corrosion stains onto masonry or concrete surfaces.

**...and St. Frances Cabrini wore a roof of stainless steel.**



St. Frances Cabrini Church, West Bend, Wisconsin/Architect: Brust & Brust, Milwaukee/Sheet metal contractor:

Stainless is so much stronger than other architectural metals (up to 125,000 psi tensile strength) that thinner gauges can be used to carry heavier loads. This excellent strength-to-weight ratio helps reduce its cost to a highly competitive point.

Nickel stainless steel is now available in varying tempers and standard shapes. If you'd like

more facts and ideas, write for our architectural fact sheet. It can help any building keep its beautiful young looks years longer. The International Nickel Company, Inc., 67 Wall Street, New York, N.Y. 10005.

**INTERNATIONAL NICKEL**



Reinke & Schomann, Inc., Milwaukee/Roofing material: AISI Type 304 stainless, .015 gauge MicroFlex, Washington Steel Corp., Washington, Pa.

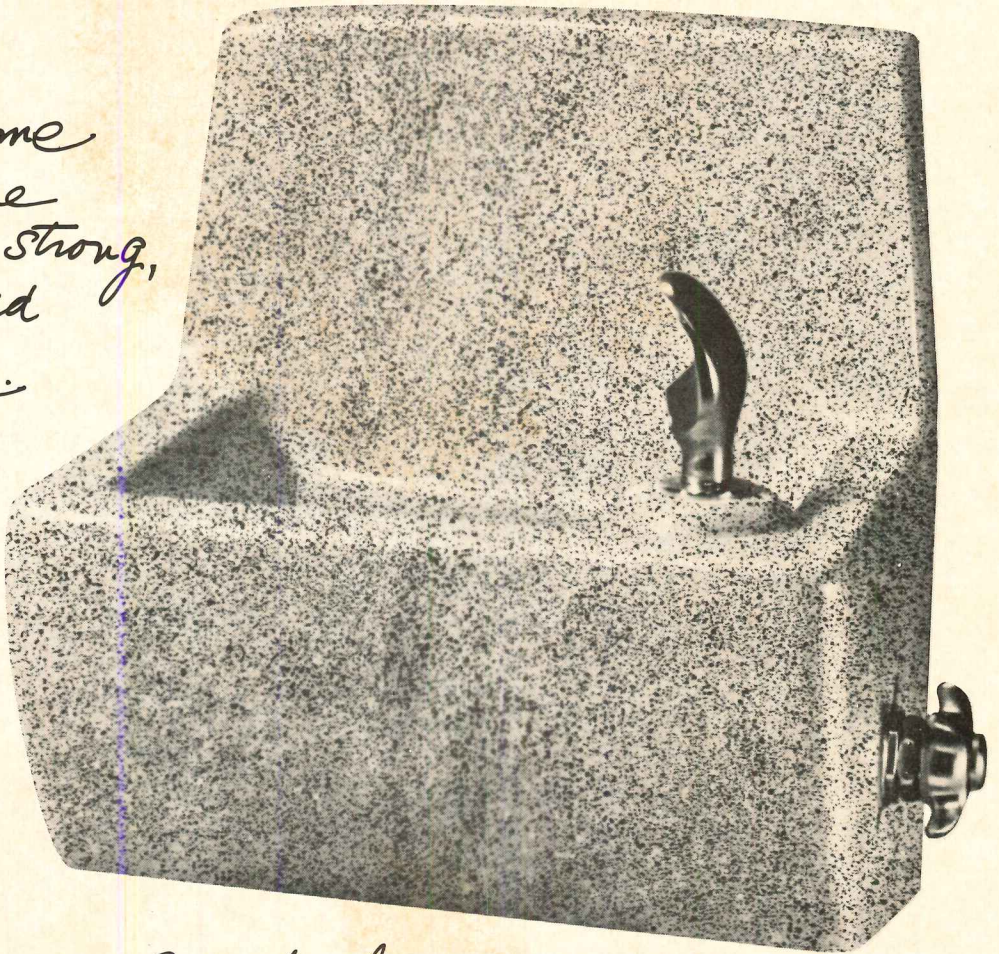
*Happily wed forever!*

# POLYESTER & STONE

*drinking fountains by*

# WESTERN

*Beautiful, handsome  
Polyester & Stone  
So lightweight, so strong,  
So beautifully wed  
together forever.*



*Easy to look at. Easy to love.  
Easy to install. Easy to drink from.  
Easy to specify... and so excitingly  
beautiful... Easy does it!*



Write today for complete Catalog. Dept. AR-1169

301

**WESTERN DRINKING FOUNTAINS, INC.**  
A subsidiary of Sunroc Corporation / 14487 Griffith St., San Leandro, California 94577

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# ANSO.

The carpet fiber that makes dirt seem to disappear.



#### Why ANSO™ nylon?

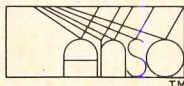
Because ANSO does strange things with light. Turns it around to reflect the beauty, color, and texture of a carpet. But not the common dirt a

carpet has to put up with.

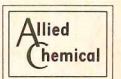
ANSO is specially engineered to resist ugly soiling and extreme wear, which makes it the ideal choice for commercial carpeting.

If ANSO happens to cost more than ordinary nylon, it's worth it.

Because ANSO keeps looking new. Longer.



The Nylon Fiber That Makes Dirt Seem To Disappear.



Carpeting of ANSO nylon available from these fine mills: Alexander Smith; E. T. Barwick Mills; Columbus Mills, Inc.; Firth Carpet Mills; Karastan Rug Mills; Laurelcrest Carpets; Mohawk Carpet Mills; Monarch Carpet Mills; Needleloom Carpets.

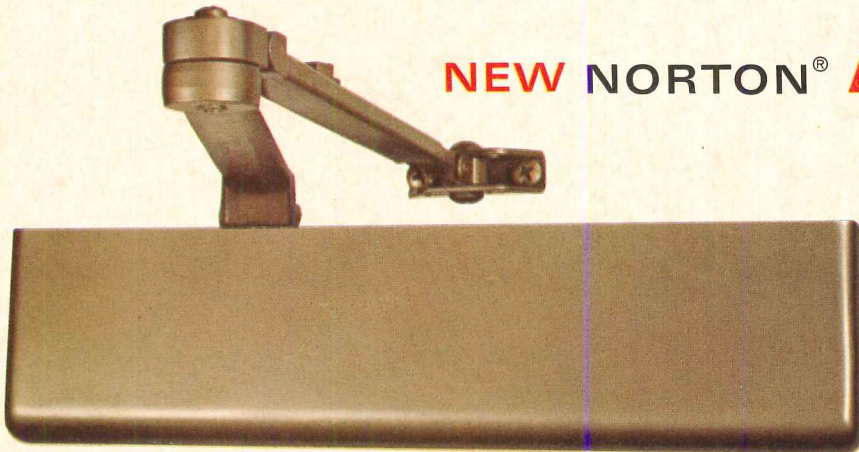
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OF GREAT DESIGN

IN THE TRADITION



reproduction suitable for framing available; write on your letterhead.



# NEW NORTON® APOLLO

## SERIES 7700 CLOSERS

A completely new Norton Closer, incorporating all the desirable features suggested by architects.

Contemporary, narrow-projection styling to meet the needs of today's architecture . . . today's decor.

With covers; in anodized bronze, brass or clear aluminum; in 67 exotic and native woodgrains for on-the-job finishing; plus all other popular finishes.

For fine-tuning its power to the environment, a plus or minus 25 percent spring power adjustment.

For exact control despite traffic abuse, a new rack-and-pinion design and adjustable-backcheck protection for all types of mounting.

For easy application, non-handed installation. Just specify regular arm, parallel arm, or top-jamb mounting.

A new Norton closer, designed for today's architecture.

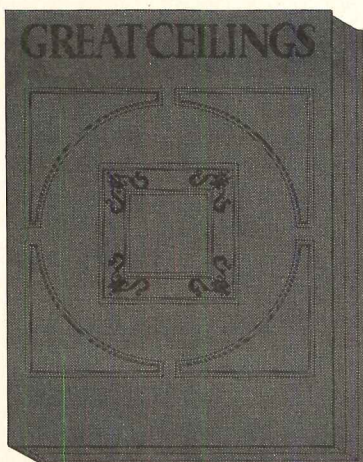
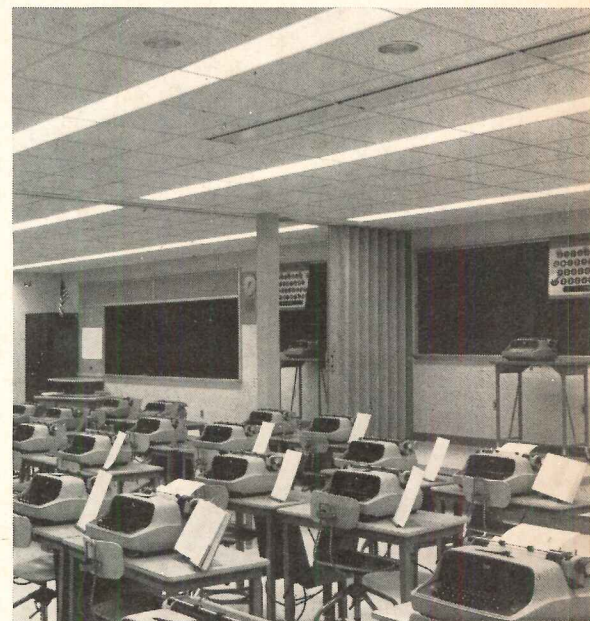
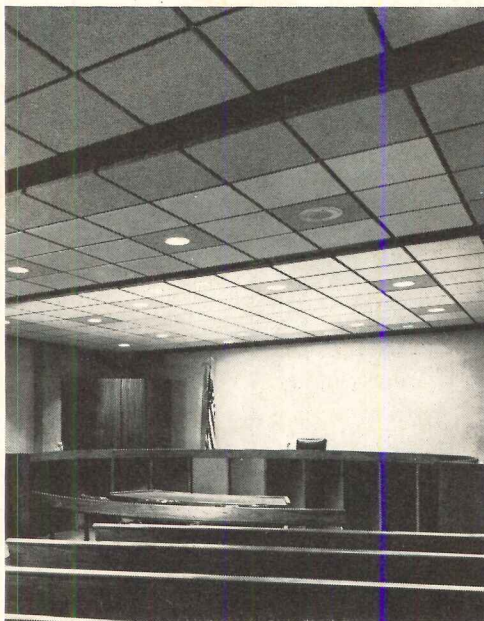


**NORTON** DOOR CLOSER DIVISION  
372 Meyer Road, Bensenville, Illinois, 60106

7700

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**Air conditioning  
that puts no ceiling  
on imagination\***



\*Bound to entice the imagination—Carrier's new Architect's Portfolio includes a dozen of the world's "Great Ceilings" suitable for framing.

Carrier's Moduline® variable volume air terminals are designed to give you freedom of design . . . to enhance rather than hinder your personal hallmark.

A showcase of what architects have accomplished in ceiling design with the Carrier Moduline is now available in a new portfolio entitled "Great Ceilings."

This handsomely bound reference book includes a variety of installations such as a school, hospital, municipal building, service center, and office buildings. Some are completely new, others are add-ons and/or renovations.

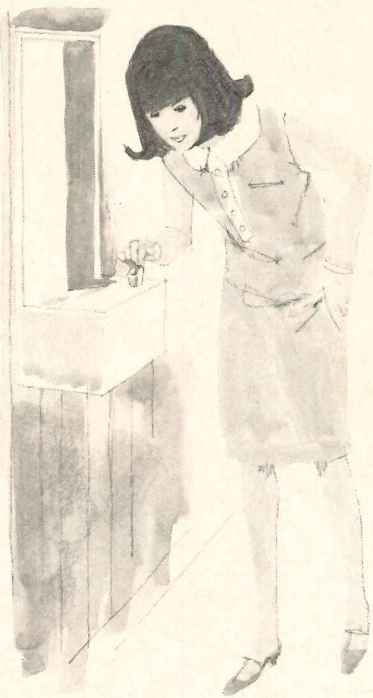
A new 7-minute companion film on the Carrier Moduline is also available for private showings. It clearly describes the unique features of this new unit and illustrates a variety of design-provoking ceilings. The name is the same, "Great Ceilings."

Registered architects who write in on their letterheads will receive a copy of the "Great Ceilings" portfolio and may also schedule a showing of the film.

Write today to William Heck, Product Manager, Carrier Air Conditioning Company, Carrier Parkway, Syracuse, New York 13201.

Carrier Air Conditioning Company

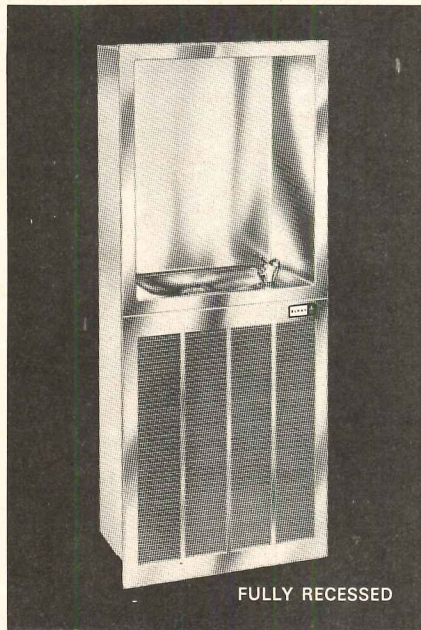




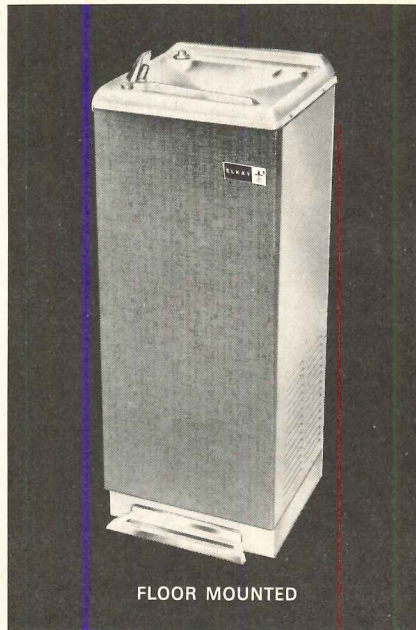
The ultimate in water coolers  
for commercial,  
industrial and institutional  
installations!



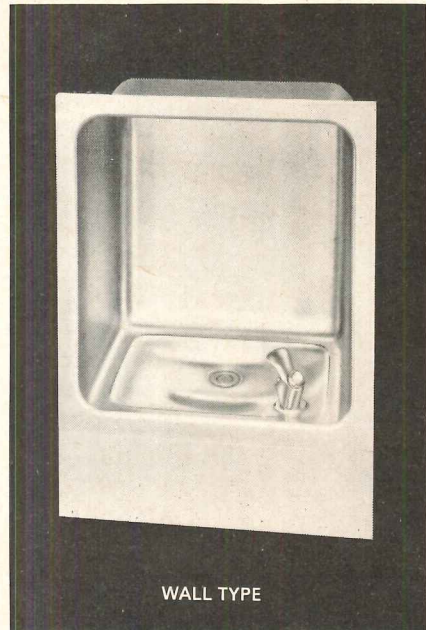
CLASSROOM SINK AND  
DRINKING FOUNTAIN COMBINATION



FULLY RECESSED



FLOOR MOUNTED



WALL TYPE

## Stainless steel water coolers by **ELKAY**

There's an Elkay water cooler model for every application, and every application provides the softly gleaming beauty of incomparable stainless steel. Models include fully recessed, semi-recessed, floor mounted, wall hung and classroom sinks. They assure ample water cooling capacity even for heavy traffic locations. Stainless steel is easy to

keep clean, actually grows in beauty with age. Never chips or cracks, resists stains. And best of all, stainless steel blends perfectly with whatever interior decor you select, never clashes with colors. Write for catalog or see our listing in Sweet's Architectural File. Go for the ultimate in cooling water...stainless steel water coolers by Elkay.

Elkay Manufacturing Company, 2700 S. 17th Avenue, Broadview, Illinois 60153

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see our catalog in Sweet's **S**

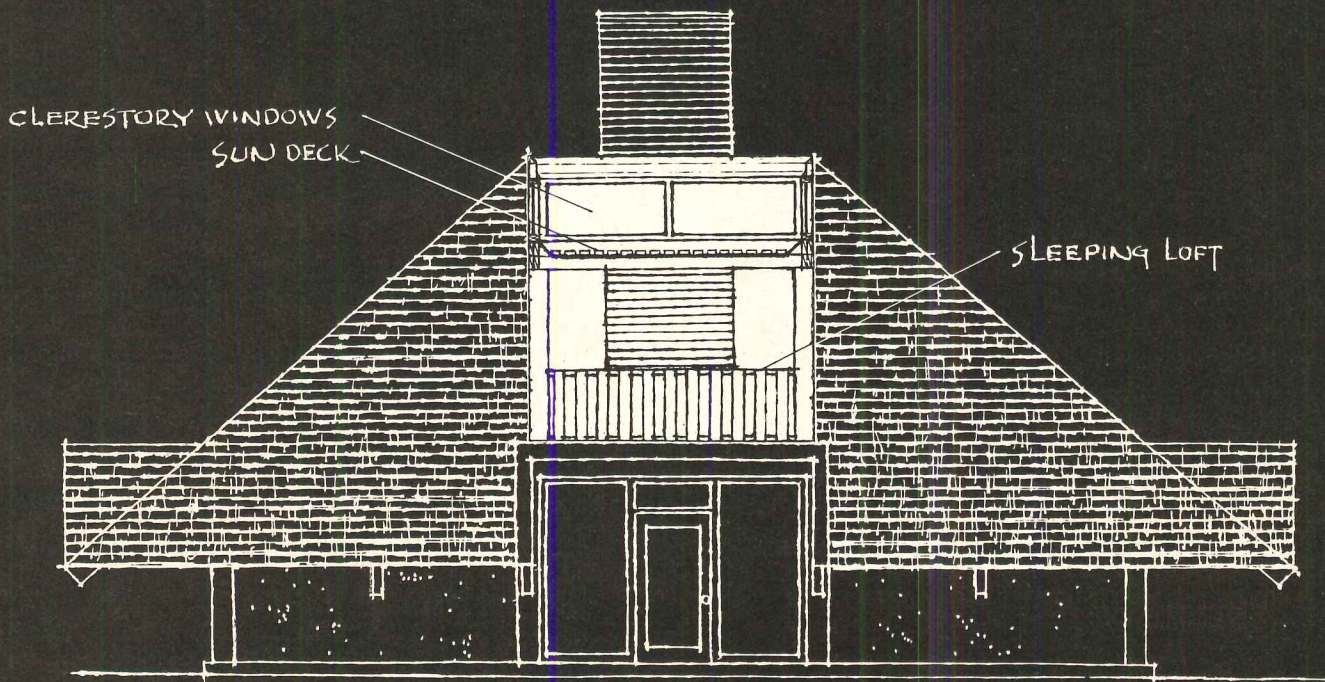
For more data, circle 23 on inquiry card

## News in brief

- The F. W. Dodge Construction Outlook for 1970 predicts "a small gain."** George A. Christie, F. W. Dodge's chief economist, said "the difference between a small decline and a small gain for the year will depend on the precise timing of the next upturn." Mr. Christie predicts the government will ease up on money restrictions, and that housing will show an upturn toward the end of 1970. (See Construction Outlook, page 69.)
- The tax reform bill is under fire from many sides.** The Conservation Foundation says the bill would "inhibit or cripple the work" of many conservation organizations throughout the country by removing tax exemptions on expenditures which attempt to influence legislation. The International Council of Shopping Centers says the bill could put most small developers out of business, leaving the shopping centers in the hands of huge corporations. And the National Association of Real Estate Boards says the bill would bring about "the virtual extinction of housing, a stagnated real estate market, and a wrecked economy." The House has passed the bill 394 to 30 and the Senate is expected to receive a milder version from its Finance Committee in December.
- The Everglades Coalition, a group of 22 conservation organizations, remains opposed to any airport** in the area, despite a proposal from Stewart Udall, head of Overview. In Mr. Udall's plan, the airport would be used only for take-offs and landings; rapid transit would carry passengers to a terminal in Miami, 40 miles away. Even the planes would be serviced in Miami. The Coalition is urging Secretary of Interior Hickel to follow the advice of the Interior Department study which said even the present training airport is intolerable (October, page 38).
- Submissions for the 1970 Honor Awards Program of the American Institute of Architects are due December 1.** For the second year, the Bartlett award for barrier-free design will be given in addition to the Honor Awards.
- The Washington, D.C. Metro is at last on the way to construction** after years of Congressional and local tie-ups. The subway, whose stations were designed by Harry Weese and Associates, was recently released from the House Committee of Rep. William H. Natcher (D. Ky.), where it had been held on condition a superhighway be constructed at the same time. The city has found a reasonably uncontroversial route for the road, and Congress, which has already authorized the plan, is expected to approve funds.
- Three cities have received Citations for Excellence in Community Architecture** from the American Institute of Architects. In Cincinnati, Pistler-Brown Architects/H. M. Garriot were cited for their Gidding-Jenny store design, part of an improvement program of a major downtown street for which the firm did the master plan; in New Orleans, architects Richard Koch and Samuel Wilson, Jr. were commended for their work on Board of Trade Plaza; and Oakland, California was cited for several new projects, including the Oakland Museum, by Roche, Dinkeloo and Associates (May 1968), the Oakland-Alameda County Coliseum and Arena, by Skidmore, Owings and Merrill (June 1968) and several rapid transit stations.
- The Association of Collegiate Schools of Architecture and the Association of Student Chapters, A.I.A.** will hold a joint regional conference November 6-8 at Ball State University in Muncie, Indiana, about "new problems, new processes, new professionals." Speakers include Jeanne Davern, managing editor of the RECORD, William Houseman, editor of the Environment Monthly, Taylor Culver, president of the A.S.C.-A.I.A., and systems designer Carl Koch, A.I.A., of Carl Koch and Associates, Cambridge, Massachusetts.
- "Environmental Impacts of New Technology: an Annotated Bibliography"** is the first of a series "intended to provide working data for the designers of environment" put out by the Department of Architecture of the University of Michigan in Ann Arbor.
- Maurice Gauthier, chief designer at Haines, Lundberg and Waehler, died September 22 at the age of 67.** Before joining the New York firm, Mr. Gauthier, who was born and educated in France, was a critic in design at Columbia University and an instructor in architecture and professional relations at Pratt Institute.



## The primitive beauty



*Certi-Split No. 1 Handsplit shakes, 18" x 3/4" to 1 1/4". / Architects: Glankler and Broadwell*

## of a civilized idea.

In "Nairobi West," the sloping roof of richly textured red cedar shakes does more than convey the look of primitive Africa.

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Which is the idea.

The first level is designed around a central utility core that contains a kitchen,

bath, closet and a heating-cooling unit. Surrounding space is for dining and recreation.

A sleeping loft perched atop the core comprises the second level. And above the loft, nestled inside the peak of the roof, is an intimate sundeck.

That's a lot for one roof to handle. But red cedar has a sure touch when

it comes to combining adaptability with beauty and durability.

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**Red Cedar Shingle & Handsplit Shake Bureau**

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For more data, circle 24 on inquiry card

# The Metropolitan Museum in New York celebrates its first hundred years

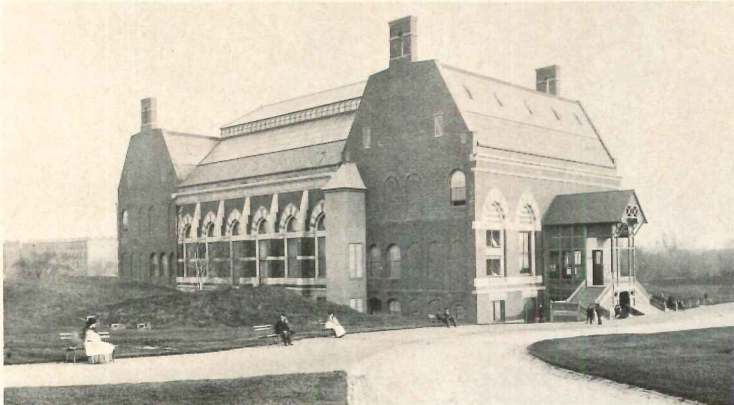
The Metropolitan Museum of Art in New York is celebrating its centenary. The commemorative exhibitions will include five galleries devoted to "The Rise of an American Architecture," conceived by architectural historian Edgar Kaufmann and co-sponsored with the Museum by the National Trust for Historic Pres-

ervation. The show will cover the period 1800 to 1900, and begins May 1, 1970. It will parallel a more general exhibit on 19th-century America and will divide the century into three architectural periods: "romantic," "bourgeois," and "esthetic," and three building types: houses, skyscrapers and "urban

amenities". The presentation will include holograms, "true" three-dimensional images produced using laser beams. In conjunction with the show, Mr. Kaufman is editing a book consisting of four essays on "The Rise of an American Architecture" by four architectural historians. It will be published in

April by Frederick A. Praeger, Inc., New York.

The Museum's own building forms a record of American architecture, especially of the late 19th century, so it is publishing "The Museum: One Hundred Years and the Metropolitan Museum of Art," a pictorial essay by Leo Lerman.



1 Illustrations courtesy of the Metropolitan Museum of Art

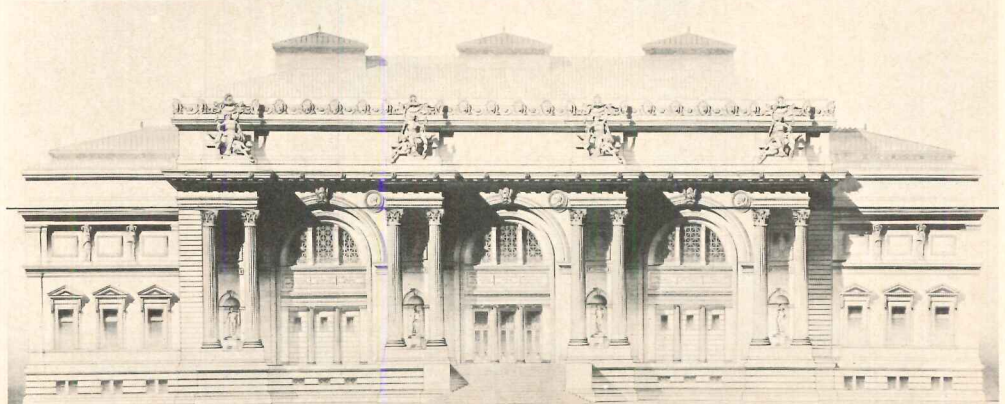
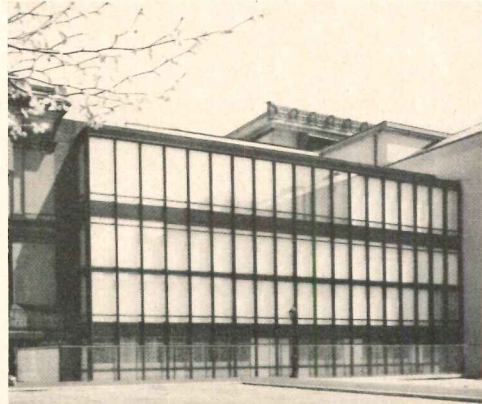


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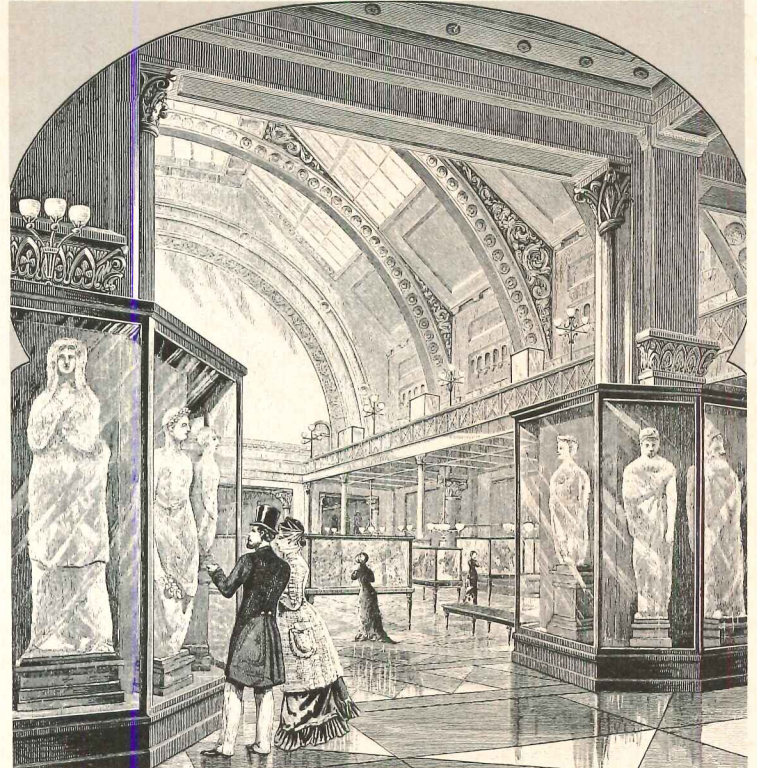
The Museum's growth—clockwise: 1) the original core, by Calvert Vaux, who had designed Central Park, where the Museum stands, with Theodore Weston (1888) and by Arthur L. T. Tuckerman (1894); 4) 1893: The Columbian Exposition left

its mark on Richard Morris Hunt's design for the Fifth Avenue facade (RECORD called it "really brilliant" in 1902); 5) 1964 library by Brown, Lawford, and Forbes; 6) remodelling by Roche, Dinkeloo, and Associates (November, 1968, page 40). A wing to house the Egyptian Temple of Dendur is planned for the near future.

5



4



2



3

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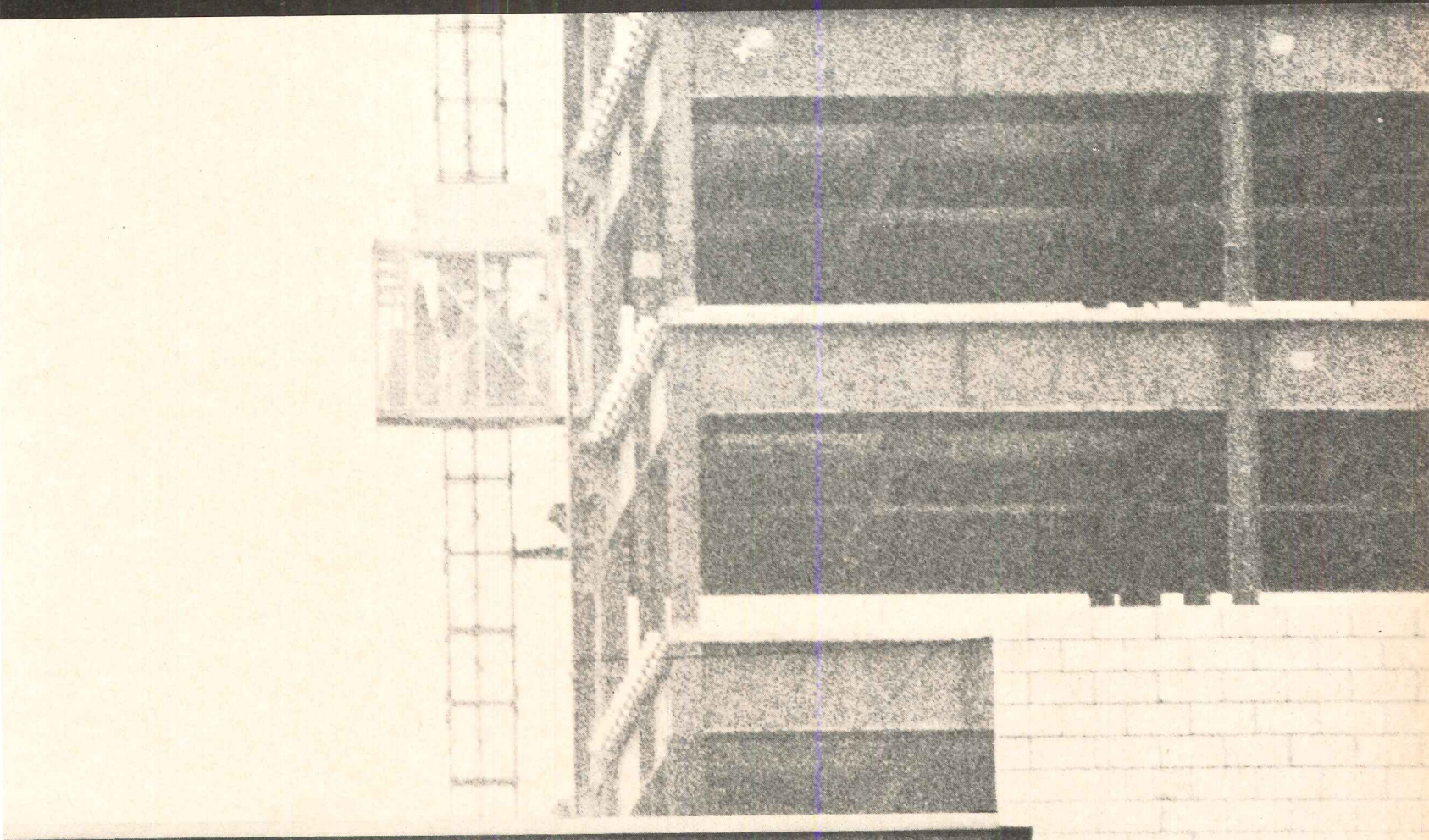
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## A.I.A. task force develops proposals to raise and spend that "\$15 million" and gets A.I.A. board approval "in principle"

An outline of the "program of social action" developed to respond to the goals set in the now-famous student-sponsored Resolution 19 of last June's annual convention of the American Institute of Architects in Chicago was presented by the A.I.A. Task Force on Social Responsibility at the fall meeting of the A.I.A. Board of Directors in Santa Fe and received approval "in principle."

The program would raise a total of some \$16 million in A.I.A. fiscal years 1970-72 through a combination of reallocation of substantial amounts of existing A.I.A. financial resources, new A.I.A. man-hour contributions, new funds to be sought from foundations and new funds to be sought from existing government programs.

Major initial thrusts of the program, according to A.I.A. Vice President George Rockrise

of San Francisco, who is chairman of the task force, would 1) encourage and support the development of more minority professionals, both at the level of the architectural schools and at the level of the architectural offices; and 2) encourage and support maximum participation through local A.I.A. chapters and their members in community design centers dedicated to working with local neighborhoods toward environmental goals set up by their residents.

A major source of implementation and of funds for the program will be the regular standing committees of the Institute. Mr. Rockrise noted that all appropriate committees will be asked to participate in the development of the program and to participate in its development in their areas.

A significant commitment toward the raising of new funds

for the purposes of the program was taken by the A.I.A. Board of Directors at Santa Fe when it agreed to match a \$500,000 grant to be sought from a major foundation for scholarships for students from disadvantaged groups. This stems from an effort begun by the task force last year, under the chairmanship of David Yerkes of Washington, D.C., to form a consortium to support development of minority professionals with contributions of \$500,000 each from the A.I.A. and the Ford Foundation and a \$200,000 contribution from the Urban League. It is estimated that such a \$1.2 million fund could support 100 disadvantaged students through a six-year architecture program.

The task force itself was reconstituted after the Chicago convention to conform to Resolution 19's pledge of full student participation in its work. Its pres-

ent members, in addition to Mr. Rockrise, are architects David Yerkes, vice chairman, Leon Bridges and Robert Nash, and students Roger Marjarum of the University of Detroit, Ray Huff of Clemson, Gene Lindeman of the University of Illinois, and (president of the Association of Student Chapters, A.I.A.) Taylor Culver of Harvard University. Elliott Carroll, director of the A.I.A.'s department of public affairs, worked closely with the task force in developing its recommendations.

Final approval of the program, and budgets to implement it, will be sought at next month's meeting of the A.I.A. Board of Directors in Washington. Meanwhile, the program was to get successive reviews from the A.I.A.'s Planning Committee; its Council of Commissioners and the Executive Committee of the Board.



### Slayton appointed A.I.A. executive vice president

William L. Slayton, president of Urban America, Inc., will become executive vice president of the American Institute of Architects next month. He will succeed William H. Sheick, F.A.I.A., who has been Executive Director since 1961. Mr. Sheick will remain with the A.I.A. on a special assignment basis.

The change in titles from director to vice president reflects the increased responsibility the A.I.A. expects to give this position, both in the interpretation of Institute policy as set by the Board of Directors, and in the A.I.A.'s efforts to take a more active role in forming public policy (see also editorial, page 9).

Mr. Slayton will be the first

non-architect executive staff director since 1949. According to A.I.A. President Rex W. Allen, this fact symbolizes the growing involvement of architects in matters of political, educational, economic, and social concern.

Before joining Urban America, a private, non-profit national organization committed to improving the social and physical environment of U.S. cities, Mr. Slayton spent five years as commissioner of the Urban Renewal Administration of the Housing and Home Finance Agency. He has also been redevelopment director of the National Association of Housing and Redevelopment Officials, vice president for planning and redevelopment for Webb and Knapp, Inc., and the planning partner of the architectural firm of I. M. Pei and Partners. His career began on the Milwaukee Planning Commission. Mr. Slayton has an A.B. in municipal government and an M.A. in public administration from the University of Chicago.

Mr. Slayton lives in one of the few private houses designed by I. M. Pei (Record Houses, 1964, pages 52-57).

### A new community in New York's East River

Philip Johnson has designed a new community for 20,000 on Welfare Island, opposite central Manhattan. The island, which will be reached by bridge and subway, will contain housing for all income brackets, office buildings, a shopping center, a town harbor, restored landmarks and a large proportion of open space, which Mayor John Lindsay hopes will become "another Central Park," used by the



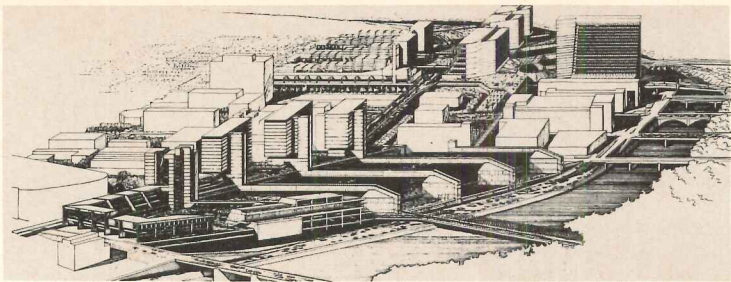
whole city. The island will be developed by New York State's Urban Development Corporation, headed by Edward J. Logue, whose reputation for getting things done encourages the belief this plan, as opposed to the many earlier schemes for the island, will really get built. The design is strongly oriented

to the pedestrian and toward the water, even to the inclusion of steps leading to the river, which Mr. Johnson compares to the Ghats of Benares on the Ganges.

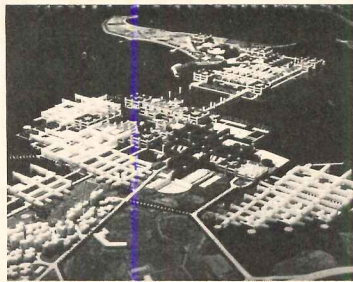
### HUD is judging Breakthrough proposals

Operation Breakthrough (September, page 36) has received nearly 600 proposals for prefabricated housing systems and about 150 proposals for construction sites. The evaluation board, whose membership HUD, in an unusual move, has kept secret (see Perspectives, page 10) is expected to present its findings to HUD Secretary Romney this month.

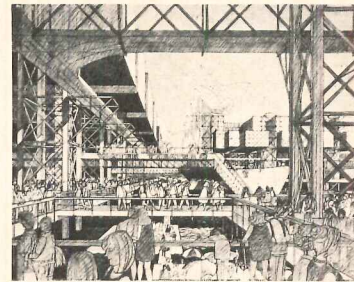
Proposals have come from individuals and from organizations of all sizes and locations, including several giant corporations and many universities. The prototype sites and the housing systems and concepts chosen will be announced late this month. The first prototype construction is expected to begin in the spring of 1970.



Philadelphia 30th Street air-rights site



Boston's floating exposition



Boston's "water plaza"

## The Bicentennial Exposition: urban environment as information

The American Revolution Bicentennial Commission is now evaluating proposals for the 1976 celebration, and should it recommend any of the major proposals it has received, the Bicentennial will put heavy emphasis on solving urban problems.

Philadelphia, Washington, D.C. and Boston made elaborate presentations to the Commission in late September, and private individuals and groups have also made proposals. Each of the three cities wants the Exposition to build permanent improvements. In Philadelphia and Boston, these improvements would take the form of demonstrations of urban design, while the Washington proposal—although including urban planning—leans more in the direction of permanent exhibitions.

Philadelphia's plan has been designed as an over-all regional and city program for development. The city intends to implement many of the ideas proposed by its Bicentennial Cor-

poration even if it does not become the center of an exposition and, for this reason, has already spent large sums on comparatively detailed plans.

These plans include a proposal to develop a series of "commuter villages" throughout the metropolitan area, which could be used to house visitors, and which would later become permanent housing. New building methods and careful site choices and community planning would set the villages apart from conventional suburbs. This project would go hand in hand with better rapid transit facilities.

Within the city itself, the exposition would have three main focal points, each of which would be centrally located, and which would redevelop depressed or under-used areas requiring little or no relocation of residents or businesses. All of the structures built would be saved and re-used, with "minimal conversion costs."

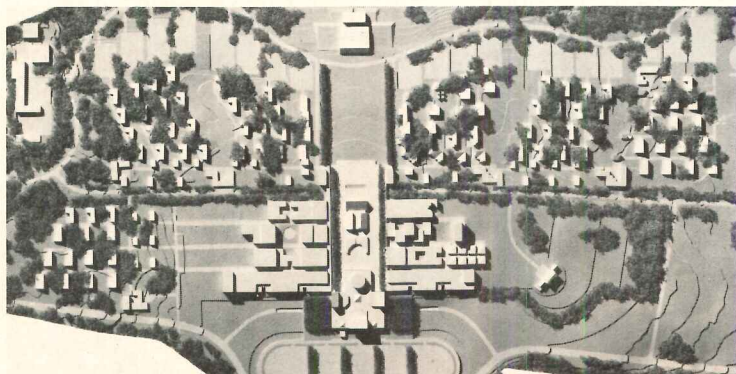
The new structures would demonstrate new land uses and technology. In the 30th Street Station area, where Penn Central air-rights would be used, exhibit areas for foreign countries would be combined with this exhibit in urban design, and would include business, housing and a major transportation center (the high-speed East Coast Metroliner stops here), and structural innovations in using air-rights. The new area would also be designed to tie together the surrounding neighborhoods.

The other two sites—one of which would encompass both low- and middle-income communities, and the other of which would link sites on both Philadelphia and Camden sides of the Delaware River—would also involve practical urban solutions carried out dramatically, and, because of the technical innovations, with the spectacle necessary to any exposition. Philadelphia claims foreign exhibits would not be overwhelmed by

the emphasis on the U.S. because the three-way division would make it possible for one or two sites to have an international focus.

Boston proposes an extensive "Urban Laboratory," which would demonstrate actual full-scale solutions to urban problems, in combination with a national communications network to the Laboratory, which would be a center for study of urban problems. The exposition would be located in Boston Harbor, using existing land, fill, and 64 acres of floating platforms which would form a megastructure with interchangeable parts. As in Philadelphia, the main structures would be preserved, although there might be more extensive changes within the megastructure in conversion to permanent use.

Several private proposals have suggested an exposition involving cities along the whole Eastern seaboard, interconnected by ultra-high-speed trains.



### College design: Expansion but not sprawl

Edward Larrabee Barnes has designed the master plan of a major new campus of the State University of New York at Purchase, New York. The campus will center on a cluster of department buildings which can

expand with future needs from either side of a "great court" 900 feet long and 370 feet wide. The focus of the compact campus will be the Performing Arts Center whose four stage towers will dominate the college.

Philip Johnson is designing a museum to contain a famous collection of 20th century art

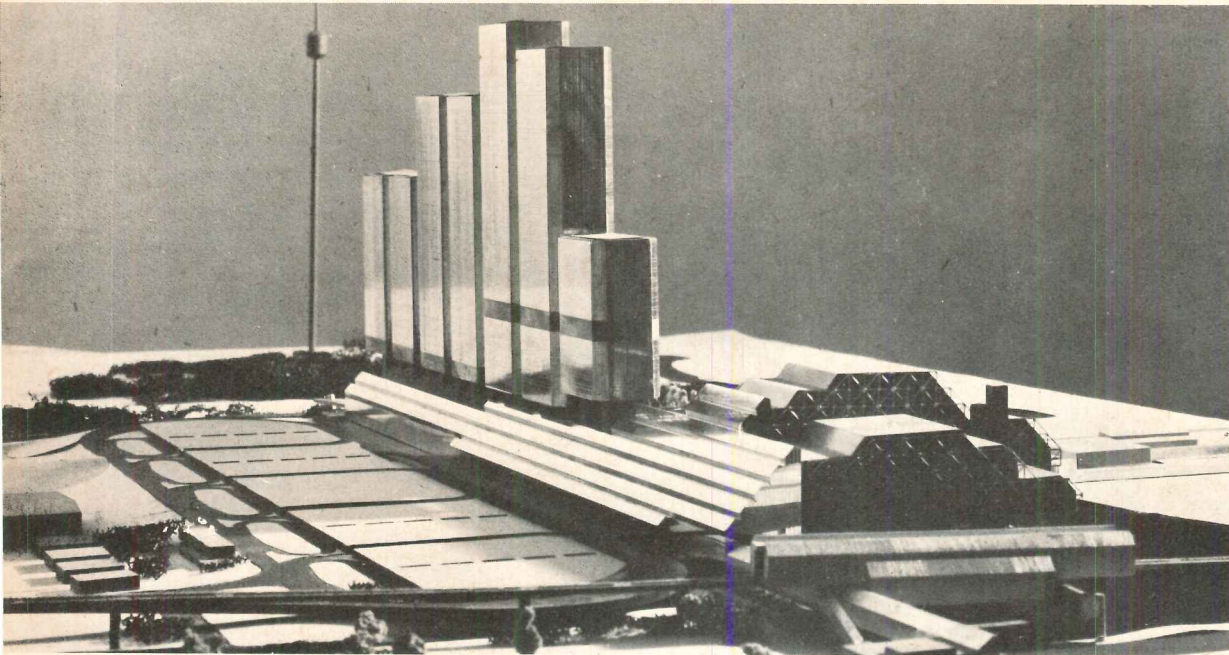
State University of New York at Purchase, N.Y., showing expandable departmental buildings spreading to right and left of central mall containing performing arts center (bottom), library (center) and gym (top). Small structures are dormitories.

donated by Roy R. Neuberger; Venturi and Rauch are designing the humanities building; Mr. Barnes is designing the library, physical education and student union; the firms of Charles Gwathmey and Giovanni Pisanella will both plan dormitories; and Paul Rudolph will design the science building.

### Climate controlled city in Alaska

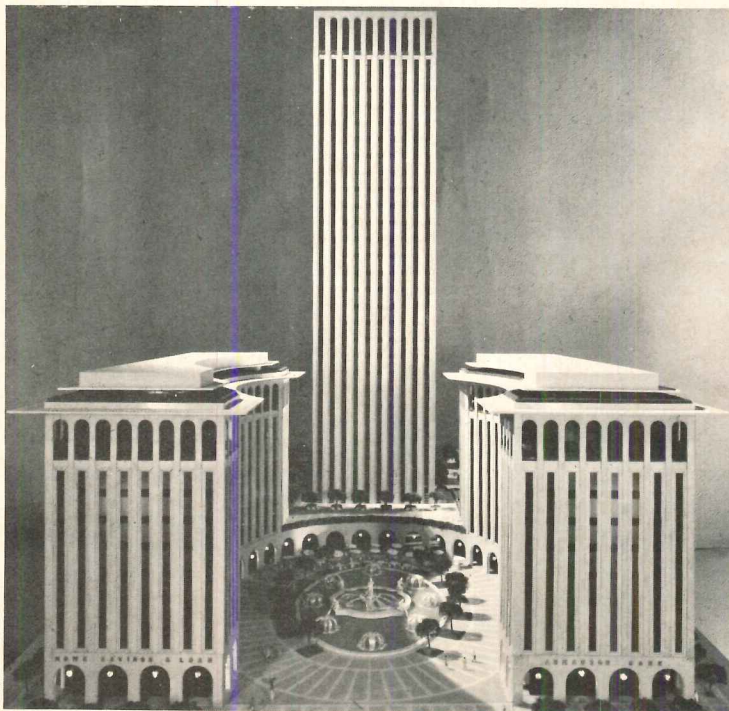
The Los Angeles firm of Adrian Wilson Associates has designed a city across Knick Arm from Anchorage, Alaska, where the temperature will be 68 degrees the year round. Twenty-thousand people will inhabit phase one.

The city will contain no cars, but will be reached by aerial tramway, and people will get around on moving sidewalks, escalators, bicycles, and, in later phases, on monorails. The city is being built because oil has been discovered in the area, and Anchorage is expected to expand 500 per cent in the next 10 years. The new city will be named Seward's Success.



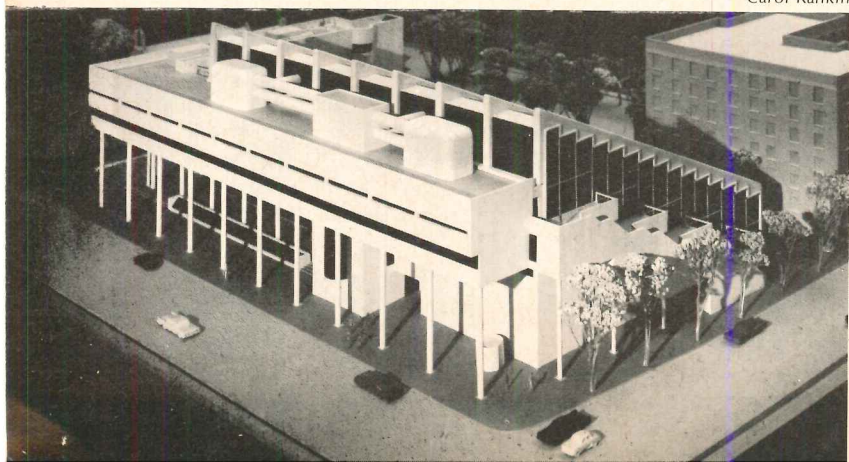
The \$20,000 first prize for the design of a headquarters for international organizations and a conference center in Vienna goes to the Los Angeles office of Gruen Associates' team of eight, headed by Cesar Pelli. Estimated cost of construction of the four-million-square-foot project is \$120 million. More than 250 designs were submitted from Europe, the U.S., South America and Asia. The jury: Pierre Vago, France; Jiri Novotny, Czechoslovakia; Ferdinand Schuster, Austria; Heikki Siren, Finland; and Sir Basil Spence, England.

Julius Shulman

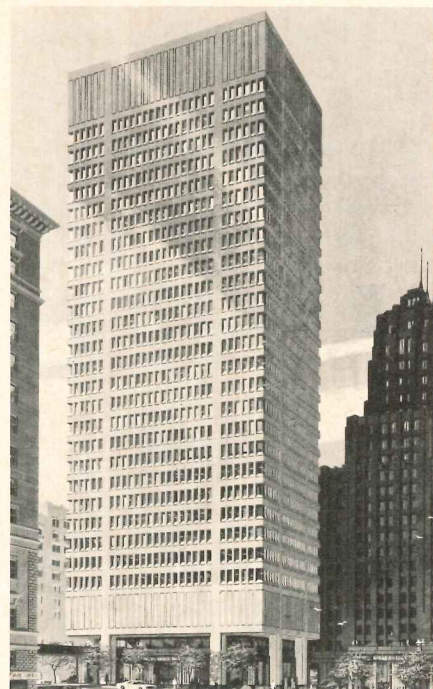


Carol Rankin

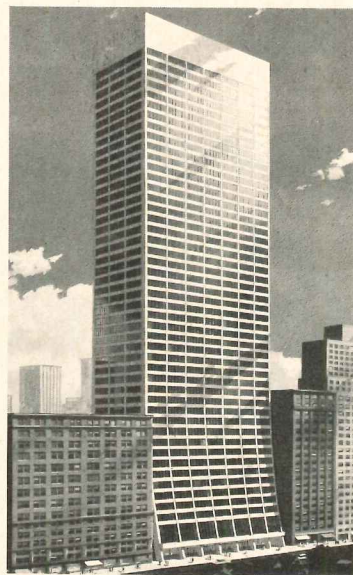
Ahmanson Center will cover an entire city block in Los Angeles, eventually encompassing twin 10-story structures, a 40-story tower and a two-acre landscaped plaza. The \$75-million office and financial complex, designed by Edward Durell Stone, F.A.I.A., will be faced in travertine marble.



Harvard Graduate School of Design, Boston, will house four levels of studio space for architects, city planners and landscape architects, a library, exhibition spaces and offices. Architect John Andrews designed a stepped series of floors with the studios on each floor sharing a common space beneath a single span of trusses.



The Financial Center, Seattle, will be supported on eight columns—two on each side—and a central core, permitting wrap-around windows with panoramic views from the corners. The exterior will be light buff concrete aggregate with bush-hammered texture. Architects: Naramore, Bain, Brady & Johanson.



A 50-story office tower on the former Stern's site on New York's 42nd Street will have a curvilinear base, allowing floor areas to range from 37,000 square feet to 26,000 square feet. The building, designed by Skidmore, Owings & Merrill, will have an exterior of travertine marble and gray glass.

## Colorado buildings honored by Structural Clay Products Institute

One award of excellence, four honor awards and three honorable mentions were named from 57 architect-designed buildings in a program to recognize high quality design accomplishments in the State of Colorado. Buildings, which had to be predominantly brick or structural clay facing tile, were judged on the quality of the solution to an architectural need, integrity of their esthetic expression and recognition of economics through the

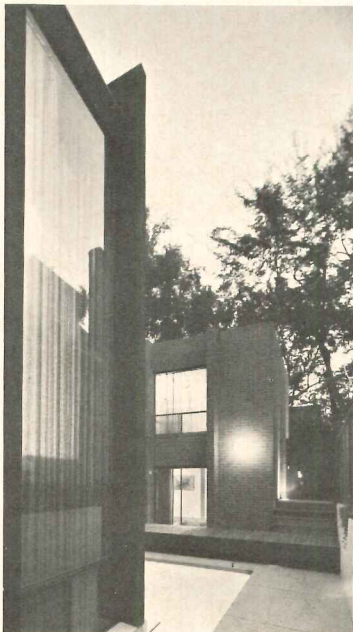
use of brick or structural clay facing tile. Buildings had to have been completed since 1963.

The jury was composed of George Kassabaum, F.A.I.A., of Hellmuth, Obata & Kassabaum, William Geddes, A.I.A., of Geddes, Brecher & Qualls, and Elisabeth Kendall Thompson, F.A.I.A., senior editor of ARCHITECTURAL RECORD. After a preliminary selection, the jury visited 20 of the buildings.

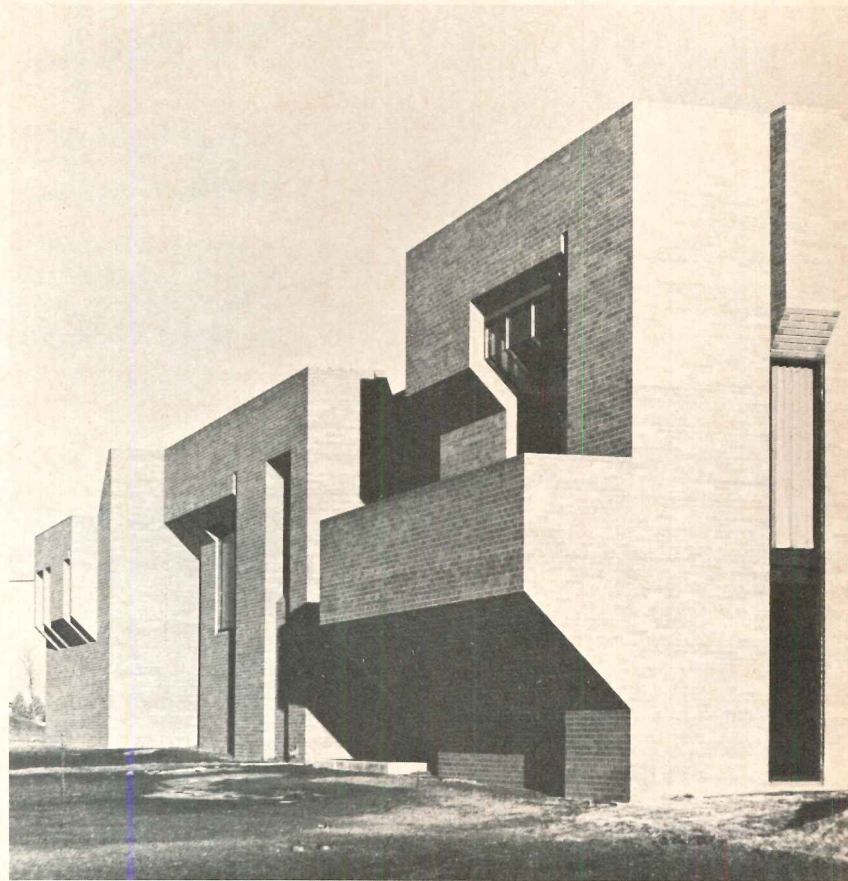


Ted Tourtelot

**Honor Award:** Vanderhoof Elementary School. Anderson, Barker, and Rinker, Architects; Rogers/Nagel/Langhart, coordinating architects for the school district. "Although the open, flexible plan for this school is similar to that in other schools of this district, the care with which the detail [of this one] has been executed sets it apart from the others."



**Honor Award:** Residence for Mr. and Mrs. Donald Roark. Donald Roark. "Full of pleasant surprises, this three-bedroom house is located on a very small and frequently found urban site, yet it achieves a degree of privacy rare in city houses on much larger sites."



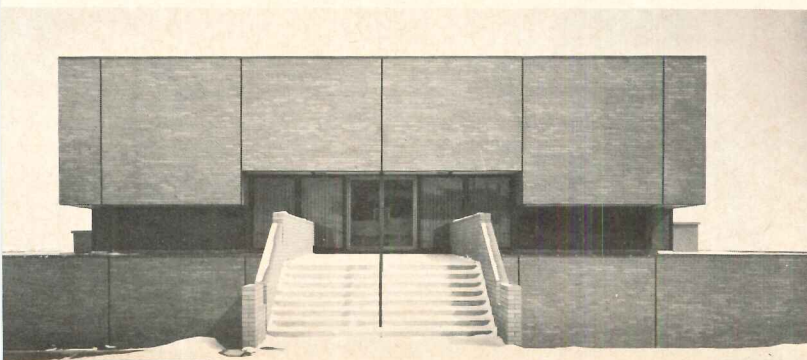
**Award of Excellence:** Kissinger Building. Rogers/Nagel/Langhart. "This headquarters for a petroleum company is a strong sculptural statement whose precision of detail in design and in execution

made it pre-eminent in the awards program. The predominance of one material gives it unity, dignity and harmony. Yet, because of skillful handling [of the dark brick] there is never monotony."



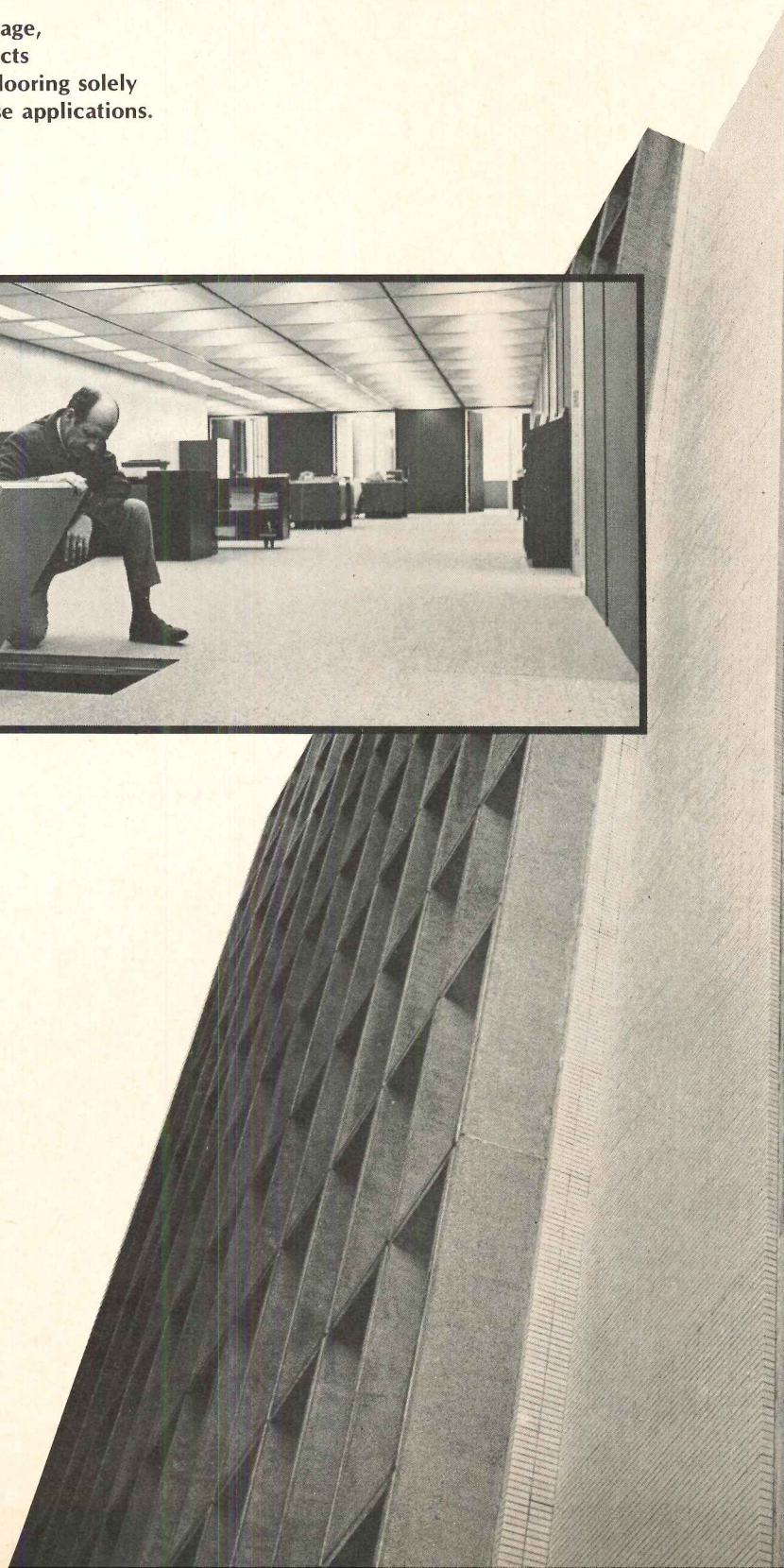
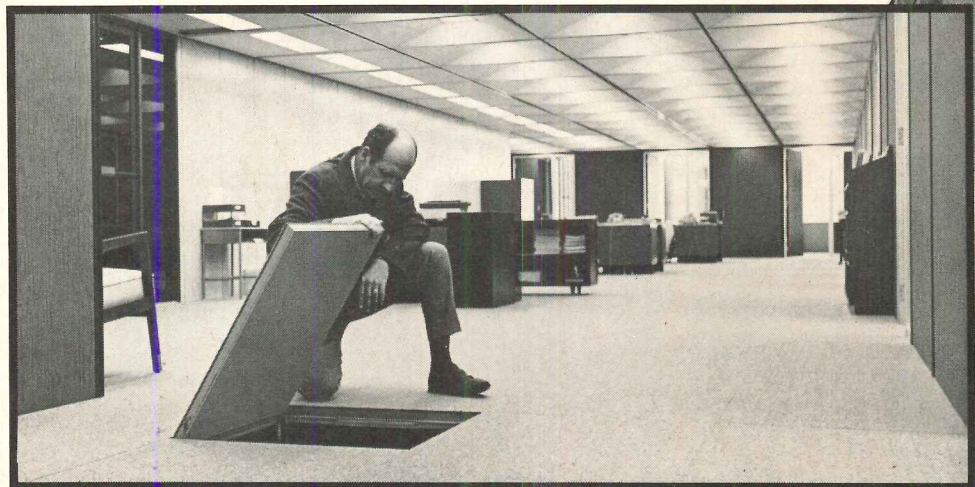
**Honor Award:** Bonfils Regional Library. William C. Muchow. "Bold in its forms and in its concept, this library building in a growing but as yet lightly developed part of Jefferson County, is a place of interesting spaces, gay colors, and unexpected vistas through the building."

**Honor Award:** Metallurgical Laboratories for Climax Molybdenum Company. Rogers/Nagel/Langhart. "The bold and simple form skillfully integrates mechanical equipment and laboratory spaces . . ."



# chicago high-rise shapes trend to access floors

A new concept comes of age,  
as more and more architects  
cease to think of access flooring solely  
in terms of special-purpose applications.



Typical of the growing trend toward access floor systems in general construction is this new office building designed for the American Hospital Association by Chicago architect, Richard O. Evans of Schmidt, Garden & Erikson.

The building is planned for nineteen stories, of which twelve are now completed and occupied. So far, a total of 128,300 square feet of free-access Weberfloor has been used in the first twelve stories, and about 90% of this is carpeted. Installed cost of the floor was less than \$2.00 per square foot (not including floor covering) but it was felt the cost was easily justified by direct savings in construction and by future savings in the building's maintenance and use.

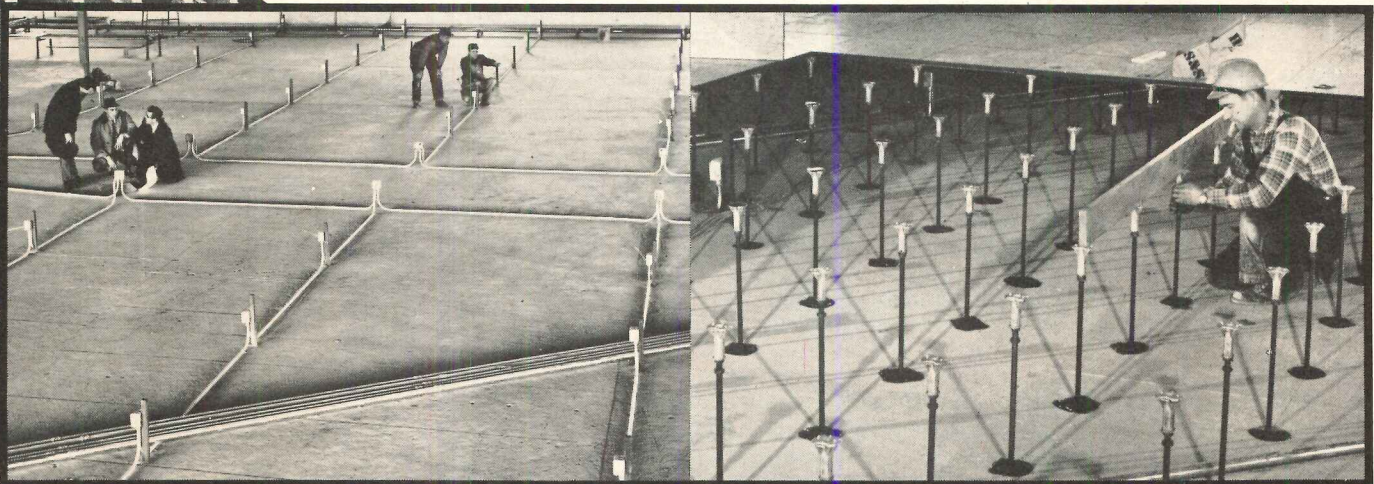
Generally the decision to use an access floor system begins paying off early in the structural phase. For example you can pour a floor slab as soon as the formwork and reinforcing has been installed. There's no waiting for mechanicals, because these are added later on top of the concrete. And if design time is limited, the use of Weberfloor can postpone the need for planning the location of electrical and mechanical services while other work progresses independently.

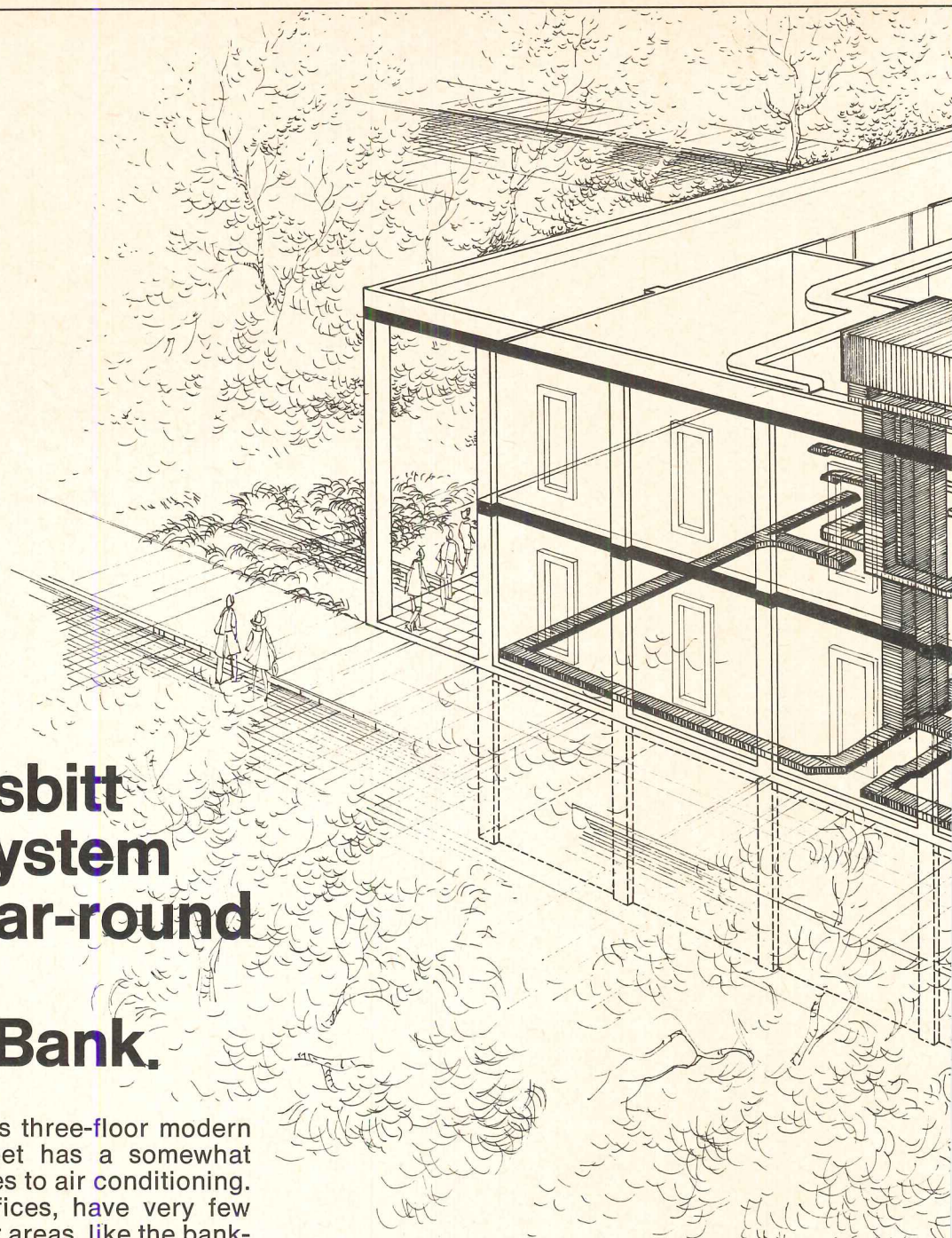
Notice too that no raceways or headers are required, and since the floor pedestals are readily adjustable for height, power troweling and other floor finishing costs are often eliminated altogether. In many areas, where local codes permit the use of the underfloor cavity as an active air plenum, Weberfloor can affect dramatic savings in the elimination of air distribution ducts.

But perhaps the single reason most often cited for adopting the Weberfloor concept is unlimited freedom to meet changing requirements with maximum ease and economy. New service outlets can be quickly tapped in virtually anywhere in the building without digging costly trenches or making core drillings in the concrete.

**Write for free booklet.** These are only a few of the major advantages and cost savings that have captured the curiosity and interest of architects everywhere. A new booklet has been published on the use of free-access Weberfloor and the impact of this new concept on contemporary architecture. A copy will be sent by return mail on request to Weber Architectural Products Division of Walter Kidde & Company, Inc., 1340 Monroe Avenue, N.W., Grand Rapids, Michigan 49502.

*For more data, circle 26 on inquiry card*





## How the Nesbitt Multizone system provides year-round comfort for Prairie City Bank.

Unlike other buildings, this three-floor modern edifice of 11,907 square feet has a somewhat unique problem when it comes to air conditioning. Some areas, like private offices, have very few people per square foot. Other areas, like the banking floor, can quickly become overcrowded with an influx of customers.

Here is how Nesbitt helped Little and Humlaker, Architects, and Bird, Bird and Associates, Consulting Engineers, provide year-round comfort for the customers and employees of Prairie City Bank.

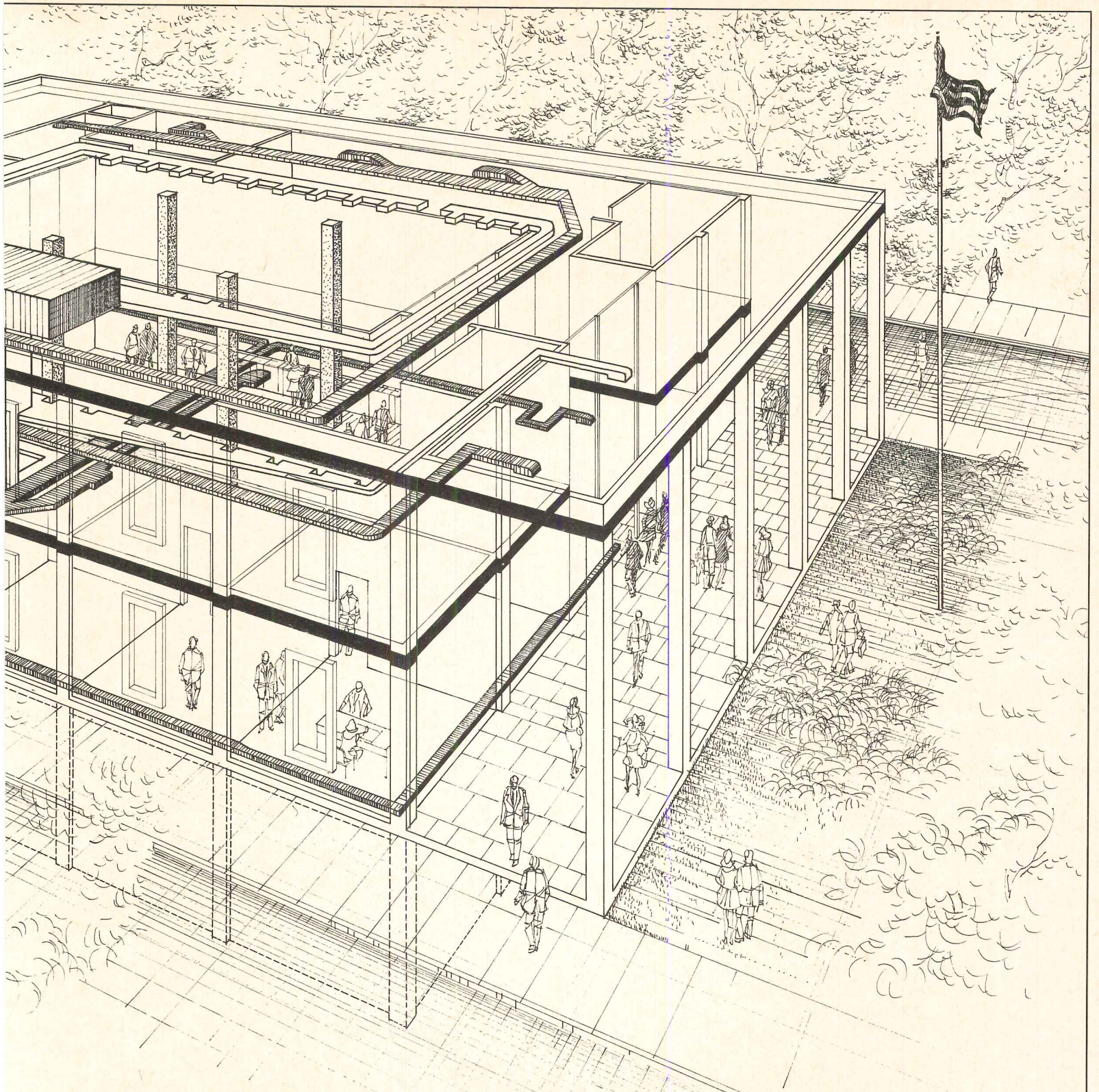
First, it was decided that a year-round multizone system could be installed on the roof instead of cluttering the basement with mechanical equipment. This decision permitted the inclusion of a comfortable community room, as well as lavatories and storage rooms.

The Nesbitt rooftop multizone system selected serves six separate and individual comfort zones. Each zone has its own thermostat to signal the requirements of the space served.

The Nesbitt rooftop multizone system has the ability to provide both heating and cooling simultaneously to meet these requirements, no matter what they may be. For instance, during cold weather, it provides heating via a direct-fired, tubular heat exchanger (although electric or glycol coils are also available) and cooling with outdoor air; during warm weather, it provides mechanical cooling and can temper the cooled and dehumidified air with an auxiliary hot refrigerant coil.

What's more, it does it economically. The economizer cycle locks out mechanical refrigeration until one zone needs more cooling than can be satisfied with outdoor air. Likewise, mechanical refrigeration is taken off the line whenever the temperature of the outdoor air is low enough to satisfy cooling requirements.





Because virtually the entire system is factory-built, there are fewer parts to assemble and install at the job site. The reduction in job-site labor (presently the fastest rising of all construction costs) tends to reduce the total cost of the building.

Finally, the Nesbitt rooftop multizone unit installed at the Prairie City Bank is equipped with a remote monitoring panel that provides instant checks on its operation and allows for control from within the building.

Overall, the Nesbitt rooftop multizone system is not only a dependable way to fit the needs of the Prairie City Bank but it is also the most economical way.

For details of how the Nesbitt rooftop multizone system can assist you in planning flexibility with economy, write the Nesbitt Operation, ITT Environmental Products Division, International Telephone and Telegraph Corporation, Philadelphia, Penn. 19136.

**NESBITT** **ITT**

For more data, circle 27 on inquiry card

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Carpet yarns tufted into "Typar" give the sharpest possible pattern definition. "Typar" is spunbonded polypropylene primary carpet backing from Du Pont.

It is absolutely uniform. So low loops stay low. High loops stay high. Level loops stay level (which means casters roll smoothly, the carpet wears more evenly, walks more comfortably and is maintained more easily). Cut piles are smoother. Tuft rows stay straight. Prints stay precise. Seams are neater.

Typar\* spunbonded polypropylene. Isotropic. Non-raveling. Man-made. Available. And it makes very sharp carpets.

For a free booklet on "Typar", write:  
Du Pont, Textile Fibers Department,  
308 E. Lancaster Ave., Wynnewood, Pa. 19096.

"Typar"—the preferred primary backing.



**Better things for better living  
...through chemistry**

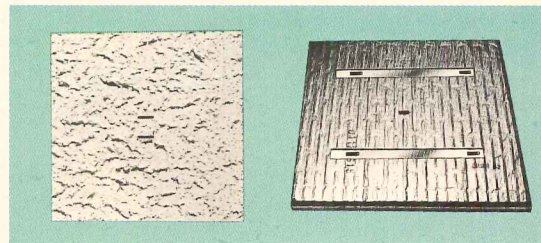
*For more data, circle 28 on inquiry card*

You can see how  
**ACOUSTONE\* Tile**  
beautifies this room.



## Look closer... it also helps condition the air.

It's hard to tell that this ceiling of ACOUSTONE Mineral Acoustical Tile is actually part of an AIRSON\* Ceiling Air Distribution System. Because the deep, fissured Glacier pattern hides the small slots through which the air flows. Adjustable slides on the back of tiles control the volume of air that passes from plenum through the tiles and into room. So, the room can be zoned and balanced for comfort. Foil back on tile prevents air seepage. The exclusive Shadow Line edge gives a recessed grid effect. Get all the facts from your U.S.G. man. Or write us at 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. AR-95.



AIRSON ACOUSTONE in Glacier pattern, showing two-slotted A-2 tile.  $\frac{3}{4}$ " x 12" x 12", 12" x 24", 24" x 24". .70-.80 NRC.

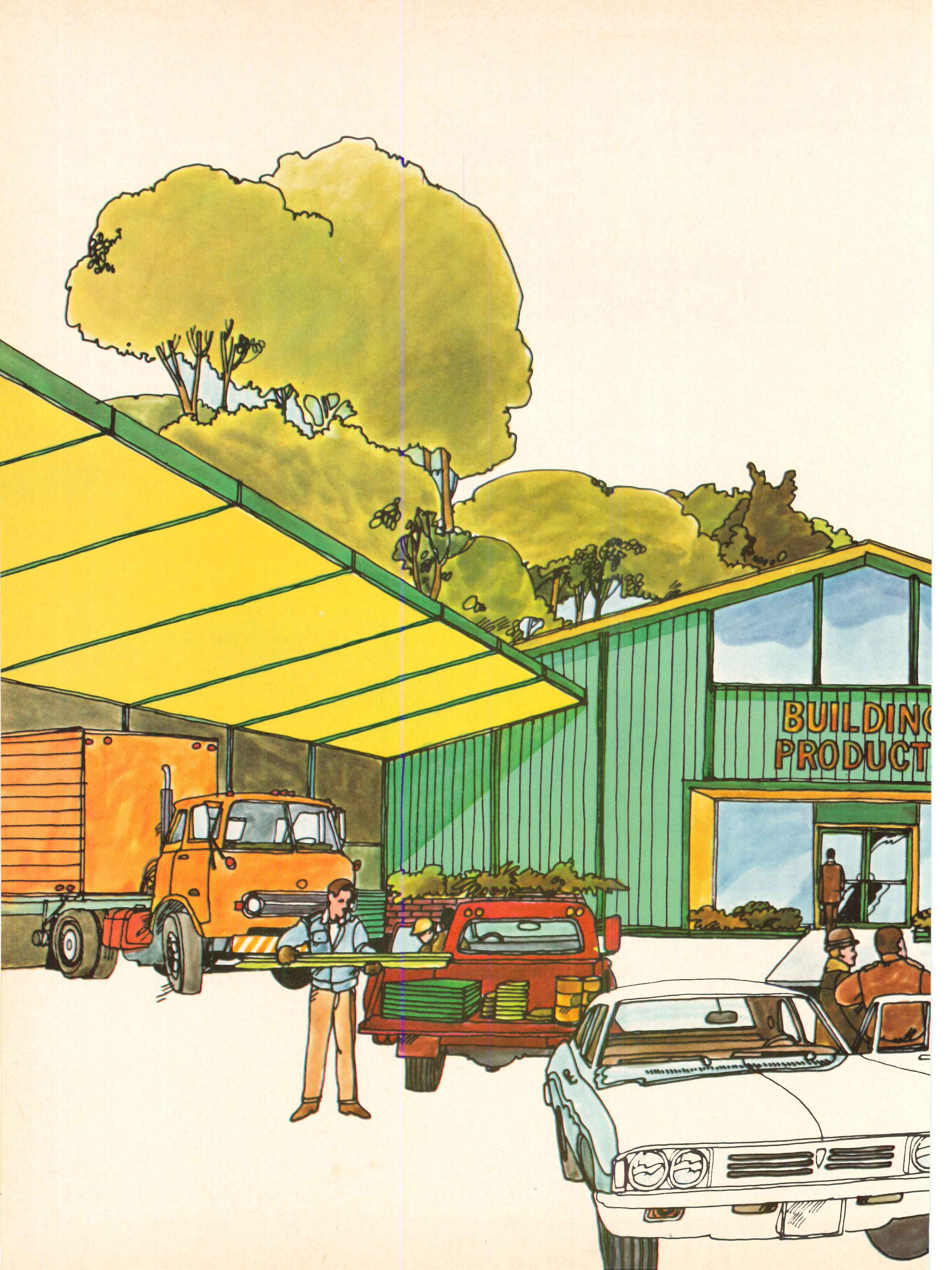
A-5 tile in bottom view showing slides, easily adjusted from face of tile to control air flow. All tiles available plastic coated.

Lafayette Bank & Trust Co., Bridgeport, Conn.  
Architect: Fletcher Thompson, Inc., AIA.

**UNITED STATES GYPSUM**

\*Reg. U. S. Pat. Off.

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BUILDING  
PRODUCTS

# Some metal buildings will never grow old

PPG coatings, factory-applied, add color that stays fresh and bright for years and years

Whatever type of metal building you're planning—warehouse, plant or store—PPG Color Coatings can beautify it and keep it looking new longer. Choose from a wide range of colors—harmonious architecturals, bright commercials, even sparkling new metallics. These PPG coatings are available on factory-finished panels, siding and roofing,

with matching or harmonizing colors for extruded components.

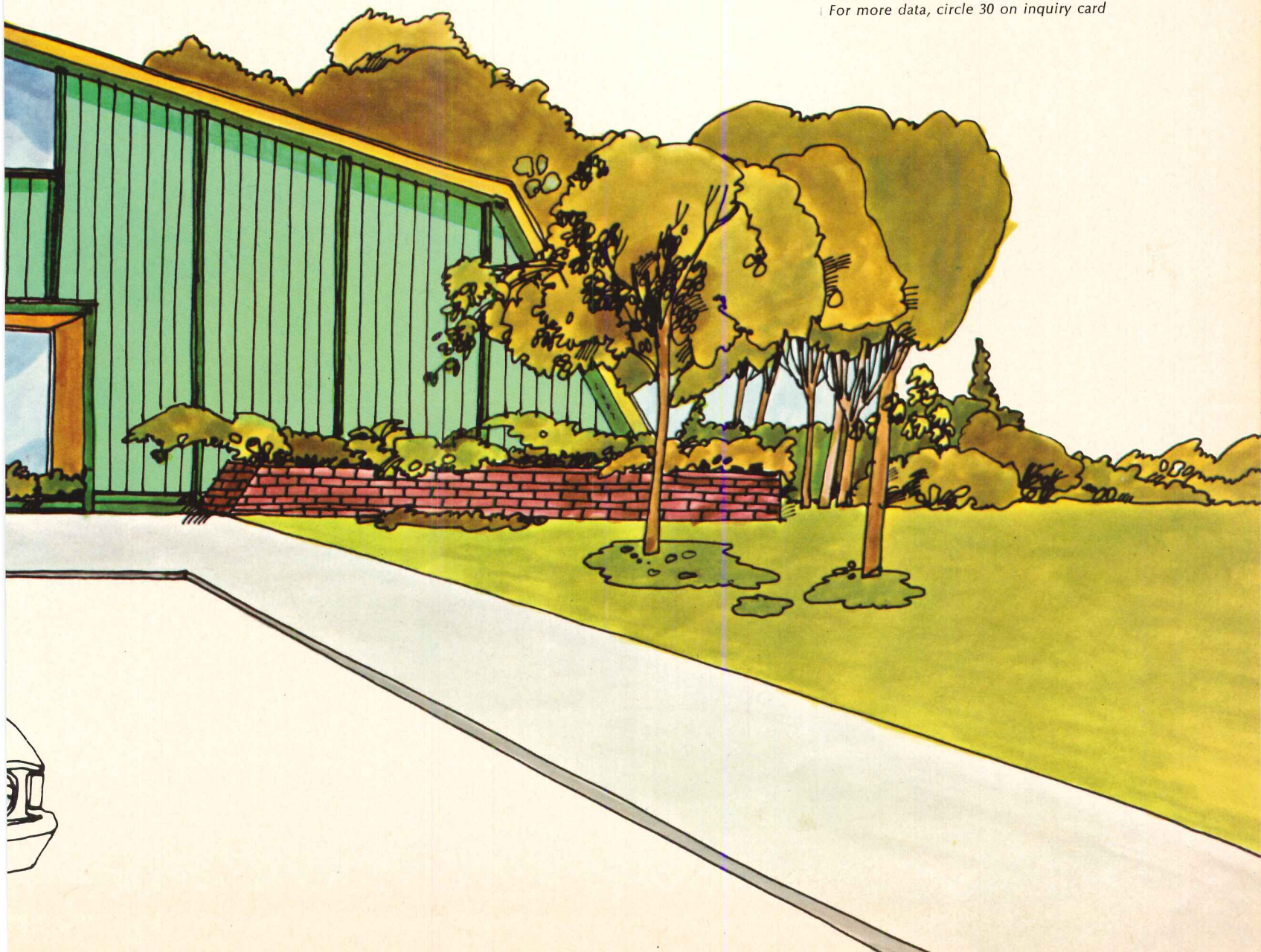
PPG coatings are tough, too. The finish won't chip, crack, peel or blister. They stay bright and care-free, resisting years of weather and industrial atmosphere. The highly flexible finish takes severe forming and fabrication, comes through shipping and installation

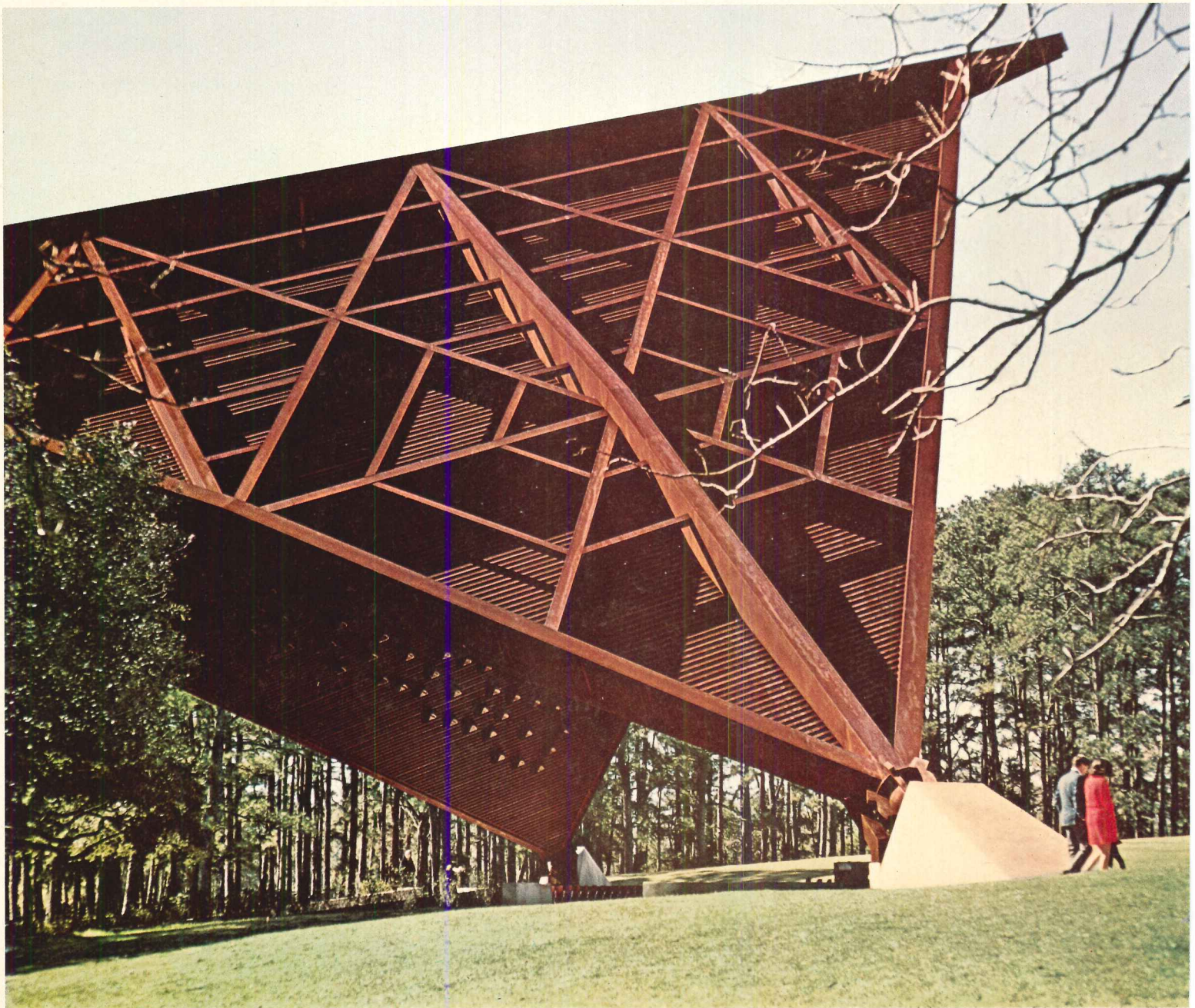
in great shape.

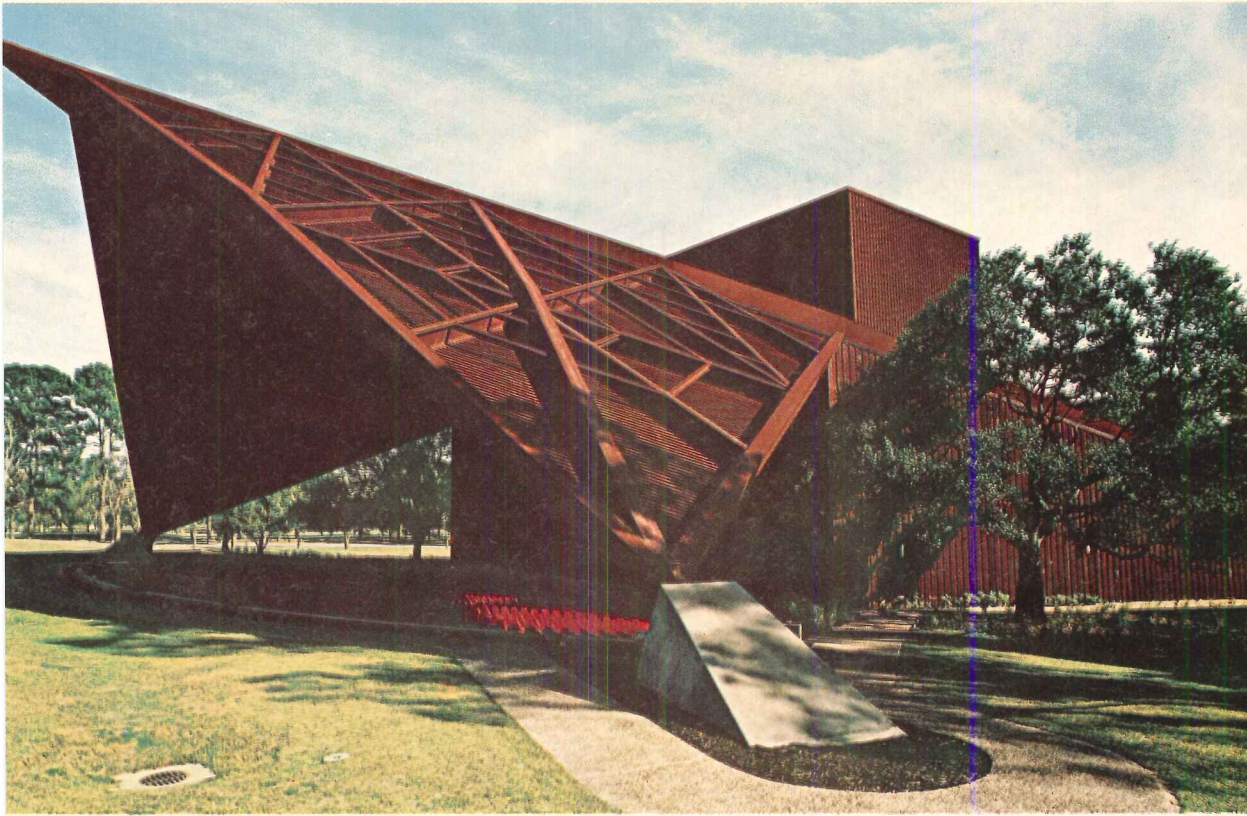
You can have the dramatic factory-applied color and long life of PPG Color Coatings on your metal buildings. Call your supplier, consult Sweet's Architectural File, or contact PPG INDUSTRIES, Inc., Dept. 16W, One Gateway Center, Pittsburgh, Pa. 15222. Telephone 412/434-3191.



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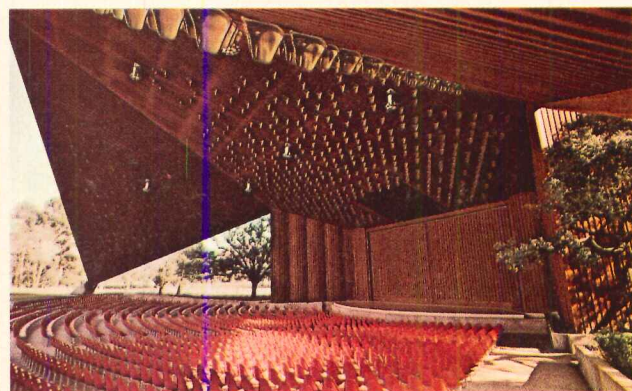
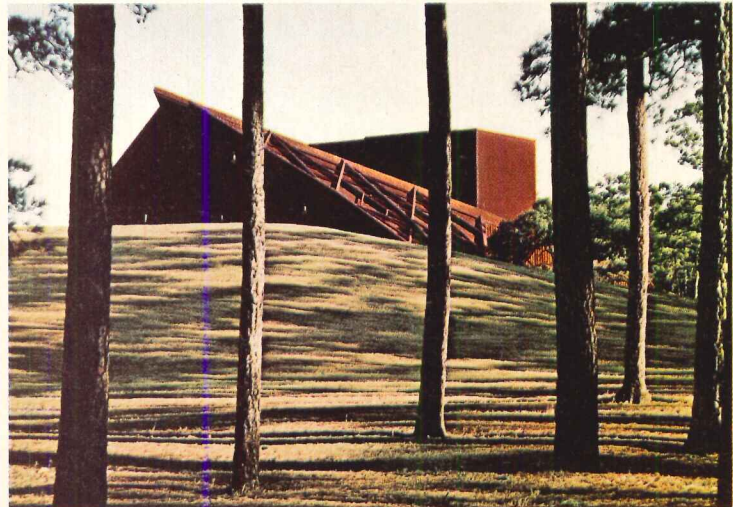
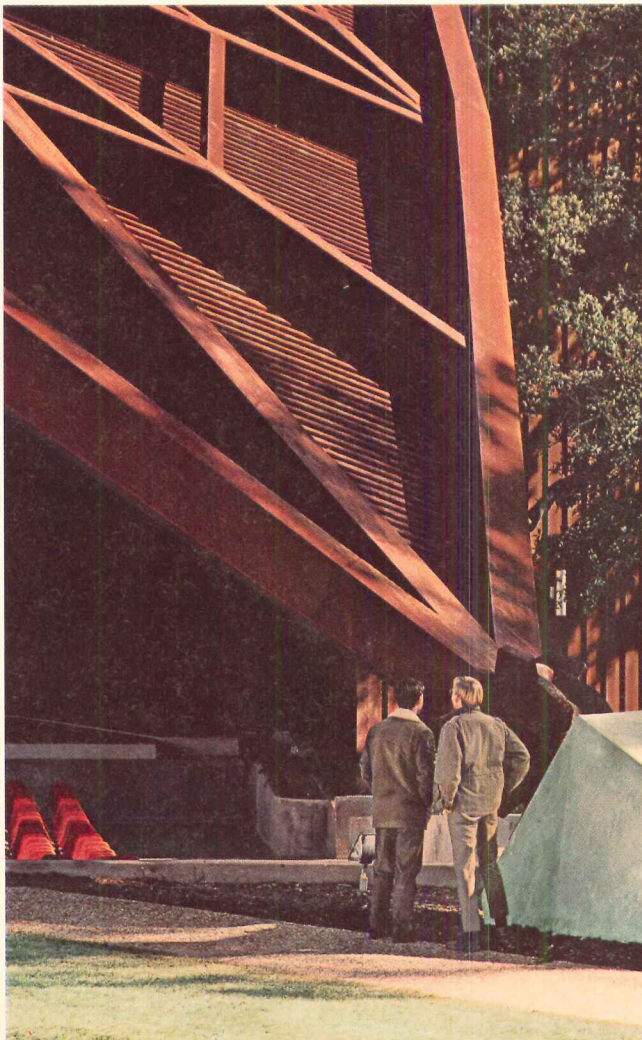


THE MILLER OUTDOOR THEATER, HOUSTON, TEXAS  
ARCHITECT: EUGENE WERLIN AND ASSOCIATES, HOUSTON,  
TEXAS

**USS** Cor-Ten Steel...naturally

STRUCTURAL ENGINEER: WALTER P. MOORE  
AND ASSOCIATES, HOUSTON, TEXAS

For information on bare USS COR-TEN STEEL, the original weathering steel, contact a USS Construction Marketing Representative through the nearest USS sales office, check your Sweet's Architectural File, or write to United States Steel, Box 86, Pittsburgh, Pa. 15230. USS and COR-TEN are registered trademarks.



# Half the carpet you specify goes to waste.

*(In fact, more than half!)*

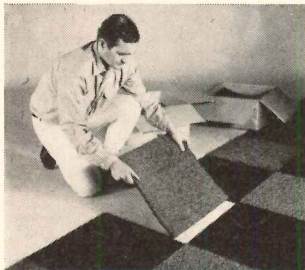
That's because 80% of the wear (and soil!) in an average carpet installation occurs on 30% of the area. The rest, the other 70%, *more than half the total area*, goes virtually to waste!

Now you can specify carpet that completely eliminates premature traffic wear patterns.

This revolutionary new carpet, proved in 33 countries, is Heugatile. The world's first truly modular carpet.

No adhesive needed. Interchangeable Heugatile carpet squares give at least three times the wear of conventional carpeting for two reasons. Because they are longer wearing than most carpets to begin with. Because they can be rotated like the tires on your car to equalize wear and eliminate traffic lanes.

Heugatile carpet squares are set snugly in place and locked to the floor simply by the vacuum they create. No glue, tape or tack-strip are required.



Installation costs go way down. You actually save 75% of installation labor cost (and headaches), to say nothing of savings in maintenance. Heugatile's special construction hides soil. Cleans easier. A damp

cloth with a little mild detergent lifts off most stains instantly. Vacuum or shampoo them like conventional carpets.

There are even Heugatile carpet squares that resist cigarette burns. They brush off without a trace of scorch.

In the event of serious damage (as by acid) — just move the square to a less visible spot — or replace it altogether.

Trench header ducts and suspended floors present no problem. Neither do stairs. And with Heugatile there is no static build-up.

Send the coupon for more information on the carpet of tomorrow.

Today.



**HEUGATILE CORPORATION**  
185 Sumner Avenue  
Kenilworth, New Jersey 07033  
Dept. AR-11

Please send catalog and specs on vacuum-set Heugatile carpet squares.

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COMPANY \_\_\_\_\_

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HEUGATILE. THE FIRST TRULY MODULAR CARPET

For more data, circle 31 on inquiry card



# Bright ideas

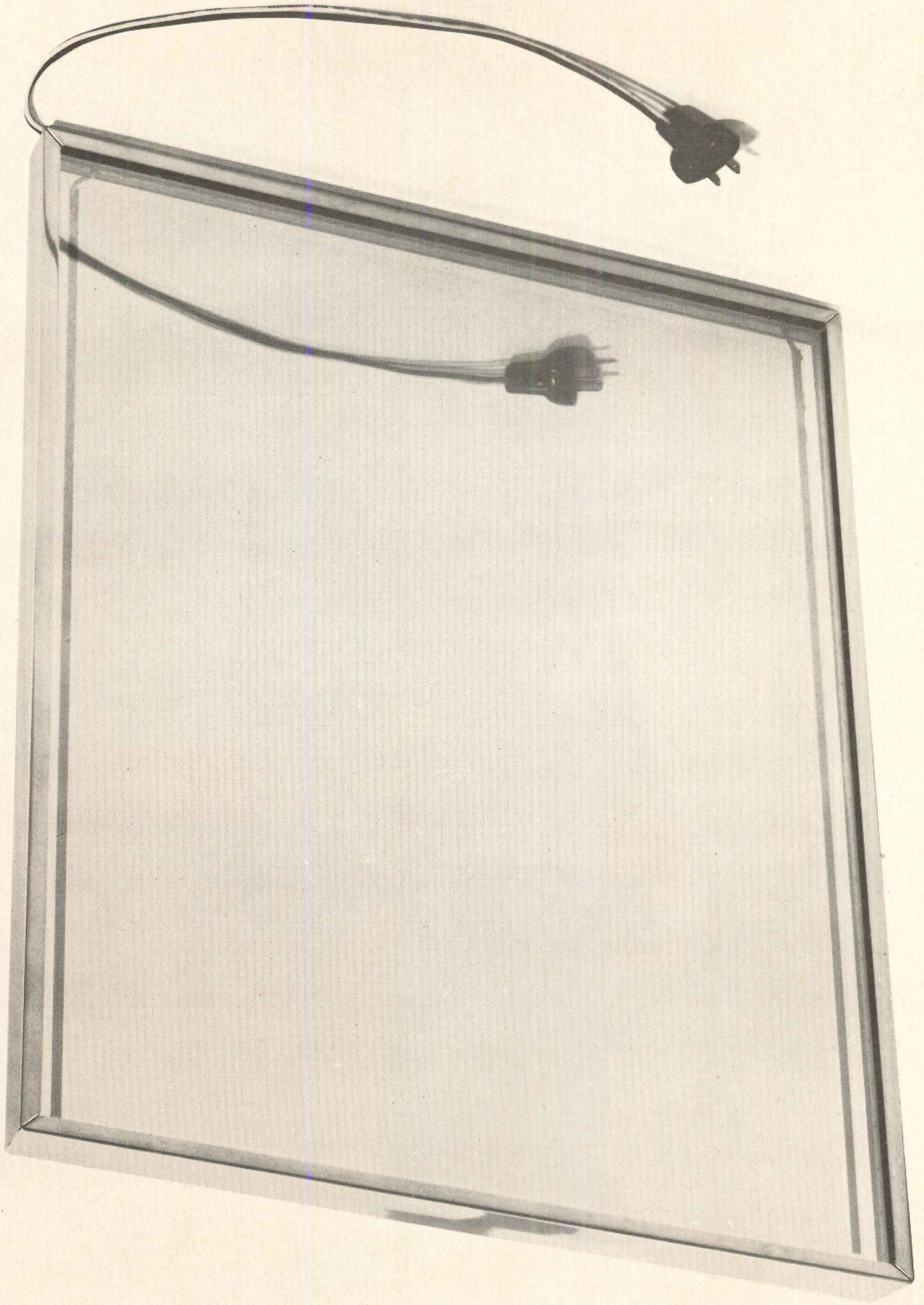


**A better way to specify and install lavatories and accessories: Bradpack!** Bradpack pre-assembled wash centers have everything you want or need built in: lav, foot control, operating mechanism, temperature selector, dispensers—everything. Installation? They're all factory pre-assembled and ready for hook-up. And foot-operated Bradpacks are sanitary. Choice of three models, all in stainless steel: foot-controlled lavs with and without storage cabinet; or cabinet and lav with wrist blades. For all installations—from hospitals to college dorms—write in Bradpack. It's Bradley's idea to make things easier for you! See your Bradley representative. And write for literature. Bradley Washfountain Co., 9109 Fountain Boulevard, Menomonee Falls, Wisconsin 53051. 67-282-R

# from Bradley!



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THE NEW PPG  
HEATED TWINDOW® UNIT.  
REMEMBER IT.

IT'S GOING TO MAKE A  
LOT OF BUILDINGS OBSOLETE.

It's a remarkable window that can eliminate peripheral heating systems; eliminate downdrafts, fogging, frosting and condensation; cut heating and air conditioning costs; and stay cleaner longer.

All you do is plug it in.

For information about this remarkable new window for custom installations, write for our new booklet.  
Mr. George Catlin, PPG Industries, Inc.,  
One Gateway Center,  
Pittsburgh, Pa. 15222.

PPG is Chemicals, Minerals, Fiber Glass, Paints and Glass. So far.



*For more data, circle 33 on inquiry card*



## If you need quick cover... specify **STEEL ROOF DECK**

You'll get immediate protection, faster completion date and earlier occupancy.

Steel Deck is easy to handle and goes down fast. A single sheet covers a large area. Moisture is no menace to steel roof deck . . . it retains its strength and remains dimensionally stable, whatever the weather. In addition to lower erection cost the fire-rated deck system saves material and lowers insurance rates.

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Please send me new design information.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

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### Cullinan Hall is in Houston

The loss of Mies van der Rohe may be felt in a particular way to those of us who spend a great deal of our time in the product of his talent. It has been my personal experience to find it a continually increasing joy to work in the exhibition spaces the accomplishment of his design has left at the Museum of Fine Arts, Houston, in the nucleus of Cullinan Hall. You will understand, I am sure, my distress resulting from your locating Cullinan Hall in Chicago, a city more fortunate in the evidence of his genius perhaps than any other, in your tribute to the great architect (September).

Edward B. Mayo, Registrar  
The Museum of Fine Arts  
Houston, Texas

### Why become an architect?

I was prompted to write to you after reading your editorial in July, entitled "Reports of the Profession's Death are Greatly Exaggerated." I have long considered obtaining a Master of Architecture degree from Berkeley, one of three programs designed for those who have had no architectural experience but do possess undergraduate and even graduate degrees in other fields. I have hesitated pursuing the program because I have heard comments made by leading members of various Chicago architectural firms. They state, in effect, that architecture is dying because only 7 per cent of all building is designed by a professional architect. And, that the percentage is decreasing yearly. Secondly, architectural opportunities and salaries, in comparison with other disciplines, e.g., law, medicine, dentistry, business administration, engineering and even the teaching positions in junior colleges, falls far below them.

If I were not still interested in the prospect of practicing architecture, I would have dismissed the matter some months ago. I am seriously interested in the profession, one dedicated to the esthetic and functional representation of a living culture. However, I am far from being convinced that I would have equal professional and business opportunities in the field of architecture. At least, this appears to be the consensus of those of position in large firms. Nor do they believe in the social or sociological involvement of the architect including the late Mies van der Rohe.

I am interested in whatever statement you wish to make on why you would encourage one to practice architecture, if that individual possessed the ability, talent and ambition to succeed.

Elliott W. Angelos  
Chicago

You are right in assuming that architects earn less per year, on the average, than do doctors or attorneys. That 7 per cent figure you quote may be accurate when buildings are counted by number, grouping chicken houses with the newest office building on

more letters on page 67

# Massey, the best seats in the house for over twenty years.

Fine Arts Center, Belmont College, Nashville, Tenn.

Although Massey is a newcomer to auditorium seating, we're an old hand at public seating problems and solutions. For 20 years, Massey has filled the house—and left standing room only. There's no business like show seating business.

If we can do that for Broadway and your neighborhood Bijou, just think what we can do for your new auditorium.

Behind every Massey seat is 20 years experience. And—usually—another Massey seat.

JOHN A. PRESTON & ASSOCIATES, ARCHITECTS, A.I.A., NASHVILLE, TENNESSEE

**Massey**  
seating co.

NASHVILLE, TENNESSEE 37208

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# The Kawneer curtain wall that zips up fast & locks out leaks zipperwall 2

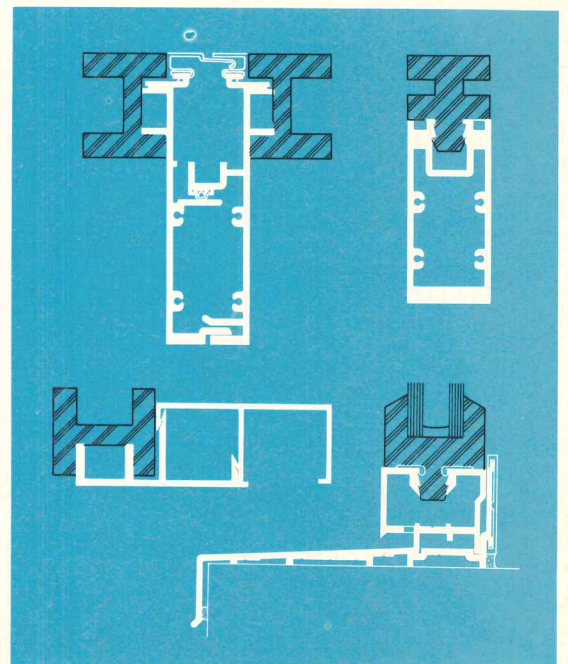
Zipperwall 2 goes up fast and easy. Provides excellent sealing and holding pressure. Structural zipper gaskets of Dupont Neoprene resist weather, sun, heat, cold, industrial smog, chemicals, oils and flame.

Single or double sight lines! Single gasketed mullion maintains neat, narrow sight lines. Double gasketed mullion lets you emphasize or heighten contrast.

Variable depth mullions. Completely reversible, too, without sacrifice of performance, cost or beauty. Multiple glazing thicknesses . . . 1/4", 3/8", or 5/8" and 1" insulating glass for greater thermal/acoustical qualities. Two insulating barriers. No through-metal thermal leaks. Gaskets in vinyl insulating strips greatly reduce thermal conductivity and interior condensation.

Unique, internal-pressure-relieved drainage system keeps water from accumulating and leaking into building. Special split mullions and telescoping head members accommodate thermal expansion and normal building tolerances.

Available as box frame perimeter system. Uniform sight line, faster erection time. An extremely watertight system. Can be inside or outside glazed.



For information, phone the Kawneer dealer in your area or write Kawneer Product Information, 1105 N. Front St., Niles, Michigan 49120.

*New Dynamics in  
Architectural Aluminum*

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ARCHITECTURAL PRODUCTS

**AMAX**  
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For more data, circle 36 on inquiry card

**THE KAWNEER CONCEPT:  
Attention to detail**



Burlington Executive Park, Burlington, Mass.  
Developers: Spaulding and Slye  
Architect: Architectural Design Group Inc., Boston  
Contractor: A. F. Martini  
Glaziers and Erectors: United Glass and Aluminum,  
Manchester, N.H.



## Whatever you design for this site, General Electric can air condition with a unitary system.

Your General Electric central air-conditioning contractor is a visionary.

Tell him your vision and he'll find a way to air-condition it, no matter how high or wide you build it.

Depending on what you have in mind, GE's Weathertron® Heat Pump may be the best. It heats as well as cools.

Or a GE gas/electric combination.

Or maybe rooftop cooling units with built-in electric heaters.

Or for perimeter-type area-by-area cooling and heating, such as for high-rise office buildings, GE's Zoneline system may be best.

Whatever General Electric cooling or heating system you may buy, be it now or in the future, you can count on it to hold up. For example, the GE Climatuff compressor is

quietly chalking up a phenomenal reliability record in over 200,000 installations.

Your GE central air-conditioning contractor will work with you and your engineer on system selection—he also can install the system right for good performance.

*Progress Is Our Most Important Product*

**GENERAL  ELECTRIC**

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# IDEAL

# WHITE

## CEMENT FOR PRECAST BEAUTY



WORTHEN BANK BUILDING—Little Rock, Arkansas

Architects: Erhart, Eichenbaum, Rauch & Blass; E. K. Riddick, Jr., Engineer,  
Little Rock, Arkansas

General Contractors: Matson-Bellows—a joint venture—Little Rock/Houston

Precast Panels by Schokkabeton Industries, Inc., Crockett, Texas



Properly hailed as "Arkansas' bold, new banking and business center," the new Worthen Bank Building in Little Rock will be the tallest—and one of the most attractive—buildings in the state.

1,200 precast window panels, made with special light-color aggregates and Ideal White Cement, give the towering 24-story concrete structure a striking brilliance. The precast sections are in two sizes: 8' x 12', and 8' x 16'. The smaller sections weigh 7,000 pounds each, the larger ones 9,000 pounds. Panels were hoisted from the ground to a horizontal monorail, which carried the section to its proper position. Sections were placed at the rate of twelve per working day.

In the Worthen Bank Building, and in other structures, small and large, across the country, white architectural concrete offers complete freedom of design, with unlimited beauty of form, texture and color.

A product of the Ideal Cement Company  
A Division of Ideal Basic Industries, Inc.  
821 17th Street • Denver, Colorado 80202







# Here's the directors' room in the American Management Association Conference Center. Furniture by Royalmetal.

The new AMA Conference Center in Chicago is designed to serve 20,000 registrants a year.

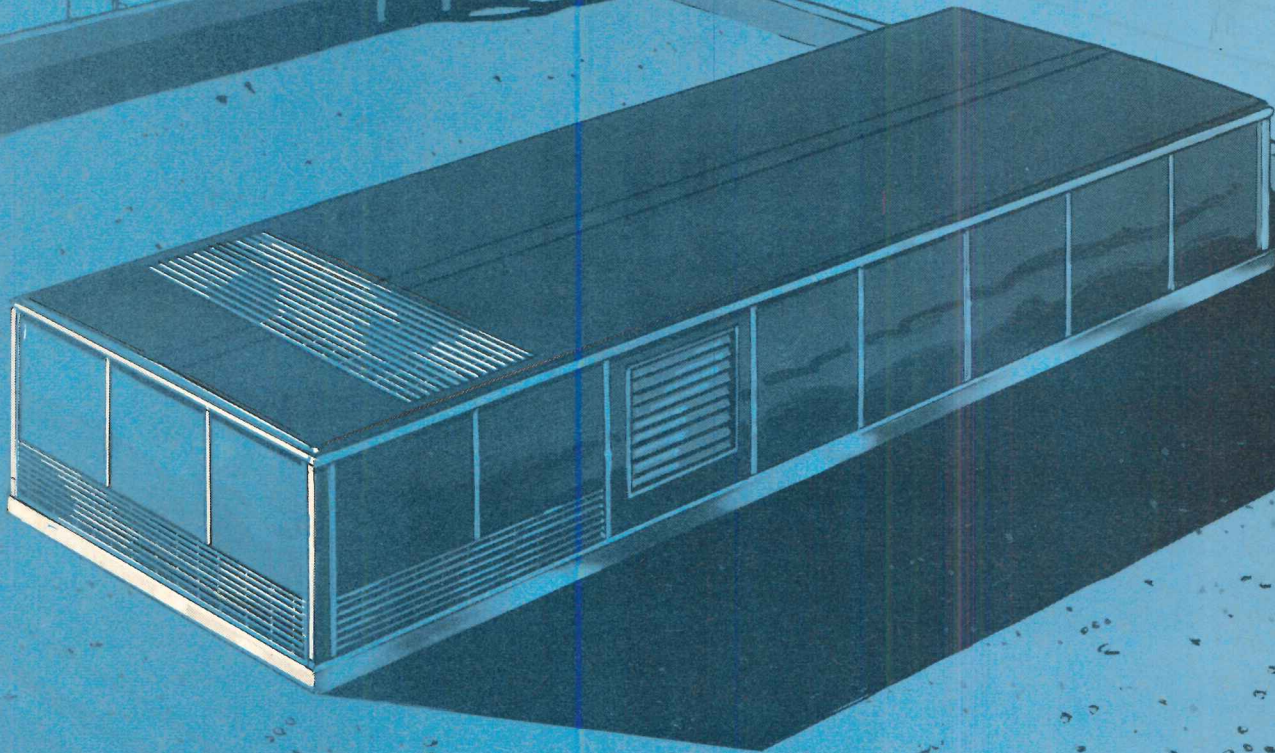
The staff members who coordinate these meetings operate in colorful surroundings with furniture by Royalmetal. Comfortable 350 line chairs, conference tables, 6000 line desks and partitions are used in the directors' meeting room, offices, and bookstore. The complete line of Royalmetal office furniture and partitions is available from your dealer.

Or write Royalmetal Corporation,  
One Park Avenue, New York 10016.

**Royalmetal<sup>®</sup>**

*For more data, circle 39 on inquiry card*

now... a multizone-  
 rooftop unit for the  
 architect who  
 wants the  
**VERY BEST**



naturally  
 it's

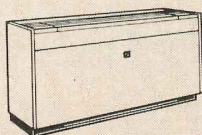
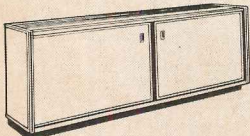
# SHEMENAUER

We took longer to produce our new "Benchmark" series Multizone-Rooftop Unit because we wanted to offer superior Schemenauer quality. And now you have it . . . handsome on the outside, unique on the inside. Constructed of weather-tight aluminum and fiberglass, the attractive, low silhouette air processing unit offers complete temperature/sound insulation. It features our unique "now or later cooling," enabling you, if you wish, to add a cooling and dehumidification package **within** the existing cabinet at a later date. Cooling system provides redistribution of heat to cooler zones—providing "free-heat" during the cooling cycle. All air is dehumidified to assure positive humidity control in all areas. Oversize dampers move just 45° to open and close, admitting air with greater accuracy. If you want to cool, heat and ventilate simultaneously, write for our new catalog No. 1500—it'll be like a breath of fresh air. Schemenauer Manufacturing Company, Holland, Ohio 43528

*For more data, circle 40 on inquiry card*

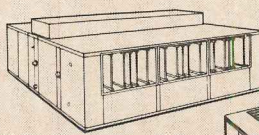
*For assurance of quality in heating, air conditioning and ventilating equipment, insist on this Schemenauer benchmark.*

Unit Ventilators



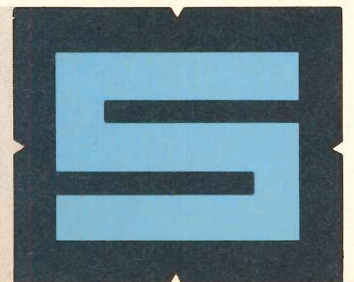
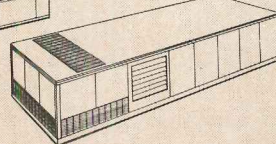
Cabinet Heaters  
 and Air Conditioners

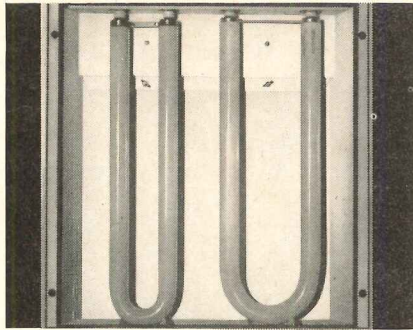
Fin Tube Radiation  
 and Enclosures



Air Handling  
 Equipment

Multizone-Rooftop  
 Units

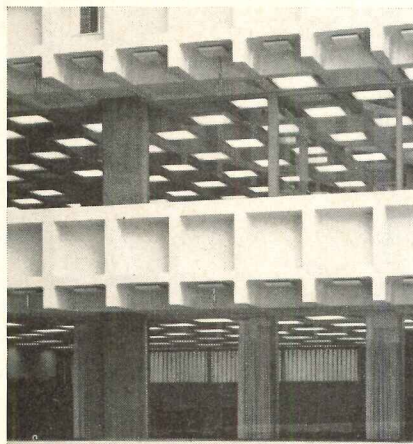




## 25% more light thanks to U.

Keene's new family of 24" or 30" square fixtures gives you 25% more light than similar units using straight fluorescents. You get high light output with complete interior design freedom. Reason: our truly one-of-a-kind fixture that uses any major manufacturer's 40-watt U-shaped lamps...the ones with the 6" leg spacing or the 3½" leg spacing.

Recessed models feature a hinged assembly that puts all electrical components on one side. There are 3 types available: surface, air and non-air, recessed. Want us to shed more light on our new fixture family?



KEENE Corporation,  
Lighting Division,  
(Formerly Sechrist Mfg. Co.),  
4990 Acoma Street,  
Denver, Colorado 80216

Send Info on "U" to Me.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

We've just begun to grow.

**KEENE**  
CORPORATION  
LIGHTING DIVISION

For more data, circle 41 on inquiry card

your block. Our most recent surveys indicate architects and engineers design by dollar volume 98 per cent and by area of space enclosed 91 per cent of U.S. nonresidential buildings reported by Dodge. The inclusion of engineers in such surveys is relevant to many people's thinking—such as the A.I.A.'s in Chicago this year—about how to increase the profession's influence and economic base; that is, broaden it, allow it to include more elements of the construction industry. We encourage and try to articulate such efforts to change architectural practice in response to changing roles, changing environments; we do not think change implies death or dying, which was one point of our editorial. Finally, your sensitive definition of architecture's highest implications, "... the esthetic and functional representation of a living culture," transcends all of the rest both you and I have written here. If you think you can do that as an architect, if you want to do that, you must try. —RJ

### Systems approach to air conditioning

I have read with interest the two articles on air conditioning (RECORD, April and August 1969), plus the July and August 1967 articles. I think that Robert E. Fischer and Frank Walsh have done an outstanding service in highlighting problems, relationships and common ground for the air-conditioning industry, architects and consulting engineers. . . .

Recently we at American Standard made a major decision relating to the future investment of our business. We decided to drop the major portion of the central systems business and concentrate more effectively on unitary packages. It is interesting to note that in your 1967 article you were predicting a greater trend by industry in this direction. . . . We firmly believe that this type of equipment will find great acceptance in the air conditioning of more diversified structures.

Don J. Massa, General Manager  
Applied Air Conditioning Department  
American Standard

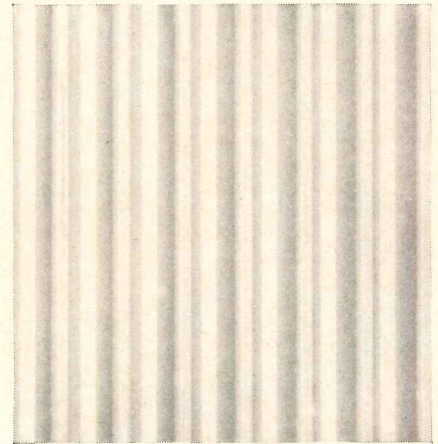
### The importance of design ability

In regard to the article on architectural examinations on pages 83 and 84 of the September issue, there are a few comments I would like to make.

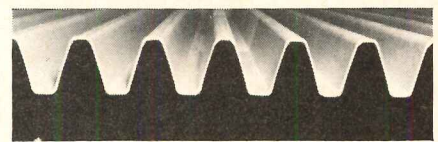
As most definitions note, architecture is first and foremost a design profession. In testing to determine whether a person is qualified to become an architect, the fundamental aptitude to consider is design ability. Whether one has a knowledge of building equipment, specifications writing or even architectural history is not important in determining design competence. The related disciplines of sociology, engineering, plan-

more letters on page 86

# NEW!



## SYMONS DEEP RIB TRAPEZOIDAL FORM LINER

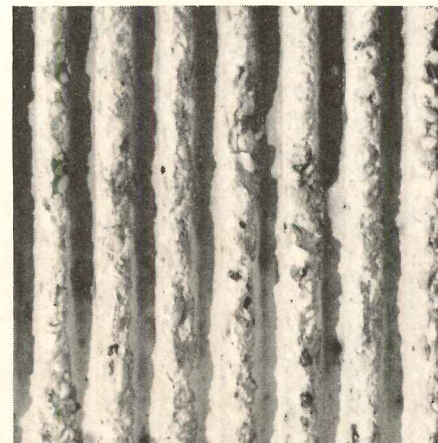


Now, deep and architecturally dramatic ribs can be easily cast into any concrete surface with this new Deep Rib Trapezoidal Liner. As the sun revolves throughout the day, distinctive shadows appear within the ribs, giving the concrete surface strong, clean lines.

The surface imparted to the concrete by the liner may be of a slightly textured finish, shown above, which is standard, or a smooth finish available on request. A rough finish, as illustrated below, may also be obtained by bush hammering or hammer blows.

Ribs are 1½" deep by 2" on center. The liner is made of special ½" plastic material which is highly durable and reusable. Either nails or a neoprene adhesive may be used to attach the liner to the form facing.

Complete information about Deep Rib Trapezoidal Form Liner available on request.



**S** CONCRETE FORMING EQUIPMENT  
SYMONS MFG. COMPANY  
© 122 EAST TOUHY AVE., DES PLAINES, ILL. 60018

**MORE SAVINGS WITH SYMONS**

For more data, circle 42 on inquiry card

# The easy-to-install cooler.

This Westinghouse Heavy Duty Wall Mount water cooler saves you installation time, so it doesn't drain off your profits. It uses a slip-fit trap, a standard hand-valve and a short pipe and tube. A time-saving installation template comes with each good-looking Wall Mount. It comes complete with stainless steel basin, vandal-proof push-button bubbler and built-in glass-filler plumbing. And the complete cooler is backed by a five-year guarantee plan that covers the hermetically sealed refrigerator system and all functional parts (excluding labor). For product details, see Sweet's, Mechanical Products Catalog or contact our local Manufacturer's Sales Representative. Westinghouse Water Cooler Department, Columbus, Ohio 43228

*For more data, circle 43 on inquiry card*

**You can be sure...  
if it's Westinghouse**



*For the first half: an induced slowdown—it's unlikely that restraint will be pushed as far as recession (except in error). Look for a moderately firm upswing in the second half—GNP will increase seven per cent, but inflation will account for half that increase*

## F. W. Dodge construction outlook: 1970

Prepared by the Economics Department  
McGraw-Hill Information Systems Company (formerly F. W. Dodge Company)  
George A. Christie, chief economist  
Robert M. Young, James E. Carlson

Inflation has virtually dominated the construction industry this past year. Not only have costs risen faster in building markets than in most other areas, but many of the steps taken by the Administration to cope with national price problems have influenced construction in a special way. More than anything else, inflation and its cures will be shaping the outcome of construction markets for the rest of 1969 and throughout 1970.

As late as the third quarter of 1969, the value of work put in place was leading 1968's total by a solid nine per cent.

Still, there were some disquieting aspects. One danger signal was the fact that all but a small fraction of the gain in value put in place consisted of nothing more than inflated prices. Compared with the general price level, which was causing trouble enough by rising at a 4½ per cent pace, construction costs were surging at seven per cent.

Another ominous sign appeared around midyear: contracts for future construction began falling off. This was one of the earliest signs that the Administration's efforts to control inflation were finally beginning to take hold.

Already slowing the rate of housing activity, tight money at midyear was also beginning to restrict the volume of new industrial and commercial building. Tight budgeting was holding down the flow of many types of public construction even before President Nixon's decision in September to cut 75 per cent of the funds for all Federal projects not yet started in the current fiscal year. These signs pointed to further declines ahead.

All the restrictive measures had one common purpose: to hold demand in check

until capacity could be increased to provide real expansion instead of just more inflation. As a result, in the closing months of 1969 the construction industry was in the midst of an externally imposed decline. It will last as long as anti-inflationary restraints are considered necessary. Once these restraints are lifted, recovery should be swift, since there is plenty of demand that is being deferred.

### Economic environment 1969/1970

Next year will start with a familiar set of economic problems—familiar only because of the failure of 1969 efforts to deal with them.

The first awareness that things were not going according to plan came early in 1969. By then, it was already apparent that the 10 per cent surtax—enacted in mid-1968 to take some of the steam out of the boom—had been less than a success. Partly, this was because there was a shift to an easier credit policy shortly after the surtax was enacted. When it became obvious that the one move had just about canceled out the other, money was retightened. Then came the second surprise.

Instead of a noticeable slowdown resulting from the double impact of fiscal and monetary restraint in 1969's first half, business activity continued to boil along. By mid-1969, the gentle policy of "gradualism" was abandoned, and the battle against inflation was escalated.

Several weapons were added to the arsenal of fiscal anti-inflationary policies. The surtax was extended beyond its original date of expiry and, in combination with further cuts in public spending, is expected to boost the Federal budget surplus to \$6 or \$7 billion. This will give the Government's fiscal operations in 1970 twice the

deflationary force they had in fiscal 1969.

Other more specific measures—such as the 75 per cent Federal construction cut-back and the elimination of the investment tax credit and accelerated depreciation—are expected to discourage spending in areas where inflationary pressures are most severe. Meanwhile, the Federal Reserve System is backing up these tax/budget measures with more of the same kind of credit restraint that has been in effect since the beginning of the year.

Even as 1969's final quarter began, some leading business indicators appeared to be losing their thrust: retail sales had leveled off, housing starts were sagging, and even as broad a gauge as industrial production was wavering.

Whether or not these were true signals of a turning point, it was reasonably certain that before much longer the tougher package of restraints was bound to slow the hectic pace of business activity. But it doesn't follow that these measures will be equally successful in halting inflation. Recent large wage settlements and price boosts of basic intermediate goods will be making themselves felt in the cost of final goods for months to come. This is why there's room for more than one point of view about the second half of 1970, even though most forecasts agree on the anticipated slowdown in economic growth during the first half of next year. In that critical second half, things could take either of two paths:

- If an induced slowdown in the early part of 1970 leads to reduced price pressures, money would be eased and a second-half recovery, aided by the expiration of the surtax, could be a fairly strong one.
- Or, if inflation stubbornly refuses to yield in the climate of slower business activity,

indefinite continuation of the measures used to produce the slowdown would inevitably lead to recession. Rising unemployment would soon bring a reversal of economic policy and an eventual upturn, though the recovery would occur later than otherwise and the swing would be more violent.

The F. W. Dodge Construction Outlook is based on an economic environment somewhere between these extremes, though a bit closer to the second case. While it's highly unlikely that restraint will be pushed as far as recession (except in error), the shift toward ease will come as a defense against recession rather than as a victory over inflation.

This forecast anticipates a moderately firm upswing in business activity in the second half of 1970, following a suppressed first half, with the total gain in the Gross National Product amounting to seven per cent. Compared with 1969, inflation will be only a bit less of a problem, still accounting for half the year's GNP increase. Real growth—at 3½ per cent—will just about equal 1969's gain.

## National construction outlook

### Business facilities

The boom in contracting for the construction of business facilities passed its peak early in 1969. After a two-year surge of more than 50 per cent in the demand for offices, factories, stores, warehouses and utilities, the successive quarterly declines in 1969 contracts for new projects clearly show that the boom has topped out.

The anticipated demands of the markets of the early 1970's are still going to require continued large-scale expansion and modernization of capacity. In the meantime, however, some temporary adjustment of these long-term plans is in order. Short-term economic conditions in 1970 are likely to affect the major types of business construction in the following ways:

**Commercial building:** In just the past two years, more office, store and warehouse construction has been started than in all of the previous three. Nationally, this year's contract value of all commercial building will easily top \$9 billion (the previous high: 1968's \$7.6 billion).

Two things cloud 1970's outlook for commercial building. One is the cyclical decline already in progress by mid-1969. It suggests that the many new buildings now under construction will, at least for a time, ease the critical scarcity of office space in many cities. The other is the proposed elimination of accelerated depreciation and the deterrent effect it could have on all commercial building.

**1970 outlook:** Commercial building value down 15 per cent from 1969's peak to \$8.0 billion, but still above the long-term trend.

**Industrial building:** Quite different from the strong cycle in commercial building, contracting for new industrial facilities has been

proceeding at an unusually steady pace—between \$3½ and \$4 billion annually—for the past four years.

No major change in this pattern is in store for 1970—only a bit less of the same. Total industrial capital spending is being stretched out in the expectation of slower growth in production most of next year.

**1970 outlook:** Industrial construction contracts easing back from their plateau—down five per cent to \$3.5 billion.

**Utilities:** In a series of progressions, construction of generating facilities by electric utilities has now reached the \$3-billion yearly level. Prior to 1965, annual contract value for generating plants averaged only a little over \$1 billion.

Long-term expansion plans and the transition to higher-cost nuclear facilities preclude any major reversal of this trend. The timing of major projects, which seem to come in multiples of \$100 million each, always makes forecasting risky for any individual construction year.

**1970 outlook:** Another \$3-billion year.

### Residential building

To home builders, 1969 looked like a rerun of 1966—housing's worst year in a long time. Like 1966, this year's residential building got off to a solid start, held great promise, and then began to wither in the drought of another credit squeeze.

Yet, even with these striking similarities, there are enough differences in today's residential market to change the outcome significantly. The most important and obvious result: 1969's tighter credit conditions are nonetheless supporting almost a quarter of a million more housing units than were built during the 1966 credit crunch. And that doesn't count nearly 200,000 more mobile homes.

There are good reasons for the difference. For one thing, the demand for housing is a great deal more urgent now than it was three years ago. In 1966, there was a moderate surplus of available housing left over from an earlier building boom. Today's vacancy rates show a severe shortage of all kinds of housing.

At the same time, this year's mortgage market is better insulated against a credit squeeze. Back in 1966, a very large share of the burden of monetary restraint was borne by the nation's savings institutions which provide most of the mortgage money. The current round of money tightness has fallen more heavily on the commercial banks. In addition, the mortgage lenders had a good deal more outside help this year. Extra support has been provided by the Federal Home Loan Bank Board and the Federal National Mortgage Association (Fanny Mae is pumping some \$10 billion into the mortgage market this year, four times the amount of its purchases of existing mortgages in 1966.) This has enabled the savings institutions to increase their lending, even though net savings flow has been shrinking.

Finally, it should be remembered that not all of 1966's housing collapse was due to credit problems. The suspension that year of accelerated depreciation privileges on most buildings stopped apartment construction in its tracks. Nor did it recover until this subsidy was restored, even though credit had eased early in 1967. This year there's been no change in the depreciation rules affecting apartments.

But even with this year's advantages, the home building market has declined steadily since spring. If tight money were pushed long and hard enough, output would eventually sink to 1966 levels. This is a fact, not a forecast.

At some point in the near future there will be an easing of credit, and this raises two questions: When will it happen? How easy will money become? Since it's not likely that even the people who will make the decisions know the answers to these questions right now, the outlook takes on a very "iffy" character.

It was pointed out earlier that the Federal Reserve is looking for a clear sign—one that either says inflation is yielding or recession is threatening—before backing off from its tight money policy. With the economy on the verge of slowing, one or the other of these signs should make itself known early in 1970. Once it does, the beginning of cautious monetary ease (not a 1967-type surge) can be expected—perhaps as early as next year's opening quarter. This change should be followed by a housing upturn.

Despite a rising trend, the total of conventional housing starts in 1970 is apt to be something of a disappointment when measured against the nation's needs. Even if the rate hits 1.7 million by the fourth quarter, the low levels of the early months will hold the year's total to about 1.50 million units—at best only 100,000 more than 1969's restricted output.

**1970 outlook:** An eight per cent gain in contract value next year will get the housing market heading upward again after 1969's weak second half.

### Institutional building

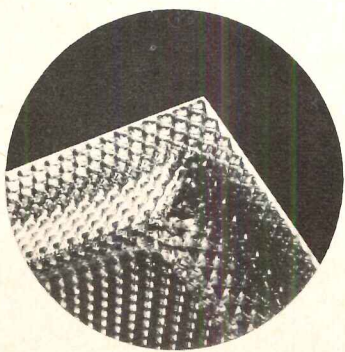
Contract value of institutional building will be up about 10 per cent in 1969. Even so, nothing much has been happening in this building market for quite some time. Most of 1969's increase reflects the fact that 1968 got off to a very poor start. Once the \$10 billion rate was reached more than a year ago, no further growth took place in contracting for new institutional construction. For 1970, only small gains are anticipated in the demand for schools and dormitories, hospitals and religious buildings.

**Educational building:** In the case of education, Congress made an important exception to its austere budgeting guidelines during 1969. In July, the House of Representatives voted to add a billion dollars to the Administration's request for fiscal 1970 school aid funds. It meant that instead of a cut of half a billion dollars in Federal edu-



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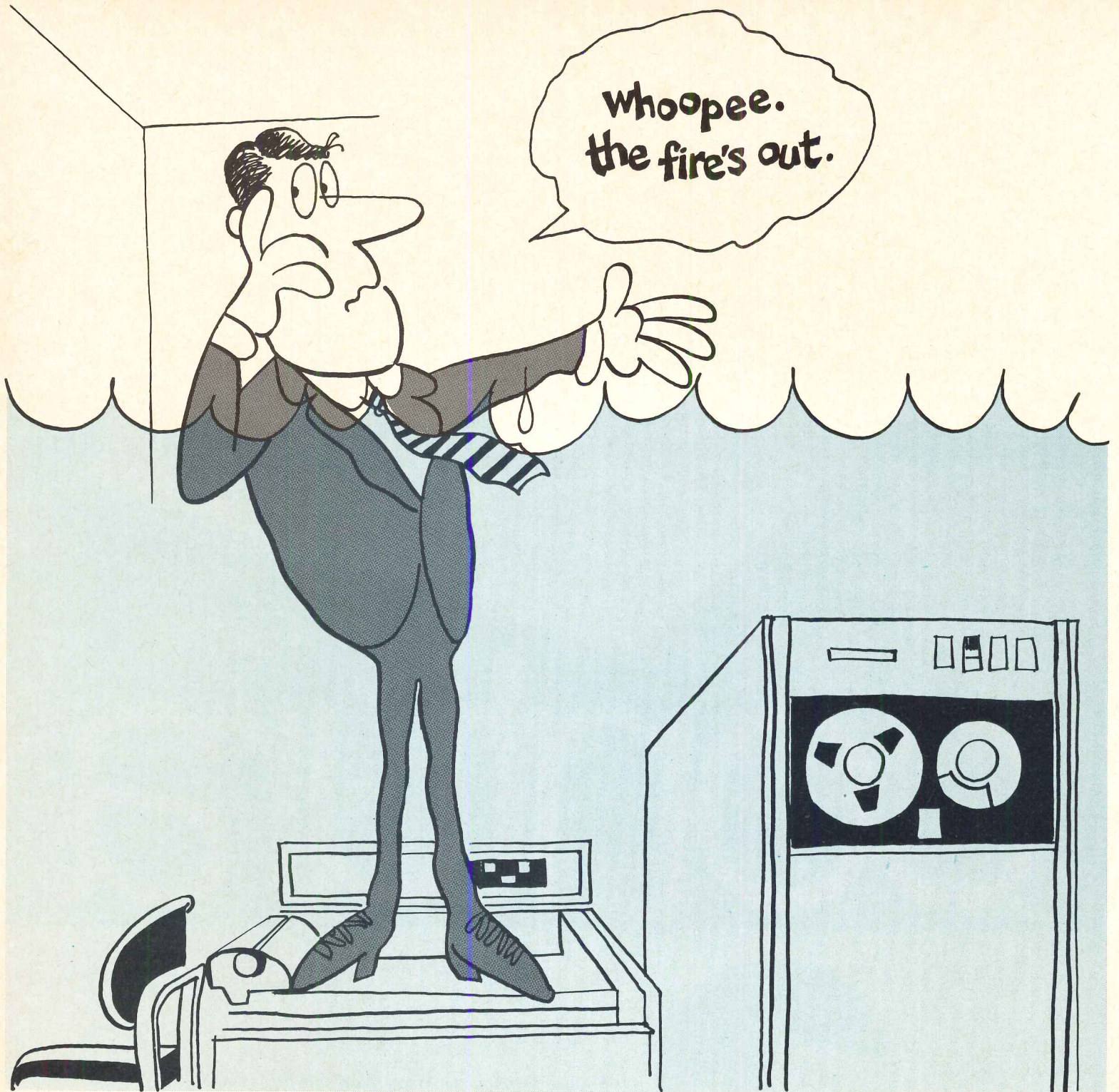
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cational support next year, funds for schools would be *increased* by that amount. Only a fraction of this amount goes for construction, however.

**Hospitals:** The nation's health facilities are faring less well. The Hill-Burton program, the primary vehicle for Federal funds in support of hospital construction, has been extended for another three years; fiscal 1970 appropriations, however, are tightly budgeted. What's more, a special bid for Federal funds for urban hospital construction and modernization was rejected.

The combination of limited Federal grants and continued difficult local financing has placed a ceiling on the potential for institutional construction next year.

**1970 outlook:** *Contract value up about five per cent, reflecting the higher cost of building the same approximate physical volume of structures.*

### Public facilities construction

A large national budget deficit can't be turned into a surplus without some heavy cuts in government spending. As one of his last official acts, President Johnson ordered cuts in most domestic programs for fiscal 1970, in order to reverse the inflationary effect that previous large Federal deficits had been having. As one of his first official acts, President Nixon ordered another \$6 billion cut from what was left and later followed this surgery with a 75 per cent cutback in any remaining uncommitted funds for direct Federal construction programs.

A second formidable constraint on public construction is the condition of the bond market, where state and local money must be raised to supplement 1970's already limited Federal funds. High interest rates forced the postponement of many projects in 1969, and municipal borrowing will continue to be difficult at least through the first half of 1970. Added up, these conditions mean that whatever changes take place are likely to be downward.

At least two things must happen before a solid advance in public facilities construction can get underway: a new Federal budget—perhaps the one that takes effect July 1, 1970—must provide more funds for domestic programs; and credit restraint must be relaxed so that states and municipalities have better access to construction money. Once these changes come about, the acceleration of public construction will be quite rapid.

Like almost every other aspect of the 1970 construction outlook, the timing of this change hinges on the broader problem of reversing the economy's inflationary course. In the expectation of easier credit conditions early in 1970 and an improved budgetary climate starting with the new fiscal year, the outlook for major categories of public facilities contracting in 1970 is as follows:

**Highways:** Use of the Highway Trust Fund as an instrument of counter-cyclical policy has created a highly erratic flow of high-

way contracting in recent years. This year's highway contracts are headed for a 30 per cent increase, largely because some three-quarters of a billion dollars held out late in 1968 were released early in 1969.

Unless the Highway Trust Fund is frozen again in the closing months of 1969, there's almost no way that 1970 highway contracting can equal this year's extraordinary total. If there is a normal, uninterrupted flow of highway funds next year, the value of work contracted would ease back about 10 per cent below 1969's unusually high amount to \$7.0 billion.

### National estimates/1970

Construction contract value  
(millions of dollars)

	1969 pre- liminary*	1970 forecast	per cent change
<b>nonresidential buildings</b>			
Commercial	\$ 9,300	\$ 8,000	-14%
Manufacturing	3,700	3,500	- 5
Educational	5,825	6,100	+ 5
Hospital/health	2,800	3,000	+ 7
Public	1,100	850	-23
Religious	650	700	+ 8
Recreational	1,075	1,150	+ 7
Miscellaneous	800	825	+ 3
TOTAL	\$25,250	\$24,125	- 4%
<b>residential buildings</b>			
One- and two- family	\$16,000	\$17,175	+ 7%
Apartments	7,500	8,125	+ 8
Nonhousekeeping	1,550	1,600	+ 3
TOTAL	\$25,050	\$26,900	+ 7%
TOTAL BUILDINGS	\$50,300	\$51,025	+ 1%
<b>nonbuilding construction</b>			
Streets, highways & bridges	\$ 7,700	\$ 7,000	- 9%
Utilities	3,100	3,300	+ 6
Sewer/water supply	2,300	2,300	-
Other nonbuilding	2,700	3,000	+11
TOTAL	\$15,800	\$15,600	- 1%
Total Construction	\$66,100	\$66,625	+ 1%
Dodge Index (1957-59=100)	186	187	
Physical volume of floor area (millions of square feet)			
<b>nonresidential buildings</b>			
Commercial	554	483	-13%
Manufacturing	296	260	-12
Educational	235	236	-
Hospital/health	87	88	+ 1
Public	34	25	-26
Religious	32	33	+ 3
Recreational	51	52	+ 2
Miscellaneous	43	43	-
TOTAL	1,332	1,220	- 8%
<b>residential buildings</b>			
One- and two- family	1,194	1,227	+ 3%
Apartments	577	602	+ 4
Nonhousekeeping	74	71	- 4
TOTAL	1,845	1,900	+ 3%
TOTAL BUILDINGS	3,177	3,120	- 2%
* Eight Months Actual; Four Months Estimated			

**Public buildings:** Post offices and other Government office buildings are the main targets of the President's moratorium on direct Federal construction. A 1970 decline of as much as 20 per cent is indicated for this billion-dollar category.

**Sewer and water:** This category of construction is below its potential, partly because the major Federal anti-pollution program is under-funded and partly because local governments aren't taking full advantage of it due to the cost of financing their share. With higher priority than many other Federal programs, the Clean Water Restoration Act will at least hold, if not increase, its current level of appropriations next year. Easing credit conditions will support enough matching local money to keep next year's contracting on a par with 1969's \$2.3 billion.

**1970 outlook:** *Federal restrictions on construction spending will dominate this category, leading to a four per cent decline in contract value next year.*

### Regional construction outlook

Regional construction patterns produced a number of surprises in 1969, all related in some degree to national economic trends.

#### Northeast

A larger-than-normal share of 1969's scarce construction money was attracted to commercial building projects where equity participation was frequently used to supplement interest earnings. In the Northeast, this helped support an office construction boom that brought contract values in only the first eight months of this year past the 1968 record annual total. Sources of funds, even at high cost, now appear to be running out, and much of the backlog of demand for new office space will soon be met.

The outlook for 1970 contracting calls for a substantial cutback in office building, which should reduce the region's share of commercial construction from almost 40 per cent in 1969 to some 30 per cent next year—about in line with the pre-1967 level. The Northeast is also expected to lose ground, relative to the nation as a whole, in the construction of most other types of nonresidential buildings. An exception is factories, since the region is an important producer of many of the products for which manufacturers are planning above-average capital expansion in 1970.

The Northeast stands to gain the most from a reversal of credit conditions, as far as housing is concerned. Both homeowner and rental vacancy rates in the region are less than two-thirds the level of those in the rest of the nation and are well below normally accepted minimum levels. The result has been a severe housing shortage in many cities which would be worse if not for the region's declining rate of growth in recent years. Any significant easing of credit should see a substantial turn-around in home building activity in the Northeast.

The region's share of road building

dropped off gradually after reaching its peak in 1967. This trend is expected to continue since the Northeast has completed a larger portion of its interstate highway network than the rest of the country.

### Midwest

The Midwest's share of commercial construction has been declining since 1967, when contract values were boosted well above the long-term trend by several major office building projects. The decline has been due to a less urgent demand for office space (vacancy rates in major Midwestern cities have remained somewhat higher than those in the East) as well as the effects of a temporary slowdown in population growth. The latter trend has been reversed in the past couple of years, and demand for store building should begin to pick up. Although 1970's expected business slowdown will limit the growth of commercial construction, the Midwest should increase its share of the national total.

Construction of manufacturing facilities in the region is expected to dip more than in the nation as a whole. With the exception of automobiles and electrical machinery, all of the major industries concentrated in the Midwest are planning cutbacks, or virtually no change, in plant and equipment outlays in 1970. Contracting for most other types of nonresidential buildings is expected to improve next year, relative to the nation.

Despite the slowdown in population growth in the mid-1960's, the Midwest until recently has expanded its share of the nation's residential construction. Nevertheless, vacancy rates have remained below the national average, with this year's decline in housing activity due largely to restrictive credit conditions. Next year's national improvement in housing will be shared by the Midwest, which will just about match the gain for the country.

The Midwest is not likely to duplicate its 1969 record level of utilities construction, when several major projects pushed the annual volume over the billion dollar mark.

### South

The South has lagged the nation in the recent commercial building boom. Earlier bursts of office building construction in Atlanta, Dallas and Houston took the pressure off demand in the region's major cities. Relatively high vacancy rates indicate that no major reversal is in the offing. Store building has remained strong, however, and can be expected to hold up in 1970.

The region contains some of the few areas of the country where an upturn in manufacturing construction may be expected in 1970. The chemical and pulp and paper industries, heavily represented in the South, are planning substantial increases in capital outlays. Food and textile manufacturers, meanwhile, plan to maintain their plant and equipment spending at 1969 levels. The South is expected to increase its

share of most other types of nonresidential construction.

The region has increased its share of new apartment construction from 20 per cent in 1965 to almost 35 per cent this year. During this period its output of single-family housing has remained nearly constant, at or about the 35 per cent mark. The expected slowdown in business activity will put a damper on some of the second-home apartment building since much of it has been financed by large institutional investors. Since vacancy rates are well above the critical level and supply has kept up with population growth, new single-family housing in the South will also lag the national gain next year.

Most types of nonbuilding construction in the South should outpace the national growth rates in 1970. Sewer and water facility construction has fallen short of need, as new residential areas have opened up. The region is also behind schedule in the interstate road building program, and efforts to speed this up are expected as the deadline comes closer.

### West

Another year of tight money and economic uncertainty has again postponed the long-awaited boom in Western construction. Although contract values in 1969 topped the previous peak achieved in 1963, the gain was a lot smaller than the potential. 1970 is likely to see a repetition of this performance—modest gains, but well below those justified by recent population growth in the West.

Commercial building enjoyed a strong year in 1969, and the West should improve its share of the national total next year. Major office building projects are in progress, or slated for early starts, in both Los Angeles and San Francisco. Retail construction should respond to the recent resumption of population growth in many areas. Although automobile and machinery manufacturers are planning to increase their capital spending in 1970, cutbacks in the region's important aerospace industry will more than cancel these gains. Increases in most other types of nonresidential construction are expected to outpace the national averages.

After reaching a peak in 1963, home building in the West declined sharply as business conditions sagged and migration to the region fell off significantly. A resumption of migration, though not as strong as in the early Sixties, and the beginning of a housing shortage in many areas bodes well for the future. Lack of mortgage funds will impede the start of this upturn, however, and improvement in 1970 will be limited to matching the national average.

Announced cutbacks in direct Federal construction will have a greater impact on the West than on other regions since many of the affected projects are located in the area. California has already announced slowdown in the construction of its huge Central Valley water project, and similar

postponements may be expected in other major projects.

### Summary

Some of the nation's severest inflation has been experienced by the construction industry during 1969. It's no coincidence, therefore, that this industry has felt the effects—earlier and more directly than most others—of the monetary and fiscal brakes that were applied to the economy in an effort to bring prices into line.

With a record rate of construction in progress as the year began, contracting for new projects diminished through 1969, slowly at first and more sharply in the final months. Housing was first to yield to monetary restraint, but after midyear it was apparent that most major types of construction were headed downward.

The 1970 outlook for construction is largely a matter of tracking the downward trend to its conclusion, and its eventual upturn. Since the primary cause of the past's decline was anti-inflationary policy, and not a shrinkage of demand, the most important condition for its reversal is the lifting of these restraints. This decision is one that must be reached by policy makers, not by the market place. For this reason, there is an additional element of uncertainty built into the 1970 F. W. Dodge Construction Outlook.

The opening quarter of 1970 is likely to be the year's weakest, with each successive quarter showing improvement. Once credit is eased, housing will be the first to advance, and with an adequate flow of mortgage money, home building will continue to gain throughout the year.

Following housing's second-quarter pickup, a moderate rise in public facilities contracting is likely to take hold soon after midyear. Also in the second half, improving business conditions should spark an upturn in industrial and commercial building.

With housing providing most of 1970's thrust, and nonresidential building showing a small decline, the regional pattern of next year's construction markets will favor the South and West, where industrial and commercial building is proportionately less important. All regions are likely to show some residential expansion in 1970, but in the Northeast and Midwest these gains are expected to be offset by declines in nonresidential contracting.

For the year as a whole, 1970's national total of construction value won't add up to much more than 1969's \$66 billion. The difference between a small decline and a small gain for the year will depend on the precise timing of the next upturn. The odds favor an early rather than a late turning point and, therefore, a small gain. Nevertheless, once construction demand is unleashed, cost pressures will not be far behind. For this reason, next year's forecast of a modest increase in *contract value* also implies a small decline in the *physical volume* of newly-started construction.

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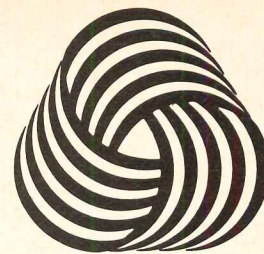
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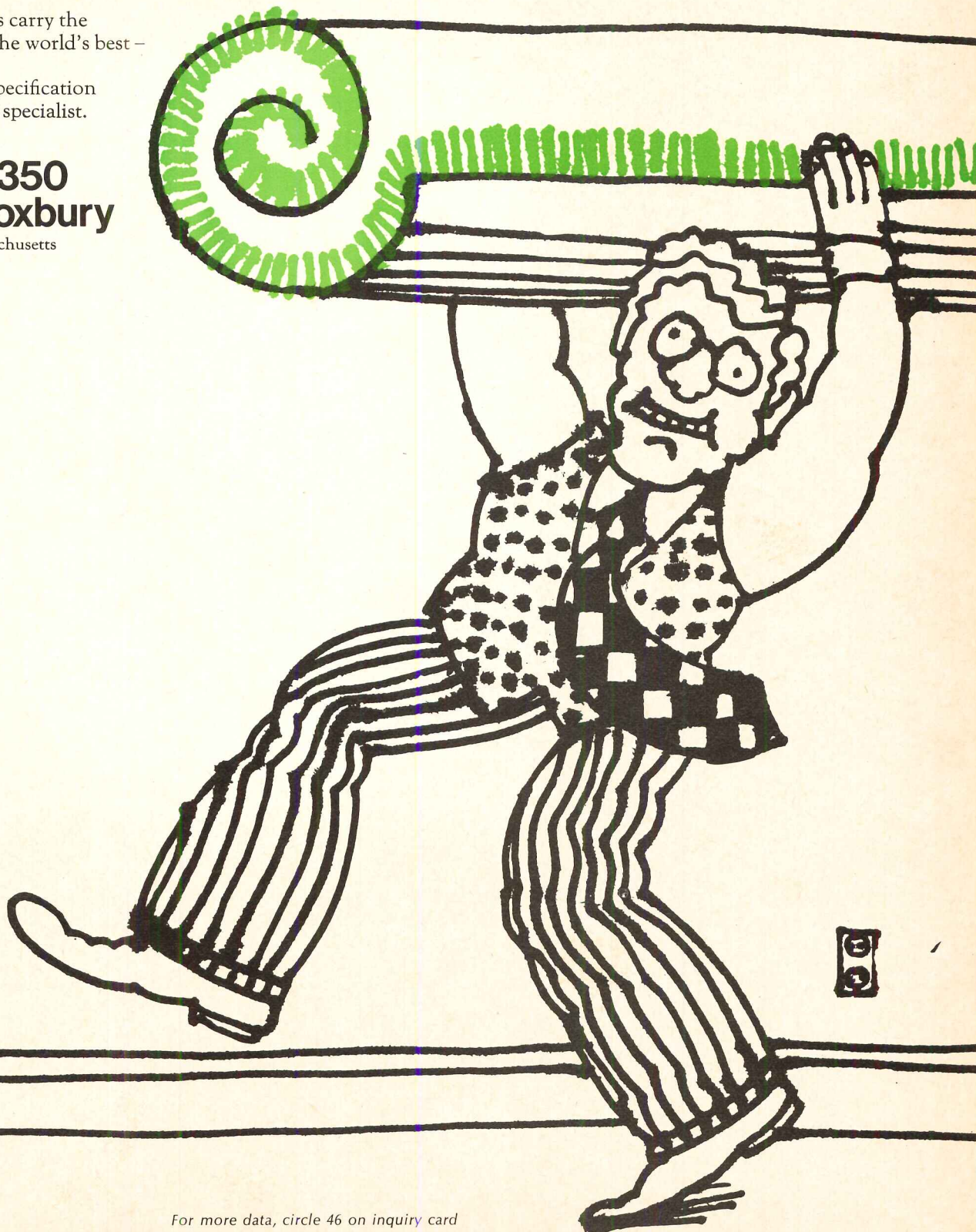
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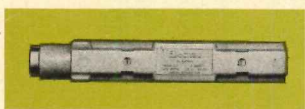


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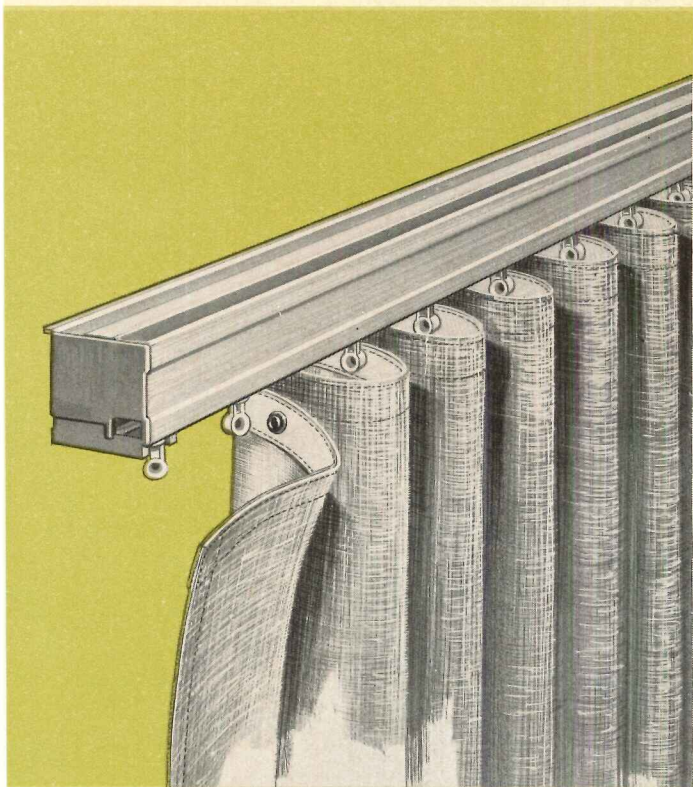
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Get complete information on K-13 for insulation and noise control. Call 713 433-6761 or write . . .

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## There is a difference in vinyl asbestos tile.

How do you make a choice among resilient floor manufacturers? We'd like you to regard us as the quality line, so we put together some facts for you to consider.

For one, the tiles we make are as close to perfection as anyone has yet come. They're well made and well cut. They're inspected and tested time and time again to insure that when they're delivered to your building project they're in first-class condition.

And most important of all, we stand behind every box of floor tile we make. After all, we've been in the business for many years, and we mean it liter-

ally when we say that our reputation is riding with every truck we send to you.

For another, we have a national organization of experienced architectural representatives and authorized contractors who will get you samples fast, answer questions and contribute their own knowledge to the solution of all your floor problems.

For more information, contact your GAF representative or write to GAF Corporation, Floor Products Division, Dept. AR-11, 140 West 51st Street, New York, New York 10020.



**GAF Floor Products**

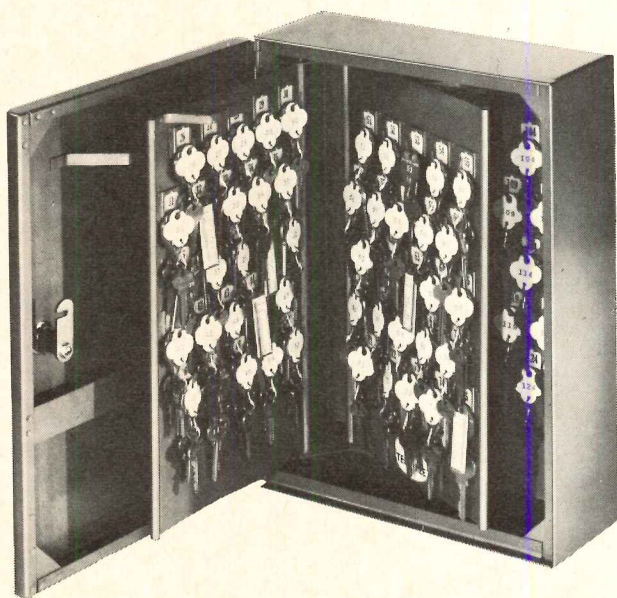
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V. A. tile illustrated is Thru-Chip #3583 and #3590.

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We hope you specified TelKee Key Control systems to your client—or else he'll be picking locks.

If he must account for 25 keys or more, it will pay him to use TelKee. So it will pay you to specify it.

The reasons are as important as those he has for keeping some people *out* . . . and letting other people *in*.

And the wish you have to protect his interests.

Write today for complete TelKee catalog. Dept. AR-119

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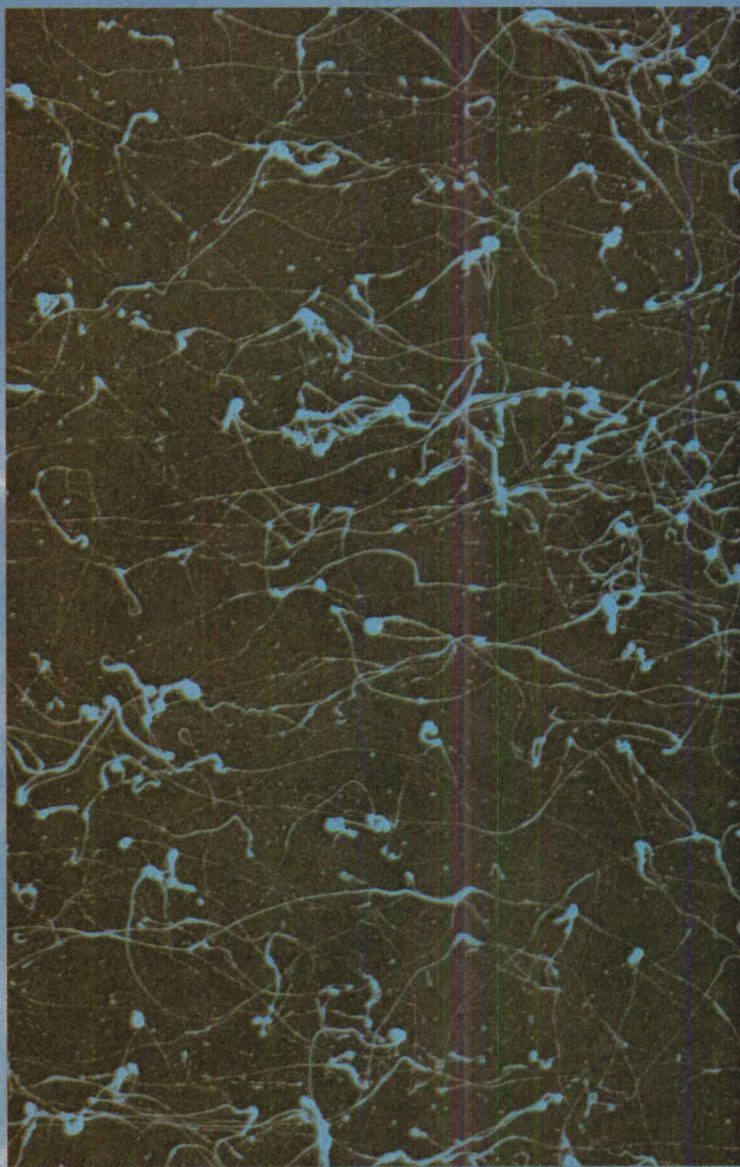
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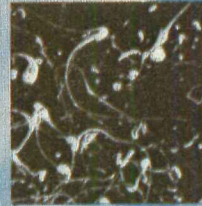
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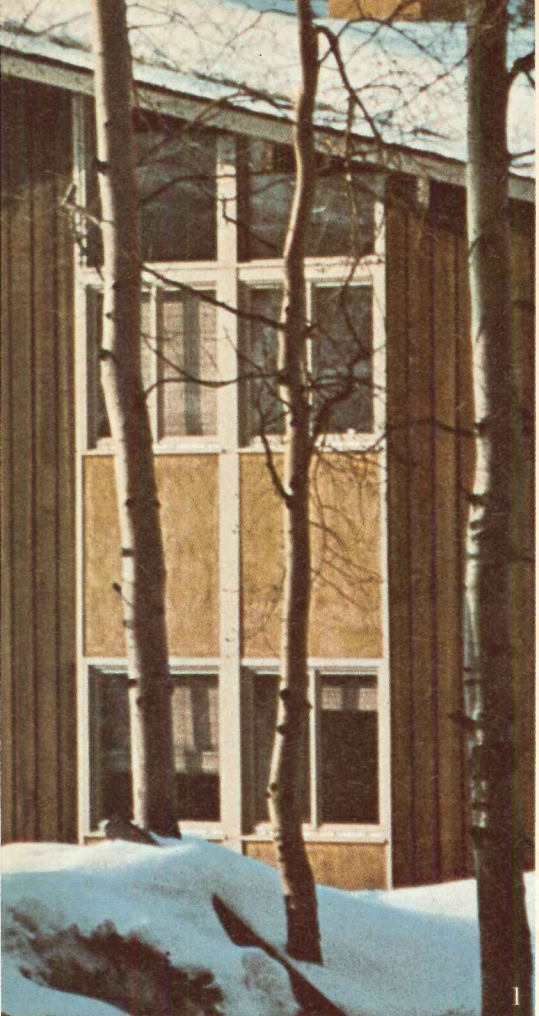
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1 and 2. Upper Willows Condominium. Architect: Fredric Benedict & Associates, Aspen, Colo.

3. Arbeiterdorf Employee Apartments. Designers: Zejdlík, Harmala, Hysell and MacKenzie, Inc., Minneapolis, Minn.

4 and 5. Snowmass Inn. Architect: Art Preusch, Aspen, Colo.

6. Shadowbrook II Condominium. Architect: Fredric Benedict & Associates, Aspen, Colo.

7. Tamarack Condominium. Architect: David J. Flood & Associates, Beverly Hills, Calif.



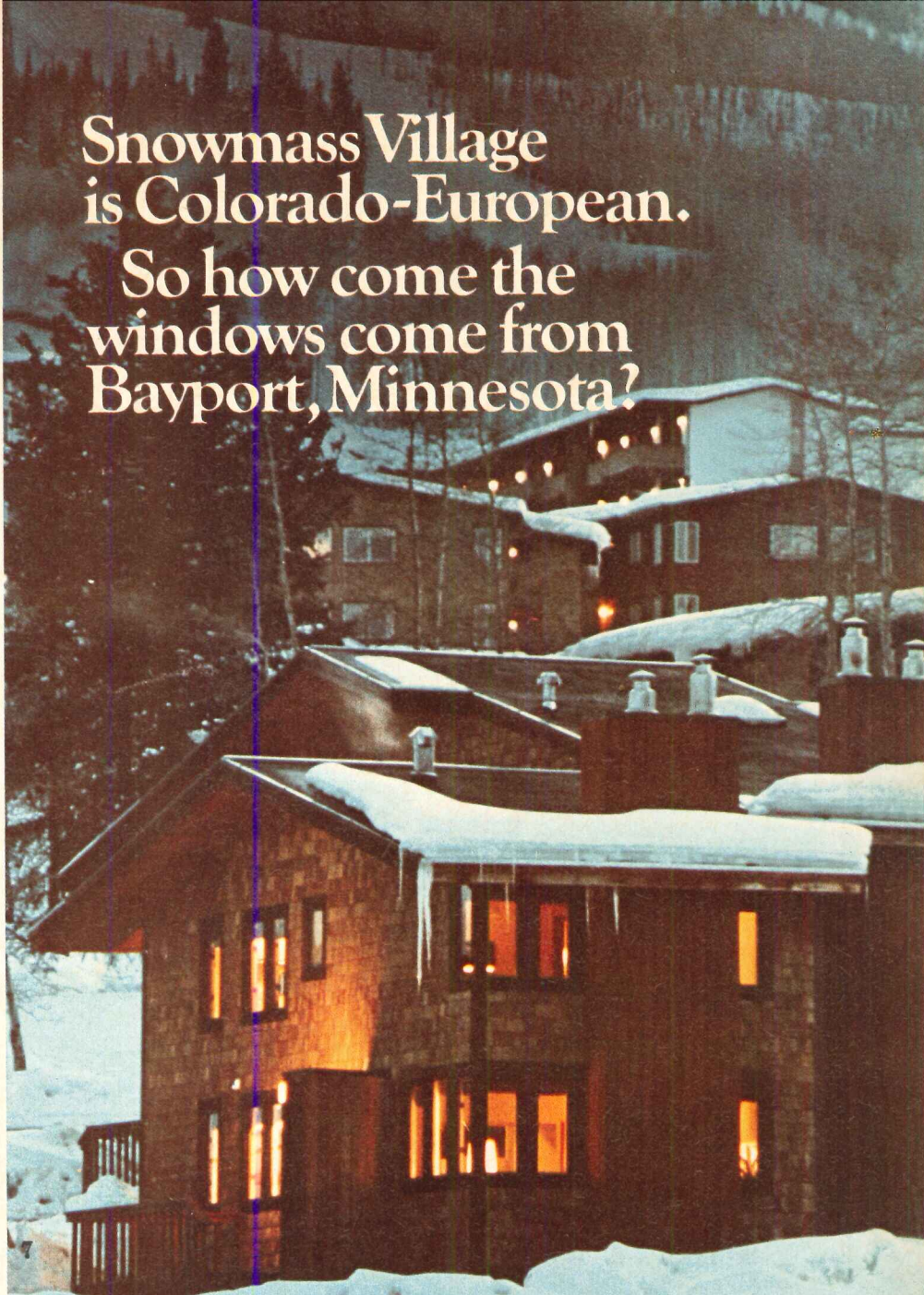
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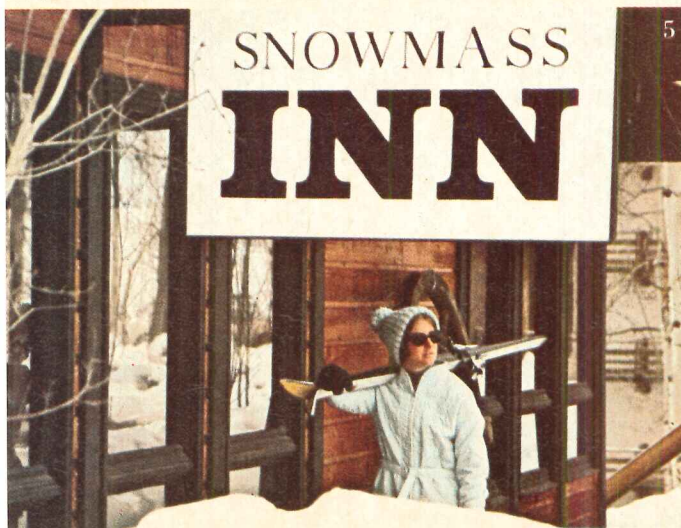


## Snowmass Village is Colorado-European.

So how come the  
windows come from  
Bayport, Minnesota?



SNOWMASS  
**INN**



Snowmass, Colorado.

The most European ski village in America. A charming cluster of buildings—terraced up the mountainside, centered around a cobblestone mall.

It took inventive architects—working with native Colorado stone and natural wood—to create this unique Rocky Mountain hamlet.

It also took Andersen Windows.

Andersen offered the architects the freedom of design they wanted—with stock wood windows in six styles and hundreds of sizes.

Wood Casements—to harmonize with rustic wood exteriors. Wood Gliding Doors—to lead to poolside sun decks. Wood Picture Windows—to

frame majestic mountain scenery.

Just to name a few.

Then, too, the Snowmass architects wanted windows that would seal out biting winter winds. (Skiers, like everybody else, like their winter weather . . . outside.) Here again, Andersen offered the extra weathertightness needed—up to 4 times tighter than ordinary windows.

So that's how come America's most European ski village ended up with windows from Bayport, Minnesota.

But that's only the beginning. For the rest of the reasons, check your Sweet's Architectural or Light Construction File. Or talk to your nearest Andersen distributor.

Andersen Windowalls™ 

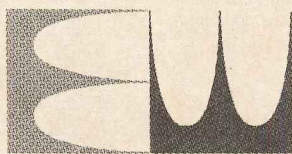
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# kitchen camouflage with E-W F.R.P.\* walk-ins— just pick your pigment

We'll match most shades, hues, or tints coordinated to your kitchen decor. And we'll custom build to your space. That ought to be reason enough to specify Elliott-Williams walk-in coolers made of urethane and fiberglass. But we'll also give you a walk-in that won't scratch or dent. It stands up longer, too, because urethane frothing eliminates decay-prone wood framing. Enough? Well, here's the best part—Elliott-Williams fiberglass costs less than stainless. Choose your color—we'll build the fiberglass walk-in to fit your kitchen. Building a walk-in that blends is easy for us. The hard part is yours—picking the color.



**ELLIOTT-WILLIAMS** \*—F.R.P. is fiberglass reinforced plastic.

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ning, and business should be used in conjunction with architecture when appropriate, but these people need not be titled architects. Furthermore, I can't believe that the truly competent people in these other disciplines are as desirous of receiving the title of architect as is implied.

The article makes sense in many regards, but architects must not lose sight of the importance of design ability in architecture.

Gary Binger  
El Cerrito, California

We do agree that architecture is first and foremost a design profession. Indeed, it is precisely that priority which has impelled N.C.A.R.B. to publicly regret those qualifying examination procedures which not only stress memorized knowledge of supportive disciplines but in fact negate those very intuitive attributes of design about which you are so properly concerned.

As we see it (although we don't presume to speak for N.C.A.R.B.) there are two major conditions that impel reassessment of examination techniques as described in the August and September articles to which you refer. First is the increasing need for ready access of the profession to the special knowledge residing in related disciplines. Second is the urgent need to salvage for support of the design function those people who enter the profession eagerly only to find personal fulfillment in supportive rather than in strictly defined design activities.

As you suggest, there are many ways of enlisting the related disciplines without demeaning the name of architecture. Perhaps that's what N.C.A.R.B. wants. —WF

## Mayer's awesome propositions

Albert Mayer's series is a real blockbuster. His propositions are so awesome that I suspect people don't want to think about them, in much the same way that they avoid contemplating the dangers of hydrogen bombs. Nevertheless, his case seems incontrovertible.

The problem seems to be to attract attention to the wholesale slaughter of the environment before the process reaches the point where it is irreversible.

I have an outrageous suggestion.

Since architects presumably are charged with the professional responsibility for environment, they would seem to be the logical ones to make the present trends stop until new directions for constructive energy can be found which will make it possible for life to survive on the planet in some reasonable state.

How about a general strike of architects so that there will be no more building until we know what we're doing? If Mayer is right, somebody better do something fast.

Incidentally, I haven't checked this out with my clients.

Arthur J. Lohman  
Public relations counselor

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They are also impressive, attractive, functional, economical. You design Smith Walls to present the image and fulfill the requirements of your specific building project.

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your design and specifications, manufactured, delivered and erected by our own people. We call it the Smith Single Responsibility concept. We do it ourselves so we know it's right. And you know you and your client will be satisfied. Our record of repeat contracts proves it.

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*General Electric Company Plant, Oklahoma City, Okla.*

*Architects: Benham-Blair & Associates, Oklahoma City, Okla.*

*General Contractor: Manhattan Construction Company, Oklahoma City, Okla.*

*Smith C-Panel, 1½" insulation, aluminum exterior finished in Kynar II. Ribwall profile on fascia. The main wall consists of Contourwall profile panels.*

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**Nine times out of ten, MONO fills the sealant gap.**

**When it can't, he can.**



We know you'd like an all-purpose trouble-free construction joint sealant. □ So would we. But right now, MONO's as close as we can come . . . and it won't do everything, any more than any other types and brands we've tested. □ Sure, MONO's good and works so well under the kind of adverse conditions (dust and moisture) that are common to the job site, that we suspect many construction people actually look on it as an all-purpose sealant. □ But actually Tremco's business isn't based on selling *any* all-purpose sealant. Instead we're a single-purpose company. We're The Water Stoppers and we want to give you leakproof security in every joint on the job. □ So we make not one, but fourteen other sealants besides MONO, like a very good polysulfide (Lasto-Meric), a highly-regarded preformed tape (440) as well as a dozen others with special purposes. □ The only all-purpose item in our catalog is the Tremco Representative. He has been thoroughly trained to provide you the proper sealant for each application and is ready to give job-site assistance before, during and after each project. □ Why not give him a call next time you run into the sealant gap? He'll get you across every time. □ The Tremco Manufacturing Company, Cleveland, Ohio 44104; Toronto 17, Ont.

**TREMCO**  
The water stoppers

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■ Go gently if you do! But don't take our word that Lyon steel office furniture is the strongest. Come in and see that even with the dictation tray and file drawer fully extended, there's no buckling. Put Lyon double-wall construction to the test. Pound on the sturdy double-layer top. Know the elegance of *complete* soundproofing. Try our exclusive "lock-in-top" that controls *all* drawers. See how you can select and join components to suit your needs. Choose from 9 lustrous 100% acrylic finishes. Make us prove Lyon quality. See your Lyon dealer.

"See our complete catalog in Sweet's Interior Design File"



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# CONTROLLED AIR FLOW

Through laboratory analysis and firsthand experience . . .

## Armstrong Rubber chose Multi-Vent® Industrial Air Diffusers

. . . designed for economical installation and maximum efficiency in minimum space

Controlling environmental hygiene problems is an absolute essential to Armstrong Rubber Company's efficient operation of its tire manufacturing facilities in Des Moines, Iowa.

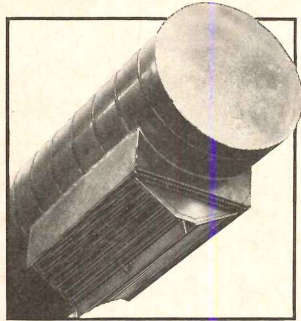
To help solve this problem in the curing section, a high velocity duct system, incorporating a series of Multi-Vent Industrial Air Diffusers for each bank of curing presses, was installed.

### A "first" in air handling for tire curing presses.

The MV-600 Air Diffusers direct air straight down and laterally to form a literal "curtain of air" to entrain contaminated air inward and upward within the hood and through roof vents. The heat factor is also considerably reduced.

Previous experience and performance double checked. Even based on the successful operation in other applications,

**MV-600 Industrial Air Diffuser.** This aluminum air diffuser gives complete mechanical control of air volume and direction and is applicable to any industrial design.



Offices and a portion of the Armstrong Rubber Company's Des Moines, Iowa, plant; one of five in the United States. With approximately five million square feet of facilities at Des Moines, Armstrong produces over 15,000,000 passenger, truck and implement tires annually.

additional evaluation tests on the MV-600's were required before they were accepted for this application. Not only have they measured up to their 600 cfm rating but they are now performing easily and efficiently well above rated performance.

### Saves money on new or remodeling installations.

This system was also installed in another section of the plant where space was at a premium and installation problems were many. The versatility and simple installation facilitated by these air diffusers enabled Armstrong to meet their target of air handling efficiency at a minimum total installation cost which was considerably lower than a conventional system. A bonus is the amazingly low noise level of this "air curtain of comfort and safety."

In addition to efficient performance, the MV-600 Industrial Air Diffuser can help you solve your specific problems through adaptability, economy of installation and space-saving factors. Send for Bulletin 696 on Multi-Vent Industrial Air Diffusers.

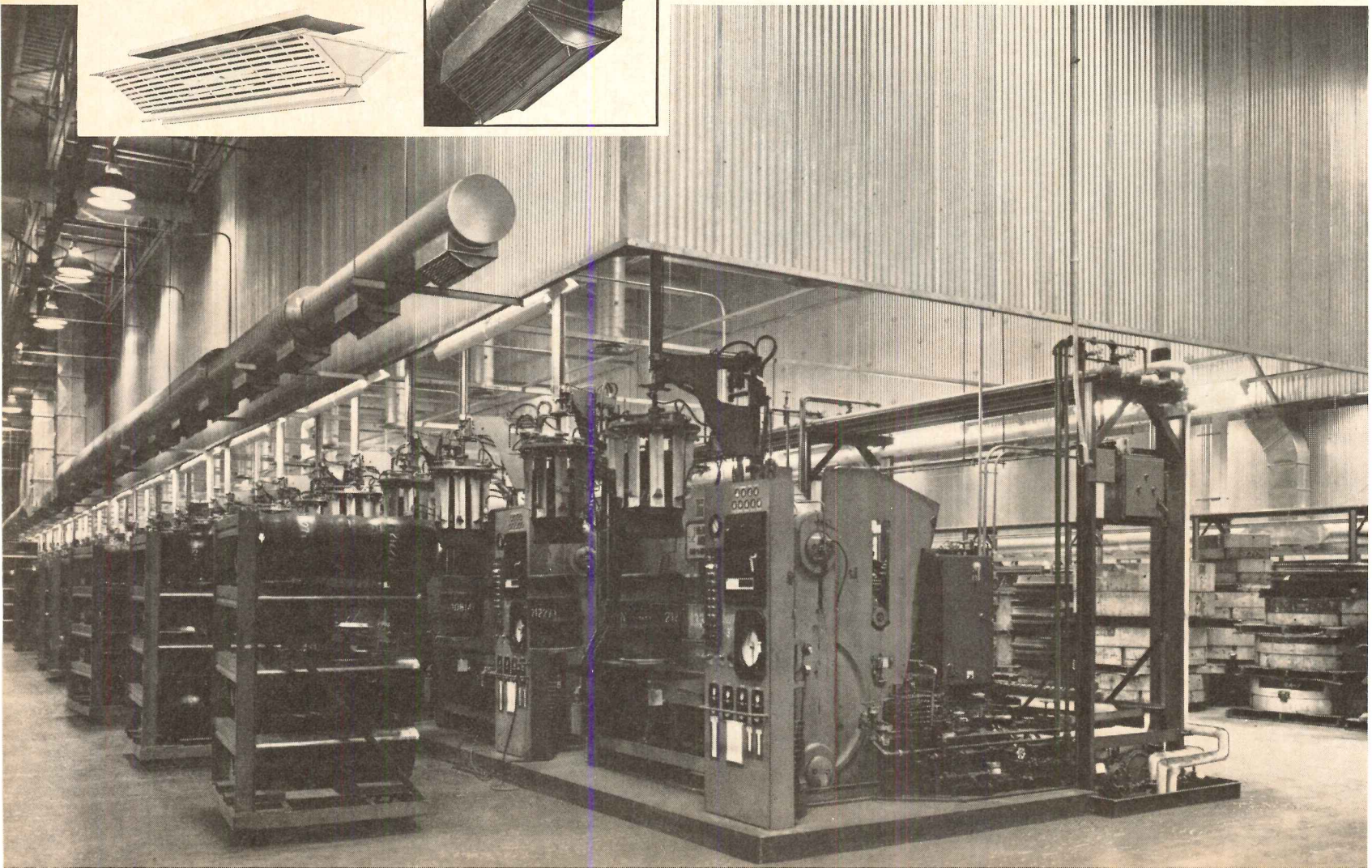
Just write:

MULTI-VENT PRODUCTS DIVISION  
Dynamics Corporation of America  
1400 North Kostner Avenue  
Chicago, Illinois 60651

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Mechanical Contractor: Waldinger Corporation, Des Moines A&E: John J. Harte & Assoc., Inc., Atlanta



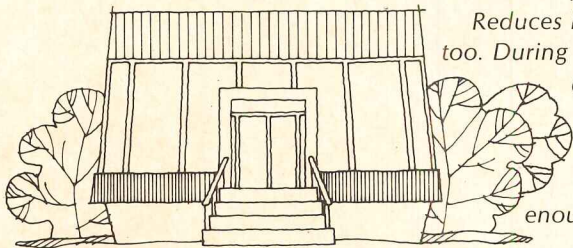


Architecture, here,  
is as changeable as the weather

The glass is slightly tilted to reflect the ever-changing sky. The L-O-F hi-performance glass, used here, does much more. It's Thermopane® insulating glass with Vari-Tran®/Chrome 114, a reflective coating that reduces visible light transmission to a nominal 14 percent.

Softens sky brightness and reduces solar heat gain. Improves interior comfort.

Reduces heating and air-conditioning costs. Provides privacy for employees, too. During the daytime they can see out but passersby can't see in. Architects



Olsen & Urbain, AIA, Chicago, designed this unusual facade for the ADS Anker Corporation building in Oak Brook, Illinois. L-O-F has developed many kinds of hi-performance glass. We now offer such variety in appearance and function that a look at Sweet's is hardly enough. Why not get in touch with an L-O-F Architectural Construction Specialist? Libbey-Owens-Ford Company, Toledo, Ohio 43624.



L-O-F HI-PERFORMANCE GLASS

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# Keene announces the instant-access ceiling.

## *New Accesso™ Concealed Suspension System for acoustical tiles and pans*

Just tilt a tile up and lift it out. Then slide it back in again. It's that easy with the new Accesso fully concealed suspension system.

There's no need to strong-arm tiles down with a tool. Or force fragile tile end joints. Or anchor tiles into a grid so rigid the ceiling has to be dismantled for servicing overhead utilities. No need for special access panels, either—*every* Accesso tile is an instant-access panel.

And because Accesso members aren't locked permanently, you're not locked into the building module. You have absolute freedom to locate lighting fixtures and air-handling devices wherever you like—then relocate them as building needs change.

What's more, the Accesso system—exclusively—can also be used to suspend metal-pan ceilings in kitchens, laundries and other high-humidity areas. You can specify just one ceiling system for the entire building!

Any standard tile can be used in the new Accesso system, with no special machining. But for instant beauty to match instant access, specify richly fissured Styltone or other acoustical tiles from Keene. For full details, write Keene Corporation, Sound Control Division, Box 458, Trenton, New Jersey 08602.

**KEENE**  
CORPORATION

**SOUND CONTROL DIVISION**

**We've just begun to grow.**

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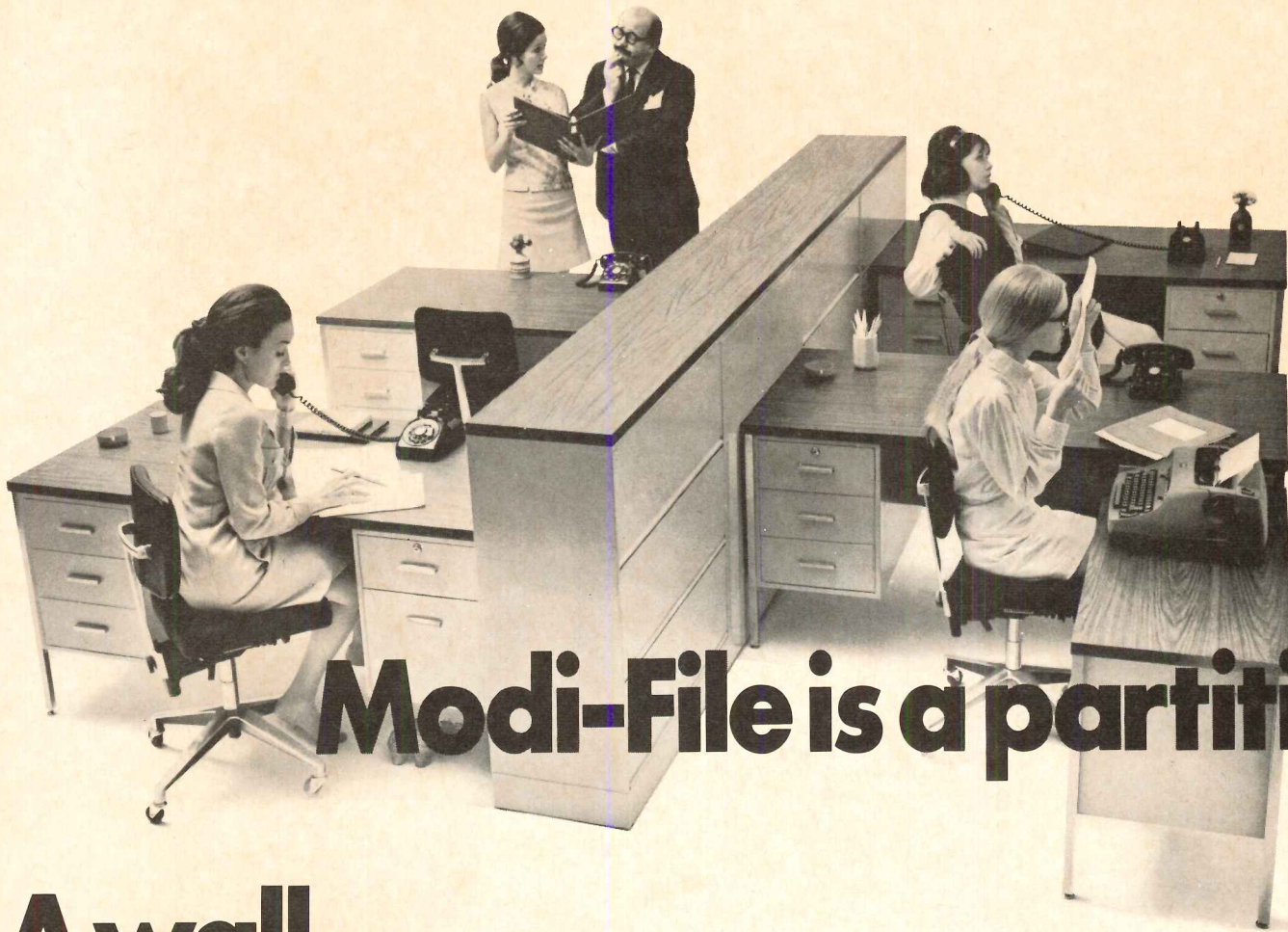


*Heublein, Inc. selected an Accesso "instant-access" ceiling system for this modern corporate headquarters building in Hartford, Connecticut.*



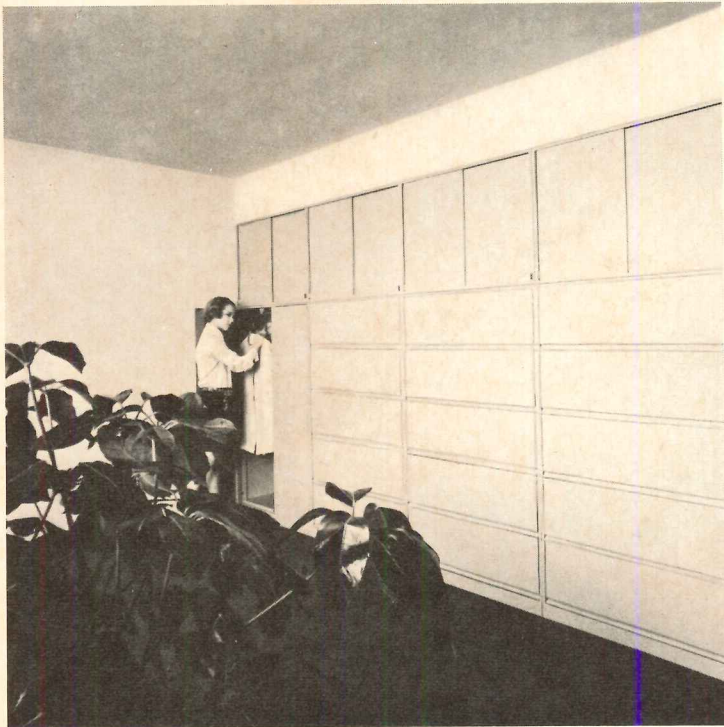
*Tiles fit snugly to form a smooth, almost seamless ceiling with Accesso concealed suspension. The design here called for 12"x24" tiles, but 12" squares are equally convenient in the Accesso system. Note that overhead systems can be serviced easily without interrupting office operations. Just push a tile up and lift it out. No tools needed with the Accesso system. And every tile is an access panel!*





**Modi-File is a partition.**

**A wall.**

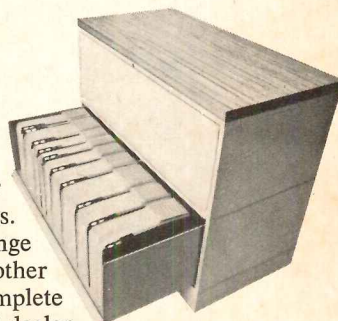


**A piece of furniture.**

**We almost forgot. It's also a file.**

It just doesn't look like one (we even eliminated the handles). That's why you can stack MODI-FILES® as a free-standing partition. Or line them up against a wall. Or disguise them as executive suite cabinets.

But deep inside, MODI-FILE is all file. Because of a unique hinge suspension that gives it more filing space for its depth than any other lateral file. In letter and legal sizes, 30 and 36 inch widths. With a complete selection of accessories (even a wardrobe unit). At your Art Metal dealer.

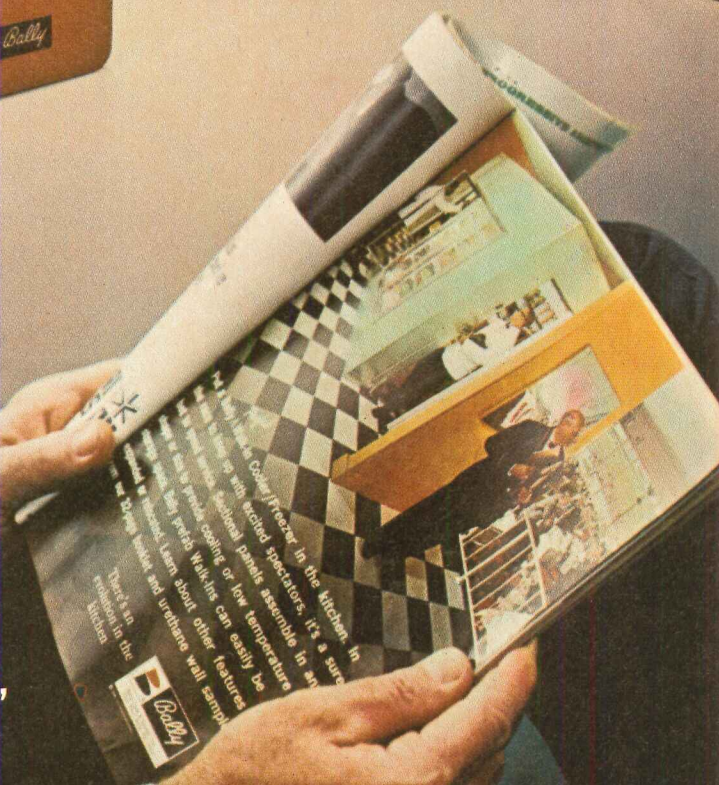


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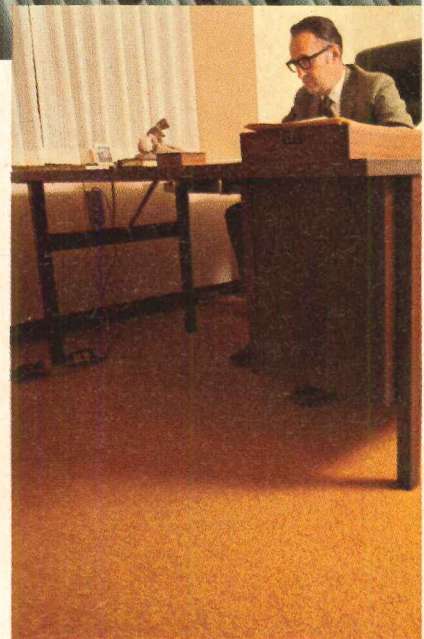
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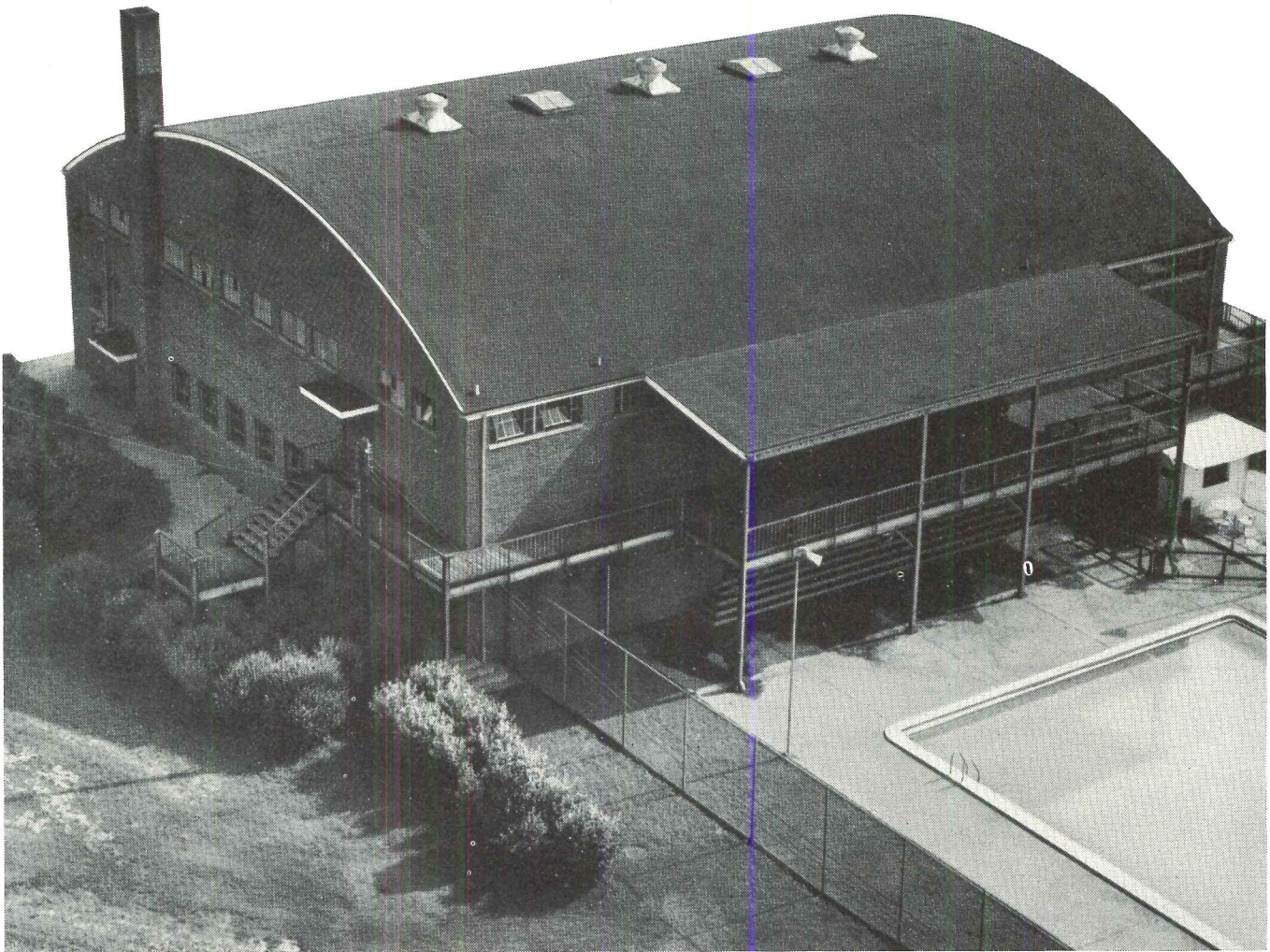


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# This J-M asbestos built-up roof just had its 30th birthday.

## And still looks like it was born yesterday



The Reynolds Park Gymnasium in Winston-Salem, N.C., was topped with a Johns-Manville asbestos smooth surface built-up roof in 1939. Today, it looks brand new. And it's never even had minor repairs. But long wear is only part of the story.

J-M asbestos built-up roofing needs less bitumen than organic felts. And organic roofs take 300 to 400 lbs. of gravel or slag per square. Asbestos roofs need none. You save time, labor and money—and get a much lighter roof.

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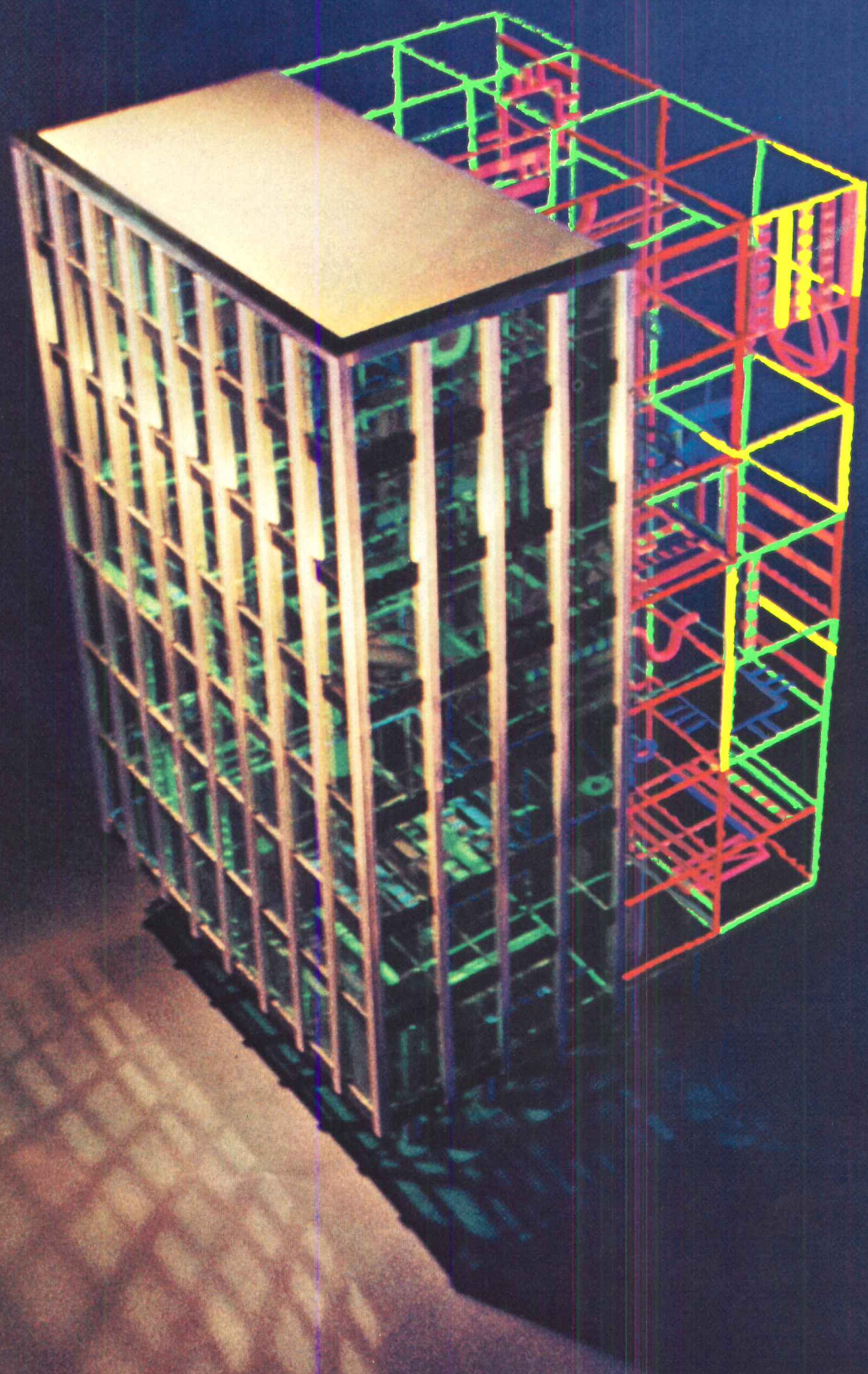
J-M asbestos built-up roofing. A very smart investment. With many happy returns.

For details, write Johns-Manville, Box 290-BI, New York, New York 10016. Also available in Canada and overseas. Cable: Johnmanvil.



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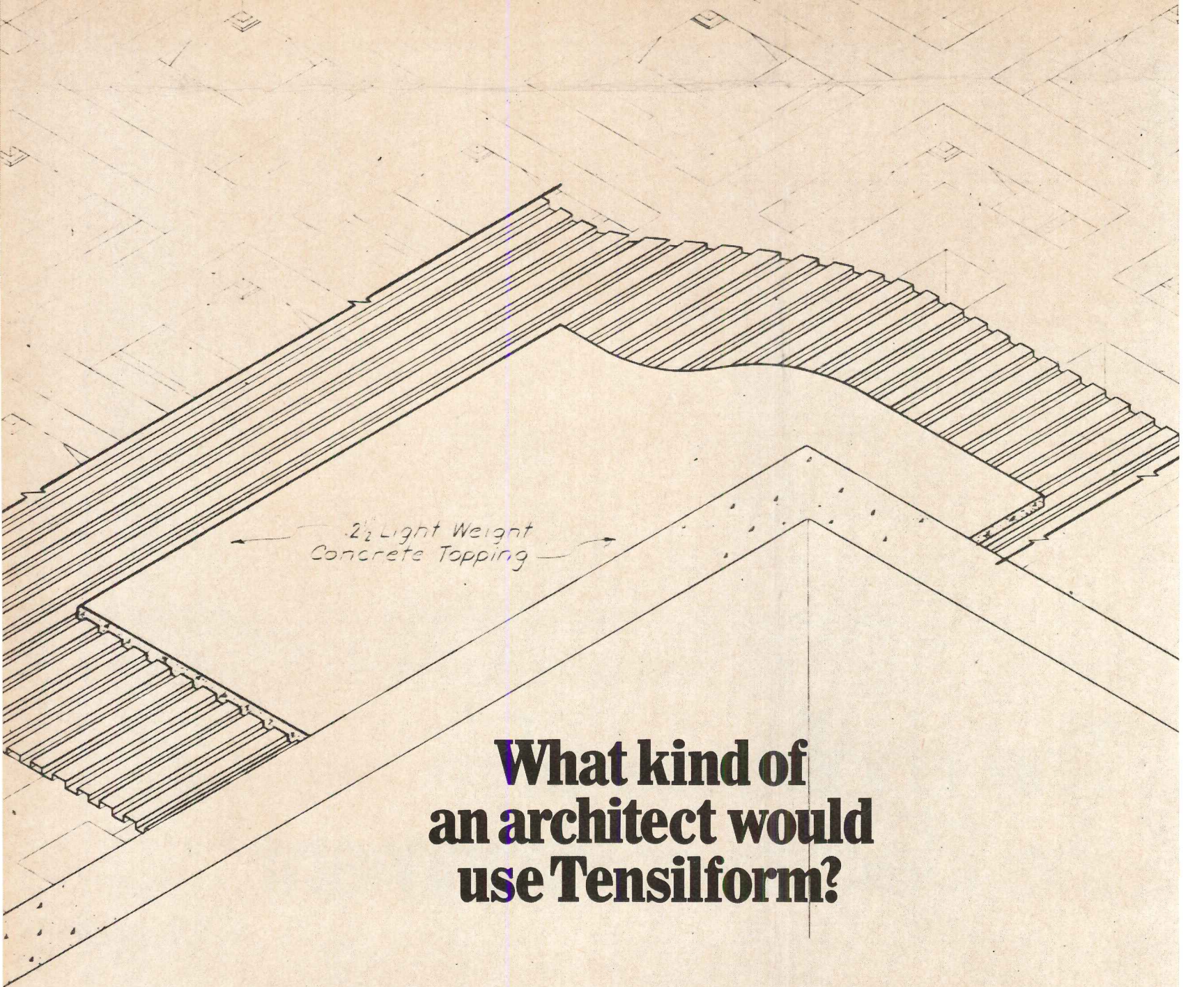
Supplying, installing and maintaining the Electro-environment is his business. The Qualified Electrical Contractor advances with the state of the art.

Your challenge is his challenge.

# The challenge of the Electro-environment

**The Qualified Electrical Contractor makes the Electro-environment work.**

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**What kind of  
an architect would  
use Tensiform?**

**EDWARD DURELL STONE, ARCHITECT**  
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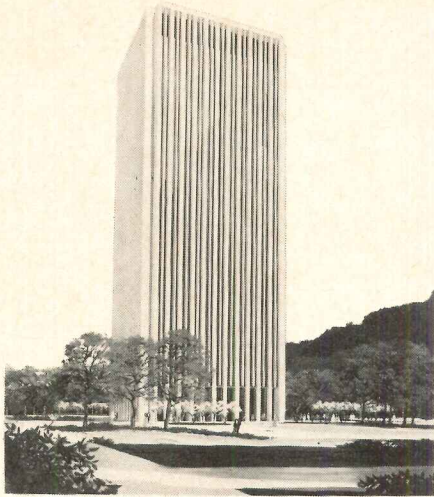
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**STRUCTURAL ENGINEERS**  
NEW YORK 17, N.Y.

**CAPITAL PLAZA  
OFFICE BUILDING**

PROJECT:

\*Edward Durell Stone architect for Phase I of the project in association with Lee Potter Smith, Pritchett, Hugg and Carter of Frankfort, Ky. Structural engineers for entire project are Praeger-Kavanagh-Waterbury, N.Y.



An architect who knows how to get the most out of a budget, because he knows how to get the most out of new building materials.

An architect like Edward Durell Stone and his associates.\*

When they designed the master plan for the urban renewal project in Frankfort, Kentucky, the budget for Phase I was \$23 million. So in the Capital Plaza

Office Tower—the largest building on the site—they used approximately 215,000 square feet of Wheeling Tensiform®; the permanent steel form for concrete floors.

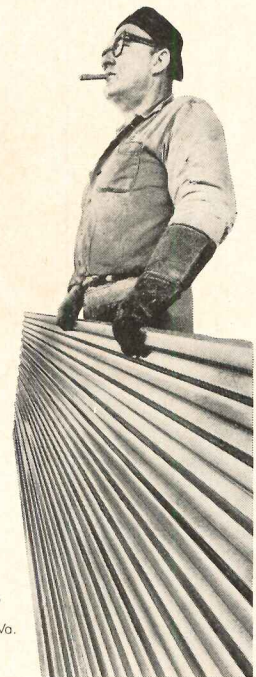
It's not hard to see why.

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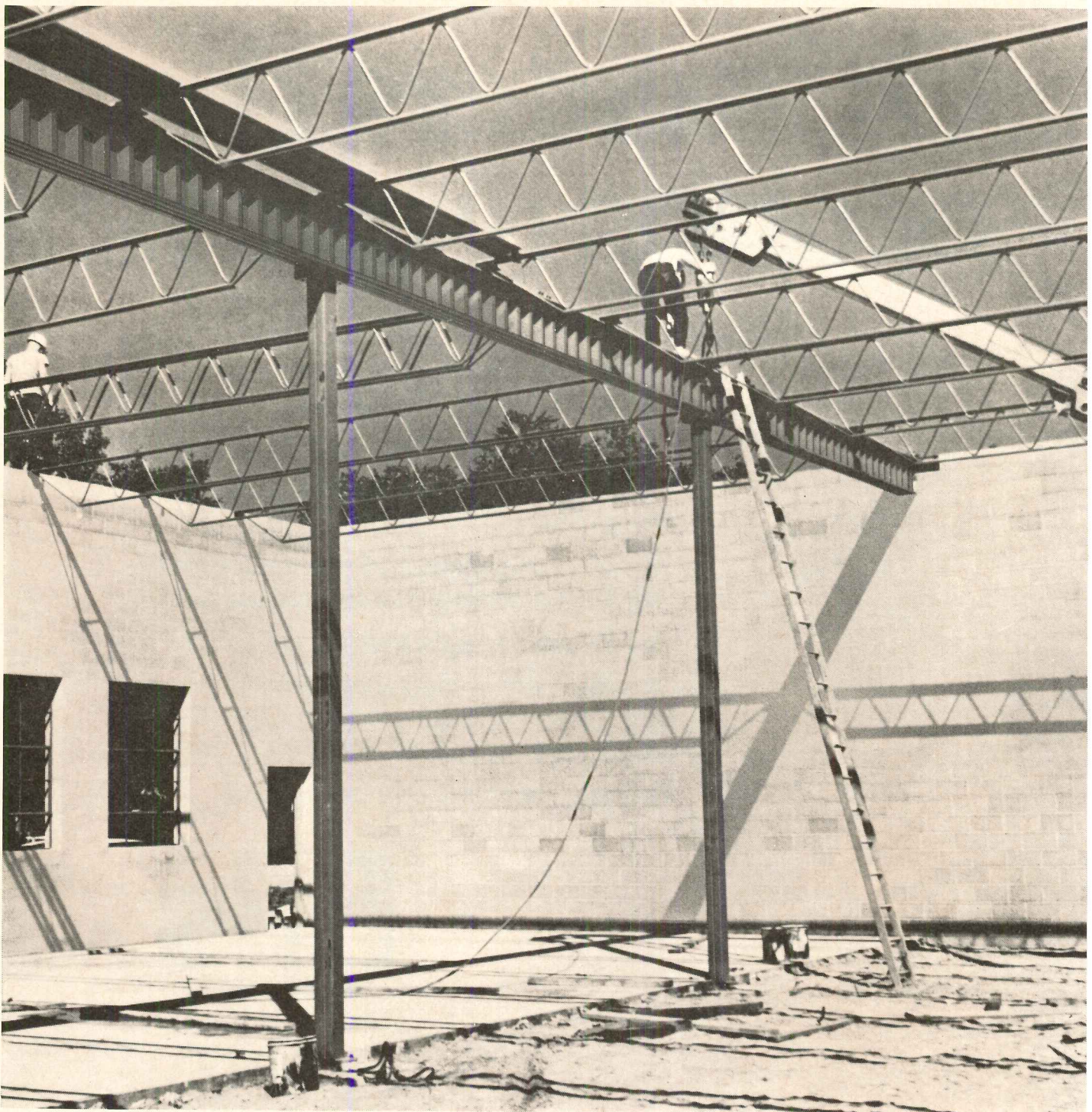
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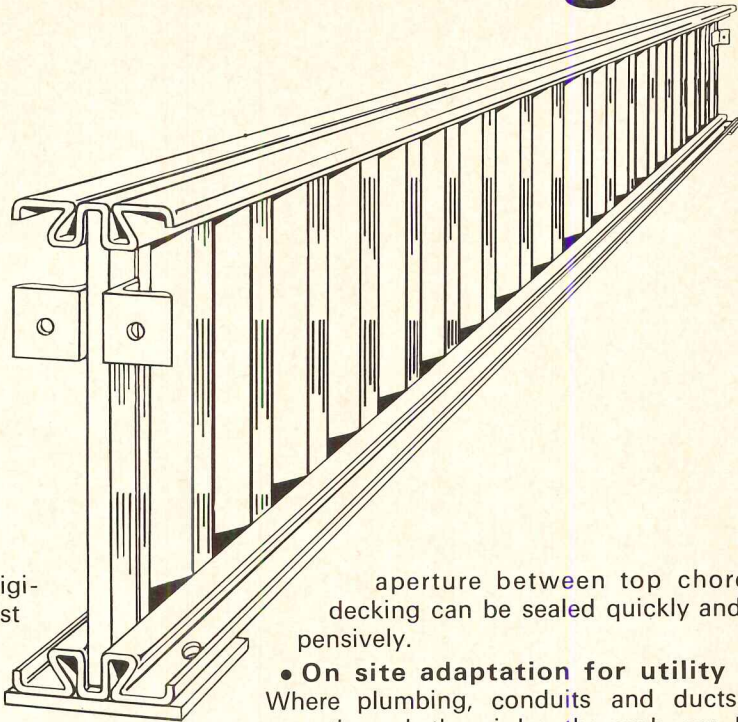
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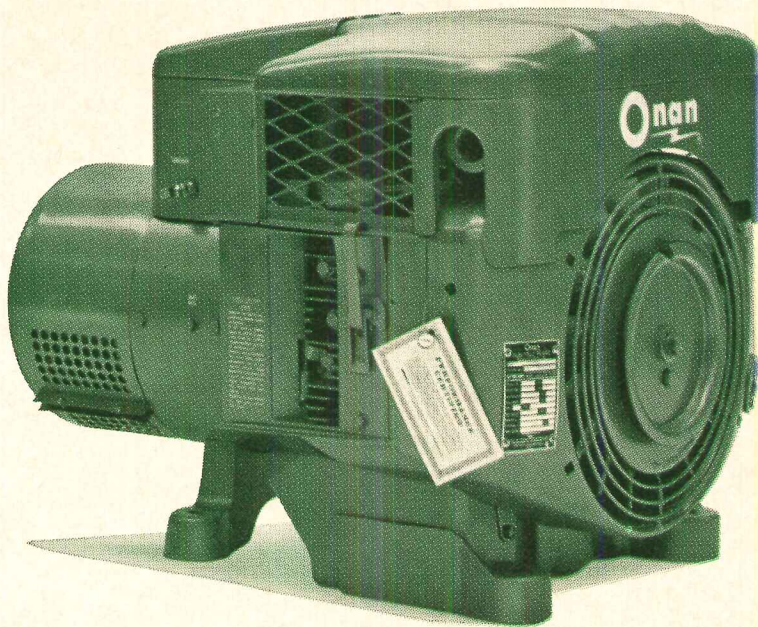
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## NEW FIRMS, FIRM CHANGES

**Caudill Rowlett Scott, Architects Planners Engineers**, has recently elected four new partners: **James Falick**, **G. Norman Hoover**, **Franklin Lawyer** and **Charles B. Thomsen**. Nine associate partners were also elected: **Alexander Brailas**, **W. C. Bonvillain**, **James R. Cagley**, **Jack DeBartolo, Jr.**, **William G. Ford**, **Joseph W. Griffin**, **Stephen A. Kliment**, **Malcolm T. Tengler**, and **James B. Thomas**.

**Raymond W. Griffin, A.I.A.** is now a vice president of **Souder, Clark and Associates, Inc.**, consultants for health care planning and architecture, Tarzana, California.

**Charles H. Griggs, A.I.A.** is now head of the new Honolulu office of **Albert C. Martin and Associates**, Los Angeles-based architects, engineers and planners.

**Winfield H. Hyde, A.I.A., Architect** has joined **Kitchen and Hunt, A.I.A., Architects**, as an associate and vice president, in charge of the firm's Oakland, Calif. office.

**Ranger Farrell and Associates, Acoustics, Lighting, Audio-Visual, Theatre Consulting**, Irvington-on-Hudson, New York, has announced that **Richard C. Oldham**, consultant in communication systems for instruction, and **Thomas E. Garrett**, theatre consultant, have joined the firm as associates.

## NEW ADDRESSES

**Affleck Dimakopoulos Lebensold Architects**, 1440 Ste. Catherine Street West, Suite 1025, Montreal 107, Quebec. (Mailing address: P.O. Box 900, Station "H", Montreal 107.)

**Clas, Riggs, Owens & Ramos, Architects**, 1015 Twin Towers Building, Silver Spring, Maryland.

**Davis, Brody & Associates, Architects**, 130 East 59th Street, New York City.

**Duplanty & Huffaker, Planning, Architecture, Interiors**, 2046 Cotner Avenue, West Los Angeles.

**Robert Lamb Hart, Adam Krivatsy, William Stubee, Planning Consultants**, 80 West 40th Street, New York City. The San Francisco office remains at 675 California St.

**Hellmuth, Obata and Kassabaum**, 315 North Ninth Street, St. Louis.

**Richard Meier & Associates**, 136 East 57th Street, New York City.

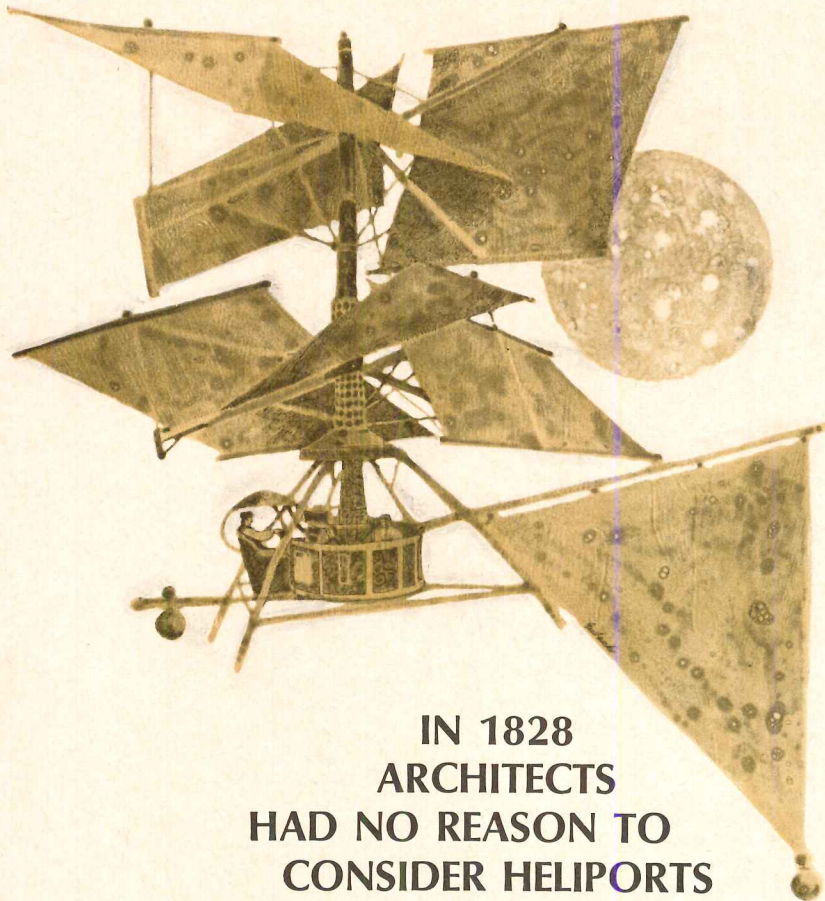
**Roy F. Johns, Jr., Associates, Consulting Engineers and Architects**, 404 Rouser Road, Coraopolis, Pennsylvania.

**Herbert H. Johnson Associates, Architects**, 950 South Miami Avenue, Miami.

**Roger Johnson Associates, Architects**, 1409 Willow Street, Minneapolis.

**K & J Designs, Office Planning, Interiors, Industrial Design** (formerly located with **Kahn and Jacobs Architects**), 521 Fifth Avenue, New York City.

**Kazmar Consultants Ltd., Structural Engineers**, 77 Progress Avenue, Scarborough, 706, Ontario.



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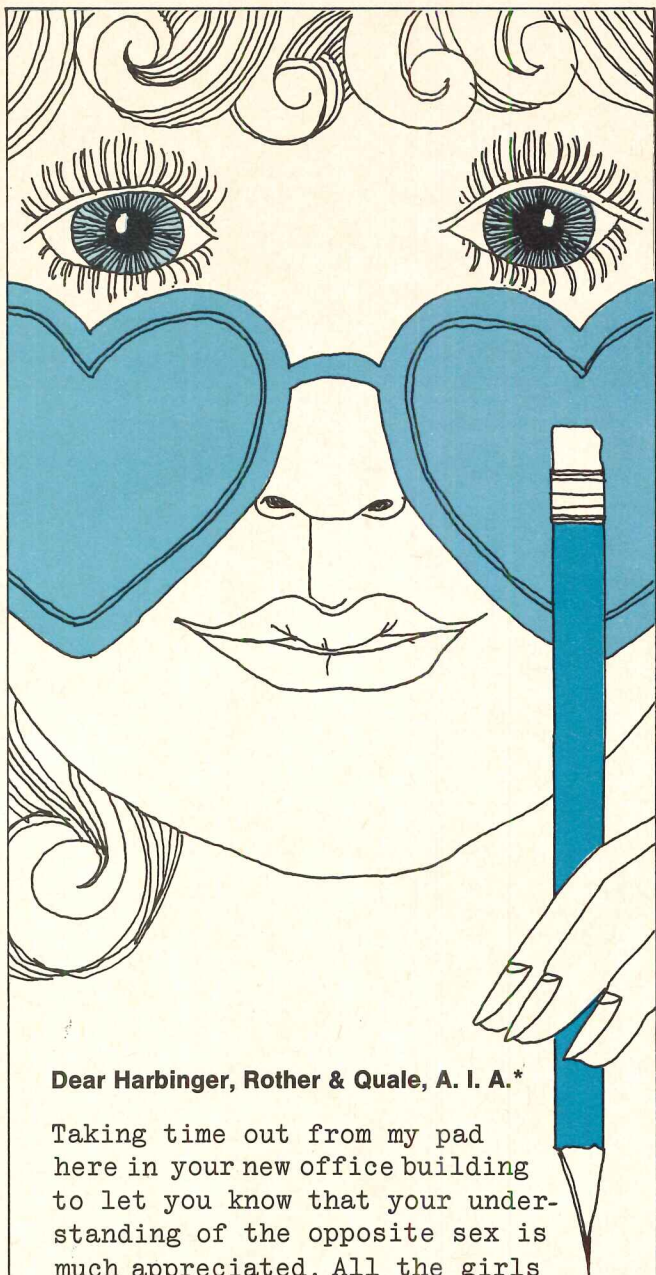
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\*(The names of the architects are fictitious. But the need is real).

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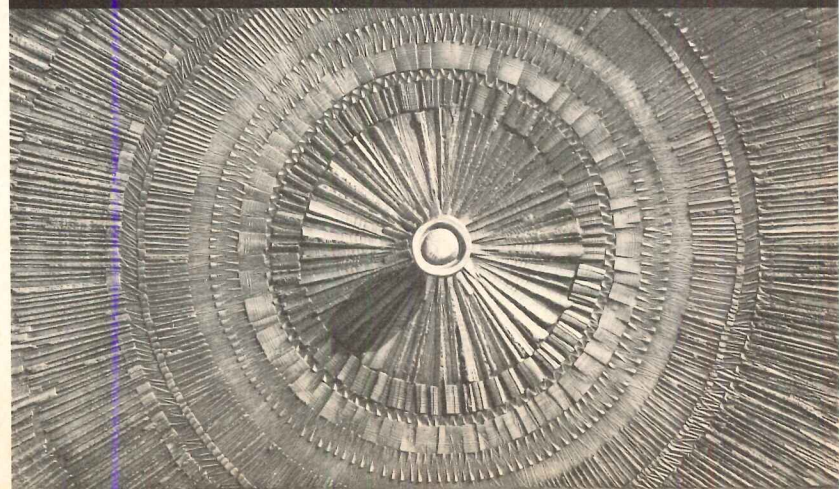
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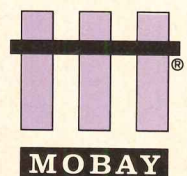
housing problem is in the development and use of new materials and methods. You probably can't work out all the answers alone; neither can we. But we are willing to share our know-how and show-how with any architect, major building contractor or building materials supplier who is interested in exploring the fascinating possibilities of rigid urethane foam—a structural engineering material that is self-insulating, self-supporting, fully load-bearing, easily fabricated and applied, inert, dimensionally stable and low in cost.

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## A CHAPEL FOR TUSKEGEE BY RUDOLPH

The recently completed chapel for Tuskegee Institute, a 2,000-student Negro college in Tuskegee, Alabama, may be Paul Rudolph's best work to date. Designed in collaboration with the firm of Fry and Welch (both black architects), it is an outstanding, original and remarkably effective religious building. It possesses the symbolic power of Le Corbusier's Ronchamp—acknowledged by Rudolph as a source—and is clearly influenced by Wright, especially inside. The ideas of Corbu and Wright, however, have been transformed by the architect's creative imagination to achieve a

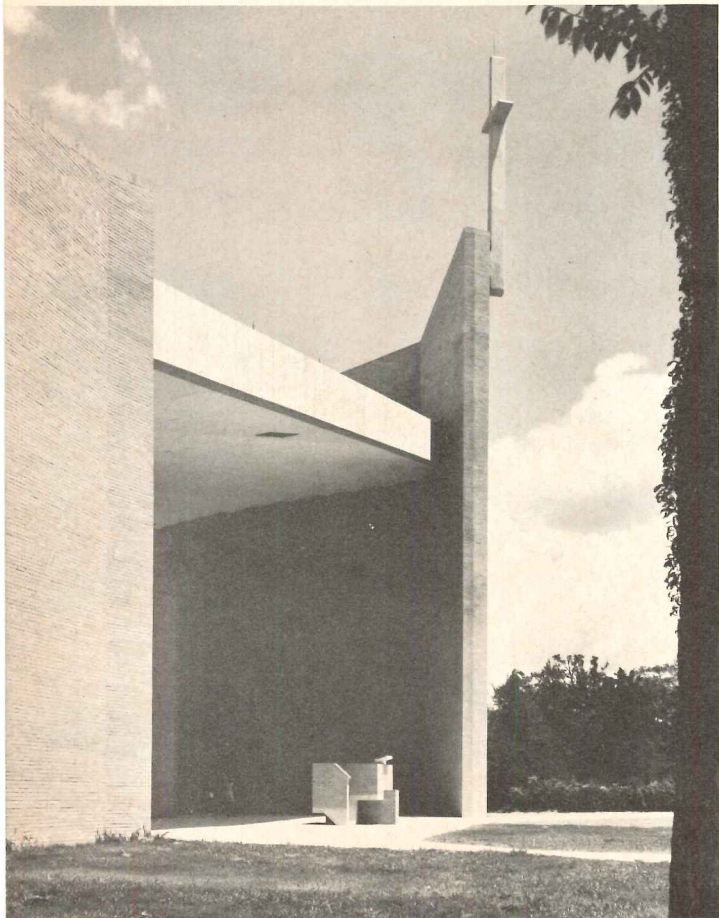
unique and highly personal work of art.

Because the Christian faith has been and will continue to be the major ideological force behind the founding and growth of this interdenominational school, and a major historical force behind the black man's struggle for equality in the United States, a strong sense of rightness made the administrators of Tuskegee wish to replace their old chapel, struck by lightning and burned to the ground in 1957, with the finest church they could afford by the best architect they could find. Unfortunately, because their fine new chapel has been built

for and by Negroes in the deep South, many observers will be tempted to see qualities in the church which evoke the Negro struggles in a literary way—to see the building, for example, as a walled, windowless fortress open only to the sky and sheltering its occupants from a hostile environment.

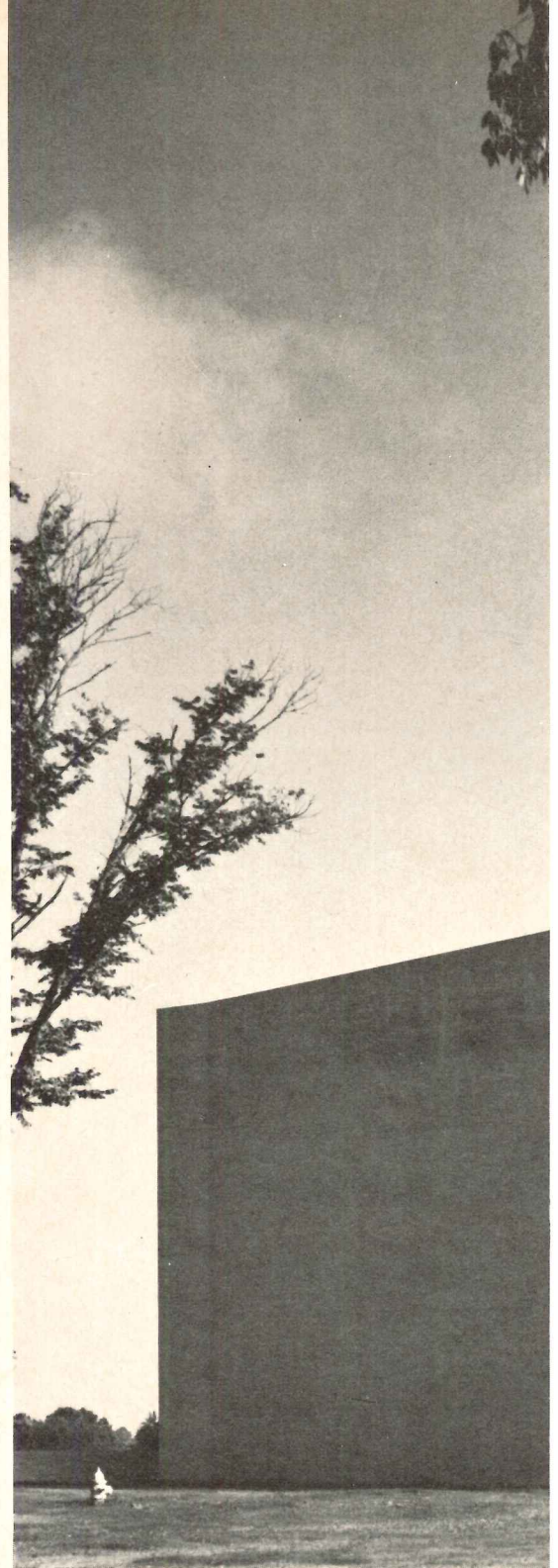
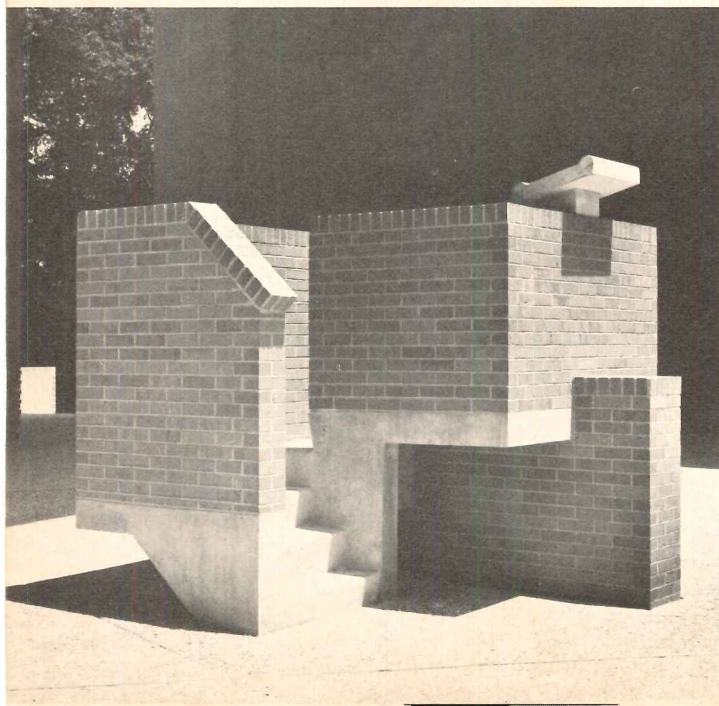
Such fantasies, while understandably comforting to some, miss the point. The highly abstract forms of the Tuskegee chapel are universal symbols, relevant to all Christians. Rudolph's chapel, given a similar site and program, would be as right for Harvard as for Tuskegee, and this is as it should be.

## TUSKEGEE CHAPEL

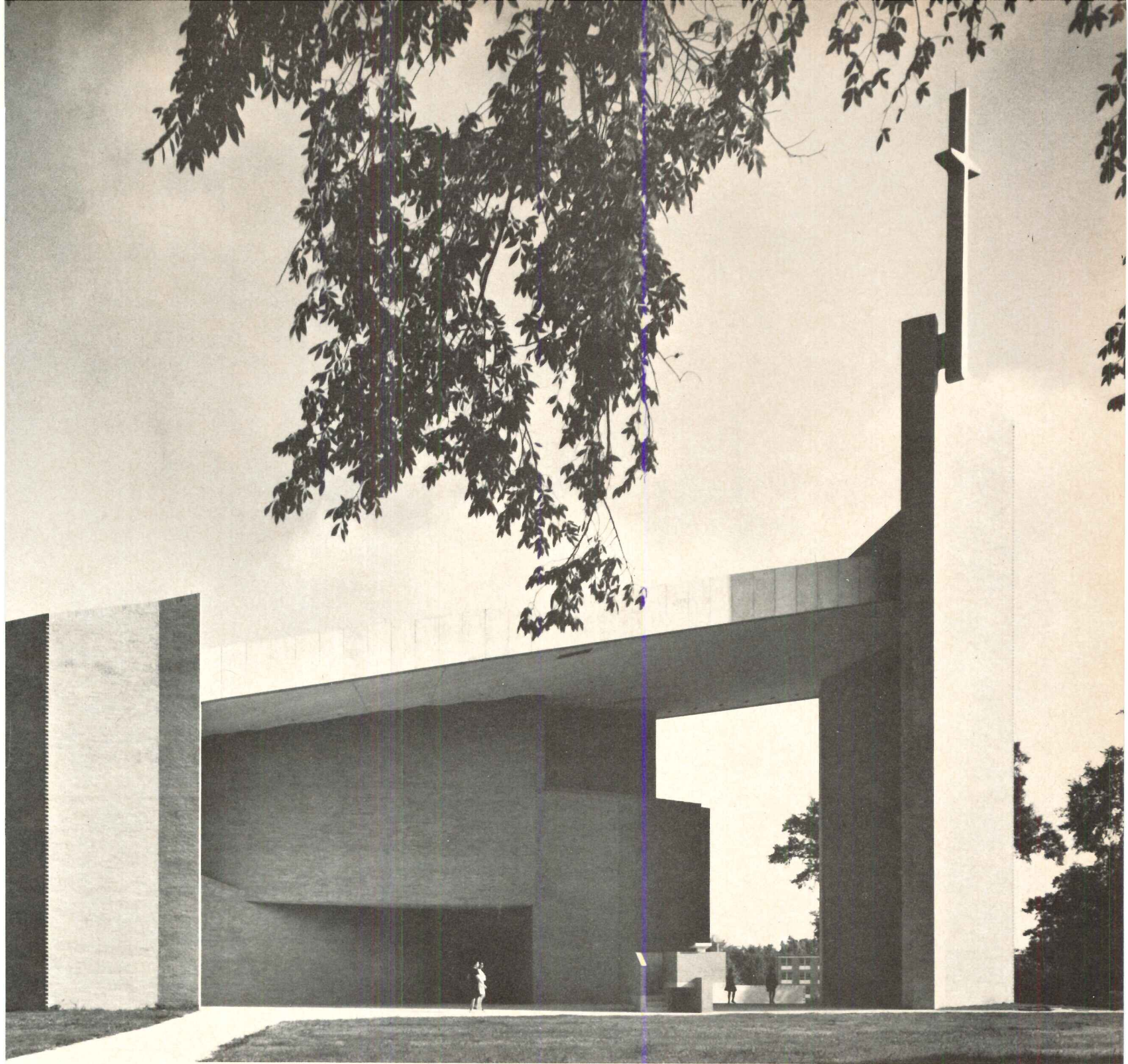


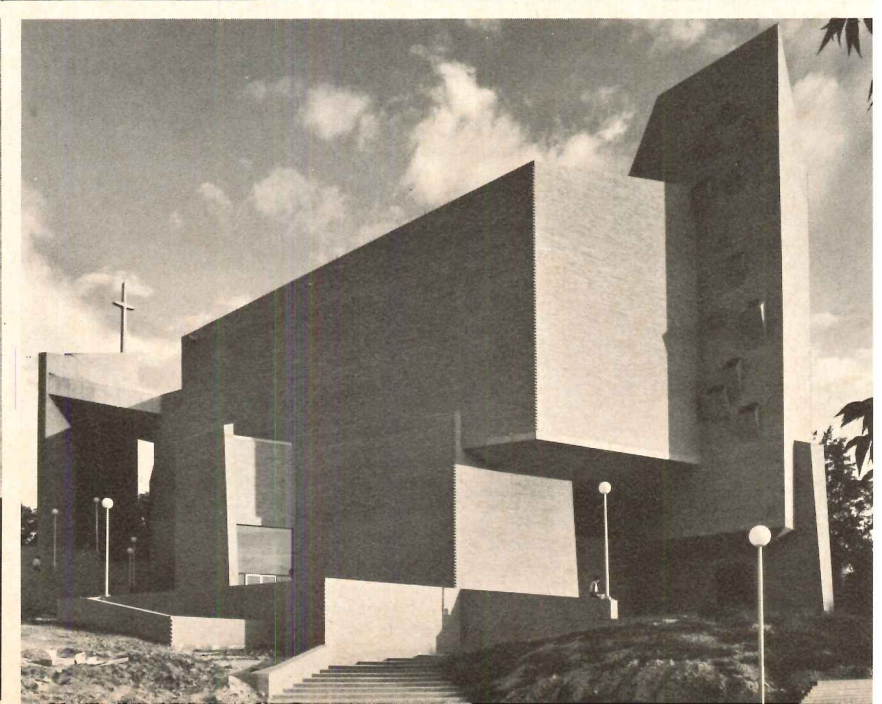
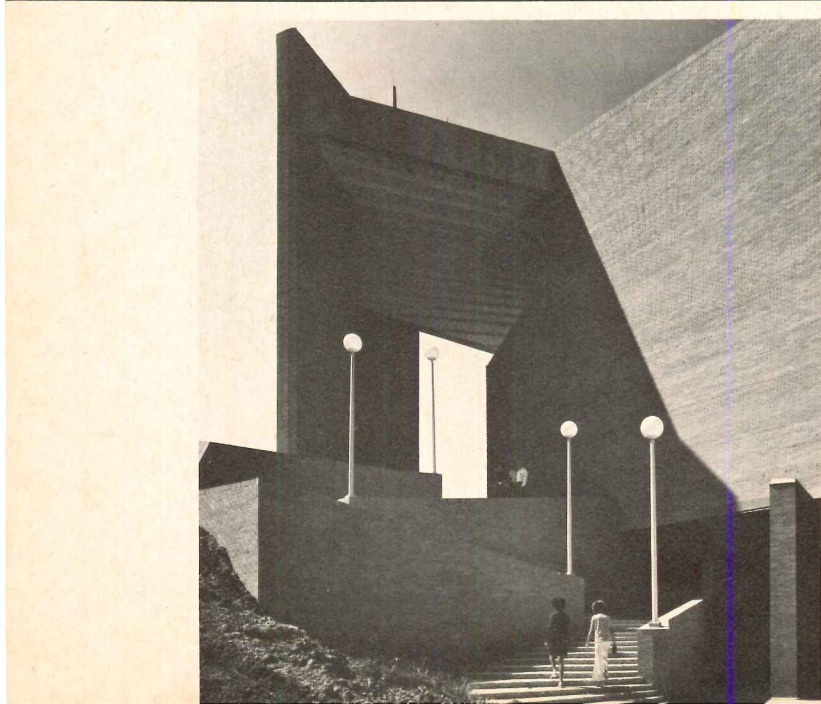
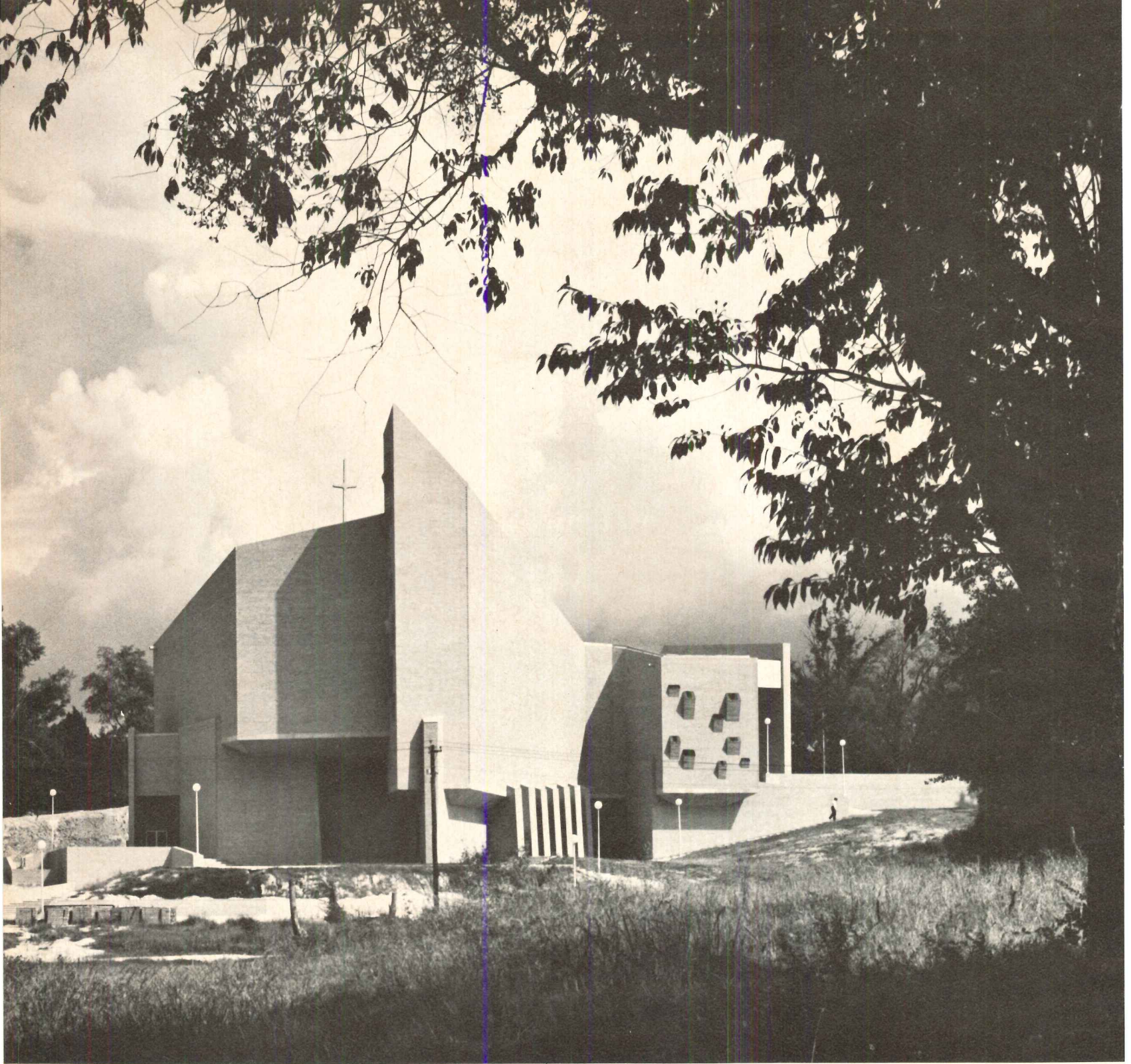
The chapel is the focal point of the campus and has been constructed near the site of the burned-down church it replaces. The photographs show the principal entrance located at the top of a broad ridge which runs through the center of the older part of the campus near the graves of Booker T. Washington and George W. Carver (the former the first principal and guiding force of the school, and the latter its first great scientist). This part of the school grounds still bears handsome traces of the original landscape plan by Frederick Law Olmsted, the first "advocacy planner" whose concern for the cause of Southern blacks began in his youth before the Civil War and continued throughout his career.

The roof of the chapel slopes boldly upward on its long axis, as at Ronchamp, and beneath its broad overhang the outdoor pulpit juts assertively forward in vertical space, just as it does on that famous French hilltop. The church was originally designed to have poured-in-place concrete walls supporting a hyperbolic paraboloid roof of open-web steel joists. To lower costs, the walls were redesigned as steel frames supporting brick cavity walls. The light-pink mechanically-produced brick lacks the character of the handmade bricks in the early Tuskegee buildings, which were molded by student bricklayers and fired in their own kilns, but it is as appropriate to the highly sophisticated building it sheathes as the handmade bricks are to the humbler structures which surround it.









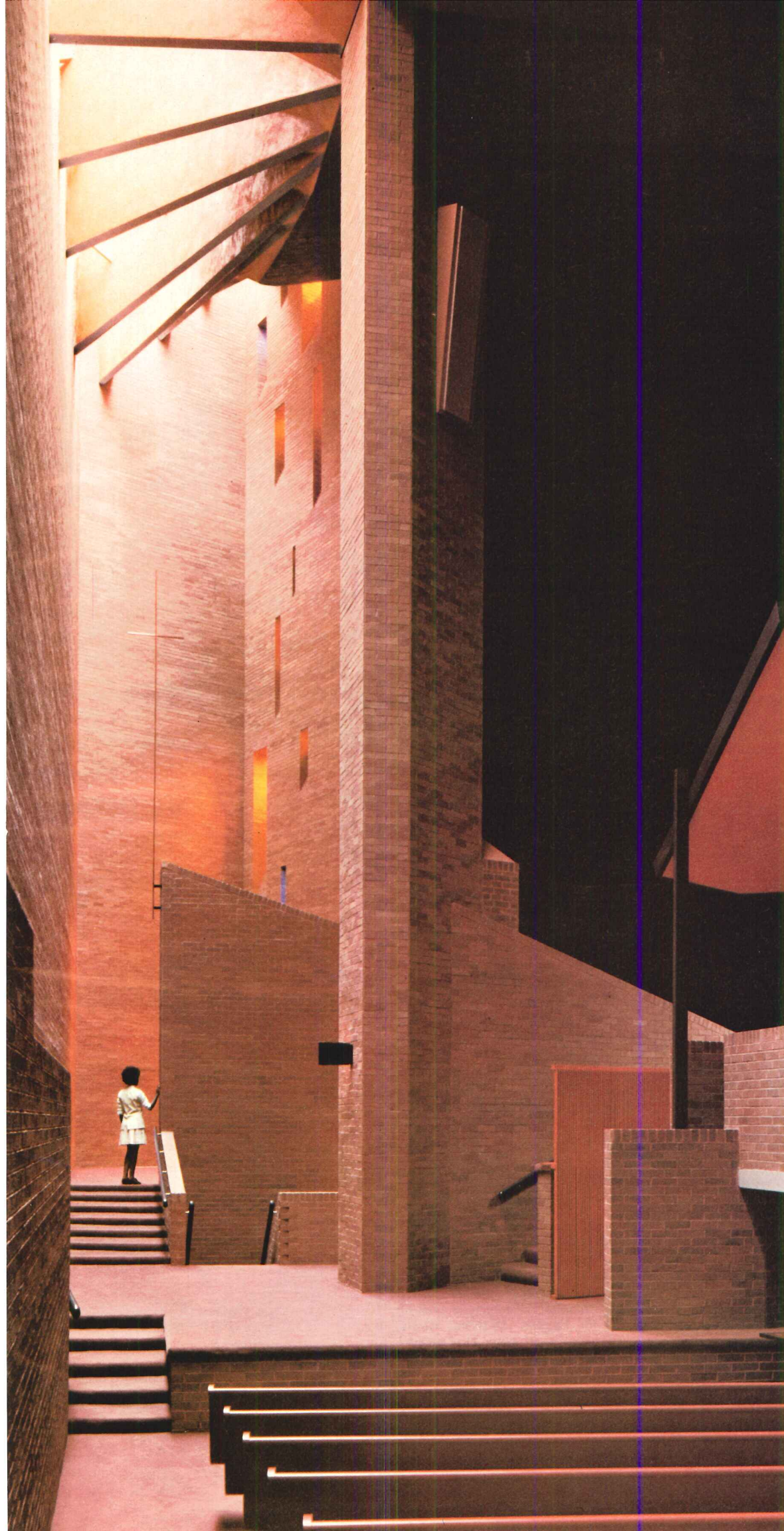
The interior of Tuskegee Chapel is one of the most dramatic and powerful religious spaces to be built in this century. It is worth a pilgrimage to the school to see. Proud alumni are returning in increasing numbers to marvel at it, proving that it meets the ultimate criterion of a space for worship—that it have the power to evoke a universal response, rather than one limited to the esthetically trained.

One approaches the interior from humble spaces—up the stair near the meditation chapel, or from the modest narthex—and suddenly enters a great asymmetrical room. The ceiling is marvelous—a great plane, curving in two directions, its warped surface formed by standard joists with straight bottom chords which appear to curve. The accordion-shaped plaster ceiling painted blue has been carefully engineered as a reflecting surface to enhance the acoustics. Air supply is equally distributed by means of brick-sheathed ducts on both sides of the chapel—handsome forms which complicate, yet enhance the interior space. Skylights parallel to the wall planes provide a mysterious and beautiful light.

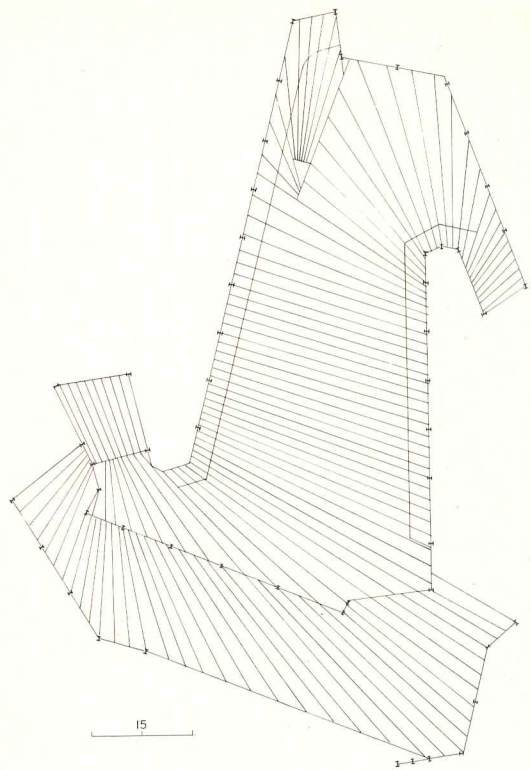
The influence of Wright upon Rudolph is quite clear in this great room, but the architect appears to have drawn upon and transformed other sources of inspiration, including—unconsciously perhaps—certain images from German Expressionist films.

The views at the far left are of the chancel, the lower photograph having been taken from the balcony. The chancel has been designed to emphasize the importance of the Tuskegee choir, and will eventually have an organ on the rear wall. The dominant position of the pulpit expresses the importance of the Word. A minister who has preached in this 1,100-seat chapel reports that from the pulpit it has a quality of intimacy and that the congregation seems near.

Beyond the steps in the photo at left is the meditation chapel, a tall, narrow room illuminated by skylights and through colored glass set in deep reveals high in the wall.



## TUSKEGEE CHAPEL



Le Corbusier said that the roof of Ronchamp was inspired by the shell of a crab which he found on a Long Island beach.

As the beautiful roof framing plan on the preceding page clearly shows, the spiral forms of the Tuskegee Chapel also appear to have been suggested by a creature of the sea. The rather less poetic diagram at the left and the early construction photos below show how this beautiful form was actually framed.

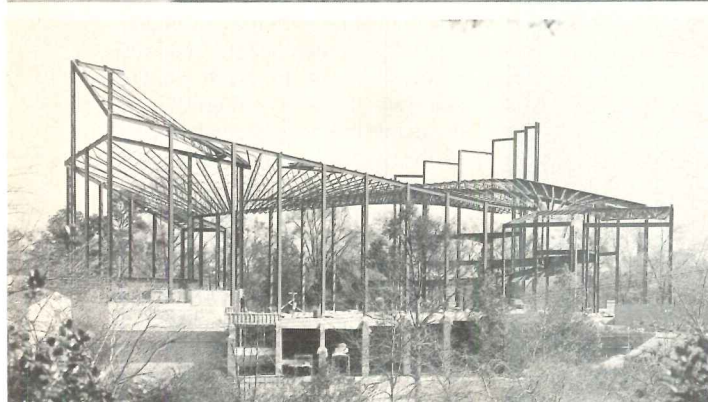
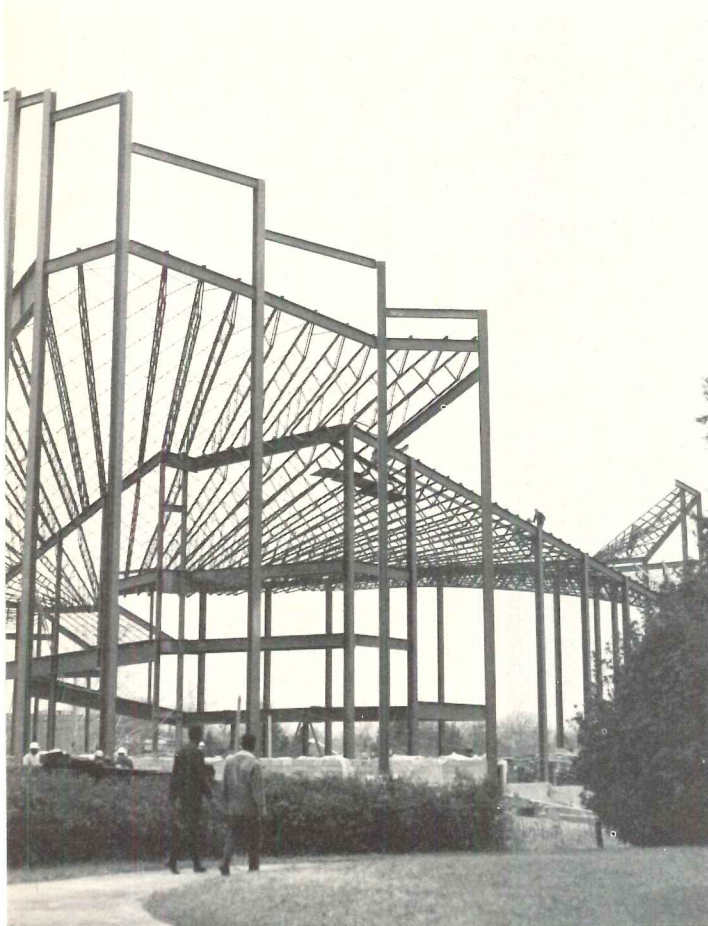
The structure is in some ways simpler and in other ways more complicated than it appears to be now that it is finished. The length of each open-web joist differs, and each slants at a slightly different angle to form the warped plane. There are 117 such members, not counting the slanting girders which carry them, and they weigh 71 tons. The columns also are of widely varying lengths.

The structure was complex enough to require much on-site measuring time by the fabricator to insure a minimum amount of field work. Since no two adjacent joists are parallel, temporary bridging was used for an initial line-up and permanent bridging custom fabricated and fit on the site. According to the American Institute of Steel Construction, the fabricator underestimated his engineering and drawing costs, overestimated fabrication costs and came out on target.

The top photo was taken from a position to the right of the great entrance porch and shows almost the entire roof including the final spiral rising to form the meditation chapel. The lower photo shows how the roof curves downward across the chancel toward the sacristy, and how it rises on one side and descends on the other as it approaches the narthex, the entrance vestibule and the main stair.

—Mildred F. Schmertz

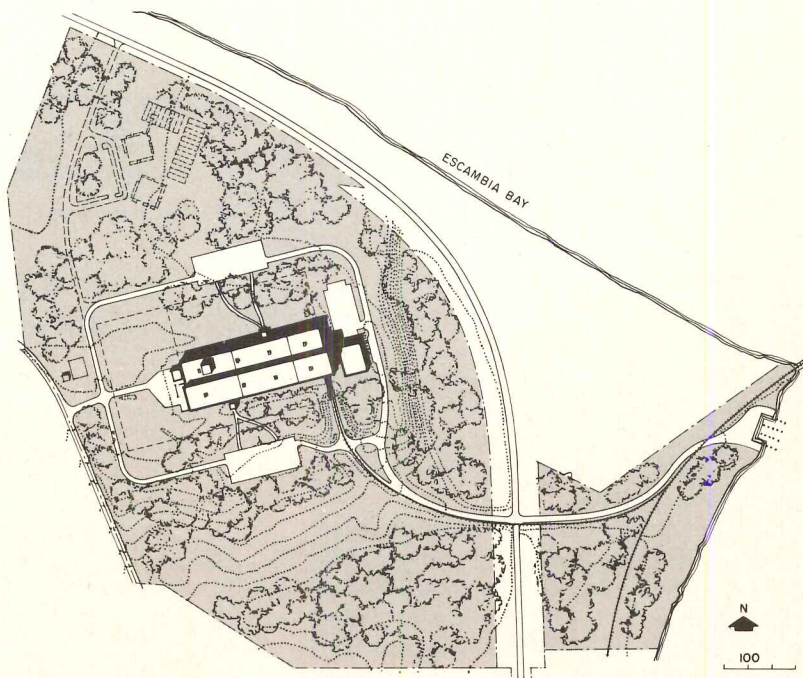
TUSKEGEE CHAPEL, Tuskegee Institute, Tuskegee, Alabama. Architects: *Fry & Welch, Architects & Planners*; associate architect (design phase): *Paul Rudolph*; architectural consultant for campus: *Moreland Griffith Smith*; structural engineer: *Donald J. Neubauer*; mechanical engineer: *A. Dee Counts*; electrical engineers: *Frank J. Sullivan Associates*; acoustical consultant: *Bolt Beranek and Newman*; contractors: *George B. H. Macomber Company* and *F. N. Thompson, Inc.*





Joseph W. Molitor photos

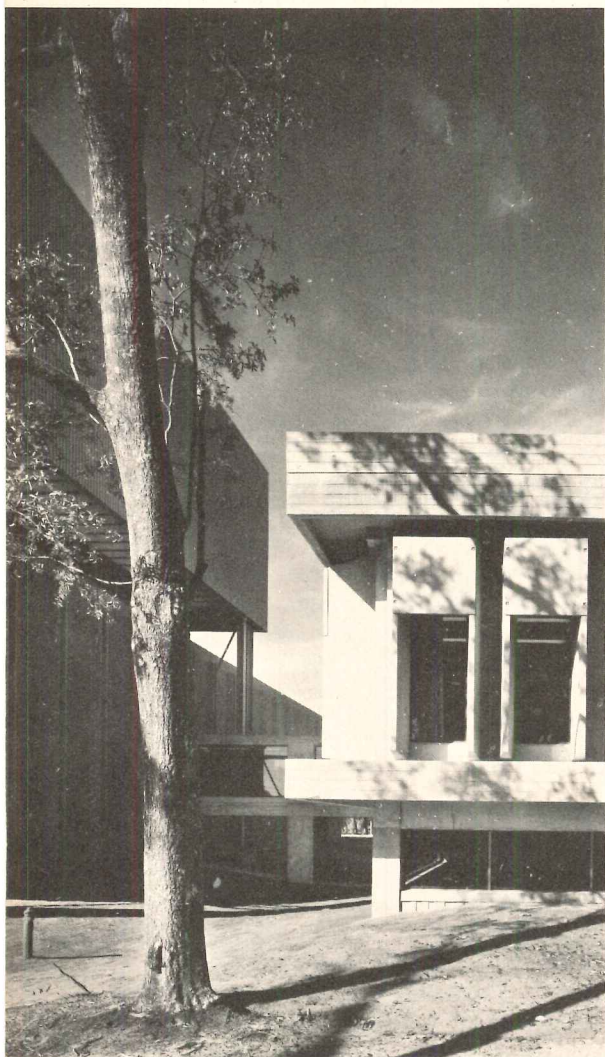
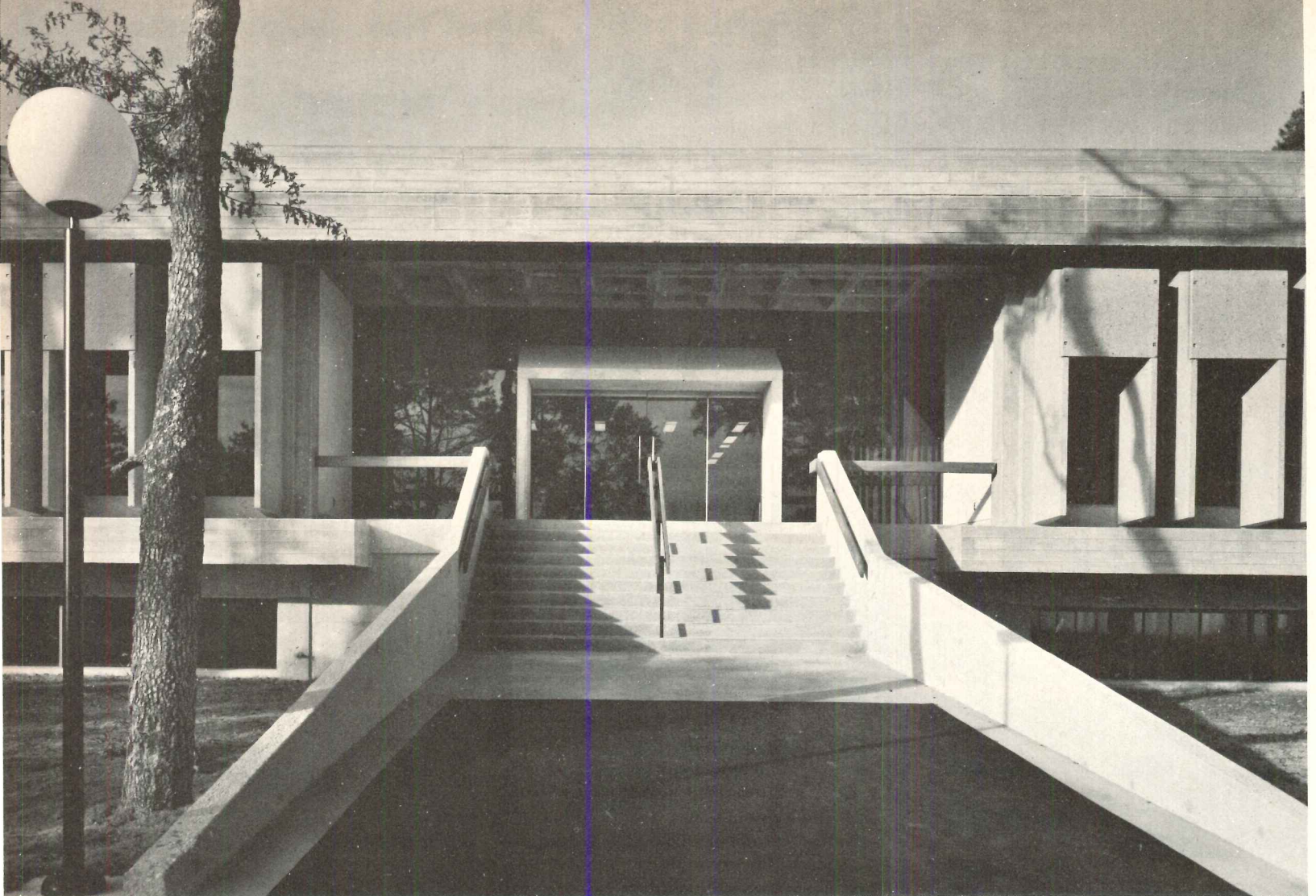
## UPGRADING INDUSTRIAL ARCHITECTURE WITH ACTIVE CLIENT SUPPORT



The site of this Westinghouse plant for manufacturing nuclear power-generating equipment is a wooded knoll overlooking Laura Point on Escambia Bay near Pensacola, Florida. Conventional approaches to industrial plant construction might have been to remove the trees and level the site as prelude to "efficient construction and operation." In this case, the client had taken steps at both corporate and "user division" levels to permit the full exercise of architectural approaches to facilities design. The trees and the knoll were saved; operating efficiency and expansibility were enhanced; construction costs and schedules were rigorously controlled; and those who work in the plant are staunch boosters of the design procedures that brought it into being.

### **Design Center's mission: to improve design quality**

Westinghouse President Donald C. Burnham established—some three years ago—the Westinghouse Design Center under E. W. Seay, director, with architect Eliot Noyes as consultant. The mission of the Design Center is to improve the design quality of all the physical properties and

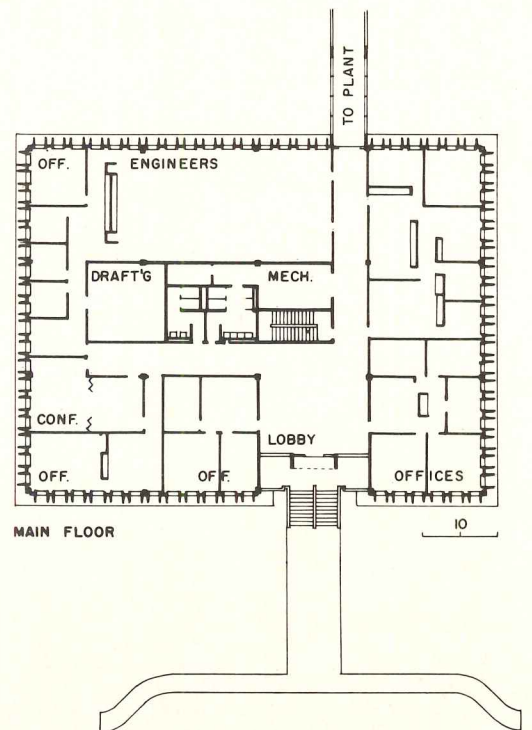


products of the corporation. The center operates three design departments: architectural (including interiors), industrial (for non-consumer products) and graphics. For the Laura Point plant, the center became a member of a three-unit task force, whose other members were assigned from the user division (for programing) and the corporate headquarters works engineers (for operations and finance). This task force then acted as the corporate client, with the Design Center retaining a role in selecting the architects and reviewing design proposals.

**Architects can provide full scope of services**

With this kind of corporate focus and backing, architects Ferendino/Grafton/Pancoast were able to further the design objectives of the Center and respond to all interests of the task force in providing full services for architectural, engineering, interior and landscape design.

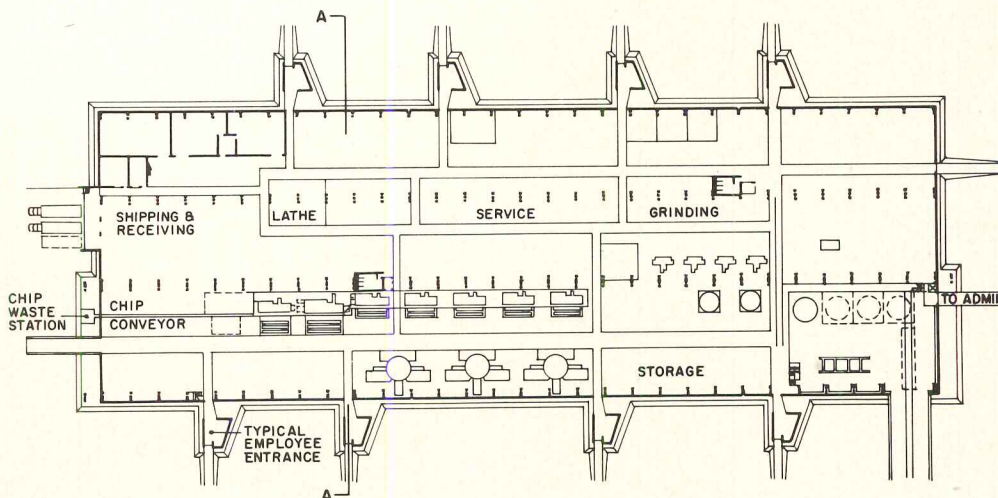
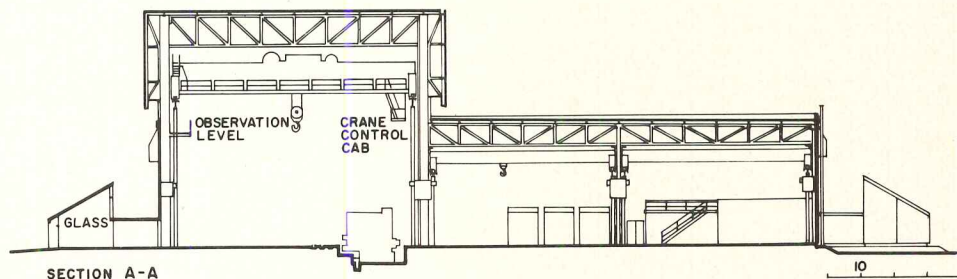
By developing a two-level administration building on the higher level of the knoll overlooking the bay, the architects were able to retain a sense of scale which was not overwhelmed by the high-bay massing of the plant itself (which was set at a somewhat lower level). The upper level of the administration building takes advantage of the over-bay view with generous use of glass protected from the sun by precast shadow boxes (as well as by the trees). These trees also provide shade and visual comfort to employ entrances and dining areas





which are set out along the perimeter of the plant.

The architects underscore the fact that the upgrading of quality at Laura Point was achieved without increase in cost or loss of time—and was made possible by a combination of two conditions. First was the ability of the task force to work closely with the architects during program and design development. Second was the consequent ability of the architects to schedule construction and purchase of materials, including steel, in advance of final phases of design. The sand-blasted precast panels, for example, could be scheduled without delay and provided an appropriate texture for this Florida site at no increase in cost over the lightweight panels to which plant personnel were accustomed. The working arrangement reduced design and development time by permitting day-by-day decisions so that, for example, foundations could be poured prior to the completion of superstructure drawings. The time lapse from initial conferences with the Design Center to completion of the project was less than nine months—despite special structural problems (involving vibration control) and the unusual requirement for year-round temperature control throughout the plant.



LAURA POINT OPERATIONS, Pensacola, Florida. Owner: Atomic Equipment Division, Westinghouse Electric Corporation. Architects and engineers: Ferendino/Grafton/Pancoast; contractors: J. A. Jones Construction Company Inc.



In context with the plea for visual quality, the Laura Point interiors also reflect a requirement for maximum flexibility in anticipation of future expansion. The flexibility requirement was met in part by systems of folding partitions in the conference and meeting areas. Further, the pan-formed concrete ceiling provided opportunities for varied treatment and modular movement of partitions. The bridge from the administration to the manufacturing areas carries a moderate display of Westinghouse products. The plant area itself is brightened by disciplined use of color not only for decoration but also for the color coding of various utilities and special work areas.



# 8 VACATION HOUSES

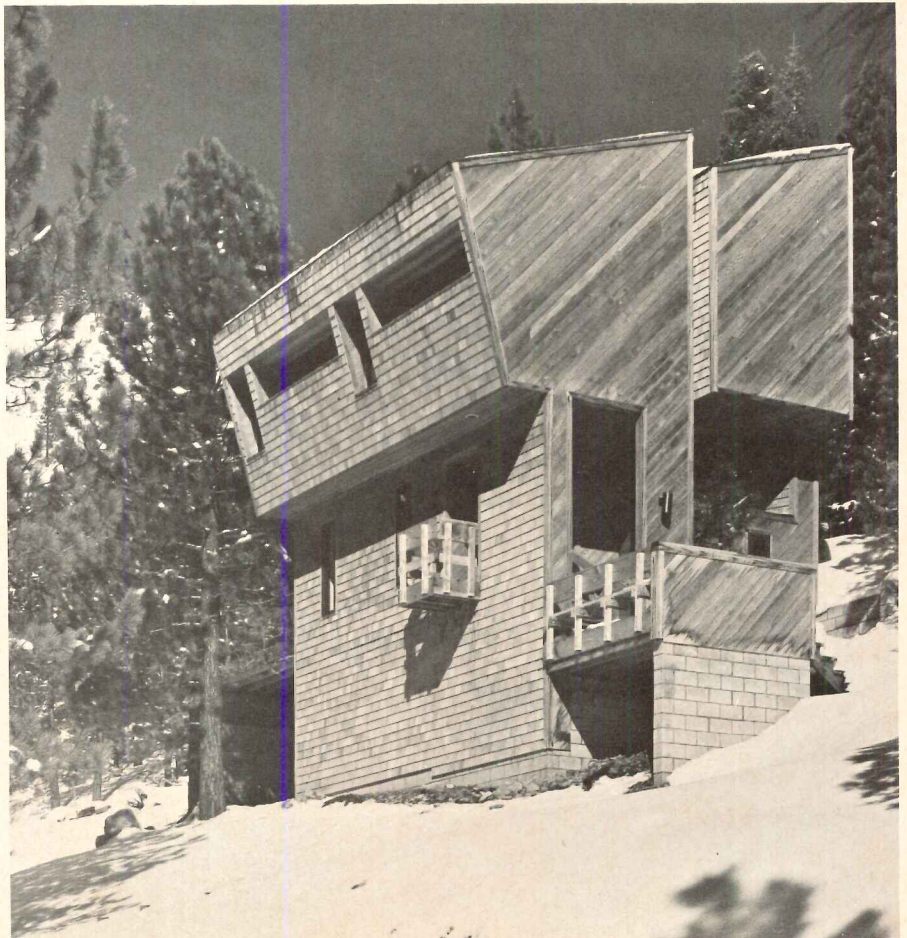
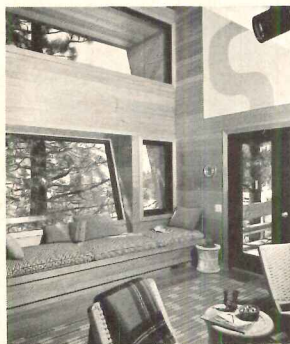
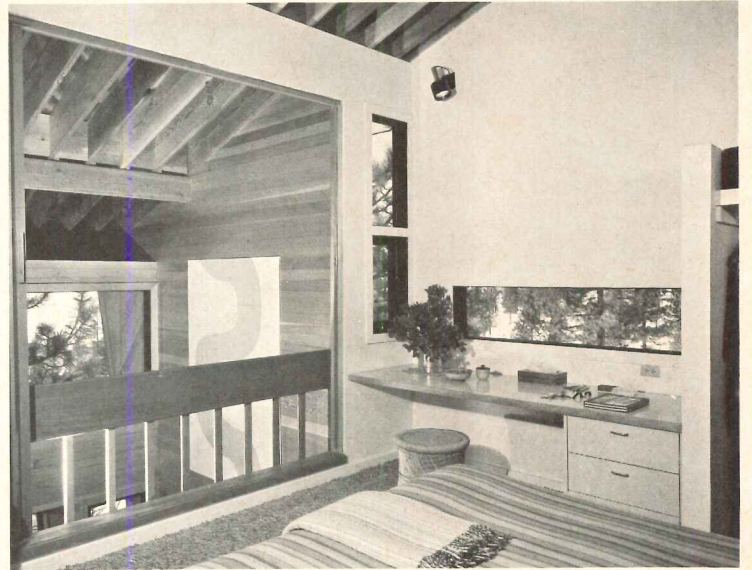
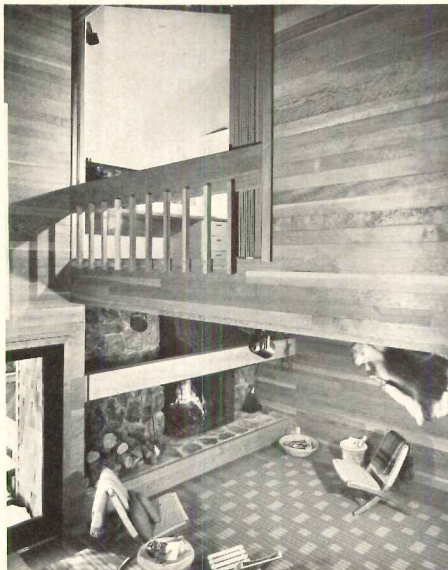
With interest and activity in second houses of all types continuing at a strong pace, the following pages present eight very interesting examples. All provide for the needed amenities and easy life for vacation living—whether for a ski resort or a beach house. And all present some fresh thinking in the design of forms and spaces appropriate to its particular location. The range of locale from the state of Washington to Florida also helps focus on some interesting stylistic and regional variations on the use of wood for houses that are fun to relax in.

## 1

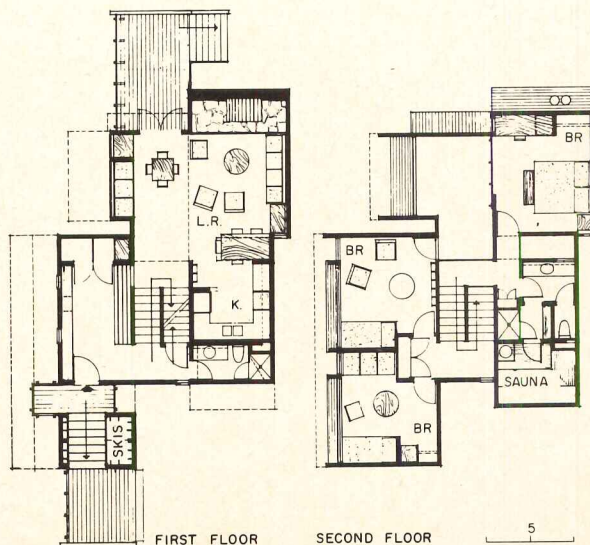
Designed expressly for the snow conditions of ski country, this family lodge derives its strong shape from an outward slope of the upper walls, which is planned to prevent ice dams and allow run-off from melting snows to fall clear of the house. View decks are provided at various levels and double as entrances in exceptionally deep snows.

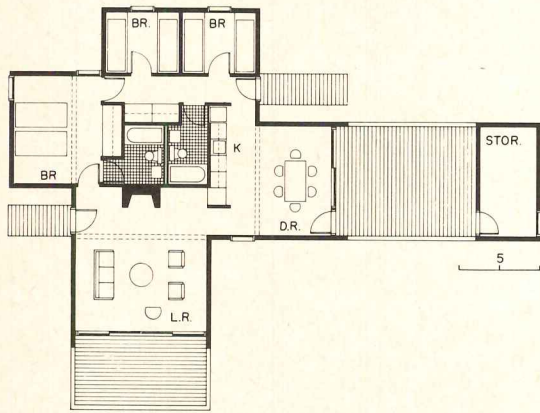
The plan is a multi-level scheme, with a variety of inter-related spaces: some are low-ceilinged, snug areas; others are two stories in height and overlooked by balcony rooms. All the interiors are comfortable, bright and easy to maintain. Much of the furniture is built in. The cost of the house was about \$41,000.

Residence for Dr. and Mrs. Sanford H. Lazar, Squaw Valley, California.  
Architect: *Gerald Gamliel Weisbach*; contractor: *Earl Kelley*.



*Douglas Simmonds photos*





## 2

A successful combination of shed roofs and a practical, uncluttered plan accounts for the great strength of this Long Island beach house for a family of four. Major rooms are organized around a central utility core

and circulation to achieve considerable economy, as well as the separation of children and adult areas which the owners required. Clerestories add light and spaciousness, and hallways are opened up to extend vistas beyond the house. Decks further expand living space, and a detached unit, used for storage, baffles

one of these for private outdoor use. Exterior walls are plywood; wallboard is used inside. These practical materials, plus the varied spaces, contribute to make this house a perfect complement to city living.

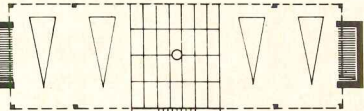
Vacation house in Quogue, New York. Architect: *Hobart D. Betts*; contractor: *Rampasture Building Company*.



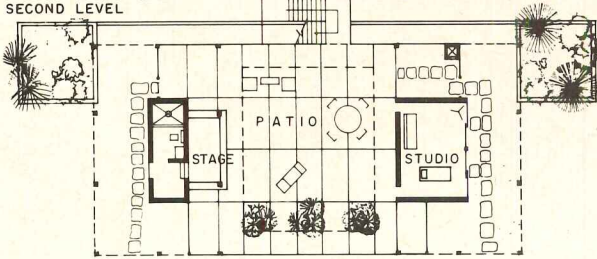
William Maris photos, by courtesy of House and Garden



FIRST LEVEL



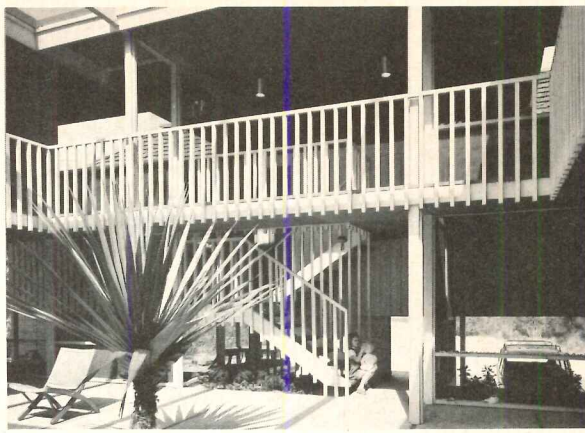
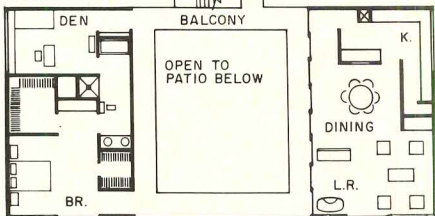
SECOND LEVEL



THIRD LEVEL



FOURTH LEVEL



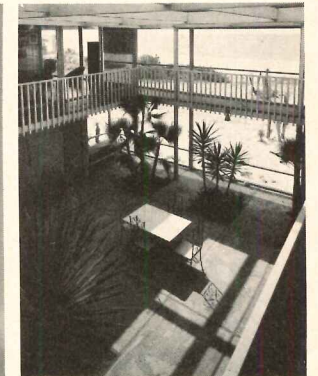
### 3

Exposure onto the Gulf of Mexico has the advantage of a splendid view and the drawback of possible hurricane tides. This delightful Florida beach house is specifically designed for both these

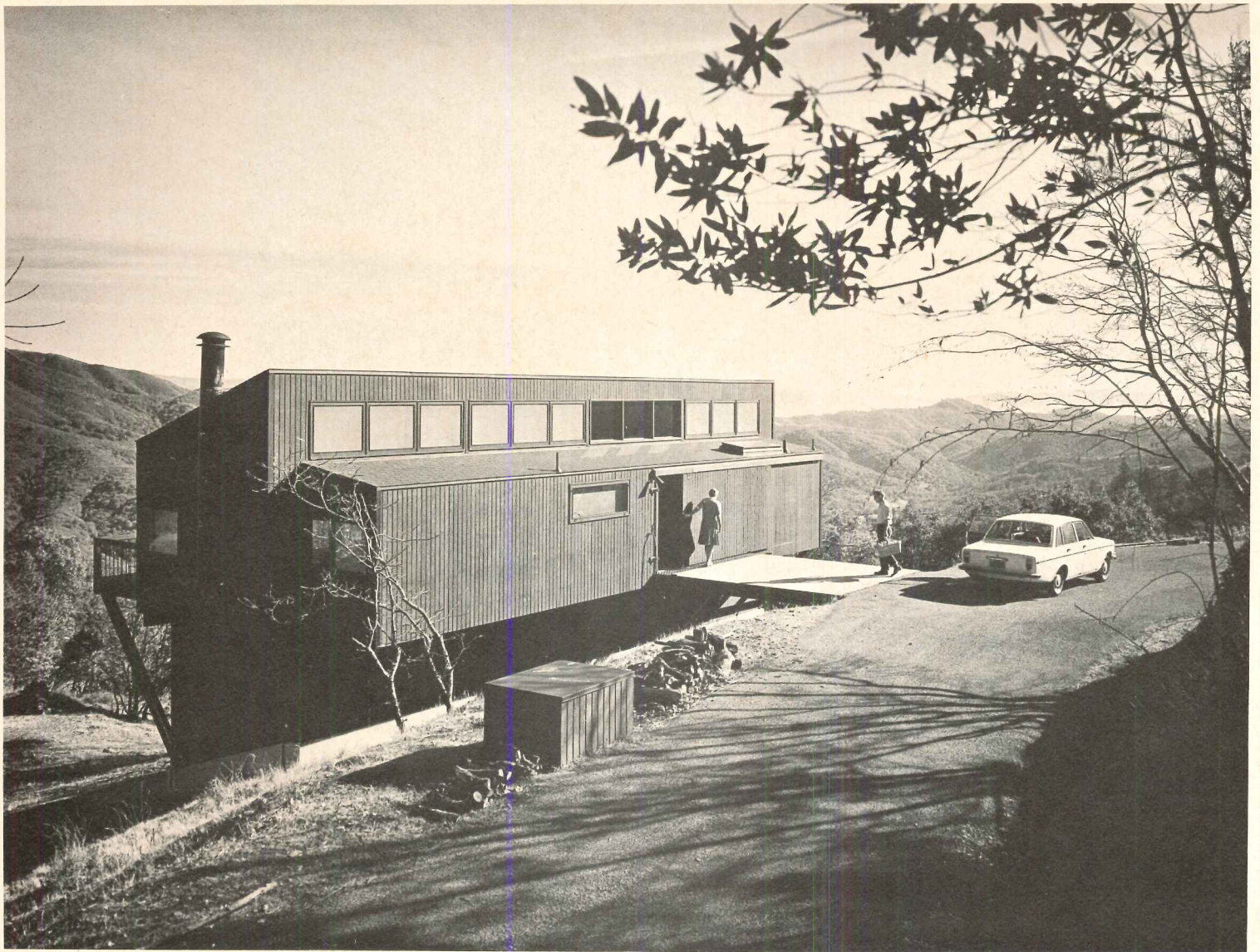
conditions and for the owners' somewhat unusual requirements—among them, a den, children's play-stage and an artist's studio. The plan makes use of a natural sand dune and separates children from adult areas. Spaces include two-story patio and surrounding balcony pictured here, each overlooking the beach and

gulf. Upper levels are stained cypress; ground levels are concrete block. The house cost \$50,000 including zoned air conditioning, and is for year-round use.

Residence for Dr. and Mrs. Richard A. Vinton, Sarasota, Florida. Architect: J. West; contractor: Cosentino Construction Company, Inc.



G. Wade Swicord photos



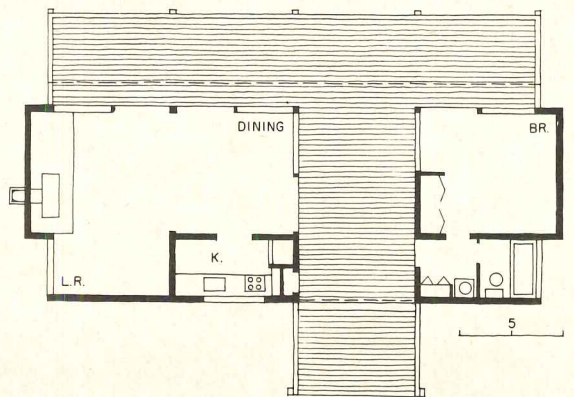
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This unusual house was built for a college professor and his wife as a weekend retreat for study and the quiet enjoyment of natural surroundings in California's Napa Hills. The architects' solution largely blanks the

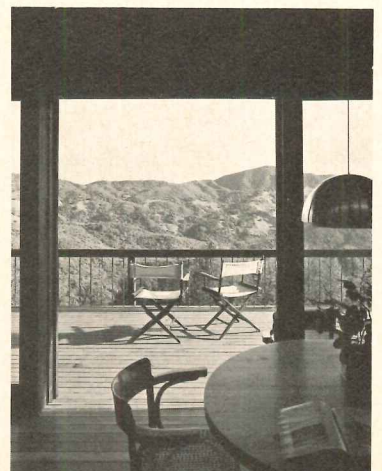
front to provide the seclusion wanted, and opens the back with glass and a full-length deck to exploit the potential of the site and view. The structure, simply shaped as it is, can be totally closed by a sliding door in front, and by panels sliding up from under the deck in back, making the house worry-free

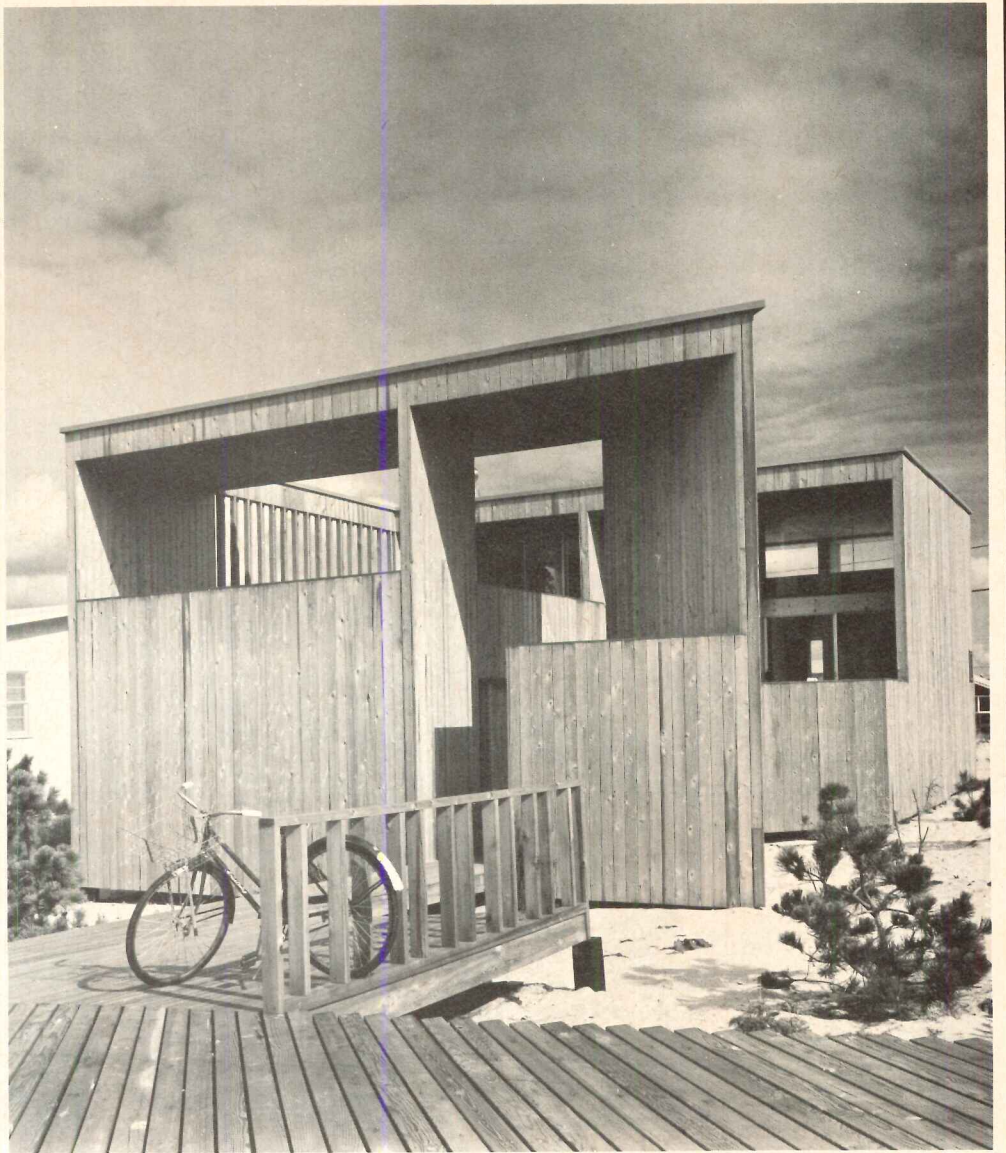
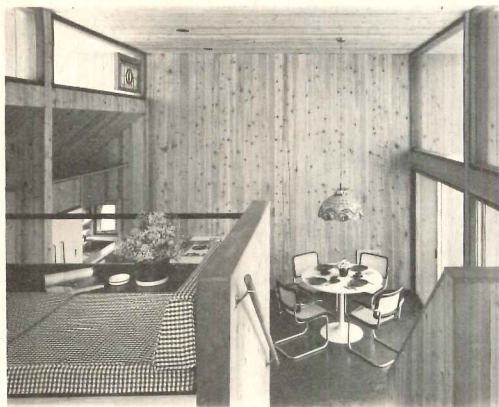
when the owners are away. The use of shed roofs and cantilevering, and exposed beams and plank ceilings, contributed to its reasonable \$20,000 cost.

Residence for Dr. and Mrs. Herwin Schaefer, Napa Hills, California. Architects: *Marquis and Stoller—Pete Kampf, associate*; contractor: *Vienop Builders*.



Joshua Freiwald photos





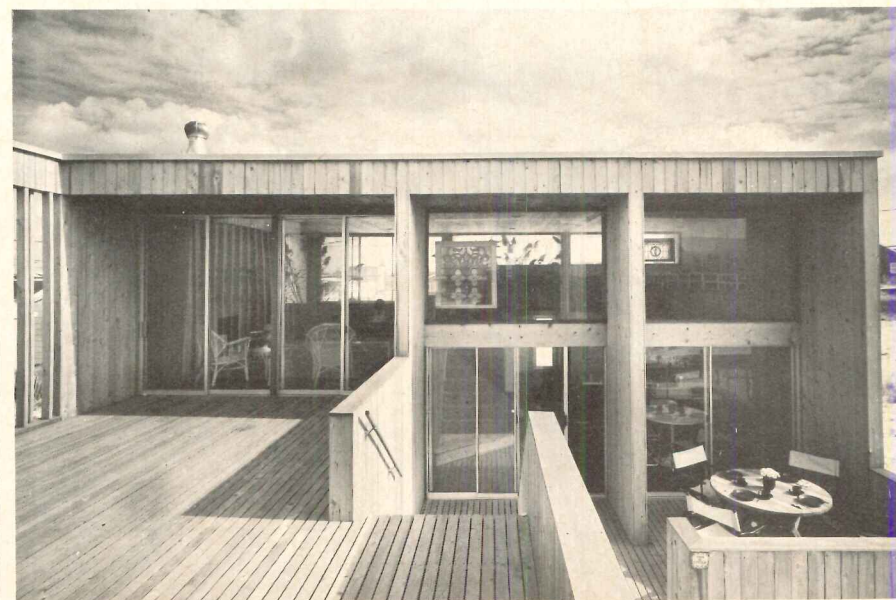
# 5

This inventive little house for a young family was designed for a 65- by 85-foot, hemmed-in lot. Instead of relying on the site, the house creates its own vacation environment, with many, but controlled,

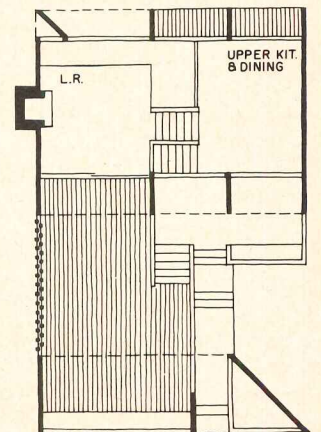
links to the outside. Changes in level, and glimpses which can be had through and beyond them, account in large part for the lively quality of the design. Use is made of a slight natural slope to step rooms up to a deck and living room balcony for a view of the ocean over neighboring roofs. Baffle

walls are placed to protect decks and exposed living areas while permitting the view. Exterior and interior are clad in natural cedar. The cost was \$28,000, excluding land and fees.

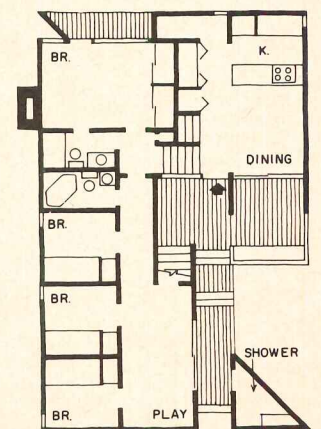
Residence for Mr. and Mrs. M. Chefetz, Fire Island, New York. Architects: *Smith & Munter*; contractor: *Joseph Chasas*.



Ben Schnall photos



UPPER LEVEL



LOWER LEVEL



6

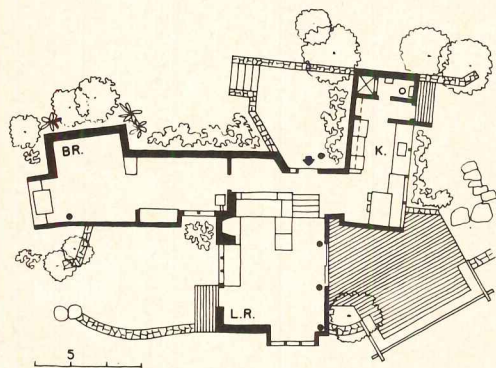
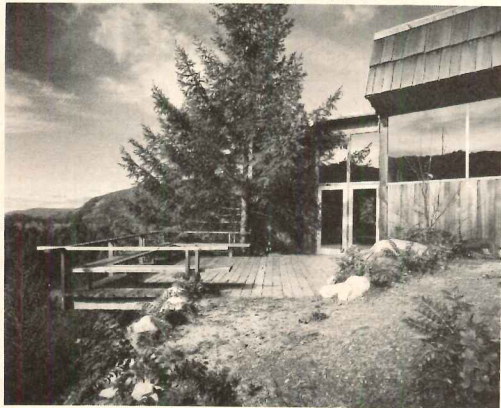
This rustic yet sophisticated mountain cabin near Mt. Rainier skillfully uses Douglas fir and stone available from the 40-acre tract. Architect Alan Liddle designed, constructed, and built the cabin over a

period of years for his own use. The materials blend well with the environment, making it an ideal weekend and vacation retreat.

Designed for a ledge halfway up a cliff, the cabin's scheme evolved from the terrain itself, with the living room the first stage, and two wings with kitchen and bedroom added

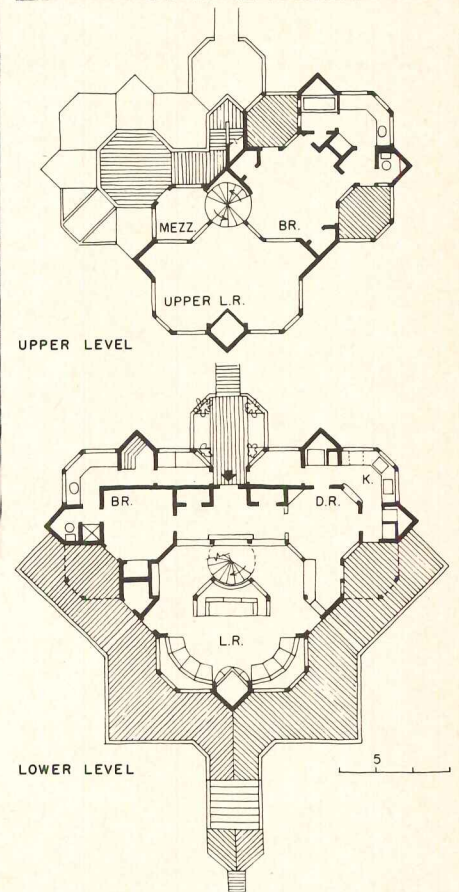
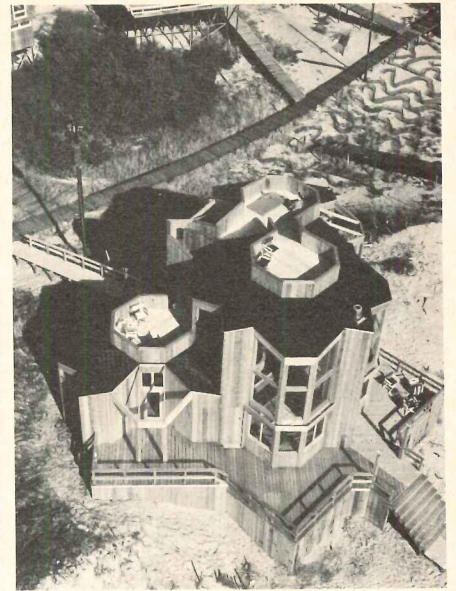
later. Finished cedar and hemlock paneling were used in the interiors. The entire cost was about \$5,000 (1,000 square feet at \$5 per square foot) with all construction done by the architect himself, including most built-in furnishings.

Mountain Cabin, Mt. Rainier, Washington. Architect and owner: Alan Liddle.



Charles R. Pearson photos





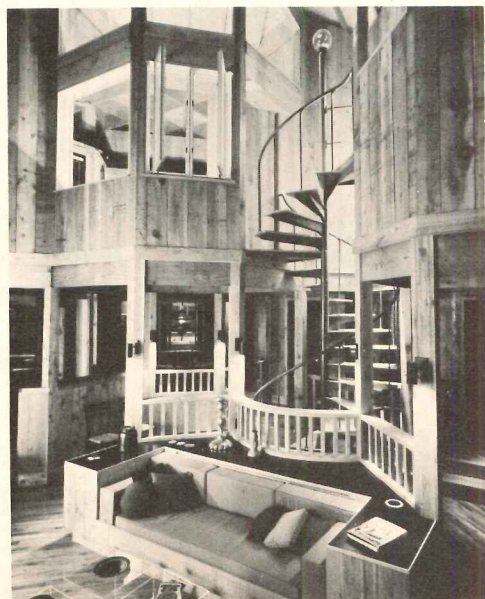
7

Great spaces and great views have made this beach house on Fire Island a luxurious yet fun place for a summer retreat. Only steps from the ocean, its two-story design of three interlocking octagons

provide wide vistas of both bay and ocean. A soaring 24-foot living room is the focal point, with all other rooms tucked neatly around it, including two bedrooms with adjoining baths, kitchen, separate dining room, sauna bath and card playing "aerie." Decks and lookout roof terraces are spacious for sunbathing.

For ease of upkeep, natural materials—Douglas fir and cedar siding—were used, painted surfaces were kept to a minimum, and most of the furniture built-in. Cost of construction was about \$42,000.

Residence for James Dines, Fire Island Pines, New York. Architect: Earl Burns Combs; contractor: Joseph Chasas.



Bill Helms photos



8

This trim, sophisticated house has an unusual staggered plan to provide both a maximum of privacy and good exposure to the morning sun. The house is not far from a beach, but the site itself is without

views and surrounded by other homes. A landscaped area was developed on the plot to give needed vistas for the sun-oriented rooms, and the sides of the house are windowless to assure privacy. An enclosed atrium adjoins all main living spaces.

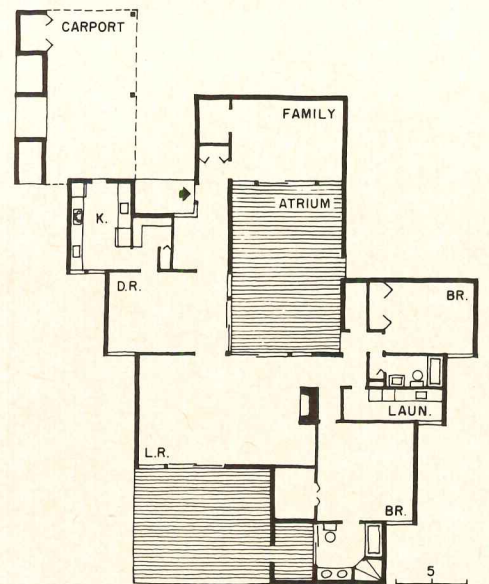
The framing is wood, with the exterior sheathed

in vertical cedar tongue-and-groove boards treated with bleaching oil. Built and equipped as a year-round second residence, the house itself cost about \$38,000.

Residence for Mr. and Mrs. Maurice Dion, Amagansett, New York. Architect: Peter Hendrickson; contractor: Ole Town Contracting.



James W. Brett photos





# IT'S NOT JUST THE CITIES

by Albert Mayer

## Part Three: Nodes on the national continuum: a rich tapestry of varied magnets

*Part Three of the continuing series by architect and planner Albert Mayer constitutes an overview of the alternatives to present trends Mr. Mayer believes could be designed toward a more humane future environment. It will be presented in two installments, with the second following next month. Below is an outline of the whole, with the sections covered in this month's installment shown in bold type.*

- 1 **The new planning: Some elements involved. Building-in the dynamic limitations, from the start. New areas: Scatteration, or sub-concentration.**
- 2 **New metropolitan areas based on a middle-sized city.**
- 3 **New towns and new cities. From scratch; or up from small settlements.**
- 4 **Galaxy of cities: the Regional City.**
- 5 **Cluster of small towns. One hour, say, from a middle-sized metropolis. More remote, with new central town. Multi-county set-up.**
- 6 **The small city or town: Freshly examined in the 20th century. With college or university. Diverse; multi-county again.**
- 7 Mini-nodes: Wide experience and nationwide sub-regional impact.
- 8 Poor people's cooperatives. Development mini-nodes. Ad hoc: or, powerful new directions?
- 9 States — Regions — Corridors based on range of nodes and adaptations.
- 10 Over-developed areas: "Residual" development.
- 11 "New" state or region: Arkansas as an example.

Part One of this series, "The National Continuum of Urgency and Opportunity," appeared in June 1969, pages 151-162; Part Two, "Megalopolis — Multiplying the Intolerable," in September 1969, pages 171-182.

I am a big-city man, a metropolitan man: by birth, and until a couple of decades ago, a devoted New Yorker. Now, a troubled New Yorker. With the unbridled technologies of construction engineering and of transportation, driven to accumulating excess by the anxiety of the city and region to keep growing, and by the impulse and freewheeling of speculative exploitation, the big city with its metropolitan area and possible megalopolitan extension becomes the monster overgrowth. What used to be real and unique advantages are often no longer advantages but tensions, for which better solutions are available. For instance, face-to-face contacts of the big city, which have been so highly prized, involve such an amount of arranging, time and stress in reaching, that such equivalent arrangements as the conference telephone between cities or intra-city save time and irritation with little loss of directness. And soon this will be enhanced by television devices into real face-to-faceness.

The long and lengthening journey to work, the time and effort to get out into the countryside or beach, the overcrowds there; the total regional overload—these are cumulative detriments: and, by contrast, constitute advantages in the new areas. These detriments are, of course, in addition to the basic deteriorations: the squalor of the slums, the accelerating deterioration, incipient and accelerating abandonment of former and present middle-class areas.

The purpose and outlook of this series are, indeed, to save the big cities and their regions, and to limit their inter-ooze by "residual" creative work, and by urgently addressing ourselves to counter-magnets, highly valid in themselves, and relieving pressures on the over-developed areas. Use of the expression "residual" work is not intended to apply to *scale*, which must still be great for some time, and needs to be fully creative. It applies to *intention*: the intention of energetically beginning to place main emphasis in other, newer, directions. In this process we create the varied nodes and node-clusters which will give the many choices known to be sought. In larger terms, these offer opportunity for the flowering of pluralism inherent in this country's ethos.

This article runs a gamut of nodes. The space

**"... to visualize and build in from the start... optimum ultimate limits as part of the initial creative energy..."**

devoted to each varies, but none is meant to be more than a brief sketch.

Later on in the series this will be followed by "generalizing sections", which further note and analyze over-all considerations and institutional problems and new handling which need to be observed and to be controlling in *all development*, and apply to all specific nodes.

Then, certain of the nodes will be more specifically developed, with sketches and designs.

Finally will be worked out architectural and environmental symbolism and symbols which are so important, as enabling one to identify with different kinds of environment and aspiration, and endowing them with deeply recognizable sublimations of their flavor and character. That is, they enhance the meaning of pluralism and of the differing nodes; and our contributions to them and from them, in a climactic way: giving the environment, as it were, a more penetrating voice.

### **1 The new planning: Some elements involved. Building-in the dynamic limitations, from the start. New areas: Scatteration, or sub-concentration.**

We have already noted some of the changes in habitual outlook and operations, and in our institutions, that are vital to adopt if we are not in the long and not-so-long run to create impossibilities not dissimilar to the ones we are in the midst of. As introduction to the rest of this section, note this again, as one that really deserves to be repeated separately, emphatically, as foreword to each of the nodes discussed:

The thing is not only to start on a massive scale the important alternatives for 20th-21st century living that this country offers or can be readily developed to offer. But, more difficult to visualize and begin to build in from the start are the optimum ultimate limits as part of the initial creative energy itself; of the élan, build-up of the start; of these new alternatives not later as an unpopular limitation, implying stagnation. That is the great problem and challenge. There is a proverb which goes either "In my beginning is my ending", or "In my ending is my beginning." Actually, both apply. It is a total organic thesis, in place of the endlessly multiplying.

The concept of birth control or family planning has been making important strides, has rightly enlisted vast and determined support. Its basis is the ultimate destructiveness of unlimited growth in the face of finite resources, as against the original now-outdated need of high birth rates to assure survival. It is fully as important, or indeed even more so, and should be less difficult to achieve, to apply this thinking effectively to the development of our environment and its living nodes or entities.

This means that planning needs new dimen-

sions. It has long since taken the first steps of providing, or at least demanding, the community and overhead elements, housing, transportation, etc., for a specific requirement predicted for a given year, say 1985 or 1990. But the over-all and wider impact must be taken account of: more total than our specific project assignment, as was discussed in connection with the upper limits of regional and mega-region carrying capacity and holo-zoning. A total planning outlook must be adopted and measures included to assure *ultimate bounds* as far as we humanly can so there will be limits to the presently unlimited upward curves. This is as important for our new galaxy of counter-magnets as for the already overdeveloped areas; to forestall *their* overdevelopment and decay.

One other introductory matter before turning loose on the list and descriptions of counter-magnets on the continuum:

In saying that we are going to recreate environment by and in new areas, new regions, we don't of course mean altogether new. Rather, we mean underdeveloped, sparsely populated areas. Nearly everywhere there are small settlements, villages, hamlets, towns. The new creators have got to make a basic decision. Are we to beef up every such settlement that seeks help? This could be excessively uneconomical in first cost, uneconomical to operate and uneconomical to give competitive services that will hold or attract people; possibly culturally inadequate even in our day of cultural diffusion. There has got to be a policy of sub-concentration and of selectivity; in short, we must prepare for hard decisions. In one proposed local Resource Conservation and Development Plan of the Department of Agriculture, one element for which help is requested is a community center for an existing urban settlement of 2,200 people. The request is for a meeting place for Town Board, Village Board, Garden Clubs, 4-H groups, firemen, fire-fighting equipment, etc. There is a basic question here: Can this size community justify and obtain the size and quality of what will satisfy the 20th century levels of expectation, or will it in any event lose population in competition? Also, should there be a joint center more or less central to a number of small communities? Should the policy be to consider whether such a community should be encouraged to continue; or, whether the larger area might justify a new town to which this and other little communities would be satellite and would find central nurture there for their needs?

I am raising such questions and alternates as these for two reasons. One is that scattered but substantial work is going on already, though of course not nearly enough; and that there is a sentimental temptation to beef up possibly obsolete situations just because they do exist, and thus add new money and vested interest to them. Second, we must think through policies on these secondary but major levels, so as to be fully prepared for the big push we hope

**"... Planning needs new dimensions... to assure ultimate bounds... so there will be limits to the presently unlimited upward curves..."**

to bring about. One might epitomize this section by saying: decentralization and scatteration; OR, decentralization and sub-centralization? Among the advantages of sub-centralization are road economy, minimum interference with farming and minimum despoilment of rural and forest land.

This is a critical set of considerations that must be worked out as criteria, and applied, if our policy of nodes-down-the-line is not to come to grief. On the other hand, tempering or modifying this, there is plenty of evidence and experience with respect to successful development in objectively not ideal locations, but due to special local human qualities and gifts: gumption, local dynamic leadership and imagination, persistence and resourcefulness.

The following are types of possible nodes in the continuum, each capable of absorbing a very substantial population in proportion to its size, because of the presence of such elements as: advantageous location, ample supply of still cheap land, availability of recreational land, cheap fuel and power, evidence of total competitive quality, local leadership and dynamism. Depending on the particular list-maker or classifier, additional or different types of node could be listed. In fact, I could myself add types. But there is enough to illustrate the principle and the opportunities. In most cases, specific illustrative examples are given, which happen to be best known to me. These are examples, and not unique or special situations. If they were unique or too special, and not essentially or attainably typical, they would probably be less entitled to be included here.

First, there is a description of nodes and node-clusters in the New Regions, dealing with them individually. Then, there is a summation of these, applying and adapting them to overdeveloped regions; and then fully flowered, into a New Region.

## 2

### New metropolitan areas based on a middle-sized city.

Why a middle-sized city, in preference to cities of three quarters of a million or more, with their correspondingly larger metropolitan areas? On the positive side, a community of 300,000 to 500,000 and a total metropolitan orbit of, say, 600,000 to a million, can encompass all the business, industrial, cultural enterprises that make for a stimulating life with levels of both intimate identification and of competitive challenge of scale and scope, with nature quickly accessible: or golf, even just at the end of the working day.

Beyond some such scale, one reaches a break into a higher level of public per capita expenditure—underground rapid transit, much more costly met-

ropolitan transit system (see Atlanta, discussed in the previous article), long distances for water supply, etc. In my book *The Urgent Future*, the city of Zurich (population 460,000) was presented in some detail, with its opera, concert hall, art galleries, art dealers, commercial and banking concentrations: the countryside 20 minutes away. Full exciting, not frenetic: a jeweled and humane ensemble.

Again, one concrete measure may epitomize the difference and choice as between the two kinds of metropolitan area. There is no doubt that to make the major metropolitan areas work, a form of automated transportation is going to be required. "Instead of the driver maneuvering the vehicle on the road and selecting the route to his own destination, the automated system carries out these functions. The driver only gives his destination; in other words, he becomes a passenger. Automated transportation will eventually make travel as easy as dialing a telephone number. . . . Automated guideways. . . . Guideway intersections serve only to switch the vehicles among the links of the network. . . ." \* At our proposed metropolitan level, you remain the driver, with your personal participation and responsibility retained. As you exceed this scale, you add one more step in your personal—or is it de-personalized?—automation.

Weighing this ensemble of factors that have been noted, you pay your money and you take your choice, I guess. At least we should make such choices possible.

Example: Little Rock—North Little Rock, Arkansas. Population about 200,000 in 1969.

Urgent. Why urgent, other than the over-all need for node-alternatives and counter-magnets to take pressure off the overloaded areas? In addition to certain advantages such as cheap natural gas, basic labor force, etc., there are these new plus factors: Through work by the Corps of Engineers, the Arkansas River is newly navigable and six barge lines already have operation certificates; a new major bridge over the river to be completed 1972; new interstate highway and circumferential. High pressure gas and oil pipe lines and a produce pipe line now serve the area; and of course an airport served by a number of lines. This can mean solid opportunity for considered and imaginative growth, with considered limits, the new 20th century ingredients being no longer those that were dominant in the 18th-19th century. But it always means land speculation (already under way here) and construction boom, unless development statesmanship intervenes and early land acquisition or land control can be arranged.

Land still available for new satellite towns: a minimum of two: Maumelle, to the west (ex-ordnance

**"There has got to be a policy of sub-concentration and selectivity: in short, we must prepare for hard decisions..."**

**"Decentralization and scatteration; OR, decentralization and sub-centralization?"**

\*THE FUTURE OF THE PARKING INDUSTRY, S. M. Breuning, Project TRANSPORT, M.I.T. Presented to Board of Directors, National Parking Association, May 25, 1969, Philadelphia.

"... a new and now feasible conception: Green Heart of the metropolitan area of the future... a 20th-21st century conception for the metropolitan area, a creative re-conception of Olmsted's central city parks..."

area), 6,000 acres; and the large military installation of Camp Joseph Robinson (some 12,000 acres) to the north. And there is White Oak Bayou, an open area of 3,000 acres, still not too sky-high in price, but already rising because it is at the terminus of the 1972 bridge. The area will surely be speculatively and spectacularly on its way before the bridge is completed. This will mean not only excessive cost of land, but unavailability in sufficient continuous area. If there is reasonably quick action, acquisition by state or county, this White Oak Bayou area can fulfill a new and now feasible conception: *Green Heart of the Metropolitan area of the future.*

Here we have a 20th-21st century Central Park conception for the metropolitan area, a creative re-conception of Olmsted's city central parks of the 19th and early 20th century. Rimming it, ecological and other research and educational institutions. And it can be a new kind of educational asset in a special new sense. It can provide full-size farming, biological, ecological and conservation experience and grasp to the children of all the surrounding school systems: not just visits but living there, working, planting, tending, belonging: a life experience. The future Little Rock Pulaski County Metropolitan area, and specifically this new kind of park-green-heart, are the subject of study by way of design, in a later installment.

In Little Rock itself, the new river port, a large industrial development area, the city's airport, are located in close and economical relation to each other, and not interfering with intra-city traffic. However, their scales are such that indefinite growth beyond a certain point will require expansion and relocation of some of these facilities: the usual upward syndrome of *perpetuum mobile*. As to the human leadership factor: In Little Rock there is a rather remarkable group called "Fifty for the Future", of thoughtful civic-oriented citizen leaders, each of whom contributes dues of \$2500 per year, toward various important studies and undertakings. Little Rock and Pulaski County have the usual supply of planning commissions, urban redevelopment commission, Housing Authority, etc.

With the favorable physical and resource situation, there is here an area that is full of potential, immediate, fairly immediate, and more ultimate. Together with the development groups mentioned, have we here the elements and possibly the will for active growth-with-limits and continuing enhancing excellence; or will it be the same slam-bang upward and outward affair? Of course, even given the will and state of mind, no one or group or groups are omniscient or prophetic. Pressures may for unexpected reasons become greater than anticipated. In that case, if the kind of thinking and new kind of ambition have taken hold that we are talking about, then the organic policy, obviously, is more new towns, after optimum mother-city size is within sight of being reached.

"Interchangeability of any place with almost any place else..."

### 3 New towns and new cities. From scratch; or up from small settlements.

These *could be* and *should be*, the crown jewels in national development of environment, but probably will not turn out to be. These two propositions will be discussed, and then: what viewpoints and ingredients would need to be injected to attain their glittering potential.

The skepticism may sound curmudgeonly from one who has been desperately urging them for a long, long time. For, in a way, "New Towns" and "New Cities" (also called new communities) have become the *in* thing. The 1968 legislation provided for substantial sums to be loaned on long term for acquisition of large areas of land and for the large initial investments (though of course in 1969 Congress in its actual appropriations riddled this full of holes). Prestigious committees have in 1968 and 1969 urged their creation on a very serious scale indeed, particularly the report by the National Committee on Urban Growth Policy, just issued. Over a score of towns are under way. But my considered opinion is that, with possibly a tiny number of exceptions, the results will not be a serious contribution to a brave new world. The name New Town as used mostly covers many kinds of enterprise other than a NEW TOWN.

Let us see briefly what we should be able to expect of a new town:

A fresh enterprise that can cleanly incorporate all we know in the 20th century of better ecological and social development and relations, fresh educational system, traffic safety: rather than more or less satisfactory patching and superimposing in existing cities.

Lower costs and maximum amenity due to new techniques and technologies, and cheap land.

Relatively self-contained for daily needs of living, sources of employment, shopping, with built-in recreation and with the surrounding green world near at hand.

Thus minimum daily need of cars and roads for commuting, and drastic shortening of journey to work.

Internal layout of land uses and of vehicular and pedestrian communication such that internal auto-mobiling is both minimized as to daily need and separated from pedestrian and cycle ways. Thus, maximizing safety, minimizing tension.

Cross-sectional ethnic, racial and income range both to effectuate the democratic thesis and to absorb normal city proportions, rather than draining off the middle and upper economic layers, as the suburbs do.

Within upper and lower approximations, planned limits on size, so that roads, utilities, community facilities can be provided of the proper scales,

avoiding the heavy costs and tense inconveniences of change, demolition, replacements and rebuilding, detours. In a dynamic society this will probably never be fully attained, and possibly not be desirable. But if this intent and thinking are among the high priorities, we will avoid the characteristic excessive rebuilding turmoil which is now a constant phenomenon of city living.

Under the presently active and contemplated mechanisms, some of these objectives will be attained among the better efforts; but the most essential ones, not. Why?

The characteristic current and contemplated mechanism is straight private enterprise—i.e., developers, some high-grade, some not so high-grade, but all drawn from the profit-maximizing sector. The better new communities will, of course, provide good land-use plans, thoroughly studied ingenious traffic solutions, good and imaginative local public and park spaces. In some cases, where the developer is sufficiently determined and resourceful, we will get industries, commercial headquarters, etc.

What we will not get:

Lowest attainable costs and rentals, because land profit is a major motivation. For this reason, and because subsidized public housing is anathema (in England the new towns have large amounts of it), there will be no cross-section of incomes to any substantial degree. Commuting in, for service workers and lower-paid industrial workers, will continue, as now. The leavening effect of a really urban cross-section will not be available. The private developer will, of course, obey the laws barring racial discrimination. But in part the economics just outlined will automatically diminish the numbers among minorities who can afford the rentals and costs. Also, the effort to overcome the well-known natural reluctance of minorities to move into a non-city-core area will not be high in his priorities of special attention. He cannot afford to wait it out.

Another important gap is this. Equating (even approximately) the number of jobs available locally, and the kinds of jobs, with the town's population, is a very, very tough assignment, to which only high-grade and resourceful men like James Rouse in Columbia and Robert Simon in Reston will devote the special emphasis and energy. Nor from the motivations of the normal developer is it particularly important—though from the total regional and road traffic viewpoint it is. From the point of view of the developer, who provides needed housing in a tight sellers' market, and probably better planning and amenity than the run-of-the-mine subdivider, he will do all right—jobs or no jobs. This is just what has happened in several completed "New Towns".

In the early days of the now 28 New Towns in Britain, industrialists were reluctant to move into New Towns. To meet this problem the Board of Trade (corresponds to U.S. Department of Commerce) refused licenses for the then scarce materials

(just after the war) except to those who *would* move into New Towns. But, once industrialists had the experience of the better conditions there, they have since on a voluntary basis *chosen* New Towns. There is now a remarkably good balance between people and jobs; minor commuting, and that to nearby towns, rather than to the metropolis. Office headquarters of major companies have been choosing them.

**A**s of now, we are very much on the wrong foot in New Towns policy and likely achievement, in the total sense for which they *could* have the potential.

What to do?

There are two measures that could convert this necessary program from one of negative or very partial or doubtful accomplishment into stirring achievement:

First, change the chosen instrument from the present normal profit-maximizing entrepreneur in favor of non-profit or limited dividend public interest groups and/or effective public development corporations such as our port authorities, both of which combine entrepreneurial drive with public interest. The British have used the development corporation throughout their successful program of New Towns. We have had good experience with the authority form here. And the public interest groups are increasingly and successfully handling very big operations. Particularly appropriate examples are the successful housing cooperative organizations such as the United Housing Foundation and the Foundation for Cooperative Housing. There are church-based groups, which are becoming more and more sophisticated, labor-union based groups, foundations. Besides the different motivations of these sectors of our system, they would not need the quick turnover of capital that the developer requires, could afford to have other priorities.

As to the question of achieving a rough equation between the New Town's employment and population, especially in the early stages, we will certainly not be able to apply the drastic means that the British Government did. Here, by unpleasant contrast, the Federal government does not in letting its large contracts even use the yardstick of whether housing, schools, etc. are available or realistically pledged or planned, whether there is positive application locally of laws on housing integration. No yardstick, no carrot-and-stick, so that the positive by-products of this potentially valuable tool are ignored, wasted. For instance, a huge \$200-million-plus atomic plant is being located adjacent to a village in Weston, Illinois (population 150), just not ready or organized or anxious to take measures to establish a community commensurate with the need. The Cape Kennedy space complex descended on Brevard County, Florida without appreciable preparation or local pledge to rationally deal with the prospect of a booming popula-

**"As of now, we are very much on the wrong foot in New Towns development and likely achievement..."**

**New towns and new cities "could be and should be the crown jewels in national development of environment, but probably will not turn out to be..."**

**"Consider as an especially favorable and seminal example small college or university towns..."**

tion that has, in fact, about sextupled in two decades. So: stupid, or tragic.

I hope it has been worthwhile to trace with some care these crucial questions and considerations, because we must first understand, and then get burned up about what may look like details, but are really the vital crux, if we are to get new values out of so marvelous a potential as that of new towns. Let's move fast, but in the right direction.

#### 4 Galaxy of cities: the Regional City.

This is an alternative to the metropolitan area living style, which can, however, command more or less equivalent sophisticated cultural, entertainment, recreational resources. With no single predominant metropolitan city or focus, this is a group of smaller cities, each of which retains, or attains, the day-to-day smaller-city social, political and physical-natural relationships; but by combining resources and purposes can command and afford a level which would be beyond the resources of any of these cities. A sort of eating your cake and having it, too.

Depending on the particular situation and configuration, there are two ways in which this kind of small city living style can be combined with the larger urban opportunities:

*The entertainment-cultural heart.* This would mean a central area, with possibly a not-too-wide greenbelt between it and the towns, both *qua* Greenbelt and for possible expansion. This heart would contain the art center, major library, theater and auditorium, hospital, night clubs, college and research facilities, perhaps stadium, and whatever else: scaled to, say, the several hundred thousand people living in the towns.

*An alternate is: no such one center.* The same level of upper scale and quality, but the same elements distributed among the constituent cities, one or several in each.

Both conceptions can be applied to either existing entities or *de novo*. The second could be particularly suitable to an existing situation where one town might already be particularly strong in one facility; say a hospital which could be enlarged, or which may be already serving the large area.

The idea of the regional city can be found originally in Clarence Stein's book *Toward New Towns for America* and in my book, *The Urgent Future*. It is illustrated there by reference to the Piedmont Crescent in North Carolina, and the Binghamton area in New York State. For that reason, and because we later cover a variation of this idea, applied to smaller towns, this is not further developed here. It is included because it is an important element in the continuum.

**"...accumulating counter-magnetic power... tending to keep people where they are... not yet attracting people in on any serious scale..."**

#### 5 Cluster of small towns. One hour, say, from a middle-sized metropolis. More remote, with new central town. Multi-county set-up.

This is, on smaller scale, thinking similar to the Regional City.

Opportunity: Planned growth of each town, each to develop different specific non-competitive facilities each of a scale adequate for the total population of the four towns presently 25,000 and ultimately some 50,000-100,000, thus absorbing substantially more than their share of the national load and achieving sizes more viable for services competitive with other kinds of nodes, and at the same time yielding a scale and quality of services which none could afford by itself. A State Park has just been voted by the State Government, located in the large core area, which will have regional-tourist as well as local functions and attractions. This major element would call for particularly penetrating planning study on what might be the optimum ultimate population. The fact that this group of towns is some 60-65 miles from the higher-echelon cultural and entertainment facilities of Memphis to the East (population 500,000) means that the tempo of life and opportunity is enhanced by this ready access. That is, the total local complex can have its own intimate-adequate character of urbanity, and close contact with open country and the grand park opportunities; and it can at the same time be readily accessible to the big city tempo.

The aim is *not* dormitory suburban relationship, because of the group's own common cultural facilities; and there are, increasingly, industrial employment opportunities locally as well as a technical college. The complex has or could have an enlarged industrial center, a community college, a hospital of a scale geared to total need, low-cost subsidized housing for local industrial workers, and workers in the new State Park, etc.

But again: dangers (already visible and some, indeed, upon us). The clover-leaf interchange has begun to acquire its rash of low-grade developments; the towns begin to thread or fringe in toward each other as they grow; and in particular, development ravel out toward and from West Memphis and Memphis; the State Park will bring along its fringe un-benefits, unless new local-state statesmanship crystallizes fast, and steps in. People of some vision and intentions have called meetings, engaged consultants; have special government, economic and other reports on their counties; have gone through many of the motions and sporadic questionings that one is familiar with, whose upshot may or may not be anything significant, whether in our full sense or not. A number of them have attended the state-wide planning development conferences that the Brookings Institution sets up. So, what? The opportunity is

still there, but decreasingly so. Interest is there, but not determination, yet. The head of one of the large industries now in the area, which is considering expansion, has been eager to see creative moves in development and community facilities particularly, and has also been eager to see creative moves in control. This may make the difference.

**T**he same sort of cluster of small towns, beyond the influence of a fairly accessible metropolis, might in some cases justify the creation of a new town as valid in itself, and as a central resource for the cluster: the large element and the smaller elements buttressing and validating each other. I have no adequate knowledge of this kind of situation over here, though I have found it referred to as one alternative being considered, in the 1968 Report of the Appalachian Commission, where smaller settlements are frequent, frequently command deep allegiance, and frequently, due to terrain and other reasons, are not themselves economically enlargable.

In Israel there has over the last 15 years been developed a new sub-region *de novo*. This is the Lachiesh area, where five village-clusters were developed, and the central mother town of Kiryat Gat established *de novo*, with now some 20,000 population, including industries, entertainment, cultural and upper education facilities. One doesn't see this as a wholly new operation over here. But the conception of a new sizable town being injected into an existing group of quite small settlements whose allegiance to their own continuing existence is a substantial human factor to be respected and made viable: This is a variation worth developing if there is an economic base, or if as in the case of Lachiesh it can be competitively developed.

**G**overnmental aspects do not constitute a major theme of our presentation at any point. But it is a truism that every level of local government, from the large metropolitan to the small town or settlement, requires new governmental conceptions and larger governmental entities or federations, for economy, effectiveness, more adequate services. In particular, national legislation in 1968, and the policy of HUD, have recognized the need in the case of small towns and counties, for combined and integrated planning. A good deal has been done along these lines with Federal 701 planning funds, in order to comply with requirements for development grants. In some cases this has injected life and vigor into a local and local-extended scene. But in most cases, plans are made and begin to gather dust, most citizens not being appreciably interested or aware.

It should, on the other hand, be one of the strengths of the smaller communities that the people can grasp and want to take part in creating new economic and environmental excellence at their scales. There should indeed be governmental or foundation grants to propel this people's participation forward.

One reason for at a later point including the range of operations of the nationwide development work of the National Rural Cooperative Association is that they bring this aspect very much to life.

**6** The small city or town:  
Freshly examined in the 20th century.  
With college or university.  
Diverse; multi-county again.

The point has been made again and again that the 20th-21st century permits, encourages technological and cultural diffusion, pluralism in choice and development. One might again say:

Interchangeability of any place with almost any place else, depending on one's subjective choice.

Living cost certainly favors the small city. As far as economy of production is concerned, several factors now favor the small city. The low capital investment and land costs have of course become more and more pronounced *vis-à-vis* the large metropolitan area. Completion of the Interstate Highway System and subsidiary state systems place many, many towns in an advantageous position for transporting products in and out. The labor market, in our fast-changing national picture, places the "new region" town or small city in an excellent position. For many of the ex-farmers and their ex-employees are looking for work which will still keep them in a life that appeals to them—i.e., they don't want to move away; and in many cases want to keep the farm. These are all handymen, used to operating and maintaining farm machinery, hence very quickly adaptable to the industrial scene. They can stay living where they are because of the road-accessibility. It is evidently a plentiful market. In one case, an electrical manufacturer who had a requirement for 300 people had a response which when winnowed down to those qualified came to 1,700 people!

And in the 20th century with recreation playing an essential and growing part in our well-being, the fact that in-"commuting" is so easy and uncrowded means many families are living right in it, as it were, and townspeople very close to nature's and man's variety of opportunity. The management echelons are no longer reluctant to live and work in the smaller places, often actually seek the opportunity.

In Minnesota, the Center for Study of Local Government at St. John's University in Collegeville, is making a study, "The Microcity Project."

There is one real negative in this small-city situation: a reasonably priced and adequate public transportation system for those without cars. This is not having the level of attention in anything like the degree of its importance for those of lower income. This is a pressing matter for these, as well as for the 50,000-and-up city. But as far as I can find out, it is not getting attention, or even being worried about. The microcity study does not have this in its purview.

**"There is one real negative in this small-city situation ... a reasonably priced and adequate public transportation system ..."**

**"The multiple and penetrating resources of the university can spread their influence ... over considerably larger surrounding populations ..."**

Consider as an especially favorable and seminal example many small college or university towns. I have particularly looked into four, with populations of (1960 Census) 12,135 to 33,933. The universities in DeKalb (Northern Illinois University) and Iowa City (University of Iowa) are particularly examples of expansive freshness, and of stimulating the town visually, architecturally, in the theater, in music, and with highly visible examples of modern architecture and sculpture. These house local talent and effort and encourage local self-expression in handicrafts, in the dance, etc. There are, too, distinguished visiting companies and traveling as well as permanent art collections. Thus high-level spectator cultural elements are available which until fairly recently have par excellence been available only in the great city. We have then something now more nearly approaching the big city's spectator arts and entertainments. We have, too, local self-expression in the arts and handicrafts in a much more over-all and permeating degree than in the big city.

The architectural-environmental factor is emphasized here, because the lack of quality or visual interest in the smaller city and its Main Street, as compared with the great city, has been a serious lack indeed.

There are also elements of fresh and unique opportunity. In some cases the university offers the locality its university schools: kindergarten, elementary school, junior high. Beyond that, the Department of Special Education and Department of Speech offer specialists and facilities for teaching children with various kinds of handicaps.

Thus, these small towns are in many instances not intellectual backwaters, but can be and often are alive and alert. The multiple and penetrating resources of the university can spread their influence effectively and probably with no less of penetration and intimacy, over considerably larger surrounding populations. And even without the university presence, note: The brilliant locally conceived and executed riverside fountain in Grand Haven, Michigan (population 11,066); in Mankato, Minnesota (population 28,454) is to be seen a massive stirring sculpture-structure by Dale Eldred. As for total scale, bear in mind too that around 1,500 four-year colleges and universities are located in towns of this size. So, a major total population potential.

Having some time ago started to think about the continuum and its varied nodes, I found that a number of quite small towns had more vitality and magnetic actuality and/or potential than one had supposed, that in a number of them the stream of population migration had begun to reverse itself.

Consider the case of Montevideo, Minnesota (population 6,000) 106 miles southwest of Minneapolis. Montevideo took its drab and declining future into its hands, carried out a quite handsome

central urban renewal with shopping mall. Its retail trade has increased, it is said, some 25 per cent; new factories, of a rather sophisticated nature, have come in: one called Control Data, E & M Electric, Chandler Industries, manufacturing precision-machined parts.

Two other cases, at what might be thought of as the extremes of Small Town:

*Tupelo, Mississippi* (population 17,221). Since more or less 1950, a strong group of businessmen and community leaders have been working on a seven-county basis, mostly rural; have been able to increase manufacturing employment from 7,000 to above 23,000. The multi-county planning base is important, as covering a real chunk of environment with its smaller communities and appurtenant rural areas: *mini-metropolitan area*, if you like.

*Mountain Home*, in Baxter County, Northern Arkansas, with a population of 3,250 offers an off-beat and semi-incredible example. As family farms in the county disappeared, the area and the town lost population. On the plus side, several Federal power projects and their dams and impounded lakes introduced recreation and tourists. However, every town in the county kept losing population; there is no rail or water access, no major road access yet. Against this unfavorable background, 1,700 industrial jobs have been produced in six years. By sheer nerve, local initiative, bond issues and attractive recreation, industry has been attracted. Baxter Laboratories (payroll of 800), McDonnell Douglas Aircraft, and others moved in. Out of 13 high-school graduates in the year 1950, 12 had moved away. Now six have returned. One of these is quoted in the *National Observer* of July 29, 1968:

"I was a supervisor with Douglas [Aircraft] at Long Beach [California] living in an apartment in Garden Grove. It was the kind of life where you got out of work at 3:30 in the afternoon, but not out of the parking lot till 30 or 40 minutes later. Then you fought one big traffic jam all the way home. My mother sent me a clipping from the local paper here. It showed them digging the foundation for a new [McDonnell Douglas] plant right in Mountain Home. 'To hell with this,' I said, and returned."

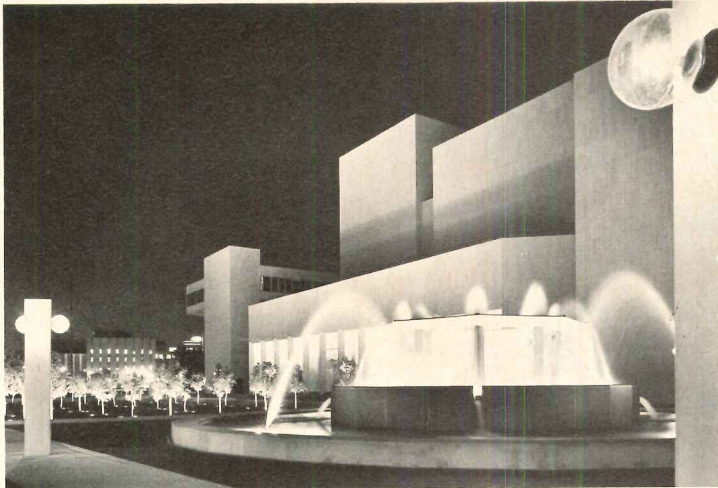
These three examples, of varying degrees of unexpectedness (purely factually all are correct) indicate accumulating counter-magnetic power, lots of actual and potential steam; tending now to keep people where they are in preference to migrating into the big centers; not yet attracting people in on any serious scale, that seriously helps the over-developed area.

These are not isolated instances, but examples of a range of motivations, of planning and non-planning. We will let them just lay for now, as a set of facts. In the last section of this article, let us consider danger signals, consider how we can assure that this refreshing kind of trend can be mainly positive, and indeed creative: not the small node awash in a sea of eager speculation and de-development.

The second installment of Part Three will be published in the December issue.

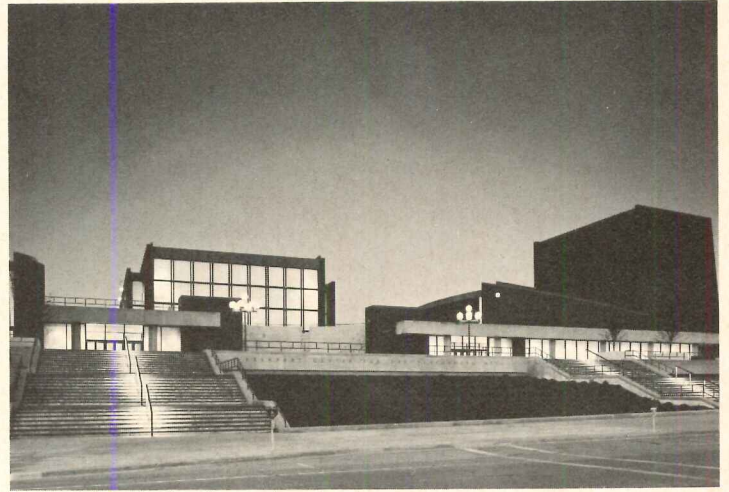


Balthazar Korab



Milwaukee Center for the Performing Arts

Hedrich-Blessing



Krannert Center for the Performing Arts

# ARCHITECTURE FOR THE ARTS OF MUSIC, DANCE AND DRAMA

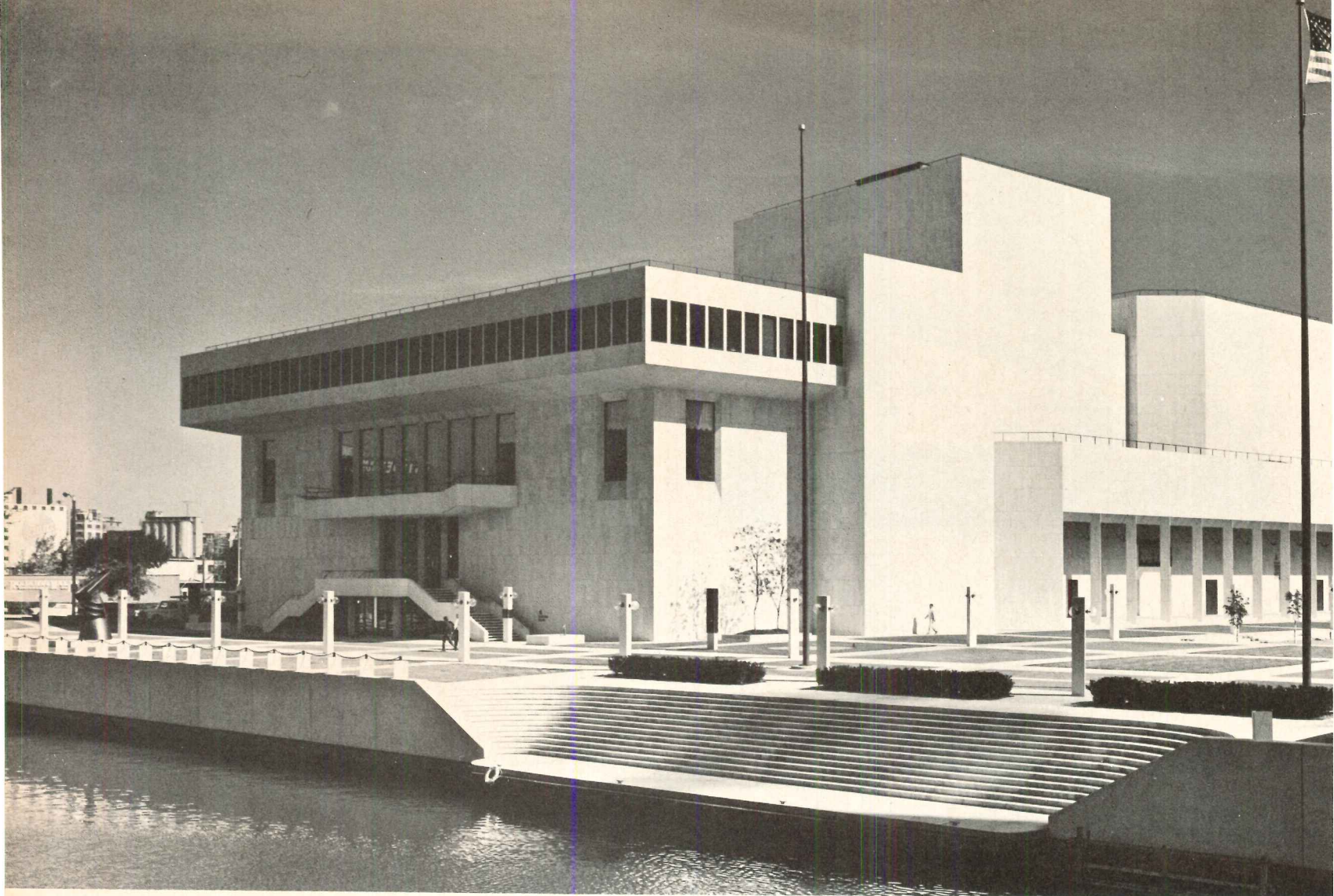
This year has seen the opening of several major performing arts centers on the campuses and in the cities and towns of the United States and Canada. Many more are nearing completion and dozens are in the project stage. As building types these centers are becoming increasingly sophisticated, and much has been learned from past successes and failures. Programming of facilities is being done on a more realistic basis than a few years ago, the advice of acousticians is now more seriously regarded, architects have developed a broader base of experience in theater design and the applied science of theater electro-mechanics continues to produce ever more flexible and adaptable space.

Two new centers opened this fall—just in time to be photographed for this issue—and they offer an interesting contrast. The first is the \$12-million Milwaukee Center for the Performing Arts by Harry Weese & Associates. This is a downtown cultural center designed for the Milwaukee Symphony, a local opera company and a repertory theater, as well as visiting artists. It accommodates six basic types of

performance in three halls—the largest of which is multi-purpose—in a single building. The second complex is the \$22-million Krannert Center for the Performing Arts by Max Abramovitz of Harrison & Abramovitz. Designed for the schools of music, theater and dance of the University of Illinois, and primarily a teaching facility, it has also been programmed as a community cultural resource. Because a single multi-purpose facility was considered less than ideal for student use, in this design five separate, basically single-purpose theaters are interconnected beneath a podium.

Milwaukee's new center is elegant and glamorous as befits its role as a catalyst for the growth of downtown Milwaukee and as a center of civic life. Krannert, though it cost more, is also more modest, more of a work place, clearly a school. Each center appears to be eminently appropriate to its purpose, however, it is still too soon to tell. Both centers will receive continuing appraisal in use by theater architects and consultants—a group of professionals notably devoted to furthering their art.

—Mildred F. Schmetz

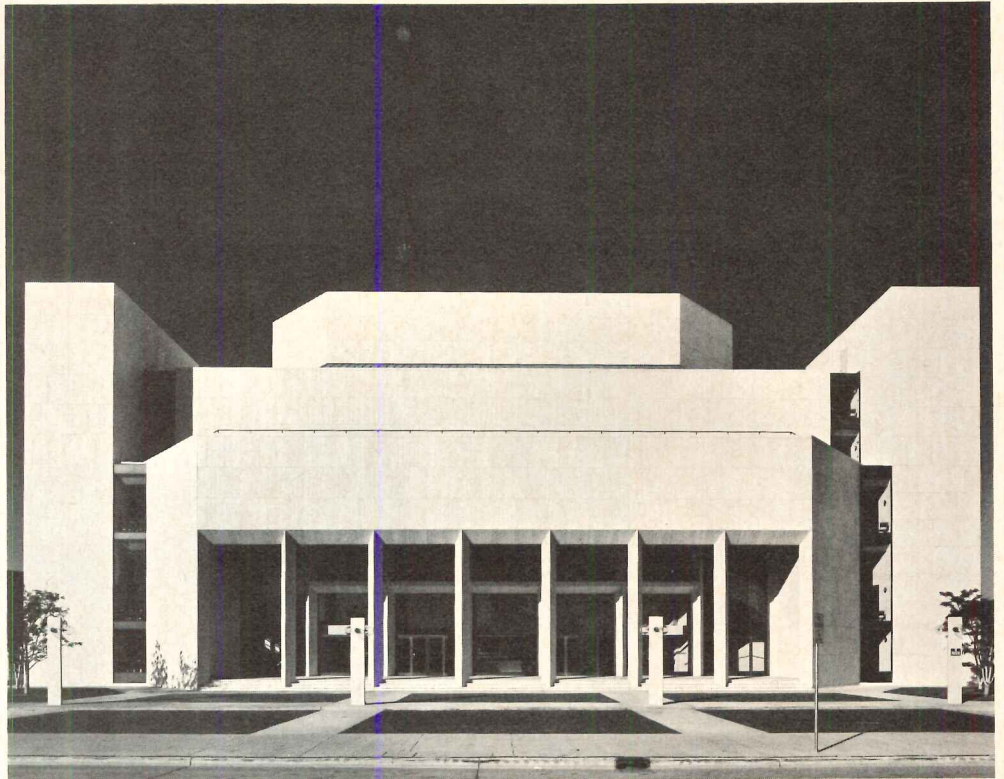
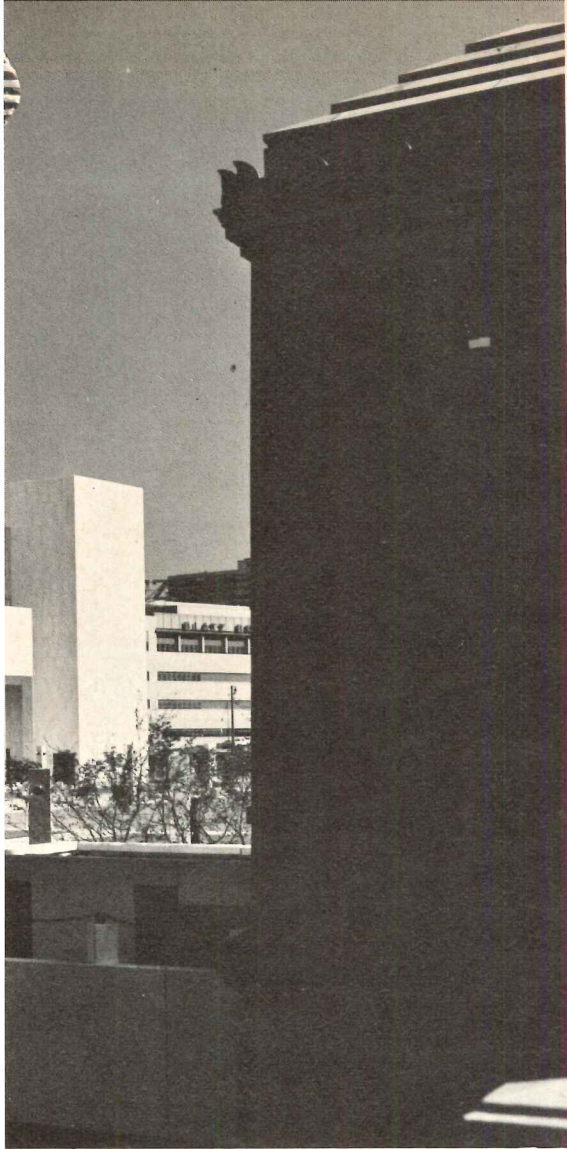


THE MILWAUKEE CENTER FOR THE PERFORMING ARTS: FACILITIES FOR ORCHESTRA, RECITAL, OPERA, MUSICAL, DRAMA



This handsome structure, certainly one of the best performing arts centers built in the United States or Canada since the postwar building-for-culture boom began, is the result of a highly successful collaboration between theater consultant George C. Izenour, who programmed the center and engineered the stage mechanics, R. Lawrence Kirkegaard of Bolt Beranek and Newman, who was the acoustical consultant, and architect Harry Weese, who designed it. The architect's task was not easy. It is difficult to organize within three halls in a single building all the facilities which make it possible to effectively mount six different kinds of musical and dramatic performance. It is even harder, of course, to organize these elements into an esthetically satisfying result, as Weese has done.

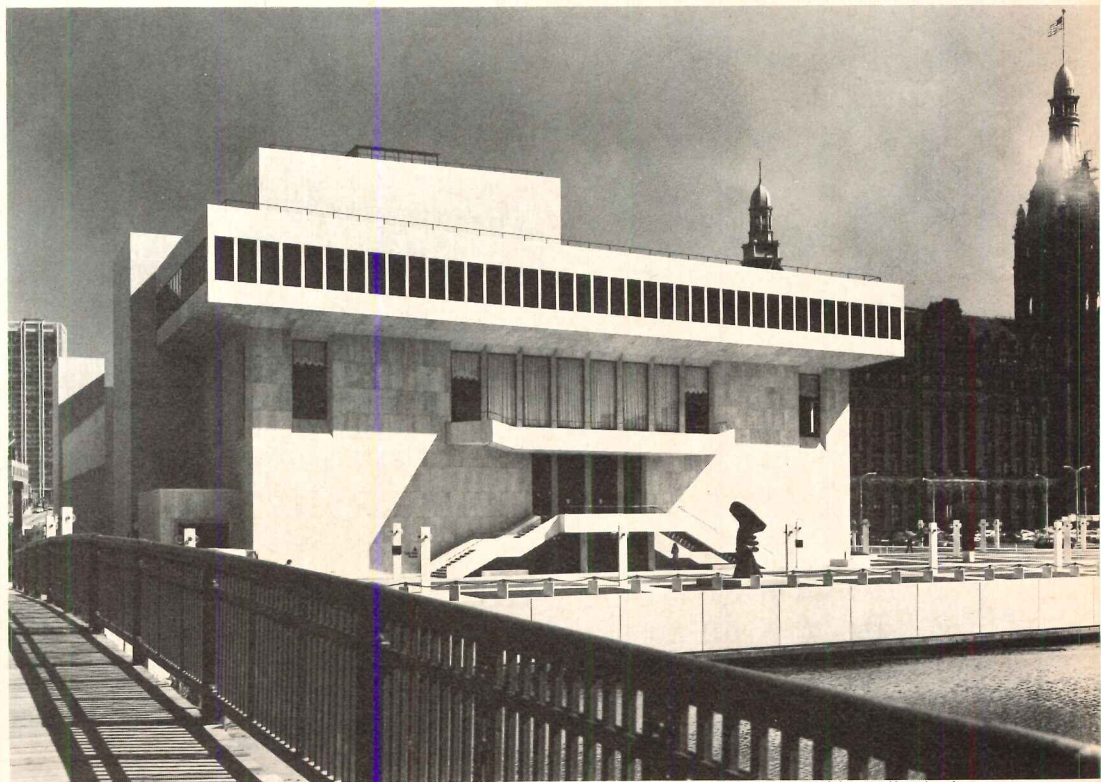
Izenour praises Weese for having resisted a tendency which he considers detrimental to theater design—letting subjective criteria determine form. Weese, unlike other architects Izenour could name and did, put theater function first and allowed the physical imperatives of sound and sight to shape his spaces. These imperatives are met by particular volumes and dimensions usually recommended by the consultants. Unless the architect chooses to ignore the



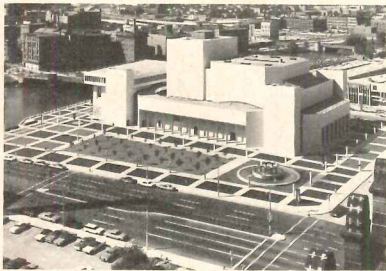
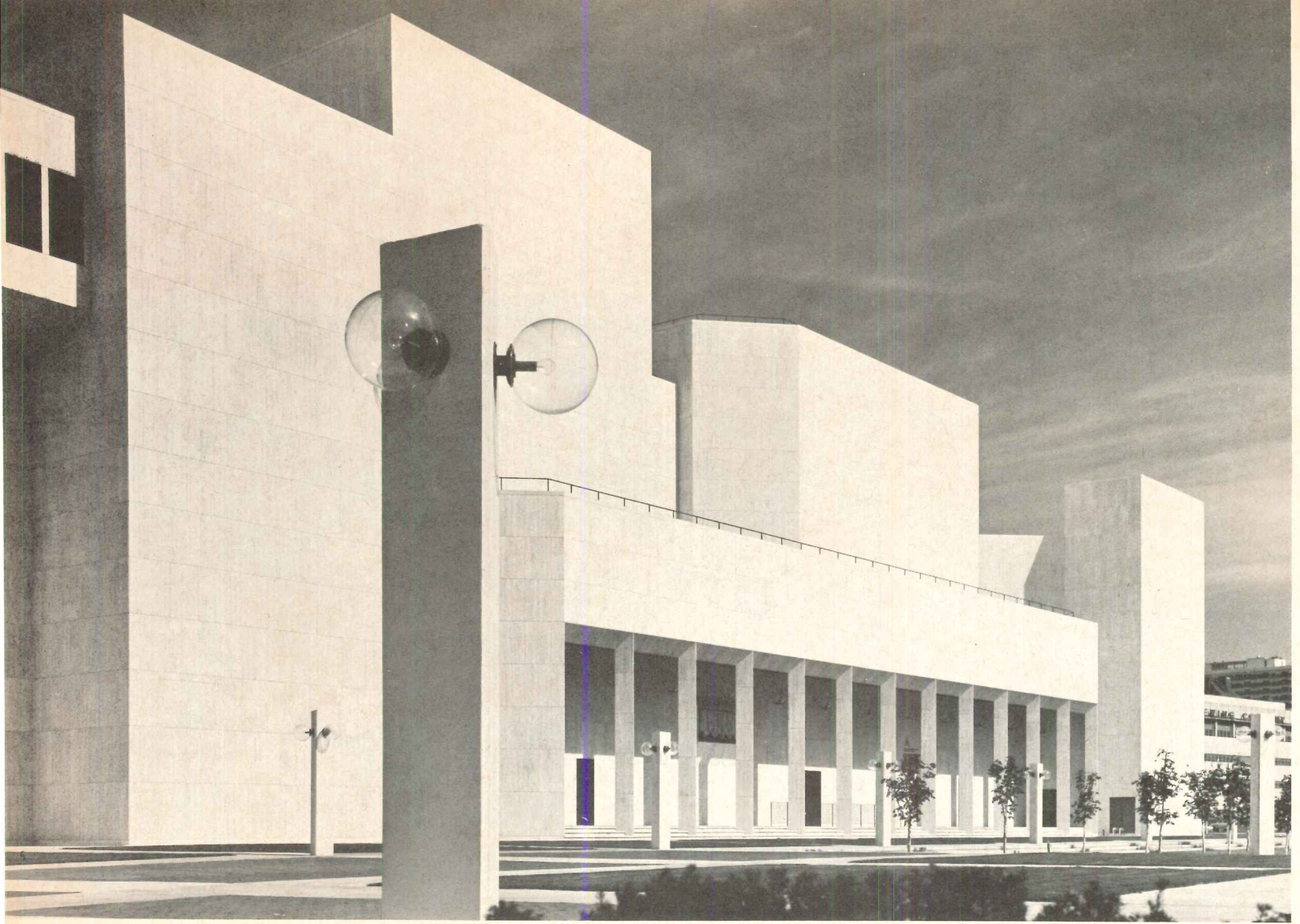
## AND REPERTORY IN ONE BUILDING

consultants his so-called form-giving is inhibited. "But Weese has so much talent," says Izenour, "it flows from his fingers—he made the building beautiful while accepting the constraints."

Built on an urban renewal site on the bank of the Milwaukee River—the \$12 million center opened in September. It is the home of the Milwaukee Symphony Orchestra, the Florentine Opera and the Milwaukee Repertory Theater. The new facility will host visiting opera, musical comedy and ballet companies, symphony orchestra and concert artists. As the site plan shows, the center is free standing on an open site, adjacent to City Hall, appearing in the photo (right). It is highly visible from all sides, its Roman travertine-sheathed volumes are well articulated and exterior glass is used with restraint to allow for well-contained spaces within lit only by an atrium garden and skylights. The windowed cornice encloses office space. The balcony below adjoins a combination foyer and banquet room which overlooks the river to the west. Beneath the balcony is the entrance to Wehr drama theater and Vogel recital hall. The upper right-hand photo shows the principal entrance to Uihlein Hall, the major facility for orchestral concerts and opera.



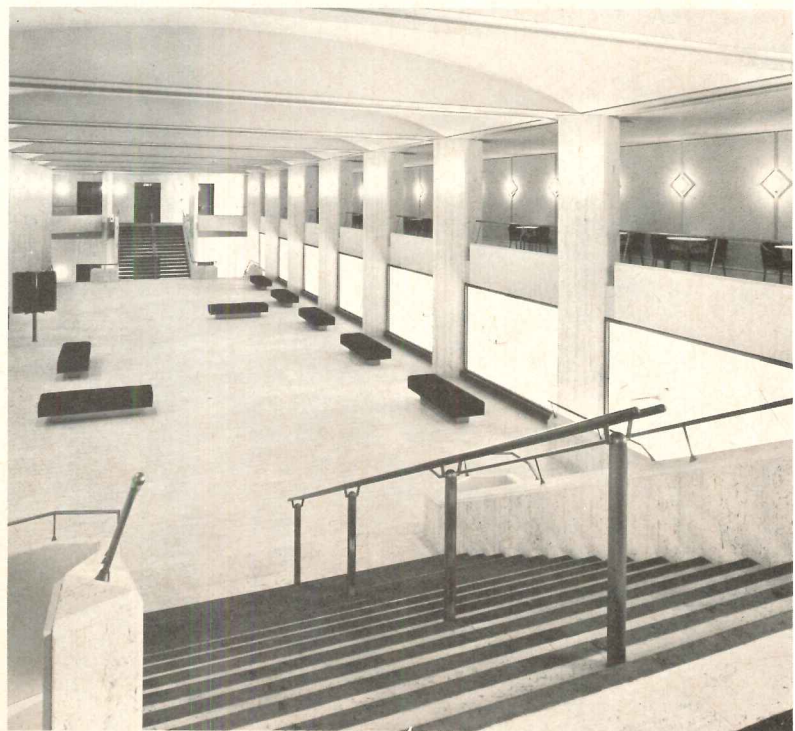
*Balthazar Korab photos*



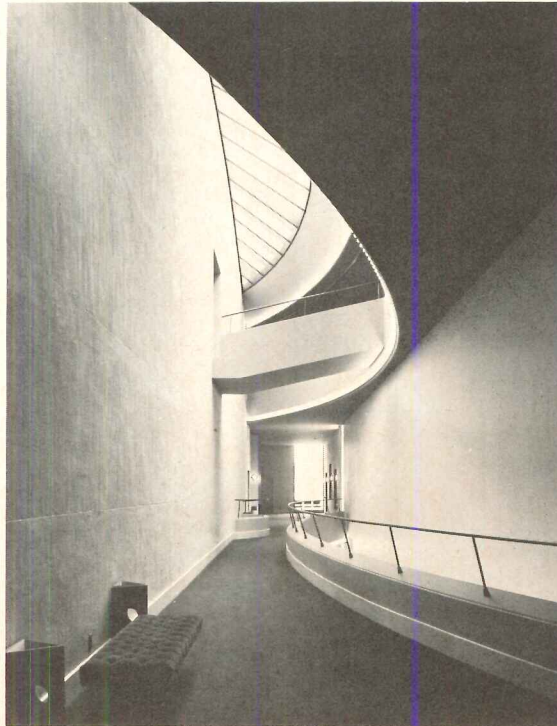
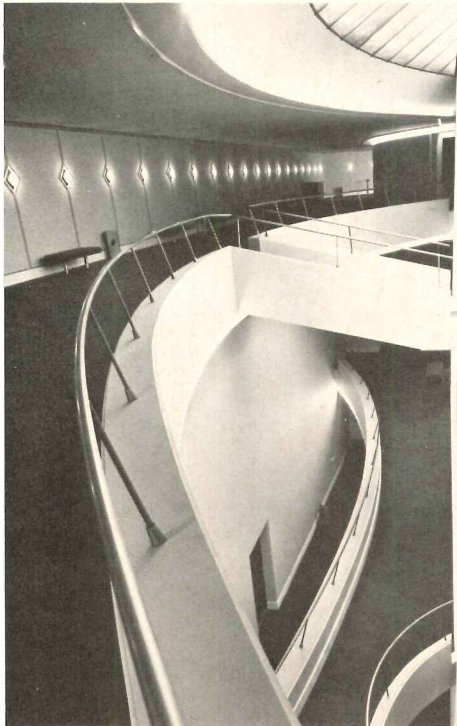
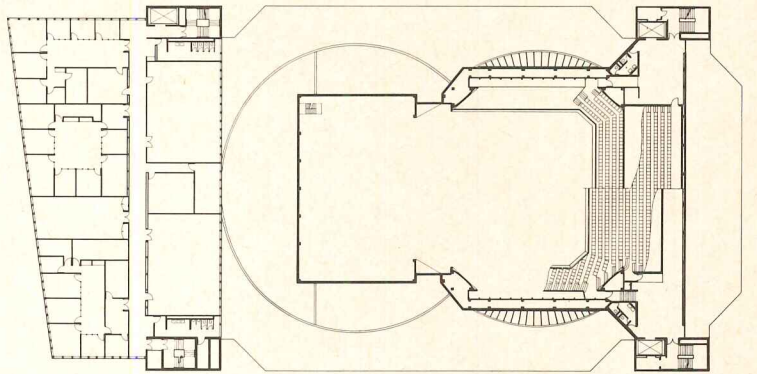
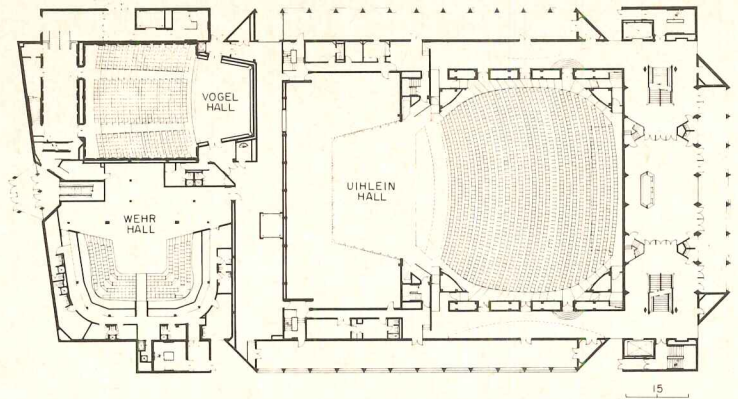
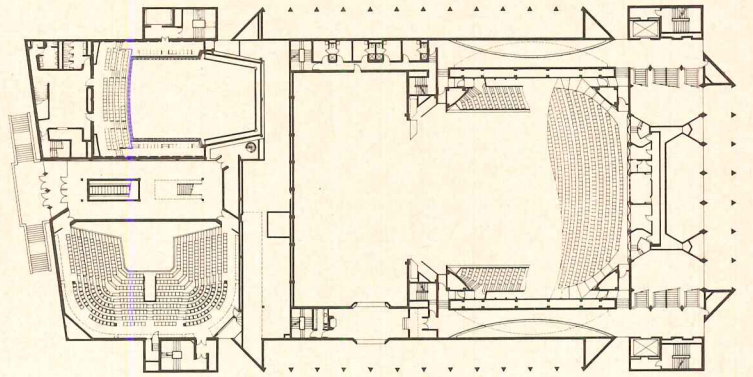
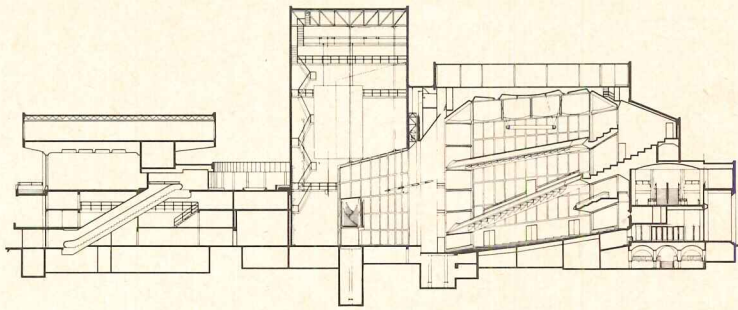
The organization of elements can be quickly understood if the section and plans are compared with the bird's-eye photo at left. Wehr and Vogel, the two smaller halls, are on the river side to the west. Above them is Bradley Hall, which overlooks the river and is shown in the photo (opposite page, far right). Above this hall and forming the cornice is the office floor. The stage-house is the tallest element. The roof of Uihlein Hall slopes downward over the center loge. The entrance colonnade to the east, seven bays wide, is similar in elevation to the twelve-bay colonnade in the photo above. The photo to the right is of Magin Hall, located just under the center loge and overlooking the entrance colonnade.

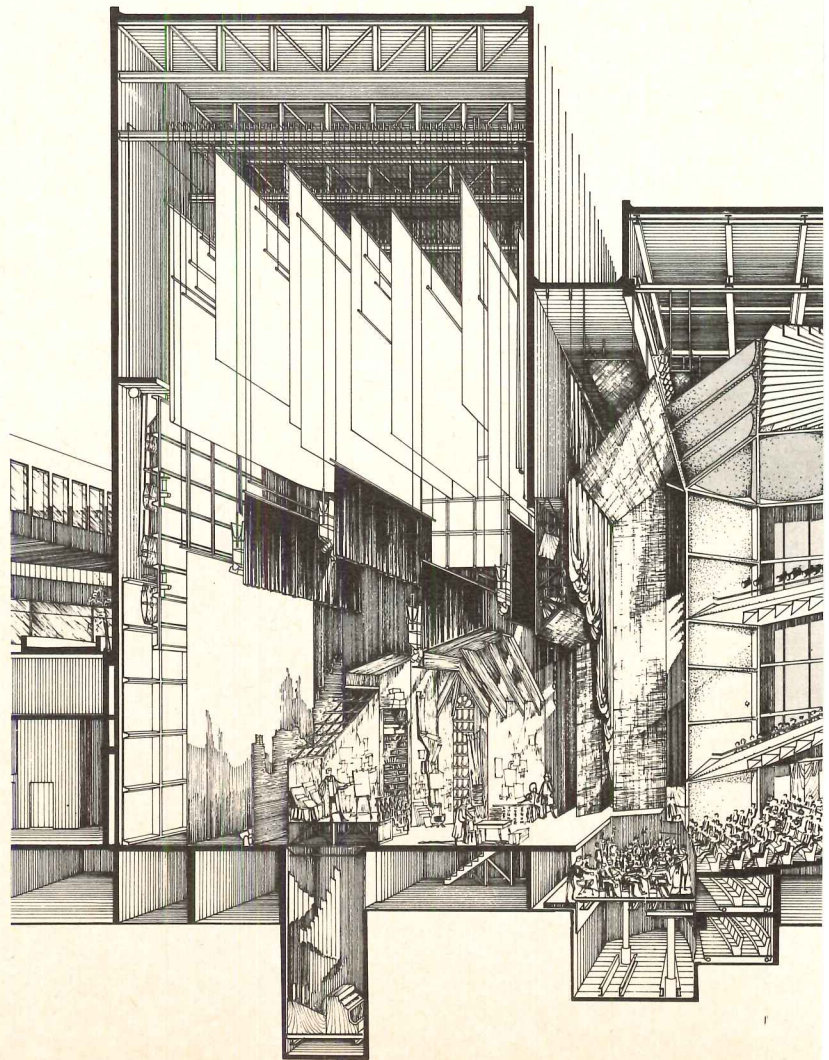
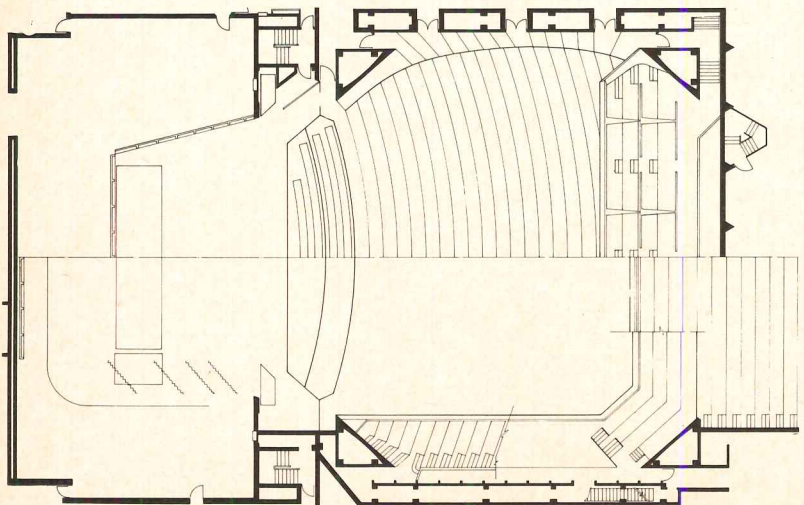
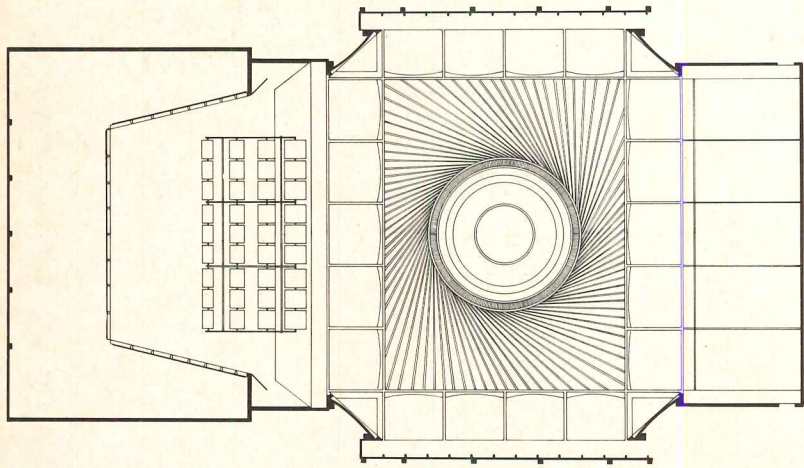
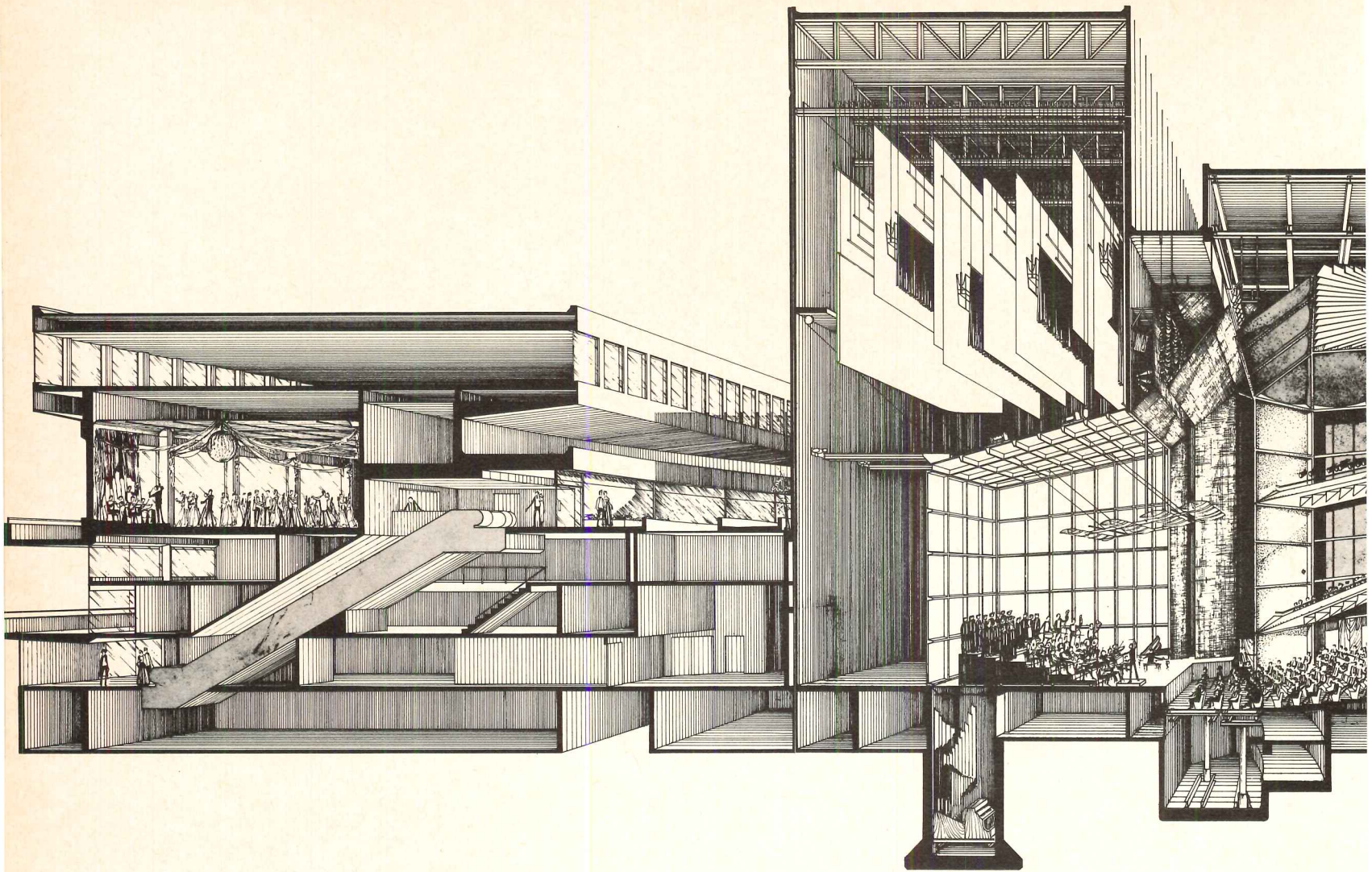
Weese brings daylight to the narrow lobby spaces on the north and south by means of crescent-shaped skylights. The curved passageways shown in the photos (opposite page, right) are directly under the skylights. They break away from the straight walls, making crescent shapes of their own. Whether one looks up or down, the handling of vertical space is unorthodox and fascinating.

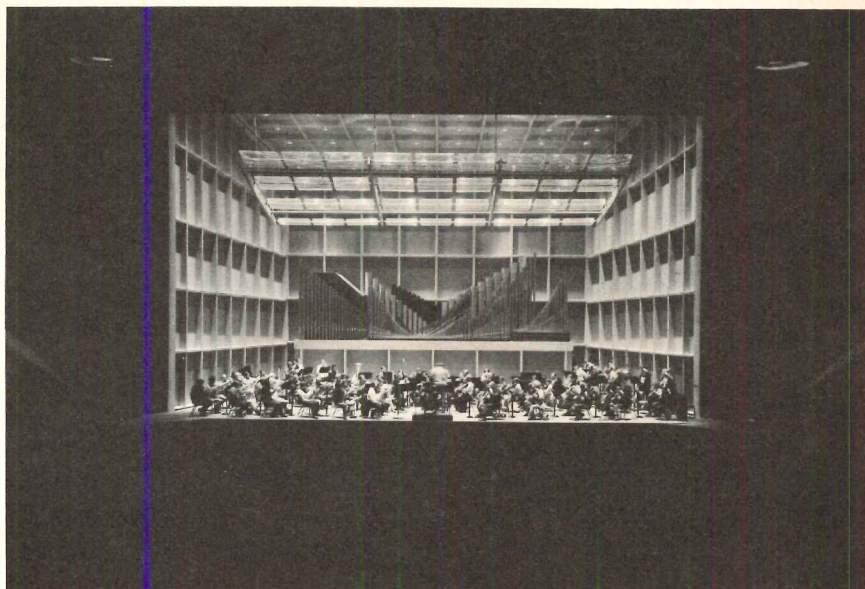
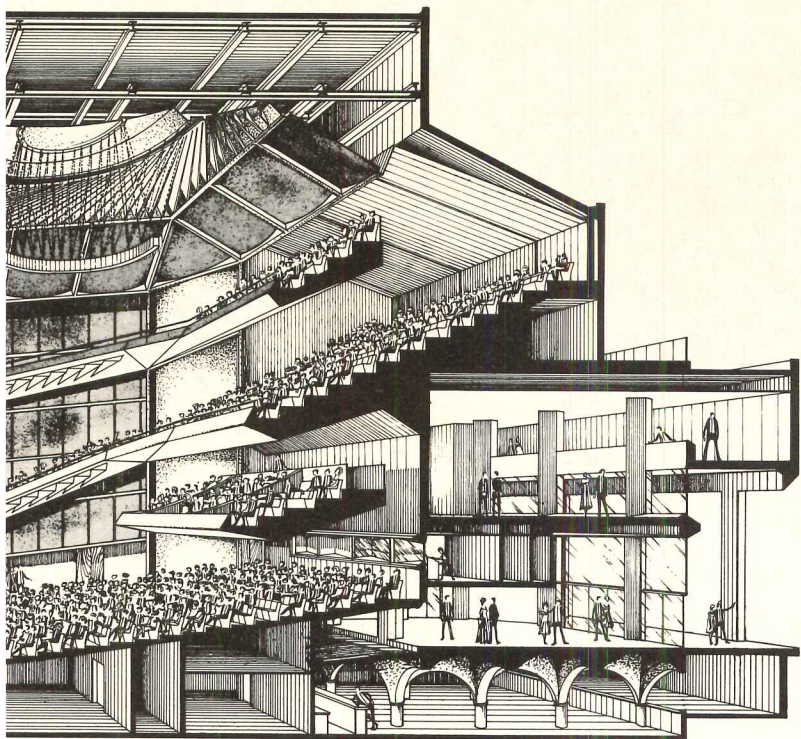
In these spaces carpeting and upholstered benches are a deep, rich red. Walls are a light ochre. The rims of the crescent shapes are lined with exposed light bulbs.



Balthazar Korab photos







Orlando R. Cabanban photos

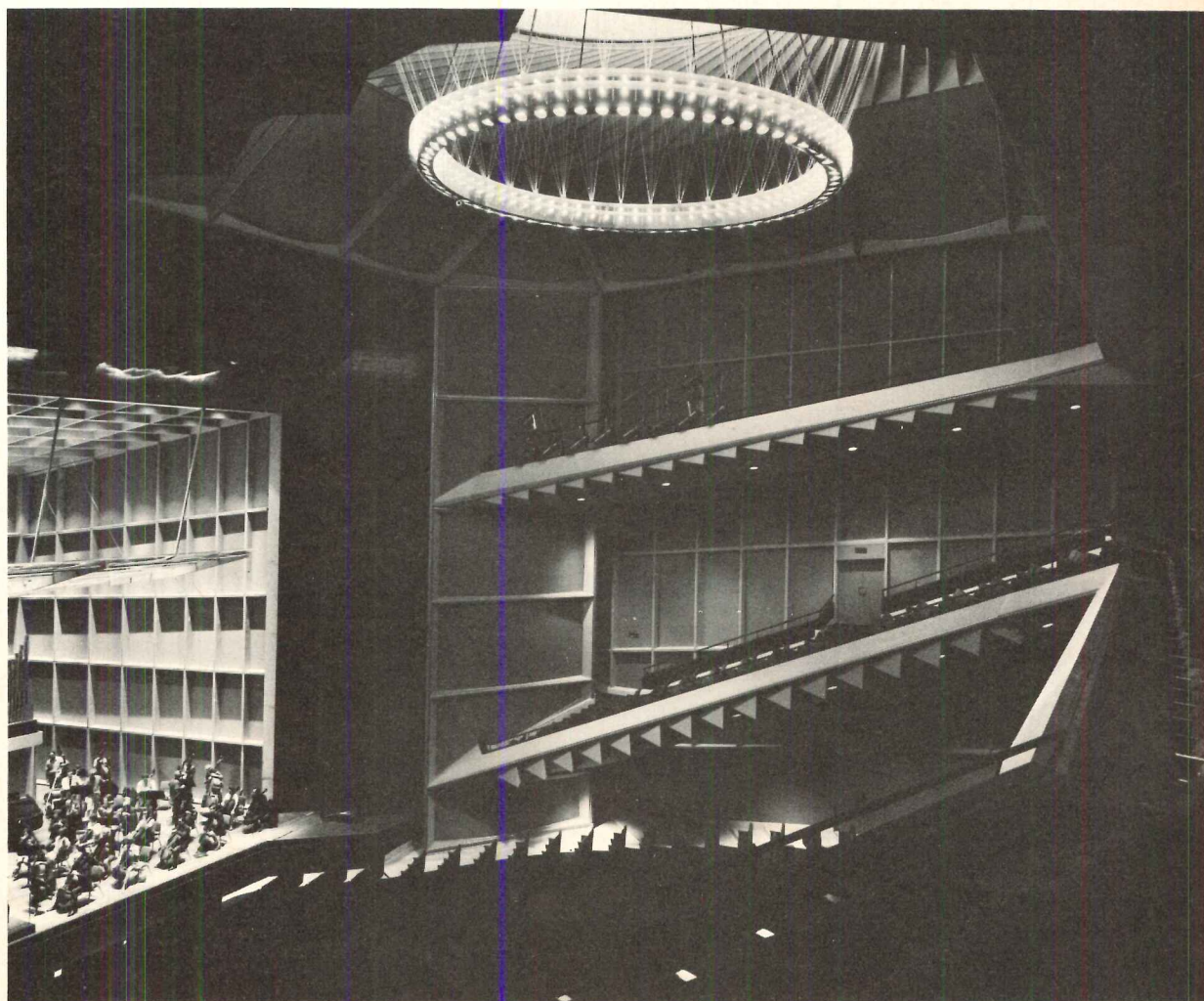
The acoustical elements of Uihlein Hall, by Weese's wish, were to be architectonic—neither hidden nor applied. Where many architects of recent halls have chosen to conceal the essential acoustical modulation behind decorative screening, he elected to design it into the room. Because this reduced the range of acoustical adjustability, Bolt Beranek and Newman built and acoustically tested a 1/10 full-size model of the hall.

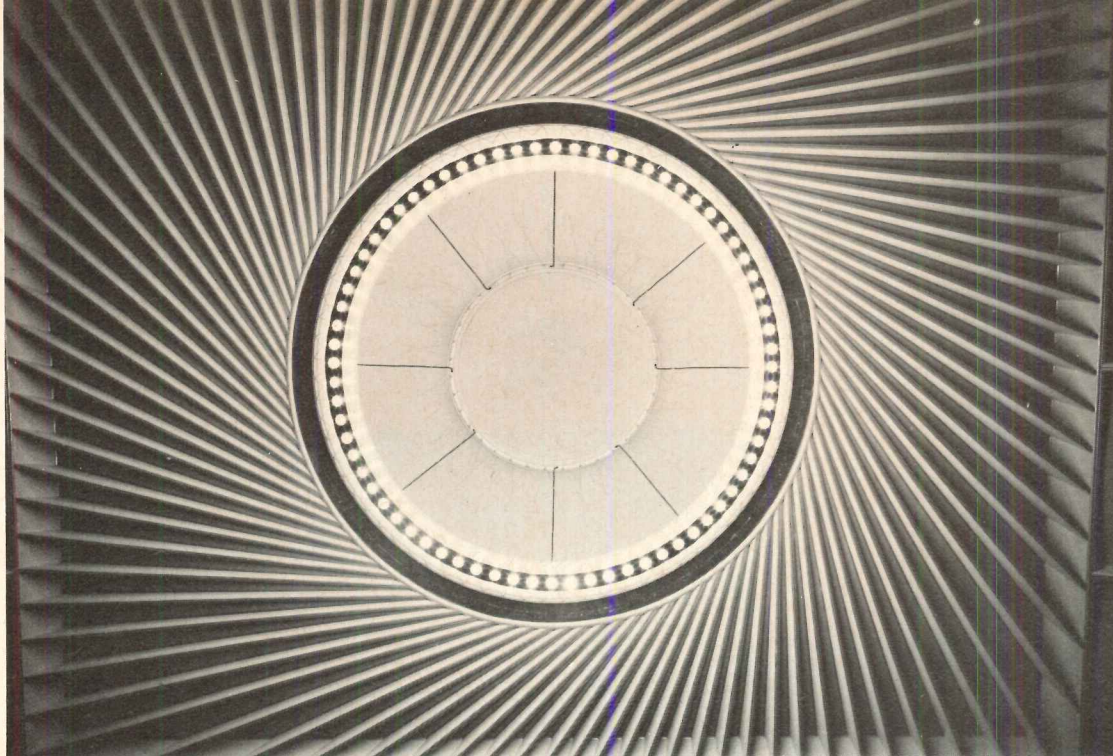
The acoustical design elements consist of the stage acoustical shell shown in place in Izenour's drawing for concert use (above) and for opera shown against the rear wall to permit full use of the 10-story fly space.

The plastic sound-reflective canopy has been designed to allow the musicians to hear one another better and to add intimacy and clarity to the mid-main floor sound from strings and woodwinds. The panels are adjustable at the touch of a button.

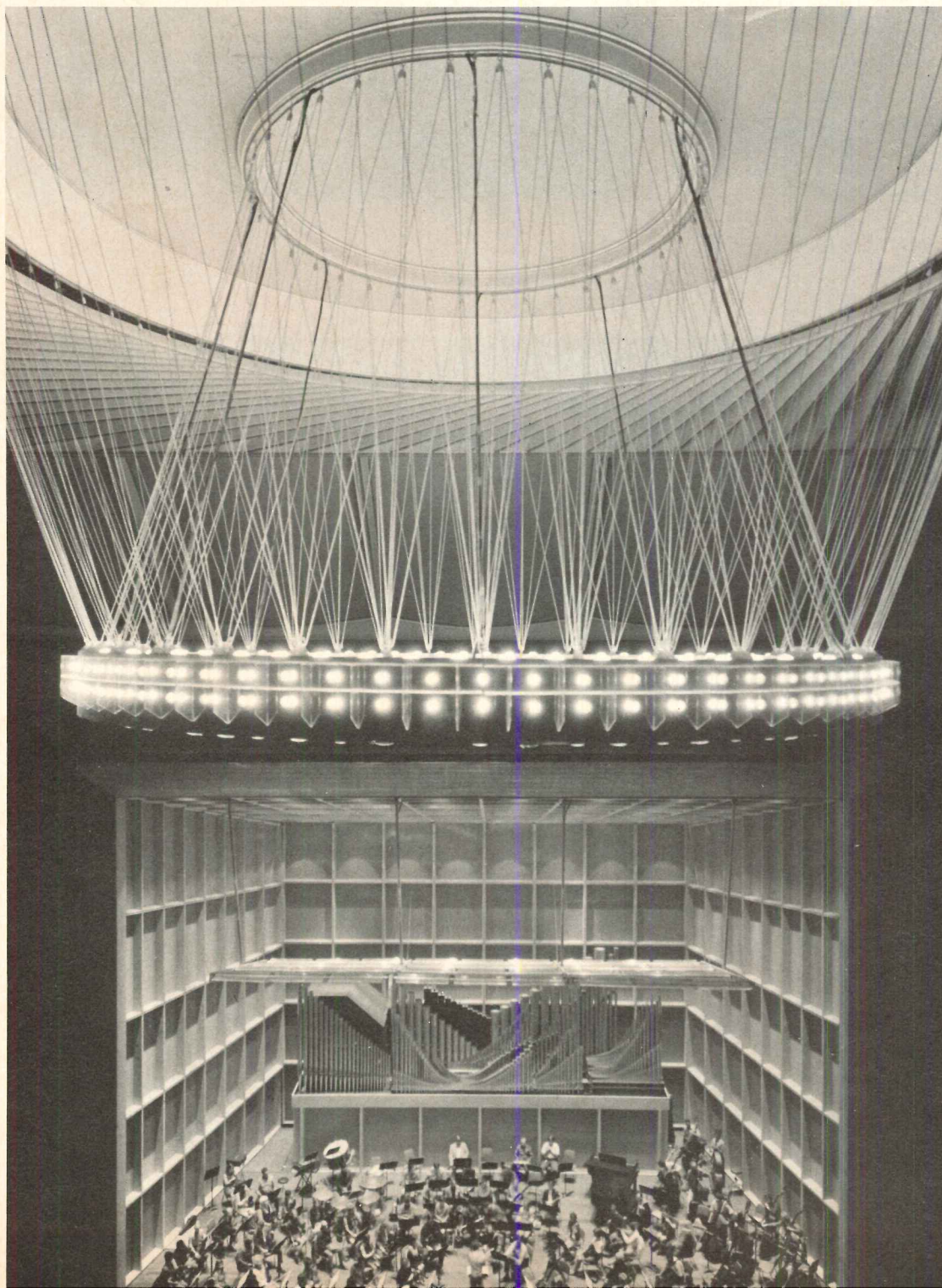
The movable teaser tormentor shown in the opera or musical comedy position (left) brings reflective surfaces close to performers, and the loud-speaker cluster into operating position.

The volume of the 2,327-seat hall provides the same length of reverberation as Boston Symphony Hall, long considered ideal.





Orlando R. Cabanban photos



The ceiling of Uihlein as well as the walls are ornamental plaster straw-colored with gold accents. These surfaces have been shaped and oriented to bring envelopmental sound to the listener at the right times, from appropriate directions, in the correct amounts. The chandelier is of glass and gold mirrors and is suspended by a beaded chain. The stage has an adjustable proscenium—45 feet by 64 feet for symphony as shown, and 16 feet by 36 feet for theater. The orchestra shell, demountable and flown like scenery when not in use, fills the full proscenium opening, extending the side wall paneling to unite the stage with the auditorium.

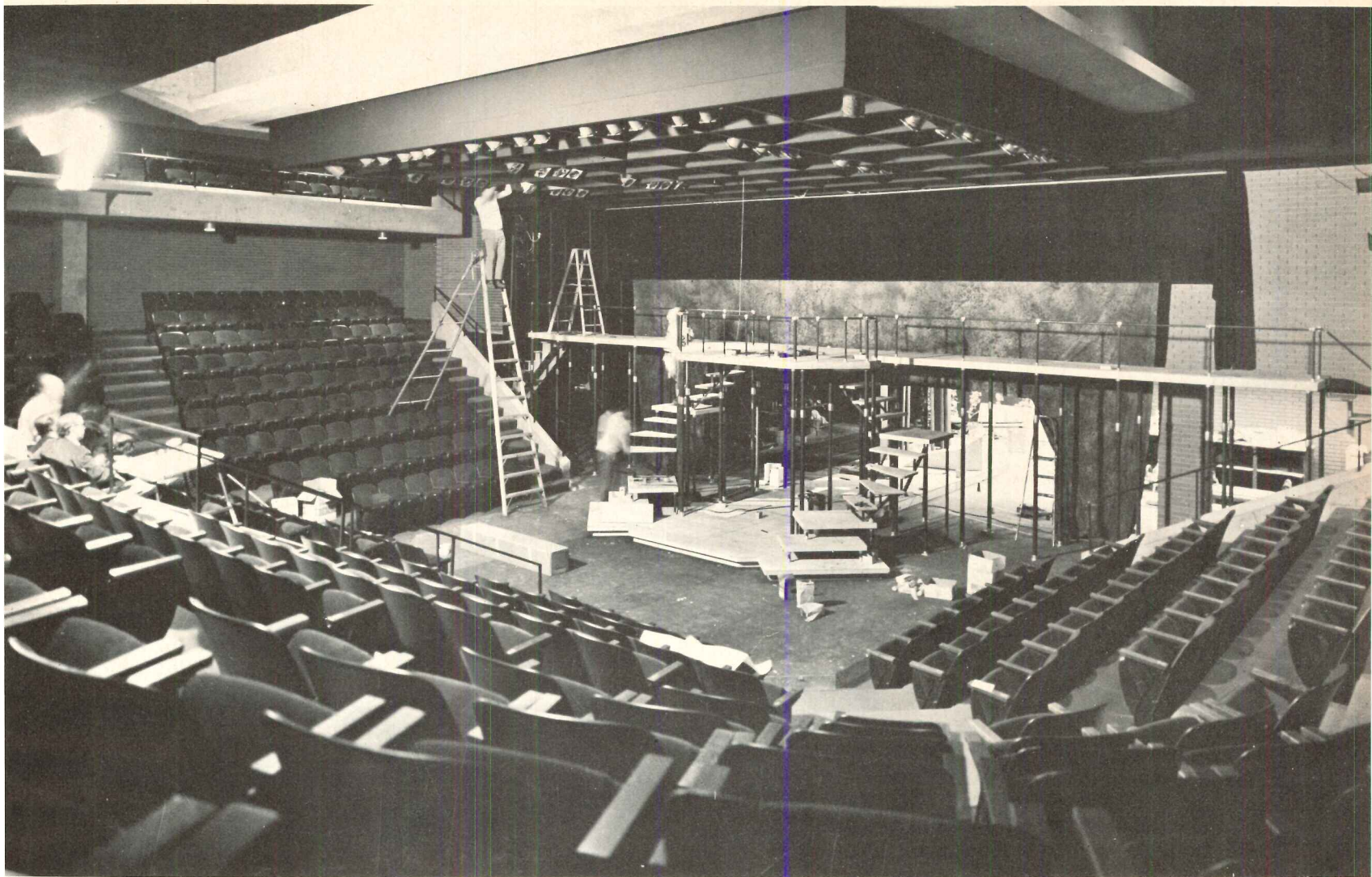
It is of unprecedented size for maximum coupling of sound from performer to listener. It is fabricated from 22 tons of dampened mild steel and has been modulated to keep brass and percussion from overpowering the strings and woodwinds. A pit in the stage floor adjacent to the shell's rear wall houses a pipe organ on a hydraulic lift.

**Wehr Theater** has three quarters seating around a thrust stage. Designed in brick and exposed concrete with a steel lighting grid, it is the home of the Milwaukee Repertory Company. This 526-seat theater functions independently with its own scenery shops, costuming shops, rehearsal rooms and office space. Since a repertory house emphasizes acting and direction and minimizes physical production, stage facilities can be minimal.

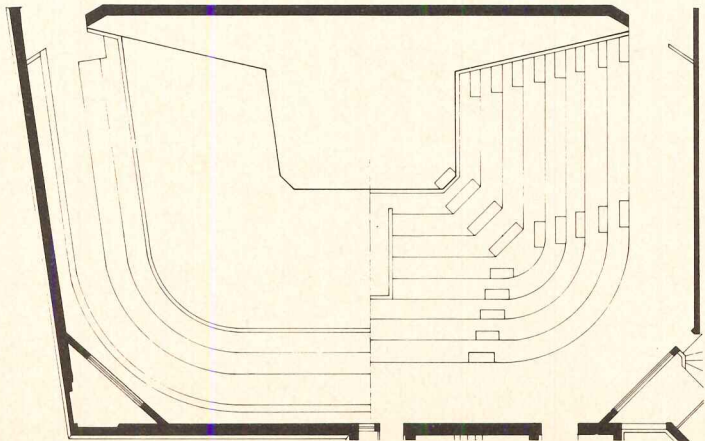
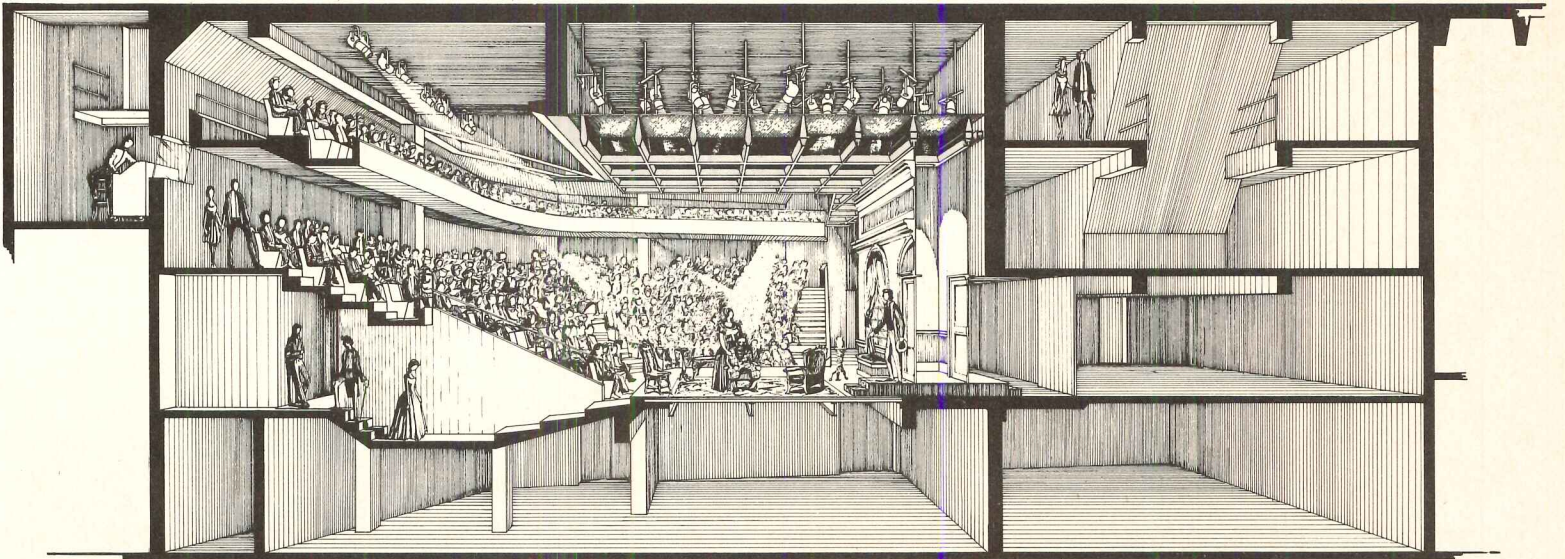
There are two basic acoustical problems to be solved in a thrust stage theater such as Wehr. The first is to prevent noise interference from mechanical systems or adjacent spaces so that the full dynamic range of the actors' voices may be heard. The second is to make the space acoustically "dead" enough that the weak sound radiated from the back of the actor's head will not be garbled by late-arriving reflections from room surfaces. This must be achieved without making the space so dead that actors find it unresponsive to their voices.

Bolt Beranek and Newman carefully shaped the hard surfaces to reinforce the actors' voices and "fuzzed" only those surfaces which could not contribute positively. Thus upholstered seating, carpeting and glass fiber above the lighting grid are the only sound absorptive materials required in the room.



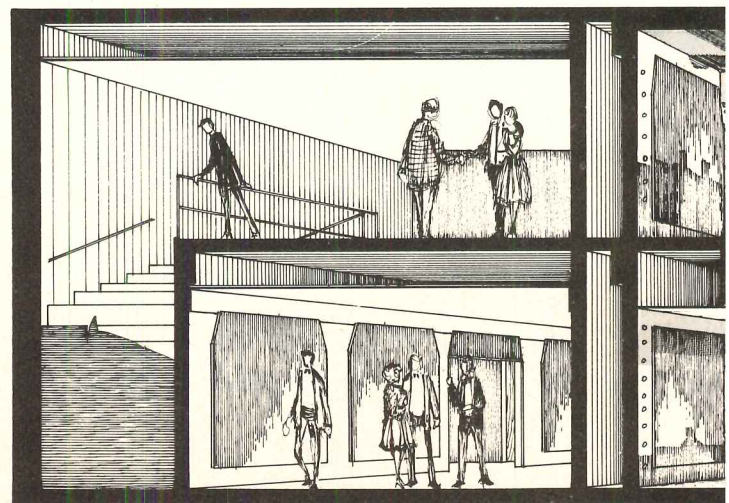
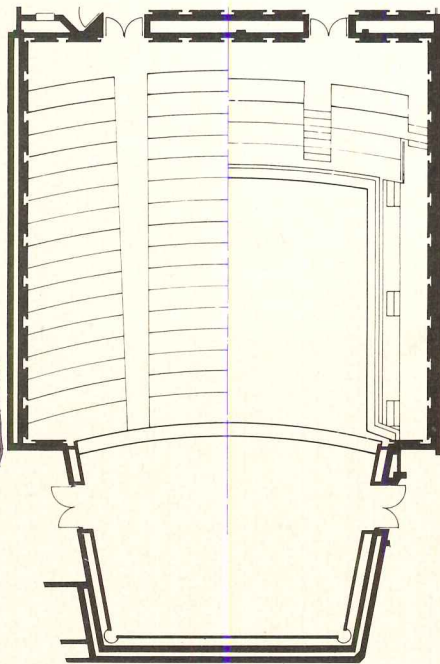


Balthazar Korab

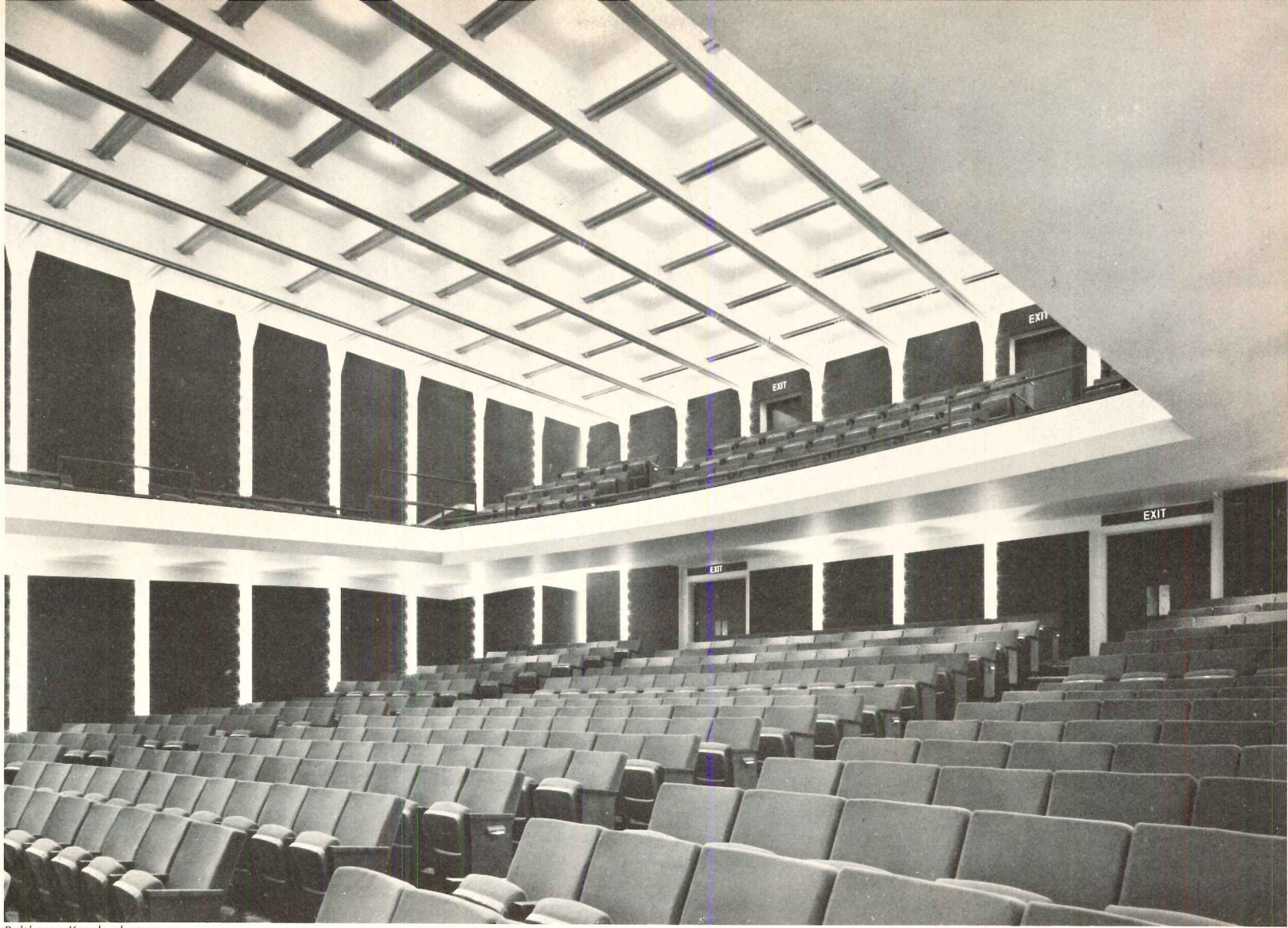




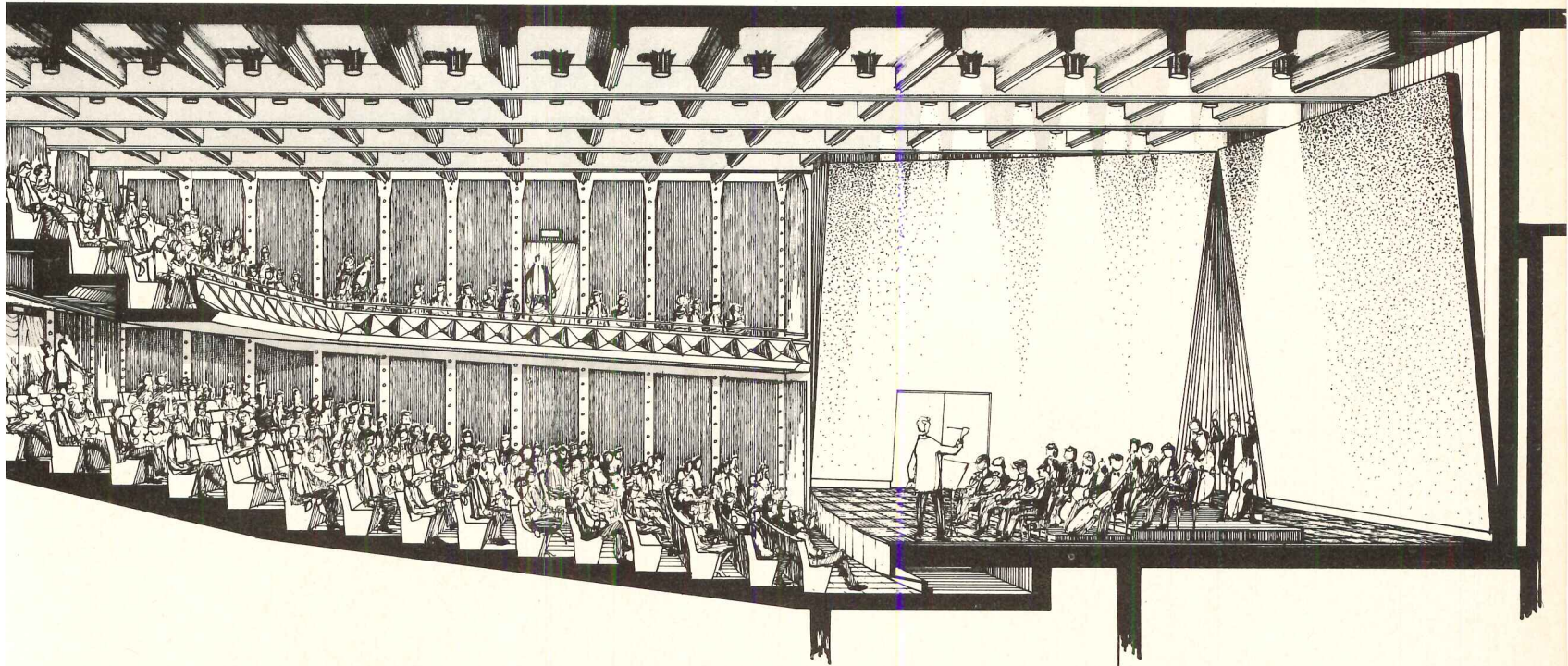
**Vogel Hall** doubles as symphony rehearsal space and a recital hall. A small house, it measures 53 feet by 79 feet with a 28-foot by 36-foot stage. There are 482 orchestra and balcony seats. The exposed ceiling structure has been treated as a decorative coffering system. The side walls are covered with velour panels for dampening. Stage walls tilt forward to reflect sound back to the musicians and to prevent flutter. Oak parquet beneath the seats combines with the hard reflective surface of the plaster balcony soffit and ceiling to provide a short reverberation time for high articulation.



MILWAUKEE CENTER FOR THE PERFORMING ARTS, Milwaukee. Owner: Milwaukee County War Memorial Development Committee. Architects: Harry Weese & Associates; theater consultants: George C. Izenour Associates; acoustical consultants: Bolt Beranek and Newman, Dr. Lothar Cremer; structural engineers: The Engineers Collaborative; mechanical and electrical engineers: S. R. Lewis & Associates; landscape architect: Office of Dan Kiley; interiors consultants: Dolores Miller & Associates; contractors: Klug & Smith Company.

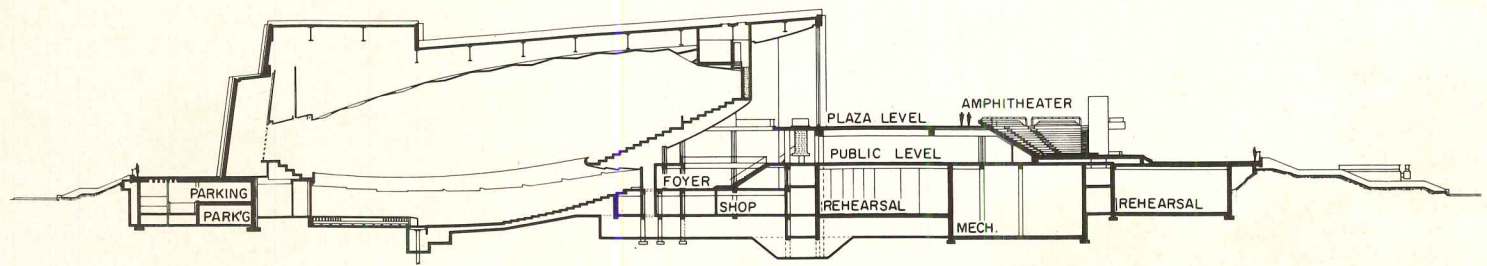


Balthazar Korab photos

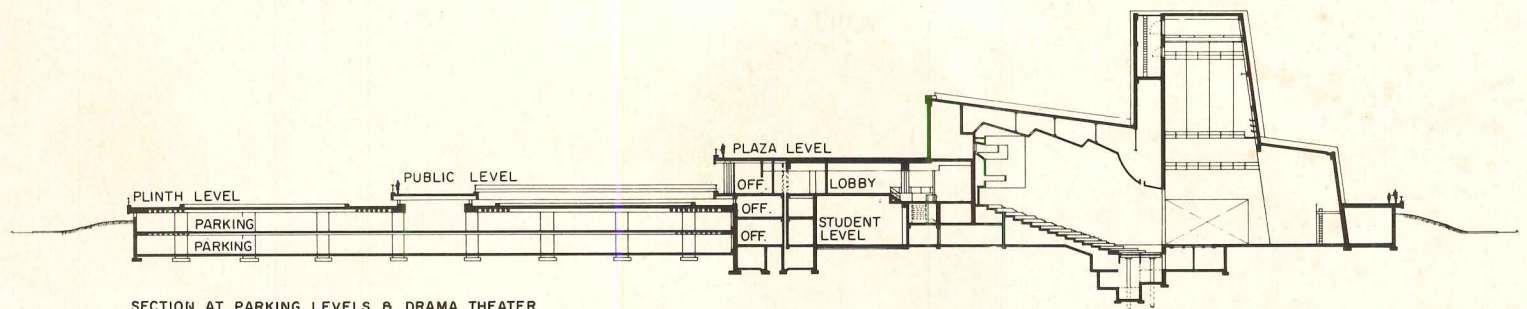




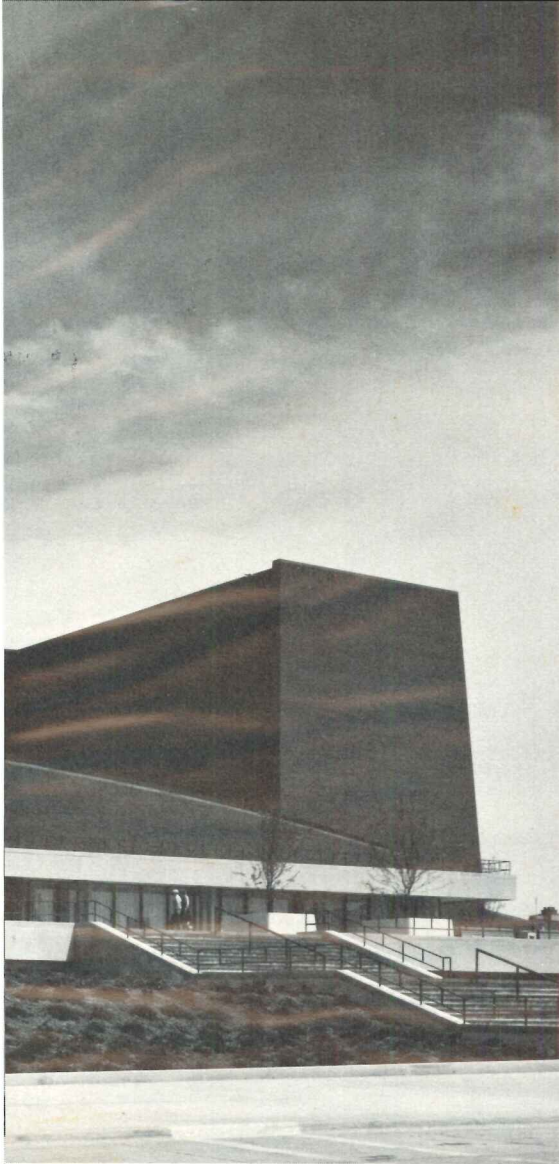
FIVE SINGLE-PURPOSE THEATERS CONNECTED BENEATH A PODIUM: KRANNERT CENTER FOR THE PERFORMING ARTS



SECTION AT GREAT HALL

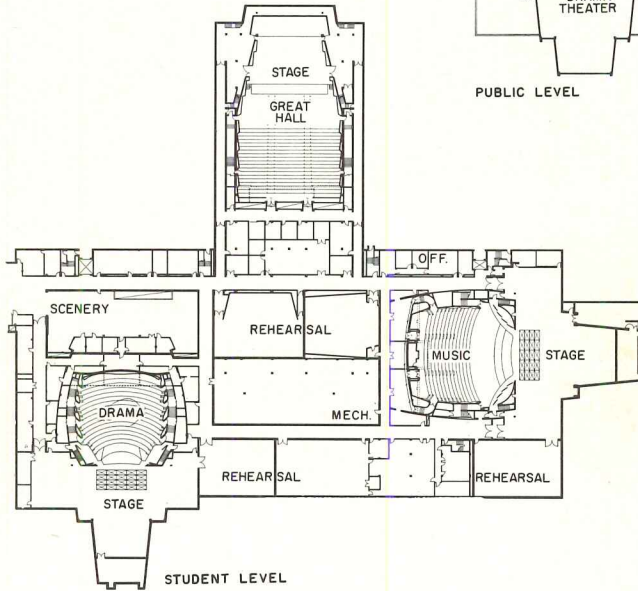
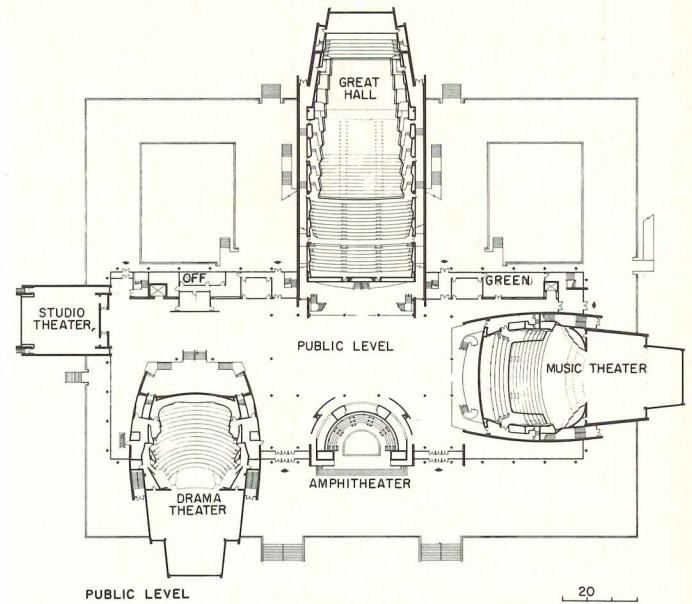


SECTION AT PARKING LEVELS & DRAMA THEATER



Hedrich-Blessing photos

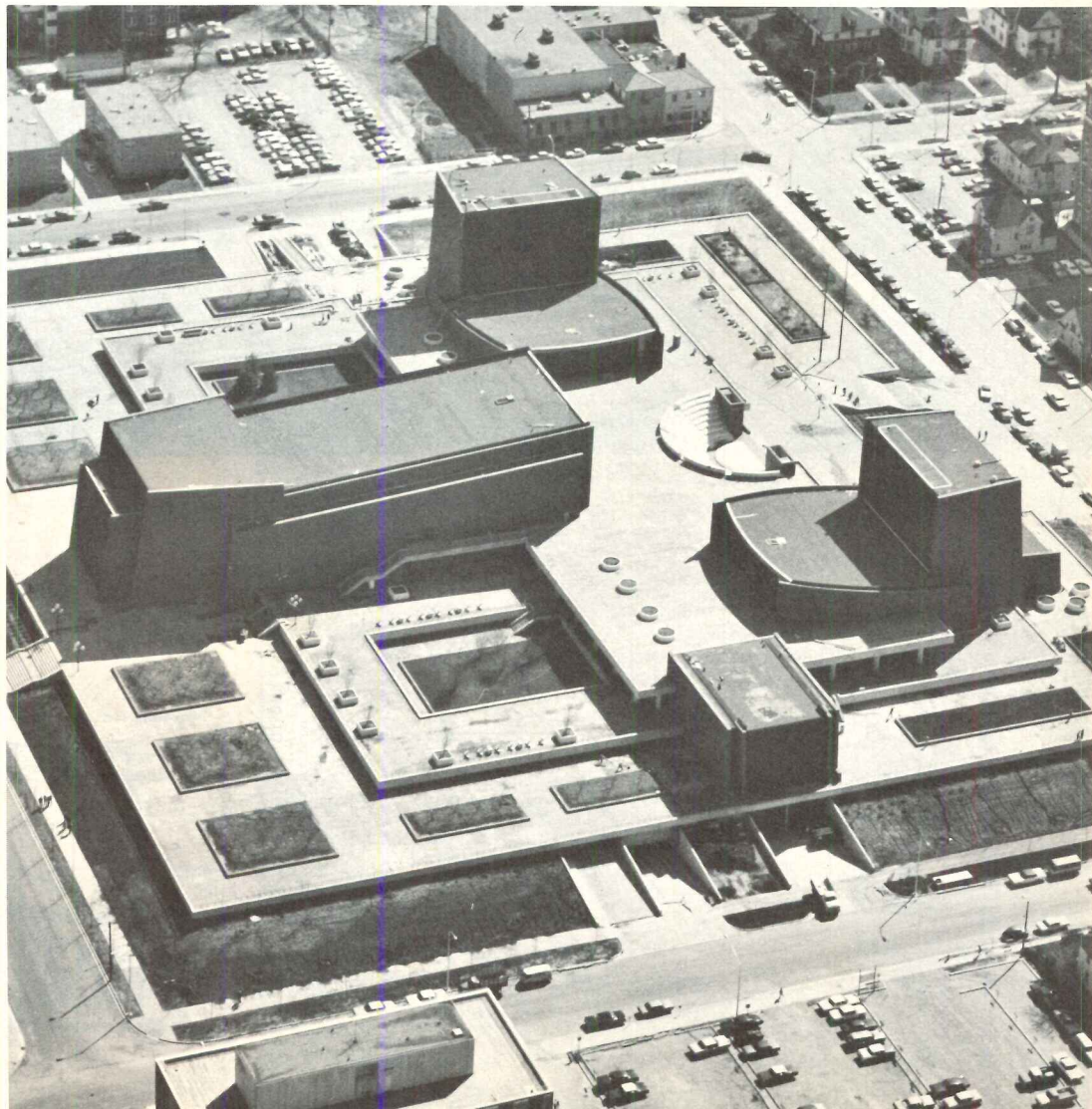
The facilities are organized in six levels. The public level (right) has a huge central lobby giving access to each of the auditoriums and is reached by two main entrances on opposite sides of the amphitheater as can be seen in the photo (left). The box office and checkroom follow the curved wall of the amphitheater. Foyers for the individual theaters are one floor down and are reached by staircases adjacent to the halls. This lobby is also directly accessible from the two-level parking garage.

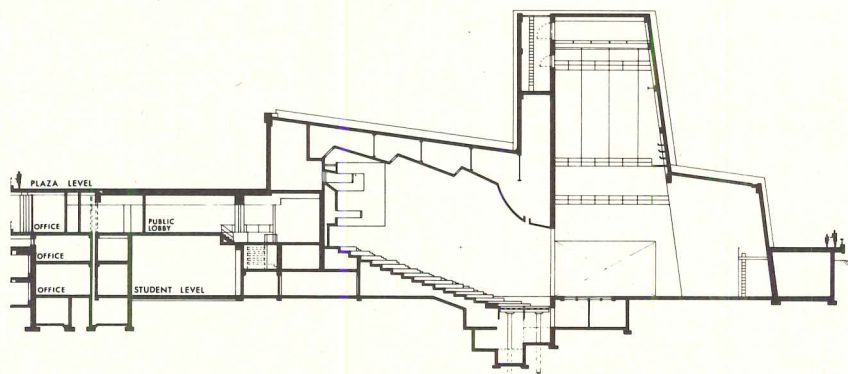
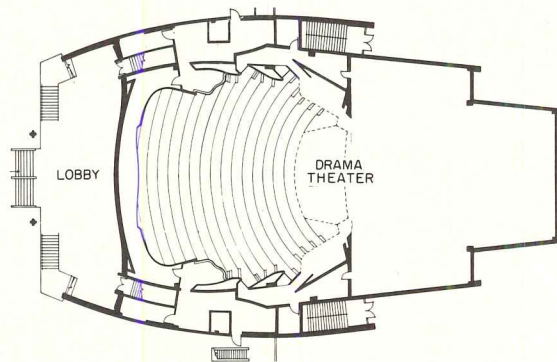


The stage level (left), located beneath the street to isolate sound and vibration, provides the necessary training and production facilities to permit uninterrupted use and great flexibility of operation. Truck docks are located to the north and south. Shown in the photo (left) are the drama theater with its 92-foot stagetower, the glass facade of the upper foyer of the concert hall, the amphitheater and the music theater. Persian red brick, dark brown wood shingle and Indiana limestone are the primary exterior materials.

This \$22-million complex, designed by Max Abramovitz with George Izenour as theater equipment consultant and Dr. Cyril M. Harris as acoustician, has been designed to accommodate the teaching and performance requirements of The School of Music, the Department of Theater, the School of Dance and the university bands of the University of Illinois at Urbana-Champaign. It is also a community cultural center serving a large public audience.

An extremely generous private grant from the Krannert family made it possible to build five different facilities each of the optimum size and shape for the types of performance housed. None, for example, require the built-in acoustical and mechanical flexibility of Uihlein Hall. The facilities include the 2,100-seat Great Hall, or concert hall, designed primarily for orchestral and choral performances, the 985-seat Festival Theater, or music theater for chamber music, intimate opera and musicals, the 678-seat Playhouse, or drama theater, designed for legitimate theater and dance recitals as well as many other kinds of performances, the 150-seat Studio Theater for experimental productions and the 560-seat outdoor amphitheater for open-air musical and dramatic performances.



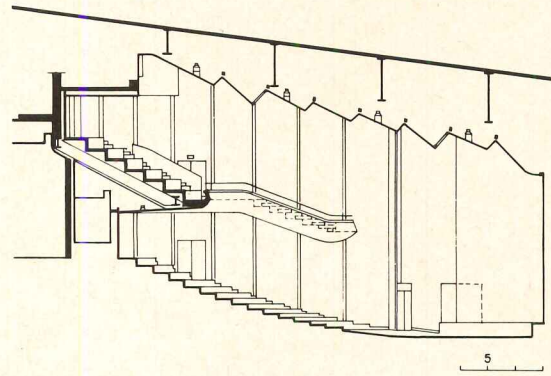
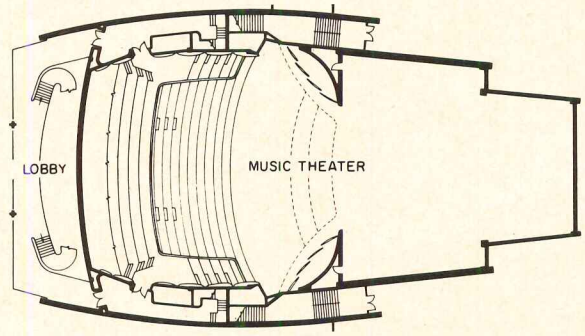
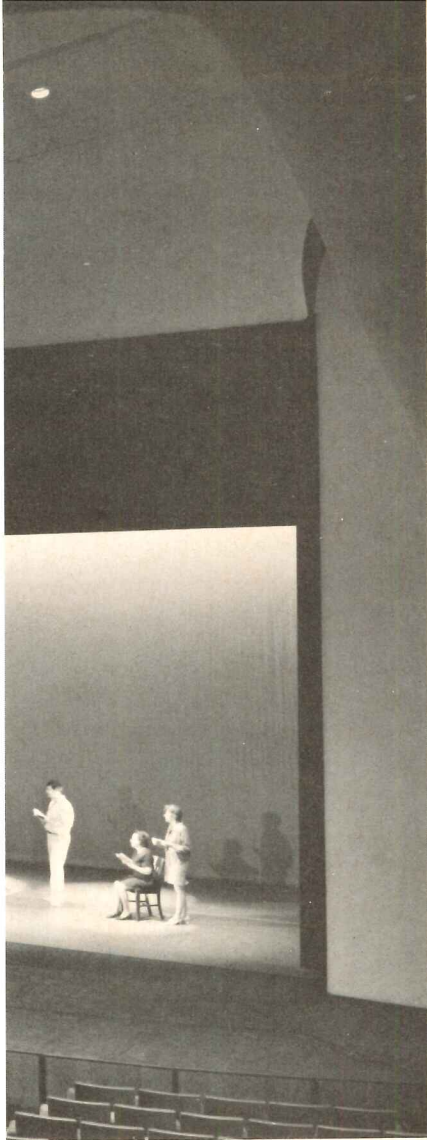


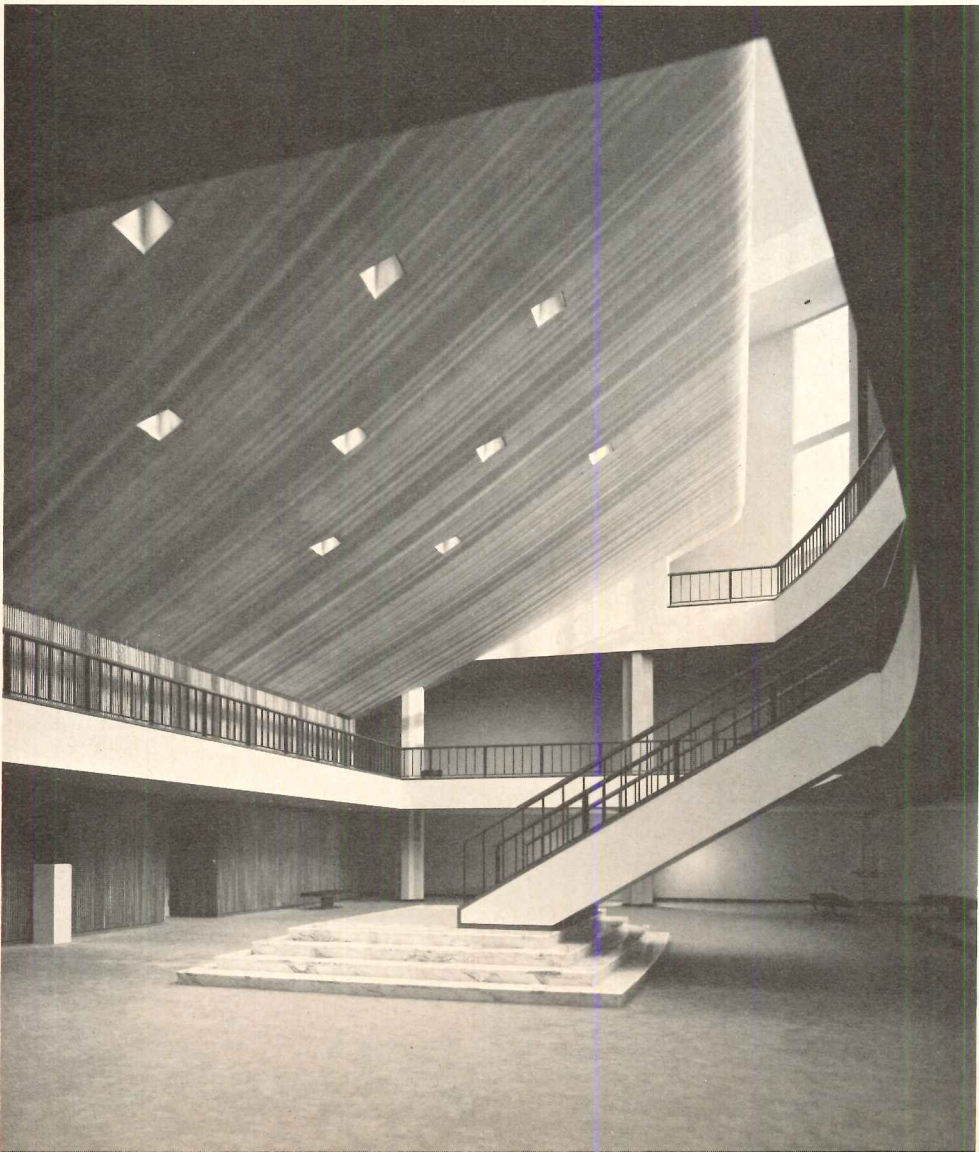
The 678-seat drama theater shown at right and in plan and section (left) was shaped to provide the lowest possible cubic volume per seat consistent with other requirements, so that speech can be heard to best advantage. The smaller volume provides a lesser reverberation time and these factors, combined with the use of reflective rather than absorptive surfaces, provide optimum conditions for spoken drama. Only the upholstered seats and the rear wall below the projection booths are absorptive. Ceilings, side walls and the face of the projection booths are of plaster.

The drama theater has steeply banked continental seating providing good sight lines and a sense of closeness to the actors on the stage. The color scheme combines Venetian red seats and smoke blue walls. The stage differs slightly from that of the music theater because of its more elaborate fore-stage, a portion of which extends into the seating area and can be raised by two hydraulic lifts to serve as a thrust stage or be lowered to accommodate a small orchestra. The proscenium opening is 38 feet wide and there is 30 feet of depth to the cyclorama.

The music theater shown at left and in plan and section (right) has 701 seats downstairs and 264 in the balcony, and except for the fact that it has a balcony is very similar in design to the drama theater. Both halls have a good rake to the seats for sight and sound. The orchestra section of the music theater has two center aisles and two side aisles, while the balcony has continental seating, thus increasing the number of good balcony seats. The balcony is high enough not to block or trap sound under it and its shape helps reflect and diffuse the sound. The hall is painted white and the seats are upholstered in red mohair. The stage of the music theater is large and well equipped. The proscenium arch is 40 feet wide and there is 30 feet of depth to the cyclorama. Two hydraulic lifts can be used to enlarge the apron of the stage. When these lifts are raised, the stage thrusts out into the audience to provide directors with opportunities for many variations in production. The lifts can also be lowered below seating level to make an orchestra pit, which varies in size according to whether one lift or two are used. Idaho white pine covers the stage of the Festival Theater.

A cyclorama, or sky drop, can be lowered into position when needed. This cyclorama is constructed of a translucent material.





**Foyers** and lounges isolate the theaters against sound and vibrations. Vertical wooden strips, covering fiberglass absorptive material, form the walls of these areas, and all floors are carpeted. Shown at left (top) is the upper lobby of the concert hall and (bottom) its main foyer tucked under the cantilevered balcony.

KRANNERT CENTER FOR THE PERFORMING ARTS, University of Illinois at Urbana-Champaign, Urbana, Illinois. Architect: Max Abramovitz of the firm of Harrison & Abramovitz; structural engineers: Zetlin, DeSimone, Chaplin & Associates; mechanical and electrical engineers: Cosentini Associates; stage design: Jo Mielziner; stage equipment: George C. Izenour; acoustics: Dr. Cyril M. Harris; landscape: Sasaki, Dawson, DeMay Associates; contractor: Turner Construction Company.



# What the systems approach means to air conditioning Part 3

by Robert E. Fischer, senior editor, and F. J. Walsh, consulting engineer

**Two main objectives of the performance specification are: 1) to reduce costs through consideration of alternative solutions that can produce the same results, and 2) to stimulate new technological ideas (provided there is the time, money and manpower). This article points out that if performance specifications are to be effective, those preparing them must**

**carefully evaluate the status of technology and codes and standards, pinpointing opportunities and constraints. Further, regardless of formalized procedures—systems approach and performance specifications—the right people have to be involved in both broad and specialty areas of design, manufacturing and construction.**

The first step in any design approach to building, including the so-called systems approach is, of course, that of determining users' needs. This process may involve the evaluation of a broad range of sociological and planning factors. The complex human needs relating to enclosed space presumably are evaluated in the process and given weighting factors to be balanced against cost, physical layout, flexibility, performance criteria, and other technical factors for the ultimate system. While it is the architect who is mainly concerned with human factors, the engineer would not like to see the systems approach applied on a too theoretical basis, ruling out judgment and experience, particularly with regard to how the occupant will use and operate the system.

Planning-wise, on paper, many solutions may seem viable—such as mixed modules in a housing scheme, assuming that any kind of mix and match is possible. Now while this may pose no problem from the standpoint of mixing and matching living unit modules in relation to certain fixed plan elements such as stairways, bathrooms and kitchens, and machine rooms for central air conditioning, it might severely limit the possibilities for air conditioning, even to the extent of making the whole scheme too costly.

The greater the allowable flexibility for mix and match of plan-element modules, the lesser will be standardization possibilities for the unitized central air-conditioning

system. The adaptable, plug-in module concept has its intriguing aspects. In fact, it is used to advantage in laboratory buildings. But here the owner *must have* practically infinite flexibility, and, moreover, he can afford to pay for it.

With housing, on the other hand, cost is of prime importance, and for costs to be kept under control with regard to mechanical systems, the exact limits on flexibility have to be spelled out in detail and the number of combinations limited and known in advance. Otherwise it is not possible to determine in advance what the costs will be for adjusting the mechanical system to different module mixes.

### **Big question about the performance specification: how much left open?**

The performance specification follows naturally from the systems approach, particularly when a multi-building project is involved. The basic implication of the performance specification is that certain aspects or details of the system are left open, with particular methods, techniques or products to be suggested by the bidder (manufacturers and/or specialist contractors). In any large project, systems approach or no, there are opportunities for cost savings based upon the use of a large number of repetitive units of equipment and materials. In a systems project where some innovation is desired, it makes sense to seek new approaches, or modifications to con-

ventional approaches, that could promise considerable over-all economies. An important question, however, is to what extent and in what areas the specification can be left open—i.e., in what areas change from previous acceptable practice would be allowed—without compromising the results in terms of initial and operating costs, performance and reliability.

A broad definition of the performance concept is that "products, devices, processes, systems, or services can be described and their performance measured in user requirement terms without regard to their physical characteristics or method of creation."<sup>\*</sup>

What this definition ignores is that the over-all system has its own limitations in regard to dynamic compatibility of elements with a system, with each other, and with the building itself. Reliability and quality must be designed and built into the system in terms of actual hardware. For instance, noise and vibration are related to equipment size, location, operating pressures and system stability. In addition, certain planning parameters (cost penalties for certain locations of machine rooms, etc.) can actually rule out some systems, and if put into the total context of building and actual system, some of these parameters may prove to be unrealistic.

<sup>\*</sup> Lawrence M. Kushner, Deputy Director, National Bureau of Standards in *ASTM Materials Research & Standards*, October, 1969.

The basic elements and components that will be used in any air-conditioning system will, for the most part, regardless of any innovation involved, be what has been used before, or close to it. Thus there is no real reason why important details regarding quality should not be spelled out in the performance specification. If they are not, then the specifier is relying on faith that the manufacturers and contractors will follow the spirit of the specification.

Further, the loose performance specification in a systems project impliedly is seeking bold innovation, with the anticipation that manufacturers will invest considerable amounts of R & D time toward development of new products—the carrot being a “seed” project of guaranteed size that will open up potential new markets. The fact is, unfortunately, that manufacturers in the air-conditioning industry have very little margin to gamble on, and prefer to amortize development costs on the project itself. The measure of true interest and R & D involvement in a project is not the number of manufacturers who submit bids. With any prestigious project some manufacturers will bid for reasons of good will, promotion or politics. And even though they may not have necessarily spent much time on R & D, bidding can be costly because of the personnel and paper work involved.

Less fault can be found in using generalized performance requirements for finish materials such as floor and wall coverings. The reason is that it is fairly easy to identify serviceability requirements depending upon severity of exposure and use. Even so, standard test procedures may be inadequate or nonexistent to quantify the performance characteristics. In lieu of such standards, the specifier must rely upon experience and judgment. To be blunt, use of an overly-loose performance specification

suggests that the specifier is either lazy, or that he is denying the knowledge exists concerning the status of technology in a given field.

It should be clear that for any performance specification on an air-conditioning system to be meaningful, the specification has to deal explicitly with the elements of the system. Aside from the reasons already mentioned is a very compelling one: whatever system may have been evolved by a manufacturer in response to a systems group's invitation to bid should be written up in great detail on every element, specifying actual sub-systems and hardware; otherwise when others wish to follow in their footsteps, the specification cannot be expected to assure a standard of quality. The manufacturer who invests development time in a project also will want a specification that spells out standards of quality so that he can protect his investment. If there are no adequate standards for quality, competitors can follow on subsequent applications and do a cheaper job if they so wish.

Systems groups which do not define specific hardware or systems often presume that since manufacturers have technical competence and staff they should be willing, provided a market exists, to develop broad system proposals. Because no single manufacturer has competence in all system areas, a broad investigation suggests that he would have to involve technical expertise from still other manufacturers and technical consultants. Too broad an investigation is a practical impossibility; demands on time and money would be excessive. Such will be the case if the performance specification is too diffuse and vague. For this reason a vague performance specification by its nature is bound to limit manufacturer involvement, particularly if innovation is the byword.

Basic to the thinking of some system project groups in their performance specifications is the concept of renewal of sub-systems after they have deteriorated or become obsolete; sub-systems—lighting, partitions, air conditioning, etc.—are assigned a presumed reasonable life span. Whatever the new sub-systems, they still must meet the same physical coordination criteria, regardless of how impressive they may be functionally. The big question is how far ahead a systems group must look to anticipate technological change. If small-size, short-life equipment is selected for small modules, then it is easier to keep up with technology, economic consideration aside. Not so with larger, more complex packages and systems.

Design of a complete system and its hardware cannot be derived directly from an abstract statement of user requirements. With an actual system in mind, however, it is possible to describe both performance and quality in narrative terms. It is also possible, but more difficult, to describe the functioning of a dynamic system in narrative, laymen's terms—being a detailed description of operation of a system and all its components at every performance condition. This can be done without reference to “numbers” and the process helps to clarify the designer's thinking and serves as an aid to communication between one engineering discipline and another, and between engineer and layman. Further, such description can be used by the owner of a building as part of an operator's manual.

Experienced and forward-thinking engineers who have a broad grasp of technology can indicate where the specification can be general and where it must be specific as to the actual parts of the system to make communication adequate.

Testing for certification of air conditioners or components based on full operating test is difficult for packages of the air-to-air type because of the necessity of simulating outdoor ambient temperature, room conditions and room load. The larger the unit, the more difficult this is to achieve, particularly for a range of variable outdoor ambient conditions. Certification is not available for unitary air conditioners above 10 tons in capacity. A systems project group could cooperate with industry to set up a test facility for acceptance testing of larger unitized air-conditioning equipment.

In addition to developing a bidding document, a systems project group could and also should look into the details of air-conditioning packages, make quality evaluations, and be sure that all components are matched.

#### **Codes and standards affect how the performance specification is written**

Before any systems groups become involved in consideration of technological change and performance specifications, they must understand what restrictions exist in terms of codes and standards.

The simpler standards are fairly clear-

### **Definitions significant in the performance specification**

**A Standard** is a document, carefully thought out by any authority for establishing an agreed practice, or for directing practice along agreed paths. It may give definite direction, or be a statement covering the most up-to-date knowledge needed to enable the agreed practice to be followed.

**A Code** is a standard on system installation which sets forth requirements based on the protection of health, safety, property, etc., and which is used as a reference by a regulatory authority which can impose penalties to enforce compliance.

**Consensus**—In standardization practice, a consensus is achieved when substantial agreement is reached by represented, concerned interests, according to the judgment of a duly appointed authority.

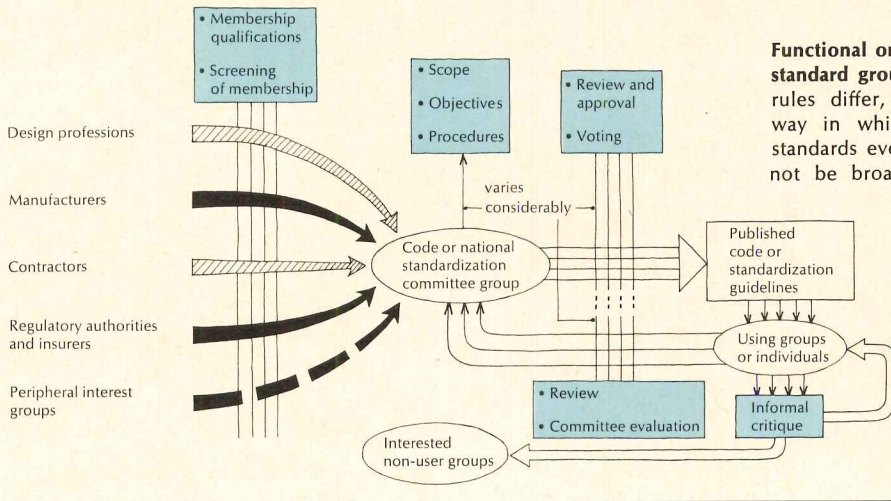
(Membership, procedures, voting rules, openness of discussion and review within membership and with users, etc. are factors of importance to any user in deciding the broadness and degree of acceptance of the consensus.)

**Specification** (in a broad sense)—A listing of technical requirements that attempt to: 1) insure that desired performance is achieved in areas of concern and 2) set the limits of all the important design parameters.

**Performance specification**—A specification that allows a bidder latitude in deciding what to provide or how to meet the specification. The latitude allowed by the specifier will be based upon his investigation and evaluation of the status of design, construction or manufacturing technology, indicating those areas in which advances are possible or imminent. The degree of latitude also will depend upon his evaluation of the bidder's R & D capability.

**Reliability**—the probability that a component, package, sub-system or system will operate in a specified manner in the environment for which it was designed, for a specified period of time. The three essential elements are: 1) conditions of operation, 2) environment to which subjected, 3) useful life expectancy.

# The performance specification: factors affecting scope, content and approach



**Functional organization for code and standard groups.** Because the ground rules differ, there is no consistent way in which industry codes and standards evolve. There may or may not be broad technical representa-

tion and reflection of the status of technology. Design professionals owe it to their clients to become more involved in these activities. (Wide arrows indicate various strengths of input.)

## BROAD-SCOPE ACTIVITIES COMMON TO THREE POSSIBLE PATHS FOR THE SYSTEMS APPROACH

(stated objectives are identical, but the degree of activity and investigation can vary, depending upon specialist areas represented and their expertise)

1. General functional requirements stated by owner's study group (user needs).  
 2. Determination of space-planning module and hypothetical plans.  
 3. Preliminary structural statement: space-planning limitations and load-carrying requirements, related to occupancy but incomplete with respect to mechanical systems.  
 4. Designation of size and location limitations for fluid-flow (air, water, etc.) mains and branches (in shafts, chases, mechanical service cores or wings, space allowance in floor, ceiling, walls or partitions) and for terminal units and/or air outlets.  
 5. Statement of parameters for mechanical service mod-

ule, related to basic space-planning modules served, for 1) central recirculating-air systems and 2) central secondary-fluid systems.  
 6. Statement of flexibility requirements in terms related to degree of need and cost premium for 1) elements required to be relocatable, 2) minimum size of temperature-control zone.  
 7. Evaluation of existing codes and standards in areas where there is non-uniform acceptance, in an effort to establish an optimum solution considering each aspect of safety, health and economic considerations as well as quality levels.

### Systems project group

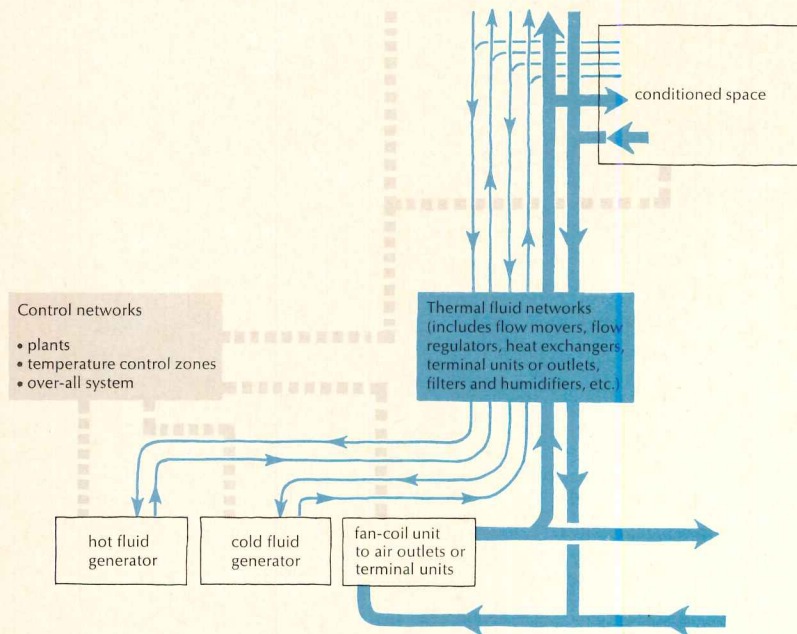
(see Part 1 for functional organization)

	A-1	A-2	B
<b>Technical investigation and staff technical expertise. Liaison with industry and profession</b>	Minimum effort	Medium effort	Maximum feasible effort
<b>Investigation of status of technology relating to building type under study</b>	Weak, or relies entirely on data offered by interested manufacturers	Comprehensive systems' hardware evaluation in terms of quality of materials, critical components, fabrication standards, reliability aspects, etc. This evaluation will consider 1) the practical limits of today's technology and 2) the specific areas in which improvements or significant new developments are imminent or may be forthcoming	Comprehensive systems' hardware and systems' design and installation. This evaluation will consider 1) the practical limits of today's technology and 2) the specific areas in which improvements or significant new developments are imminent or may be forthcoming
<b>Review and analysis of system possibilities</b>	None	None	Evaluation and selection of optimum systems and compatible sub-systems  Preliminary plans and specifications for hypothetical buildings  System engineering and system analysis for selected systems and sub-systems
<b>Performance specification bidding document</b>			
Nature of document	Systems purchasing approach with minimum description of any actual physical system, sub-system or component. Limitations on physical and design engineering aspects implied rather than stated	Systems purchasing approach with minimum description of any actual physical system, including specifications based upon systems hardware evaluation	Detailed plans and specifications for competitive bidding on all elements in complete system. Included specific selection of hardware, materials, fabrication details, components (internal design of equipment packages left open except where relative criticality and quality-level evaluation dictate otherwise
Determination of applicable engineering design technology	Completely open, therefore no independent test of hardware can be set in advance	Detailed criteria, acceptance testing and standards set for all important elements	(Similar to A-2, but more complete)
Determination of type and quality of air-conditioning system hardware	Very generalized guidelines and acceptance criteria and tests established	(More complete than A-1)	Detailed acceptance standards and tests for every aspect for performance and quality
Determination of type and quality of the air-conditioning system	Left almost completely to manufacturer	(Same as A-1)	Completely new and detailed standards established

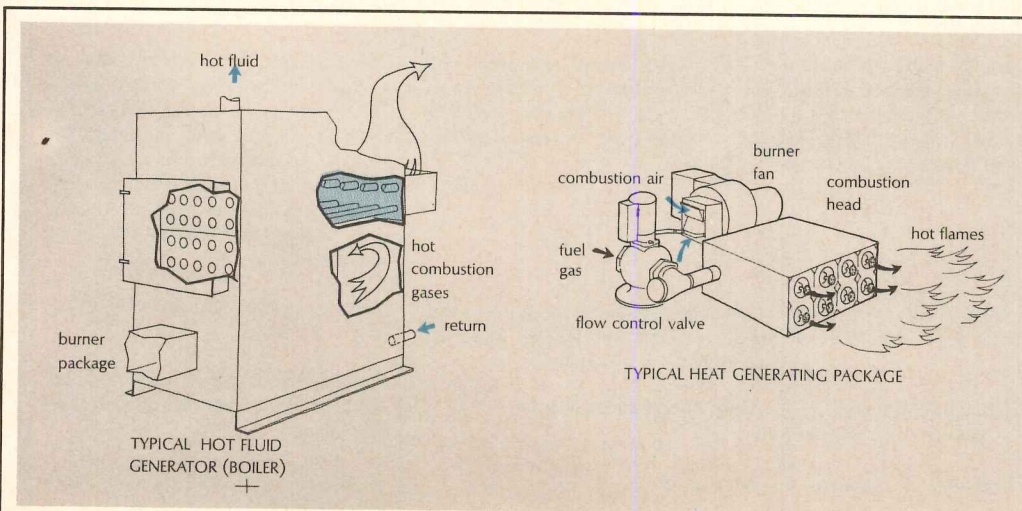
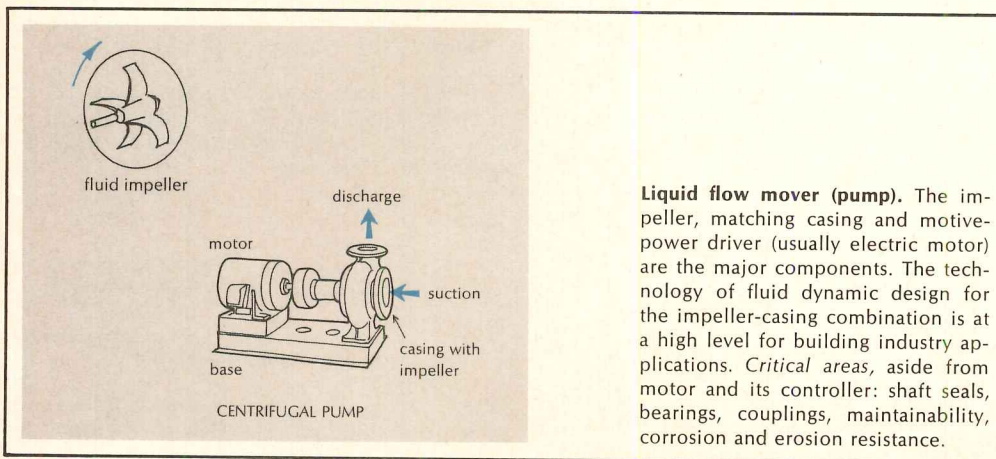
## Critical factors that affect the performance of manufactured equipment, packages and components

Criticality areas referred to in the captions on these two pages indicate particularly important ones to be considered, but the listing is, necessarily, incomplete. Simplicity and brevity are essential in specifications. These qualities could be enhanced if there were more broader-scope standards and certification provided by manufacturers for a wider range of products and materials.

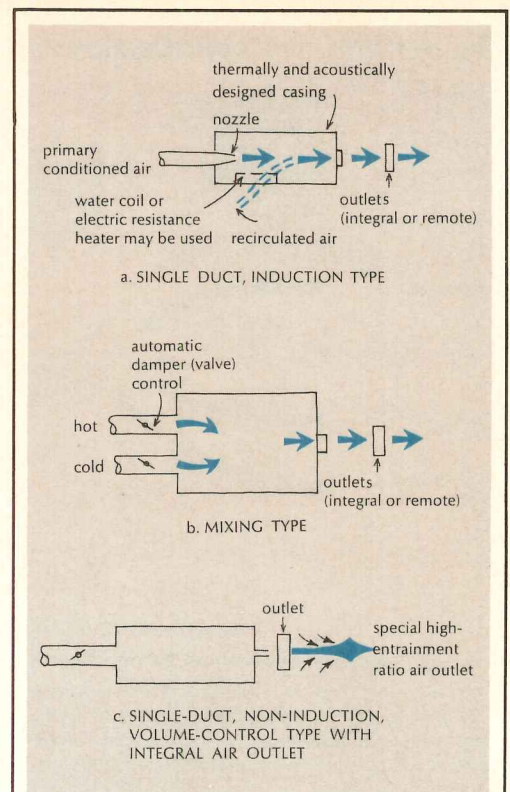
Design engineering quality is critical to system success. Broader and more detailed, nationally-accepted standards defining this quality are needed. Standards would include such factors as quality of people, engineering reference data, methods and procedures, approach to design, records and reports.



BASIC PACKAGES AND SUBSYSTEMS COMPRISING A CENTRAL AIR-CONDITIONING SYSTEM



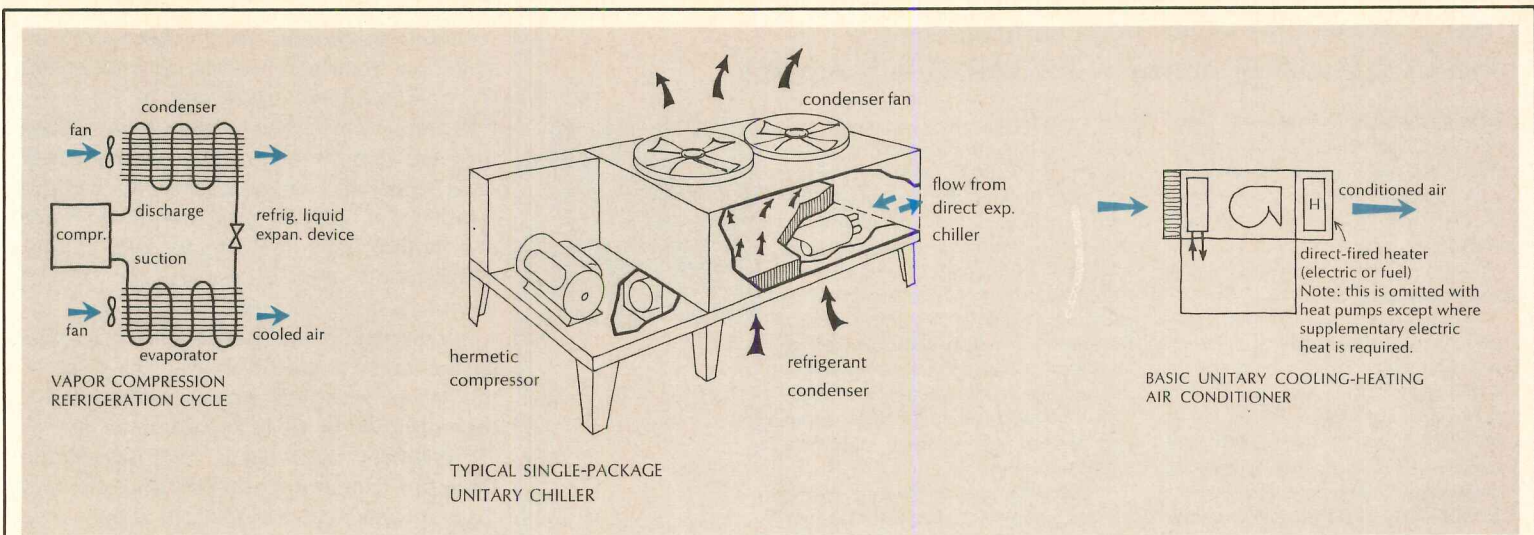
**Heat-generating and hot-fluid generator packages.** Code and standard organizations have been very active in this area because of obvious fire and explosion hazards. Problem areas remaining: combustion and safety controls, corrosion and chemical treatment, chimneys and venting, ventilation and combustion air. Satisfactory matching of output to system requirements can be especially critical when the equipment is small and not very flexible.



### Air-powered terminal units and/or air outlets.

Introduction of heating or cooling effect into the conditioned spaces by means of streams or jets of air can be accomplished in many ways with different comfort results within the space. The aerodynamic process involves a mixing of air with an infinite number of solutions of varying quality. Technology for a still wider range of installation conditions is gradually evolving. Satisfactory solutions can be obtained for most spaces and systems provided that there is careful use of proven technology and that space/outlet arrangements are relatively standard.

*Critical areas:* noise, flow stability, mixing uniformity, flow-stream-controller leakage, range of minimum-maximum flow-stream controllability (dampers or air valves); and for induction-type units: 1) reduction of induced air flow with increased static resistance and 2) reduction in total flow with increase in resistance on outlet side of unit.



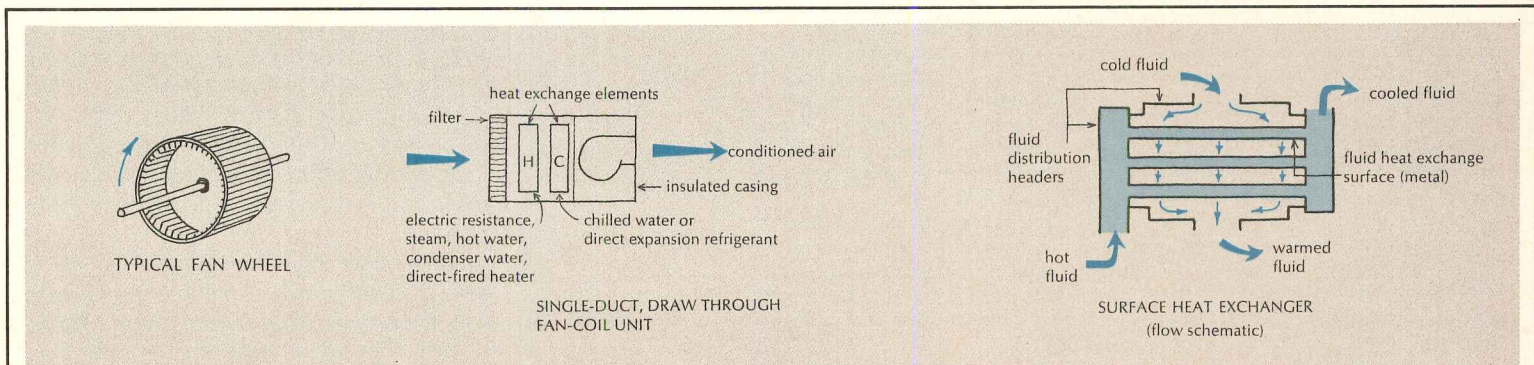
**Refrigeration cycles and processes.** All of the technological details of vapor-compression refrigeration cycles and absorption refrigeration processes do not concern the average consulting engineer. He should, however, look into features relating to: efficiencies over the operating range; satisfactory high and low ambient operation at full- and part-load; stability and flexibility of operation at all possible load conditions; exact functioning of safety and operating controls, particularly as matched to a realistic hypothetical air- or water-distribution system; noise and vibration; magnitude of dynamic unbalanced forces in each component and for the package; quality of materials and fabrication for package enclosure and structural frame; quality and functional performance details of components

within the process or cycle and the flow-moving part of the package; performance of bearings, fluid seals, refrigeration specialties, dampers, heat exchangers, fan wheels and shafts, electrical components and controls, couplings and drives, vibration isolators, etc.

**Unitary packaged cold-fluid or cold/hot-fluid (heat pump) generators.** Unitizing concepts require that only standard matched (modularized) packages be used, whether singly or in multiple. For the most part this rules out a consideration of custom design for heat rejection, such as is often required for centrifugal or absorption water chilling packages, and for complex heat transfer systems for heat recovery. Many unique and proprietary designs are possible for cooling and heat pump cycles that cannot

be anticipated in any detail. Criticality of this category of package is covered in earlier discussion on this page and under liquid flow mover (pump).

**Unitary air conditioner or heat pump package.** Criticality aspects are covered under comments on refrigeration cycle, heat generator and fan-coil packages, and on surface heat exchanger (below). The more complex the fan-coil section of the package (e.g. multi-zone or double duct) the greater the problems related to refrigeration cycle and heat-exchange capacity control and stability. Therefore, a very detailed evaluation must be made of the compatibility of all controls integral with the cooling ventilation and heating features of the unitary package, and the related over-all temperature-control system.



**Fan wheels, fan wheel/housing combinations, basic fan/housing packages.** Aerodynamic theory of fan operation is complex and comprehensible only to the specialist.

**Critical areas:** fan wheel speed, fineness of dynamic balance, generation of noise at various frequencies, durability and materials of construction, accessibility for cleaning and/or replacement, etc. Optimum selection of housing for a given fan wheel, again, is in the area of the specialist.

The fan-housing (basic "fan-head") package includes enclosures, and structural support for enclosure, fan shaft and bearings, and drive.

**Critical items** are of same nature as for basic fan wheel but include, in addition, bearings, fan shaft, drive elements (including motor and controller).

**Basic fan-coil package:** fan coil packages come in many configurations, but basically are 1) single-duct draw-through or blow-through type and 2) two-duct blow-through type for multi-zone or double duct application. They range in size from room fan-coil type to large central-system packages. Unitary air-conditioning units include this package as part of the over-all package.

**Areas of criticality** for coil-section thermal performance within the unit relate to uniformity of air conditions and velocity entering and leaving the coil or coils. For double-duct or multi-zone units this is particularly critical because of presumptions made as to performance, particularly at part-load conditions.

**Heat exchangers:** These include heating and cooling coils utilizing water

or refrigerant, exchangers in direct-fired heaters of various sorts, and converters (refrigerant-to-water, steam-to-water, water-to-water, etc.). Design of heat exchangers is very involved and sophisticated in many areas, particularly with respect to broad-range performance of heating coils.

**Critical areas:** materials, performance and fluid-pressure drops. For systems that require modulation or staged output from coils, the engineer will want to have guaranteed performance for each heat-transfer condition. Coil rating for the hypothetical condition of uniform flow and no stratification is rarely met in practice, even within a fan-coil package. Variations in output capability across the face of a coil is very important in multi-zone and double-duct applications.

## Critical factors that affect the performance of field-fabricated flow networks and control sub-systems

**Automatic control networks.** Separate, but coordinated, automatic-control sub-systems are required for air-conditioning packages, for central hot and cold generators and flow movers (air and/or water), for flow networks, and for individual space temperature-control zones.

Some buyers hold the view (purchasing-agent-type thinking) that all the performance specification has to say about controls is that they should assure thermal comfort in the occupancy zones at all times, and that there should be certain automatic or manual control features pertaining to job functions of operating personnel. Of course such a generalized specification is open to a wide variety of interpretations, and a wide variety of results.

In a performance specification it is not sufficient to describe the requirements of a control system as if there will be ideal equipment operation, optimum installation and correspondingly ideal in-space thermal performance. In a practical sense, the specification must take into account

**Fluid flow networks.** The principal fluid-flow networks in unitized systems are air and water, although satisfactory systems are possible using steam/condensate (e.g. for multi-terminal-unit room heating) and refrigerant vapor-liquid systems (e.g. for multi-terminal-unit room cooling). The latter two media, particularly refrigerant vapor-liquid, require a higher level of engineering expertise, and the areas of criticality are broader and generally less known.

*Criticality considerations* include proper selection of the pump and/or fan as required by the range through which the system will operate. Reason is that there always is a non-linear relationship between capacity and pressure or flow. With a fixed state of flow there is no problem, but this situation hardly ever exists in practice. With varying flow the engineer has to check what happens at various points on the operating characteristics curve. When capacity requirements change as, for example, through varying demands of various control zones, this tends to upset system stability. Then the pressure or velocity within each portion of the system has to be stabilized by means of valves and dampers, etc. The engineer has to work with known flow and pressure differentials. This is one of the reasons that the characteristics and operating limitations of terminal units and their control means must be carefully considered.

Optimizing of fan-coil and auxiliary package mountings and duct connections is critical in terms of system flow capability, noise and vibration and physical stability. Increasingly, manufacturers are providing advisory information on the general effects of installation conditions that depart from best practice recommendations.

Flow networks, aside from the basic packages described earlier and

that the control system is subject to a variety of functional limitations relating to sensitivity, actual effective ranges of control, and stability tied in with dynamic response of systems.

All limitations or departures from the ideal of the actual control sub-systems used with packaged equipment and related sub-systems should be known in advance by the system engineer so that dynamic compatibility will be assured. Better communication between engineers and manufacturers on such matters could help advance the art.

The advantage to the engineer of unitized systems is that the manufacturer can work closely with the control manufacturer to resolve compatibility problems at a practical level—more so than can the consulting engineer. The other side of the picture is that manufacturers may differ widely in their approaches, and, while some or all may be valid, the engineer probably is not aware of the detailed reasoning leading to certain decisions—ones that could affect his design and specifications.

flow regulating components, consist mainly of field- and/or shop-assembled elements put together by the contractor using manufactured products (e.g. sheet metal for ducts and pipe for piping systems; also thermal insulation in various forms).

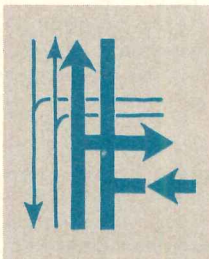
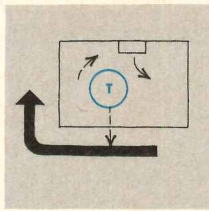
The control network sub-system that is tied in with flow networks is put together in a somewhat similar fashion. But it is far more sophisticated in operation, and, therefore, much more difficult to analyze both in terms of performance and quality.

A very big problem today is that of establishing meaningful and specific quality levels for this important and relatively costly sub-system. The reason is that consulting engineers are not familiar with all possible installation variations that can occur in practice as used by different quality-level contractors. The greatest cost cutting (with consequent reduction in quality) can be made in the areas of ductwork, insulation, and automatic controls.

*Critical areas with flow networks* include: use of proper flow-channel details; noise and vibration; corrosion, deterioration and condensation; excessive air leakage and excessive heat gain or loss; physical supports and provisions for expansion and contraction; proper application of fluid-flow-regulating elements (valves and dampers), both for shut-off, pressure control or volume control (manual or automatic).

Other critical areas involve proper provisions for flow measurement, temperature and pressure measurement, and regulating devices to allow adequate balance, test and adjustment of the system.

It cannot be overemphasized that reliability must be designed and built into a system. Well-engineered flow network design and provisions for access and maintenance are always important.



cut, covering the three different areas of technology—design, manufacturing and installation. Standards are set up in different ways and have varying degrees of influence. It is fairly common, for example, for design firms to establish their own standards. Better understood and of more consequence are standards of manufacturers on test methods and criteria and their trade associations, which tend to stabilize competition, and of the professional societies.

A number of the systems project groups have characterized the area of design technology as being relatively standardized—design should be done according to “standard engineering practice,” they say. While there are data and guidelines available and many sources of information, there is no national consensus on the detailed areas of design. The *ASHRAE Guide and Data Book* in some of its sections on applications and systems is rather broad in scope; the practical methods and procedures involved in detailed design are not discussed, with a few exceptions such as pipe sizing, duct sizing, etc. The main value of this information is to pinpoint areas of concern that should be looked into. Further, because ASHRAE is primarily an industry organization, the information on equipment and applications has to represent a composite of all industry views, and, consequently, does not necessarily represent best engineering practice in every area. Consulting engineers abstract from textbooks, handbooks, manufacturers’ application engineering recommendations, etc., to give detail and a practical aspect to design.

Of course, the ASHRAE data on heating and cooling loads, U-factors, outdoor design temperatures, infiltration, solar radiation, etc. are used directly. Still, the guide specifically states that judgment and experience will decide to what extent these factors are to be adjusted, depending upon distance from weather measuring stations and deviation of insulated constructions from optimum.

It is clear that the ASHRAE guide is useful as a composite reference source covering every area of air-conditioning design and engineering, but also that it is not necessarily always the ultimate or best source.

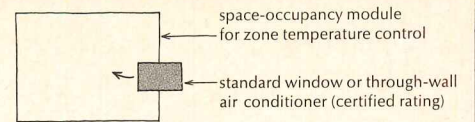
Some standards, of course, are defined by building codes—national, regional or local. These standards relate to matters of health, safety and protection of property, and necessarily represent a consensus because a governmental subdivision requires that they be conformed to. Utilities which provide services to buildings also have standards requiring installations to be done in a certain way to insure compatibility and safety. Additionally, there are insurers who may be more or less restrictive than building code authorities.

Specifications refer to all or part of an installation; codes always refer to equipment as installed, not hypothetical test of equipment separate from an actual system. Codes are standards that are mandatory; they always state minimum requirements.

## Standardization applied to the air-conditioning system, its sub-systems, packages and components

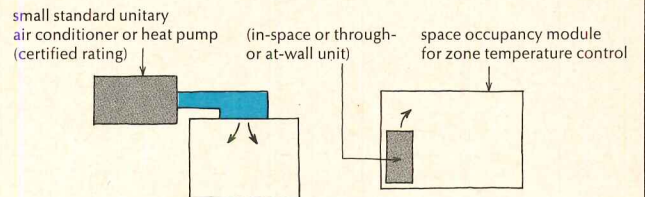
In the systems approach to air conditioning, system possibilities vary in complexity, depending upon such factors as details of thermal performance, equipment longevity, space-planning restrictions, noise, operating and maintenance costs, etc. Each of the possibilities, however, will always be based upon the use of unitized equipment and standard packages. Any systems group will have to decide, first of all, to what extent its staff should become involved with standardization in its approach to arriving at a performance specification for manufacturers to bid on. In any case, the staff's investigation should include: 1) a comprehensive evaluation of all components comprising equipment packages, flow networks and other sub-systems (e.g. automatic controls), and 2) an evaluation, to some extent, of over-all refrigeration cycle or process concepts, and the functioning of the components under all anticipated operating conditions.

As part of the systems group's over-all endeavor, detailed practical standards should be established by them for each area of air-conditioning technology they are utilizing so that industry and design professionals can evaluate them. This is necessary for the system group to establish commonly understood quality levels for their own project and for future use of their solution by others.



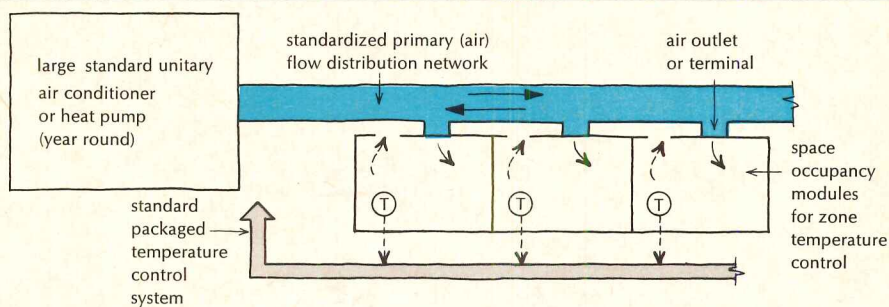
APPLIANCE-TYPE AIR CONDITIONER

**Room-by-room approach.** Uses home-appliance-type units of 2½ tons or less with Association of Home Appliance Manufacturers certification. Equipment is less flexible and has shorter life than commercial-type small unitary air conditioners.



SMALL UNITARY AIR CONDITIONER

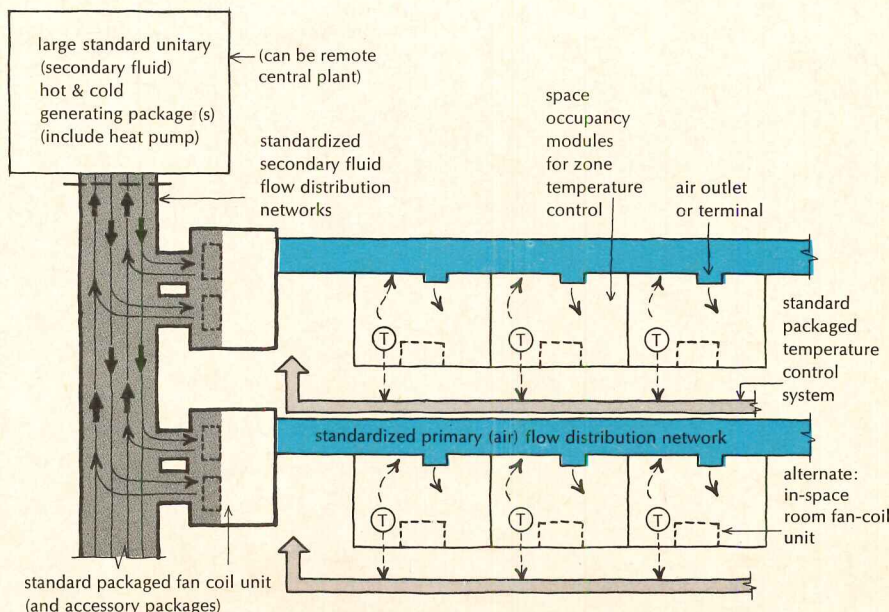
**Small direct-unitary approach.** Uses standard package unitary air conditioners of 10 tons or less capacity with Air-Conditioning and Refrigeration Institute (A.R.I.) certification.



DIRECT UNITARY CENTRAL AIR CONDITIONING SYSTEM

**Larger direct-unitary approach.** Uses standard package units above 10 tons. While there is no industry certification, test and rating procedures are available. But although multi-zone and double-duct units are quite complex in operation, standard industry test procedures have not been developed for them.

The air distribution system can be double- or single-duct, multi-zone, variable-air-volume, etc. Air-flow distribution network includes flow control devices, mixing devices, terminals and outlets. Use of in-space unitary air conditioners also is possible.



SECONDARY FLUID UNITARY CENTRAL AIR CONDITIONING SYSTEM

**Secondary-fluid unitary approach.** Many more types of system arrangements can be evolved. This is particularly so when the unitary packaged hot and cold generators are designed for use in multiple for a single building or groups of buildings. Modular unitized central plants may not be economical in larger capacities. Industry rating test procedures are available for many, but not all packages.

Secondary fluid-flow distribution networks can be chilled water, hot water, steam/condensate. Flow system includes flow-control devices, heat exchangers, coils, recirculating and booster pumps, controls, etc. Use of in-space fan-coil packages is also possible, as well as combinations and modifications thereof.

## What manufacturers say about the systems approach

"The selection of systems teams must precede formal specifications. The competition must be in terms of relative capabilities for doing the job: competence and breadth of staff; technological depth; quality of ideas pertinent to the problem; and record of performance."

"Closer cooperation between manufacturers and the various engineering societies could be greatly improved with regard to the needs of designing engineers. It seems as though there is no good clearinghouse to perpetuate this important communication."

"A generalized specification will produce higher-cost equipment in general because a manufacturer will over-engineer the product on the premise that the specification originator is unsure of the hardware required to get the job done."

"Governmental agencies, unfortunately, have become bogged down with ambiguous specification requirements. The end result is that governmental standards become totally unworkable because of their efforts to pacify all elements in our political structure."

"Inherent in the success of the systems concept is the involvement of each class of manufacturer or sub-assembler in the preparation of performance specifications. Many of these groups have test codes applying specifically to their products that should be considered. Each manufacturing group has considerable field experience and laboratory knowledge not contained in publications. Because the 'systems concept' will, in many cases, require specially designed equipment, such engineering resources should be tapped in order to prepare intelligent performance specifications."

"Once the basic performance criteria for systems projects have been outlined, consideration should be given to including graphic and charted data related to each operating component, obtained under controlled laboratory conditions. Further, performance criteria might cover air-handling characteristics, refrigerant-system characteristics, feasibility studies on operating and temperature controls, general R & D-related background studies, historical data on similar installations regarding actual running performance. Finally, longevity standards should be established based upon recorded operating history of previous installations and subsequent service and life-wear data accumulation."

"Although it may be provincial, manufacturers would prefer to write off the full cost of R & D against the requirements of the immediate project. In the case of systems this is not possible. The hidden drain on management and increased budget awareness is also to be reckoned with, in this, an industry with traditionally low profit margins."

"No manufacturer at the present time can supply a complete 'system' by the use of the products which he himself fabricates."

The National Electrical Code has been cited as being one of the best codes that exist in terms of effectiveness, use and currentness. While it is not meant to serve as a basis for design, in effect, by default, it is used for this purpose. Preface to the code states, "Compliance [with basic minimum provisions necessary for safety] and proper maintenance will result in an installation which is essentially free from hazard, but not necessarily efficient, convenient, or adequate for good service or future expansion of electrical use. This code is not intended as a design specification, nor as an instruction manual for untrained persons."

Generally speaking, codes are standards based upon statistical evaluation of failures that have occurred. Changes in codes are made to correct deficiencies in practice, determined on the basis of complaint feedback. A very good feature of the National Electrical Code is that when changes are made, the reasoning behind each change is given in fairly specific detail. Thus there is a year-by-year record and evaluation of changes. Further, each chapter lists the specialists who have been involved in preparation of that chapter.

All codes and standards should be referenced completely with technical sources, and with reasoning behind the various requirements being given. Some codes and standards are not as useful or accurately based as they might be because of a disproportionate representation of peripheral interests among their membership.

Standards in the air-conditioning field are presumed to have been developed by a broad representation of authorities who have arrived at a consensus. The *ASHRAE Guide and Data Book* is known among consulting engineers as the "bible" of the industry. As noted earlier, much of the data in the guide is accepted as a standard by consulting engineers. This does not mean that the guide as a whole is a standard because some areas would not receive a consensus among system designers. Furthermore, ASHRAE has promulgated a Thermal Comfort Standard which has not generally been accepted by consulting engineers. The reasons are: 1) it adds no new knowledge they can use; 2) it is impossible to validate by field test; 3) it is not necessary because the elements that combine to affect comfort—air distribution, U-factors, fenestration, controls, etc.—can be evaluated separately and designed so as to give optimum performance with all elements working together.

The area of construction technology is a difficult one in which to establish quality levels because installation in the field varies considerably. There really is no standard practice. Practice is the different quality levels that exist in a geographical area for a particular type of building trade construction. What is done does not necessarily conform to recommended practice of manufacturers or of other authorities. It is, in actuality, what contractors tacitly decide their

levels of standards are—minimum, medium and maximum. Because such standards are not put down in writing, it is difficult for engineers to enforce quality levels through their specifications.

Engineers say that no ASHRAE guidelines are found in most areas of physical installation practice. Design professionals always have to indicate how the installation is to be done, showing physically what has to be put in. This information has to come from the manufacturers, for the most part, rather than from contractors because contractors have to bid in accordance with the competitive market, and this limits what choice they have. If there were an authoritative reference source that made clear-cut what good, fair and poor practice is for each element of the system, then it should be possible to establish quality levels for the construction area.

If systems groups find that industry codes and standards are deficient—incomplete, too restrictive, lack acceptance testing criteria, etc.—to the extent that they might adversely affect potential for cost savings, or technical advance, then it behooves these groups to develop their own standards, delineating why this was necessary, who has been involved, what technical expertise has been retained to come up with something better. Hopefully, then, existing codes and standards would be changed and upgraded, but of course changes in codes can only be accomplished through established code bodies.

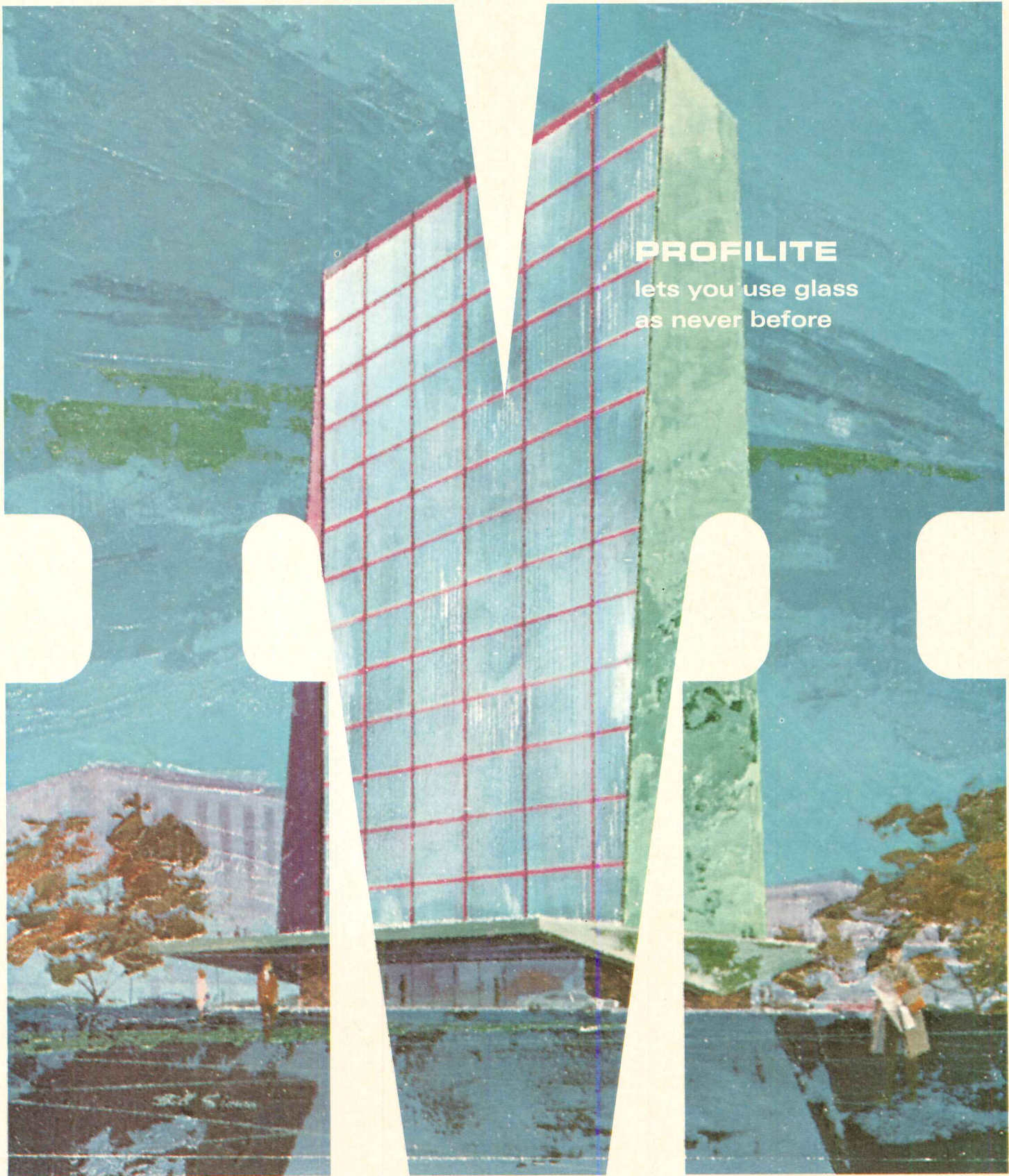
The system designer has to consider what is good or acceptable installation practice when he is preparing his bidding documents. He cannot be as knowledgeable of different quality levels, and what is possible, as individual contractors because they continually have to consider what is satisfactory quality. System designers are aware, but perhaps not to the extent as they should be, of good installation practice as recommended by equipment and component manufacturers. Manufacturers, however, do not indicate gradations of good practice for installation. Because this is so, because engineers today have much more difficulty enforcing installation as called for in the specifications, and because much of what is installed cannot be seen after the system is in, the engineer has to place a certain amount of reliance on the integrity of the contractor.

If the engineering design profession expects to upgrade its image with architects and owners, it needs to spend more time looking into the technology of installation and quality levels. The designers need to do this; contractors already have it. One worthwhile exception to the general lack of installation standards from contractor associations is the recommendations of the Sheet Metal and Air Conditioning Contractors' National Association. In other areas, however, such as physical installation of packages, piping, flow network systems, controls, etc., recognized standards do not exist.



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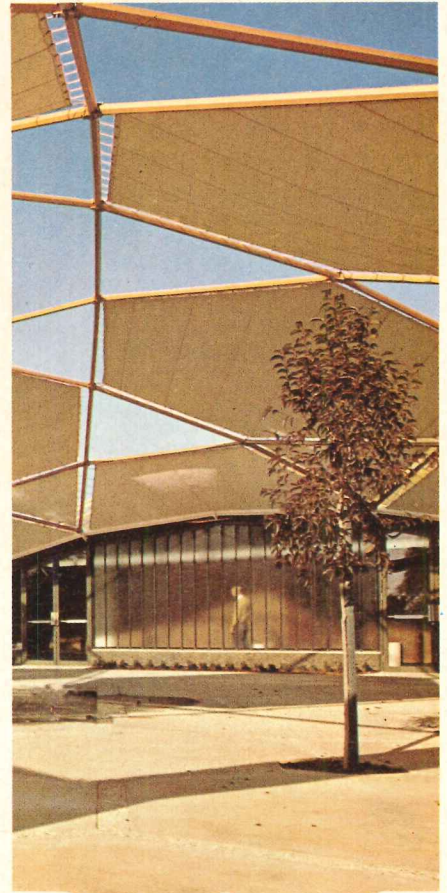
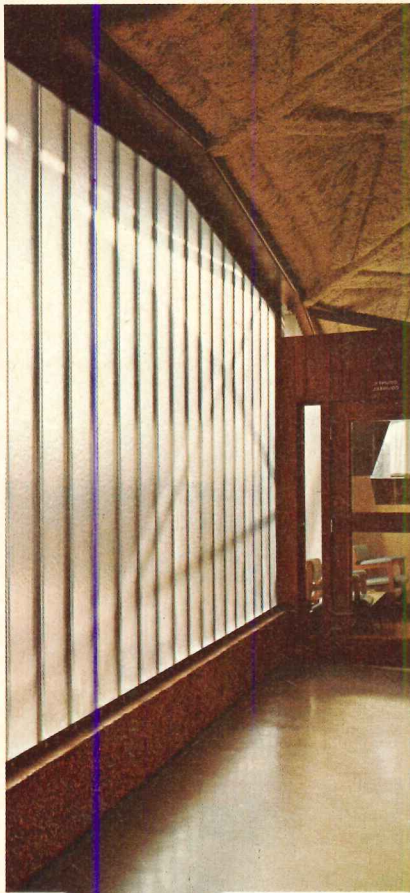
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# PROFILITE



## PROFILITE

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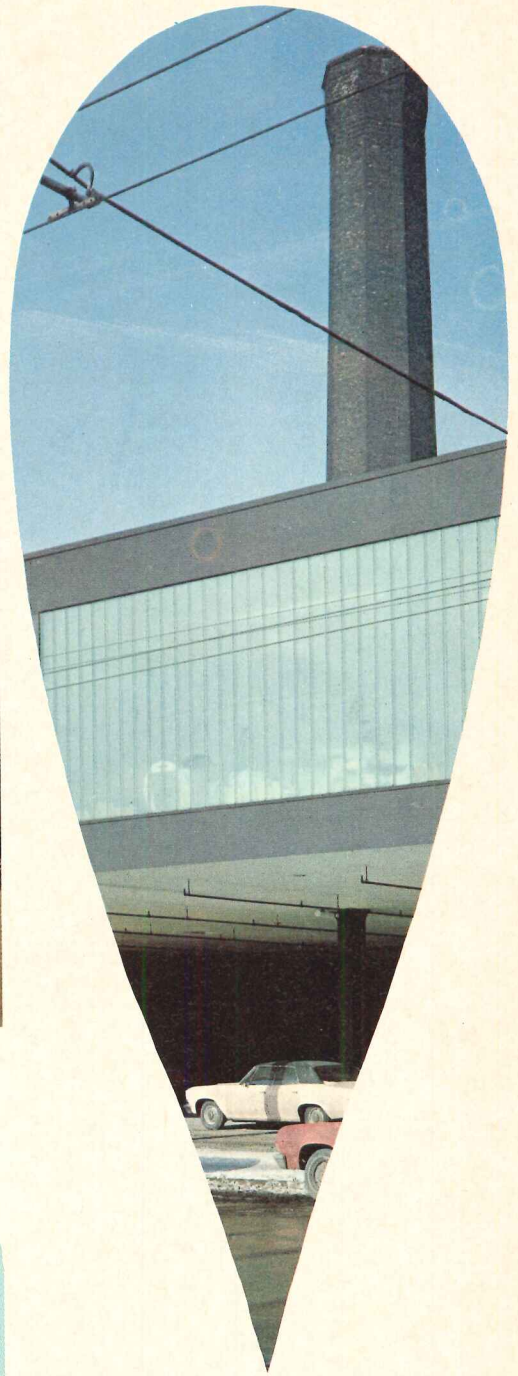
You need to think differently about glass to bring Profilite into your building plans. With it you have new design possibilities. It also offers new structural efficiencies. Picture the rising channels of Profilite giving their upsweep to building exteriors. Look down corridors where vast stretches of glass wall let in more light and stand strong without any framing to get in the way of the repeated vertical pattern.

## BOLD VERTICAL LINES add decorative effect

The adjoining flanges of the channel-shaped sections of Profilite eliminate the need for muntins . . . save this cost and provide attractive wall sections that are easily maintained. The vertical accent gives height emphasis to interiors and the glass helps distribute daylight for a more spacious feel in the environment. Each vertical line not only adds its heightening effect but also signifies built-in strength of Profilite.

## CHANNELED SECTIONS so easily handled two men can install

Profilite sections are just under 12 inches in width ( $11\frac{13}{16}$ ""). The stock lengths of 8, 10, and 12 feet are easily handled by two men without special equipment. Profilite weighs 4.34 lbs. per linear foot, so a ten-foot section could be lifted and set in place by one man if necessary and easily by a two-man team. Profilite is set in anodized aluminum sills supplied as part of the Profilite glazing system. Slip-in vinyl inserts seal the areas between metal and Profilite glass channels.



## CHANNEL MOVEMENT helps compensate as building shifts or settles

Profilite sections, because of their channel linkage, can move in relation to each other without tension. And there are no rigid metal members in between. Profilite's "flange joints" are cushioned top to bottom by non-hardening sealants or vinyl insets. The seal is positive, yet the glass is free to contract, expand, or move vertically. Profilite is thus especially suited for glazing buildings that may tend to settle.

## SO STRUCTURALLY STRONG it's practically self-framing

Profilite has proved it withstands substantial wind pressures and suction forces. The structural configuration of each section forms extra strength every foot of the way. It is so resistant to lateral pressures that you do away with vertical members necessary in conventional glazing. You enclose vast stretches of wall areas, "channeling in" Profilite that builds in extra strength section after section.

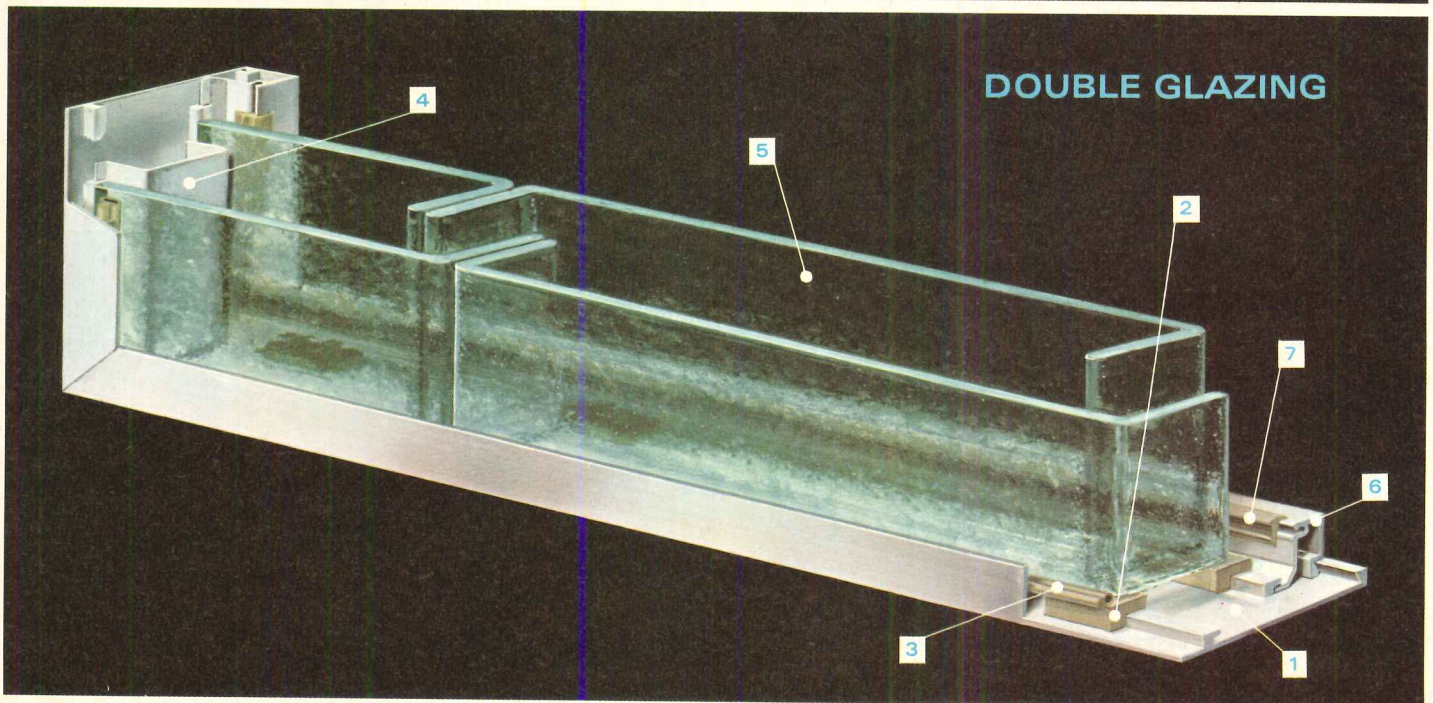
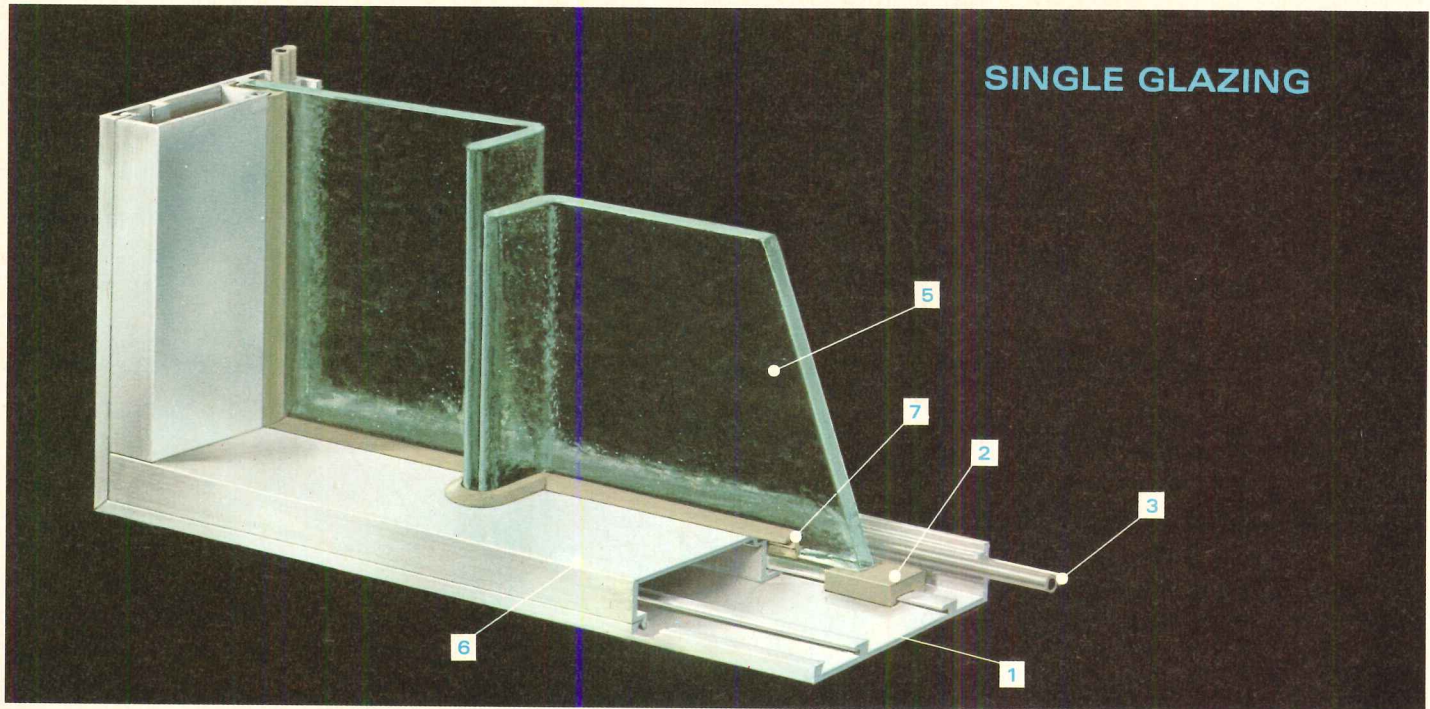
## GIVES PLANTS CURTAIN WALL LOOK

Profilite's biggest volume use at present is for exterior walls where its vertical lines give a curtain wall effect. Installed cost compares favorably with that of conventionally glazed areas. Double-glazed Profilite forms a 1½" air cushion between inner and outer channels for heat and sound insulation—U-value 0.55; visible transmittance 72%.



# PROFILITE EASY TO INSTALL

With Profilite you have a complete glazing system. Aluminium framing for periphery, jambs, heads and sill and vinyl setting blocks and slip-ins all supplied for double or single glazing.



- 1 Extruded aluminum periphery frame. 2 Vinyl setting block. 3 Vinyl slip-in. 4 Bent aluminum section.
- 5 Profilite. 6 Extruded aluminum sill snap-on. 7 Vinyl roll-in.

Write for Profilite Installation Guide for detail glazing instructions.



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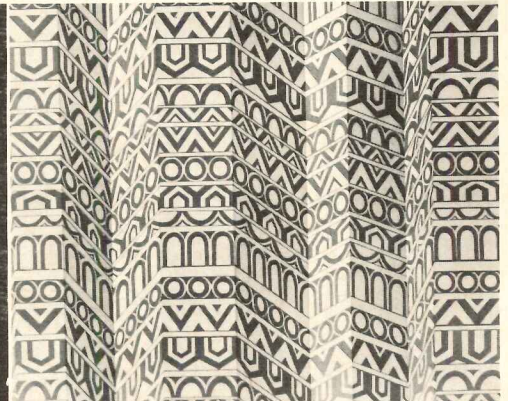
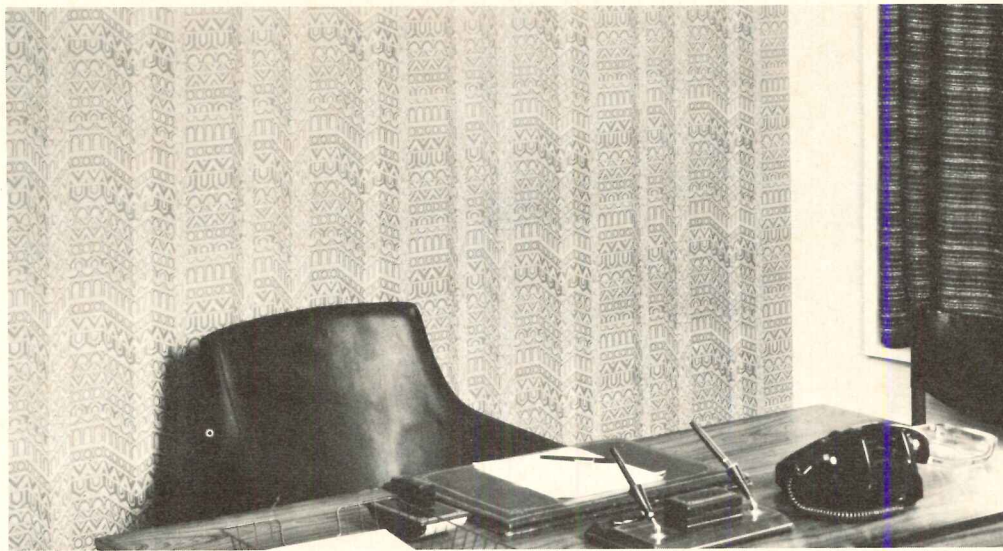
**London Style Collection of Vymura Wallcoverings includes 37 designs and 120 color combinations**

Shown are some of the 37 designs in the London Style collection of Vymura Wallcoverings from England. Vymura is a tough,

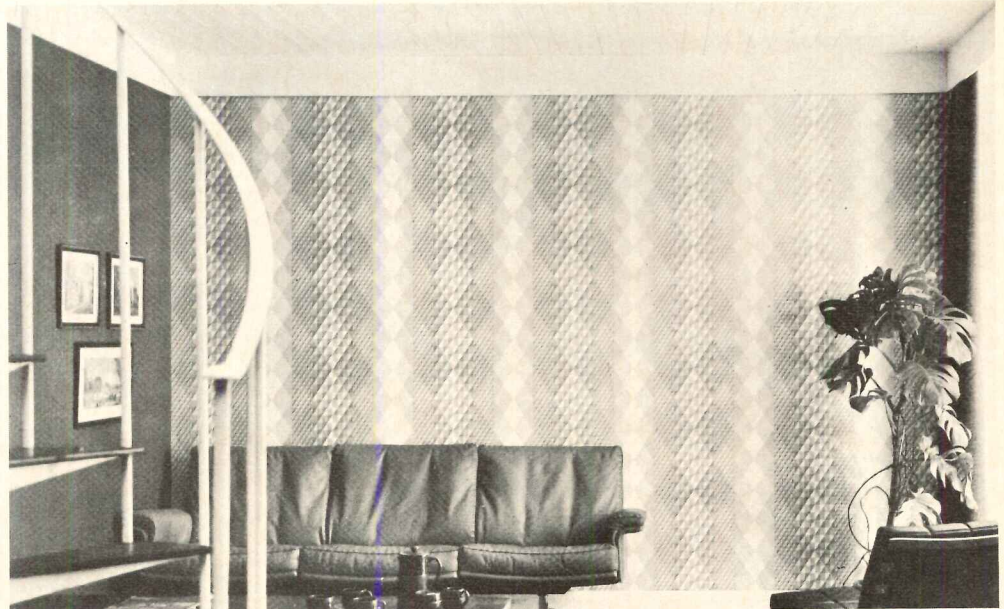
supple layer of vinyl on paper backing. It is dirt-, grease- and stain-resistant, washable and scrubbable. ■ ICI America Inc., a

subsidiary of Imperial Chemical Industries Ltd., Stamford, Conn.

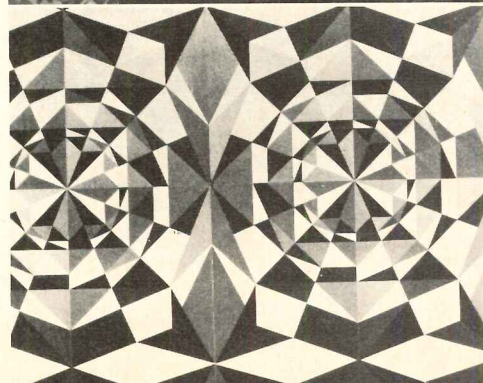
*Circle 300 on inquiry card*



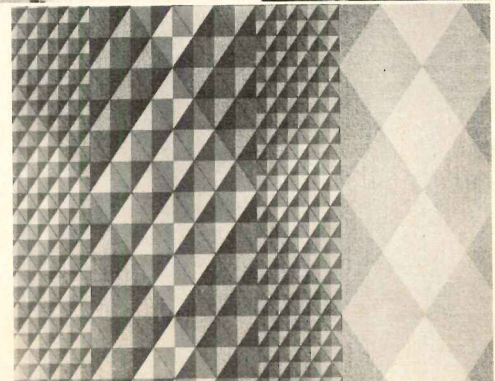
The Aztec pattern was inspired by "primitive" motifs that have been interpreted in tones-on-tones of oranges and turquoises. The resulting design has a three-dimensional optical effect.



*Solitaire* was recently presented a 1969 British Council of Industrial Design Award by Prince Philip. The diamond-like design is available in two combinations: gray/green and white; and beige/brown and white.



*Sirius*, "named after the brightest star in the heavens, seems to reflect light in a prismatic, kaleidoscopic manner." It comes in two color combinations: tones of gray and tones of bronze.



*more products on page 180*

Good weather or bad, you see only what light lets you see. We think you want to see a lot. Spacious, safe parking areas. Bright, inviting walkways. Clean, impressive architecture. That's the kind of light we sell.

You see here how a few of our Profile® lights spread even, friendly illumination over a large area. No jungle of poles. No suspicious shadows. Fewer fixtures to buy.

Today, there's an entire line of co-

ordinated Crouse-Hinds lighting fixtures. Large and small. To spot a spire or flood an acre. Contemporary or traditional. Pleasing to see by day, pleasing to see by night.

Let's begin with where you want to light. Our new Idea Book starts ideas. Check the reader service card, and we'll send it to you. Or, if you'd like to talk to one of our lighting specialists, call us or your nearby Crouse-Hinds agent or distributor. He will do

the analyzing, costing and comparing. With an assist from our home office computer.

We'd like to hear from you.

Outdoor Lighting Dept., Crouse-Hinds Co., Syracuse, N.Y. 13201.



**CROUSE-HINDS**

Light is to be  
warm and friendly by,  
even on a cold, rainy night.



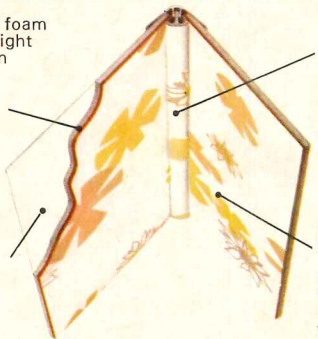
For more data, circle 77 on inquiry card

# Think tile is the only way to moisture-proof a wall? Look again.



Center core of foam conforms to slight irregularities in subwall for stronger, smoother installation. You can put Panel System 202 right over tile.

Backing sheet insures permanent bonding to subwall.



Two-piece molding system of heavy gauge extruded aluminum. Exposed trim is surfaced with matching pattern of FORMICA® laminate. Five molding shapes complete the system.

New wall surface is dependable FORMICA® laminate. Maintenance-free, won't chip, crack, discolor; wipes clear with damp cloth.

## Here's how with FORMICA® Panel System 202

Now with FORMICA® Panel System 202 you can specify a moisture-proof wall and create an entire new look at the same time. Panel System 202 features a smooth surface with no grout lines to get dirty. It won't chip, crack or crumble, and goes over any structurally sound wall. Panel System 202 comes in 18 appealing patterns and woodgrains. Best of all, it keeps its beauty for the life of the installation. Send for our new 8-page folder of application and product data on Panel System 202. Write Dept. AR-119.

Want to discuss surfacing?  
We make a strong case for  
seeing your Formica man.



## Leadership by design

There are other brands  
of laminate but only one



©1969 • Formica Corporation • Cincinnati, Ohio 45232 • subsidiary of



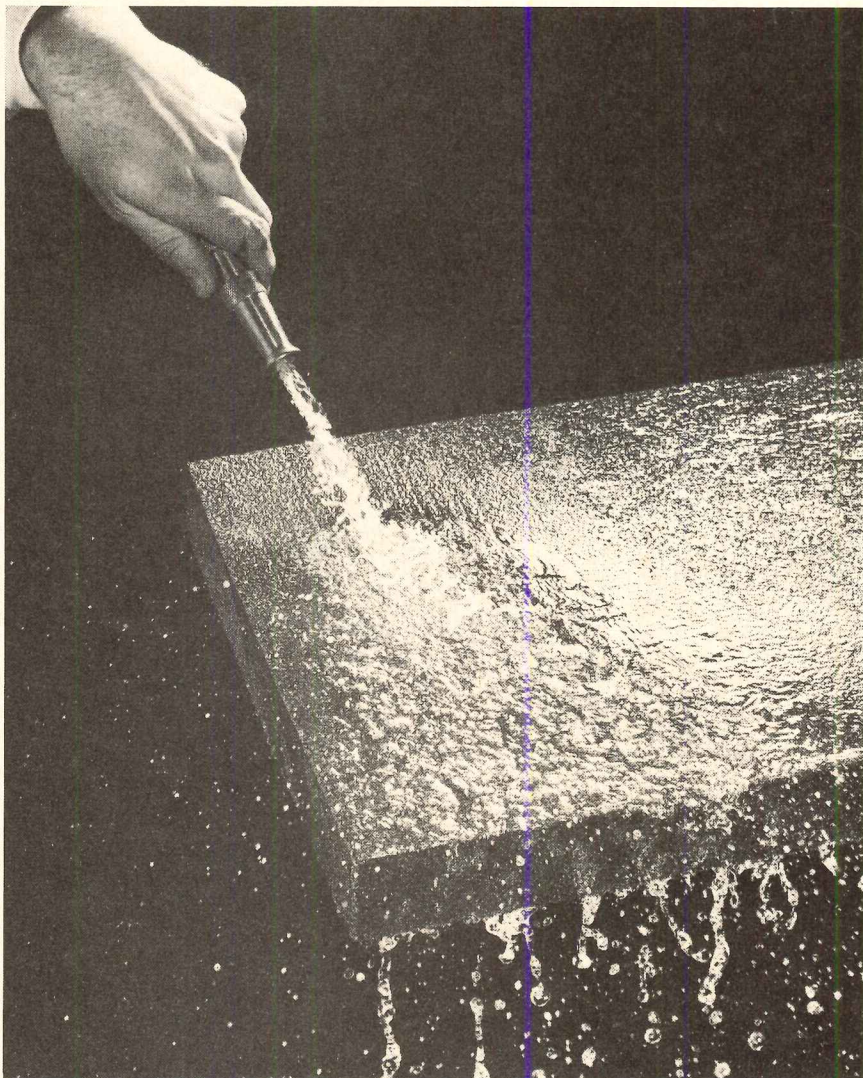
For more data, circle 78 on inquiry card

# Water problems on your roofs? Solve them with FOAMGLAS® insulation.

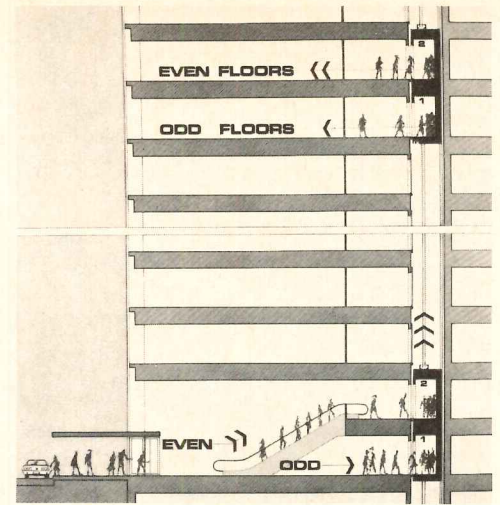
FOAMGLAS cellular glass insulation is *waterproof*. It doesn't get wet from roof leaks and can't absorb vapor from inside the building. Dimensional stability and high compressive strength of FOAMGLAS provide a solid base for roofing. No other insulation has this combination of properties.

FOAMGLAS is available in FOAMGLAS-Board and the Tapered FOAMGLAS system, for a sloped roof on a flat deck. FOAMGLAS is the only roof insulation guaranteed for 20 years. For more information, write Pittsburgh Corning Corporation, Dept. AR-119, One Gateway Center, Pittsburgh, Pa. 15222.

The Insulation People

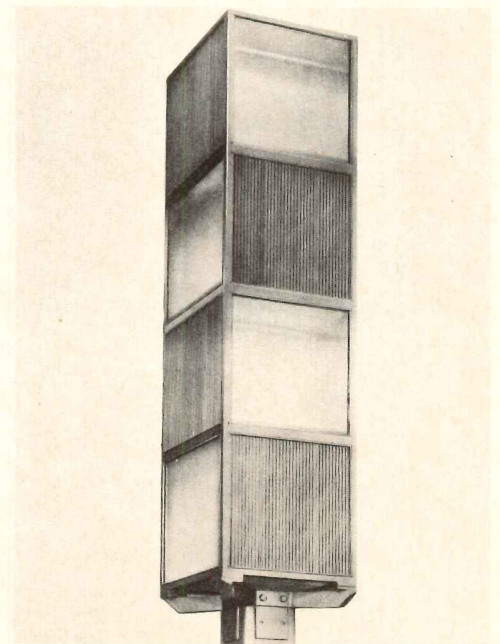


For more data, circle 79 on inquiry card



**DOUBLE DECK ELEVATORS** / Modern double deck elevators are being installed in the new 60-story home office of the John Hancock Mutual Life Insurance Company in Boston. (The only other such installation in the country is in Chicago's Time-Life Building.) In Boston, there will be 30 double deck, fully automatic passenger elevators, each with two units that will service two floors simultaneously. Passengers will enter the elevators via the lobby or mezzanine, according to whether they are going to an even or an odd numbered floor. ■ Otis Elevator Company, New York City.

Circle 301 on inquiry card



**LIGHTING** / The *Spectra Series*, modular mercury vapor fixtures for indoor and outdoor lighting, includes five new fixtures: *Spectra I* (shown) is for large area lighting in parking lots—a single unit can light an acre of parking; *Spectra II* is a post-top luminaire; *Spectra III* is a floodlight; *Spectra IV* is a wall washer; and *Spectra V* is an indoor luminaire for commercial recessed or surface mounting. ■ Wide-Lite Corporation, Houston.

Circle 302 on inquiry card  
more products on page 199



# FOLLANSBEE TERNE

## ...and the revival of metal roofing

While most architects have only recently discovered in the traditional metal roof a building element superbly adapted to the special idiom of contemporary design, roofers themselves have been aware for generations that no other roofing system can provide equivalent protection against the relentless attack of wind and weather. And Follansbee Terne is unique among metals in combining a natural affinity for color with unexcelled durability and relatively modest cost. May we send you the substantiating evidence?

# FOLLANSBEE

FOLLANSBEE STEEL CORPORATION • FOLLANSBEE, WEST VIRGINIA

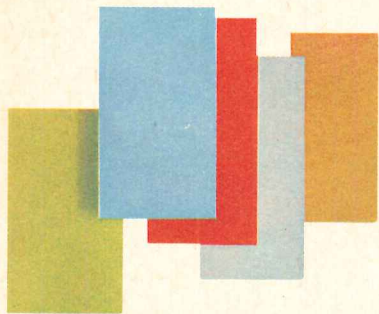
*For more data, circle 80 on inquiry card*

Des Moines, Iowa Residence Featured in Record Houses  
Architect: John D. Bloodgood  
Roofer: Iowa Sheet Metal Contractors, Inc., Des Moines, Iowa



# the quiet design

## introducing a new freedom of classroom styling with unit ventilators and accessories

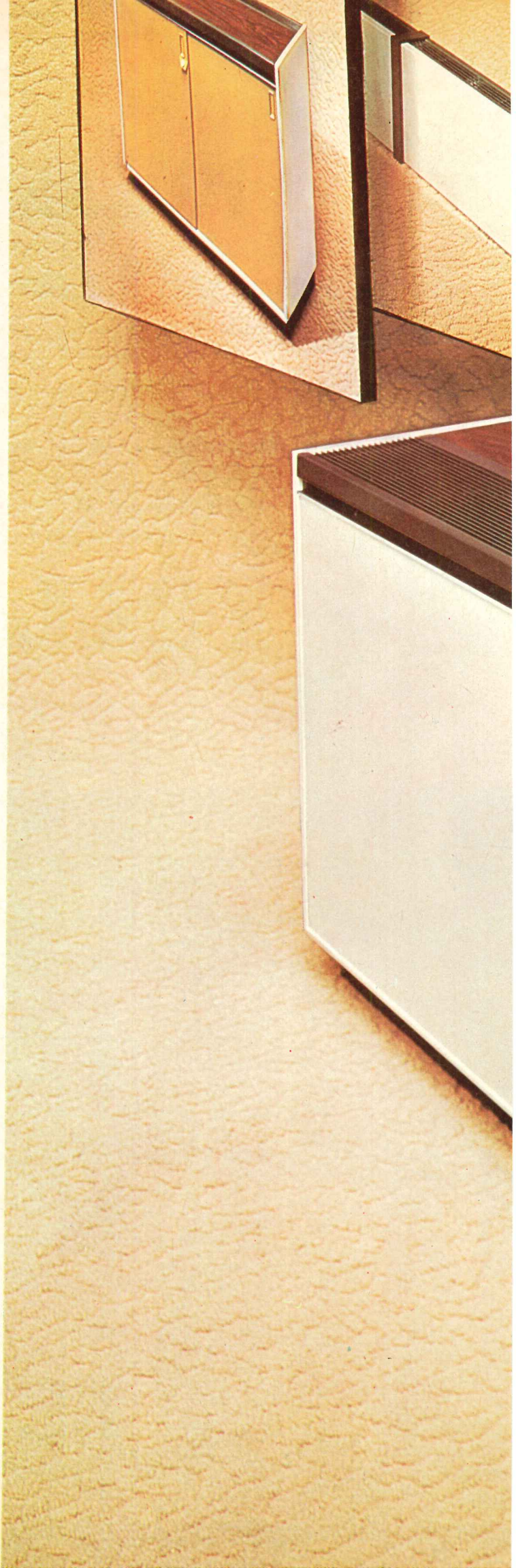


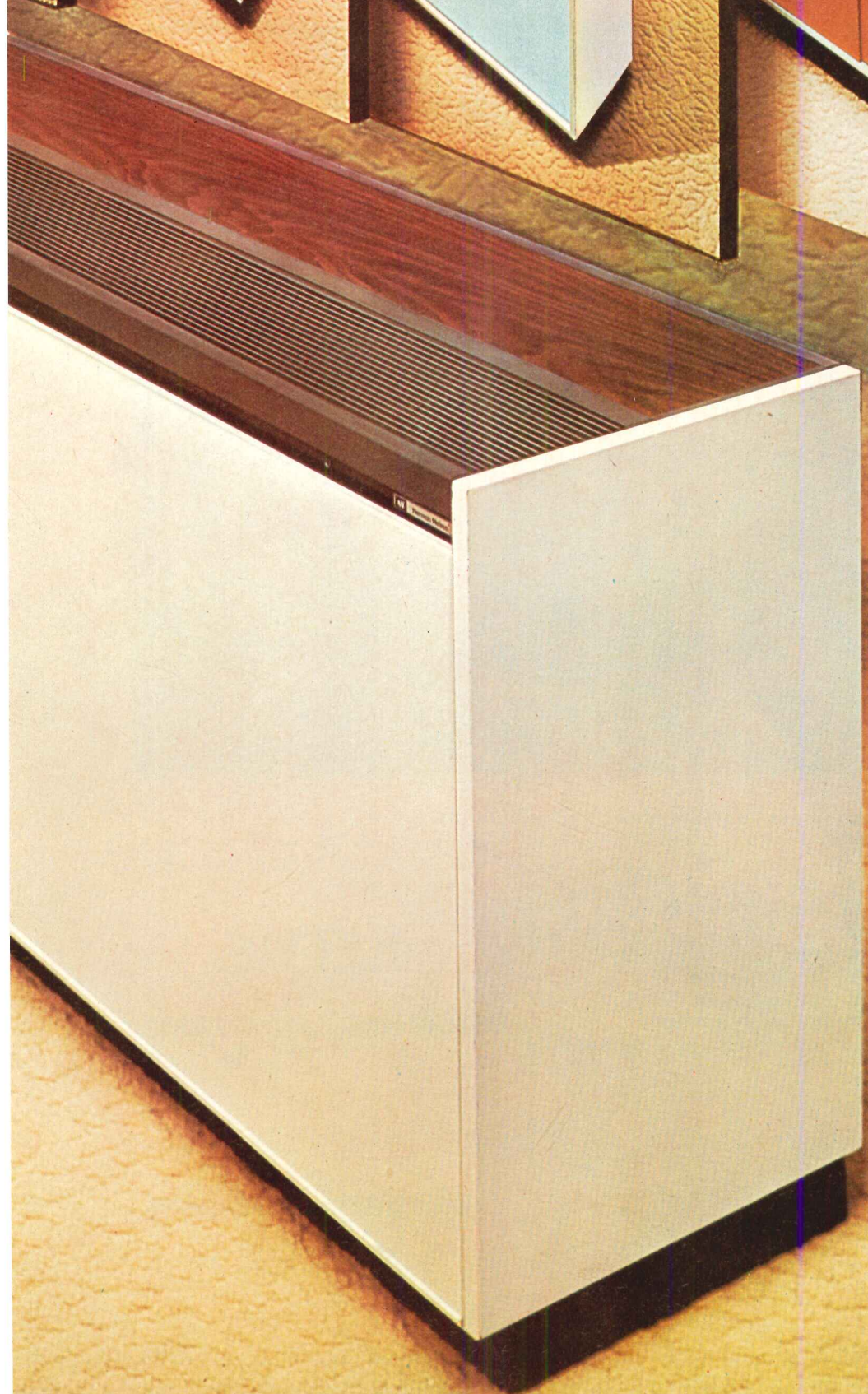
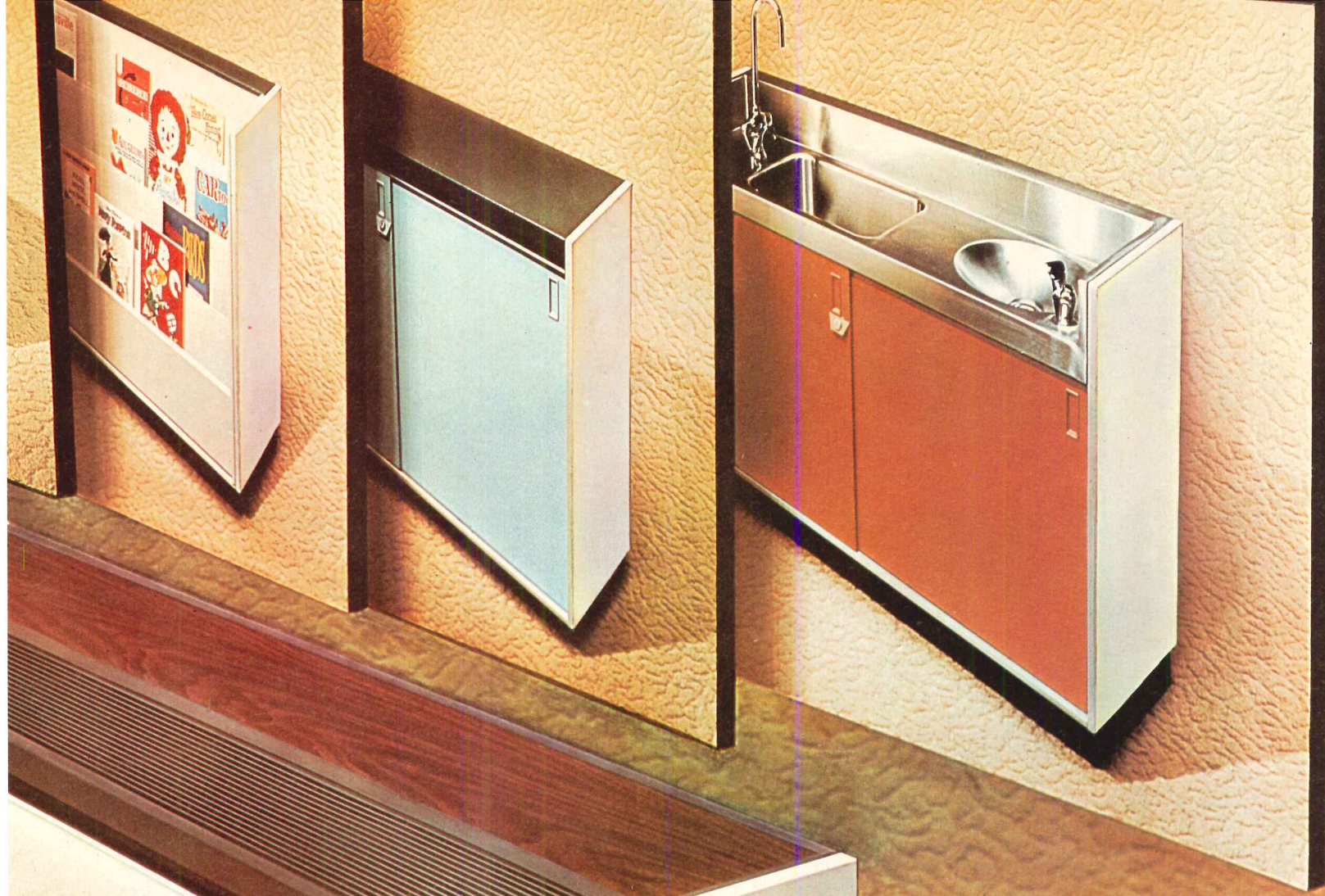
The AAF/Herman Nelson quiet design gives you greater styling freedom in the classroom than you've ever had before. First, our new earth-tone colors are quiet: tones that easily blend into the room environment; don't intrude into it. Unit ventilators are offered as

standard in soft beige with a choice of toppings. Next, the lines are quiet. No large shiny metal areas or exposed fasteners. The sleek wall-hugging design visually stretches space. And last, as always, Herman Nelson unit ventilators function quietly for the life of the building. Thousands of classrooms offer proof of the quality that has made this classroom environmental control equipment first choice of value-conscious school planners since 1917. Write for new Bulletin 600 A36, "A Climate for Learning." Or see your AAF/Herman Nelson representative. American Air Filter Company, Inc., 389 Central Ave., Louisville, Kentucky 40208.

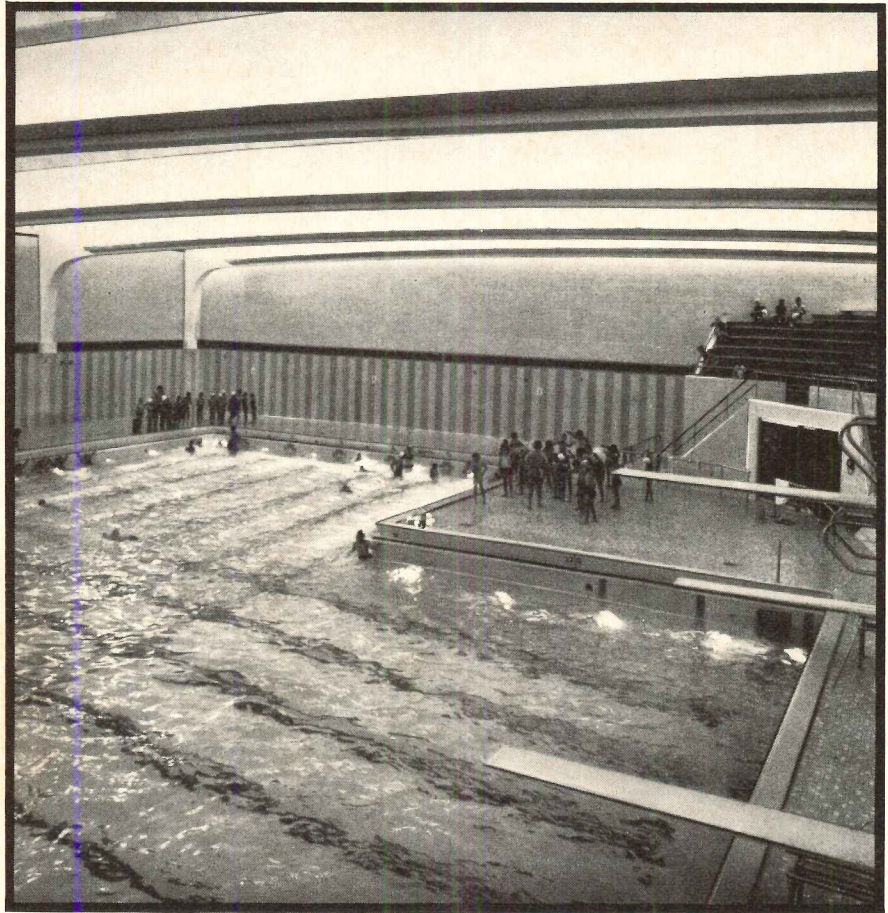
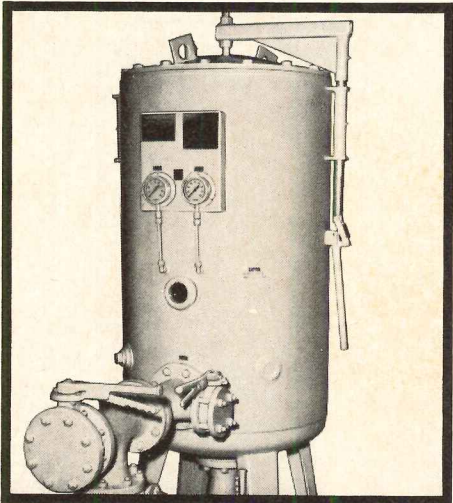
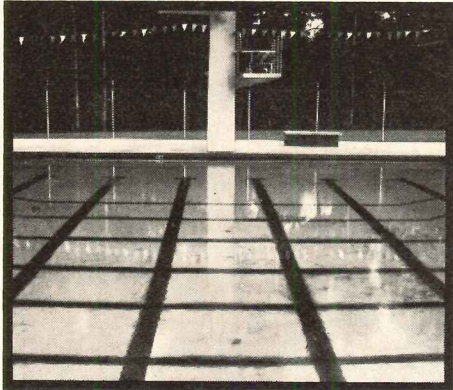
**AAF** Herman Nelson  
SCHOOL PRODUCTS DIVISION

For more data, circle 81 on inquiry card





# Besides the usual gunk, Keene filters out complaints.



Dirt, leaves, sediment of every variety... that's what a good filter has to cope with every day. And if for some reason it doesn't, then the complaints start coming in. To you. Every day.

It won't happen if you specify a Keene Model 610-E Filter for every pool you design—and make sure it goes in. The flexing action of its bags of fused-plastic STAR-COR® elements results in near-perfect cleaning dur-

ing backwash. And there are no pockets for the backwash to settle in.

The 610-E is built to *keep* clearing the water, too. The bags of STAR-COR® seldom have to be changed. You could run a truck over these vertical, porous elements without harming them. And the filter's plastic components and advanced coatings fight corrosion.

The 610-E cleans up in pools of from

40,000 to 315,000 gallons. If you've got a bigger pool in mind, we've got a bigger filter. Write us at Cookeville, Tennessee 38501.

**KEENE**  
CORPORATION

**FLUID HANDLING DIVISION**  
*Formerly Bowser Inc.*

**We've just begun to grow.**

For more data, circle 82 on inquiry card

You don't have to specify **JAMISON**

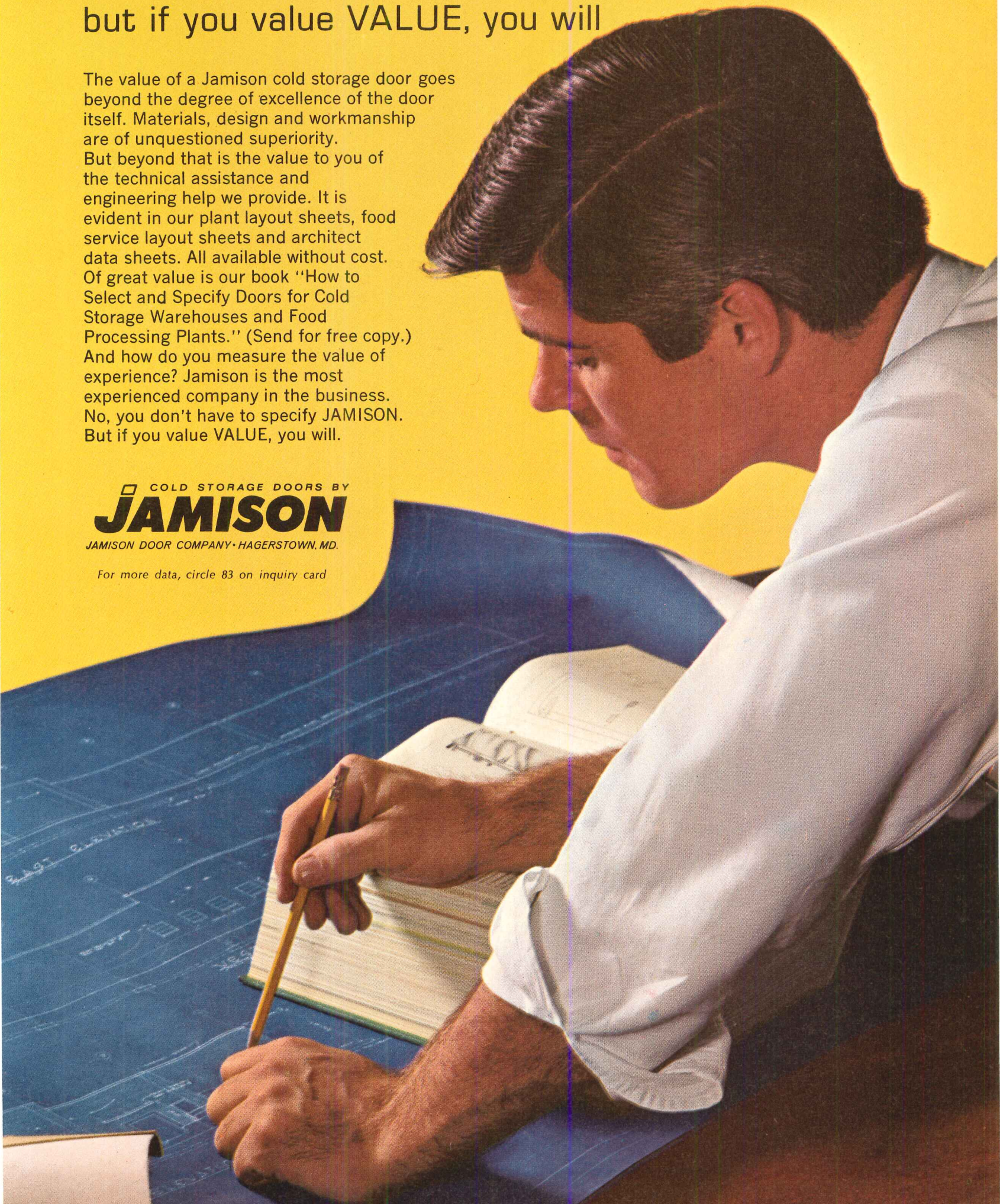
but if you value VALUE, you will

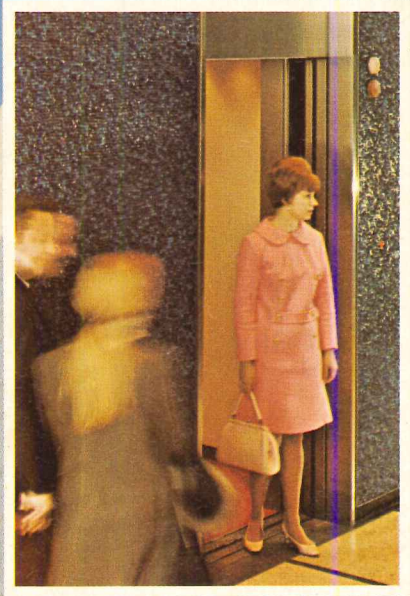
The value of a Jamison cold storage door goes beyond the degree of excellence of the door itself. Materials, design and workmanship are of unquestioned superiority. But beyond that is the value to you of the technical assistance and engineering help we provide. It is evident in our plant layout sheets, food service layout sheets and architect data sheets. All available without cost. Of great value is our book "How to Select and Specify Doors for Cold Storage Warehouses and Food Processing Plants." (Send for free copy.) And how do you measure the value of experience? Jamison is the most experienced company in the business. No, you don't have to specify JAMISON. But if you value VALUE, you will.

□ COLD STORAGE DOORS BY  
**JAMISON**

JAMISON DOOR COMPANY • HAGERSTOWN, MD.

For more data, circle 83 on inquiry card





## Haughton 1090 versus the other elevator control systems:

### No contest.

Consider the facts, proven in leading buildings coast-to-coast.

A given number of elevators under our new 1090 computerized elevator control system can move more people with speed and comfort than any other contemporary system you can specify.

There are ample reasons why this is so. Things like new concepts in solid state components. An incredibly efficient computerized *brain* that actually anticipates calls. Electronic demand response modules. And a whole lot more.

If superior elevator service for

new buildings or modernization projects is important to you, get the full story about our new 1090 computerized elevator system.

Ask your Haughton representative to call at your convenience. Or, write us.

**HAUGHTON**  
**ELEVATOR COMPANY**  
DIVISION OF RELIANCE ELECTRIC COMPANY  
P.O. BOX 780 • TOLEDO, OHIO 43601

**1000**  
HAUGHTON ■ 1869-1969

For more data, circle 84 on inquiry card



Photo courtesy of William M. Cafaro & Associates, Youngstown, Ohio

# designed to cost less with a Republic Frame-A-Lite stick system

The excellence of your own design with the cost savings of standard components. A story you've heard many times before. But we *mean* it!

Frame-A-Lite sticks offer unlimited design flexibility for entrances, halls, windows, or entire walls. The system is very inexpensive. Trim, steel sticks won't warp, sag, rot, or shrink. The need for costly planing and mortising is eliminated. And our snap-on glazing bead *looks* very expensive.

You can use Frame-A-Lite sticks with Republic full flush standard doors if you wish, to get the same creative versatility at standard

cost. These doors are modified at our factories and regional warehouses for distinctive light and louver treatments. You get beautiful doors that are exceptionally well finished, durable, and quiet. They can be purchased with Republic universal door frames for *further* design flexibility and cost savings.

Our salesmen have a kit that demonstrates the design versatility and quality of Frame-A-Lite sticks, full flush doors, and universal door frames. To arrange a meeting, call your nearest Manufacturing Division sales office, listed in the Yellow Pages. Or, use the coupon.



## REPUBLIC STEEL MANUFACTURING DIVISION

YOUNGSTOWN, OHIO 44505

- Please have a salesman call with a demonstration kit.
- Please send literature and specifications on:
  - Frame-A-Lite stick system
  - Republic full flush doors
  - Universal door frames


NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

For more data, circle 88 on inquiry card



How many access panels  
needed here?

None. Because every ceiling tile functions as an access panel. So anything at any point above the ceiling is always accessible. The key: a unique suspension system called ATS—Accessible Tile System by Armstrong. And a single tool is all that's needed to gain access. Which means the ceiling won't have to be ripped apart to work on fixtures or services. And unsightly, costly access panels are eliminated. Yet for all its accessibility, ATS lets you have the clean look of a tight tile ceiling. There are lots of ceiling innovations like ATS described in our folio. Please write for a copy. Armstrong, 4211 Rock St., Lancaster, Pa. 17604.

**Armstrong**  
Ceiling Systems that work

Or for more data, circle 1 on inquiry card.



continued from page 180



**SHOWER TOWER** / This column, which stands 68 in. high and is 6 $\frac{3}{4}$  in. wide, comes with two shower heads at different heights, a hide-away hand spray set in a revolving compartment, shower selector controls, a bath and spray control and a fill spout. The *Shower Tower*, being distributed by American-Standard, consists of an aluminum shroud that is set into the wall and contains the plumbing elements. Attached to this are face plates of melamine plastic, a hard, scratch-resistant material that also resists household chemicals. ■ Allied Chemical Corporation, New York City.

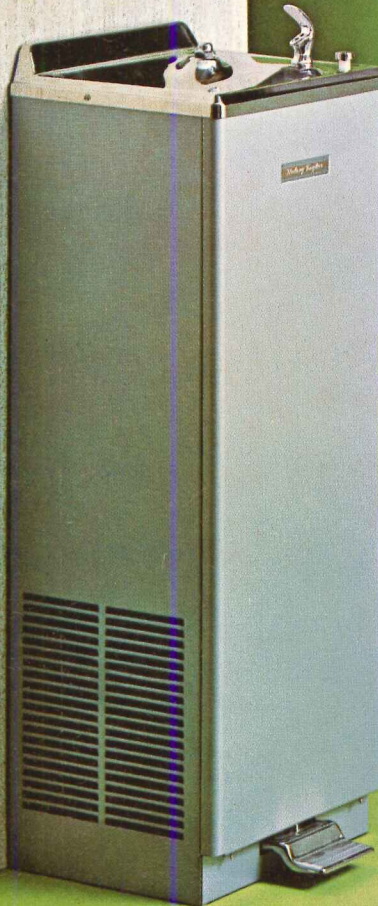
Circle 303 on inquiry card



**SNOW REMOVAL** / The steps leading to George C. Gordon Memorial Library on the campus of Worcester Polytechnic Institute in Worcester, Massachusetts show the result of automatic snow removal. The system consists of 1 $\frac{1}{4}$ -in. pipe spaced on 9-in. centers and buried in 6 in. of concrete. The mixture of hot water and antifreeze is circulated through the 2,710 sq ft installation at 160 deg F and returned to the boiler at approximately 150 deg F. ■ A. M. Byers Company, Ambridge, Pa.

Circle 304 on inquiry card  
more products on page 204

# THE TIDY COOLER



WT SERIES Floor Model Coolers


**4 Capacities** — 8.0, 14.0, 16.0, and 20.0 G.P.H. of 50° water.

**Cabinets** — Standard gray baked-on enamel or stainless steel. Can be secured flush against wall — eliminates unsightly plumbing connections and cleaning problems. Deeply-recessed stainless steel top prevents splashing on walls or floor.

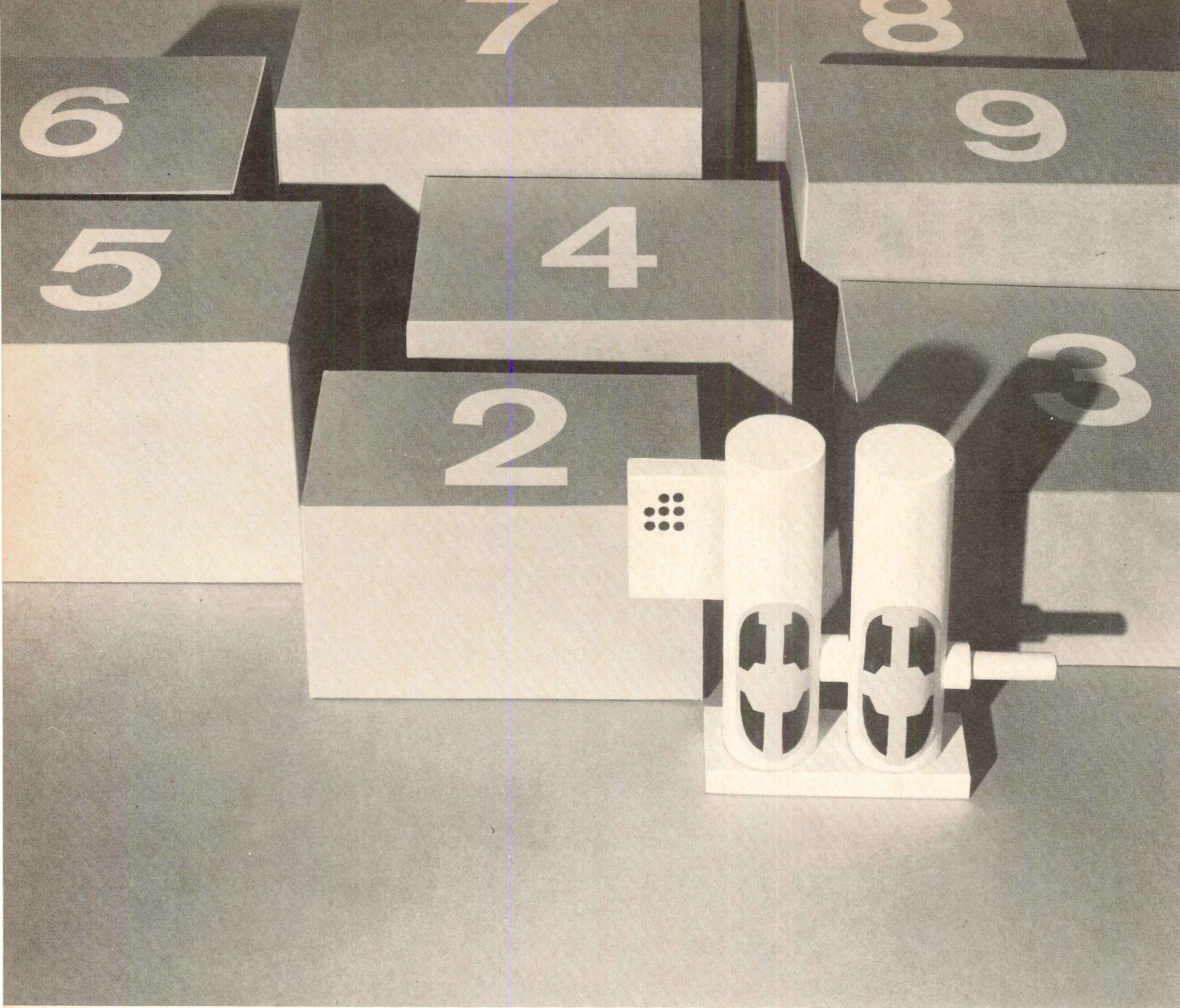
**Dual Controls** — hand and foot pedal is standard.

**Can be Factory-Equipped with** — 60-cup hot water dispenser • side-mounted auxiliary fountains for children • or water-cooled condenser for high temperature work areas.

**SC SERIES** — Same as WT, with outside plumbing connection through back of cabinet for free-standing installation.

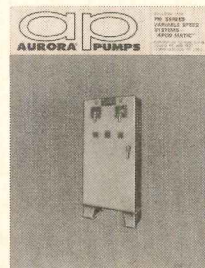
Write for Catalog and specifications.  
THE HALSEY W. TAYLOR COMPANY  
1560 Thomas Road, Warren, Ohio 44481  
SUBSIDIARY • KING-SEELEY  THERMOS CO.

*Halsey Taylor*®



**Of the 12 other  
constant pressure pumping systems,  
not one has all the advantages of  
Aurora's Apco-Matic.**

Seven don't have Apco-Matic's low initial cost (**none** costs less) • Eleven don't have Apco-Matic's low installation cost (**none** costs less) • Eleven don't have Apco-Matic's low operating cost (**none** costs less) • Five don't have Apco-Matic's instant response to system change • Eight don't have Apco-Matic's low maintenance characteristics • Ten don't have Apco-Matic's SCR control and squirrel-cage AC motors • Twelve don't have Apco-Matic's control bypass for emergency operation • Eight don't have Apco-Matic's compact dimensions (**none** is smaller) • Twelve don't have Apco-Matic's versatility that provides a built-in automatic standby, yet uses only two pumps! Need we say more? **Aurora Pump, A Unit of General Signal Corporation, 800 Airport Road, North Aurora, Illinois 60542.**



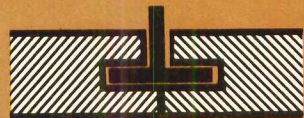
See Bulletin 710 for full details.

For more data, circle 90 on inquiry card

# Another first from SIMPSON



12" x 12" x 1/2" Self leveling tile for metal suspension systems, staple or adhesive application.



12" x 12" x 3/4" for concealed type systems or adhesive application.

Now there's a new way to achieve a completely monolithic appearance with Pyroprotect Non-directional Fissured ceiling tile.

Simpson introduces two new square edge acoustical products:

- 1 • 1/2" square edge tile with self leveling tongue and groove, flange joint. Can be installed in T&G type concealed system, stapled to furring strips or solid backing, or applied with adhesive.
- 2 • 3/4" square edge tile with kerfed and rabbeted joint. Can be installed in concealed type systems or applied with adhesive.

Edges are machined to close tolerances so joints do not detract from the monolithic appearance.

Along with the added convenience of these new edge details, you still get the top performance and superior appearance you've come to expect from Simpson ceiling products. Specify Simpson and get the best.

For more information, write or call: Simpson Timber Company; 2000 Washington Building; Seattle, Washington 98101. Phone 206-682-2828.



*Ceiling products designed for better living*

For more data, circle 91 on inquiry card



**KSH-12**

**NOTICE TO LIGHTING PANEL SPECIFIERS**—For your protection, we've given our K-Lite Lighting Panels new designations. K-5 becomes KSH-5, K-12 becomes KSH-12, K-15 becomes KSH-15 and so on for all the original "K" number products.

Why the change? K-S-H originated all the "K" number specification quality lighting panels. We believe you specified them because you wanted the performance and quality they assure and will continue to specify them for these reasons.

The problem: Other panel manufacturers have produced "cheap" versions of the "K" panels. They've lowered the standards, compromised on performance, cheated on material thickness... even given their panels similar numbers so they can be slipped in on your specifications.

The solution: Specify **KSH-12**, etc. Remember, KSH stands for the original with the performance, the quality, the satisfaction you expect and trust. "K" could stand for "KOPY" from some fixture manufacturers who don't think you care. Ask if they intend to furnish KSH or "KOPY" from an unknown source. Your client won't know the difference until he turns on the lights.

**KLITE**<sup>®</sup>

On any job where a specifier has specified "K" number panels and is disappointed in the results or feels he has been furnished "KOPY" panels, K-S-H will be happy to investigate the problem and assist in the solution of it. Please contact us.

KSH and K-Lite are registered trademarks.

**K-S-H, INC. • 10091 MANCHESTER • ST. LOUIS, MISSOURI 63122**

*For more data, circle 92 on inquiry card*

# The secret of the masters



is in every can of  
**Pratt & Lambert**  
Paint

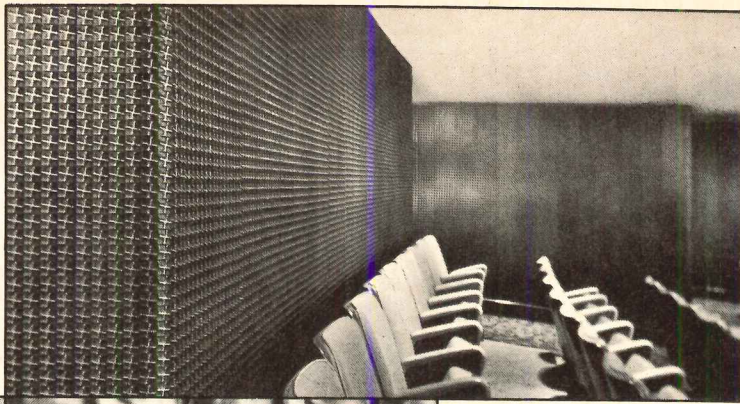


**SUPERB REPRINT** of this Master Painting

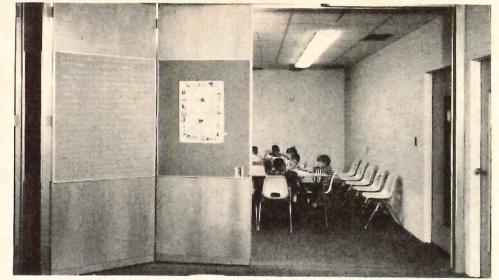
A full-color reproduction of the original, beautifully done on excellent quality paper, size 19 x 24 inches, may be had postpaid by sending \$1.00 to Department M, Pratt & Lambert, Box 22, Buffalo, N.Y. 14240.

*The Olive Orchard, Vincent van Gogh, National Gallery of Art, Washington, D. C., Chester Dale Collection*

For more data, circle 93 on inquiry card

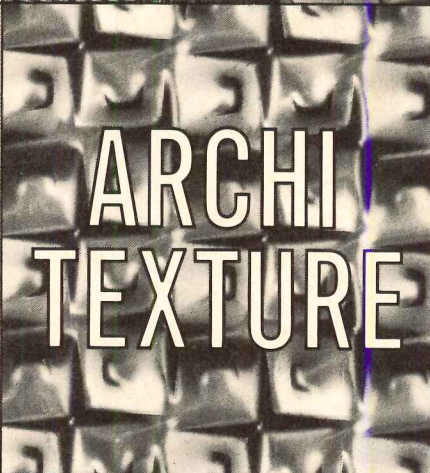
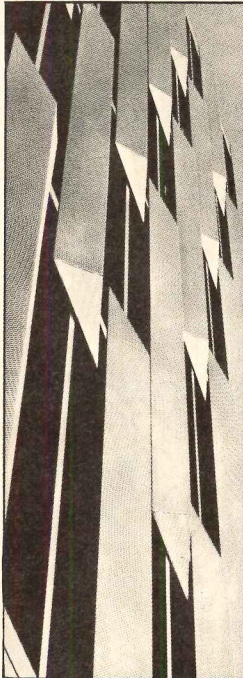


1. Auditorium Acoustical Paneling, 1-RL, Rigid-Tex Stainless Perforated, Colored and Highlighted.



**FOLDING WALLS** / *The Innovator* is a folding wall that features "a unique track that installs without marking, drilling or screws and a slim-profile aluminum jamb that eliminates all wood framing. These new ideas, combined with new methods of inserting top seals, panel guides and soffit extenders, reduce installation time and costs 18 to 25 per cent." ■ Holcomb & Hoke Mfg. Co., Indianapolis.

Circle 305 on inquiry card



2. Curtain Wall Panels, Rigid-Tex Stainless Medallion, 22 gauge 6-WL, Jefferson Trust & Savings Bank, Peoria, Illinois.

3. Elevator Wainscoting: Rigid-Tex 1-NA, Skylon, Niagara Falls, Ontario.



**STOOL TABLE** / *The Mobile-Folding Stool Table* provides individual seating "without sacrificing compact storage space when folded. The solid melamine resin stool is color-impregnated and eliminates scuffs, mars and normal-use wear and damage." Table tops are laminated with Formica in a textured suede regency walnut pattern and trimmed with a black vinyl edge. ■ Hamilton Manufacturing Company, Two Rivers, Wis.

Circle 306 on inquiry card



Why do so many leading architects specify Rigid-Tex Metals? Its inherent beauty and distinctive appearance? Mar-resistance (to stay new looking longer? Strength? Controlled light diffusion (to eliminate glare)? Weight reduction? Better acoustical properties? Yes — all these reasons and more ■ For almost three decades this unique material, available in all metals — in almost any form or finish — have been specified for curtain wall panels ■ soffits ■ mullions ■ doors ■ walls ■ ceilings ■ push plates ■ kick plates ■ elevator interiors ■ escalator balustrades ■ switch plates and even contemporary sculpture ■ Just about any place where wear and abuse may occur or a functional use of metal is indicated ■

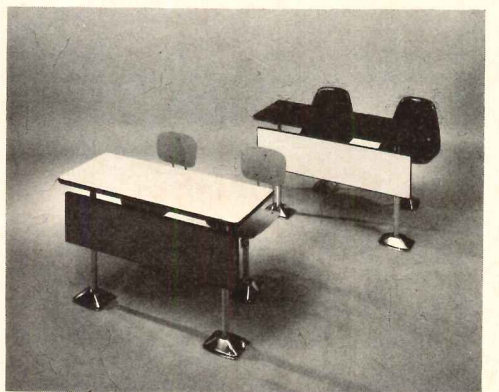
Let RTM open vistas of design opportunities for you ■ Send right now for the Architect's Applications Portfolio with Pattern Chart ■ Rigidized Metals Corporation, 6851 Ohio Street, Buffalo, N.Y. ■

*P. S. In New York City? See RTM display at Architects Center, 101 Park Avenue or look in Sweet's Architectural Catalog File Sec. 3 E.*

THE ORIGINATOR

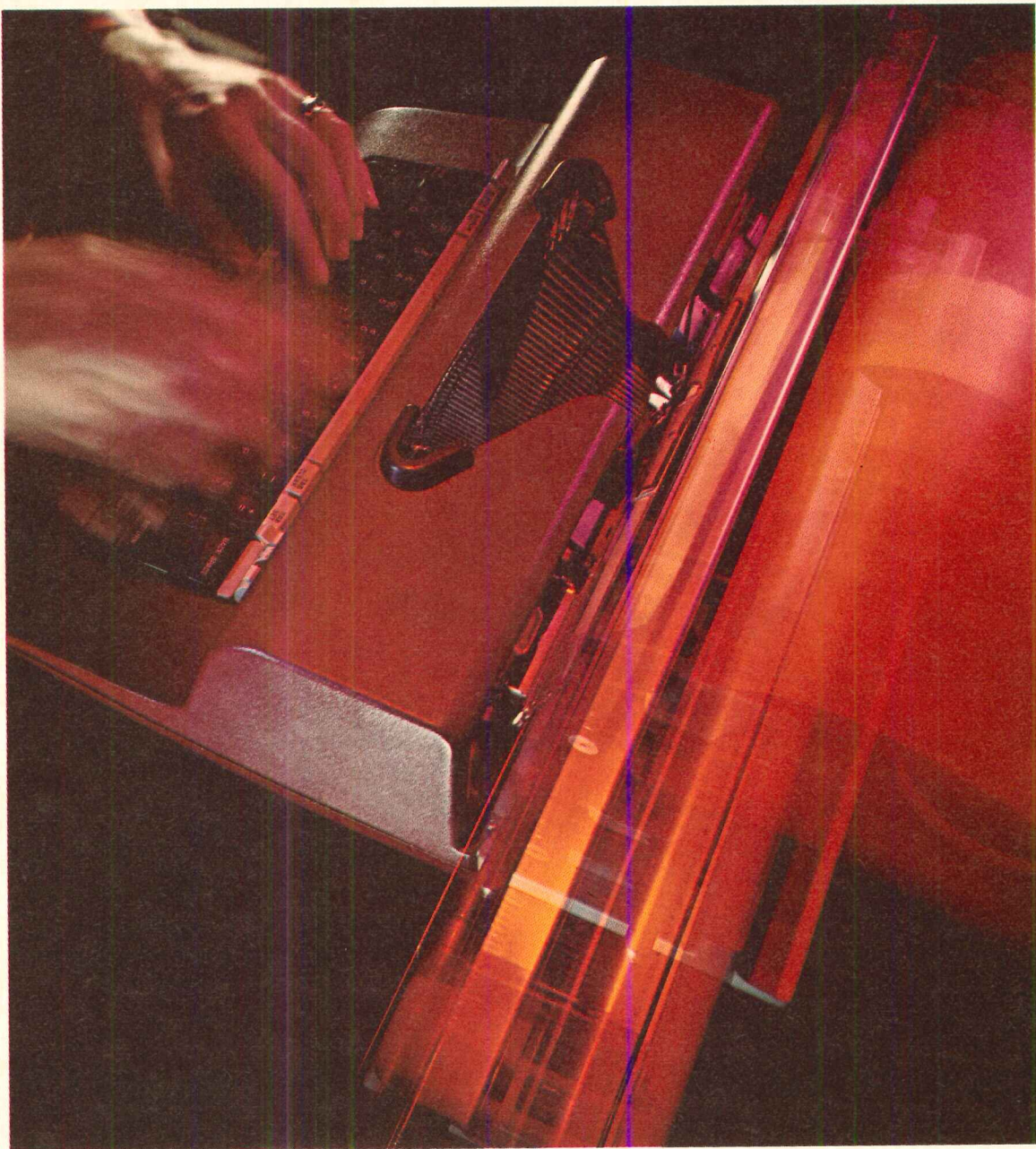
# RIGID-TEX® METALS

For more data, circle 94 on inquiry card



**PEDESTAL TABLES** / These pedestal tables help provide continuous study and work surfaces while taking a minimum of space. Tables may be mounted in straight rows, on a radius, or in other configurations. ■ Peabody Seating Company, Inc., North Manchester, Ind.

Circle 307 on inquiry card  
more products on page 212



## Introducing the gas typewriter.

### The switch to Gas Total Energy is on.

At 7:57 A.M. exactly, Mary Hopkins sat at her desk, took the cover off her typewriter and plugged it into the gas company. A lot of other girls in office buildings across the Northern Plains were doing the very same thing.

Confused? The answer is really very simple: gas total energy. The use of natural gas prime movers to generate electric power on-site. Right in the

building where it's used for lighting, motors, and other uses (even typewriters). And there's more. Something called efficiency. For while the engine/generator sets churn out the power, heat recovered from the prime mover goes to heat or cool the building, to heat water and other processes.

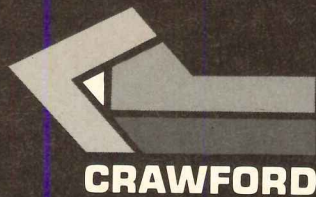
But why gas total energy? It's a fair question. Unparalleled cost economies, for one thing. Of a magnitude which men were reluctant to forecast ten

years ago. Self-sufficiency, for another. No more costly power outages and down-time, because a total energy system acts as its own standby system.

Sold? If not, you soon will be. For complete information, contact your local gas company or Bob McChane Sales Promotion Department Northern Natural Gas Company 2223 Dodge Street, Omaha, Nebraska 68102



*For more data, circle 95 on inquiry card*



## One more reason why Crawford Uprising Doors last longer, operate more smoothly.

Perhaps the difference between Crawford Uprising Doors and competitive doors can best be seen by comparing the rollers that carry the doors up and down. And down and up. For year after endless year. When you look at it, you see a *3-inch, solid* steel tire. And a *separate* case-hardened race for the ball bearings (many other manufacturers use the roller stem as a weak inner race). Not ten ball bearings, but *fifteen*. Each a full quarter-inch in diameter.

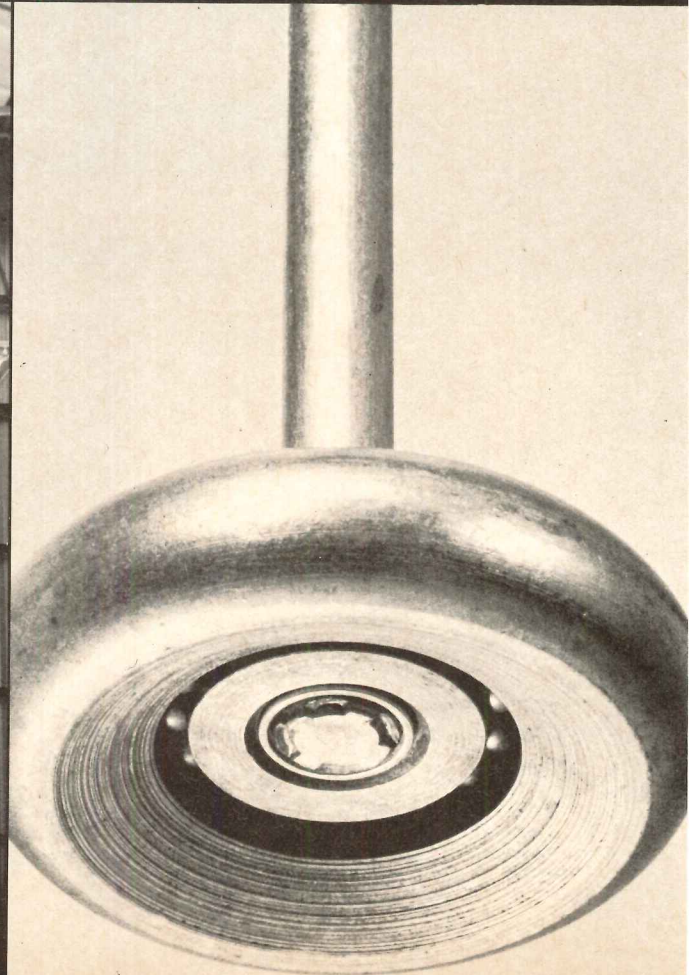
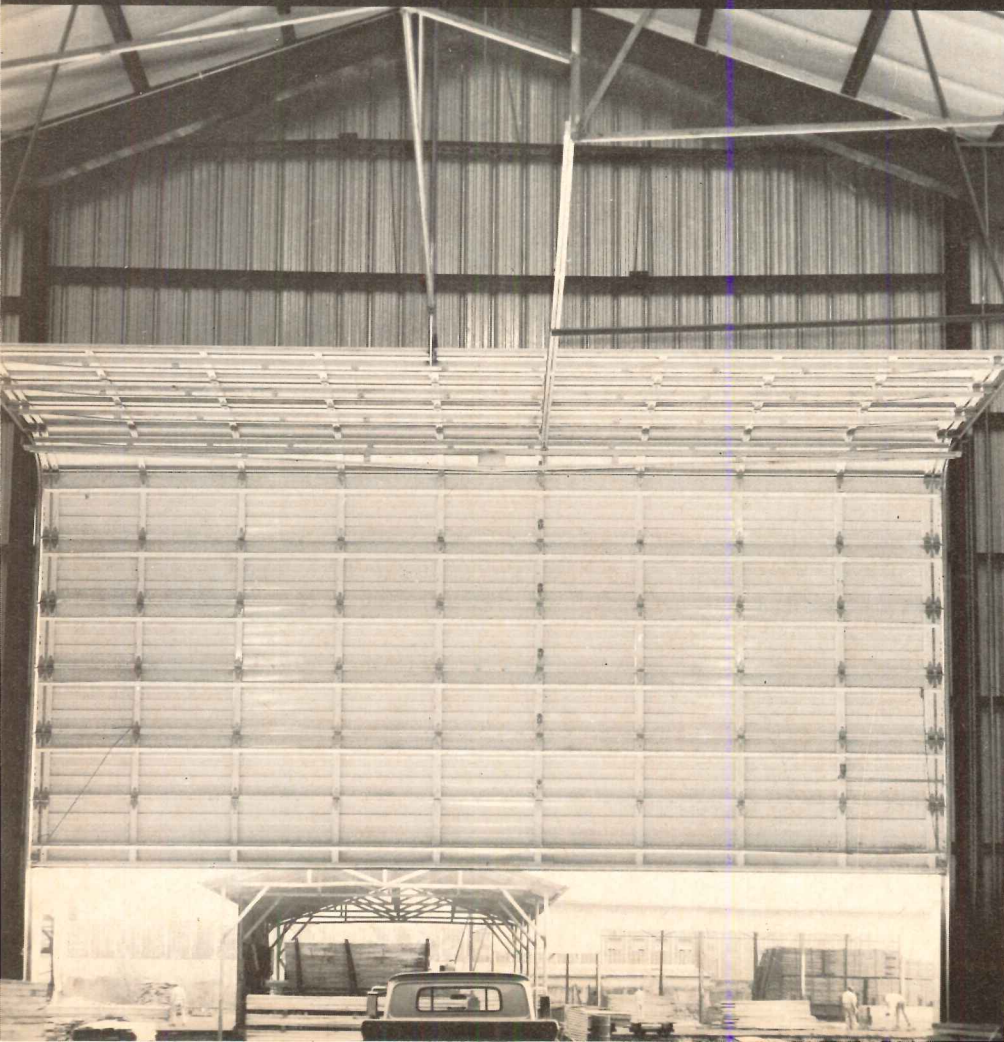
The 3" roller is made for large, heavy-duty high usage Crawford Uprising Doors like the giant (28'2" x 20') Steelmaster shown below left. It's standard on all

doors with heavy-duty custom hardware, but may be specified as an option with other hardware models.

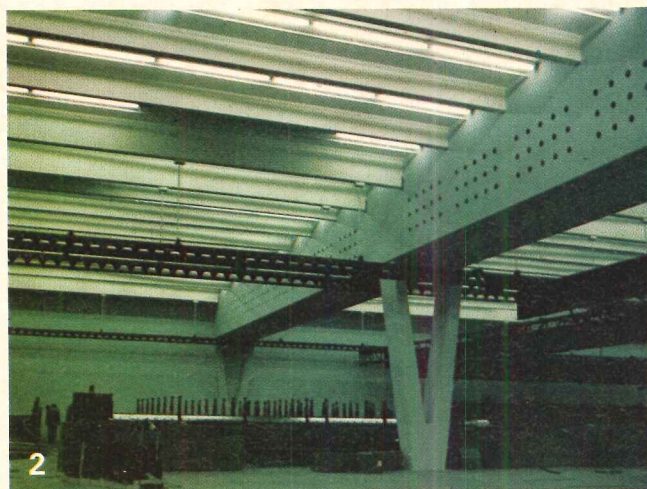
Complete details are available from your local Crawford distributor. He can also tell you about other Crawford innovations that will match every uprising door to the job it must do. Call him. He's listed in the Yellow Pages under "Doors." Or write to us.

Crawford Door Company, 4270 High St., Ecorse, Michigan 48229. Subsidiary of the Jim Walter Corporation. Manufacturers of uprising sectional doors, rolling doors, grilles, shutters and sliding doors.

## THE STRONG, SILENT TYPE







ARCHITECTS: (1) J. ALFRED HAMME & ASSOCIATES; (2) HARRY PAYNE & ASSOCIATES;  
 (3) ALEXANDER KEAY & ASSOCIATES; (4) J. ALFRED HAMME & ASSOCIATES;  
 (5) PIERSON, MILLER, WARE & ASSOCIATES

# PRESTRESSED CONCRETE

**brings the wide-open spaces inside!**

When your design calls for a broad sweep of column-free floor space, prestressed concrete gives you the long span muscle you need. Without premium cost. Ceilings have a clean, modern appearance because mechanical and electrical systems can be channeled between the stems of well proportioned structural members, providing easy access.

Get in touch with your nearest PCI producer member for complete information on how prestressed concrete can give you more design freedom in your next project. His experience can help you most in the earliest stage of planning.

*Professional membership in PCI can be of value to you in many ways. Send for membership information.*


PRESTRESSED CONCRETE INSTITUTE  PCI

ARCHITECTURAL STRUCTURAL

205 West Wacker Drive, Chicago, Illinois 60606



For more data, circle 97 on inquiry card



# If a repeat order is any testimonial, we just got a dandy for our Silicone Construction Sealant.

On the left: the 56-story Toronto Dominion Bank Tower. General Electric Silicone Construction Sealant was used to caulk its aluminium windows to steel mullions.

Now we've received a repeat order for the second Toronto Dominion Centre tower. The one on the right. We're pleased, but not surprised. Because our sealants have already caulked major buildings from Canada to the Caribbean, New York to Los Angeles. With more specs being written all the time.

And no wonder. Ready-to-use GE Silicone Sealant goes on trigger-quick in any weather. Forms a strong, durable bond to glass and other building materials. Stays permanently flexible despite extreme temperatures. Withstands severe freeze-thaw cycles. Never needs recaulking or repairing. In short, it's the closest thing there is to a truly *permanent* sealant.

Still dubious? Plan a trip to Toronto in 2001. The towers will probably still be there. And the original sealant.

But don't wait that long to get more information and the name of your nearest distributor. Write Section BG-11316, Silicone Products Dept., General Electric Co., Waterford, N.Y. 12188.

**GENERAL  ELECTRIC**

*For more data, circle 120 on inquiry card*

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# KRUEGER AFKA

---



AF200 Series



AF300 Series



AF500 Series



AF600 Series



AF400 Series

## Sensitively designed seating with function and beauty to match

Meet AFKA... Krueger's new all-purpose chairs that offer a dramatic new concept in the coordination of line, form, materials and colors. Seating elegance that not only meets your most demanding needs of today, but tomorrow as well.  Smart, durable—yes, practically indestructible fiberglass shells, designed and contour-shaped for body conforming comfort serve an added function by carefully protecting the luxurious, thick and comfortable seat and backrest cushions from wear and tear.  Naturally, all upholstery shows signs of soil and wear in time. Don't fret... there's no need to invest in a complete new chair. With AFKA, you simply replace the cushions. Fresh, new ones "lock-in" in about 2 minutes. Change color schemes, too, according to your own whims. For details, please write.

**KRUEGER**  
METAL PRODUCTS, INC. • GREEN BAY, WISCONSIN • 54306

SHOWROOMS: NEW YORK: 20 E. 46th Street • CHICAGO: 1184 Merchandise Mart • Indianapolis • Dallas • Houston • Los Angeles

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**FISHER ADMINISTRATIVE CENTER—  
UNIVERSITY OF DETROIT**

Architect:  
**GUNNAR BIRKERTS AND ASSOCIATES**  
Birmingham, Mich.

Sheet Metal Contractor:  
**FIREBAUGH & REYNOLDS ROOFING CO.**  
Detroit, Mich.

Revere Distributor:  
**ALUMINUM SUPPLY CO., INC.**  
Detroit, Mich.



**Even a roof  
can be a thing of  
beauty  
when you design with  
**REVERE  
COPPER****

The advantages of designing with Revere copper are legion. In this particular instance the architect wanted a material with all the inherent characteristics of copper plus a tone of gray that would complement the stone used for the face and mullions of the building. Result: Revere Leadtex 15 (lead-coated copper).

There are 25,000 lbs. used in 16-oz. weight on this roof, employing standing seam and flat seam construction.

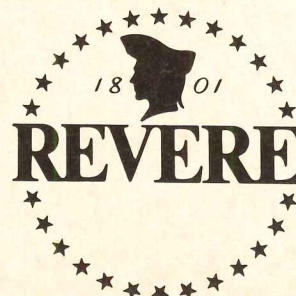
In addition to unprecedented freedom of design, Revere copper gives you: (1) A performance of endurance proved through the centuries . . . (2) A workability that permits the use of virtually any desired shape and form, with easy-to-solder seams . . . (3) Lowest ultimate cost. When properly designed and installed, copper is rated as the lowest cost per year of actual service of all roofing and flashing materials.

Make it outstanding! Make it endure! Make it big! Design with Revere copper in mind.

Send today for free copy of the 88-page brochure, "The Application of Copper and Common Sense" and companion piece, "The 4 Revere Preformed Systems of Easy-to-Install Flashings," for complete weather-proofing of masonry buildings.

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Founded by Paul Revere in 1801  
Executive offices: 230 Park Avenue, New York, N. Y. 10017  
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# Haws

There's a Haws fountain that's just right for every wall, every hall—  
and your every design idea. Consult Sweet's, or write for literature today.  
Haws Drinking Faucet Company, 1441 Fourth Street, Berkeley, California 94710.



**DRINKING FOUNTAINS**

*Let Haws solve your  
drinking problems.*

## dresses up a drink of water.

# These walls only look permanent—they're movable.

Kwik-Wall partitions have the look and feel of permanence with all the advantages of movability. Anyone can erect or store these ceiling track-mounted or fully free-standing partitions in minutes. A quick, one-handed twist of the mechanical locking lever . . . and complete rigidity of each sound-retarding section is assured. Also available — walk-through doors, completely concealed storage systems and a choice of over 1500 attractive panel facings. Send for details.



The permanent look in movable walls

**KWIK-WALL CO., Box 3267, Dept. AR  
Springfield, Illinois 62708**

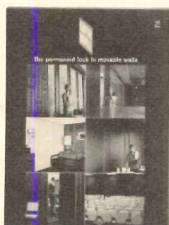
Name \_\_\_\_\_

Title \_\_\_\_\_

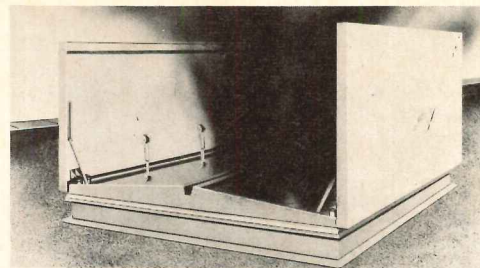
Company \_\_\_\_\_

Address \_\_\_\_\_

City/State \_\_\_\_\_ Zip \_\_\_\_\_

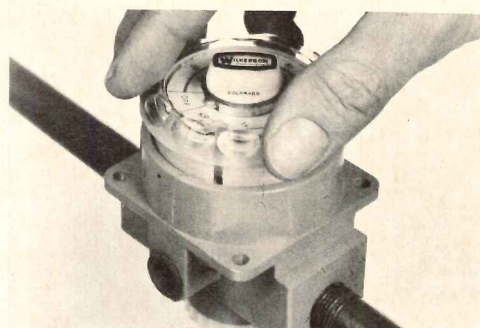


Mail coupon for **FREE** brochure



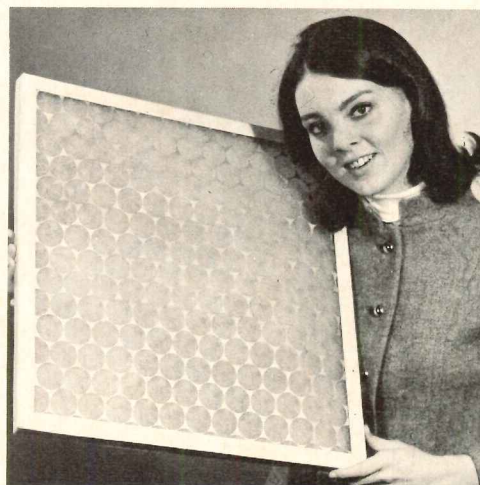
**SMOKE HATCH** / This hatch has earned Factory Mutual Research Corporation's approval and is said to be the first such product to do so. Among the many standards of performance, the hatch: remained securely closed when subjected to wind uplift of 30 psf; operated against a 10 psf snow load and automatically locked in the open position. ■ The Bilco Company, New Haven, Conn.

Circle 308 on inquiry card




**AIR REGULATORS** / Dial-Air pressure controllers are regulators that come standard-equipped with adjustment knob with a built-in pressure dial that serves as a pressure setting indicator in place of a standard air gauge. ■ Wilkerson Corporation, Englewood, Col.

Circle 309 on inquiry card



**AIR FILTER** / A disposable glass fiber air filter for commercial and industrial applications is designed for optimum performance in equipment with air velocity up to 350 fpm. ■ Owens-Corning Fiberglas Corporation, Toledo, Ohio.

Circle 310 on inquiry card  
more products on page 228



**After facing the  
problems of automating  
4000 buildings, we can  
tailor just the  
right system to yours.**

Actually, buying a Honeywell one-man control system is kind of like buying a car today.

Sure, we vary features, options and accessories to customize the system to your client's building. But the designs of the basic equipment have been pre-tested and proven in thousands of other buildings. You don't have to buy a costly, custom-built, one-of-a-kind system.

Advantages? Your client gets his system on time. You get it working on time. And there's 18 years of automation experience to help him operate and maintain it properly. An 18-year history of solving the kinds of cost and installation problems you're now facing.

Want building automation help? Send for our planning guides: Honeywell, Commercial Division, G5118, Minneapolis, Minnesota 55408.

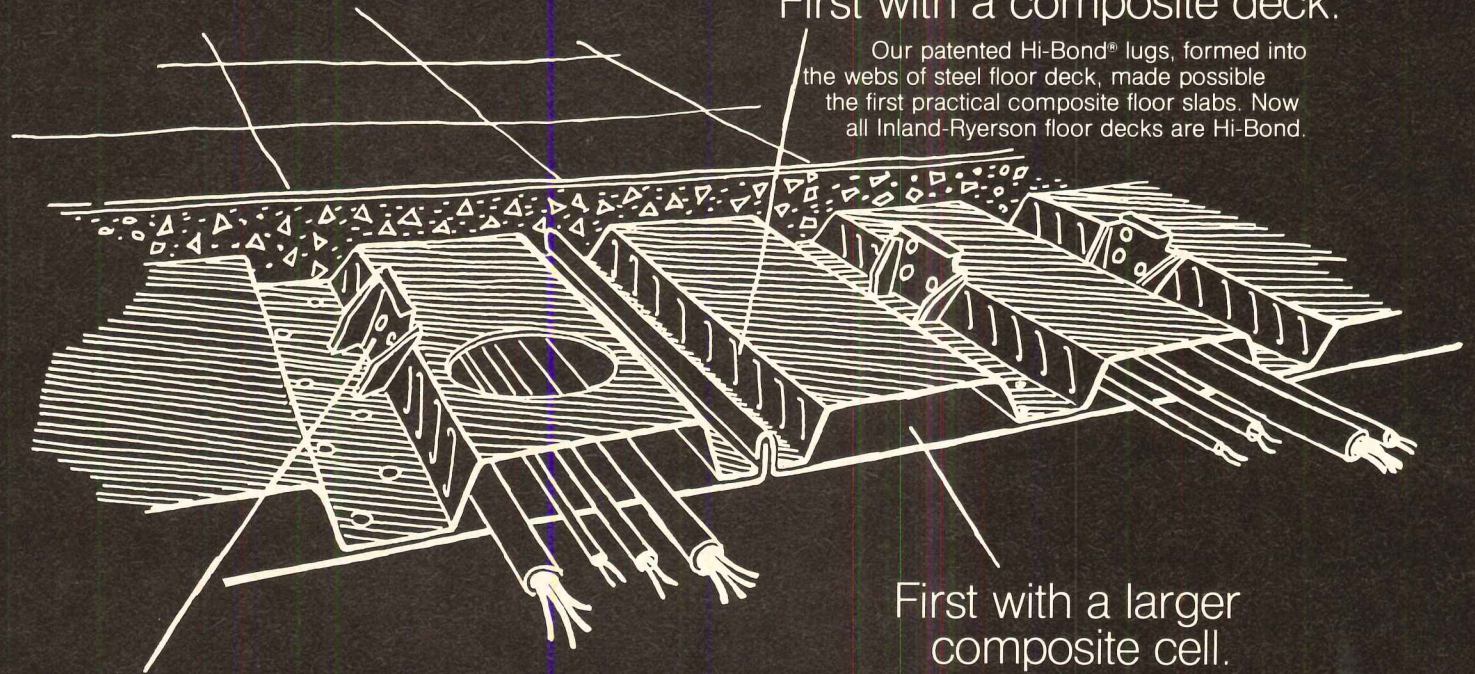
**Honeywell**  
AUTOMATION

*For more data, circle 102 on inquiry card*

# Composite design? Think of Inland-Ryerson first.

First with a composite deck.

Our patented Hi-Bond® lugs, formed into the webs of steel floor deck, made possible the first practical composite floor slabs. Now all Inland-Ryerson floor decks are Hi-Bond.



First with a tapered shear connector.

Shaped to take advantage of floor deck geometry, new Inland-Ryerson shear connectors are more efficient than any other design.

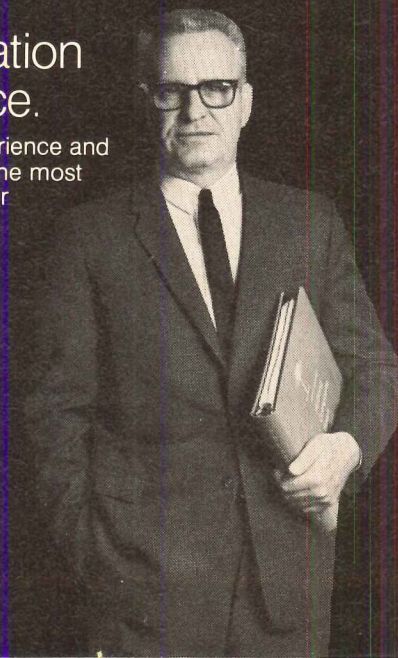
And they can be welded with conventional field-welding equipment through all deck finishes, even through double thickness cellular sections.


First with a larger composite cell.


1 $\frac{1}{8}$ " NF Cellufloor® by Inland-Ryerson, offers the first 8" cell that is compatible with 1 $\frac{1}{2}$ " composite floor deck requirements. This means 66% greater capacity than conventional 1 $\frac{1}{2}$ " floor cells.

First with information and assistance.

Our sales engineers have the experience and design data to help you select the most effective and economical components for composite beam design. Phone your nearest Inland-Ryerson office today, or write for new Catalog 272 which describes Inland-Ryerson composite design concepts. Inland-Ryerson Construction Products Co., Dept. K, 4033 W. Burnham Street, Milwaukee, Wisconsin 53201.



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**RYERSON**

A member of the  steel family

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COUNT ON

# COSCO®

WHERE THE NEW IDEAS ARE

**Sit this one  
out in comfort.**



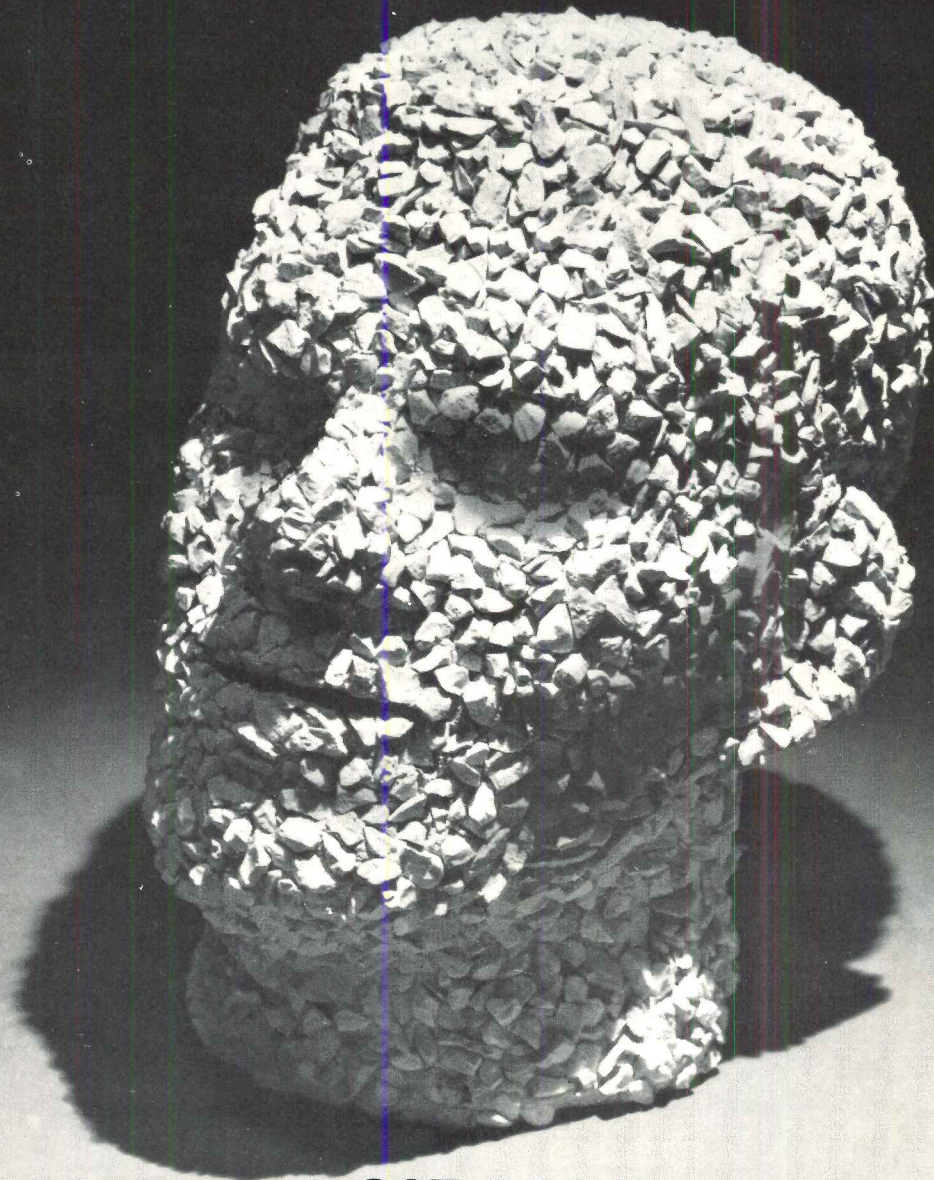
**Or stack it.**



These Cosco contemporary chairs stack easily for quick storage. They also gang. And they're so comfortable, anyone will feel at ease in them.

The series also includes a folding chair. Both models come with solid steel frames. With molded fiberglass seats and backs available in seven colors. And with a very reasonable price tag.

For complete information on the Cosco "1200 Series" of utility seating, write Hamilton Cosco, Department AR-119, Gallatin, Tennessee.



## GOT ROCKS IN YOUR HEAD?

To put it another way, do you have exposed aggregate in mind for exterior or interior walls?

Tuff-Lite® is an excellent epoxy-based matrix to use for exposed-aggregate walls.

Because it has held larger rocks (and more of them) for a longer time than any other epoxy matrix!

And because its holding power has been proven in temperature cycles of -40°F. to +135°F. for periods of up to eight consecutive years.

Write for specs on Tuff-Lite Epoxy-Based Wall Matrix. And we can also give you specs on our complete line of epoxy floor systems: Tweed-Tex® Epoxy/Ceramic-Granule, Tuff-Lite Epoxy Terrazzo (both conventional and conductive), and Heavy-Duty Epoxy Floor Topping.

Refer to Sweet's Architectural File Numbers 11g/Fu, 11o/Fu and Industrial File Number 10e/Fu.



### HB FULLER COMPANY

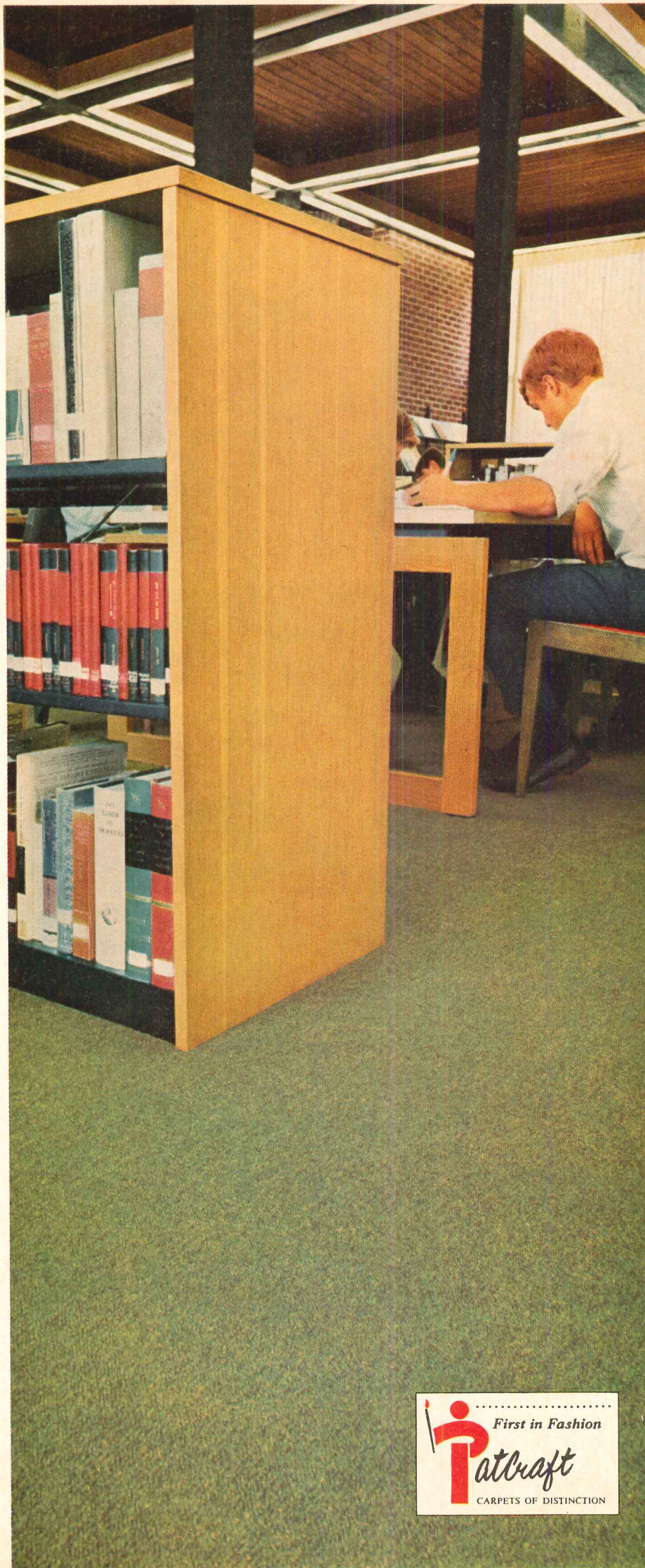
CONSTRUCTION DIVISION

2400 Kasota Avenue, St. Paul, Minnesota 55108 Dept. 34342

For more data, circle 105 on inquiry card

◆ For more data, circle 104 on inquiry card

For more data, circle 106 on inquiry card ◆



# THE THINK CARPET

**A study in sound-absorbing quiet, developed by Patcraft Mills with Zefkrome<sup>®</sup> acrylic fiber.**

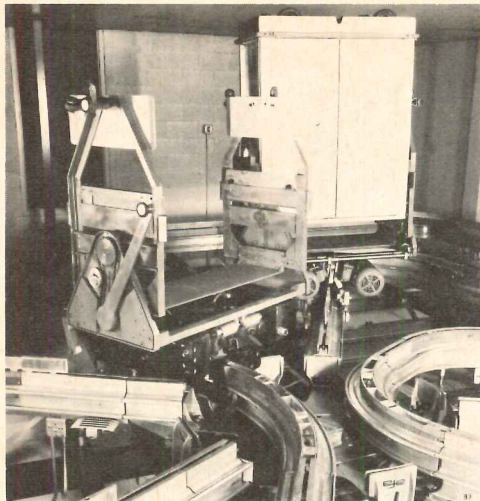
The new, anti-noise movement: carpet. Patcraft constructs an ideal one for the modern school environment, with the modern carpet fiber, Zefkrome acrylic. For concentrated quiet. For matchless wear (Zefkrome is up to 50% stronger than other acrylics). For producer-dyed color that lasts. And for a new dimension in maintenance. Less of it. Because Zefkrome makes even more of carpet's economical upkeep. Among acrylics, it offers maximum cleanability. "Entwine" is made in different weights for different traffic areas, including a heavier weight developed especially for corridors. Think about the "Think" carpet and its perfect apropos to the times. Then call or write Bill Conneen, Patcraft Mills, Inc., Dalton, Ga. 30720. (404) 278-2134.



Zefkrome<sup>®</sup>, Zefran<sup>®</sup> II, Anavor<sup>®</sup>, Vivano<sup>®</sup>, Lurex<sup>®</sup> are trademarks of Dow Badische Company, 350 Fifth Avenue, New York, New York 10001



*For more data, circle 112 on inquiry card*



**HANDLING SYSTEMS** / Custom designed hospital materials handling systems are designed to insure that the correct materials are available at the proper time. *Cyberail*, which was originally introduced as an automated system consisting of a network of monorail track, containers and container transporters, now has variations of monorail, elevator, dumbwaiter and container.

▪ Sybron Corporation, East Rochester, N.Y.

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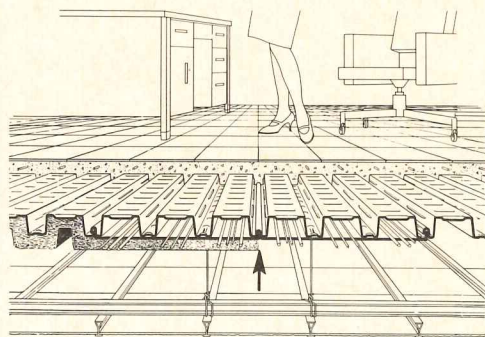
**PLASTIC COATING** / Eyebrows of 11-story University Hospital of San Diego and two-story structure in the foreground were coated in 1963 with a 40 mil thickness of



vinyl-plastic *Liquid Envelope*. The protective coating is reported to have resisted corrosion and weathering and prevented leaks.

▪ Essex Chemical Corporation, Clifton, N.J.

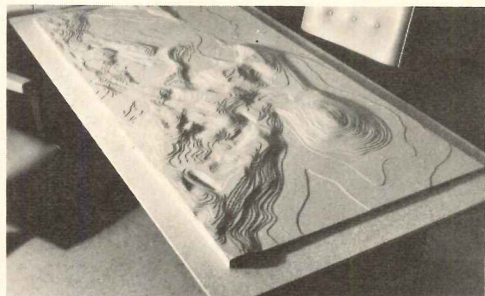
Circle 312 on inquiry card



**FIRE FLOOR** / Q-Lock Floor's two-hour fire-resistive composite construction does not require fireproofing under the steel floor per UL Design No. 267-2 hr. Illustration shows fireproofing on the left as was previously required. Three factors must be considered, however: 1) local city building departments must approve each installation; 2) a minimum of 3/4-in. lightweight concrete is required on top of the floor; and 3) fireproofing must be applied to columns and under span areas where electrical trench header is located.

▪ H. H. Robertson Co., Pittsburgh.

Circle 313 on inquiry card



**CONTOURED SCALE MODELS** / Three-dimensional, highly detailed contoured scale models of land masses are being manufactured from rigid urethane foam to any horizontal or vertical scale desired. The models are said to "cost only a fraction of a cardboard lay-up."

▪ Contours, Inc., Ann Arbor, Mich.

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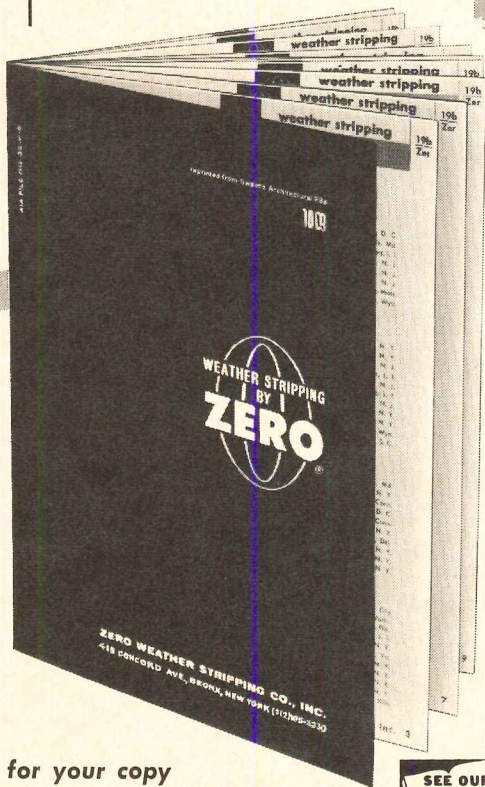
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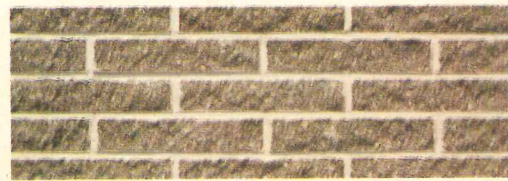
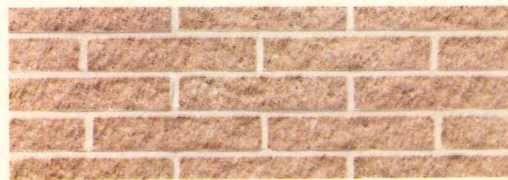
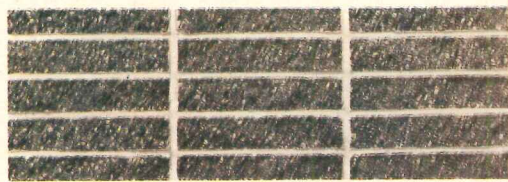
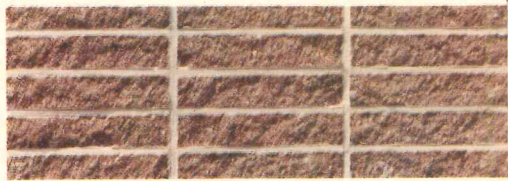


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# Permanent Resident at the Marriott... Split Block of Medusa White.

## COLORED SPLIT BLOCK WITH MEDUSA WHITE

Color Samples: Chas. Svec, Inc., Cleveland, Ohio



Split block of Medusa White assures walls of ageless distinction . . . walls that are attractive to Marriott guests. These handsome, soft textured concrete units capture light and shadows for a variety of changing effects. They are economical and fireproof.

The true white color of Medusa White Portland Cement also assures more accurate results when color pigments are used (see samples at left).

Whatever or wherever your building project . . . consider split block walls of Medusa White for greater beauty and economy. Write for brochure. Medusa Portland Cement Company, P.O. Box 5668, Cleveland, Ohio 44101.

**MARRIOTT HOTEL**, Crystal Plaza, Arlington, Virginia. Architects: Weihe, Black, Kerr & Jefferies, Washington, D.C. Owners & Gen. Contractor: Charles E. Smith, Inc., Washington, D.C. Split Block Producer: ("Random Rock" A-65) Nitterhouse Concrete Products, Inc., Chambersburg, Pa.



# MEDUSA

PORTLAND CEMENT COMPANY

White and Gray Portland Cements • White, Gray and Custom Color Masonry Cements • "CR-85 Series"® ChemComp® Cement

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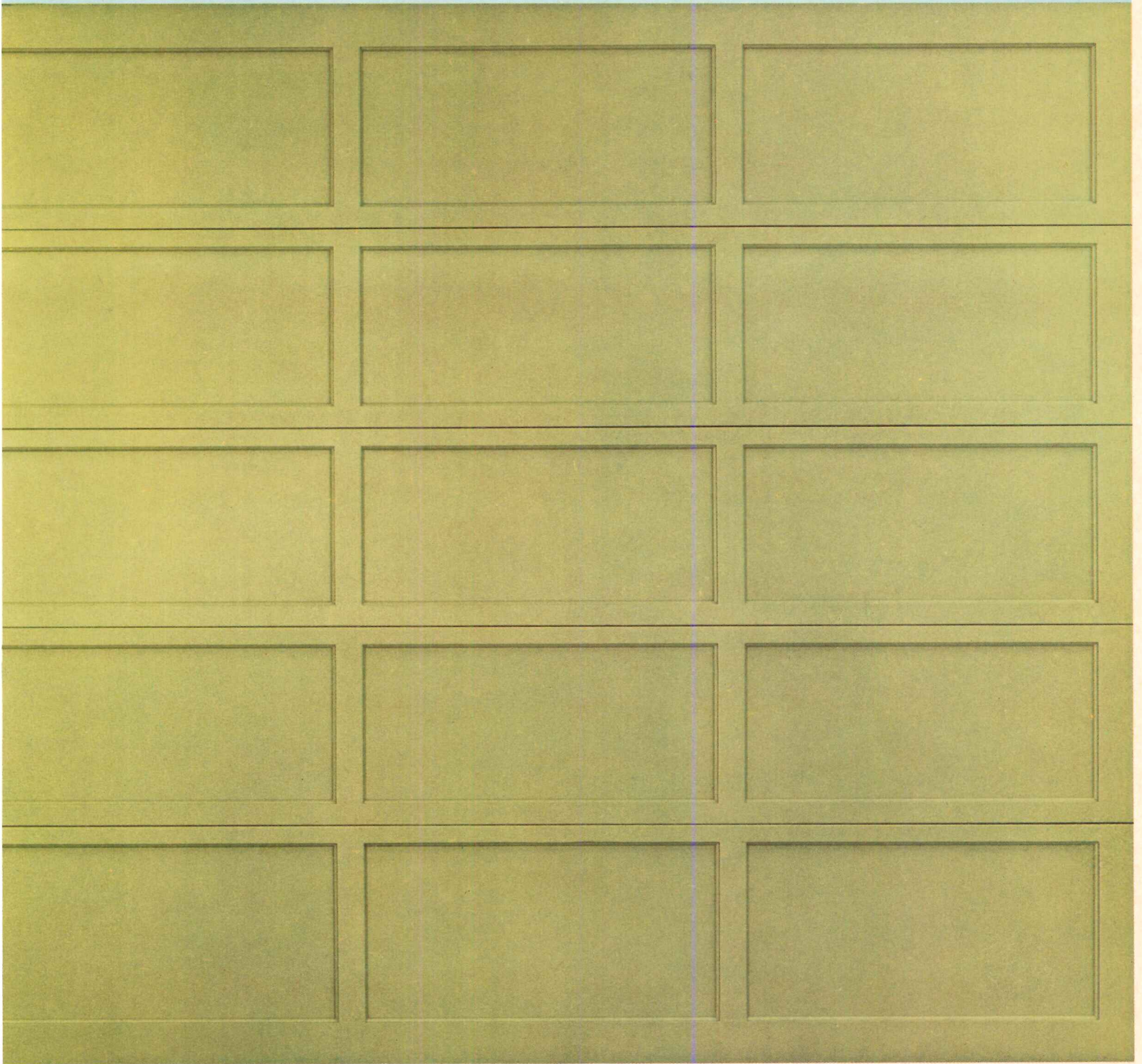
# **THE FORTUNE DIRECTORY**

# 500

**THE 500 LARGEST U.S. INDUSTRIAL CORPORATIONS**

**and the 50 Largest Banks, Retailing,  
Transportation, Life-Insurance, and Utility Companies.**

Is it quality, availability, or service that prompts nearly all Fortune 500 companies to choose The "OVERHEAD DOOR"?  
*All three. Plus old-fashioned good judgment.*



These giant industrial complexes didn't just happen. They were planned. Carefully and painstakingly. And, in most instances, the plans included The "OVERHEAD DOOR".

How have we gained the confidence of these goliaths of business and their architects? By offering them the best commercial doors on the market — when they want them, where they want them. Doors to meet any individual requirement, regardless of style, size, or design. Doors geared to our exclusive electric operators for maximum efficiency. Doors that we not only



install and warrant for a full year, but also back up with dependable service provided by factory-trained crews of experienced door specialists.

One thing we've learned after 48 years of leadership in the door business: to stay Number One you really have to *be* Number One.

And playing second fiddle just isn't our kind of music.

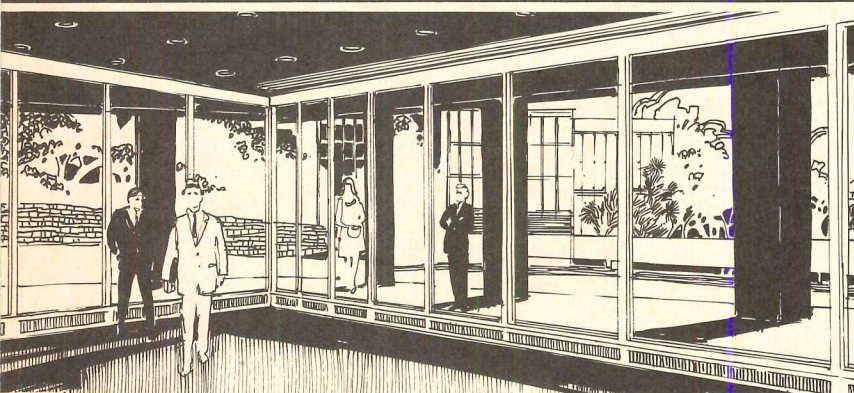
The "OVERHEAD DOOR" distributor nearest you is listed in the white pages of your phone book. Call him. He's a good man to know.



**OVERHEAD DOOR CORPORATION**  
General Offices: Dallas, Texas 75202

Manufacturers of The "OVERHEAD DOOR" and electric operators for residential and commercial buildings

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## High, wide and handsome with insulating glass by Thermoproof.

Beautiful—and functional.

A stately office building for the Commonwealth of Virginia. A tall limestone tower beautifully balanced on exposed granite columns around a podium base.

Compatible with the use of stone, aluminum and the overall modular design, architects Hayes-Seay-Mattern & Mattern of Roanoke specified over 1000 insulating glass units. And practical; these units help control heating and air conditioning costs.

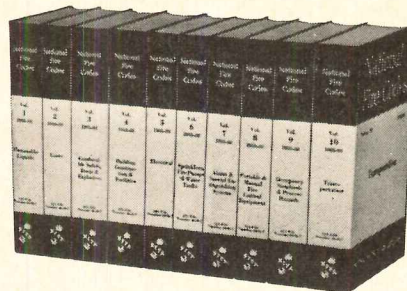
This building is one more way insulating glass by Thermoproof is made more ways to fit more of your ideas—in a big way!

Full color insert in Sweets <sup>4a</sup>/<sub>Th</sub>

Insulating glass by Thermoproof Glass Company  
subsidiary of Shatterproof Glass Corporation  
4815 Cabot Avenue, Detroit, Michigan 48210

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## NATIONAL FIRE CODES



7,762 pages (10 volumes) of the latest technical data on fire prevention and protection. All 202 NFPA Codes, Standards and Recommended Practices. Published by NFPA — worldwide, the leading authority on fire protection. Indispensable guide for architects, engineers, safety directors, property owners, fire officials, equipment suppliers. \$40 per set, f.o.b. Boston. Ask us to bill you — or enclose check with order to Dept. D2

**National Fire Protection Association**  
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Telephone (617) 482-8755

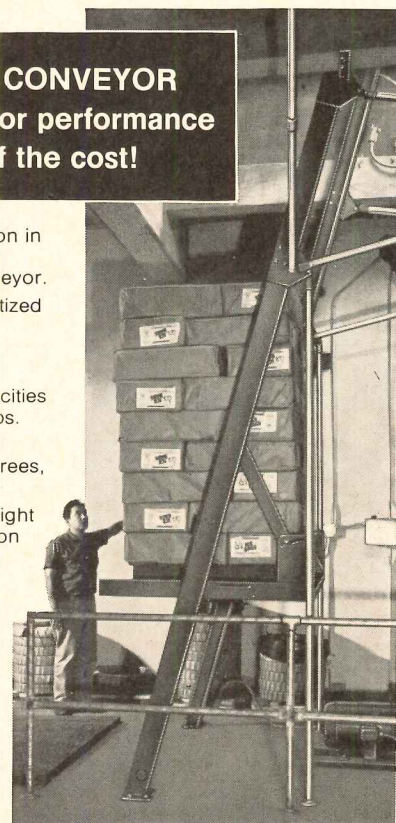
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## Moto Flow CONVEYOR

Freight elevator performance  
at a fraction of the cost!

- Approved for installation in new buildings or old; classified as freight conveyor.
- Moves bulky and palletized loads to and from mezzanines as well as between floors.
- Four models with capacities from 2000 lbs. to 6000 lbs.
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- Does the work of a freight elevator at a small fraction of the cost.
- Optional automatic loading and unloading accessories for incorporation with present materials handling system.

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## M-B COMPANY

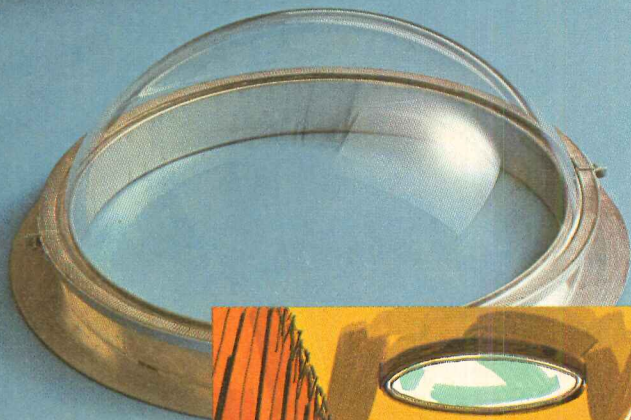
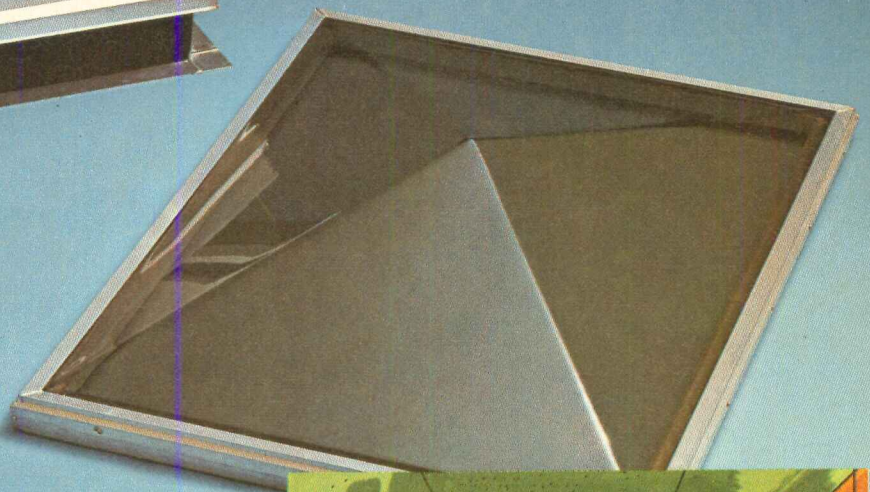
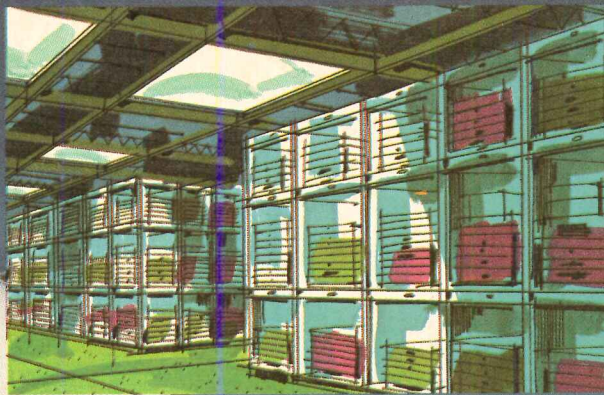
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669

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## Plexiglas® solves skylight design problems

You have a virtually unlimited choice of ready-made, well-designed and highly functional skylights to work with when you specify the one and only time-proved plastic skylight glazing material—Plexiglas acrylic plastic.

Skylight shapes in Plexiglas include domes and pyramids in circles, rectangles and squares. Both single and double domes can be specified in

colorless, in light-diffusing white translucent or in solar-controlling transparent bronze and grey tints.

Plexiglas is the only plastic skylight material that has more than a quarter of a century of successful outdoor use to prove its weather and breakage resistance. Its daylight transmitting properties are unsurpassed by other skylight glazing materials.

In addition to standard skylight applications, Plexiglas is used in heat and smoke venting domes, ventilating domes and roof scuttles.

Sizes up to 92" x 92" are available as standards (larger sizes are available on request) from skylight manufacturers across the country. Write for the names of suppliers near you.

Plexiglas is made only by



For more data, circle 119 on inquiry card



*The boy, about eight,  
and his big sister,  
about twenty,  
walked along the Sunday streets.  
They looked for an open store  
to sell them a bottle of milk,  
and they enjoyed  
the early fall morning.  
They walked almost silently.*

*Each enjoyed the quiet streets,  
and once she took his hand  
across a street where  
a car was moving.  
They continued  
hand in hand.*

*A few blocks away  
two boys appeared,*

*tossing a ball between them  
as they walked.  
One was black, one white.*

*As they passed, the boy,  
with one hand still in his sister's,  
said a little stiffly,  
"Hi fellas. See you tomorrow."  
He knew they would be teasing him  
for holding her hand.*

*She waited until the two—  
the black boy and the blond one—  
had disappeared around the corner.  
She asked, "Are they in your class?"*

*"One is," her brother answered.*

*"Which one?"*

*"The tall one," he said.*

Someday adults will see each other that way. You could help bring that time closer in your contacts with people around you. Or, on a larger scale, by joining McGraw-Hill Ideapeople (editors, journalists and educational sales consultants) in working\* for this goal: when you turn your head, you see, neither white nor black, but a person who is skinny, or fat, or wearing glasses, or short or tall, or smiling, or walking, or reading or hoping. You turn your head and see a person.

\*Want to know how? Send for our six-page report "What Is McGraw-Hill Doing About the Urban Crisis?" Write Roger Y. Barney.



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Maximum modular flexibility was the major architectural and mechanical requirement for the Philip Morris project in Virginia. David Warren Hardwicke & Partners (architects) and Robert S. Spratley & Associates (engineers) looked to Sunbeam's Interior Systems Division for the ceiling system solution.

When you're solving ceiling

design problems, it's comforting to know that Sunbeam has the most versatile ceiling system line with more dimensional, architectural, environmental, and performance possibilities than any other company. The module can be any dimension to a fraction.

Like the IS5000 system variation pictured, Sunbeam ceiling systems totally coordinate all the environmental requirements: illumination, air distribution (exclusive Sunbeam Modu-Flo® Linear Airbar®), sound attenuation, and spatial organization.

Write the INTERIOR SYSTEMS DIVISION,

Sunbeam Lighting Company, Inc., 777 E. 14th Pl., Los Angeles, Calif. 90021 for your copy of "Concepts on the Interior Environment."

It will show you the industry's longest line of ceiling system design concepts, each of which is unlimited in application.

**Sunbeam Lighting Company, Inc.**

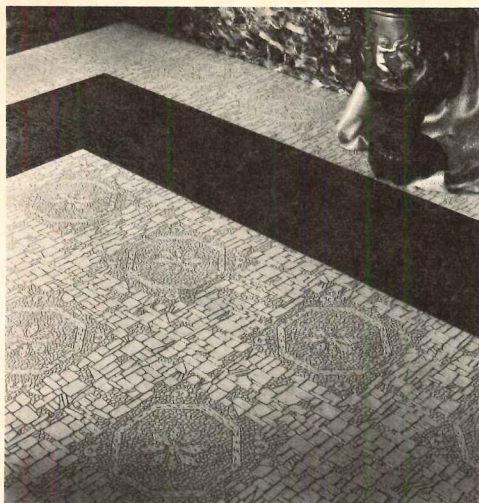
Los Angeles, Calif./Gary, Ind.

*For more data, circle 127 on inquiry card*

5' x 5' coffered modules for improved sound attenuation; Airbar grid for space emphasis; 3' x 3' luminaires with prismatic panels for comfortable, glare-free illumination...it could have gone a million other ways.



continued from page 228



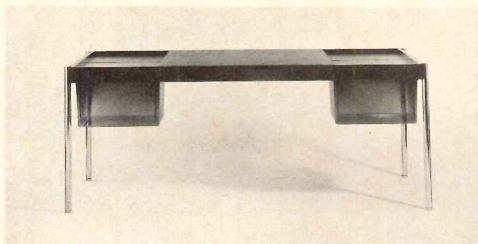
**TILE** / Repousse vinyl asbestos tile has a design that is interpretive of a Renaissance door panel sculptured by Benvenuto Cellini. The tile is made by index cutting, a method of cutting to close tolerances allowing embossed patterns to be repeated indefinitely. ■ Kentile Floors, Brooklyn, N.Y.

**FURNITURE** / *Customaire Furniture* designed for reception areas, lounges and offices has steel frames finished in either scratch-resistant, satin-smooth bronze-backed enamel or chrome. Table tops are high-pressure waterproof plastic laminate, with a wood-stained finish. Chairs have woodlike long urethane arms and a pillow



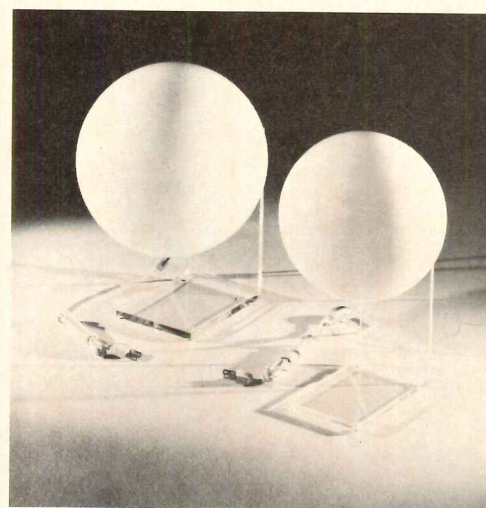
cushion design in a choice of 12 fabric and 4 vinyl coverings. ■ Samsonite Corporation, Denver.

Circle 315 on inquiry card



**AWARD-WINNING DESK** / The Institute of Business Designers' Jury of Awards announced the First Award in the Desk and Chair Category: the *Type 2, 2/B1* desk, designed by Dave Woods. The desk frame is sheathed in textured black high-pressure laminate; the filing wells are bronze-colored translucent Plexiglas and the legs are solid steel, mirror chromium-plated. The desk top, also made of textured laminate, has a series of sliding covers over the filing wells or utility compartments. ■ JG Furniture Company, New York City.

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**TABLE LAMP** / This simple lamp consists of a translucent length of Lucite plus a globe. "During the day it is an up-to-the-minute piece of sculpture; at night it is a bright ball, seemingly afloat in the air." The lamp comes in 13- or 14-in. heights and the globe can be 8- or 10-in. in diameter. ■ Auralume, Hackensack, N.J.

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Chemically Prestressed Concrete Corp., 14656 Oxnard Street, Van Nuys, California 91401  
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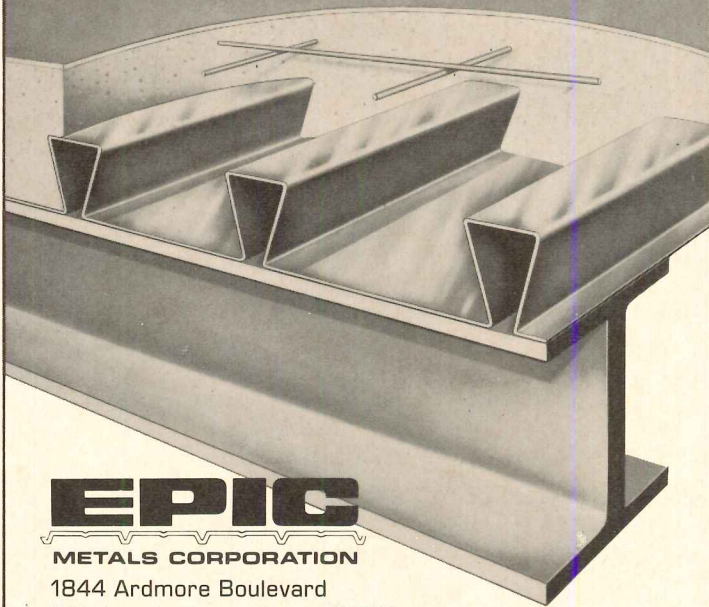
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Write for copy of new 1970 manual of Celotex Acoustical Products.

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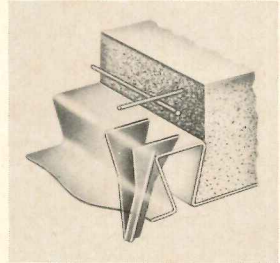
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The new Epicore Composite Floor System brings you an exclusive 2" depth-plus a big 24" width that give you wider spans, thinner slabs, and lower structural steel requirements than ever before possible.

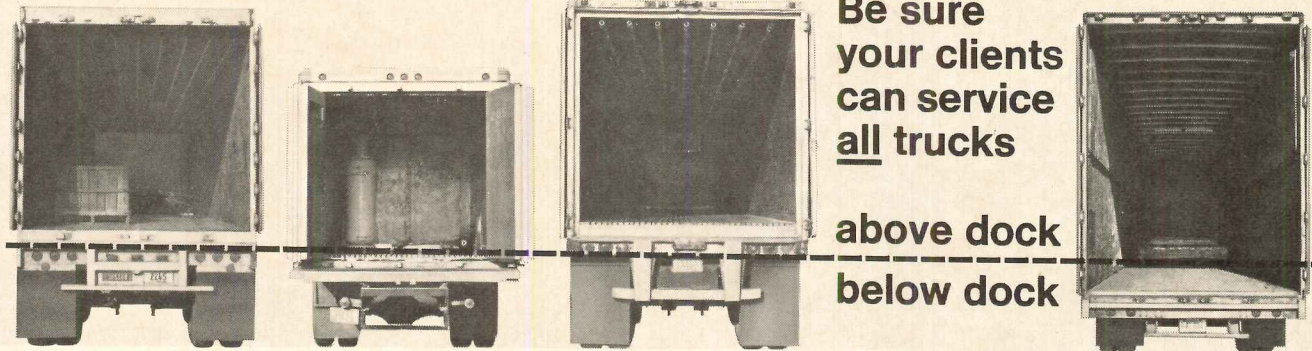
EPICORE is the answer to complex and costly conventional floor slab construction. Whether it's a plant, office, apartment, school, hospital—EPICORE makes it go up faster, easier, and at less cost.

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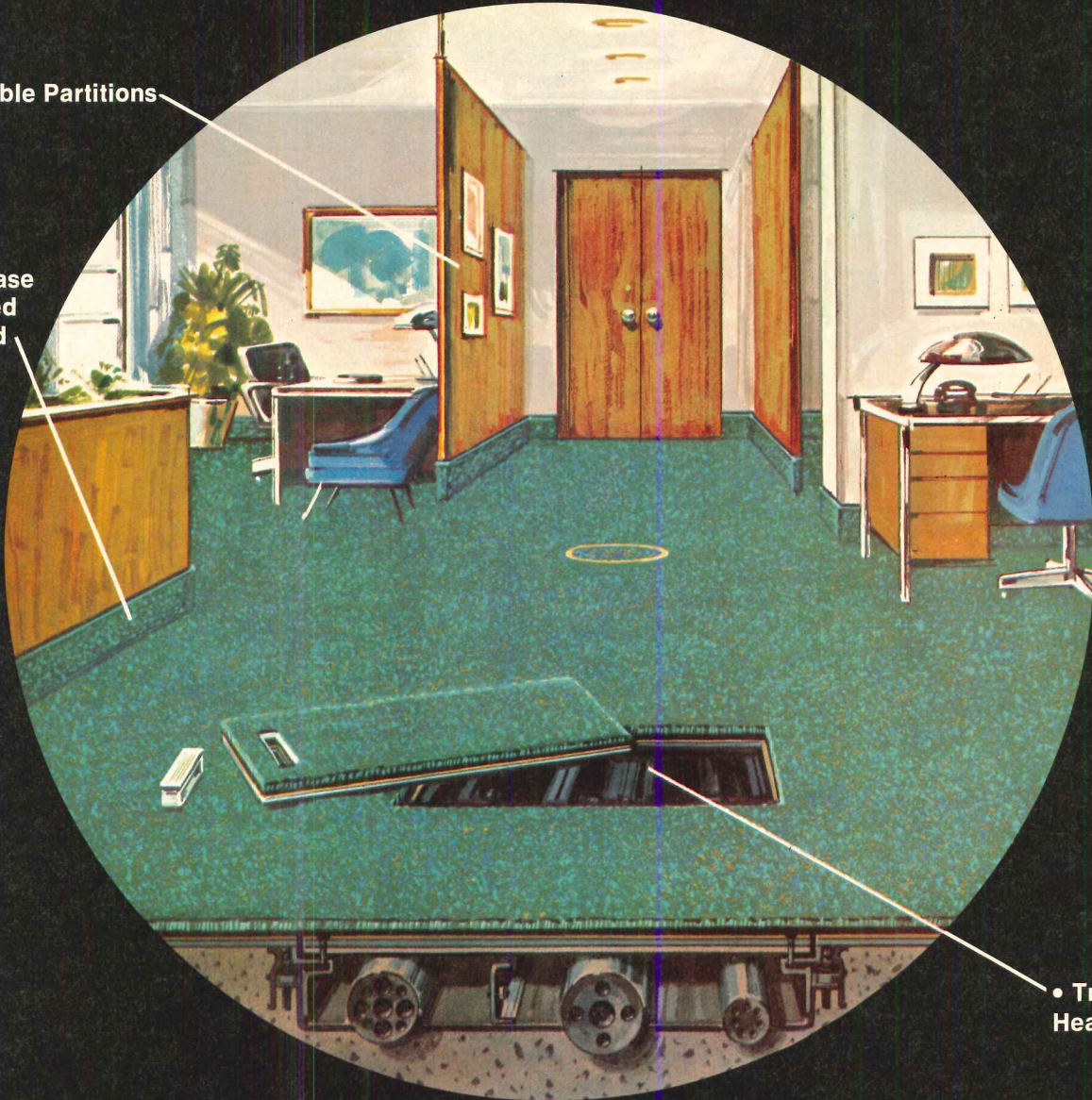


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Attention: Mr. Walter Brooks

Please send me a copy of the booklet, "Office Carpet Systems, with Acrylic 73".  Please have a CCC consultant contact me.

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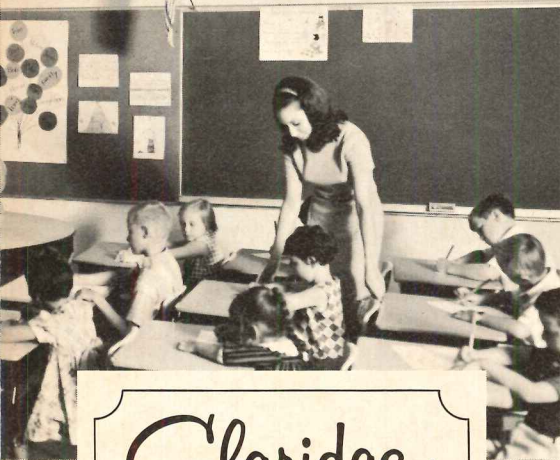
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**OFFICE LITERATURE**

*For more information circle elected item numbers on Reader Service Inquiry Card, pages 275-276.*

**AIR-ELECTRIC FLOOR** / An air-electric floor system, which incorporates a building's electrical and mechanical services distribution into thin sandwich floors, is described in a 24-page booklet. Color photos and detail drawings show how lighting, electric power, signal and communication services, air handling and water are integrated in this single, functional, space-saving system. ■ Granco Steel Products Company, St. Louis.\*

*Circle 400 on inquiry card*

**FIRE AND SMOKE SLIDE RULE** / A fire and smoke "ventalog" slide rule is designed to assist in quickly relating floor area to vent area based on four degrees of hazards. A second reading equates vent area to number of fire and smoke ventilators by model type. ■ Penn Ventilator Co., Inc., Philadelphia.

*Circle 401 on inquiry card*

**RIGID FRAMES** / A new edition of "Plywood Rigid Frames" gives complete design information on a construction concept reported to be money-saving. ■ American Plywood Association, Tacoma, Wash.\*

*Circle 402 on inquiry card*

**MERCURY LUMINAIRE** / A 12-page brochure covers the *Prismpack 11*, a ballasted, second-generation, prismatic-glass mercury luminaire for industrial, institutional and commercial applications. ■ Holophane Company, Inc., New York City.

*Circle 403 on inquiry card*

**FURNISHINGS** / Presentation material presents products from ashtrays to desks and 105 chair variations, "all to help the designer coordinate and expedite his ideas." ■ Burke, Dallas.

*Circle 404 on inquiry card*

**WINDOWS-DOORS** / A new recommended standard for wood windows and another for hardwood flush doors have just been printed. The new window standard consolidates information previously contained in eight existing publications. The standard for doors includes hardboard and plastic-faced types. ■ National Woodwork Manufacturers Association, Chicago.

*Circle 405 on inquiry card*

**GLASS** / A 10-page brochure, "10 Architects Separate Space With Glass," features glass wall design from a cross-section of architects across the country. ■ American Saint Gobain Corporation, Kingsport, Tenn.\*

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*\*Additional product information in Sweet's Architectural File*

*more literature on page 258*



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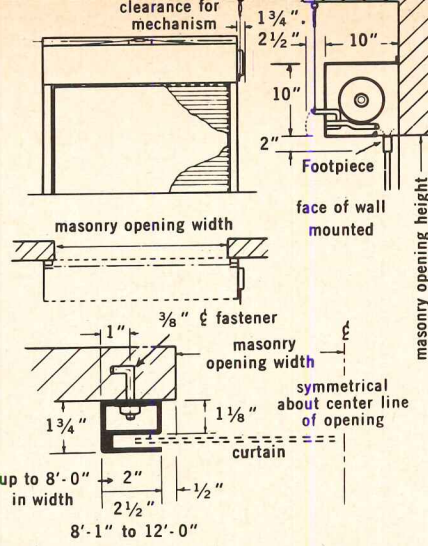
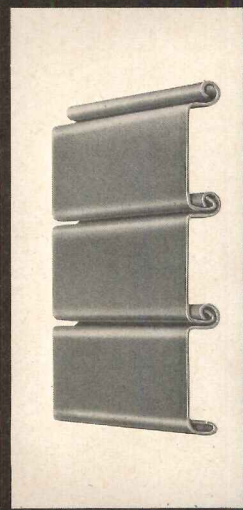
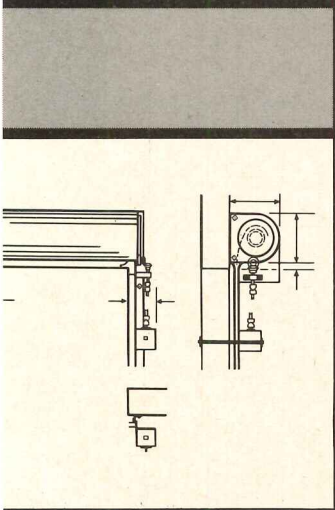
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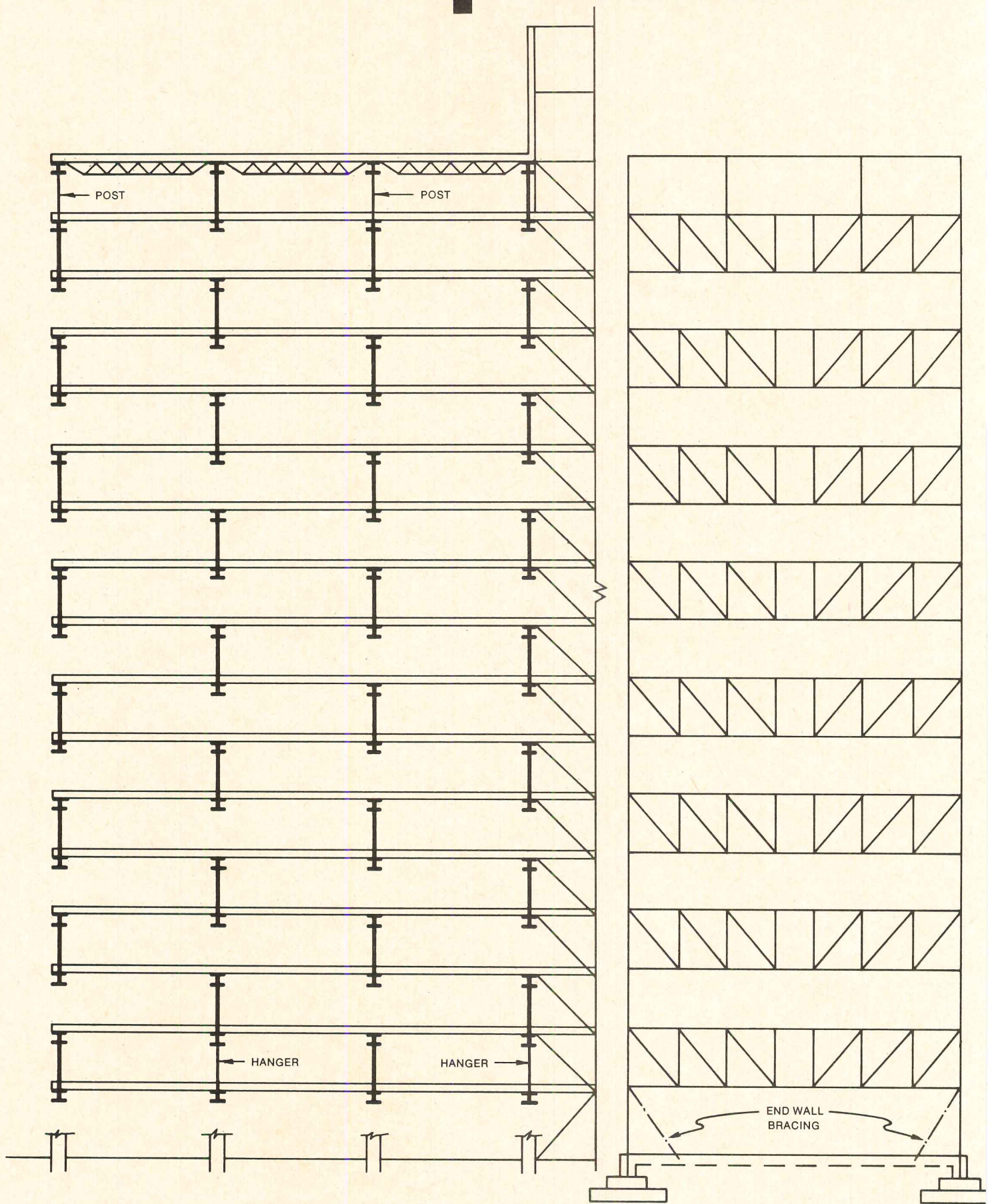


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The COOKSON Company, 700 Pennsylvania Ave., San Francisco, California 94107

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# Apartments:



Half longitudinal section:  
staggered trusses.

Cross section:  
(Note corridor space in center of truss.)

# when steel goes up costs come down.

First cost is just one of the ways to save with steel. This 186-unit apartment building shows how imaginative design with steel brought a project in at \$59,580 below budget.

The building is a low rent housing project for the elderly. Two 17-story towers flank a service core. Each apartment contains 455 sq. ft. The assignment was to design a building for pleasant living within a modest budget.

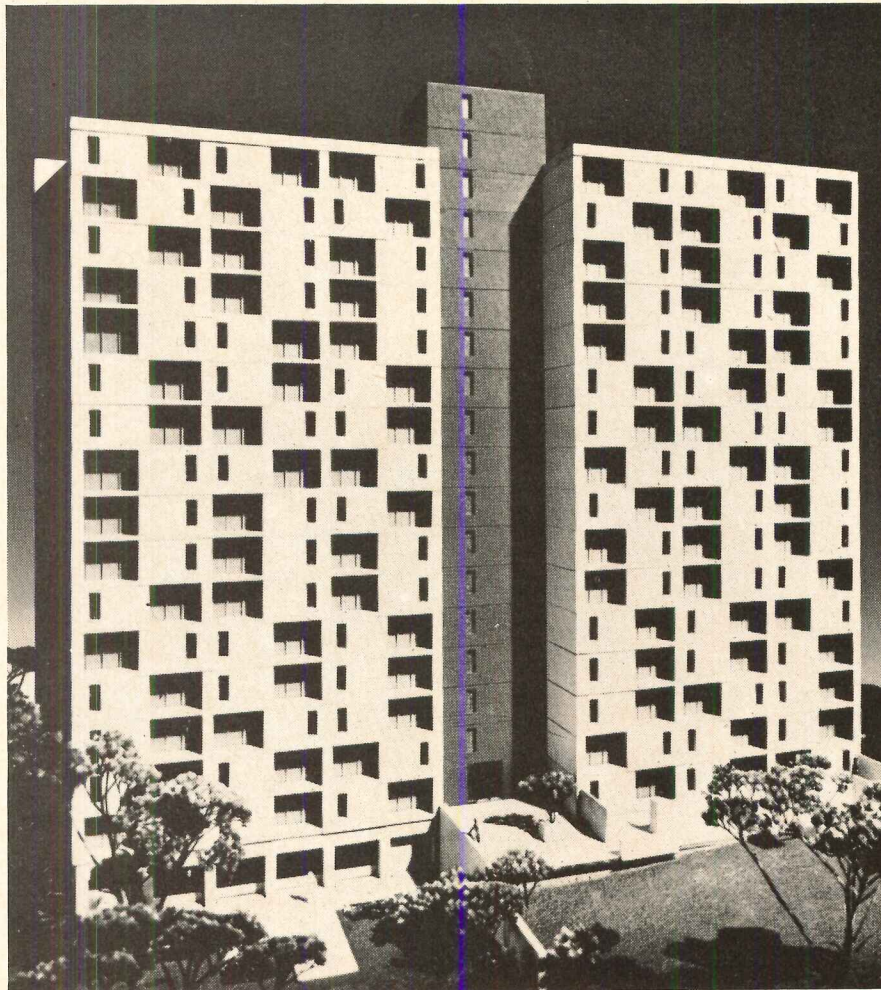
After evaluating several structural systems, the architects found their answer in a *staggered steel truss system*. This is the first use of the staggered truss system, which was developed at MIT in a research program sponsored by U. S. Steel.

Story-high trusses, spanning the building's 52'0" width, are set in a staggered pattern (see diagram). They are located within the separating walls of alternate apartment units. Precast concrete floors rest on the top chord of one truss and on the bottom chord of another truss. The floor slabs act as diaphragms together with the trusses to effectively resist wind loads.

Total steel requirement for the building was about 480 tons for an average weight of 6.8 lbs. per sq. ft. The A572 steels used in the welded trusses are USS EX-TEN 50 and 60 High-Strength Low-Alloy Steels (50,000 and 60,000 psi min. yield points respectively). Construction cost, including mechanical and electrical bids, was \$2,282,870. Sq. ft. cost: \$16.31.

## Structural Report

This is one of many ways to keep costs down with steel. Used imaginatively, steel usually wins out in



HOUSING FOR THE ELDERLY, 1300 Wilson Ave., St. Paul, Minn. Owners: Housing and Redevelopment Authority of the City of St. Paul. Architects: Bergstedt, Wahlberg & Wold, Inc. Structural Designers: Bakke & Kopp. Structural Engineers: Schuett-Meier Co. General Contractor: Knutson Construction Co. Structural Fabricator: The Maxson Corporation. Structural Erector: Sandberg Erectors.

first cost compared with other building materials. In the long run, there's no question. Only steel-framed buildings can be altered at low cost when it comes time for major remodeling.

If you're planning a new building, look into the staggered truss system. Get a copy of our "Struc-

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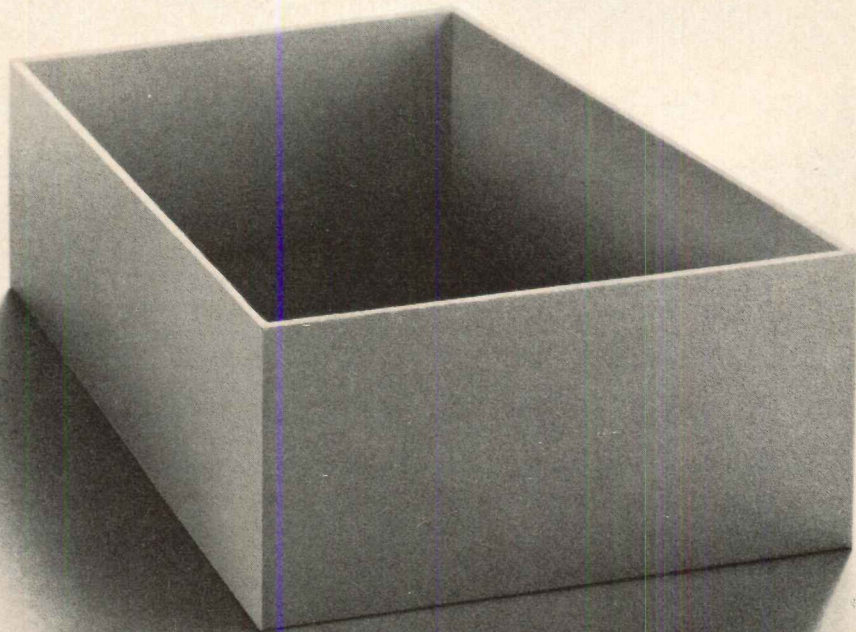
# To make your buildings grow, sprinkle them.

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Here are quotations from the four major building codes regarding "increased building area":

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**The National Building Code:** (SEC. 401.3) "When a building is equipped with an approved automatic

the permissive clauses from the four major building codes, and put them into a booklet called, "The Code Book."

For a copy, simply mail your request to Mr. E. A. Stroupe, Director of Marketing,

sprinkler, the floor area limits for any story may be increased by 200 per cent; where the average height to the roof, or to a fire retardant ceiling does not exceed 25 feet in a one story building, the floor area limits may be increased by 300 per cent."

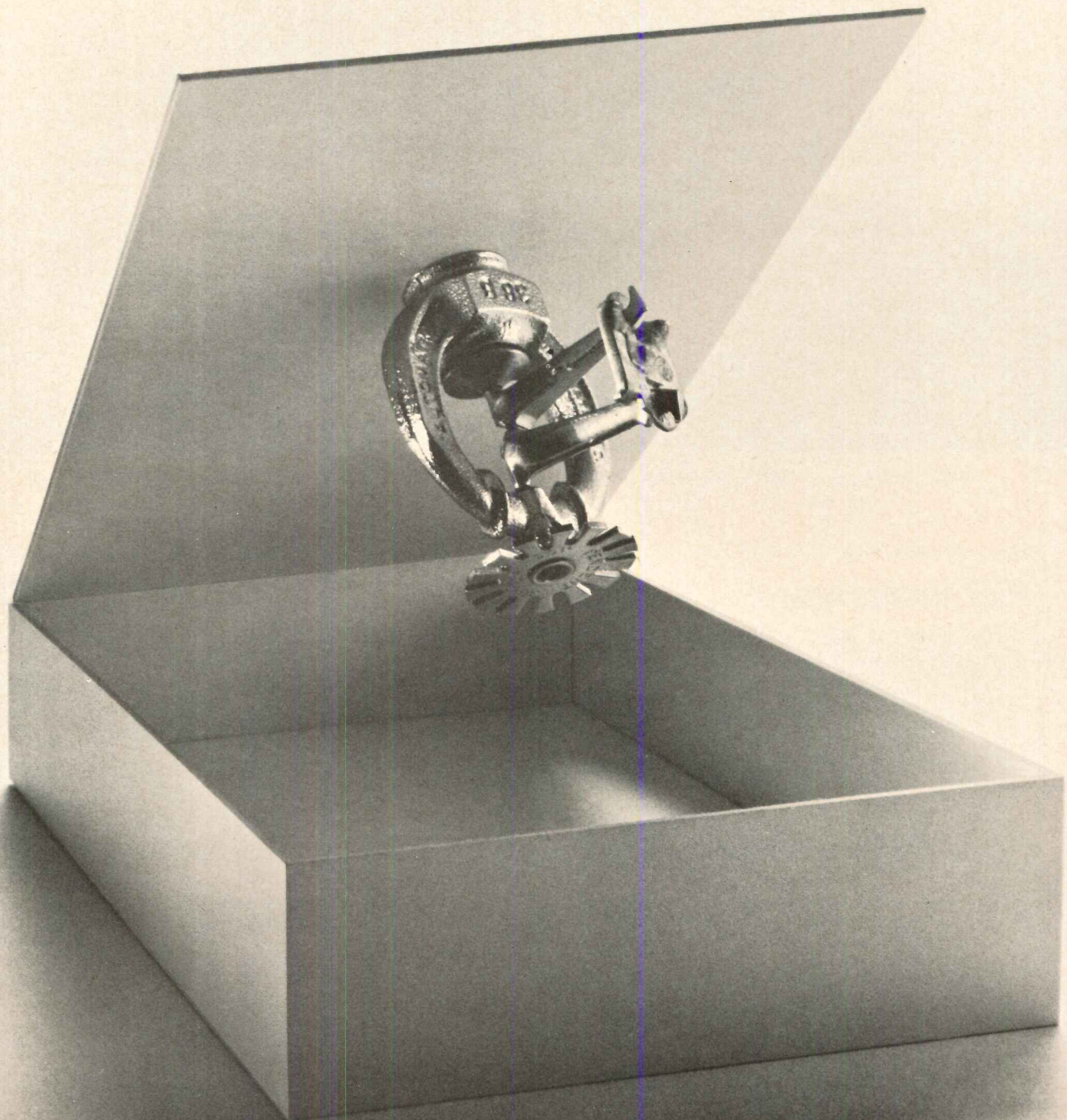
**The Southern Standard Building Code:** (SEC. 403.6) "The maximum allowable floor and attic area may be increased by 200% for one story buildings, and by 100% for buildings over one story in height if the building is provided with automatic sprinklers throughout."

"Automatic" Sprinkler Division,  
Dept. D-369, Box 180,  
Cleveland, Ohio 44141.



**The Basic Building Code:** (SEC. 308.2) "When a building of low hazard or moderate hazard storage, or mercantile, industrial, business or assembly (use group F-4) use group is equipped with an approved one-source automatic sprinkler system, unless such sprinkler system is required by the provisions of article 4 or article 12 for structures of special use and occupancy, the tabular areas may be increased by two hundred (200) per cent for one (1) story buildings and one hundred (100) per cent for buildings more than one (1) story in height."

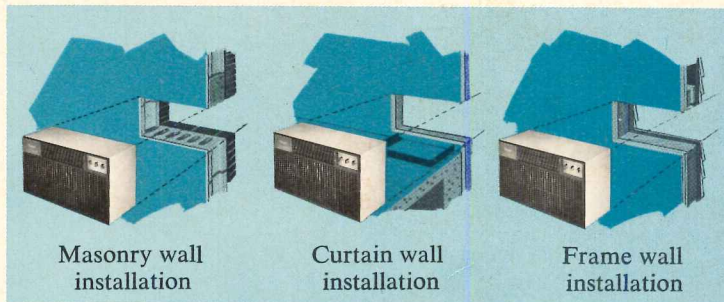
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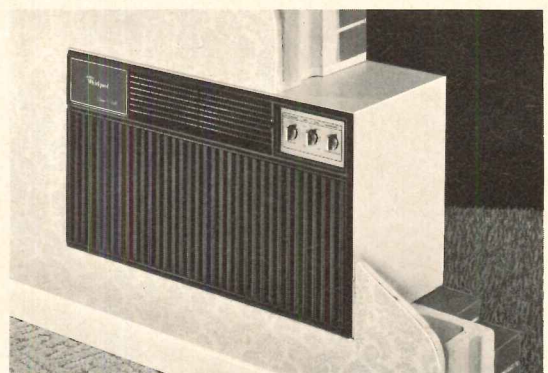
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Choose a model to provide cooling only; cooling with reverse-cycle heat; cooling with electric resistance heat; or cooling with reverse-cycle and electric resistance heat.

Whirlpool Therm-O-Wall units fit seven courses of standard brick with a total depth of only 14 $\frac{1}{4}$ " or 16 $\frac{3}{8}$ " (including front and back grill) depending upon the model you select. This unique front-to-back dimension allows a flush installation without any protrusion inside or outside in a standard block-brick, masonry wall. Only 32" wide, and there are no restricting side louvers either. Now, in addition, the Therm-O-Wall offers such advanced features as a 3-speed fan and exhaust-fresh air control. And without a doubt, the simulated Fruitwood-grain decorator front makes it the most handsome conditioner on the market (period!)

Of course we can't begin to give you all the facts about our new Therm-O-Wall in this ad. So just fill out the attached coupon and zip it to us. We'll be delighted to give you the full scoop on the proudest piece of merchandise you've ever specified for any building. What's more, the price is right.

Air Conditioner Department  
Whirlpool Corporation, Administrative Center  
Benton Harbor, Michigan 49022

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Please rush me complete details on your new Therm-O-Wall cooling and heating equipment. I understand there is no obligation.

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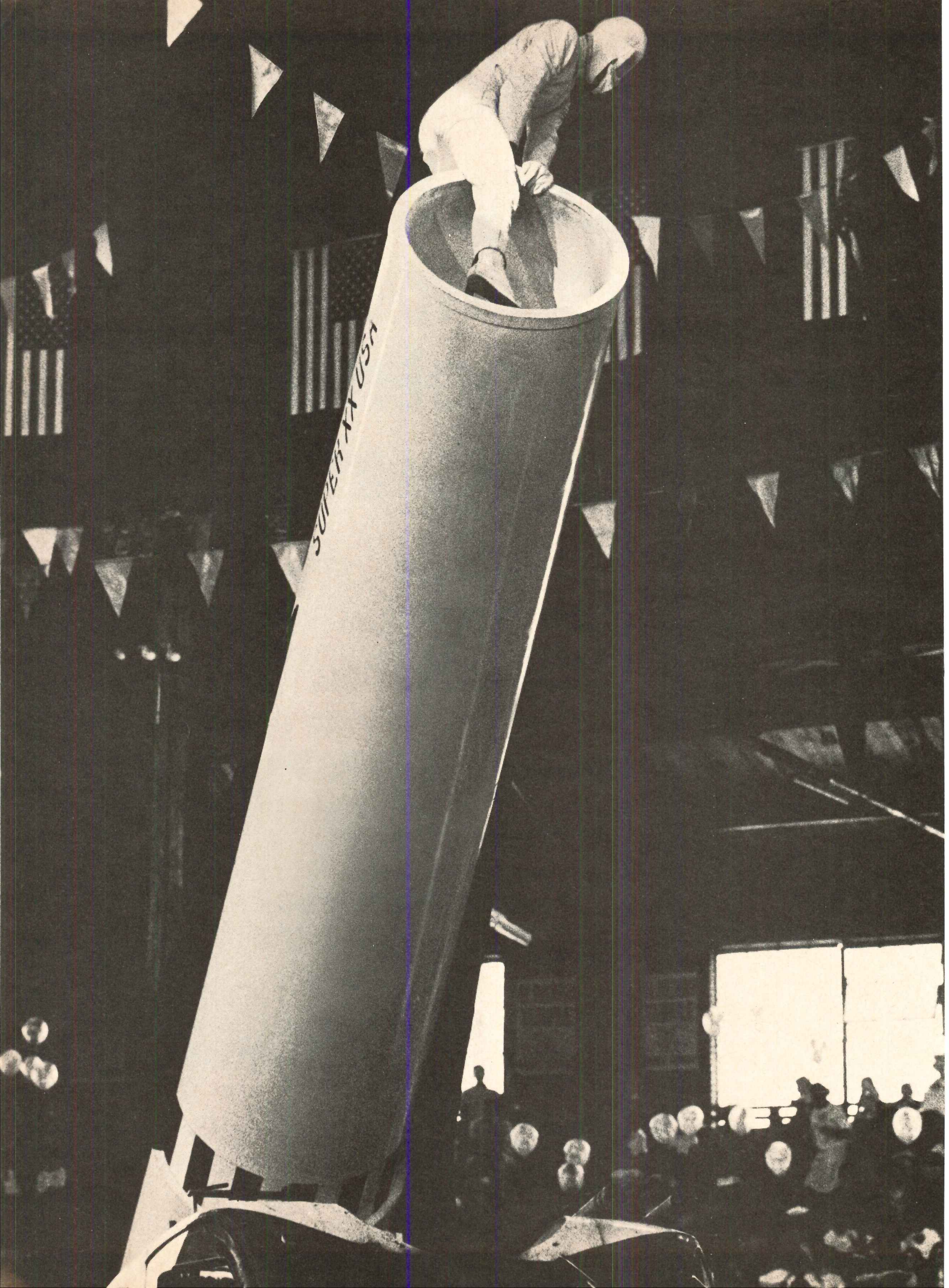
City \_\_\_\_\_

State \_\_\_\_\_ Zip Code \_\_\_\_\_

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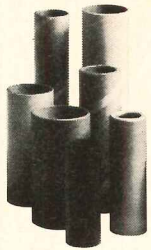
  
**Whirlpool**  
CORPORATION  
takes better care

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# Before you do anything unusual with a tube, think. You could probably do it with a paper tube.

Sonoco's strong, lightweight paper tubes and cores are used to wind things, ship things, store things.



They're even used as component parts of things. Like rocket launchers.

They come in all sizes with various degrees of beam, crush and torque strength.

They can be treated to resist moisture, oils, chemicals, heat and abrasion.

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There's almost no end to what we can do with them.

So maybe there's something they can do for you.

And if they can't, maybe some of our other products can.



Products like fibre pipe. Fibre forms. Containers.

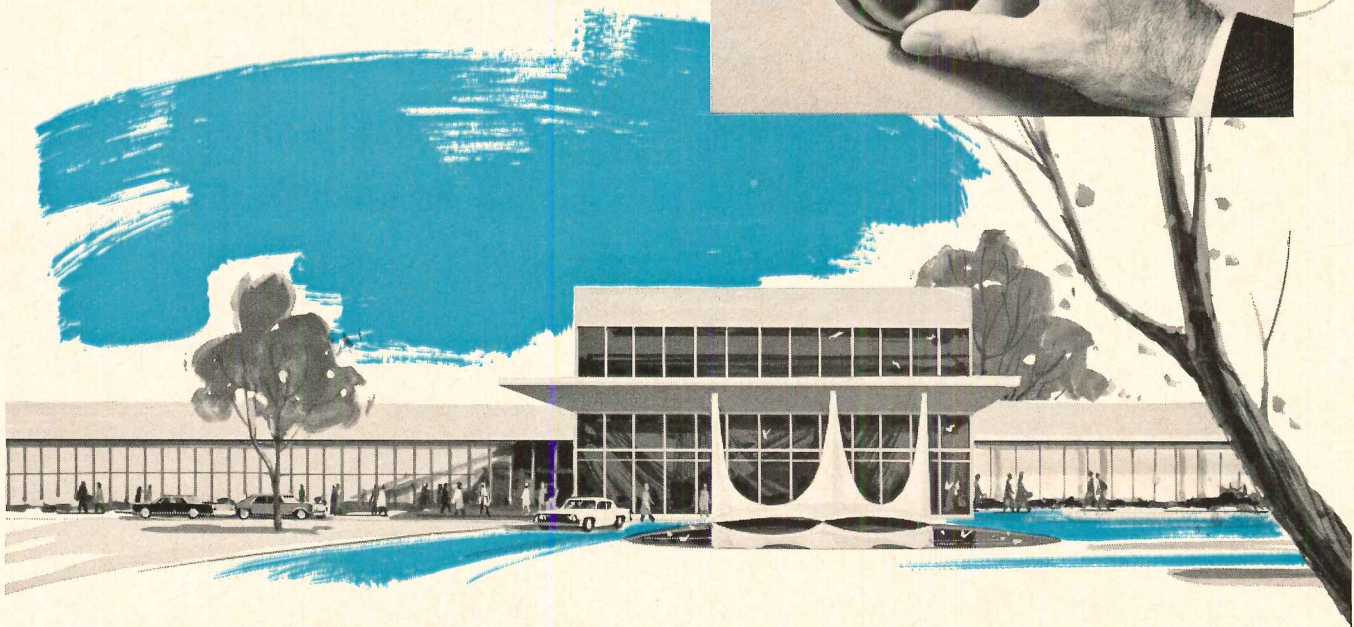
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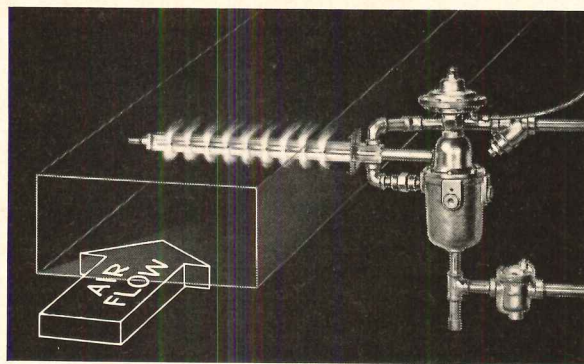
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as it is to provide  
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Those who remember central humidification as a series of crises centered around dripping ducts, fluctuating humidity and constant maintenance will be pleased to know that humidification and trouble no longer need be synonymous. Controlled humidification can now be achieved as easily as controlled temperature and at a lot less cost.

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The many problems of adding moisture to the air that once existed have been solved with Armstrong Dry Steam Humidification. It provides accurately controlled humidification without drip, mess or maintenance.

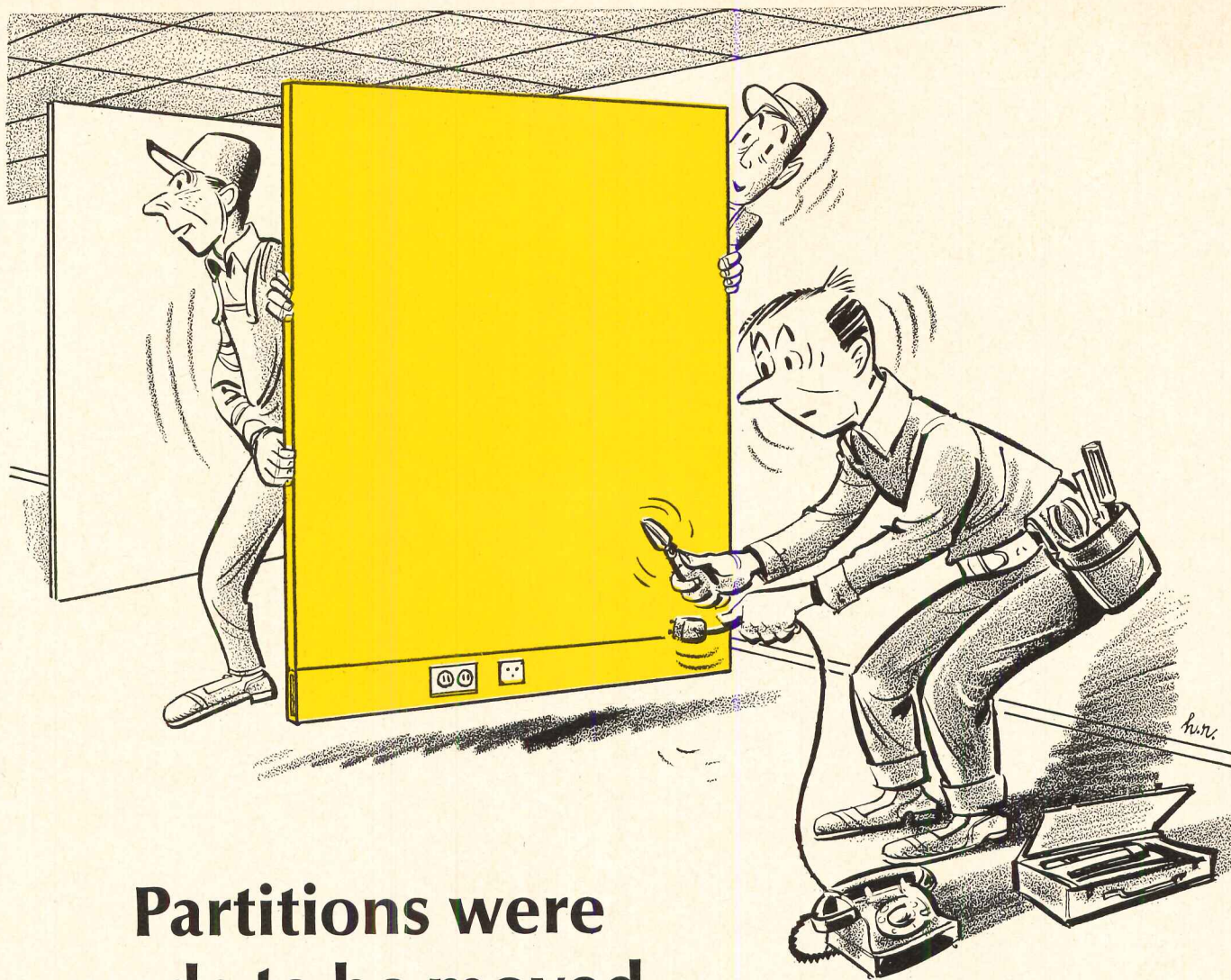


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And you can bet that your client will take advantage of that fact during the life of his building. That's why the wiring system you recommend is so important.

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The Pyramidal Feed system saves money, both in the original installation and in countless changes in the building, while still offering unparalleled versatility. Find out more about it. Write Square D Company, Dept. SA, Lexington, Kentucky 40505.

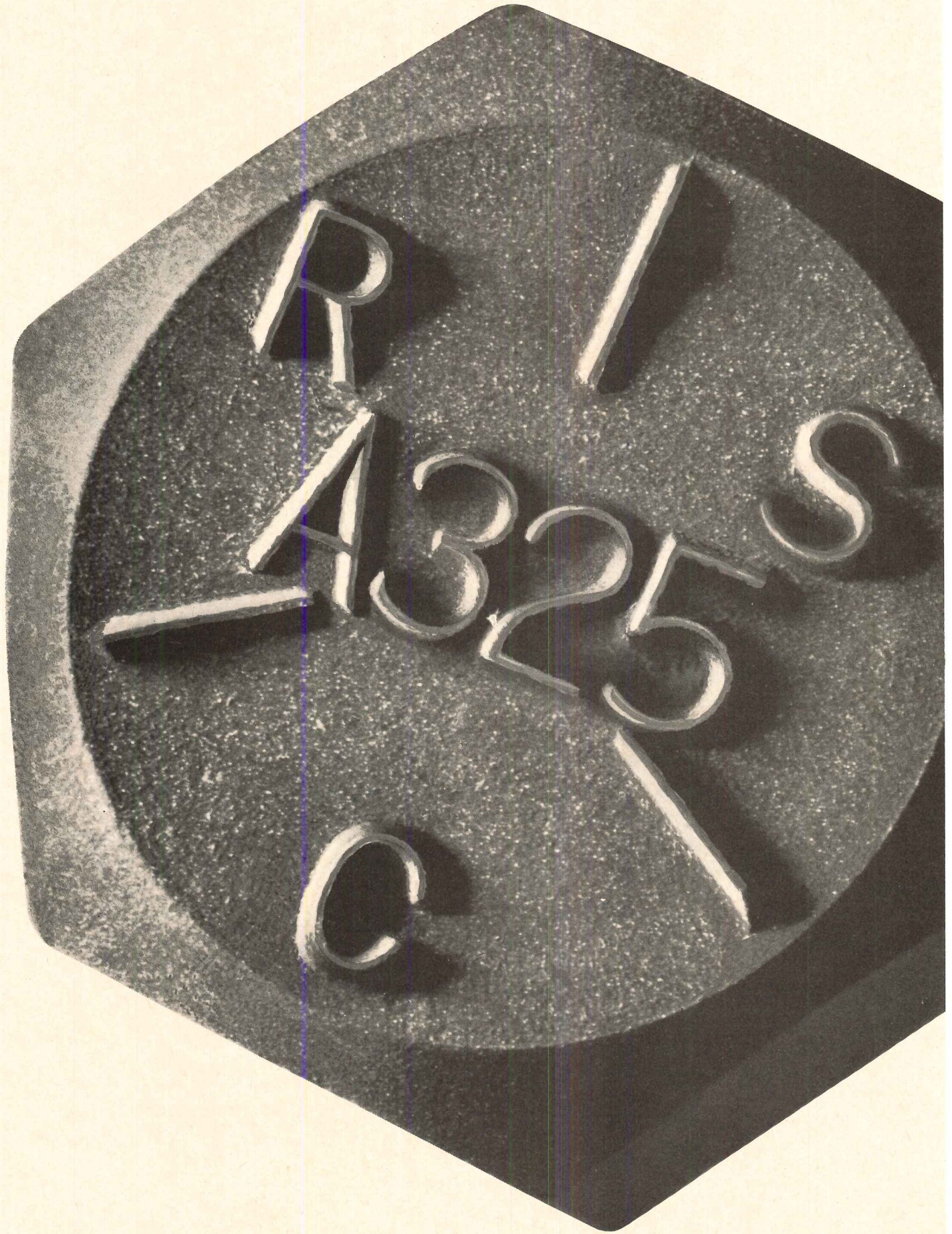
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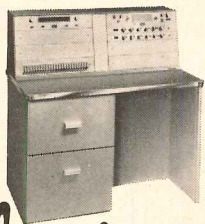
BOLT AND NUT DIVISION

1441 Republic Building • Cleveland, Ohio 44101



For more data, circle 137 on inquiry card

continued from page 242



planning a  
sound system?

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*Rauland*

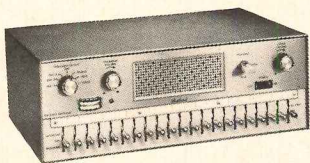
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**WALL ASSEMBLIES** / A catalog titled "Sound Advice" presents wall assemblies for control of sound transmission in homes, schools, offices, apartments and other construction. Over 30 assemblies are discussed in detail. ■ Georgia-Pacific Corp., Portland.\*

Circle 407 on inquiry card

**GRANITE** / A 24-page brochure details the availability of colored granite, which, "owing to its beauty, durability and comparatively low cost, is considered a choice building material." The brochure shows several interesting applications of granite. ■ Department of Natural Resources, Quebec City, Quebec.

Circle 408 on inquiry card

**REGULATORS** / A 12-page catalog describes constant plug-in regulators that maintain constant flow in supply air ducts. The catalog includes drawings and charts giving performance and dimension data. ■ Anemostat Products Division, Scranton, Pa.

Circle 409 on inquiry card

**CLASSROOM VENTILATORS** / A 20-page brochure features the redesigned unit ventilators with colors of soft beige with vinyl-painted pebble-textured gray or brown tops. Optional accent colors: Bimini blue, burnt sienna, colonial red and laurel green. Matching accessories include storage cabinets, book shelves, magazine racks, bubbler fountain and sink and draft/stop wall system. ■ Herman Nelson School Products Division, American Air Filter Company, Inc., Louisville, Ky.

Circle 410 on inquiry card

**ELEVATOR CONTROL** / An eight-page booklet describes the 1090 computerized control that is said to be the only one operating on the "floating-zone system." ■ Haughton Elevator Company, Toledo, Ohio.\*

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**STEEL** / A color brochure entitled "Man, Nature, and Time. . . A Collaboration," outlines the characteristics of COR-TEN weathering steel. The brochure explains that COR-TEN is available in three grades with minimum yield strengths up to 60,000 psi, weathers naturally with time, forming its own attractive surface-oxide coating to protect against further corrosion. Illustrated with several structural applications, the brochure covers properties, advantages and limitations, plus suggested welding and fabrication practices. ■ Inland Steel Company, Chicago.

Circle 412 on inquiry card

\* Additional product information in Sweet's Architectural File


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It's  
a matter  
of life  
and  
breath.



Christmas  
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There's a new way to incorporate sculpture and textural relief in building design. It can be done with Facad.<sup>®</sup>

This sculptured facing system of easy-to-install thin, molded, reinforced cement panels can be used as a total wall element; as spandrel panels, fascias, balcony panels or soffits.

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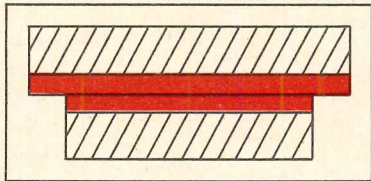


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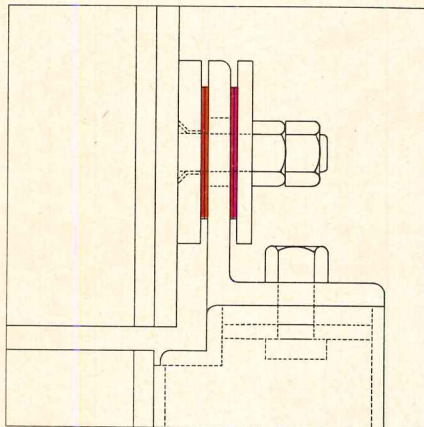
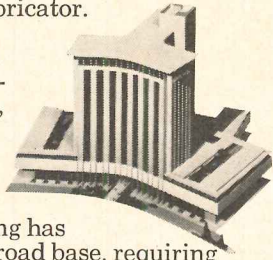
For more data, circle 139 on inquiry card

# Expansion bearings of TEFLON: here are three types used to solve varied architectural problems.

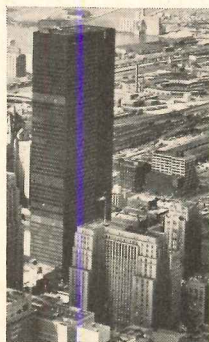


Case 1: Horizontal sliding bearing pads are the most common construction used in architectural applications. Shown above is a typical construction of sheets of Du Pont TEFLON fluorocarbon resin bonded to steel plates by an experienced bearing-pad fabricator.

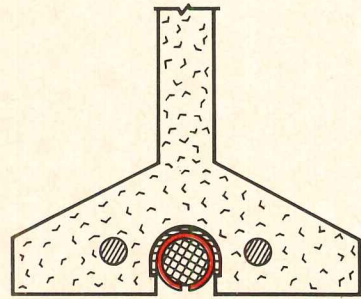
Forty of these pads were used in the Meadowbrook Hospital, Long Island, New York (illustrated at right). This 18-story building has an extremely broad base, requiring expansion joints designed into the basic structural framework. Where the expansion joints cross a load-bearing beam, bearing pads of TEFLON, of various sizes, were installed. In addition, bearing pads of TEFLON utilizing an extra layer of neoprene to allow for deflection were used in an entry bridge for this hospital building.



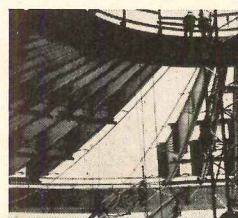
Case 2: Curtain walls in Canada's twin-tower Toronto-Dominion Center use vertical expansion bearing pads made with TEFLON to compensate for temperature changes. Room for  $\frac{3}{8}$ " vertical expansion in each section is provided by expansion joints in the mullions at alternate floor levels. A total of 38,000 bearing pads of TEFLON, each only  $2\frac{1}{4}$ " in diameter, assures easy, smooth—and, above all, quiet—movement of the curtain walls. And TEFLON, being resistant to weathering and



corrosion, will retain its slippery qualities indefinitely.



Case 3: Sleeve bearings of filled TEFLON are used in the arena of the Oakland-Alameda (Calif.) Coliseum Complex. The



bearings played an important part in the construction of one of the world's largest cable-supported roofs. Cables

were stretched between an inner and outer ring and 12- to 14-ton concrete I-beams were then hoisted into place. Each beam has steel cable shoes imbedded on 9' centers along a longitudinal slot in the bottom flange. The cable shoes ride on 6" lengths of filled tubing of TEFLON. (See illustration above.) The low-friction bearing of TEFLON permits smooth placement of I-beams on cables before the final tightening in place.

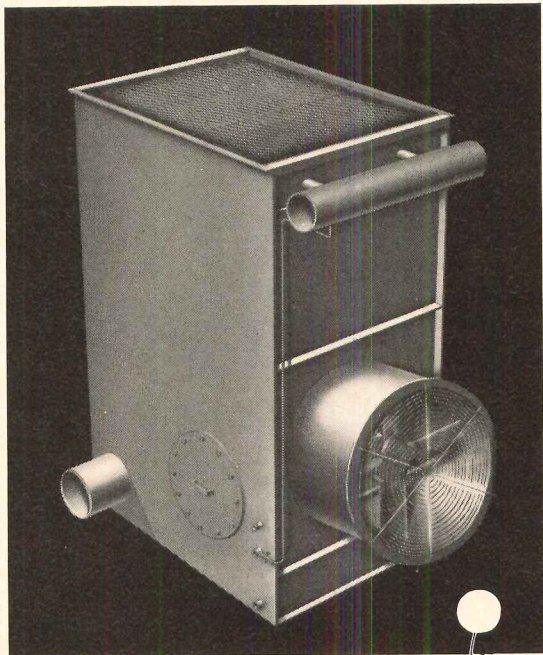
These are just three examples of the ways that many different types of bearing pads made with TEFLON are now being used to cope with problems of expansion and contraction in architectural applications. The design of these pads, tailored to the individual needs of the application, is best accomplished with the help of experienced bearing-pad manufacturers. For further information, write to Du Pont Company, Room 7645A, Wilmington, Delaware 19898.

**DU PONT**  
REG. U.S. PAT. OFF.  
**TEFLON**<sup>®</sup>  
fluorocarbon resins

See Research Recommendation No. 2186.3 of the International Conference of Building Officials.

For more data, circle 140 on inquiry card

# A new specification for package cooling towers: guaranteed performance

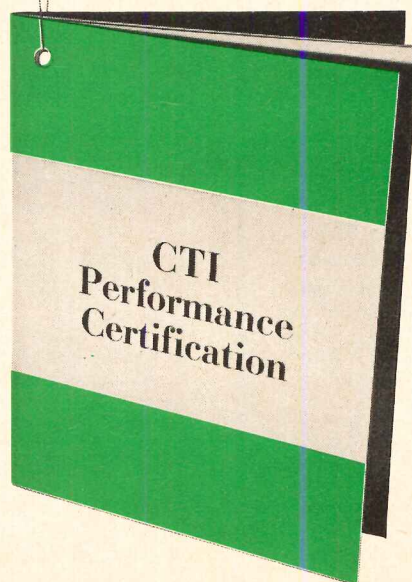


Every Moduflex cooling tower is performance certified by the Cooling Tower Institute (CTI). This means you get all of the capacity you specify and pay for. Your guarantee of full performance is as simple as including the following statement in your next mechanical specification:

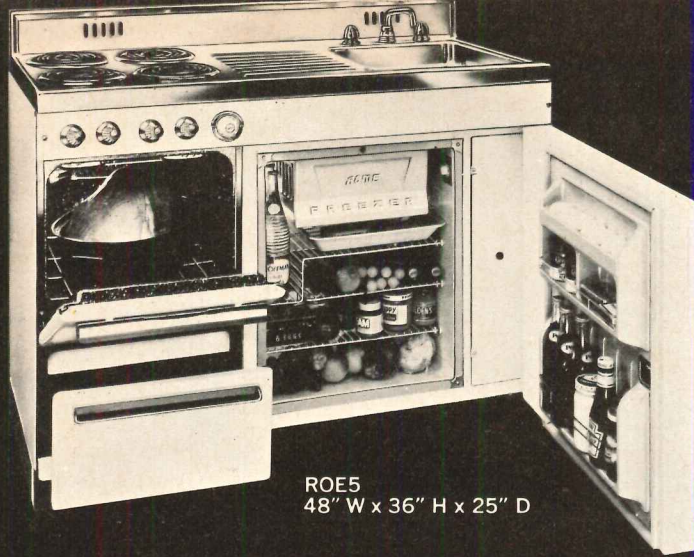
"The cooling tower shall carry a CTI label. It shall be from the line of towers produced by the tower manufacturer which has been certified by the Cooling Tower Institute in accordance with CTI Bulletin STD-201; or the cooling tower shall be field tested in the presence of a CTI test observer after installation in accordance with CTI Bulletin ATP-105. The cost of the acceptance test shall be borne by the manufacturer of the tower. Should the test results indicate a design deficiency, the manufacturer shall make whatever corrections are necessary to produce specified performance at no cost to the owner."

For all the facts on Moduflex cooling towers and what CTI Certification means to you, write Dept. M091

**THE AIR PREHEATER COMPANY, INC.**  
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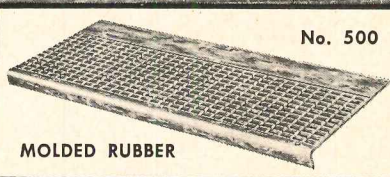
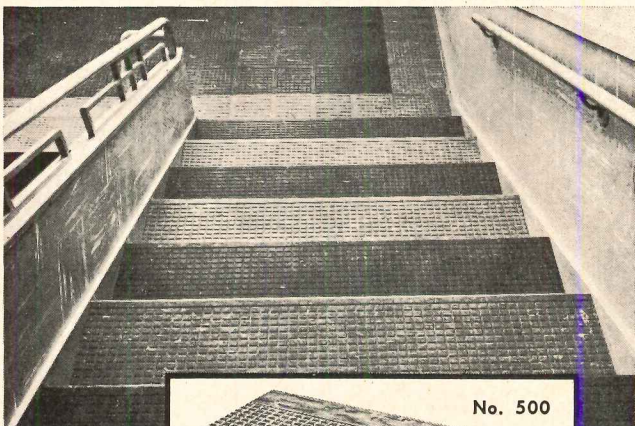
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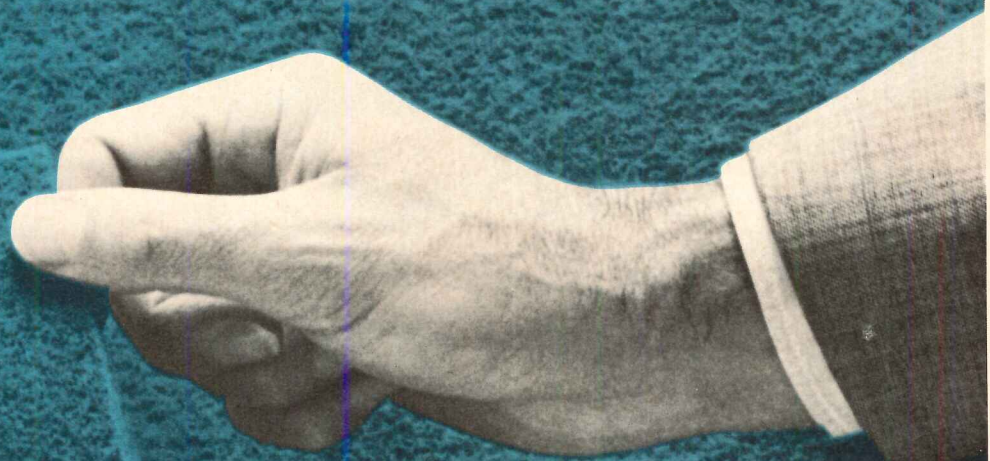
And initial cost is low too. You can cover a 9 x 10 room for under \$50. That's less than most hard floors. And about half the cost of most other carpets.

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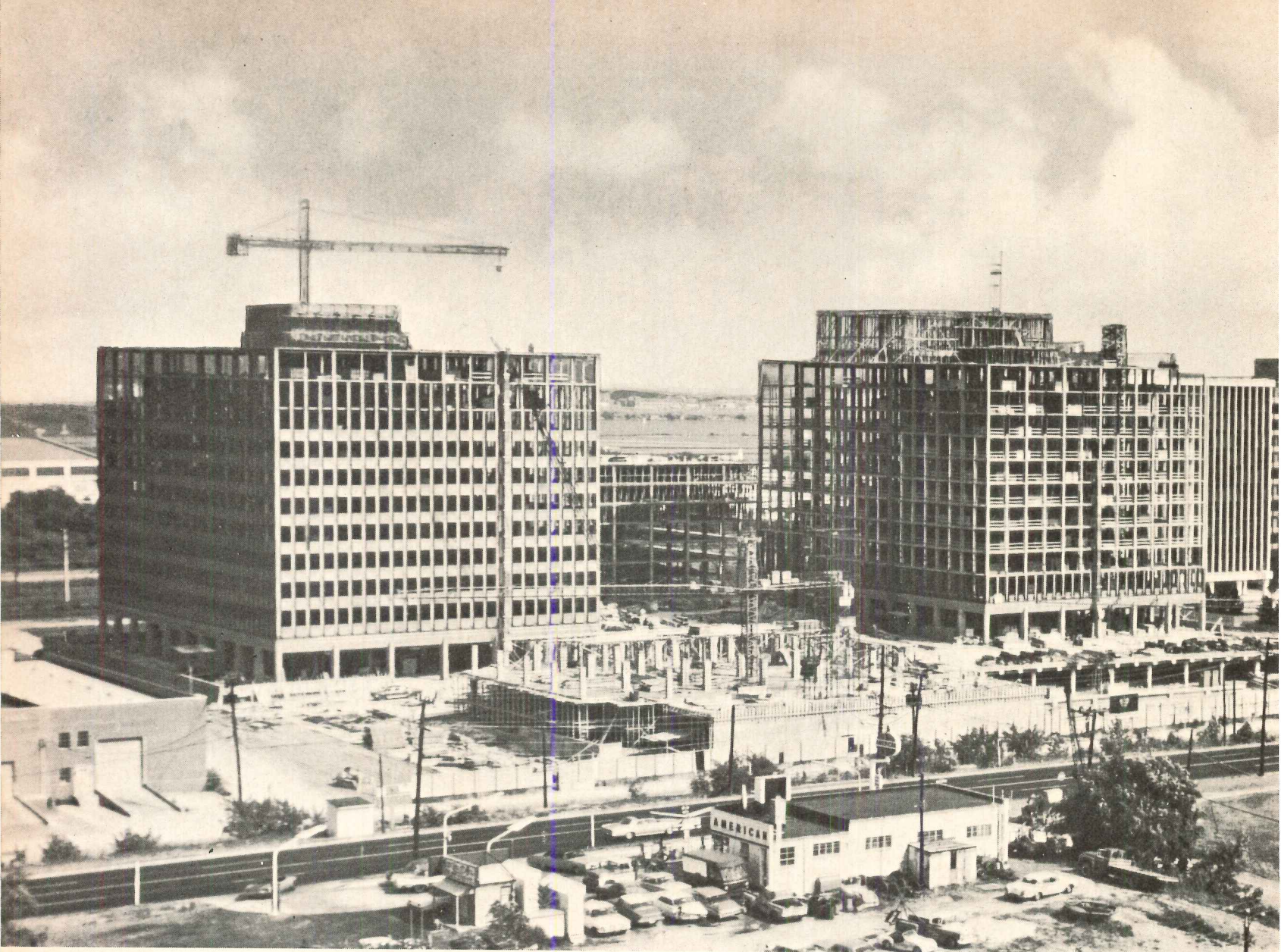
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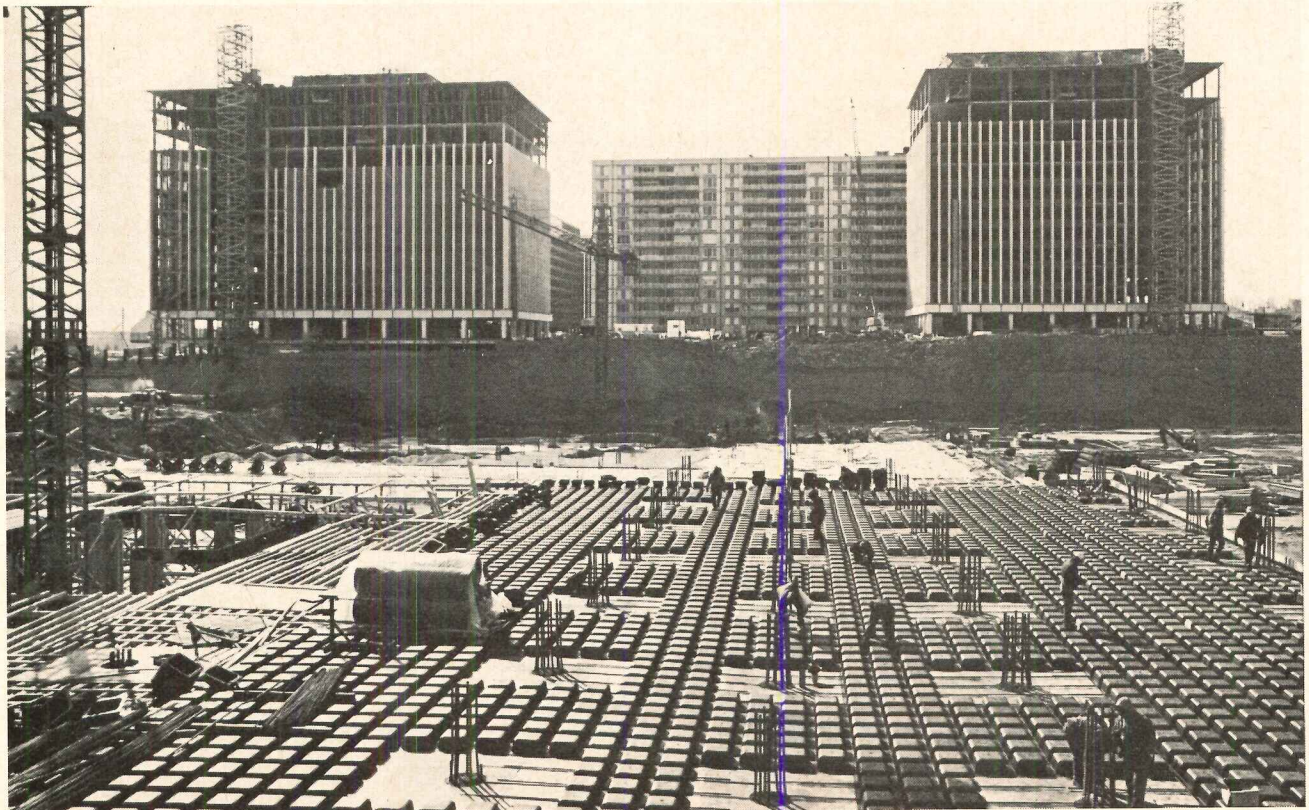
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Foreground—Ceco Steeldomes in position before placement of reinforcing steel and pouring of concrete

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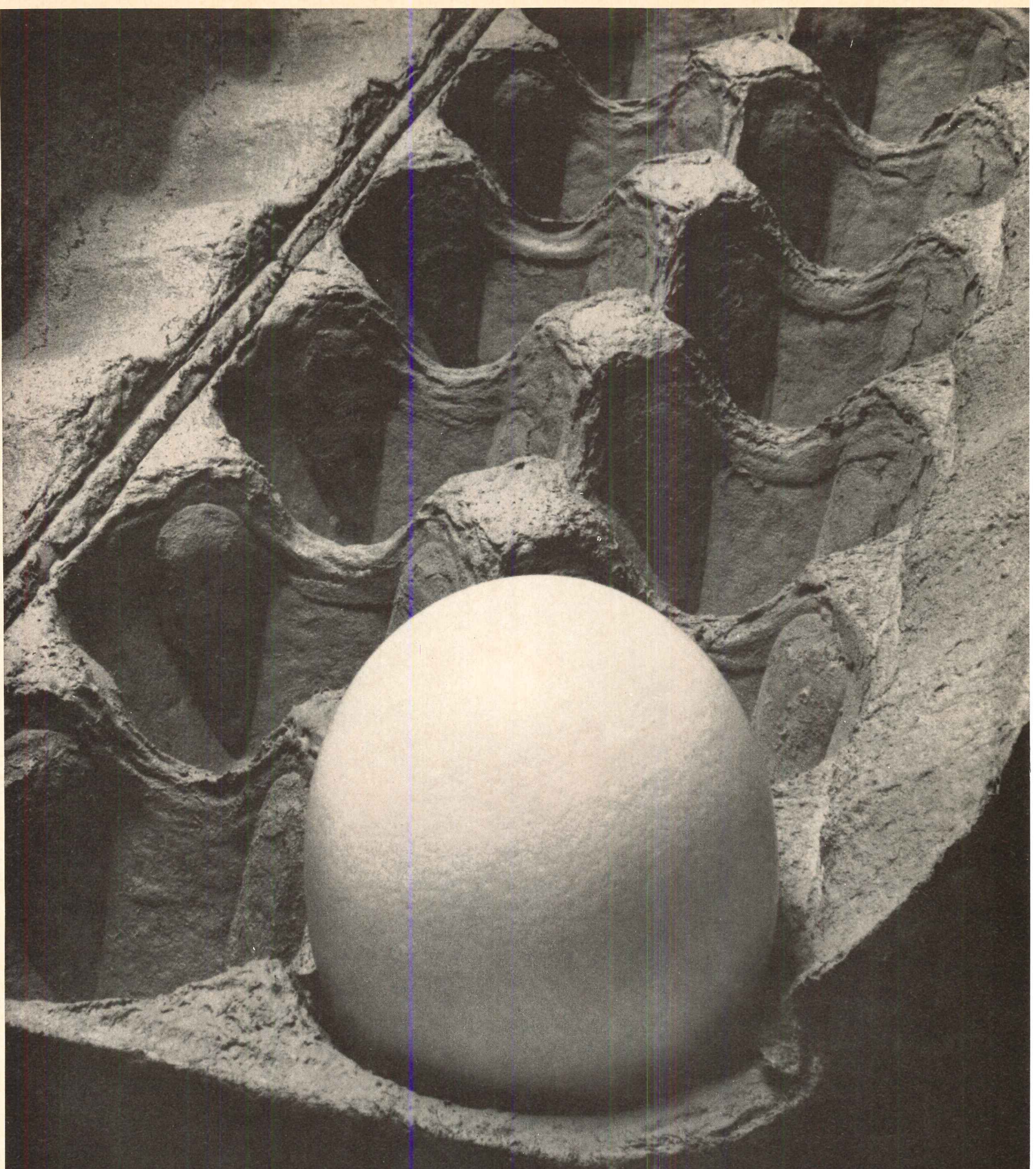
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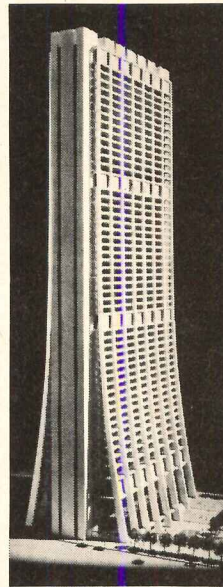
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## Inland Welded Structural Shapes

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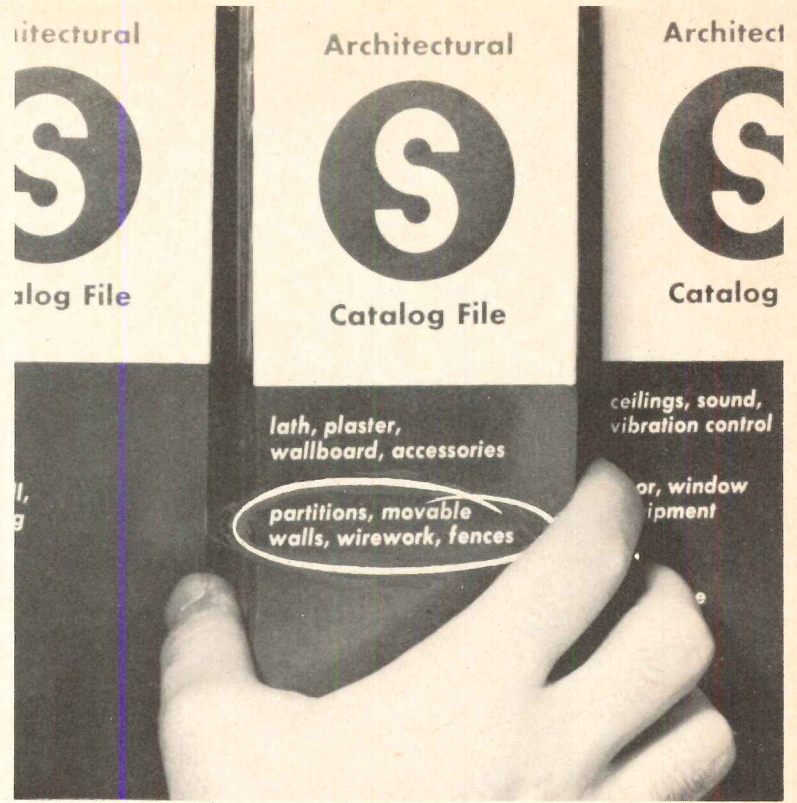
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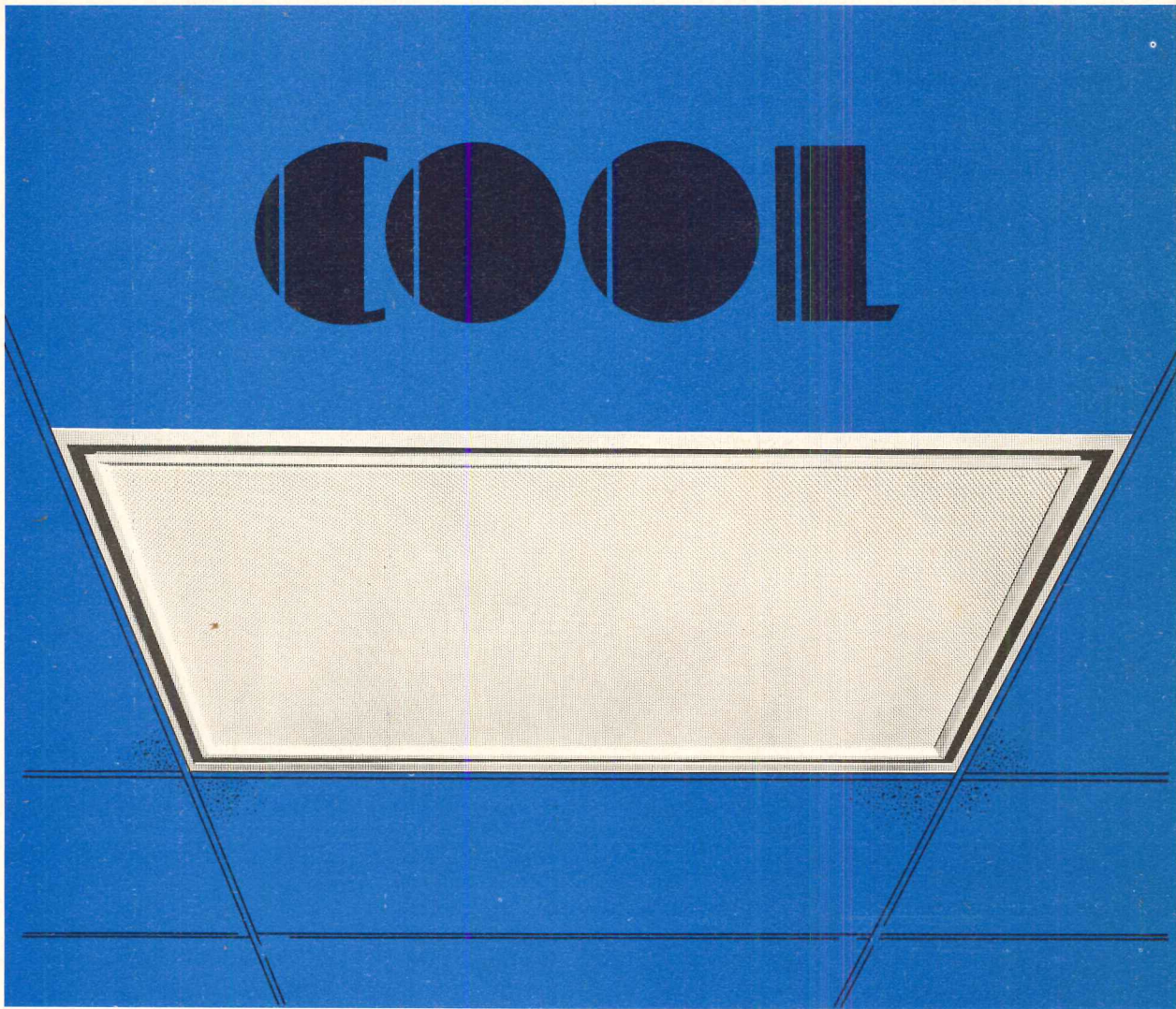
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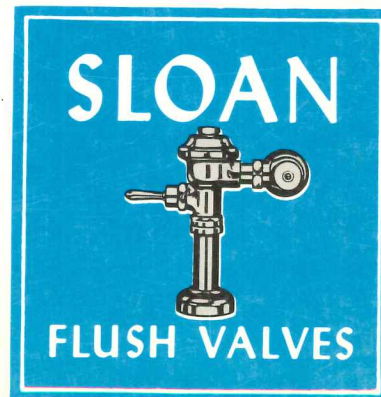


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