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FULL CONTENTS ON PAGES 10 AND 11

# ARCHITECTURAL RECORD

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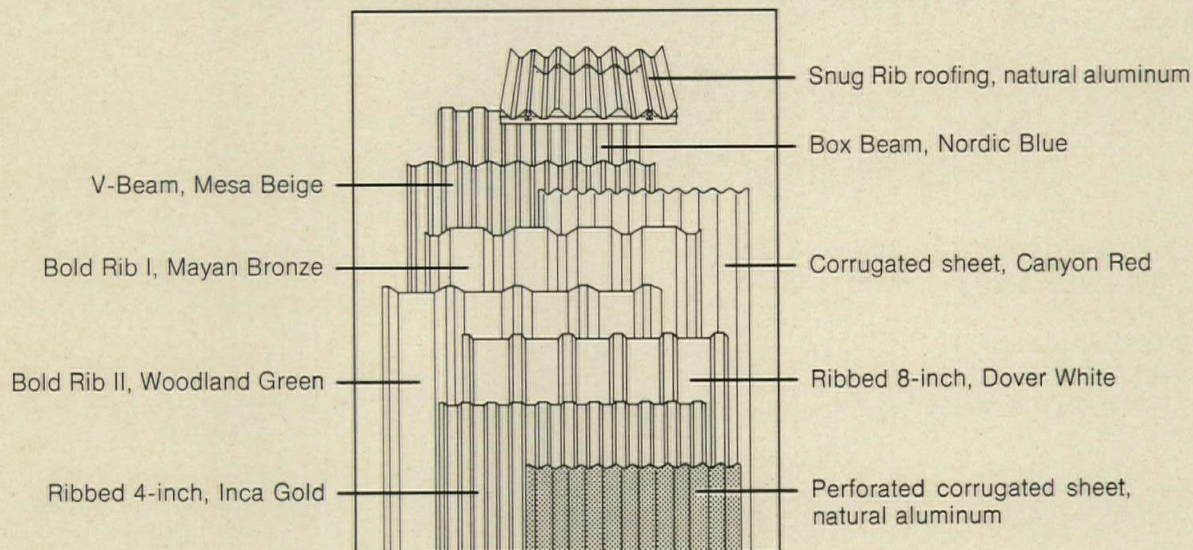
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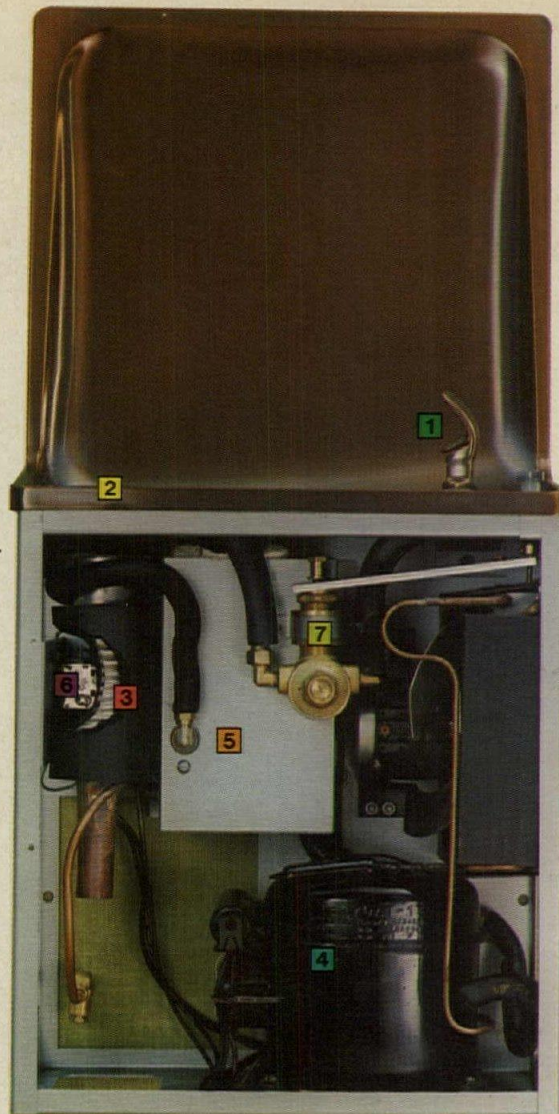
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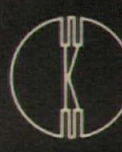


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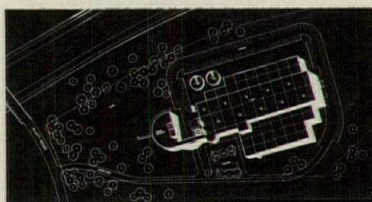
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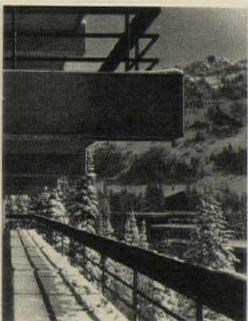
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Patrick King

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**Building Types Study 459: Shopping Centers**

Regional shopping center construction is facing a downturn due to the fuel shortage, the lag in housing starts and other factors. The trend may be toward more downtown shopping malls. Both regional and downtown centers will be discussed from the standpoints of land use, economic and feasibility analysis, zoning and design for retail.

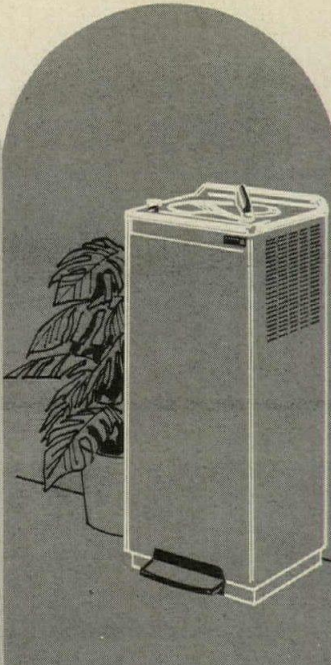
**Park Central**

Park Central is Denver's handsome and significant new office/retail/banking complex and the latest addition of its downtown urban renewal area (Skyline Project). The Muchow Associates with George Hoover in joint design were the architects.





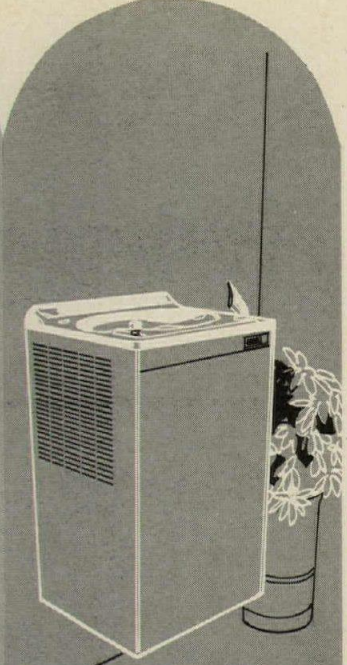
Three models of fully recessed water coolers in 8 to 12 gallon per hour capacities. In satin finish stainless steel or in bronze-tone finish. Model shown EFR-8A.



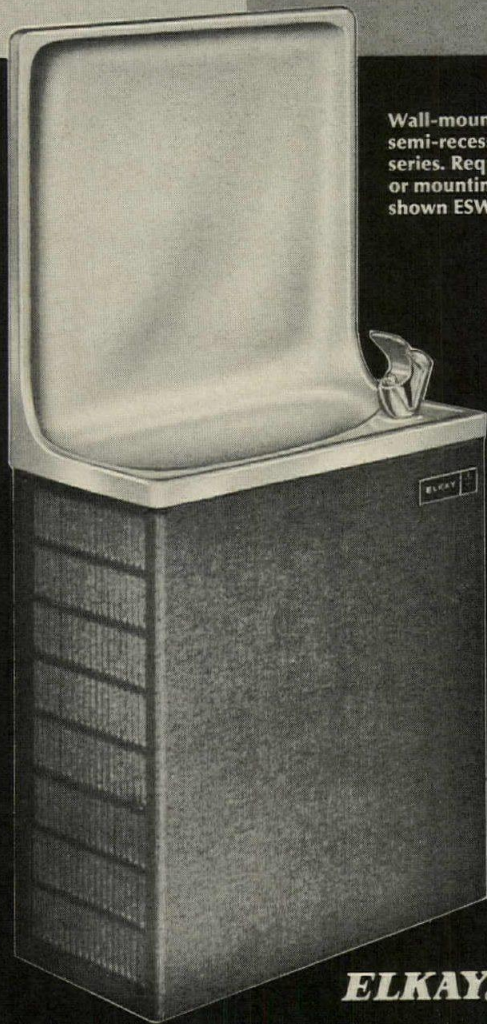
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## National growth policy: the AIA builds a strong new framework for action

Archibald Rogers, the new (since December) president of the American Institute of Architects, is a man with a cause.

Since the formation of the first AIA task force, Arch Rogers has been perhaps the nation's most ardent supporter of AIA (and other) efforts to establish and give teeth to a national policy for urban growth and regrowth—and most especially land-use policy. He now has lots of new help—with a lot of new muscle.

The first report of the AIA's National Policy Task Force, of which Rogers was the chairman, created a massive stir when it was published in January 1972. A detailed analysis of that report—and the reaction to it by the 1972 AIA Convention—was given in *RECORD*, June 1972. Later (in November 1972) a special Ford Foundation-financed conference was held to analyze and criticize the conference. And the Third Report, just issued, attempts to respond to the complaints of some whom felt their ox was gored, expands to meet the legitimate complaints of some whose interests were overlooked (inevitable in an effort this broad), and faces up to disagreement with some other interest groups.

### **New input has tempered some of AIA's original proposals**

As a result of the 1972 "constraints conference," the then-president of the NAHB, Stanley Waranch, suggested that his and other organizations might join in developing the next report.

The AIA wisely (and unselfishly, since they had done a great deal of research and spent a great deal of time and money) did accept input from other organizations, and a Coalition for a National Growth Policy has now been established with active participation, or at official representation, from 39 organizations—ranging from such conservative bodies as the Chamber of Commerce of the United States and NAREB to the activist National Organization of Minority Architects and the National Committee Against Discrimination in Housing; from the Junior League of Washington and the League of Women Voters to the Associated General Contractors. The Coalition now includes mortgage banking interests, engineering bodies (ASCE and NSPE), landscape architects, planners, lawyers, industrial designers, the United States Conference of Mayors, and many other appropriate and concerned groups.

The organizations, working in coalition with AIA, have brought some tempering and

enlargement of the AIA's original ideas—changes that will be greeted by some with relief and dismissed by others as "copping out." For example, there was a large amount of politically conservative objection to the First Report's alleged "over-reliance on an enlarged role for government," and its recommendation of power shifts to regional agencies of authority now exercised by city authorities. Many in the black community, supported by liberal sentiment in AIA and elsewhere, felt the First Report—with its emphasis on the development of new neighborhood "growth units"—gave far too little attention to inner-city and minority problems. Others argued that the First Report unwisely paid little attention to small-town and rural housing opportunities as an alternate to increased loading (overloading?) of cities. Many felt that the First Report's assumption of continued population growth was a basic flaw—though it is now clear that even with zero population growth there will have been a substantial population increase by the year 2000.

Some of these concerns have been met—or at least are well understood by all.

### **But some of the most important proposals of the Task Force Report are still under fire**

As the AIA's new report points out: "The principal disagreement appears to center upon the desirability and feasibility of imposing a national policy—any policy—upon our pluralistic society. Additional disagreements focus upon these five proposals for inclusion in such a policy:

"(a) the deliberate evolution of the Highway Trust Fund into a Community Development Fund;

"(b) the recapture of that increment in the value of private property created by the public investment in the infrastructure [perhaps the hardest of all for many people—like home builders and land speculators to accept.—*Ed.*];

"(c) the oversight by the states of police powers (such as zoning and subdivision regulation) now delegated to local governments;

"(d) the establishment of metropolitan planning and development agencies with 'teeth.'

"(e) the public acquisition of land for short-term conversion through private development [a common device in Europe.—*Ed.*] or for banking over the long term."

Controversial as they may be to some members of the new Coalition, the AIA has said that "these proposals stem from the First



Report's 15 premises, which together form the philosophic cement for its recommended policy"—and are therefore, at least for now, non-negotiable.

And hooray for that stand! For if the AIA, now that it has agreed to share its initiatives, gives in to pressure on matters it believes to be fundamental, surely this effort will be so compromised as to be useless—or like the Jackson land-use bill in Congress—sound good but be absolutely toothless.

### The Third Report restates the philosophical base—and argues its acceptance

It recommends nine strategic elements as the framework for a national regrowth policy. All are easier stated than accomplished—but none should find disagreement among most architects for they go right to the heart of design and construction problems. They won't (probably can't) all be implemented—either physically or politically—but surely they are steps in the right direction. Wildly oversimplified (the complete report deserves careful study by every architect), the nine strategies are:

1) A population distribution strategy designed to:

... "foster resettlement within cities in ways which will relieve the pressure on ghetto concentrations of the poor and/or minorities, and attract tax-paying middle-income families back into the city;

... "enhance the economic and cultural opportunities of smaller cities and towns, as well as rural areas, in order to enlarge available locational options"; and

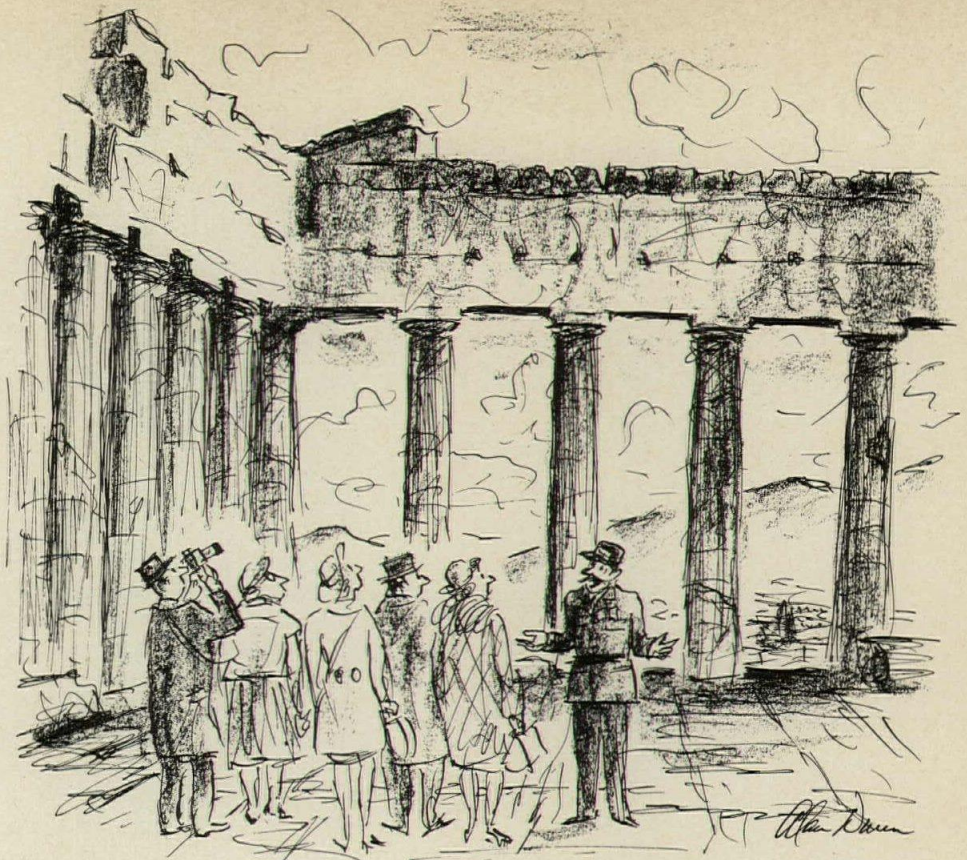
... "encourage the distribution of economic and employment magnets in ways that will reinforce these settlement patterns."

2) A conservation strategy would be designed to identify and protect unique natural and man-made features, clean up our air and water, protect irreplaceable raw materials by finding alternates and by recycling, conserve the land through "a more rational system of design and development," reduce energy consumption through tough incentives and disincentives while expanding the supply of energy resources.

3) A transportation strategy designed to provide a balanced system by "encouragement of alternatives to the automobile."

4) A land-use strategy designed "to establish use and intensity criteria for the accommodation of new and renewed neighborhoods . . . and supporting facilities"; to provide enough agricultural land; to encourage the thoughtful establishment of open space within and around urban areas and to "describe" the form of neighborhoods, towns, and cities; to provide near-at-hand recreation; and—most importantly—"to provide for the assembly, maintenance, and evaluation of all data required to accomplish land-use planning . . . and the dissemination of these data to those charged with such planning and implementation, i.e. multi-state regions, states, metropolitan areas, and local governments of sufficient size."

5) A community design and development strategy designed "to discourage the subdivision of land for housing alone, . . . encourage the development of Growth Units as well as



"If you want my opinion, Phidias, Ictinus and Callicrates kicked back ten percent to Pericles and they got the job."

remodeling of existing neighborhoods to meet Growth Unit Criteria, . . . and encourage, for both, a location and design"—and how important this is—"that provides the fullest possible range of housing costs and types . . . shopping, employment and recreation wherever possible within walking distance of homes; and . . . incorporate as systems such essential services as health care, education, and security. . ."

6) A housing strategy would be designed, according to the AIA report, to provide incentives for relatively low-cost housing, both new and renewed, "in adequate quality and quantity to satisfy the needs of low-income families . . . , recognizing that it must be not only within the economic reach of these users but also geographically accessible." The report, significantly, also insists that "incentives [be applied] toward the goal of reducing the cost of all elements that make up the annual housing dollar—[not just] construction cost [but] the cost of time in gaining public consents; the cost of land, money, services, operation, and components replacement."

7) The next strategy called for is an "urban rebuilding strategy," which AIA suggests should be designed to rebuild the city fabric, with new and enlarged functions for the CBD to assure its 24-hour use; new attention to commuting problems; and rebuilding of ghetto neighborhoods to minimize forced relocation.

8) A fiscal strategy, the AIA argues, should encourage public investments in ways that reinforce the other strategies, with (again) "recapture by the public of a substantial portion of increments in the value of private property created by this public investment". This fiscal strategy would also seek new sources of steady mortgage money, especially the "patient money" needed to cover the heavy front-end costs of the major building projects envi-

sioned. The strategy also recognizes that the present tax and financing systems do not necessarily reward most those who subscribe to the other strategies—and would attempt to change that. Finally. . .

9) "A strategy for governance" would be designed "to identify the roles of the various levels of government in implementing these strategies" and "equip all levels of government with powers appropriate to their roles"—including specifically much more control over land use and the power to acquire land by purchase or—under appropriate safeguards—condemnation.

### The Task Force proposals are, of course, strong medicine—but implementation begins

The AIA's 1974 program—under Arch Rogers stewardship—will lean heavily in the direction of implementing these policies and strategies developed over the past three years.

Any architect can agree or disagree with this thrust—but I'd urge no architect to be disinterested. The "Structure for a National Growth Policy"—which should be in your office by now—is to my mind must reading. If you can help, with thoughts, or time, I'd urge you to volunteer that help to Washington.

For it seems to me that there is no more appropriate force to develop and plan for the growth and regrowth of this country than the architects assembled—and the other professionals they have gathered about them in the Coalition for a National Growth Policy. Political efforts have so far been blunted hopelessly by compromise. And without a policy—broadly accepted and respected—our country will continue to grow without direction, without hope of correction of terrible ills, and with little hope of the kind of real excellence we all want for our future. —Walter F. Wagner Jr.



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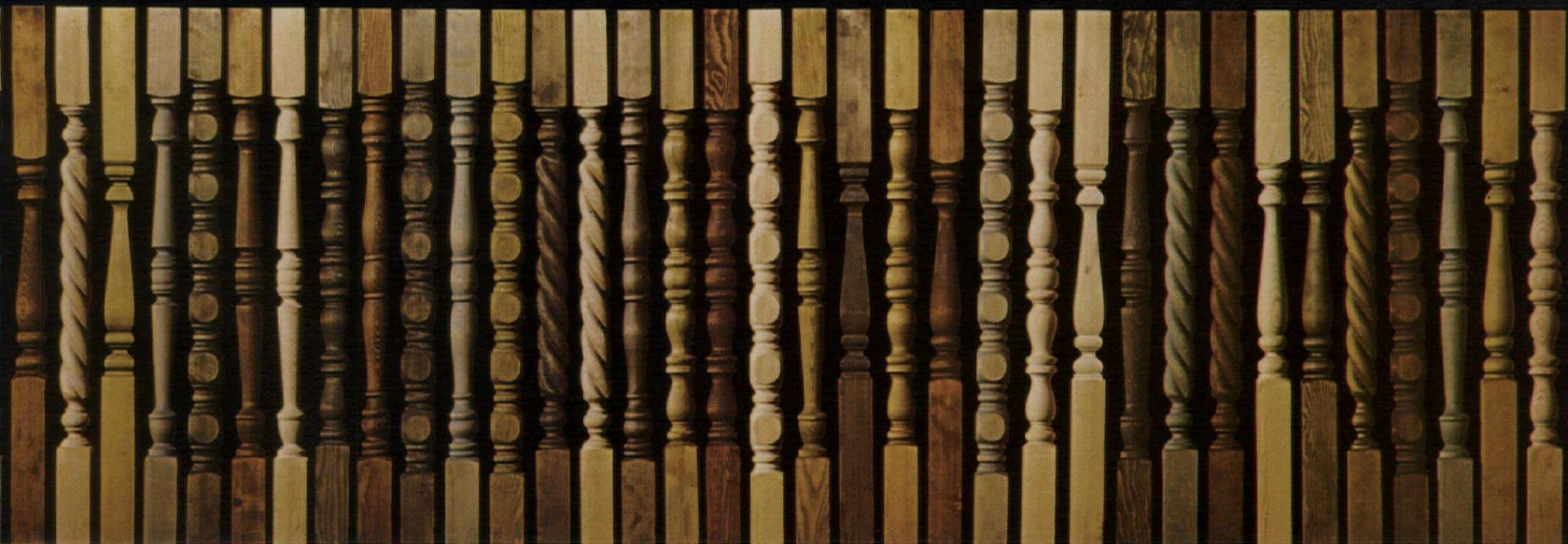
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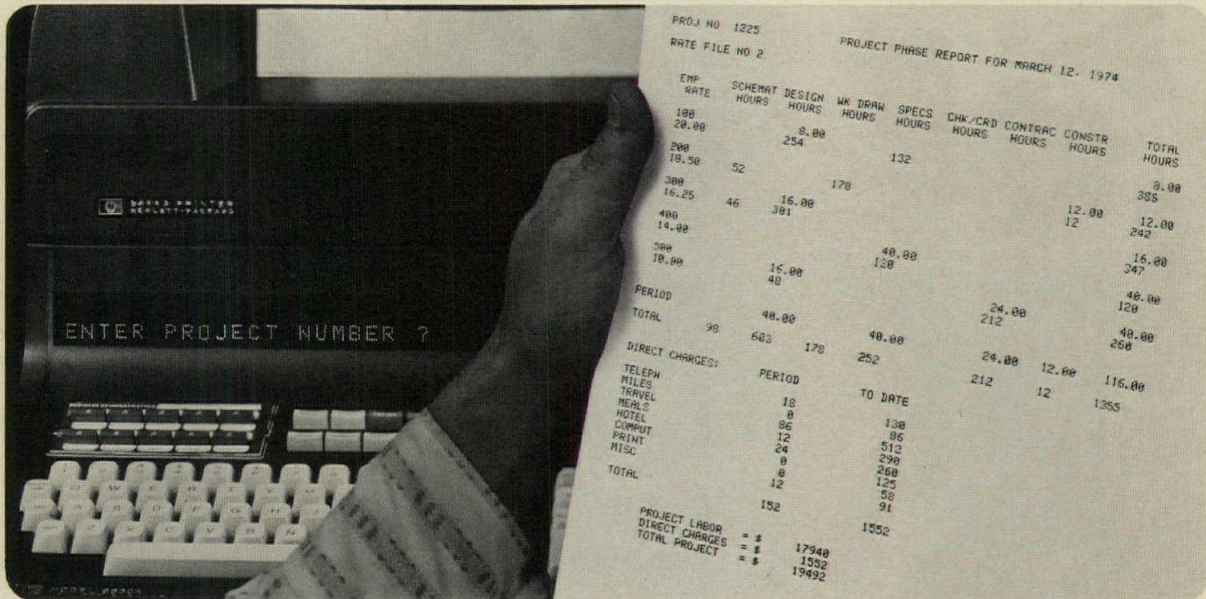
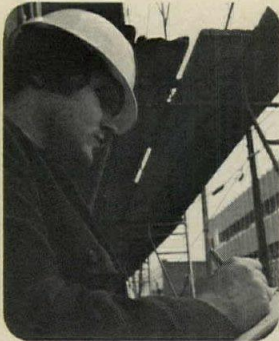
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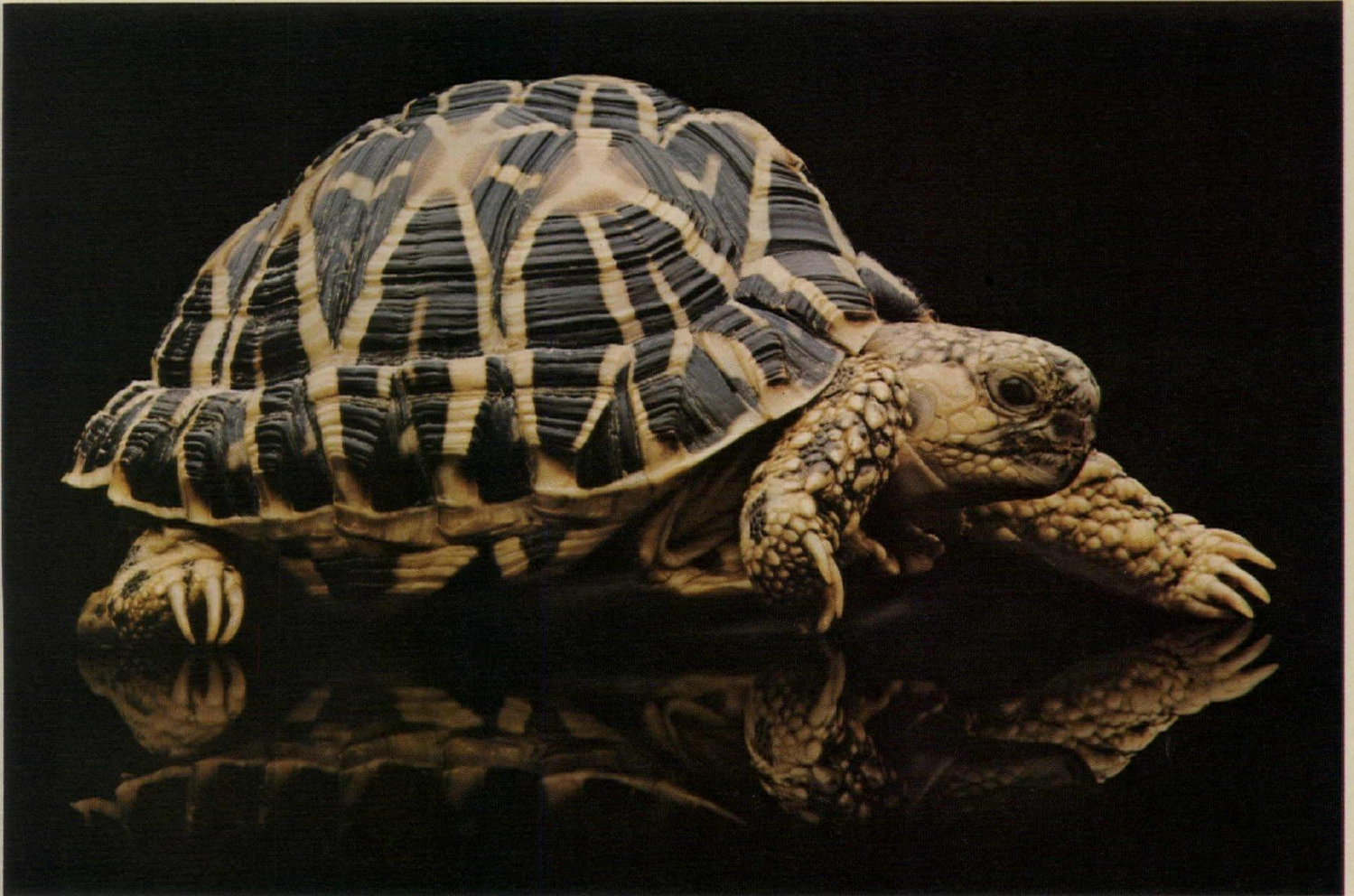
AR 3-74

For more data, circle 23 on inquiry card for information

For more data, circle 24 on inquiry card for demonstration



# The only organic roof that might outlast the Owens-Corning all-Fiberglas roofing system.



Conventional asphalt roofing systems have organic felts. So moisture and heat can cause them to curl, wrinkle, fishmouth, char and rot. And that can lead to an early failure.

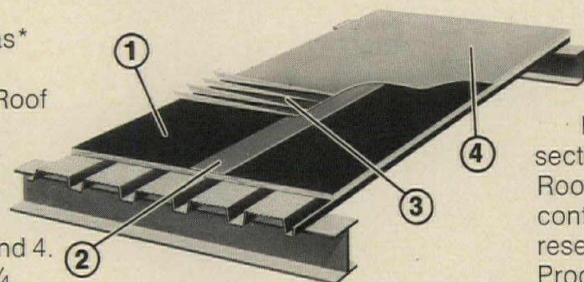
Not so with our all-Fiberglas\* roofing system. Here's why.

**1.** It begins with Fiberglas Roof Insulation. This has a bottom surface that conforms to minor roof irregularities. And a top surface that stays flat. (FM Class 1 construction. UL 1, 2, and 4. Thickness from 15/16ths to 2¼ inches. C-value certification.)

**2.** Fiberglas Roof Tape then provides reinforcement at the roof

insulation joints and helps reduce failures caused by normal deck movement.

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



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

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

**4.** Fiberglas PermaCap (where available) tops everything off. It's surfaced with inert, non-combustible ceramic granules that help beautify the roof.

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

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

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**This page:**

*Left:* Residence  
Arch.: Robert O. Holm

**Opposite page:**

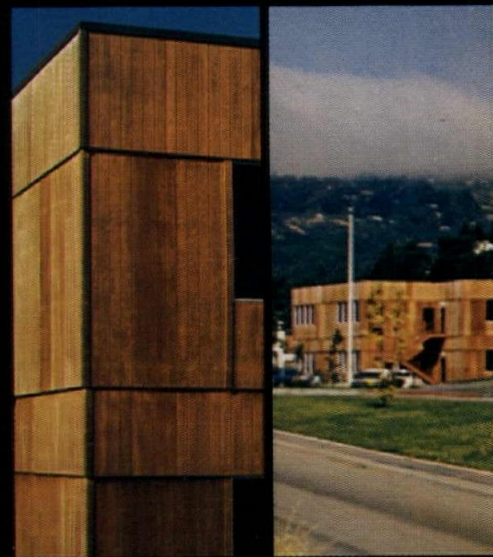
*Upper left:* Medical Clinic, Bakersfield, Ca.  
Archs.: Badgley & Brady

*Top right:* Tahoe Tavern, Tahoe City, Ca.  
Archs.: Bull, Field, Volkman,  
Stockwell

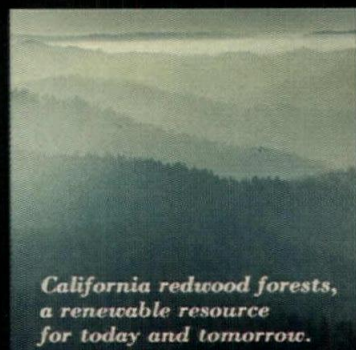
*Middle right:* Auditorium, Normandale State  
Junior College, Bloomington,  
Minnesota  
Archs.: Community Planning  
& Design Assoc., Inc.

*Below:* Middle School, Mill Valley, Ca.  
Archs.: Wong & Brocchini  
& Associates

Note slip-shingle overlap  
application in detail below left.



**Redwood Plywood.**  
Not just because it's beautiful.  
Because it works.



*California redwood forests,  
a renewable resource  
for today and tomorrow.*





Rich, natural beauty is obviously the primary reason for building with redwood plywood. Wherever it is used — commercially or residentially, indoors or out — it brings a warm visual appeal not only to the structure itself, but to the environment in which it is set.

But beyond aesthetic values, redwood plywood offers many practical advantages and economies to the architect and builder. For example, it is naturally resistant to weathering, and has a high capacity for taking and holding all kinds of finishes.

Redwood plywood, in  $\frac{5}{8}$ " thickness, has earned a low flame-spread rating that qualifies it for all Class II uses in the Uniform Building Code.

Redwood plywood has an unusually high strength-to-weight

ratio. It can be applied directly to studs, without diagonal bracing or building paper. It is available not only in standard 4 x 8 panels, but in 4 x 9 and 4 x 10 sizes, for greater flexibility in modular planning and installation.

Redwood plywood, like other forest products, affords high insulation value, an important factor in conserving heat and energy.

And redwood plywood offers a variety of design patterns — plain, grooved and inverted batten — with saw-textured facings that combine high surface interest and low maintenance.

Many of the patterns can be seen in the accompanying photographs, which illustrate redwood plywood in a wide range of uses. For additional information on redwood plywood, write Dept. P for a new 8-page color booklet.



# Ideas to build on.

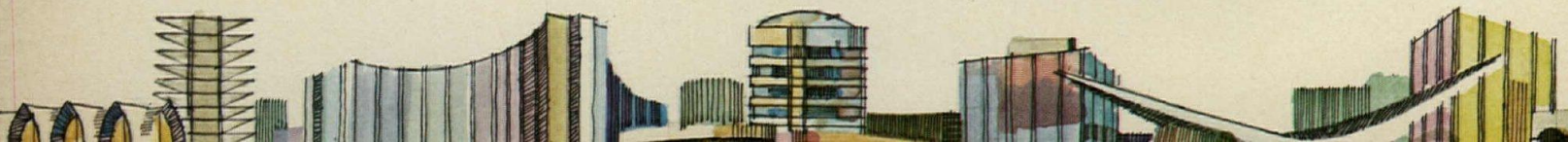
## A better way to frame.

Design with Inryco/Milcor® Light Gage Steel Framing. Because of their proven economies, steel studs and joists have been used extensively in framing commercial and light industrial structures for many years. Now they are making significant inroads in motel, hotel, condominium and other residential applications. Formed from high strength steel, they're lightweight; will not rot, warp or twist; do not appeal to termites. Their selection is often decided by the substantial insurance savings the owner gains through their "non-combustible" rating.

*For more data, circle 16 on inquiry card*



**Ideas from Inryco help you design**







## Efficient firefighters.

When fire strikes, Inryco/Milcor Heat & Smoke Vents open automatically to release heat, smoke and noxious gas. Prompt venting retards the fire's spread, aids the safe evacuation of occupants, helps firemen locate and subdue the blaze. Made in Low Profile or Sloped Cover styles; galvanized steel or aluminum. Sizes from 4' x 4' thru 4' x 8' are Underwriters' Laboratories listed and Factory Mutual approved. Special sizes on request. They're part of our broad line of roof hatches, skylights and floor and sidewalk doors.

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## A wall for all reasons.

Inryco® wall panels give you the design freedom you want. With a choice of profiles that offer a variety of shadow patterns. Non-fading, long-life Duofinish™ colors factory-applied over galvanized steel. Or in attractive Cor-Ten® weathering steel, if you wish. Where noise control is a factor, Acoustiwall™ interior surfaces substantially reduce reverberation. In buildings requiring tall interior walls, Inryco long span systems eliminate the clutter of exposed structurals.

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On Inryco wall panels.  On Inryco/Milcor light gage steel framing.  On Inryco/Milcor heat and smoke vents.

Name \_\_\_\_\_

Title \_\_\_\_\_

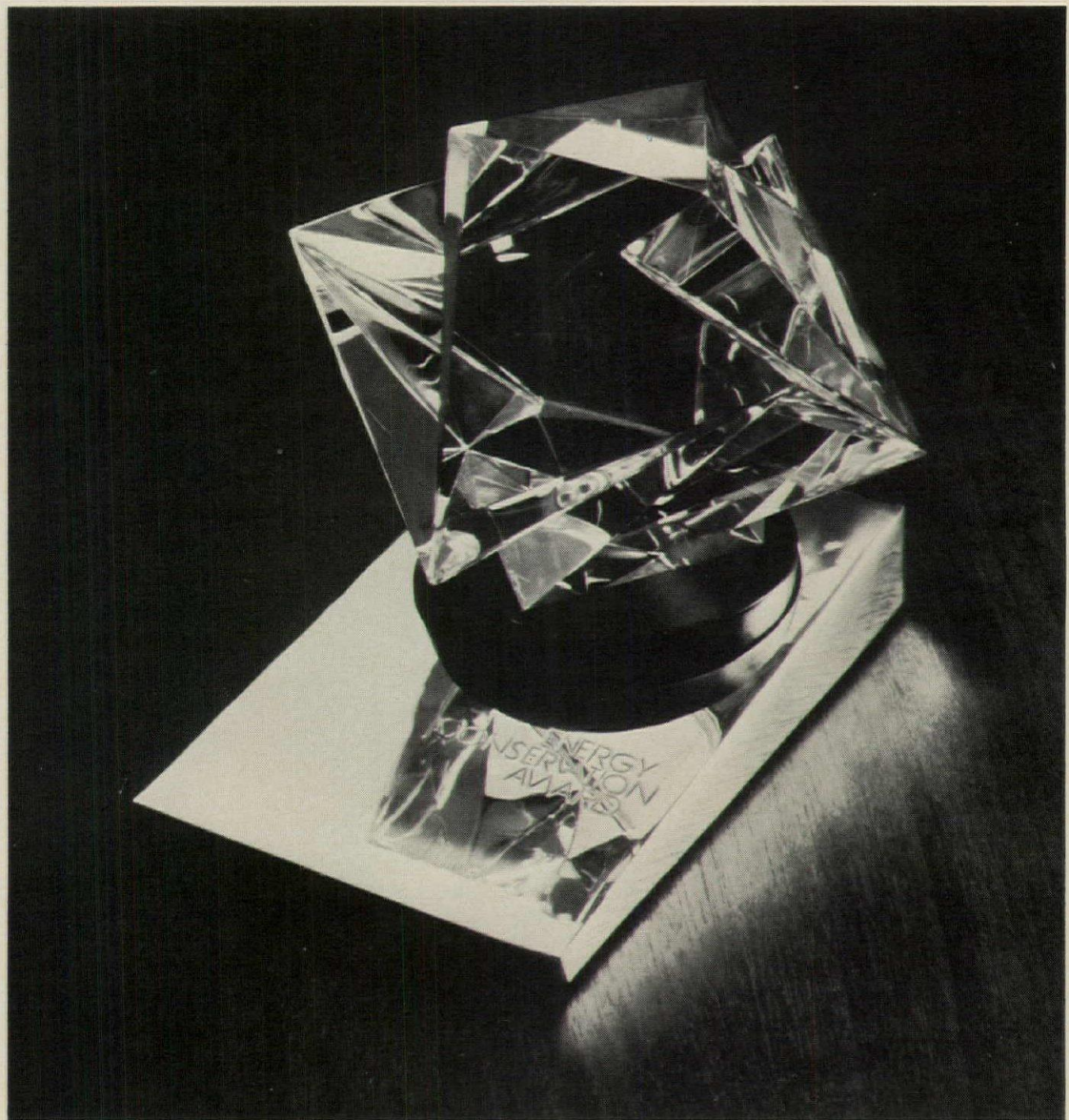
Company \_\_\_\_\_

Address \_\_\_\_\_

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



**Owens-Corning announces  
its third annual  
Energy Conservation Awards Program  
for architects and engineers**



The Owens-Corning 1974 Energy Conservation Award.  
"Triangles," a Steuben Crystal sculpture that captures and refracts light from multiple triangular planes.



## **This year, the whole world is watching.**

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

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

Too many buildings waste fuel and contribute to environmental pollution.

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

### **Who can enter**

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

Although Fiberglas\* products are an excellent way to conserve energy, their use is not a requirement.

### **Four entry categories**

A winner will be selected in each of these categories:

Institutional—schools and hospitals, for example.

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

Industrial — including manufacturing plants, research centers, warehouses.

Governmental—post offices, administrative buildings, and military structures to name a few.

### **The Awards**

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

### **The Awards Jury for 1974**

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

H. Fred Campbell, H. F. Campbell Company, Detroit, Mich.; Walter H. Costa, Skidmore Owings & Merrill, San Francisco, Calif.; Sital Daryanani, Syska & Hennessy Inc., Engineers, N.Y., N.Y.; Dr. Donald P. Greenberg, Prof., Cornell Univ., Ithaca, N.Y.; George T. Heery, Heery & Heery, Atlanta, Ga.; Philip J. Meathe, Smith Hinchman & Grylls, Detroit, Mich.; Richard L. Mullin, Symes Maini & McKee, Cambridge, Mass.; Thomas A. Stokes, Cary B. Gamble & Associates, Inc., New Orleans, La.

### **Send for entry details now**

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

For a brochure giving complete details, contact your local Owens-Corning representative. Or write N. E. Meeks, Owens-Corning Fiberglas Corporation, Architectural Products Division, Fiberglas Tower, Toledo, Ohio 43659.

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

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# E CUBE: A COMPUTER PROGRAM TO HELP YOU MAKE MONEY-SAVING, ENERGY-SAVING DECISIONS.

## A THREE-PART LIFE CYCLE ANALYSIS—

### 1. ENERGY REQUIREMENTS.

E CUBE computes the hour-by-hour energy requirements of your building or planned building for an entire year—taking into account U. S. weather data, solar loads, building design, operating and occupancy schedules, and other operating factors. It sums them coincidentally—for single or multiple zones, even multi-building projects. And there's an easy manual check for every calculation.

### 2. EQUIPMENT SELECTION.

E CUBE lets you build, on the computer, a model of an energy system. Lets you "operate" that system so you can evaluate its performance. E CUBE can simulate many systems for you to compare—from all-electric to total energy, or any combination along the way—so you can choose the one that works best for you.

### 3. ECONOMIC COMPARISON.

E CUBE compares the total operating and capital costs of each system you study—takes project life and equipment life into account, provides for irregular and replacement expenses, and ranks the systems comparatively for life cycle costs.

**E CUBE is accurate.** There are other computer programs in this field, but E CUBE is by far the most advanced and has the experience of thousands of runs made by the American Gas Association member companies, industry, and people in private practice. The U. S. government is among the many successful users of E CUBE.

**E CUBE is fast, private, moderately priced.** When we say it's private, we mean you give your information directly to the computer. Your project data and the results are never seen by any third party. E CUBE is available to you through the Cybernet® System of Control

Data Corporation, with installations in 44 major cities. Of course, we stand ready to provide assistance at your request.

**An energy saver for new buildings and existing ones.** Whether you're in the construction-planning stage, remodeling, upgrading and replacing old equipment, or simply want to check your building's efficiency, E CUBE can help you make the right decision. Right financially and right for conserving America's energy.

**Helps you prepare many required reports.** Here's another reason you'll find the impartial, statistically calculated results of E CUBE a tremendous help. It provides information for environmental impact statements, cash flow projections required by senior lenders, and is useful in profit planning.

For further information, mail in the coupon below or telephone Ken Cuccinelli, American Gas Association, (703) 524-2000.

Kenneth T. Cuccinelli  
Manager, Gate/Energy Systems  
American Gas Association  
1515 Wilson Boulevard  
Arlington, VA 22209



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**ENERGY CONSERVATION  
UTILIZING BETTER ENGINEERING.**

**AGA** American Gas Association

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# montgomery's new SSC-6010 ... solution to the elevator energy crisis ... the only fully developed energy saving elevator power control system in North America

The Montgomery SSC-6010 Solid State Elevator Control System saves power consumption up to 15% per elevator. This advanced elevator system provides greater reliability. Requires substantially less maintenance. Saves valuable space. Produces less heat. Reduces installation time. Conserves energy.

This solid state system, an industry first, is an example of Montgomery's Total Capability in design, manufacturing, installation and maintenance of elevator, escalator, Power Walk and Power Ramp Systems throughout North America.

Contact your nearest Montgomery office. You'll find we're not very far from anywhere in North America.

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Outside, one of 11 colors to choose from in our low maintenance, acrylic coated aluminum finish.

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



(a)

Inside, the familiar warmth and beauty of a wood window in a child's world.

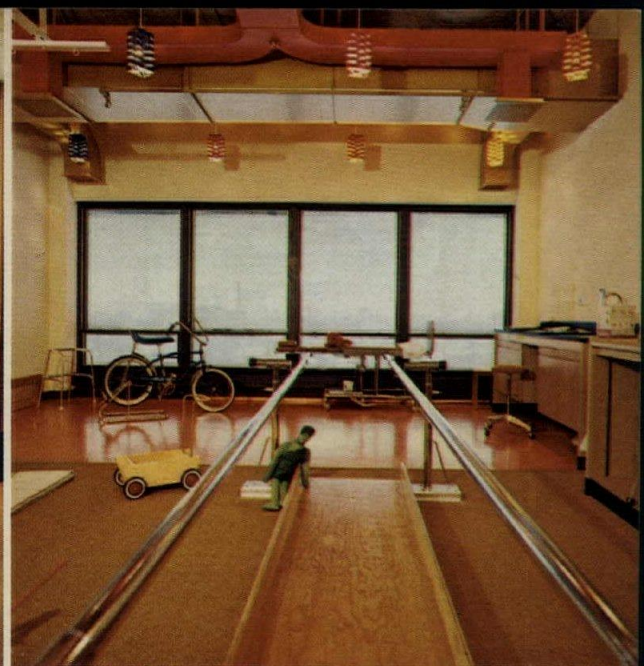
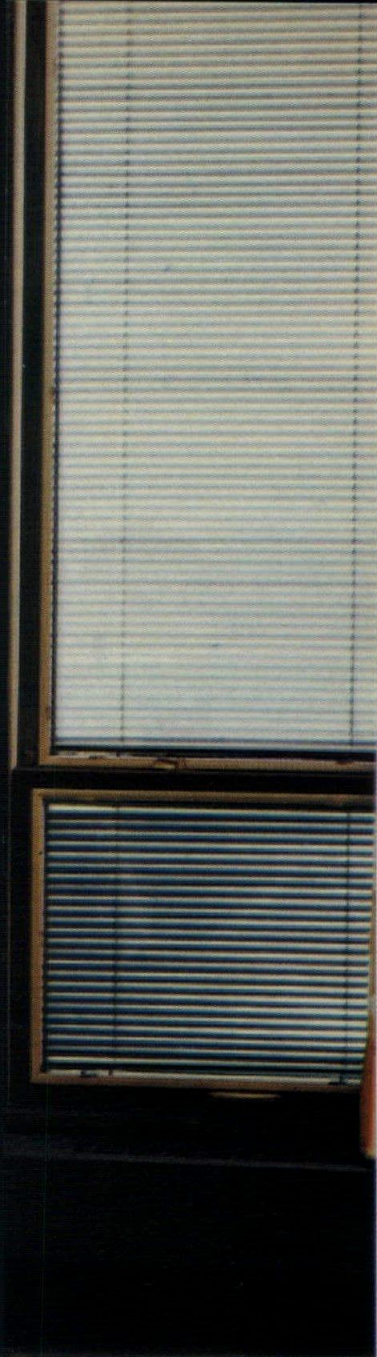
Wood windows are known for their warmth. Visually. And because of their natural insulating value. And in designing the Pella Clad Wood Window, we left both of those properties unchanged. The exterior aluminum skin does not penetrate the frame or sash (b). Nor is it visible anywhere on the inside of the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



(b)

**At the Children's Health Center and Hospital, this Pella Clad window system contributes to the relaxed atmosphere, inside and out.**





Architect: Ellerbe Architects - Engineers - Planners Builder: Bor-Son Construction Inc. Windows: Pella Clad Fixed Units and Contemporary Double-Hung

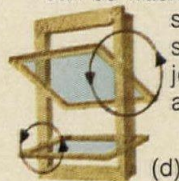
**In between, the built-in advantages of Pella's unique Slimshade®.**

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

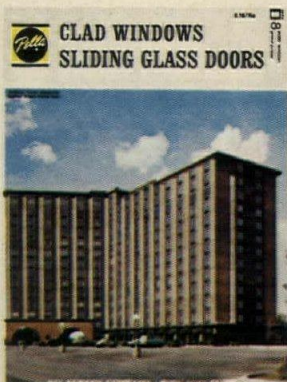


**Afterward, the ease of washing a counterbalanced, pivoting sash double-hung window.**

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



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



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

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Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_  
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Mail to: Pella Windows & Doors, Dept. T31C 100 Main St., Pella, Iowa 50219. Also Available Throughout Canada

**This coupon answered within 24 hours.**

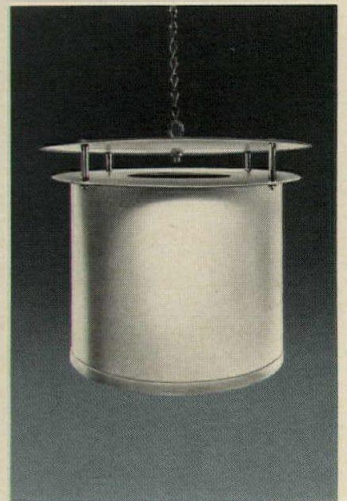


# This beach has the 3 essentials Owens-Corning has the system

1. Acoustically non-reflective "ceiling"



1. An acoustically non-reflective ceiling is a *must*—to keep sound from bouncing to other areas. An independent acoustical testing laboratory examined eight ceilings, including expensive coffered and baffled systems. Their verdict: Owens-Corning's Nubby II Fiberglas\* Ceiling Board (left) in any standard exposed grid suspension system is *best* for achieving speech privacy at economical installed cost.



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



# for speech privacy in open offices. that puts it all indoors.



2. Masking sound

3. Sound barrier "screen"

2. An unobjectionable background sound helps mask distracting speech. Special electronic speakers, installed in the plenum, make it possible to hear normal conversation clearly within defined areas, without being overheard in other areas.



3. A barrier or the proper acoustical *screen* is necessary to keep unwanted speech from going *directly* between work areas.

All three essential elements should be "tuned" to work together with the help of an acoustical consultant.

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

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# Think of your building as a system. We do.

Johnson's integrated building automation concept combines air conditioning, heating, security, firesafety, electrical equipment, communications, control centers — and more, including completely computerized operation. All interfaced to work together smoothly. Efficiently.

Starting with planning, our responsibility extends to expert installation. Checkout. System start-up. Emergency service. And

comprehensive programmed maintenance. Always with emphasis on energy conservation and progressive management techniques.

With almost 90 years in the business, Johnson has the experience and the technology to meet all your building automation needs. And tie them all together. Find out more. Write today for our free brochure, "The Big Idea in Building Automation."



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**President's budget message: increases for waste treatment and community development.** Hospital construction would be terminated, but funds are proposed for historic preservation and new construction in national parks. Details on page 35.

**Architecture in sympathy with users and the natural setting will be examined at the 1974 AIA convention,** May 20-23 in Washington, D.C. In addition to discussion pertinent to the theme, "A Humane Architecture," convention activities will, according to AIA, include a range of tours emphasizing the variety of architectural environments and life-styles in the Washington-Baltimore area. A brief story on the convention appears on page 34.

**Construction may increase in 1974 by 7.4 per cent to approximately \$144 billion,** according to the Associated General Contractors of America. The estimate is based on adequate fuel and materials supplies. However, AGC figures compare with a 2 per cent increase, or \$101 billion, predicted by economists at McGraw-Hill Information Systems Company.

**Fuel allocations for future construction will be assured, according to the Federal Energy Office.** FEO administrator William E. Simon, meeting with construction industry representatives, said that in formulating allocation regulations, his agency has included construction in the "industrial" category, and allocations have been set at 110 per cent of the base-period volume.

**December construction contracts slipped 5 per cent below the level of a year earlier, to \$6,132,566,000** according to the F. W. Dodge Division of McGraw-Hill Information Systems Company. Despite this, last year's total contract value reached a record \$100.1 billion for new construction work of all kinds, up 10 per cent from 1972. Part of the December drop was attributed to the decline in housing starts.

**March 21, 1974 is the application deadline for the Rotch Travelling Scholarship of \$11,000** for nine months' travel abroad. Second Prize is \$6,000 for five months. Applicants must be under 31 years of age on March 10, 1974 and have an architectural record that includes study or experience in Massachusetts. Application forms may be obtained from Hugh Stubbins, Secretary, Rotch Travelling Scholarship Committee, 1033 Massachusetts Avenue, Cambridge, Massachusetts 02138.

**Congress has begun debate on a bill to authorize \$50 million for solar heating and cooling research,** for both residential and commercial applications. The demonstration program would last five years.

**Work by women architects is invited for an exhibit sponsored by the New York Chapter, AIA.** Submissions must be received by April 15, 1974. For further information, contact Rosaria Piomelli, NYC/AIA, 20 West 40th Street, New York, New York 10018. Phone (212) 565-1866.

**Designing energy-saving techniques into new buildings will be discussed in eight national seminars,** for architects and engineers, sponsored by the American Gas Association. Energy analysis through computer programs is to be a feature of the program. More information can be obtained from the American Gas Association, Arlington, Virginia.

**March 15, 1974 is the deadline for receipt of the \$80 registration fee for an international competition** to develop the Portuguese island of Porto Santo. The competition is open to teams of Portuguese or foreign architects, and is approved by the International Union of Architects. Contact: Competition Secretariat, Planning of Porto Santo Island, Rua Ferreira Lapa N° 29, Lisbon 1, Portugal.

**A national design competition for low-rise buildings using aluminum has been announced** by the Architectural Aluminum Manufacturers Association and The Aluminum Association. Eligible is any building five stories or less, new construction or rehabilitation, which has been completed since July 31, 1973. Entries must be received by October 1, 1974. For further information, contact the AAMA at 410 North Michigan, Chicago, Illinois 60611.

**The AIA has informed state components that fee schedules may be a violation of anti-trust laws.** In agreement, the New York chapter has withdrawn its fee schedules. Details on page 34.

**Washington observers see mandatory Federal measures governing construction by next fall.** Aimed specially at energy problems, the measures would influence all building types.

**A building moratorium has been declared on 15 per cent of the greater Miami land area.** The Dade County Commission approved the action, covering 200,000 acres, to protect the county's water supply. In the last two years, large-scale developers have been moving westward into the now-protected area, securing zoning for apartment construction averaging 25 units per acre.



## AIA sees OSHA confusing designers

The American Institute of Architects codes and standards committee completed two days of meetings on problems concerning Occupational Safety and Health Administration regulations which cause confusion for the designer by stipulating standards in conflict with state and local regulations. AIA is working with the Council of American Building Officials and other professional bodies to get these differences resolved.

The AIA group also heard a report on the new draft proposal developed by the National Bureau of Standards on conservation of energy in new buildings.

Members expressed concern that any such standard might make new construction more costly—perhaps 10 to 20 per cent higher.

## AIA convention details announced

Host chapters for the 1974 AIA national convention have announced plans for the event, to be held in Washington, D.C. on May 19-23.

In a brochure released by the AIA headquarters in Washington, the Washington Metropolitan, Baltimore and Potomac Valley chapters outline a series of tours through the Capital, Maryland and Virginia, and present the range of professional conferences focused on the convention theme, "A Humane Architecture."

Architects contracting for work with the Federal government will find one of the programs deals with value analysis and construction management, services currently sought by the General Services Administration. Also on the agenda are discussions of architect-oriented public relations programs.

Practice topics dealing with concentration on one special building type, design freedom, and national growth guidelines are also on the program.

Tours include Reston, Virginia; Baltimore; the Washington Metro subway system; Arlington-Alexandria; Georgetown; Mt. Vernon; and major examples of the Capital's architecture, old and under construction.

This year, the reconvened convention will be in Madrid, Spain, from May 24 to June 8.

For registration information and further details on the convention, contact the AIA headquarters in Washington.



## French city to have U.S.-built personal rapid transit

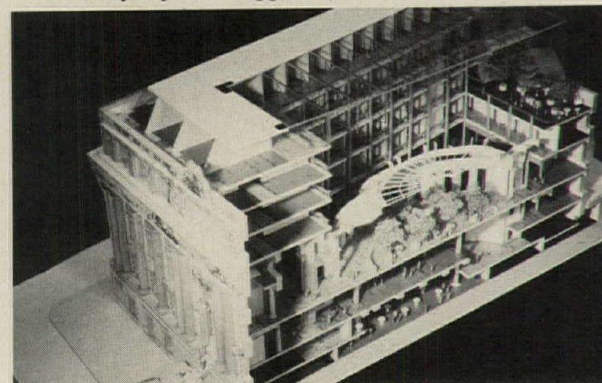
The city of Nancy, France, will have the world's first full-scale installation of an automated system for personal rapid transit—PRT—that promises to solve some pressing problems of urban transportation.

Using hardware developed by an Otis Elevator Company affiliate—Transportation Technology Incorporated—the new PRT system carries passengers in computer-supervised, air pad-supported cars gliding along slender guideways above the traffic. Since the PRT cars

are electrically propelled by an efficient linear-induction motor system, they neither consume gasoline nor contribute to air pollution, according to Otis.

The Denver-based TTI-Otis also set up its PRT vehicles for public view and demonstration rides prior to the city's 1973 Rapid Transit Development bond issue, in which Denver residents solidly passed a program to develop a PRT system. The TTI test track in Denver is one of the very few working test tracks for PRTs in the country.

## I. M. Pei proposal suggests new life for landmark



Register to the commerce of the western hemisphere for nearly seven decades, the United States Custom House (model above) now stands abandoned at the tip of Manhattan. Distinguished by the history of its site, and its monumental scale, the building may become a center of shopping, entertainment and culture, combined with hotel or office space. GSA, hoping to see the building restored, plans to turn it over to the City of New York.

I. M. Pei & Partners have prepared proposals to bring the 1907 structure by Cass Gilbert up to date. The Custom House contains 450,000 square feet of space on seven floors. An elliptical rotunda forming the central court on the main floor measures 85 by 135 feet and is covered with a large skylight. (This

was the scene of a large party of architects recently. See item on Ada Louise Huxtable, profession honors noted critic.)

Open, seven-story spiral stairs at either end of the rotunda are considered the building's most valuable features.

All areas of the building would be renovated and finished, and architecturally, four major changes are proposed: 1) creation of 55-foot high arcades flanking the rotunda, 2) Addition of a 157,000 square foot glazed skylight over the central court at roof level, 3) Removal of masonry veneer from the walls of the central court, and glazing of the open structural bays, and 4) Removal of the slate tile mansard and copper cornices at the seventh floor, and glazing of the surface on the slope of the present roof line.

## HUD studies total energy systems

James T. Lynn, HUD Secretary, has announced the start-up of a total energy plant in New Jersey, launching a research project that could meet some of the nation's energy needs.

Located in a HUD-assisted development in downtown Jersey City, the \$2.7-million packaged energy plant will demonstrate and, for the first time in the United States, evaluate the cost, efficiency and reliability of a total energy system as compared to conventional utility plants. Though other such plants exist in this country, none has conducted a scientific evaluation of cost and reliability data, from design through long-term operation.

HUD experts predict the total energy system will knock one-third off the amount of fuel needed to service the site conventionally, and cut 25 percent from the annual cost of operating and maintaining a conventional utility plant.

Parallel to these initiatives in the energy field, HUD has completed a study on the economic feasibility of total energy systems on a national scale, and a report based on that analysis is now available free to anyone interested in the total energy field. Titled *Economic Evaluation of Total Energy—Guidelines*, the report permits quick assessment of a total energy system's potential for any size development at any location.

## AIA award winners announced for 1974

Among the 1974 AIA award winners recently announced are: Kevin Roche John Dinkeloo and Associates, the Architectural Firm Award; Jack D. Train, the Edward C. Kemper Award for significant contribution to the profession; Walter McQuade, the Architecture Critics' Medal; Ralph Knowles, the Medal for Research; Stephen van Daalen Cram (posthumously), the Whitney M. Young Jr. Citation for services rendered to minorities; the New York State Urban Development Corporation, the Citation of an Organization; David Hirsch, the Architectural Photography Medal; Ruth Asawa Lanier, Fine Arts Medal; Olivetti Company, Industrial Arts Medal; Kevin Lynch, Allied Professions Medal for urban design and planning; and Sheila Hicks, the Craftsmanship Medal.

The Institute also announced award of the 1974 Architecture Critics' Citation to

The Regional Plan Association of New York, the world's oldest metro planning organization.

Ten honorary memberships will be conferred by AIA, and 11 architects from other countries have been elected Honorary Fellows.

All awards and honors will be presented at the AIA convention in Washington, May 19-23.

## Profession honors noted critic



Ada Louise Huxtable (pictured), architecture critic for The New York Times was honored by members of the architectural profession and press at a gala black tie event held at the old U. S. Custom House in New York in December.

Ostensibly, the dinner—held by The Architectural League of New York—was to recognize Ms. Huxtable's recent appointment to the Editorial Board of the Times, and nearly 300 architects paid \$100 each to attend. The money will benefit the New York Landmarks Conservancy. However, it is more important to note that the honor paid Ms. Huxtable attested to the continuing importance of her critical work in the cause of major architectural and environmental issues.

For the occasion, the Custom House (see renovation story) was spruced up, and the bronze gates and main entrance opened for the first time in 25 years. Arriving guests were heralded by trumpeters, and in the foyer, a brass ensemble played baroque music. At the candle-lit dinner, former Mayor Lindsey presented Ms. Huxtable with New York's Diamond Jubilee Medallion.

## AIA advises states on fee guides

Speaking recently in New York, AIA executive vice president William L. Slayton, said that AIA has advised components that fee schedules, although advisory only, may in fact be in violation of the Sherman Anti-trust Act.

Concurring with this, the New York Chapter has resolved that documents pertaining to compensation are to be rescinded, and should be destroyed.



## President's budget calls for construction spending

Energy and economic factors were large controlling influences in the structuring of the fiscal 1975 budget presented to Congress last month.

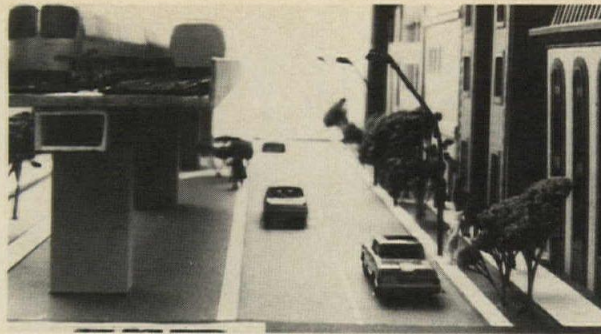
In the section on natural resources and environment, for example, the program-by-function document tells of contract authority to states for waste treatment plant construction being raised by \$1 billion to the \$4 billion level next fiscal year. While this is not nearly as much as environmentalists want, the Administration notes that it is a one-third increase over the current year.

A steady increase in budget outlays for the community development and housing programs is indicated. The 1975 total is estimated at \$5.7 billion, \$200 million more than this fiscal year and the government expects to be spending at the \$7.4 billion level on these activities

in 1976. The White House is counting heavily on the enactment of its proposed Better Communities Act and has structured the budget to include \$2.3 billion for this purpose in the year starting July 1. Most of the spending in the whole community development and housing budget projections will result from prior-year commitments.

National Park Service (Interior Department) would spend \$14.9 million on preservation of historic properties and the budget includes \$54 million in authority for construction of projects in 14 national parks.

Again the President proposes termination of medical facilities construction, contending that there is an aggregate oversupply of hospital beds. States the budget document: outlays for health facility construction would drop from \$264 million to \$216 million.



## Design revealed for Atlanta rapid transit system

The Metropolitan Atlanta Rapid Transit Authority (MARTA) has selected an architectural design concept for the aerial structure to be used along some 16 miles of the city's 54-mile system.

The design is said to feature a "clean line" look to give the entire structure a minimum profile. Depending on location and land surface, the aerial structure will generally range between 10 and 30 feet high. Each individual four- by eight-foot column of the structure will be con-

structed of reinforced concrete. The columns will be placed approximately 70 feet apart, and girders of either pre-stressed concrete or steel will tie individual columns together. They will support the deck for the dual track rail line which will have a maintenance walk-way in the middle.

The aerial structure was designed by Aeck Associates and Parsons Brinckerhoff-Tudor-Bechtel, MARTA's general engineering consultants.

## Donald C. McGraw dies at age 76

The RECORD notes with sadness the death of Donald C. McGraw, chairman of the executive committee of McGraw-Hill, who died February 7, at the age of 76.

The youngest son of the late James H. McGraw, founder of McGraw-Hill, Mr. McGraw led expansion of the company to include 60 business publications, among them ARCHITECTURAL RECORD.

During this period, McGraw-Hill also acquired financial and construction information services, including Standard & Poor's Corporation, and F. W. Dodge Company (now McGraw-Hill Information Systems Company).

## Maryland governor seeks A/E controls

Governor Marvin Mandel of Maryland, in his state of the State message to the legislature, asked for new authority to compel state boards that license architects and engineers to adopt codes of professional conduct. He also seeks the power to direct these boards to revoke or suspend the license of architects and engineers violating the provisions.

The American Institute of Architects has a particular interest in the Maryland developments. In fact, AIA has decided to make the Maryland situation an object of thorough study to see if its eventual development and outcome could be used as an example.

## Planning's fiscal impact computerized

Marcou, O'Leary & Associates, (MOA), a local urban planning and development subsidiary of Westinghouse Electric Corporation, has devised an improved approach to predicting the public costs and revenues associated with urban planning.

Described as the Municipal Impact Evaluation System (MUNIES), the new tool was developed by MOA with technical assistance from the Westinghouse Research Laboratories.

"MUNIES is a computer-assisted system for evaluating the potential fiscal impact on local governments of proposed urban developments," said Dennis E. Gale, director of the program for MOA.

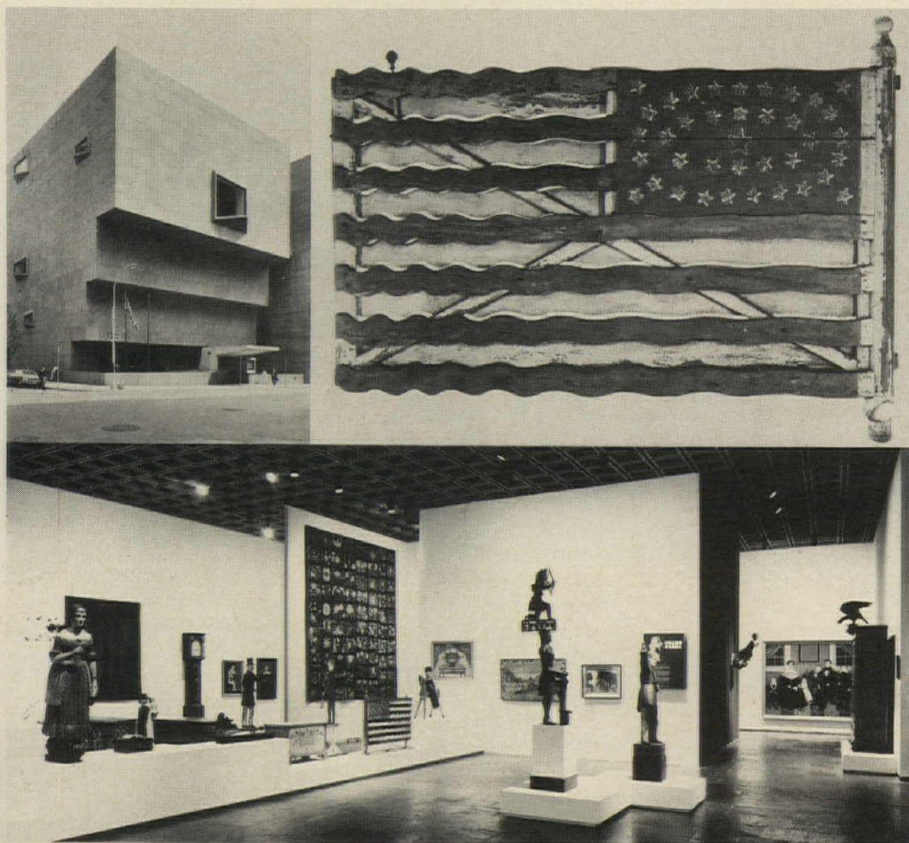
Mr. Gale said the new technique has considerable flexibility and several applications. The two most important are: 1) Individual projects such as residential subdivisions, planned unit developments and new communities can be evaluated in terms of expected demands for public services and their attendant costs; and they can be analyzed on the basis of projected revenue from taxes and other sources. 2) The estimated annual demand for services and amount of projected revenues from overall growth—for up to 20 years—can be calculated for an entire urban planning area, such as a municipality.

He said MUNIES is currently being used in a three-month test study of a medium-size Midwestern city.

## BOCA fire code is performance type

The Building Officials and Code Administrators International, Chicago, says it will proceed with publication of the controversial BOCA 100 Standard for the Design and Installation of the Fire Suppression System for Life Safety. The document involves sprinkler system applications and follows a six month study of the pros and cons of fire suppression systems.

This is BOCA's first published standard and is likely to be a subject of opinion differences for a long period. It has been opposed strenuously by the National Fire Protection Association, which views it as a challenge to NFPA's 13 Sprinkler Standard. The BOCA publication is a performance standard which it claims provides designers more flexibility in planning adequate fire suppression systems. Some local codes are performance types.



## Marcel Breuer debuts as exhibit designer for Whitney Museum

Marcel Breuer, whose Whitney Museum opened in New York in 1966, observed an opening at the site last month.

It was a new exhibition at the Whitney, one that marks Mr. Breuer's debut as an exhibition designer. "The Flowering of American Folk Art 1776-1876" is a collection of some 300 examples of paintings, sculpture, furniture, quilts, toys and other items of everyday use, created by the everyday folk during the

first hundred years of American independence, a period not yet pressured by the industrial revolution.

Mr. Breuer's installation, according to one art critic, amplifies the visual rather than historic emphasis of the objects chosen by Jean Lipman and Alice Winchester. The result is "dramatic, high-spirited and illuminating. The visitor finds himself in a garden of visual wonders in which each item is a

distinct esthetic experience," says Hilton Kramer of The New York Times.

The exhibit runs through March 24, and was made possible through a grant from Philip Morris Incorporated. It will subsequently be seen at the Virginia Museum of Fine Arts in Richmond, from April 22 through June 2; and at the M. H. De Young Memorial Museum in San Francisco, from June 24 through September 15.



# “Another example of GE’s ability to 3,443 tons of cooling in the

Joseph H. Gauss, Vice President and General Manager,



In Greenville, South Carolina, there's a factory that makes gas turbines large enough to generate electricity for a city of 60,000 people.

There, rotor assemblies weighing as much as 26 tons are machined to a tolerance of  $\pm .0005$  (that's about one quarter of the thickness of the piece of paper this advertisement is printed on).



The plant makes these rotor assemblies, and the rest of the turbine, in three shifts a day, five

days a week, throughout the year.

And even though Greenville has an average summer temperature of 79 with a normal daily high of 89, the plant has never had to shut down because of heat.

Nor has hot weather ever ruined a 26-ton rotor assembly.

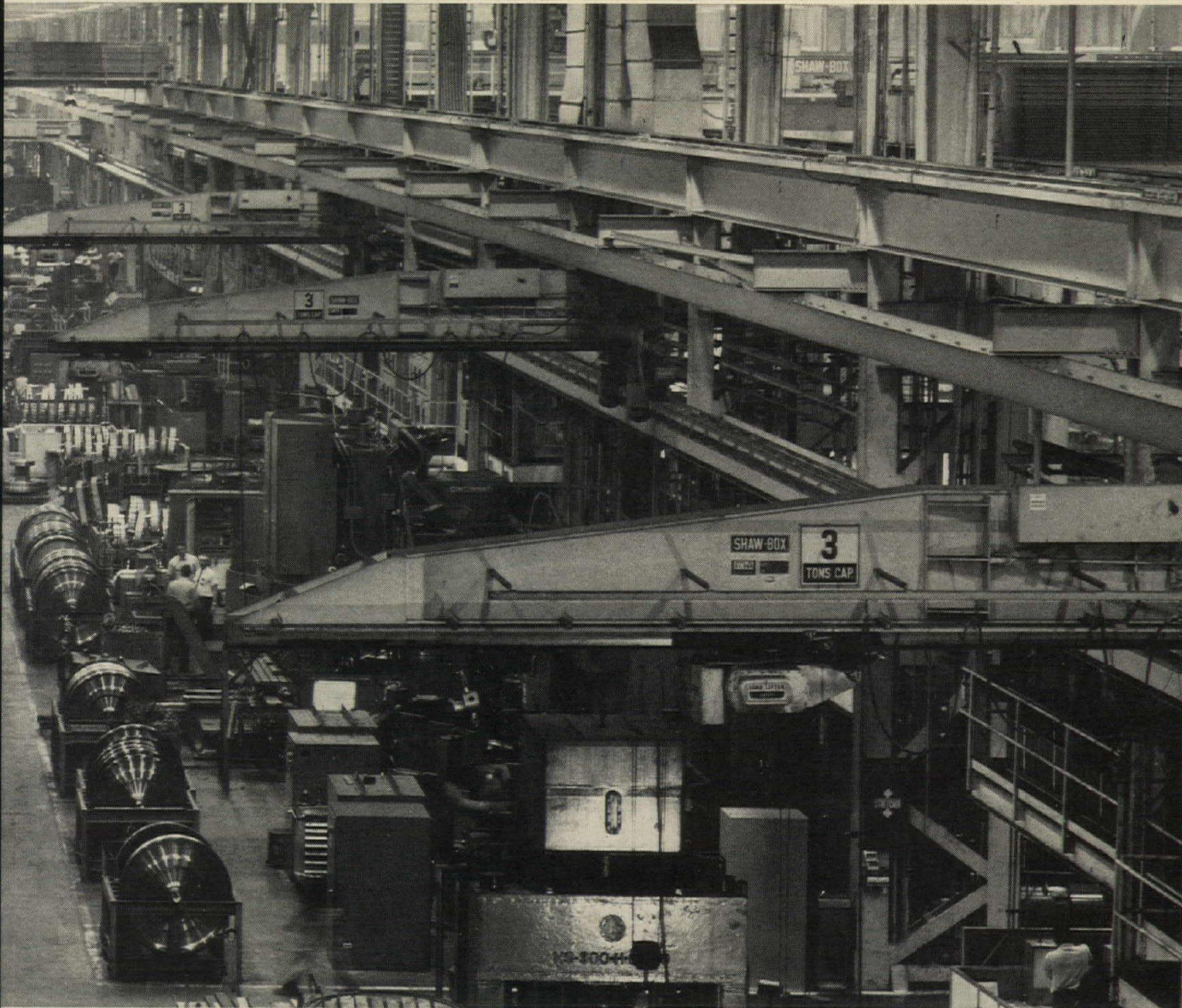
General Electric central air conditioning helps to maintain quality control and to make this plant a clean comfortable place to work.

John Funke, manager of Greenville



# serve the Commercial Industrial Market world's largest Gas Turbine factory.”

Air Conditioning Products Division.



plant facilities, has his own private morale booster: the General Electric Service Contract that was bought with the installation.

The contract lets John budget his maintenance costs (resulting from normal usage) to the penny. With the contract, John knows that one predictable check will take care of anything that will have to be repaired or replaced for the life of the contract.

Manufacturing men are discovering

that the air in their factories is a very important part of their business. And GE Central Air Conditioning Dealers are making factories and plants an important part of their business.

If you're not already a General Electric dealer, this is the time to become one because there's never been a better time.

We mean business.  
For both of us.

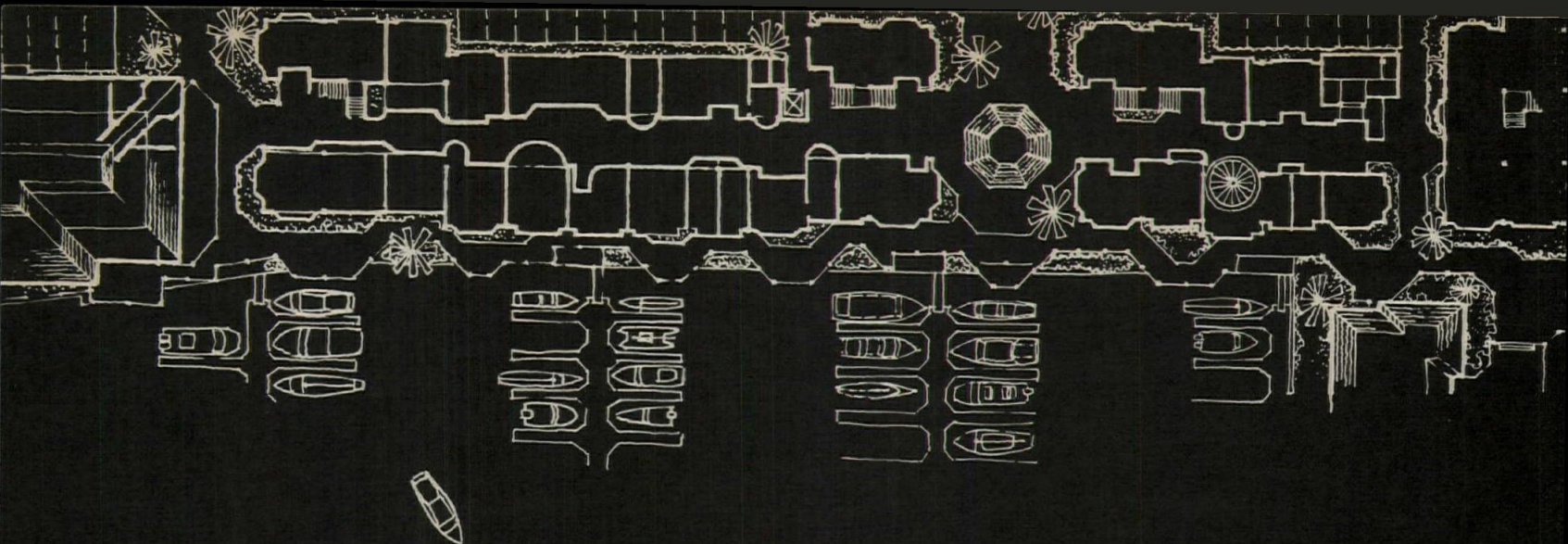


Joseph H. Gauss

**GENERAL**  **ELECTRIC**

For more data, circle 30 on inquiry card





## Red cedar helps make a shopping center seaworthy.

*The Waterfront Village, Oahu, Hawaii. David D. Stringer and Associates Ltd., Architects.*



At Kaiser-Aetna's \$5 million dollar Waterfront Village near Diamond Head, two decks of shops and offices have been infused with the warmth and texture of red cedar. (2,600 squares of red cedar handsplit shakes.)

The architect's unique nautical themes are stated in crow's nests, rigging, lifeboats and a smooth, informal transition from marina to shore. What other material could offer red cedar's range of design applications? From the "thatched" mansards to intimate interior mall spaces,

red cedar has combined distinction with quiet, island informality.

And red cedar shakes will weather anything the tropical skies can bring. From heat waves to hurricanes. Red cedar's unique insulative properties make it an efficient as well as beautiful building covering.

Next time you're launching a project, consider the building material with warmth, durability and almost infinite design possibilities: Red Cedar Certi-Split Shakes and Certigrade Shingles.

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



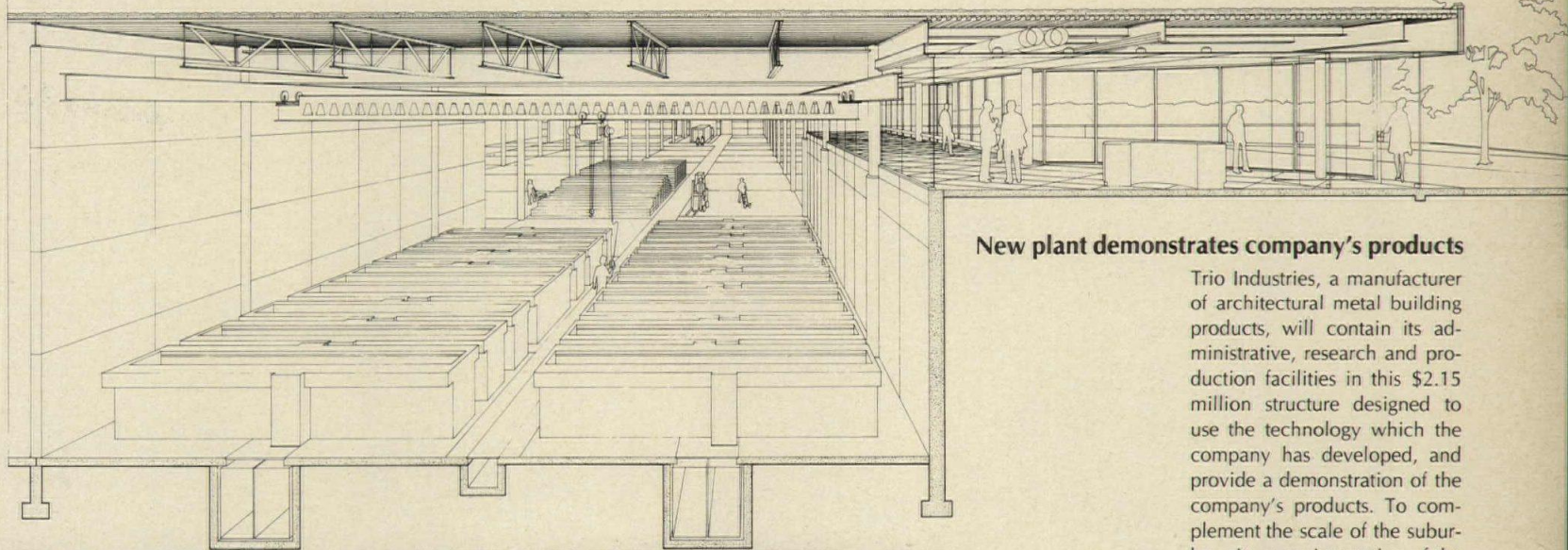
*These labels on bundles of red cedar shingles or handsplit shakes are your guarantee of Bureau-graded quality. Insist on them.*

### Red Cedar Shingle & Handsplit Shake Bureau

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

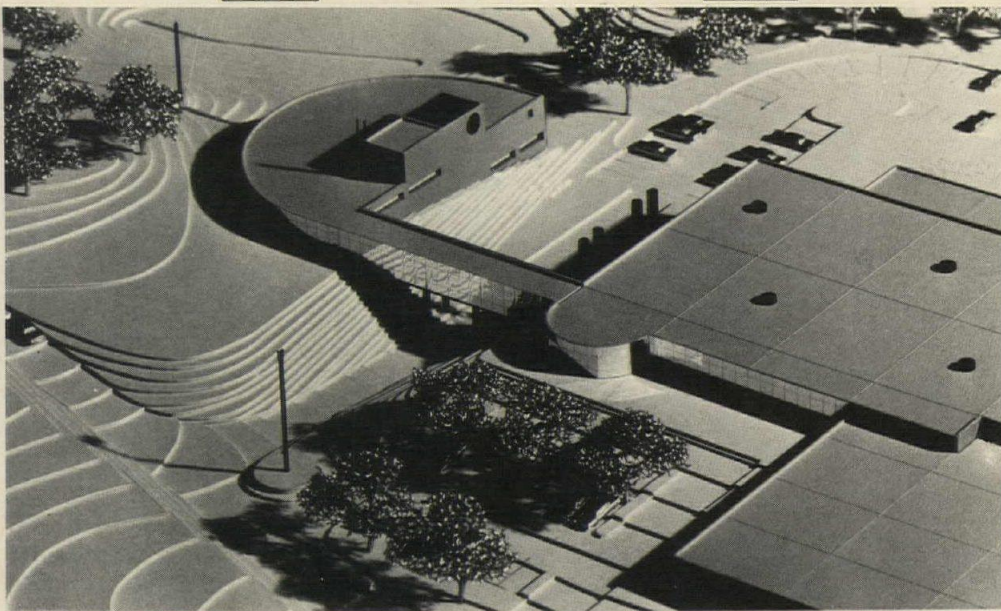
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**New plant demonstrates company's products**

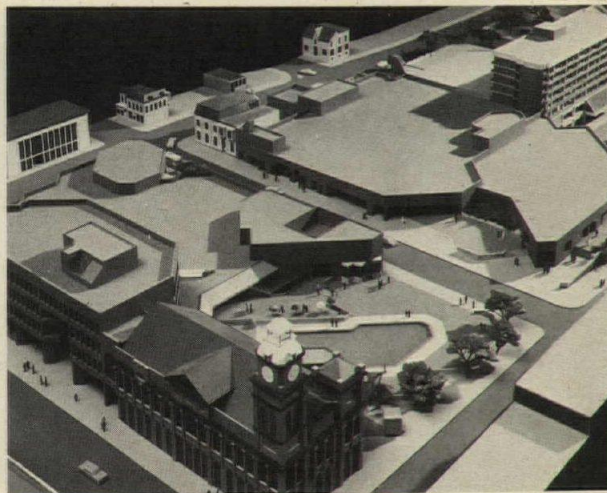
Trio Industries, a manufacturer of architectural metal building products, will contain its administrative, research and production facilities in this \$2.15 million structure designed to use the technology which the company has developed, and provide a demonstration of the company's products. To complement the scale of the suburban site, a major portion of the building's eastern wall is depressed below grade, and the overall facility is oriented to take advantage of the south to north downward slope of the land. The semi-circular administration building is connected to the plant by a gallery and entrance sheathed in reflective glass. To achieve structural height economy, mechanical, electrical and process services are distributed through the voids of the open-web truss purlin network, using flexible down-feeders at required locations. Architects are Shreve, Lamb & Harmon Associates, with Robert W. Jones, partner in charge, and Evan L. Schwartz, project designer. Completion is planned for this spring.



**A Canadian landmark to be retained amidst growth**

A small scale renewal project—Peterborough Square in the heart of Peterborough, Ontario—shows care for a landmark clock tower and market hall which will be preserved as part of this nine-acre commercial and recreational development. The old building will provide space for boutiques, and be linked to nearby new office and hotel space by a two-level shopping mall, including a large department store. Interspersed in the design are parkland areas. Scheduled for completion in 1975, the project was designed by Crang & Boake.

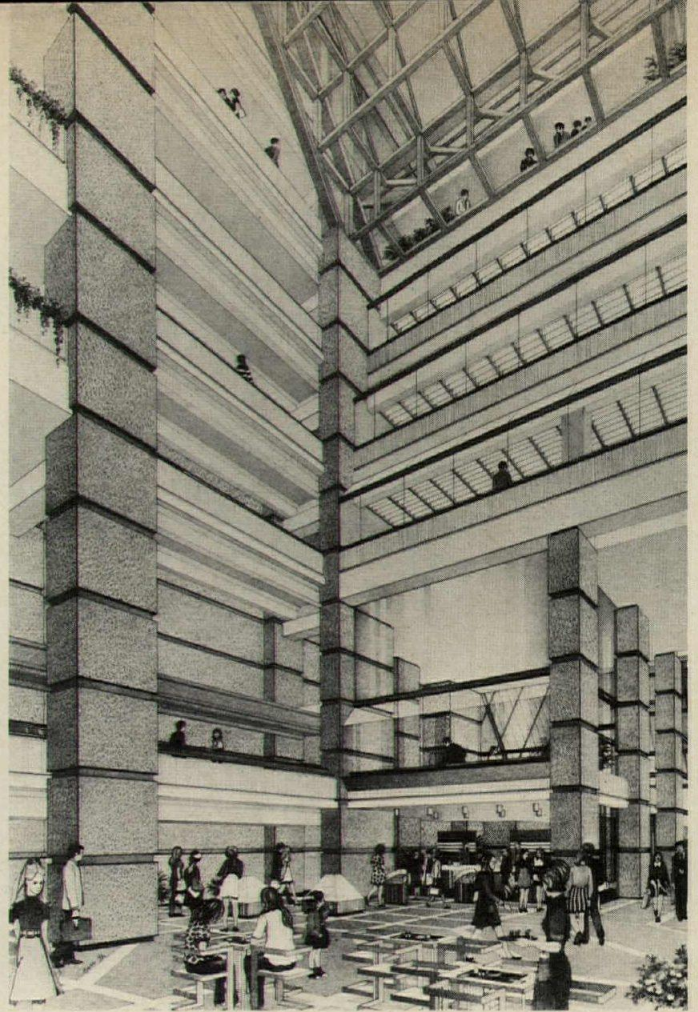
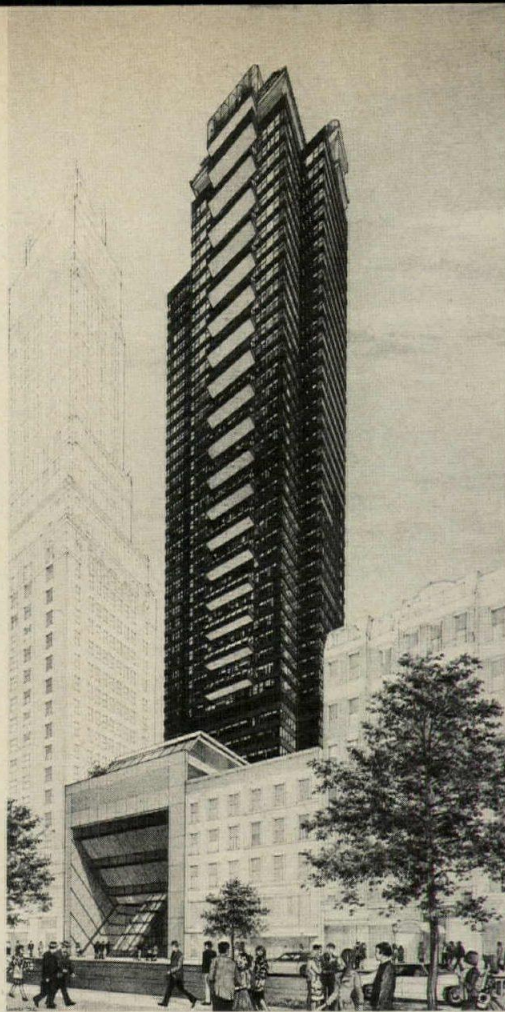
*Panda Associates photos*





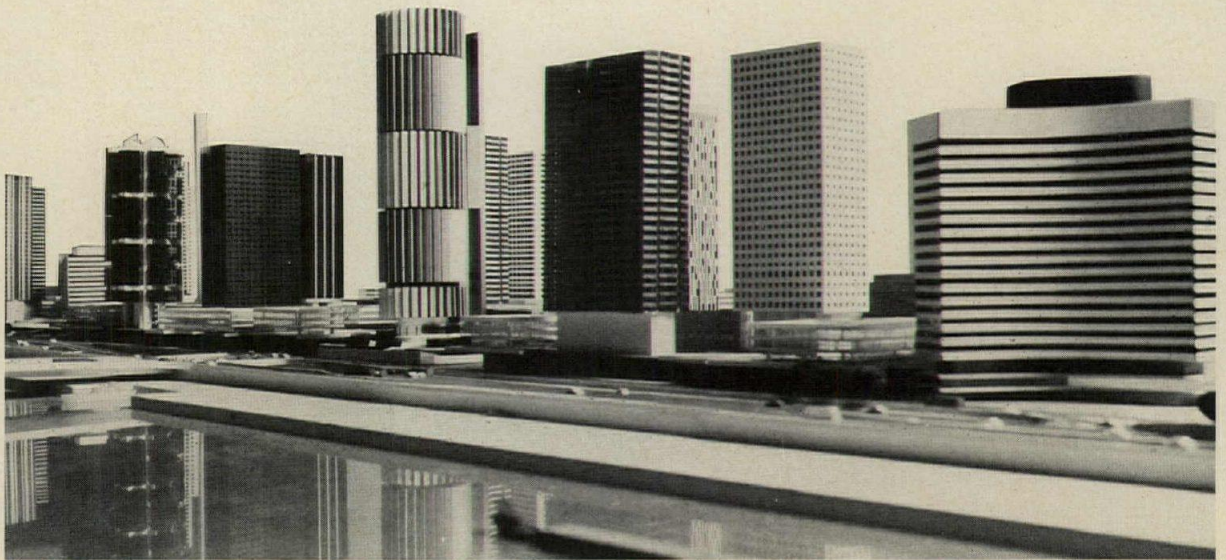
### City within a city

Seven different urban functions will be accommodated in this 52-story multi-use building under construction in New York. Designed by David Kenneth Specter, the building will include a garage, galleria retail space, sidewalk cafe, commercial office space, a private club, and 37 floors of residential space. Most extravagant of the apartments is the four-level, 16,000 square foot penthouse designed for millionaire Stewart Mott. Except for the master bedroom and Mr. Mott's office, the top floor of the penthouse will be given over to sun decks, plantings and the pool. Below, the living room and library will have their own skylights, punctured by fireplace chimneys. The architect for the other apartments in the building is Philip Birnbaum. At sidewalk level, the building will have a through-block retail galleria, with a 100-foot high atrium. Glass-walled office space will overlook the atrium, and open bridges will connect various offices. Cost of the building will be more than \$30 million.

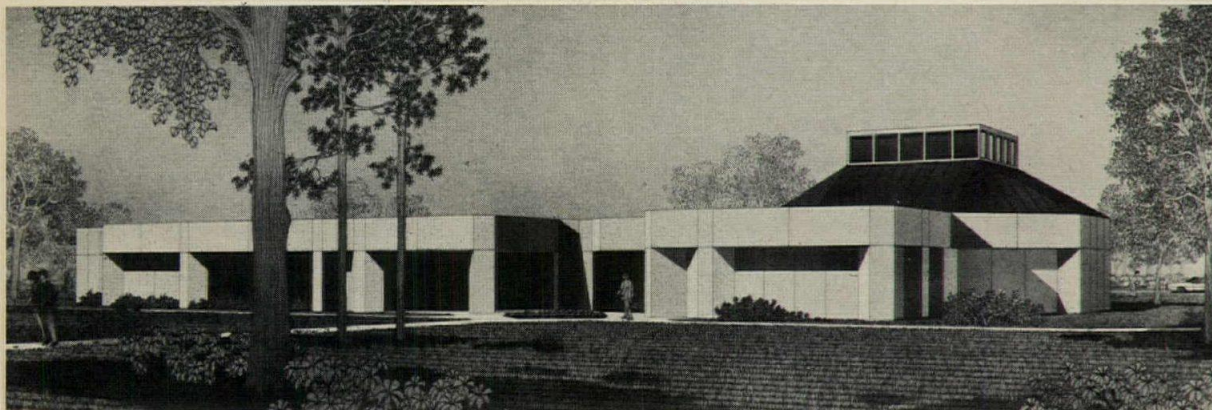


### Paris: the new left bank

Part of the Front de Seine project half-completed along the left bank of the Seine River in Paris is a 40-story office and studio tower (vertical finned structure, left center) proposed for France's state broadcasting monopoly. If approved by the client, the design will rise ten stories above all other buildings in the project, which has a 30-story height restriction. A variance is anticipated. Paris architect Maurice Novarina designed the building with a concrete core supporting floors set on brackets. The building would rise from the pedestrian platform of the project.

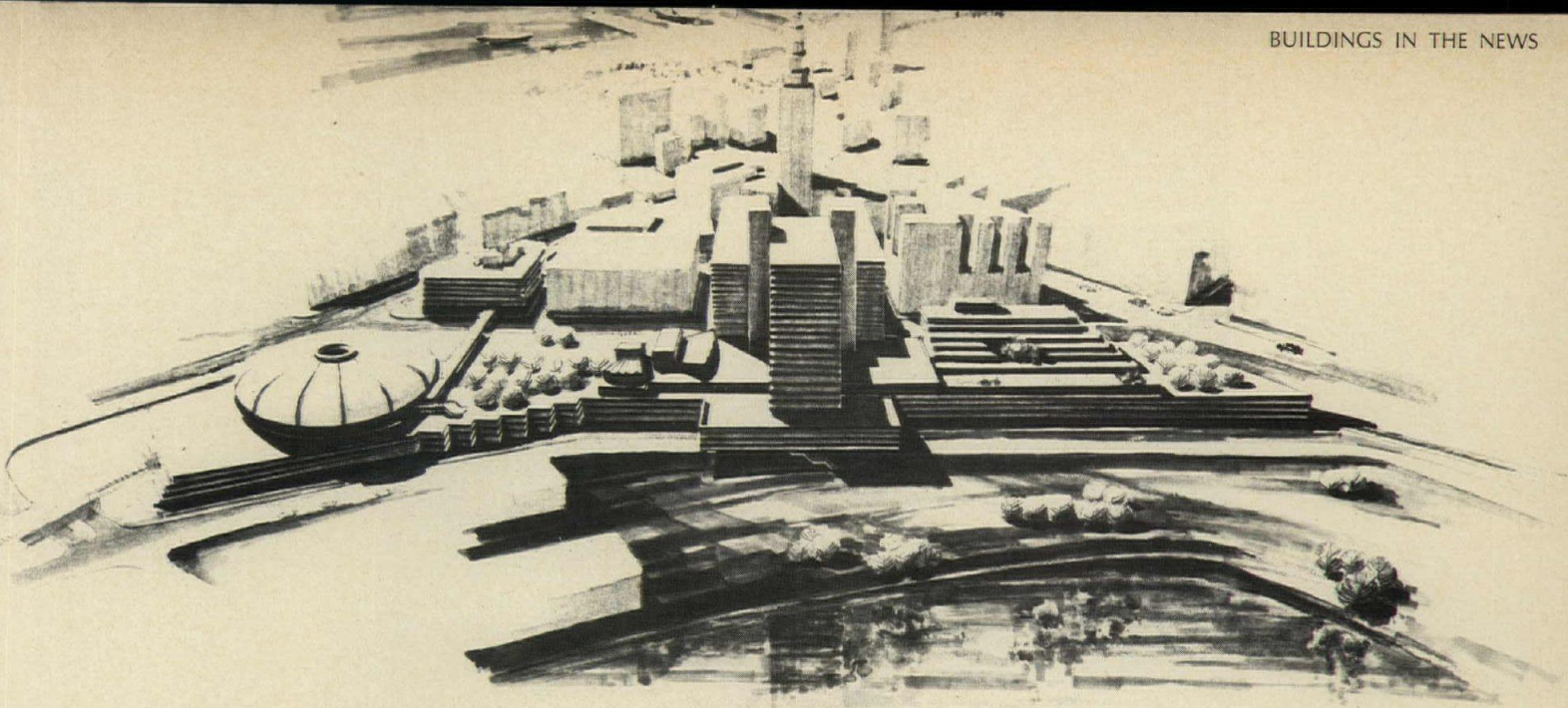


### A small municipal building for a city in Georgia



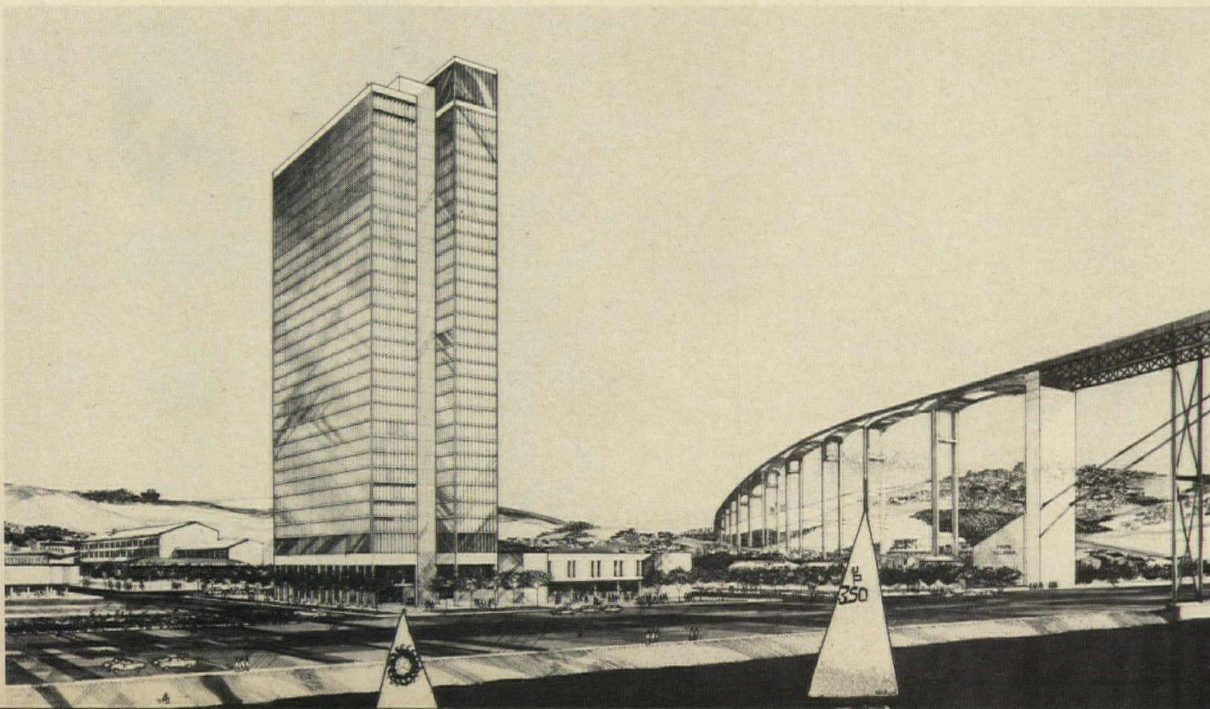
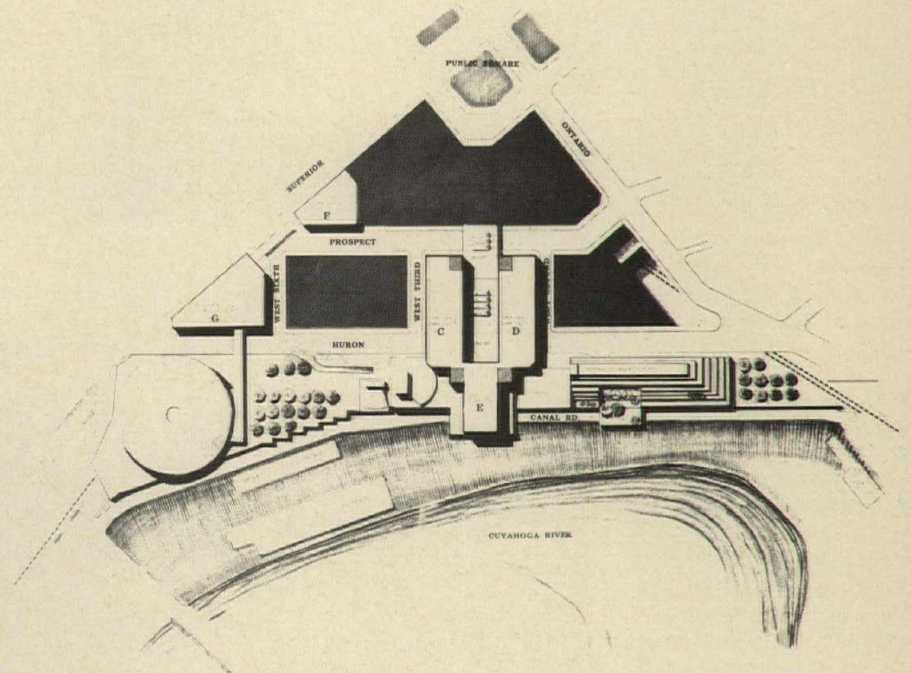
The City of Forest Park, Georgia wanted a municipal building that would be something other than a typical box. Working within a budget of \$350,000 John J. Harte Associates designed a structure of 10,000 square feet, enclosed within an undulating wall of 3/8-inch exposed aggregate epoxy panels applied over steel studs. A special aspect is the octagonal council chamber framed by exposed steel trusses. Completion is planned for fall.





**Cleveland's Terminal Tower center of proposed renewal project**

U. S. Realty Investments of Cleveland has signed an agreement to purchase 33 acres behind Cleveland's Terminal Tower, paving the way for start of construction of the \$350 million Tower City project planned by Dalton Dalton Little Newport. Groundbreaking is expected in early spring for twin office towers on foundations installed behind the present Tower in the late 1920's. A four-level shopping mall of more than 1 million square feet would run beneath Terminal Tower and the new buildings, including a 700- to 1000-room hotel overlooking the Cuyahoga River. Two apartment towers and a terraced apartment complex, transportation center, underground parking, restaurants and entertainment are also planned and construction is to cover a period of up to ten years.



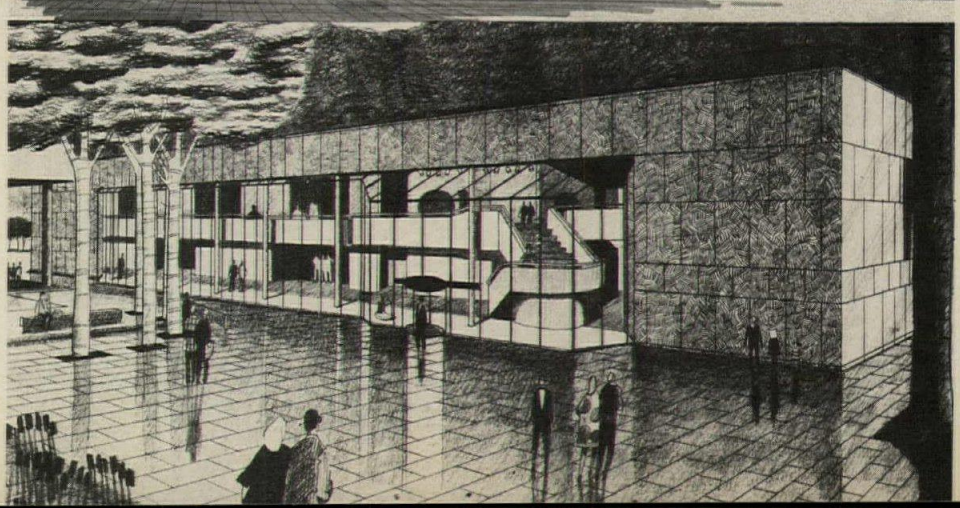
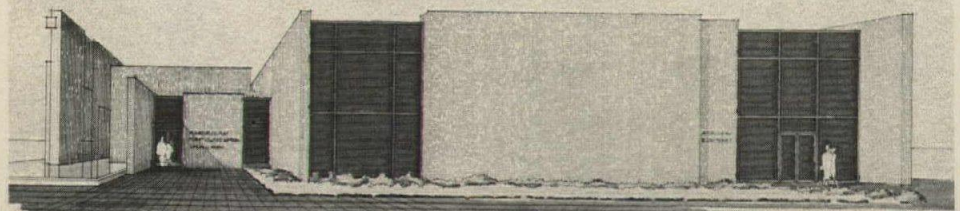
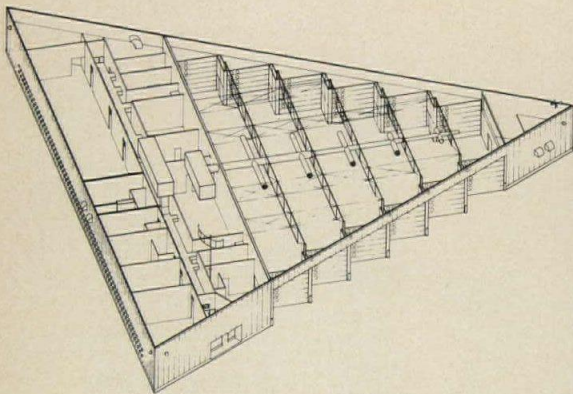
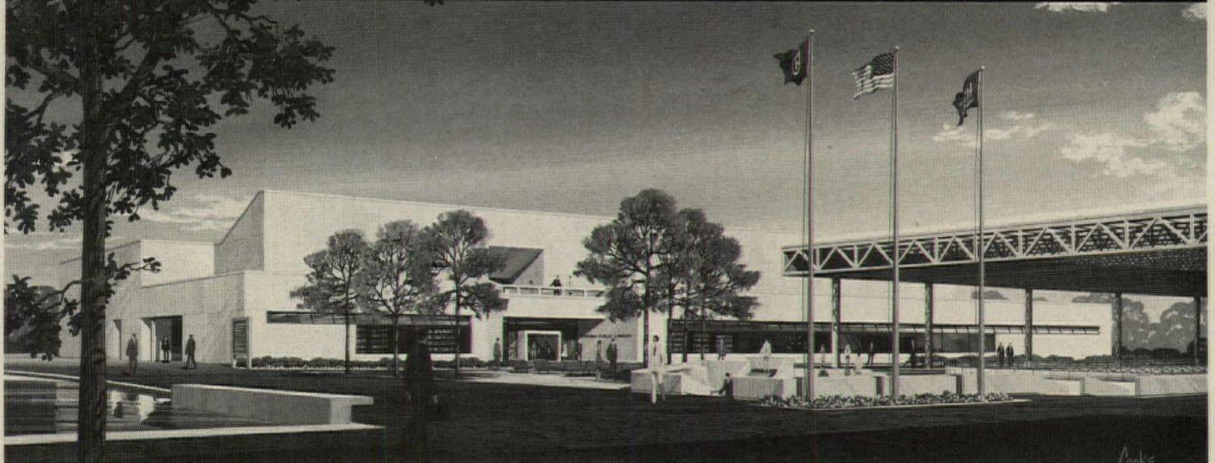
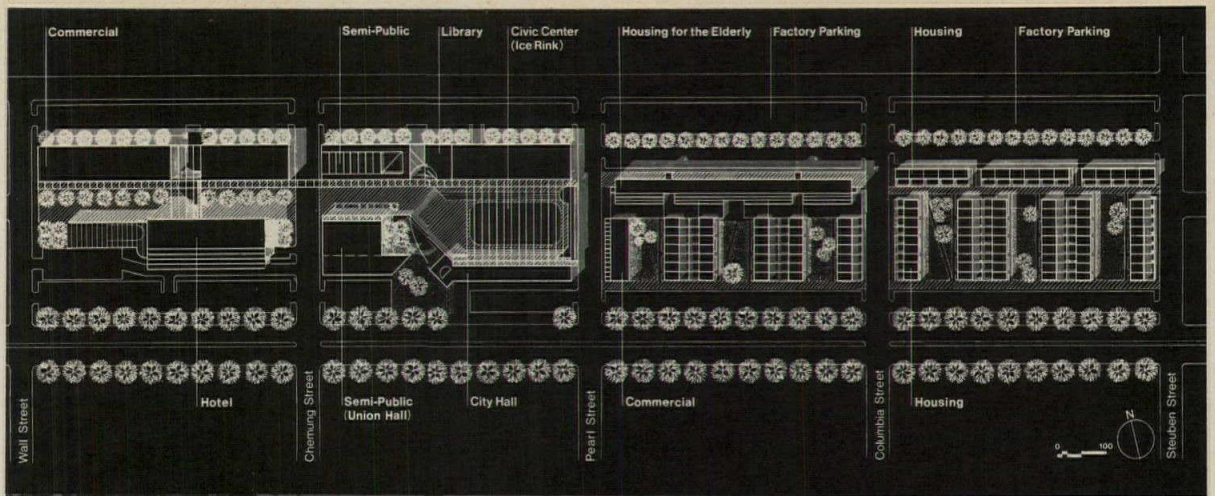
**Portugal's tallest**

The tallest building in Portugal, a 30-story office tower with a two-story base of shops and service establishments, is proposed in a master plan completed by Emery Roth & Sons, in association with Multiplano of Lisbon. The building would be built in a 700,000-square foot urban renewal site on the banks of the Tejo River in Lisbon. The plan calls for more than 800,000 square feet of space, more than exists in any building in Portugal. The site is west of the Ponte Salazar, the longest suspension bridge in Europe. Besides office space, the building would provide 120,000 square feet for shops and underground parking for 700 cars.



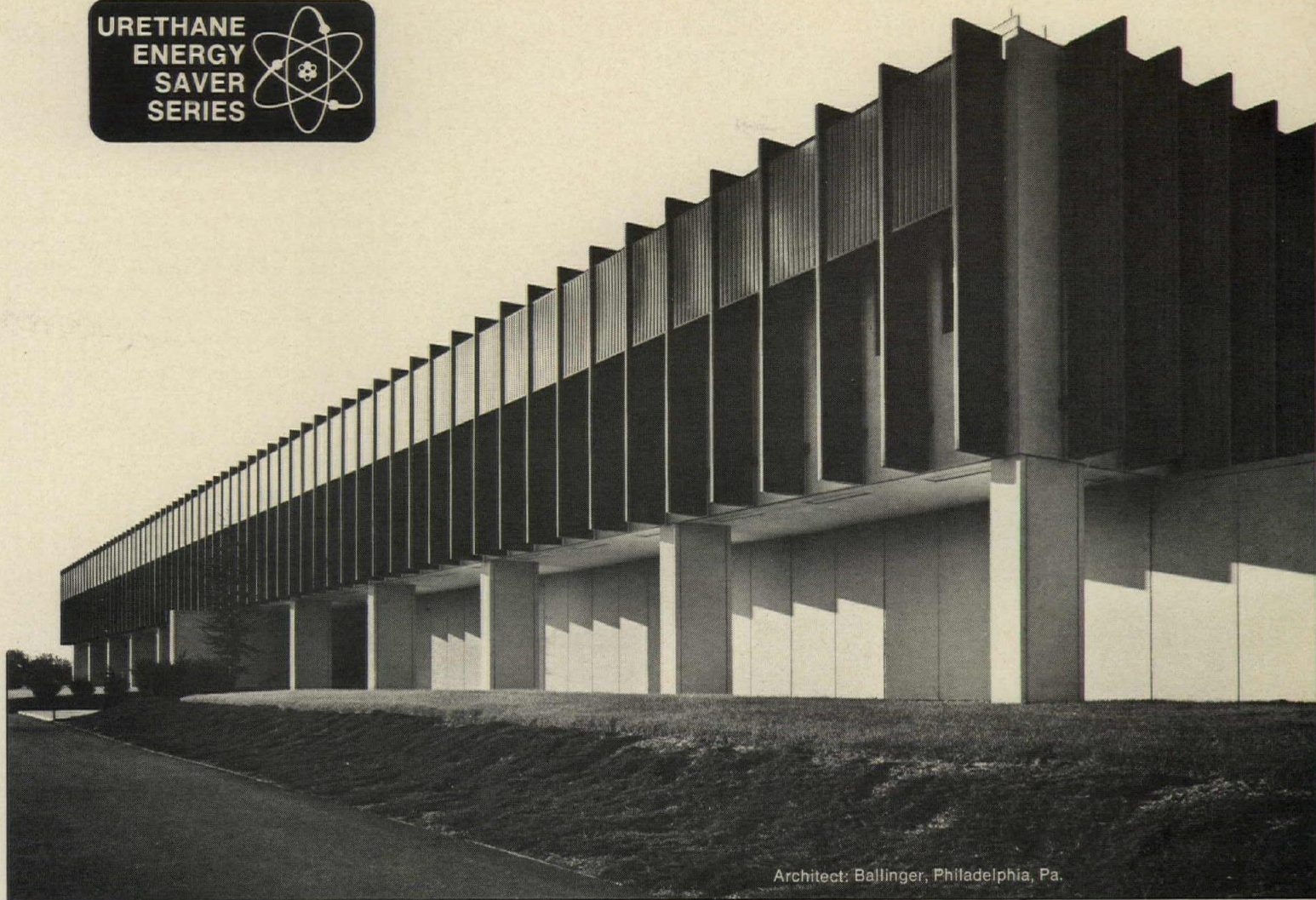
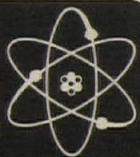
**After the flood,  
a city rebuilds**

Two years ago this June, the city of Corning, New York was devastated by floods occurring in the wake of tropical storm Agnes. Turning the disaster into a unique opportunity to improve the area beyond pre-flood conditions, the city has completed long-range planning, and this year will open several major new buildings in what is to be a downtown Civic Center (top right). Among them are: the city hall (bottom rendering) and library (top rendering) by RTKL; a hotel (right middle) by Sasaki, Dawson & DeMay; a fire station (isometric below) by Gunnar Birkerts & Associates; and a union hall (second from bottom) by Joseph A. Connell. Also participating in design work for the city are: Skidmore, Owings & Merrill; Geddes, Brecher, Qualls & Cunningham; and Tasso Katselas. Concurrently, several other major planning projects include restoration and integration of the previous eight-block central business area which has been recommended for inclusion in the National Register of Historic Places. Parks and open space restoration and development are included in the area's renaissance, along with new transportation proposals. Central to total redevelopment is a separate program, Federally-approved Project Agnes, in which relocation of more than 600 families and 30 businesses would be accomplished in a 500-acre area of the city. As part of this work, urban design input—aimed at major land use change—is being provided by Skidmore, Owings & Merrill. Project Agnes involves residential development, and the total acquisition of large land areas where major reuse and development will occur.





URETHANE  
ENERGY  
SAVER  
SERIES



Architect: Ballinger, Philadelphia, Pa.

## 5-year 'track record' proves energy-saving efficiency of urethane insulation in advanced building design...

A unique "heat-by-light-and-people" energy system, combined with urethane foam wall insulation and solar-tint windows, has logged an excellent 5-year power-saving "track record" for Rohm and Haas' Central Engineering Division building.

The new system, designed by the firm's engineering staff, was intended specifically to conserve energy — by coordinating maximum heat reclaim with minimum heat loss. The energy is gathered from secondary internal heat sources, such as lights, people, and the "back end" of the chiller unit.

In addition to conserving energy, the system has eliminated the need for a boiler, operating engineer, and external heat supplies, such as steam, circulating hot water or electric space heaters. "The system has been so

effective," says Harry S. Kent, principal mechanical engineer, "that annual energy consumption between 1969 and 1974 averaged 5 to 7 per cent less than the pre-occupancy projection of about 5,500,000 kwh annually. Energy consumption has not varied more than 2.5 per cent."

### Urethane Foam Insulates Walls

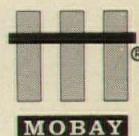
Contributing to the success of the energy system is rigid urethane foam used to insulate the pre-cast concrete walls. Urethane panels, 1" thick, were installed in the first floor walls, which are protected from excessive solar gain by a second-floor overhang. The second-floor walls were insulated with 1½" of urethane.

"If standard insulation and glass had been used, the heating-cooling system would have been excessive," accord-

ing to Harry S. Kent. Urethane's thermal resistance (R-7.14 per inch) is the highest of any commercially available material. This compares with glass fiber's R-4.54, polystyrene's R-3.58 and foam glass' R-2.86.

If you would like to design-in, build-in energy-saving urethane insulation into your specifications, write today for the new Mobay "slide-rule" calculator. It shows how to compute urethane insulation to cut energy consumption, reduce heating-cooling costs.

Mobay Chemical Company  
Div. of Baychem Corp.  
Code AR-34  
Pittsburgh, PA 15205



**First in Urethane Chemistry**

For more data, circle 32 on inquiry card

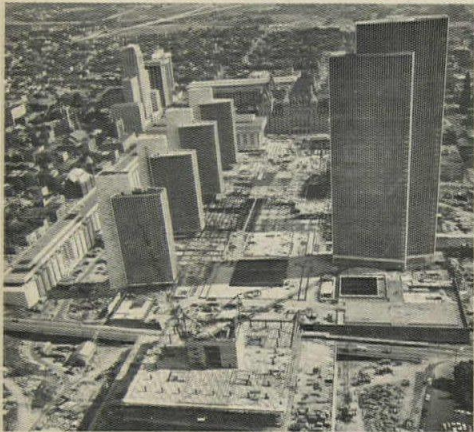


# TRANS-VAC®

↓

## progress report

It won't be long before we'll be cleaning up the Empire State Plaza . . .



with our giant vacuum cleaner!

### Progress Report

While workmen are driving toward completion of the beautiful Empire State Plaza in Albany, New York, a modern vacuum trash collection system is being installed by the TRANS-VAC Systems Division of Montgomery Industries International, Jacksonville, Florida. When completely installed this giant vacuum cleaner system will be the largest fully pressurized central waste collection system in an office complex anywhere in the world.

The Empire State Plaza consists of eight separate office buildings, a meeting center, and a combined library-museum clustered around a huge 5-story main platform. The platform itself, in addition to underground parking, a health laboratory, and other service facilities, also contains a large auditorium which can accommodate 2,800 persons for lectures or conventions, or 1,500 sit-down guests at a formal banquet. The giant complex is intended to provide modern, centrally located office space for a state work force of 11,000 to 12,000 people, many of whom are presently occupying various rented quarters in downtown Albany.

This large concentration of people in the enormous complex led to the decision to install a centralized waste collection and processing system. Otherwise, the Plaza might well have found itself buried under a daily anticipated accumulation of 50,000 lbs. of waste paper and trash (which is equivalent to the trash and solid wastes generated by a typical town of 5,000 people).



### System Outline

The refuse handling system presently being installed by TRANS-VAC Systems includes approximately 6,000 ft. of large diameter conveying pipe and some 68 loading stations located in the various office buildings. Although all buildings in the complex will be connected to the waste disposal system, only the 44-story main office tower will have pressurized vertical chutes. Bulk loading stations are being installed in the four 23-story agency buildings and in the platform area, while a motorized cart system will pick up from the meeting center and shopping areas on the main platform. Six Montgomery shredders and four compactors will be employed to reduce the accumulated trash and process it for final disposal.

When fully operational, the entire waste disposal system will utilize electronic computerized control stations to provide proper sequencing and operation. Changes can be made in sequencing so that discharge is regulated from one building to another simply by changing panels in an electronic control station.



### Background

Montgomery Industries has been designing, manufacturing, and installing pneumatic conveying systems since 1925. In 1970 the TRANS-VAC Systems Division was created to further develop this fast growing new application of a proven material handling concept in large office buildings, hospitals, hotels, sports complexes, and large residential projects.

#### We can be helpful

For best results, a pneumatic system should be decided upon during the preliminary planning stages of design. See our Catalog 11.25/Tr in SWEET'S 1974 Architectural Reference File. Please write or phone Dept. AR for additional information and/or design assistance.

**TRANS-VAC® SYSTEMS**

A Division of MONTGOMERY INDUSTRIES INTERNATIONAL

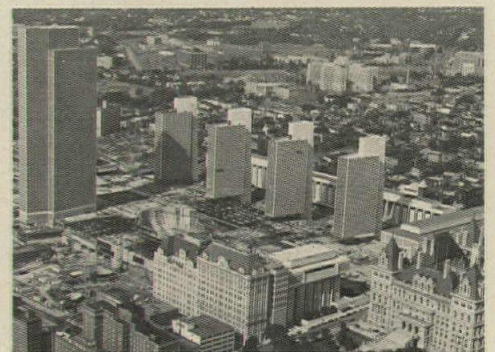
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JACKSONVILLE, FLORIDA 32206

TELEX 56292 PHONE 904-355-5671

All TRANS-VAC Systems are custom designed for each structure in which a pneumatic system or a waste disposal system is desired. Systems are designed around the architect's preliminary structural layout for new construction projects or for renovation of existing facilities. Each system design considers:

- The characteristics of the materials to be conveyed.
- Location of loading stations.
- Conveying velocities throughout the system.
- Sizing and placement of collector hoppers to receive the conveyed material.
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**News from the counterculture**

WASTELAND: *Building the American Dream*, by Stephen A. Kurtz; Praeger Publishers, New York, 1973, 125 pages, illus. \$7.95.

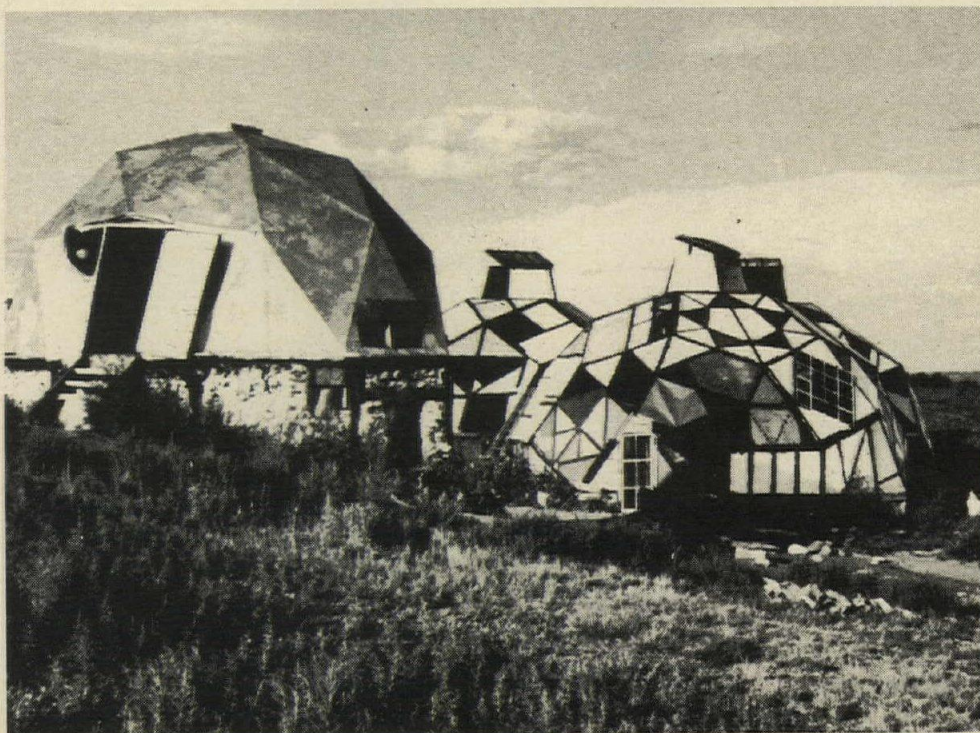
*Wasteland: Building the American Dream*, was billed in advance as "the first and only book to translate effectively the insights of the counterculture into a critique of design as the product of social values." Such advance publicity is hard on any book, but particularly hard on this one because of its modest length, uneven quality, and quirky subject matter. I think I'd rather be Daniel entering the lions' den than a mouthpiece for the counterculture.

Kurtz is an essayist and critic whose writings on architecture and design have appeared in several journals and who has an extensive background in philosophy and firsthand experience with life among the countercultural. His close personal involvement with his subject matter makes Kurtz a zealous advocate who sees the counterculture as a revolutionary, radical, alternative lifestyle in possession of the only remaining viable morality. But the evidence provided by Kurtz's book ironically suggests that the counterculture and its insights are largely reactionary, thriving more on negative rhetoric and the well-articulated put-down than on proffering revolutionary living possibilities. In the specific field of architecture, the counterculture has focussed interest on only two ideas of rather limited application—the "zome" and the handbuilt house. Meanwhile,

*Wasteland* suggests that everything built within "the system" (which is to say, everything else) is at worst dangerous, and at best lacking in integrity.

The format of the book is a series of chapters—really quite separate essays—loosely threaded together by a concern for the possibilities of new relationships to the built environment arising out of alternative life styles. Some of the essays are cogent, serious, and obviously heartfelt critiques of the oppressive and destructive nature of built-America. Other essays are little more than mindless propaganda from Drop City. However, the intensive muckraging is omnipresent, piling up to the point where the reader feels inundated. *Wasteland* is essentially humane, but the humanity, the searching for a new consciousness and renewed moral judgment of the environment are all but buried under the relentless invective.

The essays are divided into three groups: the highway, the suburbs and countryside, and the city, with a concluding section on the ar-



chitectural profession. "The Art of the Road" shows the impossibility of separating "beautiful" forms like interstate highways from their social context (often the ghetto neighborhoods through which the highway slices and slices up). "Howard Johnson's: Elevating the Host" is a Woody Allenesque socioesthetic critique of the classic Hojo, suggesting that it is a paradigm of how America has eliminated place and occasion. "Levittown" is a psychological study of the suburban lifestyle and environment, using Gans' classic study as a basis for a new and even more scary interpretation. "Urban Housing" discusses how a group of tenants bought and co-oped their condemned building as an option to eviction. These four essays, each thoughtful and provocative, stand in considerable contrast to the others.

"Intentional Communities," discussing life at Libre, Colorado, suffers from being a rather self-satisfied piece about the option (open to a minute portion of the population) of handbuilding one's house among friends in a tiny community of staggeringly low density—thirty persons to four hundred acres. The essay includes, as a subplot, a morality play featuring the zome vs. the cubiform (with the zome winning), which reveals in Kurtz a curiously elitist viewpoint, and indeed suggests that he has seen very little architecture, or at least has not looked very hard at what he's seen. I don't know of a single zome that is as sensitive to the uses and arrangements of interior space, to the relationships with the larger environment, or to the psychological and territorial demands of the inhabitants as any number of "conventional" houses I could list; houses which for all their "convention" and "cubiformness" are more subtly and seriously radical than any zome with its intrinsic systematized formalism. But further, Kurtz advocates Steve Baer, inventor of the zome (actually a rip-off of the classic Bucky Fuller dome), who in turn suggests the best material for zomes is the hacked out top of a car, which is a curious material, since its continued availability is dependent on some poor bloke being forever chained to the assembly line in Detroit that makes the car that supplies the top for the house that Steve built. So much for alternative life styles for the masses.

"Downtown: Culture, Commerce, Government" rightly criticizes institutions for their monolithic size and bureaucracy, but sees the alternatives merely in terms of smaller size, with ad hoc, or nonexistent organizational structures, and heavy popular participation, all of which is hard to argue with, but equally hard to imagine producing much of more than common interest.

"Make it or Break it," ostensibly about the





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professional architect, is really a reprise of the counterculture's most mindlessly confrontational stance, circa 1968. "Can it be, then, that the greatest architects of our age are not those celebrated in the histories—Le Corbusier, Mies, Gropius, those of the Bauhaus, the CIAM, the engineers, and the formgivers—but rather the architects of Algiers, who created holes where buildings had been, and terror in the heart of complacency?" During the salad days of the revolution, such a statement might have stirred the hearts of the many. Today, such a statement would seem tired and trite, were it not that the inheritors of "the revolution"—the Palestinian guerillas—continue to hijack and destroy people and planes for their own purpose. That Kurtz would actually pose such a question seriously shows the degree to which he has become entrapped in the mechanics and the chic of dropping out.

In the end, it's hard to know just what Kurtz is providing the reader. His muckraking criticism is fascinating, but not persuasive; the how-to-do-it chapter on urban squatting is not really informative enough; for all the apparent specificity of each essay, the reader is left with little of lasting substance.

What the book does show, however, are the ways people react to a popular movement like the counterculture (or the current interest in para-psychology). For some, the counterculture has been an objective thing, like a bar of soap to be bought, a set of answers to be learned, a way to be absorbed; for these people (and for the architects among them) the new consciousness has meant little more than a move from one comment to another. For other people, the counterculture has been a genuinely cathartic device, a chance to renew, or modify, or change one's vision and commitment and relationship in a personal, subjective, and unique way, rather than by rote. It is the vacillation between these two poles in Mr. Kurtz's own personal struggles, and the seriousness and intelligence of that struggle that make this at least an interesting book to read.

—Richard Oliver

*Mr. Oliver, an architect who works in New York, has taught in the architecture schools of the University of Texas and UCLA.*

#### Also Received

FINANCING REAL ESTATE DEVELOPMENT, edited by Harry A. Goleman; published for the American Institute of Architects by Aloray Publishers, Englewood, New Jersey, 1974, 143 pages, illus. \$21.50.

This new book is designed to be a reference work, with rapid-scanning page headlines, a two-color format and an extensive glossary; six contributing authors, in addition to the editor, provide expertise from the legal and economic fields. Some of the subjects that are covered are: financing types, financing techniques, financing sources, organizing and obtaining financing and the resulting tax consequences.

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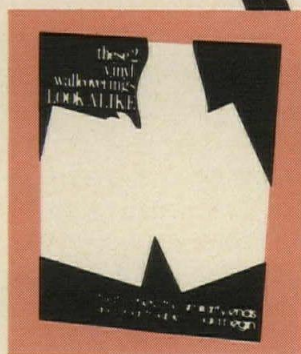
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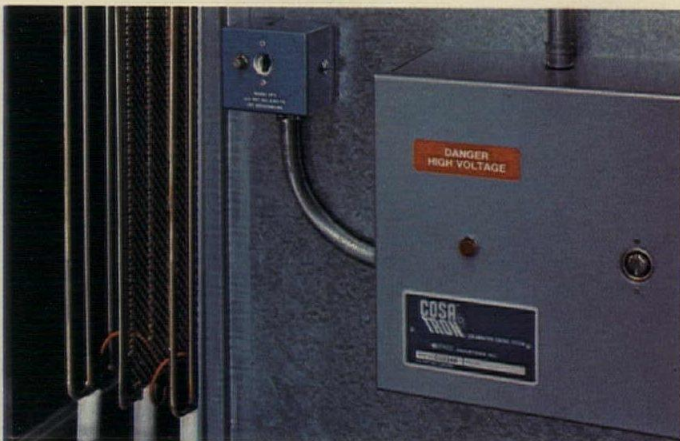
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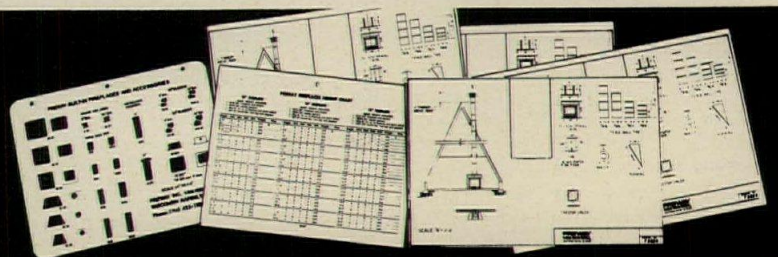
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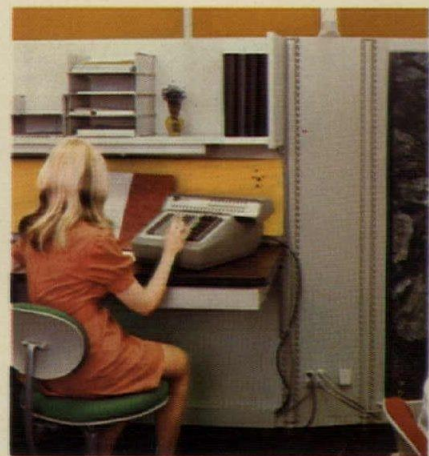
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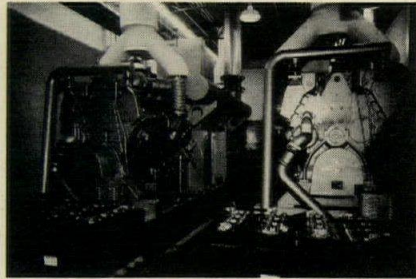
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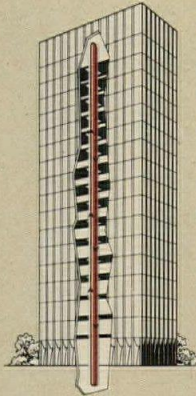
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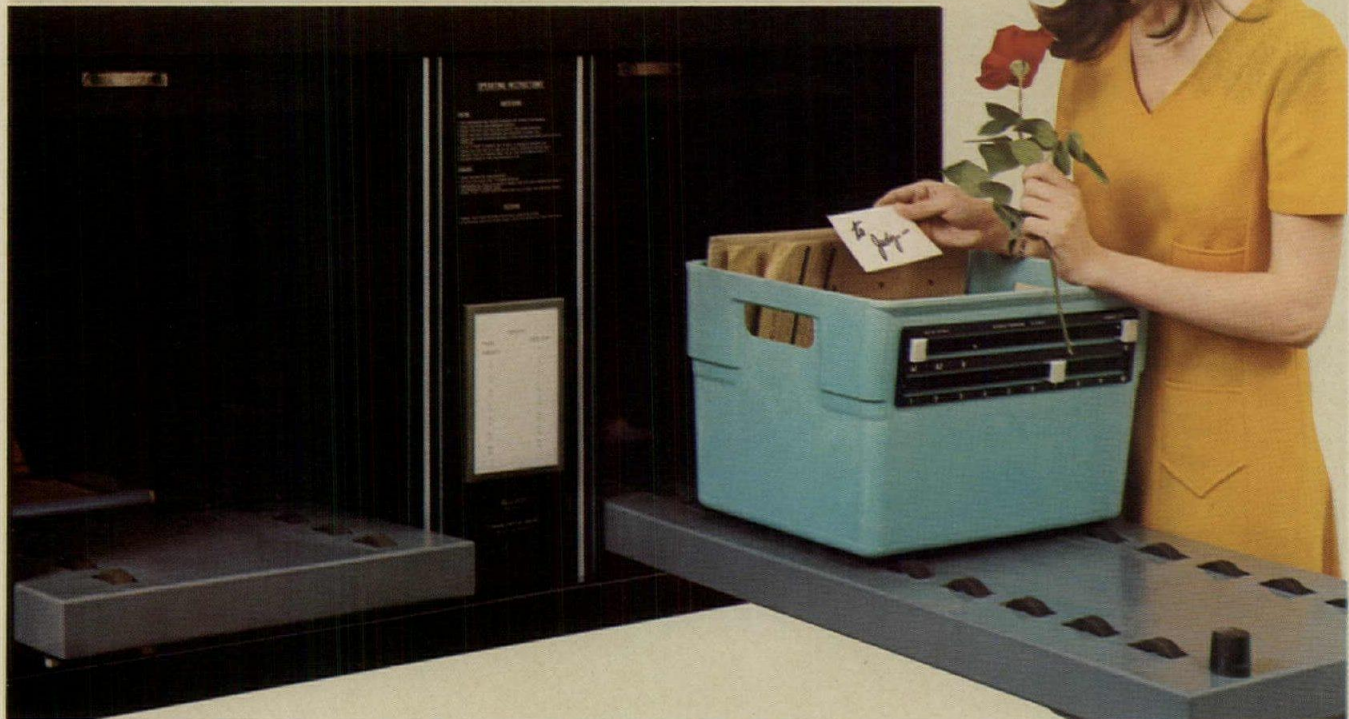
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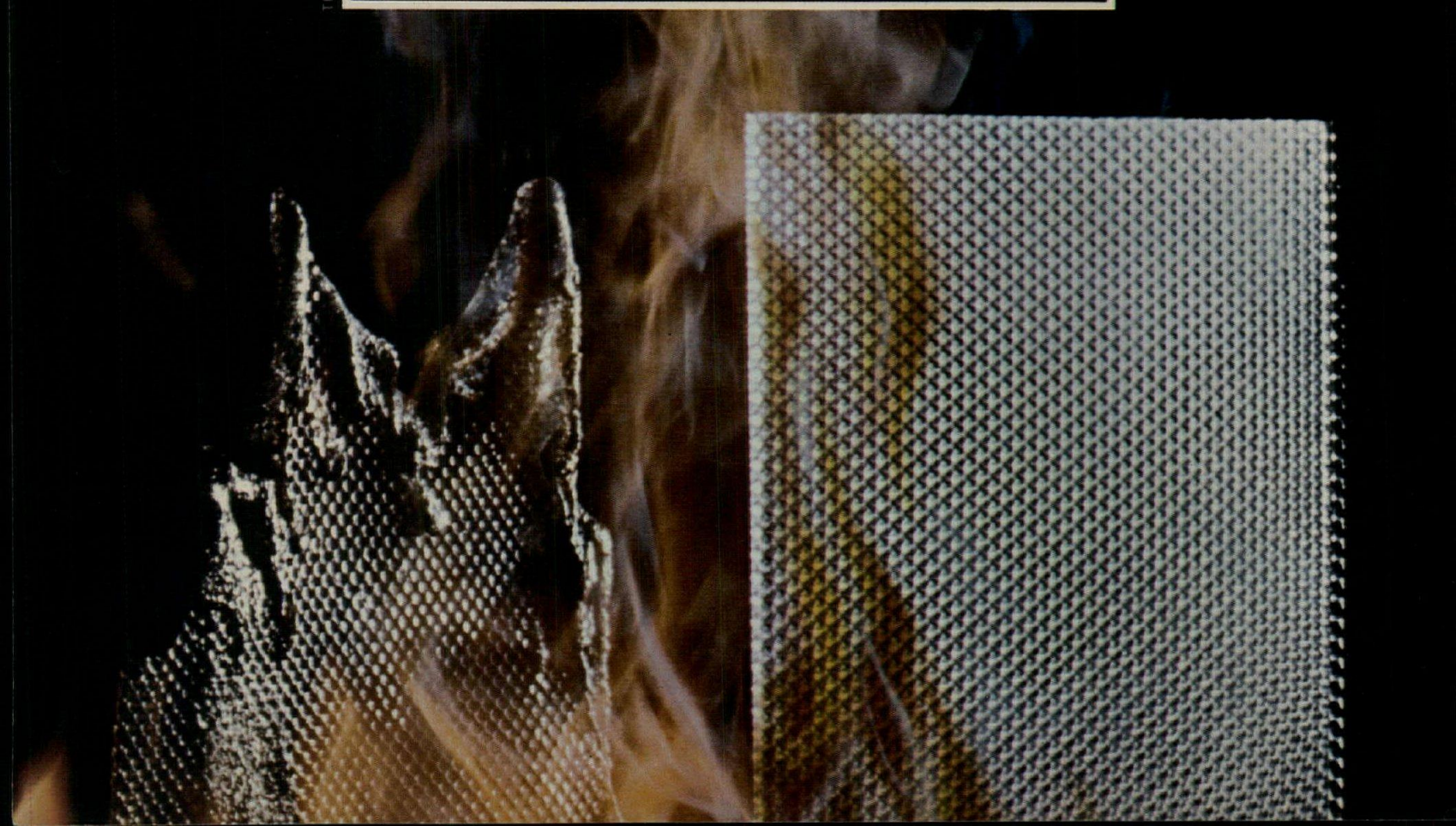
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Spanning 47' 6", these spandrel members consist of 70-inch-deep built-up steel girders with 14 gage steel sheet flange shielding. The girder, as a structural member, supports cladding, frames for fixed and vertically pivoted windows and a portion of the floor construction. Cladding for the column and flame shielding for the spandrel

flange is galvanized sheet steel while the spandrel girder steel is ASTM A36.

Spandrel girders, cladding and sash are weather-protected by a three-coat paint system.

## New ideas invited!

A vast research program preceded the design of One Liberty Plaza. The architects were encouraged to delve into any aspect of architecture which excited them. The result is a building which incorporates many new concepts—and a fund of ideas for future use.

One aspect of the research covered internal wind bracing. Four schemes were evaluated to determine the best possible combination of internal and external bracing. The resulting pattern produced an optimum framing system for the 54 story building—and cut the steel weight to 25 lbs. per sq. ft., with no columns in the perimeter office space.

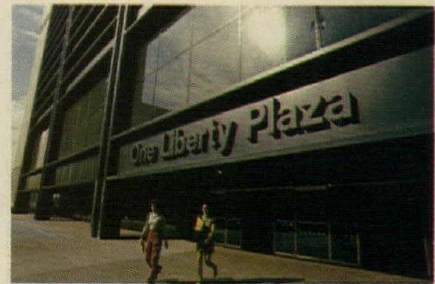
## Rental space increased by 10%

A Split Core with central corridor was selected in place of a Perimeter Corridor System. Choice of this system increased rental space by 10%.

Spaciousness results

from an entirely column-free interior. This allows completely flexible arrangement of office space in which a modular partition system can create walls at will.

One Liberty Plaza is an imaginative example of how architecture and structure can blend to produce a building that makes economic sense, functions well and is pleasing to look at.



## "Nine new looks at office buildings"

This fascinating report on the nine research programs that preceded the design of One Liberty Plaza, shows in detail how the best systems for this building were arrived at. For a copy of this report or for any other details, call our nearest sales office and ask for a USS Construction Marketing Representative. Or write U.S. Steel, Box 86, Pittsburgh, Pa. 15230.



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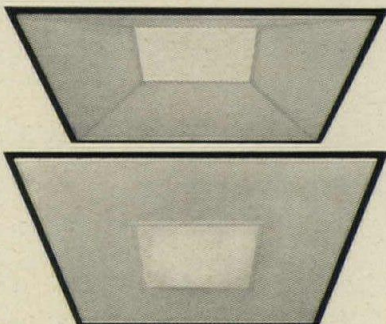
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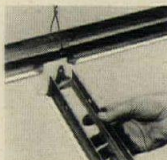
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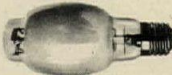
Slots along the center of the runners make it possible to conceal air handling boots anywhere on the 5'x5' grid. These runners also mate with moveable partitions, giving the designer great flexibility in organizing work space.



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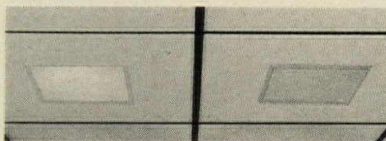
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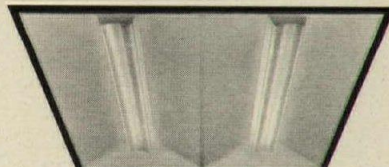


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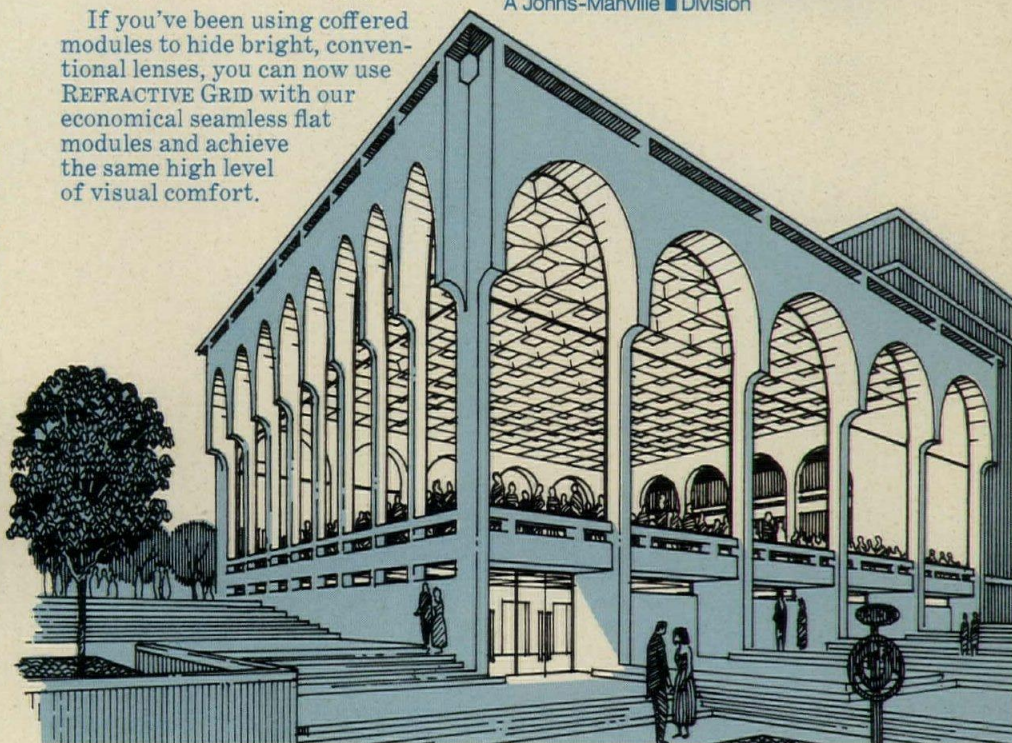
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## Organization for professional business development

*HOW TO MARKET PROFESSIONAL DESIGN SERVICES*, by Gerre L. Jones; McGraw-Hill, Inc., New York, 1973, ix+354 pages, illus., index, \$14.50.

This book is not afraid to call business development by its right name, *marketing*—and marketing by its right name *selling*. It is full of practical information and is written in an eminently readable style that pulls no punches while it avoids the usual language of “courses in salesmanship.” A sampling of Mr. Jones’ broad knowledge has appeared in this department before and has found its way with appropriate amplification into his book. The January 1973 article on how to approach government agencies and the April 1973 article on the standard government form 251 are examples.

Mr. Jones spends appropriately brief pages on historical background and principles of marketing and comes quickly to Chapter 3 on “Getting Organized” followed by practical and well-researched sections on where to find prospects, promotional tools of the trade, presentation techniques and many other items in a well-indexed 16 chapters. One of the timely chapters is a candid one on political action which not only reports on some of the news in this field but puts serious analysis of lobbying and political contributions into perspective.

Following is a direct extract from introductory pages of Chapter 3 on getting organized. This material is backed up in the book by suggested forms for work sheets and prospect data files of various kinds.

### Getting organized

“The odds are that the reader’s interest in the subject of business development is occasioned by one of the following three conditions:

1. Up to this point his firm has had no formalized approach to new client acquisition; perhaps he has become disenchanted with the results from chasing leads obtained from purely social contacts and he is looking for a business-like approach to getting business.

2. He has had a halfhearted, basically hit-and-miss business development program which intensifies with the completion of current work, but tends to slack off when his staff gets busy. The peaks and valleys caused by this on-again, off-again pursuit of clients distresses both his associates and his accountant, not to mention his creditors.

3. His firm has had a reasonably successful business development program over the years and has enjoyed a moderate-to-good annual growth rate as a result. However, he cannot shake the feeling that his present approach

needs a long, hard look, probably some pruning and touching up, and possibly even a complete overhaul. He would like to know what other firms are doing in this field and is receptive to picking up suggestions for improving his own efforts.

### Know your firm

“Whichever category a firm falls under at this particular time, there are a few initial steps indicated before any meaningful decisions can be made about the intensity and complexity of its new or revised business development program. These steps may be loosely classified as internal investigations, under the heading Know Your Firm.

1. Know your principals (partners and associates); your professional, technical and office staffs, and their present and potential capabilities and specialties. It goes almost without saying that you should be equally aware of their drawbacks and limitations.

2. Know your general practice mix and—of equal importance—what is missing from it.

3. Establish realistic profit goals and attainable growth rates for the foreseeable future.

4. Know your competition—present and future.

5. Establish a desirable geographic coverage for your firm’s operations. If expansion is indicated determine the best method of achieving it, e.g., purchase of other established firms or setting up your own branch offices; going into a new area “cold” or waiting until you have a major job in the desired city, either on your own or with an associate.

“Only after a genuinely objective and introspective look has been taken at a firm as it now exists and operates, coupled with an analysis of its goals for ten, fifteen, even twenty-five years from now, is one ready to embark upon an aggressive, effective, and professional program of business development. The short-range scatter-shot, hit-or-miss approach to client development is not nearly so productive in the long run as the reasoned, planned, and organized attack.

“The principals may want to consider retaining an outside management consultant for all or part of this self investigation. Many professional firms do bring in outside consultants, with no particular relation to the design firm’s size. The sad history of many such surveys is that the client heeds only what he believed or wanted to hear in the first place and ignores or denigrates the sections of the report which run counter to his preconceived ideas.

“No matter whether the decision is to es-

tablish one’s own investigative task force or hire a management consultant, the principals should be prepared to accept and act upon most, if not all, of the findings and recommendations for getting their own house and ideas in order.

### Market research

“Other types of surveys may be helpful to future planning. Marketing studies, for example, can analyze client needs and thinking, qualify prospects, and measure the degree to which a firm is known by prospective clients and the general public.

In mid-1971 a large Midwestern firm of architects, engineers, and planners commissioned a marketing survey by mail among past and present clients scattered across the United States. The sponsoring architectural firm was not identified and the questionnaires were returned unsigned by the respondents. Among the results turned up by the study were these:

1. About two-thirds of the respondents indicated their organizations would require design and planning services in the next twelve months. (A 49-percent response was obtained from some 500 questionnaires sent out.)

2. Respondents were asked to rate seven considerations for selecting an architectural firm. The order in which the seven factors finished is interesting in that it seems to explode a myth or two about how and why clients select their architects. The seven factors and their ranking:

- Total-service capability
- Engineering know-how
- Design creativity
- Past projects of the firm
- Post-construction follow-up
- Proximity of the firm to the project
- National prestige of the firm.

3. A question on client preference for the staff size of an architectural firm left the respondents almost evenly divided between “under 50,” “51-99,” “100 and over,” and “No Answer.” Each category accounted for approximately one-quarter of the replies.

“In a summary of their report, the market research firm that conducted the survey commented:

... the respondents provided what we believe are valuable guidelines for new business activity. The survey confirmed that your strengths are important to them and that your firm is better known than any other. It also provides a scale of importance that can be used to fine-tune marketing activities and to guide you in adopting a posture that might be varied to



fit the needs and desires of different prospects. One type of prospect, for instance, may prefer one "image" over another. And the large size of your firm is perhaps something to underplay in some cases. In other words, the results of this study may help you to 'give them what they want.'

"After all, research is a marketing tool which should be used to supplement executive judgement; it's an advisory function that can be instrumental in business success if the data provided is useful to management.

### The director of business development

"It is hoped that some of these studies and surveys will turn up one or more individuals among a firm's principals with an organizational bent. Regardless of how large or restricted the client acquisition efforts will be, one person must be assigned the primary responsibility for making it work. His job will be to coordinate all efforts, make assignments of principals and other staff where and when indicated, review promotion materials and presentations, maintain contact records, and follow up on all prospects. There should be a clear understanding with the rest of the staff members about their continuing obligations in obtaining new business, but every army requires a commander if it is to accomplish its mission.

"It is probable, except in the largest of firms, that the person in charge of business development will be able to devote only part of his time to such efforts. For this and other obvious reasons it is vitally important that he be backed up in his work by an above-average secretary-assistant. Thoroughness, accuracy, conscientiousness, awareness, imagination, and alertness are some of the necessary attributes of this assistant.

"A few of the larger practices have separate departments for business development headed by a vice president or similarly titled executive. The staff, all full-time, of these departments varies from one to a dozen or more specialists."

### Recruiting and budgeting for sales

Mr. Jones offers many hard facts and figures about the job descriptions and compensations to be expected in manning a business development department. One of the job descriptions is in the form of an executive circular several pages long describing more than a dozen qualifications for the director of business development. The list is a formidable array of talents, and the starting salary was \$28,000 plus an annual bonus. It is pointed out that many salaries for these positions in larger firms are from \$35,000 to \$50,000, often related to performance of the marketing endeavor as reflected by growth in billings. In the case cited, the executive's first year's compensations of about \$32,000 represented less than four-tenths of one per cent of his firm's total billings of over \$8 million for that period. The following section on budgeting for marketing costs is typical of factual guidance to be found in this book.

"Since promotion budgets of design pro-

fessionals are seldom made public, one must interpolate, interpret, and adapt to come up with specifics on the subject. The American Management Association says an average figure for sales or marketing expense is around 10 per cent, and includes the time of partners and other principals spent on business activities.

"In one recent seminar on marketing professional services the participants said their firms budgeted or spent on business development amounts ranging from 10 to 20 per cent of annual billings. The largest figure was for a highly specialized consulting firm.

"As a base point for setting up a budget for sales efforts, business development, promotion—whatever the activity is called—a figure of between 5 and 8 per cent of annual billings has been suggested. On \$1 million in projected billings for the year, a tentative budget range might be \$50,000 to \$80,000.

"This is probably the most logical manner in which to arrive at a budget for business development. With the total amount in mind, the number of man-hours it will pay for and make available for new business efforts can be computed easily.

"An alternate way is to decide in advance which staff members are to be assigned to business development, estimate the time each may spend, multiply this by man-hour costs, and thus arrive at the total figure. If the 5-to-8-per cent guideline has been exceeded by this method, a cutback may be in order."

### Planning for Growth

"As to the practice mix—the second consideration in the internal investigation—it is surely obvious that a firm makes more profit from one \$40 million project than it does from twenty \$2 million jobs, everything else being equal.

"One firm's principals decided that an average of \$2.5 million in new work was required each week to maintain the rate of annual growth established over the previous five or six years. While all of the principals had generally been aware of the fact that a certain amount of new business was required each year to fuel their fairly large firm, no one had ever bothered to break it down to this precise weekly need. The general state of shock this fact induced initially almost convinced the accountant that his calculations—or at least the announcement of them—had been a mistake.

"He was able to ease the blow somewhat by pointing out that two or three \$10 and \$20 million jobs took care of a number of weeks, but for some period following the disclosure of the \$2.5 million weekly requirement the managing partner was observed muttering "\$2.5 million a week!" all the while shaking his head as in utter disbelief. In spite of this one accountant's experience, it is prudent and advisable for firms to have a similar check run on their own billings.

"The arithmetic is not involved. One method of arriving at a weekly or yearly required input of new work for the coming year is to project the unserved fees for the firm as of December 31 of the current year. Then esti-

mate as accurately as possible how much of this amount will be earned in the next year. This will give the next year's earned income if no new work is obtained—a highly unlikely situation. Next, determine how much in new billings will be needed to just duplicate the present year's results and, finally, multiply by the hoped-for annual growth factor.

"As an example, let's look at a firm which expects to have \$1 million in unserved fees at the end of this year. The principals estimate that 80 per cent of the \$1 million carry-over will be earned during next year—or \$800,000. Billings for this year should total \$2.5 million. The firm has enjoyed a 15-per cent annual growth rate for the past seven years, so for next year, on this basis, the firm should achieve \$2,875,000 in gross billings (\$2.5 million plus 15 per cent of the \$2.5 million).

"Since the firm will begin next year with the expectation of earning \$800,000 in billings for work already in house, simple subtraction shows a requirement for \$2,075,000 in new billings for next year. Keeping in mind that only part of this new work—say 75 per cent—will actually be earned in the next twelve months, we determine that almost \$2.8 million in new billings, in addition to the assured \$800,000, will be needed next year to maintain the 15-per cent growth rate. Using an average fee of 5 per cent, the \$2.8 million translates into some \$55 million in new work required to earn the necessary billings. This can then be broken down into monthly or weekly goals for the business development office."

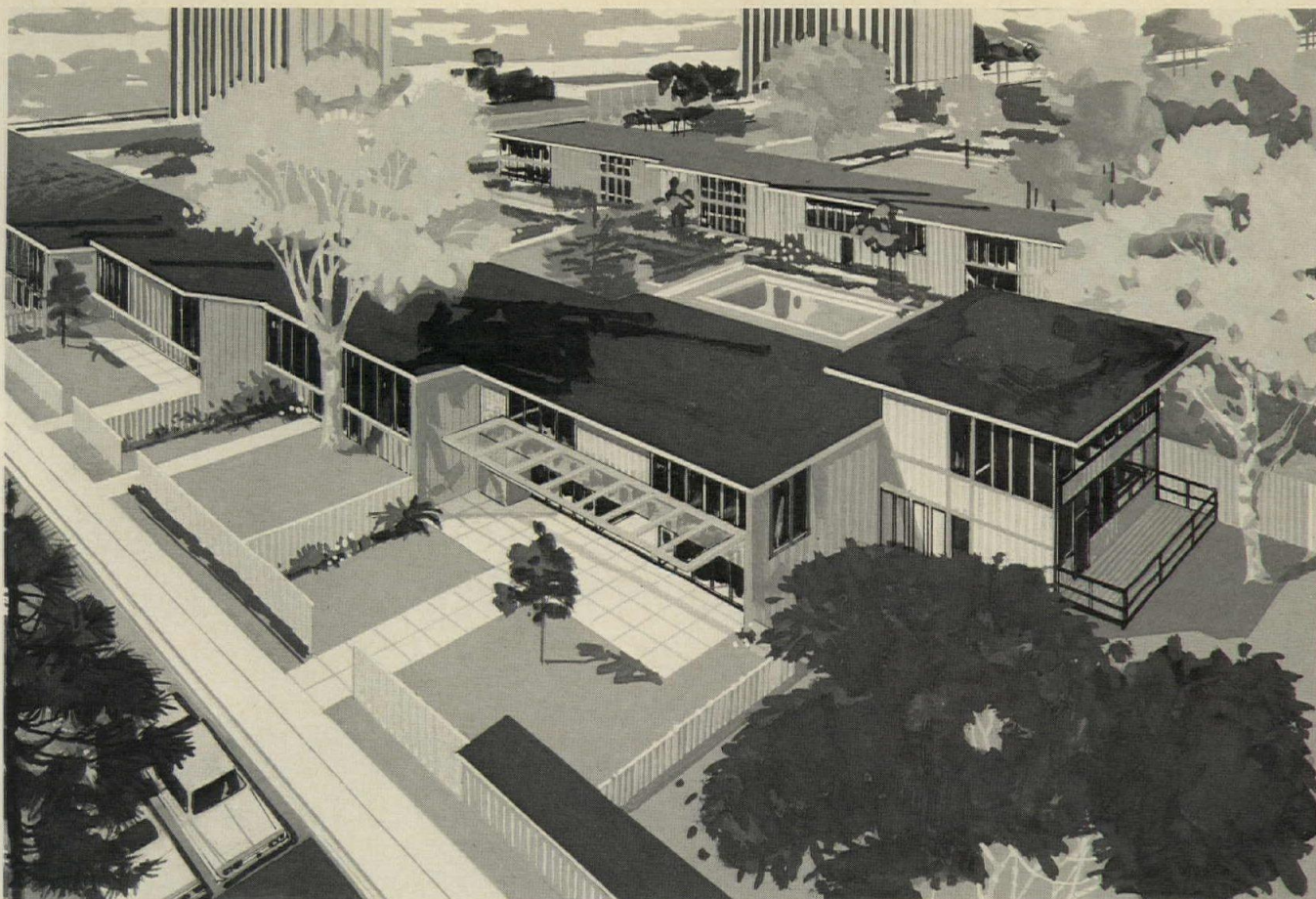
In considering the importance of the practice mix of job variety in building types and sizes, Mr. Jones points out that many firms who are financially successful discover the balance of their practices more or less after the fact. One of the firms he talks about made an analysis showing that their jobs were about equally divided between public and private projects and that over 70 per cent of its work came from past clients. While this did reflect favorable client reaction, it also pointed out the fact that failure to develop new clients could result in a falling off of repeat business eventually.

One of the devices for developing business in special lines of expertise, says Mr. Jones, is to have staff experts publish articles or books in the special area. This book is certainly an example of this method.

### About the author

*Gerre L. Jones knows how to market professional design services. His career as market development executive for several national firms developed out of early experience in public relations specializing in architectural firms. He is now vice-president of a Washington, D.C. firm, Gaio Associates Ltd., whose Building Industry Development Services division publishes a current-work jobletter called b.i.d.s. and is co-sponsor with ARCHITECTURAL RECORD on a series of professional marketing workshops for architects, engineers and related professional consultants. The seminars, for which this book is included among work materials, are held on a monthly basis in various cities as shown on page 244.*





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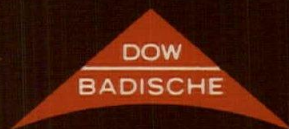
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## Let's define construction management

*George T. Heery, president of the Atlanta-based firm of Heery & Heery, has long been an articulate protagonist of time and cost control management in support of the architect's primary design role. His book, "Time, Cost and Architecture" is scheduled for publication by McGraw-Hill in November of this year. The following definition by George Heery is not so much a direct quotation from the book as it is a commentary on the recognized need for understanding at this time.*

The term *construction management* may be following in the footsteps of too many other perfectly good terms toward ambiguity and misunderstanding. For one thing, there are many different ideas, some in conflict with others, as to what construction management is. A major reason for this myriad of definitions is this: Many people who think of "Construction Management" are really thinking only of one small sector of the broad field.

So to start off right, let's begin by defining the *whole* of Construction Management:

*CONSTRUCTION MANAGEMENT IS that group of management activities over and above normal architectural and engineering services related to a construction program, carried out during the pre-design, design, and construction phases, that contributes to the control of time and cost in the construction of a new facility.*

The professional construction manager, then, is the individual or firm who ties himself to an owner in a professional arrangement and applies the proper combination of management activities to a construction project to achieve time and cost control.

As a practical matter, professional construction management services do not include the direction of work within a contract or sub-contract, but are concerned with the planning for and manipulation of those contracts. If the construction management plan for a given project involves a series of eight separate contracts awarded in phases, it is neither the responsibility, nor the proper function of the construction manager to undertake the contractual responsibilities of supervision, direction, and coordination of any of the work *within* any one of the eight contracts. This is an area of confusion among some who have not done their homework on the emerging professional service of construction management.

There is a school of thought, which is quite common today, that construction management is limited to the process in which the

general contractor is eliminated and the construction manager administers a series of separate contracts under a professional fee arrangement with an owner. Of course, this arrangement has become common and can certainly work well in some situations. *But* it ignores, or at least minimizes attention to the fundamental fact that the greatest savings in time and cost in a construction program can be achieved during the design phase. It is during the design phase that the quantity and quality of the building are established, the systems which will affect construction procedures are selected, the start time for construction is determined. These activities almost invariably have more control over time and cost than management activities not instigated until during construction.

Another school of thought says the construction management means phasing of design and construction, overlapping the two functions to shorten total time. This "fast track" system has also been shown to work. But in many situations it has distinct shortcomings including the fact that the owner cannot be assured of a final construction cost on a completed set of documents; that is, he can't be certain just what he is going to get for his money, or for that matter, how much he will be required to spend.

Are these two approaches really Construction Management as identified by the term? Certainly they can be a part of it. But each approach is only one of many ways in which a project can be accomplished, and at best, each offers only part of the control construction managers should be attempting to provide.

In order to be most effective, the construction manager should always be involved before or during the design phase to assure that the emerging design can be constructed within the budgeted time and cost. The CM will provide pre-design programming and budgeting, cost analysis and value engineering, scheduling, along with guidance on materials and construction methods, and make recommendations regarding the way in which the construction contract package should be arranged, and should generally determine the plan of construction. He will manage bidding and negotiations, and handle contract awards.

Although there are any number of possible construction management plans for the construction phase, most will fall into one of four basic formats:

1. *A single-responsibility general contract, ob-*

tained through competitive bidding or direct negotiation, depending on the respective owner's posture and desires. It is in relation to this format, which might be referred to as the traditional approach, that the greatest misunderstanding exists. The idea that when one uses a single-responsibility general contract construction management is not needed, or that when one uses construction management the use of a single-responsibility general contract is precluded, comes about from a very narrow view of construction management. Or, it may be that this view comes about from a lack of definition of the goals of CM; i.e., optimum control of cost and time for the respective project. Assuming that competitive bidding is to be employed on a project, there are virtually no differences in the construction management activities that should be undertaken during the design and pre-construction phases whether there be a single-responsibility general contract or any number of other arrangements employing separate contracts for the construction work. Certainly, the design phase and other pre-construction activities of the construction manager are fully as important for this format as for any of the others, such as the three discussed below.

It is true that the scope of construction management services in connection with a single-responsibility general contract will be substantially smaller in terms of man hours during the construction phase than it will be for that phase in any one of the three following contract formats. However, the services are hardly less valuable to the owner.

2. *Separate early contracts* awarded for portions of the project which are identified as potential constraints. Subsequently there would be the award of a general contract, and by contract provisions in this and the early awarded contracts, one or more of the previously awarded contracts could be transferred into the general contract. The separate early awarded contracts might be for such things as the structural frame, electric switch gear, systems components, grading or foundations, etc. By the transfer procedure, as soon as feasible the owner has a single-responsibility general contract in effect for the project.

3. *Separate prime contracts* that remain separate throughout the project for statutory or phasing reasons. This approach is sometimes referred to as "fast track." (However, there does not appear to be a universally accepted definition in usage for "fast track," and, in turn, a great deal of confusion seems to accom-





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The DURANAR 200 on ALCOA® BOLD RIB® industrial siding helps do all three. First, it offered Hofmeister Company the color they wanted—a dusky Mayan bronze to blend with a multi-colored brick.

As for strength, DURANAR 200 color finishes will last for years and years. And DURANAR 200 coatings have the

built-in properties to resist intense sunlight and industrial chemicals, not to mention wind, rain, sleet and snow.

Want a building finish you can be proud of? See DURANAR 200 coatings in Sweet's Architectural or Industrial Construction File 9.10/PPG. Or contact the Market Manager, Coil Coatings, PPG INDUSTRIES, Inc., Dept. 4-6, One Gateway Center, Pittsburgh, Pa. 15222.

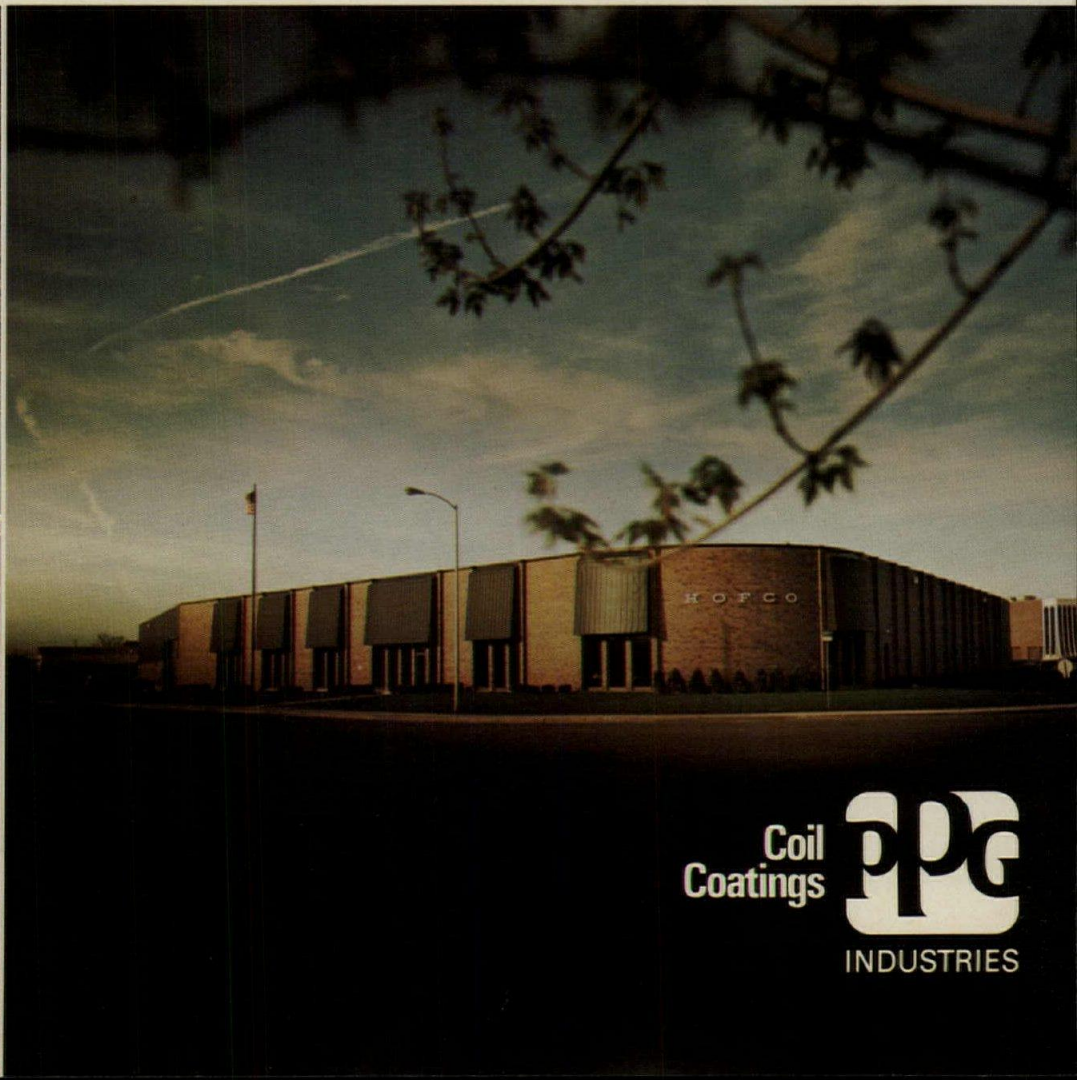
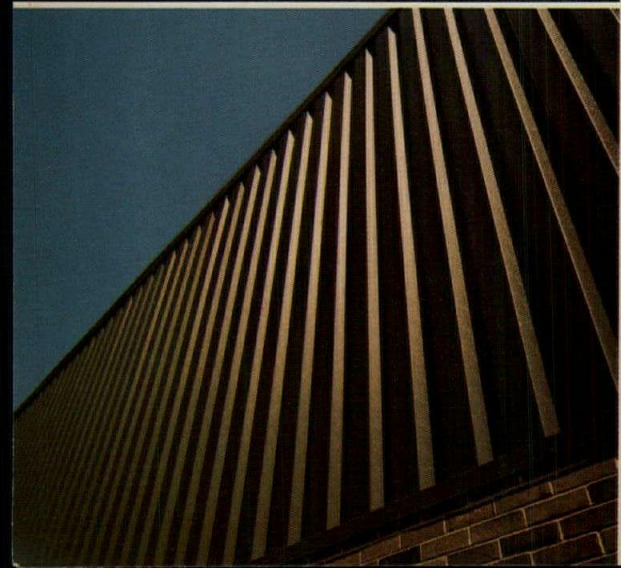
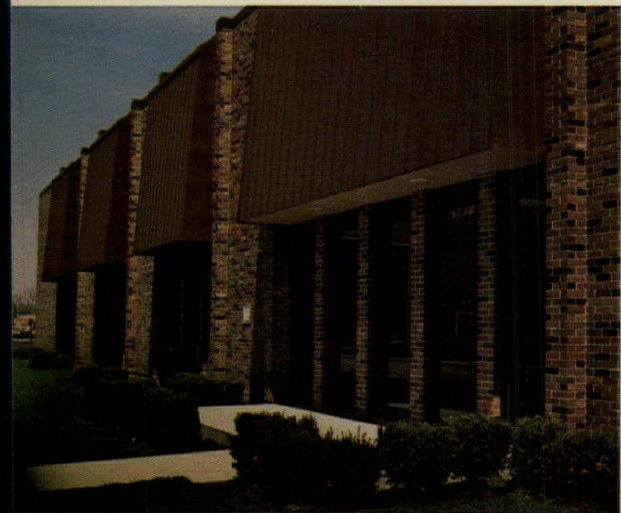
**PPG: a Concern for the Future**

\* ALCOA and BOLD RIB are registered trademarks of Aluminum Company of America.

Hofmeister Company, Niles, Illinois. Developer: J. Emil Anderson, Tam O'Shanter Industrial Park, Niles, Illinois. Construction: Allstate Erectors, Inc., Park Ridge, Illinois. Panel Coater and Fabricator: ALCOA.

For more data, circle 53 on inquiry card

4-6



Coil  
Coatings



INDUSTRIES



pany the use of this catchy jargon.) Under this format, the separate prime contracts might include the major parts of the project such as mechanical work, electrical work, structural work, systems components, special equipment, site work, and general construction.

There is a variation to this format which is often found useful. The owner and construction manager may determine that the majority of the construction work should be included in a single, "general" contract, but that one or more later separate contracts should be awarded for items such as carpeting, food service equipment, laboratory equipment, graphics and signing, or landscaping. Usually this plan is best during projects with long construction times which dictate that the items mentioned cannot be realistically priced during the general contract bidding period (due to their purchase and installation occurring late in the construction period).

4. *Direct management* of separate trade contracts and field crews. A separate trade contract is a contract for a portion as large as the mechanical systems and as small as the tile work, glazing, painting, cabinet work, cleaning or the like. Within this format it is not unusual to find thirty to forty separate trades on a project. Field crews (i.e., not separate contracts, but labor crews directly employed by the owner under the Construction Manager's supervision) might be used for such miscellaneous tasks as cleaning and unskilled labor work. In this case, and to some extent in approach 3, there is no actual general contractor. This approach, and approach 3, as outlined above, might frequently be employed in situations when the traditional owner-contractor relationship may not be in the owner's interest.

Of course, construction management for a project may be obtained in ways other than a separate professional construction manager or through a combined design and construction management contract. For example, the architect-contractor team approach might be said to automatically provide construction management to the owner. While this approach to a project is neither available to nor always in the best interest of all owners, it can be highly productive to the right owner, with the right combination of architect and contractor, and in the right set of circumstances. However, when this approach is employed, it should not be confused with construction management as a professional service provided on behalf of the owner.

Construction management provided through a combined design and construction management service, by a single entity, is, of course, a professional construction management service, and, assuming that a firm with this broader capability is available to the owner, may be the very best way for an owner to obtain CM services. The fact that the CM is not separate from the architect-engineer can easily have as many advantages to the owner as the separate CM arrangement.

To review, the function of the professional construction manager is to control time and cost on behalf of an owner during the construction process. In order to do this effectively, his efforts must begin concurrently with

or before the design process. These efforts must continue throughout all phases of design and construction.

During the construction phase, the construction manager performs services which include detailed observation of the appropriate liaison/coordination of architects and engineers, contract administration, payment control, and reporting to the owner. When there are two or more contractors on one site, the CM must coordinate the efforts of these separate contractors. But these services are only the basic CM services during construction. Other CM activities may include scheduling and CPM program maintenance, administration of owner or tenant move-in, coordination of off-site work, recommendations regarding recovery plans if contractors are behind schedule,

preparation of maintenance manuals, and many other services, depending on the needs, desires, and authorizations of the owner.

The most important point, however, is to remember that there are any number of ways to apply construction management. The one most applicable to a given project should be used regardless of whether or not it utilizes a single-responsibility construction contract or multiple contracts. Once again:

*CONSTRUCTION MANAGEMENT IS that group of management activities over and above normal architectural and engineering services related to a construction program, carried out during the pre-design, design, and construction phases, that contributes to the control of time and cost in the construction of a new facility.*

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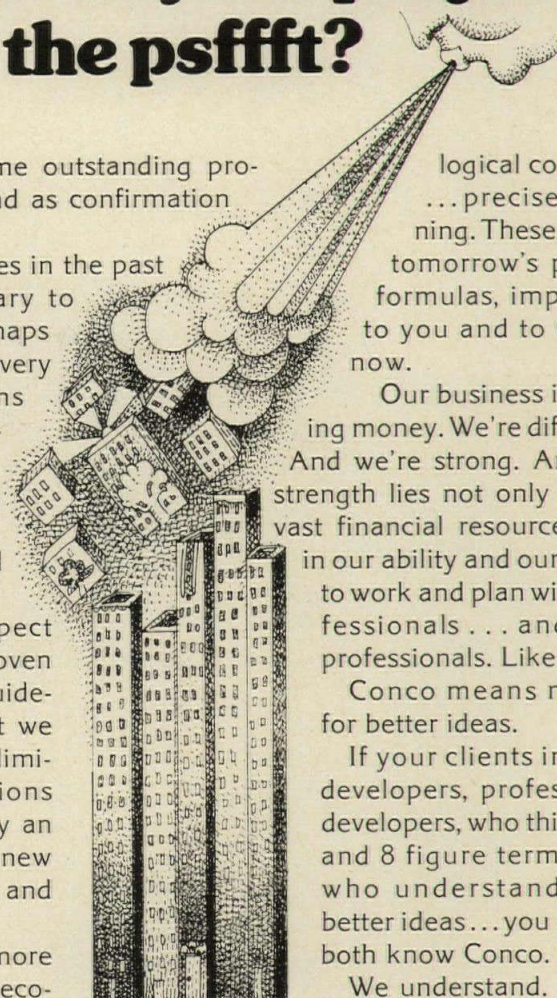
logical concerns... precise planning. These will be tomorrow's proven formulas, important to you and to Conco now.

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# Would you believe

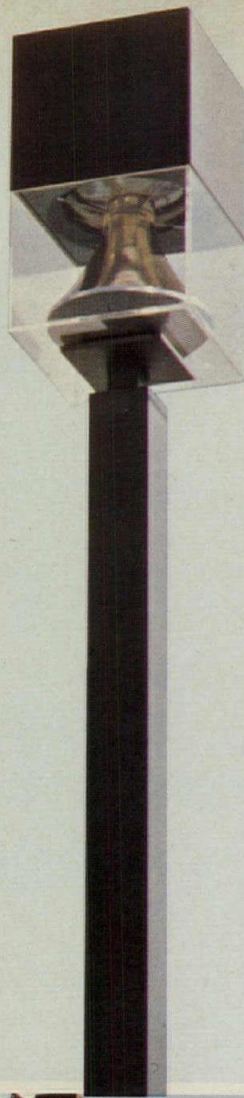
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**one watt of energy for 55 sq. ft.**

of excellent illumination\*?



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In our recent 2 page spread headlined "Some Hard Facts About Outdoor Lighting, Visibility and Energy Consumption," the beautiful Pericline Contemporary clearly has the answers to help in energy conservation without the sacrifice of architectural considerations.

Test data is available upon request, that compares spacing and illumination levels of a broad range of area lighting luminaires.

\*Based on a 400W High Pressure Sodium lamp with 27 ft. mounting height, 170" x 130", staggered spacing, producing .55 footcandle at the least illuminated point in the area.

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**Costs of indoor tennis courts**

Indoor tennis courts, seem to be experiencing the same boom that hit the bowling alley business in the fifties. The typical tennis court contains between three and six courts. As an added inducement there is usually a pro shop, sauna and massage room and a shower and lounge. There is often separate space for a tennis pro who also serves as manager.

The tennis courts are constructed on an asphalt base, typically six inches thick, which costs from \$3.00 to \$6.00 a square yard depending upon soil conditions. A playing surface is applied onto the asphalt which is either an acrylic paint, an emulsified product or a urethane or neoprene material placed on an epoxy bed. The cheapest and least durable surface is the acrylic paint finish which costs approximately 40¢ per sq ft to apply, followed by the emulsified surface which costs about 65¢ per sq ft then the urethane, neoprene surfaces which range in price from \$1.50 to \$2.20 per sq ft and are by far the most popular playing surface for the indoor courts.

Generally, indoor tennis courts range in size from 20 to 30,000 square feet. Pre-engineered steel buildings are the most economical to construct and seem to have a wide acceptance in this field. Costs of the finished structure range from \$9.50 to \$23.00 per sq ft depending upon the quality of the interior finish and the supplemental facilities.

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

**INDEXES: March 1974**

1941=100.00 (except as noted)

Metropolitan area	Cost differential	Current Indexes				% change last 12 months
		non-res.	residential	masonry	steel	
U.S. Average	8.1	439.7	413.0	430.3	420.1	+11.87
Atlanta	7.5	553.4	521.8	541.5	529.7	+ 9.52
Baltimore	8.1	485.5	456.6	473.4	460.1	+13.17
Birmingham	7.3	409.2	389.7	394.9	390.5	+12.30
Boston	8.8	445.4	421.0	439.2	428.4	+11.07
Buffalo	8.7	478.5	449.5	470.6	457.1	+10.63
Chicago	8.4	517.7	492.3	499.2	493.0	+14.53
Cincinnati	8.5	470.4	442.7	457.3	446.3	+12.65
Cleveland	8.7	470.6	442.9	459.7	449.3	+ 7.74
Columbus, Ohio	7.9	453.7	426.1	441.4	432.4	+ 9.72
Dallas	7.5	442.3	427.3	431.7	423.4	+12.94
Denver	7.9	468.0	440.4	459.9	445.4	+11.04
Detroit	9.5	508.0	484.5	511.4	491.8	+15.73
Houston	7.0	397.9	373.8	387.9	380.9	+ 7.22
Indianapolis	7.5	398.4	374.2	389.2	381.0	+ 9.06
Kansas City	7.9	413.0	390.3	403.6	393.3	+10.65
Los Angeles	8.4	517.3	473.0	501.7	491.3	+18.82
Louisville	7.4	437.6	411.1	427.1	418.0	+11.77
Memphis	7.7	434.2	408.2	417.4	411.7	+16.99
Miami	7.7	454.5	433.1	440.7	431.8	+10.11
Milwaukee	7.9	479.9	450.7	469.9	456.2	+ 8.66
Minneapolis	8.5	463.1	435.8	454.7	444.7	+10.53
Newark	8.4	420.8	395.2	413.2	405.3	+10.00
New Orleans	7.3	427.9	404.0	421.6	411.9	+13.81
New York	10.0	498.4	463.6	486.3	428.8	+14.76
Philadelphia	9.0	492.4	469.2	487.8	474.6	+15.42
Phoenix (1947 = 100)	7.7	252.2	236.4	244.1	240.0	+12.34
Pittsburgh	8.5	431.0	405.6	425.9	412.9	+11.67
St. Louis	8.4	451.9	426.6	444.5	434.4	+10.43
San Antonio (1960 = 100)	6.9	161.8	152.0	156.5	153.4	+ 6.20
San Diego (1960 = 100)	8.0	182.0	171.0	178.0	174.4	+17.57
San Francisco	9.2	648.3	592.8	641.9	622.6	+12.67
Seattle	8.4	437.3	391.6	432.4	416.4	+14.30
Washington, D.C.	7.5	407.6	382.8	395.4	386.9	+ 8.69

Cost differentials compare current local costs, not indexes.

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

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

1941 average for each city = 100.00

Metropolitan area	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972 (Quarterly)				1973 (Quarterly)			
										1st	2nd	3rd	4th	1st	2nd	3rd	4th
Atlanta	306.7	313.7	321.5	329.8	335.7	353.1	384.0	422.4	459.2	472.5	473.7	496.1	497.7	516.4	518.0	543.8	544.8
Baltimore	275.5	280.6	285.7	280.9	295.8	308.7	322.8	348.8	381.7	388.1	389.3	418.8	420.4	441.8	443.6	474.5	475.5
Birmingham	256.3	260.9	265.9	270.7	274.7	284.3	303.4	309.3	331.6	340.4	341.6	356.7	358.3	371.7	373.2	401.1	402.1
Boston	244.1	252.1	257.8	262.0	265.7	277.1	295.0	328.6	362.0	377.3	378.5	392.8	394.4	414.0	415.6	436.8	437.8
Chicago	301.0	306.6	311.7	320.4	328.4	339.5	356.1	386.1	418.8	422.8	424.0	442.7	444.3	465.3	466.9	507.6	508.6
Cincinnati	263.9	269.5	274.0	278.3	288.2	302.6	325.8	348.5	386.1	399.9	401.1	400.1	410.7	430.4	432.0	461.4	462.4
Cleveland	275.8	283.0	292.3	300.7	303.7	331.5	358.3	380.1	415.6	415.2	416.4	427.7	429.3	436.7	438.3	461.2	462.2
Dallas	253.0	256.4	260.8	266.9	270.4	281.7	308.6	327.1	357.9	364.9	366.1	385.0	386.6	407.3	408.9	435.4	436.4
Denver	282.5	287.3	294.0	297.5	305.1	312.5	339.0	368.1	392.9	398.3	399.5	413.8	415.4	429.5	431.1	460.0	461.0
Detroit	272.2	277.7	284.7	296.9	301.2	316.4	352.9	377.4	409.7	416.9	418.1	431.5	433.1	463.4	465.0	500.0	501.0
Kansas City	247.8	250.5	256.4	261.0	264.3	278.0	295.5	315.3	344.7	348.7	349.9	365.4	367.0	387.7	389.3	404.8	405.8
Los Angeles	282.5	288.2	297.1	302.7	310.1	320.1	344.1	361.9	400.9	407.8	409.0	422.9	424.5	453.3	454.9	503.2	504.2
Miami	269.3	274.4	277.5	284.0	286.1	305.3	392.3	353.2	384.7	391.5	392.7	404.8	406.4	419.0	420.6	446.2	447.2
Minneapolis	275.3	282.4	285.0	289.4	300.2	309.4	331.2	361.1	417.1	401.7	402.9	411.3	412.9	430.6	432.2	455.1	456.1
New Orleans	284.3	240.9	256.3	259.8	267.6	274.2	297.5	318.9	341.8	350.9	352.1	368.1	369.7	382.1	383.7	419.5	420.5
New York	282.3	289.4	297.1	304.0	313.6	321.4	344.5	366.0	395.6	406.5	407.7	421.5	423.1	453.5	455.1	484.3	485.3
Philadelphia	271.2	275.2	280.8	286.6	293.7	301.7	321.0	346.5	374.9	394.2	395.4	417.9	419.5	459.3	460.9	484.1	485.1
Pittsburgh	258.2	263.8	267.0	271.1	275.0	293.8	311.0	327.2	362.1	364.5	365.7	378.7	380.3	406.3	407.9	423.4	424.4
St. Louis	263.4	272.1	280.9	288.3	293.2	304.4	324.7	344.4	375.5	385.5	386.7	400.9	402.5	427.8	429.4	443.2	444.2
San Francisco	352.4	365.4	368.6	386.0	390.8	402.9	441.1	465.1	512.3	535.3	536.5	559.4	561.0	606.4	608.0	631.3	632.3
Seattle	260.6	266.6	268.9	275.0	283.5	292.2	317.8	341.8	358.4	363.0	364.5	369.9	371.5	388.4	390.0	423.4	424.4

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



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Painting: Pablo Picasso, *La Cruche Fleurie*. San Francisco Museum of Art; gift of W. W. Crocker.

Sculpture: Henri Matisse, *Le Serf*. San Francisco Museum of Art; bequest of Harriet Lane Levy.



## Where we've been: regional roundup

The February article on this "Building Activity" page charted the behavior of construction markets in the nation during 1973. We saw that sharp gains in nonresidential and non-building contracts more than compensated for a sagging housing market, to push the nation's construction industry to its third consecutive yearly gain of 10 per cent or more. This month, we are focusing on the major regions of the country, to see whether they conformed last year to the national patterns of activity, or marched off in other directions.

Sorting out the data for strengths and weaknesses, we find that two regions, the South and Midwest, bettered the national trend by surging ahead more than 10 per cent. But, it was the Midwest, with all three major construction categories gaining 10 per cent or better, that turned in the best all-round record.

The strong pace of general economic growth throughout 1973 kept industrial and commercial contracting in the region moving along at a rapid rate. It was a prime reason why total nonresidential building, ahead by nearly 20 per cent, was the strongest category in the Midwest. But, nonresidential building was not the real key to the region's strong overall performance. This category posted even higher gains in both the South and West. The resilience of the Midwestern housing market was the prime factor behind 1973's strength.

Residential building in the nation officially peaked in 1973's first quarter, tracing a general downward pattern throughout the remainder of the year. But that pattern was followed faithfully in only two regions—the Northeast and South. The West actually peaked in the first quarter of 1972. It began the downhill slide a year before the national figures turned sour. For the Midwest, though, the seasonally-adjusted rates of housing activity leveled off during the first half, rather than declining, and held steady well past mid-year. It was not until the closing months of 1973 that the region began to weaken. It ended the year with a 10 per cent contracting gain, while both the Northeast and West dropped below 1972 levels, and the South managed a slight four per cent gain.

It's really not surprising that housing stayed strong in the region once we look at the economics of the situation. The heavily industrialized Midwest always tends to fare better than the rest during a period of strong economic growth like 1973. The major economic measure of "prosperity to the people"—personal income—recorded the sharpest increase

**Total construction contract value; Percent change, 1972-1973**

	total U. S.	north- east	mid- west	south	west
nonresidential					
commercial and manufacturing	1/8 24	1/8 7	1/8 21	1/8 33	1/8 33
other	1/8 10	1/4 5	1/8 18	1/8 18	1/8 18
total nonresidential	1/8 18	—	1/8 19	1/8 27	1/8 26
one & two family houses	—	—	1/8 13	1/4 6	1/4 2
apartments	1/8 5	1/4 5	1/8 3	1/8 21	1/4 6
other (nonhousekeeping)	1/8 25	1/8 25	1/8 21	1/8 33	1/8 12
total residential	1/8 3	1/4 1	1/8 10	1/8 4	1/4 3
total building	1/8 8	—	1/8 14	1/8 11	1/8 7
streets, highways, bridges	1/8 11	1/8 18	1/8 17	1/8 10	1/4 2
other	1/8 20	1/8 15	1/8 18	1/8 23	1/8 24
total nonbuilding	1/8 16	1/8 16	1/8 17	1/8 17	1/8 14
total construction	1/8 10	1/8 3	1/8 15	1/8 12	1/8 9

in the Midwest last year, giving the region's residents the means to purchase more in the way of goods and services. And the demand for new housing was there as well. While not the lowest in the nation, Midwestern vacancy rates for both single- and multi-family dwellings moved consistently downward through most of 1973. In addition, Midwestern savings and loan associations experienced a proportionally greater rate of savings inflows than the national average. And effective mortgage terms stayed below the national average for most of the year.

At the other end of the spectrum, the Northeast squeezed out a slim three per cent contracting gain in 1973—a gain that was solely dependent on the strong performance of nonbuilding, or heavy engineering work. Huge gains in highway contracting, sewer and water facilities and utilities kept the region's construction market buoyant last year while the building categories were hard pressed to stay even with 1972 levels.

The region's housing market followed the national pattern, and for most of the same reasons—scarce credit, localized overbuilding, and the housing subsidy freeze. Conversely, nonresidential building in the Northeast deviated sharply from the pattern of activity in the rest of the regions. It just managed to stay abreast of 1972, while gains averaging close to 25 per cent prevailed in the other regions.

Breaking the data down, the region's nonresidential building market had two significant areas of weakness. The store component of industrial and commercial building, a high flyer in the Northeast over the recent past, ended the year 4 per cent below 1972 levels. In contrast, store building gains in the other regions averaged close to 30 per cent. Growth in per-

sonal income lagged behind the other regions last year, trimming retail sales below expectations. This plus the housing decline, which generally leads store building, account for most of the weakness.

The other major troublespot in the region last year was the hospital and health facility contracting. The Northeast has become more heavily dependent on Federal funds for the rehabilitation and expansion of older general hospitals in the core areas of its major cities in recent years. Its hospital construction program was hampered by the on-again-off-again status of the Federal Hill-Burton hospital construction program, which interfered with the flow of funds. This was reinforced by the generally tight credit situation that prevailed through last year's second half.

A summary of the regional trends is outlined in the table above.

In total, at least, every construction category recorded a gain in contracting activity last year. Our 1974 construction outlook (an update of which will be featured next month) calls for little or no change in the 1974 total of contracting over 1973. For the regions, comparisons will be made not so much on the basis of who gained more than whom—rather, they will hinge on who managed to edge above 1973's performance, and who fell below it. There's little doubt that housing will be down in every region this year. The region that manages to beat the national average will be the one that normally constructs a lot of industrial plants, electrical generating plants, sewer and water facilities and other heavy engineering works. Don't be surprised if the Midwest has a slight edge again.

James E. Carlson, Manager, Economic Research  
McGraw-Hill Information Systems Company



# Steel and nature blend at Wellesley Office Park



**Aesthetics, environmental concern, construction speed, and economy were key factors influencing the design of this 140,000 sq ft building in Wellesley, Massachusetts.**

Known as Wellesley Office Park's Building 5, this four-level "Weathering Steel" project is the fifth and largest office building to be constructed on the 25-acre, woodland site. A sixth and slightly larger structure is in the planning stages.

The project was designed by Pietro Belluchsi and Jung/Brannen Associates, Inc. of Boston, Architects in joint venture. The two firms also designed Building 4, which won a 1970 Architectural Award of Excellence from the American Institute of Steel Construction (AISC).

According to Mr. Robert Brannen, "Great effort was made to retain the park-like setting of the site. We turned to a Weathering Steel exterior, since its matured, natural earthy brown color would blend with the landscape.

"From a practical standpoint Weathering Steel

was beneficial for other reasons. Being readily weldable, extraneous connection material could be eliminated, making possible a weathertight building that requires virtually no paint maintenance.

"Construction speed and economy were also important considerations. Once dollars are committed, owners want their building as soon as possible. That's one of the main reasons we selected structural steel framing. We estimate that by using steel Building 5 was completed about six months earlier than would have been possible with other framing materials."

Steel is a natural for speed, ease, and economy of construction. And it can be beautiful, too! For more information get in touch with the sales engineer at your nearest Bethlehem sales office.





An open atrium provides a feeling of spaciousness in the court area. Maximum flexibility of plan and ease of convertibility were design "musts" for this all-rental office.

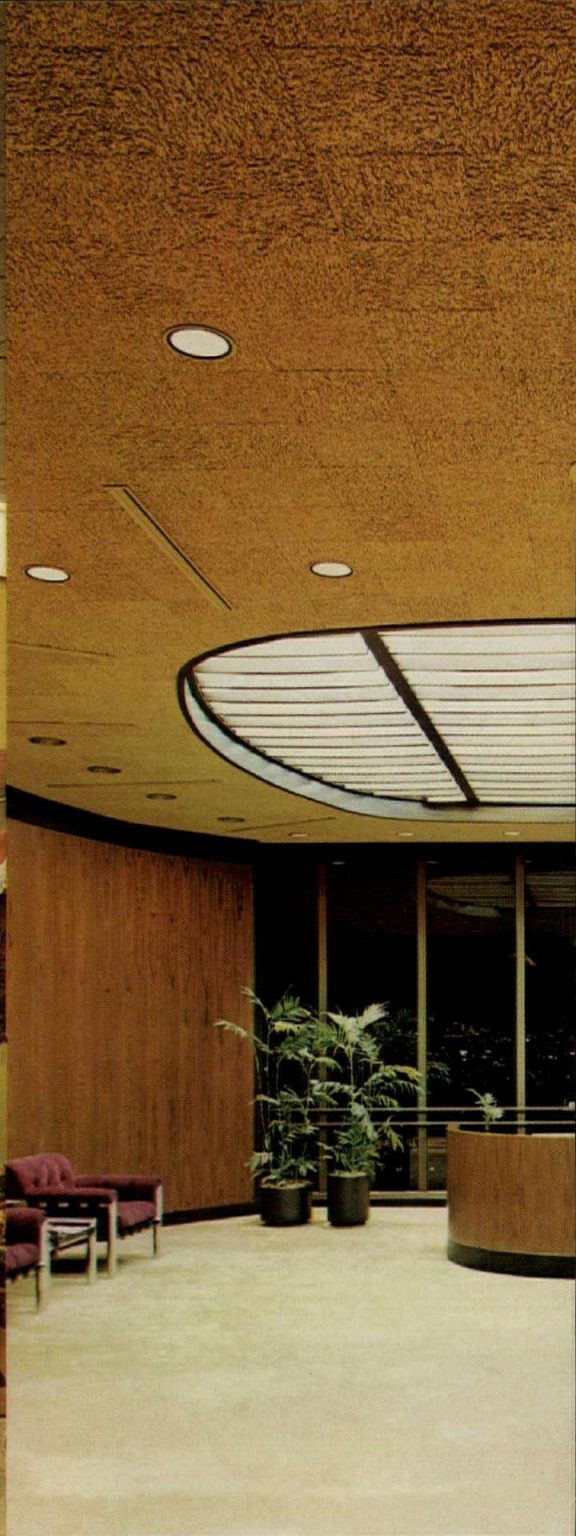
"We, at Wellesley Office Park, are extremely proud of our newest building," reports Mr. Edward D. Cochran, building manager for the owners. "We have experienced absolutely no problems with the Weathering Steel process, the coloring, or the maintenance. We have received nothing but compliments from the occupants, as well as from visitors who have come to the park just to observe the building."



The 4-level structure is owned by Wellesley Office Park Associates, a joint venture of Beacon Construction Company and State Mutual Life Assurance Company of America. Architects are Pietro Belluchsi and Jung/Brannen Associates, Inc., in joint venture. Weidlinger Associates is the structural engineer. Babcock-Davis Associates, Inc. fabricated and erected the Mayari R Weathering Steel exterior. The structural steel frame was fabricated and erected by Thames Valley Steel Company. Beacon Construction Co., Inc. is the general contractor. Bethlehem furnished all of the ASTM A36 structural shapes and Mayari R Weathering Steel plate for the project.

**Bethlehem** 





# Celotex ceilings combine

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

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

Start with that name, and

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

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

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





# beauty and performance.

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

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

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

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

contact your Celotex commercial ceilings representative.

**Celotex™**

**BUILDING PRODUCTS**

The Celotex Corporation, Tampa, Florida 33622

a **Jim Walter company**

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# Brunslon<sup>®</sup> and Brunsmet<sup>®</sup> are the Number One static-control system in carpet.

## It didn't happen overnight, 'cause it doesn't happen overnight.

It takes years to develop a fully effective static-control system. Years of pioneering research, followed by day-in, day-out on the job performance. This kind of performance has made Brunslon and Brunsmet the sales leader in static control. The World's Number One system.

Brunslon and Brunsmet are on the job today in over 90 million sq. yds. of carpet. And used by over 80 major carpet manufacturers in over 360 lines of carpet. No other system gives you better sales performance, technical superiority, flexibility. Brunslon and Brunsmet are easily incorporated into carpet of every fiber, construction, color, design.

Our proven system created the demand, and we've got the supply to meet it. In fact, we've recently opened another new plant — in Westborough, Massachusetts — that will keep carpet manufacturers fully supplied.

Insist on the Number One static-control system. The one that has earned its success with dealers, distributors, and manufacturers.

## The Number One System is available right now.



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PRODUCTS**  
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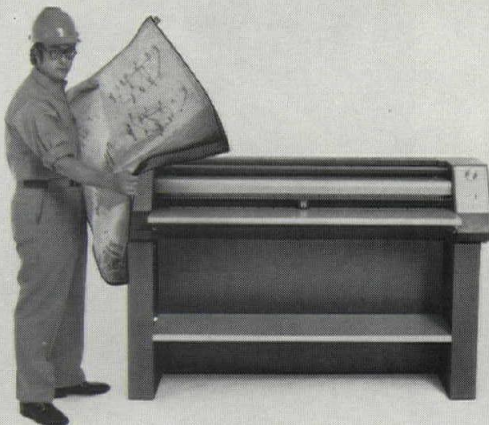
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# Introducing the GAF® 180 Diazoprinter:



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RESEARCH & DEVELOPMENT



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ARCHITECTURE



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## It works where you work!

How would you like to just reach over from your desk or drafting board and run off a copy (or copies) of your original? And how would you like those copies to be crisp and clear?

Discover the GAF® 180 Diazoprinter and it will happen . . . every time!

First, it needs no venting! That means it goes any place you work . . . by your desk . . . alongside your drafting table . . . wherever you do your thing.

The GAF 180 has only 3 operating controls making it easy to use. An exclusive instant on/off demand system allows the GAF 180 to start up—pronto—when you insert paper, and turn off after the paper goes through.

The big 11x54 inch feedboard makes an ample work area, and there's a handy compartment to store a 50-yard roll of diazo paper. The GAF 180 is the only fluorescent printer that will take originals up to 48 inches wide (120 cm)—which means you can meet international re-

quirements and the current demand for metric system standards.

Add to these features a solid state electronic drive system for accurate speed, two high-output 120 watt lamps, versatility to use a broad range of repro materials, like blue lines, black lines and intermediates, and you've got a diazo-printer that's going to be hard to beat!

Rediscover Diazo with the GAF 180 Diazoprinter. First step is to mail the coupon . . . today.



### Rediscover Diazo®

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Office Systems Division, Dept. 666-034  
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New York, New York 10020

Gentlemen: I'm for rediscovering Diazo!

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 Please send literature on the GAF 180 Diazoprinter.

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# Jute carpet backing a "microscopic thickness"



(Close-up photo magnified 20 times)



## Entangles adhesive and makes carpet glue-down really work

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

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

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

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

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Latter includes 8-year record at Ford Motor Co.

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

## STEEL JOISTS SPEED ERECTION, SAVE SPACE, PROVIDE FLEXIBILITY AND ECONOMY IN NEW APARTMENT

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Open web steel joists were used in this luxurious new high-rise apartment. Why? In the words of architect Tasso Katselas, "For speed of erection, the ability to thread piping and ductwork through the open webs, flexibility for future remodeling, and assurance of staying comfortably within the budget."

These are just some of the many benefits offered by strong, lightweight, economical and versatile open web steel joists. The full story is contained in the current Specifications and Load Tables for Open Web Steel Joists, Longspan Steel Joists and Deep Longspan Steel Joists. Send for your free copy today.



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NAME \_\_\_\_\_

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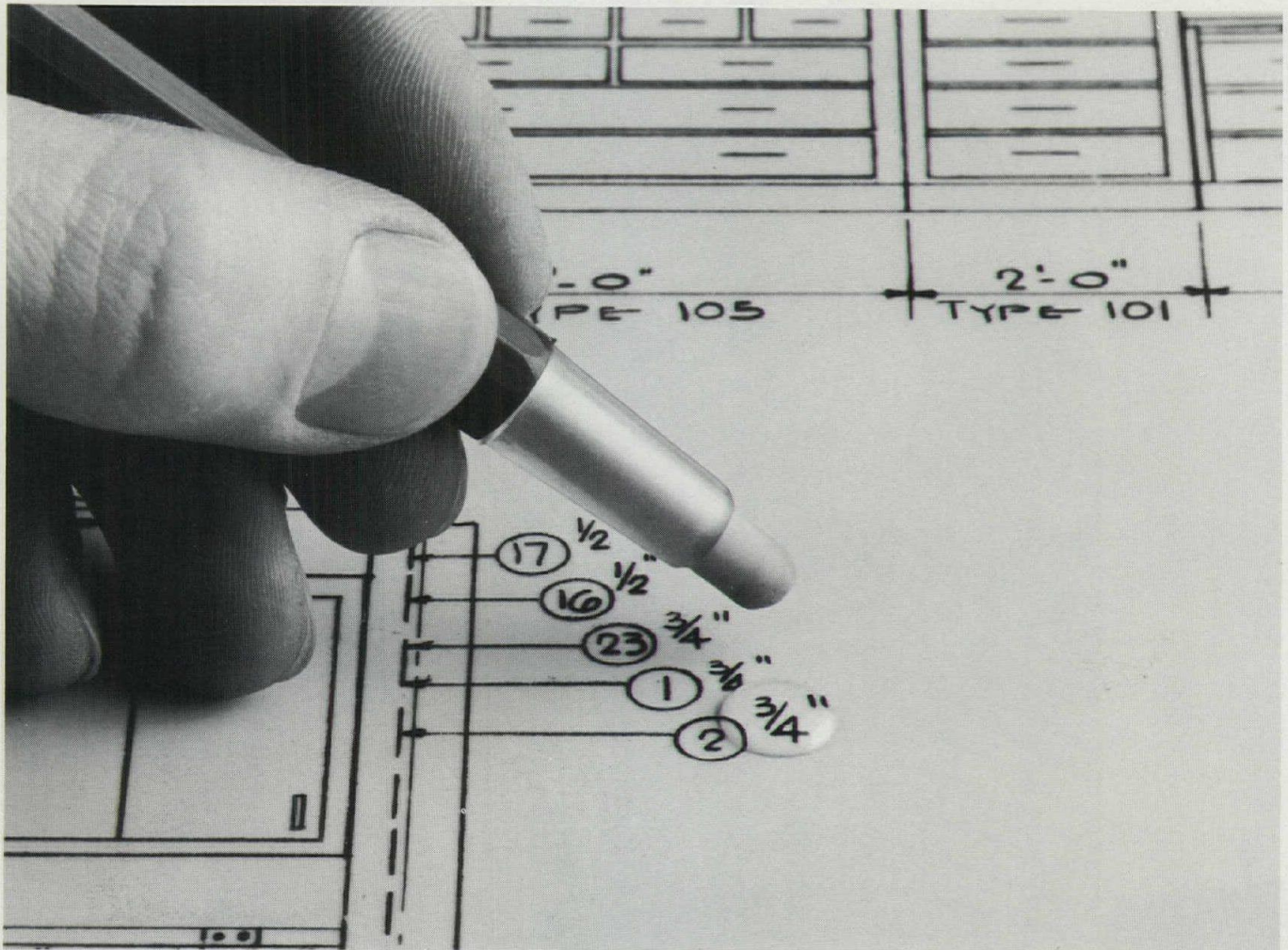
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# Get the drop on redrawing drudgery.

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Shortcuts with Kodagraph materials can turn drafting hours into minutes.

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Nobody likes to retrace a whole drawing just because a few revisions are necessary. You don't have to if you make a second original on Kodagraph wash-off film. Simply wet-erase what you don't want—using plain water and a soft eraser—draw in the new details and the job is done.

If on the other hand, you're faced with repetitive details, draw them once. And then order as many Kodagraph film or paper reproductions as you need. Cut them out,

tape down on drawing form, rephotograph and you have a new original.

When you need to restore a battered, old drawing, have a reproduction made on Kodagraph film. Stains virtually disappear. Weak lines come back strong. And you end up with a crisp, legible black-on-white print.

---

Get the details.

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Write for information on how you can reduce drafting time with photoreproduction techniques. Eastman Kodak Company, Business Systems Markets Division, Dept. DP743, Rochester, N.Y. 14650

**Kodak products for drawing reproduction.**



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New ecl 2200—an exit control lock with horn alarm, for the security you want with the safety you need. Always operable for emergency exit.

Can be locked to un-

authorized entrance. Four variations let you pick and set the security level you want—from total exit/entrance freedom to alarm-exit/no-entry even with key. After exit, security is always restored to your chosen level automatically by unique dead-locking latchbolt. Attractively styled, Detex's ecl 2200 has wide application flexibility, including system interface. Conforms to OSHA requirements; UL listed. Send today for details on how the ecl 2200 can help protect your interests.

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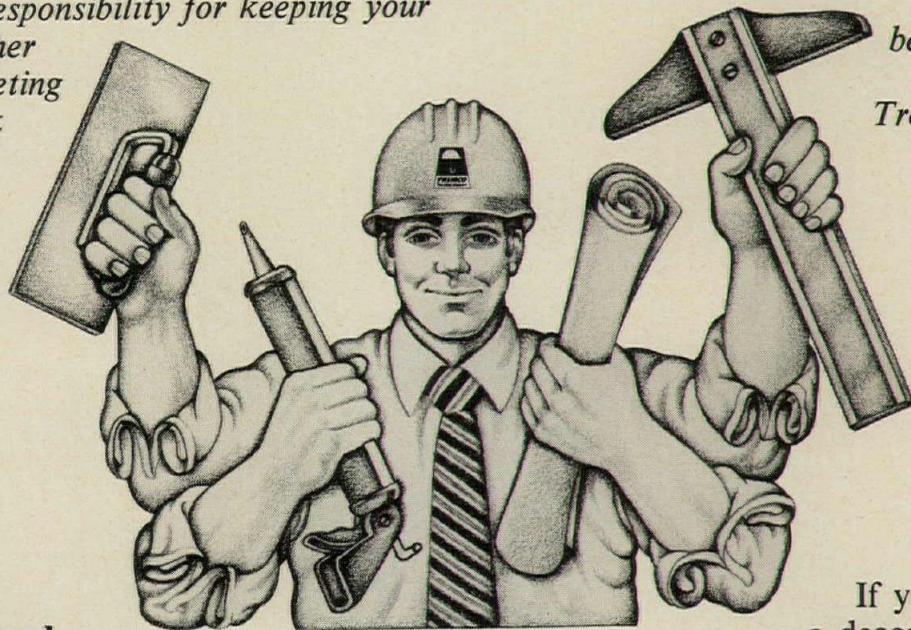


# You can talk to a lot of different people about a lot of different waterproofing systems. Or you can talk to us about it all.

*Think of all the advantages there are to having one source for all your waterproofing needs — convenience, assured system compatibility and one overall responsibility for keeping your building dry. Rather than 3 or 4 competing sources, you work with just one. Tremco's*

*representative assists you with specifications, information and service from drawing board to job site instruction. And wherever you need*

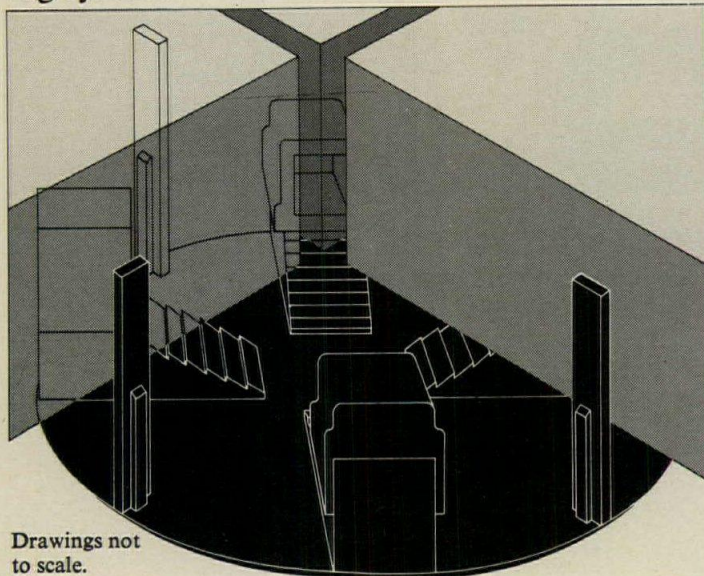
*waterproofing — below, on or above grade — there's a Tremco system that will do the job effectively.*



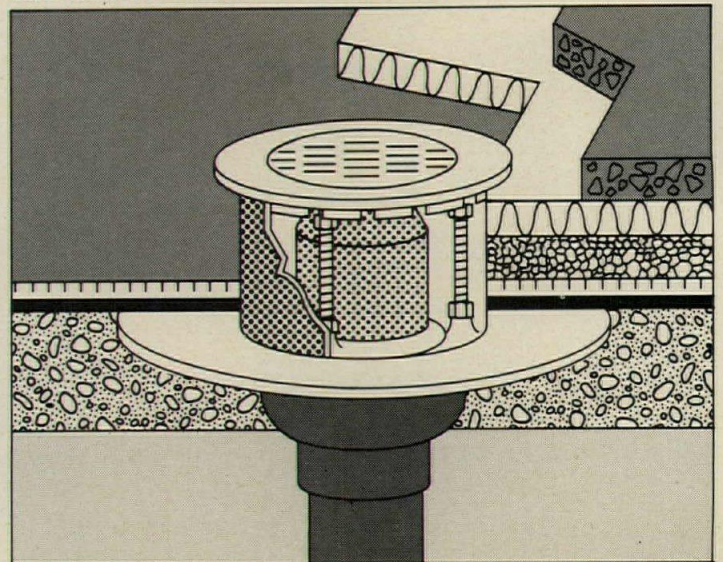
## Two systems for keeping water out at the ground level.

TREMproof™ liquid polymers form a monolithic seamless blanket. They are adaptable to insulated or non-insulated applications, exhibit excellent cold weather flexibility and elongation properties, and will withstand continuous water immersion. These properties make them perfect for use with either of the following waterproofing systems.

If you're considering a decorative plaza, deck or terrace, you should consider pavers. Our KingPin™ pedestal gives you design freedom, a level paver surface and uniform open joints between pavers. The KingPin supports the paver surface above the structural slab waterproofed with TREMproof. Water runs through the open joints in the paver surface and down the drains at the structural slab level.

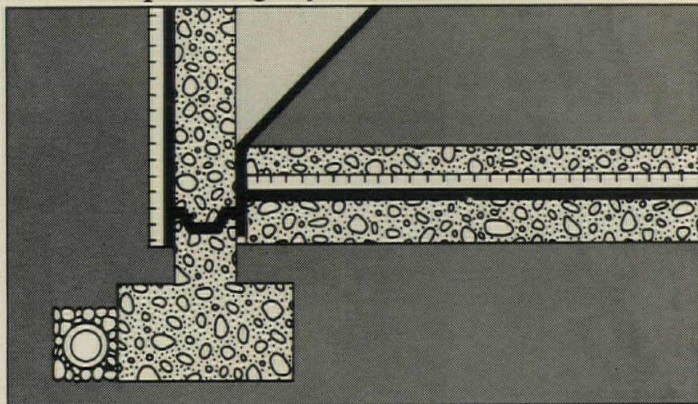


Drawings not to scale.

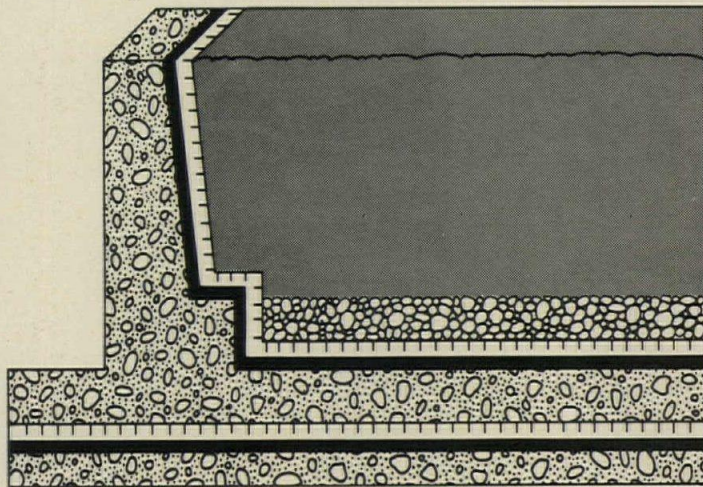




If you're designing a poured concrete wearing slab, our unique All-Level Drain used with TREMproof assures positive drainage on all levels. Water is taken off the traffic surfaces, the insulation layer, the percolation layer, and the waterproofing layer itself.



Of course TREMproof liquid polymers can be used for the waterproofing of foundations, planters, reflecting pools, etc. They're self-adhering and become an integral part of the



structure. Their superior adhesive quality prevents any lateral movement of water between the substrate and waterproofing blanket.

**Systems to waterproof traffic-bearing surfaces.** TREMproof Systems also come in a decorative, moisture-curing liquid polymer for the traffic-bearing surface of plazas, balconies, terraces, interior floors, etc. It cures to a flexible, seamless blanket and becomes an integral part of the structure. It's easy to use and has excel-

lent resistance to abrasion, chemical spillage and ponded water.

**Systems for interior waterproofing.**

For those difficult interior waterproofing jobs such as washrooms, and mechanical equipment rooms, TREMproof Systems make for easy, labor saving application in single- or twin-slab construction.

**A variety of masonry preservatives.**

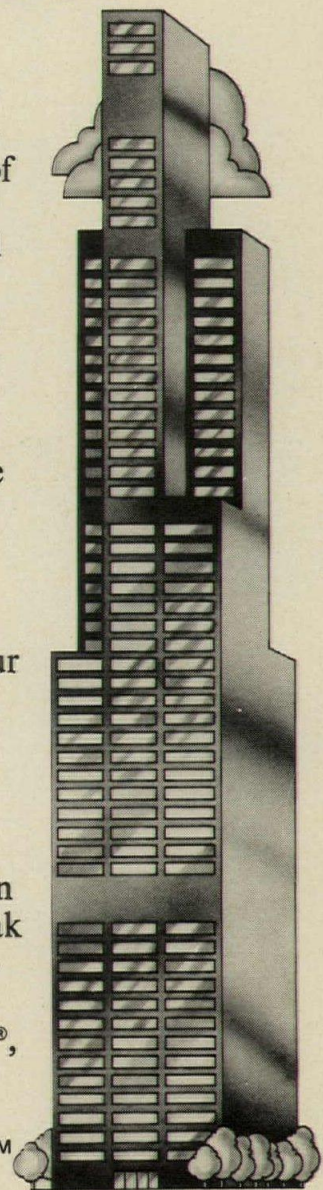
To complete the waterproofing job, Tremco can provide you with a wide variety of preservatives to keep water out of masonry walls. You can select from heavy-bodied decorative preservatives available in architectural colors. Or, choose from our clear, transparent preservatives that retain the natural beauty of the masonry.

**A complete system, one source.**

Is there any reason why Tremco shouldn't be your one source for waterproofing?

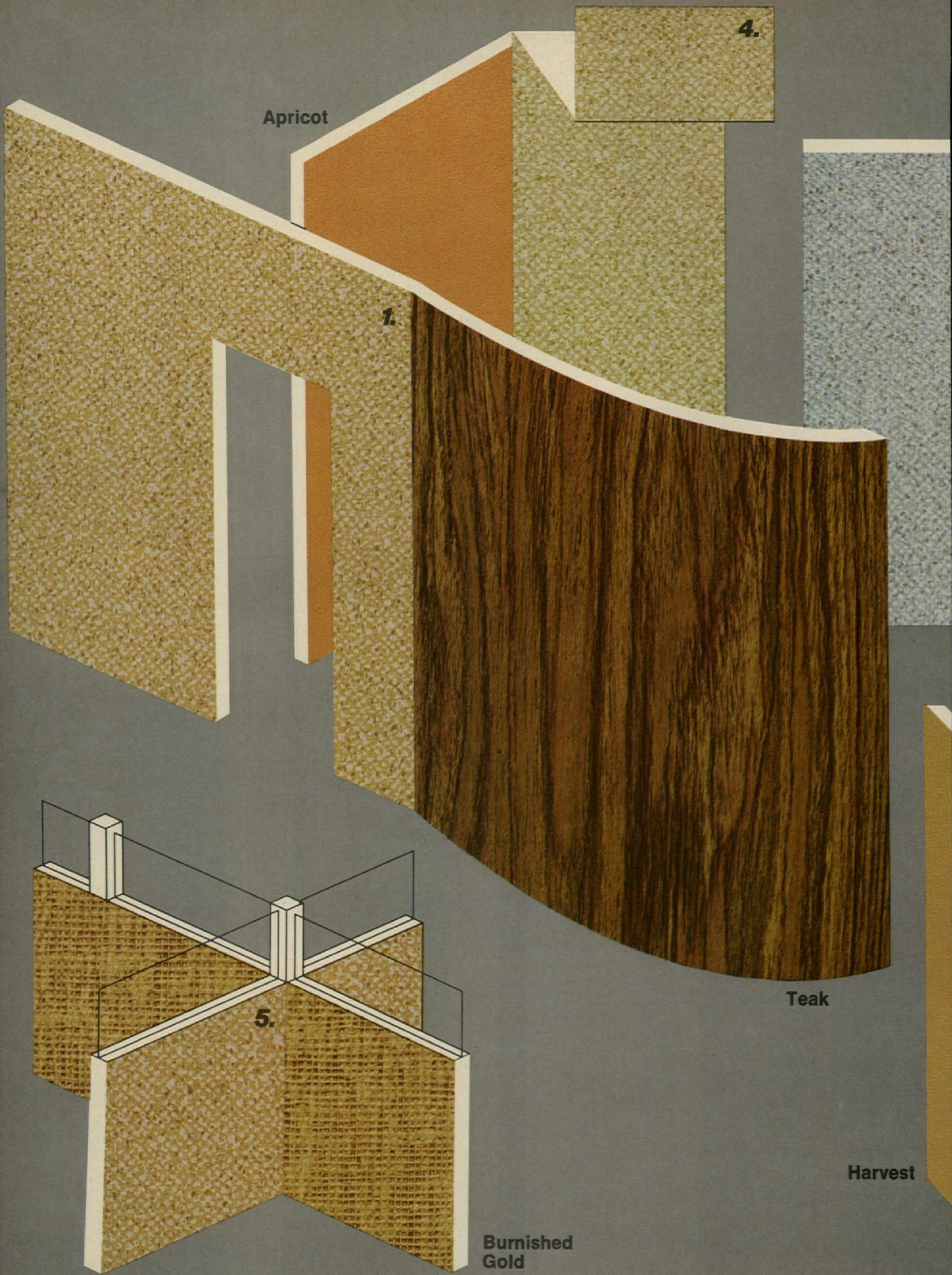
We've waterproofed some of the world's largest buildings. For over 45 years, we've been providing top quality leak proof systems and products, such as our job proven sealants MONO®, DYmeric® and Lasto-Meric®, and our roof-edging system, Tremline™.

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**TREMCO®**  
The water stoppers

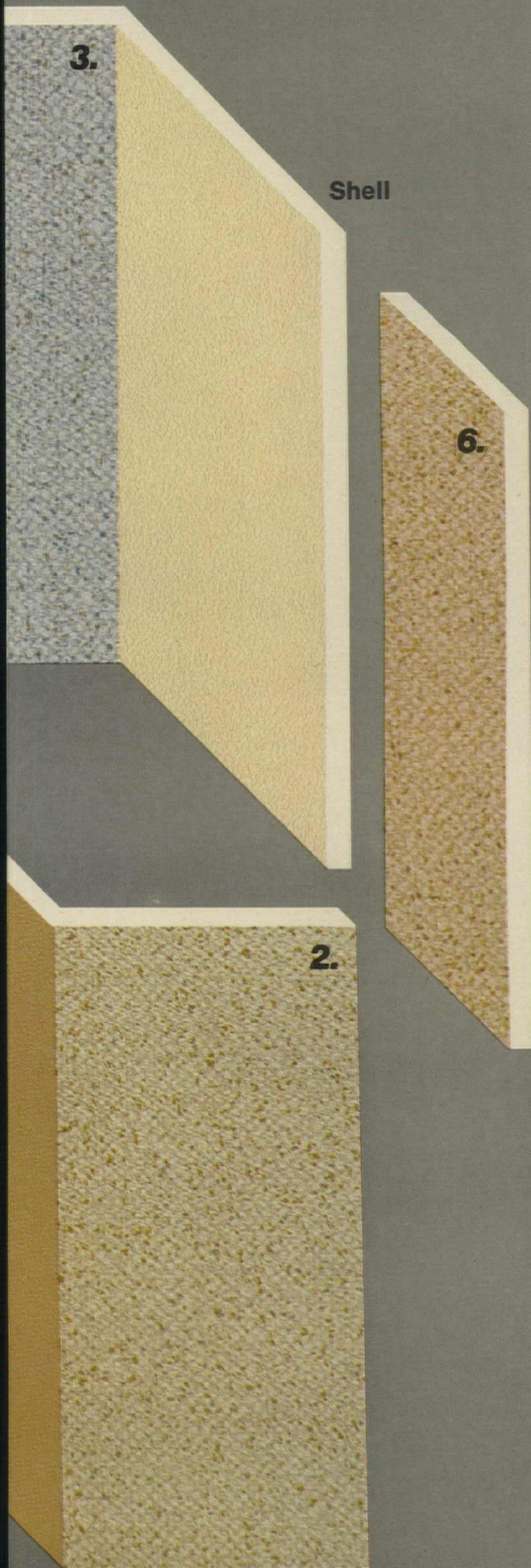






## New **TEXTONE**® tweeds mix or match to suit any room.

Now, TEXTONE Decorative Vinyl-faced Gypsum Panels come in new tweeds and solids to spark up interiors. Mix or match them with our collection of 21 other solid or woodgrain colors and textures to create exciting new effects. These are the panels made of tough, wash-and-wear vinyl prelaminated to fire-resistant SHEETROCK® Gypsum Panels. They're designed to work perfectly with U.S.G. wall systems, including USG® Demountable Partitions and Ultrawall® Partitions. And matching moldings are available for that professional finishing touch. See your U.S.G. Representative for a copy of our TEXTONE brochure. Or write to us on your letterhead for sample swatches. 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. AR-34.



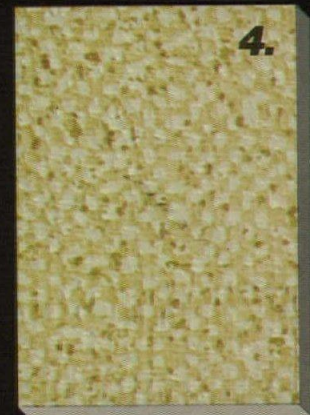
Golden Tan



Stone Beige



Cadet Blue



Springtime



Butterscotch



Desert Sand

**UNITED STATES GYPSUM**   
BUILDING AMERICA

For more data, circle 60 on inquiry card





# The design opportunity of the year: it's as big as all indoors.

There are lots of things you do to design lasting quality into your houses, apartments and other projects. Unfortunately, some of these things cannot be seen by your clients. But one kind of quality that *is* visible is wood panel and louver doors—inside and out.

They're a symbol of your careful thought and planning. And an indication of the quality that makes your work a worthwhile investment for the client. That's why so many architects specify wood panel entrance doors. But there's no reason to stop there.

#### **Panel doors add character to every room.**

Good doors are like good furniture—they bring

character to each room. No matter what the decor, carefully sculptured wood panel doors will enhance the beauty of any room. Not only at the front entrance, but all through the house.

For instance, French doors can change a dining room from just a place to eat into an elegant dining experience. With deep sculptured bi-fold doors, a closet becomes a design accent instead of a hole in the wall. Swinging cafe doors give kitchens a light, perky touch. Even the utility room brightens up with an attractive (and practical) louver door.

And, of course, sliding wood patio doors do an excellent job of tying indoors and outdoors together. (Their greater insulation quality means less heat loss than with metal patio doors, too. That's an important consideration with the current need for energy conservation.)

#### **Wood panel doors keep a design theme going.**

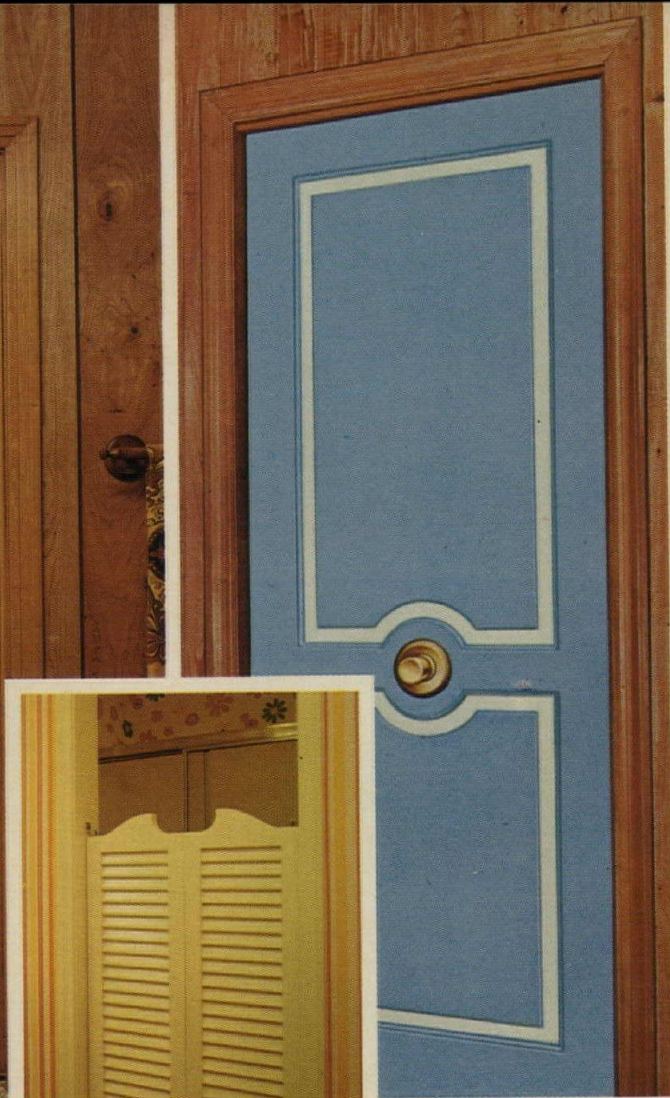
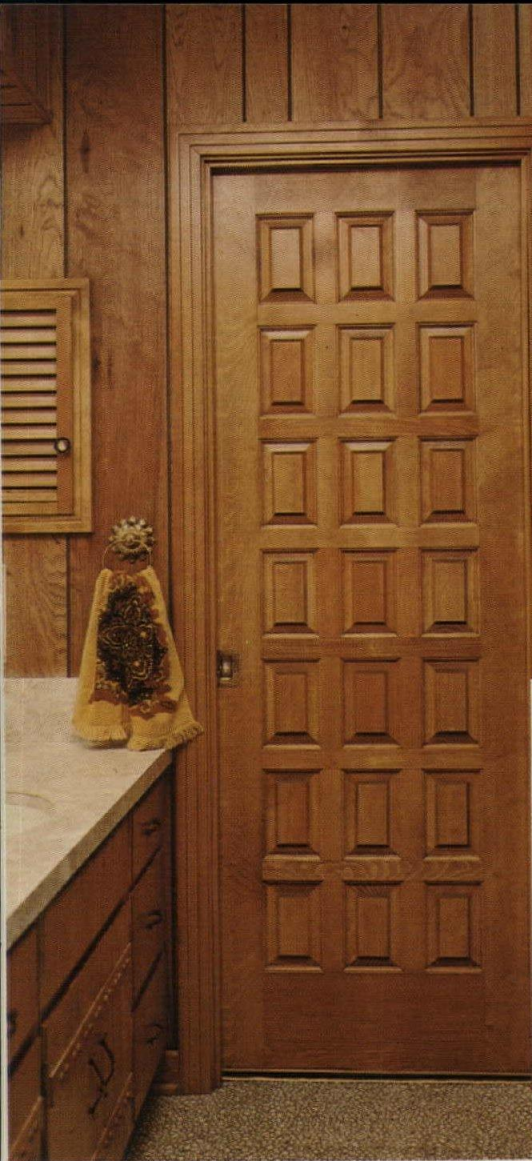
Whether you're designing traditional, colonial, Spanish, modern or something else, you'll find the right wood panel doors.

They help you keep the design theme going from the front door to every room. The panel and louver doors pictured here are just a few examples of the dozens of types and styles that you can use to tie every room into the total design.

#### **Consumers prefer wood panel doors.**

In three major surveys conducted in 1968, 1970 and





1972, consumers in 39 states reported what they want most in doors, what kind of door they prefer—wood panel or flush—and why. The results clearly indicate that preference for flush doors has fallen while panel door preference is increasing.

	Front, Main Entrance			Rear, Other Entrance		
	1968	1970	1972	1968	1970	1972
Panel Doors	59%	64%	63%	54%	54%	62%
Flush Doors	36	26	28	33	26	24
No Preference	5	10	9	13	20	14

	1968	1970	1972
Panel Doors	31%	32%	34%
Flush Doors	60	47	49
No Preference	9	21	17

**Wood panel doors meet consumer needs. And yours.**

Before you specify the doors in your next project, consider the facts. Our research shows that consumers say appearance and durability are the qualities they want most from their doors. And they rate panel doors better than flush doors in both instances.

From your side, wood panel and louver doors offer great flexibility in design. So you can actually design *with* the doors, instead of around them. It's a happy match of consumer preference and architectural advantage.

**Send for your free copy of our survey report.**

We think you should have a report on the major findings of five years and \$40,000 worth of research—“The consumer of the 70's: a report on his housing plans and preferences.” It reveals consumers' preferences for doors and windows as well as their plans for moving and remodeling. It's an important study that can help you know your market a little better and maybe even make you a little more effective in anticipating client needs. Send in the coupon today.



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A member of the American Wood Council.

Send me a copy of your research report.



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# If our salesmen could carry samples, You'd always specify BILCO.

When all you have to go by are the pictures on the catalog pages, one brand of horizontal doors looks pretty much like another. But if our sales representatives could carry samples you would immediately recognize the advantages of Bilco Doors.

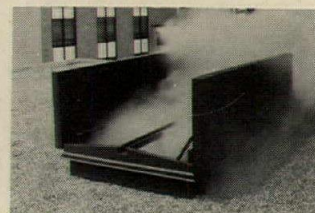
You would see for yourself how easily they open and close, their superiority in design and workmanship. You would readily see that Bilco Doors are built to deliver long, trouble-free service, assuring your clients of sound value and complete satisfaction.



**ROOF SCUTTLES**  
Standard sizes for personnel access; special sizes in single and double leaf types for equipment access.



**FLOOR and PIT DOORS**  
Four standard types in a variety of sizes for every interior and exterior requirement. Special sizes on order.



**FIRE VENTS**  
The finest in fire protection equipment. Eight standard sizes with UL and FM labels. Special sizes to order.



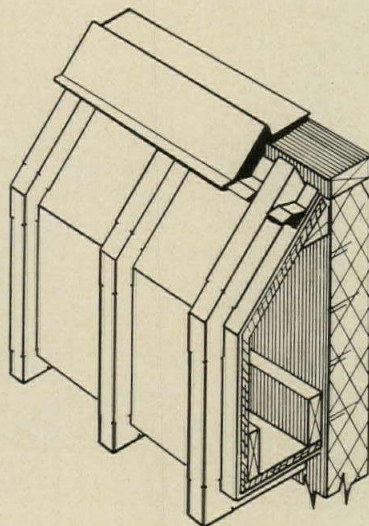
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The first and only formed batten available for mansard roof construction. The batten is manufactured from the same pre-finished Kynar 500® or baked enamel on aluminum for absolute uniformity of finish, reduced costs and positive deliveries.

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14 models of incandescent and fluorescent dimmer switches to handle virtually every requirement. Voltage compensated, solid-state circuitry. Complete, self-contained units. From economy units to attractive Decorator Styled designs. Send for your FREE dimmer switch reference file.

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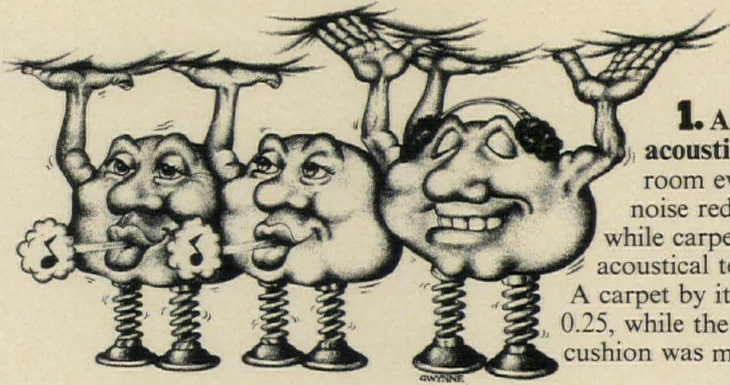


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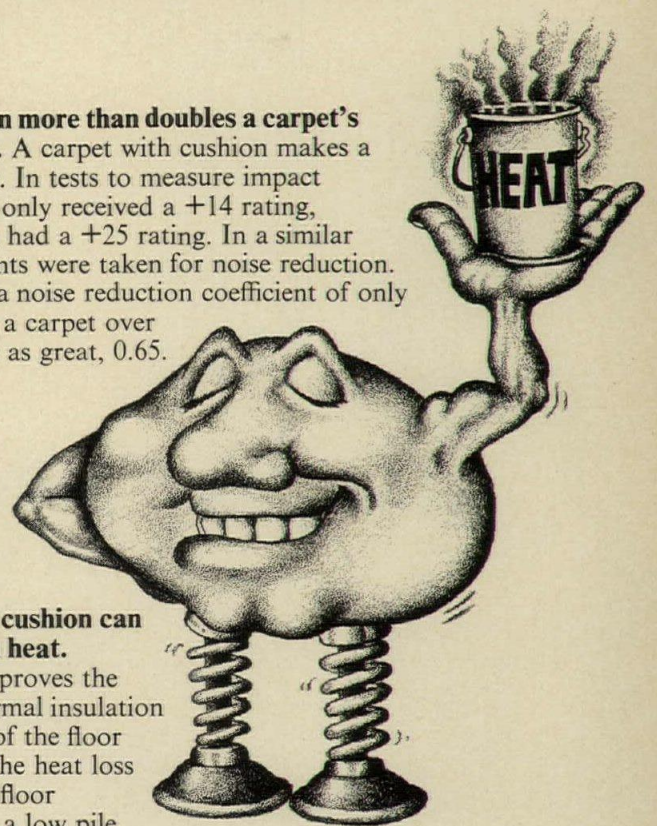


# Before you pull the padding out from under another rug, read this.

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

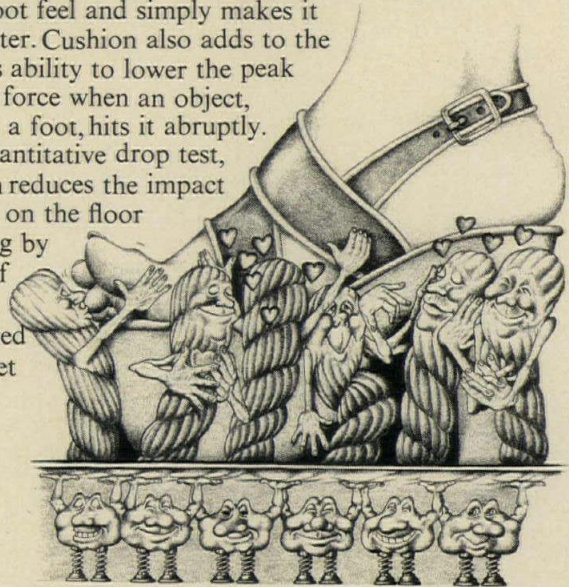


**1. A carpet cushion more than doubles a carpet's acoustical properties.** A carpet with cushion makes a room even more quiet. In tests to measure impact noise reduction, carpet only received a +14 rating, while carpet over cushion had a +25 rating. In a similar acoustical test measurements were taken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



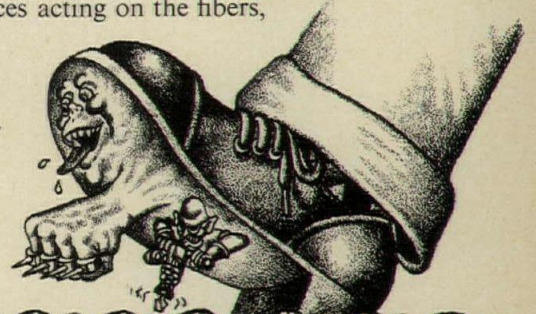
**3. Carpet cushion can help retain heat.** Cushion improves the overall thermal insulation properties of the floor covering. The heat loss factor of a floor covered by a low pile carpet and a cushion is about one-third of what it would be with the same carpet alone.

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

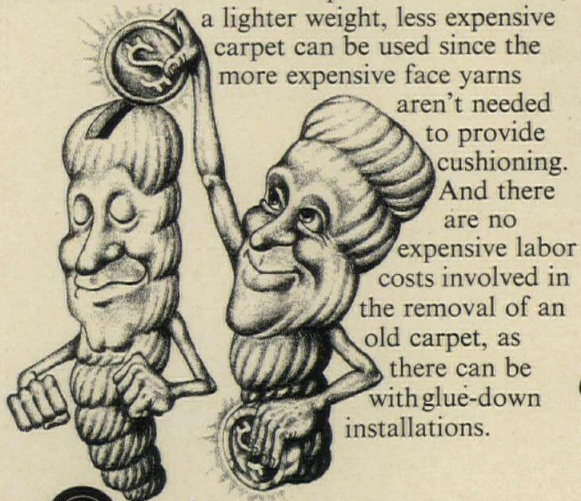


**5. Separate cushion makes a carpet easier to maintain.**

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



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



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

members  
carpet cushion council

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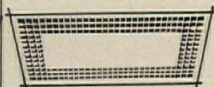
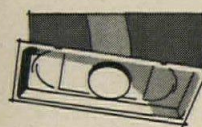
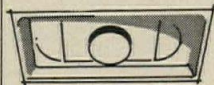
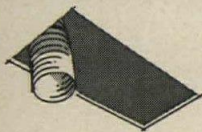
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**When  
smudge-free  
high capacity  
air movement and modular  
interchangeability  
are a must...**

you need MULTI-VENT  
engineered air diffusion



Installation is to flexible duct work to which the pan is attached. The pan is then positioned in the ceiling and the exposed diffuser panel is snapped into place. The air valve is adjustable through the diffuser panel.

Time was, when ceiling smudges around the air diffuser were reluctantly considered the penalty for having good air movement. Today, thanks to Multi-Vent High Capacity Modular Air Diffusers, ceiling smudge is a relic of the past.

**Unique angular air throw keeps ceiling clean.**

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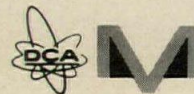
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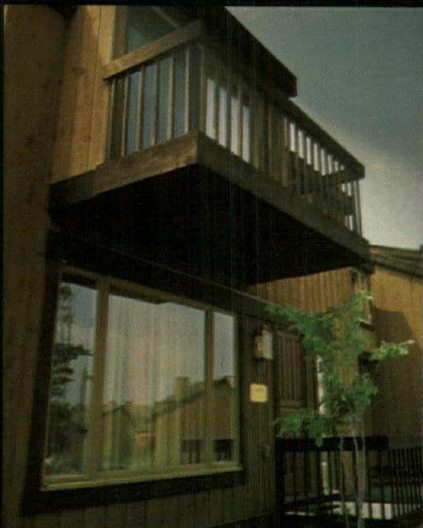
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Architect: Tomblinson, Harburn, Hanout & Associates Inc., Architects, Flint, Michigan.  
Builder: Genesee Commercial Builders, Inc., Flint, Michigan.



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Architect: Edward C. Collins II, Associates, Lincoln, Massachusetts.  
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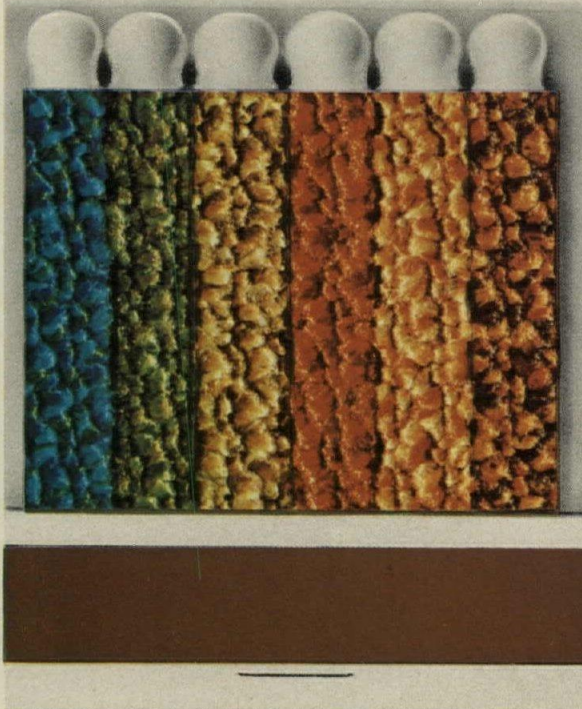
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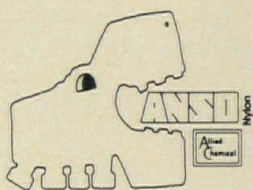
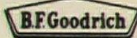


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# Some housing in Europe —and some thoughts about options



Walter F. Wagner, Jr. photos

Housing for students in Stuttgart. Architects: Ebert

As you travel around the country these days, you get (at least I get) a sinking feeling that our housing is developing a kind of sameness. With rare exceptions, our housing seems to be designed and built to a standard—designed and built for some average family with average tastes and average aspirations.

I mean you can't sell anything too extreme, right? Or too contemporary? Everyone knows that. Every developer also knows that anything new—like terrace housing or irregular forms (see photo)—is too expensive to build.

Well, a lot of European architects designing for-sale and for-rent housing—for families of all sizes and all incomes—don't seem to know any such things. And they seem to find sponsors and lenders who don't know any such things either.

As I wrote in an earlier editorial (RECORD, August 1973) I had an opportunity not long ago to tour a variety of housing projects in Germany and France. The tour—sponsored by TICOR, Owens-Corning Fiberglas, PPG Industries, Westinghouse, and Arthur Goldman & Associates, a consulting firm—gave our group of builders, lenders, developers, planners, and architects a lot of fresh insights. Some were impressed by the commitment of the governments (and the labor unions, who invest heavily in low- and middle-income housing) to build housing. Some were impressed by the land-use planning and control. We saw a great deal of housing which, in varying degrees, impressed us a great deal or which we didn't like at all.

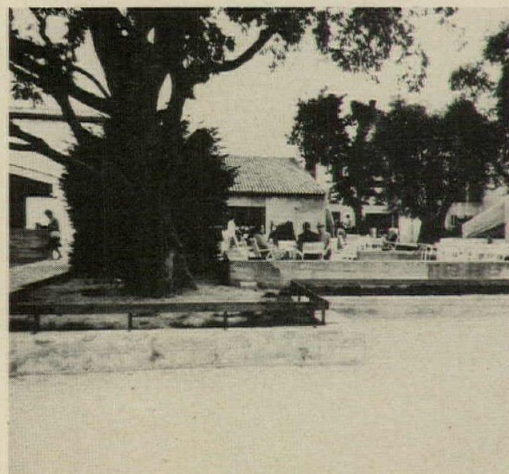
But the thing that impressed me most was the variety. We saw all kinds of housing—from high-rises that would look perfectly normal on the fringes of any U.S. city to some work that by any measure would be called extreme. The point is the variety—a buyer or renter in the cities we visited has, it seems to me, far more options in his style and way of living than we offer.

The projects shown on the next 13 pages were chosen, of course, to make my point. I make no pretense that they are typical. If some are expensive, they are not outside the framework of costs common in this country—and some are very inexpensive. None involve any gee-whiz European industrialized technology; but some are developed under "social housing" schemes that help a great deal with the financing. The rooms are smaller than U.S. standard and some of the densities are extraordinary—but, again, the European architects and developers seem to be willing to explore variations from the norm—and the people who live there have clearly accepted compromises in one direction for advantages in another. Different people, different housing, different life styles.

Perhaps, in different places around this broad country, there are places for the same kind of experimentation—for more options? —Walter F. Wagner Jr.



**Some of the housing in Europe  
is thoroughly contemporary,  
but fits the vernacular of its traditional setting**





## La Colle-sur-Loup

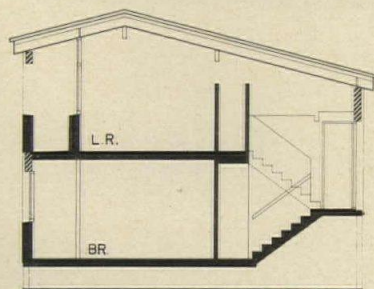
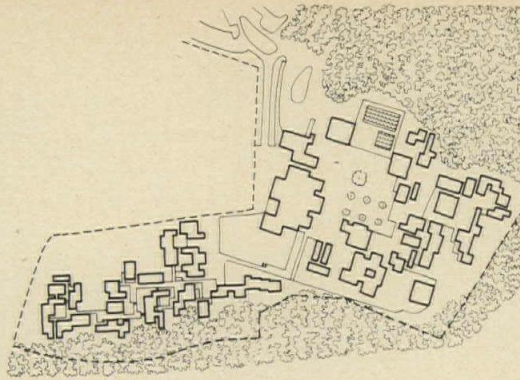
... is one of 50 "family vacation villages" built for low- and moderate-income families in all areas of France—some in farmland, some in the mountains where they are heavily used by skiers, and some near the sea. La Colle-sur-Loup is near St.-Paul-de-Vence, 14 miles from Cannes, about six miles from the beach via shuttle bus.

This project, designed by architects Michel and Nichole Autheman, is not as daring in design as some of those on the following pages, but it is strikingly handsome in form and plan and finish of both buildings and plantings—and closely related despite its clearly contemporary spirit to the architecture of the region.

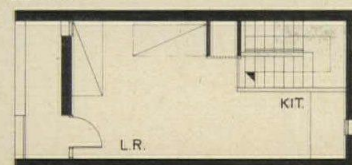
La Colle-sur-Loup has 1600 beds in 119 freestanding houses without kitchens, 98 with; 72 apartments in six buildings, and two small "hotel" units of 17 and 30 units. The buildings, from one to three stories, are sited over a 60-acre rolling site (plan above). The core of the project is a handsome plaza (photos opposite and right) with places for sitting in sun and shade and quiet games, and set off by its own Calder. Ringing the plaza are the reception building, the restaurant, a day-care center, and both enclosed and open-walled recreation rooms adjacent to a heated swimming pool. Tennis courts and riding stables are within walking distance of the center.

The bungalows are sited in a relaxed manner through the site—some in quite dense patterns (photos right and below) near the plaza; others a longer walk into the wooded site.

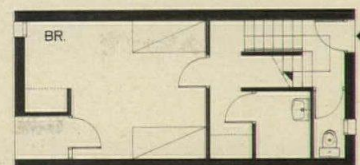
The project was built by SCIC (Société Central Immobilière de la Caisse des Dépôts) under a unique financing scheme. Fifty per cent of the cost (about \$3000 per bed) was financed with low interest loans from the French government; 25 per cent by low interest loans from the central bank of which SCIC is a building subsidiary, and 25 per cent by loans from French companies and industries which, by helping to capitalize these villages, assure their workers a certain number of guaranteed reservations through the year—a unique employee benefit. With this building subsidy (but no operating subsidy), rents—including all recreation facilities—are held to \$8 or \$9 per person in season, \$6 off season with restaurant meals; less than \$2 per person without meals. Off-season visitors are mostly retirees who can stay up to three months.



SECTION



SECOND FLOOR



FIRST FLOOR



# In the U.S., terrace housing gets only as far as preliminary drawings —in Europe, it gets built

## Wohnanlage Tapachstrasse

... in Stuttgart comes close to what still seems an American dream—housing with terraced apartments open to the sun, with gardens of flowers and greenery trailing over to the terrace below. It works beautifully—the relatively small apartments (a two-bedroom unit in this building has 810 square feet of enclosed space) are opened dramatically by the 225-square-foot terrace; and because of the slope the terraces have complete privacy—you cannot look into the terrace below without unseemly gymnastics.

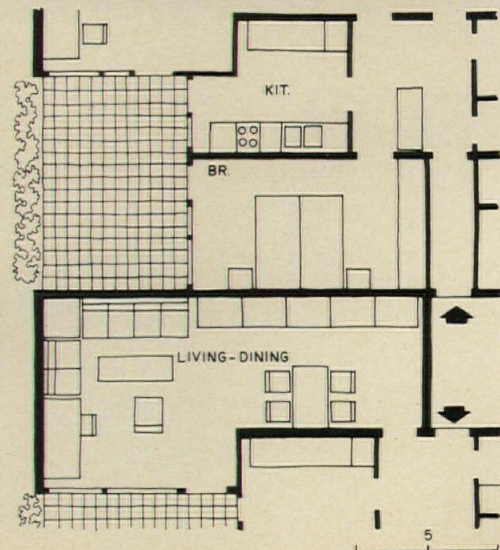
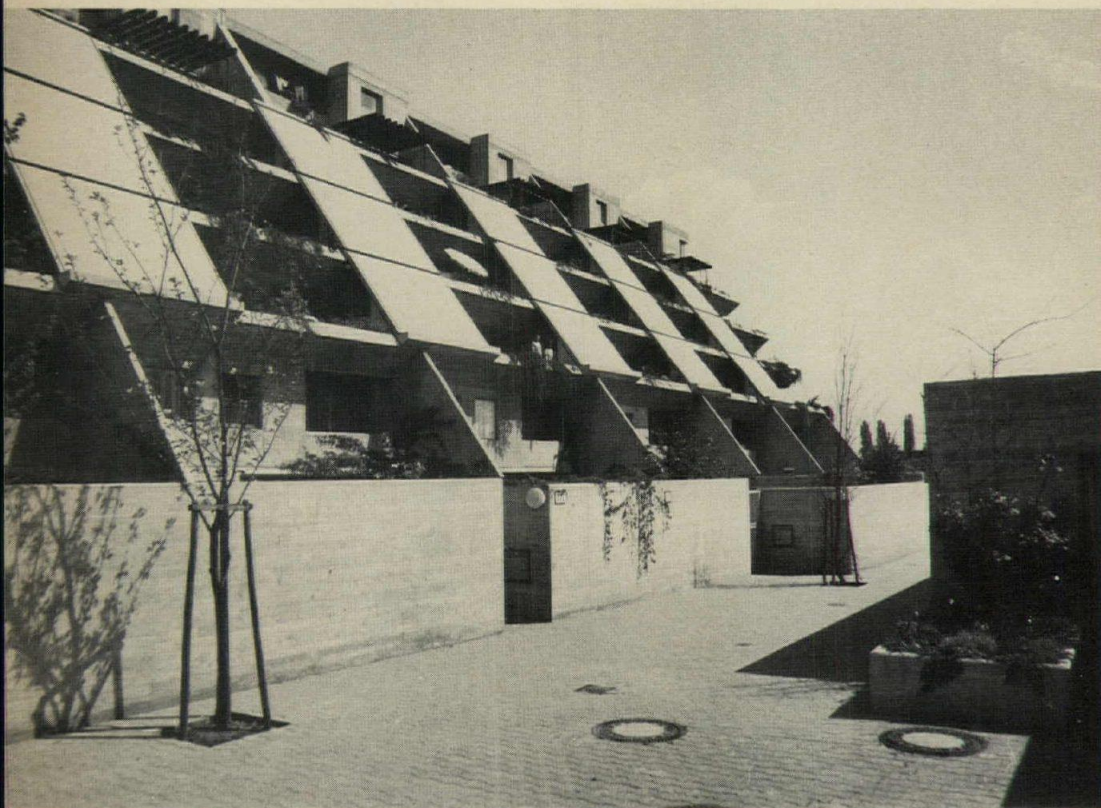
The “underside” of the building (photos below) was not yet completed when the photos were taken. But near the base of the building, where these undercover terraces are deep, the space is used for parking. Mid-height terraces are broad enough for play areas, though, of course, they are shady much of the day. The narrower spaces near the top of the building are used merely as outside corridors.

The building—partly pre-cast, partly poured-in-place—is given color by the plantings and bright sunshades and umbrellas.

There are 80 units in the six-story building, which overlooks 19 units of single-story, one-family housing with private gardens at its base. There are two-, three-, and (in duplex units at the top of the building) four-bedroom units, with 1,243 square feet of enclosed space and 356 square feet of terrace.

Rents range from \$213 to \$324, but most of the residents of this project are government workers, whose rent is subsidized 40 per cent.

The terrace building has a total of 76,245 square feet of enclosed space with 17,324 square feet of terraces; cost \$2,100,000 three years ago. Architects are Peter Faller and Helmut Schröder.

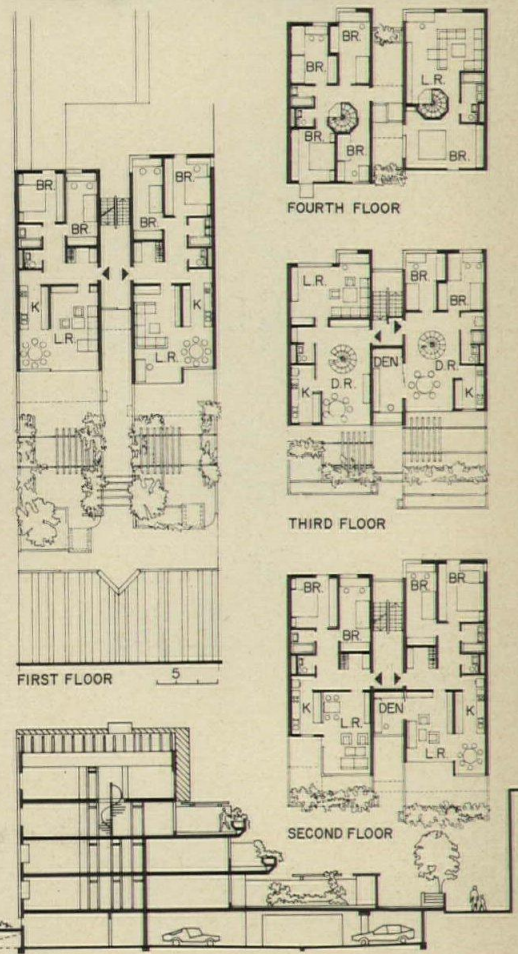




## Neugereut

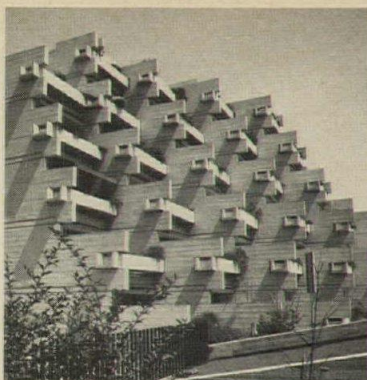
... is another terrace housing project by Faller and Schröder in Stuttgart, and it has attracted young families. There are 112 units in the four-story buildings shown below. The section shows the parking below grade, large first floor apartments with on-grade gardens in front, smaller apartments with terraces above, and duplexes with terrace on top. Most interesting in this project is the transition from public space to private—at the right in the section is a broad pedestrian mall leading through the project and connecting with the 580-unit high-rise in the background. Up a few steps is a narrower walk which is used primarily by the residents. Beyond that—and well fenced—are the gardens with the terrace gardens above.

As in most European housing, the units are small in area—but here the gardens, terraces, and bright colors create a forceful and festive environment.



SECTION



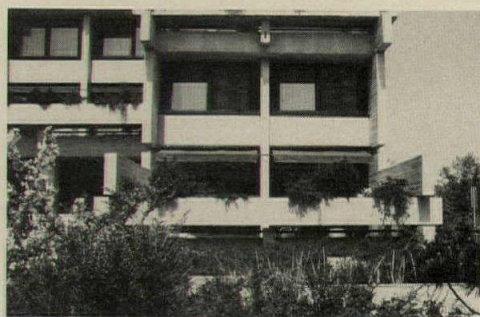


## Student housing

... at the University of Munich takes yet another form of terrace design. Assembled from precast wall, floor, and planter units (which act as interlocks in the system), this "apartment hill" complex has a direct structural pattern which reads clearly from the outside (see top photo, for example). As seen from the street, the project has an incredible quality of abstract sculpture. Well established planting softens the hard edges, and lends color to the stark whiteness, and—in a rolling green meadow setting—the effect is stunning. Again the terraces formed by stepping back to smaller units creates handsome and usable outdoor spaces opening to the apartment interiors through walls of sliding glass.

A children's playground at the rear of the project echoes—in simple wooden shapes—the same sculptural quality as the building.

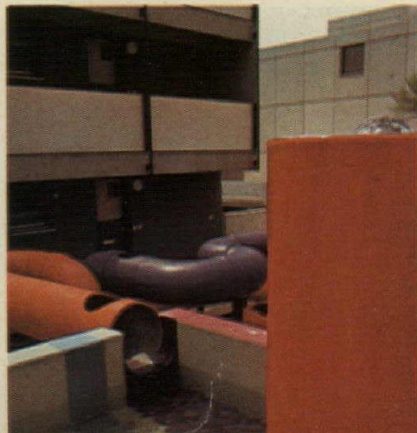
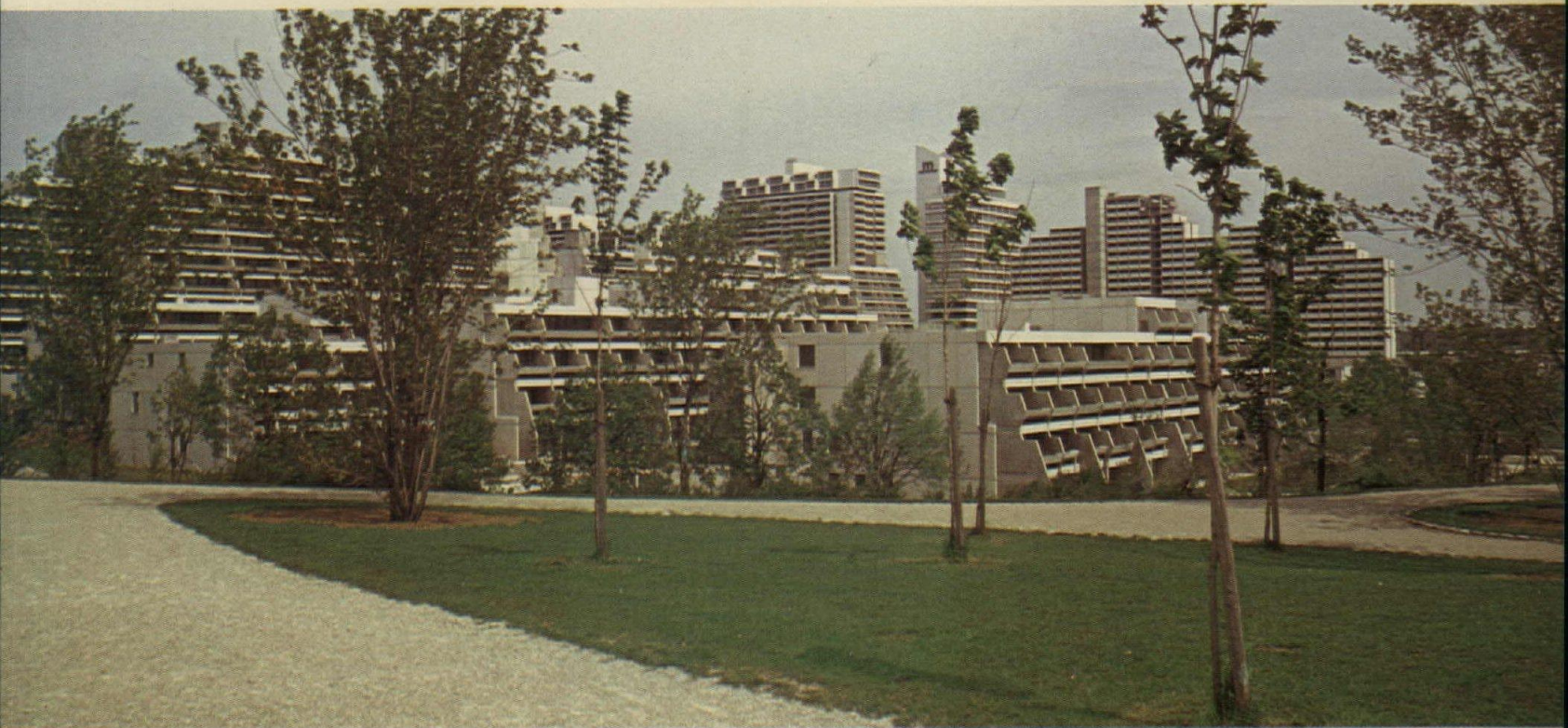
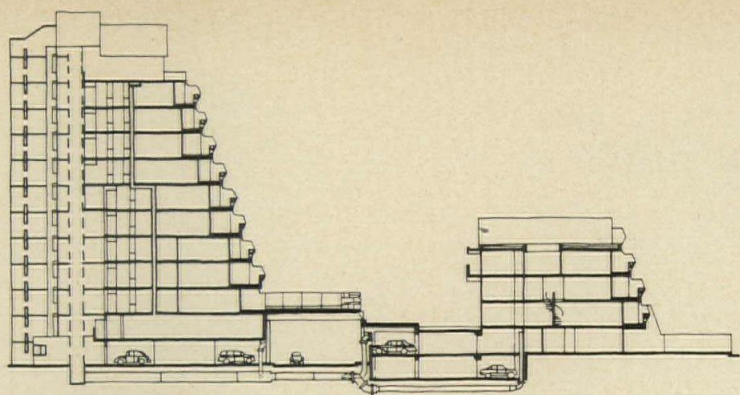
This housing, designed by architect Ebert, was donated to the University for use of Fulbright Scholars by Volkswagen.





## The Olympic Village

... in Munich is a unique grouping of terrace housing—surely the most extensive and most urban, and perhaps the most exciting anywhere. To many, it is too dense, “too cold”—and the units have not sold well since the Olympics; but it is an extraordinary experience to walk the handsome planted pedestrian ways between the buildings, under a trellis of brightly painted service lines (photos below left) that double as directional signing throughout the project. There are extra surprises for pe-



destrians—bright and abstract fountains (bottom photos) are everywhere.

The units shown here are what were the male athletes' quarters, now available as luxury housing to Münchner. The women's quarters (not shown) were low-rise projects built at the base of this high-rise work, now used for student housing.

As the section above and the photos show, each apartment in the terraced high-rises has an outdoor space open to the sky and sun (all buildings face south)—and privacy is assured by deep planting troughs. Since the north faces of the buildings are essentially vertical, the apartments are obviously bigger on the lower floors, and this space is used for extra bedrooms. Some of the narrower spaces on top are combined into duplexes.

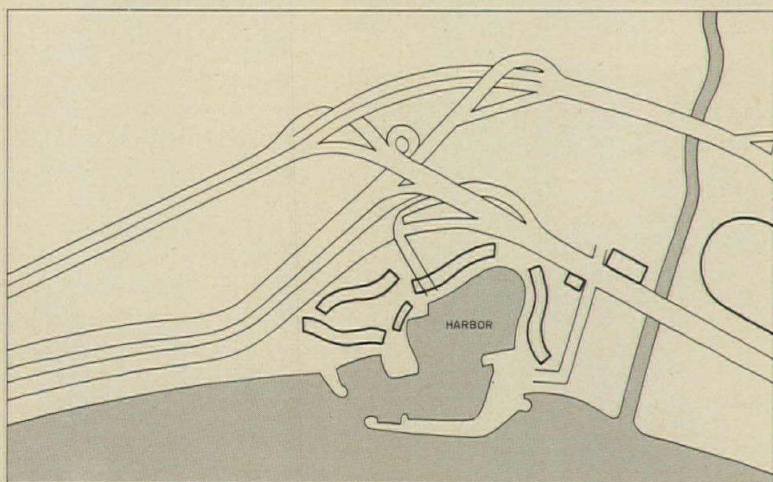
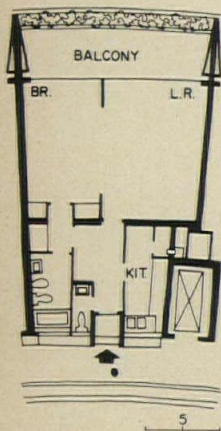
There are 2000 units, with eight plan variants, in this terrace housing, designed by Heinle, Wischer & Partner. The Village also includes 500 units in conventional high-rise (which includes three floors of hotel rooms), 1800 units of student housing—all on about 100 acres. At the core, there is a non-denominational church, the village center and shopping area, schools, and office space. A subway will soon whisk residents to downtown in about ten minutes. The views, of course, are to the athletic area, which today provides residents with, needless to say, extraordinary recreational facilities.



**On the Riviera, the answer  
to the question "why?"  
is sometimes just "why not?"**

## Marina Baie des Anges

... is surely not everyone's cup of tea. But this immensely strong composition—like the totally different confection opposite—makes the point again: we see here a design variety and choice of ways of living that simply does not exist in the United States. Some might see these sinuous hills of concrete as appropriate only to Miami Beach, or, say, the Riviera; but for any warm place it is a functional design and the "side of the hill" apartments—with 33- by 48-foot terraces—offer a kind of outdoor living



that is perhaps unique.

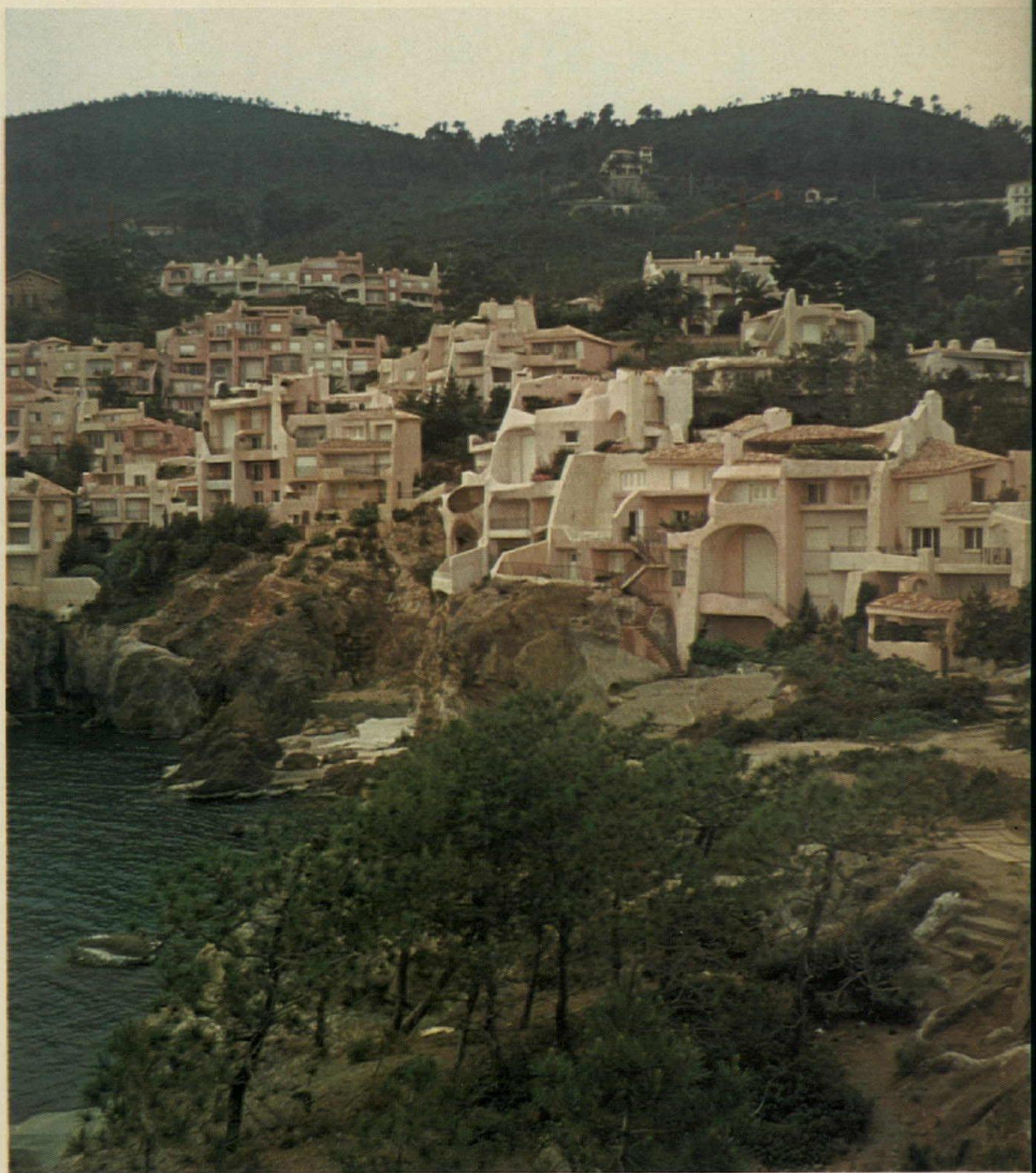
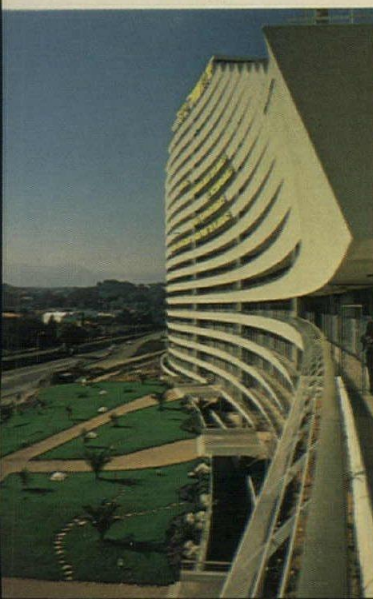
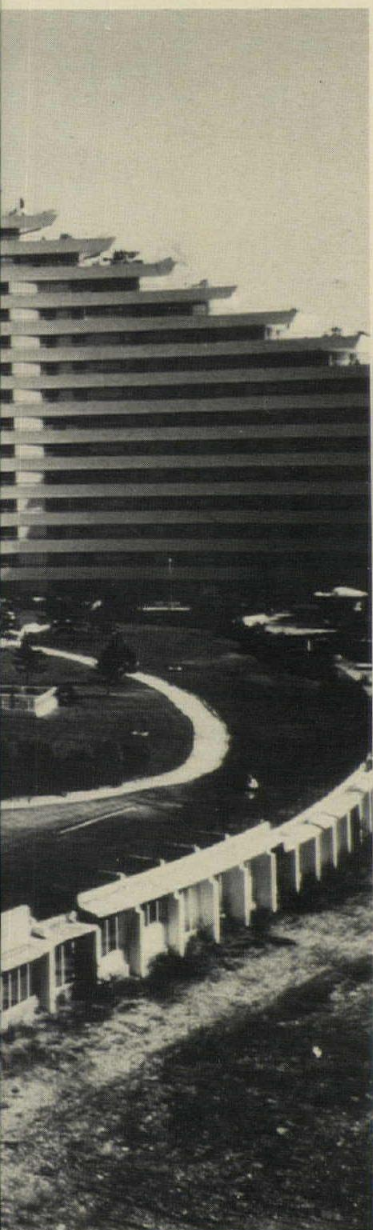
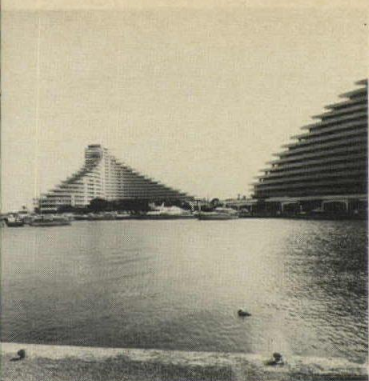
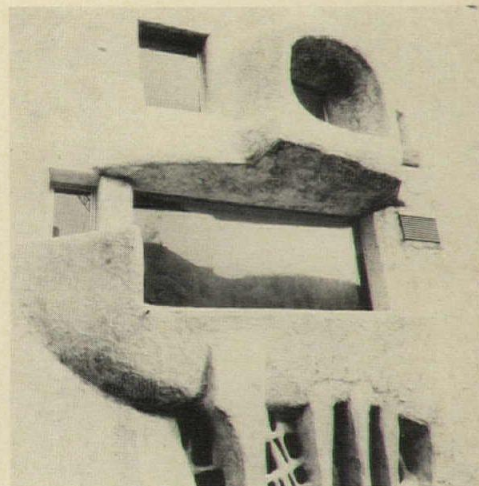
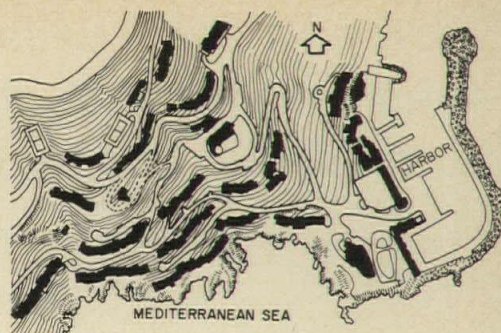
The buildings—two are now complete of a projected four—are only one apartment deep, assuring cross ventilation and views not just of the sea but of the hills behind the site from the rooms, from the balconies, and from the outdoor corridors. Within the complex, architect André Minangoy has provided two-, three- and four-bedroom units. Apartments are separated by 12-inch-thick walls, and floors are a sandwich of 10-inch concrete with 6 inches of sand, felt and tile flooring creating complete sound-proofing.

Finishes are superb: for example, the bedrooms are carpeted, but staircases, landings, and outdoor corridors, as well as halls and living rooms have travertine floors. Ah, why not?



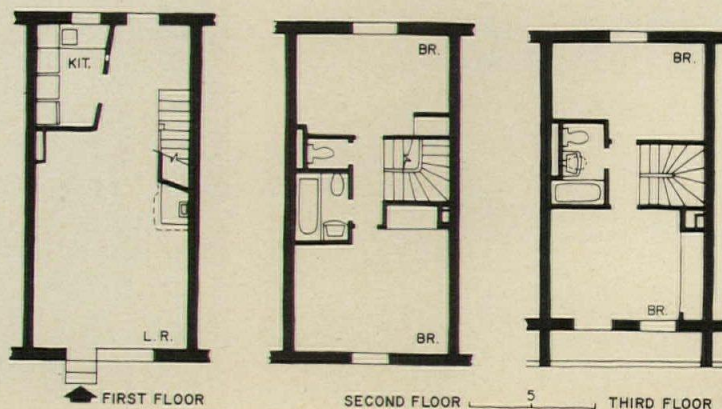
## Cité Marine de Port La Galère

... is surely another "why not." To some it seems whimsical. It is certainly not economical. But, clinging to the side of a cliff overlooking the Mediterranean near Cannes, Port La Galère seems almost alive. And that was clearly just the purpose of architect Jacques Couelle. The site plan suggests a scheme less complex than the reality—while the houses do indeed sit in narrow clusters along the serpentine road, the photos better explain the character of the place—houses of infinitely varied shapes and fanciful form and handcrafted decoration—cement hand troweled onto carefully laid block walls. The units are separated by seemingly random but carefully planned gardens and paths and changing views of the rocks and sea beyond. The houses, which all have terraces with 180-degree views of the water, vary from one to three stories, two to six rooms, 700 to 2000 square feet. In total, 400 houses cling to the 60-acre site. A central clubhouse offers a restaurant, library, discotheque, and swimming pool; and the winding road leads at its base to a 180-slip marina. Off the quay of the marina are a small number of shops and boutiques, another restaurant, and—mandatory for any French Mediterranean harbor—a bistrot. Ah ... why not?





Now that Saint-Tropez is too crowded,  
the French are calmly building  
to meet the market for the picturesque





## Port Grimaud

... is in fact only five miles from the old town (color photo below), and even though the project is still under construction—about 1,000 of an ultimate 1700 houses are completed and sold—it already has an extraordinary character of its own. The project began with the dredging of a swamp at the base of the Golfe de Saint Tropez in 1966—and yet the village already looks as if it had been there forever.

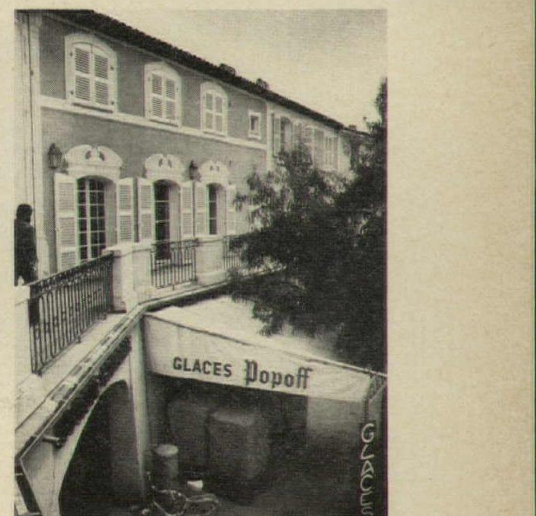
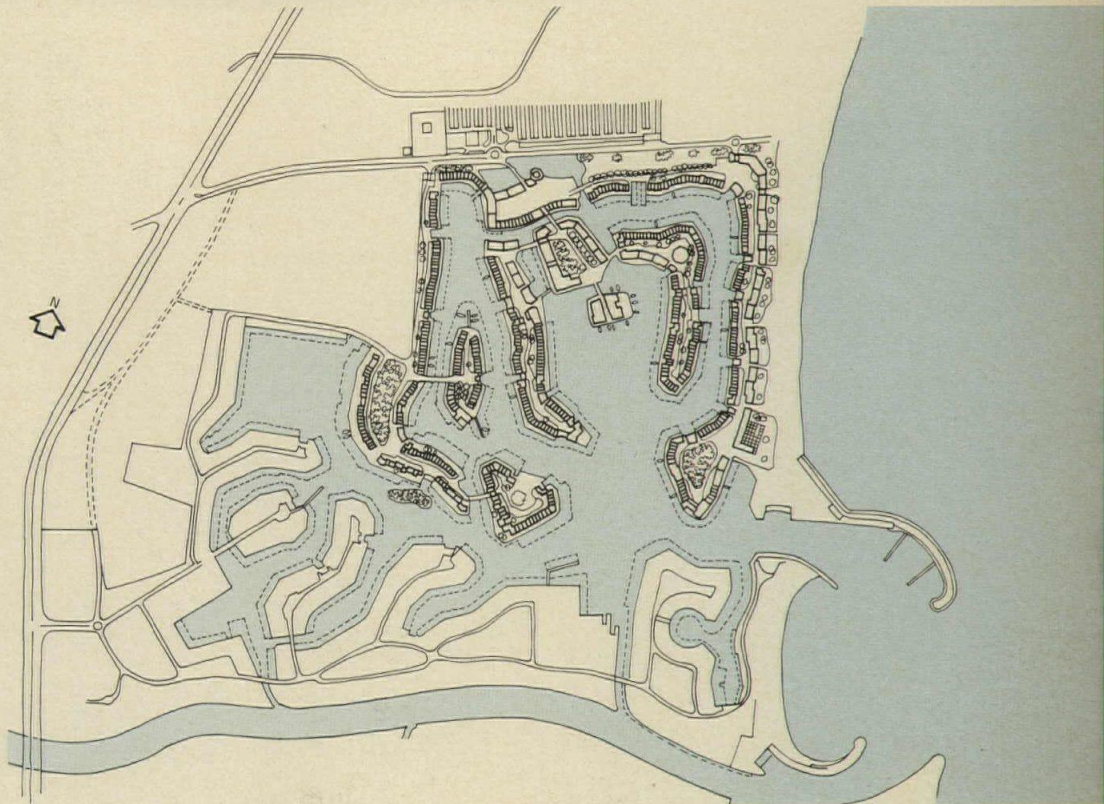
And that is exactly what architect François Spoerry had in mind from the start, and he wields an iron design hand in accomplishing it. The dredging created fingers of land, now lined on both sides with houses separated only by narrow, meandering ways with cobblestone paving, planting and gardens. These are primarily pedestrian ways because the residents, by a kind of mutual understanding, drive their cars to their houses only when they have a heavy load of vacation equipment, or a week's load of groceries.

The alternate they use is a small ferry which leaves the parking area on the land side of the project and meanders through the waterways which serve every house.

On the lagoon side, every house has a small garden behind the sea wall; and boats up to ocean racing size can use the whole lagoon.

The construction of the houses is quite mechanized; giant cranes swing concrete roof sections and floor planks into space. There are eight plan options—two- and three-story. But beyond those disciplines, architect Spoerry's personal and total control creates the "old world" ambience that is Port Grimaud. He insists on control of the massing of adjacent units; and works with the client in the development of the facades and choice of materials and color. Cement blocks are painted in appealing combinations of color; bricks are used, varied wooden balconies and terrace sun shades help create a random, hand-crafted character which is, of course, very controlled. Inside, the rooms are smaller than American standard, but again, the spaces—finished in stuccos and brick and handmade tile and hand-hewn wood—seem appropriate to the place.

The best piece of land in the lagoon was used for the community center and for a handsome church. "When the church was finished," says Spoerry, "Port Grimaud became a real village."





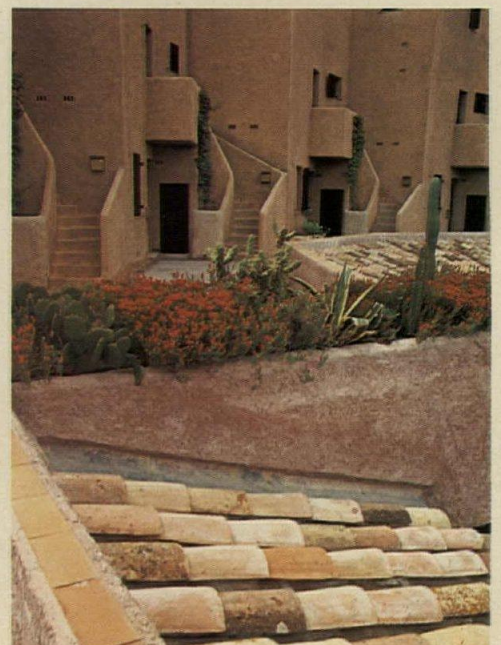
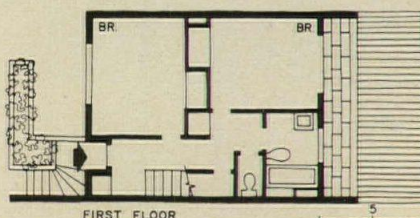
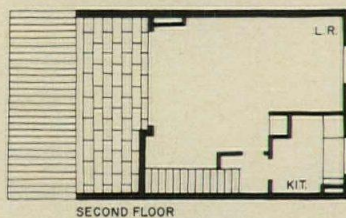
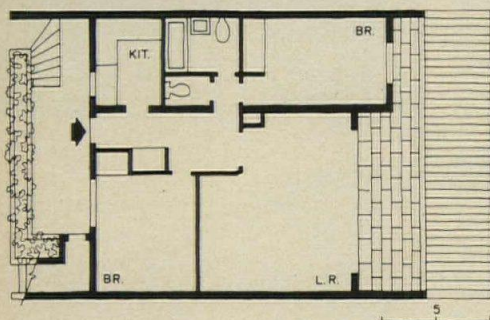
## Marines de Cogolin

... is a second new neighbor of Saint-Tropez on the gulf—with a very different character, but as strong a character as Port Grimaud. It too is a yachting-oriented community, built around a series of basins which open to a protected harbor and in turn to the sea:

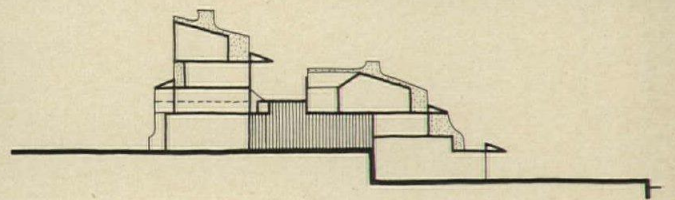
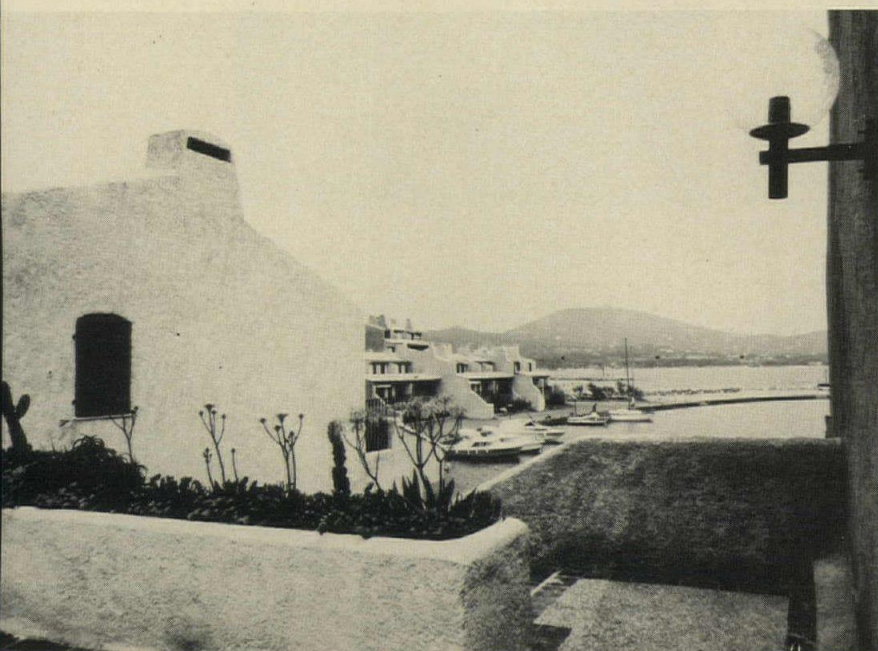
The housing (see photo right and section) is separated from the basins by a broad quay, which in season will have the bustle and color one associates with seaports anywhere along the Mediterranean. Opening to this broad public way are the commercial spaces—post office, a bank, restaurants, clothing and furniture shops, a movie house, and everyday stores. Broad stairs lead up from this public level to narrow pedestrian ways which work like double-loaded corridors—with some houses on the water side that are reached through walled gardens, other houses (below) which reach up for the view and are entered by curving stairs. From this second-level promenade, residents are offered occasional surprise views of the harbor and mountains beyond (photo, below right).

With this ingenious and compact multi-level scheme, architect Jean Dimitrijovic is managing to fit 1000 units and "maisonettes" around the harbor—a dense and urban solution which is nonetheless festive and fun. The design is contemporary—yet the softness of the edges (stucco over concrete block) and the handsome roof tiles and the color and the spare but effective planting make Marines de Cogolin a comfortable, familiar place.

The units are small—most are under 1000 square feet—appropriate to their mostly vacation-house use. Interior finishes are stucco with traditional tile floors, beamed ceilings, and arched windows—but set back into the broad terraces and decks are thoroughly contemporary walls of sliding glass that open to the breeze and views. Prices vary widely, but \$40,000 might be average, including a mooring along the quay or one of the many finger piers extending into the harbor. Automobiles are confined to parking spaces away from the houses and the water—and the residents seem not only to accept this "inconvenience"—but to point it out as a benefit.









## Cap-d'Agde

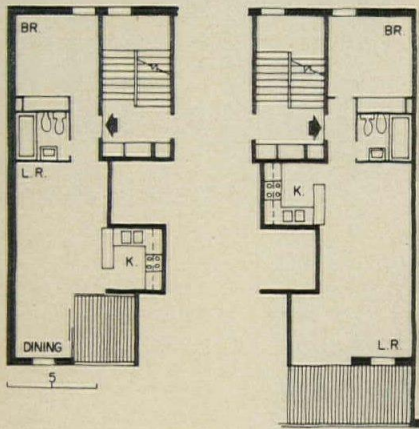
... is a new community being built along the seacoast near Montpellier. Begun in 1969, it now has 1200 units, mostly in the dense complex shown here along the harbor. Eventually, 60,000 people will live on the 1500-acre site—some in high-rises on the hills behind the harbor.

This is a much lower-priced area than the Saint-Tropez complexes on the previous pages—two-bedroom apartments, again with much smaller rooms than would suit the American market, are in the \$15,000 to \$20,000 range. Construction is stucco over block, with some use made of precast units in floor decks and walls.

The broad quay opens along its length to plazas (below) where a variety of stores, shops and restaurants are located. Despite the relatively lower cost, a group of 12 architects under the direction of architect Jean Le Coureur is creating a most handsome and carefully planned city—the scale, whether from the water side or in the narrow pedestrian streets (above), is most pleasant. And great attention has been paid to detailing—to the choice of colors, the patterns of paving underfoot, outdoor lighting, and the spare but effective use of wood in doors and window frames and trim.

So—a third new Saint-Tropez; a third design option and the most contemporary.

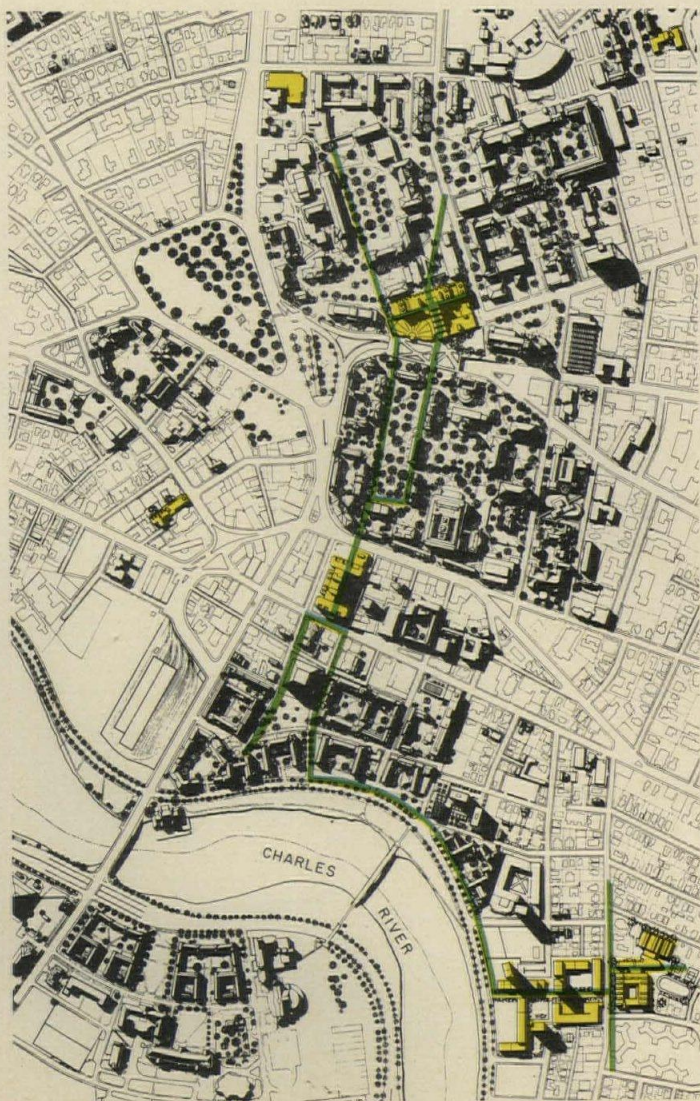
Which, with the other projects shown on these pages, made me wonder why the French and Germans seem to be able to offer their renters and homebuyers—from hourly paid workers to the very well-to-do—more design options; to be able to build complexes that we would think "too expensive to build." They offer, to my mind at least, some very pleasant alternates in the way of living. Ah, why oh why can't we?  
—W.W.







Steve Rosenthal photos



## High-density design for undergraduate science at land-starved Harvard

Back in April 1959, the *Harvard Alumni Bulletin* accused the University and the City of Cambridge of being slow in solving their problems because of their reluctance to accept their urban status.

Harvard thinks of itself as a residential college, much more like Princeton and Dartmouth than Columbia and Chicago. It is understandable, but it just isn't so. Harvard University is an urban university, sitting right in the middle of a busy metropolis. On the other hand, many Cambridge citizens do not think of Cambridge as a city. For them it is much more like Princeton or Williamstown than it is like New Haven or Morningside Heights. This is understandable, but it just isn't so. Cambridge is a functional part of metropolitan Boston. . . .

Fortunately, at that time this criticism was made it was no longer valid—if it ever had been. In 1960 the Harvard University Planning Office brought forth an inventory for planning which for the first time defined the future growth of Harvard in a city and regional context, in what was to become the language of urban design. It called for the intensive use—in terms of building volume and density—of Harvard's available land and at the same time urged the continuation and strengthening of the university's open space network of quadrangles and pedestrian paths and their linkage with the open space systems of Cambridge and Boston. Jose Luis Sert was then Dean of the Faculty of the Graduate School of Design, Professor of Architecture and consultant to the planning office. He was soon to begin to design a series of major buildings for Harvard (page 118) which were to be shaped by the planning criteria of the 1960 report. The Undergraduate Science Center by Sert, Jackson and Associates is the latest of these and it is as stern and tough-minded as its predecessors. Again the consistent Sert has worked rigorously with the ideas which interest him most. Once more he has seized the opportunity to transform a portion of the Harvard campus into his vision of what the modern city should be.

—Mildred F. Schmertz





*"An urban campus is a cultural center within a city, and should set an example of good planning and good design for the city. It is, in a way, a micro-city, and its urbanity is the expression of a better, more civilized way of life."*

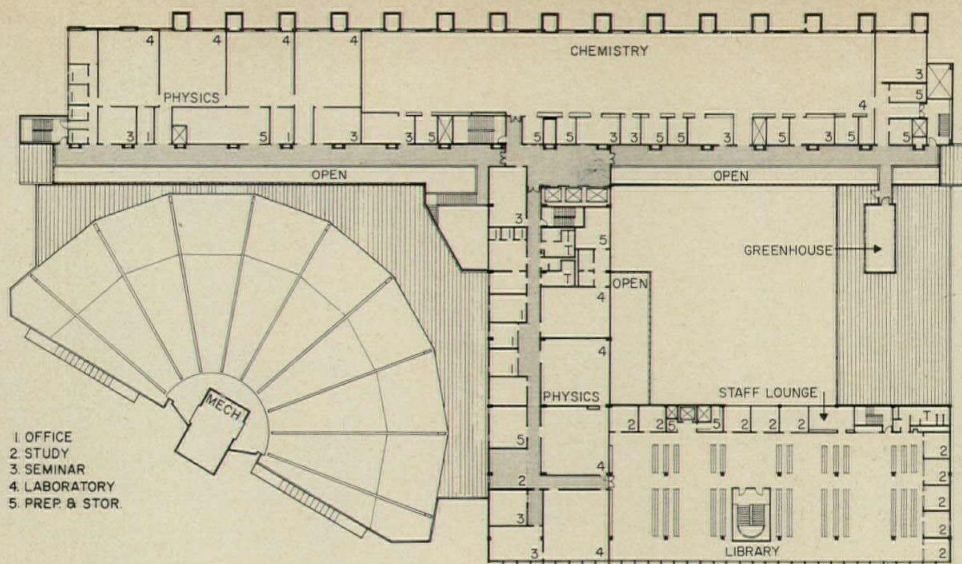
—Jose Luis Sert

### The challenge of size and complexity

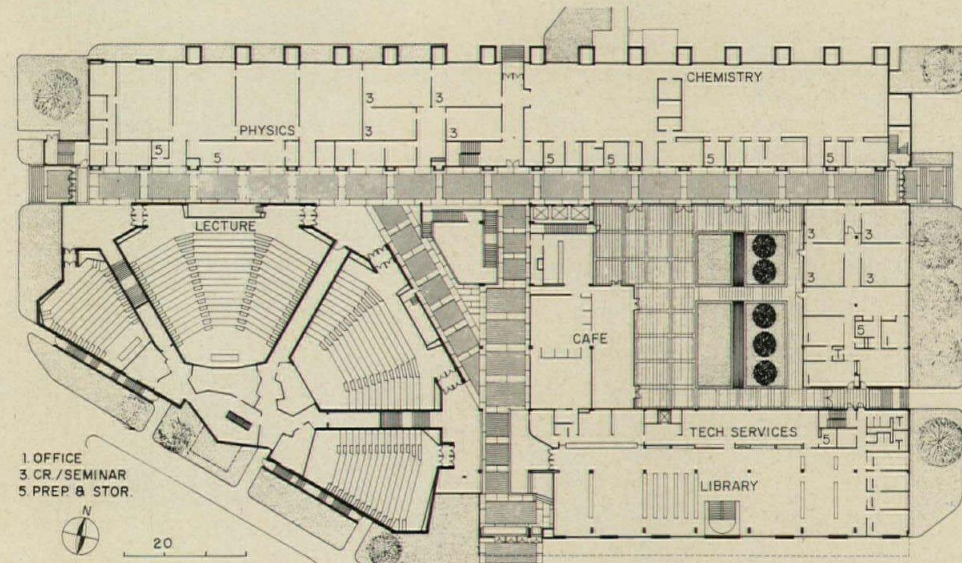
Harvard's new \$15.06 million Undergraduate Science Center, which has been combined with a \$5.3 million chilled water plant, is a mammoth addition to the Harvard campus. As the plot plan (below) indicates, it completely fills a full city block to the north of Harvard Yard. This plot of land now holds 291,000 square feet of facilities for chemistry, biology and geology, physics, mathematics, statistics and astronomy, as well as four large lecture theaters, a cafe, three libraries and administrative offices. The chilled water plant which serves nearby and projected campus buildings occupies another 58,000 square feet. This combined laboratory, library, classroom-administrative structure and power plant, in its density of use and complexity of function, is indeed a micro-city rather than a building. Its inner network and the massing of its elements relate to Harvard's circulation system and the scale and massing of the buildings in the Yard. By extension the design of the Science Center is an integral part of the City of Cambridge and its surrounding region.

### Extending and improving the site

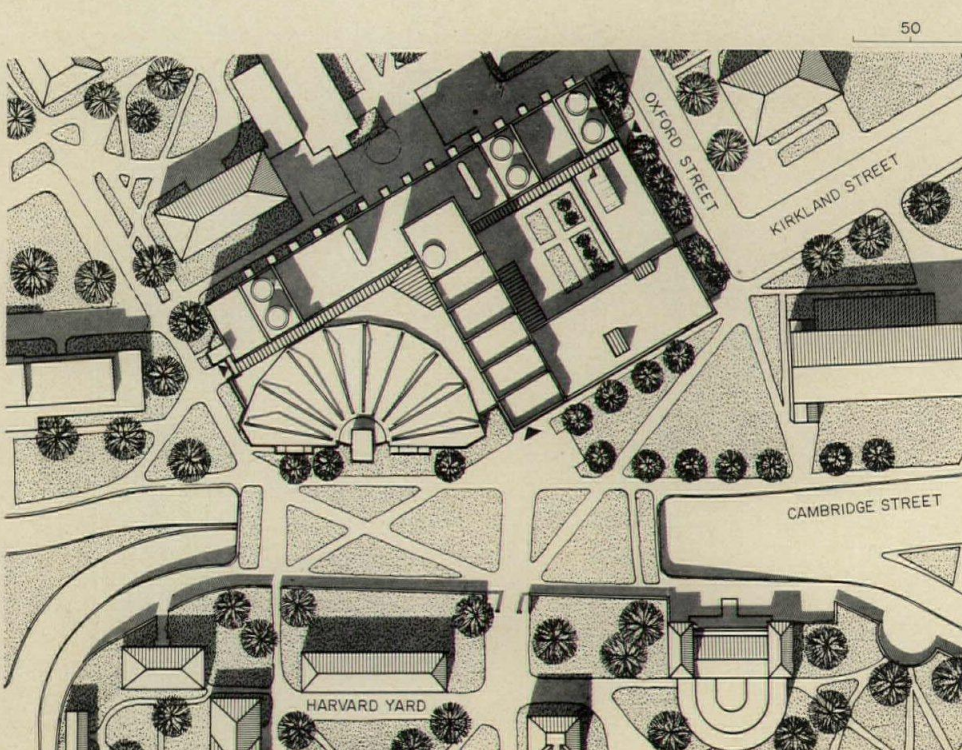
The Harvard University Planning Office, prior to the construction of the Science Center, recommended that the University in agreement with the City of Cambridge turn a portion of Cambridge Street into a vehicular underpass with a park on top. Additional land for building was acquired by eliminating the intersection of Kirkland Street and Cambridge Street (see site plan right). Even more importantly, by paying



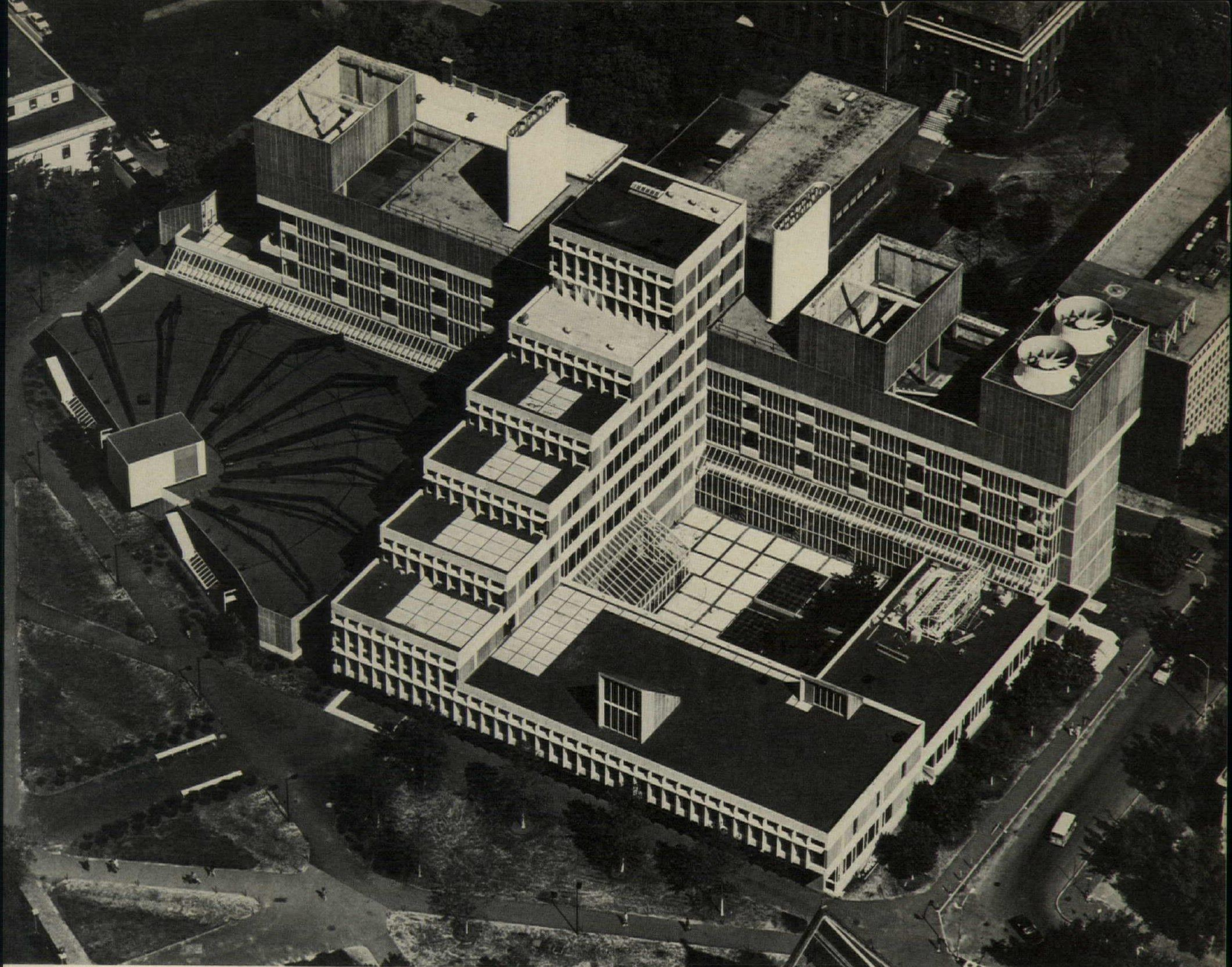
SECOND FLOOR



FIRST FLOOR

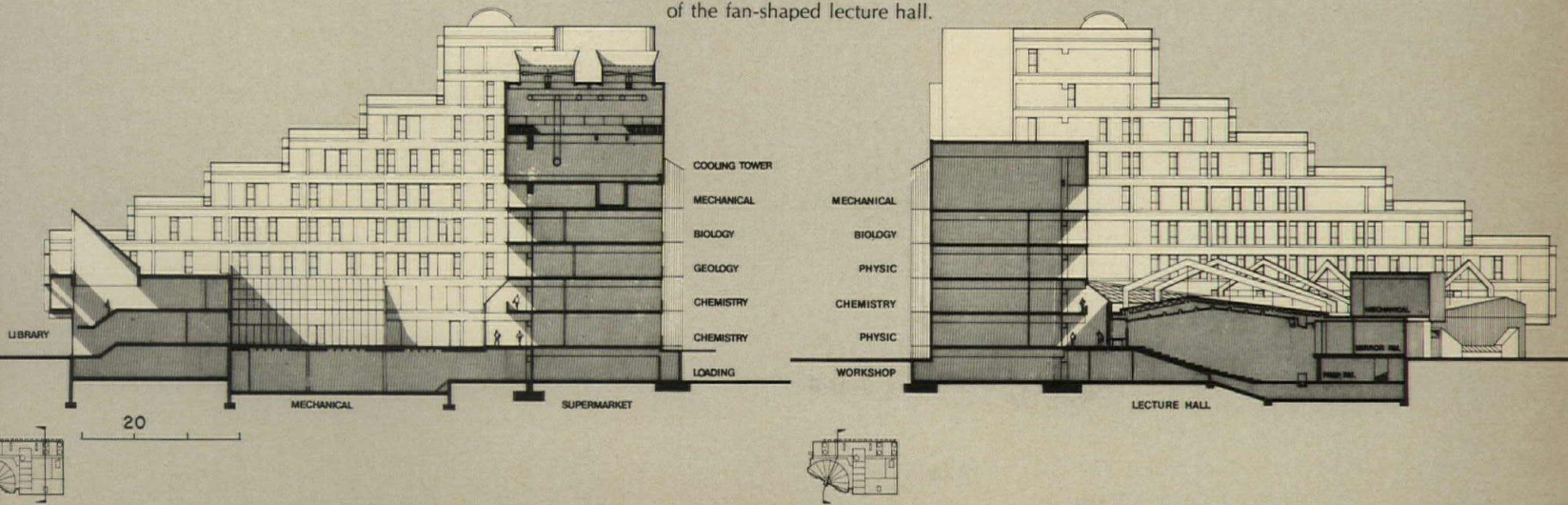






Laurence Lowery

The Science Center consists of five basic elements: the laboratory wing at the rear of the site; the six-tiered classroom wing for the mathematics department; the three-story library and the one-story administration wing. Lower elements face Harvard Yard across a new park created by depressing Cambridge Street (see site plan opposite). The steel and cable space frame supports the roof of the fan-shaped lecture hall.





to sink the road, Harvard created a pedestrian connection linking the northern campus to Harvard Yard. This connection can be seen in the photo (page 112), taken through one of the gates from the Yard. As the Harvard campus plan (page 111) indicates, this little park extends the network of pedestrian paths, quadrangles and well-scaled open spaces northward from the Harvard Business School, across the Charles River, through Holyoke Center and the Yard to the principal entrance of the Science Center.

### Reinforcing the circulation pattern and humanizing the scale

Sert has often pointed out that in all human settlements, the patterns of circulation are the most ancient. Buildings disappear or their uses change with the passage of time. A network of trails, however, may become a pattern of streets within an overlay of boulevards—all developed from increasing intensity of use rather than change of function.

Since in Sert's hierarchy of architectural values circulation comes first, it should surprise no one that the Science Center is organized about two skylit interior passages (see cover) at right angles to each other, one heading northwest and the other northeast to eventually link up with existing or projected pedestrian networks—green fingers which will extend as far as the Harvard Observatory in one direction and the Divinity School in another.

Having created this T-shaped pedestrian spine as the basic given, Sert and his team began to organize the elements called for by the program. He was undaunted by the University's request that he find a way to tuck in the chilled water plant since he enjoys resolving intricate spatial and functional puzzles. For him the most important problem was posed by the fact that volumetrically the building would be a monster. How could it be sized and massed so as not to overpower the buildings of the Yard, or the people who use them?

The architects elected to keep the massing as low as possible on the side of the building which faces the Yard and the new little park. The lecture hall element was designed as a pivot to turn the corner of the site as the orientation of the Cambridge Street geometry changes. To give it as little apparent bulk as possible, much of its volume is below ground and its roof is hung from an exposed space frame made of weathering steel and marine cables. The classroom wing for the mathematics department steps down in a series of terraces which end one story above the roof of the three-story library. The latter element has been scaled to harmonize with the Yard buildings directly across the park. The laboratory wing with its penthouse cooling towers and exhaust ducts has the most combined height and bulk and is therefore set farthest back. Within the complex is a small courtyard, one side of which is contained by the low administrative wing. The lower elements of the Science Center give the little park a definite edge. In combination with the adjacent Harvard buildings, they transform the park into a new quadrangle rather than an amorphous open space.



Window and panel widths conform to a strict module and the structural system is clearly expressed throughout. The bas-relief modeled in sand (below) is by Constantino Nivola and

was donated to Harvard by the Olivetti Corporation of America. It was originally created for a since-demolished New York City showroom but is in excellent scale here.









### Devising a precast system for fast assembly

Sert has long been interested in rapid assembly methods and, in the case of the Science Center, this interest coincided with the desire of the University to move ahead quickly. Since the structural system and construction process for this building has already been described in some detail (RECORD, February 1972), it will be discussed only briefly here. The laboratory wing is a totally precast system with 3-foot, 8-inch deep, 60-foot long reinforced concrete girders—perforated for utilities—spanning between "ladder" columns on one side of the building and post-tensioned, U-shaped concrete shafts on the other. The girders which cantilever 7 feet over the single corridor, are used in pairs (7 feet apart) on 24-foot centers. For economic reasons, all the girders were made the same and therefore each has the maximum number of penetrations which could be permitted structurally, although many are not utilized.

The three-story-high ladder columns have haunches at each floor to carry the perforated girders. The wind loads on the laboratory wing are taken entirely by the post-tensioned concrete shafts and no rigid frame action has been employed.

The Science Center laboratory wing has 15 mechanical shafts, 24 feet apart, with 6- by 8-foot interior dimensions, running from the basement to the mechanical floor. Mainly they are used for ducts for fume hood exhaust, but they also carry plumbing and electrical risers.

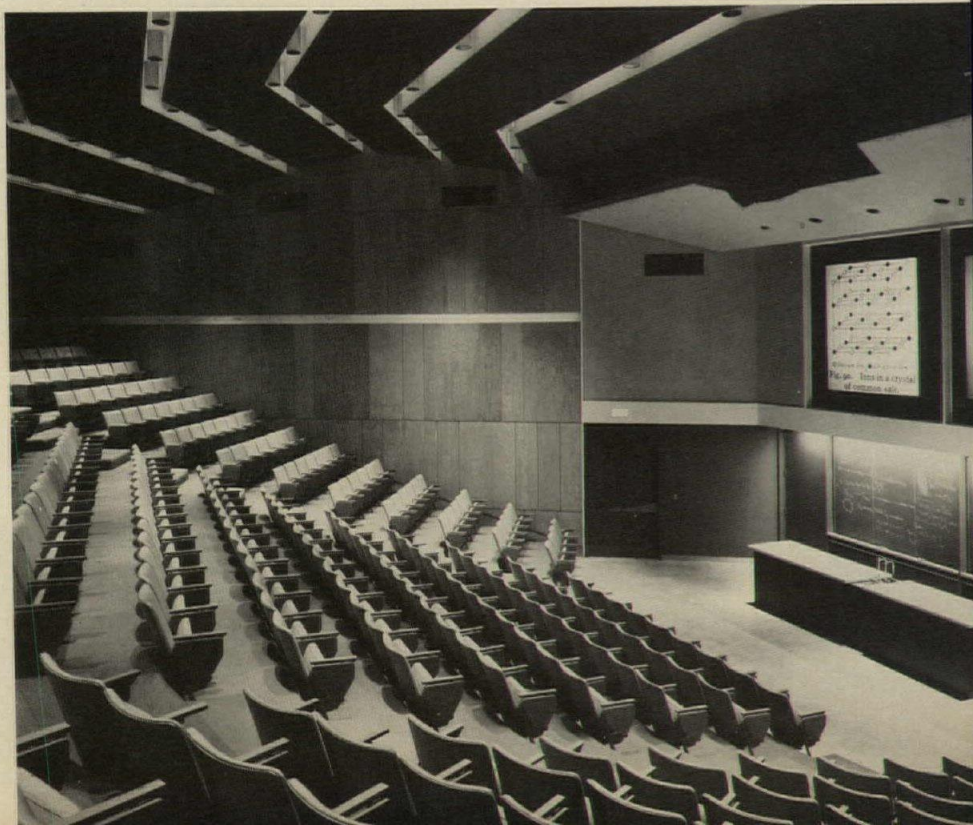
The structure for the 60- by 400-foot laboratory wing was erected in seven months, due mainly to the choice of the precast framing system. Precast concrete was used everywhere except in the lecture hall wing which is framed in steel, and the special basins and supporting structures for the rooftop cooling towers which are poured-in-place concrete.

Throughout the entire complex, structural concrete members are exposed on exterior walls. Infill panels are of precast concrete with an exposed local aggregate of purplish hue which is normally used only in foundation concrete. Both grey and clear glass are used in the painted aluminum windows. The sunshades on the building's south elevation, which permit the use of large windows in the library, are also fabricated of painted aluminum. The interior finishes are austere. Wherever possible the final floor finish is sealed concrete and the finished ceiling is painted concrete plank. Partitions are of painted gypsum board in the laboratory wing.

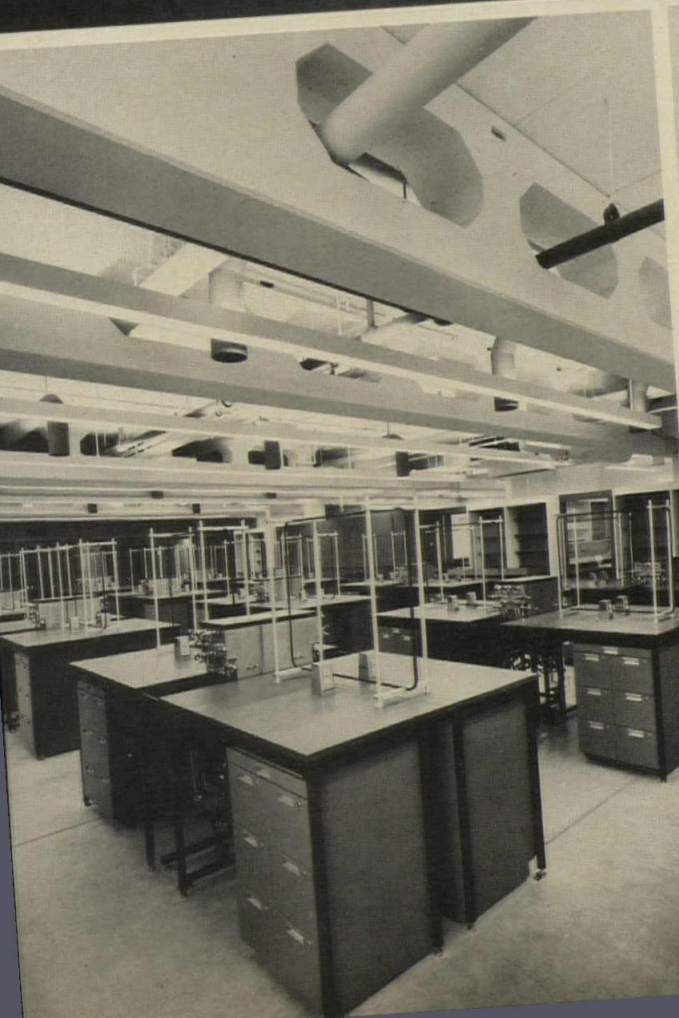
UNDERGRADUATE SCIENCE CENTER AND CHILLED WATER PLANT, Harvard University, Cambridge, Massachusetts. Architects: *Sert, Jackson and Associates, Inc.*—principals-in-charge—*Paul H. Krueger, Joseph Zalewski*; associates—*Hugh Russell (job captain), Donald Vitters, John Williams*. Engineers: *Lev Zetlin Associates, Inc.* (structural); *Syska & Hennessy, Inc.* (mechanical); *Bolt, Beranek & Newman, Inc.* (acoustical). Consultants: *Simpson, Gumpertz & Heger* (specifications); *Dick Oldham Associates* (audio-visual); *Crabtree, Dawson & Michaels* (kitchen); *Burgess P. Standley* (laboratory). General contractor: *Turner Construction Company*.



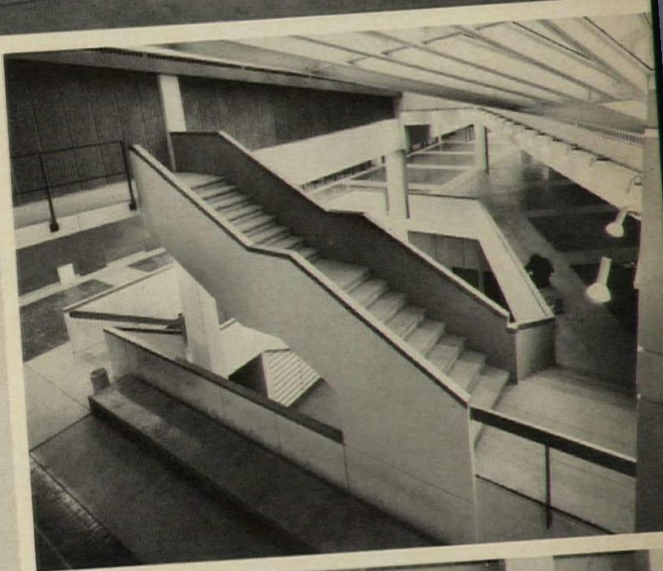
The glass enclosed cafe (above) is centrally located along one of the two principal corridors overlooking the courtyard. The large lecture hall (below) is one of four within the complex.







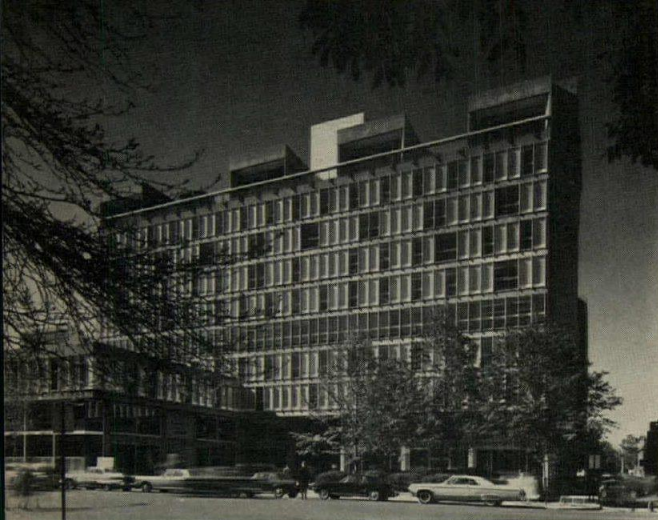
The main stair (above and right) is located at the intersection of the two principal corridors or interior streets. It inhabits a dramatic and handsome skylit space which connects the main floor with the supermarket and other services in the basement.



All services to the laboratory benches (left) are delivered from exposed piping in the ceiling which passes through perforations in the precast structural girders. The exhaust ducts at the rear of the laboratory wing (right) are five-stories high. At this point in-line fans expel the fumes. Ten of the 15 shafts are heavily used and five lightly.







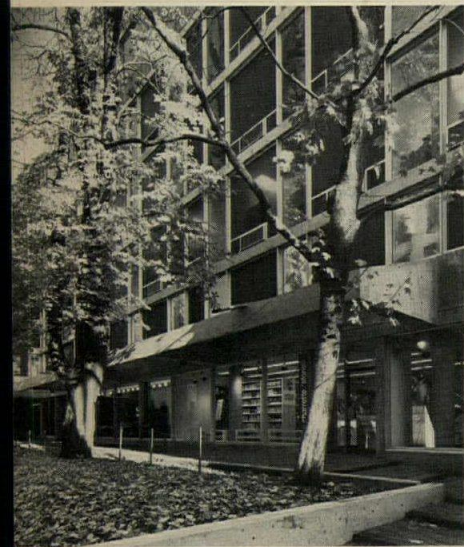
Laurence Lowery

Laurence Lowery

3, 4

1, 8. Holyoke Center, Harvard;  
2, 5, 6, 7. Brattle Street office building and shopping arcade;  
3. Boston University; 4. Peabody Terrace (married students housing) Harvard.

5



6

The work of Sert, Jackson and Associates at Harvard and in the Cambridge/Boston area is instantly recognizable as theirs. It is characterized by an unrepentant urban scale and density which at the same time acknowledges humbler neighboring buildings and modest human needs such as those of the pedestrian (below). The facades appear to be almost random in their projections, fenestration and terracing, making explicit the functions within. Boldly expressive, the work avoids the false picturesqueness perpetrated by those who deliberately seek it. The buildings make honest use of readily available and economical materials and rapid systems of assembly, without being in any sense ugly. Sert himself does not appear to have wavered in his belief in the basic tenets of the modern movement and such single-minded consistency is cheering if only because it is so rare these days.



Bennett Jones

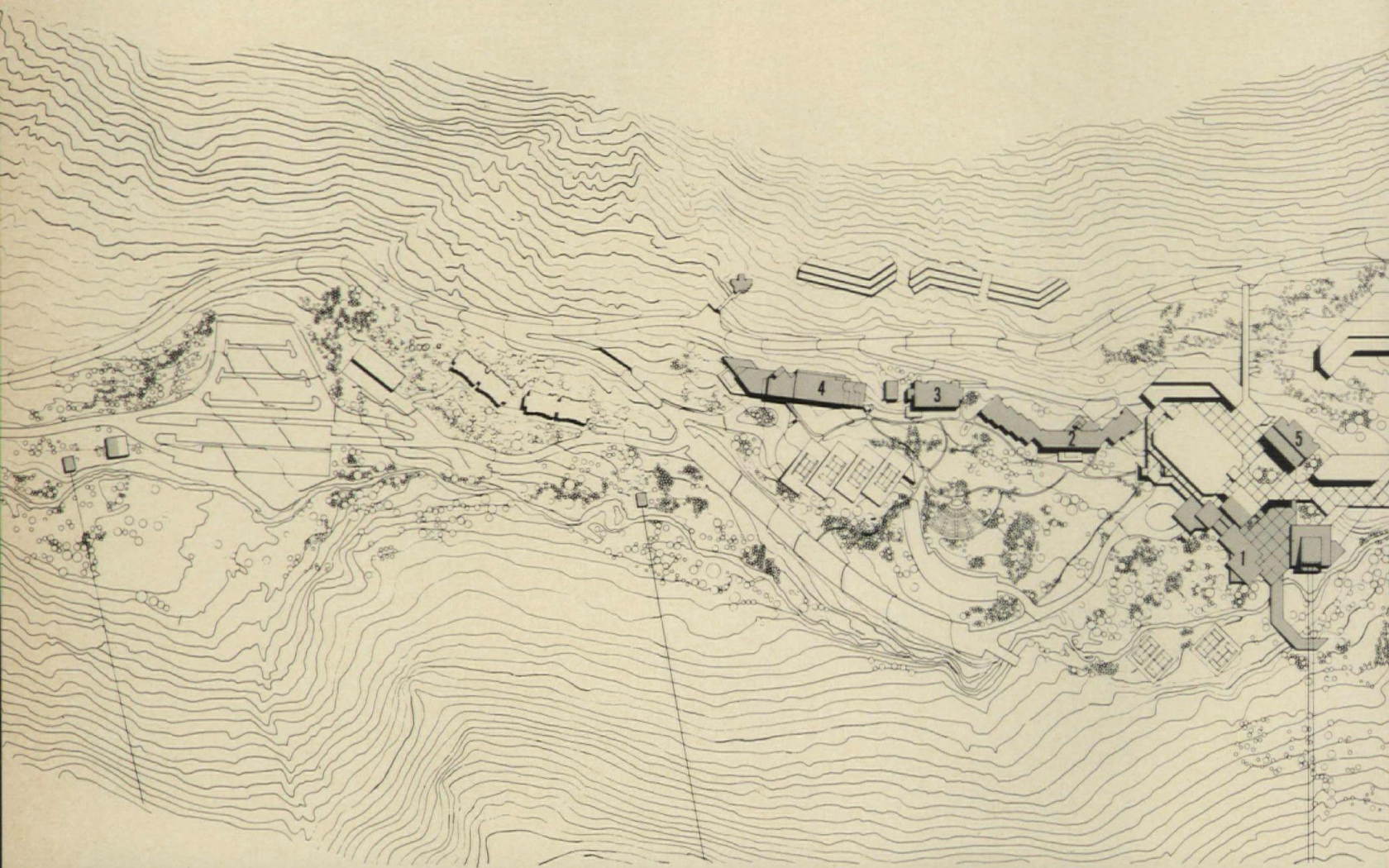
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SNOWBIRD:  
IN SCALE WITH  
THE  
MOUNTAINS



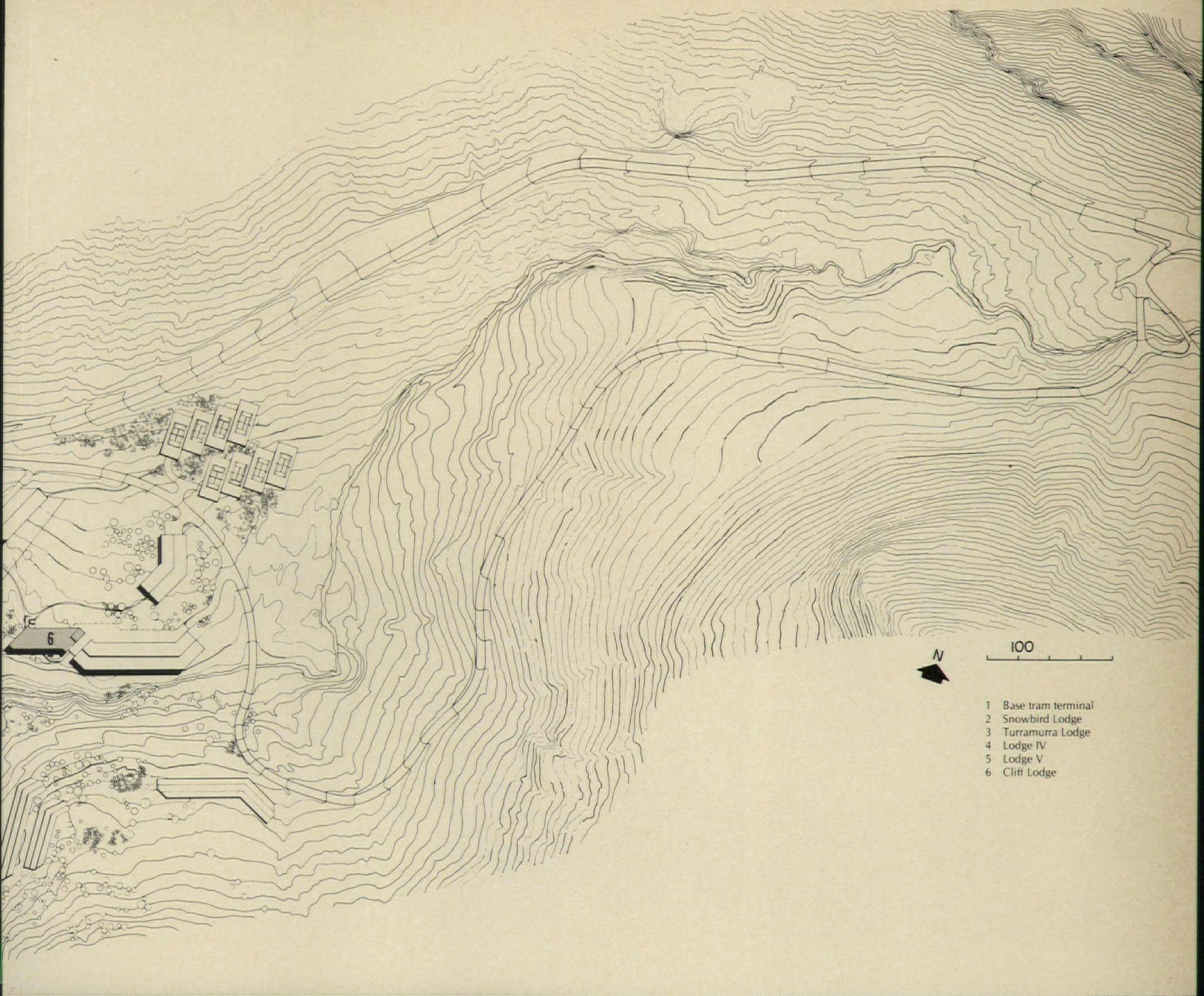


Snowbird provides a good instance of planning that knows when to be timid and when to be bold. Nearly a decade ago Ted Johnson, a skier who is now president of Snowbird Corporation, began acquiring old mining claims in Little Cottonwood Canyon in the Wasatch Mountains near Salt Lake City; his goal was to use the land (together with additional land leased from the United States Forest Service) to make what Snowbird has been called by some, the finest ski resort in America. By 1966, the initial master plan and architectural concepts—based on lengthy studies of the natural qualities of the canyon, including the patterns of its avalanches—had been developed by Brixen & Christopher, architects, and by the firm of Bliss & Campbell and John R. Smith, architectural consultants; the Office of Dan Kiley acted as site planning consultant. "From the beginning," Smith says, "we wanted something in suitable physical scale—not necessarily human scale. We felt that Snowbird should be a strong, bold, high-density, very studiously 'American' resort." In the continuing development of the master plan (which is now being carried on by Enteleki Architecture, Planning, Research, a firm of which Smith is a principal) the designers have managed to stick to these

original goals with an admirable consistency.

The plan (above) is composed of an integrated series of multi-level structures that provide lodging and commercial space. These are set low in the site and their roofs are covered with sod to minimize their visual impact when they are seen from roadways or from other buildings above. The planners were anxious to avoid the piecemeal multiplication of small chalets across the site, and so no private land has been offered for sale. Instead, the necessary residential accommodations are provided in relatively few buildings. In doing one set of things that they thought desirable (not covering much land, preserving as many trees as possible, and minimizing water runoff), the planners were also able to provide buildings of sufficient size to be in scale with the rugged setting. They do not sprawl across the mountainous terrain as hundreds of individual houses would have; instead they stand in partnership with the steep mountains around them. All of the major lodge buildings are organized in a linear fashion that follows the strike of the natural contours and allows an easy flow of pedestrians, services and utilities along generally level lines, rather than across the steep land on either side. Thus a pedestrian





- 1 Base tram terminal
- 2 Snowbird Lodge
- 3 Turramurra Lodge
- 4 Lodge IV
- 5 Lodge V
- 6 Cliff Lodge

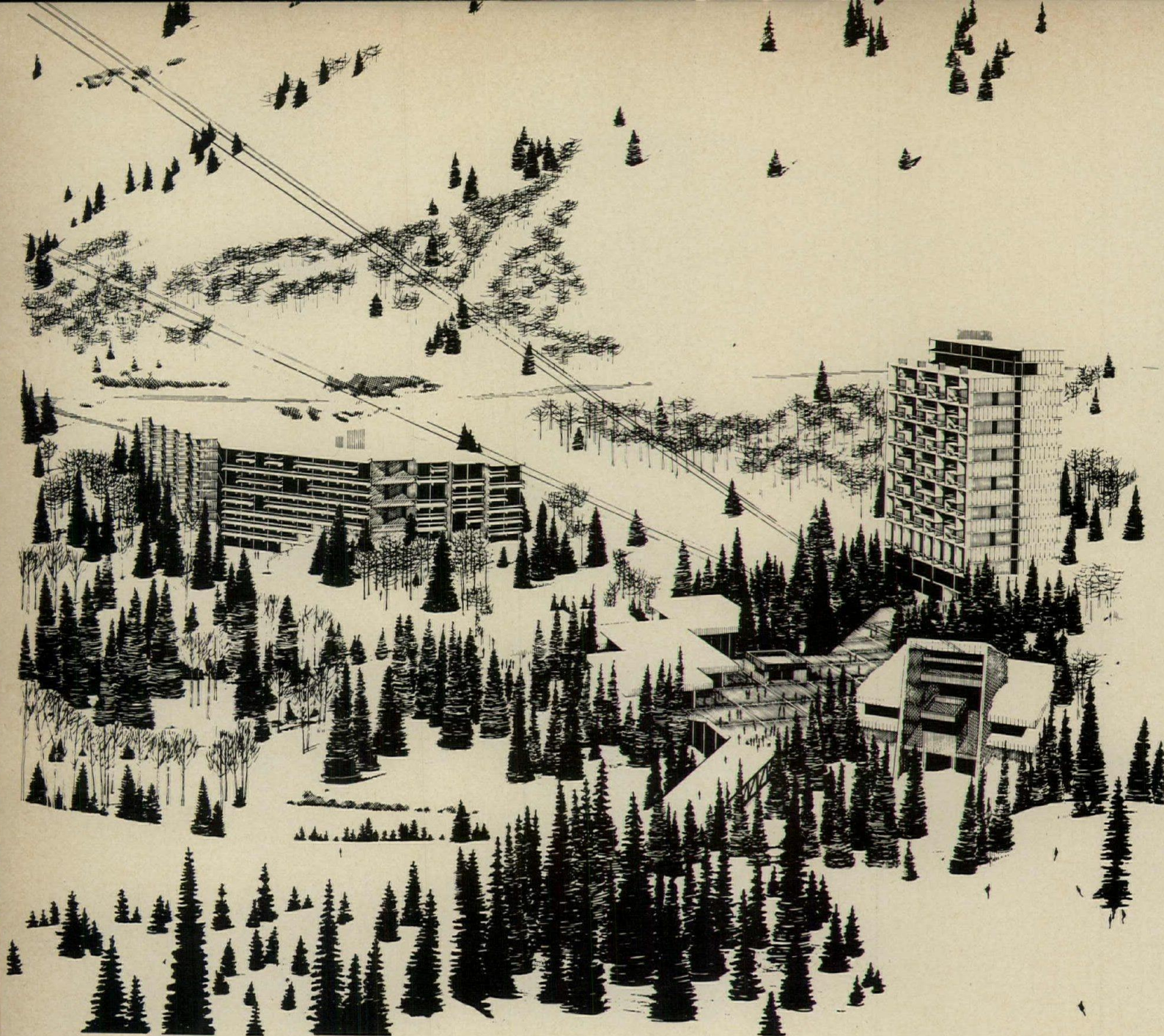
can move—usually under cover, an important consideration here since the annual average snowfall is 450 inches—between most buildings and to the central plaza without inconvenience.

Ultimately the greater Snowbird development is planned to provide overnight accommodations for 6,500 people in the base village and in three satellite villages, and the lift and trail capacity will be close to 10,000 skiers a day by 1980. Even though the designers of the resort manifested from the beginning an unusual respect for the ecology of the mountains, they are encountering pressure from some citizens in the Salt Lake City area who would like to see the development of Cottonwood Canyon (which supplies about a quarter of Salt Lake City's water) more strictly limited. It is not yet completely clear how much effect the proposed development would have on the water supply, or how that effect could be minimized. But, as John Smith admits, "We are—and rightly so—having to come up with more and deeper answers to many environmental problems." Judging from the way the Snowbird planners have dealt with such delicate issues in the past, the possibility of finding solutions seems hopeful, and desirable as well.

—Gerald Allen

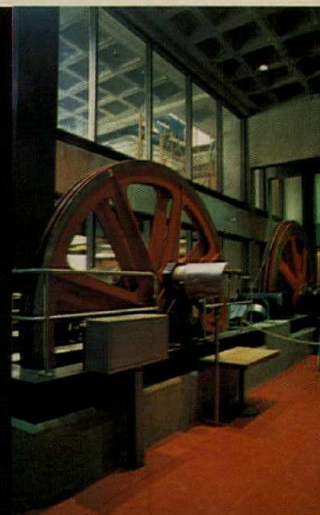
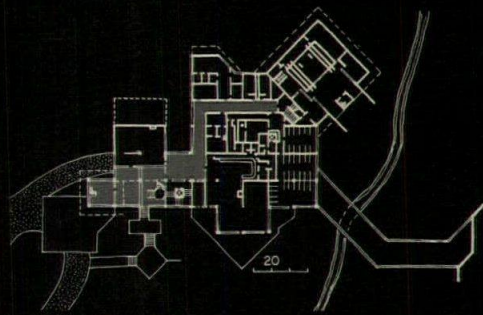






**The first public facilities for Snowbird** were built at the Base Village, and they are a terminal for the 120-passenger jigback tramway, a base plaza with commercial facilities and, below it, more commercial space, offices and restaurants. This is the village center for skiers and for other pedestrians. The three-level building provides vehicular access, and some parking, on the first level, on the second the commercial spaces begin (plan right) and on the top is the plaza (seen to the left of the tram terminal in the above drawing). The tram machinery, which looks like a set of parts lifted from some outside Swiss watch, is enclosed by glass walls and on one level surrounded by a bar, the better to charm the eyes of weary imbibers. The building is designed eventually to provide integral connection, both above and below ground, to the collection of lodges built around it.

SNOWBIRD BASE TRAM TERMINAL, VILLAGE PLAZA AND SKIERS' BRIDGE. Architects: *Brixen & Christopher*. Engineers: *Edmund W. Allen* (structural); *Bridgers & Paxton* (mechanical); *Blomquist & Brown* (electrical for tram terminal); *Arthur H. Nielson* (electrical for village plaza and skiers' bridge). Consultants: *Robert O. Richins* (restaurant and bar interiors); *Ted Nagata* (graphics). General contractor: *Cannon Construction Company*.







**The Lodge at Snowbird** (above and on the left in the opposite drawing) takes its form from the linear principles of the overall land planning. It is a 160-unit condominium hotel, and the units vary from singles to studio apartments to three-bedroom apartments with kitchens. These are arranged along single-loaded corridors (plan right) so that they all have the advantage of facing the sun and the ski runs. This was the first full-scale illustration at Snowbird of the principles of high-density residential units large enough to be a presence in the landscape, but with sufficiently low site coverage to avoid destroying it. The 140,000 square feet cover only about a half acre, and, according to Snowbird officials, only four evergreen trees had to be removed to put it there. Though it successfully manages to signal its presence by force of its size, the Lodge, with its cantilevered balconies, seems somewhat less continent and less bold than some of the other buildings that have been built more recently at the resort.

THE LODGE AT SNOWBIRD. Architects: *Brixen & Christopher*. Engineers: *Joseph E. Patrick* (structural); *Bridgers & Paxton* (mechanical); *Blomquist & Brown* (electrical). Consultant: *Robert O. Richins* (interiors). General contractor: *Cannon Construction Company*.

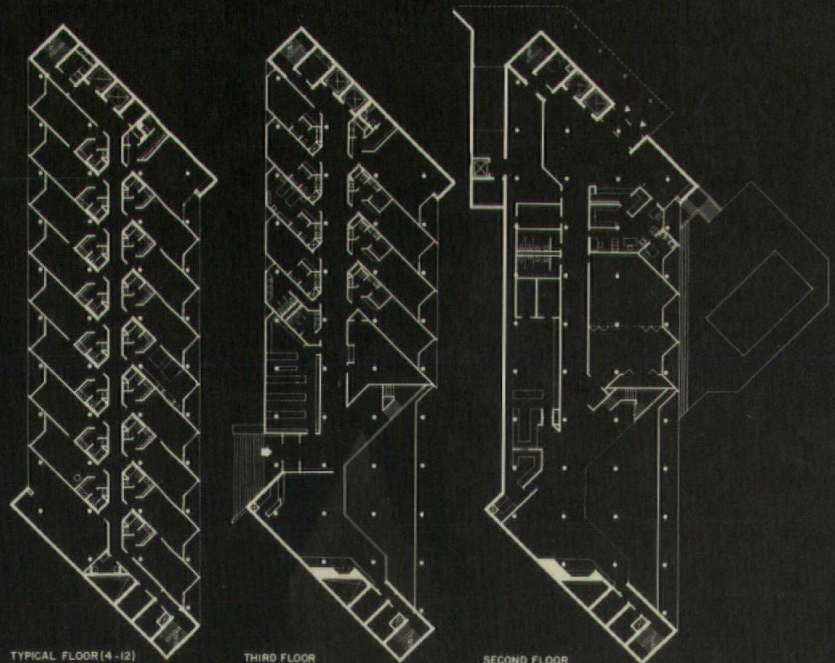






**The Cliff Lodge** at Snowbird, unlike the first lodge near the Base Village Plaza, is a conventional rather than a condominium hotel. It is a 12-story reinforced concrete building with 162 rooms, restaurant, saunas, swimming pool, library, lounge and bar. The plan of the lodge is skewed from rectangle to parallelogram in order to attain longer views up and down the canyon—though the structural grid manages without apparent strain to remain orthogonal (plans right). The first three floors contain on the whole public spaces, including the double-volume lounge and dining area. The remaining nine floors consist entirely of guest rooms. The folding together of structural and programmatic concerns, as well as those of siting and massing, seem comfortably appropriate. There is little here that screams for attention, but much that seems altogether fitting for the occasion.

THE CLIFF LODGE AT SNOWBIRD. Architects: *Enteleki Architecture, Planning, Research*. Engineers: *Edmund W. Allen & Associates* (structural); *Rollins, Brown & Gunnell, Inc.* (foundation); *Bridgers & Paxton Consulting Engineers, Inc.* (mechanical); *Nielson Engineering* (electrical). Consultants: *D. R. Mansfield & Associates* (interiors). General contractor: *Cannon-Galesburgh Construction Company* (joint venture).





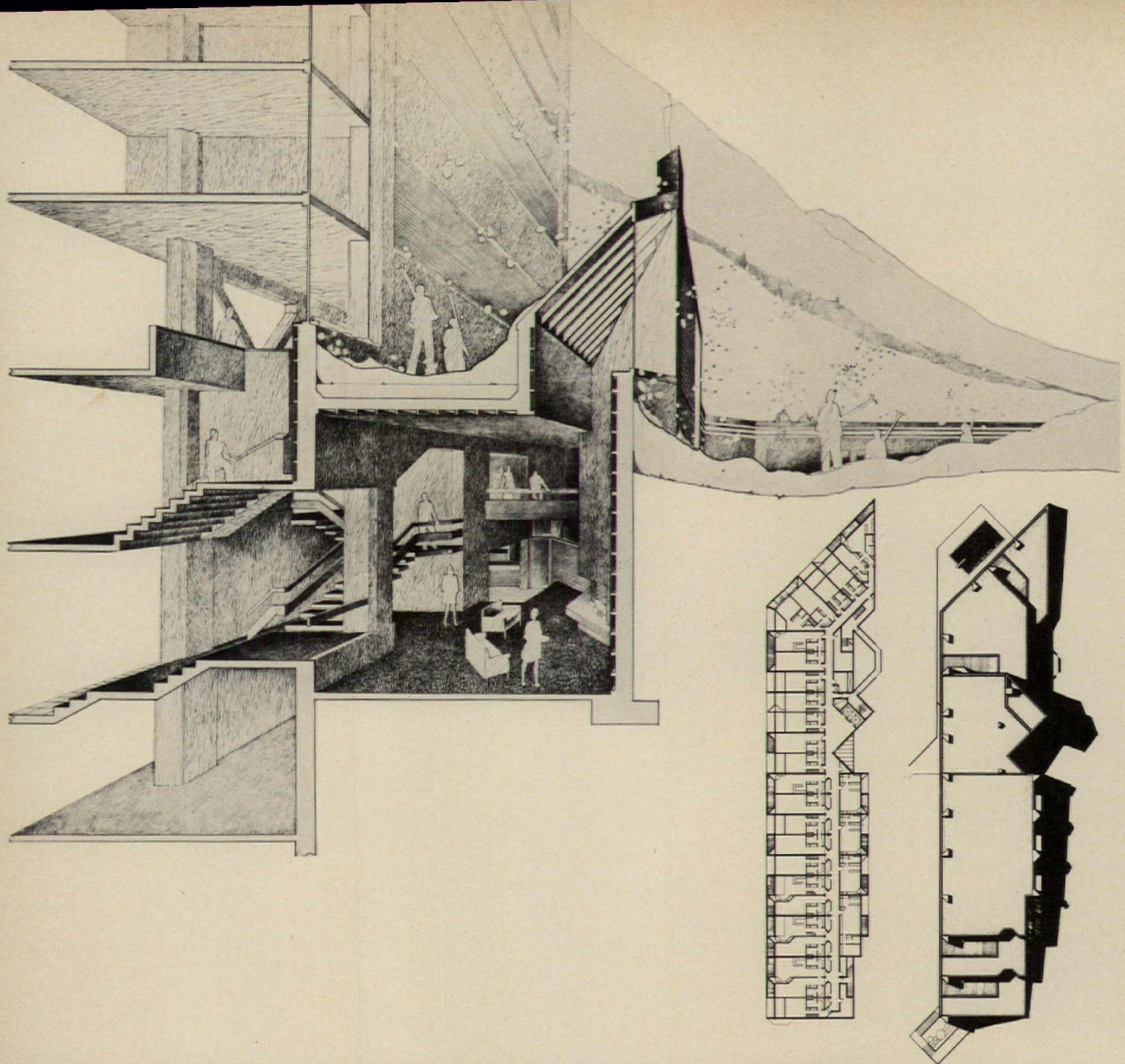


**Mid-Gad Valley Restaurant** is located approximately half way between the bottom and the top of the ski runs. It can warm and feed about 200 skiers at a time (and also resist 125 mile an hour winds, and earthquakes, if necessary). The building is a 10,000 square foot structure of laminated wood beams and glass. Point load columns at the corners support the entire structure fifteen feet above the ground. The structural system consists of a series of interlocking laminated wood trusses with steel gusset plates. The transparent framework of the building affords panoramic views of the mountains and the village below. At the center of the building, where the truss members come together to form an inverted pyramid, there is an open fireplace which is the visual focus of the interior. A part of the square plan is eroded (site plan, right) to provide an outdoor terrace as well, where skiers can, on bright days, relax in the sun. Overall, the building is remarkable for the clarity which it manages to maintain while meeting the functional requirements of an unusual site.

MID GAD VALLEY RESTAURANT. Architects: *Enteleki Architecture, Planning, Research*. Engineers: *Edmund W. Allen* (structural); *Bridgers & Paxton Consulting Engineers, Inc.* (mechanical); *Nielson Engineering* (electrical). General contractor: *Cannon Construction Company*.







**Lodges IV and V** are the most recent designs for Snowbird by Enteleki Architecture, Planning, Research, and they show that firm's continuing interest in accommodating the varieties and nuances of a building's program within a clear and rational building system. Lodge IV (above) is, like the first lodge at Snowbird, a linear structure, and it is built parallel to the main access road (see site plan, pages 120-121); it is a 74-unit condominium hotel. Lodge V (right) is a condominium hotel with 69 units, and it is just next to the Base Village plaza (see drawing on page 122) and will be linked to it on two levels by a plaza extension. There are five basic types of apartments ranging from a one-module studio unit through two-, three- and four-module apartments with interior balconies. The configuration of various module units is shown in the axonometric drawing, far right.

SNOWBIRD LODGES IV AND V. Architects: *Enteleki Architecture, Planning, Research*. Engineers: *Joseph Joseph Patrick* (structural); *Rollins, Brown & Gunnell, Inc.* (foundation for Lodge IV); *Bridgers & Paxton Consulting Engineers, Inc.* (mechanical); *Nielson Engineering* (electrical). Consultants: *Reed, Jones Christoffersen, Ltd.* (consulting structural engineer for Lodge V); *Richins Organization* (interiors for Lodge IV). General contractor: *Henry C. Beck Company*.

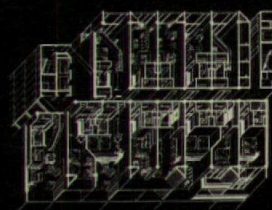
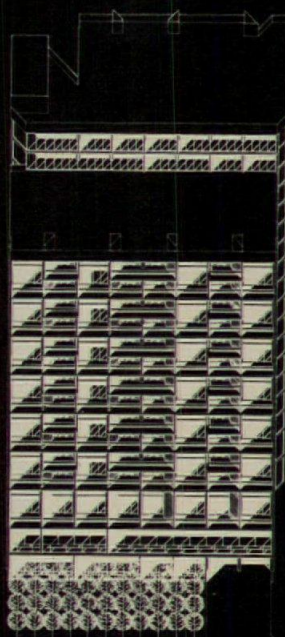


Illustration credits: Enteleki Architecture, Planning, Research—pages 119, 122, and 126; P. Kent Fairbanks—page 121; Patrick King—pages 122 and 123; Gordon Peery—pages 124 and 125.



## Designing and engineering computer controlled acoustic flexibility for a multiple-use theater

by George C. Izenour

Theater consultant George C. Izenour is Professor of Theater Design and Technology and Director of the Electro-Mechanical Laboratory at the Yale University School of Drama. This article is abstracted from the text and illustrations of a forthcoming book, *Theater Design*, by Professor Izenour to be published by McGraw-Hill, Inc. in October 1975.

The Edwin Thomas Performing Arts Hall at the University of Akron (Ohio), could well be the most sophisticated multiple-use building for the performing arts in the world. For me, it is a culmination of a long-range program (over two decades and some 20 odd other multiple-use theater designs) that set out to achieve ultimate environmental control over the auditorium and stage, where seating geometry, auditorium volume, and acoustics are integral with the architecture—not in opposition to it. This is a room where acoustical dynamics are a literal manifestation of Wallace Clement Sabine's reverberation equation (which states the reverberation time is directly proportional to volume and inversely proportional to absorption) and John Scott Russell's sightline criteria for auditorium seating. The theories of these men are integral to my auditorium and stage systems engineering design.<sup>1</sup>

The building program was derived by an unusually happy conjunction of adventurous minds. The client—the University of Akron, the architects—Caudill Rowlett Scott and Flynn, Dalton, Van Dijk, the engineer—R. M. Gensert, the acoustical consultant—Dr. V. O. Knudsen, and the contractors pulled it off together within a modest budget. Function for function, this multi-use theater does as well or better than any other single-use building of equal size and architectural sophistication (see cost analysis page 148).

### The program: seating, sightlines and acoustics

After 15 years of collaboration, Knudsen and I were by this time able to read each other's minds and with full authority from the client and cooperation of the architects we exercised complete control over the auditorium acoustical and seating geometry respectively. A 30

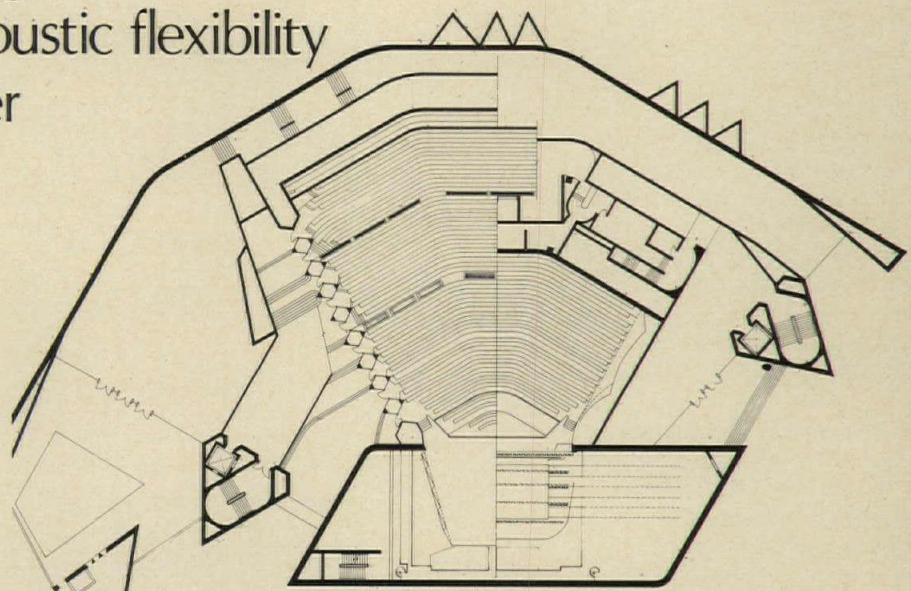


Figure 1 Plan

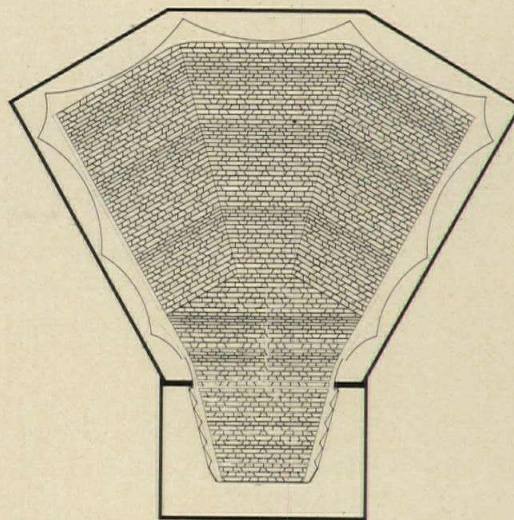


Figure 2 Reflected ceiling plan

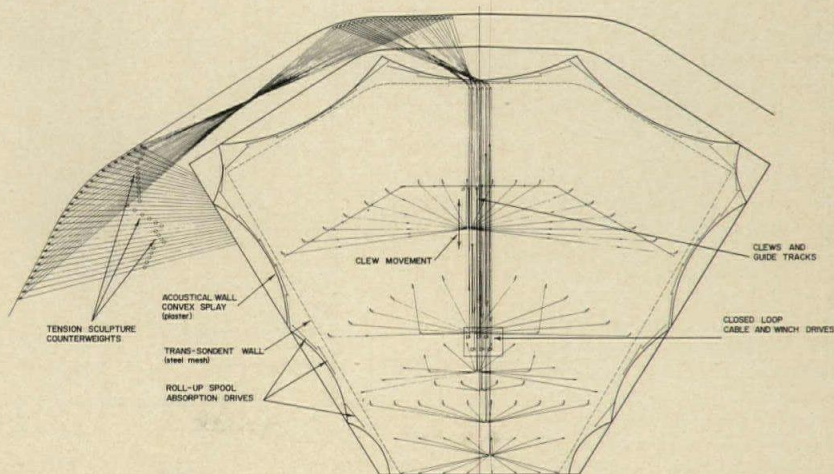


Figure 3 Ceiling rigging plan

<sup>1</sup> See Sabine: "Collected papers on acoustics" (New York: Dover) and the essay entitled "Elementary consideration of some principles in the construction of buildings designed to accommodate spectators," by John Scott Russell (Proceedings of the Royal Scottish Society of Arts).



degree auditorium in plan (figure 1) and section (figures 4, 5, 6) was chosen from the start as acoustically practical and as being the most efficient seating scheme. It provides for the division of auditorium space into a shallow orchestra section seating 800-900, with good vision from every row to an extended stage apron configuration. The scheme provides a shallow flying balcony<sup>2</sup> seating 600 over a deep grand tier seating 1500; both with every other row vision to a proscenium stage configuration. The seating in all three divisions is continental, with 39 in. back-to-back spacing. These seating divisions, maximizing vertical and horizontally staggered sightlines, room volumes and seating capacities, are compatible with the complex movable ceiling geometry. The ceiling takes variable positions to form a concert hall (figures 4, 7, 8), opera/musical comedy theater (figures 5, 10) and intimate drama theater (figures 6, 11). The maximum sightline distances from the stage are as follows: intimate theater and recital—70 feet (proscenium), 54 feet (apron); opera/musical comedy—130 feet; concert—130 feet.

**The theater building: structure and form**

The primary structure is a massive poured-in-place reinforced concrete system of walls, beams, and folded plates. In over-all plan, the building consists of the auditorium, lobbies, plazas, and an underground parking structure wrapped around a parallelogram-shaped stage house (figure 1) on a hillside site adjacent to a downtown railroad cut. Both sides of the auditorium are enveloped by a glazed lobby terminated at the rear by a buttressed great wall. This wall serves as one of two structural supports (the stage tower is the other) for spanning the lobbies and the auditorium. The roof is a reinforced concrete, post-stressed cable, valley beam and folded plate structural system. The secondary inside auditorium wall structure is a combined block masonry, steel-framed lath and plastered system from lobby-orchestra floor to roof. A series of catenary cables<sup>3</sup> are restrained at either end by steel frames and suspend 3600 acoustically dampened steel plates (figure 2). These constitute in the aggregate an auditorium ceiling system which is hung by still another cable supporting system from a steel interfacing structure connected to the primary roof.<sup>4</sup> This catenary system is both a vis-

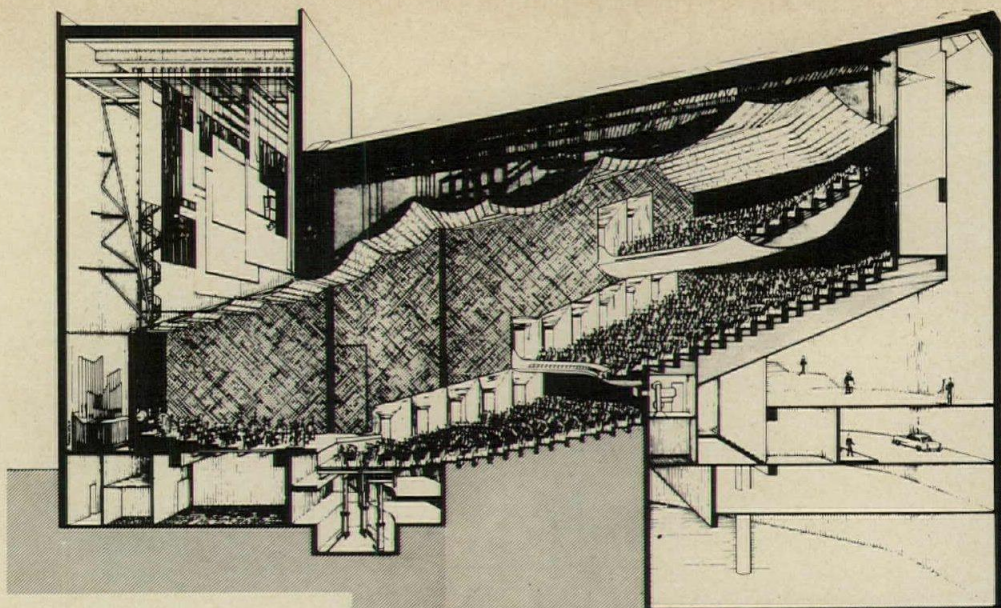


Figure 4 Longitudinal perspective section—concert hall configuration (lightbridge closed)

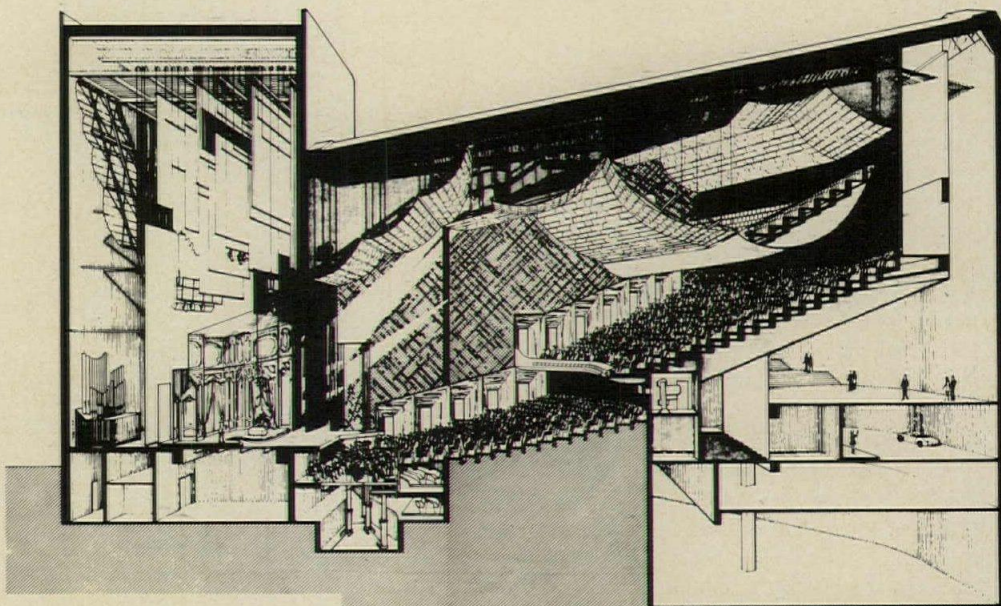


Figure 5 Longitudinal perspective section—opera-musical comedy configuration (lightbridge open)

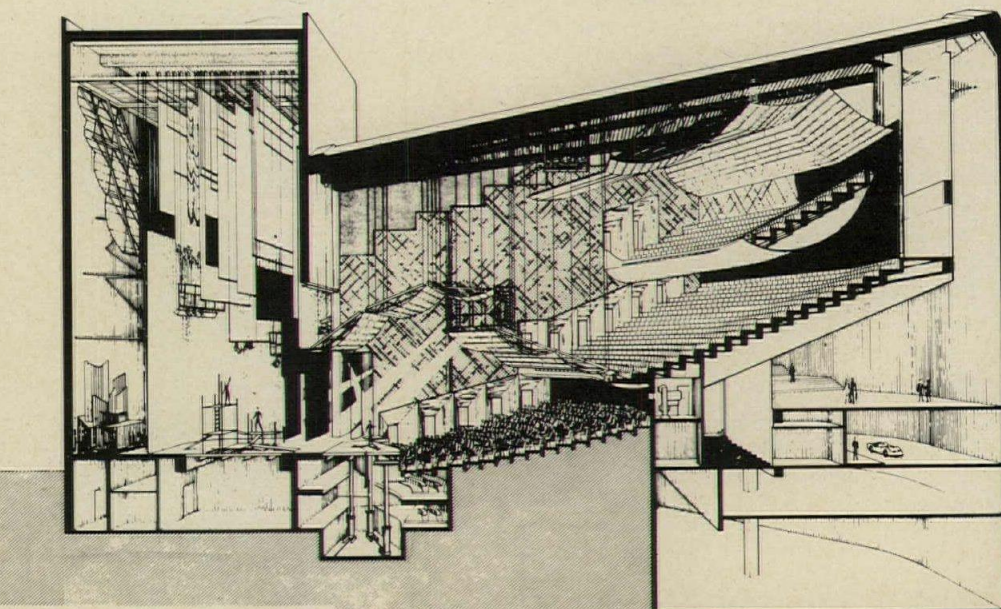


Figure 6 Longitudinal perspective section—intimate theater configuration (lightbridge open)

2 A flying balcony unlike the usual kind is here forward of the rear wall of the auditorium to permit acoustical energy circulation around it. Precedent for this design belongs to Dankmar Adler, who first used it in his design for the Chicago Auditorium-Theater in 1889.

3 A catenary curve is described as the sag due to gravity of a cable or chain restrained at both ends. The degree of restraint and/or sag for these catenaries was determined by Knudsen from acoustical studies and verified by his three-dimensional acoustical model testing.

4 The advantage of hindsight is instructive. Had the primary structure over the auditorium been a steel truss system instead of the post-stressed reinforced concrete system, the complex interfacing structural steel system required for resolving the torsional forces of the ceiling cable suspension system into the valley beams of the roof would not have been necessary. In general, structural concrete roof systems have not, in the experience of this consultant, worked to advantage in theater construction for either auditorium or stage house.



ual and acoustical ceiling for the auditorium. The ceiling, originally designed to be executed in non-specular acoustically dampened stainless steel, is instead, due to a budget cut, fabricated in epoxy painted, acoustically dampened, mild steel. The stage house is a monolithic *in situ* reinforced concrete box (figure 12). It contains a suspended steel gridiron, a storage truss for the acoustical shell ceiling (figures 5, 6) a single purchase counterweight stage rigging system, a full slip stage wing on stage right, and a fully automated dampened steel acoustical shell.

The sound reflecting steel auditorium ceiling and matching stage acoustical steel shell ceiling (figure 2) float free of the walls. These are of woven *in situ* trans-sondent steel exposed to view. In the auditorium, behind this steel mesh but invisible are hard plaster, convex, splayed, sound reflecting walls. On the stage, the acoustical shell consists of dampened steel sound reflecting walls. Between the woven steel and sound reflecting surfaces is interposed 12,000 square feet of programmed absorption<sup>5</sup> (figure 3). The movable ceiling weighs 44 tons and utilizes six closed loop, clew stabilized, electro-motive winch drives connected to 27 lead filled chrome plated steel cylinders (counterweights weighing approximately 47 tons) hung in the main lobby as a tension sculpture (figures 3, 17).

Auditorium lighting for the concert hall and opera/musical comedy theater configurations is indirect except for downlights in the shell ceiling, grand tier and flying balcony soffits. The upright incandescent quartz iodine lighting fixtures, directed through louvers at the ceiling, are installed in the flying balcony rails, front and rear, and the front of the grand tier. The intimate drama theater configuration is separately illuminated by a series of small optical downlights installed in the voids between individual panels in the warped trapezoidal framed ceiling section immediately forward of the auditorium ceiling lightbridge.

#### Designing, fabricating, erecting and rigging the acoustical system

From the first, Knudsen and I considered room dynamics as a kinetic space where a movable automated auditorium ceiling structure, movable automated stage acoustical shell, and a variable absorption system were to be controlled by a multiple programmed analogue computer activated from a remote control console (figure 13). The fabrication, erection and rigging of this auditorium ceiling and stage acoustical shell structure was most complex.<sup>6</sup>

The individual steel ceiling panels (in seven shapes randomly displaced) that make up the ceiling acoustical surface, are arranged in four rectilinear and 12 mitered arrays (figure 2) and constitute a complicated geometry which we solved in three dimensions by a  $\frac{1}{24}$

<sup>5</sup> The materials used in construction of this auditorium (steel and plaster) shatter the ancient acoustical myth of wood being the only suitable material for auditoria; as expressed in the often quoted jingle "Sound is round and only wood is good." To this, my response is "NON-SENSE!"

<sup>6</sup> Fabrication, erection and rigging was executed by: Mid States Ornamental Iron Works of Kansas City, Missouri, and J. R. Clancy of Syracuse, New York, respectively.

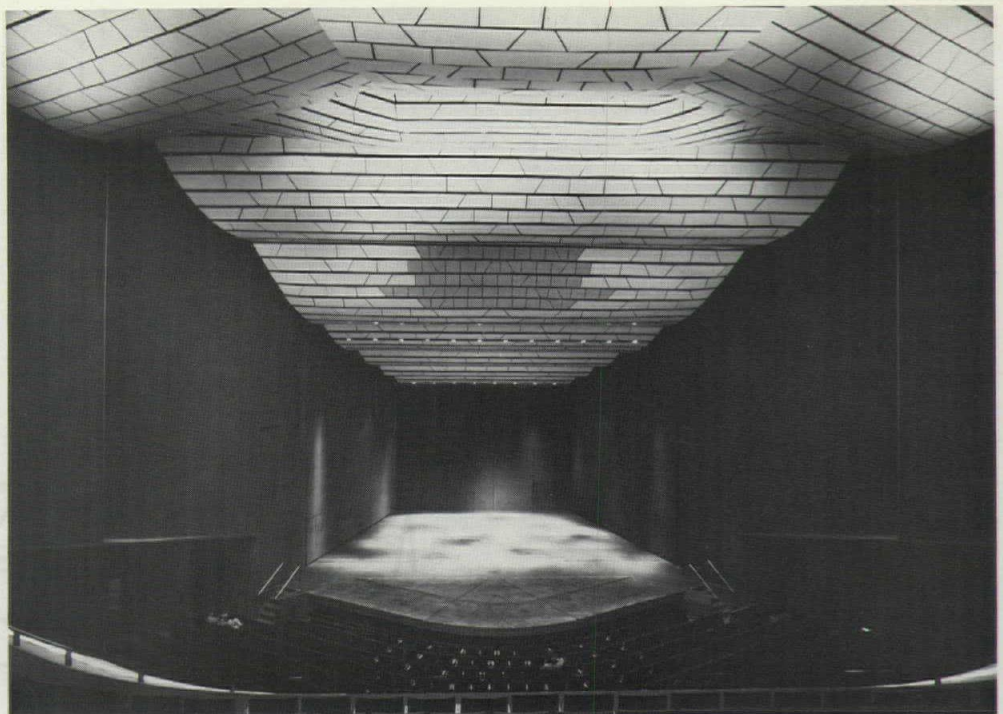


Figure 7 Concert hall configuration (auditorium to stage) (lightbridge closed)

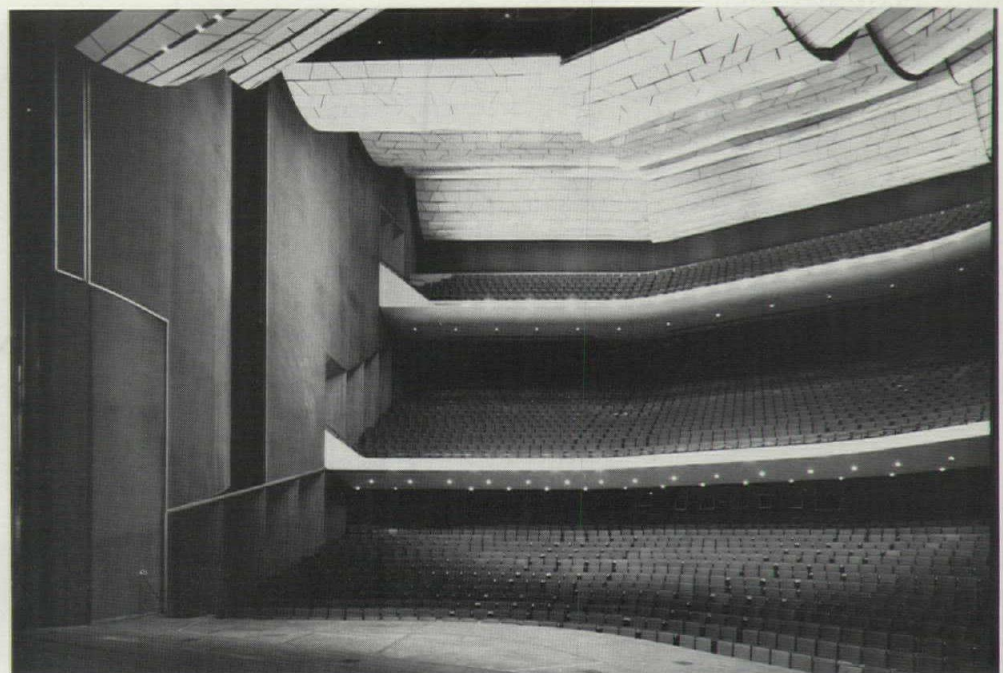


Figure 8 Concert hall configuration (stage to auditorium) (lightbridge open)

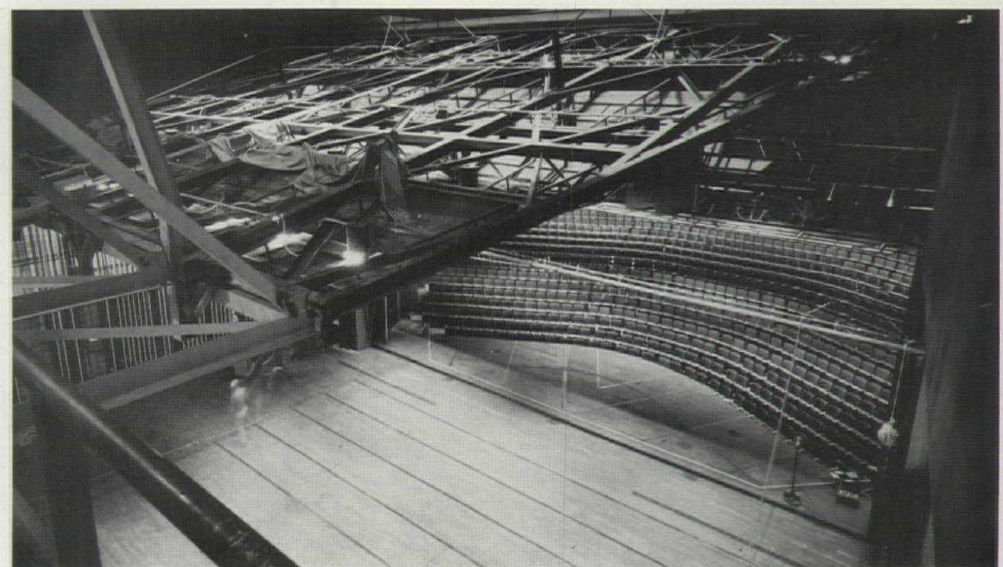


Figure 9 Concert hall configuration—stage pin rail stage right to auditorium (acoustical shell walls stored, shell ceiling in concert hall configuration)



scale working model which also served Knudsen as a three-dimensional live acoustical energy test model. In addition to its acoustical and lighting functions, the total ceiling has also to provide 11 per cent over-all transparency for passage of air from supply ducts above the movable ceiling to a negative air plenum in the auditorium floor. The total visual effect of the ceiling is that of a continuous geometrically abstract mosaic-like drapery hung in slightly overlapping mitered catenary folds (figures 2, 7). The movable panel ceiling sections are grouped in arrays, group counterweighted and electro-motively driven linearly up and down as well as radially displaced.

Movement of the entire structure is synchronized by means of analogue and differential amplifiers directing interfacing and interlocking switching logic and finally motor reversing contractors. The amplifier system and its mechanically linked interfacing control elements are designed to sense linear and/or angular displacement between adjacent sections of the ceiling. Each array operates within fixed preset electronic limits as well as mechanically set and fixed ultimate and operating limits. This control network also transmits commands to other interfacing and interlocking switching logic, insuring that the separate drives during movement do not ever get out of step with each other. This insures balance between separate drives and in the event that a mechanical or electrical fault develops during a given duty cycle, the control system, sensing the fault condition, issues the proper command and shuts the system down until the fault condition is corrected and movement can again be initiated. A system of tally lights arranged to suit the three ceiling positions gives the operator at the console a visual check and indication of ceiling operation and position (figure 13). Figures 14 and 15 show from a position in the grand tier the intimate theater ceiling movement cycle at two stages: 50 per cent and completion.

In concert position, the movable ceiling catenary panel arrays articulate between the fixed catenary panel arrays over the flying balcony at the rear of the auditorium and the fixed ceiling arrays within the acoustical shell, itself pre-erected within the stage house (figure 9), yielding a series of convex modulations that direct evenly diffused first energy reflections over an auditorium seating 3008 (figure 4). Angular displacement of the group of three mitered catenaries directly ahead of the flying balcony, with stage acoustical shell stored and with either full- or small-sized orchestra pit, yields an opera/musical comedy theater seating 2400 (figure 5). The six sections immediately forward of the proscenium, including the lightbridge (also with stage acoustical shell stored) when angularly displaced and lowered 15 feet at the proscenium and 48 feet to the grand tier balcony rail, yield an intimate drama theater with or without an apron stage and/or orchestra pit, or, with small stage acoustical shell erected, a recital hall seating 850-900 (figure 6). Separate angular articulation of the single trapezoidal ceiling leaf on the stage side of the lightbridge opens the ceiling in front of the bridge for front lighting the opera/musical comedy theater mode (figure 10).



Figure 10 Opera-musical comedy theater (stage to auditorium) (lightbridge open)

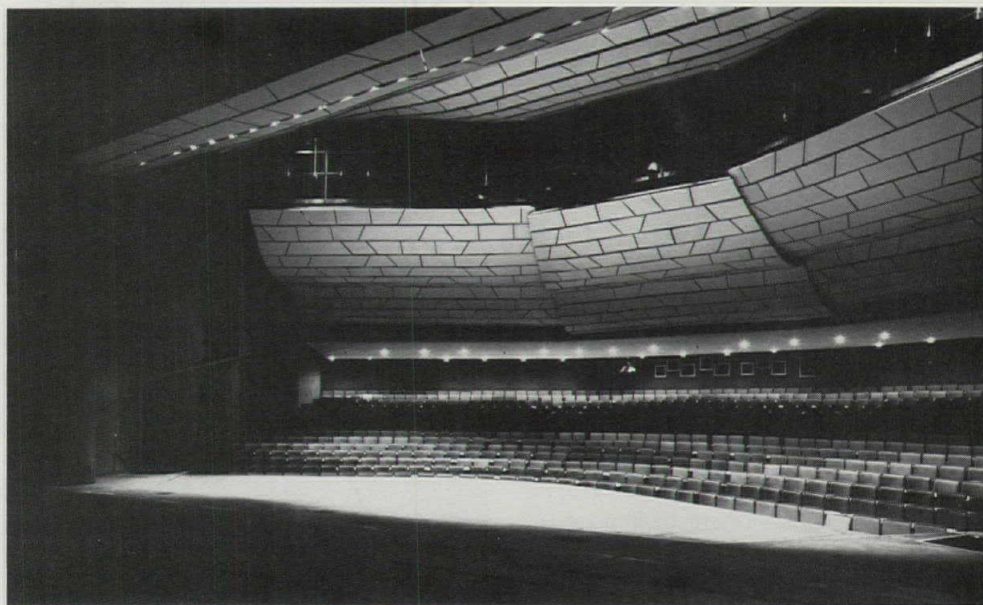


Figure 11 Intimate theater (stage to auditorium) (lightbridge open)

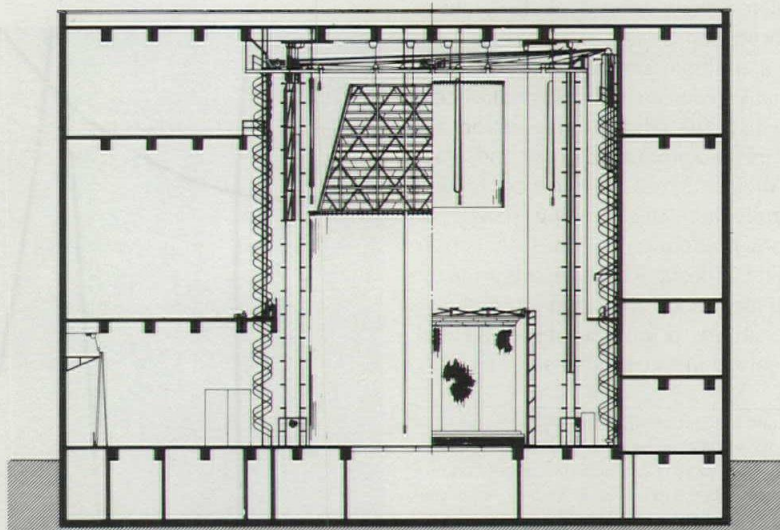


Figure 12 Transverse section through stage



A system of manually-operated proscenium pull-out panels articulates with the proscenium teaser (the section of the movable ceiling adjacent to the stage) in the intimate theater mode and reduces the scale of the proscenium from the 58-foot-wide by 40-foot-high concert opening to a 48- by 25-foot theater opening. This opening is reduced still further by motor-driven onstage steel framed teaser and tormentors to a minimum opening of 36 feet wide by 18 feet high. When the lifts are in stage position, manually operated pivoting caliper panels open up on the forestage at the auditorium sidewalls for actors making entrances before the proscenium and for side lighting. The two pit/apron lifts provide either a shallow or massive apron projecting forward into the auditorium ten or eighteen feet. This flexible proscenium system is shown in plan and elevation (figure 16).

Acoustical flexibility, in addition to the volumetric control provided by the movable ceiling, is achieved by a system of 37 individual motor-operated absorption drives between the woven steel trans-soundent mesh and hard plaster reflecting convex splayed side and rear auditorium walls. Each is programmed for five preset conditions (figure 3). In addition, there is a roll-up cut-off absorption curtain in line with the flying balcony rail that when lowered prevents rear wall reflected energy from coupling back into the used portion of the auditorium in the opera/musical comedy theater mode. These absorption drive controls determine not only the selection among drives but the position of each individual drive for each condition, as well. These conditions range from all hard concert hall surfaces to maximum absorption for intimate theater, with intermediate conditions for opera/musical comedy, recital and lecture. The system accommodates a lecture hall in any one of three sizes (900, 2600, and 3008) with the central loudspeaker cluster and sound reinforcement system in use.

#### Cost analysis: does computer-controlled acoustic flexibility cost too much?

Some explanation is essential to understanding the figures in the budget analysis (overleaf). Mechanical and structural flexibility for the convertibility feature of this multiple-use facility is represented in the budget by: (1) pit/apron lifts (\$62,000); (2) rigging (\$300,000); (3) special steel (\$320,000). But these also include amounts not spent for the conversion equipment. Deleting \$100,000 of the amount for special steel for a fixed ceiling (required in any case) and \$100,000 from the rigging budget for regular theatrical stage running rigging, the total budget for conversion equipment comes to \$482,000—less than  $\frac{1}{4}$  the cost (at today's prices) of a similarly equipped separate 900-seat proscenium theater (not to mention the cost of the intermediate sized opera/musical comedy theater).

During the past two decades it has taken to perfect these theater engineering techniques there has been much unsubstantiated talk, originating with academics, architects, stage designers and assorted critics, to the effect that the unwarranted cost of massive mechanized conversion of the kind necessary for multiple-

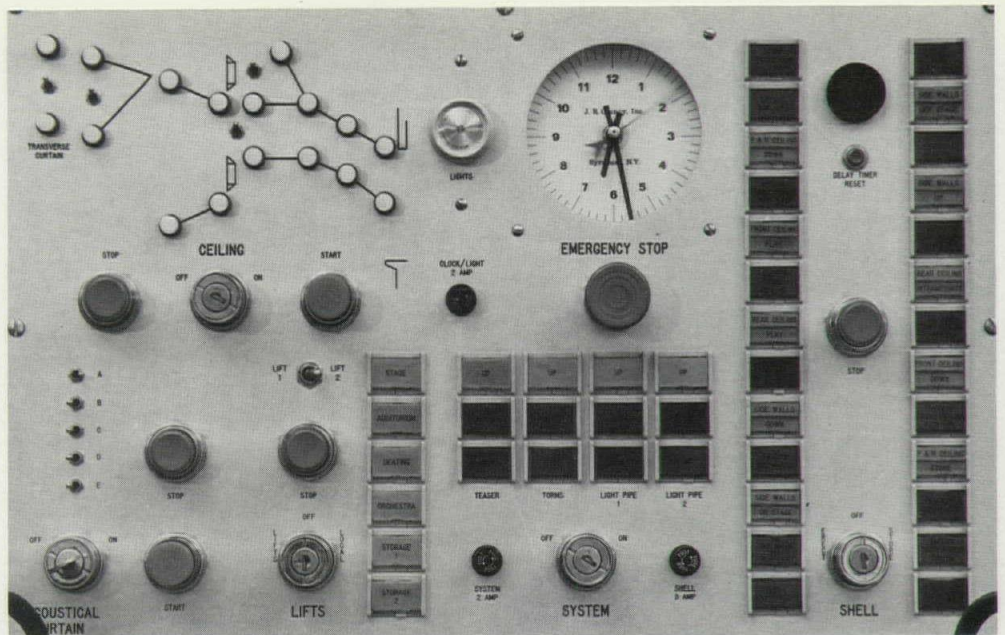


Figure 13 Computer remote control panel

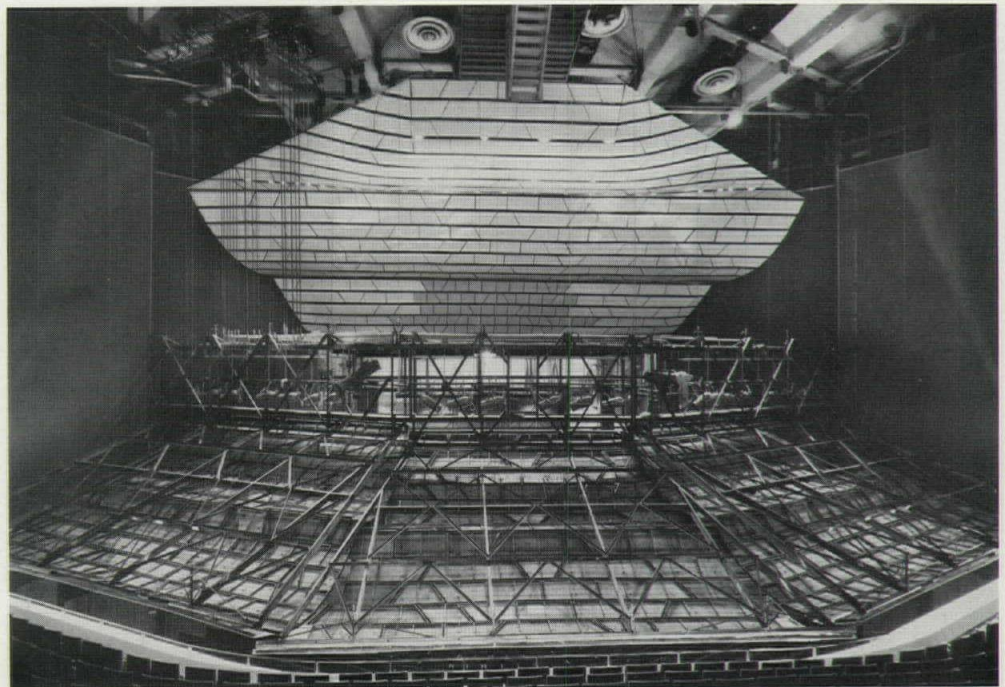


Figure 14 Intimate theater configuration (from behind ceiling which is 50 per cent through reduction cycle)

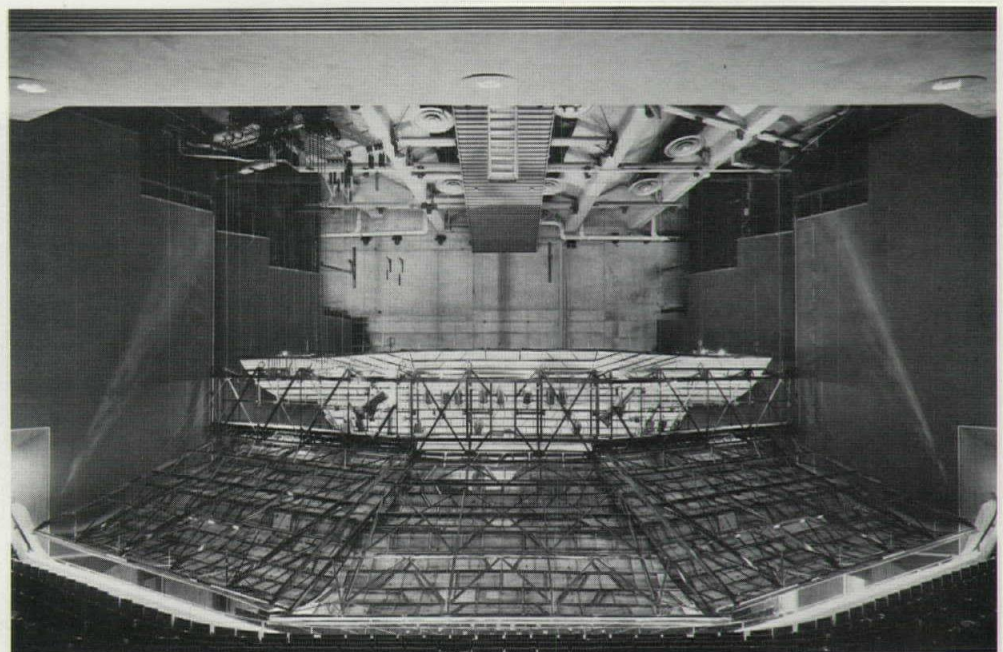


Figure 15 Intimate theater configuration (from behind ceiling—reduction cycle complete)



use theater design as advocated by me was for all practical purposes as expensive as another theater building. The cost figures displayed here show that nothing is further from the fact. What costs money in a theater building, no matter how you cut or slice the budget, is still the building itself—and not stage machinery or the requisites of essential flexibility for successful multiple-use theater design and acoustical function.

**Direct building costs:**

△ General construction .....	\$5,180,000 — 57.0%
Heating, ventilation, air-conditioning .....	1,315,000 — 14.5
Electrical wiring .....	809,000 — 8.9
Plumbing .....	484,000 — 5.3
Passenger elevators .....	115,000 — 1.3
Auditorium seating .....	172,000 — 1.9
Furnishings .....	188,000 — 2.1
Orchestra pit/apron lifts.....	62,000 — 0.7
Stage lighting .....	93,000 — 1.0
*Stage and auditorium special steel .....	320,000 — 3.5
*Stage and auditorium rigging.....	300,000 — 3.3
Sound reinforcement system.....	44,000 — 0.5
<b>Total direct building costs .....</b>	<b>\$9,082,000 — 100%</b>

**Indirect costs:**

Parking deck.....	\$2,187,000
Site cost.....	300,000
Site development.....	97,000
Fees.....	910,000
Other.....	24,000
<b>Total indirect costs .....</b>	<b>3,518,000</b>

**Total cost:**..... \$12,600,000

△ parking deck deleted

\*includes orchestra shell and auditorium ceiling

\*includes orchestra shell and auditorium ceiling rigging

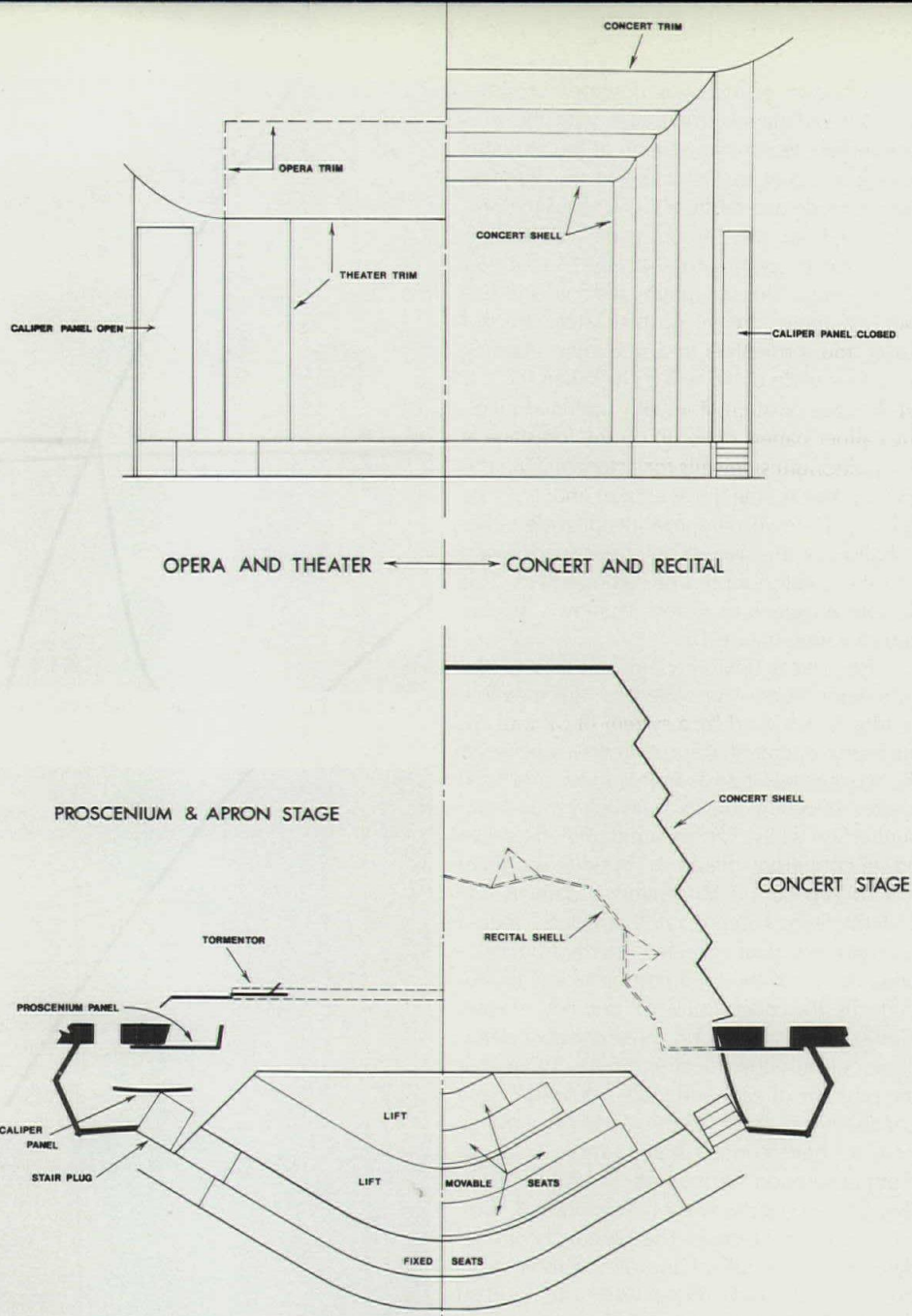


Figure 16 Plan and elevation—flexible proscenium system

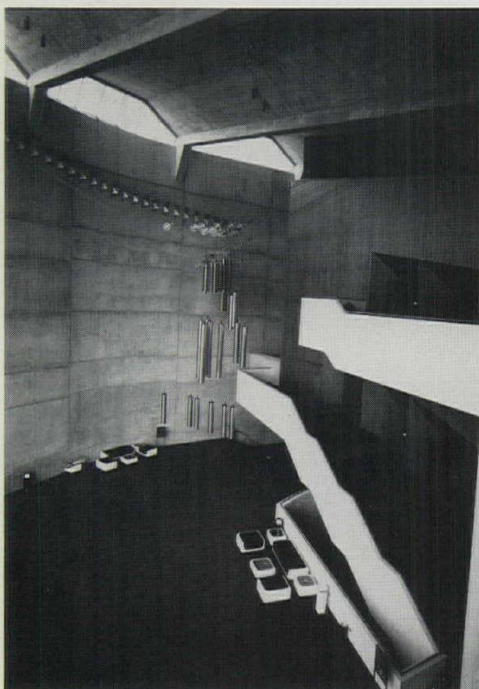


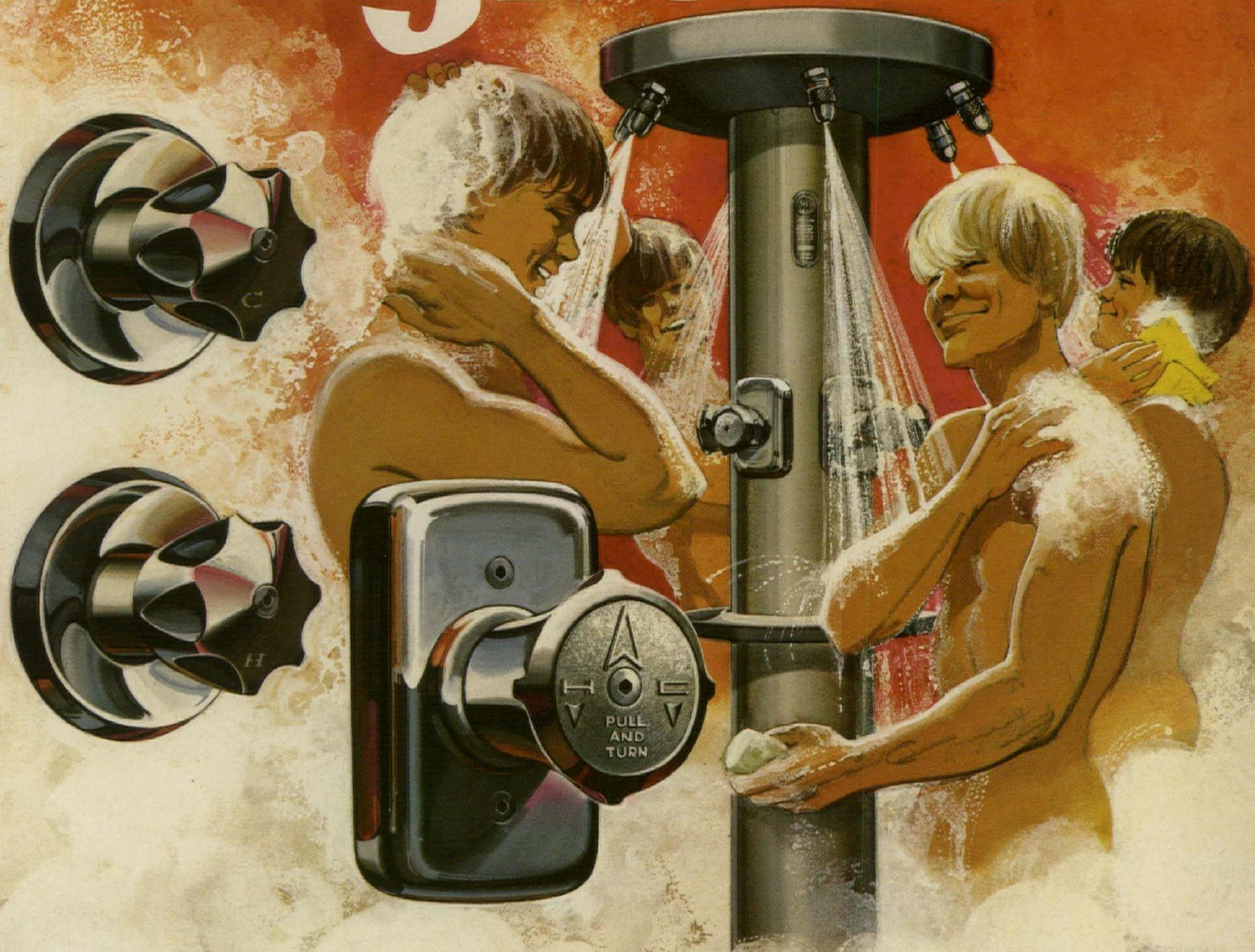
Figure 17 Lobby and tension sculpture



Figure 18 Over-all view of the auditorium with all house lights on, showing the movable ceiling from the rear in the intimate drama theater configuration. Cut-off of the remaining volume of the auditorium demonstrates conclusively how the continental seating system of side aisle access only (with all houselights behind lowered portions of the ceiling turned off) allows the auditorium to be reduced in size without the audience being aware either during ingress, egress, or when seated in the auditorium or moving about in the lobbies that the reduction in size is at all a makeshift architectural arrangement.



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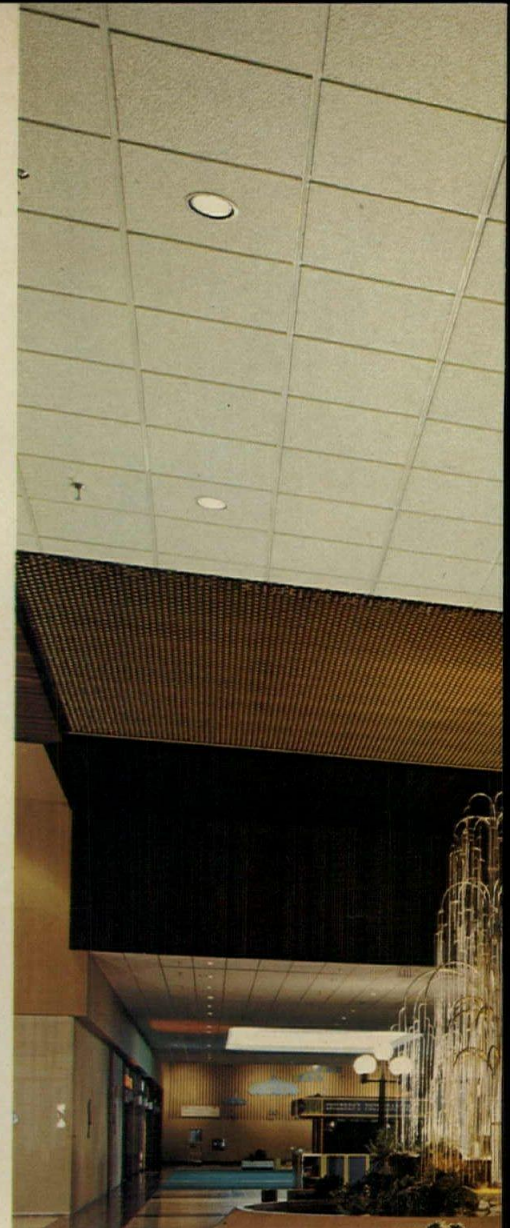
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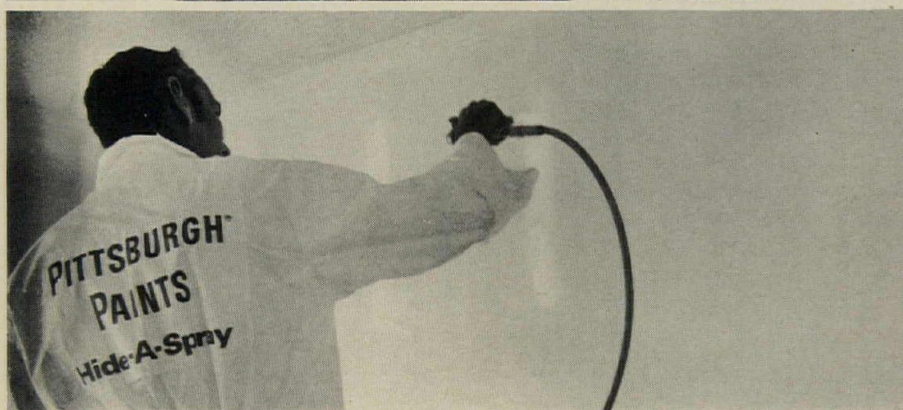
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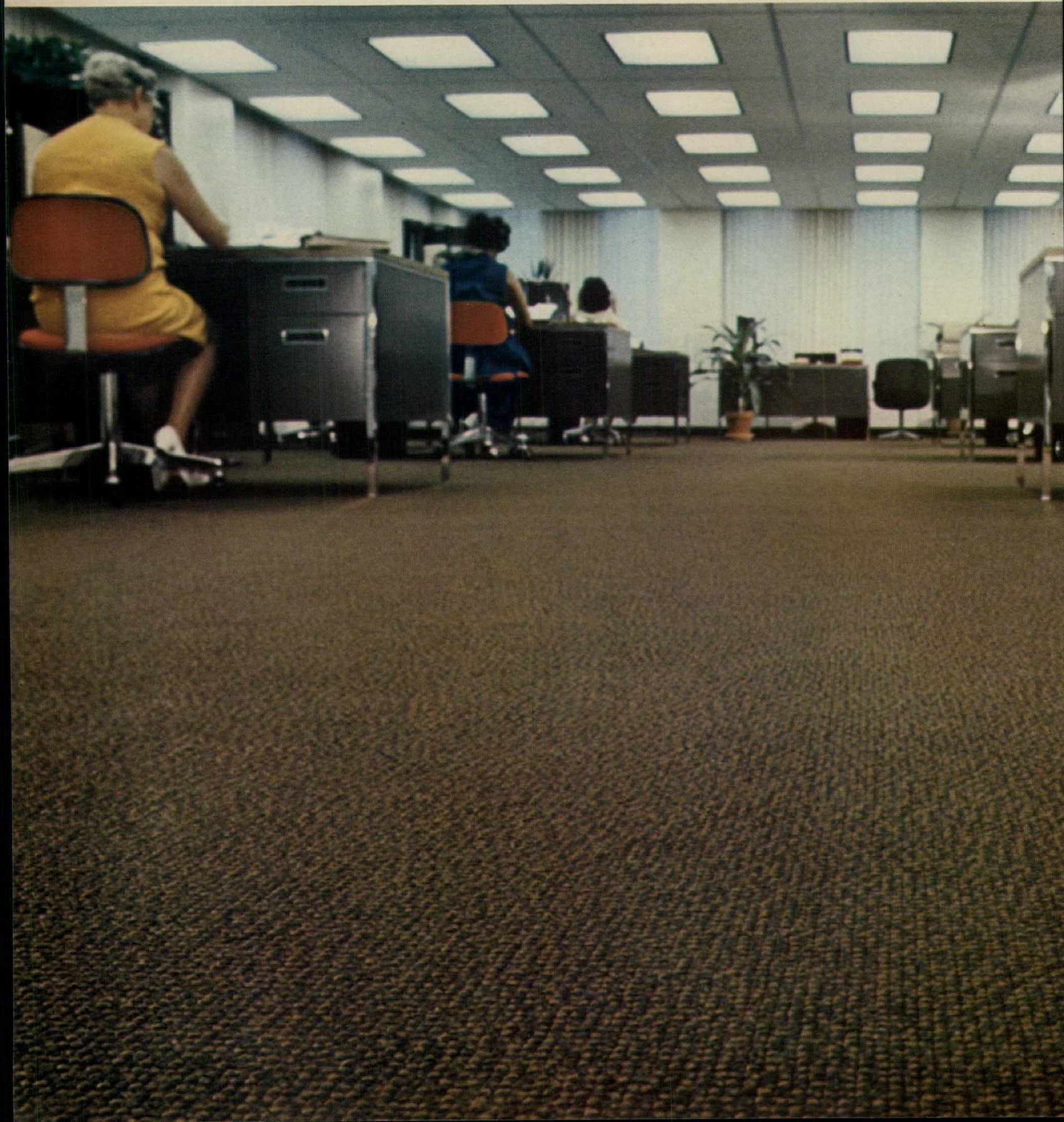
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ADDRESS ALL CORRESPONDENCE TO DEPT. AR-3

For more data, circle 76 on inquiry card



# New headquarters carpet of Antron® on





# building has 52 floors.



You don't put down nineteen acres of carpeting without a great deal of certainty.

In the case of the new corporate headquarters building at 1221 Avenue of the Americas, Rockefeller Center, New York, the carpet specifications were rigid: it must be a custom carpet of unusual style, having the durability and resilience of nylon, be easy to care for, be soil-hiding by virtue of its pile fiber and color.

It was to be installed throughout most of the building, including offices, corridors, bookstore, library, storage, printing and graphic areas. The final selection: a woven cut/uncut construction with pile of Antron\* nylon.

"Antron" scored high because of its unique hollow filament structure which optically screens out much of the appearance of soil. Instead of appearing as spots, soil concentrations tend to blend in with the overall color and texture of the carpet.

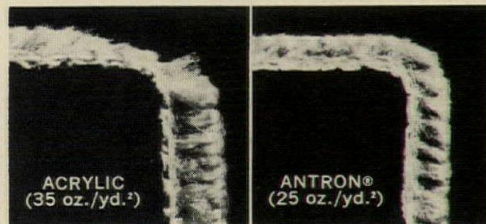
"Antron" also has exceptional durability (see stair edge test) and resiliency. This, together with its superior soil-hiding, keeps carpet of "Antron" looking fresh longer.

And maintenance costs with carpet of "Antron" are minimized by the need for fewer wet cleanings than with carpets of other fibers.

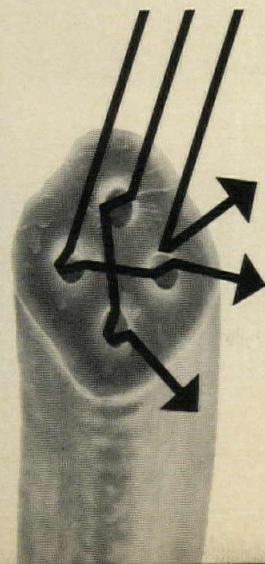
Specify "Antron" for high-traffic commercial carpet. It has no equal in long-term appearance retention.

For further information and a list of mill resources, write: Du Pont, Contract Specialists, Room 108/AR, Centre Road Building, Wilmington, Delaware 19898.

Poor and Swank & Partners. Architects/Engineers—Architects for the Interiors.



Abrasion test on simulated stair edges shows pile wear in level-loop carpets after equal exposure.



**How "Antron" hides soil.** Its filament structure is unique, as shown in this magnified (650 ×) cross-section. The four precisely-placed holes in each filament scatter light like the facets of a diamond to minimize the dulling effect of soil, while helping to retain color clarity and luster.

\*Du Pont registered trademark. Du Pont makes fibers, not carpets.

*For more data, circle 77 on inquiry card*





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Architectural Record. Its architect and engineer paid subscribers are responsible for over 90 per cent of the total dollar volume of all architect-planned building, nonresidential and residential, large and small.

A fact documented by Dodge Reports.

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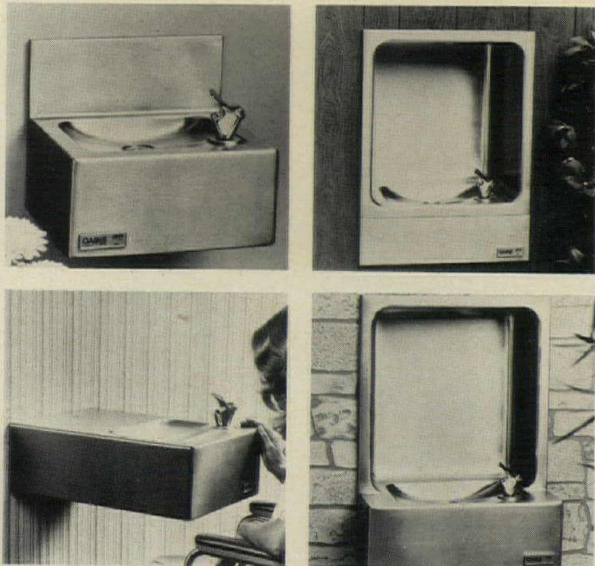
# architectural magazine



when one advertising value leads to another...and another...and another...you've located the leader



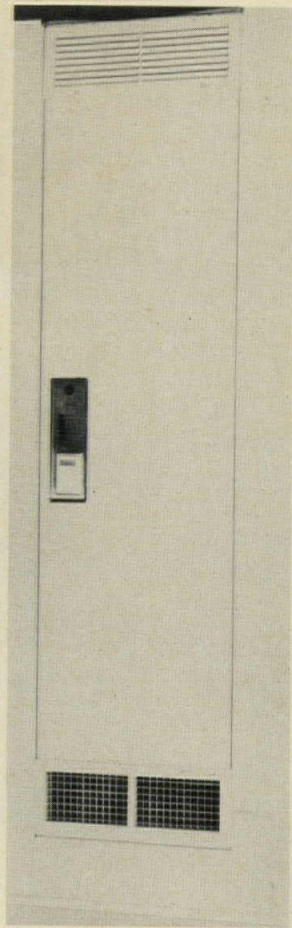
For more information, circle item numbers on Readers Service Inquiry Card, pages 251-252.



### Four new models added to company's fountain line

For use with the company's line of packaged chillers or for direct connection to cold water lines, the models shown are of seamless 18 gauge stainless steel. Clockwise from upper left are: a compact fully exposed wall-mounted unit that can be installed at any height. Next is a fully recessed unit with generous headroom, recommended for areas requiring unobstructed passage. A specially designed wheelchair model extends 21 in., and the semi-recessed unit adjacent extends 6½ in. ■ Oasis, Columbus, Ohio.

Circle 300 on inquiry card



### Heating-cooling unit for apartments

A self-contained heating-cooling unit is said to eliminate the need for a furnace room. The all-electric *Hi-Riser* is compact, measuring 14 in. wide by 37 in. deep by 90 in. high. It needs no pipe chases for fuel or refrigeration lines; it is offered in cooling capacities up to 23,000 Btuh. ■ Sears, Roebuck and Co., Chicago, Ill.

Circle 302 on inquiry card



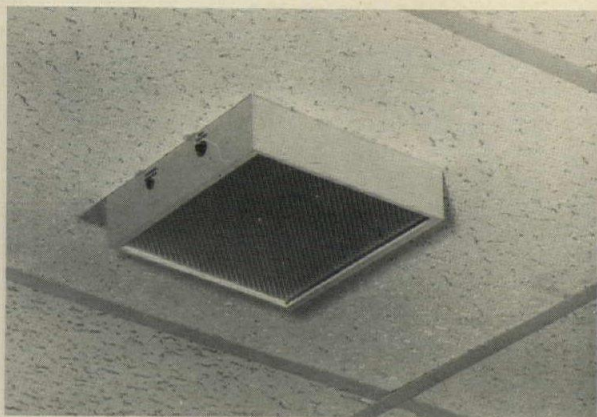
### Cantilevered wall system includes lighting

The system is said by the company to group lighting, storage, and display elements in one unified sculptured entity. It is composed of 23 modular elements that include shelves, drawer, door, open and bar cabinets, as well as electrical components, graphic displays, mirrors, etc. Each unit is approximately 24 in. square. The cabinets and shelves are cast in one piece of *Duromer* plastic, an anti-static, sound-absorbent material that is said to be an excellent insulator. All units are finished in satin-like urethane enamel which is washable. Colors are white, black and silver. The wall units

install a few inches in front of existing walls. The wiring is concealed and there is no need to remove moldings. The company claims the system can be installed floor to ceiling and wall to wall, or groups of units can be combined and hung as wall murals. The system is recommended for homes, offices, conference rooms, display areas, lobbies, restaurants, stores and showrooms. One architect is said to be recommending the system's use in several Chicago barbershops. ■ Harvey Propper Inc., New York City.

Circle 303 on inquiry card

more products on page 169



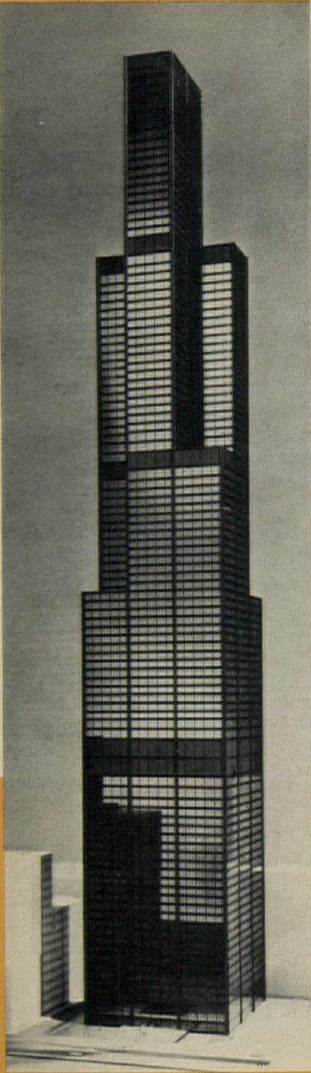
### Emergency lighting with architectural design

This clean-line compact unit is offered in one size, one shape, one beam pattern and supplies a power source for all applications. It measures 9 in. square by 4 in. deep and affords an all-around 172 degree beam spread, free of glare. Available in oyster white, the unit contains a high-efficiency Quartz-Halogen capsule producing a white light. The rechargeable battery is said to offer more than 1½ hours of light. Rated life of the unit is 300 hours, sufficient for 20 years of emergency lighting operation. The unit uses a constant current, solid-state charging circuit designed to recharge the battery to UL standards in 12 hours. ■ Chloride Systems (USA), Inc., North Haven, Ct.

Circle 301 on inquiry card



Sears Tower



# High marks of AEROFIN CITY

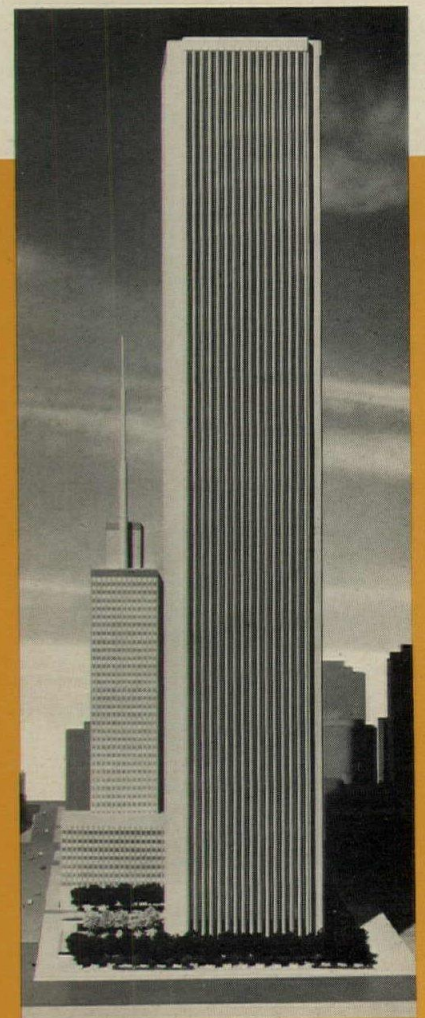
## Buildings of the 21st Century use Aerofin Coils for Comfort Control

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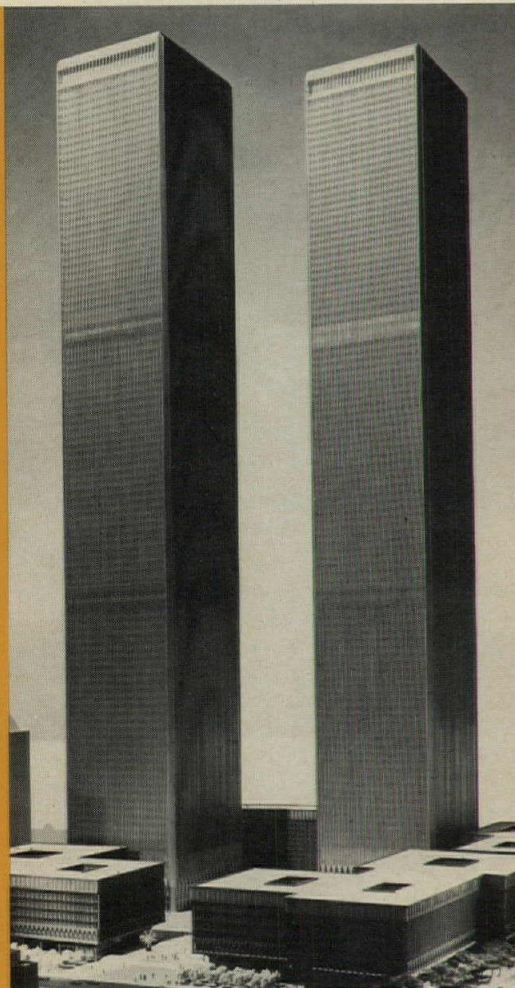
In structural system, these buildings offer new advances in skyscraper design and technology. The WORLD TRADE CENTER's 1350 ft. exterior wall serves as the load-bearing wall. The world's tallest 1450 ft. SEARS TOWER employs the "bundle tube" design concept. And the 1136 ft. STANDARD OIL COMPANY (INDIANA) building's tube principle utilizes an outside wall of vertical triangles that act as conduits for mechanical services.

Future structural systems may erupt. But the very tall 21st century buildings will most likely use a form of "tube" frame. Mechanical equipment rooms may be located within the hollow center, in a continuous vertical shaft, or in customary through-floor systems. In any event the built-up reliable fan/coil system promises to be part of these futuristic vertical cities—and you can count on Aerofin Coils scaling those heights, too.

Standard Oil Company (Indiana) Building



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Explains how with an appropriate and attractive architectural design, and with someone to show the people in each country how to use their native materials, even the poorest people could have inexpensive housing that they could construct and that would be socially and aesthetically satisfying.

1973 xviii, 236 pages + 112 pages of illus. Cloth \$10.95

For more information, circle numbers on  
Readers Service Inquiry Card pages 251-252.

**INSULATING CONCRETE** / A new four-page brochure covering perlite insulating concrete contains tables showing "U" values for different thickness slabs, thermal conductivity and compressive strength as well as comparisons with other concretes including expanded slag, shale or clay and sand and gravel. ■ Perlite Institute Inc., New York, N.Y.

Circle 400 on inquiry card

**ROOFING** / The 24-page booklet features color photographs, asphalt shingle color guide, and tips on the selection and application of asphalt shingles for both reroofing and new construction. There is also a useful glossary of roofing terms plus suggestions on roof maintenance. ■ Asphalt Roofing Mfg. Assn., New York, N.Y.

Circle 401 on inquiry card

**DUMBWAITERS** / The manufacturer of custom and automated dumbwaiters announces its 1974 new-product brochure. It offers complete specifications, plans, and elevations to facilitate the work of the architect, engineer and elevator constructor according to the company. ■ Energy Elevator Co., Philadelphia, Pa.

Circle 402 on inquiry card

**ROLLING METAL DOORS** / The 1974 edition of the company's catalog, presents architectural details on a line of rolling metal doors and fire doors, rolling grilles, rolling pass window shutters in standard and packaged units, fire shutters and sliding grilles made of galvanized steel, aluminum and stainless steel. All products are available in a wide range of sizes. ■ Cornell Iron Works, Inc., Wilkes-Barre, Pa.

Circle 403 on inquiry card

**REDWOOD PLYWOOD** / Ruf-sawn redwood plywood and the new Ruf-Sawn 316 textured MDO plywood are featured in an eight-page sidings brochure emphasizing end use of the products, ranging from a single-family residence to an apartment project. Two pages are devoted to architectural details of various structures, including window wall treatment, fascia and soffit, cross-banding, and other new ideas effectively employed by architects and builders in the projects shown. ■ Simpson Timber Co., Seattle, Wash.

Circle 404 on inquiry card

**ACCESS FLOORING** / In addition to specification information, a 10-page brochure describes the strength of pedestals and panels, the wear qualities of the company's *Micarta* surfaces, and optional accessories such as panel carpeting, under-floor air conditioning and movable office partitions. Full color installation photos are included. ■ Westinghouse Electric Corp., Grand Rapids, Mich.

Circle 405 on inquiry card

**CARPET CUSHIONING** / The company's eight-page catalog on the carpet cushioning material, polyester pneumacel, is being distributed to architects and interior designers as part of the Sweet's Architectural File. The catalog will be included under Index 9.29/Du. Detailed in the Performance Characteristics section are load/compression figures, thermal insulation properties, mildew and chemical resistance, dimensional stability, durability and flammability, and acoustical properties. Both *Belmeade 3000*, the pneumacel style recommended for heavy-traffic, commercial areas, and *Lansdown 5000*, recommended for luxury installations are covered. ■ DuPont Co., New York, N.Y.

Circle 406 on inquiry card

**TRAFFIC DOORS** / Insulated traffic doors designed to save heating/refrigeration costs and engineered to meet OSHA requirements for safety are detailed in the four-page 1974 condensed catalog. Over 28 styles of drive-through doors are offered for use in warehouses, industrial facilities, stores, hospitals, food operations such as meat, bakery, produce, and dairy plants, textile manufacturing and commercial buildings. Special items are outlined as are several of the special designs. In addition, summary specifications and ordering information are supplied. ■ RubbAir Door Div., Ayer, Mass.

Circle 407 on inquiry card

**GYPSUM PARTITIONS** / The design flexibility claimed by today's gypsum partition systems is illustrated in a series of color brochures. Information is provided on fire resistance and sound control, as well as aluminum door frames and glazing extrusions. Complete details and specifications are available. ■ Vaughan Walls, Inc., Los Angeles, Cal.

Circle 408 on inquiry card

**GRILLES AND DIFFUSERS** / The catalog contains a complete line of commercial and residential steel and extruded aluminum registers, grilles and diffusers, including adjustable and stationary models for ceiling, sidewall and floor applications. ■ Environmental Air Products, Inc., Tucson, Ariz.

Circle 409 on inquiry card

**SHOWER HEADS** / Four "Rotary Massage" shower bath heads are described in a four-page, full-color catalog now available. All four of these patented shower heads have an inner nozzle which rotates rapidly in an oscillating orbit, discharging streams of swirling water. ■ Rain Jet Corp., Burbank, Cal.

Circle 410 on inquiry card

**DESIGNING WITH GLULAM** / A 36-page brochure on designing with structural glued laminated timber systems is designed to provide technical information for architects and engineers; the brochure contains stress tables, section properties tables, and preliminary beam design and arch design tables. It also provides examples of typical construction details and information on decking systems. In addition to technical information, the brochure contains more than 35 color photos of completed glulam projects. ■ AITC, Englewood, Colo.

Circle 411 on inquiry card

**LIGHTING PRODUCTS** / A 44-page catalog featuring a line of Tiffany style, stained-glass lamps is now available. Among the new fixtures is a replica of the original Coca-Cola lamp. The leaded, stained-glass lamps are offered in a full spectrum of colors and combinations of color. ■ Gramercy Park Lighting Co., Bronx, N.Y.

Circle 412 on inquiry card

**DESIGNING FOR DISASTER** / The proceedings of a conference, "Designing to Survive Disaster," have been published by IIT Research Institute. Experts on various hazards such as flood, earthquake, wind and fire were able to exchange views and technical information. Considerable attention was given to people survivability which may or may not relate to the criteria normally used for building survival. Non-structural elements also received considerable attention. The proceedings of the conference are available in soft cover book form at \$15.00 per copy from IIT Research Institute, Box 4963, Chicago, Ill. 60680.

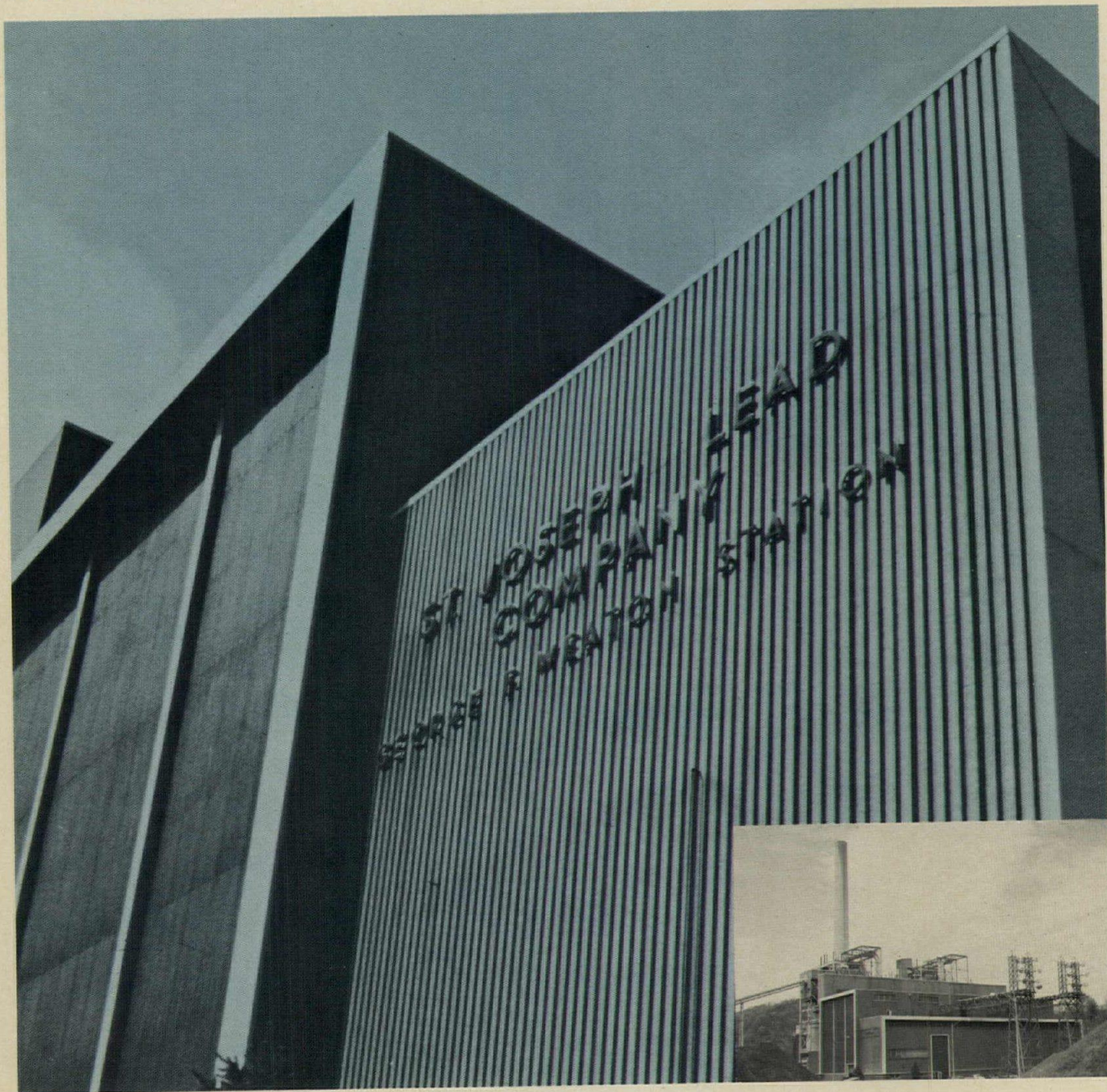
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More literature on page 186

The University of Chicago Press  
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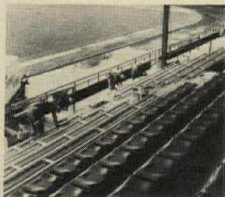


**ARCHITECTURAL TRIMS** / The Colortrim group, comprised of mansards, gravel stops, fascias, copings and soffits, is offered with a 20-year guarantee on its range of 16 color coatings. Duranodic bronze finish is also offered. ■ Construction Specialties, Inc., Cranford, N.J.



Circle 304 on inquiry card

**STADIUM SEATING** / The seats are made of polyethylene with extruded aluminum frames, so they are said to be light and easily moved. A complete line of seating for indoor and outdoor applications is offered for new or rehabilitation projects on steel or concrete foundations. Contour formed seats come in yellow, blue, green and red. ■ Sport Seating Co., Emmaus, Pa.



Circle 305 on inquiry card

**PLAIN COPIER** / The VHS-R copier is said by the company to produce its first copy in 3½ seconds and three copies faster than most other copiers produce one, accepts originals up to 14 by 18 in. All copies are standard 8½ by 11 in. in size. The copier accommodates virtually any original, including volumes and three-dimensional items. ■ 3M Co., St. Paul, Minn.



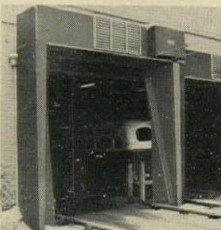
Circle 306 on inquiry card

**INDUSTRIAL ROOFING** / The Bond-Deck Shear Clip Diaphragm System is said to be a new approach to commercial and industrial roofing that is subjected to shear loading. Bond-Deck is roof decking, panelized by virtue of heavy-duty Kraft paper bonded to one side. It incorporates four individual runs of 2 by 6 T&G, non-resinous Hem-Fir, kiln dried to 12 per cent moisture content. Each panel face has a net width of 20 in. and can be ordered surfaced or resawn, V-groove or channel pattern, in any one of four grades. ■ American Forest Products, San Francisco, Cal.



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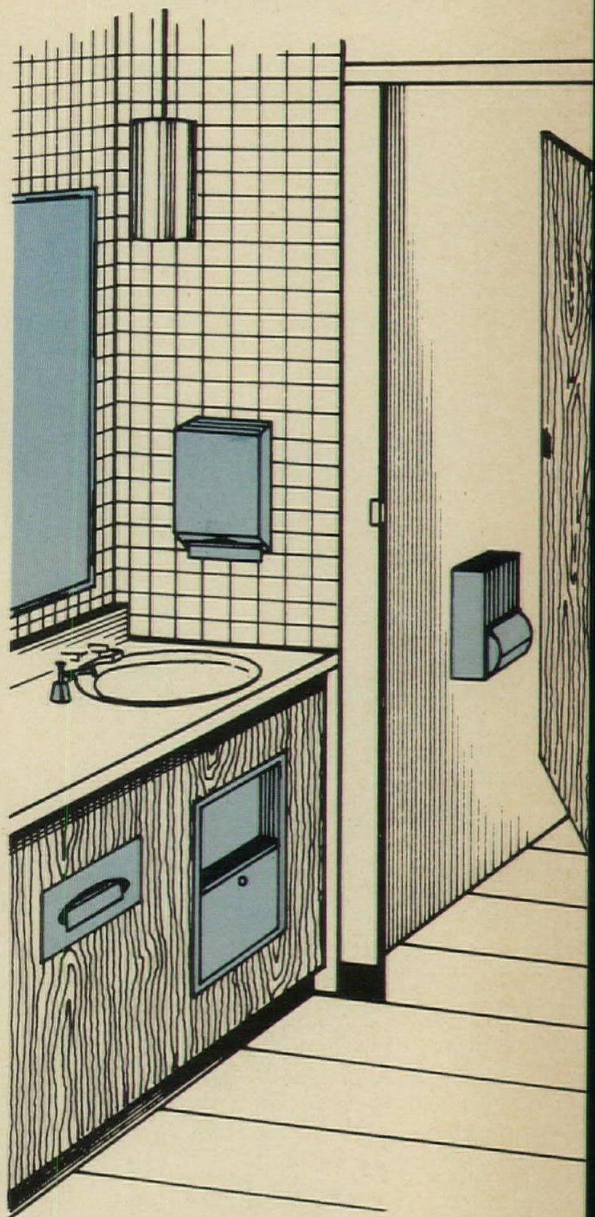
**AIR CURTAIN DOORS** / Typical applications for the air curtain doors are truck terminals, warehouses, shipping/receiving docks, etc. Acting as a make-up air unit, the air curtain doors can deliver substantial savings on space heat according to the company. Available in sizes up to 20 ft high and 22 ft wide, the horizontal flow air curtain doors are prewired, prepiped and ready to connect to existing utilities. They can operate off of steam, hot water, electric, oil or gas power sources. ■ Environmental Control Systems, Inc., Minneapolis, Minn.



Circle 308 on inquiry card

more products on page 171

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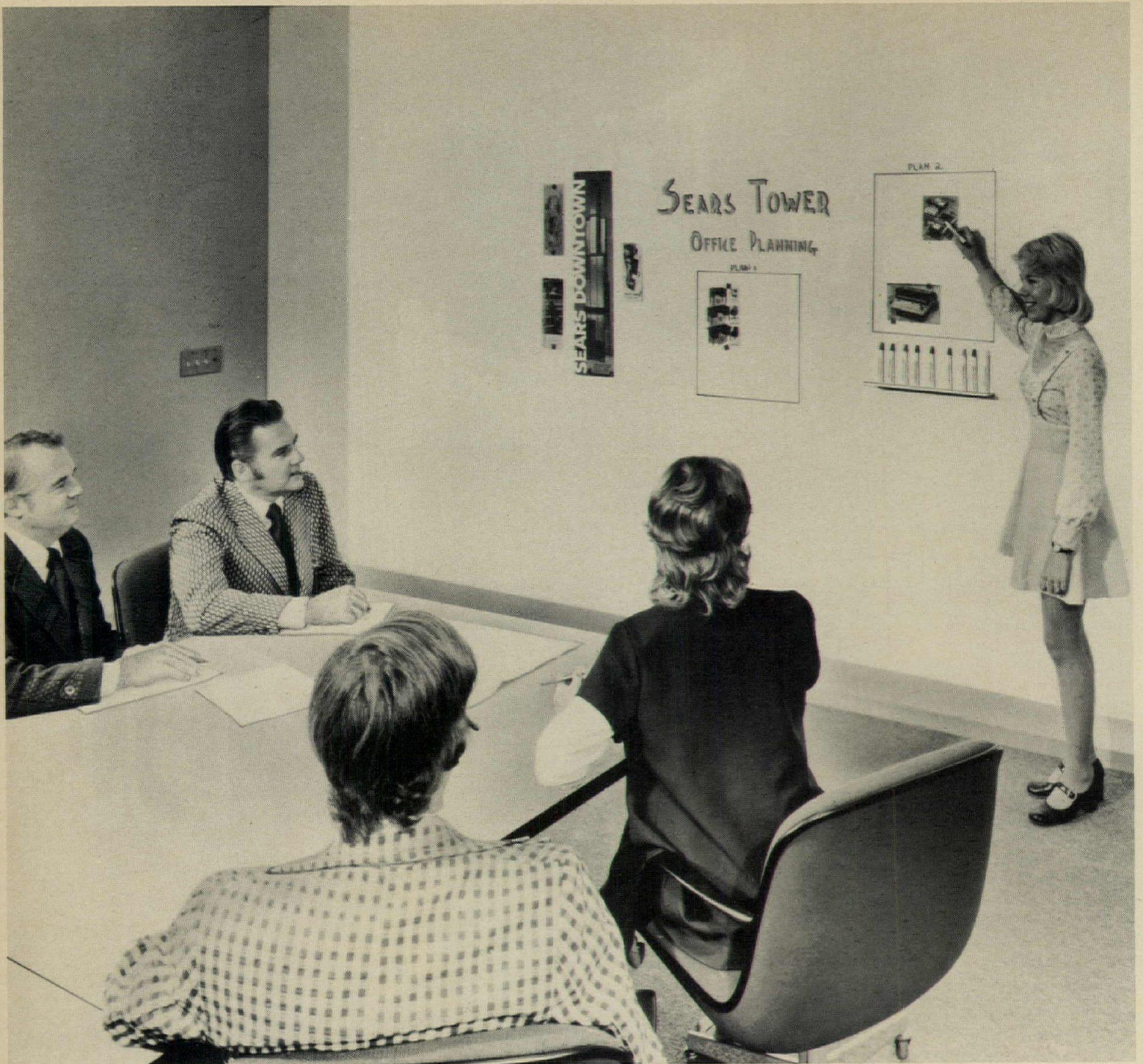
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**DEEP REGRESS TROFFERS** / A line of deep regressed troffers is designed with a 1 1/2 in. vertical, matte black regression. The frame is constructed of slightly ribbed, extruded aluminum, with precision corners. Offered in sizes of 6 in. by 4 ft, 1 by 4 ft, 2 by 4 ft, 2 by 2 ft, 3 by 3 ft, and 4 by 4 ft, the units house from 1 to 8 lamps. ■ Keene Corp., Denver, Colo.



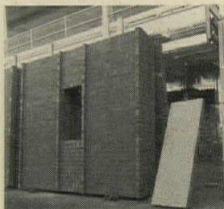
Circle 309 on inquiry card

**ALGEBRAIC CALCULATOR** / A programmable desk-top calculator for business, scientific and industrial use includes a tape cassette unit for program and data storage. Storage capacity of over 40 times the basic calculator memory is provided by the built-in tape cassette unit. Programs can be recorded onto, or loaded off the cassette manually or under program control. ■ Hewlette-Packard Co., Palo Alto, Cal.



Circle 310 on inquiry card

**MORTAR ADDITIVE** / A new mortar additive is said to give prefabricated brick panels the strength needed to be constructed without reinforcing rods or conventional concrete block backup walls. The additive is *Sarabond* brand high mortar additive. Portland cement mortar containing *Sarabond* latex mortar additive is said to cure to a strength greater than the brick it bonds. ■ AMSPEC, Columbus, Ohio.



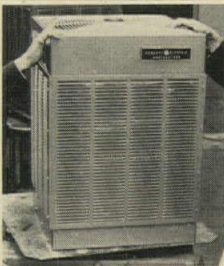
Circle 311 on inquiry card

**FURRING CHANNEL** / The company has developed an innovative new method of attaching its *Chandelier* ceiling tiles to plaster, dry-wall or exposed joists—eliminating wood furring strips altogether. The new system is designed to accommodate either 12 by 12 in. tiles or the larger 1 by 4 ft units. Key to the system is a new, lightweight steel furring channel that takes the place of wood. ■ Armstrong Cork Co., Lancaster, Pa.



Circle 312 on inquiry card

**HEAT PUMP** / The *Weathertron* heat pump is said to remove heat from the indoor air in the summer, like a central cooling unit, and in the winter extracts heat from the outdoor air and brings it indoors to maintain the same comfort level. Residential models are available in capacities from 18,000 Btuh to 60,000 Btuh and commercial models to 240,000 Btuh. The indoor parts of the system can be located in a closet, attic, crawl space or basement. The outdoor sections have an appearance similar to central air conditioning condensing units. ■ General Electric Co., Louisville, Ky.

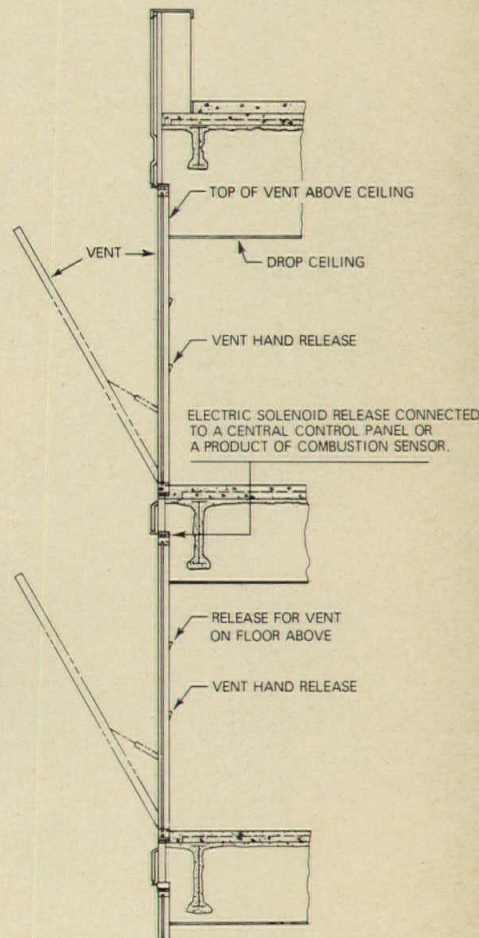


Circle 313 on inquiry card

more products on page 173

# High Rise/Life Safety Code Requirements

If you will be designing a multi-story building which must comply with the ICBO, BOCA or Southern Building Codes, Wasco Products can help you. Having worked very closely with the professionals in developing the smoke control provisions, Wasco is now able to provide the hardware that can meet them. For instance, we have completed or are now installing exterior wall smoke vents with remote release devices, similar to the drawing below, in eight multi-story buildings.



WASCO EXTERIOR WALL SMOKE CONTROL VENT

These vents not only meet code requirements but allow the architect a wide range of choice of both exterior and interior panels or glazing.

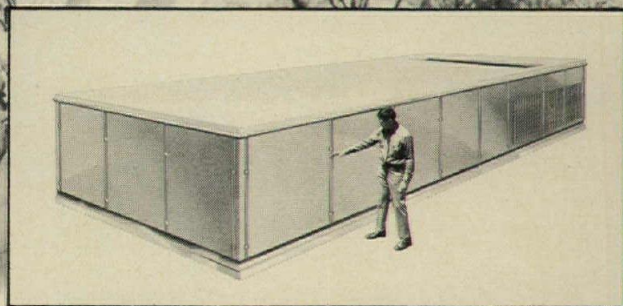
Because Wasco has been so close to this life safety effort, we can also offer extensive design assistance.

For copies of the various code sections pertaining to life safety or for specific help on individual jobs, write Richard L. Swan, Wasco Products, Inc., Box 351, Sanford, Maine 04073, or call 207-324-8060.

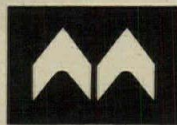
For more data, circle 84 on inquiry card



# Weather changes never get ahead of Modine rooftop units.



Modine HVAC units offer uniform comfort at all times, in all seasons or regions, in all parts of your building. Our Multizone and Singlezone rooftop units adjust instantaneously to outside . . . and inside . . . variables. They do it quietly, economically. Sizes up to 60 tons. Learn more about Modine rooftop HVAC. Write to Modine, 1510 DeKoven Ave., Racine, Wis. 53401.



**MODINE**

*For more data, circle 85 on inquiry card*



**SAFETY SURFACE** / This line of patented rubber matting to protect children against playground falls is made from 1-in.-thick chlorinated butyl non-toxic rubber, molded into interlocking sections. Suitable for indoor or outdoor use, it has a smooth upper surface that is nonslip, wet or dry, and a double honeycomb pattern on the underside that won't bottom out on impact. *Safety Surface* can be assembled into any size with dimensions divisible by two feet. ■ Game Time Inc., Litchfield, Mich.

Circle 314 on inquiry card

**CONCRETE ADMIXTURES** / A new additive for concrete uses a patented combination of ingredients to chemically control the interaction between portland cement and water in the formation of concrete. Through "hydration control" higher compressive strengths and greater flexural strength can be developed in concrete, along with improved finishability, according to the company. The company claims that concrete produced with the admixture is often more than 10 per cent stronger than concrete with competing admixtures. ■ W. R. Grace & Co., Cambridge, Mass.



Circle 315 on inquiry card

**CARPET AND FABRIC** / *Metropolis*, a new Wilton weave carpet, is said to provide the feeling of understated movement in its multi-toned prismatic design. The scale of the design is 72 in. with a one-half drop repeat, and the carpet is jacquard woven of 100 per cent wool. *Turnabout* covering *Helikon* armchairs, is an overscaled herringbone weave, enhanced by the designer's use of heavy slub yarns, and relates in color and design to *Metropolis*. ■ Jack Lenor Larson, Inc., New York, N.Y.



Circle 316 on inquiry card

**MOVABLE PARTITIONS** / Constructed of steel, steel and glass, or all-glass as shown in this installation, *Spacestyer* partitions are available in 2½- and 3-in. panel thickness, and in a full range of heights, from low railing to ceiling high. There is also a wide variety of accessories including storage shelves, counters, convactor enclosures, clothes closets and steel ceilings. ■ Rockaway Metal Products Corp., Inwood, N.Y.



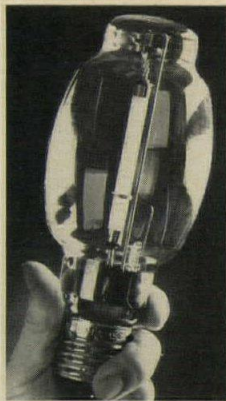
Circle 317 on inquiry card

**STATIC-CONDUCTIVE FLOORING** / A seamless flooring system for hospital surgeries and other critical areas requiring the dissipation of static electricity is offered in 3-ft square sections. Then all joints are grooved and filled with a heated polyvinyl bead that welds the sections together to form a permanent seamless surface. ■ Vinyl Plastics, Inc., Sheboygan, Wis.



Circle 318 on inquiry card

**ENERGY CONSERVING LAMP** / A 150-watt high-pressure sodium lamp which operates on lower energy levels than the most efficient 175-watt mercury lamp is said by the company to produce 55 per cent more light. The *Unalux* lamp may be used in most instances by installing it in indoor or outdoor sockets where 175-watt mercury lamps are in use. The lamp is designed to operate in all burning positions. ■ GTE Sylvania Inc., Stamford, Conn.



Circle 319 on inquiry card



**WOVEN WOOD SHADES** / Textured basswood slats finished in natural stains or colors feature interwoven yarns and cords that are said to resist sun and mildew. ■ Graber, Middleton, Wis.

Circle 320 on inquiry card

more products on page 175

for safer, more comfortable, more enjoyable living

## TALK-A-PHONE HOME INTERCOM-RADIO SYSTEM

**Fully Transistorized.** Everyone in the family will enjoy the comfort, convenience and peace of mind this system provides. You can:

- Independently originate and receive calls to or from any other room.
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Send 25 cents for catalogs. No charge to Trade or Professionals.

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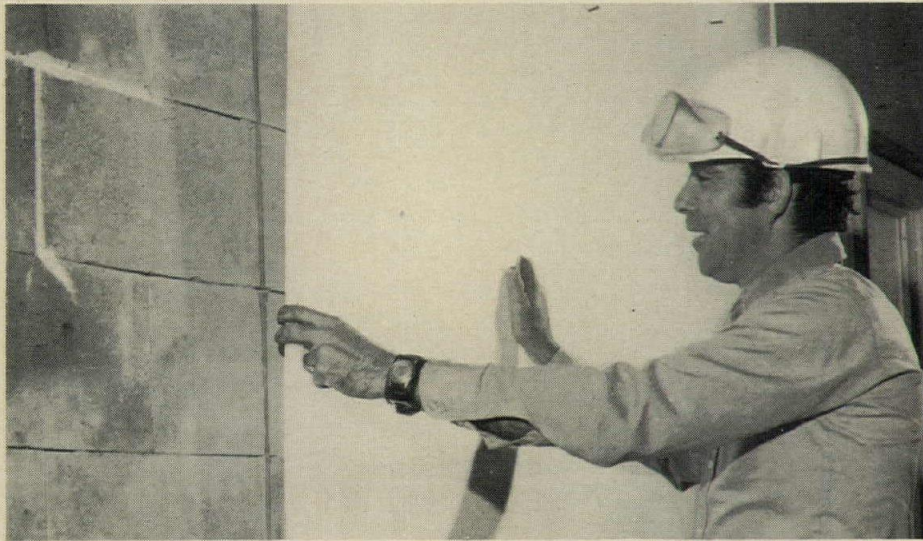
**INTERCOM FOR APARTMENT HOUSE.** Provides instant and direct 2-way conversation between any Apartment and Vestibules — in buildings of any size. Greater performance with these exclusive Talk-A-Phone features • Ample volume without "boom" • Automatic privacy • Individual volume selection for each apartment • Built-in Buzzer • 1 or 2 talking circuits.

**INTERCOM FOR OFFICE, INDUSTRY, INSTITUTIONS.** Instant and direct 2-way conversation between any 2 points. Saves thousands of man-hours, simplifies routine. Distinctively styled, ruggedly built for continuous day and night use. From 2 to 100-station systems, you can do it better and more economically with Talk-A-Phone. Pays for itself many times over.

For more data, circle 86 on inquiry card



# Zonolite Thermo-Stud...an entirely new, simpler, continuous wall insulation system.



Position ZONOLITE Styrene Foam.



Imbed THERMO-STUD channel in Foam.



Nail through Foam to masonry.

Here's a completely new, mechanical insulation system for masonry walls that are to be finished with gypsum wallboard or other interior treatments.

**ZONOLITE® THERMO-STUD®** It eliminates insulation shorts, providing a permanent moisture-resistant barrier.

Yet, installed costs are competitive with other, less trouble-free insulation methods.

Lightweight ZONOLITE Styrene Foam Boards are butted together against masonry walls. They're held in place with serrated THERMO-STUD channels, which are mechanically fastened to the wall.

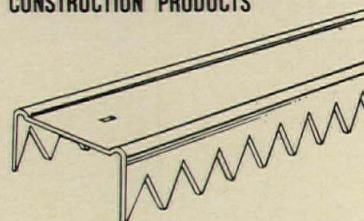
Troublesome adhesives are eliminated. Drywall can be applied immediately using self-tapping screws through the serrated channels.

Installation is so simple, yet trouble-free.

ZONOLITE THERMO-STUD meets or exceeds power company "U" value requirements of 0.10 or better for wall insulation. "R" values increase accordingly. Result: heating and cooling economies.

Get booklet SF-1 that tells everything you need to know about the ZONOLITE THERMO-STUD system. Contact the ZONOLITE sales office in your area, or write: W. R. Grace & Co., Construction Products Division, 62 Whittemore Avenue, Cambridge, Massachusetts 02140. In Canada: 66 Hymus Road, Scarborough, Ontario.

**GRACE**  
CONSTRUCTION PRODUCTS

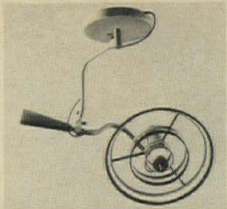


For more data, circle 87 on inquiry card



**SHADOWLESS SURGICAL LIGHT** / Source lighting

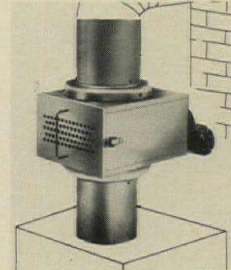
is said to achieve its shadowless character through use of a central high intensity xenon lamp surrounded by a cylindrical lens. Since light is projected from all sides, shadows are eliminated.



The xenon lamp cartridge is guaranteed to provide a minimum of 1000 hours service, with 85 per cent of its original output remaining at the end of this period. The light requires 7 amp service operating at 300 watts. ■ Pilling Co., Fort Washington, Pa.

*Circle 321 on inquiry card*

**HEAT RECLAIMER** / This simple, inexpensive unit,



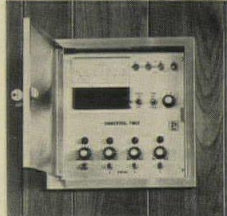
according to the company, is designed to reclaim from oil, coal and gas furnaces heat that is normally lost up the chimney. The unit can reduce fuel requirements perhaps as much as 30 per cent and is installed in the flue pipe. The unit has been

tested and approved by the New York City Board of Standards and Appeals, and several states. ■ Dolin Metal Products, Inc., Brooklyn, N.Y.

*Circle 322 on inquiry card*

**SHOWER ROOM CONTROL** / A water- and energy-

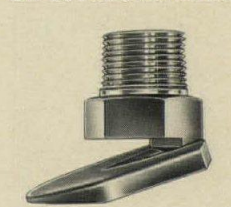
saving control is said to permit timed water shut-off and reset temperature adjustment from a remote control panel. The unit is recommended for renovation since it requires no major changes to existing



systems. The unit assures that shower rooms are used only when needed and that each shower is shut off when not in use. ■ Powers Regulator Co., Skokie, Ill.

*Circle 323 on inquiry card*

**EXPOSURE SPRINKLER** / This UL-listed sprinkler is



designed to be installed in deluge-type systems to provide protection for windows or glass walls against exposure fires. Unit is said to provide uniform coverage of the glass

and supporting members with water which has downward velocity to overcome updrafts. ■ The Viking Corp., Hastings, Mich.

*Circle 324 on inquiry card*

**EMERGENCY HEADS** / For use on all the company's

battery-powered emergency lighting units, the head contains a swivel which permits it to lie on top of the cabinet, or to be in front of the cabinet, completely concealing the swivel arm. The heads are finished in a light beige tone and are made of ABS for high strength. ■ Tork Time



Controls, Inc., Mount Vernon, N.Y.

*Circle 325 on inquiry card*

*more products on page 177*

*For more data, circle 88 on inquiry card*

# 62-63

**JG Furniture Company, Inc.** 121 Park Avenue  
Quakertown, Pa. 18951

Auditorium seat designed by Peter Dickinson  
Installed at the Jennie King Mellon Library,  
Chatham College  
Johnstone, McMillin and Assoc., architects,  
Pittsburgh, Pa.  
Kilham, Beder and Chu, Consulting architects  
for design, NYC.



# JG





## Beautiful, isn't it?

The United States of America creates 70% of the solid waste produced in the world.

Which is a lot of garbage. And garbage creates a lot of problems. Disposal problems. Collection problems. Sanitation problems. Esthetic problems.

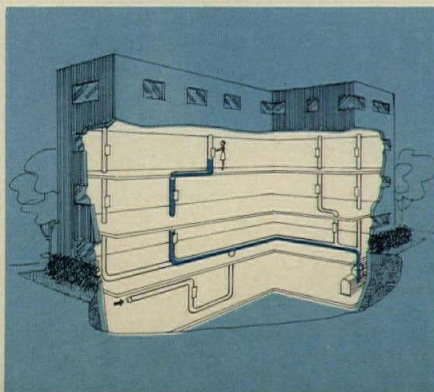
ECI Air-Flyte® pneumatic waste collection systems have solved these problems for many companies and communities. As the originators of the pneumatic waste disposal idea, we

have the capability to engineer an efficient, flexible and safe waste disposal system for almost any installation.

The benefits of an Air-Flyte pneumatic system, both in operation and cost, are many. Its flexibility (trash can be moved up, down, around corners) offers tremendous advantages in the

design of new buildings, be they residences (high rise apartments, multi-structure developments), industrial plants, hospitals—you name it. And centralized collection and compaction eliminate the accumulation and "display" of trash—inside or outside the building.

Ask your ECI representative for the whole story on Air-Flyte pneumatic trash collection systems. It's beautiful.



For more data, circle 89 on inquiry card

"AIR-FLYTE" is a registered trademark



**ECI Air-Flyte Corp.**

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 BOSTON • CHICAGO • LOS ANGELES • ATLANTA  
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**PAINTABLE GALVANIZED SHEET** / The company has announced two steel sheet products: a green tinted galvanized sheet, and what is said to be the first paintable galvanized sheet. For roofing, siding, etc., the paintable product has a clear chromate-phosphate film to enhance good paint adherence, and the tinted sheet is said to withstand a wide range of forming operations. ■ United States Steel Corp., Pittsburgh, Pa.



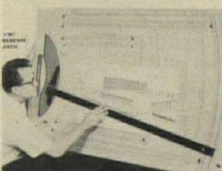
Circle 326 on inquiry card

**QUICK SETTING CONCRETE** / According to the company, the product's immediate application is in highway and bridge deck repairs, because of sets in five to ten minutes and hardens in two hours. The product bonds to structural steel, old concrete, wood, glass and even paper. ■ Republic Steel Corp., Cleveland, Ohio.



Circle 327 on inquiry card

**SIMPLIFIED PERSPECTIVE DRAWING** / The product is identified as the *Klok Perspective Drawing Board* and comes complete with special T-squares, vanishing point pins and a fully illustrated instruction manual. Boards are offered in three professional models. All scales are said to be easily readable, and users of the product report that accurately-scaled drawings can be produced in 1/3 the time required under any other method. ■ Fibresin Plastics, Div. of United States Gypsum, Oconomowoc, Wis.



Circle 328 on inquiry card

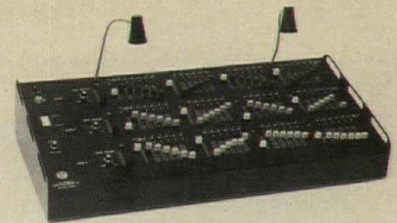
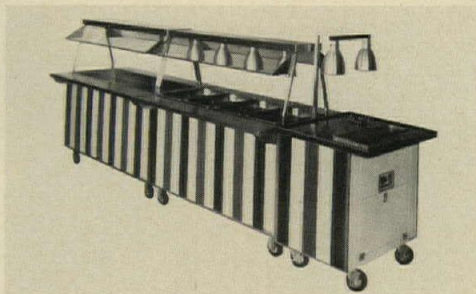


**LAUNDRY SYSTEMS** / A complete line of washers and dryers in a variety of sizes features automatic dispensing and built-in programs to match user needs. Monitors on all models show cycling steps. Units are said to be vibration-free, and can be operated free standing without the necessary bolting down on most models. No foundation is required on certain models. ■ Economics Laboratory, Inc., White Plains, N.Y.

Circle 329 on inquiry card

**HOT BUFFET LINE** / The portable cafeteria line is available in *Formica* finishes, and all component units are offered in either solid colors or wood-grains. Hot and cold service is featured on this unit. ■ Duke Mfg. Co., St. Louis, Mo.

Circle 330 on inquiry card



**STAGE DIMMING DEVICE** / This automated control allows pre-setting of all lights on three different scenes, with instant cuts or variable length faded between scenes. All units in the series operate on 20 volts and are completely portable, with modular construction. Lighting groups can be controlled with sub-masters. ■ Hunt Electronics, Dallas, Tex.

Circle 331 on inquiry card

# the ENERGY CRISIS is news — KALWALL® isn't!

but KALWALL

is certainly timely!

**Kalwall is a complete, translucent, insulating wall — or roof — system!**

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

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

- It can have a variety of "U" Factors ranging between .06 and .40!
- It can have a light transmission value ranging between 3% and 75%!
- It can have Shading Coefficients from .50 to less than .10!

And Kalwall can be engineered for every building situation, every location, and every exposure!

PLUS — Kalwall buildings win design awards every year!

Write or phone Mr. Bruce Keller, Vice President, for complete information.

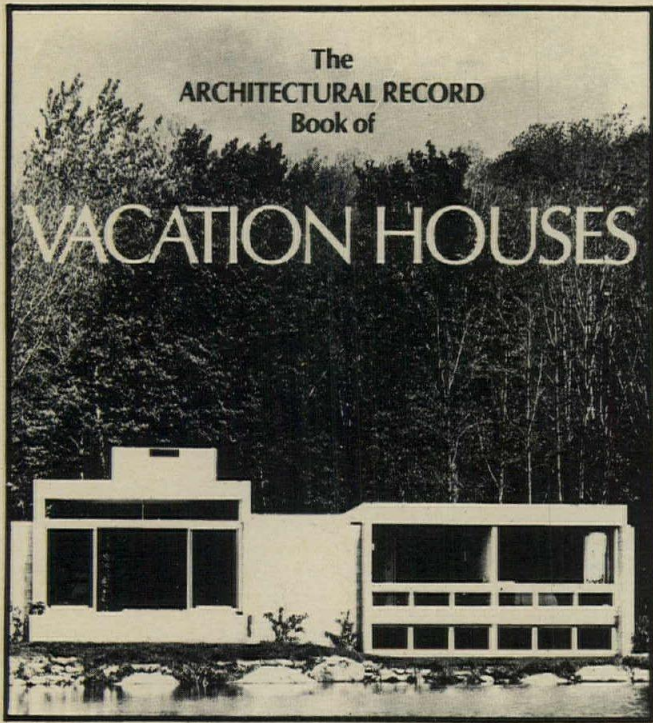
**KALWALL  
CORPORATION**  
1111 Candia Road  
Manchester, N. H. 03103  
Phone 603-627-3861

Patented

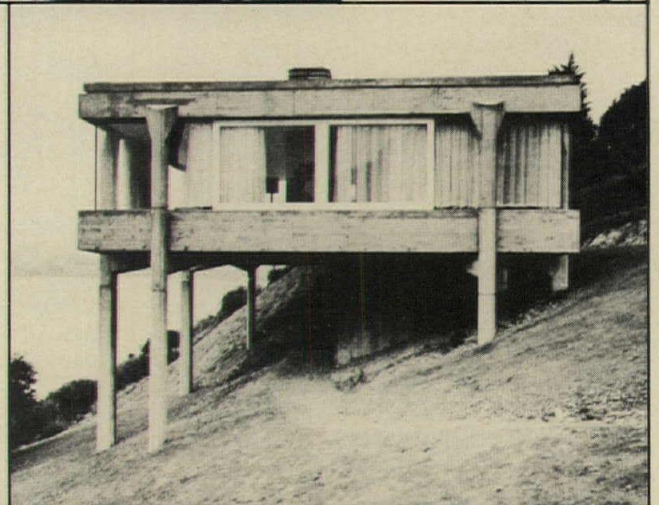


For more data, circle 90 on inquiry card





# Exciting ideas from 60 different dream hideaways



A sparkling collection of architect-designed vacation houses for all climates and terrains—from a mountain-top chalet in British Columbia to a beach house in Florida. Selected by Architectural Record editors, these houses range in price from less than \$5,000 for a very small two-room cottage to more than \$100,000 for large structures. Each house is fully described with floor plans, site plans, photographs and construction details. For easy reference the book is divided into five sections: beach, mountain, lakeside, resort and country, weekend and summer homes.

256 pages 9 x 12 \$9.95

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Please send me \_\_\_\_\_ copies of Architectural Record Book of Vacation Houses @ \$9.95 each.

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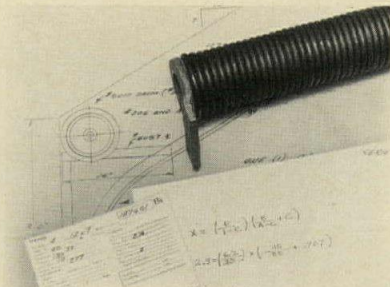
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AR3-74

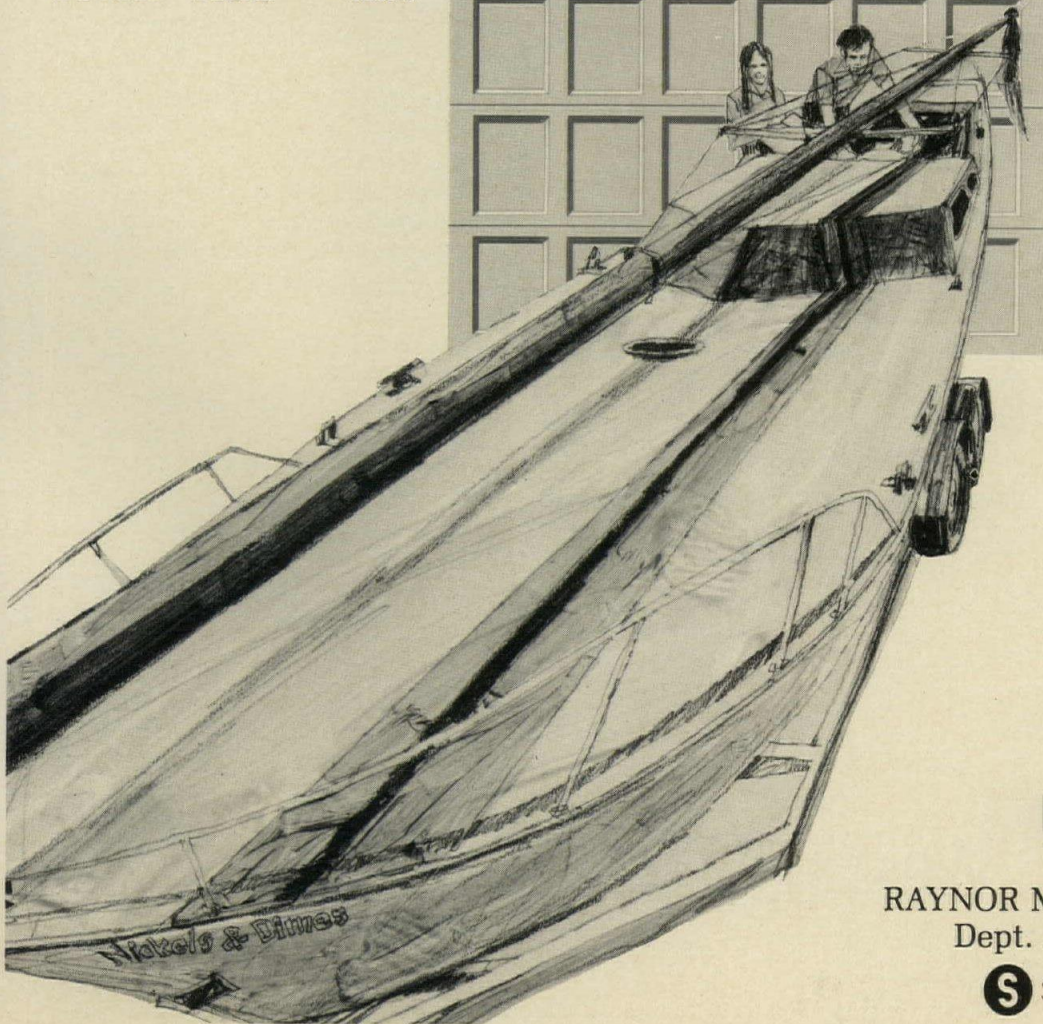
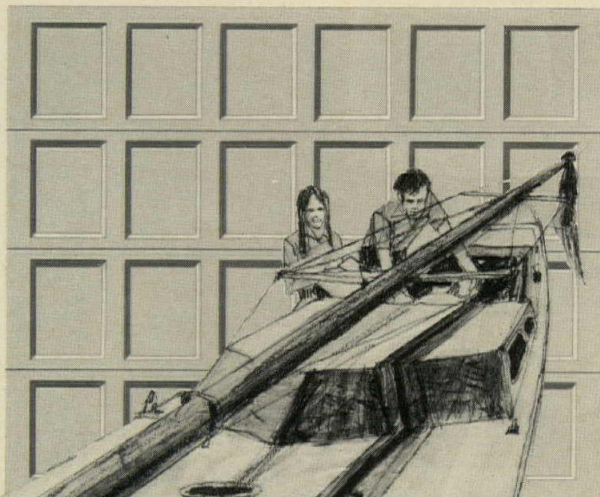


# If It's Worth Protecting, It Deserves A Raynor Door

There are good reasons why Raynor doors are appearing on more and more homes and apartments throughout the country. It's largely due to the many extras that only Raynor offers. There's a wide choice of materials, from wood to steel to fiberglass. And a choice of styles to blend with any architectural decor. Increasingly, builders are looking to Raynor for the new and better idea — like



the low-priced Rebel door that features rigid extruded aluminum rails so panels stay straight and true longer. There are extra quality touches, too. Springs are custom wound and all hardware is custom engineered to perfectly suit the characteristics of each door. It's extra work to do it that way, but Raynor goes to the trouble so you won't have trouble later. Whatever protective purpose you have in mind, it deserves a Raynor door.



**Raynor**  
The Brand  
You Can  
Depend  
On



**RAYNOR.**  
The Brand You Can Depend On

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Dept. AR-3, Dixon, Illinois 61021

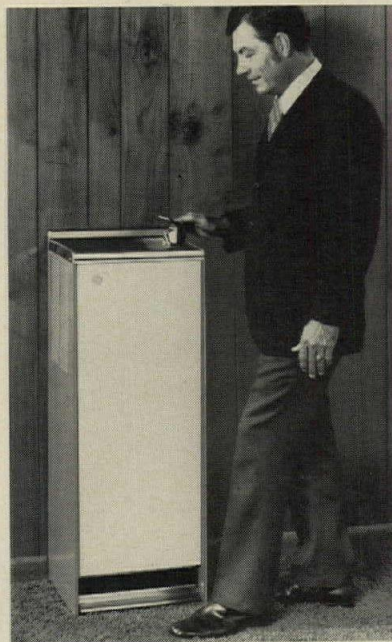
**S** SEE OUR CATALOG IN SWEET'S

For more data, circle 91 on inquiry card

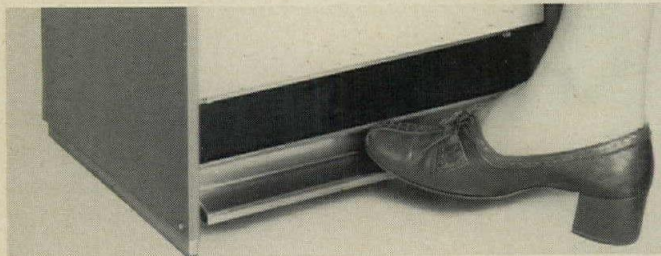


# You can only get Westinghouse water cooler performance from Westinghouse.

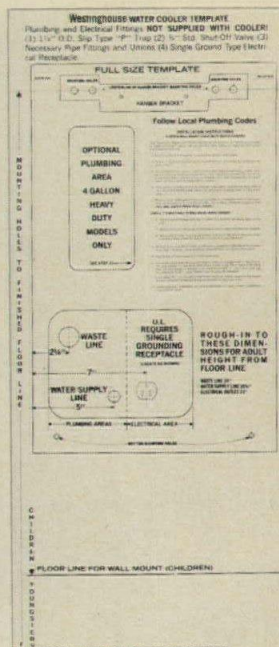
You get instant cold . . . the Westinghouse innovation that delivers refreshing cold water the instant the bubbler is pressed. And instant hot, from a factory installed Hot Water Heater.



You get a full-width, fully recessed stainless steel foot pedal on all floor mounted models. For safety's sake.



The Sure Service symbol means prompt, complete, professional service by thousands of Westinghouse trained technicians anywhere the water cooler is installed in the U.S.A. **Westinghouse water coolers work for you.**



You get a time- and labor-saving full-size installation template with full instructions and dimensions. Just to make everything simpler.

You get a choice of 21 basic water cooler models. Plus a variety of types. A spectrum of colors and finishes. All for design versatility.

But you can only get it from Westinghouse. For people who specify quality. Westinghouse Electric Corporation Water Cooler Department Columbus, Ohio 43228.



## Westinghouse

Performance certified in accordance with ARI standard 1010-71

For more data, circle 92 on inquiry card



## Can you apply modular rooftop heating/air conditioning concepts inside a multistory building?

In the face of today's spiraling costs and energy squeeze, architects and engineers are turning to Lennox for the economy and flexibility owners/operators need to compete in the multistory market. Here's why:

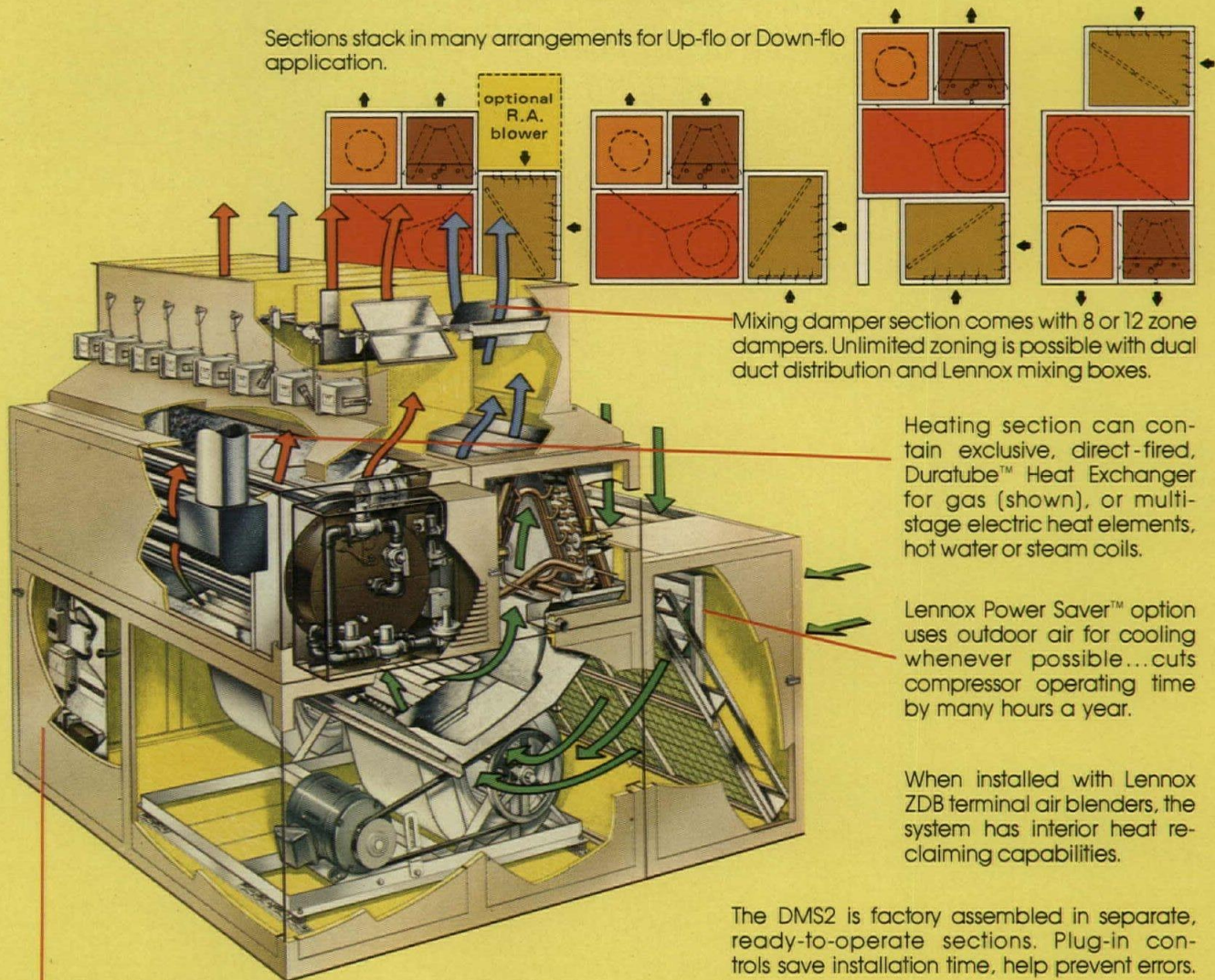
Lennox interior multizone equipment has a low initial cost. DMS2 flexibility allows the owner/operator to occupy sections of the building as they are completed, or add units as space is rented by simply connecting and zoning each area with mixing boxes.

Saves valuable, rentable floor space... eliminates need for vertical shafts, thereby increasing the life-safety characteristic of a building. The DMS2, with horizontal distribution installed in accordance with NFPA Pamphlet 90A, provides excellent fire and smoke control.

**Absolutely.**

**The unique Lennox DMS2 Multizone is the modular system designed for installation inside multistory buildings.**

Sections stack in many arrangements for Up-flo or Down-flo application.



Mixing damper section comes with 8 or 12 zone dampers. Unlimited zoning is possible with dual duct distribution and Lennox mixing boxes.

Heating section can contain exclusive, direct-fired, Duratube™ Heat Exchanger for gas (shown), or multi-stage electric heat elements, hot water or steam coils.

Lennox Power Saver™ option uses outdoor air for cooling whenever possible...cuts compressor operating time by many hours a year.

When installed with Lennox ZDB terminal air blenders, the system has interior heat reclaiming capabilities.

The DMS2 is factory assembled in separate, ready-to-operate sections. Plug-in controls save installation time, help prevent errors.

Solid commercial quality construction. Rigid, insulated cabinets. Easy access to all enclosed components. Remarkably quiet.

**FOR MORE INFORMATION** see your Lennox representative, or write Lennox Industries Inc., 469 S. 12th Ave., Marshalltown, Iowa 50158.

**LENNOX**®

AIR CONDITIONING • HEATING

# Nifty problem-solving ideas from Lennox.

For more data, circle 94 on inquiry card



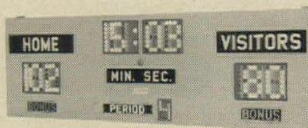
# NEVCO SCOREBOARDS FOR ALL SPORTS

NEVCO  
SCOREBOARD  
CO.  
(618) 664-0360

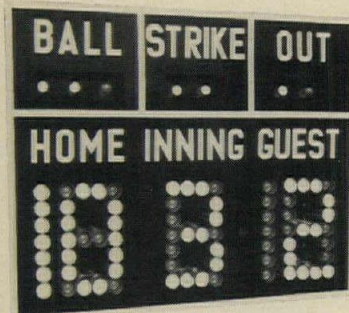
Football Model 520



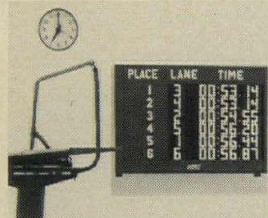
Basketball Model 12-201



Hockey Model 12-HP4-20



Baseball Model 450



Swimming Model 600-AM-X

Send literature  Rush—will purchase  
in 30 days

AR-3

NEVCO Scoreboards for

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 Baseball  Football  Swimming  
 Other \_\_\_\_\_

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TITLE \_\_\_\_\_  STUDENT

SCHOOL \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY/STATE/ZIP \_\_\_\_\_

PHONE \_\_\_\_\_

**NEVCO SCOREBOARD CO.**  
215-225 E. Harris Ave.  
Greenville IL 62246  
(618) 664-0360

For more data, circle 95 on inquiry card

**CRUSHED STONE AGGREGATE** / Written for engineers, architects and concrete technicians, a 32-page publication discusses desirable properties for fresh and hardened cement concrete and describes the physical and chemical properties of crushed stone coarse aggregates and their effect on concrete. Information is also included on the use of "stone sand" as the fine aggregate. The brochure presents a nine-step mix design and proportioning procedure utilizing basic NCSA and ACI concepts. An up-to-date reference list and glossary of concrete terms is also featured. ■ National Crushed Stone Assn., Washington, D.C.

Circle 414 on inquiry card

**KENNELS** / This new brochure explains the construction features of a modular kennel system for large animal-housing installations. Complete details are included. Featured also are two-way kennel doors, and other accessories. Design details and construction specifications are included. ■ Long Environmental Systems, Gambrills, Md.

Circle 415 on inquiry card

**ESTIMATING** / A new time-saving process to preliminary design and estimating of its *Versa-space* commercial/industrial buildings is announced by the company. The *Speed Design* process offers the opportunity to compress the design and estimating time requirement down to a single hour and thus allows for as many as eight alternate solutions to be developed in a single man day. *Speed Design* provides complete engineering solutions for double-tees, beams and columns as well as solutions for the selection of column foundations. ■ Precast Systems, Inc., Chicago, Ill.

Circle 416 on inquiry card

**CORROSION CONTROL** / A four-page technical bulletin provides installation procedures for the company's light-duty, thin-film protective coating. Included are details for surface preparation of both steel and concrete; application coverage figures; mixing instructions; cure times; recommended methods for spray and brush-on application; equipment maintenance; testing and safety factors. ■ The Ceilcote Co., Berea, Ohio.

Circle 417 on inquiry card

**INDUSTRIAL FLOORS** / This brochure describes and illustrates a floor surfacing that because of its formulation of high performance polymer resins and hardeners and specially blended powders produces a surface that is unharmed by spillage of solvents, oils, fat, acids and other types of destructive substances. ■ Stonhard, Inc., Maple Shade, N.J.

Circle 418 on inquiry card

**FOAM ROOFING** / A new application and specification guide to aid the architectural and construction specifier in the use of rigid, lightweight, urethane foam insulation roofing panels contains comparative specification, physical property, thermal characteristics, and applications data required in the specification of built-up roofing systems. ■ Apache Foam Products, Linden, N.J.

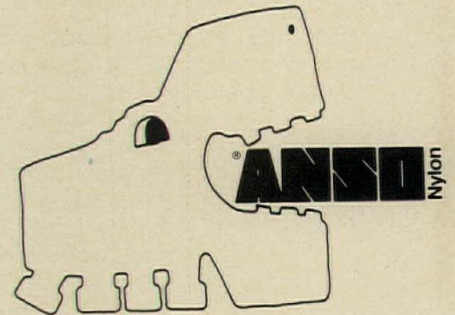
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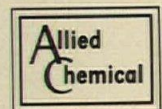
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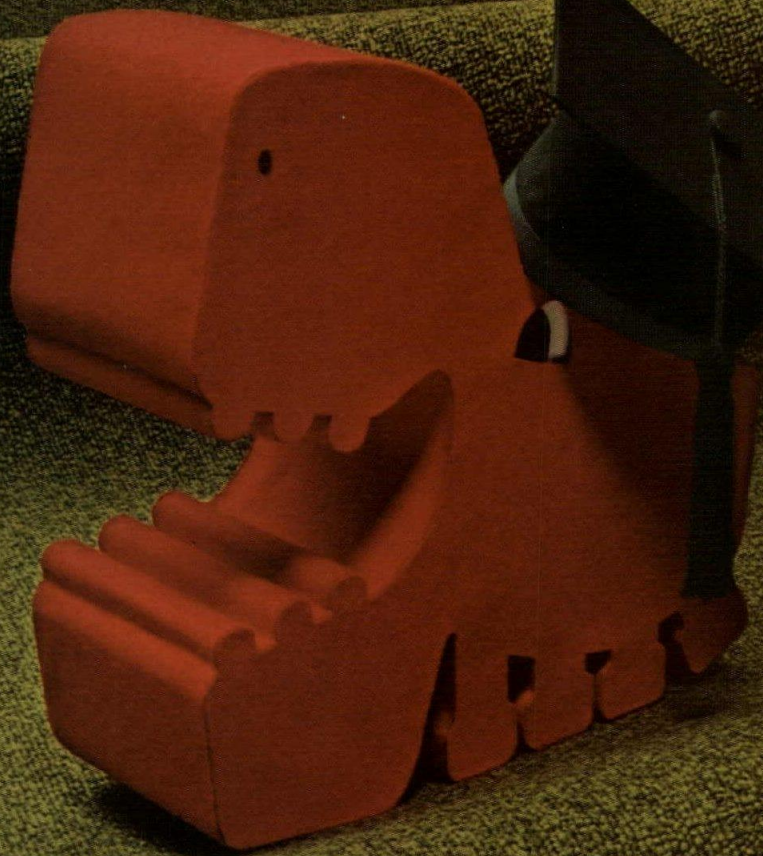
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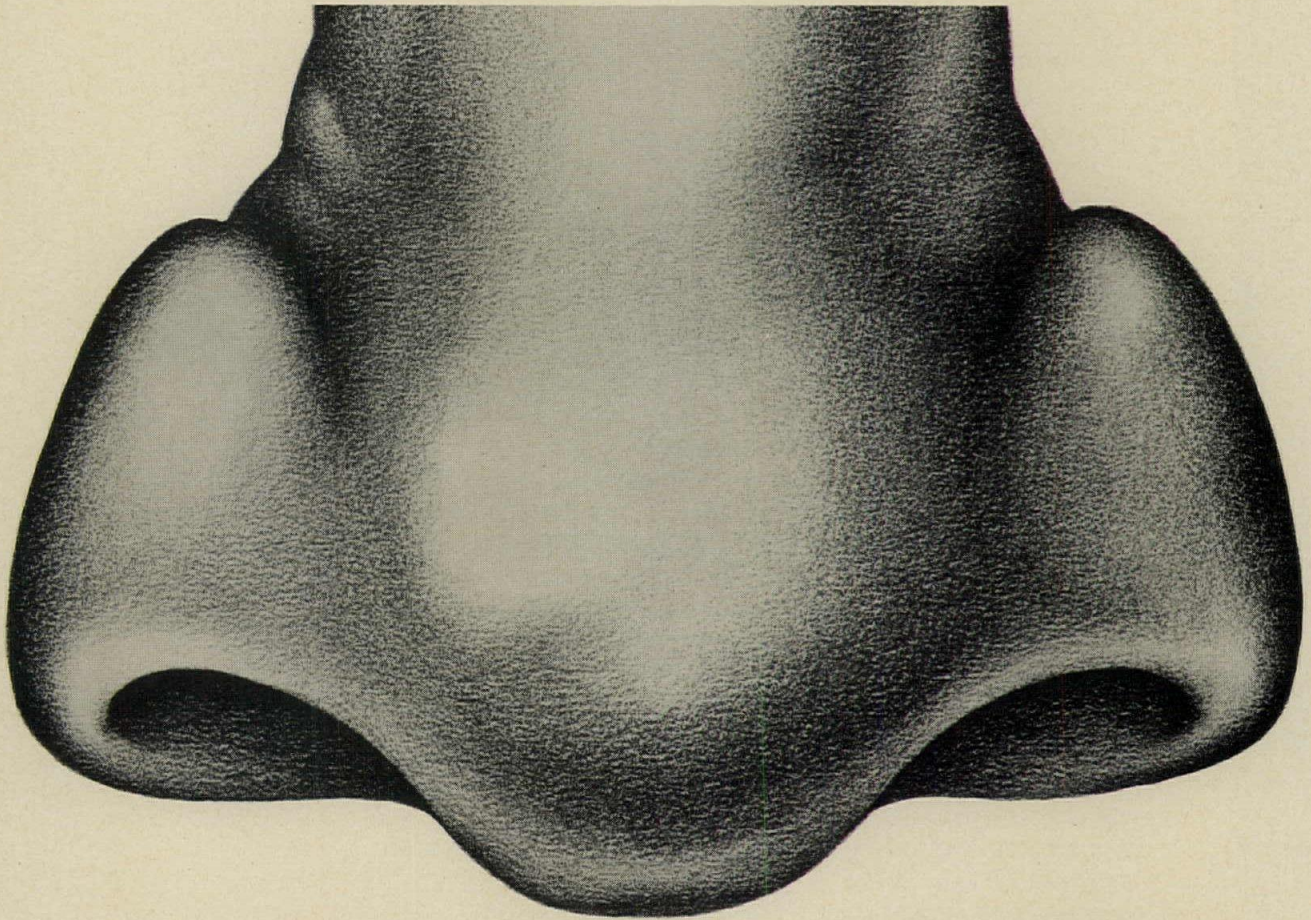
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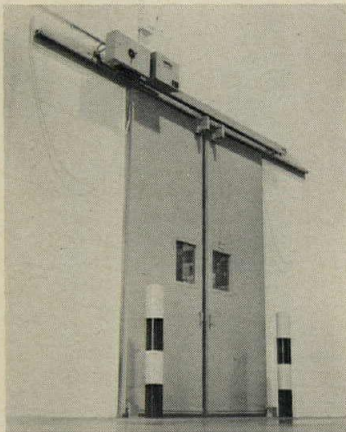
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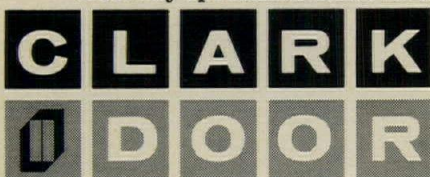
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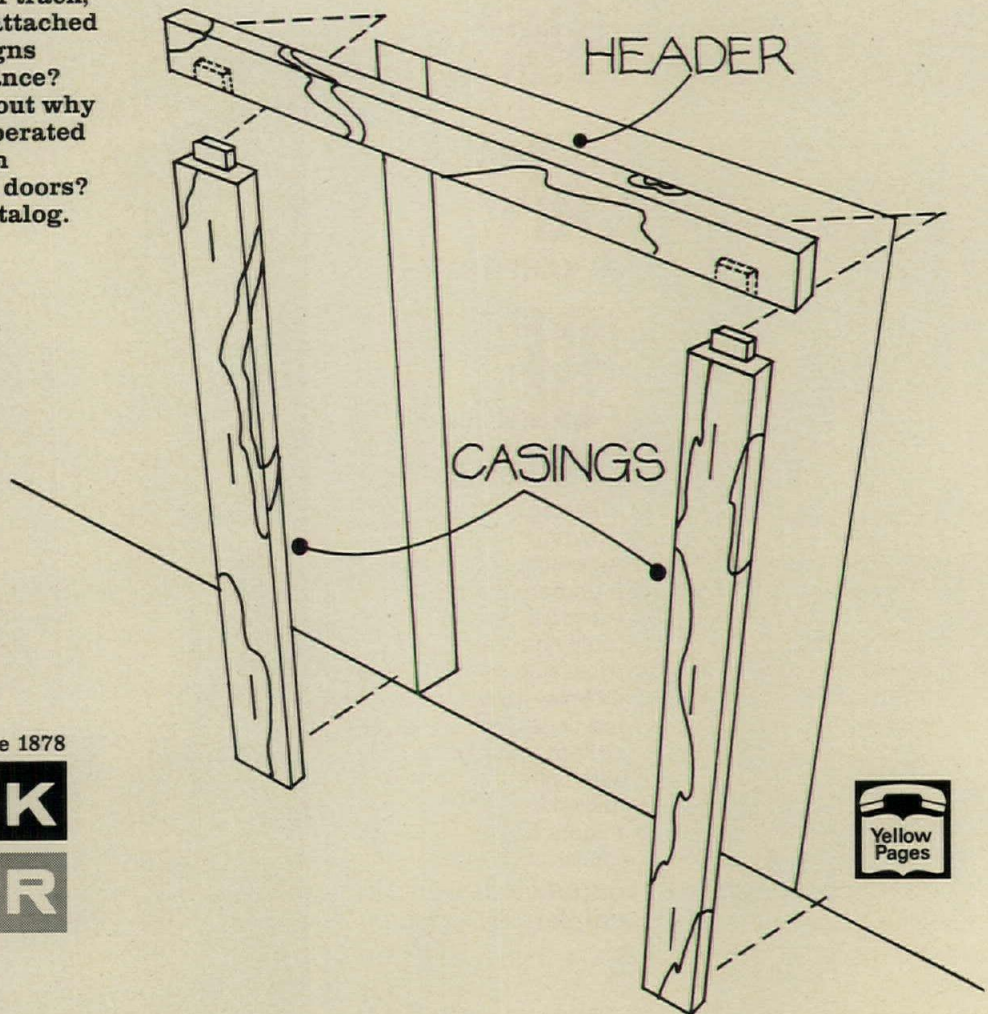


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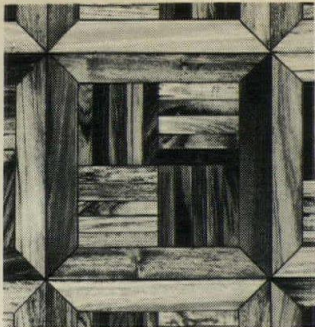
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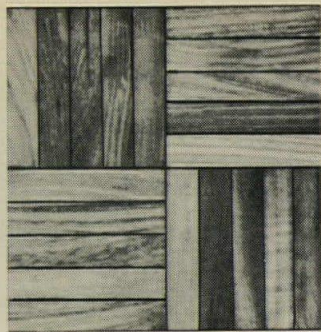
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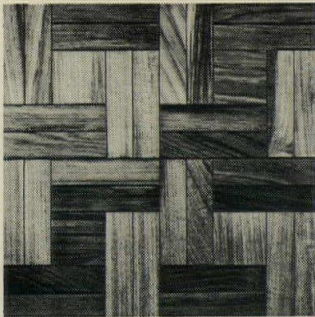
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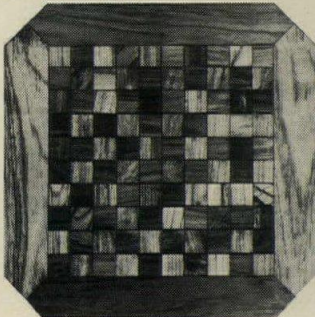
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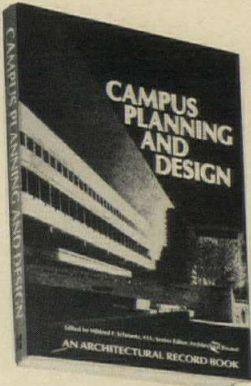


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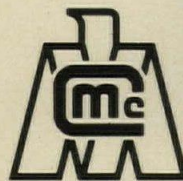
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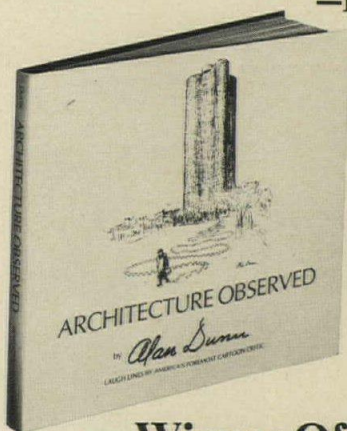


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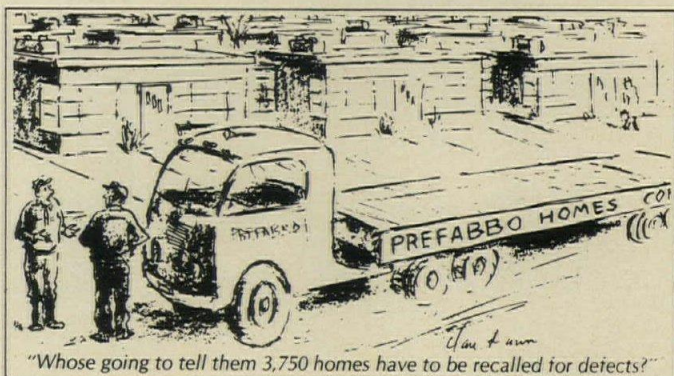
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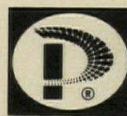
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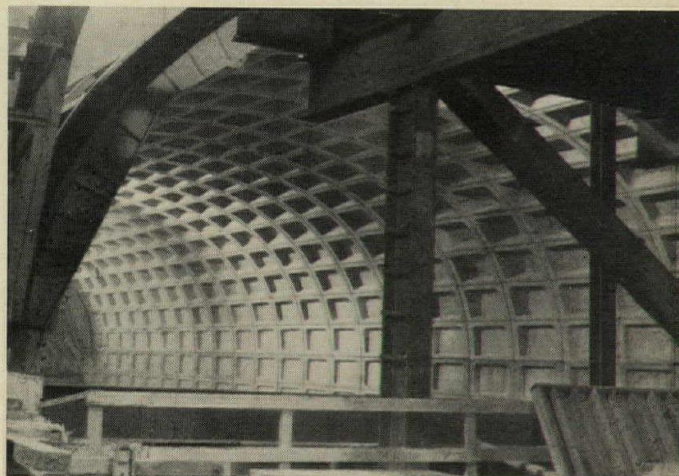
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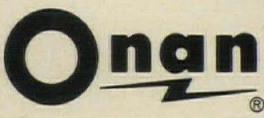
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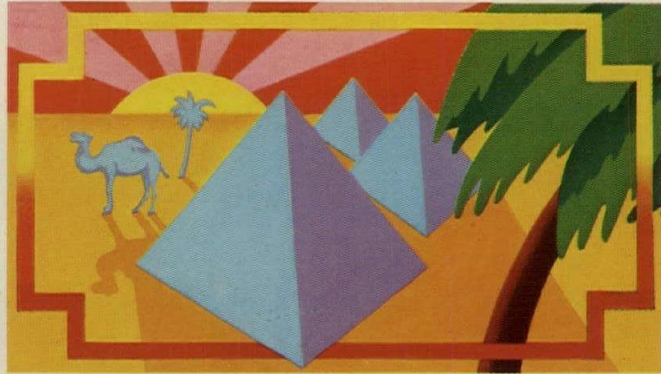
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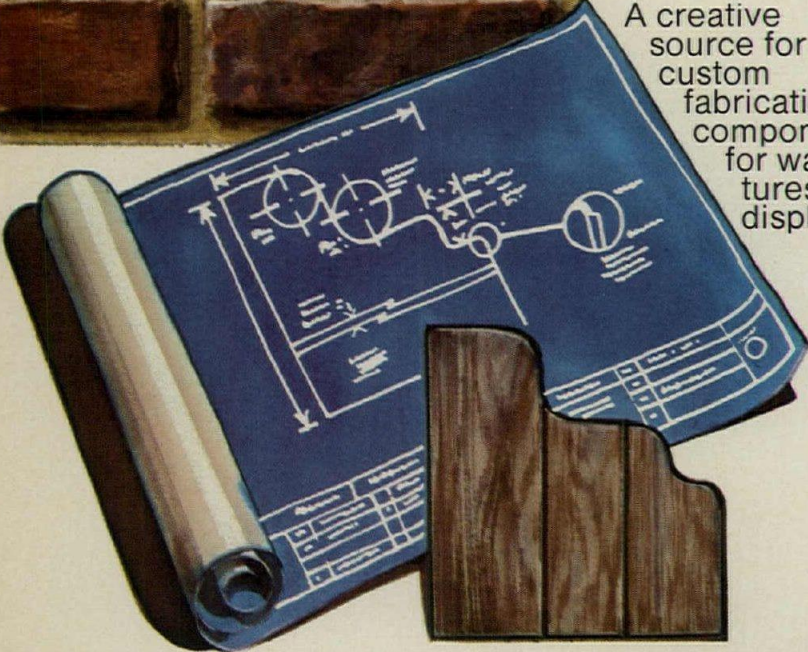


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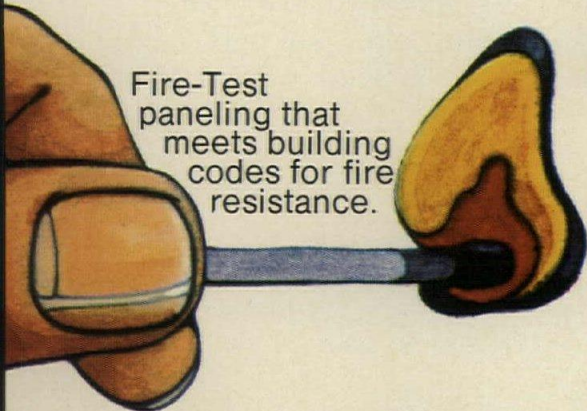
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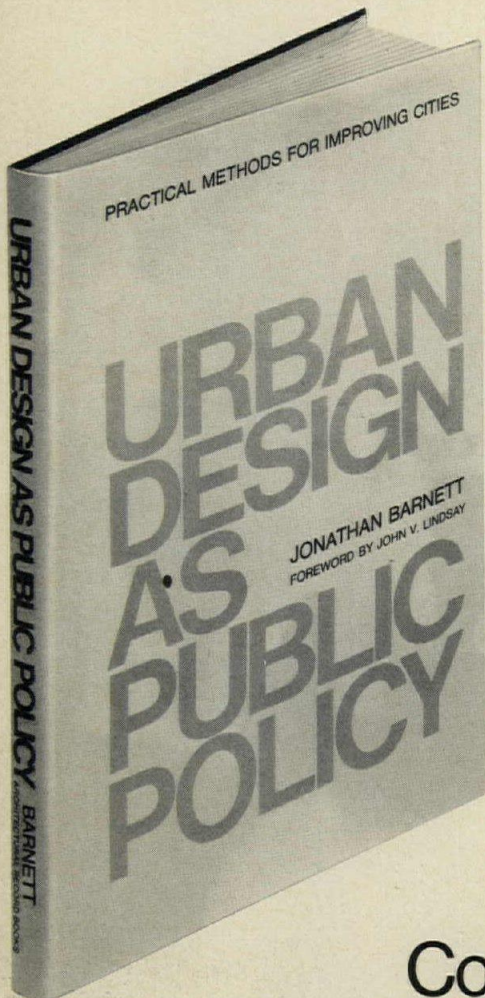
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**—From the forward by  
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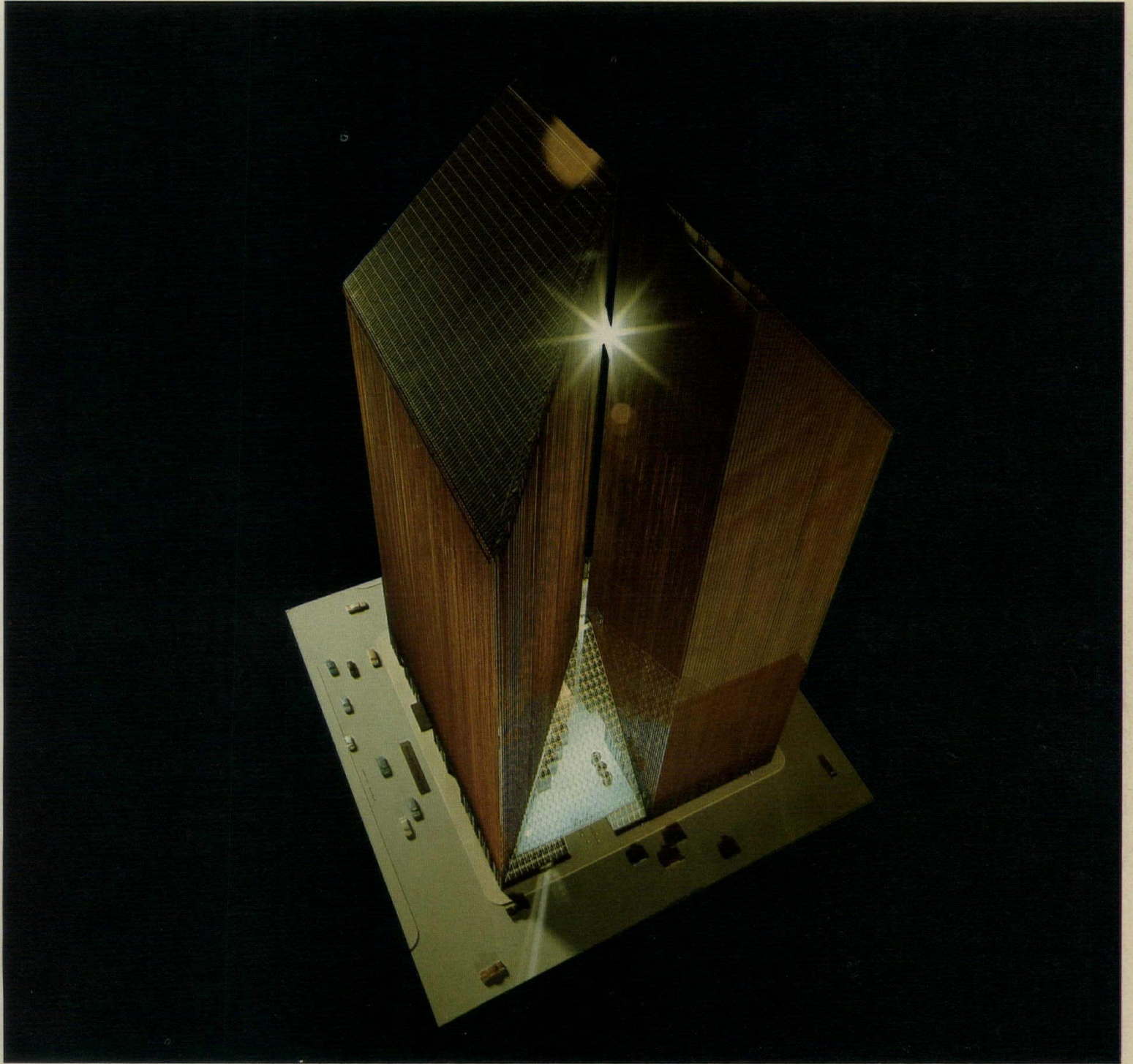
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# VARI-TRAN<sup>®</sup> AND THERMOPANE<sup>®</sup> SQUARE-OFF AGAINST A TEXAS SKY.



Pennzoil Place, Houston, Texas. Owner: Gerald D. Hines Interests, Houston.

Architects: Philip Johnson & John Burgee, New York City, and S. I. Morris Associates, Houston. General Contractor: Zapata Warrior Constructors—A Division of Zapata Constructors, Inc. Curtain Wall & Glazing Contractor: Cupples Products Division, H. H. Robertson Co., St. Louis.

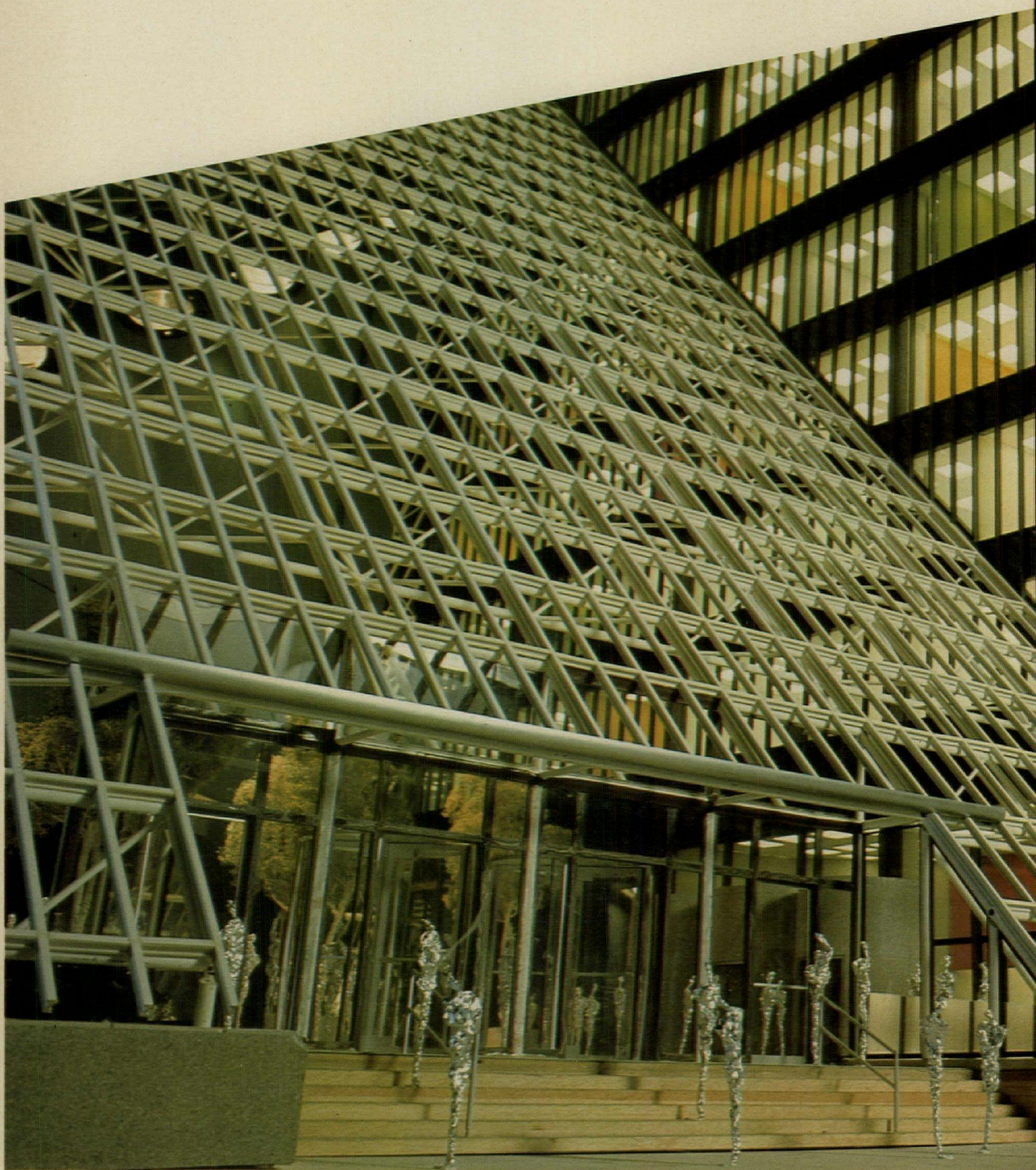
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# TWIN CANOPIES CREATE A CLIMATE

---





# CONTROLLED ENVIRONMENT.



Houston's largest office complex will be Pennzoil Place. It's scheduled for occupancy in early 1975.

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The preceding page shows the sloping roofs of the juxtaposed towers: Specified for the roof to the south are Thermopane insulating units of Vari-Tran 4-114 reflective glass, both lights tempered. This will reduce solar heat gain by as much as 75%. The tower roof facing north will be Vari-Tran 4-120 in Thermopane units—this will reduce solar heat gain by 70%.

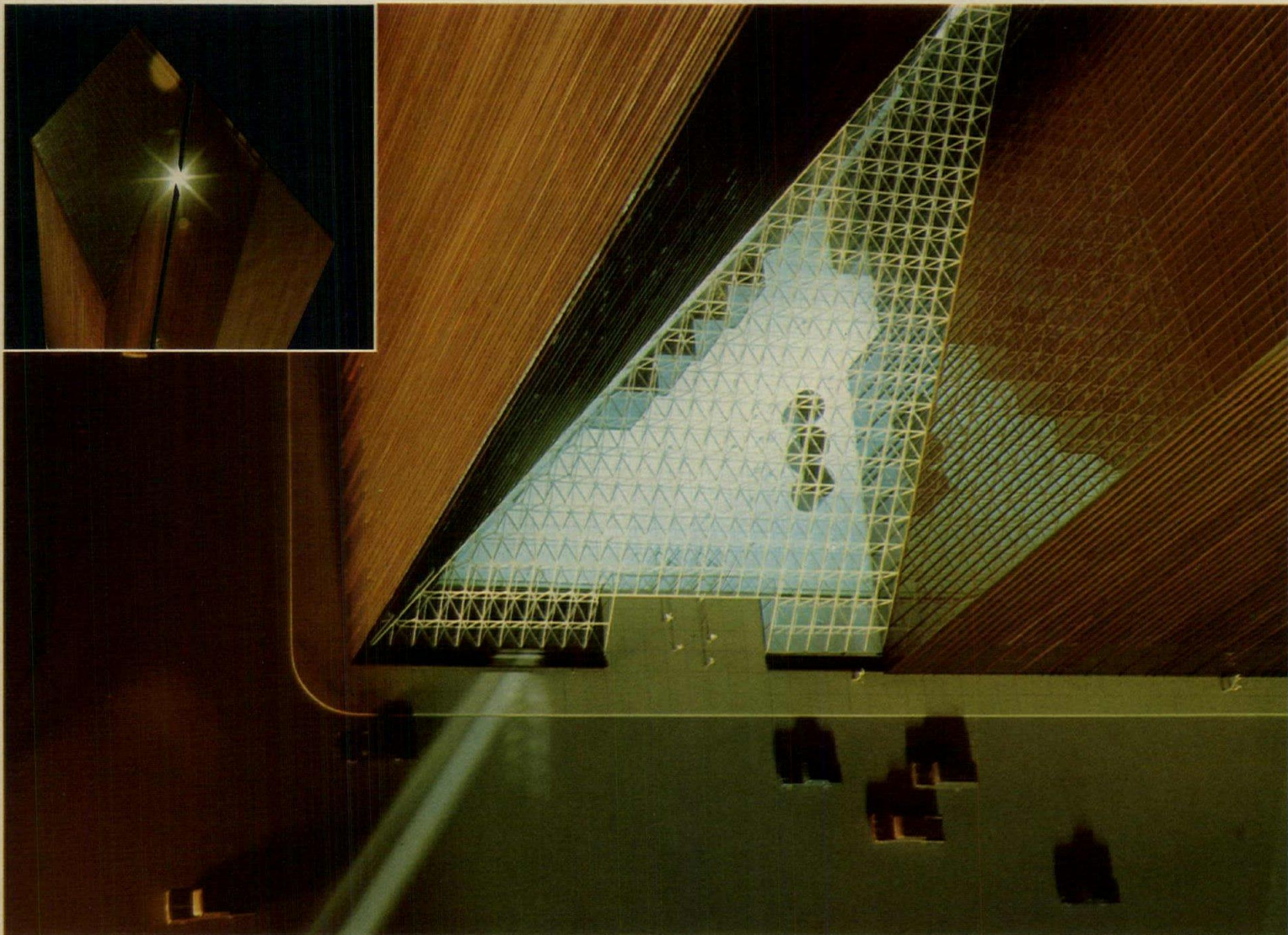
What we at LOF would like you to know, too, is that with Vari-Tran coated Thermopane, cooling and heating load reductions are precisely calculable and convincingly impressive in energy savings.

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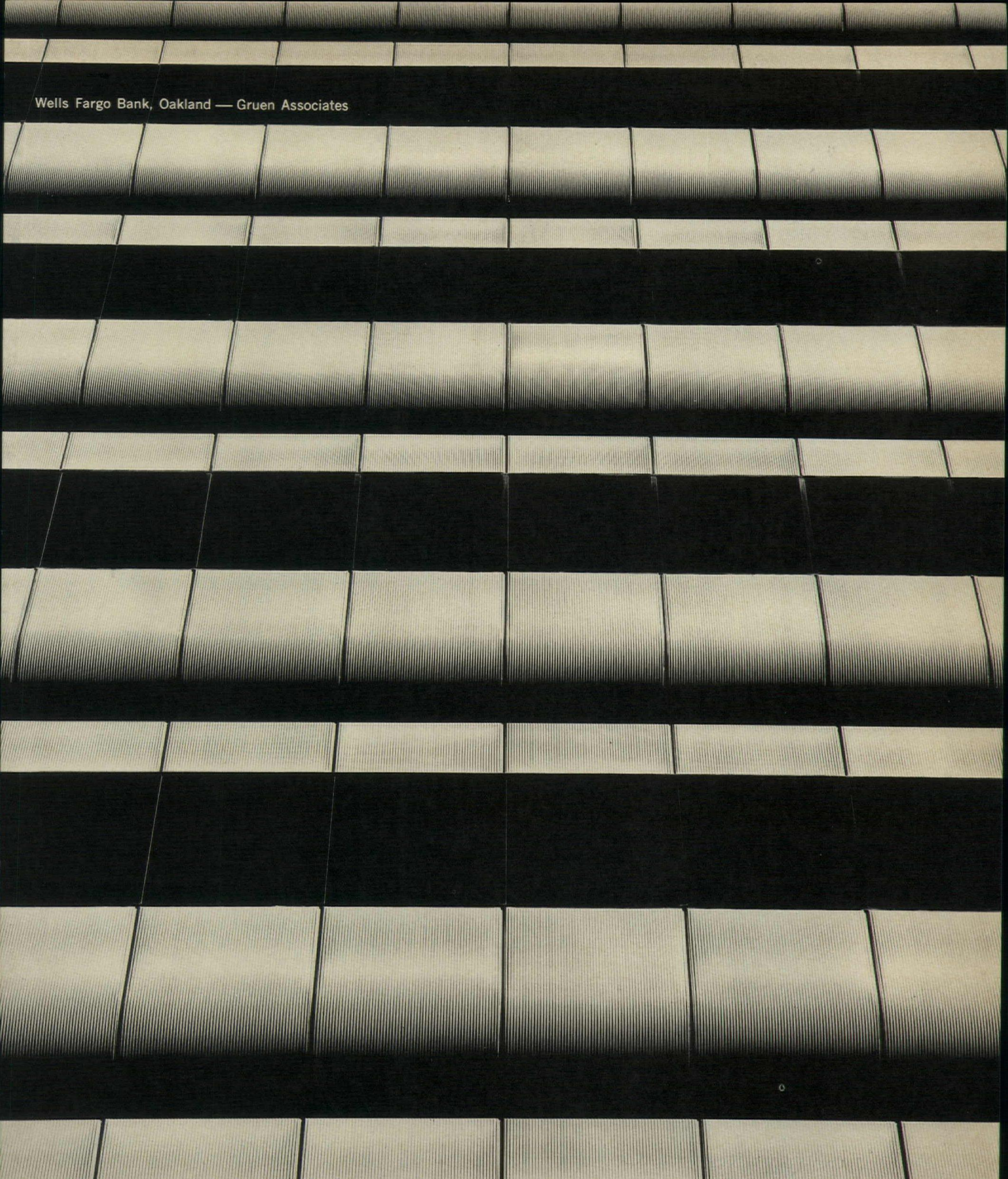
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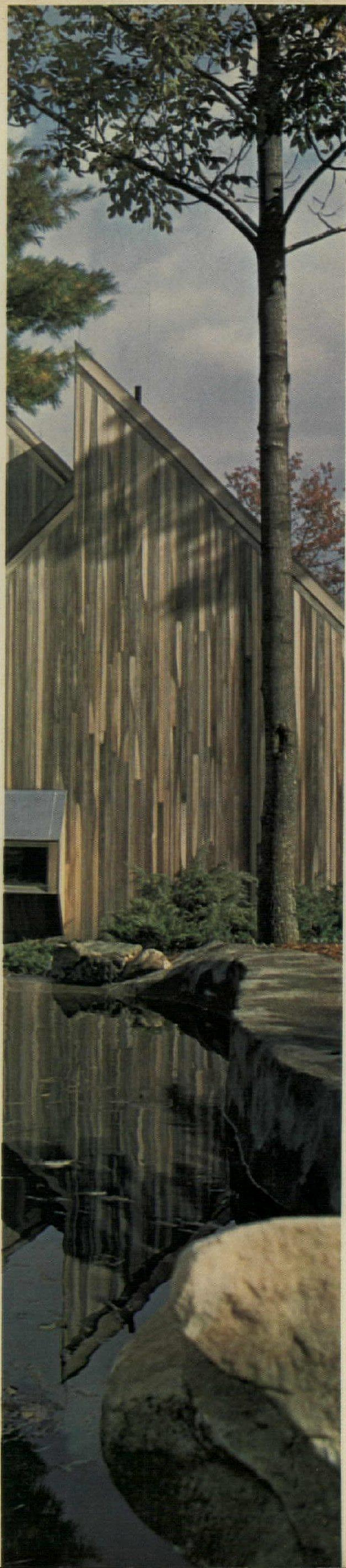
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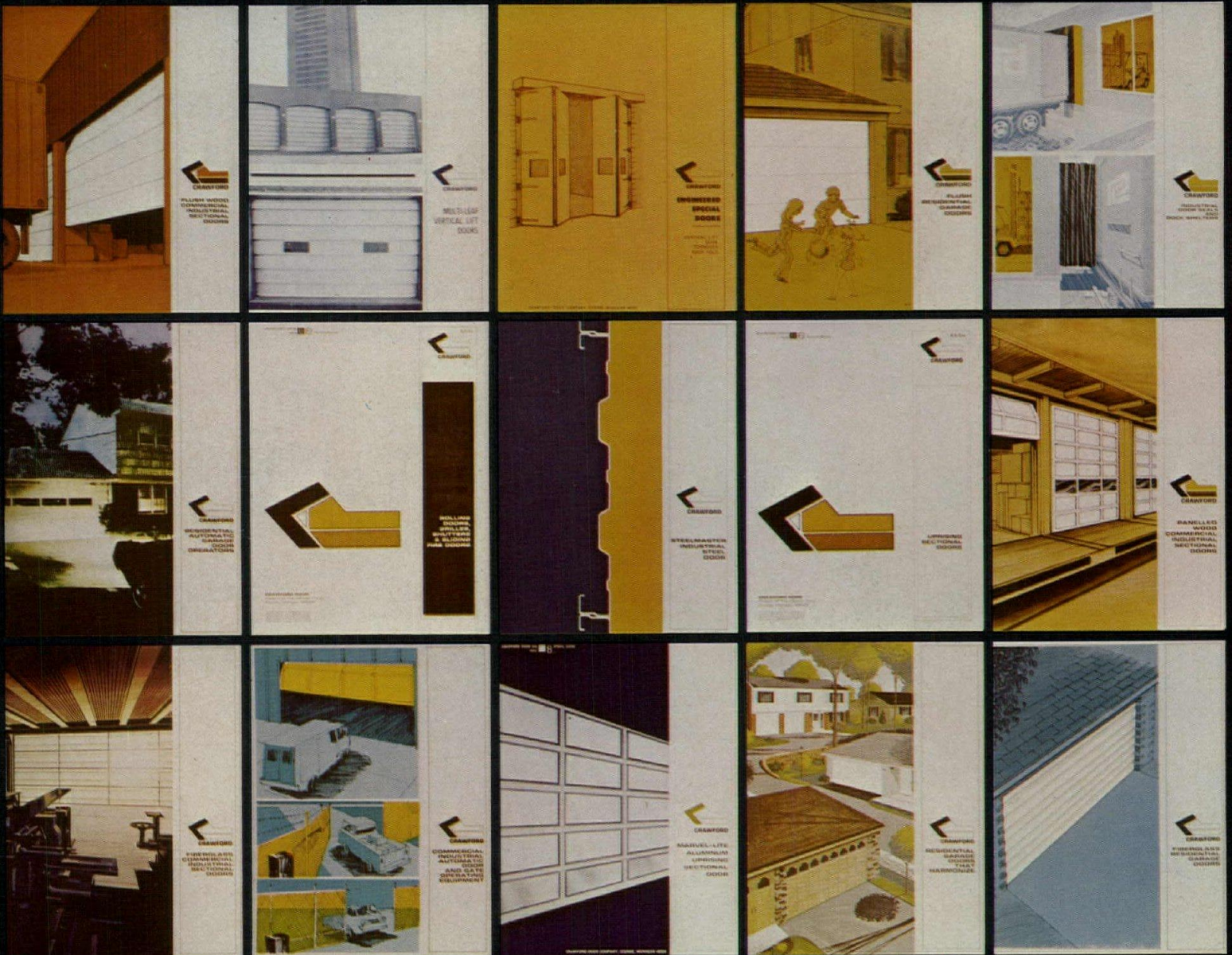
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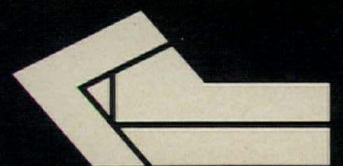
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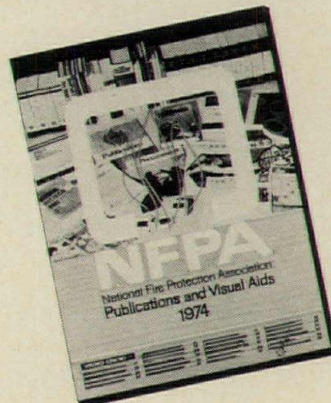
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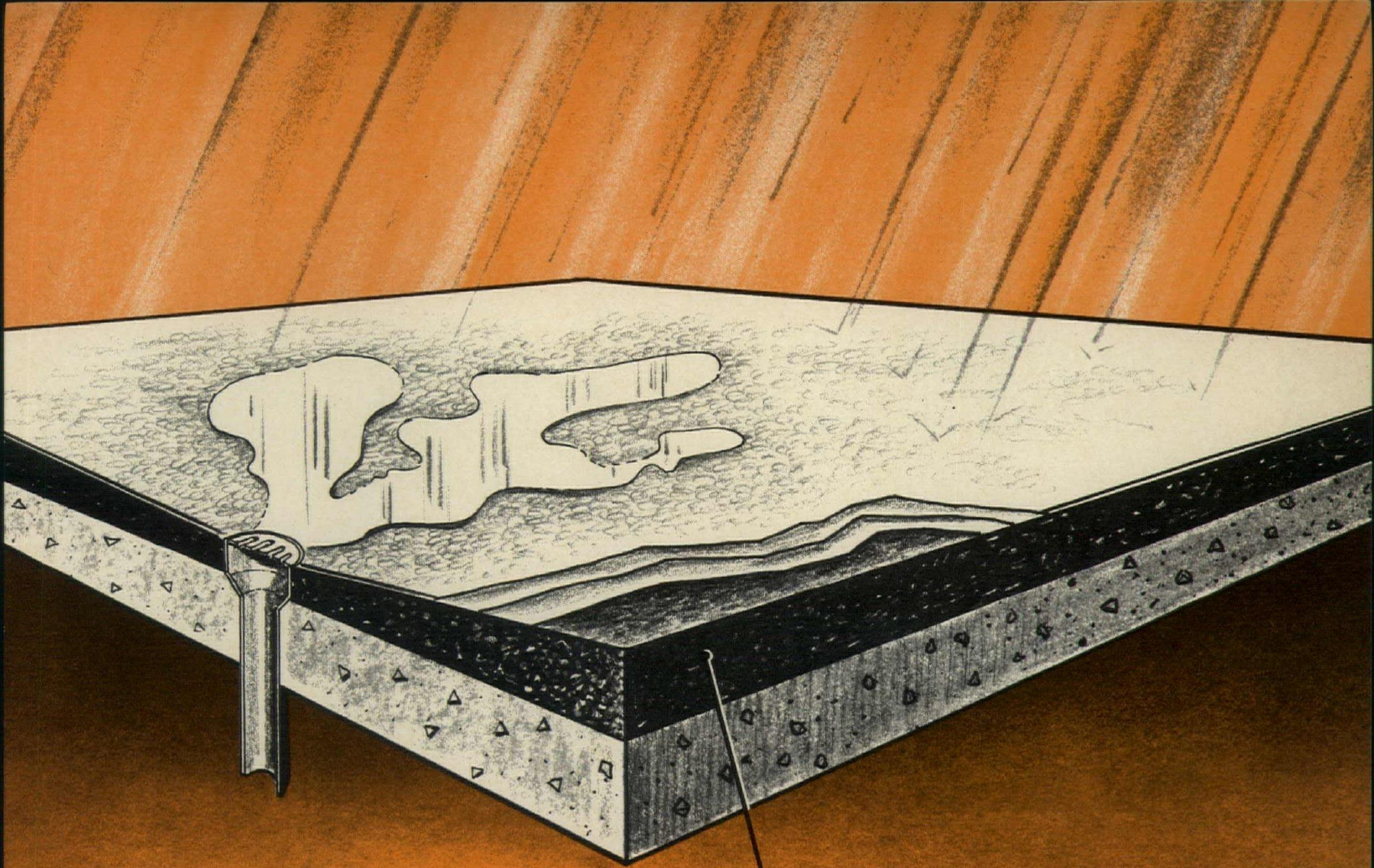
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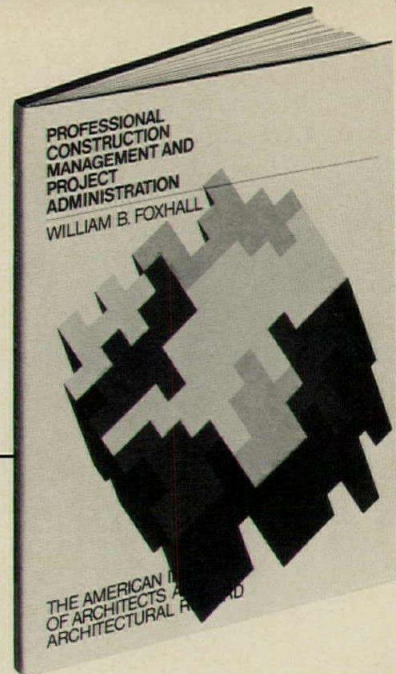
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# PROFESSIONAL CONSTRUCTION MANAGEMENT AND PROJECT ADMINISTRATION

By William B. Foxhall  
Senior Editor Architectural Record

**AUTHORITATIVE, CONCISE TEXT  
FOR UP-TO-DATE INFORMATION  
ON IMPORTANT, INNOVATIVE CHANGES  
IN MANAGEMENT OF THE BUILDING PROCESS.**



In the increasingly complex world of architecture and the building process, there continually appear new (and sometimes confusing) ideas and terms that have major effects on you, your firm, and your firm's operations. Here, in one place, William B. Foxhall, senior editor of Architectural Record, describes and explains how new trends and innovations in four major areas are affecting the management of today's complex building process.

- Increasing size and complexity of projects, and the clients—public and private—who commission them.
- The corresponding shift in contracting method toward the multiple contract system that still requires a single management to unify and solidify the process.
- Inflationary costs that set a terrible price on delay and call for management to shorten the time from identity of the need to delivery of the completed building.
- Increasing technical complexity of management itself calls for special knowledge in the areas of CPM, computer application, and other techniques.

Construction Management is the successful unification of skills that can serve to deal with these areas of change and the entire complex building process. In this "primer", Mr. Foxhall illustrates and explains, item-by-item, what these skills are, their components and functions, and how they relate to the central professional requirements of time, cost, and quality control.

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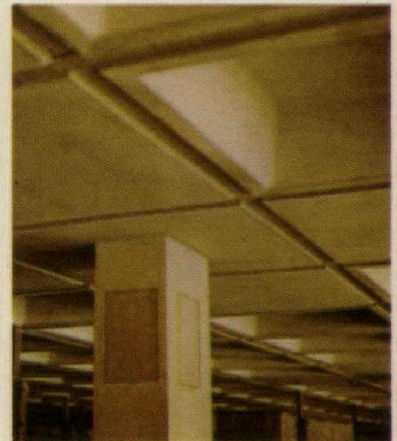


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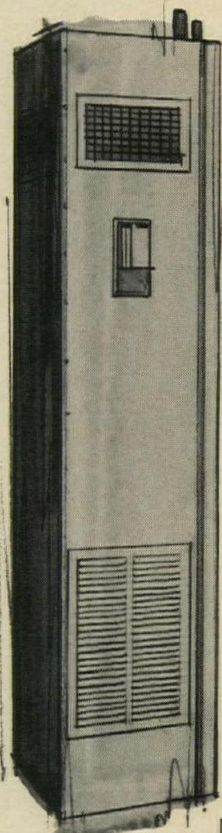
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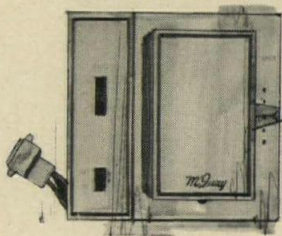
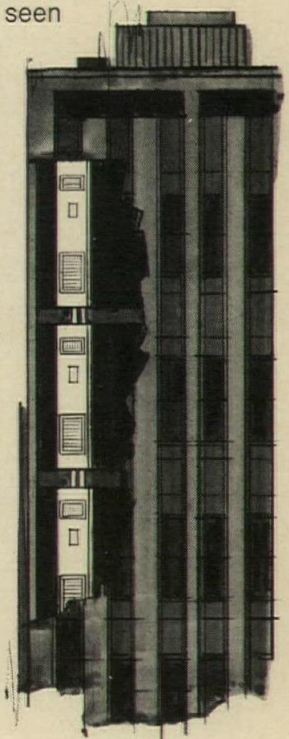


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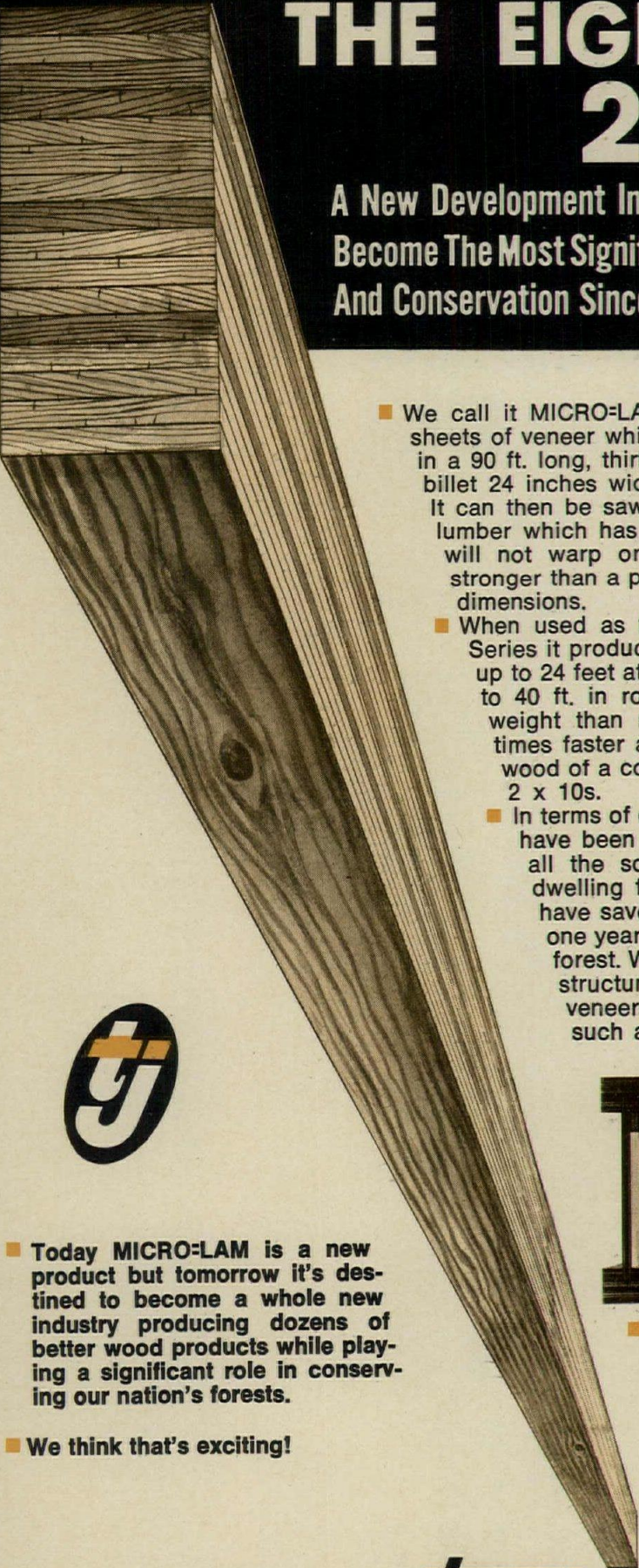
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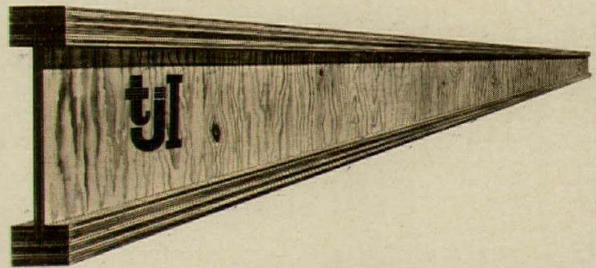
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**trus Joist**

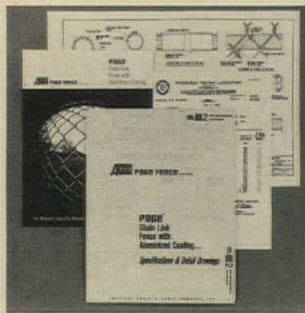
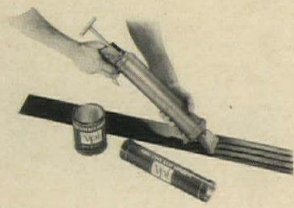
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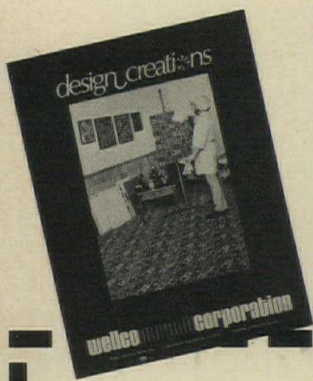
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# This steel-frame parking 7 months...at only \$5.97 a

The steel design for this self-park, open-deck garage in Greensburg, Pa., just had to be a contract winner. It had so much going for it: low construction cost, no fire protection required, optimum usable space and fast construction time — for a quick return on invested capital.

No wonder. The garage uses the increasingly popular exposed steel-frame, long-span design concept, with USS EX-TEN Structural Steel. The floors are steel reinforced concrete poured on metal decking.

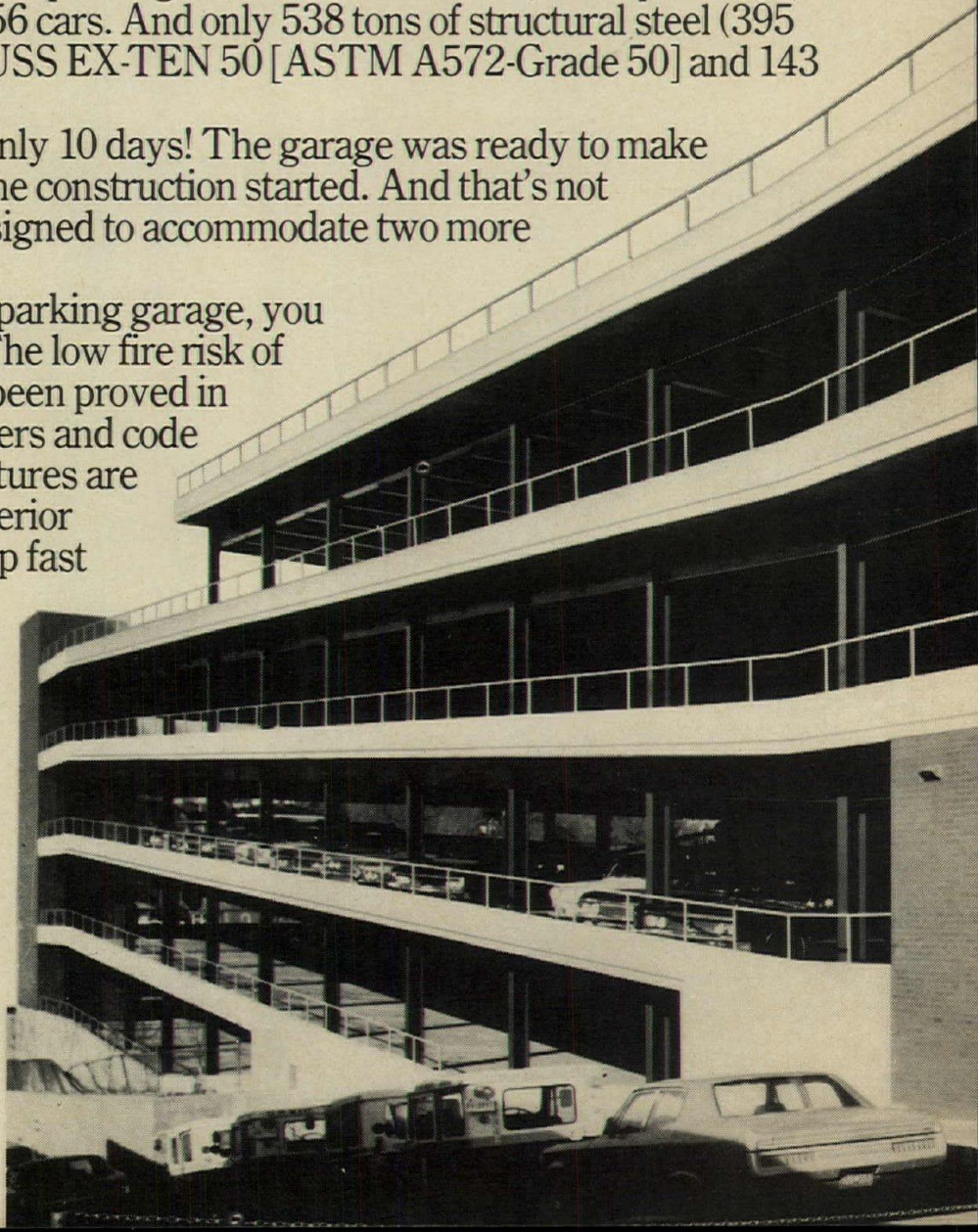
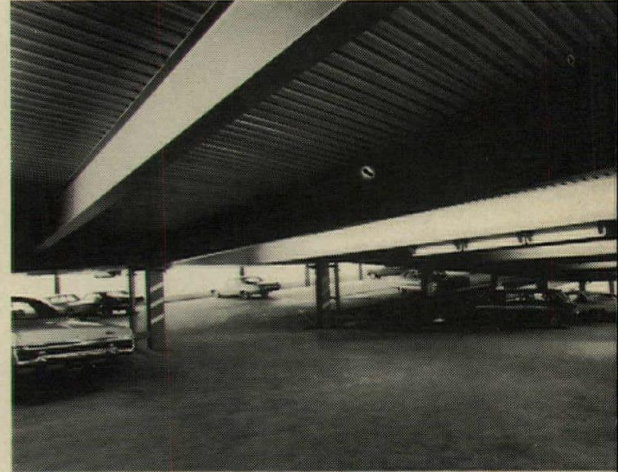
Project budget was based on low “design/construct” bid. The winning design beat five others, including four pre-cast schemes. Actual cost: only \$5.97 a square foot!

The garage was a tremendous bargain. Parking ramps are 55 feet wide, so full-size cars can be parked at 60° angles. There's a two-way access lane. Columns are few and far-between and there are *no* columns in the parking area! Gross area: 153,000 square feet, in five tiers. That adds up to space for 456 cars. And only 538 tons of structural steel (395 tons of high-strength, weight-saving USS EX-TEN 50 [ASTM A572-Grade 50] and 143 tons of ASTM A36).

Erection of structural steel took only 10 days! The garage was ready to make money just seven months from the time construction started. And that's not the end of it. The garage has been designed to accommodate two more tiers at a later date.

If you're planning or designing a parking garage, you should keep these points in mind: 1. The low fire risk of open-deck, steel-framed garages has been proved in actual tests. And insurance underwriters and code officials recognize this. 2. These structures are lighter, with more usable space, no interior columns, fewer footings. 3. They go up fast because of factors like shop fabrication, modular sub-assemblies and field bolting.

*Owner:* Greensburg Parking Authority, Greensburg, Pa. *Architect:* Thomas G. Donald, South Greensburg, Pa. *General Contractor:* L-D Building Company, Latrobe, Pa. *Fabricator:* Moore Metal Manufacturing Company, Greensburg, Pa. *Erector:* Penn Erection and Rigging Company, Turtle Creek, Pa.





# garage went up in just square foot!

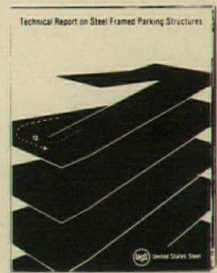
When you're ready, United States Steel is ready—to help you design a long-span, open-deck garage. And to supply the steel.

For openers, we have two free brochures. The "USS Structural Report," which contains all the details of the Greensburg garage. And our 54-page "Technical Report on Steel-Framed Parking Structures" (shown at right).

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Or write U.S. Steel, Dept. C164,  
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But not just any blind. For these four buildings, the architects used the Levolor Riviera blind.

Rivieras enhance design, regardless of structure. Their less than one-inch-narrow slats and lace-like ladders "disappear" when viewed from a distance. And Levolor's Top-Lok keeps blinds uniform: they are either fully up or fully down.

While each building uses Rivieras with distinctive modifications, all four enjoy their easy maintenance and ability to cut air-conditioning power costs; two bonuses master builders of past ages didn't ask of their blinds.

But you can ask today, for tomorrow, and get them from Levolor—in 60 colors and designs, in two color slats, in perforated slats, in metallics. . . .

For complete details on Rivieras and other Levolor blinds, write to Levolor-Lorentzen, Inc., 720 Monroe Street, Hoboken, N.J. 07030.



THE UNOBTRUSIVE BLIND

## LEVOLOR RIVIERA BLINDS

A fresh old idea, unsuccessfully imitated the world over

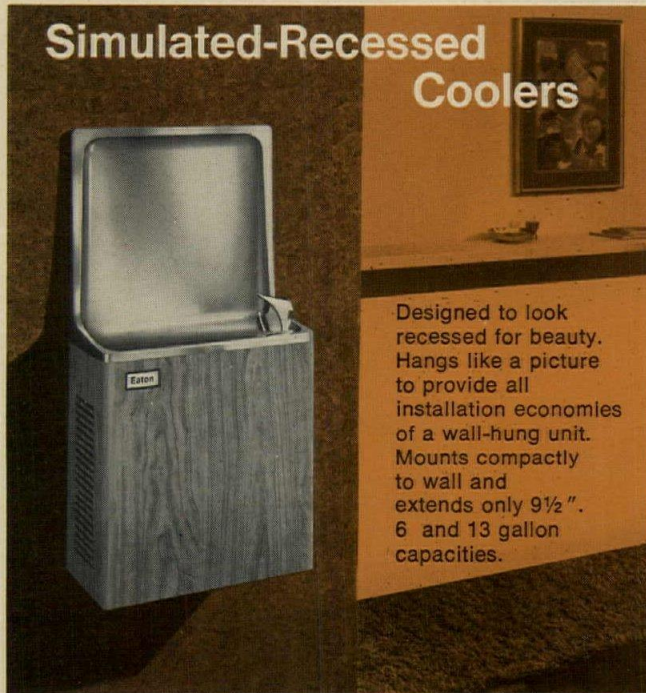
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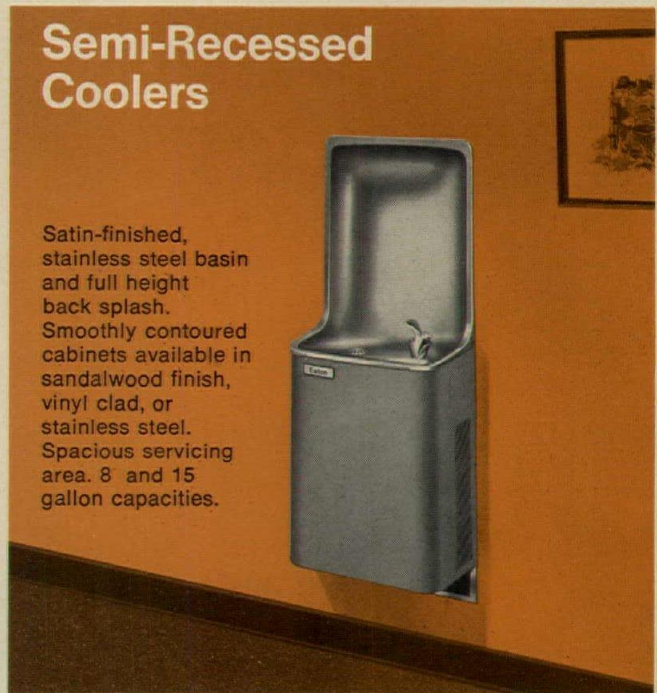
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Designed to look recessed for beauty. Hangs like a picture to provide all installation economies of a wall-hung unit. Mounts compactly to wall and extends only 9½". 6 and 13 gallon capacities.

**EAT•N** Controls Products

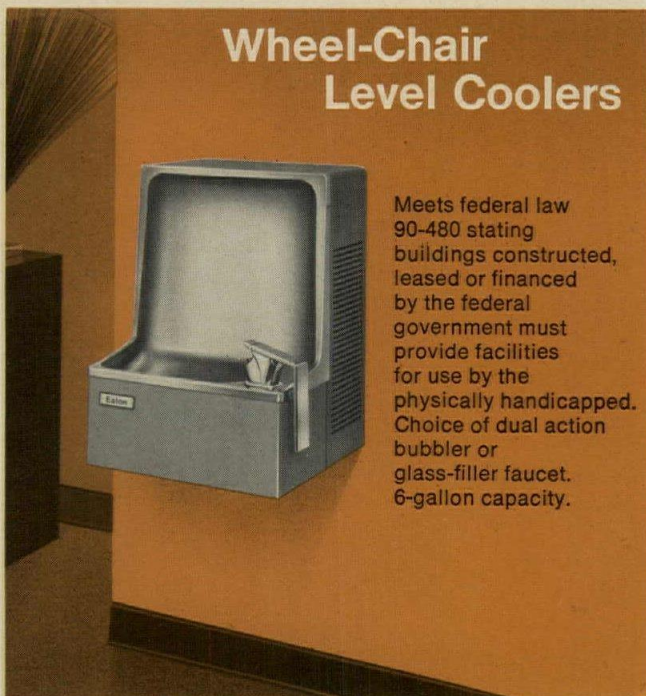
### Semi-Recessed Coolers



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Contractor: Brighton Construction Co.



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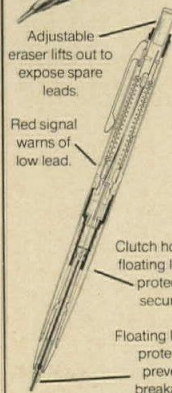
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PRESENTS

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a McGraw-Hill book by Gerre L. Jones

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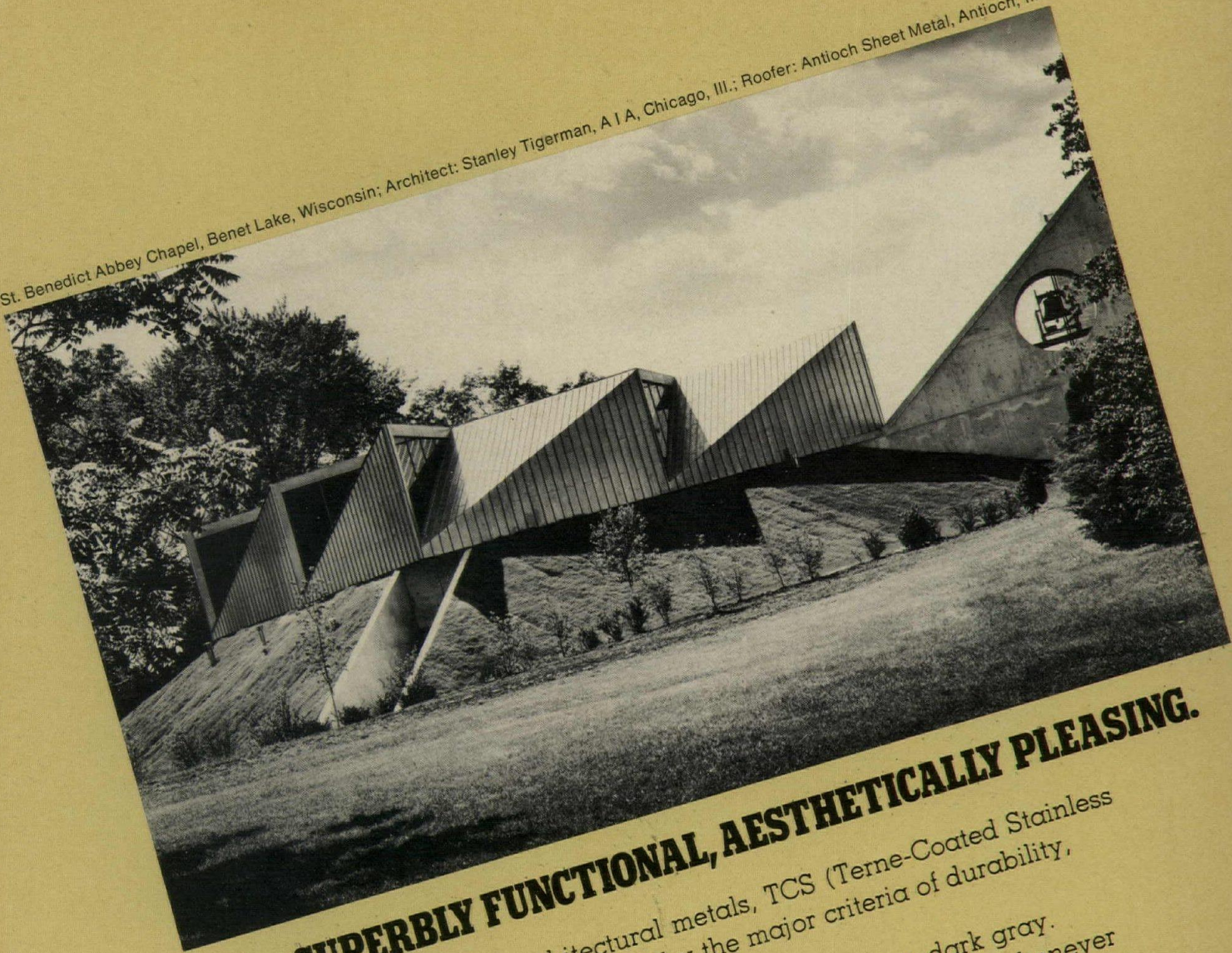
1974 Professional Marketing Workshops® are planned for the following cities:

<input type="checkbox"/> Atlanta, Georgia	March	14-15
<input type="checkbox"/> Boston, Massachusetts	April	17-18
<input type="checkbox"/> Denver, Colorado	May	2- 3
<input type="checkbox"/> Chicago, Illinois	June	6- 7
<input type="checkbox"/> Newark, New Jersey	September	5- 6
<input type="checkbox"/> Tulsa, Oklahoma	October	7- 8
<input type="checkbox"/> Houston, Texas	November	4- 5
<input type="checkbox"/> Phoenix, Arizona	December	5- 6

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



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TYPE AND NUMBER OF STUDENTS SOUGHT: Architect Civil

Mechanical Electrical Other: (Draftsman, Illustrator, Model Builder, etc.)



3/74

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**TOWLINE CONVEYOR** / The range of towline applications has been extended with heavier track construction which raises distributed wheel load capacity to 10,000 pounds, twice the industry standard. And, in addition to installation economies, the new low profile track permits the system's use in the areas where a deeper track is impractical. ■ Rapistan Inc., Grand Rapids, Mich.  
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**SOUND REDUCTION DOORS** / A fully illustrated catalog on sound reduction doors discusses applications such as jet engine test cells, sound stages and studios, anechoic chambers, dynamometer test cells and special industrial and commercial installations. The catalog contains a detailed listing of door construction and design features, and a guide for architectural specification. Doors are offered in single and double swinging, horizontal and vertical sliding models. ■ Jamison Door Co., Hagerstown, Md.  
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**ERRATUM**

The author, William Fain, Jr. has brought to our attention an error of fact and an ambiguous designation which appeared in his article "New towns in Britain and France" in our December 1973 issue. The error of fact: On page 135 the caption ". . . Milton Keynes density is 10 persons per acre" should read "12 persons per acre." The ambiguous designation is the use of the word "commune." It should have been "a new urban unit."

**Additional credits**

The Wake Forest University Fine Arts Center, published on page 41, in the December 1973 issue of the RECORD should have credited the firm of Newman Van Etten Winfree Associates as associate architects on the project.



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Prefiled catalogs of the manufacturers listed below are available in the 1974 Sweet's Catalog File as follows.

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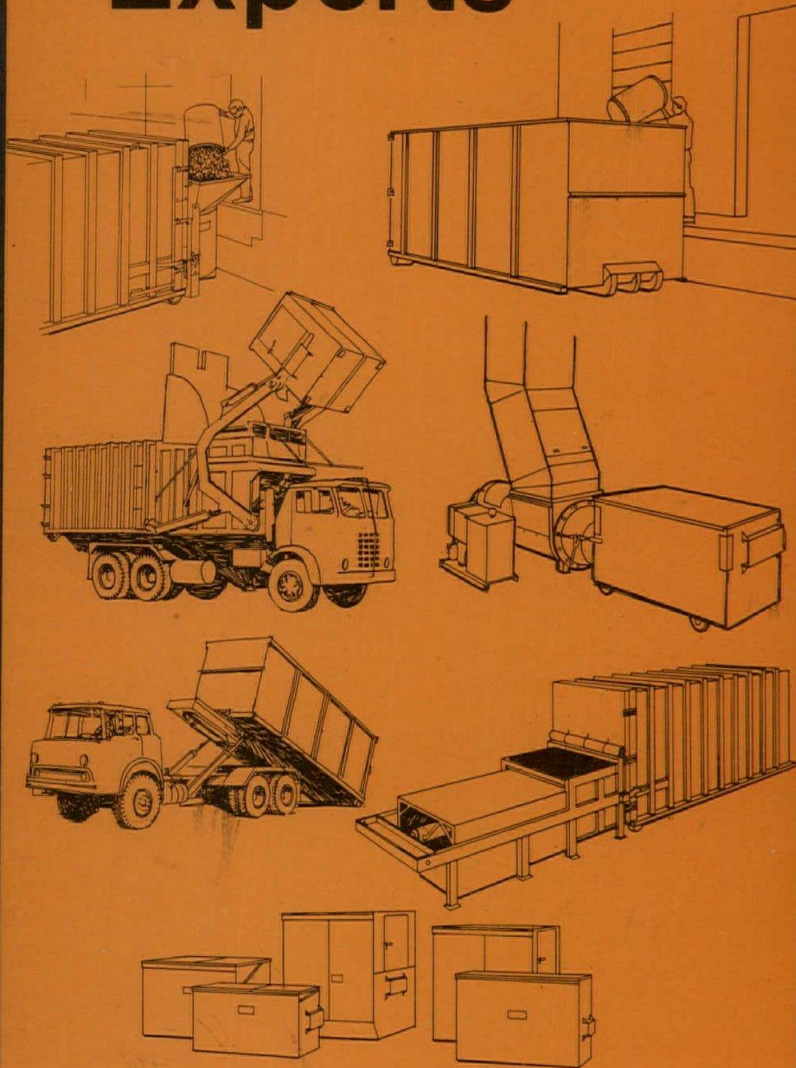
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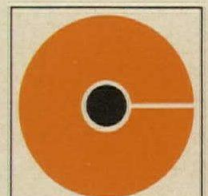
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