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ROCHESTER INSTITUTE OF TECHNOLOGY: A UNIQUE COLLABORATION

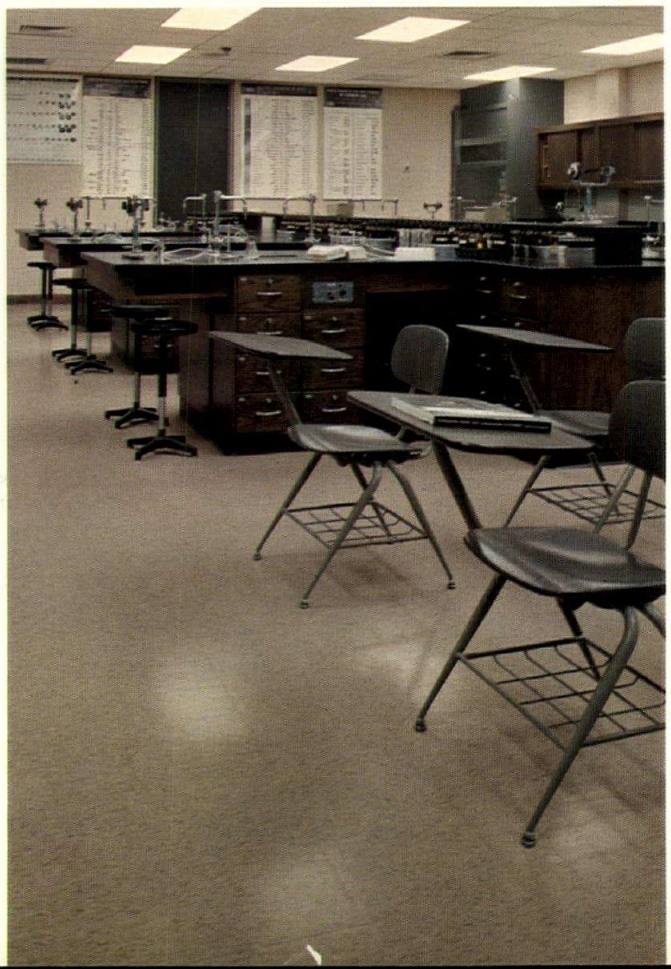
BUILDING TYPES STUDY: SCHOOLS

F. W. DODGE CONSTRUCTION OUTLOOK, 1969

FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD

OVEMBER 1968 11 A McGRAW-HILL PUBLICATION TWO DOLLARS PER COPY



Armstrong offers the widest variety of resilient floors. The best is the one that suits your design.

Evanston Township High School, Evanston, Illinois. **Architect:** The Perkins & Will Partnership, Chicago, Illinois. **General Contractor:** George Sollit Construction Company, Chicago, Illinois. **Flooring Contractor:** Johnson Floors, Berwyn, Illinois.

For the Evanston Township High School, the best floor is Imperial Modern Excelon Tile.

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To the staff, it's the concept of four schools in one—each with its own administrative and academic faculty but all sharing nonacademic facilities.

To the community, it was the spending of nearly $14,500,000 for new and remodeled buildings.

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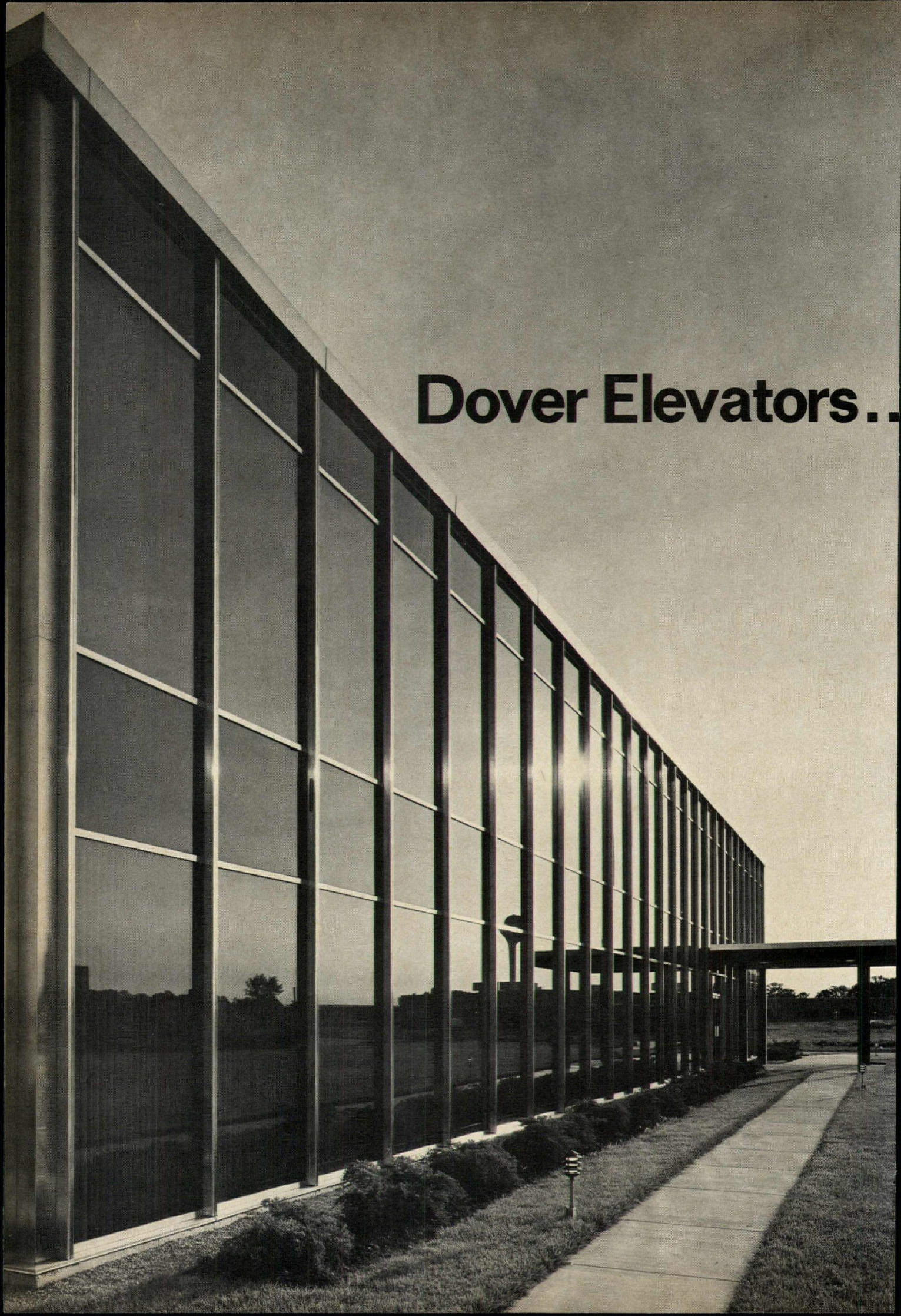
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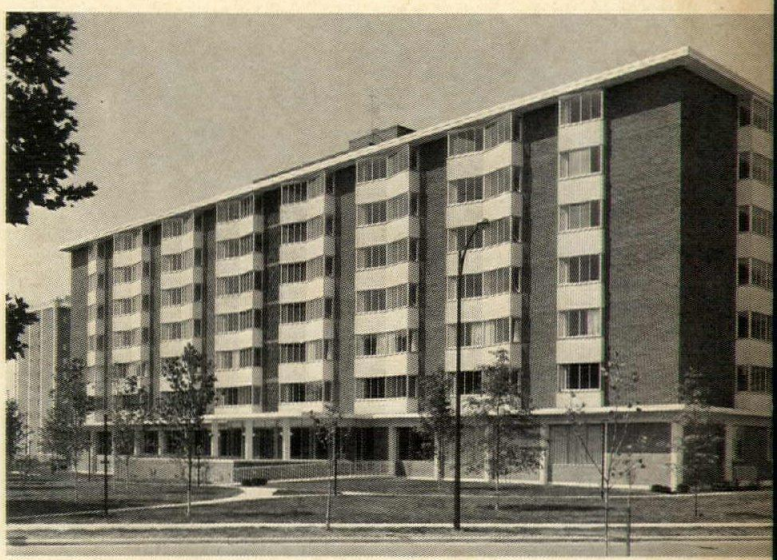

Left: ITT TELECOMMUNICATIONS ADMINISTRATION AND RESEARCH BUILDING, Oak Brook, Ill. Architect: Fred H. Prather. General Contractor: Del E. Webb Corporation. Dover Oildraulic passenger elevator installed by Dover Elevator Co.

Right, above: OHIO PRESBYTERIAN HOME, Columbus. Architects: Tully and Hobbs; Richard, Bauer and Moorhead. Built by John W. Galbreath & Co. for United Redevelopment Corp. Two Dover electric traction elevators installed by Dover Elevator Co., Columbus, Ohio.

Right, below: MISERICORDIA CONVALESCENT HOME, York, Pa. Architects: J. Alfred Hamme & Associates. General Contractor: L. M. Klunk & Sons, Inc. Dover Oildraulic Elevator installed by York-Gregg Elevator Company.

DOVER CORPORATION / ELEVATOR DIVISION

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Cover: The New National Gallery in Berlin
West Berlin, Germany
Architect: Mies van der Rohe
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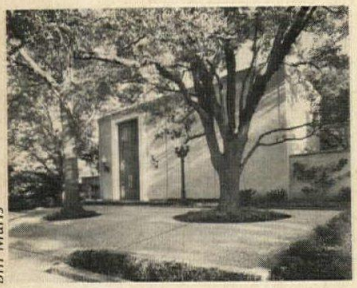

Bill Maris

Frank Lotz Miller

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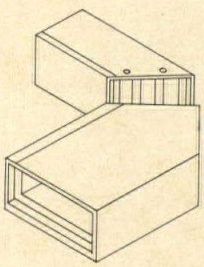

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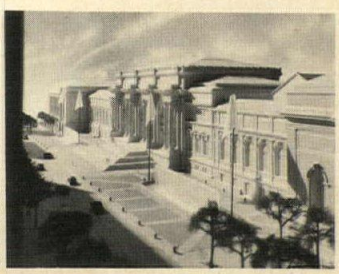

COMING IN THE RECORD

ULRICH FRANZEN'S LATEST BUILDING AT CORNELL

The new Home Economics Wing at Cornell demonstrates Franzen's very powerful, sculptural approach to design, which articulates a composite program grouping together such functions as administrative offices, a television studio, chemistry laboratories and lecture halls.

BUILDING TYPES STUDY: PLANNING FOR LEISURE

The fiftieth state has organized the process of planning for the effective development of tourism—Hawaii's second-largest industry—through the evolution of environmental guidelines which constitute an innovative and far-sighted approach to effective regional planning. Next month's Building Types Study will present the story of this process and show some of the first design results.

McGraw-Hill

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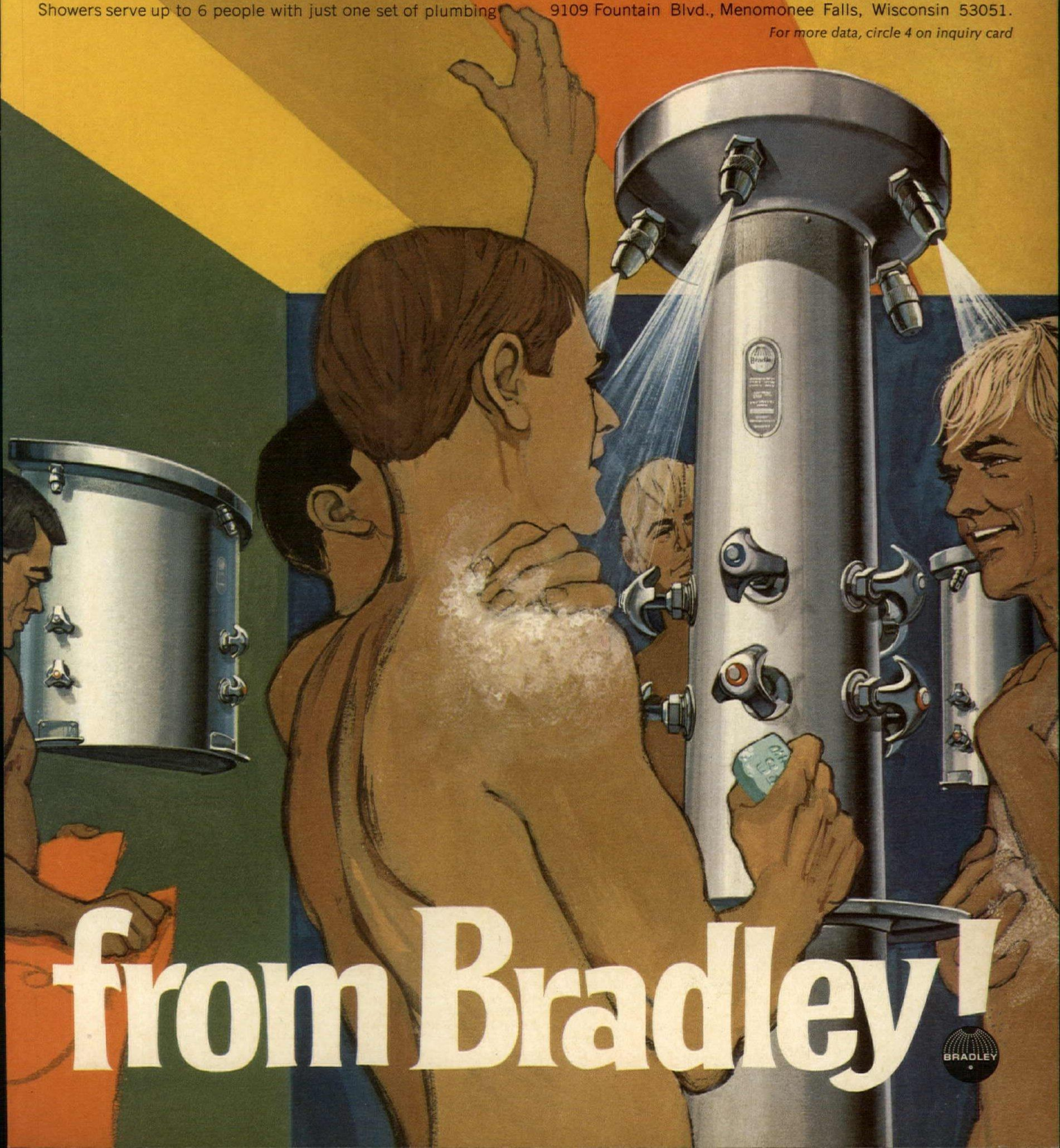

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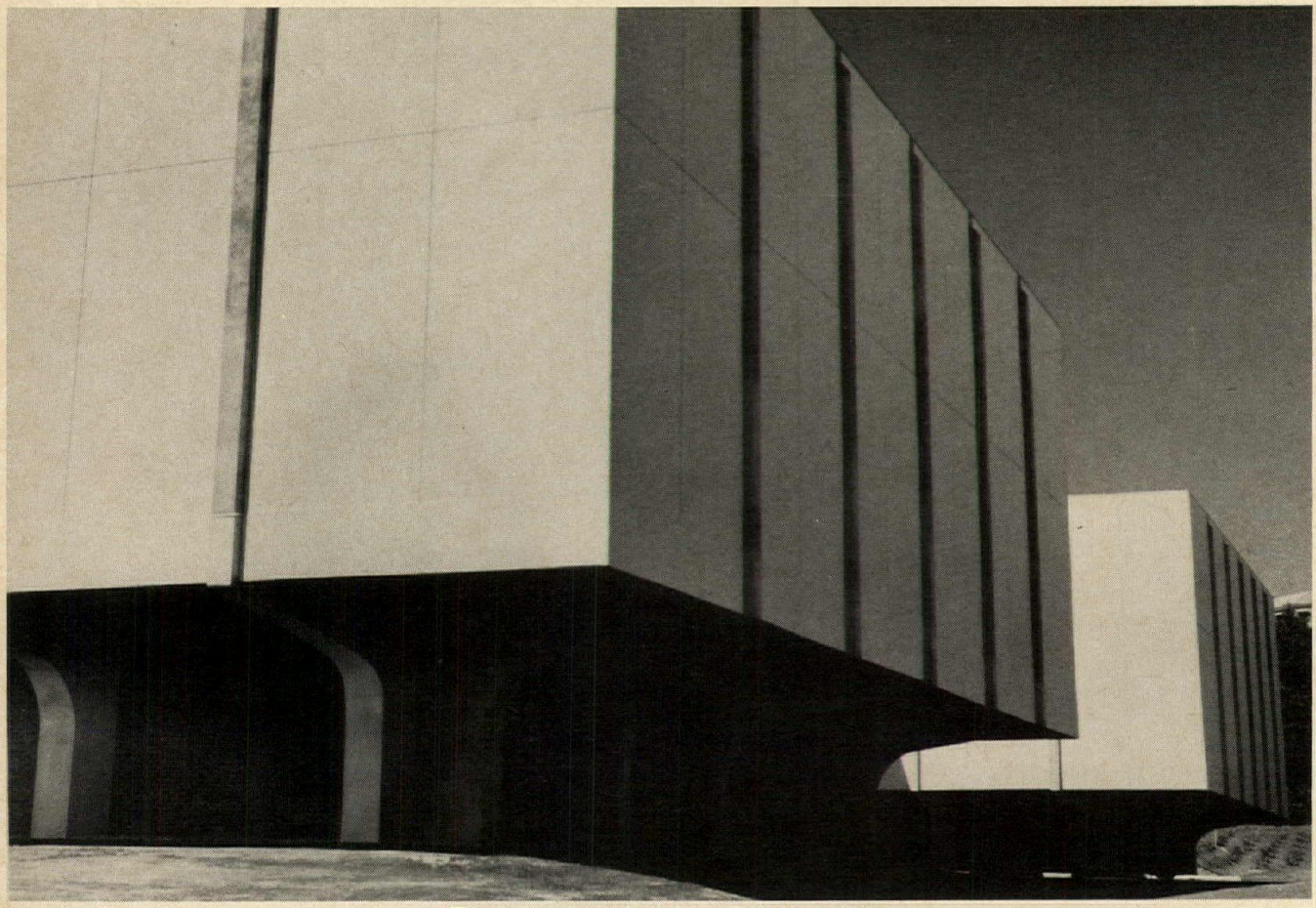

University of Washington Intramural Activities Building, Seattle. Architect: Robert Billsbrough Price and Assoc., Tacoma. Lathing and Plastering Contractor: J. Jefferson & Son, Inc., Seattle. General Contractor: Century Construction Company, Seattle.

The Intramural Activities Building at the University of Washington provides an almost classic example. The University needed a strong, economical, good-looking building exterior. They got what they wanted by choosing Marblecrete. For a lot of good-sense reasons:

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Getting them built is not pure fantasy, it's plain hard work

Not long ago I received a letter from a young architect who has just opened an office in "a small conservative Midwestern town." And he told a familiar story: "The clients on my first building asked for 'Early American' design. After three preliminaries we compromised with my original building and two of their bay windows . . .

"My point is this: each month I look forward to your publication. I read it cover to cover, enjoy the current buildings, marvel at the millions spent, and attempt to absorb new construction and engineering techniques. However, I feel that this is pure fantasy, and that worlds and clients such as these cannot possibly exist. Some clients are most difficult to work with, some have little money, most are ignorant of good design and slap down progressive ideas.

"There must be hundreds of young architects who are in a position much like mine. . . . We believe in quality architecture, but very few of us have the clients and the financing to produce many of the fine buildings that you show. . . ."

Well, I'm sympathetic. I'm all for clients who know what they want and what they want is good architecture, and I'm all for clients with plenty of money. But there are very few of those. We've never surveyed the question formally, but I would guarantee that the architects whose work we publish have not somehow met, one after another, the rare client who is easy to work with, has plenty of money to spend, has thought about the values of architecture, and is receptive to new ideas.

It is no doubt true that some architects get a certain number of commissions because they are well known. But mostly, I feel certain you'd find the architects (even the best-known architects) of almost all the work we publish have had to work very hard and carefully to sell (if you'll pardon the expression) themselves, their ideas, their approach, and—eventually—their design.

In an earlier editorial (RECORD, March) I argued the case for the architect who, in being interviewed for a job, talks as if he believed in architecture instead of coming on with the same flexibility and sensitivity to the way the wind is blowing as a used-car salesman. He is then in a position—whether or not the client is difficult to work with, ignorant of good design and prone to slap down progressive ideas—to argue his ideas on his own ground; on architectural ground. An architect, it is to be hoped, will bring to discussions of design some ideas that the client could not possibly have conceived, and which he has to be persuaded are the right thing to build. I'd invite you to decide, for example, whether the bold and beautiful concept for Rochester Institute of Technology (page 123 of this issue) had to be "sold" to the college trustees by the architects involved; whether the school on page 162 was exactly what the building committee visualized when they commissioned architect Charles Colbert to design it; and whether the small bank on page 155 of last month's issue was exactly what the owners of the County Federal Savings & Loan of Westport, Connecticut (incorporated 1767) had in mind when architect Lew Davis walked in to make his presentation. What the architects brought to the client in each of these cases was a strong, efficient, functional, and handsome solution to the client's problem—and the clients in each case accepted it because the architect was able to convince them—and work within their budget.

The process of persuading clients is worth some thought. Kevin Roche—who seems to contribute more than his share of first-rate architecture ("pure fantasy"?) to the world—argues his design concepts with a step-by-step, detail-by-detail, problem - solved - by - problem - solved logic. He is not, I have observed, above using two slide projectors arranged to create overlapping images that extend his "ideas" a step at a time to the finished preliminary design, without blackouts between slides that invite interruption of his presentation. I've seen him make a presentation, and while intellectually I've known there must be alternate solutions, I'm darned if I could think of them.

Of course, most of the architects who "sell" (if you'll pardon that expression one more time) innovative design to their clients are able to do so not just because of their skill at committee meetings, but because of their skill at the drawing board. The buildings we publish are not "pure fantasy"—they are real jobs done by real architects for real clients who, in varying degrees, are difficult to work with, have little money, and are ignorant of good design. Getting them built is not pure fantasy, it's just plain hard (and very skillful) work.

—Walter F. Wagner, Jr.

Drawn for the RECORD by Alan Dunn

"He was one of the country's greatest architects— none of his buildings ever interfered with TV reception—"

The headquarters building: a professional attitude

I continue to be impressed by the attitude of the A.I.A. board in handling the continuing, difficult, and embarrassing problem of the headquarters building design. As noted in last month's Record Reports, A.I.A. President Kassabaum, in commenting on the resignation of Mitchell/Guirgola Associates, added that: ". . . we feel that the principle of design review boards is the best known means in maintaining order in the face of all of the pressures leading to chaos. We continue to support the principle of approval by design review boards, such as the Fine Arts Commission, even though sometimes their decisions lead to differences in professional judgment." It is easy to imagine some of the comments made at the board meeting which issued that statement, but what was issued is sensible and statesmanlike. This is a situation that could have generated—in its hotter moments—public statements that would later have been regretted. Instead, great dignity and restraint—a professional attitude—have been shown every step of the way.

Environmental awareness: a good beginning

"The need for increasing visual awareness of the physical environment and of the factors that make it—for good or bad —what it is, has been long recognized by A.I.A. members." So begins the report of the A.I.A.'s Task Force on Elementary and Secondary Education, which not only recognized the problem of visual awareness but has now done something pretty effective about it.

What it has done for openers is develop a guidebook intended as "a temporary guide in response to many requests for help by chapters that want to initiate discussions with local school districts and state departments . . . to eventually develop a curriculum for public schools." The guidebook lists the projects that have already been developed and tried by various chapters, suggests "occasional programs" and available slide films, discusses several programs for the training of teachers, and lists programs by other organizations (the National Park Service, for one). It includes a "suggested procedure for chapter action"; and lists books recommended by the task force.

In his introduction to the report, Arthur Rigolo, F.A.I.A., notes that: "It takes three participants to make good architecture. These are the owner, the architect, and the builder. . . . Public officials, public boards, corporation boards, managers, entrepreneurs and ordinary voters of budgets and bond issues, and every man who builds a house, a store, an office or a factory building are decision-makers in the quality of architecture and, except by accident or coincidence, generally are unprepared to perform this function."

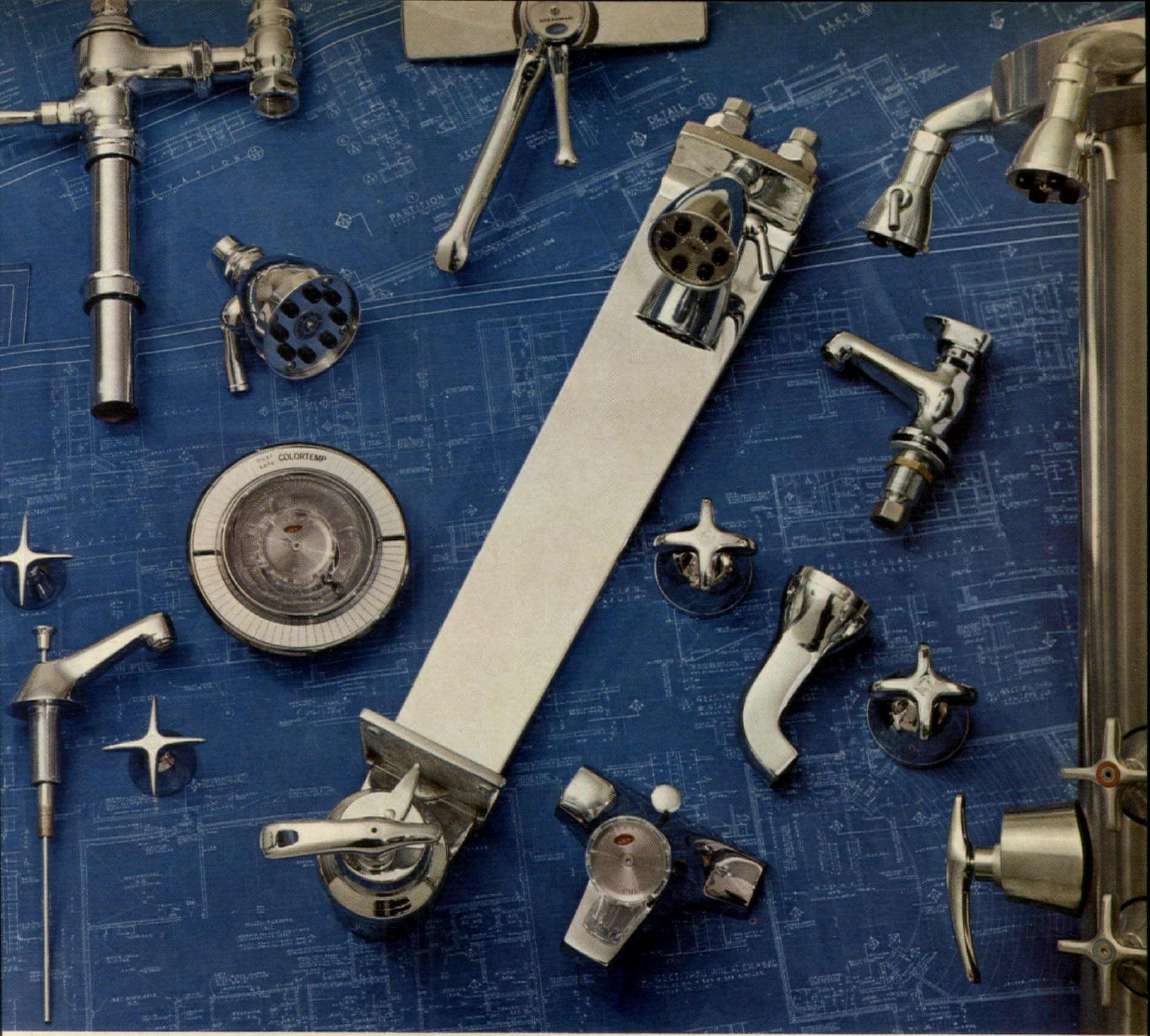
Besides Rigolo, members of the task force are Edwin B. Cromwell, F.A.I.A., and Elisabeth K. Thompson, F.A.I.A., RECORD senior editor. If I may be forgiven a personal note, we have some idea around this office, through Betty's involvement, just how long and hard this task force has worked, and how high its hopes are for continuing effort in training young people to know good architecture. The need for architect involvement—as chapters or as individuals—in making this program go is immense. Increasing environmental awareness by all of the public could eliminate much of the problem described overleaf in this month's editorial. But most important, it could make this country a more pleasant place to live.

P.S. to the report on awareness

There's a quote from Arthur Rigolo's introduction that's worth writing down for future use at presentations and cocktail parties alike: "Satisfactory environment is not just a matter of esthetics thought to be important by finicky people. The design of an architectural space and the amenities of the visual environment comprising a neighborhood, a highway or a city, create an atmosphere which has a critical influence upon the activity which takes place within it and upon the people who dwell there. One of the products of a good visual environment is human dignity and pride. The chaos of ugliness can breed only resentment and despair."

". . . to be fully literate visually as well as verbally. . . ."

Early next year, Eastman Kodak plans to sponsor a forum for educators "and others" to explore the concept of "visual literacy." The big question to be explored: "How to enable the student to grasp fully what today's visuals are telling him, and make full use of visual means of expressing himself." Attendees are to include photography specialists, linguists, authorities in the arts and industrial arts, educational psychologists, persons working in perceptual research and audio-visual experts. While architects are not, at least yet, included, surely nothing but good can come out of studies of visual literacy. We could use more of it. —*W.W.*



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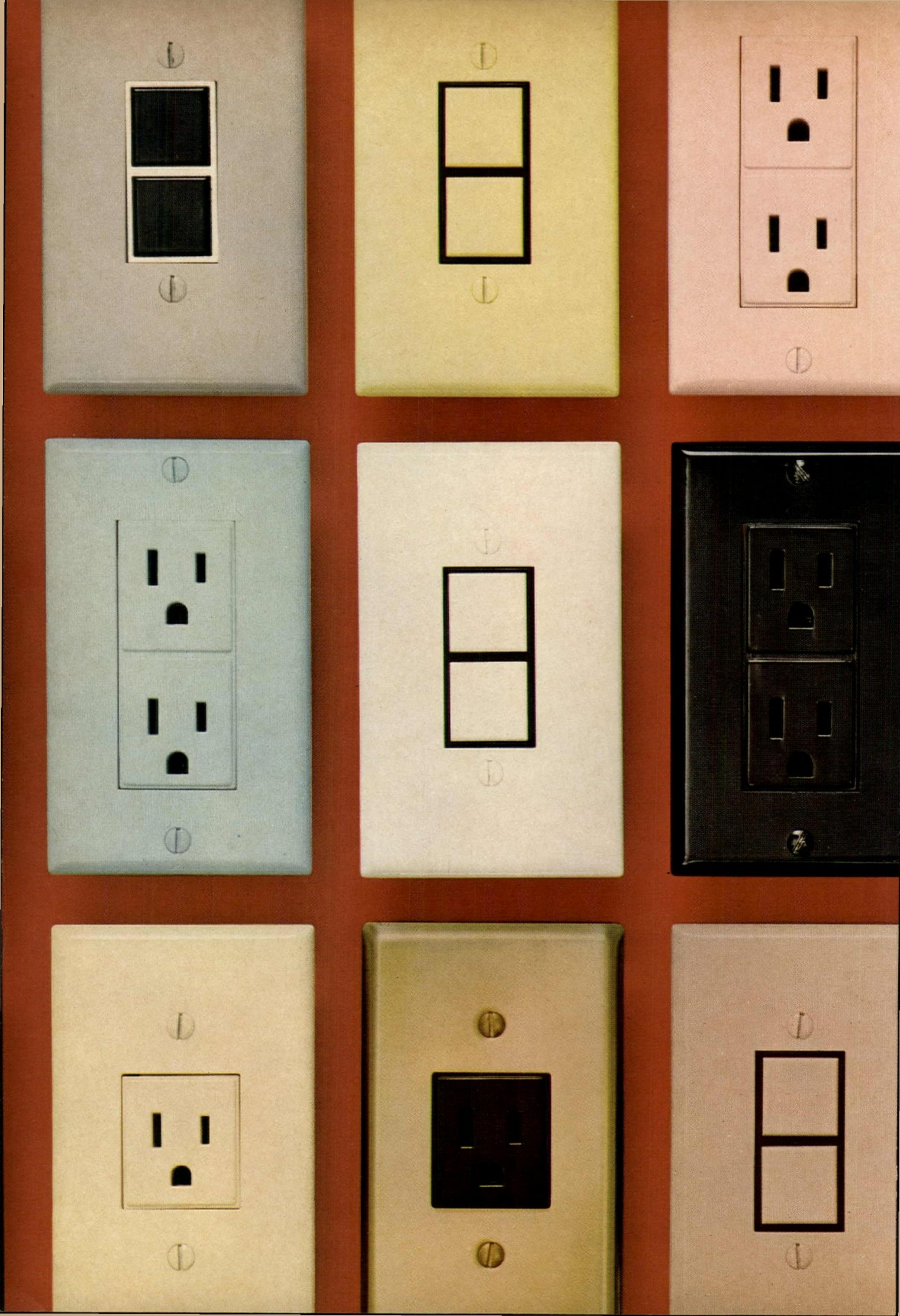

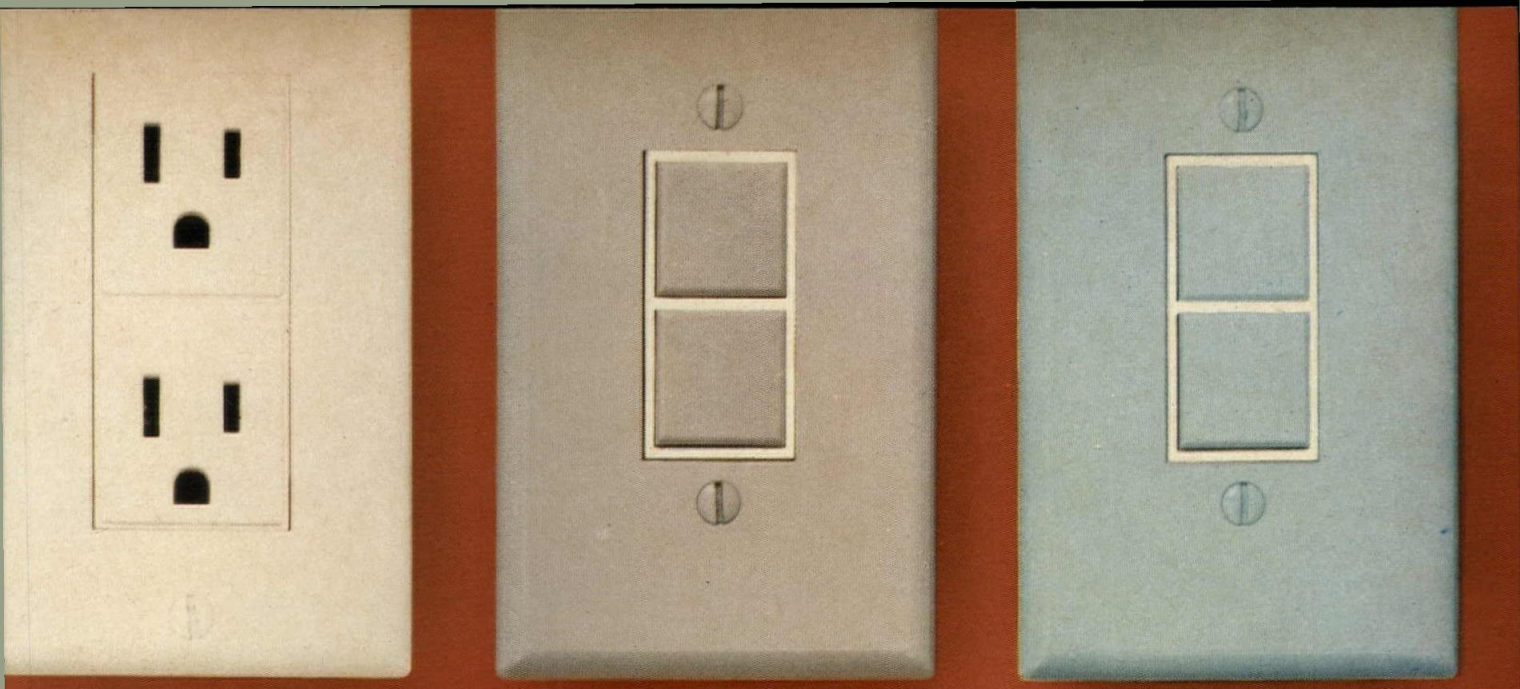

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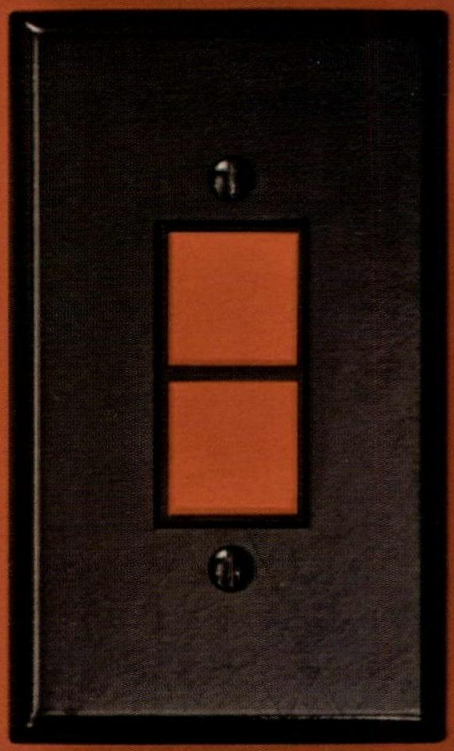

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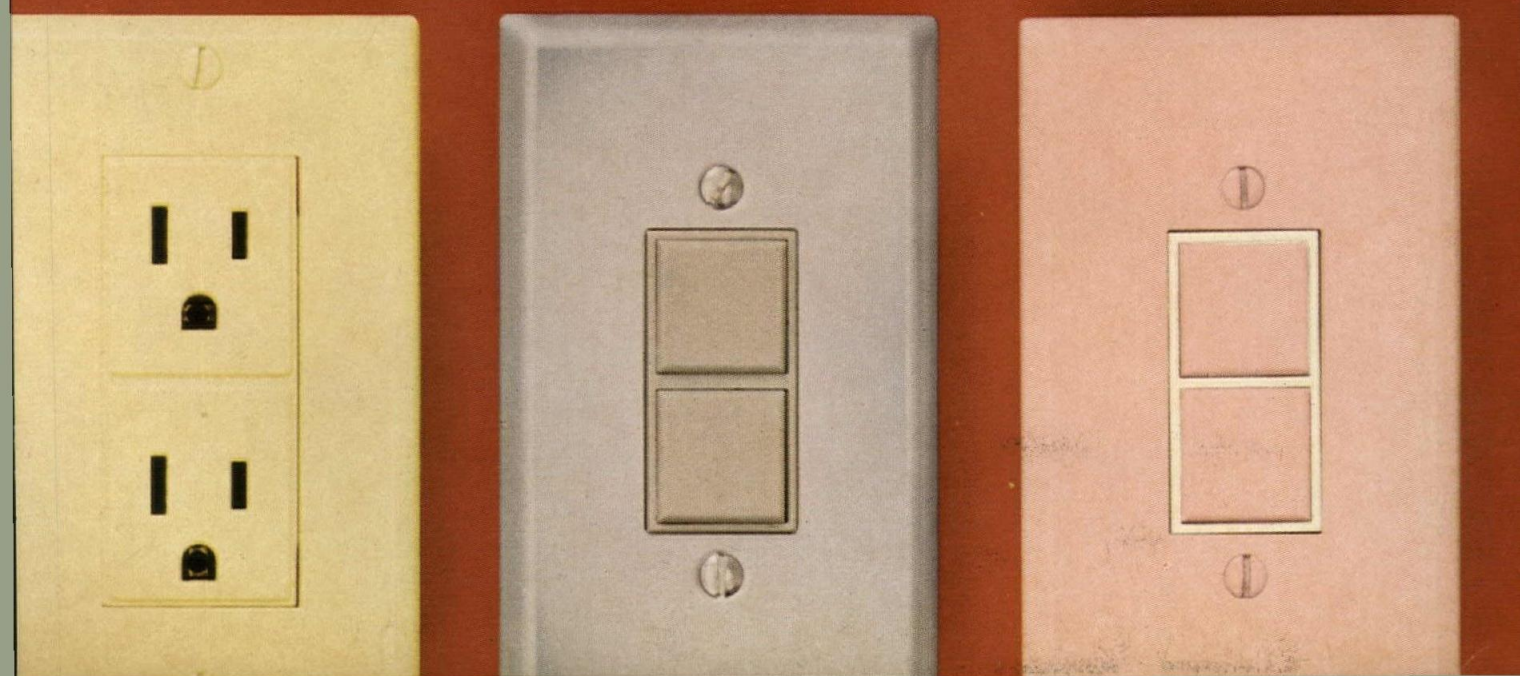
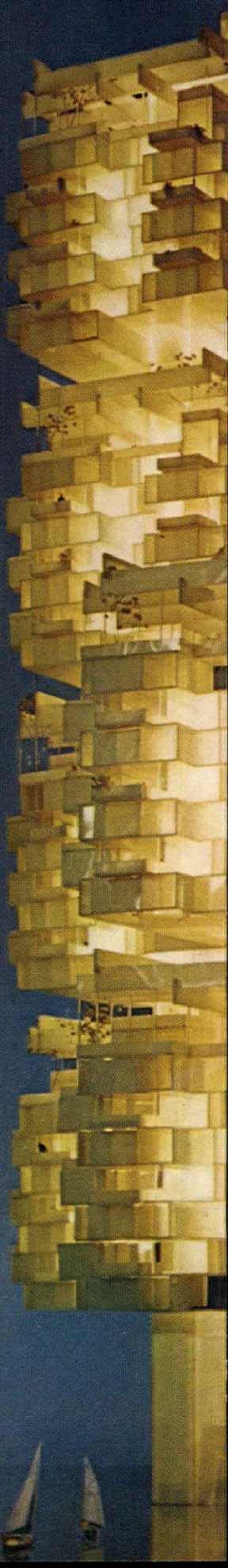


Goodyear Chemicals moves into the city of tomorrow



This is architect Paul Rudolph's model for the new home of the Amalgamated Lithographers of America. Prefabricated units are supported by cables, so the roof of each unit forms a terrace for the unit above.

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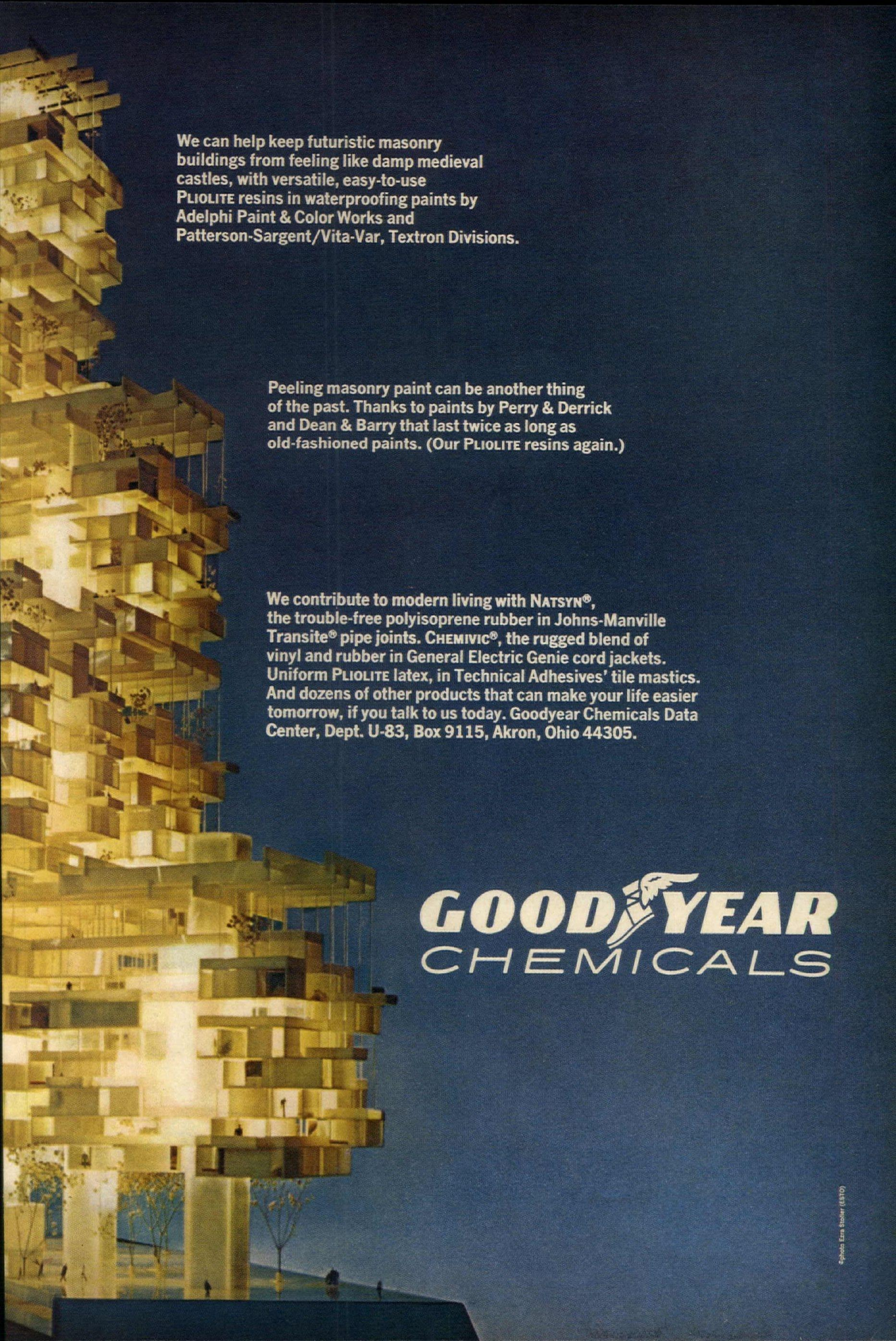

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We don't paint Kohler electric plants to camouflage what lies beneath. Look and you'll see **a wide world of difference**

In choosing an electric plant, you're wise to look beyond the colors. One coat of paint can cover a multitude of parts, each made by a different manufacturer.

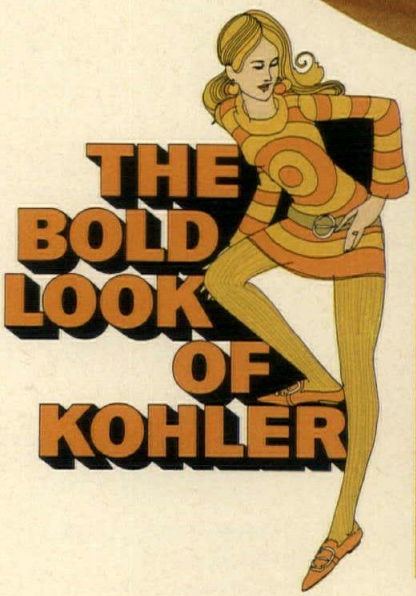
Kohler electric plants are Kohler through-and-through. On all models through 7.5 KW, Kohler builds the complete set: engine, generator, controls. For larger plants up to 230 KW, Kohler carefully selects heavy-duty industrial engines, built to our own specifications and tailored to the job at hand: standby, portable-mobile, prime power, marine. This unitized construction assures a perfect teaming of engine and generator. (A fact we confirm by rigid testing—at rated capacity and with ample overload.)

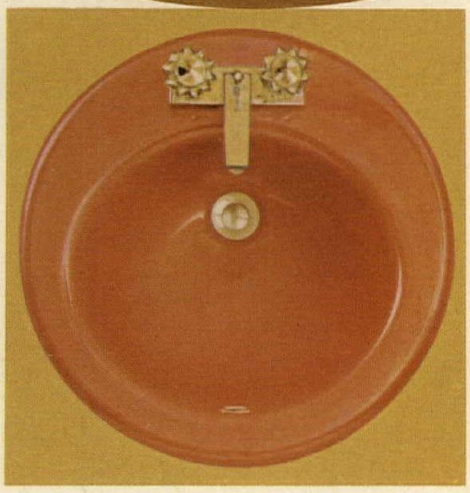
That's why we urge you: when you look at electric plants, look close! You won't find another like Kohler—not in the whole wide world.

KOHLER
ELECTRIC PLANTS WORLD WIDE
Kohler Co., Kohler, Wis.

For more data, circle 8 on inquiry card

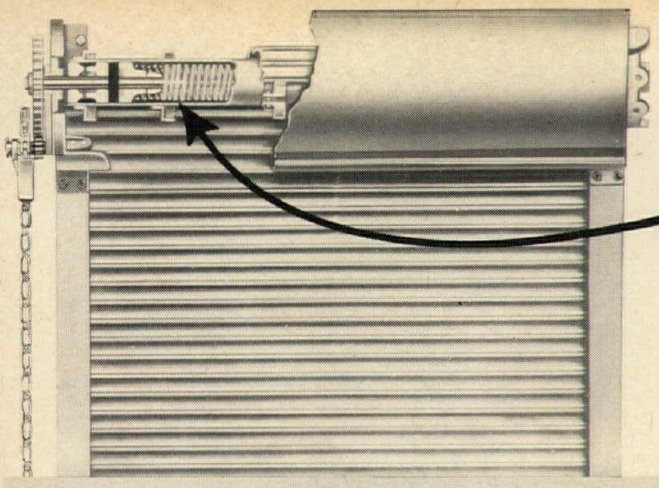
For more data, circle 9 on inquiry card





Princely new fittings...Bold Gold! For '68, Kohler presents a full line of fittings electroplated in 24 carat gold. Pictured: the Flair pattern, with handles of amber acrylic. Crowning touch for lavatories, bathtubs and bidets, the new fittings are equally at home with all Kohler colors, from cool Avocado to new Harvest Gold —to this vibrant new Tiger Lily.

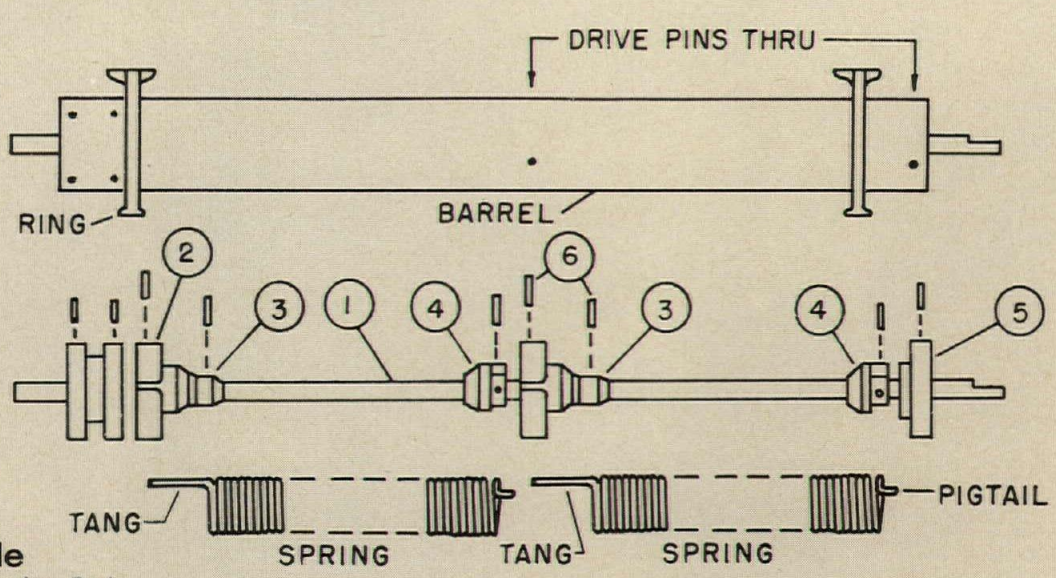
KOHLER OF KOHLER
Kohler Co., Kohler, Wisconsin



counterbalance

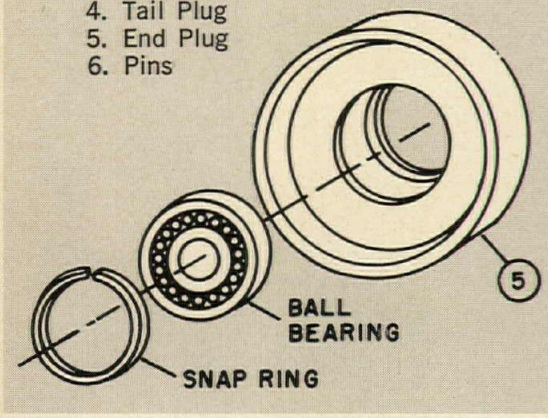
attention to design details that are hidden under the hood is another explanation of the extra value you get when you specify —

KINNEAR
ROLLING DOORS



Code

1. Tension Rod
2. Head Plug
3. Collar Plug
4. Tail Plug
5. End Plug
6. Pins



The torsion-spring, single-shaft counterbalance is a good example of hidden — but proved — extra worth of a Kinnear Rolling Door. It's what you might call thoroughly engineered simplicity. The minimum number of parts of top grade materials to insure maximum carefree service life! And yet such a cleverly designed, carefully coordinated mechanism that the quick, easy and smooth door operation it provides has never been surpassed.*

This is only one of many extra value features that have made Kinnear Rolling Doors — the original interlocking slat type — the preference for better than 70 years of Building Designers, who seek the best money can buy in door service.

*For more complete details of the workings of this uniquely designed power plant of a Kinnear Rolling Door — ***write today*** for a copy of the Kinnear Catalog.

Also Manufacturers of Kinnear Metal Rolling Fire Doors, Rolling Grilles, Counter Shutters and Kinnear Wood, Steel, Aluminum and Fiberglass Overhead Doors.

KINNEAR ROLLING DOORS

Saving Ways in Doorways Since 1895

KINNEAR CORPORATION
and Subsidiaries
1880-89 Fields Ave., Columbus, Ohio 43216
Factories:
Columbus, Ohio 43216 • San Francisco, Calif. 94124
Centralia, Wash. 98531 • Toronto, Ont., Canada

Offices & Representatives in All Principal Cities — listed in Yellow Pages under "Doors." Also see Sweet's!

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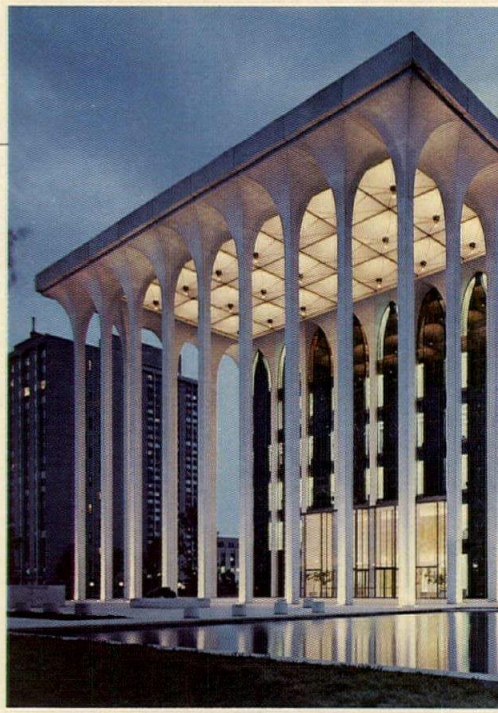
Elastomers in Industry/Engineered Construction.

ENJAY



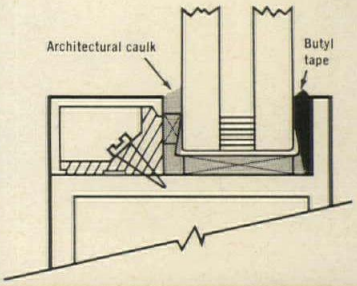
Butyl rubber sheeting forms seep-proof barrier between rooftop gardens and apartments below.

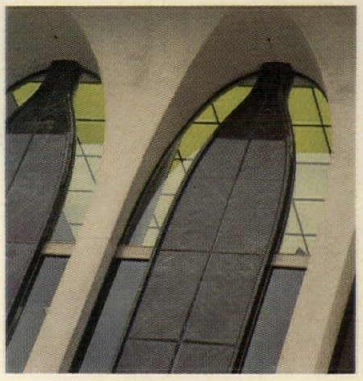
Think of a sandwich—an upper and sub-surface layer of concrete with a membrane of Butyl rubber as the "ham" in between.

That's the way the roofs of the luxurious Watergate East apartments in Washington, D.C. were constructed. Tough, long-lasting sheeting made of Enjay Butyl rubber makes a practical, impermeable barrier against moisture. It can withstand wide extremes of winter and summer temperatures as well as resist attack by fertilizer and other corrosive soil-borne elements.

Sponsor: Watergate Improvement Associates
Architects: Luigi Moretti (HFAIA), Milton Fiscger (AIA)
General Contractor: Magazine Brothers Construction Corp.
Sheeting Subcontractor: Washington Plyrite Company
Sheeting Fabricator: Goodyear Tire and Rubber Co., New Bedford, Mass.

From 30° below to 100° above... Butyl tape keeps insulated windows leak-free.





Flexible, non-hardening Butyl tape makes an effective seal against the extremes of weather on these tall dual-pane windows of the Northwestern National Life Insurance Building in Minneapolis.

The preformed tape of Enjay Butyl and polyisobutylene has 100% non-oxidizing solids... provides a strong bond between glass and external stop...gives practically permanent sealing. And it resists shrinking, hardening, cracking and ultraviolet rays.

On sashes with interior stops, glazing with Butyl tape can be done from the inside, with no scaffolding or external clean-up. Butyl tapes are also widely used for sealing mullions and exterior panels. They are available in many shapes and colors, and with internal reinforcing to prevent distortion.

Architect: Minoru Yamasaki Associates, Birmingham, Michigan.
General Contractor: George Fuller, Chicago, Illinois.
Glazing Contractor: Larry's Glass & Mirror Company, St. Paul, Minnesota.
Tape Manufacturer: Tremco Manufacturing Company, Cleveland, Ohio.

Structural gaskets of VISTALON® ethylene-propylene rubber have excellent weather resistance and low temperature flexibility.

More and more modern buildings are utilizing structural gasketing of VISTALON to maintain long-term resiliency under all weather conditions. These pre-formed seals allow glass or panels to float freely without strain. They permit speedy and easy installation of glazing and panels, as well as a simple means of removal or replacement of broken glass.

For more data, circle 12 on inquiry card

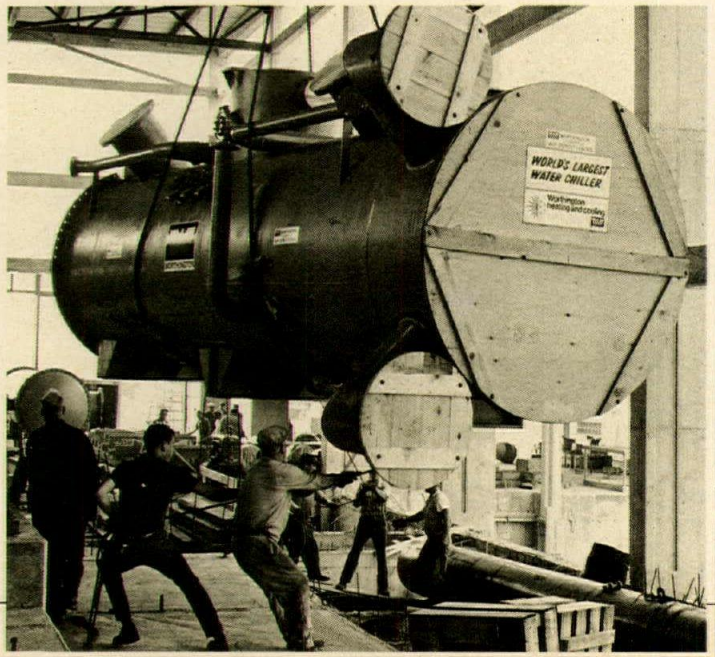
Architects: Cartmell and Rossman, Phoenix, Ariz.
Glazing Contractor: Standard Glass Co., Phoenix, Ariz.
Caulk: DAP Inc., Dayton, Ohio

Unusual window design uses Butyl rubber caulk for sealing.

The new co-ed residence, Manzanita Hall, at Arizona State University has hexagonal and triangular windows that contribute both to aesthetics and to the building's strength. All the windows were shop glazed, complete with hardware. They feature aluminum frames with operable lower sections. Butyl rubber caulk as a sealant between the glass and frame was chosen for its permanent flexibility and excellent weatherability. Butyl-based caulks last up to 5 times longer than conventional caulk over a wide range of temperatures. Butyl caulks can be applied with conventional tools without elaborate joint preparation. They can be colored to match mullions of panels.

Butyl pads damp noise and vibration

Enjay Butyl is the ideal material for use under such environmental control systems as air conditioners, generators, etc. Butyl mounting pads are unequalled for vibration and noise damping characteristics.



ENJAY

Enjay Chemical Company
Synthetic Rubber Division
60 West 49th Street
New York, N.Y. 10020

VISTALON is a registered trademark used by Enjay Chemical Company

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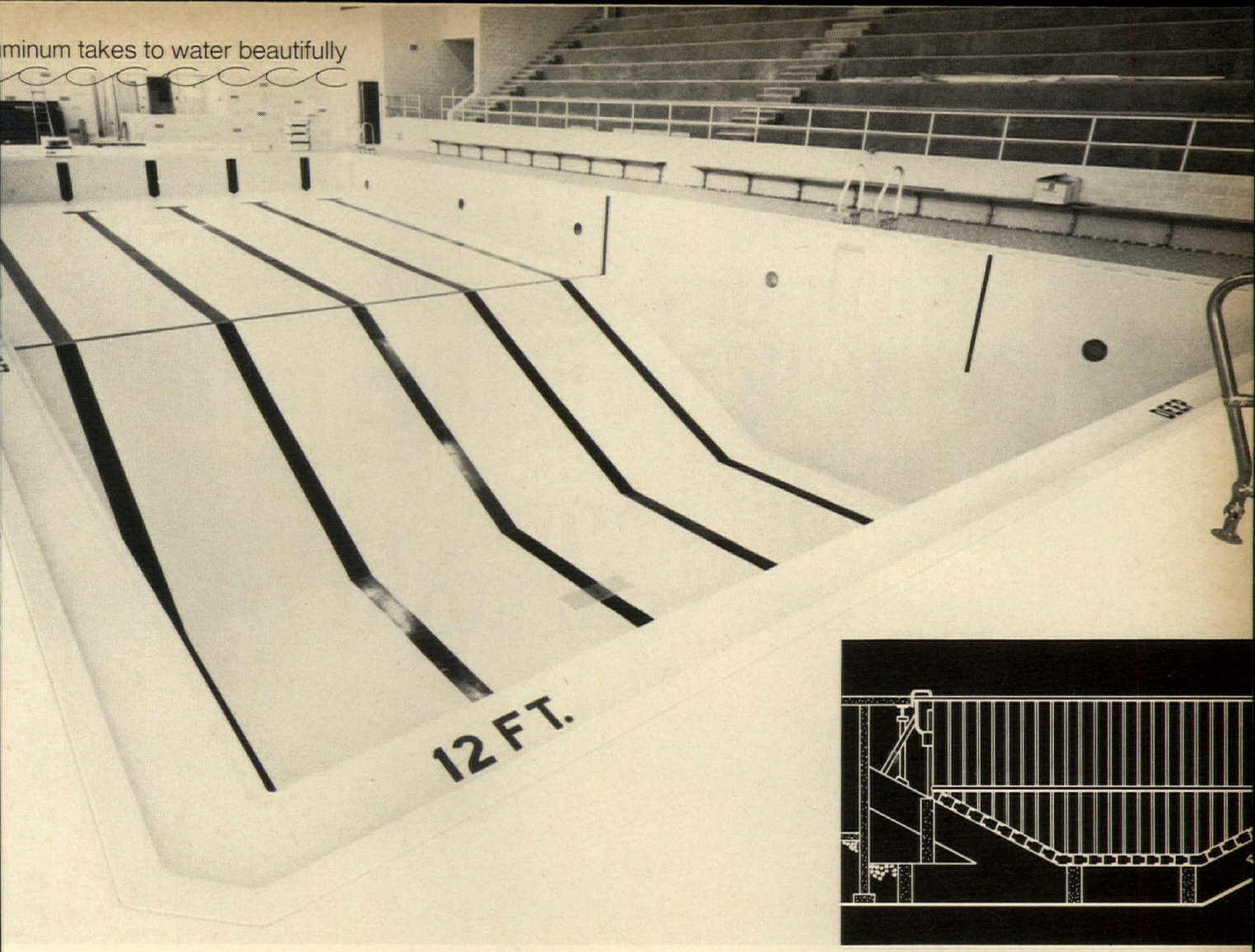


No matter where you build an all-aluminum pool, you're always on solid ground.

Because a pool of Alcoa® Aluminum has the rugged strength and strong constitution needed for tough terrains.

Where can you build an aluminum pool? Practically anywhere. The pool above was built on the edge of a hill over an abandoned coal mine. It could have had terrain trouble. But this all-aluminum pool is self-supporting; prefabricated aluminum walls are vertically stiffened and solidly buttressed by aluminum channels (see cutaway).

The pool's makeup? A special aluminum alloy of magnesium and manganese for durability. It is tested for strength, is corrosion-resistant and absolutely watertight. And with aluminum's prefabricated techniques, your construction costs are kept to a minimum, your installation time slashed. Add this to low maintenance requirements, and aluminum pool costs are comparable with other types.

Build a beautiful addition to any landscape—a pool made of Alcoa Aluminum. For more information or names of Alcoa customers who can engineer your aluminum pool requirements, write Aluminum Company of America, 1619-L Alcoa Building, Pittsburgh, Pa. 15219.

Change for the better with Alcoa Aluminum

ALCOA

Customers don't know it's the lighting they hate.

They just know they hate your store.

It's just a feeling.

But it can be strong enough to make them say, "Let's get out of here."

And when a good store is hurt by bad lighting, that's tragic.

Mariner Luminaires are made to prevent that kind of trouble.

It's true they're expensive, at first. But they quickly start paying for themselves.

They attract customers. They don't chase anybody away.

They're beautiful. Not just the way they look, but the way they light. Mercury or Metalarc lamps are used in them. Sylvania's Metalarc, for instance, gives you powerful light and warm colors that help you sell.

They're economical. You need fewer of them, because of the intensity of the light and the way it's directed.

Replacement and maintenance costs are lower, because the lamps last longer. And your electric bills are modest. (It's the nature of Metalarc and mercury lamps not to eat up a lot of electricity.)

If you compare the Mariner with other methods of store lighting then you see you're really getting something for your power dollar. You get plenty of light where you want it. And merchandise that never looked better.

Mariner Luminaires not only look down, they look up. Fifteen percent of their light is sent to the ceiling, lighting it softly and giving depth to the room.

They're Practical.

Mariner Luminaires are well engineered. Here are some of their highlights—

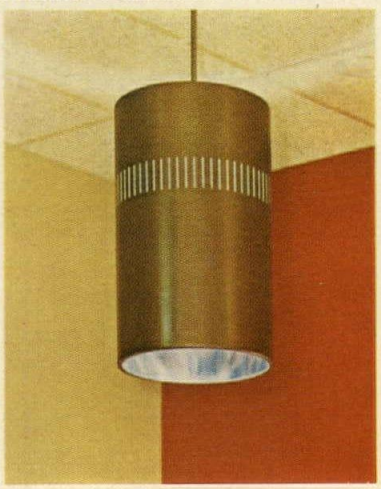
The shades come in three different designs (as you can see). And in all sorts of handsome colors.

You get a wide or medium spread of light—whichever way you want it.

Glare-free reflectors let you see comfortably and don't draw attention to themselves.

The open construction lets air flow through, so the fixture is self-cleaning and stays cool.

For safety, the weight of the Mariner Luminaire is distributed



throughout the entire framework. It doesn't just hang from the cover of the ballast.

You can easily re-lamp the Mariner Luminaire with a lamp stick while standing on the floor.

You can easily remove the shades (by a lift-and-shift movement) without using tools.

We've done everything to make Mariner Luminaires durable and easy to install.

There are lots of things about them your customers won't see.

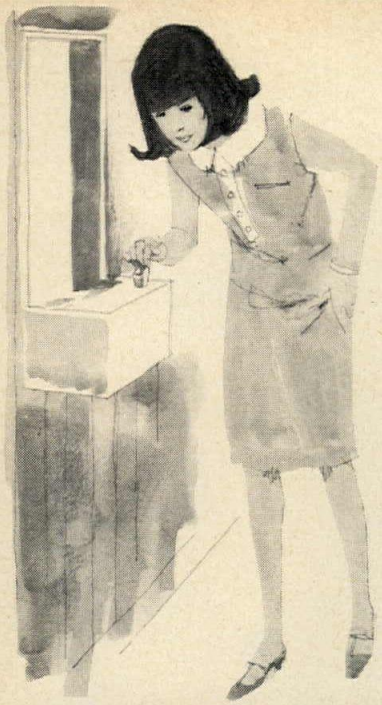
Maybe they won't even notice the Mariner Luminaires.

But they'll sure notice what they do for your store.

Mariner Luminaires are just as good for lighting public places such as lobbies, auditoriums and showrooms. We'll be glad to send you the design and architectural details. Write to: Sylvania Lighting Equipment Division, Sylvania Lighting Center, 100 Endicott Street, Danvers, Mass. 01923.

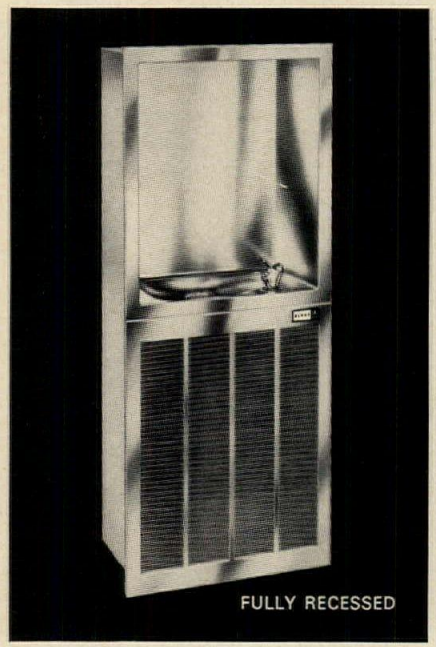
SYLVANIA
A SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS

For more data, circle 14 on inquiry card

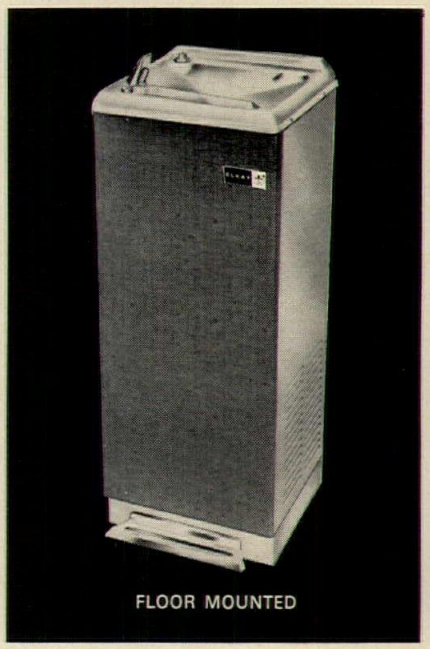


The ultimate in water coolers for commercial, industrial and institutional installations!

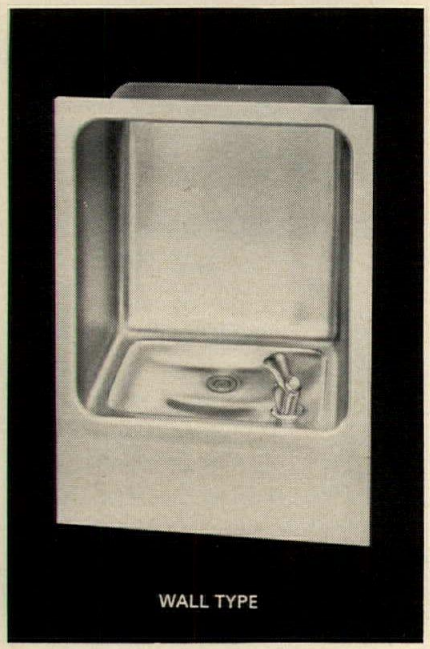
CLASSROOM SINK AND
DRINKING FOUNTAIN COMBINATION



FULLY RECESSED



FLOOR MOUNTED



WALL TYPE

Stainless steel water coolers by *ELKAY*

There's an Elkay water cooler model for every application, and every application provides the softly gleaming beauty of incomparable stainless steel. Models include fully recessed, semi-recessed, floor mounted, wall hung and classroom sinks. They assure ample water cooling capacity even for heavy traffic locations. Stainless steel is easy to keep clean, actually grows in beauty with age. Never chips or cracks, resists stains. And best of all, stainless steel blends perfectly with whatever interior decor you select, never clashes with colors. Write for catalog or see our listing in Sweet's Architectural File. Go for the ultimate in cooling water...stainless steel water coolers by Elkay.

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

ELKAY®
Stainless Steel Water Coolers

see our catalog in Sweet's (S)

For more data, circle 15 on inquiry card

The 10″ slab is reinforced with positive and negative layers of Keyweld fabric. Total floor design was aided by Keystone's computer service.

Addition to Finished Products Warehouse, Weirton Steel Division of National Steel Corporation at Weirton, West Virginia. Designers: Weirton Steel Engineers, J. W. Martt, Chief Engineer. Construction by Weirton Steel Construction Department, F. W. Schmidt, Superintendent.

inner strength FLOORS

from **Keystone**

Computer helps us

Keyweld concrete reinforcement fits the space and the specifications—in one layer or two—in sheets or rolls. There's a minimum of waste and cutting time—and practically no engineering supervision needed.

engineer Keyweld® Sheets for your concrete reinforcement

You simply tell us the design problem.

Our engineers, with the aid of a computer, figure the most efficient reinforcement plans for your concrete slabs, floors and walls... size and spacing of the steel... dimensions of Keyweld Reinforcement Sheets...embedment depth and placement pattern... even designs for use of positive and negative reinforcement when two layers of mats are more efficient.

All of which saves you hours (perhaps days) of research, design, detailing and spec writing.

In most cases, it also saves you thousands of pounds of steel, compared to reinforcing with standard rebars.

But that's only the beginning.

On the job, Keyweld Reinforcement Sheets are mechanically handled and placed. This cuts construction time, inspection time and labor costs.

It's all part of the revolution in reinforcement; Keystone's Inner Strength products and engineering for roofs, walls and floors.

For computer-aided design and engineering help on concrete reinforcement, call your Keystone representative. Or write Keyweld, Keystone Steel & Wire Company, Division of Keystone Consolidated Industries, Inc. Peoria, Illinois 61607.

inner strength
ROOFS · WALLS · FLOORS

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

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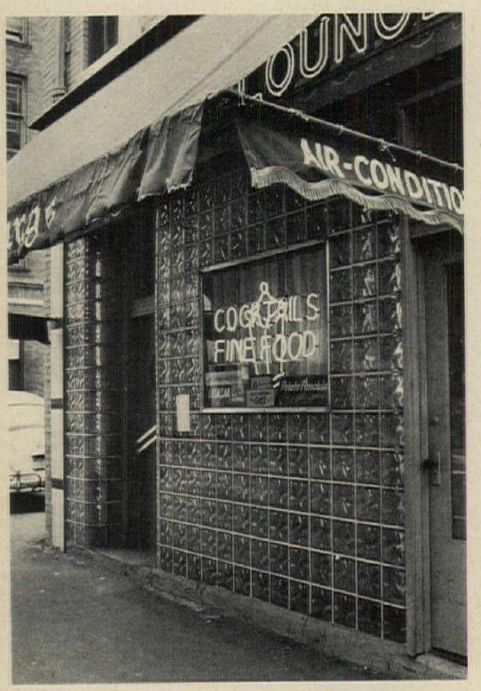
IF YOU THINK GLASS BLOCK STILL LOOKS LIKE THIS



YOU'D BETTER

You'll see exciting new designs in sculptured patterns like Pittsburgh Corning's newest glass blocks — CHIARO. Alfred Clauss, A.I.A., of Bellante, Clauss, Miller and Nolan, the architect, used Chiaro in the lobby of Piper Aircraft headquarters in Lock Haven, Pa.

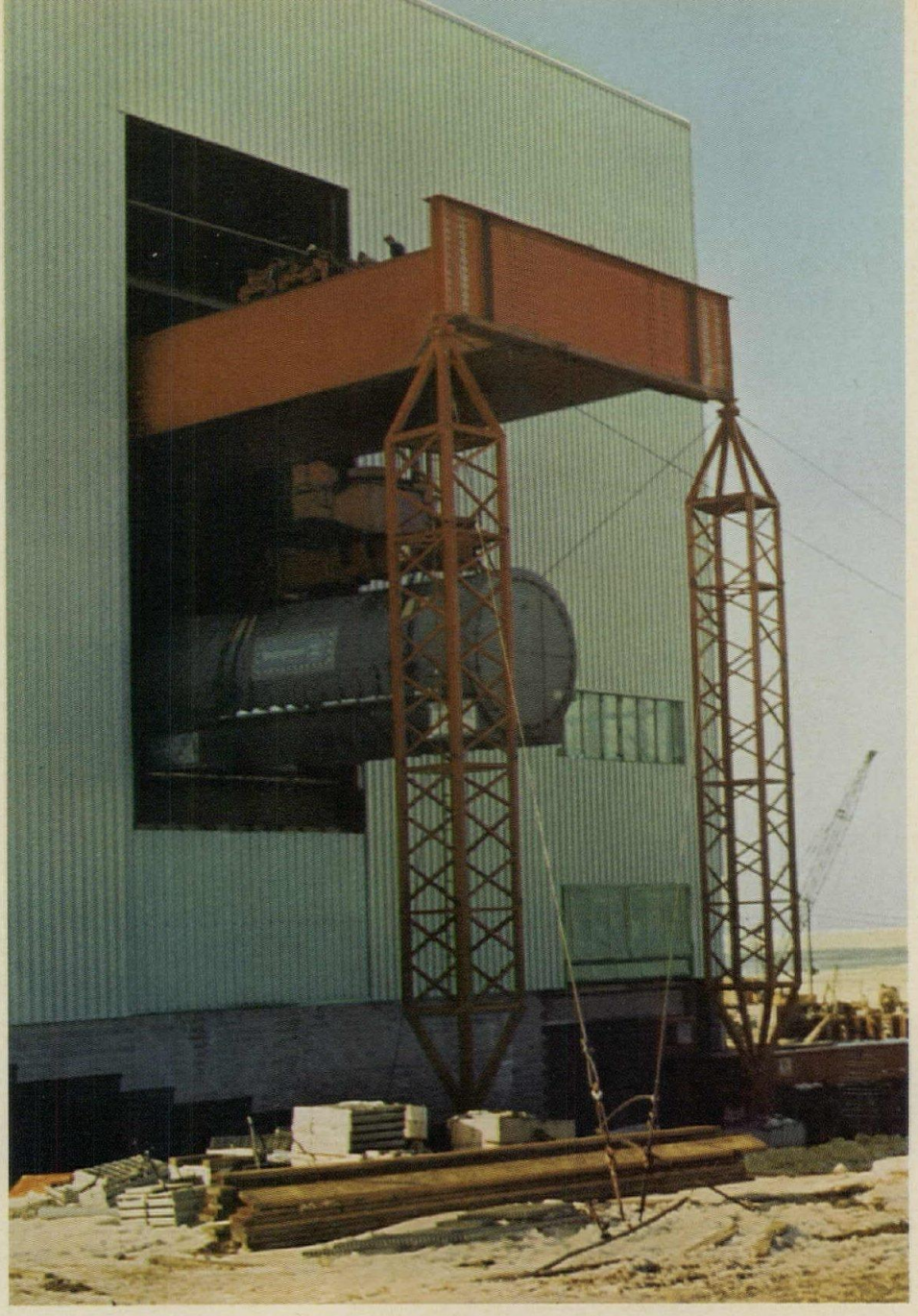
The handsome accent wall visually separates the vestibule and lobby spaces. Grille-like Chiaro creates the illusion of openness as it transmits outdoor light into the reception area. The unique pattern of the wall was designed to enhance the feeling of motion expressed throughout the building as appropriate for the manufacturer of aircraft.

Get a closer look at new Chiaro glass blocks, PC Intaglio units and any others you may have missed. Write for our catalog: Pittsburgh Corning Corp., Dept. AR-88G, One Gateway Center, Pittsburgh, Pa. 15222.

LOOK AGAIN

PITTSBURGH PC® CORNING

Robert Emmett Ginna Nuclear Power Plant, Unit #1 . . . Owner: Rochester Gas & Electric, Rochester, N.Y. . . . Engineers and Consultants: Gilbert Associates, Reading, Pa. . . . Finish: Glidden Nubelar® with Kynar 500, a product of Glidden-Durkee, Division of SCM Corporation.



Metal walls ease access, . . . stay "young" with finishes containing Kynar 500®

For your next building, consider using metal walls. Why? Because they go up faster (10 times faster than brick or stone) . . . provide easy access for installation of new equipment or repair of old . . . save valuable time and money!

What about color? No problem when using finishes containing Kynar 500*! They come in a wide selection of colors. They're durable. Accelerated tests by Pennsalt, plus years of exposure data, project 30 years of maintenance-free life!

For your next building, consider metal walls protected with a colorful finish containing Kynar 500. For more information, contact Plastics Department, Pennsalt Chemicals Corporation, 3 Penn Center, Philadelphia, Pa. 19102, (215) LO 4-4700.

*Kynar 500 is a registered trademark of Pennsalt for its polyvinylidene fluoride

Make your base specification Kynar 500! PENNSALT®

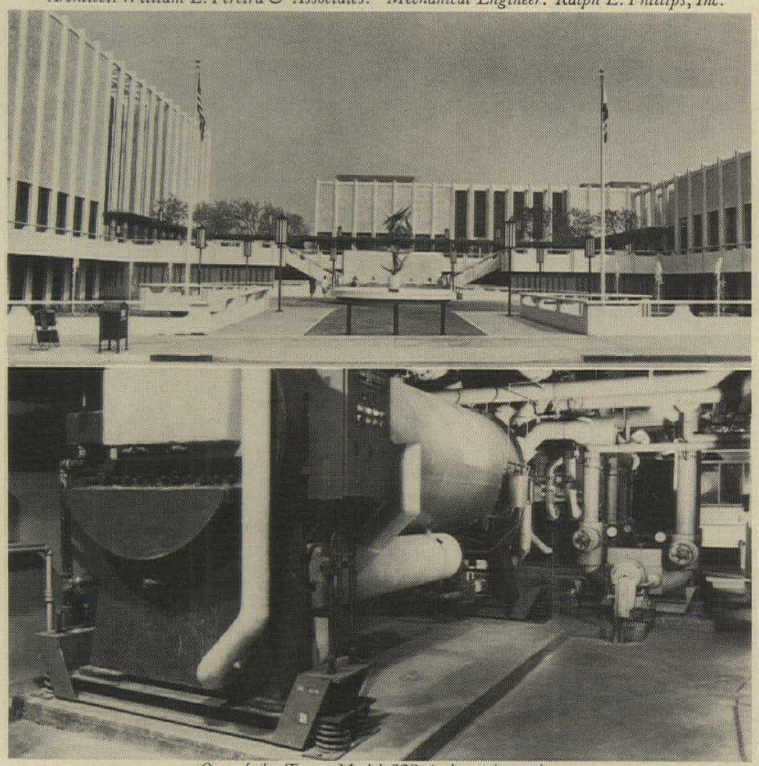
For more data, circle 18 on inquiry card

Gas Air Conditioning

"Above all, it's dependable"

says E. Hutchinson
of the Los Angeles
County Museum of Art.

The Los Angeles County Museum of Art.
Architect: William L. Pereira & Associates. Mechanical Engineer: Ralph E. Phillips, Inc.



One of the Trane Model 328-4 absorption units.

Great works of art are fragile things. They require a constant temperature, a constant humidity. The Los Angeles County Museum of Art cannot afford to take chances. It needs dependable, precise air conditioning and heating. That's why gas was selected. "Many types of air conditioning systems currently in use in the United States were surveyed," explains Mr. E. Hutchinson, master mechanic at the Museum. "The gas absorption air conditioning system was chosen in the belief that it would be quiet, economical, and above all, dependable. It has been."

This gas air conditioning system is one of the most sophisticated in the world. Two 330-ton Trane absorption units fed by steam from Kewanee boilers cool 233,000 cubic feet of air per minute. The temperature is kept at 72°F and the humidity never varies more than ½ of 1%. Temperature and humidity are precisely controlled by hypersensitive thermostats built into the return air ducts.

Each building in the three-building complex has its own automatically-controlled system for regulating air flow. In the largest building there are four separate air distribution systems, vertically stacked, each supplying ¼ of each floor area with cool air. This arrangement provides air conditioning throughout the building even while one of the systems is shut off for servicing.

Whatever your particular air conditioning needs, check with your Gas Company Engineer first.

SOUTHERN CALIFORNIA GAS COMPANY
SOUTHERN COUNTIES GAS COMPANY

THE gas COMPANY

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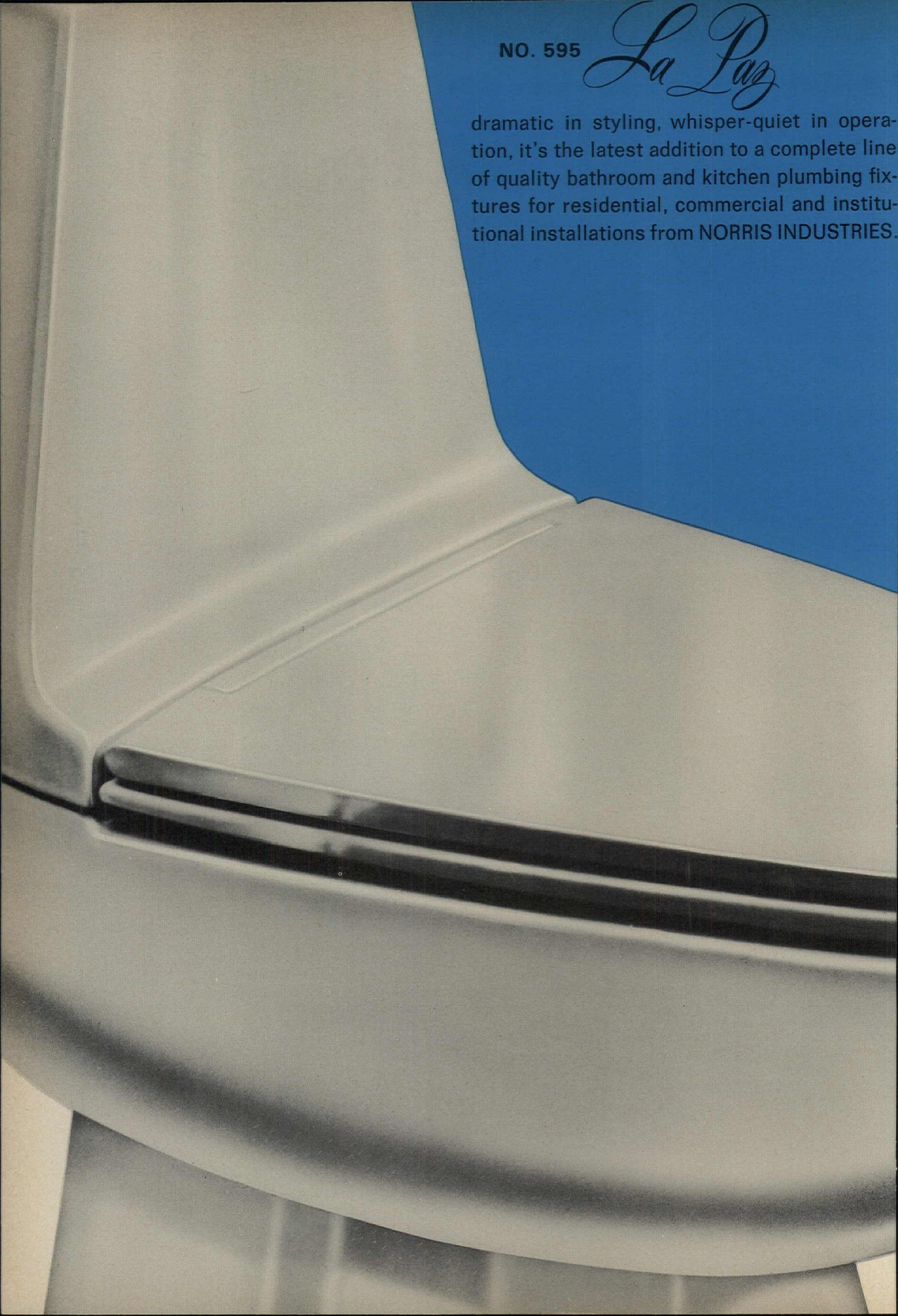

NO. 595 *La Paz*

dramatic in styling, whisper-quiet in operation, it's the latest addition to a complete line of quality bathroom and kitchen plumbing fixtures for residential, commercial and institutional installations from NORRIS INDUSTRIES.

For more than a generation our talented designers and craftsmen have been refining our balanced approach to the concept of *TOTAL DESIGN*. The porcelain-on-steel and Vitreous China fixtures appear in an array of perfectly matching colors and a series of beautiful shapes...from the traditional functional forms to the highly futuristic lines of 21st Century living. They all have one thing in common... they're made for a lifetime of use. ▪ All fixtures are available in lively and livable colors. Rouge Pink · Café Tan · Forest Green · Lilac · Yellow · Blue · Grey · White.

For today's sophisticated and demanding market let your imagination run away with itself. Think...

MARK OF QUALITY
Seven Leagues Ahead
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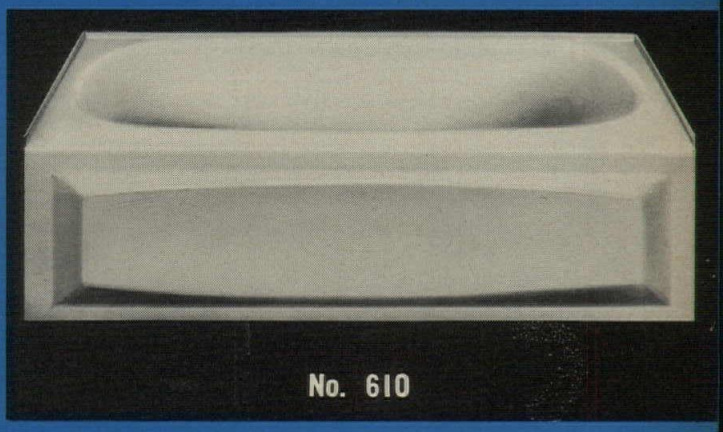
MANUFACTURING FACILITIES · 700 WATER STREET · CITY OF INDUSTRY, CALIFORNIA

No. 217 Arroyo

No. 208 Manzana



No. 610

No. 1-2 San Clemente

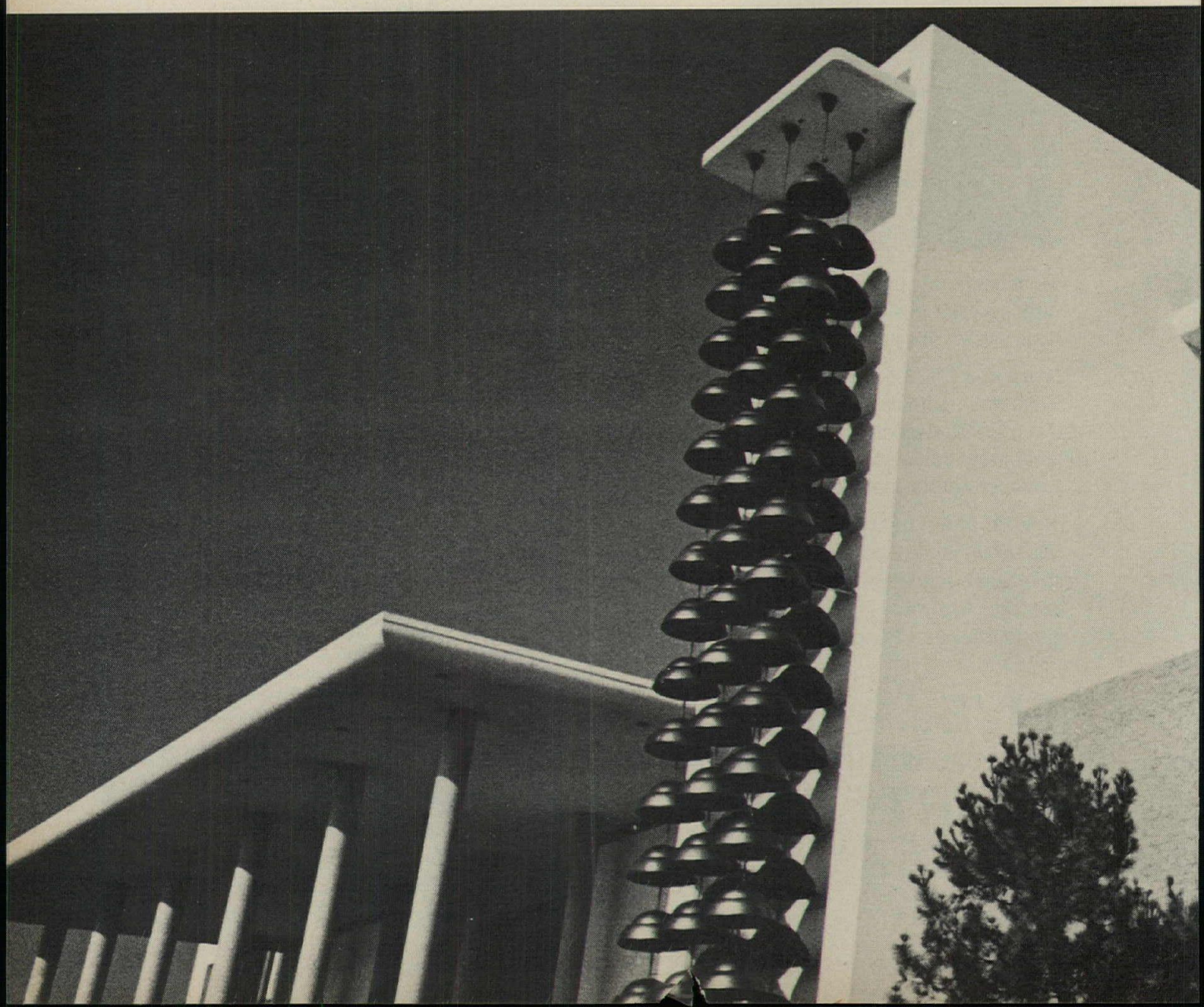
Beauty you can see.

Quality you can trust

Another big one goes all-electric.

The advantages of the all-electric concept for commercial buildings are demonstrated once again. This time, in Robinson's beautiful retail facilities in Newport Beach. This store is one more important addition to the long list of all-electric buildings owned and operated by major corporations.

Electric space conditioning systems can save builders 30% to 50% in first cost installation. In most cases, expensive stacks, flues and vents are



eliminated, often saving the equivalent in space of whole floors. There's more freedom of design in all-electric buildings. Less room is required for the main space-conditioning plant. The result is a low first cost, low maintenance building with very competitive per square foot operating costs. Add up all the advantages and savings. The all-electric building invariably has the lowest total annual cost.

The planning and architecture of Robinson's, Newport Beach, was by William L. Pereira & Associates. Robinson's, Newport Beach, now goes into Edison Company files as one of the hundreds of case histories of all-electric buildings in Central and Southern California.

The Southern California Edison Marketing Engineering Department will be glad to show you how to apply the all-electric building concept to your project for remarkable savings. Write: Marketing Engineering Department, Post Office Box 62, Terminal Annex, Los Angeles, California 90051.

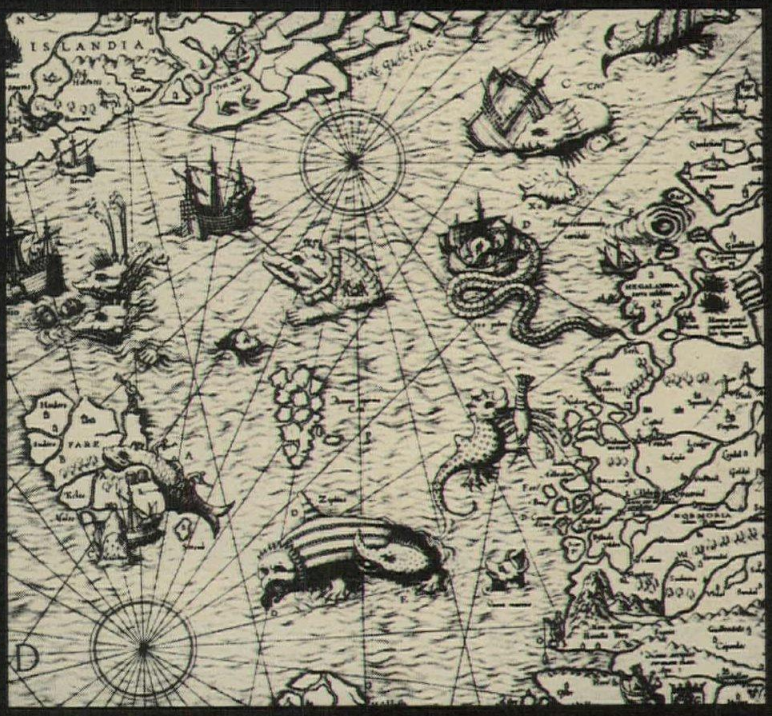
SCE

Southern California Edison

Robinson's, Newport Beach.

ALL-ELECTRIC BUILDING AWARD

By kind permission Trustees, British Museum.



The way some people think about mental retardation, you'd think we are still back in the dark ages.

Many people still think that mental retardation is a shameful condition caused by "bad blood" or something else equally outlandish.

Many people still think that all retarded children and adults should be put out of sight. Out of touch with normal people.

It's time to get rid of these old notions. Once and for all.

Although some of the retarded require care in institutions, the vast majority need to be helped and challenged by the world. Not hidden from it.

In fact, at least 85 percent of the retarded can learn enough to become fully or partially self-supporting. But only if you give them proper schooling, job training, job opportunities—a chance to live like the rest of us.

How can you help? Urge your civic, church, social or fraternal organizations to sponsor activities for them. Like week-end athletic programs. Or take them on outings, hikes, fishing trips. Nothing frustrates the retarded more than being left out of activities other people enjoy.

Write for a free booklet to The President's Committee on Mental Retardation, Washington, D.C. 20201.

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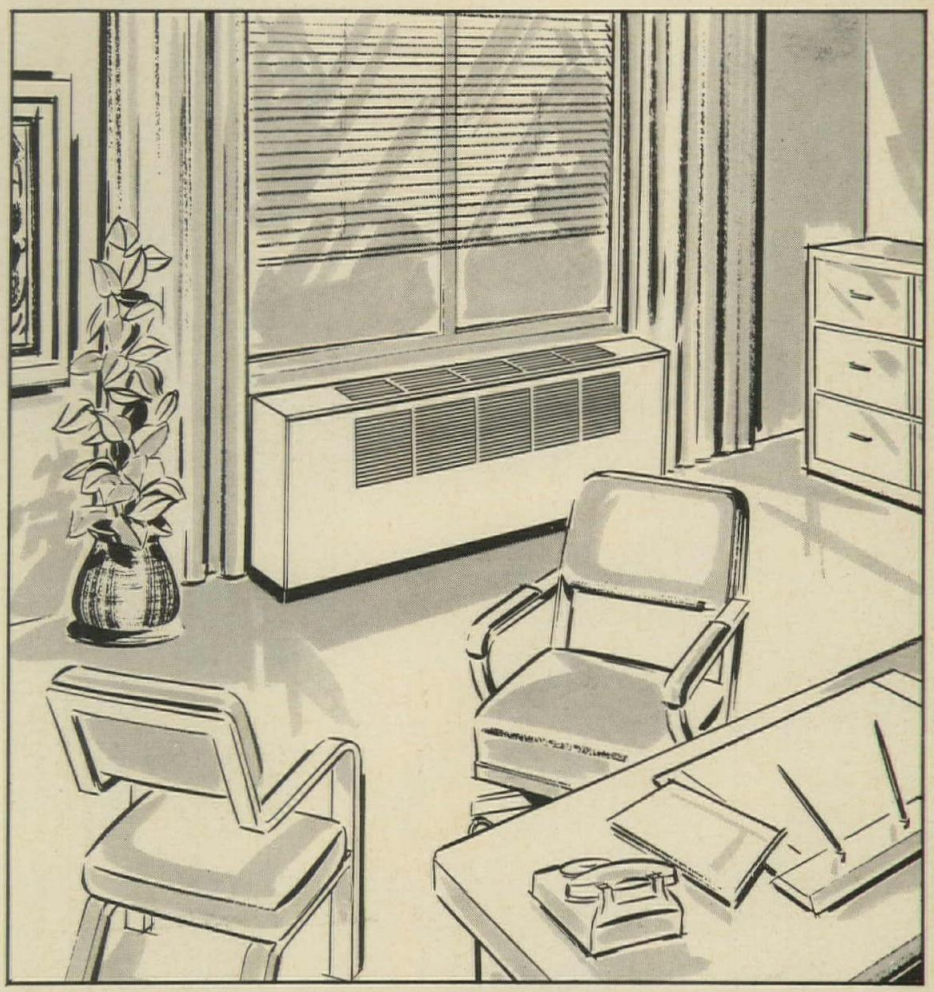

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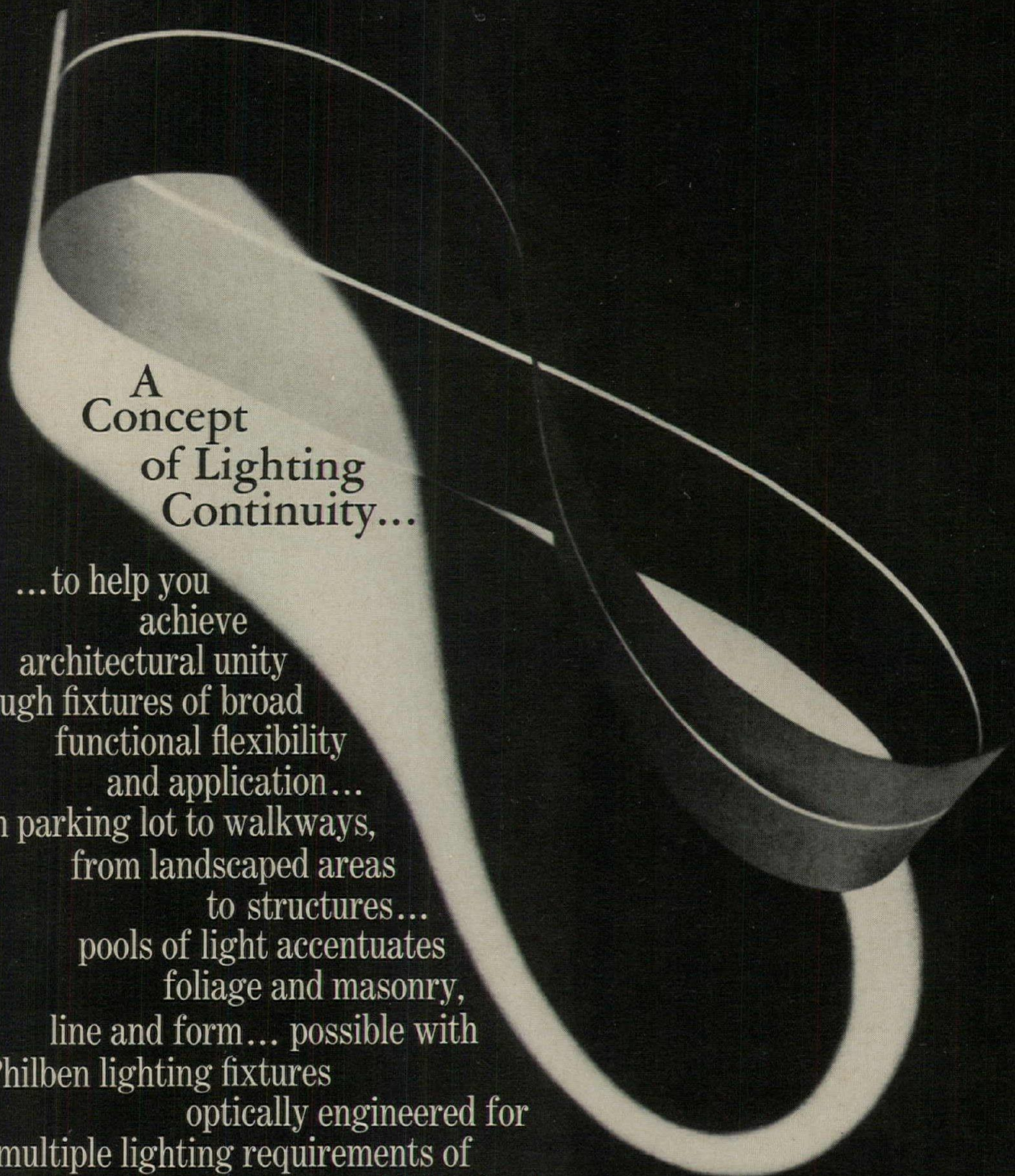

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For 1969: nine per cent gain; new action committee on cities

The good news of the 30th Annual Building Products Executive Conference, sponsored by McGraw-Hill Information Systems Company, was chief economist George Christie's analysis that "With the economy under the deliberate restraint of extra taxation, construction is strengthening," and that "If balance is restored to the economy, and the restraints are lifted, all types of construction can be expected to advance vigorously in the second half of 1969." Christie's forecast, published in full beginning on page 81 of this issue, predicts a nine per cent increase in total construction and a 10 per cent increase in total building construction, including a 13 per cent increase in residential building and a strengthening of all nonresidential building types.

In his evocative speech, Wallace F. Traendly, president of McGraw-Hill Information Systems Company and conference host, proposed the formation of "a centralized body that can function as the construction industry's action commission to help solve the urban crisis." Traendly suggested 10 areas in which the commission could make "significant contributions," including examination of Federal policies for financing low-income houses, examination of codes and zoning regulations, review of tax-money allocations back to the cities, stimulation of construction-system research and performance testing, creation of job programs for the disadvantaged, coordination with government bodies, encouragement of ghetto-based construction businesses, and better information flow within the industry.

Traendly invited the attendees—all executives within the construction industry—to express their interest in the proposed commission. Response so far has been "encouraging," and Traendly has since been invited to present his proposal before the newly-formed Construction Affairs Committee of the U. S. Chamber of Commerce.

Architects and space scientists find they need each other

Alabama architects and scientists from the Marshall Space Flight Center of the National Aeronautics and Space Administration in Huntsville, Alabama last month began a dialogue which could have far-reaching architectural consequences.

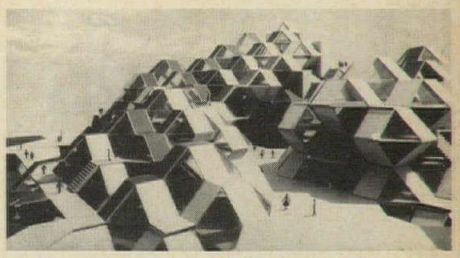
It led the man responsible for the development of NASA's manned space stations, Dr. Georg von Tiesenhausen, Chief of the Orbital Mission Group in the Space Center's Advanced Systems Office, from a view at the beginning of the discussions that architects were essentially and perhaps wholly concerned with esthetics while "we must now be 100% functional" to a quite different concept expressed in his response to the final question in the closing discussion: What could NASA and architects learn from each other?

NASA, said Dr. von Tiesenhausen, could learn how better to utilize available space in the design of its space stations and how to make them "not just functional" by integrating functional requirements with esthetic objectives. And architects could learn to work with new materials and new ways of joining materials which could lead to new kinds of structures.

The occasion was the fourth annual convention of the Alabama Council of the American Institute of Architects, held October 10-12 at the Carriage Inn Motor Hotel in Huntsville, with A. Jackson Davis of the Huntsville firm of Dickson, Davis and Associates, president of the Alabama Council, as program chairman.

The other speaker from the Space Center, Project Engineer Rondal Crawford, gave an analysis of "Planetary Environment" that caused at least one architect present to remark that it made him feel inadequately equipped with information about conditions on the sites of his earthly buildings.

John Desmond, F.A.I.A., of Hammond, Louisiana, Professor Imre Halasz of the Harvard Graduate School of Design, and Robert Durham, F.A.I.A., of Portland, Oregon, immediate past president of the Institute, were the other major speakers. A panel consisting of the speakers and Dean J. Ingraham Clark of the Auburn School of Architecture and A.I.A. Regional Director Arch Winter of Mobile, Alabama, led the very lively discussions with the audience. Moderator was Jeanne Davern, managing editor of ARCHITECTURAL RECORD.



Moshe Safdie and students design a Student Union

A Student Union for the students, by the students, and with the architect of their choice seems as though it would be one excellent way to approach the current problem of a larger student voice in the management of their own affairs. And apparently this means, which was used by San Francisco State College to acquire the Moshe Safdie concept shown above for their own Student Union, could work.

The choosing of the architect was actually done by the College Union Council, which was comprised of eight students, three faculty, and five administrators. The concept of the Council was to "create an environment that would be directly responsive to the students' needs and desires." Realizing that to be most effective a defined expression of "needs and desires," *and* just the right architect, had to be found, the Council established parameters to work within by testing student opinion. Once the parameters were established the Council began interviewing architects, and ultimately retained the architect of Habitat, Moshe Safdie, age 29.

University trustees have so far withheld design approval of Safdie's design for the student-financed project, which consists of a system of interlocking and varying-sized hexagonal modules, whose sloping surfaces consist mostly of glass and vegetation. Irregular module arrangement will create much visual excitement. Burger & Coplans are Safdie's associates.

Schools for New York City —at no cost to taxpayers

The New York City Educational Construction Fund, a new state authority, will build five schools in New York City at no cost to the taxpayers.

It was explained that the fund will issue its own bonds to meet the cost of acquiring the sites and building the

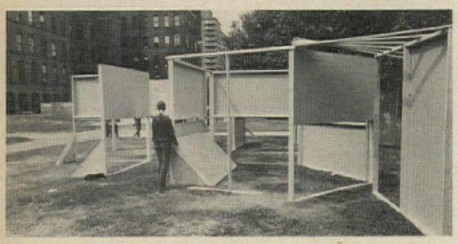
schools. The air-rights above the schools will be leased to private developers for construction of apartment houses.

One of the educational-residential combinations will be a 35-story apartment tower constructed above a four-story school. Though sharing the foundation and mechanical systems, each of the two functions will have a separate entrance and identity. Feldman-Misthopoulos will be the architects and Brown Guenther Battaglia associate architects.

When each project is completed, the Fund will lease the school for one dollar a year to the Board of Education to operate. The apartment tower will be operated by the developer.

The Fund's income from the apartment tower will consist of the rental for the air-rights and a payment from the developer equivalent to the normal real estate tax. This income will go to pay off the debt service on the bonds. The entire structure will be exempt from real estate taxes during the life of the school debt, approximately 40 years. After this debt has been retired, title to the school will be conveyed to the city, and the owner of the apartment tower will pay real estate taxes to the city.

John O'Brien photos

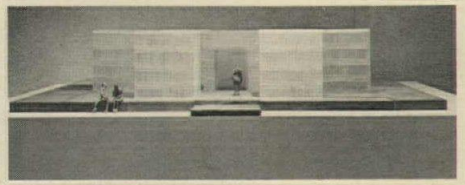


Campaign Culture finds some budding architects

Last summer, Pratt Institute's School of Architecture conducted a program, under the guidance of Edward Schiffer and Myron Goldfinger, called "Campaign Culture," in which an attempt was made to interest high school juniors and seniors from deprived areas in architecture. The students, paid by the Federal Government while attending the program, were exposed to elementary concepts of architecture, basic drafting and design skills, and techniques of improving their neighborhoods through architecture. Augmenting this classroom work were field trips to museums, Bedford-Stuyvesant, and a visit—which included a party—at the ARCHITECTURAL RECORD offices.

At the end of the program a "design competition" was held which resulted in the construction pictured below left.

An ultimate goal of the program—the identification of potential architects—was successful. But beyond identification, Myron Goldfinger feels that an interest must be sustained in these students. He proposes a follow-up of ten field trips throughout the year to expose these promising students to a wider architectural environment. Mr. Goldfinger calculates that $1000 will be enough money to accomplish this goal. As yet, a source for the funds has not been found.



Louis Kahn designs a Memorial to Six Million Jews

Designed by Louis Kahn for a site in New York's Battery Park, the monument offers a physical embodiment of hope as well as despair. Commissioned by the Committee to Commemorate the Six Million Jewish Martyrs, it consists of a granite pedestal on which are placed seven glass piers, so that, in the architect's words, "the sun can come through and leave a shadow filled with light."

The six piers around the center, all of equal dimensions, are blank. "The center one—the chapel—speaks: the other six are silent." The walls of this chapel will be inscribed.

The cubes stand on a granite base 66 feet square, and high enough so that people may sit on its edge. Each glass pier is 10 feet square and 11 feet high.

News Briefs

November 1: An international competition for the future Headquarters of International Organizations and an International Conference Center in Vienna, Austria, began today. Those wishing to participate should address inquiries (accompanied by proof of membership in a professional organization of architects and a reimbursable deposit of $100) to: Ziviltechnikerteam/ Internationaler Organisationen und Konferenzzentrum/ Appel; Fleischer, Lintl, Schwanzer/ Marc Aurelstrasse 2a-30/ A-1010 Wien, Austria.

Another competition, the $6000 Brunner Scholarship for advanced study, is now open to all U.S. architects. Applications and details are available from the New York Chapter, A.I.A., 20 West 40th Street, New York City, and will be received until January 15, 1969.

Two new positions at A.I.A. National Headquarters have been filled. James M. Fenelon was appointed Assistant Executive Director, and Jackson T. Right became Director of Housing. **Also at the A.I.A., three new 16 mm. movies** featuring the impact of highway construction, large housing developments, and graphics on metropolitan areas were produced. The color films, each running about 14 minutes, may be borrowed from Headquarters by local chapters.

Appointed to the New York State Council on Architecture by Governor Rockefeller were: George Dudley (chairman), Burnham Kelly (vice chairman), George Nelson, G. E. Kidder Smith, and William J. Strawbridge.

The Joint Committee on Employment Practices plans a seminar in St. Louis, Missouri, on December 6. Titled "Alternatives to Unionization—An Examination of Modern Employment Practices", it will deal with acquiring and retaining firm personnel.

The Architecture and Gardens Tour of Japan and Hong Kong will make two trips in 1969—in April and October. Contact K. Nishimoto, Pasadena, California.

N.C.A.R.B is now making a thorough analysis of examination effectiveness. Under the guidance of the Educational Testing Service questionnaires requesting data to be used by E.T.S. are being sent to architects. Those who receive the questionnaires can help in this effort by promptly and carefully responding.

Obituary

Eugene J. Mackey, F.A.I.A., a partner in the St. Louis architectural firm of Murphy and Mackey, died July 27 in St. Louis at the age of 56.

Mr. Mackey's firm, which won the 1961 Reynolds Award for its design of the Clinmatron in St. Louis, has been the designer of many schools, college buildings, hospitals and churches. Among their more notable buildings of the last few years were the Ober Library at Washington University and the Medical School Facilities and Queeny Tower at the Barnes Hospital, all in St. Louis.

Mr. Mackey was a former professor of architecture at Washington University and a past president of the St. Louis Chapter, A.I.A. In a speech he was preparing at the time of his death, he expressed his continuing concern for the effects of architecture on people: "I am optimistic that the context of our environment can and will be improved, if we do the best we can in our own special competence, listen and learn from others, and, above all, connect up with the people with whom we are planning."

TenMain Center Office Building and Parking Facility, Kansas City, Mo. Monolithic reinforced concrete design/Robert P. Ingram, developer/ Charles Luckman Associates, architects/Marshall & Brown, associate architects/Howard, Needles, Tammen & Bergendoff, engineers/Winn-Senter Construction Company, general contractor/506,354 sq ft of standard Ceco steelform services/ 2,900 tons of fabricated reinforcing bars by Ceco.

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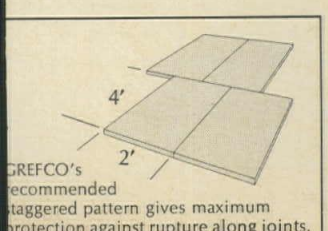

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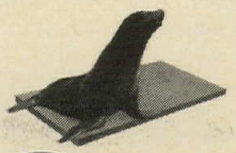

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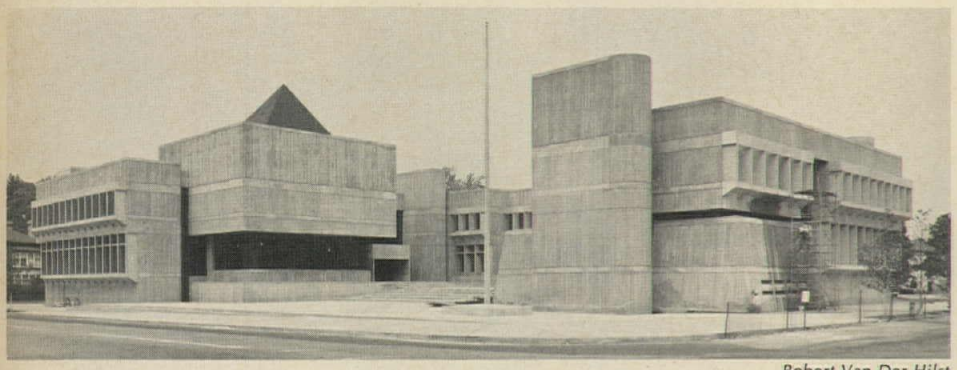
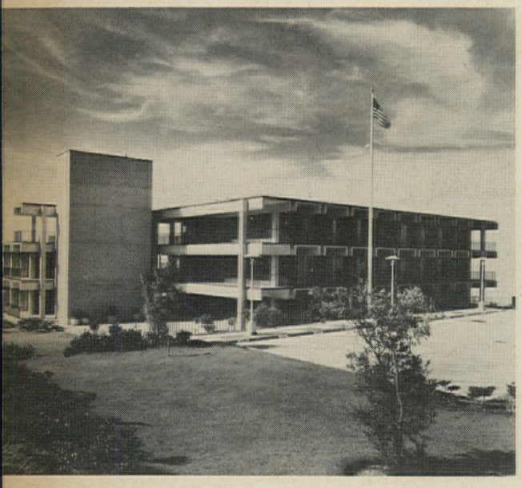
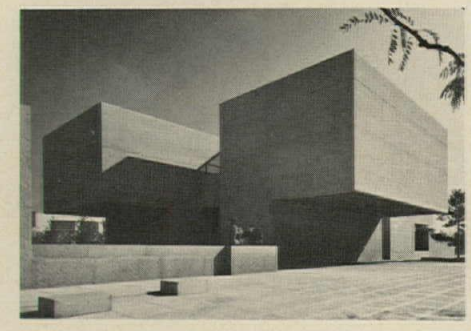


Robert Van Der Hilst

Brantford City Hall and Magistrate's Court, Ontario, was selected by competition in 1964, and commended because it "did not seek to dominate the square or the city. Rather, it represented a scale that was in keeping with its neighbors, and was pleasing from all points, yet made extension to the east possible for the future. A feature . . . rare in Canada was the internal open court which can be used for a variety of purposes." Michael Kopsa designed the complex.



Bureau of Commercial Fisheries Laboratory, Scripps Institute of Oceanography, La Jolla, California, is a First Honor Award winner in the first A.I.A.-NAVFAC Biennial Awards Program for Distinguished Architectural Achievement sponsored by the Naval Facilities Engineering Command of the Department of the Navy in cooperation with A.I.A. The building was designed by Frank L. Hope Associates Architects and Engineers. The jury: Henry L. Kamphoefner, F.A.I.A., Hugh Stubbins, F.A.I.A., and Paul Rudolph, A.I.A.

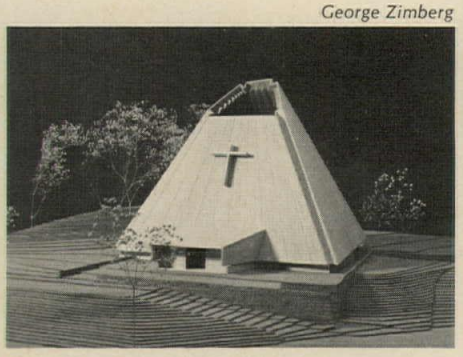


The Everson Museum, Syracuse, New York, has four main galleries cantilevered out over a plaza area and flanked by an administrative-members area on one side and an auditorium on the other. A circular stair dominates the two-story-high central sculpture court. I. M. Pei & Partners are the architects, and Pederson, Hueber, Hares & Glavin, associate architects.

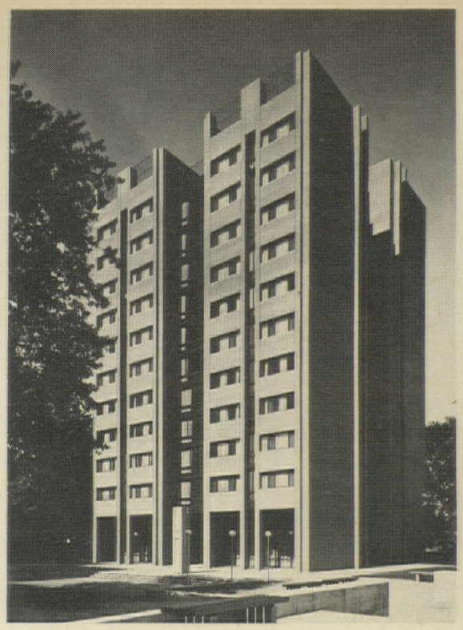
© Ezra Stoller (ESTO)

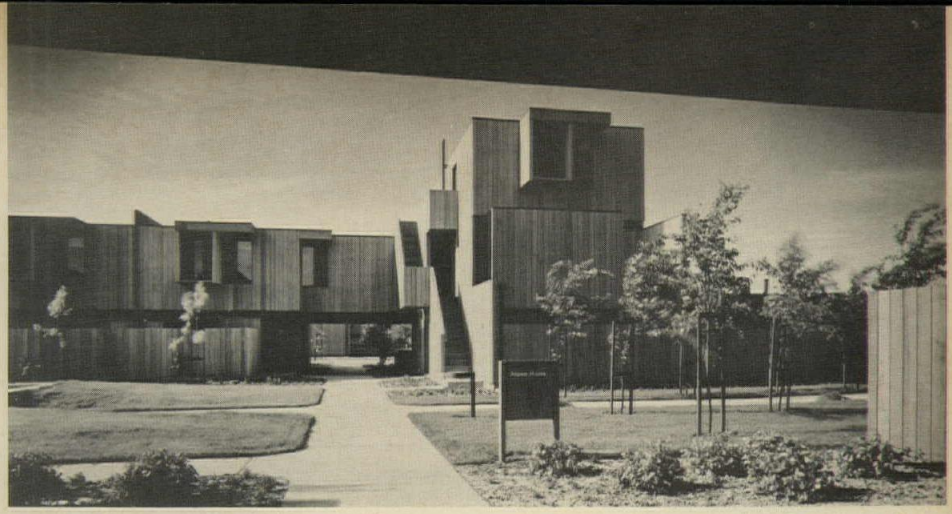
New York's Metropolitan Museum will have a new facade designed by Kevin Roche John Dinkeloo and Associates. The changes include removing the main entrance vestibule, changing the main steps into a broad tiered stairway flanked by two great fountains, and replacing the automobile drive with auto/pedestrian entrances. Estimated cost of the 1200-foot Fifth Avenue front is $1.6 million.

George Zimberg

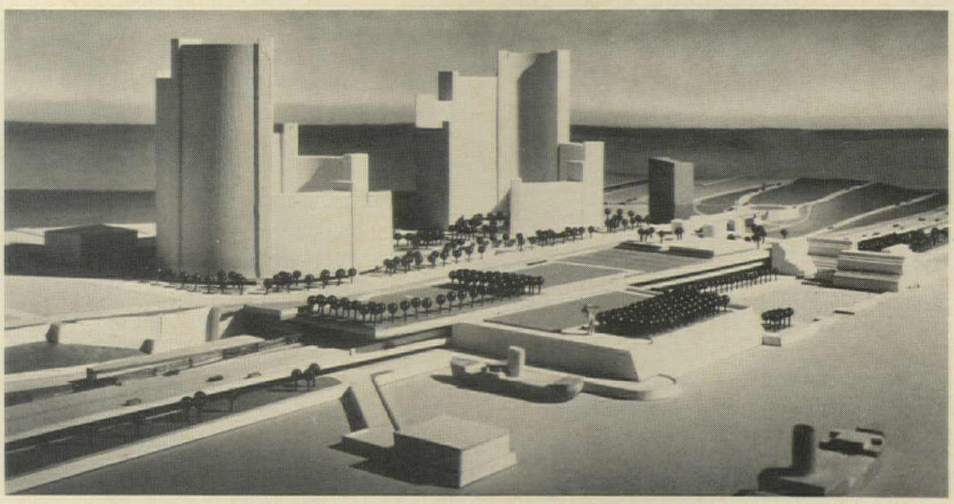


Sacred Heart Church, Vernon, Connecticut, has a series of dart-shaped, prestressed concrete tee sections inclining from a bush-hammered concrete foundation to a trapezoidal compression beam 85 feet above the ground. The webs of the tees will give the interior a radial pattern from the 30-foot by 40-foot roof-light. Peter McLaughlin is the architect. Estimated cost: $375 thousand.

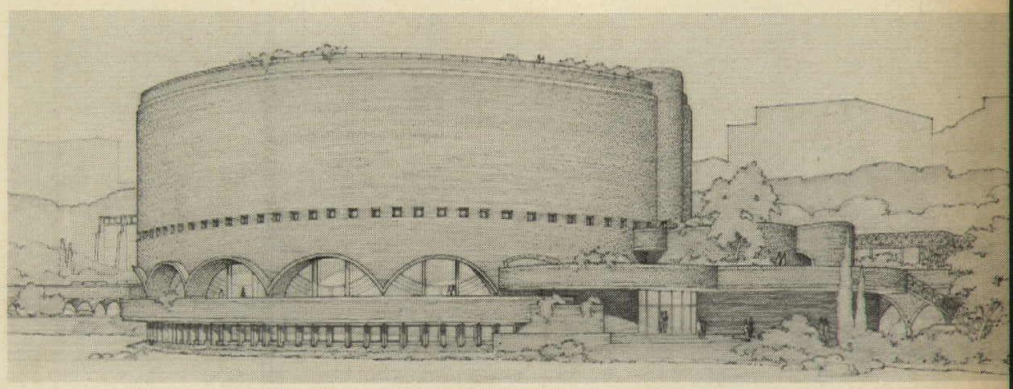




Two of the 27 award winners in the 1968 HUD Awards for Design Excellence are the Clarke Tower Men's Dormitory, Case Western Reserve University, Cleveland (left), designed by Fred S. Toguchi Associates, and College Town, Phase I, Sacramento State College, California, designed by Neill Smith, A.I.A. and Associates with Dreyfuss and Blackford, A.I.A. as supervision architects. Criteria included the relationship and service of the designs to the immediate and community environments and "the extent to which they recognize and include human values in the city's physical structure."

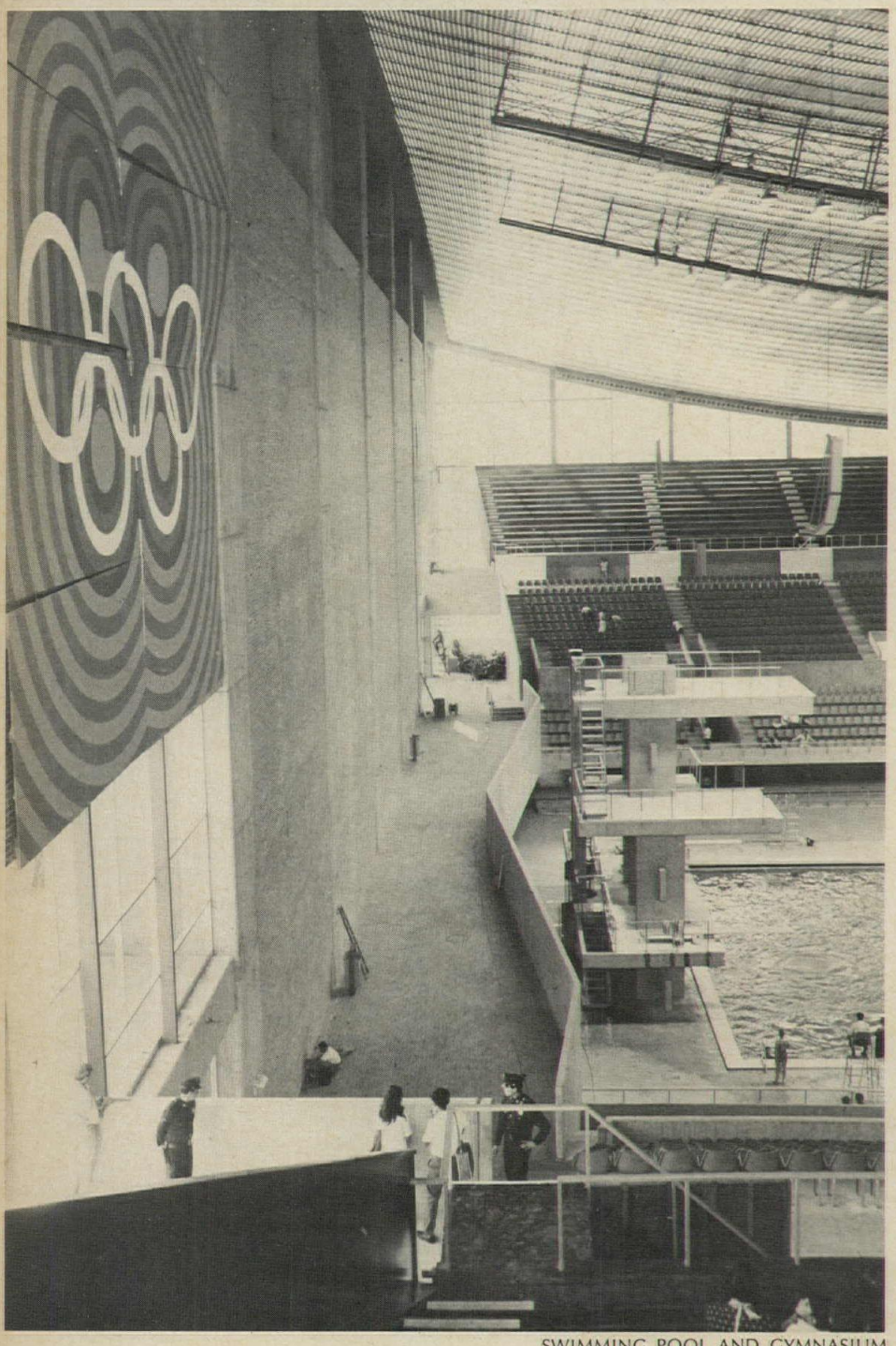


Riverside Park Community, sponsored by the Negro Labor Committee, will cover a ten-block area in New York City's Harlem. The huge complex will include seven apartment buildings, ranging from eight to 54 stories on a platform above an industrial area, and commercial, recreation and education facilities. There will be office space, a shopping center, restaurants and research facilities. Along the riverfront on the raised apartment level will be an amphitheater, a marina and boatel, a promenade with fountains and cafes, and a large ballroom. Architects are Richard Dattner and Henri LeGendre.



The National Football Foundation and Hall of Fame, Piscataway Township, New Jersey, is a bold concrete triumphal arch. (Says Pierre Zoelly, one of the associated architects, "Just as the Romans celebrated their successful generals, we celebrate our football heroes.") A three-level foyer will contain a ticket counter, souvenir shop, cafeteria and offices. Above that will be two movie chambers, a two-story library, and balconies containing exhibits. Associated architects: Pierre Zoelly and Haines Lundberg & Waehler.

The Civic Auditorium, Madison, Wisconsin, the first increment of the Monona Basin Project designed by Frank Lloyd Wright to connect the waterfront with the center of town (RECORD, May, 1958), now scheduled for bids in February, 1969. Collaborating with Taliesin Associated Architects in the preparation of construction documents are: Yosh Nakazawa & Associates (architectural working drawings and specifications, and coordination of contract documents and cost estimates); Wilson, Andros, Roberts & Noll (structural engineering); and E. R. Ronald & Associates, associated with Olsen & Associates (mechanical and electrical engineering). Cost is estimated in excess of $5 million.



SWIMMING POOL AND GYMNASIUM

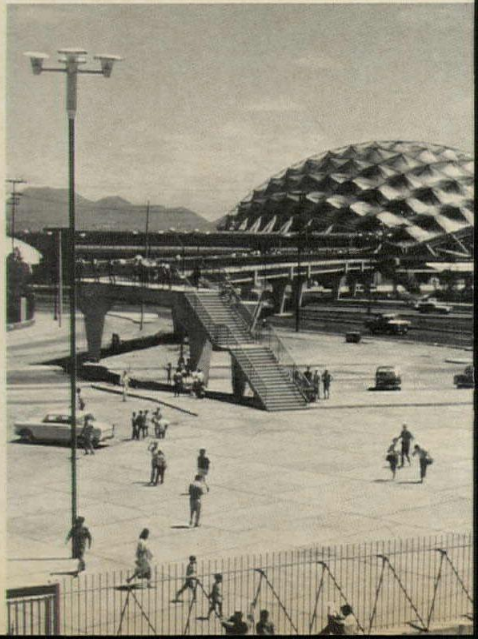
MEXICO'S OLYMPIC ACHIEVEMENT WAS ALSO ARCHITECTURAL

Mexico's architects are to be praised for having taken the largest possible view of their monumental task of planning for the Olympic Games that were held last month in Mexico City. The architects judiciously provided all the required facilities for athletic and cultural events by reshaping existing facilities in accord with Olympic Game standards and by adding new works wherever required. (A small budget allowed only 20 per cent of all facilities to be new structures.)

The Mexican Olympic Committee—headed by architect Pedro Ramirez Vasquez—capitalized on the tight program by conceiving the entire Mexico City, where hundreds of events took place, as a great *champs des fetes*. Because existing facilities were widely scattered throughout this sprawling city (15 miles north to south, 13 miles east to west) of 7,015,000 inhabitants, this concept meant systematizing circulation routes and traffic to assure 100,000 guests (including 10,000 athletes and their entourages) that each one would be able to meet his own precise schedule of events wherever and whenever they should take place. The architects invented an ingenious system of color coded maps and streets and dozens of graphic symbols to guide visitors through the city's 1,750 miles of streets. The graphics will remain part of the city's road system and, they believe, will point the way for improving traffic conditions, as well as the general character of graphic work, throughout Mexico.

The Olympic Committee realized that decentralized facilities for the events

SPORTS PALACE

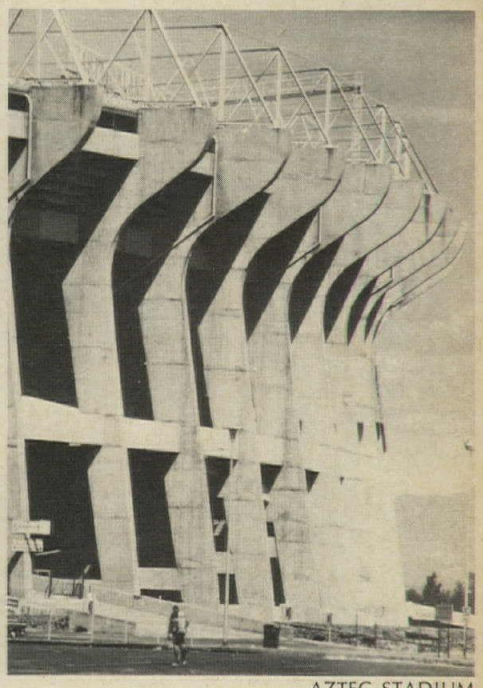


meant that visitors would receive maximum exposure to Mexico City and its people. Unlike the usual situation where international events—games and fairs—are held in one gigantic setting, in Mexico City visitors joined the "life" of the city's inhabitants for the brief few weeks; the exposure was not only culturally enlightening, but from my experience, joyous as well. It was Ramirez Vasquez' ambition to make this year's Olympic meeting have cultural as well as athletic import—as it had been in Greece in the first Olympiads. The dispersion of visitors throughout the city fostered cultural confrontation on an unofficial but meaningful level. (Official cultural programs were offered by all nations during the games and for one year since 1967.)

Facilities were executed by teams of architects from the Department of Public Works and by those chosen through national competitions. All work was under the direction of the Minister of Public Works and a capable staff. Each design fulfills certain aims and deserves to be examined. Three projects of particular note are the Olympic Swimming Pool and Volleyball Gymnasium, the Sports Palace, and the Aztec Stadium. These accommodate 10,571, 5,098, 22,000, and 106,213 spectators respectively. To sports-minded Mexicans these represent meaningful, permanent additions to community facilities and will be reminders to all inhabitants, and particularly to hopeful young athletes, of the spirit of the Olympic Games.—*Raymond Lifchez*

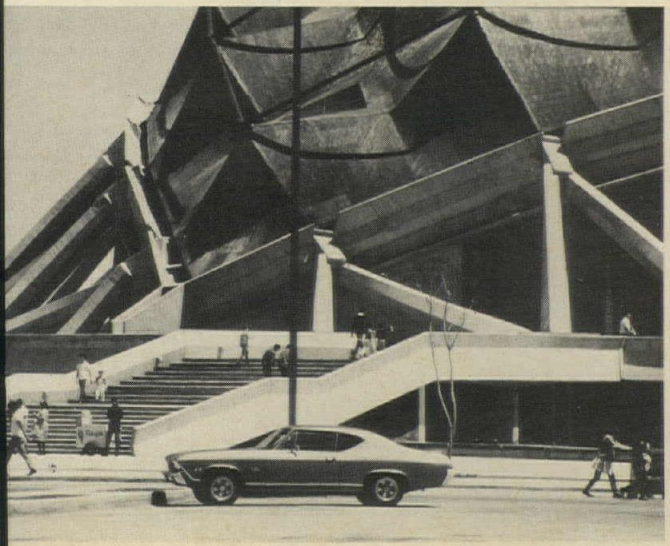
THREE INSTALLATIONS OF THE XIX OLYMPIAD, Mexico City, Mexico. Clients: *Ministry of Public Works of Mexico and the International Olympic Games Committee.* SWIMMING POOL AND GYMNASIUM—architects: *E. Gutierrez Bringas, A. Recamier Montes, M. Rosen Morrison, X. Valverde Gerces.* SPORTS PALACE—architects: *Felix Candela, Enrique Castaneda Tamborrel, Antonio Peyre.* AZTEC STADIUM—architects: *Pedro Ramirez Vasquez, Rafael Mijares.*

Lifchez photos



AZTEC STADIUM

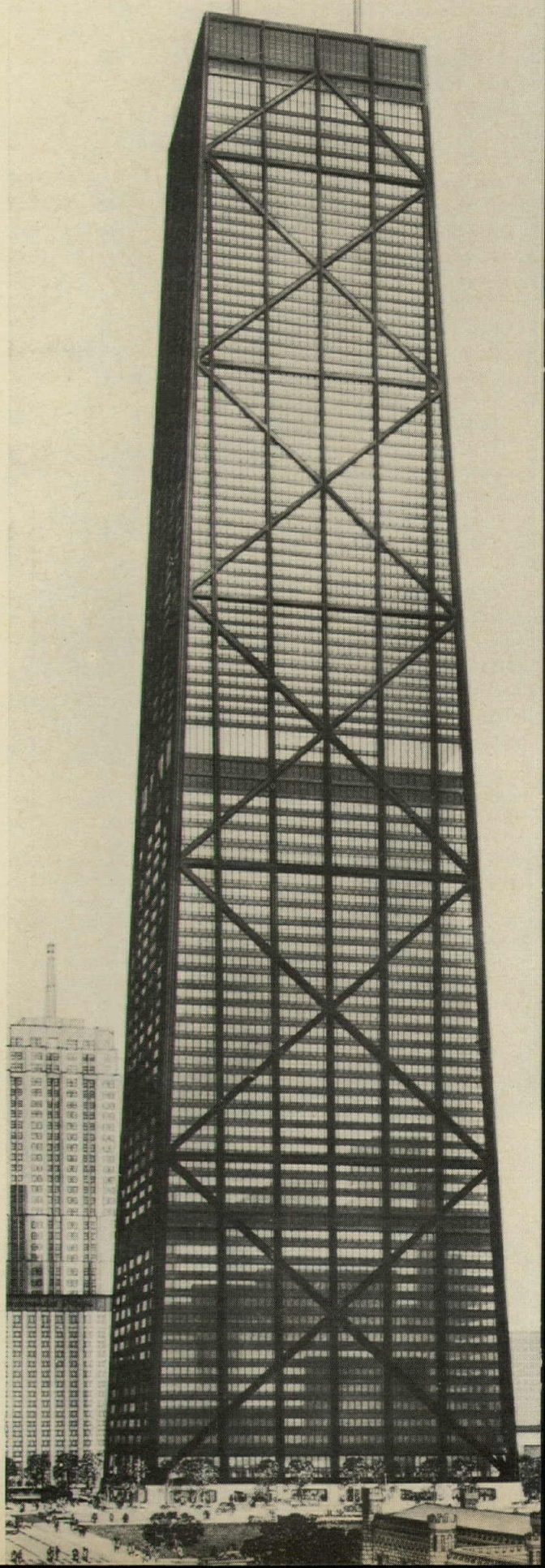
The forms of the buildings are pleasingly comprehensible through the clarity of their constructions. The Aztec Stadium is partially covered by a gigantic awning. The roof is suspended from cantilevered trusses resting on concrete stanchions which form the stadium's basic structure. The dome of the Sports Palace appears somewhat Fulleresque. It is a triangulated geodesic construction of an aluminum frame strengthened from above by a network of steel hoops. The frame is covered by plywood, waterproofed and copper-sheathed. The swimming pool and gymnasium are covered by hanging roofs. A cable construction forms roofs with double curves to reduce vibration. The tension of the cables is transmitted to concrete columns—at the end walls of the enclosures—by means of a perimetric frame surrounding the roof. The roof surface is of galvanized metals covered by concrete.



when the designers of the 100-story John Hancock Center specified a standby power system...

they chose Waukesha

Owner/Developer: John Hancock Mutual Life Insurance Company
Architects/Engineers: Skidmore, Owings & Merrill, Chicago
General Contractor: Tishman Construction Company



The new John Hancock Center is the world's tallest residential office building. Including the twin television antenna, the new 100-story giant rises 1451 feet into the Chicago skyline. Power to keep this vertical city within a city thriving will come from local utility sources. To make sure that a power failure would never affect the Center's elevators, emergency lighting and control systems, Hancock designers chose Waukesha Enginator® equipment for standby power.

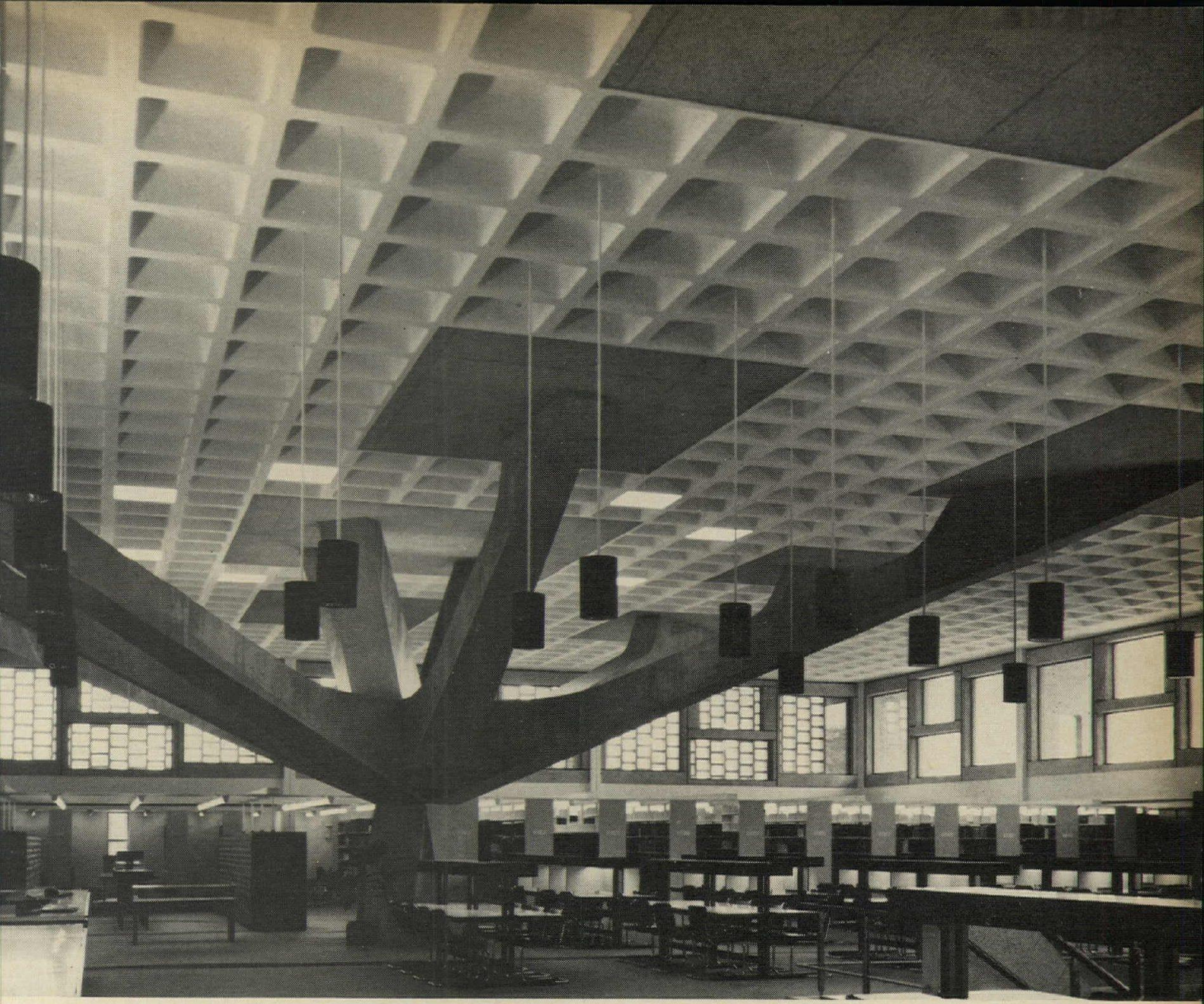
Why Waukesha? Because Waukesha has a reputation as a pioneer in the total energy field as well as emergency standby electrical power. Waukesha's high quality of engineering and product is a by-word wherever reliable engine power is needed for electricity, heating and air conditioning. Today, scores of new installations in important buildings and building complexes use Waukesha power.

Consult your Waukesha distributor for data on standby power to total energy.

Waukesha Motor Company
WAUKESHA, WISCONSIN 53186

Carlstadt, N. J. 07072 • Tulsa, Okla. 74107 • Los Angeles, Calif. 90058 • Anchorage, Alaska 99502

For more data, circle 28 on inquiry card



St. John's University Library, Collegeville, Minnesota
Marcel Breuer & Associates, architects
Johnston-Sahlman Company, structural engineers
Gunnar I. Johnson & Son, Inc., contractors
Ceco Steeldome Service for waffle-pattern monolithic concrete joist construction

Find aesthetic repetition in Ceco's Standard Steeldome Floor-Forming experience

Think how you can use these repetitive units to bring beauty out of standardization. Standardization spawns creativity. It has always done this, from the Parthenon to the skyscraper. Great things come out of standardization.

This is no less true with standard steeldome modules for monolithic concrete joist construction. You can use them aesthetically in sculptured waffle ceilings. You can create with a sure hand, relying on Ceco's 56 years of experience in forming floor systems with removable steelforms. This means you work and shape fluidly, molding versatile monolithic structures of strength and rigidity. Ceco's experienced crews and project supervisors are adept at carrying out your design and coordinating with other trades. Your project starts fast, speeds ahead. Forms, rebars, concrete materials are close at hand.

Another thing: monolithic concrete floor forming is economical, often $1.00/sq. ft. less than other types. Ceco is big in experience as a nationwide specialist in floor forming, known for dependability and quality. So as you plan your next project, call on Ceco experience. The Ceco Corporation, general offices: 5601 West 26th Street, Chicago, Ill. 60650.

CECO

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Economical Gas Total Energy fills

Gas Total Energy produces electricity at the site of the building. In generating electricity, cooling and heating are also produced.

Natural Gas-fueled engines are at the heart of the system. And this Gas Total Energy system is more than twice as efficient as conventional electric plants.

Perhaps making your own electricity sounds complicated. Actually, it's quite simple.

Gas is used to fuel the engines driving the electric generators. The heat released from these engines is recovered for use in air conditioning and space heating. This on-the-spot power installation makes Gas Total Energy the most reliable power system you can have.

Carrier keeps Regency Square climate-controlled all year 'round.

This multimillion dollar shopping center in Jacksonville, Fla., uses natural Gas for all energy

every need you can think of.

needs, including air conditioning. The enormous cooling job is done with Carrier absorption chillers.

Altogether, Carrier equipment provides over 1,700 tons of cooling to Regency Square. Sixty-three stores and a 55,000 square-foot shopping mall are kept at springtime temperatures every day of the year.

If you're planning a new building, or remodeling one, be sure to take a good look at Gas Total Energy. There's a good chance you'll find it the most reliable and economical source of power. (Surveys indicate that 25% of new buildings show a favorable economic picture with Gas Total Energy.)

For the complete story, write to Carrier Air Conditioning Company, Syracuse, N. Y. 13201. Or get in touch with the Sales Engineer at your local Gas Company.

AMERICAN GAS ASSOCIATION, INC.
For heating and cooling, Gas makes the big difference.

For more data, circle 30 on inquiry card

Lyon doesn't Stop with the Strongest Top

MAKE US PROVE IT!

LYON METAL PRODUCTS, INC.
1151 Monroe Avenue, Aurora, Illinois 60507

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☐ I'd like the name of my nearest dealer

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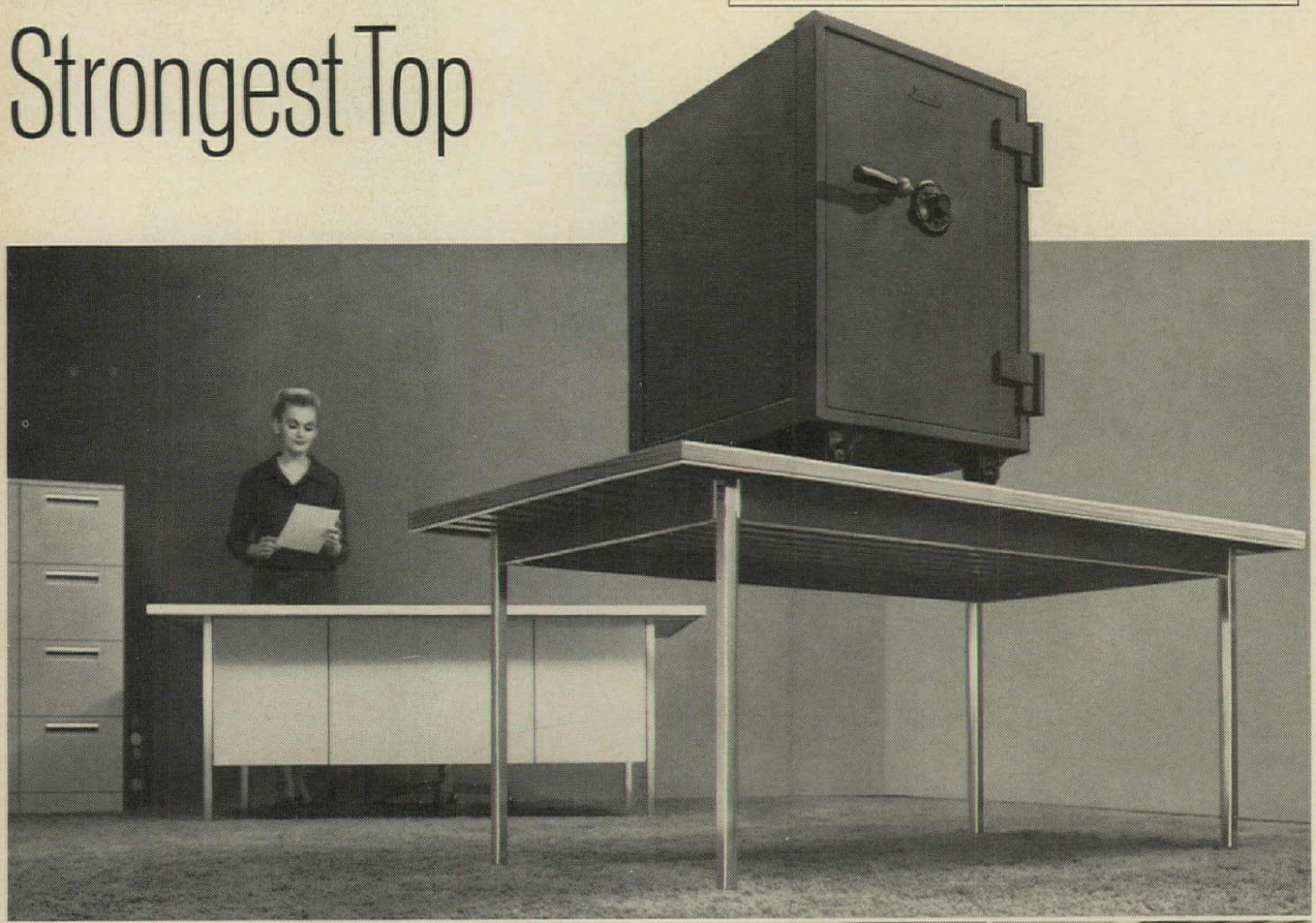
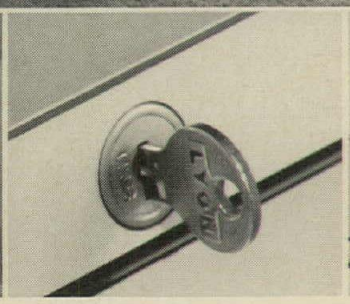
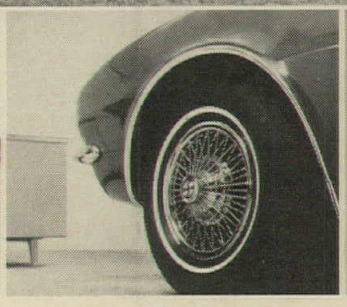






Our two-layer steel top is where Lyon advantages start! For extra strength, we make it the main structural member from which all other parts stem. But it's the quiet elegance you'll notice first about our office furniture. Back panels are double-wall type, with honeycomb fillers for complete soundproofing. Even the drawers are double walled, with quiet vinyl glides and rubber bumpers. Then there's the exclusive Lyon "lock-in-top" which controls *all* drawers. And your choice of 9 lustrous *100% acrylic* finishes that will last with the furniture. Plus truly versatile basic design, which means that you can combine components to suit your needs. For *quiet strength with flair,* see your Lyon dealer! Or, write: Lyon Metal Products, Inc., 1151 Monroe Ave., Aurora, Ill., for the name of your nearest dealer and a free color brochure.

LYON OFFICE FURNITURE

Showrooms: New York, Aurora, Los Angeles

For more data, circle 31 on inquiry card

For more data, circle 32 on inquiry card

Globe-Union builds a "jewel box".

Highlighting the superb design by Harper-Drake & Associates, Inc., Architects, of Milwaukee, is the arrangement of the facility's three buildings around a reflecting pool. This two-story executive office building is completely surrounded by the pool's expanse. Glass-walled enclosed bridges span the pool to join the various buildings.

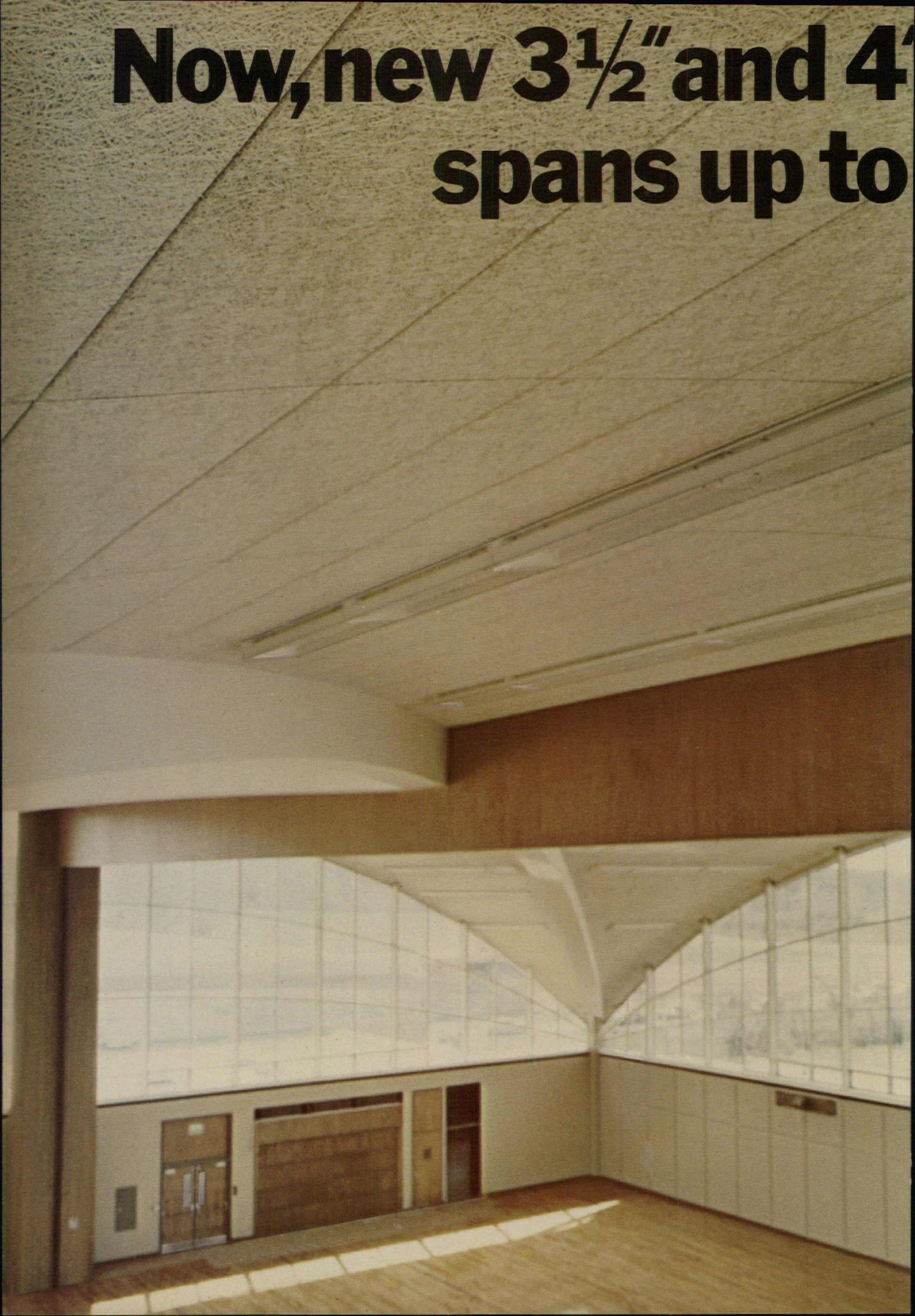
Floor-to-ceiling walls of bronze-tinted Thermopane® insulating glass give the structure a "jewel box" elegance, enhance the corporate image of this manufacturer of electronic components, batteries and other packaged power units.

Thermopane with Parallel-O-Bronze® plate glass contributes more than beauty to the buildings. It softens the brightness of the sky and pool reflections. It reduces sun heat transmission through window areas. It reduces cost of heating and air conditioning. It heightens employee morale by affording eye-restful views of the site's natural beauty.

L-O-F makes a particular kind of glass for every purpose in building design. Consult Sweet's Architectural File. Or call your L-O-F Glass Distributor or Dealer listed under "Glass" in the Yellow Pages. Libbey-Owens-Ford Company, 811 Madison Avenue, Toledo, Ohio 43624.

Libbey-Owens-Ford LOF GLASS

Now, new 3½" and 4
spans up to



tum gives you and 60".

Appearance. Tectum has a random swirl surface — a naturally rich texture that is enhanced by the new wider spans available with 3½" and 4".

Structural. Engineered to carry ultimate design load of 200# (50# with SF of 4) for the 54" and 60" spans, a generous safety margin for roof decks.

Light weight — so less dead weight. Lighter roof framing and time and materials saved — that's what Tectum gives you. Because there's less dead weight. And the tools you need for Tectum are the same you need for wood.

Insulation. K Factor .53 — improved thermal values meet requirements for many electrically heated and air-conditioned buildings.

Acoustical. 3½" and 4" Tectum is an efficient acoustical material with noise reduction coefficients up to .85.

Class 90 Rating. The first structural wood fiber deck to receive the Underwriters' Laboratories Class 90 Uplift Rating. An attachment system utilizing bulb tees, Tectum grout, factory applied felt and solid mopped asphalt makes Tectum remarkably resistant in winds to hurricane force.

Noncombustible. Tectum is rated noncombustible and is found in the Underwriters' Laboratories Building Materials List.

We've been asking you to "Think Tectum First". Now we're asking you to think a little deeper. And wider.

Think about how heavy other decks would be if they were 3½" and 4" thick. But not Tectum. It's still light. Still strong. Still has the thermal characteristics you want. (.13 for 3½" and .12 for 4"), this includes the built-up roofing.

And think about the advantages of new thicker Tectum. Spans up to 54" and 60". More freedom in joist spacings. Lower framing costs. And more of that intriguing Tectum texture showing.

So next time you're plotting big things, think first about new thicker Tectum®.

Expanding your viewpoint is a National responsibility.

Gypsum Company

Gold Bond®
TECTUM

The name Gold Bond® identifies fine building products from the National Gypsum Company. For sample and further information on Tectum, write Dept. AR-118T, Buffalo, New York 14225.

ctum form plank shapes the roof and ceiling at
ge Williams College Leisure and Creative
Center, Downers Grove, Illinois.

tects: Mittelbusher & Tourtelot, Chicago.
actor: Turner Construction Company, Chicago.
m Distributor: Roeth & Cutler, Inc., Chicago.

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For more data, circle 34 on inquiry card

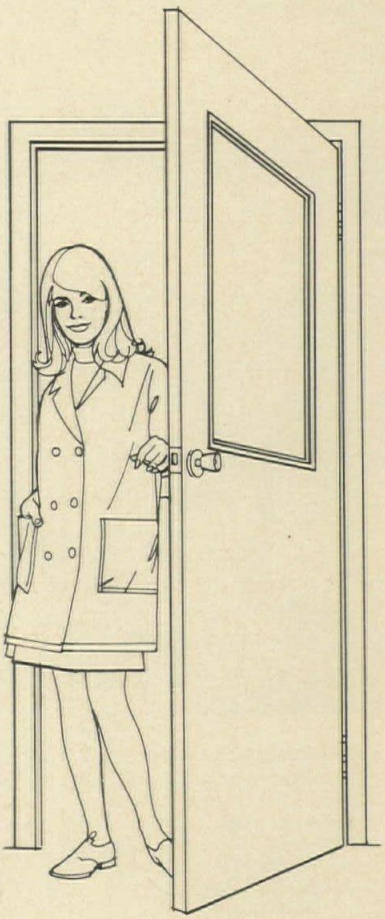

KROKER '68

With Republic Style-able Standard Doors you'll have a real entree!

No specials. Just full flush doors that we or our distributors can louvre and light the way you wish! Sturdy honeycomb inner structure, plus quickly fitted snap-on glazing beads make it easy for you to customize Republic full flush doors for *any* decor or function.

You get one-of-a-kind doors at mass production prices!

Add full choice of colors, craftsman's attention to detail and finish, plus matching standard or fit-anywhere door frames and it's probably the best door buy you can make, anywhere.



Then, for the walls that create the room behind the door — Republic's economical, easy-up Frame-A-Lite stick system! Easily fitted steel sections frame-in walls, halls, and entries fast. Assured square, too — no planing or mortising on the job. And Frame-A-Lite won't ever warp, sag, rot, or shrink!

Our representative in your area has demonstration samples of Republic style-able standard doors and the Frame-A-Lite stick system. Ask him to bring them to your office — or send the coupon. See for yourself what a great entree they'll create for you, with any customer!

REPUBLIC STEEL
MANUFACTURING DIVISION
YOUNGSTOWN, OHIO 44505

REPUBLIC STEEL CORPORATION
MANUFACTURING DIVISION
Youngstown, Ohio 44505

( ) I'd like a demonstration of your ( ) style-able standard doors ( ) Frame-A-Lite stick system. ( ) Have a representative call.

( ) Send literature and specification details on ( ) style-able standard doors ( ) standard door frames ( ) universal door frames ( ) Frame-A-Lite stick system.

Name_____ Title_____

Company_____

Address_____

City_____ State_____ Zip_____

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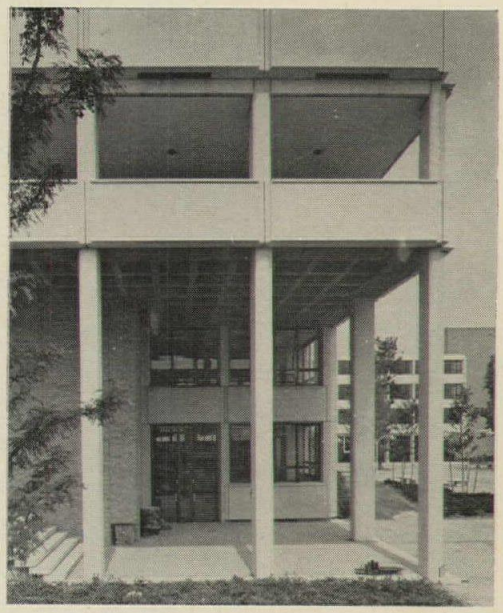
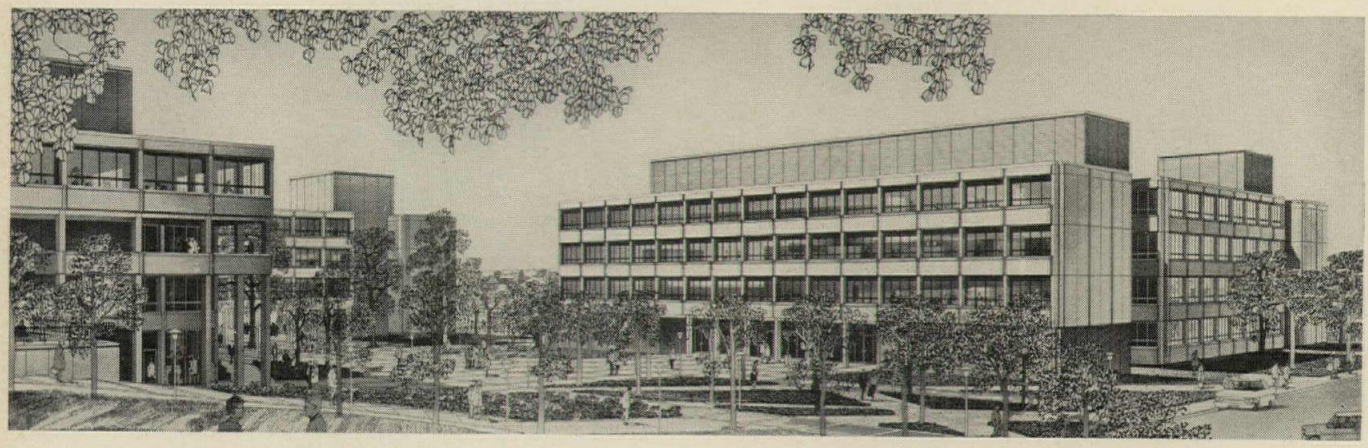
Community Queen in white.



Medusa White.



From architect's rendering to faithful reality . . . a common occurrence with Medusa White. Beautiful Queensborough Community College is a reality. Architectural precast panels are Medusa White. Write for Decorative Precast Panel Book. Medusa Portland Cement Company, P. O. Box 5668, Cleveland, Ohio 44101.

QUEENSBOROUGH COMMUNITY COLLEGE, Bayside, N. J. Architect: Holden, Yang, Raemsch & Corser and F. P. Wiedersum, New York, N. Y. Gen. Contractor: Foster Lipkins Corp., Freeport, N. Y. Precast Units: Prefabricated Concrete, Inc., Farmingdale, N. J. 07727.

MEDUSA PORTLAND CEMENT COMPANY

White and Gray Portland Cements • White, Gray and Custom Color Masonry Cements • "CR-85 Series"® ChemComp® Cement

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Solving the "people problems" in all types of buildings...

MODULAR CENTRAL SYSTEMS **LENNOX**
AIR CONDITIONING • HEATING

People comfort? Economy? Or Design freedom?

(Why choose? Lennox flexibility guards all three.)

When you plan to air condition a building – single-story or multistory – consider all the people problems as well as the building problems . . . and the Lennox solutions.

We create people comfort . . . to match the different problems of different people. In all types of buildings. For all types of people. Doing all manner of things. At the same time. In the same building. Whatever the weather.

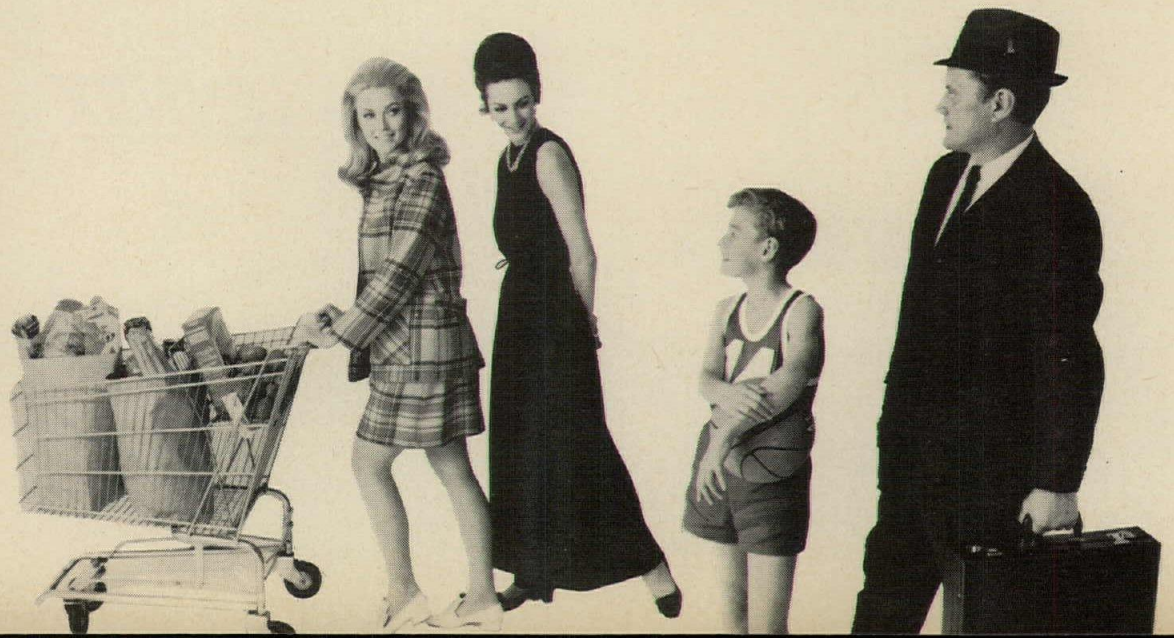
Tough problems? Sure. But Lennox modular central systems can handle them. They have the flexibility, the sophistication of control for an almost infinite variety of "micro-climates" – individual comfort zones.

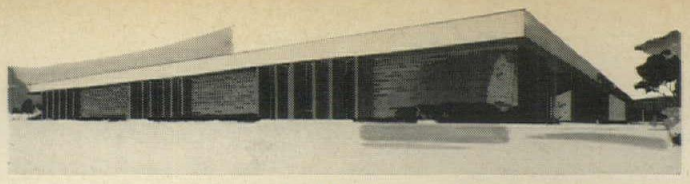
Whatever the building type, there's a Lennox system–or systems combination–to match its demand for "micro-climates."

Take the Lennox Direct Multizone System (DMS), for rooftop or multistory installations . . . up to a dozen comfort zones; or DMS with dual ducts and mixing dampers. Or take the single-zone Lennox combination system for gas, oil, or electric heating with electric cooling; or air conditioning with add-on heating; or unitary systems with a wide variety of coil-blower units.

When you plan for people comfort in any building–school, office, apartment, motel, plant, clinic, shopping center, home–plan with the "micro-climate" advantages of Lennox modular central systems.

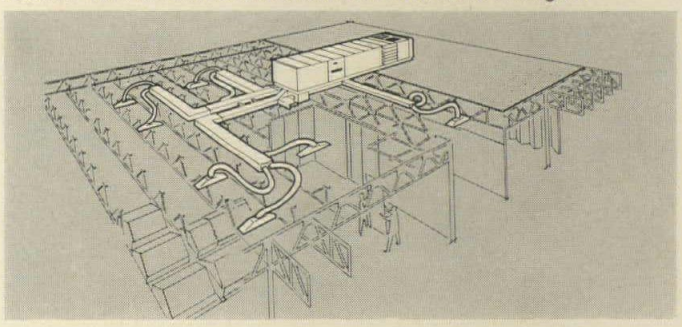
For details, see Sweet's–or write Lennox Industries Inc., 334 S. 12th Avenue, Marshalltown, Iowa 50158.

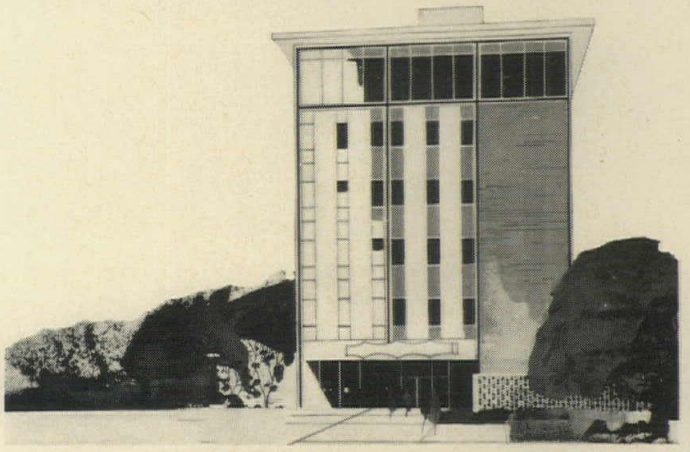




Functional new offices of midwest manufacturer, where four Lennox DMS rooftop units provide the "micro-climates" necessary to meet a variety of individual comfort requirements spread through its 24,000 sq. ft. area. Each DMS combines up to 22 tons of cooling capacity with up to 700,000 Btuh of heating (can be gas, oil, electric or hot water). Each unit can provide comfort in up to 12 of these "micro-climate" areas, and can heat some while cooling others.

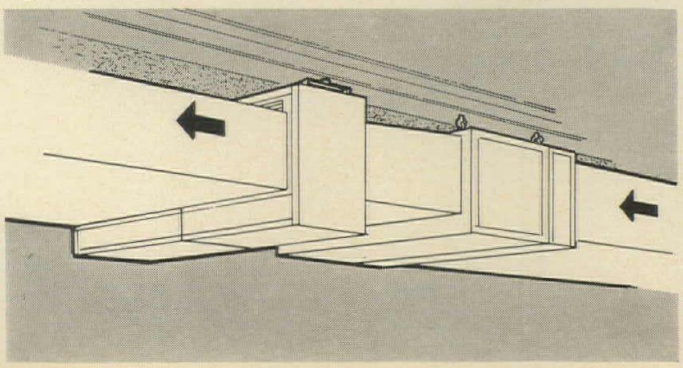
Direct Multizone units on roof serve many comfort zones through flexible duct which can be moved as zones are changed.

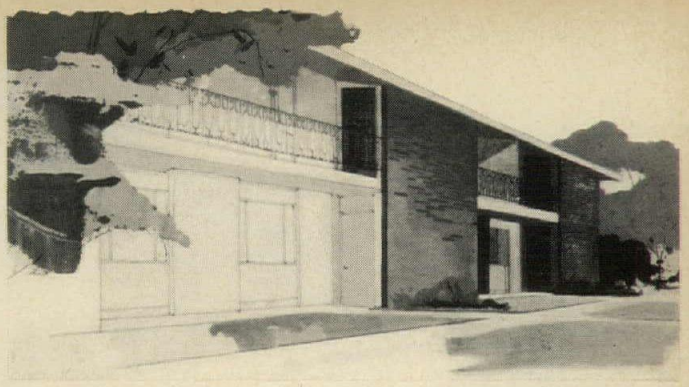




Seven story professional building has shops on lower level, offices on middle floors, restaurant on top. Lennox "micro-climates" meet the varying comfort needs. Thermostatically-controlled dampers select cool or warm air for each comfort zone. An air handler gives constant circulation in each zone. Heating / cooling source is gas duct furnaces coupled with blower-coil-filter units. Air-cooled condensing units are outdoors at grade level. Restaurant is served by two gas heat/electric cooling units on roof. POWER SAVER™ supplies fresh air and cools "free" when outdoor temperature is below 57°F.

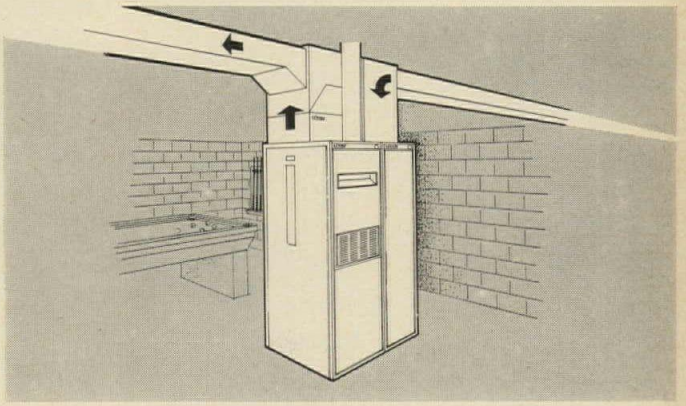
Fan-coil units coupled with duct furnaces supply heating or cooling to first six floors. Rooftop units handle cafe on top floor.

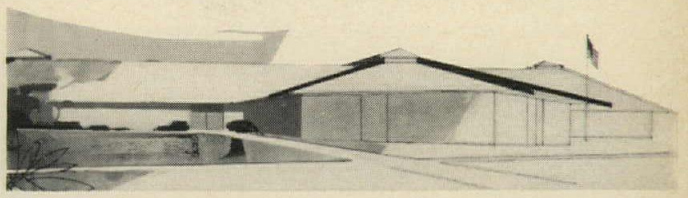




This striking, modern condominium provides individual comfort control for occupants of its apartments with Lennox remote air conditioning systems. Each apartment is cooled and heated by a gas furnace-cooling coil combination located in the basement. Condensing units are concealed on the roof. Cooling capacity for each apartment is 2½ tons; heating is 110,000 Btuh.

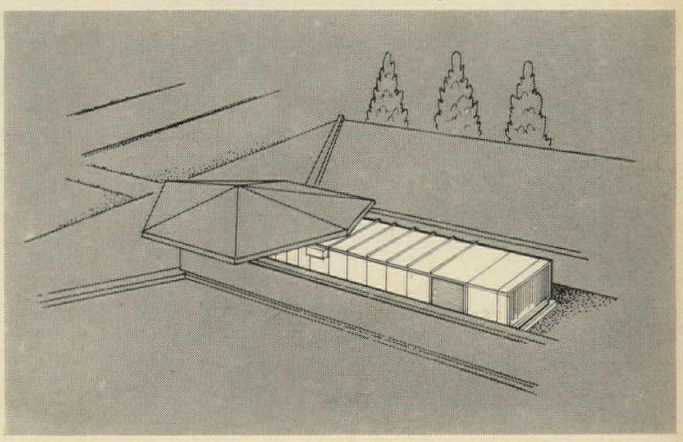
Each apartment has its own heating / cooling system for complete flexibility and tenant control.

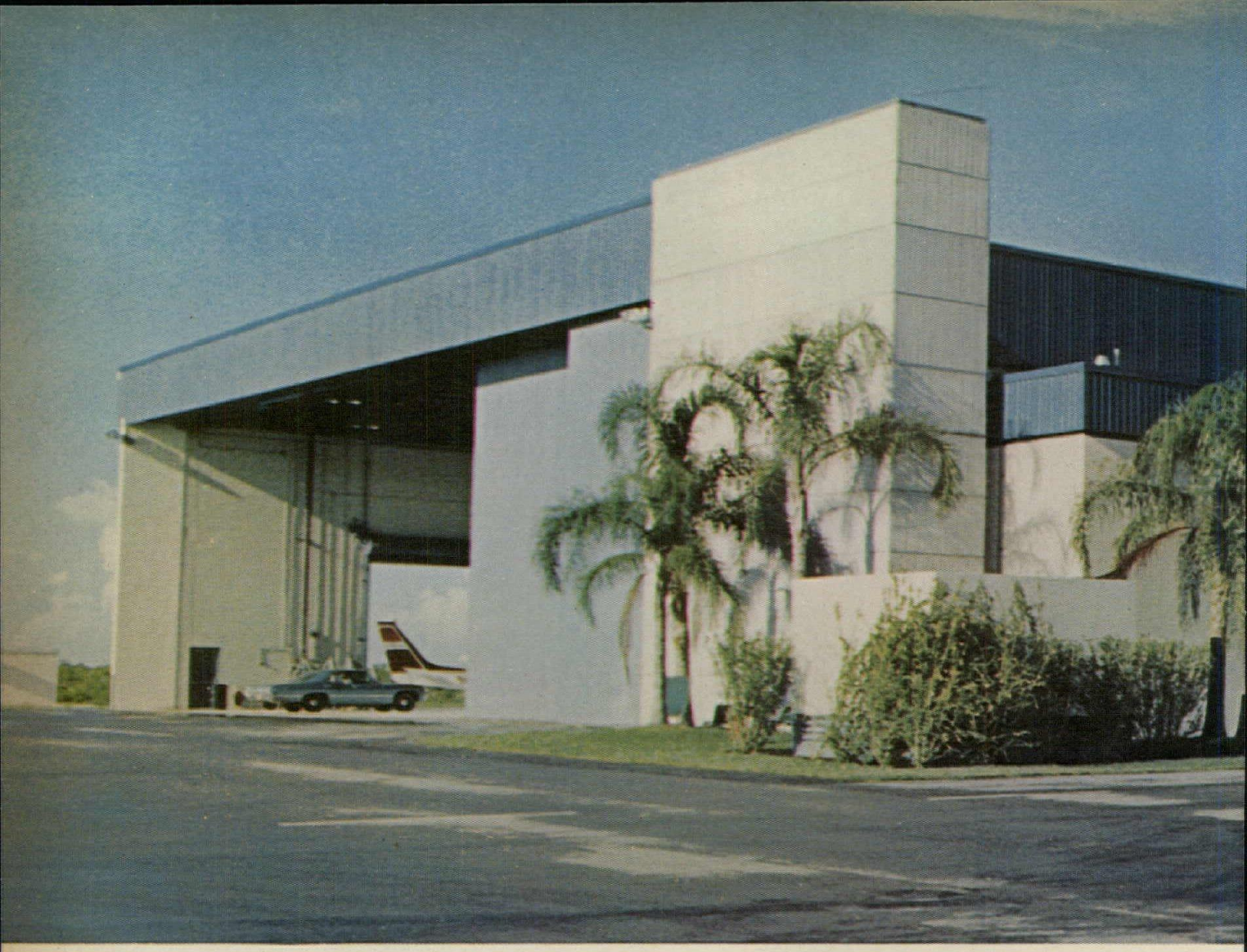




This progressive elementary school utilizes the flexibility afforded by Lennox DMS rooftop units to help promote the advanced concept of team teaching. More than 30 teaching/study areas, offices, and other rooms are heated and ventilated by the four DMS units. Individual thermostatic control in the large class areas permits varying occupancy and activity, while maintaining comfort levels. The DMS units are completely hidden from sight, do not intrude on the school's design esthetics.

Architecturally-designed enclosure conceals the DMS equipment and contributes to esthetics of the building.





John Singer Sargent, "Oyster Gatherers of Cancale".
In the collection of the Corcoran Gallery of Art.

You can obtain a regular $16.00 full color 22 by 33½ inch print for only $4.60, including postage. Send for your print today on your Company letterhead.

North American Rockwell Corp.
Rockwell Hangar Building, Homestead, Florida
Architect: Pancoast, Ferendio & Grafton, Miami, Florida
Engineers: Oboler & Clarke, Inc., Miami Beach, Florida
General Contractor: Burk Builders, Inc., Miami, Florida
Material used: F-2, Protected Metal, Color Clad Blue

Plasteel Panels: The expression of an idea

The creative process begins with an idea. Yet, without the proper execution even the greatest idea remains just that — an idea.

It takes the perfect blending of many elements to create a work of art. An artist is in reality a master blender.

John Singer Sargent had an idea. And, he knew how to combine imagination, theme, and design to create a work of art. He called it, "Oyster Gatherers of Cancale".

Architects also begin with an idea. And, like their canvas painting counterparts, they blend many elements in their dimensional masterworks.

Plasteel panels can be a major ingredient in creating distinguished architecture. The reason is quite simple. Plasteel panels never dictate an idea. They only transform an idea into its fullest physical expression.

For imaginative freedom in design, with strength and durability to last the years, expand your creative horizons with Plasteel panels.

Plasteel

PRODUCTS CORPORATION
McAdam Ave., Washington, Pa. 15301

A Subsidiary of Rosewall Industries Inc.

SEE OUR CATALOG IN SWEET'S OR WRITE FOR YOUR COPY.

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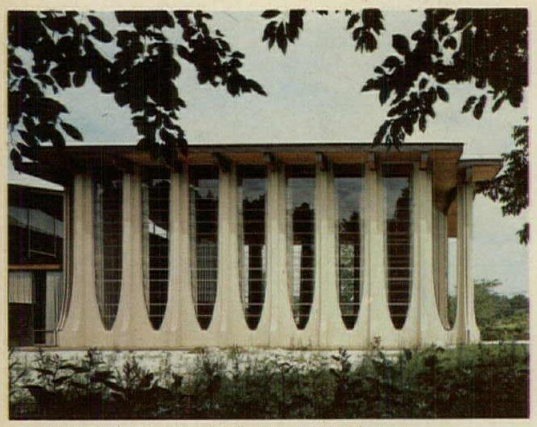


Temple Beth Shalom, Livingston, New Jersey
Architect: C. J. Wisniewski

ASG's Lustracrystal helps set the mood for worship

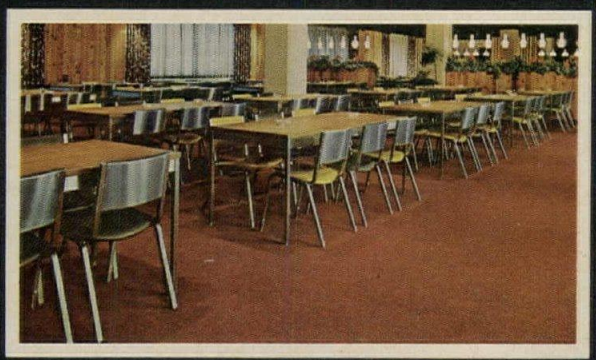
Bathed in the mellow light of afternoon, this synagogue sanctuary has an atmosphere of total serenity. It is the product of warm wood, gently curved. Of concrete columns, softly tapered. Of airy expanses of clear glass framed in soaring windows.

These graceful windows, set in slender bays, are glazed with ASG's Lustracrystal® sheet glass. Through them the congregation looks out to the temple's wooded site. And through them comes the tree-softened light that gives the sanctuary its peaceful and reflective atmosphere.

Helping create a mood is just one of the things glass by ASG can do. In the broad ASG family you'll find glasses that cut heat and glare, that protect privacy, that diffuse light, even glasses that soak up sound. You'll find an ASG glass, in fact, for just about every architectural purpose under the sun. See for yourself. Look us up in Sweet's, or write for more information. Dept. D-11, American Saint Gobain Corp., Box 929, Kingsport, Tennessee 37662.

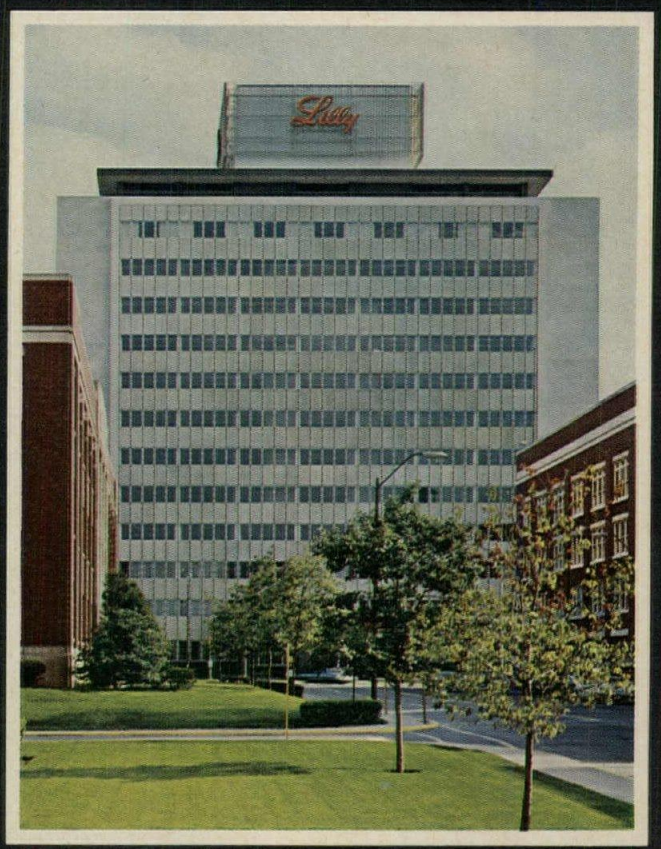
Glass by... ASG
CREATIVE IDEAS IN GLASS

The Eli Lilly employee lounge and library. Beautifully carpeted in Cabin Crafts Cimarron. Eight shades, in greens predominately, give this area a feeling of quiet serenity. A big plus is the carpet's acoustical value.



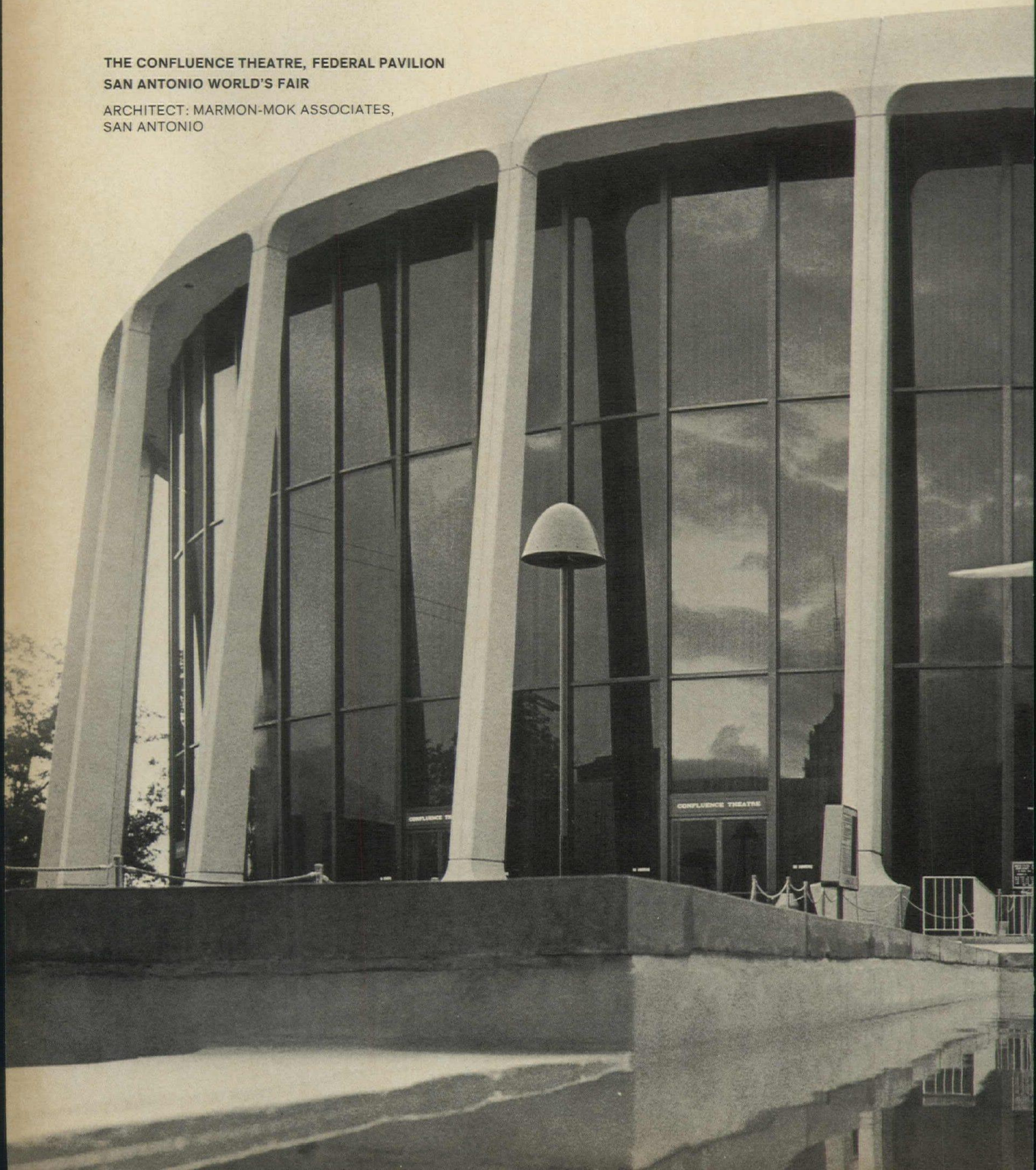
One of several employee cafeteria dining areas gets its look of understated elegance from Cabin Crafts Cimarron. A beautiful look that stays that way! Its dense construction keeps soil on the surface. Spills and stains are no problem. Cleaning is easy.

Cabin Crafts Cimarron graces this office area. Notice how Cimarron blends with a wide range of colors. Gives the whole room decorator continuity.



This is the new administration building of Eli Lilly and Company, international pharmaceutical manufacturer.

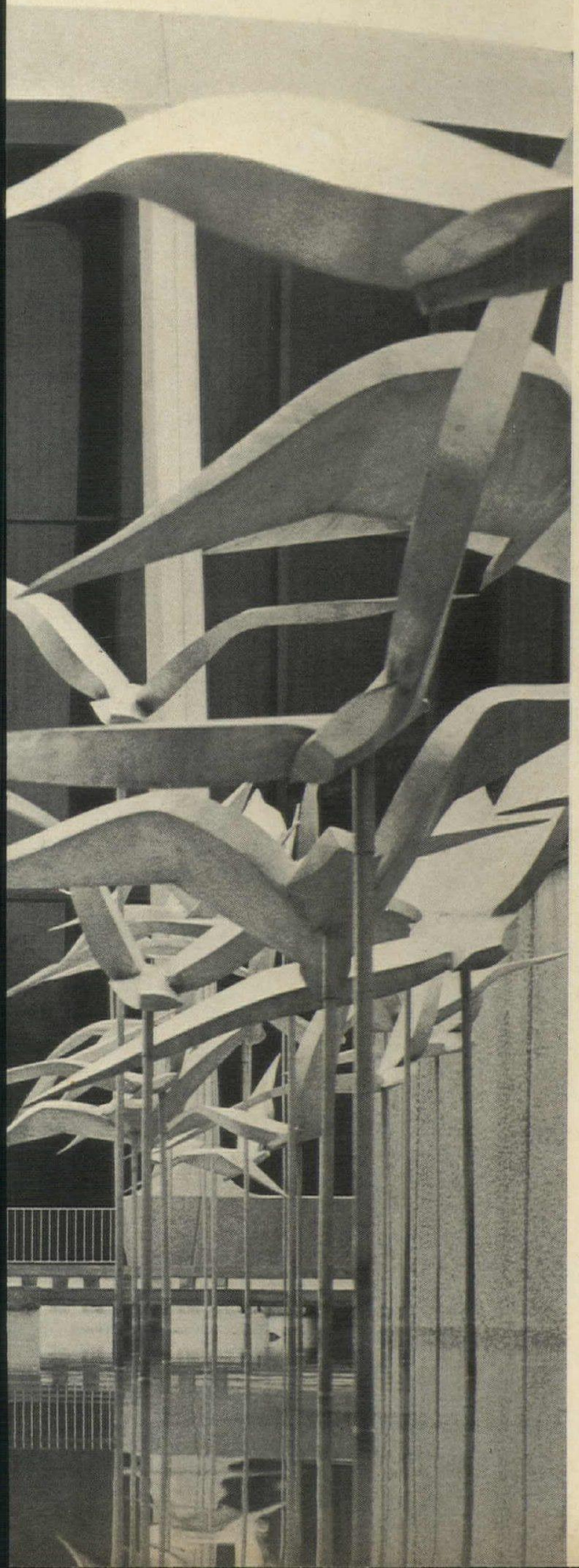
Keene focuses



THE CONFLUENCE THEATRE, FEDERAL PAVILION
SAN ANTONIO WORLD'S FAIR

ARCHITECT: MARMON-MOK ASSOCIATES,
SAN ANTONIO

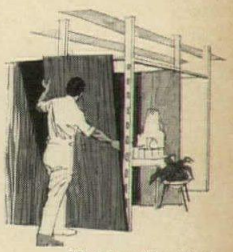
ngenuity on Speed-Steel.™



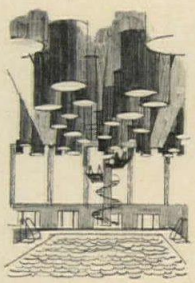
When architectural ingenuity joins with Keene's ingenuity in a race against time, the results are strikingly beautiful. The San Antonio World's Fair is a case in point. With opening day fast approaching, the benefits of Speed-Steel structural framing were confirmed as deadlines were met. Nineteen of the Fair's principal buildings were built with Speed-Steel.

Speed-Steel structural framing is lightweight and easy to handle. So it goes up fast. Yet it has one of the highest work-to-weight ratios of any building product. Architects like its versatility because it adds to design freedom.

Speed-Steel is just one example of Keene's ingenuity in building products. Keene's movable partitions are another. When the new Merchandise Mart in Charlotte, N.C., was built, architects specified Keene's Penwall system. Penwall is the only movable partition system that allows the architect to select a variety of paneling materials within the same installation. And the partitions are really movable since they're constantly being shifted to meet the changing requirements of exhibitors.

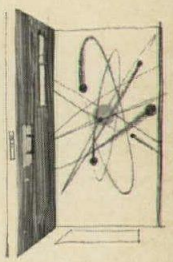


Merchandise Mart, Charlotte, N.C. Keene movable partitions selected for flexibility and design variety.



Simon Fraser University, Vancouver, B. C. Keene Sonosorbers keep things quiet.

If you've ever tried to make yourself heard around a huge indoor swimming pool, you'll appreciate Keene ingenuity at the Simon Fraser University gym. To solve the acoustics problems, Keene Sonosorbers were hung from the ceiling. Not only do they absorb extraneous noise, but they add a unique, aesthetically pleasing design.



Niagara Nuclear Power Plant, Lake Ontario, N.Y. Keene fire doors serve as effective and attractive barriers to retard fire and heat from power generation equipment.

Keene is pretty ingenious in not-so-visible places, too. As in a nuclear power plant on Lake Ontario. Keene fire doors separate heat producing equipment from operations personnel to maintain safe, comfortable working conditions.

Greater use is being made of Keene architectural mesh. In the New York Life building, Keene mesh was selected for its beauty and because it permits free air flow and diffuses natural light.

You'll be hearing more about Keene ingenuity on the job. In the meantime, send for our catalog on Speed-Steel and other Keene building products. Write to: Dept. A-11, Keene Penn Metal, Parkersburg, W. Va. 26101.

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CORPORATION

We've just begun to grow.

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CELOTEX GLAZED TOTAL CERAMIC ACOUSTICAL PANELS are completely incombustible. Remain unharmed even when directly exposed to high-temperature flame. Meet UL requirements for 2-hour time-rated assembly and have 0-0-0 Fire Hazard Classification: Zero Flame Spread; Zero Fuel Contributed; Zero Smoke Developed. Contribute zero BTU during exposure to fire.

Celotex research has forged history's most durable material into the world's most modern ceiling.

Glazed total ceramic acoustical ceilings.

Not merely painted or ceramic coated mineral fiber, new Celotex Total Ceramic Acoustical Panels represent an entirely new technical achievement — a glazed, kiln-fired product that's *all* ceramic, through and through.

The striking appearance of a Celotex Ceramic Ceiling adds permanent distinction to any fine interior, whether office, institutional or technical. These incredibly durable panels bring acoustical control even to swimming pools, clean rooms, saunas and other "impossible" areas.

High acoustical efficiency — NRC .65 — is achieved without conventional drilling or fissuring. Complete cleanability, too — panels may be subjected to repeated applications of acids and disinfectants.

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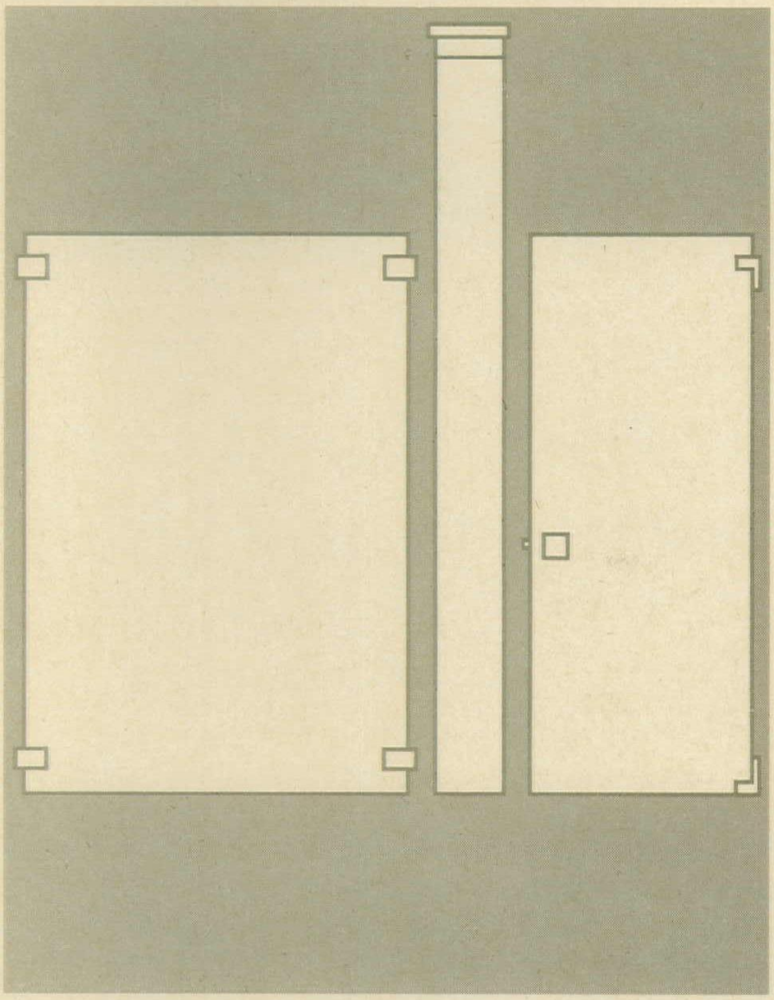
The unique features of Mills Compartments are: MILLS exclusive galvanized bonderized steel, MILLS patented interlock construction, MILLS foolproof emergency lift release latch, MILLS quality design hardware, MILLS patented true gravity hinges, MILLS durable baked acrylic finish. The unique features of Mills Compartments are: MILLS exclusive galvanized bonderized steel, MILLS patented interlock construction, MILLS foolproof emergency lift release latch, MILLS quality design hardware, MILLS patented true gravity hinges, MILLS durable baked acrylic finish. The unique features of Mills Compartments are: MILLS exclusive galvanized bonderized steel, MILLS patented interlock construction, MILLS foolproof emergency lift release latch, MILLS quality design hardware, MILLS patented true gravity hinges, MILLS durable baked acrylic finish. The unique features of Mills Compartments are: MILLS exclusive galvanized bonderized steel, MILLS patented interlock construction, MILLS foolproof emergency lift release



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Our Rocky Point carpet. It can stand up to any kid in school.

A.C.E. ALLIED CHEMICAL ENGINEERED NYLON

We learned one thing quick about making carpets for schools. You have to be firm with kids.

Because when you total up all the slop and goo (and even the normal wear and tear), you find that kids can be a pretty formidable enemy of clean, fresh carpeting.

We started the battle with nylon. Specially engineered cross-section nylon from Allied Chemical.

It's the same material used in flak vests and combat uniforms. Fabrics just don't come any tougher.

Another advantage of nylon is that it resists damage from oil and many other chemicals. It also resists crushing and abrasion. But while nylon itself is hard as nails, our Rocky Point carpet is nice and soft.

A miracle? No, just a common sense combination of nylon and our own modest genius.

We did work hard to achieve it, though, because softness is so important to soundproofing. (And if you've ever stood in a hard-surface corridor during recess and heard that thundering clackety-clack, you know what soundproofing means.)

Rocky Point carpeting comes with the A.C.E. label guaranteeing surface wear for three years.

And it comes with this assurance from us: when we make a carpet for kids, we don't kid around.

WALTER CARPET MILLS

A Component of Ludlow Corporation
P.O. Box 2377, City of Industry, California 91746

The right carpets for the right people.

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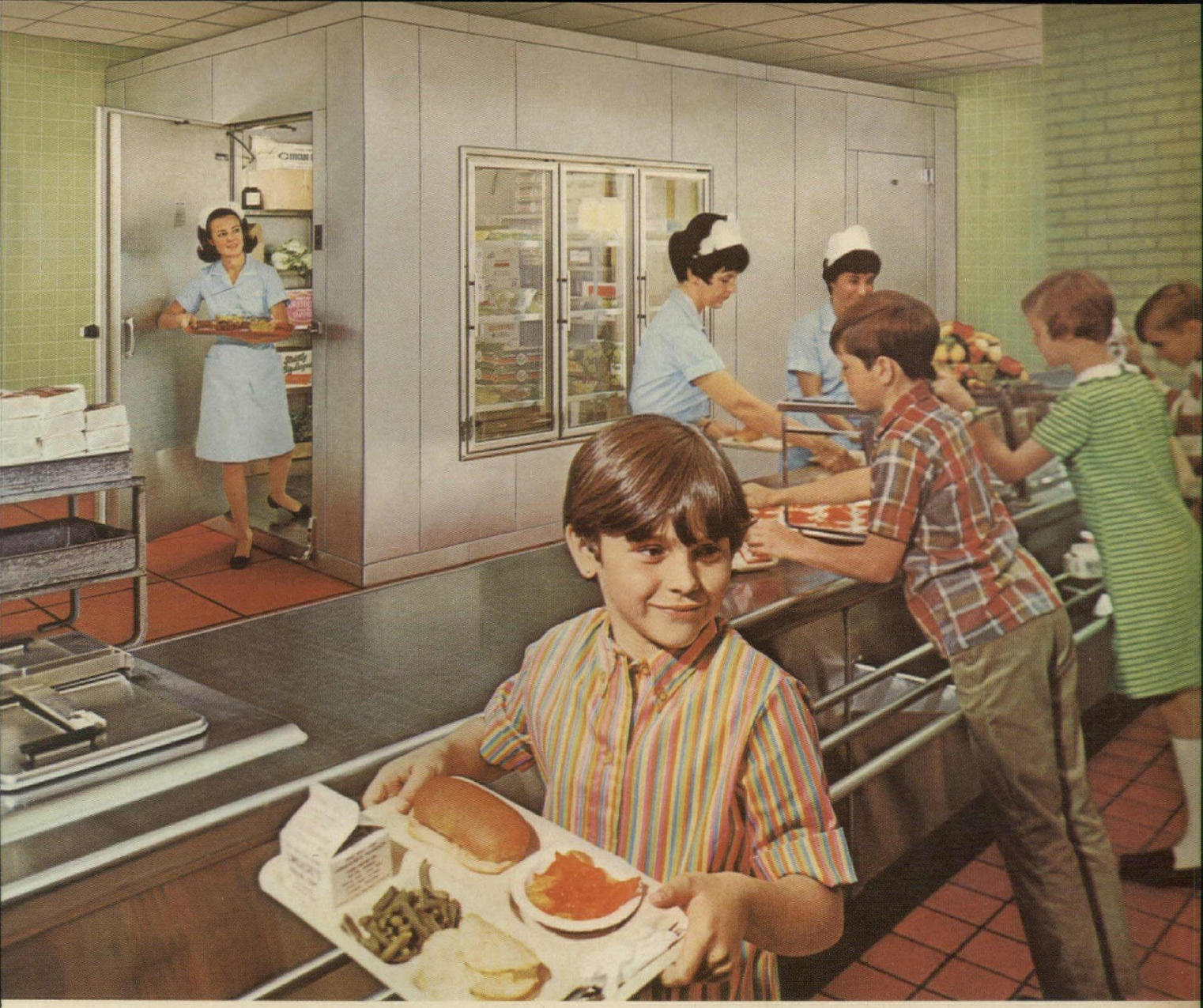

Bally Walk-Ins help meet rising standards of kitchen cleanliness.

Kitchen cleanliness is a fine old American custom. This admirable tradition is being carried on today in mass feeding kitchens where the level of spic and span neatness is higher than ever before. It is a wholesome kitchen practice which pleases and attracts diners while meeting the rigid sanitation requirements now imposed by health authorities everywhere.

Efficient food handling that utilizes proper refrigeration is a requisite for kitchen cleanliness. And the big refrigeration job everywhere is being done by Walk-In Coolers and Walk-In Freezers which perform their critical function 24 hours each day. When properly sized and located, Walk-Ins provide the space needed to preserve and protect prepared and uncooked meats, dairy products, fruits and vegetables, and frozen foods. Walk-Ins are a constant guardian against spoilage, waste, unfresh foods.

The modern emphasis on kitchen sanitation exerted an important influence in the design of Bally prefab Walk-In Coolers and Freezers. They can be assembled in any size or shape from standard modular panels with interiors and exteriors clad in gleaming stainless steel, attractive lifetime aluminum, or rugged galvanized steel. Their metal surfaces are surgically clean . . . free of pores, crevices or joints where food scraps or juices can accumulate. With Bally Walk-Ins there is no need to worry about unpleasant odors, insects and vermin.

Cleanliness is but one important Bally Walk-In characteristic for mass feeding operators. We will gladly tell you of the many other fine design features which will be of equal benefit. Write Bally Case and Cooler, Inc., Bally, Pa. 19503, for free 32-page catalog and sample of urethane wall insulation.

There's an evolution in the kitchen

Bally®

Address all correspondence to Dept. AR-11.

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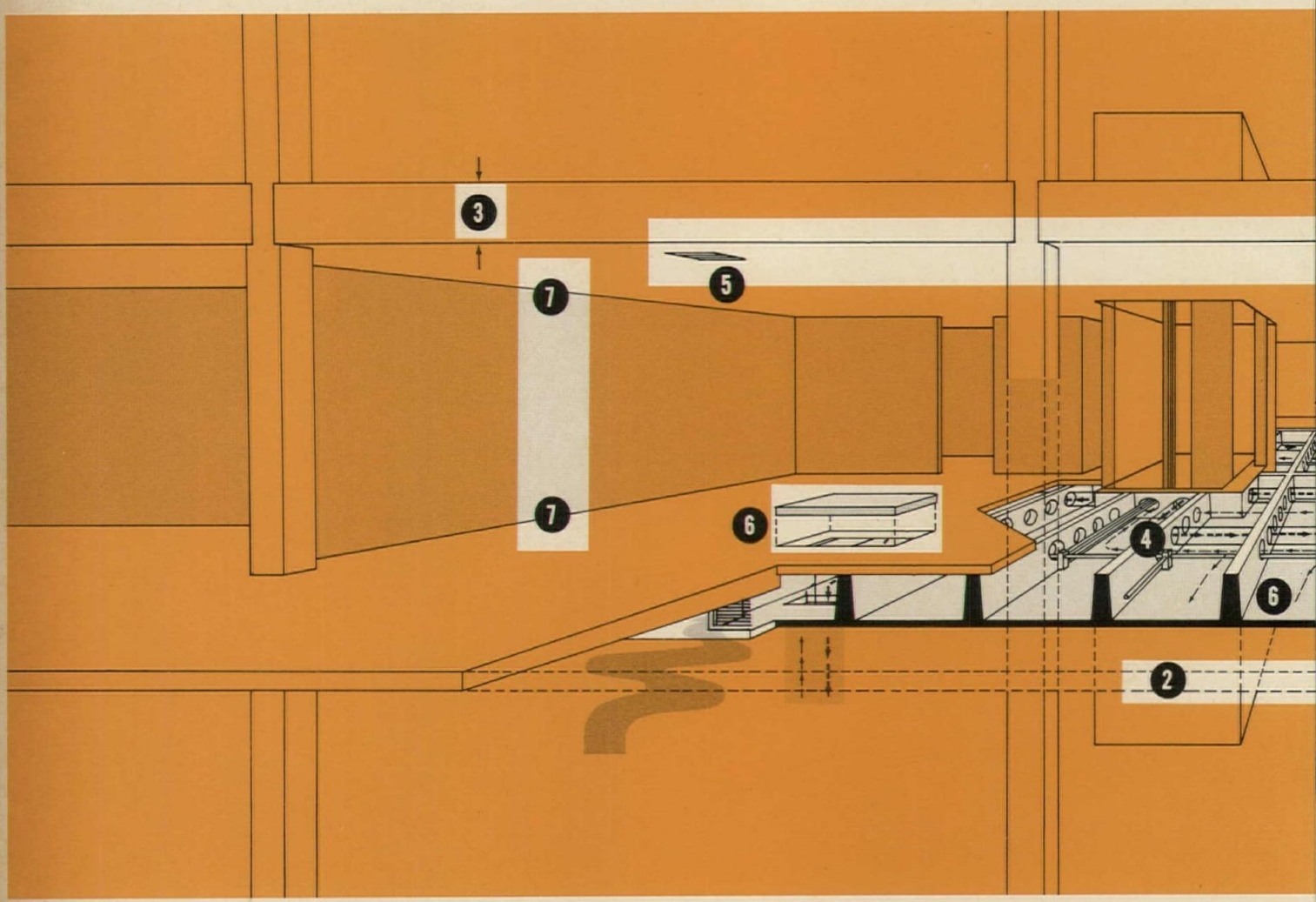
PCA introduces design in a new concrete building system.

Triposite



1 Spanning members, columns, shear walls and stairs are precast.

2 Beams, composite acting floor slabs and shear wall connections are cast-in-place, tying all members into a monolithic structure.

3 Total depth of the floor/ceiling system is reduced. No suspended ceiling. No topping slab needed as surface leveling.

4 All mechanical and electrical work is done in the floor. Avoids expensive overhead work and hangers. No forming or temporary scaffolding is required.

Cooperation between precast plant and HVAC, electrical, mechanical and communications contractors result in substantial savings. 5 Grills can be easily cast into spanning members. By casting grills in exterior beams, plenum can be used for fresh air supply and exhaust. Depressions for bathrooms can be made without restricting span length.

freedom

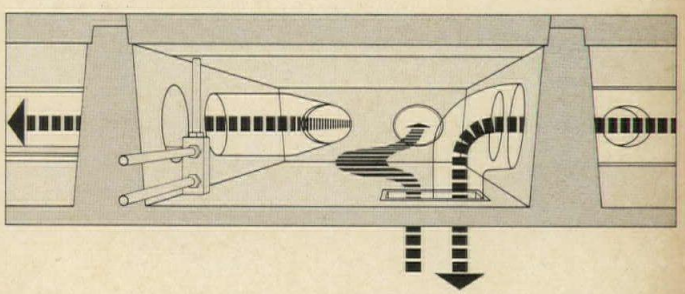
Tri|posite was first conceived by the Portland Cement Association as an industry answer to the needs of educational buildings. Yet the system is applicable to almost all buildings.

Other systems tend to force architects to design buildings in rigid patterns.

Tri|posite does not.

It accommodates to almost any exterior configuration. Spans up to 35 feet with 18-inch depth. There is complete freedom in choosing exterior material. The cast-in-place beams lend themselves easily to an exposed frame. Beams can hold inserts, shelf angles and can receive any architectural treatment.

A composite system of (A) structure, (B) HVAC and (C) partition is the key to Tri|posite, hence the name.



The open horizontal zone makes compatibility possible. The zone can accommodate other subsystems such as plumbing, electrical and communications.

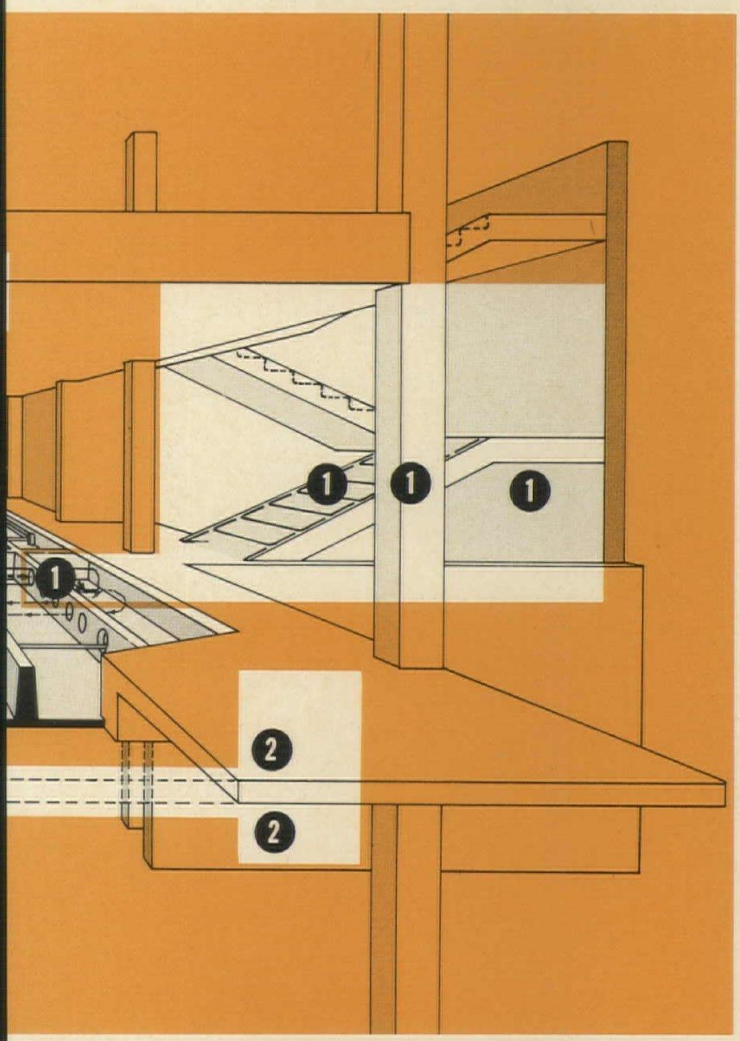
The credentials of Tri|posite are impressive.

Hellmuth, Obata and Kassabaum, St. Louis, were consultants for the detailed design work for the system. It is the structural system to be used for URBS (University Residential Building System) by the University of California.

Interpace Corp. of Pomona, Calif., is the bidder of the system for the URBS project. They (or any other reputable precast firm) can economically produce the system to your specs.

Tri|posite provides a fast, flexible, economical solution to almost any structural problem. Yet it doesn't infringe on your freedom to design.

For complete information, mail the coupon.



6 **Open horizontal zone for HVAC, mechanical, electrical and communication services. Plenum is inside structural spanning system. Bottom and stems are precast. Top is cast-in-place and acts as compression member and diaphragm. Precast slabs over plenum sections for service access.**

7 **Partitions are fastened to concrete top and bottom. Fire-rated demountable partitions attach directly to structure. No complicated detailing as with suspended ceilings to provide acoustic barrier.**

PCA *An organization of cement manufacturers to improve and extend the uses of portland cement and concrete.*

Portland Cement Association, Dept. 11-8
Old Orchard Road, Skokie, Illinois 60076

Please send me information about your new Tri|posite building system. (U.S. and Canada only)

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Simon's Rock School,
Great Barrington, Massachusetts
Architects: Morehouse, Chesley and Thomas,
Lexington, Mass.

How Simon's Rock School got its stock Andersen Windows.

Once there was an architect who was commissioned to design a one-of-a-kind campus which was to be the home of a whole new concept in secondary education. So he carefully studied the future needs of the school, the wooded, 350-acre site, the beautiful Berkshires in the background, and decided to frame the views with stock Andersen Windows.

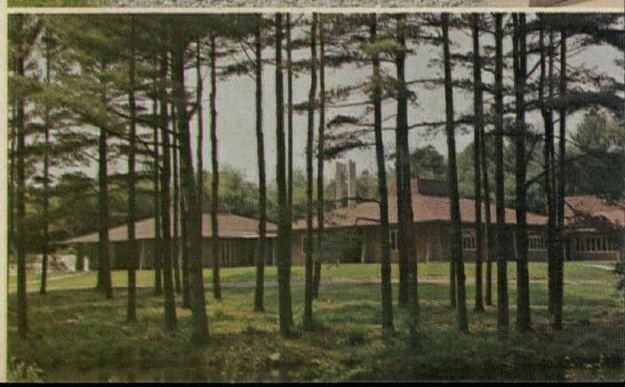
Why *stock* windows in such a unique design? With **six types and hundreds of sizes,** our architect had complete design freedom. He knew he could get them fast from **local warehouse stock** to meet his construction schedules. (He liked the **local service backup,** too.)

Then, of course, he wanted the natural look and warmth of the best wood windows so as to avoid condensation problems and insulate against the frosty New England falls and winters. He knew that the welded, insulating glass and close Andersen tolerances might mean as much as a **15% fuel saving** in some of the buildings.

Finally, his experience told him the Andersen windows would **operate beautifully** for ever after.

And that's the story of how—and why—Simon's Rock School got its Andersen windows. May we help supply the happy ending in your next design?

For more information, see Sweet's Architectural or Light Construction File. Or, call your nearest Andersen Distributor.



Andersen Windowalls™

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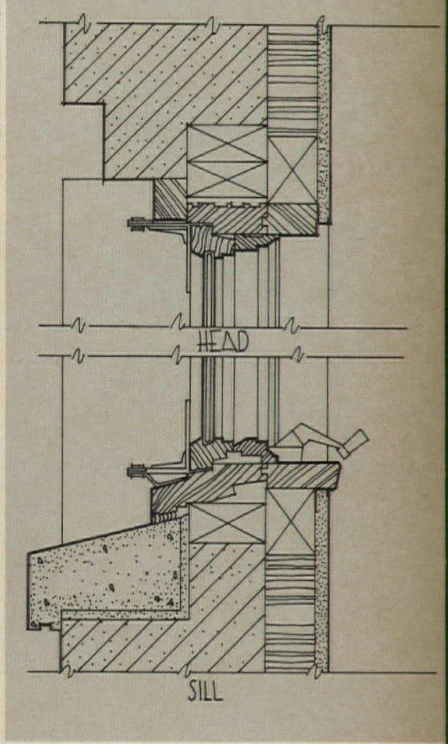
Window Beauty is Andersen


HEAD
SILL

ON THE CALENDAR

NOVEMBER

19-21 National Fire Protection Association Fall Conference—Sheraton-Schroeder Hotel, Milwaukee.
20-22 Aluminum Association annual meeting—New York Hilton, New York.
29-30 Joint South Dakota Chapter and Building Chapter, Associated General Contractors of South Dakota conference—Sioux Falls, South Dakota.

OFFICE NOTES

OFFICES OPENED

Donald Kenneth Busch, A.I.A. has opened offices for the practice of architecture and space planning at 150 Broadway, New York City.

Eckbo, Dean, Austin & Williams has opened a Honolulu office at 1649 Kapiolani Boulevard, Suite 22.

Martin J. Goldman, P.E. has opened consulting engineering offices at 101 Park Avenue, New York City.

Peter Hendrickson, Architect, has opened an office at 261 North Main Street, Southampton, New York.

Frederick P. Humberstone, A.I.A., has opened an architectural office at 5580 Park Boulevard, Pinellas Park, Florida.

Robert A. Little & Associates has opened an office for the practice of architecture and urban design at 12025 Shaker Boulevard, Cleveland.

Naramore, Bain, Brady, and Johanson, Seattle-based architectural firm, has recently opened a Honolulu office.

Donald D. Snow, Architect, has opened a new office at 243 East Home Street, Long Beach, California.

James G. Thompson, A.I.A. recently opened an office for the practice of architecture, located at 500 Times Annex Building, 63 South Fourth Street, Minneapolis, Minnesota.

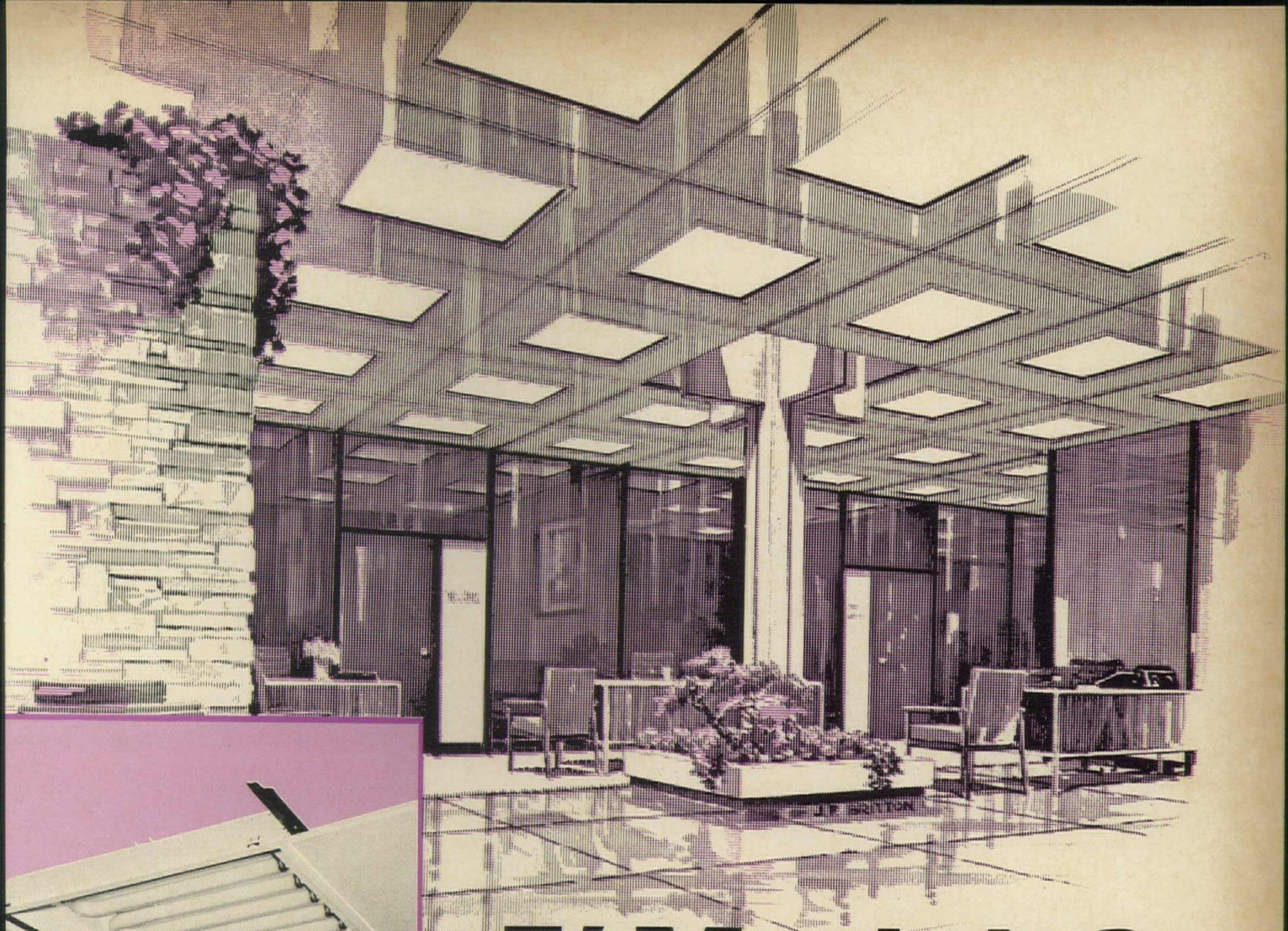
NEW FIRMS, FIRM CHANGES

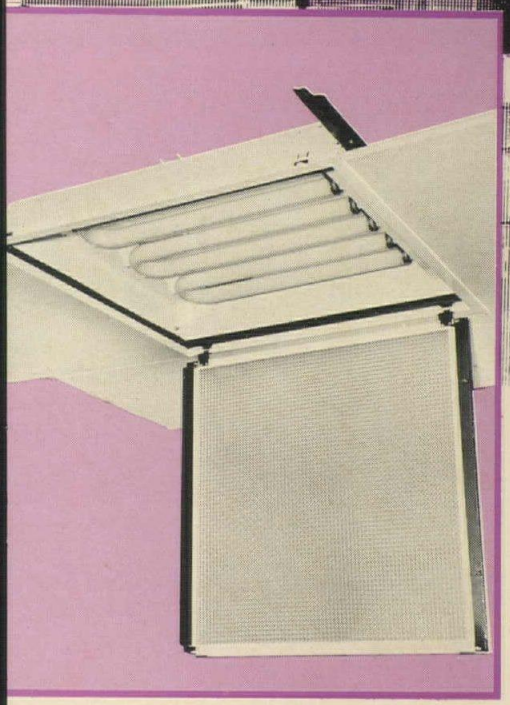
Kurt M. Anderson, A.I.A. has been made a partner of the Princeton, New Jersey, architectural and engineering firm of **Collins, Uhl & Hoisington.**

Alvaro Cardenas and Francisco Baracaldo have announced the formation of their architectural partnership. The firm, known as Arquitectos Consultores Asociados Ltda., is located in Bogota, Columbia.

Izumi Arnott and Sugiyama announces the continuation of its practice under the new name of **Gordon R. Arnott and Associates, Architects, Engineers,**

continued on page 93





hrist recessed troffers for the 40 Watt U-shaped
p feature a unique unitized electrical assembly.
asts and sockets are lined up to a common hous-
which can be hinged and removed for easy instal-
on and maintenance. Positive supporting brackets
d the curved end of the lamp so that positive
tact is made with the telescopic lampholders.

5′ Module?

Yes...with the New 30-30 from Sechrist, featuring 40 watt U shaped lamps

What could relate better to a 60″ square than a 30″ square? The 40 Watt Lamp has been bent and now fits into a 2′—or better yet, 30″ package. No longer is the 4′ lighting fixture length the only economically feasible one for office construction. Sechrist realizes that the U-shaped lamp offers you wholly new dimensions in design flexibility. We are anxious to work with you in selecting the proper-sized square fixture for your next job. Our complete testing facilities enable us to work with your engineers to assure satisfactory air supply, air return, and lighting performance. See your nearest Sechrist representative or give us a call.

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Tough terrazzo is still good-looking after 3,000,000 shoppers.

(Shell Epon® resin has what it takes.)

Epoxy thin-set terrazzo floors based on Epon resin pass the test of wear and time. The epoxy terrazzo above was installed in the mall of a shopping center over 3 years ago. Three million customers later, after 3 years of foot traffic, scrubbings, moisture and temperature changes, it still looks and performs as good as new.

Terrazzo based on Shell Epon resin absorbs impact, vibration and noise—and can be made flexible enough to apply without divider strips. Its ¼-inch thickness limits weight to 3 to 4 lb./sq. ft., reducing load-support requirements compared to portland-cement terrazzo.

Installation is fast and simple over conventional subfloor materials. The floor cures quickly, and can be ground in 16 to 20 hours.

The mall of Rascoe-Tempo Stores, Fair Oaks, California, has an epoxy terrazzo floor based on Shell Epon resin. It has withstood over 3,000,000 shoppers since installation in December 1964.

Shell supplies Epon resins to companies who make terrazzo flooring materials. *Write on your letterhead* if you'd like one of these companies to get in touch with you—and show you the many colors available, with either marble or granite chips. Be sure to describe your flooring projects.

Shell Chemical Co.
Plastics & Resins Div.
113 West 52nd Street
New York, N.Y. 10019

SHELL

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For the first quarter, "a small advance,"
by spring, "the stimulative effects of easy money will begin to be felt"
and at mid-1969, "the economy is slated to get a powerful boost
. . . and construction can be expected to advance vigorously."

F. W. Dodge construction outlook: 9 per cent more in 1969

Prepared by the Economics Department
McGraw-Hill Information Systems Company (formerly F. W. Dodge Company)
George A. Christie, Chief Economist

Highlights of 1968

Even before 1968 began, the construction industry had recovered from the "credit crunch," the main source of its problems during the two previous years. A strong flow of contracts for new projects in the closing months of 1967 boosted the total of construction in progress above the $80-billion rate at the start of the current year, and a continued high level of contracting kept it there. It was clear early in 1968 that the year's final totals would exceed the suppressed values of 1966 and 1967 by a wide margin.

This improvement in construction activity during the past year triggered a strong increase in the demand for building materials. As contracts were translated into on-site construction, shipments of building products rose by more than 15 per cent between summer 1967 and spring 1968.

At mid-year, the construction market began to reach its full potential for the first time in several years. The combined strength of current and postponed needs for housing, commercial buildings, and other facilities sent the Dodge Index soaring into the 190's in the third quarter of 1968. (Last year's average was 153.) Even if the rate of contracting eases back from this extraordinary pace before year-end—as it probably will—it's nevertheless clear that the character of the construction market has changed.

Several important events took place in 1968 that are breaking the grip of old constraints on construction growth. Passage of the long-overdue surtax and budget cut program was a giant step toward a better balance of monetary and fiscal policies that will lead to easier credit in 1969. Other 1968 legislation will shape the future of two major segments of the construction industry—housing and transportation.

These events, like all important changes, are bound to bring short-term problems as well as longer-term benefits. Their impact on 1969's construction outlook is discussed in the pages that follow.

Economic environment/1968-69

The year 1968 has been a curious blend of the past and the future. The months up to June 30 were like an extension of 1967; the period that began with July 1 was, in a way, the start of 1969. What divided these parts at mid-year was a distinct change in the policies by which our economy is guided.

For some two-and-a-half years we were trying to operate a war-inflated economy on a business-as-usual basis. It didn't work. The ever-increasing strain showed up first as a crisis in the credit markets and then as a runaway of prices in general. By the beginning of 1968, it was all too clear that reliance on the tight money policies of the previous two years had failed to contain the pressures of excessive demand. When the switch finally was made at mid-year to more general fiscal restraint, prices were rising at an annual rate of five per cent.

The new economic program that began on July 1 is, in no uncertain terms, a deliberate attempt to slow down the price spiral by the direct expedient of eliminating some large blocks of spending power. The surtax will take $15 billion out of private (consumer and business) income. The fiscal 1969 budget cuts that were linked to the tax program will eliminate another $6 billion or more of planned public spending. This removal of over $20 billion of demand over the next twelve months is designed to cause a general dampening of economic activity.

It's not hard to see what direction the economy will be taking under these new anti-inflationary measures. Much less predictable is their timing and the *degree* of restraint they will cause. Most likely, the sequence will go something like this:

The heaviest impact on economic activity is apt to be felt toward the close of 1968 and during the early months of 1969. Even though the tax surcharge cut immediately into incomes, momentum carried the spending boom well into 1968's third quarter. At this stage, re-

ARCHITECTURAL BUSINESS THIS MONTH

straint was mostly in *anticipation* of future weakening of demand, showing up in the form of inventory adjustments and stretched-out capital spending. Even so, it was enough to reduce the gain of the Gross National Product from $20 billion in the first and second quarters to about $18 billion in the third. By the fourth quarter, when the slowdown really takes hold, GNP growth will ease back to something between $5 and $10 billion. The opening quarter of 1969 will show a similarly small advance.

By spring of 1969, however, the stimulative effects of easier money will begin to be felt. Once the restraints of taxation and government spending cuts begin to steady the price level, we can expect a solid improvement in credit markets. In 1969, monetary policy will be used *positively* as a means of keeping the slowdown from snowballing—just the reverse of its recent role.

At mid-1969, the economy is slated to get a powerful boost. If the tax surcharge is permitted to expire according to plan, consumers and business firms will suddenly find themselves richer by well over $10 billion. Also, at that time the Federal government will be entering a new fiscal year, and Congress is likely to be more generous with the 1970 budget requests.

Vietnam is the one big question mark that hangs over 1969. Despite the explicit wording of the *Revenue and Expenditure Control Act of 1968,* it is highly unlikely that the surtax will be permitted to expire next June 30 *unless the war is concluded beforehand.* How and when these issues are worked out will greatly influence the economy in the second half of next year.

If everything goes according to plan, however, 1969's pattern of economic activity will turn out somewhat the reverse of 1968's—a restrained first half; a vigorously expanding second half. But that's where the similarity ends. By the latter part of 1969 we'll be noticing these important differences:

- With inflation under better control, more of next year's growth will be realized in goods and services instead of price increases.
- With balance restored between fiscal and monetary policies, the credit-starved housing market will be getting a lot more nourishment.
- With less of our resources being siphoned off for military purposes, there'll be more available to meet our urgent domestic needs.

An analysis of how next year's economic environment will affect each of the major construction markets is given in the following columns.

1969 business construction demand

In the closing months of 1968, the trends of two key business construction markets were headed in opposite directions. While commercial building contracts were piling up a large lead over last year's total, industrial building was lagging slightly behind.

As a result of their big buildup during the middle sixties, most manufacturers still are holding a good bit more unused capacity than they normally like to keep in reserve. Compared with a desired operating rate of about 92 per cent, the average firm was utilizing only 84 per cent of capacity in the third quarter of 1968.

The likelihood is pretty slim that the rate of industrial production will soon advance by the 10 per cent or more needed to take up current slack. With economic activity being held in check between now and next summer, industry will do well to significantly increase its rate of output at all. Thus, with only modest gains in physical output expected through the first half of 1969, and with the surtax cutting into the profitability of that output, there's little incentive to add to already excessive productive capacity.

There is, however, good reason for industry to upgrade its existing facilities now. Firms normally allocate half or more of their investment outlays to replacement and modernization. Faced with today's sharply rising costs, manufacturers will look to means of boosting productivity by replacing technologically outmoded equipment and plants.

Outside the manufacturing sector, business construction was clearly responding to a need for additional capacity in 1968. The electrical utilities have been engaged in a huge expansion program for the past three years, and 1968's growth was by far the biggest yet. Commercial building was another expansive force in the 1968 business construction market.

After a decline in 1967, store building recovered its former peak level in the past year. Office building showed an even more promising trend, extending the strong wave of expansion that has been underway since the start of 1967. Together, the recovery of store building and the further growth of office construction combined to produce a 14 per cent gain in the contract value of 1968 commercial building construction.

The slow, then faster, pattern of general business activity expected for 1969 implies that most business-related construction markets are headed for a sluggish first half. Nevertheless, early reports of plans for business capital outlays indicate an increase next year of five per cent or more. In order for this to happen, demand for new business facilities will have to pick up sharply around mid-1969 in anticipation of solid gains in output and sales during the two closing quarters.

Within that general framework, business-related construction markets can be expected to behave as follows:

Manufacturing buildings: The opening quarter of next year will bring a further decline in the rate of industrial plant contracting, but the direction should be reversed before midyear. Total industrial building contract value will be up only about three per cent in 1969. The improvement between the first and fourth quarter rates of contracting will be something in excess of 10 per cent, however.

Commercial buildings: There is a great deal of underlying strength in the commercial building market, but next year may bring a brief hesitation in 1968's strong upsurge. *Store* building is vulnerable to a temporary slowdown of consumer spending in the early part of 1969; but strong housing growth will support the development and expansion of shopping centers. *Office* space continues to be in great demand, and 1969 probably will bring another gain in building. A tapering-off from the 15 per cent-a-year pace of the last two years is in order, however.

Utilities construction: Least susceptible to short-term swings in business activity, utilities expansion plans cover long periods of time. The addition of individually large facilities tends to be erratic, however. Next year's total will be high by recent standards, but it is likely to fall short of 1968's unusually large amount, which was swelled by several contracts for huge installations to be built over the next several years.

1969 family housing demand

Events in 1968 added further proof—as if any more was needed—that the current housing market can be as good or as bad as the supply of mortgage money permits.

At the outset of 1968, conditions were right for a big year of home building. The strong flow of savings into mortgage-lending institutions during the latter part of 1967 had already brought the rate of housing starts back up to the 1.5-million-unit level. With any sustained support from the credit markets, housing output could have held to, or exceeded that volume for 1968.

By spring however, the dual problems of inflation at home and continued deficits abroad forced a return to credit restraint. Savings flows dwindled, mortgage rates rose to a new high, and housing starts slipped back to the 1.3 million rate as a result.

Since mid-year, the pendulum has begun to swing back in the direction of credit ease. This time it should be on a

more lasting basis since we no longer have to rely solely on monetary policy to contain inflationary pressures now that the surtax is in effect.

So far, however, it's been taking longer than anyone expected for the tax and budget restraints to do their job. And with the Federal Reserve threatening (in September) to reimpose credit curbs temporarily unless the rising price level yields soon, it could be several months before any real monetary ease is felt in the mortgage markets. Even so, the mere prospect of an end to tight money policy helped bring housing activity back to the 1.5-million-unit rate in the third quarter.

For 1968 as a whole, total housing starts will exceed 1,475,000—still short of what might have been, but a decided improvement over the depressed totals of 1.2 and 1.3 million of the past two years.

1969 "should be the year:" If credit is really all that is holding back a housing boom, then 1969 should finally be *the* year. Demand—as indicated by the low vacancy rate for rental housing, the small inventory of unsold homes, and the intensity of the search for solutions to urban housing problems—is stronger than ever.

Next year's opening rate of 1.5-million housing units will be boosted to the 1.6-million mark by mid-year as more favorable mortgage rates draw some postponed demand out of hiding.

Then late in the summer of next year, the housing market will begin to feel a secondary thrust as public housing programs take on a more important role. The brand-new Housing and Urban Development Act of 1968 authorizes more than $5 billion over the next three years in support of a massive and multi-faceted program of housing for low-income families.

Unlike direct public housing, this plan—which features interest subsidies to open the way to home ownership for poor families, and rent supplements for low-income apartment dwellers—has the potential for stimulating a lot of new housing with a minimum of immediate Congressional appropriations. It does, of course, rely heavily on private lenders to finance the construction, and requires that HUD enter into a long-term commitment to amortize it.

Right now, however, the problem is that even a little bit of backing for this program is hard to find. There's no real support in the fiscal 1969 budget, although there is a good chance that the HUD Act will be better funded in fiscal 1970. It could add as much as 150,000 or 200,000 units to total housing output during the second half of next year.

Not all of the emphasis of these newer programs is on conventionally-built housing. Some of the HUD Act funds, for example, will go for rehabilitation of existing units, and some will go to finance mobile and other types of manufactured housing units. Nevertheless, with the added thrust of publicly-aided housing, next year's final quarter rate of *conventional* housing starts could reach as high as 1.8 million. For 1969 as a whole, housing starts will number 1,650,000. The distribution of single and multi-family units will move only slightly away from 1968's proportion of ⅔:⅓ in favor of owner-occupied, single-family homes.

In addition, sales of about 325,000 mobile homes will fill out next year's total shelter demand of close to two million units of family housing.

Estimates/1969

Construction contract value
(millions of dollars)

nonresidential buildings	**1968 preliminary***	**1969 forecast**	**per cent change**
Commercial	$ 6,950	$ 7,250	+ 4%
Manufacturing	3,575	3,700	+ 3
Educational	5,200	5,425	+ 4
Hospital/health	2,050	2,225	+ 9
Public	975	1,300	+33
Religious	800	850	+ 6
Recreational	925	925	—
Miscellaneous	700	750	+ 7
TOTAL	$21,175	$22,425	+ 6%
residential buildings			
One- and two-family	$16,800	$19,350	+15%
Apartments	6,075	6,700	+10
Nonhousekeeping	1,425	1,475	+ 4
TOTAL	$24,300	$27,525	+13%
TOTAL BUILDINGS	$45,475	$49,950	+10%
nonbuilding construction			
Streets, highways & bridges	$ 6,600	$ 7,250	+10%
Utilities	3,100	2,750	−11
Sewer/water supply	2,300	2,500	+ 9
Other nonbuilding	2,425	2,550	+ 5
TOTAL	$14,425	$15,050	+ 4%
Total Construction	$59,900	$65,000	+ 9%
Dodge Index (1957-59=100)	168	183	
Physical volume of floor area (millions of square feet)			
nonresidential buildings			
Commercial	453	464	+ 2%
Manufacturing	284	285	—
Educational	235	235	—
Hospital/health	67	71	+ 6
Public	33	38	+15
Religious	39	39	—
Recreational	45	44	− 2
Miscellaneous	42	44	+ 5
TOTAL	1,198	1,220	+ 2%
residential buildings			
One- and two-family	1,272	1,427	+12%
Apartments	485	528	+ 9
Nonhousekeeping	74	75	+ 1
TOTAL	1,831	2,030	+11%
TOTAL BUILDINGS	3,029	3,250	+ 7%

*Eight Months Actual; Four Months Estimated

1969 institutional construction demand
During 1968, the value of contracts for the construction of institutional buildings —schools, hospitals, churches, etc.— barely matched the record level achieved in 1967. This lack of growth can be traced largely to a sharp decline in educational building during the early part of 1968. Though school building improved later in the year, the earlier loss was never quite recovered. In contrast, hospital building made another solid gain in 1968.

With credit market conditions easing, the path for further growth of institutional building should be smoother. A look at the trends of educational and hospital/health building shows other factors that will affect the outlook.

Educational building: The fairly constant level of new educational construction during the past three years conceals a pattern of strong gains in college and university building balanced by a softening elementary school building market. Enrollment trends suggest that the declines in elementary school building will become dominant in the very near future.

In 1969, a modest gain in total educational building contracts can be anticipated as easier credit conditions revive demands that were postponed during the 1966-68 period.

Hospital and health facilities: Despite a poor start, 1968 contracting for medical buildings recovered sufficiently by summer to put the year's total ahead by nine per cent. Supported by easier credit and an underlying demand for more adequate health facilities, the growth in outlays for hospital construction in 1969 should at least match this year's gain.

1969 community construction demand
Very few of the many types of publicly-aided construction will escape the effects of Congress' order to eliminate $6 billion or more from the originally proposed Federal budget for 1969. But now that the areas of cutting have been pretty well settled, it turns out that the reductions in construction programs haven't been as severe as it first seemed they would be.

More than half the cut was taken from military appropriations, while another billion or so was eased out of the budget by accounting "gimmicks" involving various Federal loan programs. That left only a couple of billion to be squeezed from the civilian agency budgets, and most of that came from construction funds.

Social urgency has been the key to budget priorities in 1969. By that standard, the heaviest cuts were made in the "pork barrel" projects—postponable

construction like dams and river-harbor development. Construction appropriations for the Corps of Engineers and the Bureau of Reclamation for fiscal 1969 are at their lowest since 1962 and 1948, respectively. By contrast, the Water Pollution Control Administration's work is considered urgent and has been given the support it requested.

Somewhere between these extremes of urgency is the nation's highway program. Highway construction depends heavily on Federal support, but since these funds are allocated from the specially-earmarked Highway Trust Fund (instead of the general budget) a restriction on the spending becomes a *postponement* rather than a permanent loss. Back in 1966 more than a billion dollars of the Fund was "frozen", only to be released early in the following year. This time the holdout on highway construction is relatively light—only about $200 million will be frozen in 1969.

Although the budget squeeze will limit *Federal* backing of many public construction programs for a while, there's the possibility of some offsetting expansion of state and municipal support. Next year's easier credit conditions should stimulate a higher volume of bond issues to provide funds for local construction.

The effects of these factors on contracting for the major types of public facilities construction are as follows:

Highways: The initial impact of freezing $200 million of Trust Fund support is most likely to be felt as an interruption in the upward trend of contracting during the final quarter of 1968. The drop-off in *expenditures* will show up early next year. As the funds are restored later in 1969, highway construction will get a strong boost. Release of the frozen $200 million, plus a normal half-billion-dollar gain in Trust Fund allocations adds up to a 10 per cent gain in the value of contracts for streets, highways, and related construction next year.

Sewer and water: Heavy support from local government funds, as well as insulation from Federal budget cuts, will keep this category expanding in 1969. With the current emphasis on pollution control, gains in sewer and sewage treatment construction will lead to a total contracting gain of about nine per cent.

Public buildings: Though the lid will be on spending for Federal office buildings most of next year, one *non*-Federal project—the Port of New York Authority's huge World Trade Center—will more than fill the void. Contract value for public buildings of all kinds is expected to be one-third higher in 1969.

Other public facilities: The rest of the public construction sector reflects a mixture of ups and downs resulting in a net increase of four per cent in 1969. Declines will take place in most of the Federal public works projects which will bear the brunt of fiscal restraint. These losses will be offset by gains in airport construction and military projects, including the new Sentinel anti-missile system.

With cutback in Federal construction exerting most of its negative effect on contracting late in 1968, little gain is expected for the current year. In 1969, however, contracting for public facilities will be picking up by mid-year and finish 10 per cent ahead of 1968's value.

Building costs and physical volume

Labor and materials costs: Hourly wages for contract construction workers averaged six per cent above their year-ago rates during the first half of 1968, and the trend in the industry labor negotiations promises to extend this rate of gain well into 1969. Prices of building materials, which remained virtually unchanged in 1967, shot up at better than a six per cent rate in the early months of this year as inventories were liquidated and increased output used up much of the excess capacity that had developed during the past couple of years. Similar increases are not expected for 1969, but higher costs will continue to push prices up.

Per foot building costs: In contrast to sharp increases in wage rates and materials prices, average per square foot costs of all buildings, as measured by contract value, moved up only a little more than one per cent by fall of 1968, compared with the more than five per cent gain registered last year. This seeming contradiction is explained largely by the resurgence of residential building, which is one of the lowest-cost building types. Square footage of one- and two-family houses and apartments increased as a share of total building, from 53 per cent in 1967 to an estimated 60 per cent in 1968.

In addition, the number of large chemical and petroleum plant contracts —industrial types with high value and low square footage—declined in 1968, so that the average cost per square foot of manufacturing buildings fell substantially. Finally, a trend toward lower-cost office buildings has softened the impact of a substantial increase in the number of construction contracts for this normally high-cost building type.

Residential contracting is expected to continue to increase relative to total building in 1969, which will tend to reduce the average cost per square foot. On the other hand, labor and materials costs will be rising at a faster rate, and the "mix" of industrial projects is expected to resume a more typical pattern. The combination of cost factors and the changing mix of construction types should yield a two per cent increase in total 1969 per square foot costs.

Summary

The contract value of new construction work is headed for a nine per cent gain in 1969, almost matching 1968's strong 10 per cent advance.

These two welcome gains, coming after a period of below-average performance, add some weight to the oft-heard statement that construction is inherently a counter-cyclical industry. When the economy is booming (so the contention goes), building activity slackens; when general business slows, construction moves ahead faster.

Certainly 1966 was one of the boom years for the economy as a whole. It was also one of the weakest for construction, as the Dodge Index declined 30 points from start to finish. In 1967, as the economy cooled off, construction came back vigorously, but when business surged ahead early in 1968, construction leveled off once more. And now, under the deliberate restraint of extra taxation, construction is strengthening again.

Like most generalizations, this notion of a rigid inverse relationship between construction and general business activity is an oversimplification. It's true that some types of public works construction are frequently timed to offset the business cycle. Yet other types—industrial and commercial building, for example—are usually at their strongest during business upturns. And that other important segment of the construction market —residential building—also would probably expand along with each rising phase of business activity, except that housing never seems to compete effectively against other demands for credit in periods when funds are scarce.

Several of these factors will come into play during 1969. In the early half of the year the surtax will be putting the brakes on business expansion, inhibiting industrial and commercial building temporarily. Federal government budget limitations will also hold down many types of public construction through the first half. As that happens, though, credit will become available for housing in greater quantities and at lower rates, sparking a residential building expansion.

For as long as the economy remains under deliberate restraint, conditions will favor housing and other types of building, which thrive on low-cost credit; these same conditions will work against most types of business and public construction, however. If balance is restored to the economy by midyear and the restraints are lifted, all types of construction can be expected to advance vigorously in the second half of 1969.

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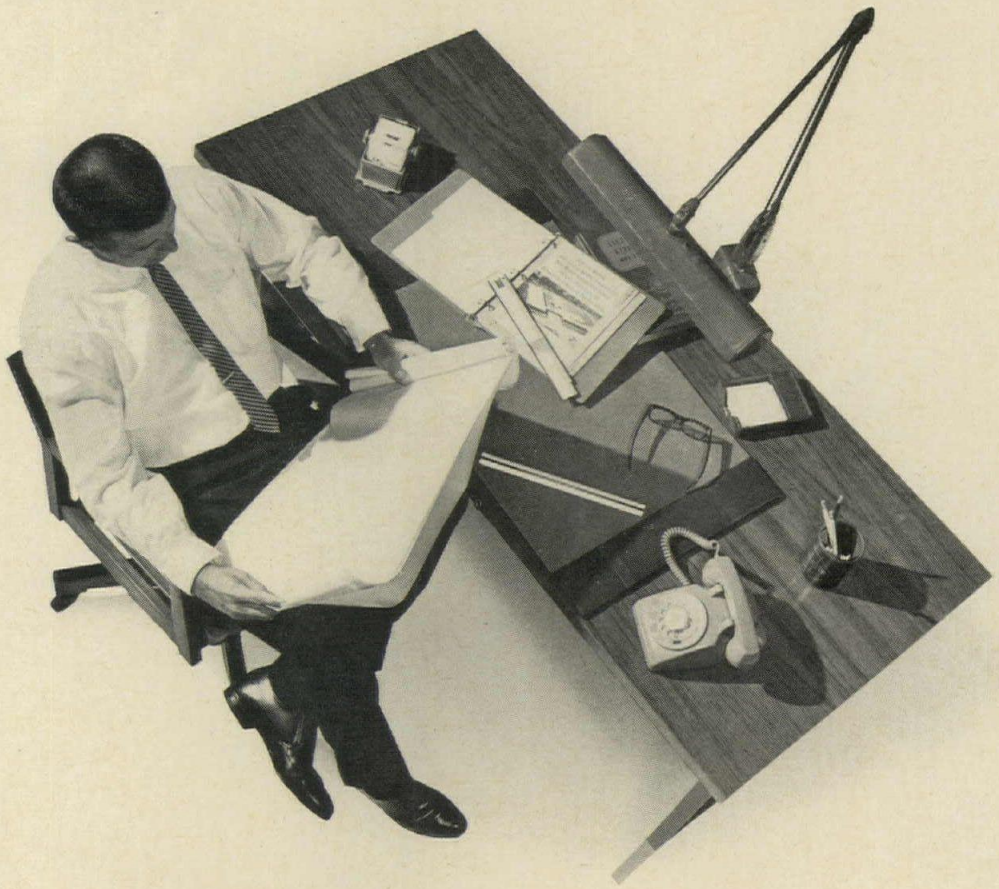

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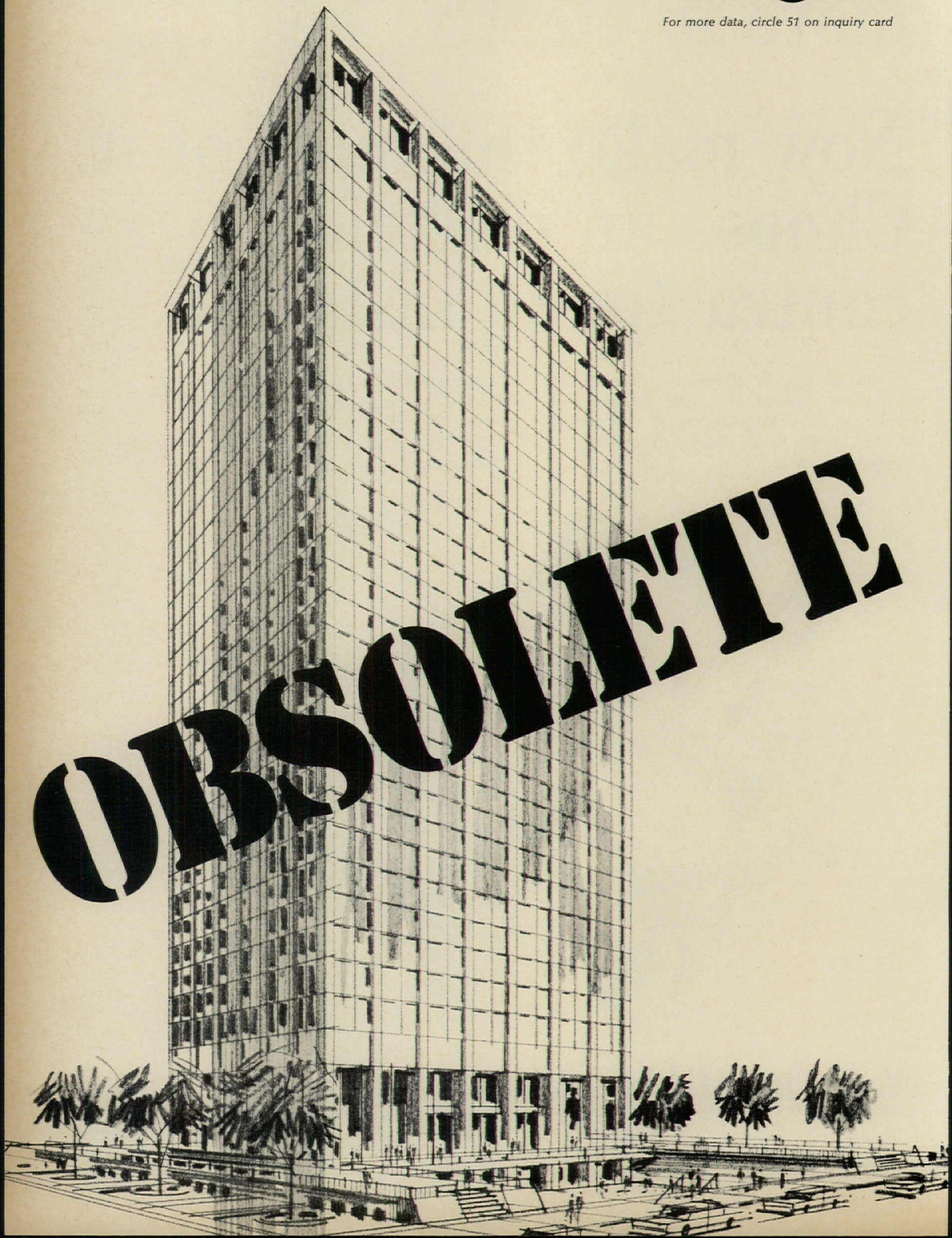


TRENDS AND ANALYSIS

Lawrence C. Jaquith
McKee-Berger-Mansueto, Inc.
Construction Consultants

HUD'S In-City program develops hard data on systems

Within the last year, industrialized building systems have become the subject of a deluge of studies, seminars and magazine articles. The major impetus to this activity has been a growing interest in systems on the part of government agencies, primarily the Department of Housing and Urban Development. Faced with demands for massive construction programs—especially in housing—these agencies have been actively seeking answers in this area of building technology.

This government involvement is significant, for it was government support that led to the successful and widespread use of these techniques in Europe. If innovation of industrialized systems is about to occur in this country—and there is every indication that it will—the design professionals who will implement these approaches in various projects face a formidable task. Numerous questions must still be answered concerning the probable impact on design and on the role of the architect; the technological problems; public acceptance; resistance by unions, building code restrictions and the costs of construction. Many are only now being explored.

In the meantime, the architect will be confronted with assorted promotional material and articles on each new system as it comes on the market. Many will claim that their system is faster to erect, cheaper to build and more flexible in design than any other system yet revealed. Evaluating conventional construction products may be a headache for the architect, but he has his own experience to guide him. Industrialized building systems, on the other hand, pose some completely new problems. Thus, objective information will become the most important factor when the question of applicability and choice of an industrialized technique on a project first comes up.

The In-City project: which systems work best?

Extensive research undertaken in conjunction with a recent major study may be a big first step towards providing this vital data. The study—made by the team of Daniel, Mann, Johnson & Mendenhall, and the Cambridge, Massachusetts firms of Abt Associates and Ecodesign—was one of three studies in the first phase of the In-City Low Cost Housing Experiment. Conducted by HUD, the In-City project is undoubtedly the most ambitious exploration of the potential application of industrialized building systems in the U.S. to date. Its purpose is to develop experiments in residential construction in 20 different cities using new construction techniques, including new materials and industrialized building systems and components.

In this study, the major areas of responsibility were the research of Model Cities (DMJM); the investigation of social cost benefits in housing (Abt); and the technological research of systems (Ecodesign). The recommendations of each firm were then coordinated to produce several combined technological, social and political-economic experiments and reports.

In a recent talk before members of the American Association of Cost Engineers, Ecodesign principals Richard Gardiner and Professor Laurence Cutler described their research and the approach developed for the selection of systems. They spoke of one of their biggest headaches: "The minute the word got out that we were investigating industrialized building techniques, we were bombarded with samples, sketches, plans, and phone calls from all over the U.S. and Europe."

Actually, this barrage may have helped in the long run. For it alerted them to the huge number of industrialized building systems, components and materials that were either available or being developed. This indicated a need not only for an extensive amount of research but also for a systemized approach, using a computer, to identify, classify, and evaluate each item. Only in this way could an objective selection for the experiment be made.

Time did not permit extensive development of a program for data storage and retrieval. Nonetheless, information on approximately 400 different systems, components and materials was systematically classified and evaluated. Of these, the 90 techniques that rated best according to the selection criteria were reexamined in more detail. This was accomplished by an impartial review board made up of architects, planners, economists, sociologists, etc. This group selected approximately 40 industrialized building techniques, which were then recommended to HUD as most suitable for the experiment.

The systems have now been classified

Following completion of the In-City Experiment, Ecodesign began, with the help of Design Systems Inc., to expand and resystemize the data they had gathered into a program known as IBIDS (Information Bank for Industrialized Design Systems). In IBIDS, each industrialized technique is classified under one of six major categories:

1) Monolithic unit; 2) total system; 3) structural system; 4) non-structural component; 5) special construction techniques; 6) other.

Also in this program, a profile has been developed for each industrialized technique that includes a description of its salient features and numerical evaluation under various criteria. This profile has the following format:

DWELLING UNIT TYPE
- Single-family attached
- Single-family detached
- Walk-up
- High-rise

ACCESS TYPE
- Stair
- Elevator
- Individual unit access
- Single-loaded corridor
- Double-loaded corridor
- Tower-access core

PLAN FLEXIBILITY
- 1 bedroom
- 2 bedroom
- 3 bedroom
- 4 bedroom
- Efficiency
- Balcony

Yard
Duplex
UTILIZATION
Safety
Privacy
Children's play
Adaptable to family size
Growth
Design flexibility
ADAPTABILITY
(Compatibility)
Module
Open or closed
Site and soil
Climate
Sunlight orientation
Cross ventilation
Openings
Span size
Weight of maximum component
MATERIALS
(Basic materials of construction)
In-situ concrete
Precast concrete
Steel
Masonry
Wood
Plastics
Aluminum
Reinforced plastics
Asbestos cements
Fire-resistant
Code conformity
Finishing required in field
MAINTENANCE AND REPLACEMENT OF WORN PARTS
Durability
Replaceability
RESISTANCE
Moisture
Stain and odor
Vermin
Sound transfer
Heat loss
EFFICIENCY
Percentage: on-site
off-site
Wet or dry
SPECIAL EQUIPMENT
Crane (conventional)
Crane (special)
Unique equipment
LABOR
Skill
Site labor
Seasonal limits
TRANSPORT
Highway
Highway extra-wide load
Rail
Not transported (require site factory)
Cost per square foot
Time to build 100 units
Systems management (CPM, etc.)
APPLICATION
Contract guaranteed
Uncertain
Not available by October, 1968
LEGAL PROBLEMS
Financial
Foreign
Domestic
Union problems
Marketability

The data now classified in IBIDS are a source for all architects

The specific recommendations for the In-City Experiment will certainly be of interest to anyone considering the eventual use of an industrialized building technique in a project. But the real value, it would seem, is contained in the total body of research that preceded these selections: that is, the data now being incorporated in IBIDS. This is primarily because the recommendations for systems use in a project involving other types of housing, building types or geographical areas could very likely be different from those found most suitable for HUD. The large data bank obviates the need for repetitive re-evaluation.

Ecodesign has not been able to include every industrialized technique in the IBIDS file. Many of those not yet evaluated, however, are still in the theoretical stage. They do feel that nearly every major approach to systems building is on file—especially those that have actually been used in both U.S. and European projects to date.

During the HUD project and the subsequent development of IBIDS, Gardiner and Cutler have been able to gain insights into the current state of industrialized building and the prospects for innovation in this country.

They have concluded that the initiation of industrialized building in housing in this country does not require a technological breakthrough. The problem is instead one of adapting existing techniques to U.S. requirements. They feel, therefore, that as a solution to the housing problem, research efforts should be directed toward adaptation and coordination of current methods rather than in a time-consuming search for as yet untried new solutions.

The European systems: are they adaptable?

The developers of many European systems have claimed that their approaches are adaptable to housing in this country. But Ecodesign feels that many would not be. This is because a number are based on low criteria that would prove unacceptable under U.S. building codes. Also, many of those classified as structural systems are based on 10- to 12-foot spans (because of transportation difficulties) which would produce a room size too small for widespread acceptance in this country. These systems would then need to be adapted to longer spans. But this is tantamount to changing the entire technique because of the specialized equipment involved.

On the other hand, they feel that panel systems would be adaptable and more acceptable in this country because of the generally higher social cost benefits inherent in these systems. Structural systems have the advantage of being more flexible and are somewhat less expensive. But these advantages are outweighed by problems in handling, poor acoustical and fire-proofing qualities and the additional time necessary for on-site finishing of materials.

In the long run they believe that a solution can be found through the total integration of panels and frames. For example, the use of a structural system at the lower levels would provide more flexibility for parking and commercial use. The upper floors could retain the advantages of a panel system.

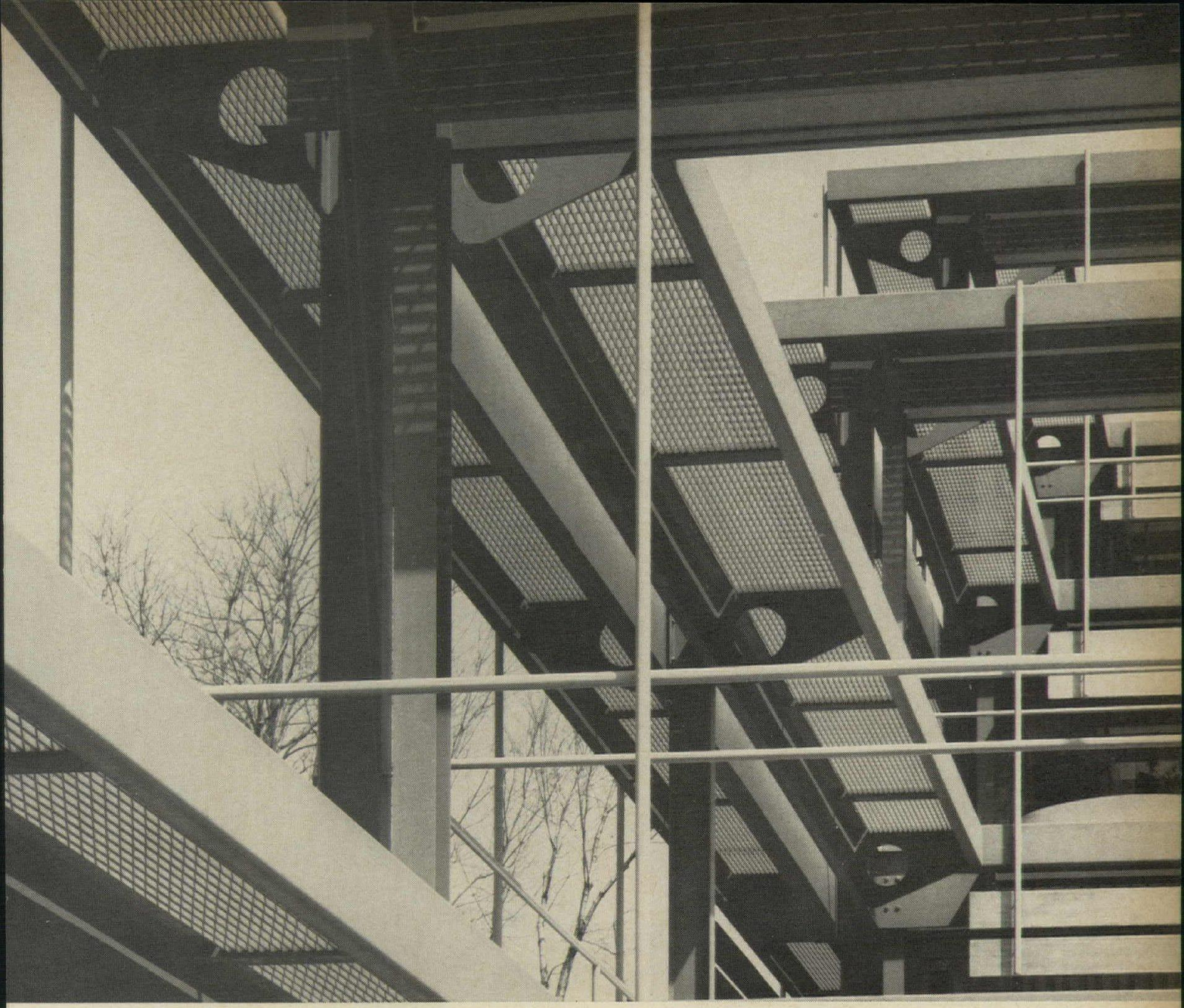
They have become critical of the approach to systems building taken by many manufacturers. Very few systems exist, they believe, that will save money and time *and* provide good environmental conditions. This was the result, they feel, of design being approached from a technical point of view and not from a user's point of view. Fortunately, HUD's goal so far appears to be housing with a higher social cost benefit and not just a cheaper structure.

The major savings are in shorter time and reduced finishing

In terms of cost, Ecodesign feels that the major savings in systems building occurs via shorter construction time and reduced finishing requirements. There appears to be a trade-off between the savings gained in the plant—such as efficient handling of materials, inventory control, prefinishing, etc.—and the cost of special equipment and transportation. One novel solution suggested by Cutler to overcome some of the transportation problems is a mobile casting barge for use at coastal cities.

Monolithic units have a special problem in transportation. And among the total systems' approaches, those designed for low-rise housing are the least efficient in terms of cost, and seem unlikely to replace conventional construction methods.

The development of the IBIDS program is continuing, with special attention being given to more detailed cost information, compatibility of different techniques, and expansion of the criteria for users' need. When industrialized techniques begin to gain wide-spread use, this data bank will prove a valuable store of information for architects and owners.



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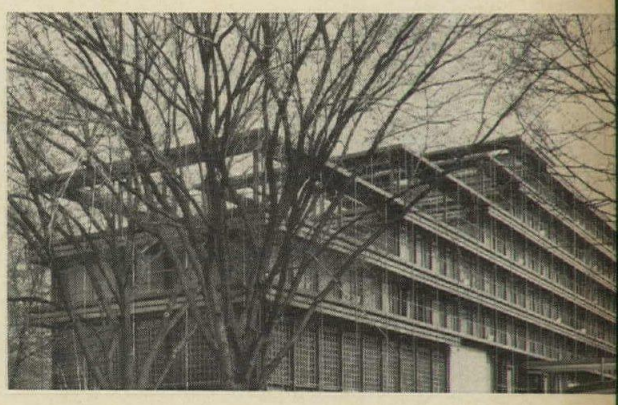

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continued from page 78

Planning Consultants. The firm is located in Regina, Saskatchewan, Canada.

Four new staff architects have been added by the Seattle-based architectural firm, **Fred Bassetti & Company.** They are **Donald Breiner, James F. Hamilton, Howard Peterson** and **Karlis Rekevics.**

A new corporation to carry out housing, commercial, and institutional developments in Negro communities has been organized in Chicago. The new corporation, **Developers, Architectural Research, Engineered, Inc.** (DARE) has offices at 10 South La Salle Street.

John D. Doran, A.I.A. has been appointed an associate with the New York City firm, **William A. Hall, Architecture/ Planning.**

Philip H. Fisher, A.I.A. is now vice president of the California architectural firm, **Howard R. Lane Associates.**

L. Philip Flowers and **John A. Thompson** are now partners in the St. Louis architectural firm, **Froese, Maack and Becker.**

James M. Graham, A.I.A. has joined the firm of **Chapman & Miller, Architects** as senior associate. The firm is located in Washington, D.C.

Jack M. Graves, A.I.A., formerly a partner of **Graves, Lampkin, Walker, Inc.,** has established a new architectural, engineering and planning firm located at 703 Hightower Building, Oklahoma City.

The Ballinger Company, Philadelphia architects and engineers, recently announced the appointment of **Robert W. Hill, A.I.A.** as an associate member.

The architectural firm of **Harbeson, Hough, Livingston and Larson** has announced the following new associates: **F. Daniel Cathers, Paul E. Doering, Barry N. Eiswerth, Alan N. Hartell, Herbert W. Kramer, Steven Lichtenstein, Fritz Neubauer, Paul V. Riale** and **Domenic A. Tedeschi.**

Richard W. Hoagland has become an associate with the New Jersey architectural firm of **Ludlow, Jefferson, Tuzik & Associates.**

Four members of the Dallas firm of **Jarvis, Putty, Jarvis, Architects and Planning Consultants,** have been promoted to associate level positions. Promoted to senior associate was **Bill D. Smith;** to associate architect, **David L. Atteberry;** to associate, **Weldon W. Nash, Jr.** and **Joseph R. Drake.**

Kahn and Jacobs, Architects have admitted **Irving H. Kaplan** as general partner of the firm.

Hall and Goodhue announces that **Peter Kitchell** has joined the firm to work from its San Francisco office.

continued on page 106

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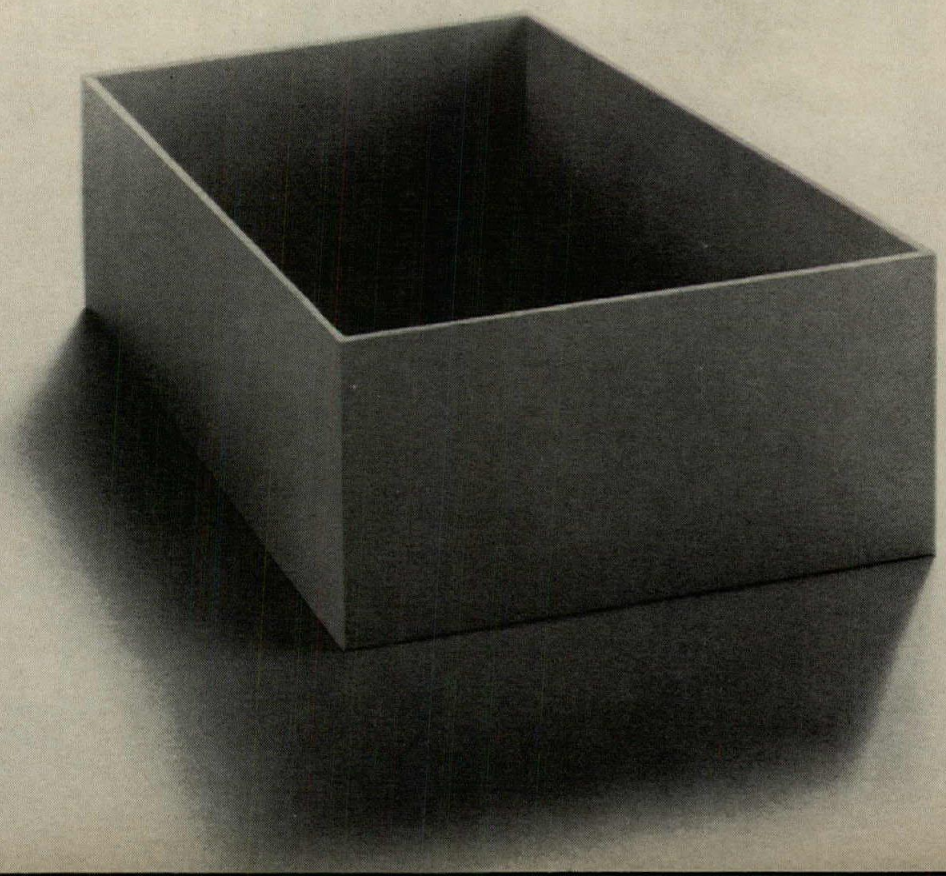

Scrutinize your local building codes for the many specific advantages you can gain for various types of structures when you design-in an "Automatic" Sprinkler system.
To help, we have compiled some of the permissive clauses from the four major building codes, and put them into a booklet called, "The Code Book."
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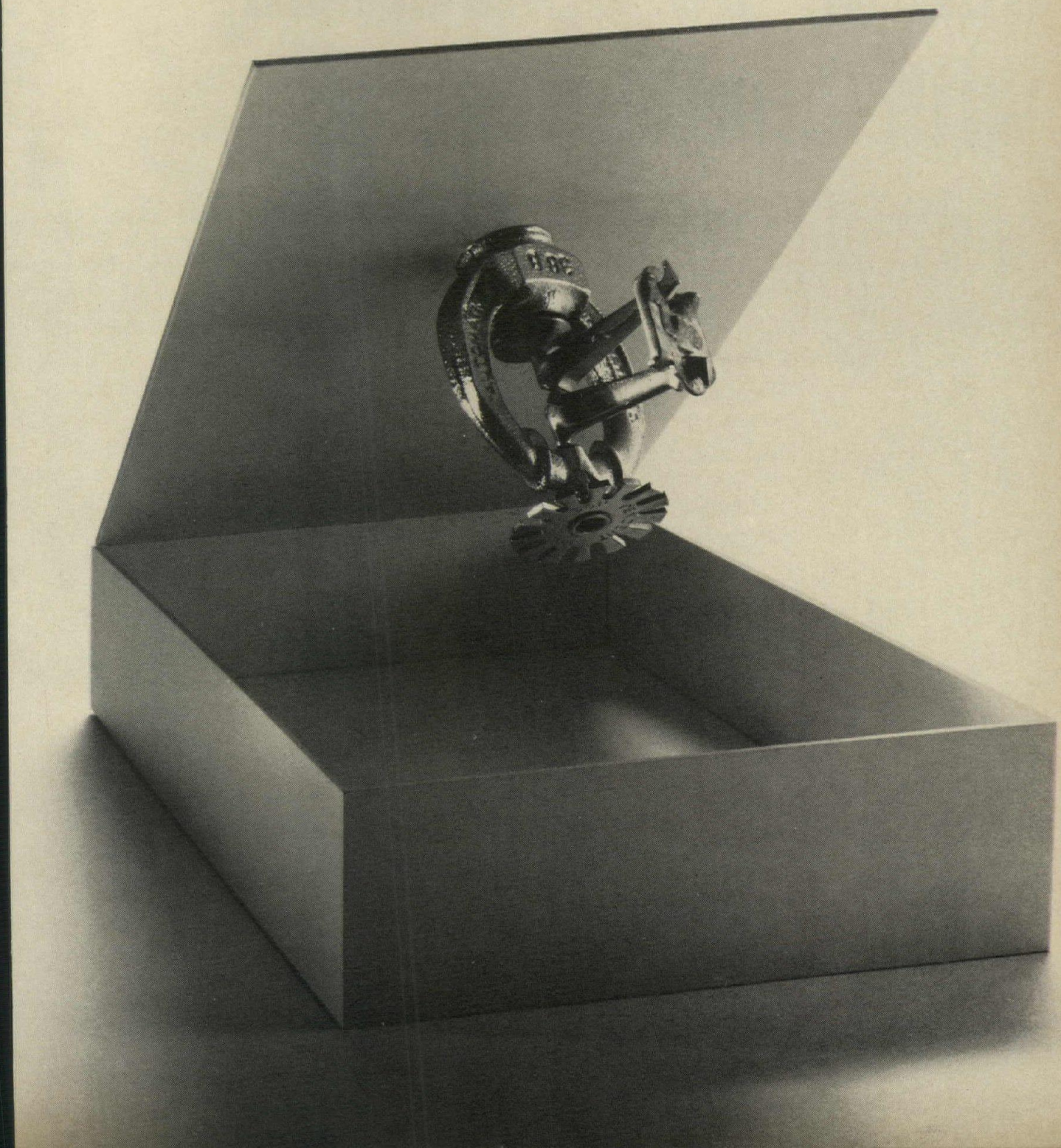
Here are quotations from the four major building codes regarding "increased building area":

The Uniform Building Code: (SEC. 506) "The area specified in Section 505 may be tripled in one-story buildings and doubled in buildings of more than one story if the building is provided with an automatic fire-extinguishing system throughout."

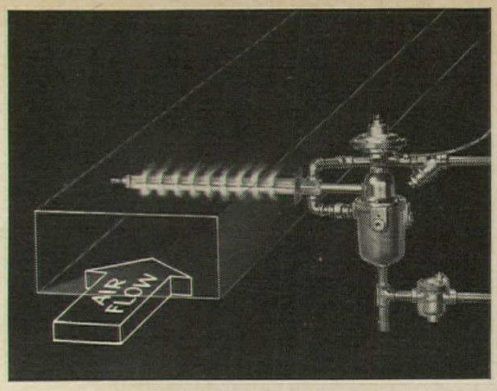
The National Building Code: (SEC. 401.3) "When a building is equipped with an approved automatic sprinkler, the floor area limits for any story may be increased by 200 per cent; where the average height to the roof, or to a fire retardant ceiling does not exceed 25 feet in a one story building, the floor area limits may be increased by 300 per cent."

The Southern Standard Building Code: (SEC. 403.6) "The maximum allowable floor and attic area may be increased by 200% for one story buildings, and by 100% for buildings over one story in height if the building is provided with automatic sprinklers throughout."

The Basic Building Code: (SEC. 308.2) "When a building of low hazard or moderate hazard storage, or mercantile, industrial, business or assembly (use group F-4) use group is equipped with an approved one-source automatic sprinkler system, unless such sprinkler system is required by the provisions of article 4 or article 12 for structures of special use and occupancy, the tabular areas may be increased by two hundred (200) per cent for one (1) story buildings and one hundred (100) per cent for buildings more than one (1) story in height."



7 reasons why architects should be concerned with humidification



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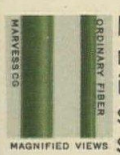

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And more beautiful. Because Marvess CG, a Phillips 66 fiber offers new designer colors that are richer than ever before. In fact, the nicest thing about new Four Seasons Niagara is its warm, attractive appearance. Proof that a carpet doesn't have to look tough to be tough.

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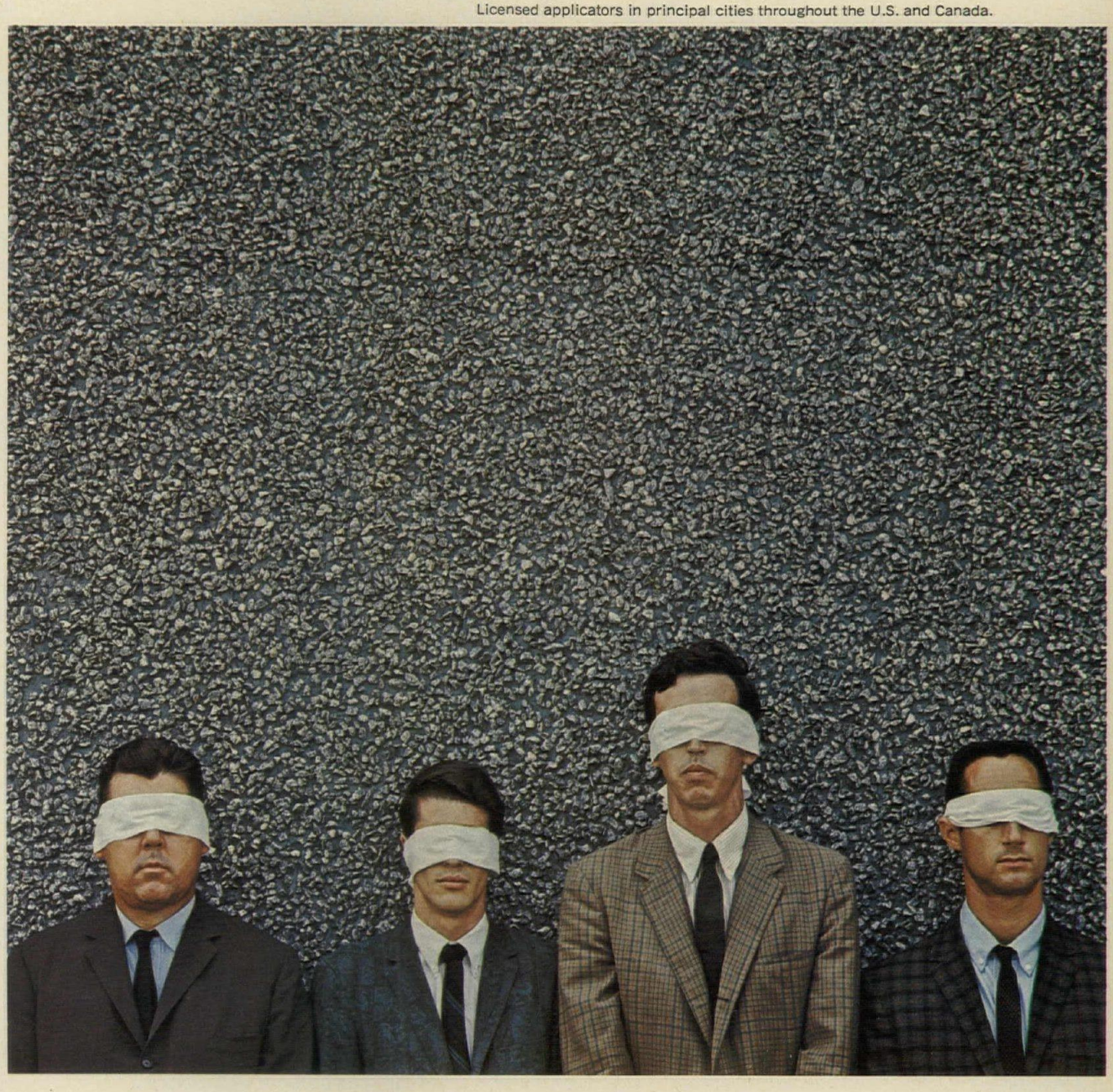

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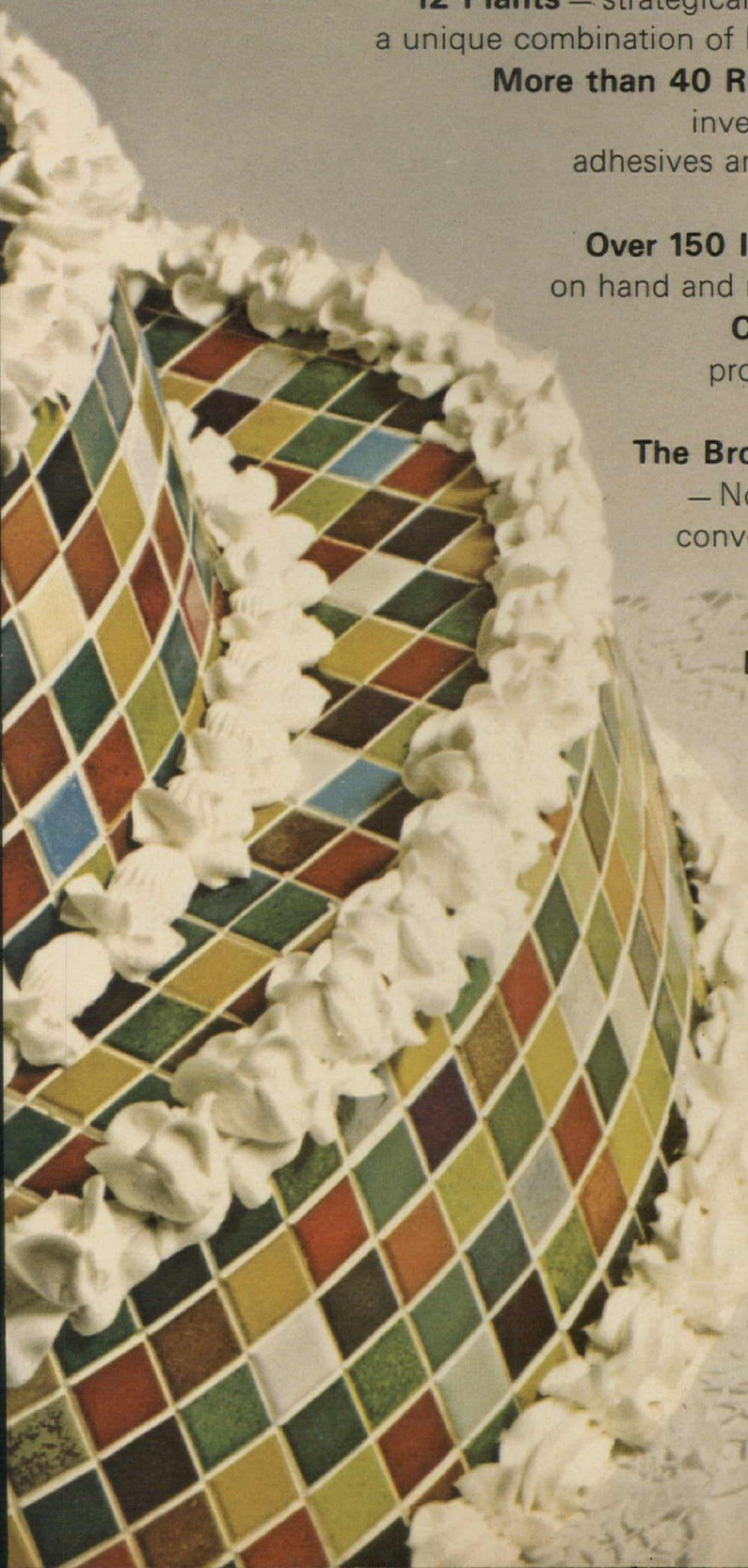
the Stylon·Mosaic merger



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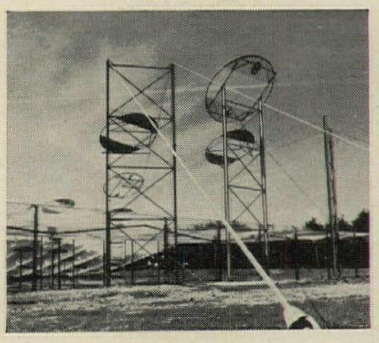
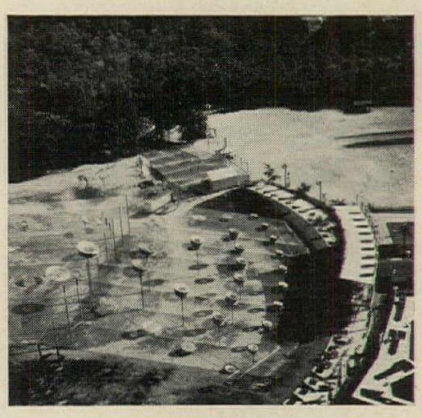
In the game, called Stargets by the owner, Family Leisure, Inc., golf balls are fed automatically to the covered tee positions. From here, participants use any of several irons to hit the targets in one of many of game variations . . . day or night and in most weather.



steel cable supports unique golf structure



The target area is served by a bi-level, steel-framed tee platform, constructed with Bethlehem structural steel and joined with our ASTM A-325 high-strength bolts.

Golfers of varying ages and proficiency are finding great satisfaction in an unusual adaptation of the game in Hanover, Mass., just south of Boston. The structure employs a series of towers guyed by 800 ft of wire rope, 35 targets supported by 1,800 ft of strand, and a net braced by 3,250 ft of wire rope. The cables were furnished with a variety of terminal connectors.

Steel cable is also finding increasing use in cable roof structures. We have long been associated with these and other projects where cables are used as structural elements. Call on our experience and let us supply the cable and end-fitting data for your cable supports. *Bethlehem Steel Corporation, Bethlehem, Pa. 18016.*

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General Contractor: Taverna Brothers
Steelwork: Chestnut Welding & Iron, Inc.

Steel

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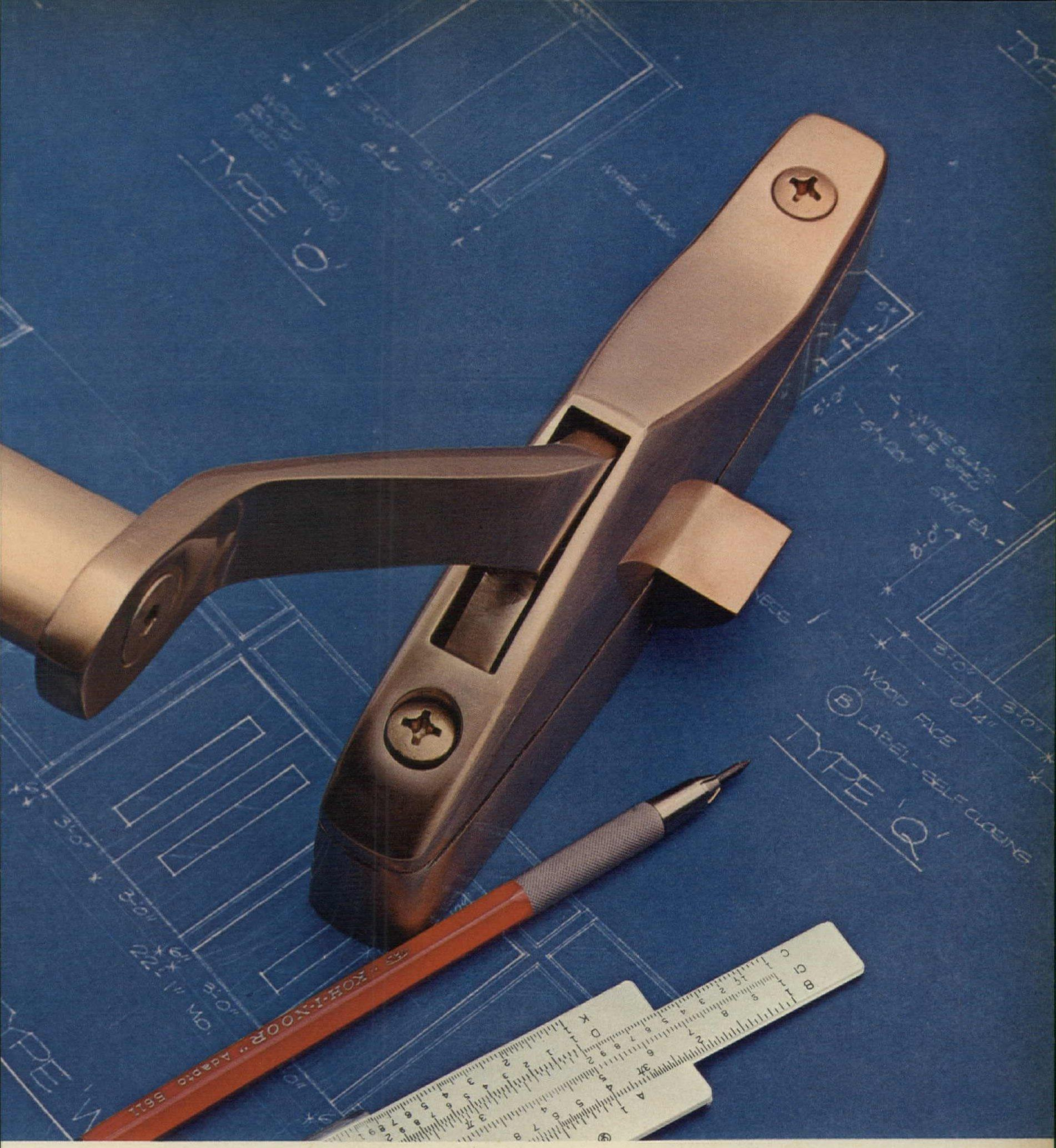
BETHLEHEM STEEL



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continued from page 93

Fridstein Fitch & Partners, Chicago architectural-engineering firm, have named the following as associates: **Robert E. Alfe, Michael Gelick, Anton E. Kampf, George Loschky** and **Wallace A. Rappe.**

Helmut F. Geiger, Architect and Engineer, has formed a new architectural and engineering practice with offices located at 1544 Irving Street, Rahway, N.J.

Donald W. Y. Goo has been made a junior partner of **Wimberly, Whisenand, Allison & Tong Architects, Ltd.**

Hackner, Schroeder and Associates of La Crosse, Wisconsin has changed its firm name to **Hackner, Schroeder, Roslansky & Associates, Architects/Engineers/Planners.**

Hayden H. Harriss, A.I.A. has been made an associate in the Atlanta architectural firm of **Jova/Daniels/Busby.**

William C. Henderson has joined **Linde Hubbard Associates, Inc.** as a principal. The architectural firm is located in Burlington, Vermont.

A new architectural firm has been formed from the merging of **Jones/McCormack/Peacock, Associated Architects** and **Tillar and Garn, Architects.** The new firm, **Jones, Peacock, Garn and Partners,** is located at 2662 Madison Road, Cincinnati, Ohio.

The Washington, D.C. firm of **Keyes, Lethbridge & Condon, Architects** announces that **James C. Blount, John E. McCartney** and **William J. Rabon, Jr.** have been made associates.

Mark A. Lechowski, A.I.A. has been named an associate of the San Francisco architectural firm, **Rex Whitaker Allen and Associates.**

Two new associates, **Gerald K. Slawin** and **Nicholas J. Nowicki, Jr.,** have been appointed by the Chicago architectural firm of **Ezra Gordon—Jack M. Levin & Associates.**

Arden L. Larson, A.I.A. has been made director of consulting services for **Charles Luckman Associates.**

The Cleveland architectural and interior design firm, **Arthur Lawrence Associates,** recently changed its firm name to **Lawrence-Hawyer Associates.**

Allen Y. Lew, A.I.A. has appointed **William E. Patnaude,** architect, and **Harry A. Chinn** as associates in the firm. The Fresno, California firm is now known as **Allen Y. Lew Associates, Architects.**

Carl C. McElvy, A.I.A. recently joined the Los Angeles office of **John B. Parkin Assoc. Architects, Engineers, Planners.**

Robert Woody McFadyen and **Roman C. Plugge** have been elected vice-presidents of **Grayson Gill Inc.,** Dallas architectural and engineering firm.

continued on page 240

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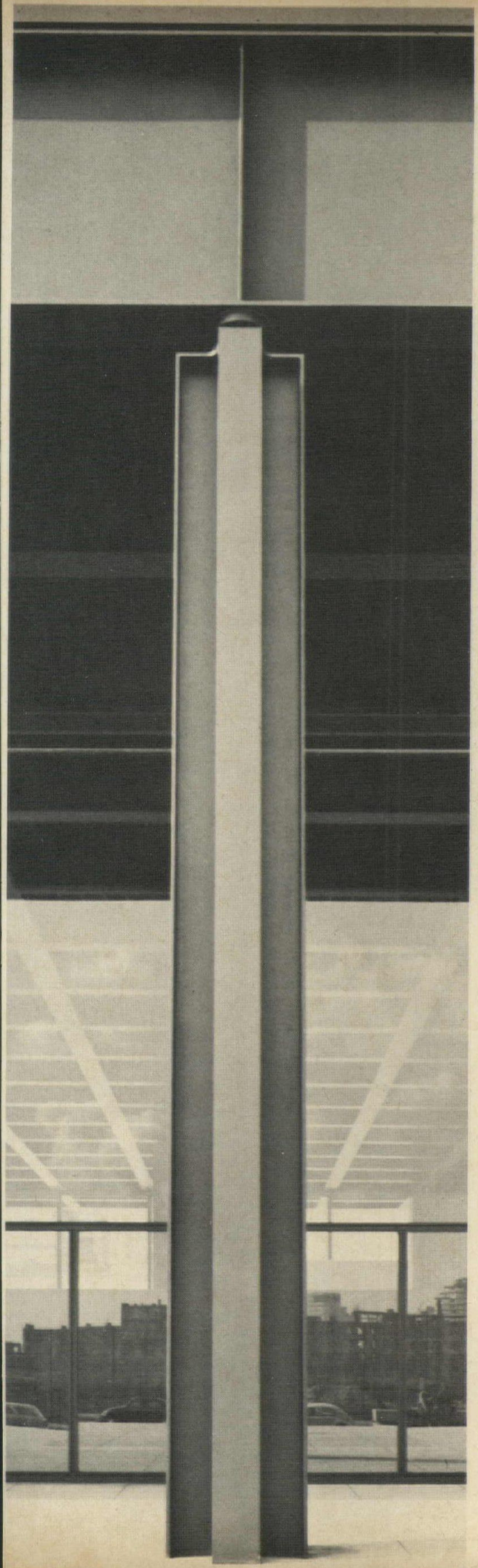
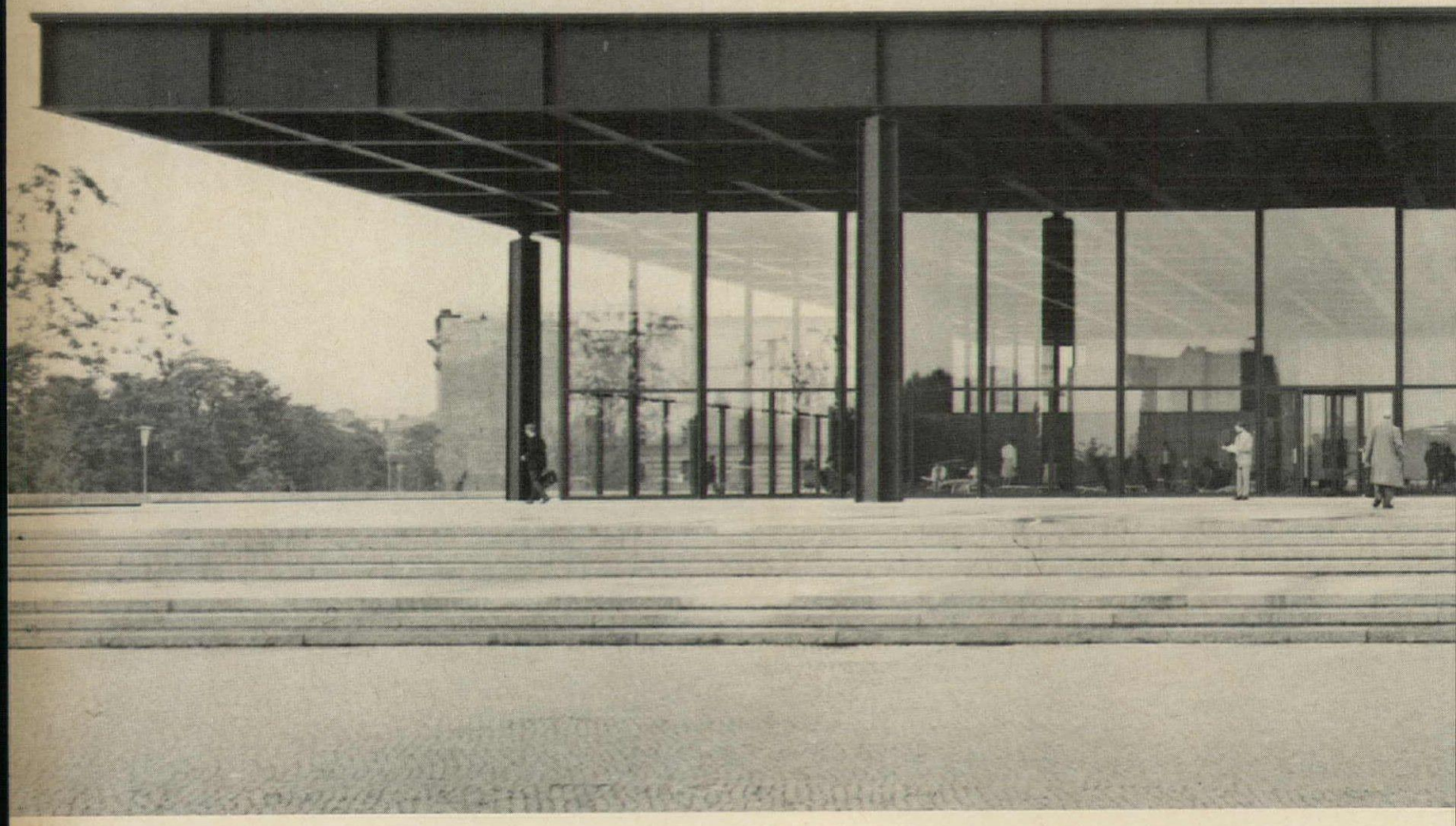


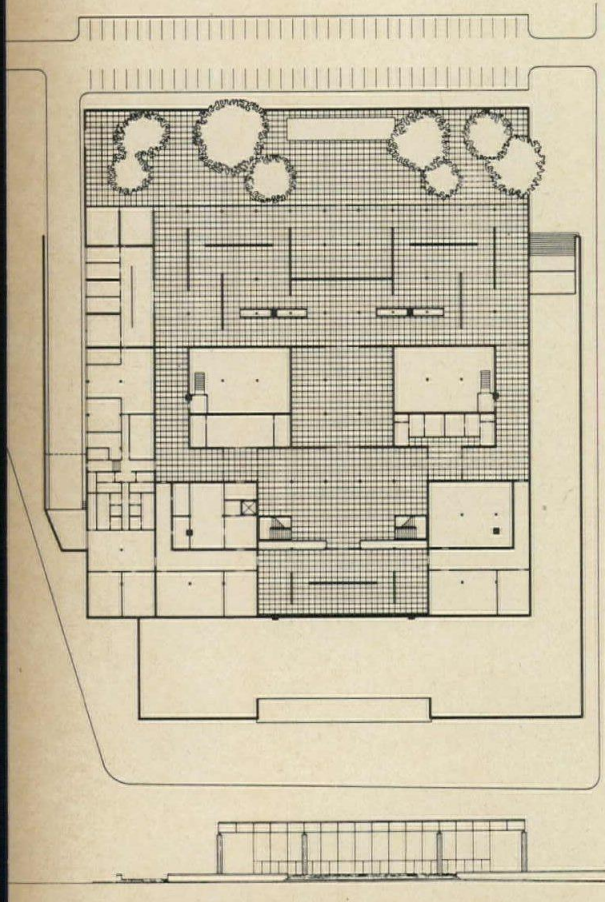
THE NEW NATIONAL GALLERY IN BERLIN BY LUDWIG MIES VAN DER ROHE

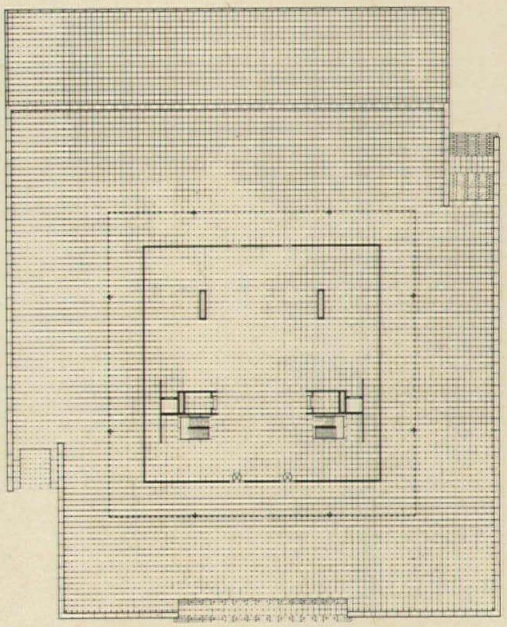
The gently tapering column shown at left is one of eight which support the 1250 ton, 210-foot-square roof of the first Mies building to be erected in Germany since he left his native country 30 years ago. Acclaimed by many as the consummate masterwork of an artist who has created many of the finest buildings of our time, it is certainly one of the most beautiful buildings ever constructed. In no way does this new exhibition hall represent a change in direction for the 82-year-old Mies. Its design, made possible by the most advanced structural technology, fulfills a theme first stated in his earliest work and well developed in the never-built Bacardi headquarters building for Santiago de Cuba, designed in the late fifties.

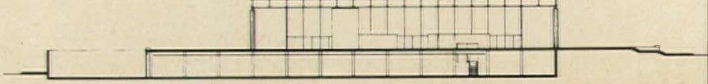
Asked why he has yet to depart from a design approach so consistent as to appear inevitable, Mies has laughed and said lightly: "I refuse to invent a new architecture every Monday morning."

NEUEN NATIONALGALERIE, Berlin. Owner: *Stiftung Preussicher Kulturbesitz;* architect: *Mies van der Rohe;* structural engineers: *Dienst and Richter;* mechanical engineers, general contractors and field supervisors: *Der Senator Fuer Bau-Und Wohnungswesen.*







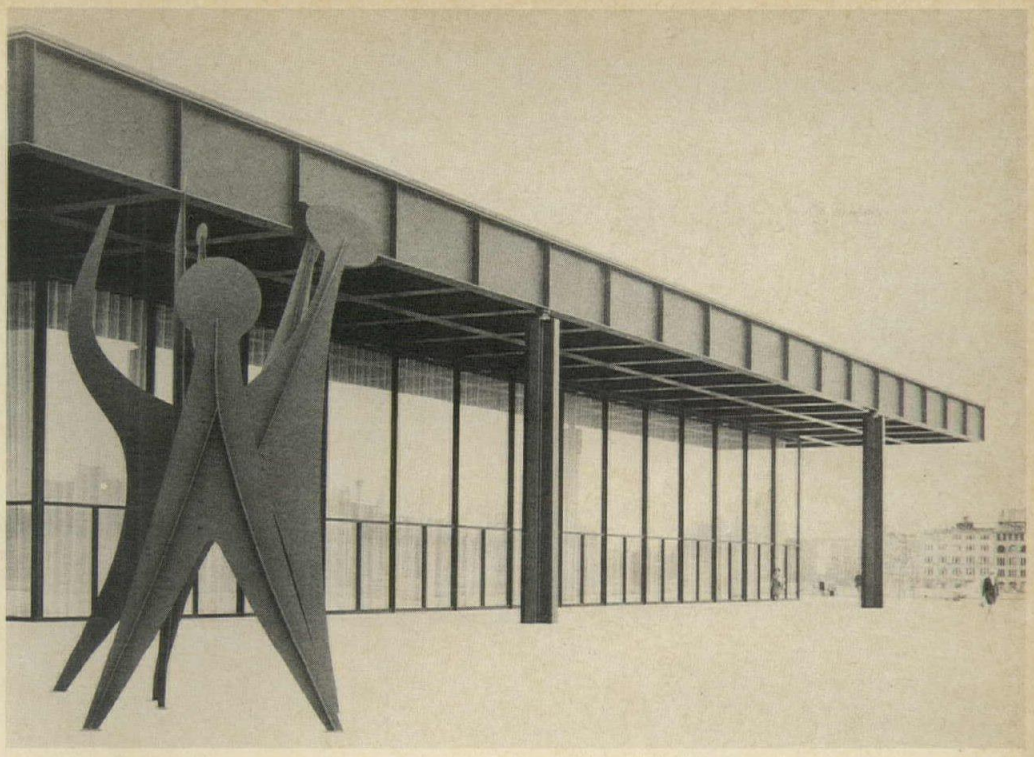


The vast terrace which forms the base of the New National Gallery is only a part of the even larger *Kemperplatz*, West Berlin's new cultural center, which now includes Scharoun's famous orchestra hall and the old *Matthaikirche* which can be seen at the right-hand edge of the photograph above. The immense gallery, truly monumental in scale, now dominates the *Kemperplatz*, and, because of its pivotal location, will continue to do so when the proposed state library and a complex of five other museums are added to the cultural center.

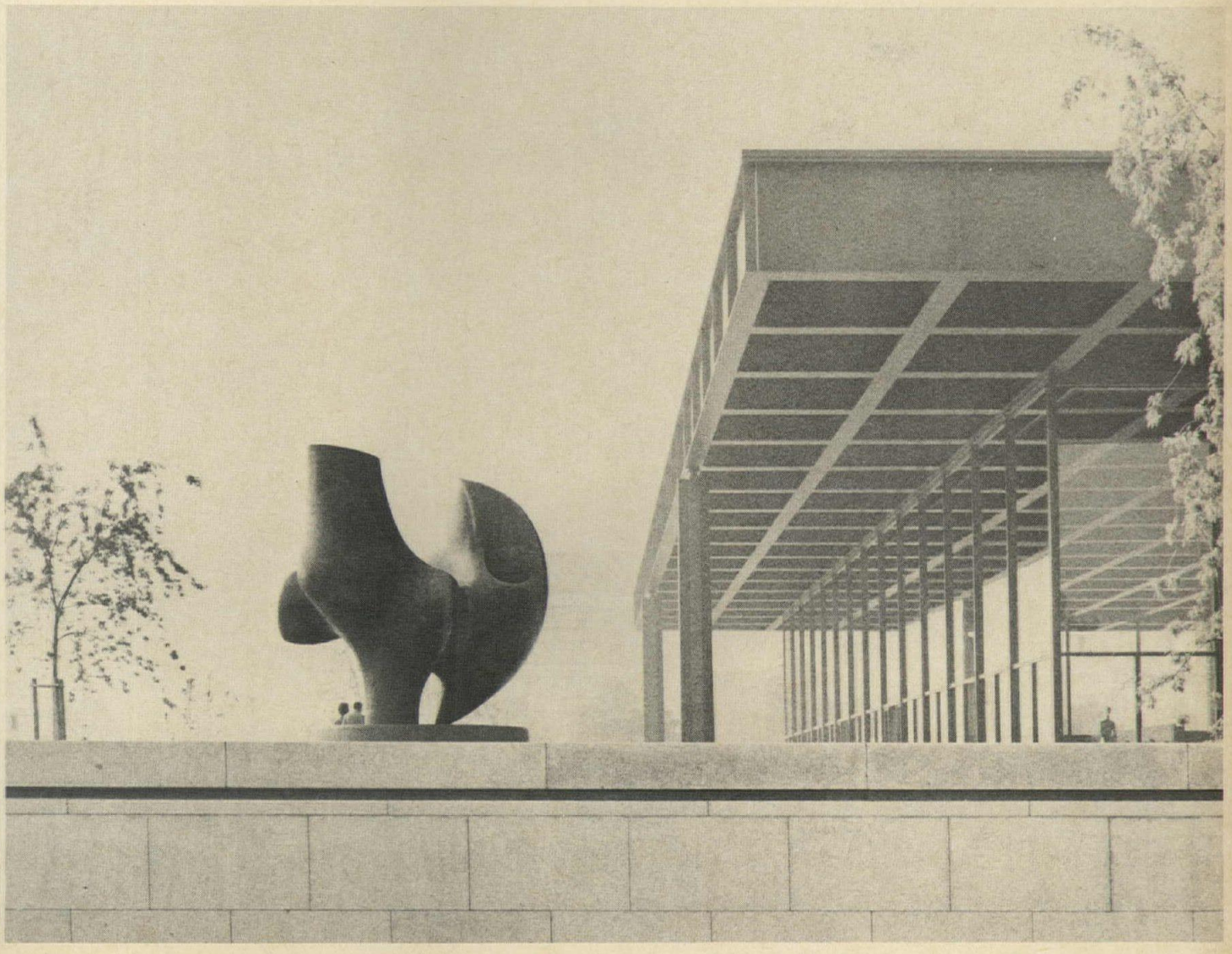
The building consists of two parts. On the terrace level a 25,000-square-foot, virtually unobstructed universal space serves as an exhibition hall for changing exhibitions. Below the terrace are gallery spaces for the permanent collection of paintings, prints and sculptures of the 19th and 20th centuries. The ceiling of the lower

floor is conventionally framed in reinforced concrete but the roof of the exhibition hall is a technological feat in steel. A flat, two-directional structure painted off-black, it is 210 feet square and approximately 6 feet deep. It consists of welded steel web girders 12 feet on center in both directions forming a square structural grid. The continuous upper compression plate is reinforced with steel ribs to prevent buckling. The roof has been slightly cambered at the four corners and mid-spans to appear flat. Eight cross-shaped steel columns, two on each side, support the roof which transfers its load to each column through a pin joint. The hall itself is 177 feet square and 28 feet high. Its great space is interrupted at only four points by two mechanical ducts and stair, elevator and coatroom elements. The lower floor opens upon a sunken sculpture court which may be seen in the section at left.

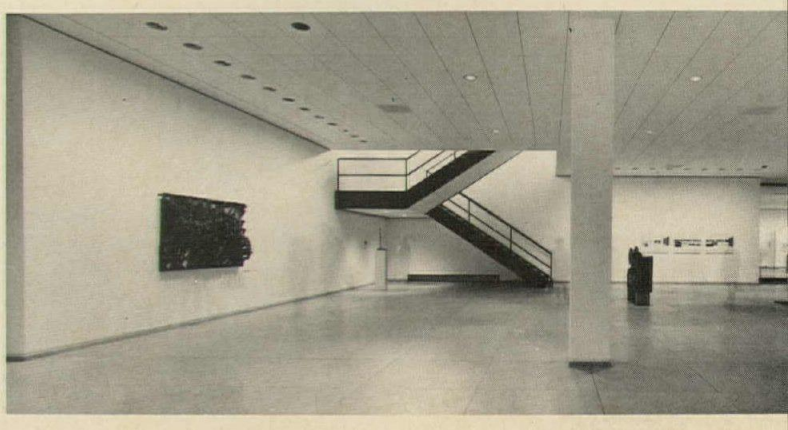
Balthazar Korab photos

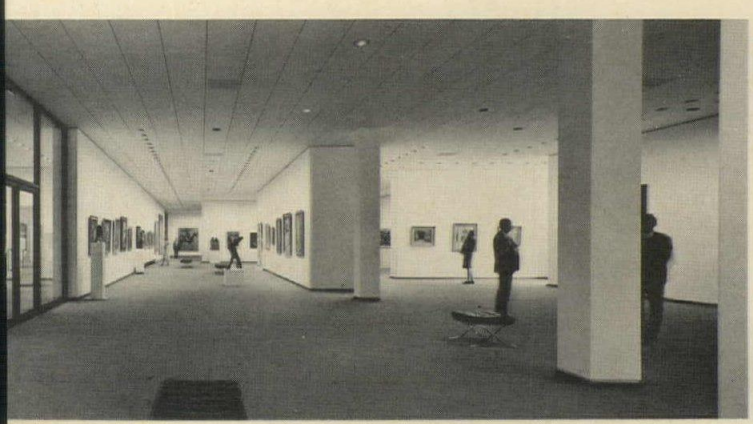


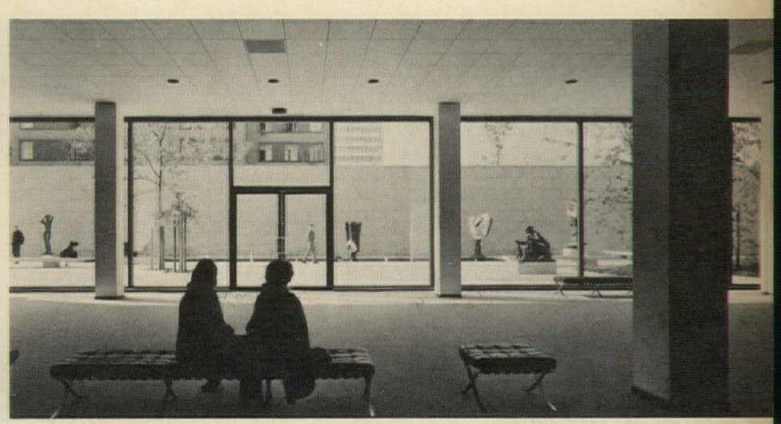
The granite terrace is approximately 345 by 361 feet and covers almost a full Berlin city block. It is approached by three broad stairways and defined by a continuous granite bench which also serves as a guard rail. Like the exhibition hall itself, the terrace is a noble setting for monumental sculpture. Above and at left are two different views of an Alexander Calder stabile. Below is a work by Henry Moore.

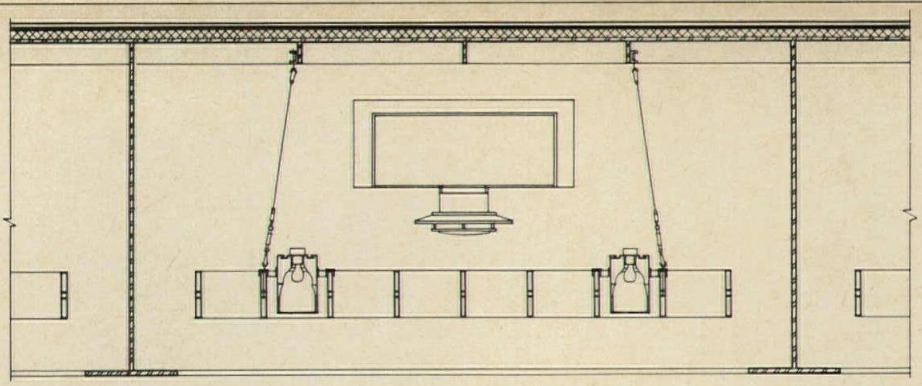


The exhibition hall, shown above, is best suited for large scale artworks, an opportunity which was not exploited by the choice of Mondrian's small paintings for the opening show. The lower floor shown in the two photographs at the right is less than ideal as gallery space because most of it is without natural light. The sculpture court, shown at the far right, lies below the street level and is surrounded by high granite walls. It includes a pool, generous planting areas and some large trees.

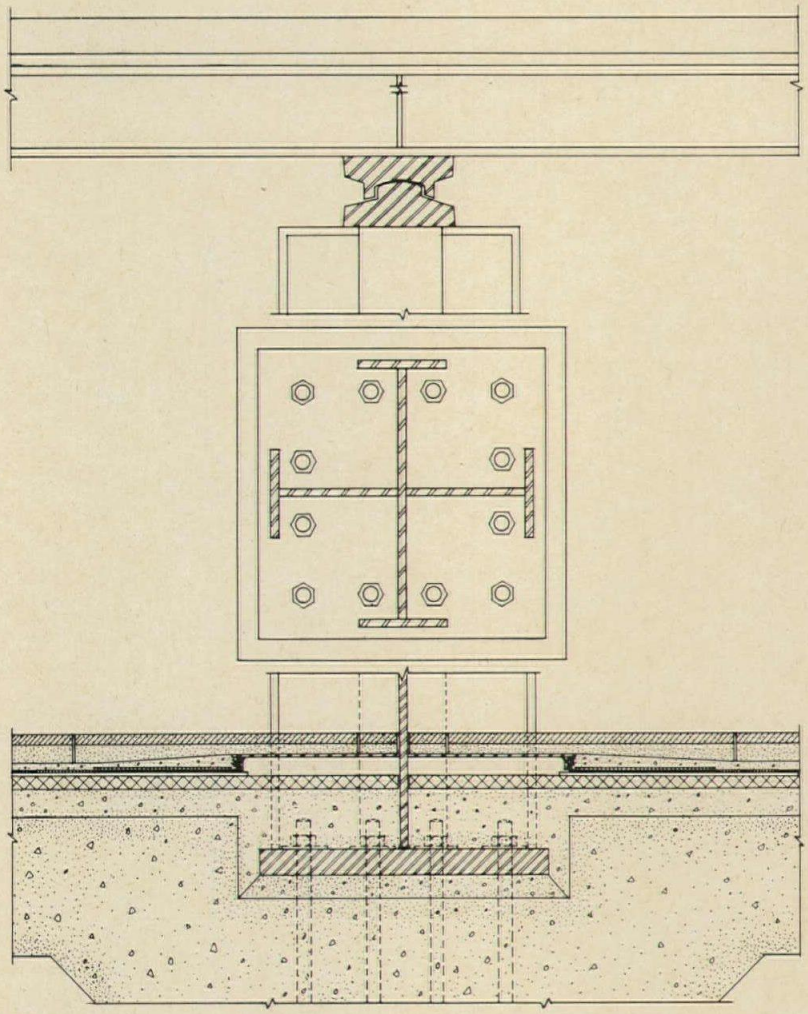






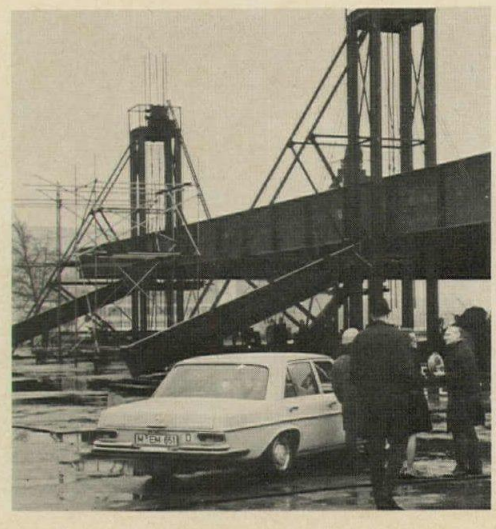


CEILING



COLUMN

The ceiling of the exhibition hall consists of black aluminum grilles recessed in the structural steel frame. As the construction photos indicate, large segments of the roof structure were brought to the site and welded together on the ground. The columns were connected in a horizontal position by means of pin joints. The 1250-ton roof was then raised by hydraulic jacks to a position slightly above its final elevation of 28 feet in approximately nine hours. The columns gradually swung into a vertical position during the lifting process. The entire structure was then slowly lowered into place.



R.I.T.'S NEW CAMPUS— A UNIQUE DESIGN COLLABORATION

Rochester Institute of Technology's new campus is an important achievement in the arts of architecture and planning. It is the work of landscape architect Dan Kiley, and five architects—Lawrence Anderson, Edward Larrabee Barnes, Kevin Roche, Hugh Stubbins and Harry Weese. Starting with a fine rural site approximately one mile square, these men have collaborated to achieve a campus plan which—in addition to functioning well in a practical sense—becomes the framework for bold compositional effects, great vistas, beautifully scaled courtyards which will become settings for sculpture, and broad playing fields incorporated within the campus fabric (rather than relegated to its margins).

Further, these architects have collaborated to establish and work within a common esthetic, which includes a shared vocabulary of structure, scale and materials to achieve a campus as unified as a medieval city.

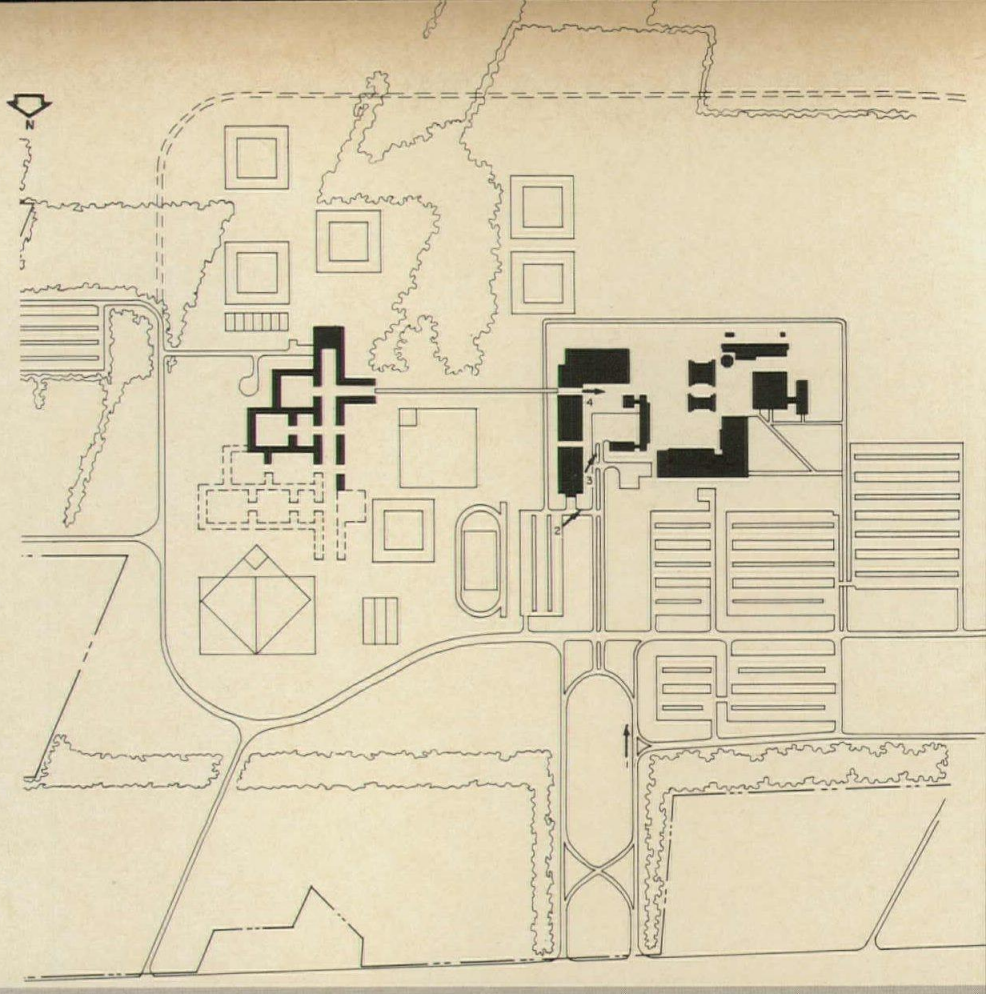
This accomplishment is, to say the least, highly unusual. An architect will occasionally defer, in matters of scale and material, to those noteworthy buildings of architects long dead which may bear a visual relationship to his new structure. If, however, the buildings which are to bear this relationship are the works of architects who are alive and practicing, neither the desire to collaborate nor the procedures for so doing often exist. For this reason it is interesting to examine briefly the development of the collaborative design process at R.I.T. which began in 1961 when Dr. Mark Ellingson, the president, determined to move the entire campus from dilapidated buildings in downtown Rochester to a splendid site several miles outside of the city. He decided that the move should occur in one phase rather than several—an immense job, therefore, for all concerned. One of the schools to be included on the new campus was the School for American Craftsmen, founded by the American Craftsmen's Council whose chairman, Mrs. Vanderbilt Webb, is also a R.I.T. trustee. Mrs. Webb, the late architect David Campbell, and Dan Kiley persuaded President Ellingson and the trustees that the campus should be the work of five of the best architects they could find, one for each of the proposed academic, social, athletic and administrative groupings within the Institute, and one for the dormitories. They proceeded to select those whom they felt could develop an approach in common. Lawrence Anderson became coordinating architect and Dan Kiley space coordinator and landscape consultant. When the architects began, it was not firmly established which buildings they should do, but as the site plan developed, it began to resolve itself into five complexes. Kevin Roche argues that the basic concept of five separate groupings of functions into five complexes should have been challenged. He asserts that had it not been necessary for each collaborator to go back to his office and do his complex, the final site solution might have been quite different and possibly better. For this reason he believes that the campus should have been the work of a single good firm—a more efficient process, he contends. The other collaborators don't agree. Anderson feels that it was essential that each functional grouping within the Institute have its own architect because of the difficulties inherent in developing so many complex programs to be built at once. He also believes that each of the five architects, challenged by his peers, did his best work. Weese considers the collaborative process highly successful. "Architects need to work each other over as we did."

All the architects admit that working together on R.I.T. was quite trying at times, and no one believes that the final result is a complete success.

Several argue, for example, that the student residences should have been closer to, and better integrated with, the academic area, although the fact of the co-existence on this campus of both day and evening schools would seem to call for an explicit separation of academic and dormitory facilities to provide day students with some degree of quiet, privacy and separateness in the evening. This arrangement also allows for more freedom of choice in the location of future academic facilities. All of the collaborators regret that Dan Kiley's planting scheme is not being carried out, and that the architects lost control of the interior furnishings. Curiously, none of the architects seem to realize what an extraordinarily good job they have done. Perhaps they will when they finally recover from the wounds of a remarkable collaboration.

—Mildred F. Schmertz

R.I.T.'s 1300-acre site was occupied this fall by a total enrollment of over 14,417—including 3821 day students and 10,596 evening and special program students. A dormitory complex for 1900 students and 13 academic buildings were all constructed in one phase for approximately $60 million. The campus is organized in two distinct areas—the academic and the residential—each on its own hill and connected by a long pedestrian mall. Buildings A, B and C form the dormitory complex, which includes a dining hall and future dormitory construction. Other buildings include the physical education-athletic center D, the college-alumni union and pool E, the evening school G, the business, health and administration building H, the library J, the general studies building K, the graphic arts and photography building L, the fine and applied arts building M, and the applied science N, science O, and proposed health sciences buildings P.



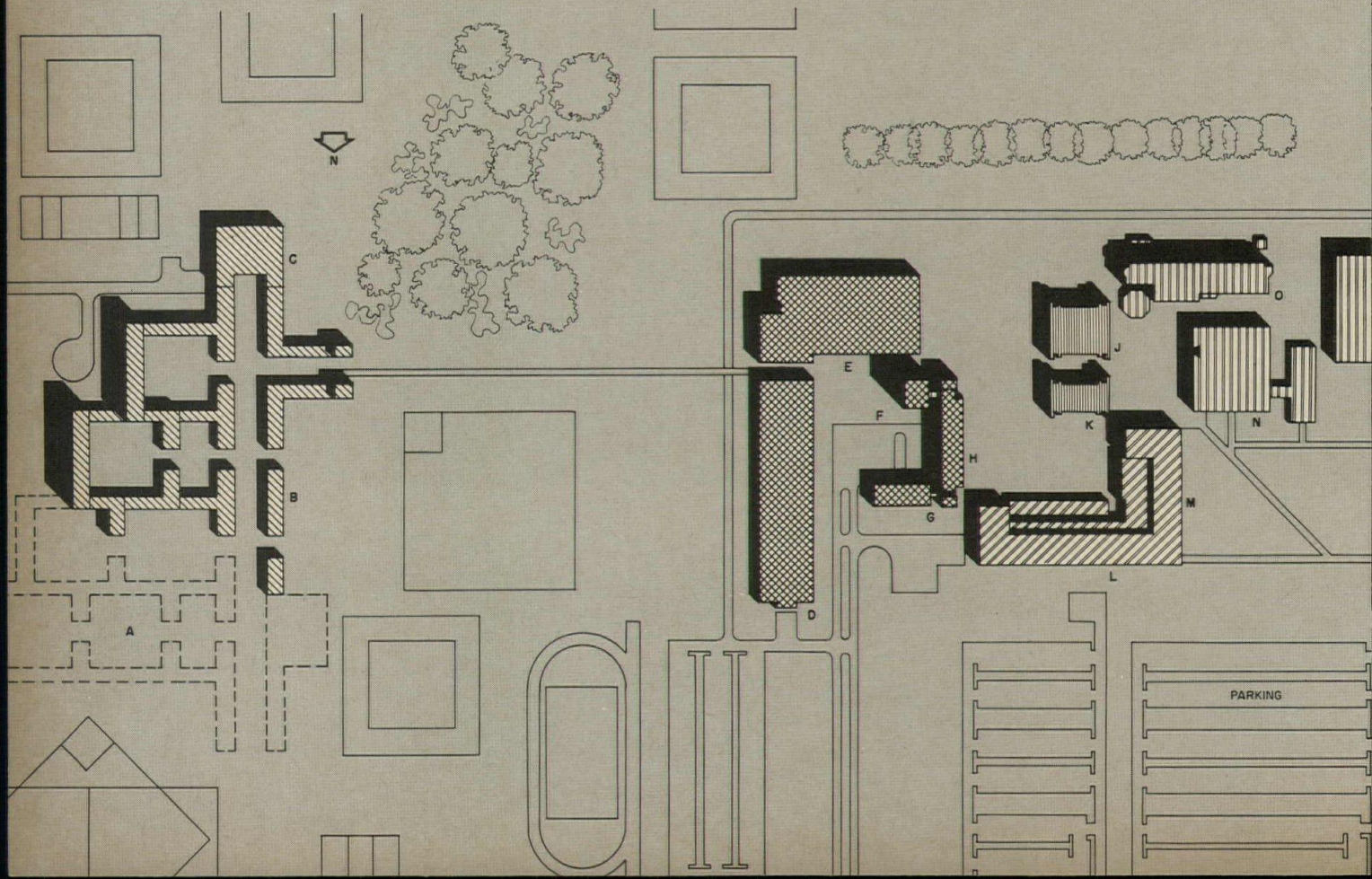
EDWARD LARRABEE BARNES

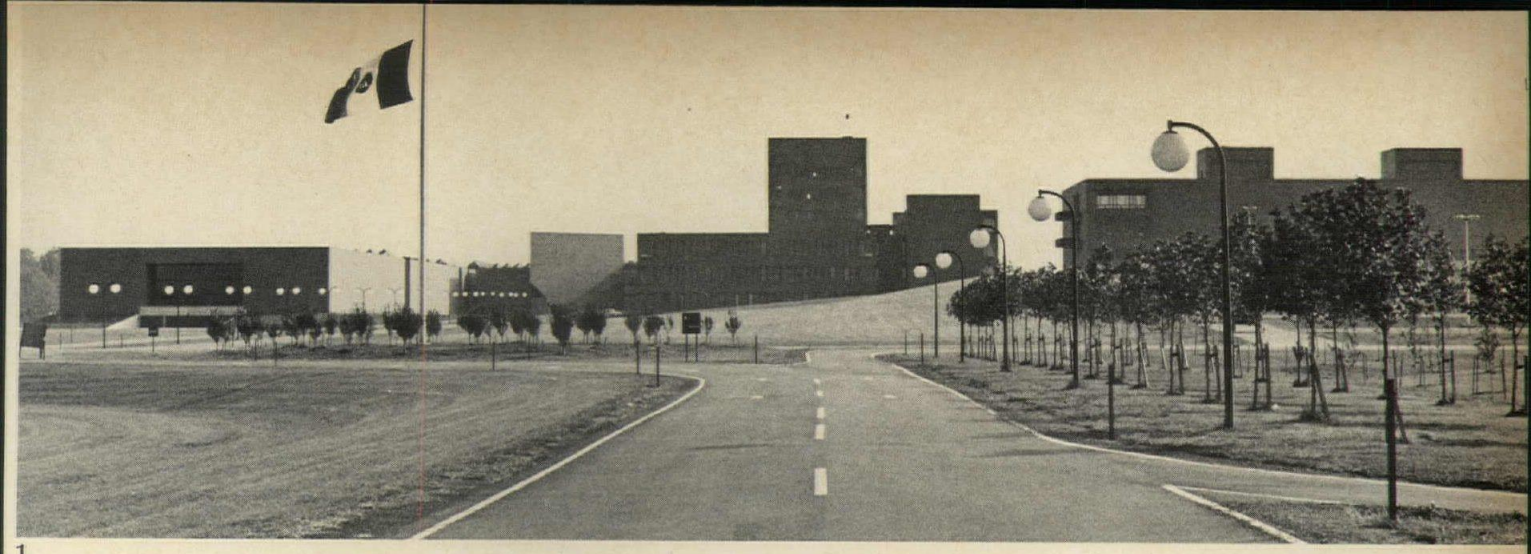
KEVIN ROCHE, JOHN DINKELOO & ASSOCIATES

HARRY WEESE & ASSOCIATES

HUGH STUBBINS & ASSOCIATES

ANDERSON, BECKWITH AND HAIBLE





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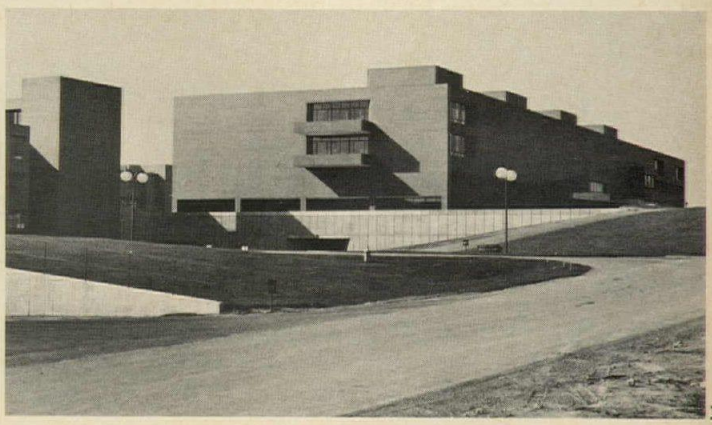
The academic complex ↑ is approached by a long and formal access road. It is on axis with the tower of the administration building, which serves as the main campus landmark. The center of this complex ↓ is reached by a drive which gives a good view of Hugh Stubbins' fine arts and graphic arts buildings → to the east. The campus center, designed by Kevin Roche, opens upon an axial vista to the east that culminates in the applied science building by Anderson, Beckwith and Haible.



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Mildred F. Schmertz photos

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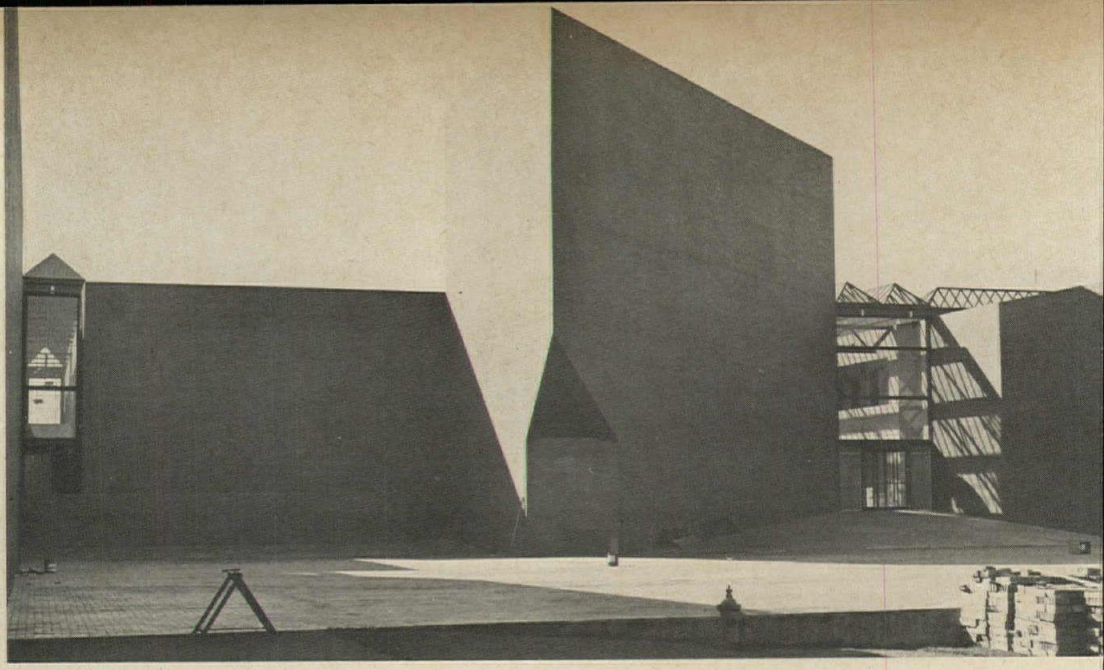

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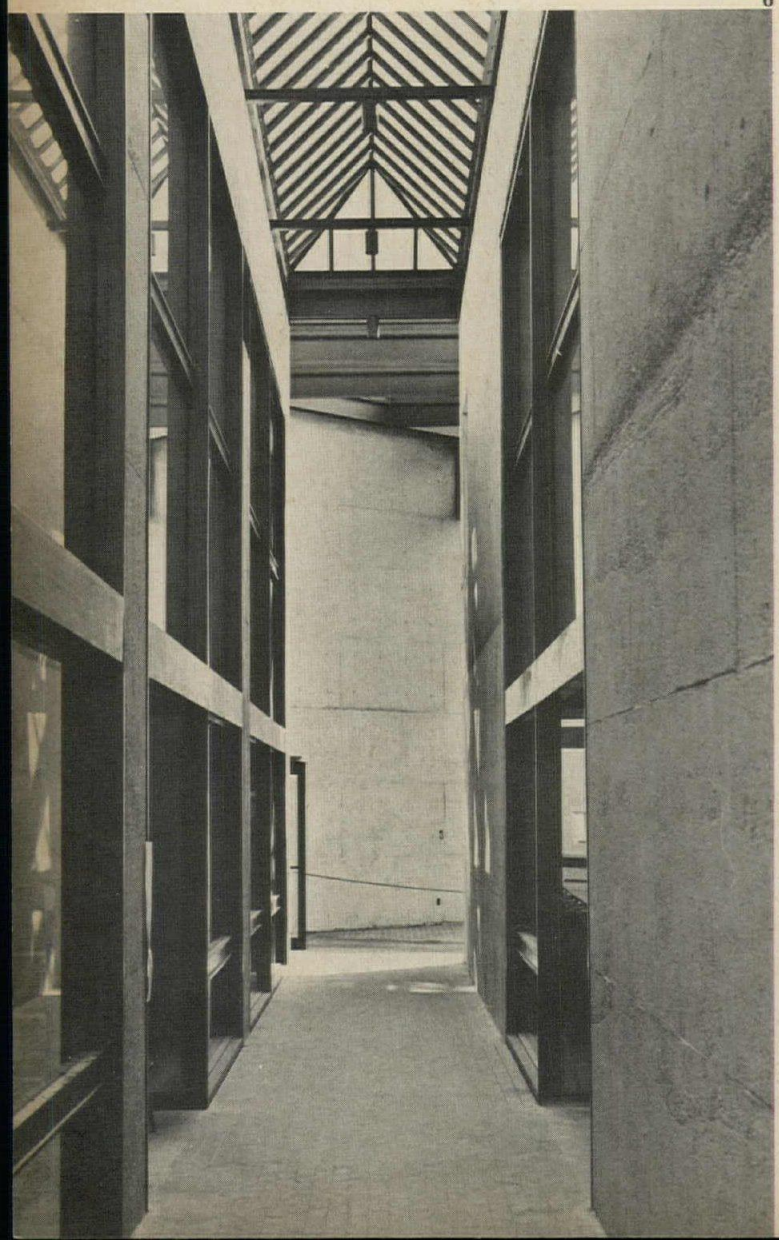
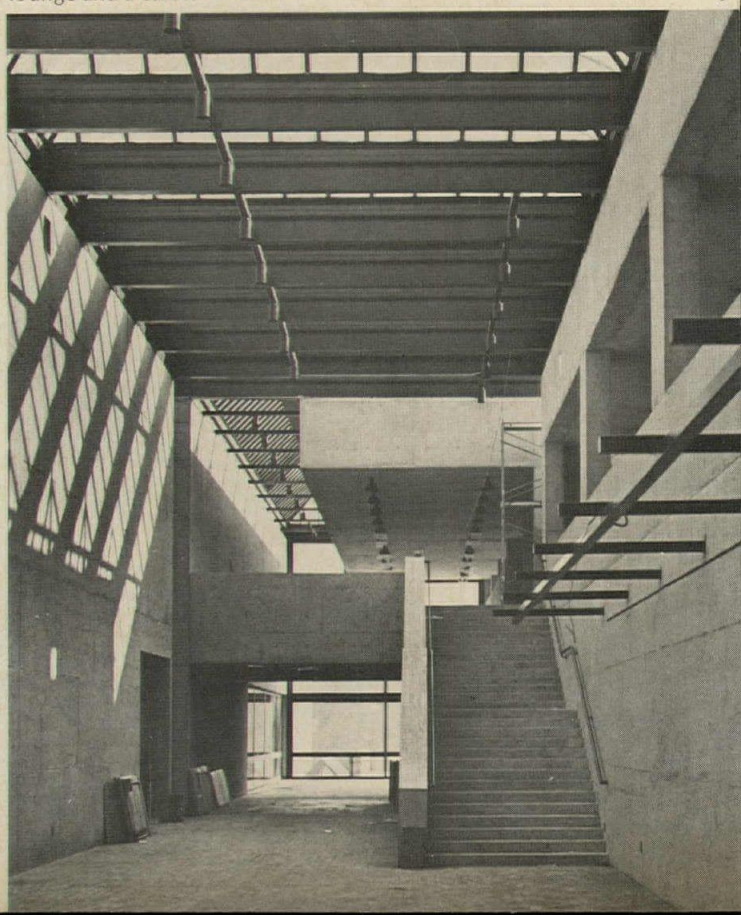
Roche's college-alumni union encloses the campus center to the south. ↑ A 500-seat auditorium forms the principle mass. Its shark-like profile was designed to partially reveal the east-west vista formed by the campus pedestrian walk. Since this facade faces north it has been angled to catch the sun. The building plan has been organized to require fenestration on the three other exposures in order to provide a continuous brick surface for this portion of the campus center. The passageways in this building and throughout the campus have been carefully integrated with the pattern of outdoor circulation. In Roche's buildings, skylights make these corridors seem part of the outdoors. ↓ The union includes a lounge and a cafeteria. →

6





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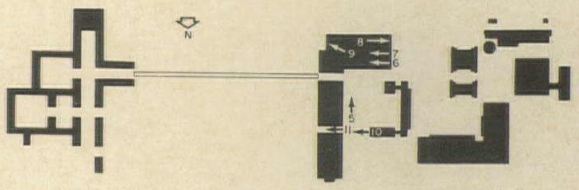

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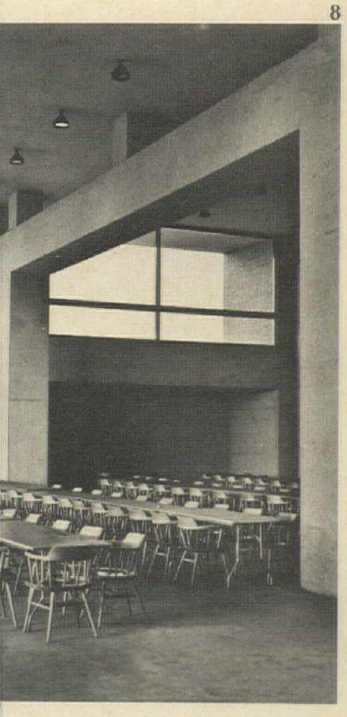

The principal entrance to Roche's physical education and athletic building → separates the ice arena from the gymnasium. The main lobby ↓ leads to a terrace which overlooks the playing fields and the dormitory complex beyond. The brick used throughout the campus is Pennsylvania iron-spot, which changes in the light from pink to a purplish brown.

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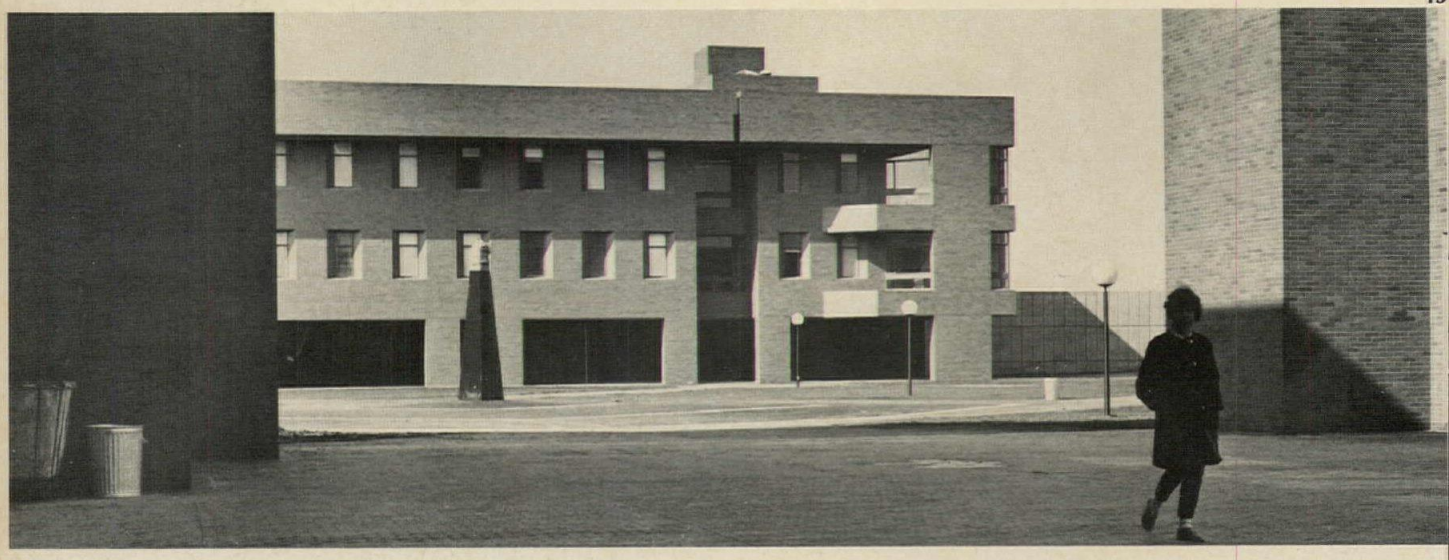

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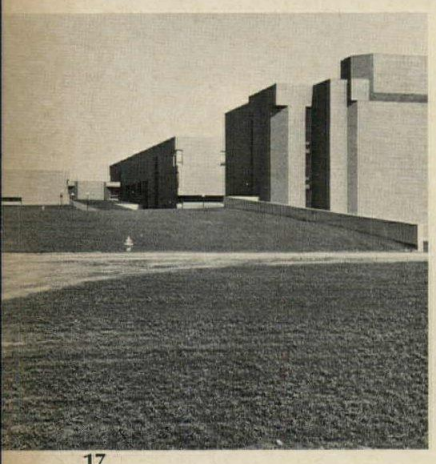

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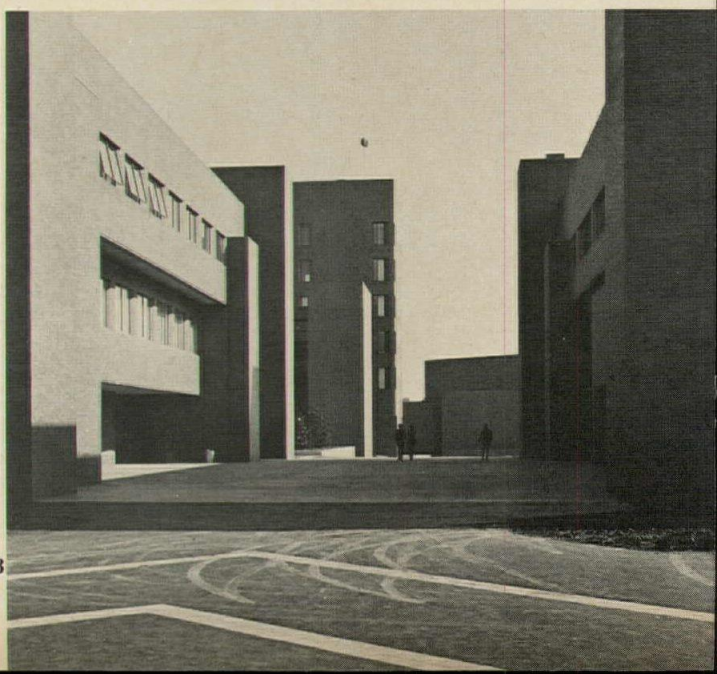
The applied science building at the western end of the campus major axis ↑ faces a plaza which is defined to the east by two buildings by Harry Weese—a library to the south and a general studies building to the north. Weese's buildings also appear in the photograph of the vista from the science plaza east toward the campus center. → Roche's notched facade, which opens the view to the dormitories, can just be discerned in this photo. It can be seen more clearly in the adjacent photo. The science complex ← is at the western edge.



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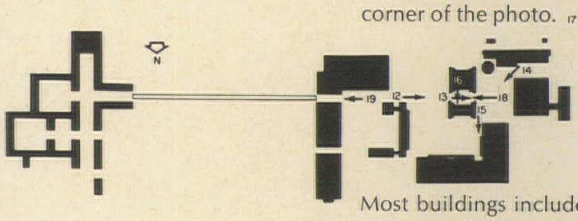
The science plaza opens into another court formed by Stubbins' colleges of fine and applied arts and graphic arts and photography. ↑ Weese's general studies building appears in the right-hand corner of the photo.



Most buildings include open passageways which interconnect courtyards, plazas and perimeter parking areas. Two examples are at the intersection between two elements of Stubbins' arts complex → and within Weese's building.

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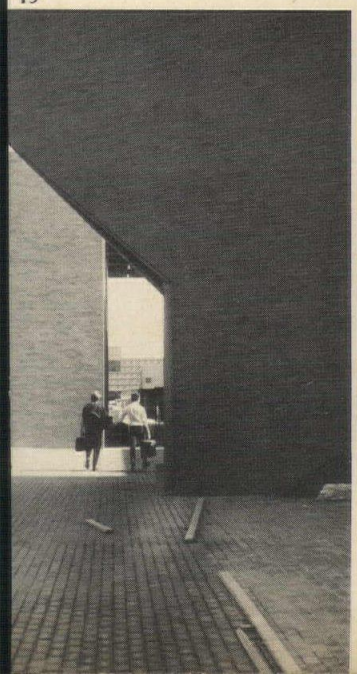

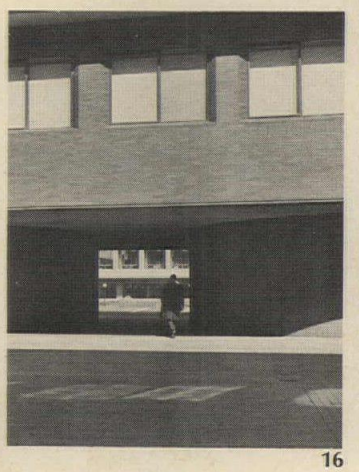

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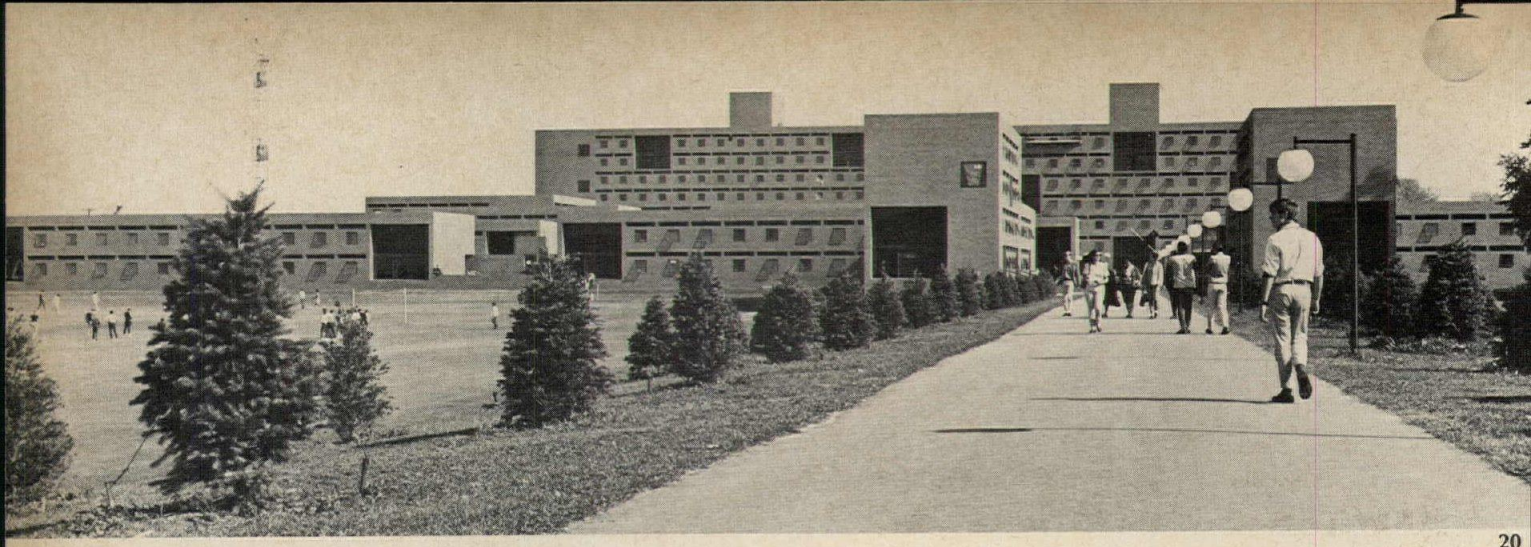

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Edward L. Barnes' dormitory complex ↑ is located on a slight rise at the eastern end of the campus axis beyond the playing fields. At its main intersection is a sundial ← designed by architect-sculptor Alistair Bevington, an associate in the Barnes office. The sundial, very handsome but never designed as a seat, has nonetheless become an important student gathering place. ↓ It is of rusted steel with an aluminum rod supported by cables. It is one of a number of works of art commissioned for the campus.

22

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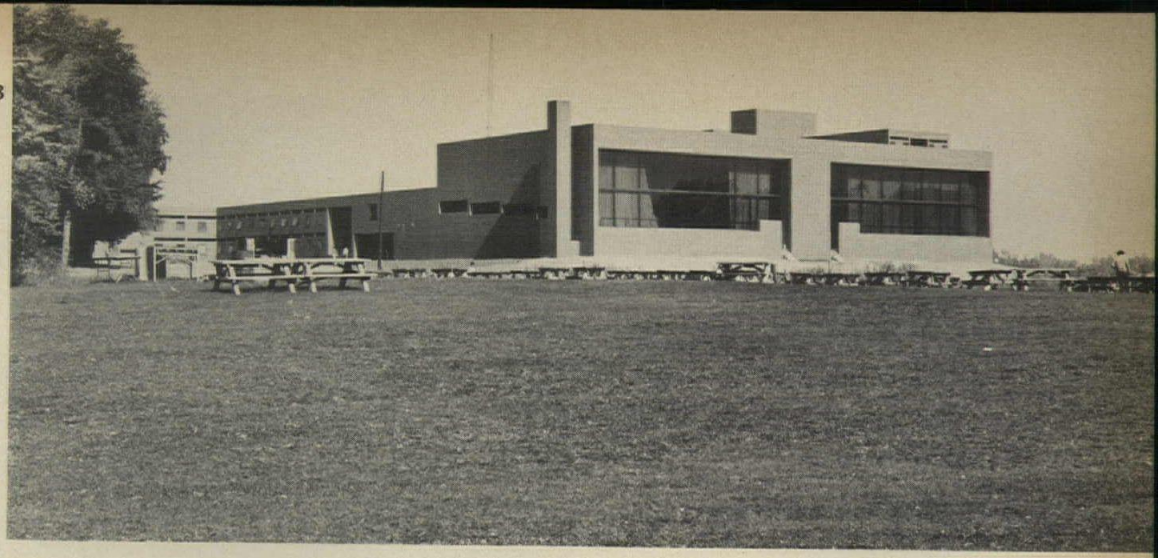

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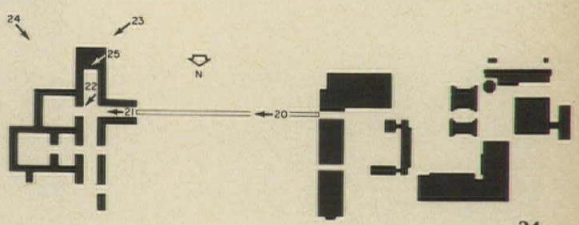
The dormitory complex includes a dining hall ↑ which overlooks a broad meadow, with picnic tables and an outdoor fireplace, to the south. The interior of this 950-seat hall is stepped downward ← and its fenestration follows the slope. The farmland south of the dormitory complex ↓ is quite extensive in acreage and will eventually be developed to add to the generous and well located recreation facilities already provided on the flat open fields of this campus.



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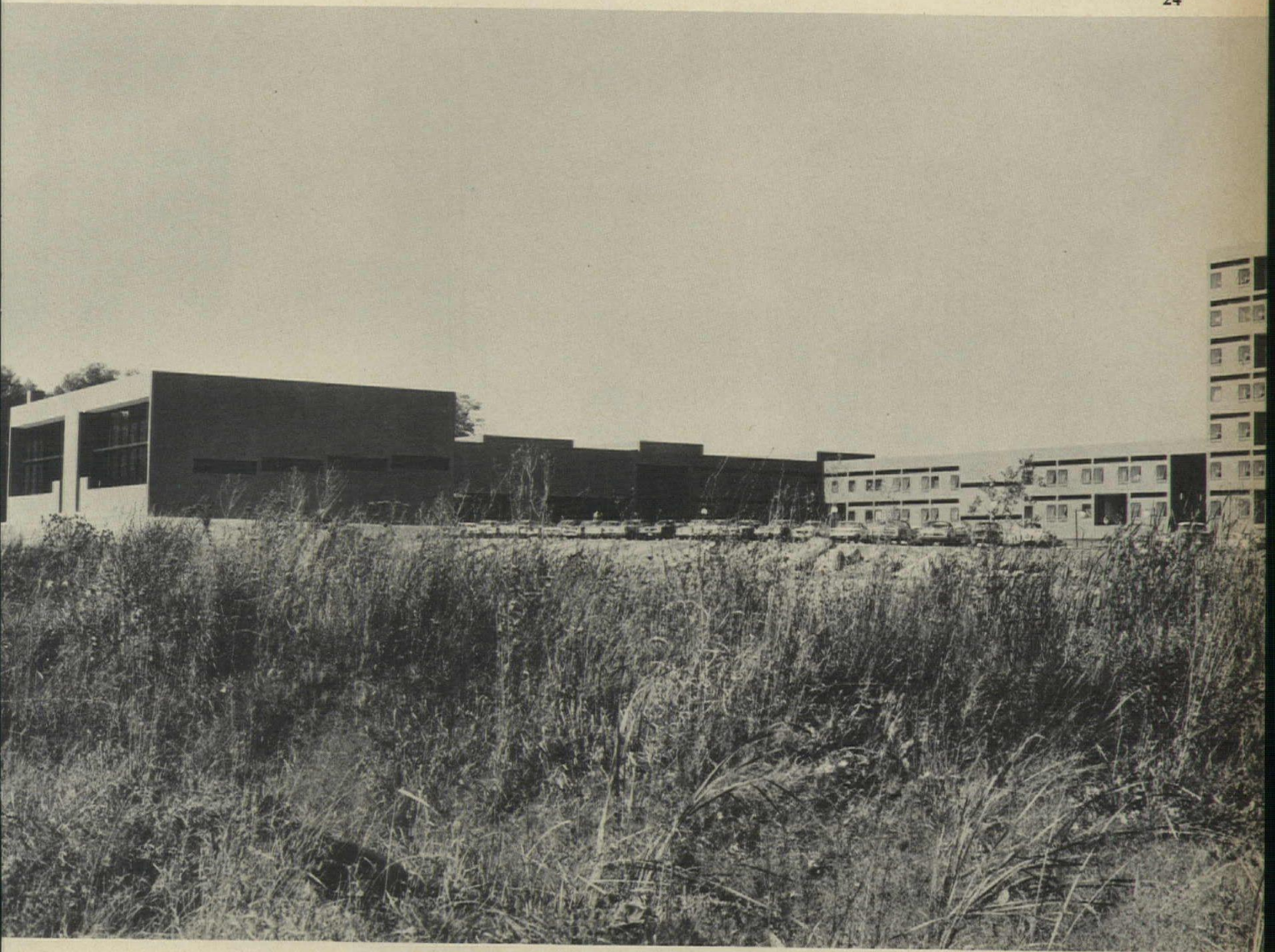
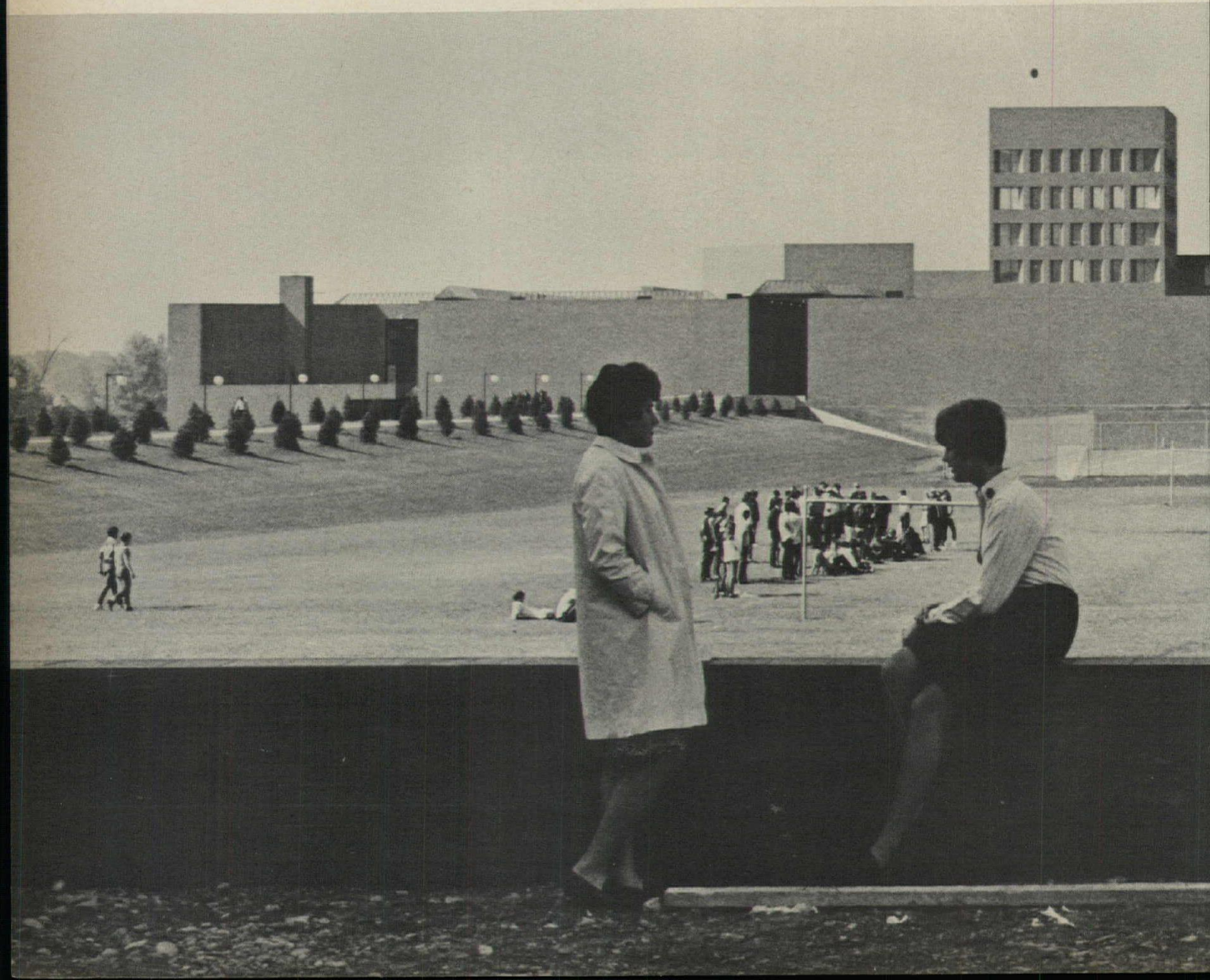
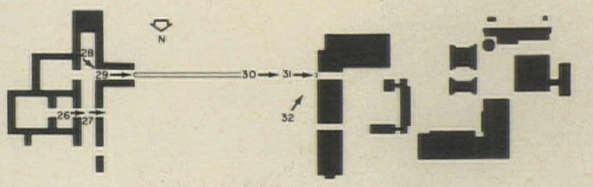




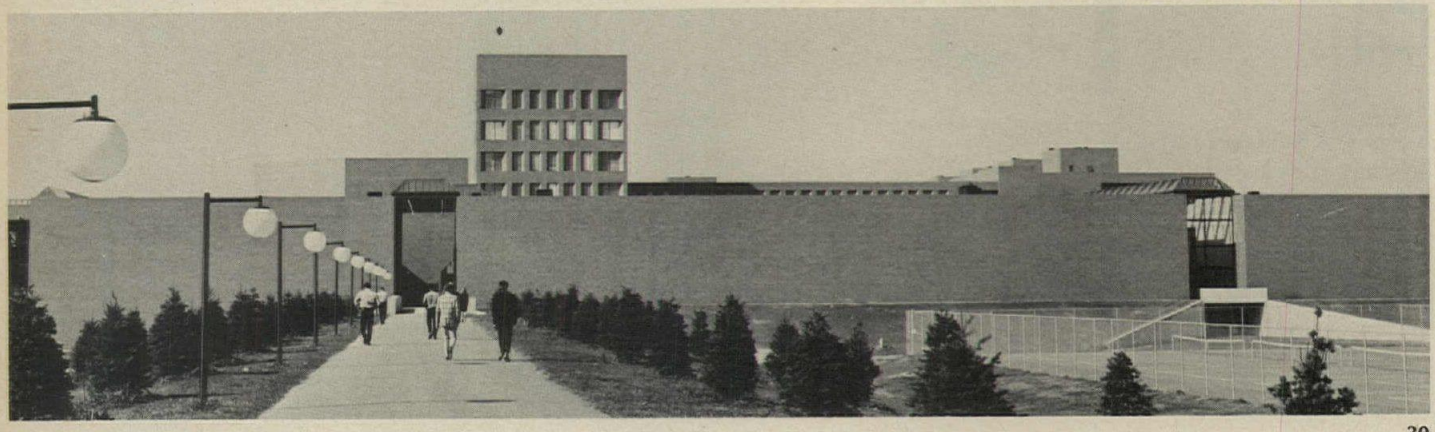


A surprising little doorway, ← the only one of its kind on the campus, was designed by Barnes as part of the dormitory complex to frame the administration tower and lead to a small terrace. The terrace affords a splendid view of the playing fields at the foot of the castlelike walls of the academic complex. ↓ The principal pedestrian axis appears at left.

28

The student's walk to the academic complex begins at the sundial ↑ and proceeds between two four-story fraternity units ← to the pedestrian walk on a raised spine above the playing fields. ↓

29



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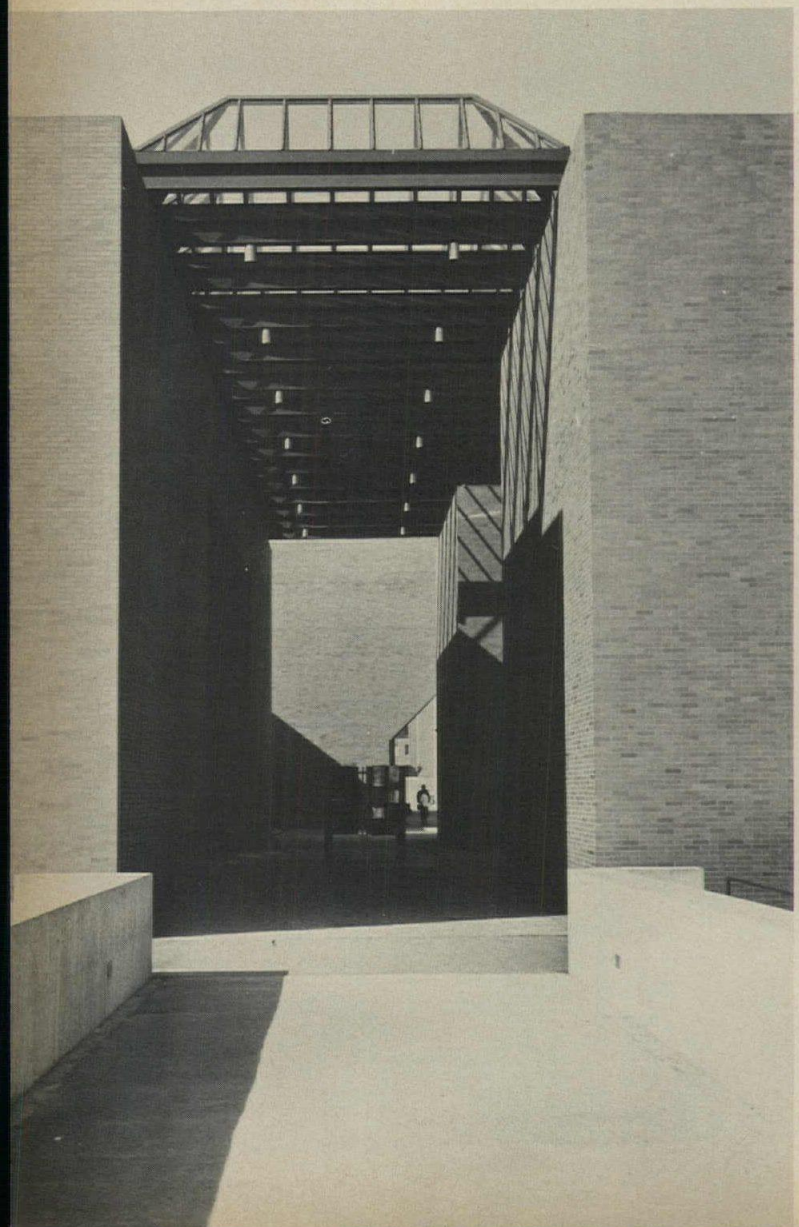
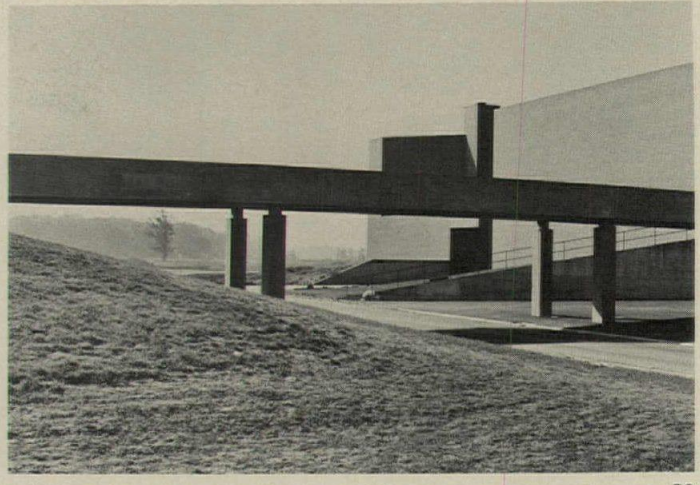
He enters the campus center through the portico which separates the gymnasium and swimming pool in Roche's physical education complex. ← The notched facade of Roche's auditorium can be seen in the middle distance. As it nears the academic complex, the pedestrian walk becomes a handsomely designed bridge. ↓

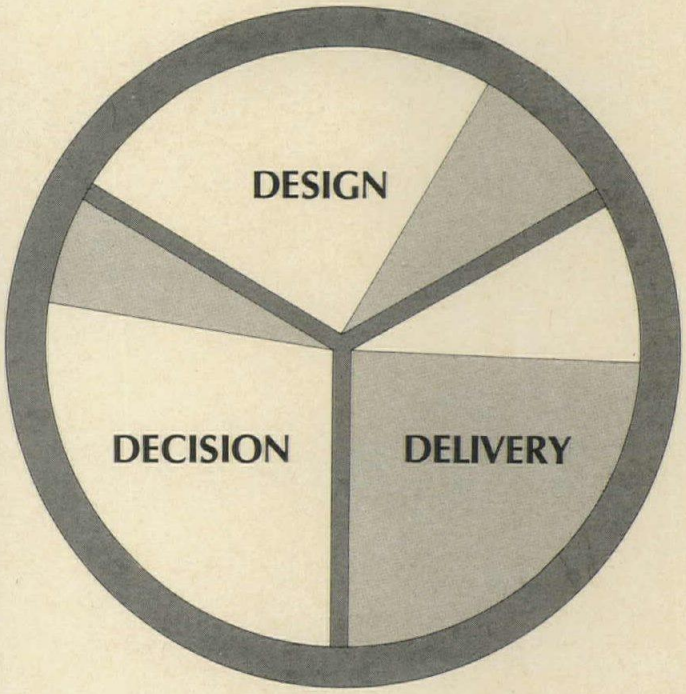




32

PROPOSAL: A NEW AND COMPREHENSIVE SYSTEM FOR DESIGN AND DELIVERY OF BUILDINGS

by Robert F. Hastings



Comprehensive System
Rim and spokes of the wheel are project management skills uniting the three steps, decision, design and delivery. White areas represent planning skills. Shaded areas show relative weights of production skills in each step.

Robert Hastings, president of Smith, Hinchman & Grylls Associates, Inc. and a long-time student and advocate of comprehensive systems, now firmly believes that architects, engineers, and planners must radically change, expand and coordinate their skills with those of builders and manufacturers to meet the needs for new construction ahead.

Imagine what could be done if all the processes by which buildings are commissioned, designed and built were suddenly freed from all tradition. Imagine that you could now invent those processes in the most logical array possible. The new processes must be the most efficient and the most generative of beauty, functionalism and economy. In your freedom from tradition, you are not constrained to think of labels such as *architect, engineer* and *contractor*. You have the power to muster all the talents and resources now available and to develop new ones as needed—under whatever label and in whatever combinations seem appropriate.

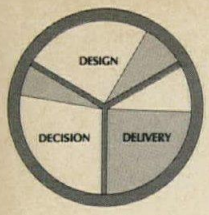
If you take into account the enormous problems now inhibiting building processes—and realize that many of those problems are self-generated by the patterns in which we all now operate—you will arrive at a new system quite different from that which now prevails.

To encompass the full sequence of factors affecting any system, you would start at the very beginning—where the decision to build or not to build is made. You would back off from the confusion of trial and error that now besets every client and consider a new *comprehensive system* that might unify the processes of initiation with the processes of design and construction. You would analyze the *needs* of such a system, the *steps* required for its orderly implementation, and the *skills* required of the men who must make it work.

The comprehensive system proposed here assembles the talents for building with insistence on only one criterion: Professional service to clients in delivery of the best possible building, on time, and at the lowest cost consistent with quality.

As with all ideas freed from prejudice, simplicity emerges as a prevailing characteristic. At risk of seeming to force simplicity into the "ancient rule of three," we can list—under each of our three categories of needs, steps and skills—three items.

- *The needs* in the building process are for control: 1) control of *quality;* 2) control of *cost;* and 3) control of *time* required for the whole process. It may be argued that cost and time are intimately linked—as they surely are even when they are not synonymous. In the building field, however, the control of time is a management process quite separate from the options of design and materials controlling other costs of a project.
- *The steps* that must be taken in any building process are again three: the *decision* of where, how much and when to build; *design* of the building; and *delivery* of the building on time and in the budget.



• *The skills* marshalled in varying combinations and degrees at succeeding phases of the process are skills in *planning, production* and *project management.*

In order to clarify the logic by which all these triads lead us through today's complex building process, let's review each in some detail.

NEEDS

CONTROL QUALITY
CONTROL COST
CONTROL TIME

It is increasingly apparent that our clients continue an unending search for a comprehensive system for creating buildings within the disciplines of quality, cost, and time. This search manifests itself in many ways. Some corporate clients will try on one day the package-design-and-build approach; the next day, the traditional architect-engineer-general contractor approach; then the lease-back, and then a mixed approach of package-builder with independent design affiliation. Such clients are constantly searching for a simpler, more comprehensive way to create their buildings so that they can get on with the business of producing their own particular product. They need assurances that their buildings will be built within the shortest possible time, within the lowest possible budget consistent with quality.

The basic separation between independent professions and package dealers lies in the fact that the latter usually sell their services with primary emphasis on savings in time and cost. Built into the very concept of professionalism, however, is the fact that any real service to clients must rest on a *three-point* balance of time, cost *and quality.*

Clients are no longer satisfied with merely saving time and money. They are increasingly insistent upon higher and higher quality—of design and materials —within their budgets.

STEPS

DECISION
DESIGN
DELIVERY

• *Decision* is obviously the first stage in any process for creating buildings: decisions as to feasibility, decisions as to basic program, decisions as to location, site, budget, size—these are all decisions that in the end must be approved by a client before moving into the next stage of design.

Because buildings are becoming far more sophisticated, however, and because the problems of finance are becoming more complex, clients are more and more leaning upon others to assist them in the decision-making period. *This is a professional service.* It should be provided by, and is being provided by, architects, engineers, planners, real estate developers, management people, other consultants and banks. Above all, this service must be provided professionally, as distinguished from an entrepreneurial production service, so that the advice that is presented can be unbiased advice and can help a client make the very important decision as to whether or not it is good judgment to go ahead with the project in the first place.

Further—to an increasing extent in today's political and social climate—the advice must rise above the client's enterprise itself as a profitable venture and view the project in context with the needs of society. This may sound like a pretentious posture and/or an unwarranted demand upon the professional. But if he *is in fact professional,* he has no choice but to defend both client and community against any grossly exploitational disaster as he sees it.

The decision stage, then, is a crucially important stage. It requires all the professional input of the best possible people in order to arrive at the proper starting point and stopping point and all points in between in a viable program. It will become even more difficult in the future.

• *The design stage* is, of course, the creative stage so far as the physical facility is concerned. (It should be acknowledged, however, that there is a great deal of creative work being done in the decision stage too; creative in a financial and business sense, perhaps, instead of an artistic, architectural or engineering sense.) During the design stage the skills traditionally attributed to designers, architects, engineers, planners, landscape architects, sociologists, psychologists, economists and others should be brought to bear to develop the most creative design concept possible to meet the total program needs spelled out in the decision stage.

In order to do this, there must be a close relationship between those who work on decision, and those who work on design. In fact, in many instances, they should be the same people. The design stage will become increasingly difficult because, again, time must be shortened; costs must be rigorously controlled; and quality must be improved.

In the design stage, it is going to be necessary to apply all of the sophisticated devices available in the business field to provide a broader choice for making design decisions. The computer is going to be extremely important and people from many disciplines are going to be needed. Thoughtful "design" people are already working in this direction (and I use the word "design" in quotes to mean not only architects but all those contributing to total design, taking into account all the facets of a problem).

• *Delivery* of the actual building itself—the creating of the physical structure toward which the decision and design work has pointed—is the third step in the process. Delivery, again, will be done by a team which I believe will involve not only the various construction trades—contractors and material suppliers—but, increasingly, the now-emerging new professional acting as a construction manager or coordinator. Furthermore, I believe that, just as it is vitally important that the producer play a part in the decision process, it is equally important that the planner play a part in the delivery stage. It seems apparent that in the future the delivery stage will be quite different than it is now—just as the design stage

will be totally different. The groups involved in delivery will not at all be those that presently exist. Just as architecture and engineering, as they are now practiced, must undergo metamorphosis, the general contractor, mechanical contractor and the electrical contractor must also take on new identity. All of these groups, I believe, will develop a newer, better, more effective and efficient system of creating buildings.

SKILLS

PLANNING
PRODUCTION
PROJECT MANAGEMENT

In the comprehensive processes of decision, design and delivery; planning skills, production skills and project management skills are required in each phase. The terms are used in the broadest possible context. Planning, for example, applies to the total creative process—planning skills in the areas of finance, real estate, sociology, economics, in some instances political science, architecture, engineering, product manufacturing, and construction techniques—must be brought to bear on the decision process. During the design stage, many of the same planning skills are required in order to develop the ideal design. By having some of the planners play a role in both the decision and the design stages, the needs of the client can be spelled out more accurately, and carried out more consistently. And time and money can be saved.

• *The planning skills* required for the design stage will in the future call for the creation of a design profession made up of diverse specialists who have a clear understanding of one another's areas and contributions, but at the same time have specialized skills in the various disciplines necessary to bring about creative design. In other words, I believe the basic education of architects, engineers, and planners will have more and more in common, and their professional identities will merge as communication becomes more fluent. Specialization then will be an elective taken late enough in the professional career to truly reflect and use the special talents of the individual. Drop-outs will diminish. And the part-way stations of achievement, at which some arrest for one reason or another, will be honest goals and useful nodes of accomplishment—not failures.

In the delivery stage, planning skills are already increasing in importance. While the mechanical and electrical trades—and the product manufacturers—have been making bigger and bigger contributions toward the total structure, many general contractors, for some reason, have failed to equip themselves with the manifold planning skills involved in the construction management of these other disciplines. In general they have limited their management controls to structural trades only, and have merely shuffled the paper for the other trades. Unless general contractors take on total construction management, as a certain few have done, I believe they will fade in importance and another breed of professionals will take their place.

In fact, as those who retain their construction planning skills give up contracting, they may become construction management professionals. Then they must work strictly for a fee, and have no profit to gain by cutting corners in a compromise with quality. Any savings in costs will then properly accrue to the owner, and the construction manager will be able to work professionally without conflict of interest.

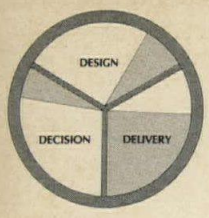
• *Production skills,* while obviously required in a documentary and graphics sense at every step, take on special importance at the delivery step. It is already apparent that in a comprehensive system of control the production skills of contractors, trades people, material suppliers and manufacturers must be increasingly taken into account—even in the decision and design stages.

Three factors will profoundly affect the application of production skills throughout the building process: 1) buildings of the future are going to be much larger in scale; 2) the mix of the traditional trades is going to be quite different; and 3) there must be a greater input by the producer in the decision and design stages. Therefore, I believe we must find a completely new approach to the delivery stage that will enable us to take advantage of the production know-how of the manufacturer and the tremendous financial resources that make research and development work possible. We must develop a comprehensive construction system which will make it economically sound for the producer to do research and development work on building groups.

In the past, this has been extremely difficult, because, in general, we have been talking about one building at a time in the cost range of one million or two million dollars. It was not economical for a producer to spend a great deal of time and research developing products for one specific building and not have them applicable or available for others. However, the scale of projects is growing every year—hundred-million-dollar projects are now quite common. Certainly, on projects of this scale there must be considerable research and development work by manufacturers for that specific project in order to realize the greatest savings and highest quality.

I believe that more and more product manufacturers will be developing systems and sub-systems (they have already started) that are unique for particular projects. I do not mean that they are going to develop for example, a wall, and then try to sell it for every building that comes out in the next ten years; but I do mean that a wall manufacturer will become expert in creating walls, of all types, that are technologically excellent. He will not only design to the architect's performance specifications, but he will be able to test, manufacture, install and guarantee these walls as to actual performance in-place.

So I believe that, in the future, product and systems manufacturers are going to be selected much, much earlier, in some instances way back in the decision stage; in many other instances early in the design stage. And the designer is going to be working with the producer in these early stages in order to develop the most economical systems with the highest quality.



Here again there will be a great need for a professional construction manager who can coordinate on-site assembly of the various systems and sub-systems. Such a manager could be an architect, an engineer, or another designated firm doing only construction management. The important thing to remember is that he is a professional who understands the decision and design processes and has special expertise in the area of delivery.

• *Project management,* then, takes on identity as the third skill which will be necessary to make this comprehensive system work. This skill can be supplied by any professionals who qualify to do the task. They may be architects or engineers, if they have the vision to prepare themselves. They may be primary contractors, real estate developers or management specialists. It all depends upon the skills and training of the people involved, for theirs is going to be the very important job of holding together the decision, design and delivery steps of the total process.

In the comprehensive system, management unites all steps and skills

By representing the steps in the creative process as segments of a circle (as in the chart entitled "Comprehensive System") each step touches upon the other two, which is exactly what should happen in the most efficient and effective process. The problem of the past has been that each of the three steps has been taken by itself, almost totally ignoring the other two. The project-management wheel is intended to illustrate that the three steps of the process are held together tightly by the rim and relate to one another by the spokes of project management. The white areas illustrate the planning skills and the dark-toned areas represent the production skills. The percentage of one area versus the other will vary, of course, with the particular project at hand.

I sincerely believe that this continuous unification of relationships is the direction of the future. There is already a great movement in this direction and, hopefully, this wheel-shaped framework expresses the direction that is gradually evolving in the construction industry. Who has these skills at present? I don't believe that any one group has them inherently. I do believe, however, that there are groups emerging that are preparing themselves for one or more of the key roles in such a comprehensive system.

Architects must now assess the role that means fulfillment

I am profoundly concerned that the architectural profession as a whole is not moving as rapidly in the direction of broad-scale responsibilities as it should be. In fact, I am sure there are many architects who believe their role is in "pure design," and they narrow their role even further by envisioning themselves only in the esthetic and planning phases of design. I am encouraged, nevertheless, by the number of architects who see very clearly that the professional role of the future will be involved in the planning and project management areas described.

The pressures for a comprehensive system for creating buildings are becoming so great that the professions and the rest of the building industry are going to be forced into drastic changes. So long as these changes are made with the interests of clients paramount, there can be nothing but gain for all concerned, even though each group has to re-adjust traditional concepts of its identity.

Contractors, for example, as well as architects and engineers must make radical adjustment in their present form. Architects and engineers will design buildings utilizing performance specifications for major systems and sub-systems, rather than the traditional details of construction. Manufacturers will fabricate the major systems and sub-systems in their factories, erect them at the building site, and guarantee their performance. The building contractor will field-fabricate and erect those parts of the building that hold the major systems and sub-systems together. Construction management will bring together the prefabricated systems and field forces for coordination and erection.

How might this comprehensive system work?

Within the system we are trying to describe, project management skills will bring together the various planning and production skills where needed in the decision process. Building programs, since they are becoming more sophisticated, must be prepared by inter-disciplinary planning groups that have a good grasp of the function, economics, and other factors social and political surrounding the making of decisions. Many of these decisions of the future will be in the multi-million dollar bracket. Therefore, every little aspect in decision becomes very important. The digits to the right of the decimal point make a very material difference in the total fee when you are talking about construction costs.

I believe that, in the future, gross design decisions will have to be made during the decision period in order to come up with the basic starting points that continue to be valid through the remaining steps of the total creative process.

All this will be possible and logical, because both planners and producers have taken part in the decision stage. There will be no loss of effort, no starting over again because the programs were wrong or impractical, or because gross design decisions made in the first stage were wrong or impossible for the ultimate designer to work out.

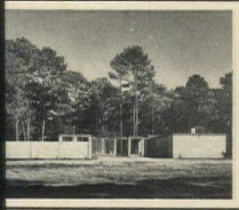
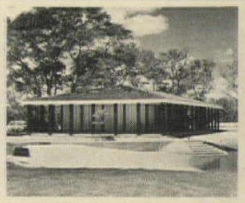
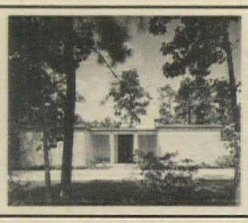
In like manner, as the various disciplines bring their skills to bear upon the design step, the planning skills must interrelate with the producing skills in order to come up with a design concept that will waste no motion, increase no costs, lose no quality when the project gets to the delivery stage.

Those architects and engineers who can see into the future, will, I believe, give leadership to the creation of a new profession or a set of new professions that completely understand and relate to one another in developing man's physical environment. I believe that architects and engineers of the future will prepare themselves thoroughly to understand and administer the planning and project management skills. I believe that they will eminently fulfill this role. But I do not believe that they will have an exclusive claim upon this role. Others are already preparing themselves for it and will fill it very well.

We have a responsibility to think primarily of the needs of society and to develop our skills and our services to meet those needs. The immediate future, I know, is going to be agonizing for all of us. But I can see so many advantages, so much to gain, that I am looking forward to these new horizons.

PRESTON M. BOLTON, ASSOCIATES: A FIRM THAT THRIVES ON HOUSES

At a time when too many architects claim that house design is "too much trouble and too unprofitable," it is reassuring to see a firm that limits its work to nothing but houses prosper. With a large volume of houses built during his years of practice, and a large volume constantly on his boards, Preston Bolton has developed an expertise in building houses that people like to live in. His design approach and six of his newest houses are presented here.


"I limit my practice to houses because I like doing them. I also decided early that I wanted to maintain a small office, to maintain design control of every facet of a project. I believe this is the only way to do a good job for the client and the only way to create good houses.

But I cannot do speculative houses, because I need to design for a client—one with limitations of scope, and always a budget.

I of course considered the fact that there are very few architects who have limited their work to houses, and the environment has suffered from this lack of interest. The environmental influences of the home are far-reaching and quite important in our social world today.

I never tell clients that I am going to do a house for them. Always, I say that I am going to help them design a house, and I mean it. Too many architects—when they do design a house—design it for themselves, and they expect their clients to conform.

One has to know a lot about clients to design a good house. One visit to their present living quarters is worth many office conferences. I try to deal equally with the husband and wife, and few projects are handled by one or the other. Then it is more their house, and less mine. The plan is first and most important, for that is what makes a house really livable for that particular family.

The elevation, second, needs imagination and flair that reflects the personality of the client.

Materials form the third part, and the main thing is to keep the client from using too many. What the architect can do that the client cannot is urge the softness of brick, or the hardness of terrazzo, to develop a feel for space.

Next one must design the multitude of details—kitchen cabinets, bath dressing tables, and front doors. No two families live alike. I love details and how things go together—and this is most important in a house. Details can make or miss the original design concept if they are not kept in rein. I often wonder if the client really cares about all of the trouble we go to for a ½-inch reveal around all trim and cabinets. I like to think that they do. At least, they know that they like the feel of the finished product.

One cannot help but become vitally involved with all elements of design. The lighting must be adaptable to the quiet of every-night living, and to the noise of party crowds. The light, airy feeling of daytime living must be captured after dark for festive occasions, and easily adapted for more serene ones.

And there must be concern for furniture. It is important to think where to put the bed in a bedroom, and consequently I almost have to have a furniture plan in my mind to make a plan livable. I like to be consulted on interior design.

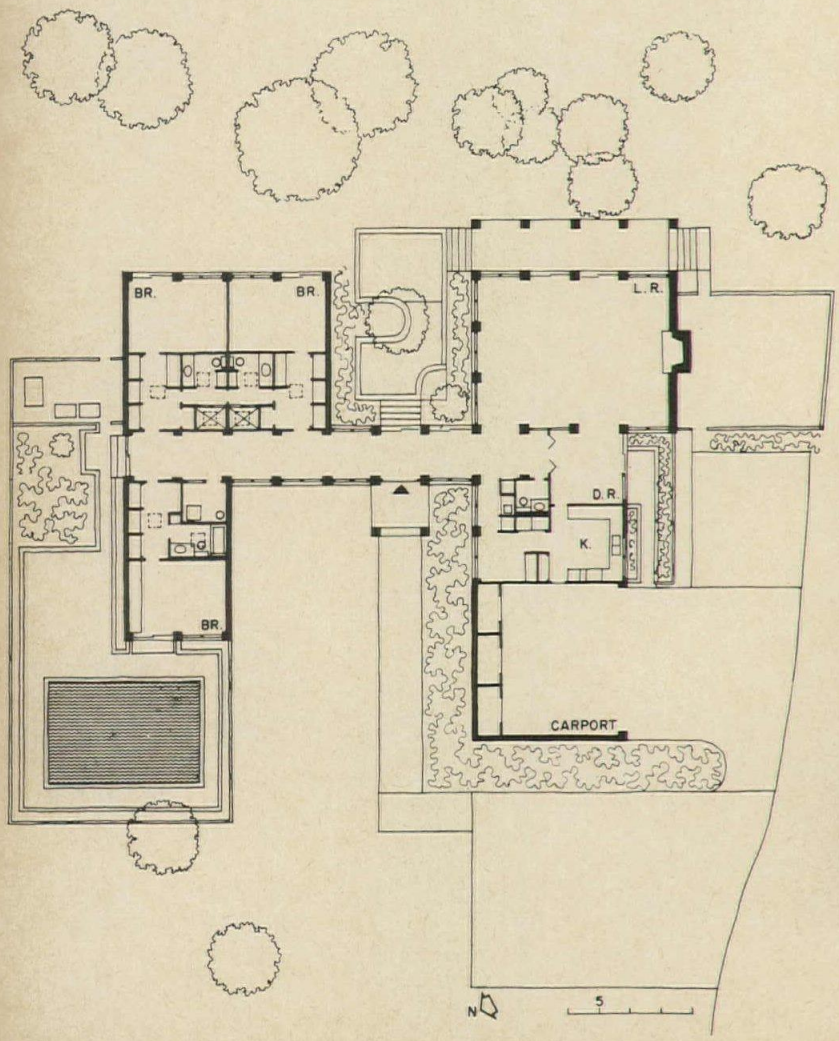
I like landscaping—but the right kind in the right place. Here again, I try to see in my mind—during the design stages—that magnolia tree, and try to encourage the client to buy it.

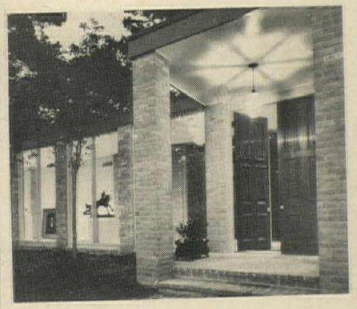
Domestic architecture is a most rewarding profession. It is great to see people enjoy a house that combines their thinking and the thinking of an involved architect. Often, you can completely change the lives of a family.

I have never been sorry that I chose this profession. I am never happier than when I can spend hours at the drafting board. I could not do this in a large office. I wish more architects would join me in what I consider the best field of our profession."

—Preston M. Bolton

AN ELEGANT CONCEPT OF LINKED PAVILIONS AND COLONNADES has been developed by Preston Bolton for this fairly large and formal house. It forms a very appropriate scheme for the ample site, and affords desirable views of the large trees and small stream on the property. On the street facade, a generous setback and solid brick walls for major rooms give the needed privacy. A wide entrance gallery, which adds greatly to the sense of style in the house, separates the entertaining areas and the bedroom areas into a bi-nuclear plan. A separate, working artist studio was placed in a quiet location across the stream, on axis with the house and accessible by a bridge. Champagne-colored Mexican brick is used.

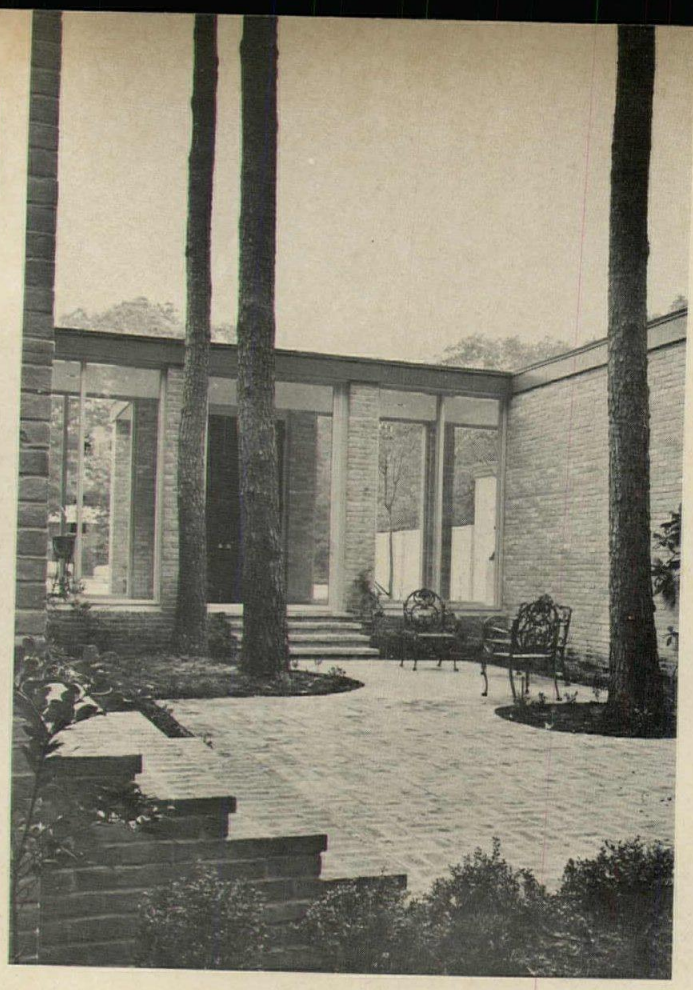




Spacious interiors focus on planned vistas through glass walls set between the modular pattern of brick columns. Concrete slab floors have terrazzo or oak finish.

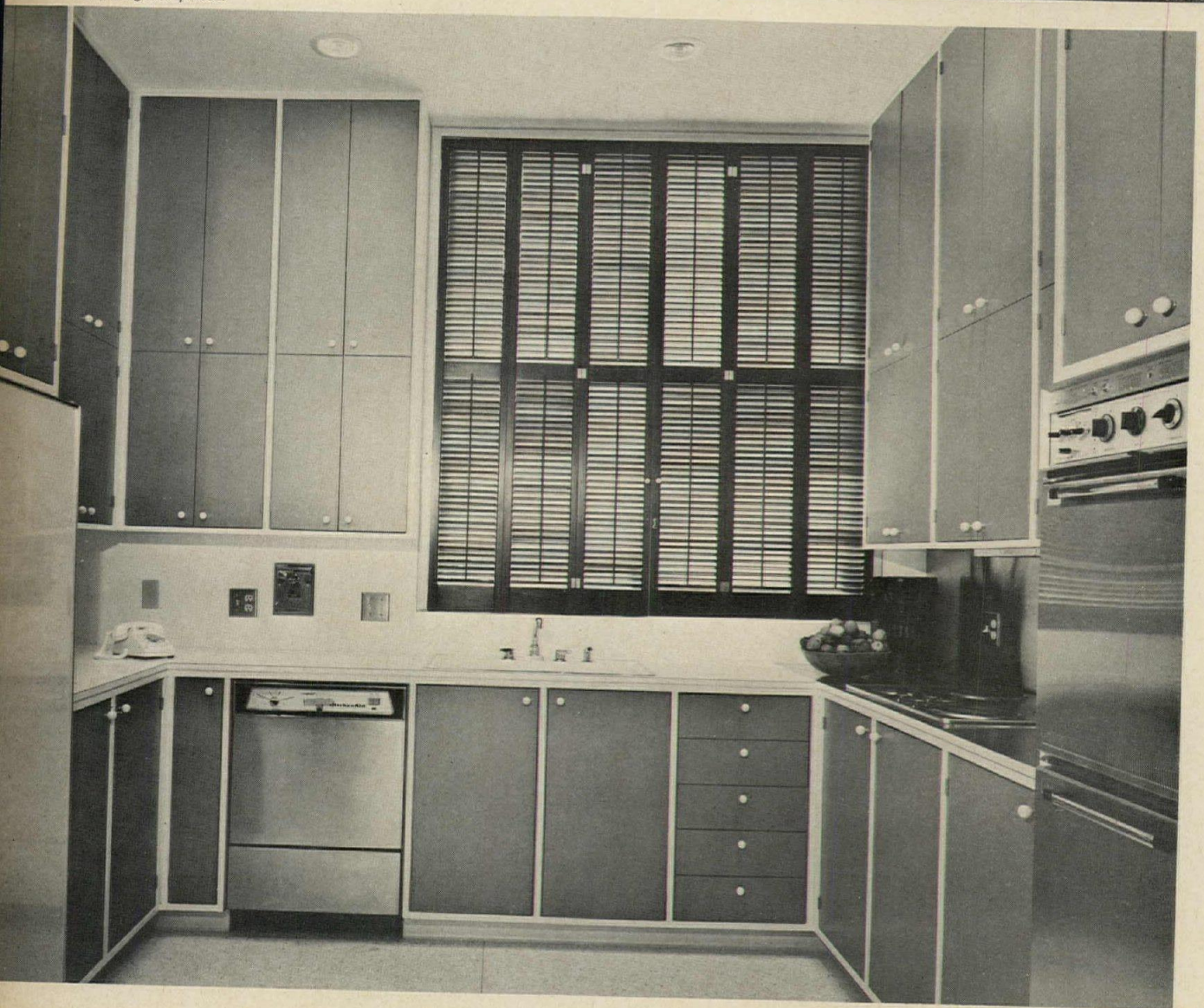
HALPERN RESIDENCE, Houston. Owner: *Leonard Halpern;* engineers: *Cunningham and Lemus;* landscape architect: *Courtade;* contractor: *Alan Huvard Associates.*

Jerry Bragstadt photos

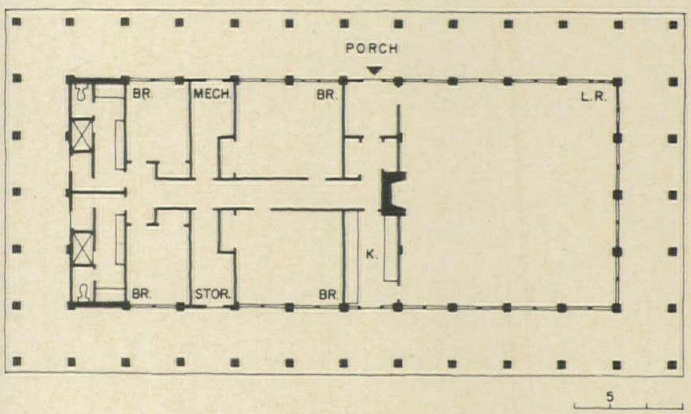


The Halpern house affords an excellent example of Bolton's constant concern with indoor-outdoor relationships of spaces, for day or night, and of his meticulous detailing and vigorous use of color in all cabinet work (the kitchen doors below are a strong ochre-yellow).

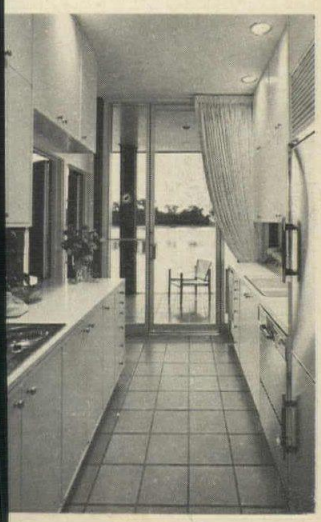
Jerry Bragstadt photos



RUGGED MATERIALS FORM A WEEKEND HUNTING LODGE for a large Texas "working ranch." Set among oak trees on the edge of a man-made, sand bottom lake, the house aptly echoes its antecedents in low, horizontal lines, straightforward comfort and a usable surrounding porch. A big living-dining area, flanked by a small galley-type kitchen, is at one end of the plan; two combination dressing rooms and baths are at the other end and four bedrooms are in the center. Every room opens to the porch. Most surfaces have natural finishes: cedar board-and-batten exteriors, charcoal-stained cedar posts, teak paneling in the living room and painted pine boards for all other interiors.

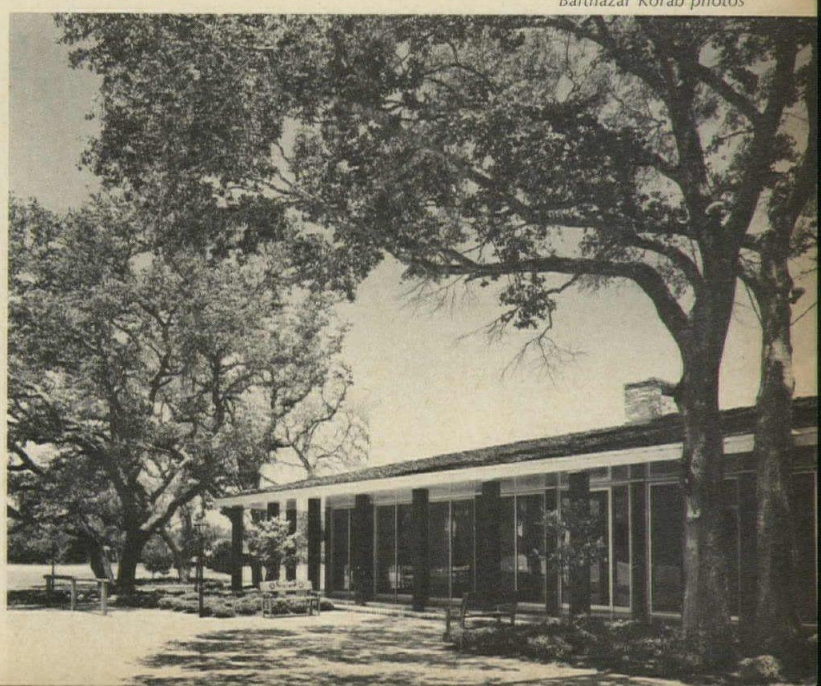


Balthazar Korab photos



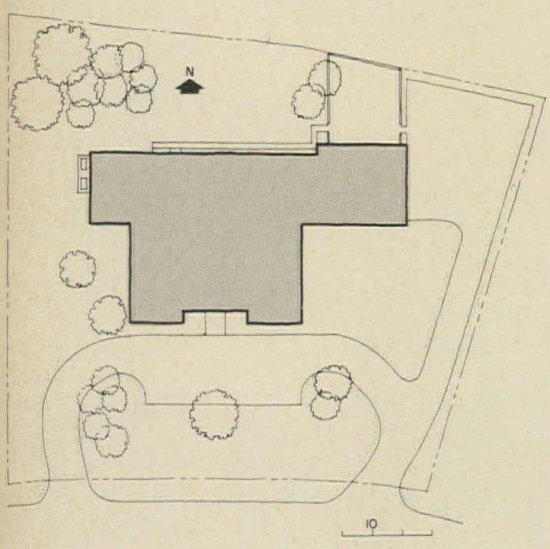
Preston Bolton uses glass walls, protected by the porch, to open every room to the lake and the ranch acreage beyond; extension of ceiling and floor materials into the porch area helps further to visually link indoors and outdoors. The living room has an exposed beam ceiling and brick fireplace.

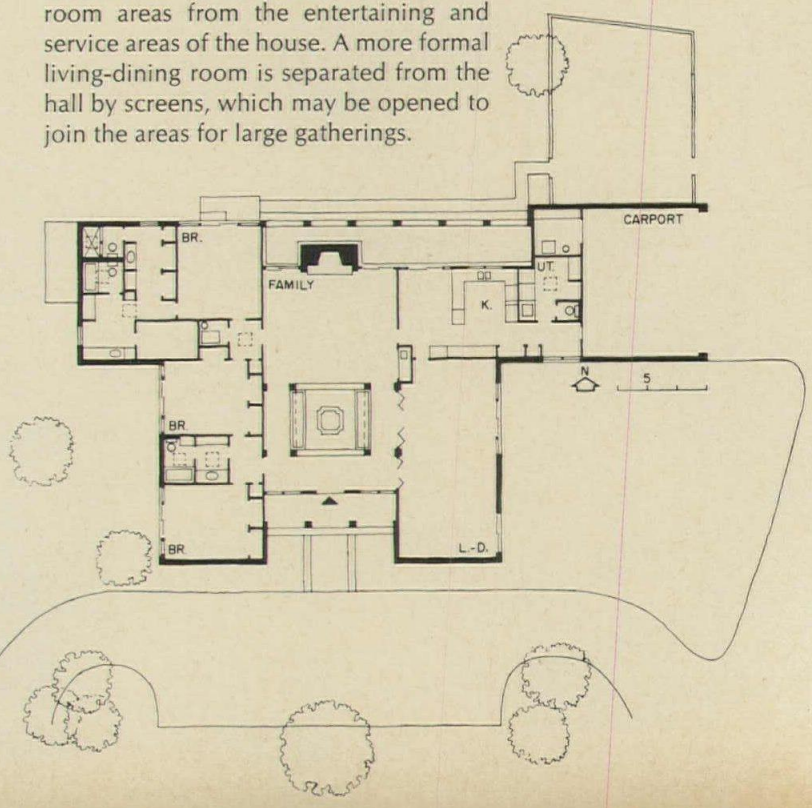
RANCH HOUSE, Wallis, Texas. Engineers: *Cunningham and Lemus;* contractor: *Koenig Construction Co.*

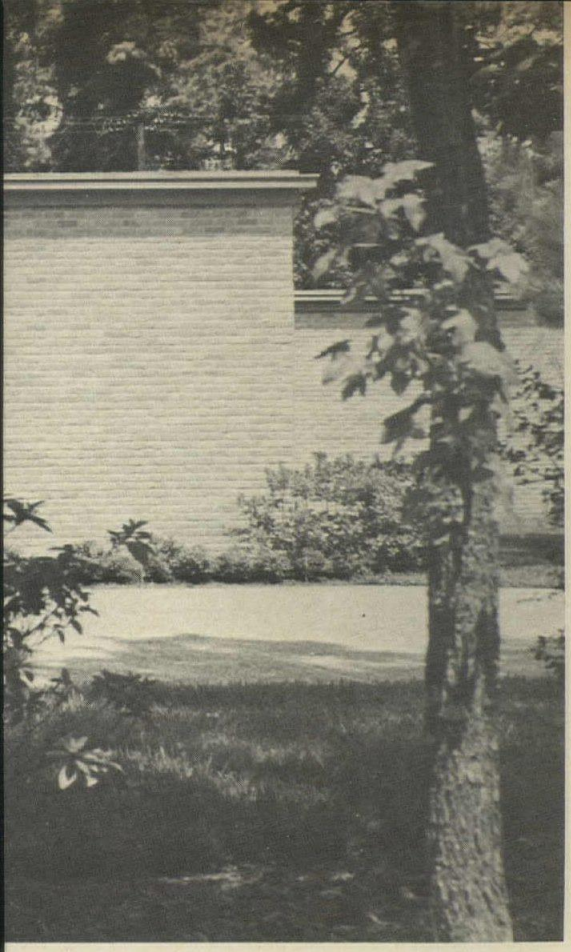


A CENTRAL "HALL" FOR FAMILY VISITS KEYS THIS PLAN to the needs of the owners, whose children are married and do not live at home, but who wanted the house to provide for visits of their grandchildren. The big room doubles as a foyer, and has a skylighted plant area with a central fountain to separate the entry from the family living area. The room opens at back to a covered porch and a terraced back yard. The site is a one-acre lot in a typical Houston subdivision.

The central hall also divides the bedroom areas from the entertaining and service areas of the house. A more formal living-dining room is separated from the hall by screens, which may be opened to join the areas for large gatherings.

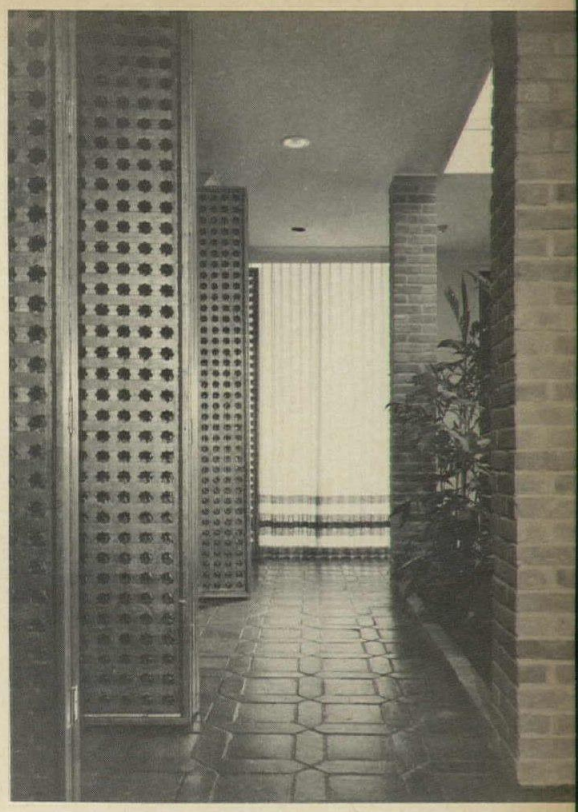






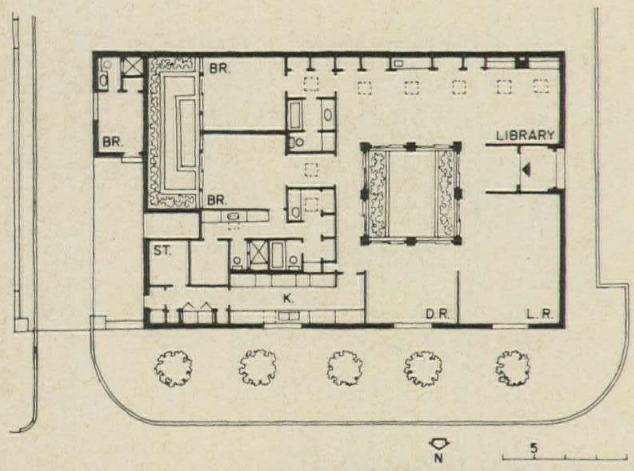
Careful planning and the creation of vistas and focal points give this house the appearance—and livability—of a much larger house and a much larger site.

GENITEMPO RESIDENCE, Houston. Owners: *Mr. and Mrs. Joe Genitempo;* engineers: *Cunningham and Lemus;* contractor: *Pelham Construction Co.*

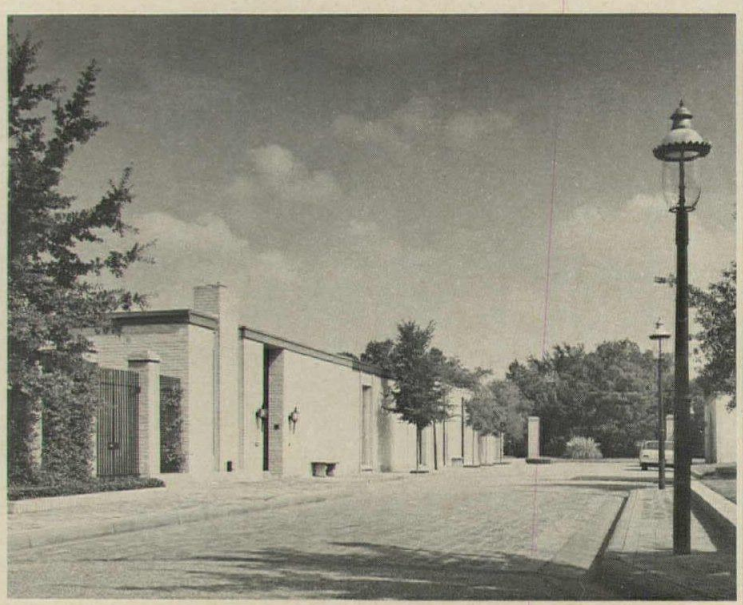


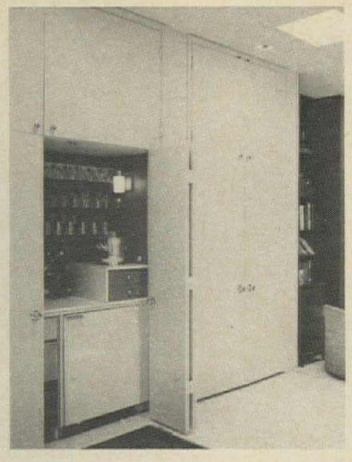
Jerry Bragstadt photos

A COMPACT TOWNHOUSE ON A 45-BY 78-FOOT LOT



provides all the amenities, even outdoor living space. Part of a townhouse subdivision Preston Bolton has created, this house is stylistically related to the others, but preserves its own strong sense of individuality. Bolton has been commissioned as architect for most of the structures. The house is an atrium plan, with all rooms opening off interior patios. To give maximum room and good circulation for large parties, the living room, dining room, library and bar are all ranged around a central atrium. The bedrooms open off a more private patio. Kitchen and utility areas are planned in a long galley-type arrangement and open to service, carport and maid's room.

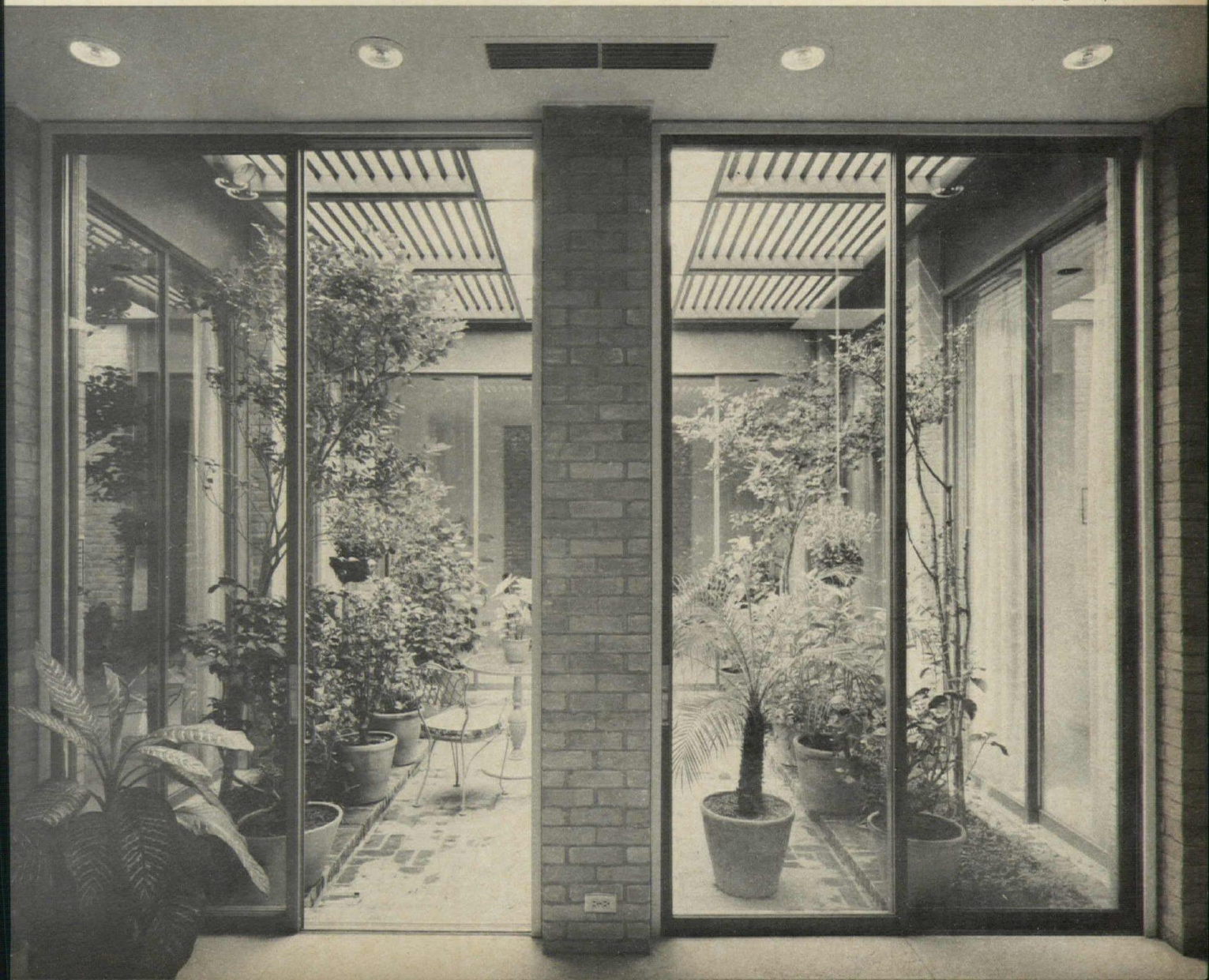


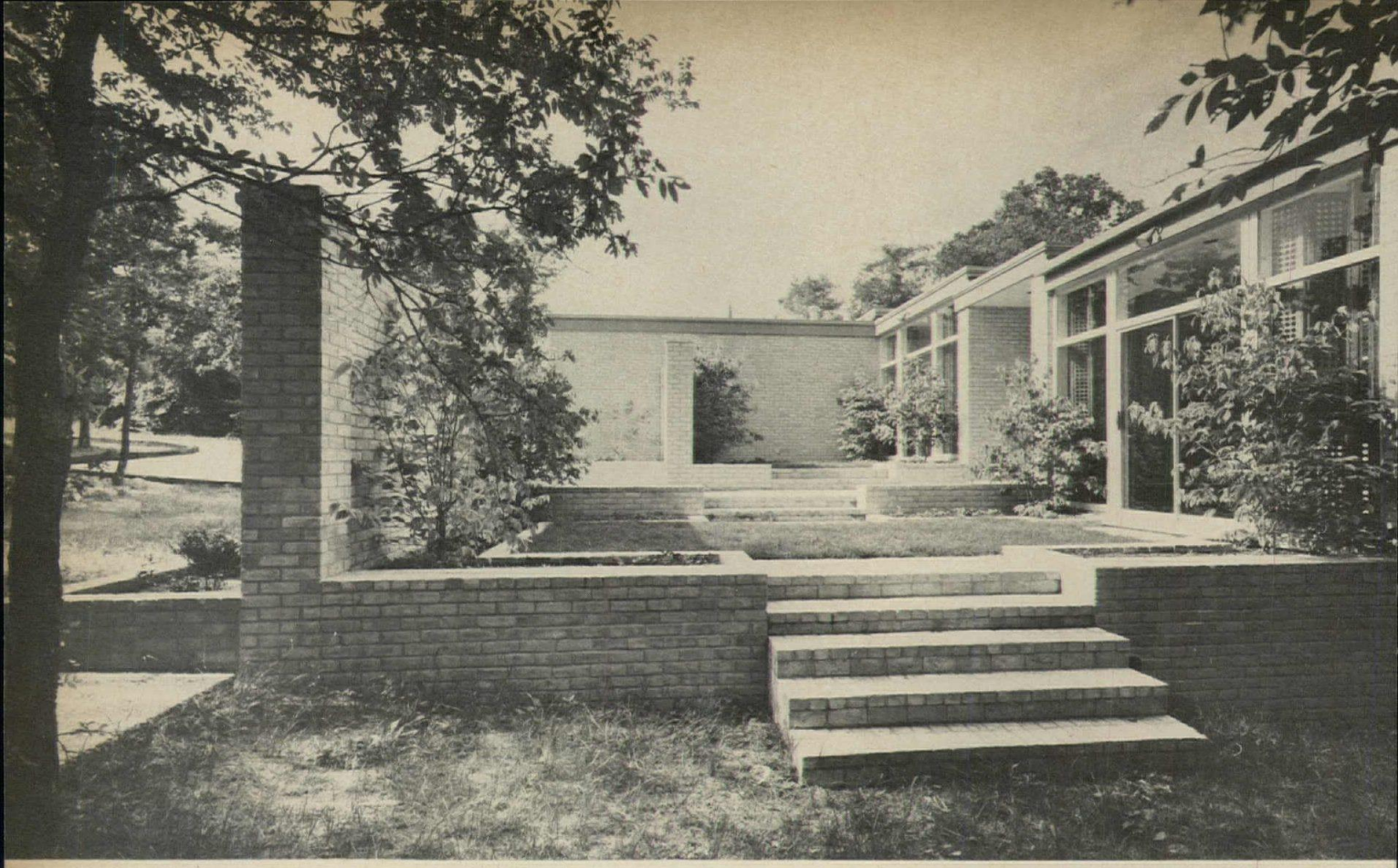


Careful planning and detailing of cabinet work and lighting are as noteworthy in this little townhouse as in Bolton's large residences. Tiny pockets of outdoor space are used to give garden-like vistas to highly urban and compact plans.

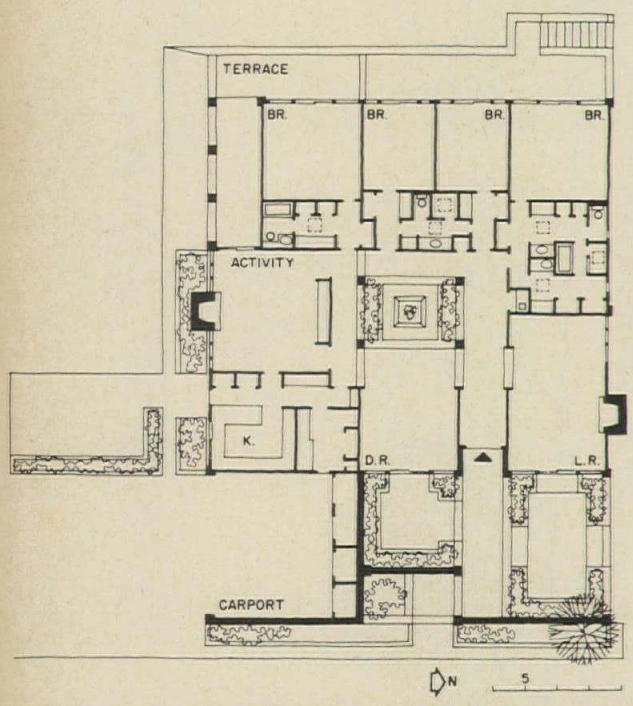
HUDSON RESIDENCE, Houston. Owner: *Richard C. Hudson;* engineers: *Cunningham and Lemus;* interior design: *Helene Sprong & Company;* contractor: *Ivanhoe Construction Company.*

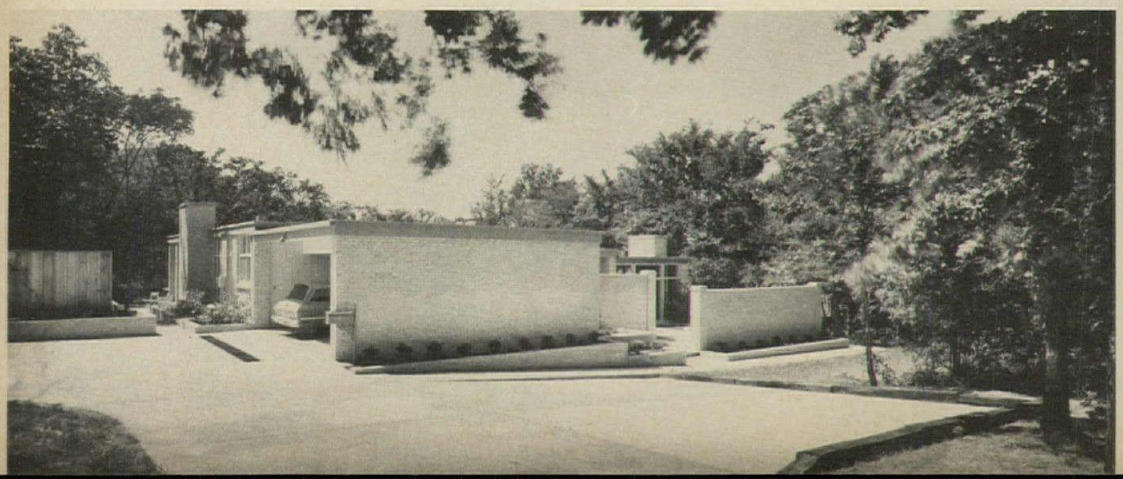
Jerry Bragstadt photos

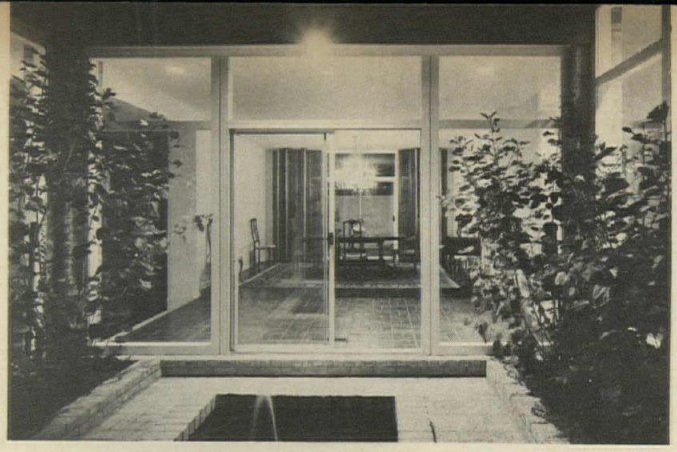




WELL-ORGANIZED SPACES FOR A FAMILY OF FIVE are integrated here into a basically square, "doughnut shaped" plan, extended by terraces and a carport. An outdoor atrium is the focal point for all the living spaces, and galleries around it link all the rooms into a very spacious entertaining area. All bedrooms are sound-buffered from the living spaces by a bank of baths and closets. Four changes in level are used to adapt the house to the gently sloping site. A variety of private terraces and gardens have been provided to closely link each room with the heavily wooded lot. The house is wood framed and veneered in champagne-colored Mexican brick.



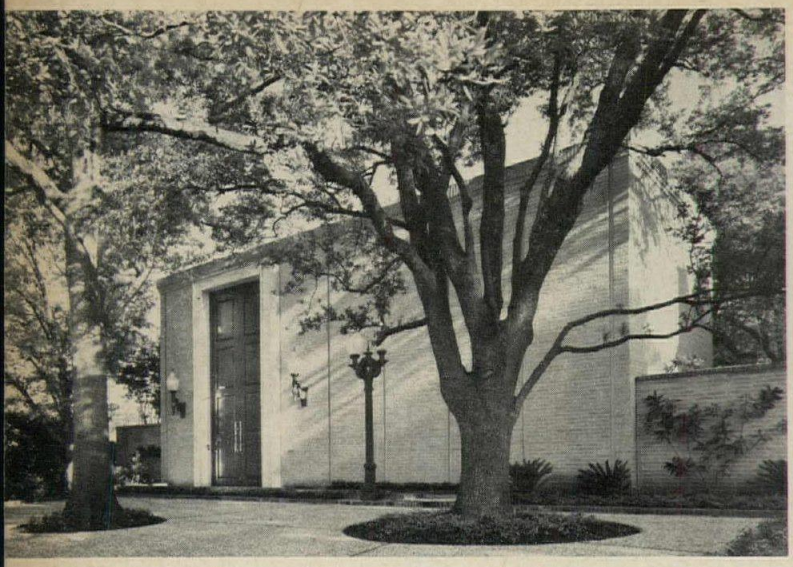




A relatively open plan, and a variety of courts and terraces provide a new vista at each turn within the Eads house. The house is zoned to group the children's bedrooms near the "activity" room, and the master bedroom adjoins the more formal living room. The same brick used on the exterior is used for terrace and atrium floors, and on some interior walls; other walls are painted plaster board. Interior floors are dark-stained Mexican tile or oak. The entrance doors and shutters are hand carved.

EADS RESIDENCE, Fort Smith, Arkansas. Owners: *Mr. and Mrs. William M. Eads;* engineers: *Cunningham and Lemus.*

Frank Lotz Miller photos

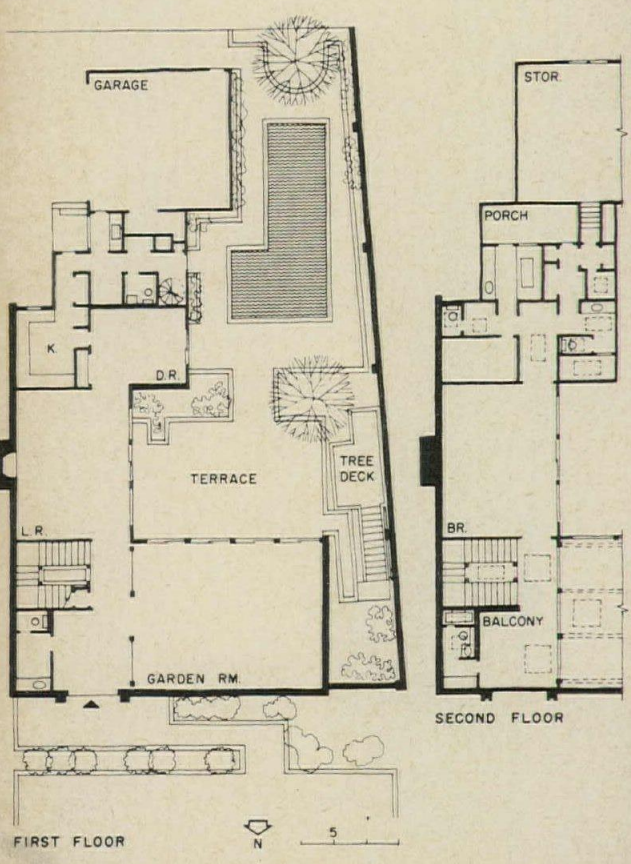


A ONE-BEDROOM TOWNHOUSE provides spacious privacy and comfort for the owner and his wife. The site is a narrow corner lot at the intersection of active thoroughfares; the neighborhood is quite built-up and has property restrictions requiring two-story residences. Quiet and privacy were achieved by walling in the entire lot, and by using solid exterior brick walls—broken only by the entry door. All rooms open inward onto a landscaped terrace and pool. A terraced "tree house" was created to screen the view of the adjoining house.

A two-story garden room forms the indoor counterpart to the courtyard. The living room and dining room also have sliding glass walls to permit all spaces to be used together.

LOY RESIDENCE, Houston. Owner: *Milton E. Loy;* engineers: *Cunningham and Lemus;* exterior lighting: *John Watson;* contractor: *Al Stan Building Company.*

Bill Maris photos



Alexandre Georges

BUILDING TYPES STUDY 390
®

SCHOOLS

Although the economists are predicting a future decline in school building as the population bulge passes, with some softening already noticeable in the construction of elementary schools, the fact remains that the coming year will be a very busy one for architects working with this building type. It will be one of the biggest years ever.

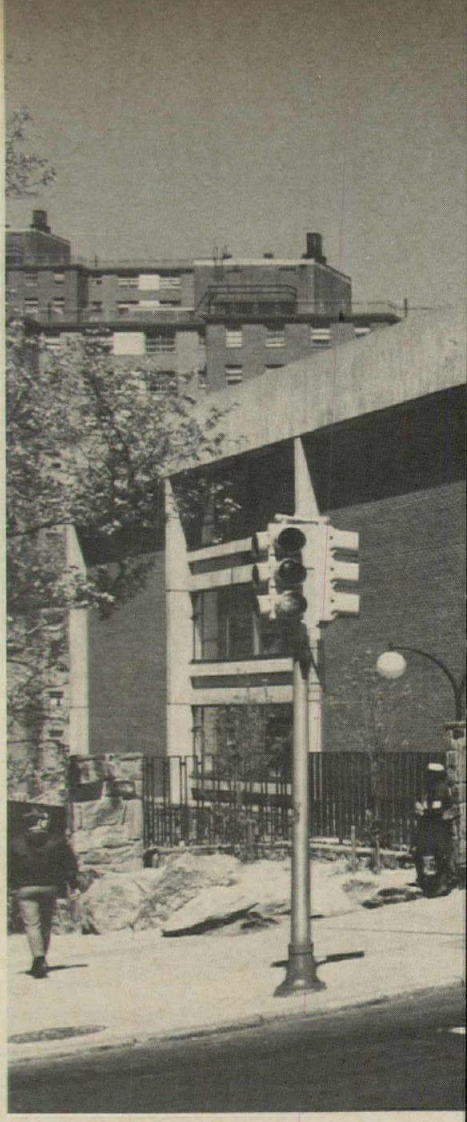
And there are a number of factors which will make it an even more challenging field than it has been. Exploration of curriculum innovations and new teaching methods (by machine and otherwise) is continuing, and school administrators across the nation are far from any consensus in their notions on sheltering the learning process. Not only each different site, but each different faculty and school board will require careful and individual planning. The growing focus on community involvement and parent participation—stimulated by such movements as the school decentralization programs and the U.S. Office of Education's Central City School Projects—adds another major factor to programing and planning.

Seven well planned, well designed and soundly constructed schools are presented in this study as illustrations that these qualities, as well as local requirements, can be met in a building type where costs are always under stringent control. The group of seven also illustrates many typical planning problems: conservative programs and progressive ones; urban sites and countryside; additions; grade levels from kindergarten through the end of senior high; private schools. The main factor that they all have in common is an unusual appropriateness for the local scene.

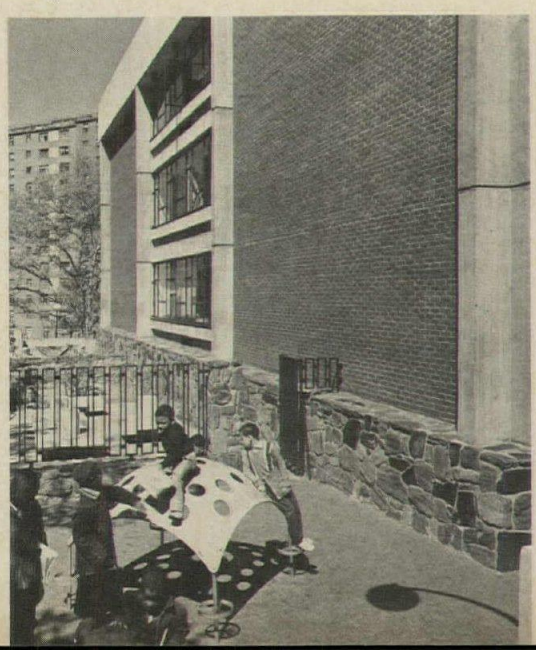
P.S. 36 IS SCALED FOR VERY SMALL PUPILS —AND A HIGHLY URBAN SETTING

For a highly urban site bordering Manhattan's Morningside Park and edging a dense public housing project, Frost Associates' P.S. 36 combines a delightful learning and play environment for its 1200 "K-2" pupils with a great—but as yet not fully realized—potential for shared community use. An inventive scheme breaks out of the traditional city-block, link-fenced playground mold, and steps clustered units across the hilly, irregular terrain. Designed for an unusual program, the cluster plan permits division of the 1200 kindergarten through second-graders into three sub-units of 400 each. Each sub-school has both standard and divisible classrooms and links by a mid-level bridge to a fourth, central unit providing administration and services for all. The many small-scale outdoor spaces between and below were designed by landscape architect M. Paul Friedberg as a variety of sunken and terraced playgrounds and set-back, street-level plazas. The 40-foot-high welded steel sculpture by William Tarr, composed of a myriad of alphabet symbols and numerals, was designed especially for children, yet helps create, with the school itself, a handsomely sophisticated landmark for an urban neighborhood.

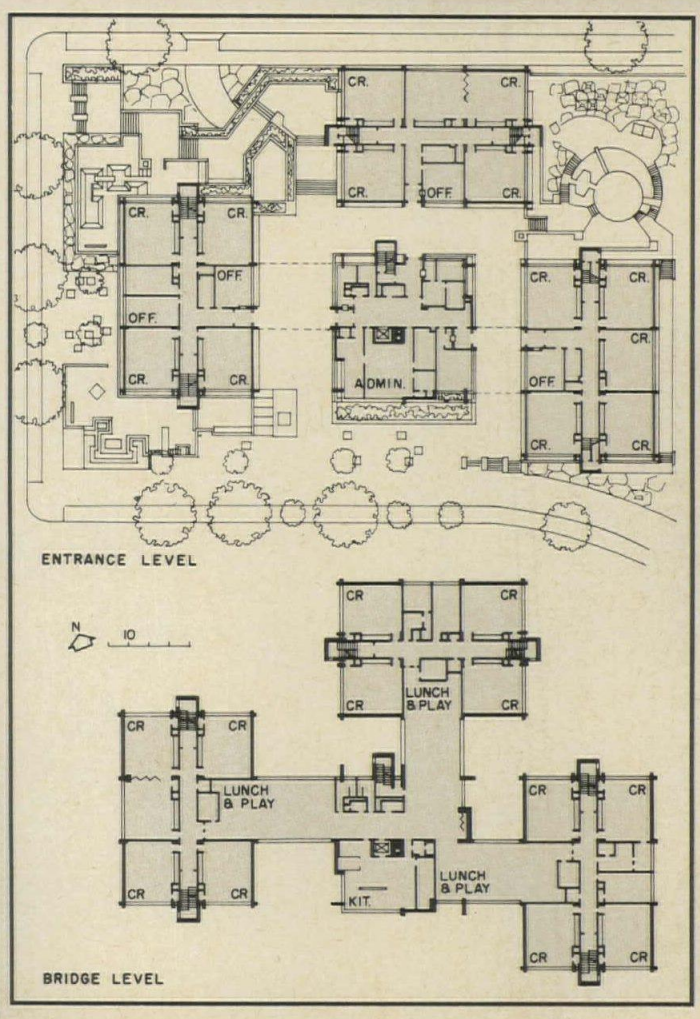
MORNINGSIDE SCHOOL, New York City. Architects: *Frost Associates;* engineers: *Ames & Selnick* (structural); *Kallen & Lemelson* (mechanical, electrical); landscape architect: *M. Paul Friedberg & Associates.*

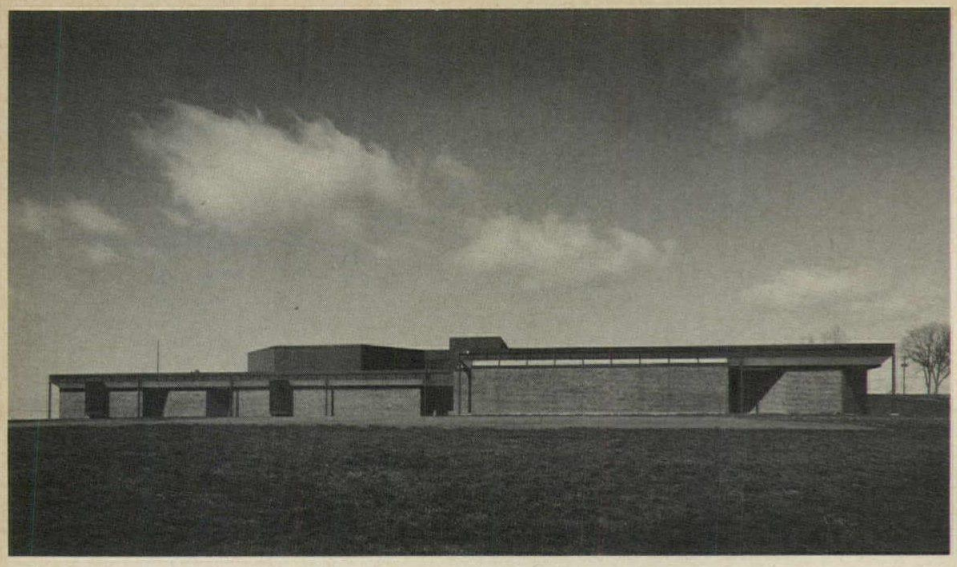


Within a great variety of playgrounds, plazas and classrooms, a clear pattern of circulation and space usage is assured throughout. Upper street-level entrances are set back under bridges for easy control, and give onto a spacious plaza provided for community use. Truck access is from the lower street, reaching the service core through an underpass that cuts under childrens' areas. The many outdoor spaces that climb up and down the hilly site can be used after school by neighborhood children. The second-story bridges form spacious playrooms. These connect the central unit at kitchen level and can double as lunch areas. The building is of brick and concrete with yellow and off-white inside walls and vinyl asbestos tile floors.



Alexandre Georges photos

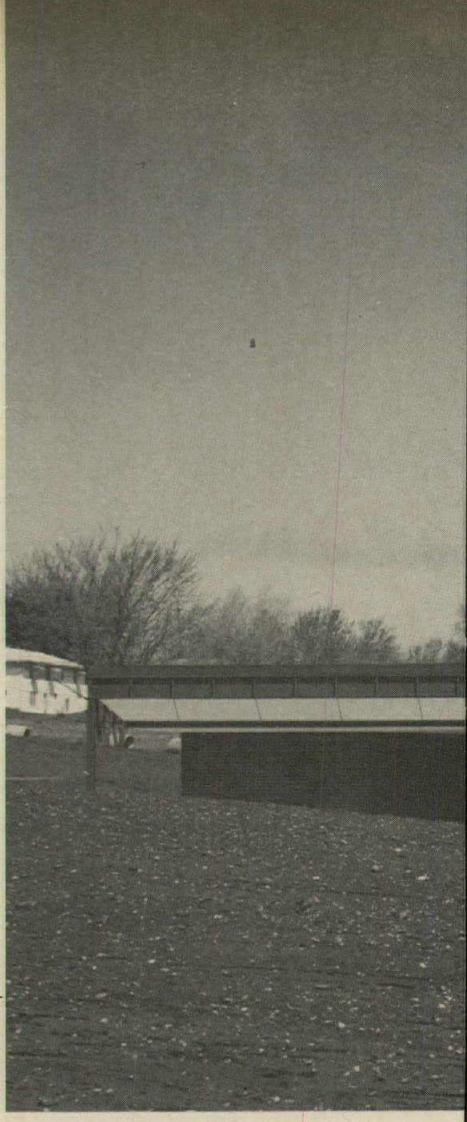




A FLEXIBLE TEACHING ENVIRONMENT FOR AN ELEMENTARY SCHOOL

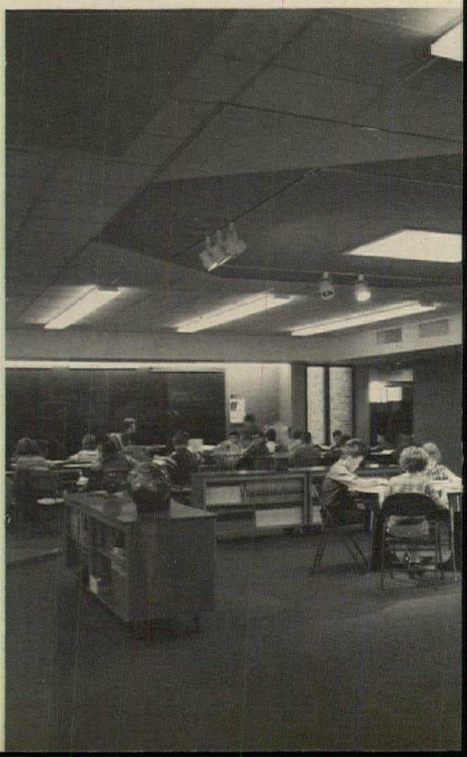
Educators and architects have for years, of course, been experimenting with school designs which they hope may "free" the teaching process. This elementary school in Kansas City is an imaginative and sophisticated response to these continuing needs for flexible spaces; it provides environments for teaching much smaller or much larger groups of students than can be accommodated in the standard classroom. The school has facilities for 60 kindergarten students and 360 students in grades one through six. The latter are taught in two large "suites" which have no partitions: the various classes or groups are defined within the larger space only by the arrangement of movable shelving and furniture (see below, center). Each suite, however, has its own adjacent entrance, toilets, coat rooms, and subsidiary space for art, music, or other special small-group activities. In addition, a planning room near the entrance to each suite provides conference facilities for six to eight teachers. The concept of open interior space has been applied to the rest of the school, as well as to the suites, giving this plan a remarkable sense of clarity and completeness.

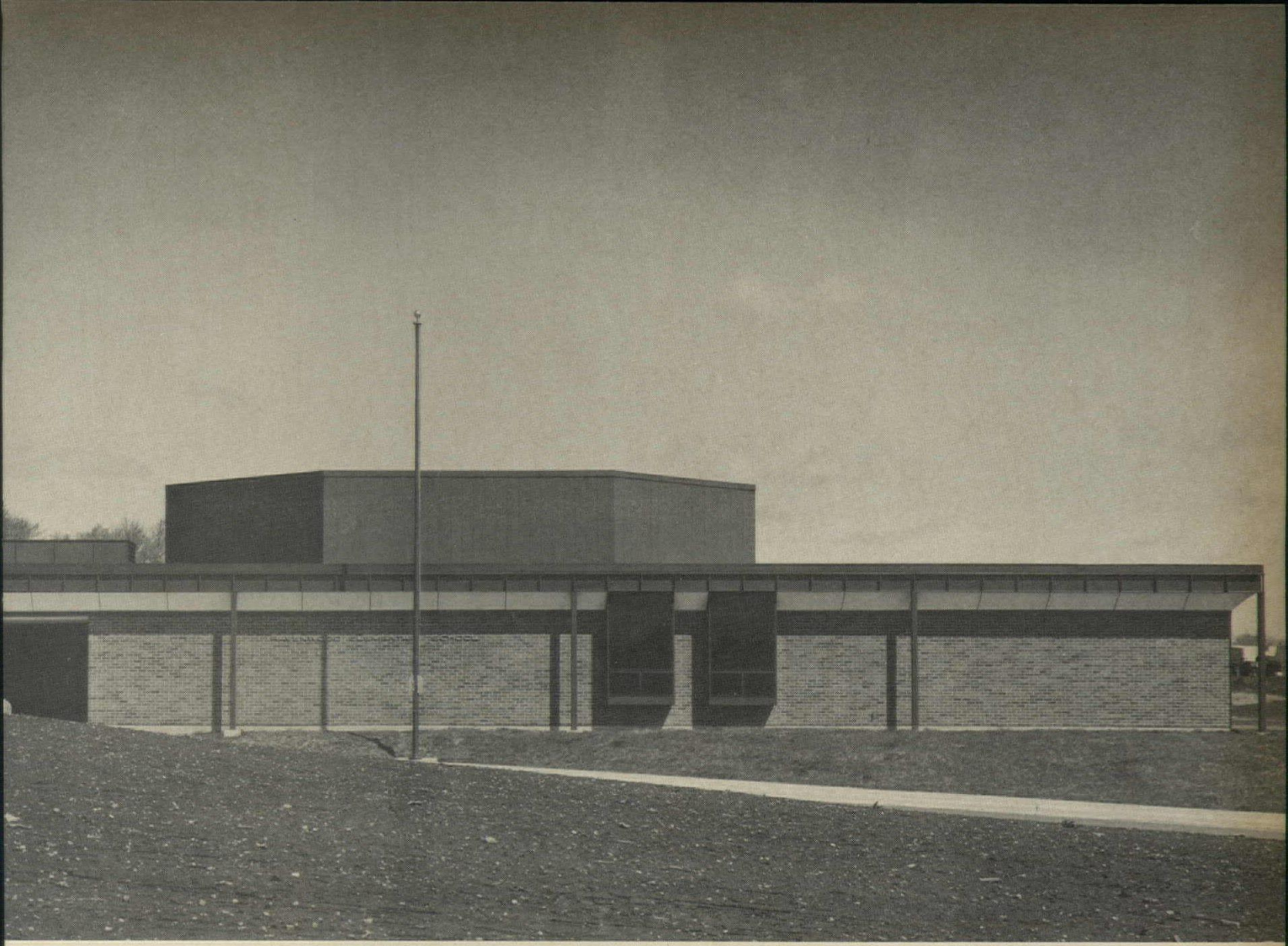
RAVENWOOD ELEMENTARY SCHOOL, Kansas City, Missouri. Architects: *Kivett & Myers—James E. Arnold, vice president-in-charge;* mechanical engineers: *Smith & Boucher;* structural engineers: *Pfuhl & Stevson;* kitchen consultants: *W. Milt Santee;* contractor: *Bob Eldridge Construction Company.*

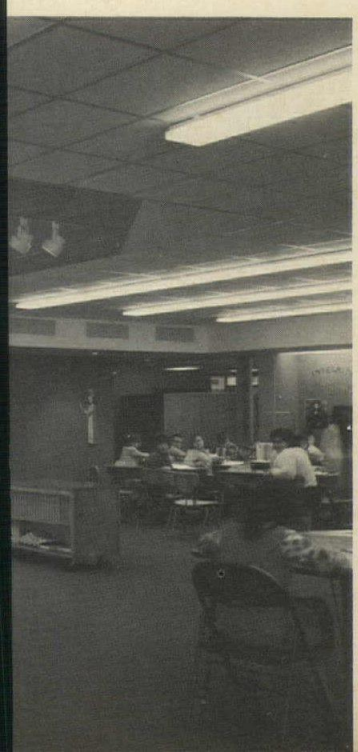


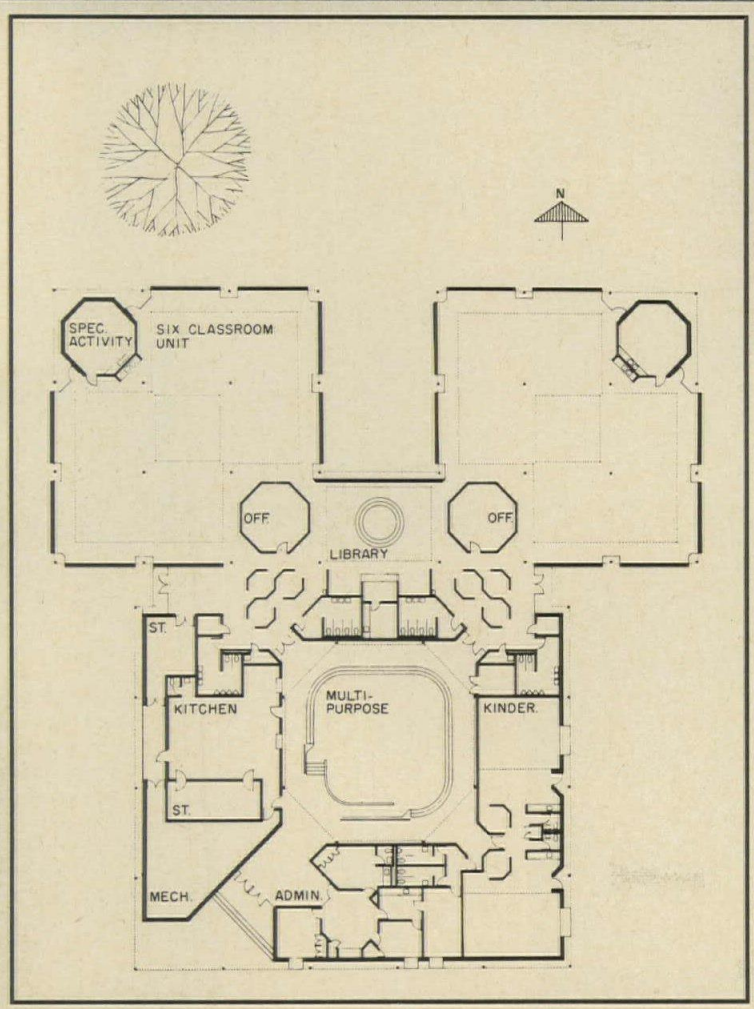
Paul S. Kivett photos

The school is situated in an open, rather treeless suburban area (above). Its dominant horizontal roof fascia holds the design firmly on the ground, as if to avoid the sun and prairie winds. The soft orange of the fascia repeats one of the principal colors of the brick and is accented by primary hues on all exterior doors. Careful color selection has certainly enhanced this design. Clearly stated entrances help eliminate cross-traffic within the school.



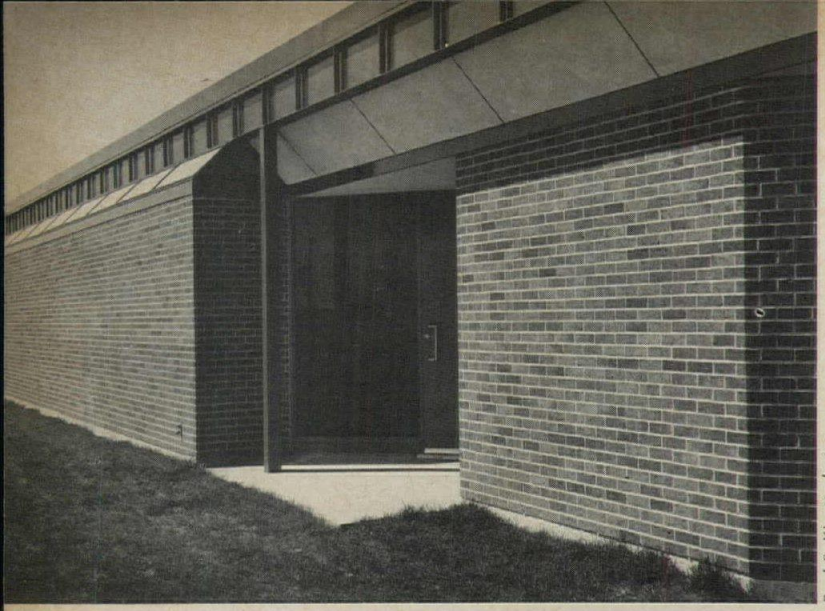






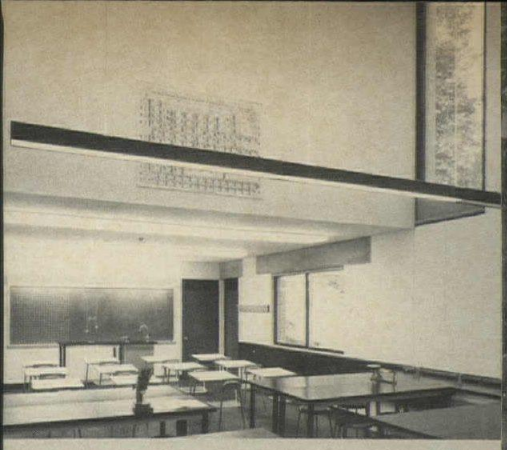
Exterior detailing, particularly the metalwork (above), is clean and well fabricated. The four-by-four-inch newel columns stand free of the masonry and support the steel edge-beaming system. Short steel tubing has been placed along the fascia for articulation.

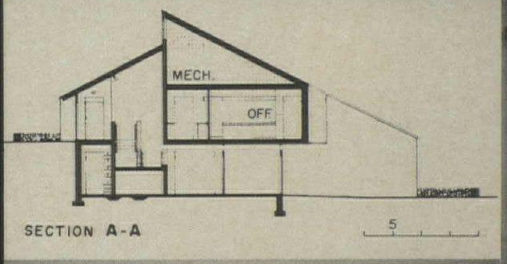
Inside, in spaces other than the two teaching suites, corridors have been eliminated and circulation takes place from space to space, particularly around the ground level portion of the multipurpose room (photo far left). This room has a lowered center with risers around its perimeter that serve as student seating. The upper level, besides becoming a circulation definer, can be used as a stage or podium. The administration area includes a principal's office, clinic, conference room, teacher's lounge, and reception area. The two kindergarten rooms have direct access to the multipurpose room.

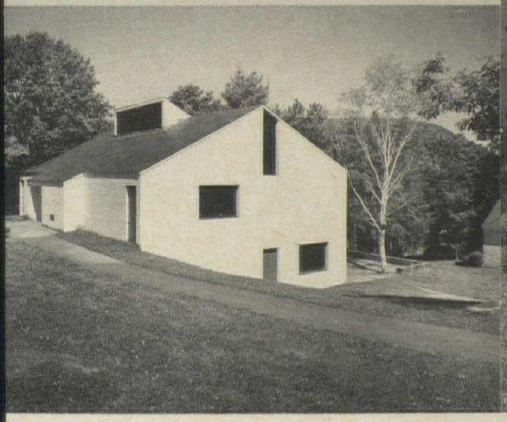


Paul S. Kivett photos

There are no operating windows at Ravenwood. Natural light is admitted through occasional vertical "window boxes" placed along the outside walls (see previous page), and through continuous strip "skylights" angled down from the fascia to the top of classroom exterior walls (see above). Inside, these clerestory strips admit dramatic yet glareproof light along chalkboard and display surfaces. Fluorescent fixtures maintain proper lighting at desk height. All classrooms and the library are fully carpeted, and a simultaneous heat pump provides year-round air conditioning. Mechanical equipment is electric.





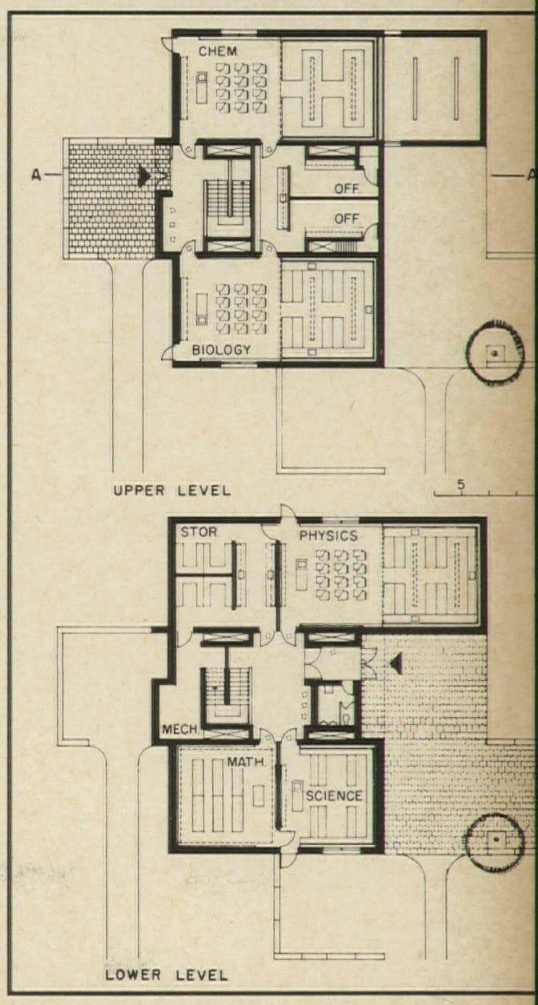


Malcolm Smith photos

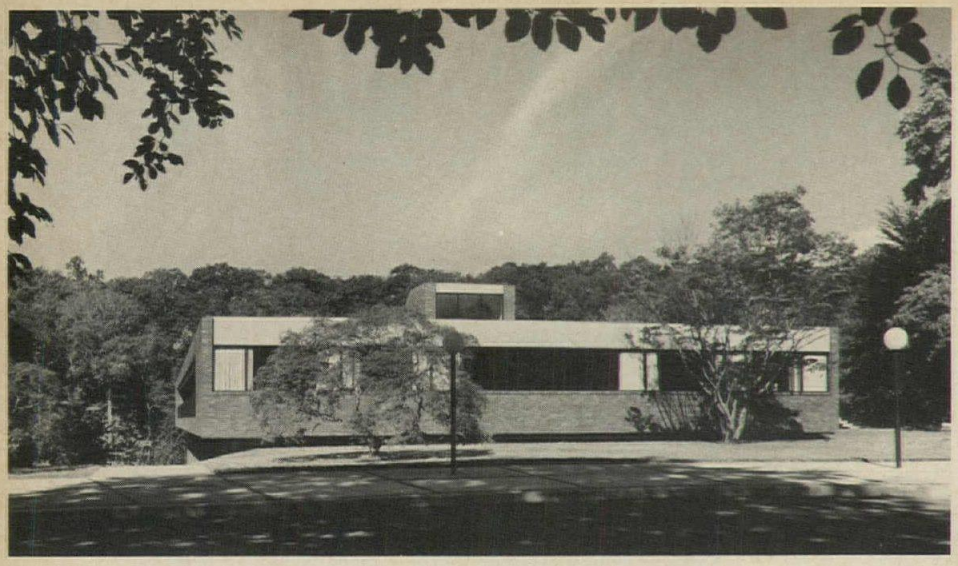
MODERN SCIENCE LAB FITS INTO A TRADITIONAL PREP SCHOOL CAMPUS

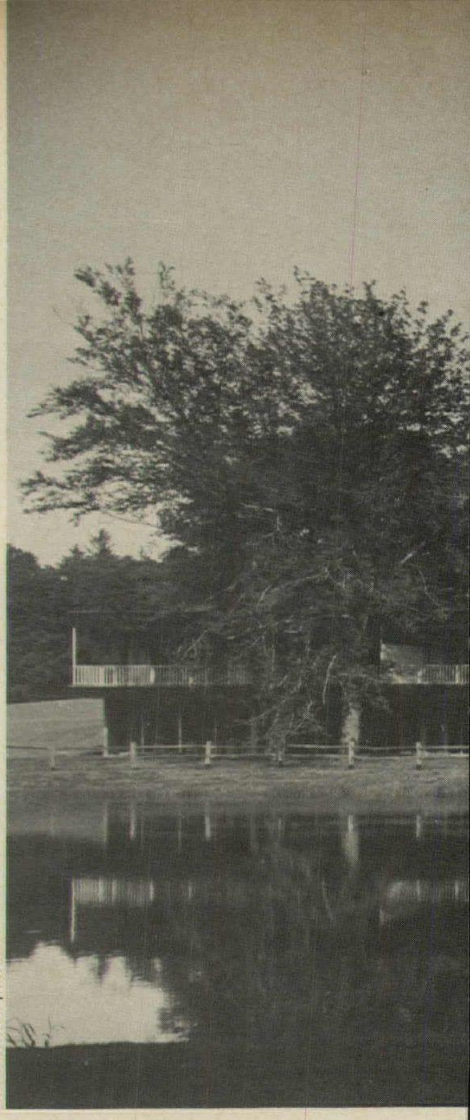
This science center for a small (150-student) boys' preparatory school fits smoothly into its site and unites sympathetically with neighboring buildings. The simple, gabled roof form of the science center was expressed, in the Cubist tradition, as a randomly-punctured solid block. This form is nevertheless easily reminiscent of the similarly shaped classroom structures next to it, conceived in an earlier era, within quite different architectural philosophies. From certain vantage points (photo upper right), the slope of the roof seems to match the slope of the ground below it, skillfully and specifically uniting building with site. The exterior is white-painted common brick, as are several older buildings.

WITTENBERG SCIENCE AND MATHEMATICS CENTER, South Kent School, South Kent, Connecticut. Architects: *The SMS Partnership—Timothy Martin, project architect;* structural engineers: *Fromme & Vosganian;* mechanical engineers: *Hill & Harrigan;* site consultant: *George Cushine.*



The sloping site permitted entry on two levels. Physics and mathematics are located on the lower level, with chemistry and biology above. The math classroom has no windows, for maximum chalkboard and instructional surfaces, while ample preparation and storage areas are adjacent to all classrooms.



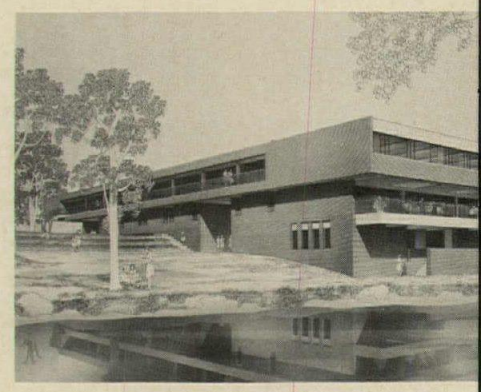


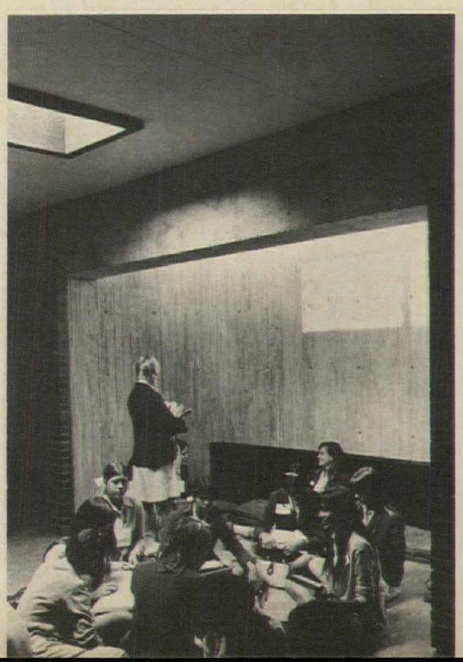
David Hirsch photos

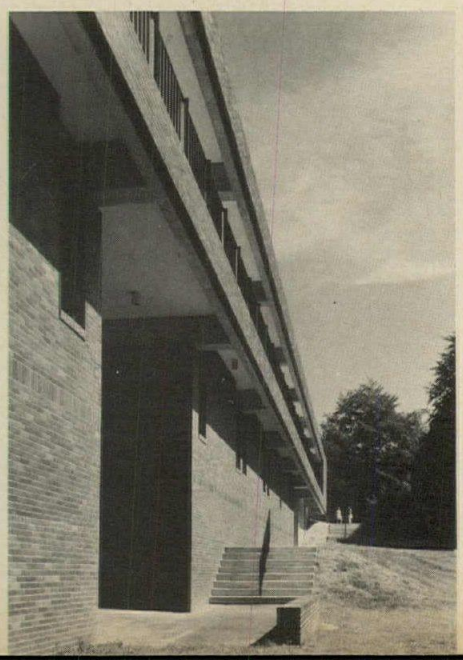
A GIRLS' SCHOOL CONTINUES ITS IMPRESSIVE NEW CAMPUS

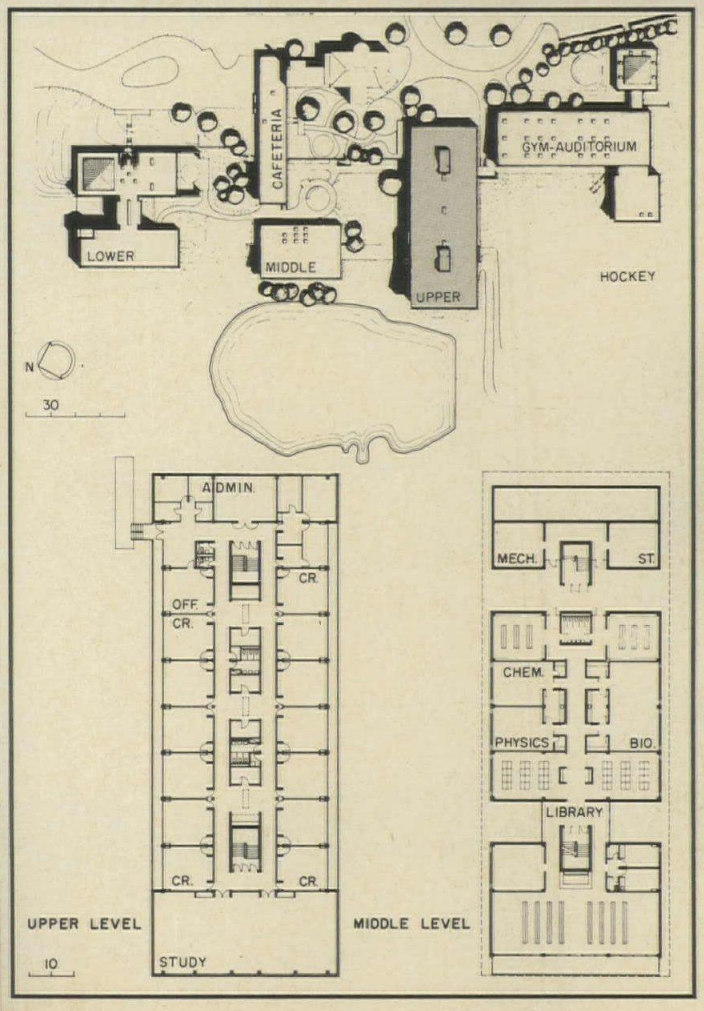
Greenwich Academy, a girls' school for grades one through twelve, began its new campus about seven years ago, as older facilities became inadequate. The Upper School, shown on these pages, is the second phase of this new campus, and becomes a dramatic addition to the previous new buildings and master plan (RECORD, October 1963). As it houses grades nine through twelve, the Upper School is the largest of the new campus buildings, yet its front elevation (above) makes it appear quite small to the visitor. From the pond at the rear, however, (see right photo and rendering), the size, sweeping overhangs, and steeply-sloping site of the Upper School become more apparent. At ground level there are two open walkways through the building for campus traffic, and the upper floor has an exterior promenade within its overhang, which also provides sun shading for the large glass areas. Exterior materials are exposed concrete and a dark red-brown brick, with painted steel light poles, window sash, and handrails.

UPPER SCHOOL, GREENWICH ACADEMY, Greenwich, Connecticut. Architects: *The SMS Partnership;* mechanical engineers: *Smith & Hess;* structural engineer: *Alvin Fromme;* landscape architect: *George Cushine;* contractor: *Ray Adler.*

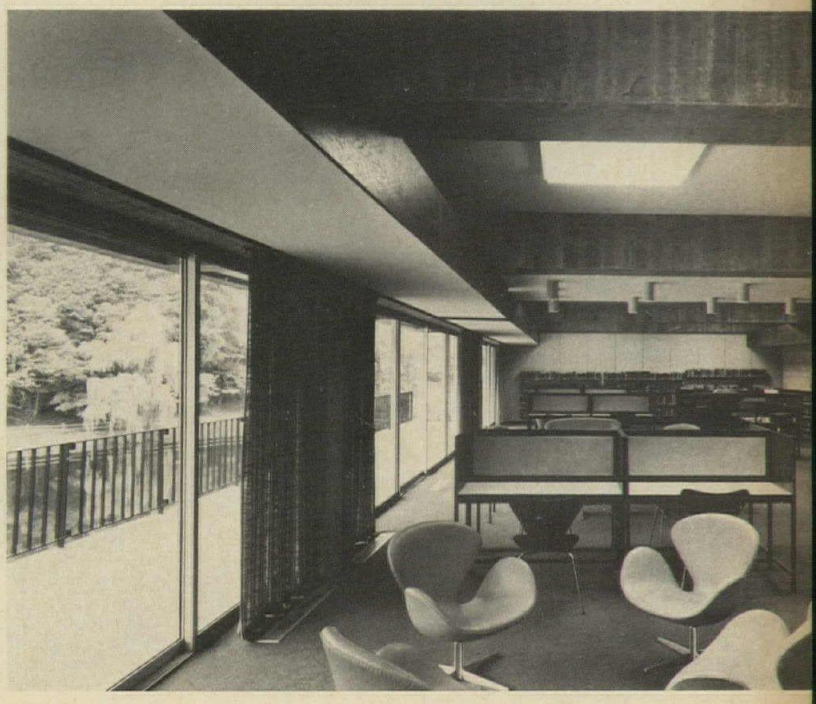


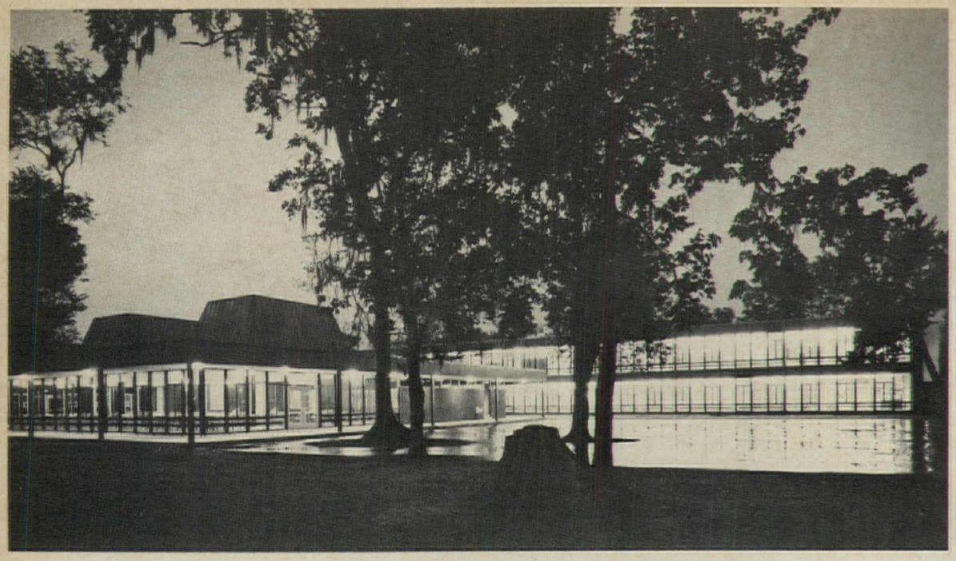






The three-story Upper School has 13 classrooms and a study hall on the top level, along with an administrative area. Science laboratories, a library, and locker rooms are on the middle level, with art and music suites located on the ground floor. When the last phase of the campus is completed, the administration facilities will be relocated, providing additional classroom space in the building. The library (below) is spacious, with its own balcony overlooking the pond and the woods beyond it. The pond is a strong asset, used as a focus for the site.



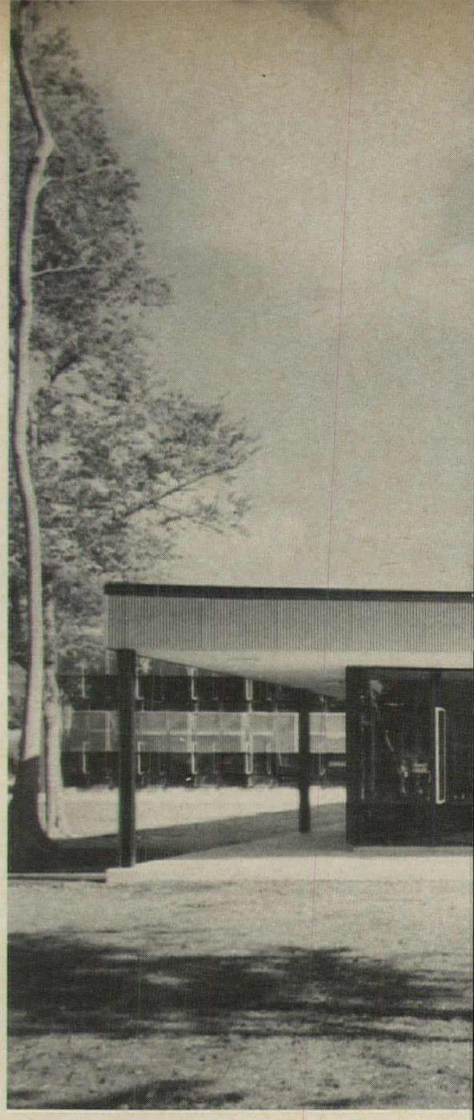


METICULOUS DETAILS MAKE MOST OF A GRADE SCHOOL'S STRINGENT PROGRAM

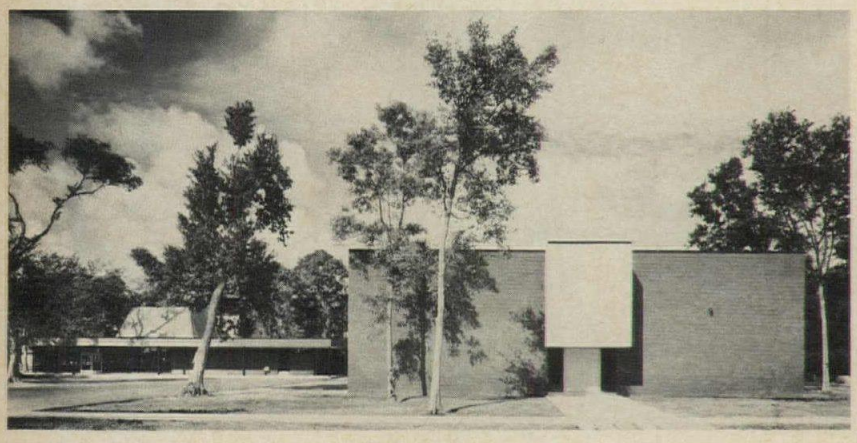
Architects face one of their strongest design challenges in buildings whose programs are highly specific, detailed, and of fixed dimensions and arrangements. Charles Colbert has shown his mettle in this school by providing a distinctive and elegant building to meet the stringent requirements. The school was planned for kindergarten through sixth grade, and to accommodate 770 children in 22 classrooms. The room sizes were predetermined, as was a two-floor building and central corridors. The site, located across the Mississippi River from New Orleans, occupies one municipal square of about two acres and is strewn with beautiful swamp trees. But Colbert comments that, "it was difficult to save the trees, due to zoning regulations: every outside perimeter building face was established by setback requirements of the local ordinance. Further, the director of physical education needed two paved play areas adjacent to the multipurpose building."

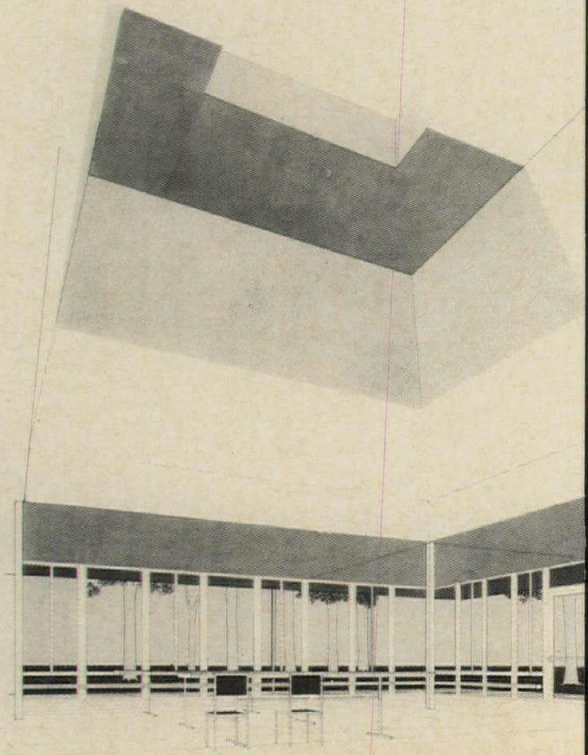
The all-too-familiar program has been envigorated by very careful detailing and discerning proportions, materials and colors: brick and painted steel are dark brown, glass is gray-brown, copper skylight hoods have a green patina, operating steel sash and stair enclosures are white, aluminum fascias are light brown and entrance doors are vermillion.

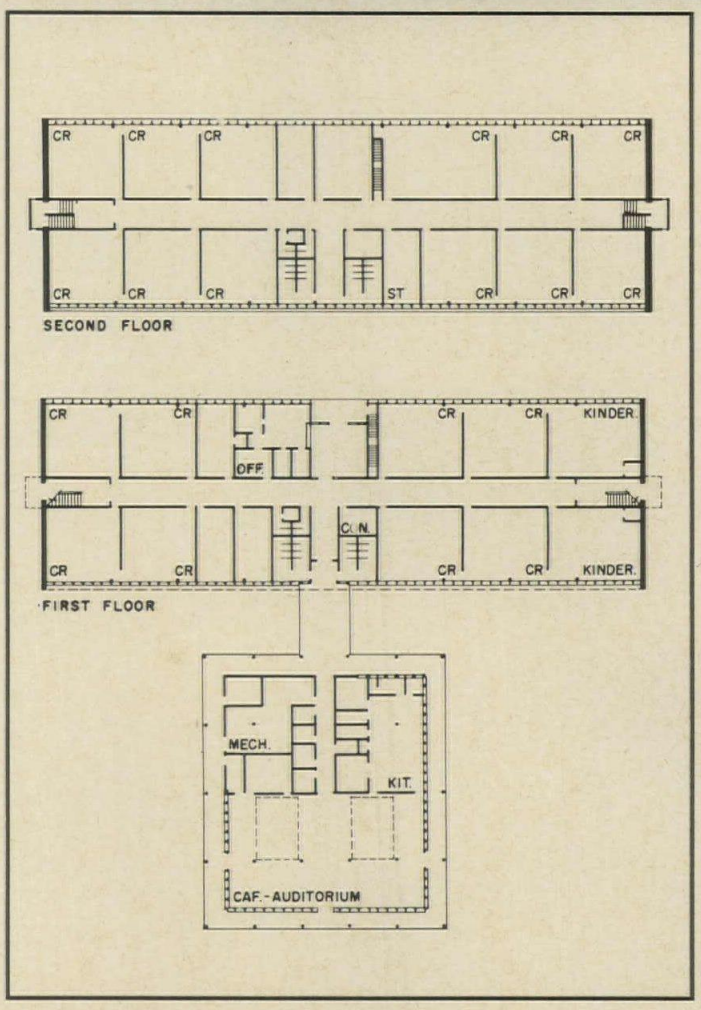
PAUL B. HABANS ELEMENTARY SCHOOL, Algiers, Louisiana. Architect: *Charles Colbert;* engineers: *Guillot, Sullivan & Vogt;* contractor: *Bartley Inc.*

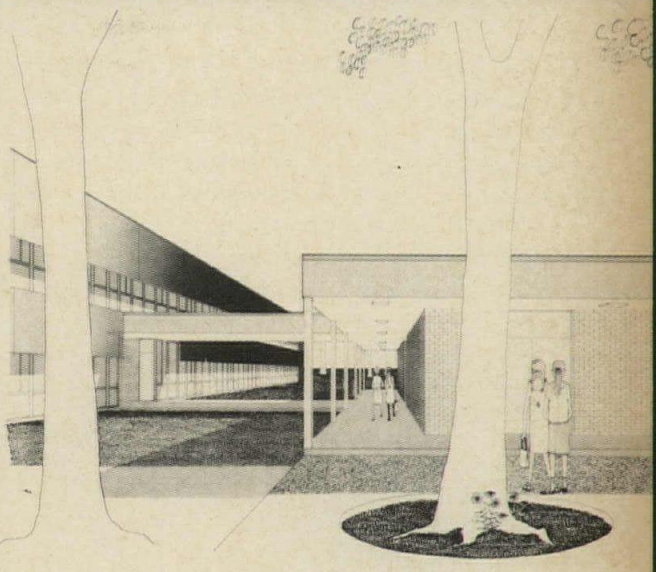


Subdued colors and ample sun control adapt the school to the hot, humid climate. The banks of operable windows are shielded by a perimeter walkway and wide overhang around the multipurpose building, and by screens manufactured from aluminum boiler gratings in the classroom unit. The cafeteria area has big pyramidal skylights to relieve the large expanse of low ceilings.

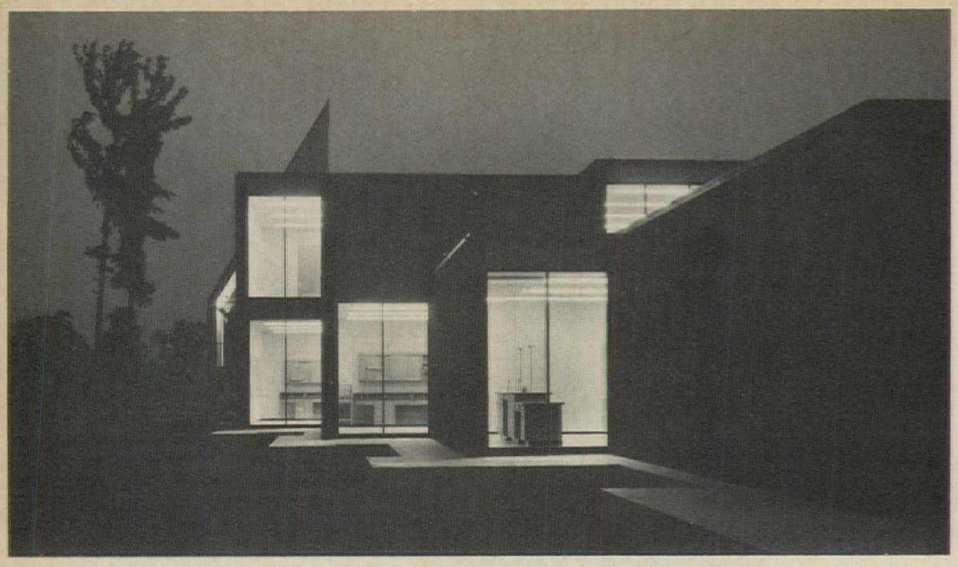








Frank Lotz Miller photos

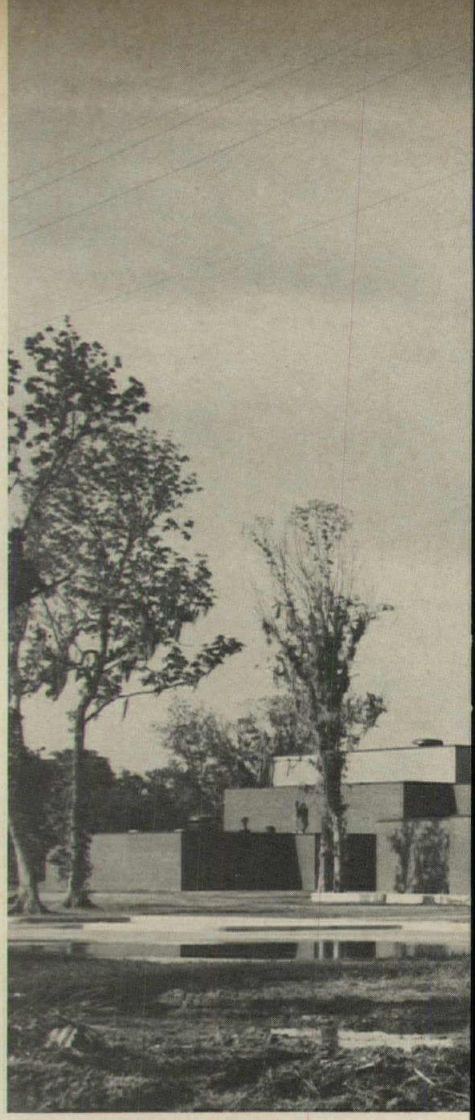


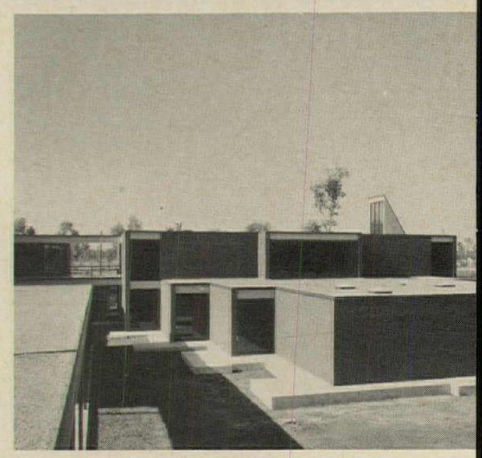
SPIRITED DESIGN MAKES JUNIOR HIGH A PACESETTER FOR NEW SUBDIVISION

A highly unified, but many-faceted structure has been created for this school to clearly express each element and closely relate it to the outdoors. A continuous exterior podium or building base was created to raise the structure above alluvial mud and to provide outdoor spaces for teaching and dining; each space is partially screened by the staggered walls, and provides a direct entrance to the adjoining room. There is also access from the central corridor.

The school is located in a virgin swamp five miles south of New Orleans, and will serve a new and developing single-family subdivision that is being drained and constructed alongside an industrial canal. The site was heavily wooded until Hurricane Betsy struck the area in 1965. Colbert notes that "high humidity, great quantities of rain, standing swamp water, extremes of temperature, insects and other exterior detractions demanded air-conditioning. Hurricanes and heat losses suggested that openings be reduced to a reasonable minimum and face only north and south, while full masonry walls resist intense east and west sun exposures." The result is an intriguing building which reportedly functions very well.

HELEN COX JUNIOR HIGH SCHOOL, Harvey, Louisiana. Architect: *Charles Colbert;* mechanical engineers: *Lucien Vivien Associates;* structural and electrical engineers: *Guillot, Sullivan & Vogt;* contractor: *J. B. Bush, Inc.*

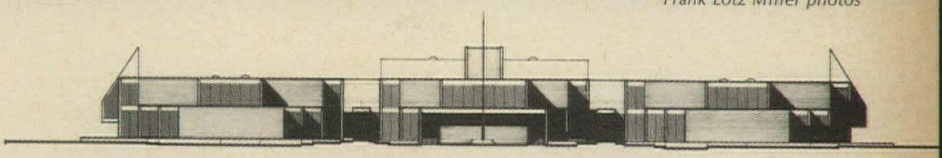


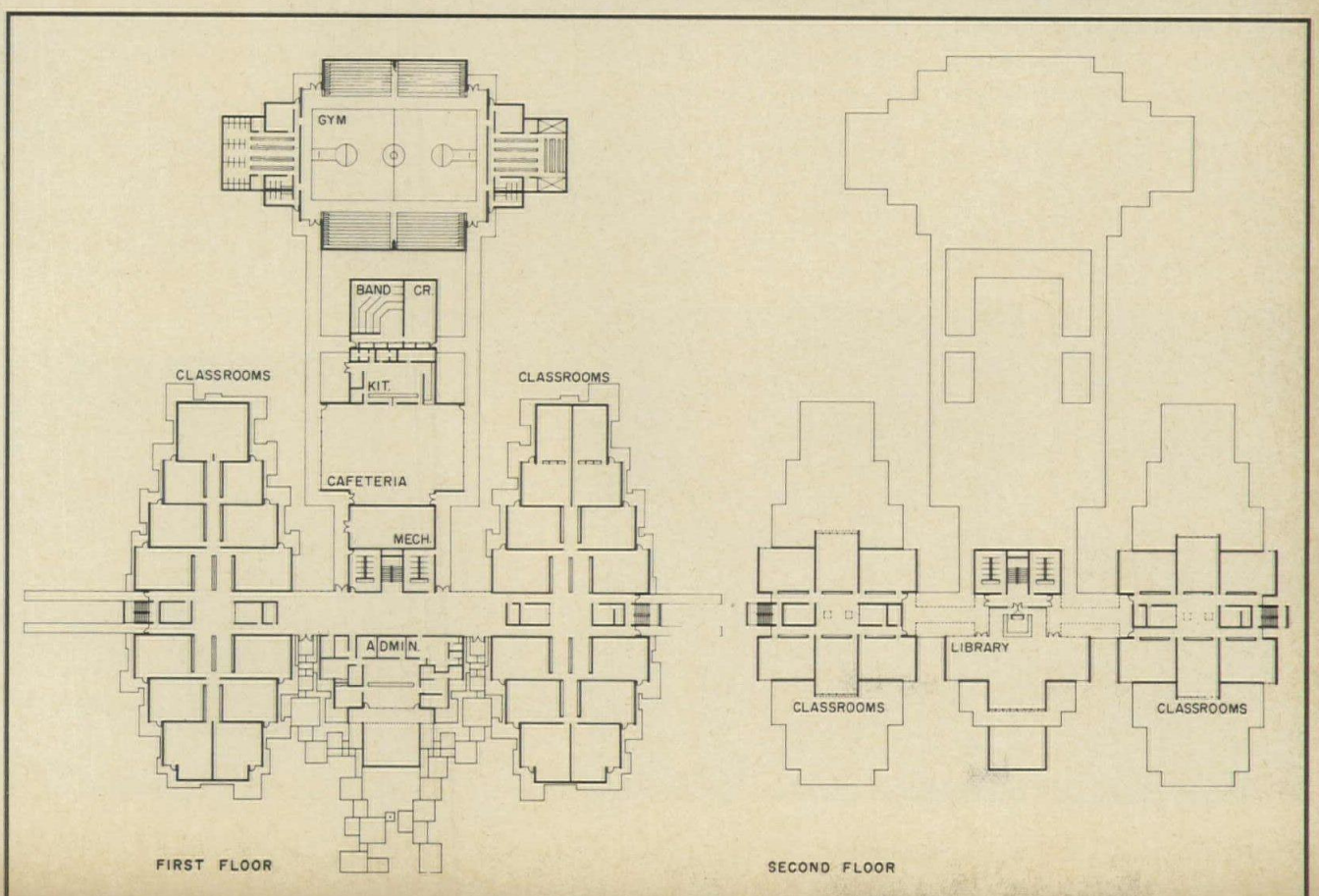


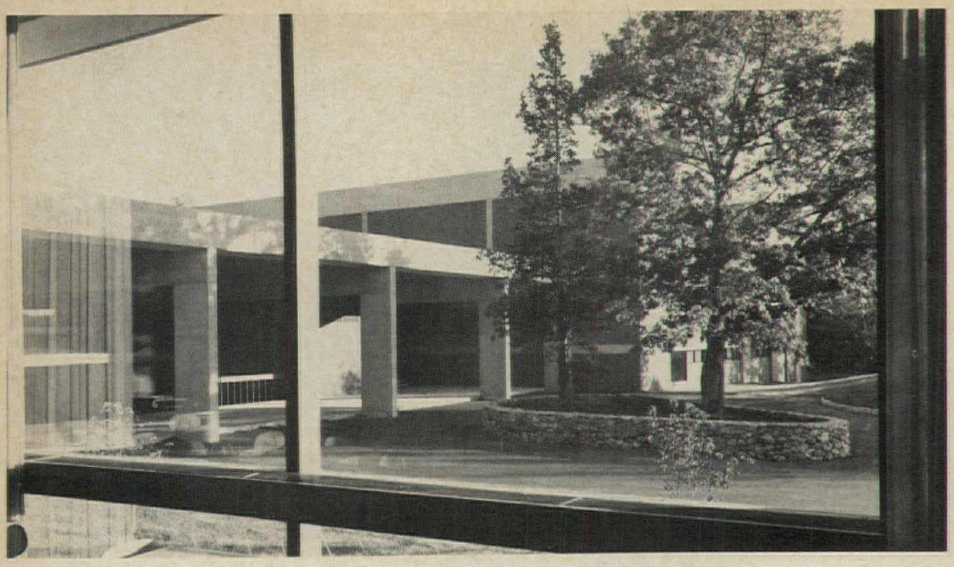
The general massing of this school for grades seven through nine was planned to give a strong contrast to the flatness of the adjacent swampland. The general arrangement was made feasible by use of bearing-wall construction and uniformity of structural bays; uniform length bar joists are used throughout most of the structure. Colors and materials are dark brown brick with horizontal raked joints of dark mortar, light tan plaster matching the natural concrete base, dark brown finish on metals and vermillion doors.

The school contains 85,015 square feet of enclosed and air-conditioned floor area, and cost about $17 per square foot.

Frank Lotz Miller photos





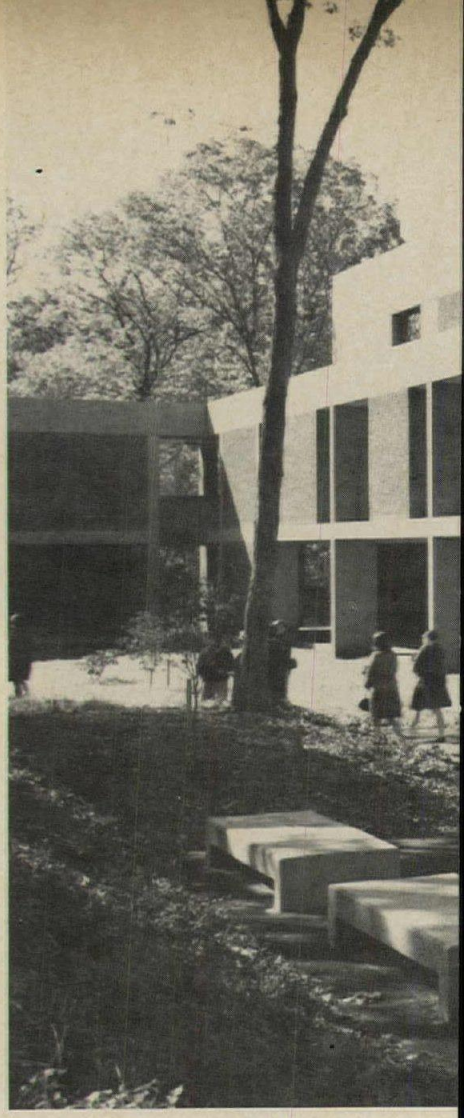


COURTYARD HIGH SCHOOL CREATES A CAMPUS OF A BEAUTIFUL SITE

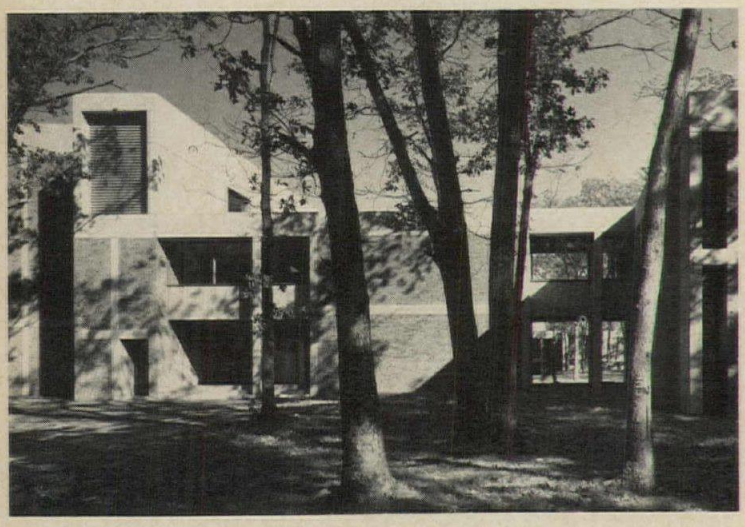
This school is a singularly good example of design appropriateness for site and neighborhood. The architects worked from a strong conviction of this premise: "the site is a particularly beautiful piece of land and the building is carved out of the landscape, preserving every possible tree. In contradiction to the attitude that a school should be a closed antiseptic box, this school strives to expose its students to the wonders of nature. It is arranged around a large, hilly court which, although the building completely surrounds it, can be reached directly at the ground level by open areas under the building. As the normal path of circulation between classrooms, it is heavily used in good weather. Continuous enclosed circulation is at the second level."

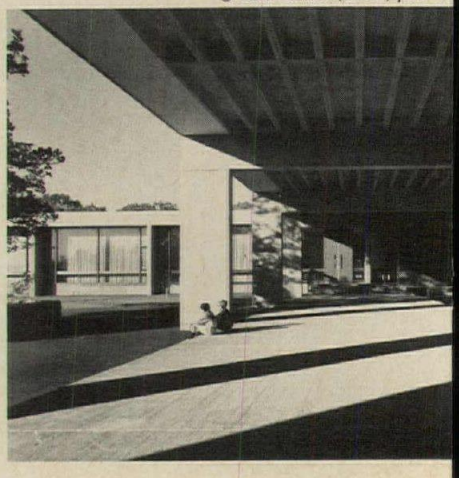
The handsome, simply-stated structure of concrete and brick relates well with the landscape, and creates an outdoor lobby from the large covered area at the entrance. Parking was specifically designed behind a wooded knoll to be invisible from the entrance drive or school, yet convenient to both.

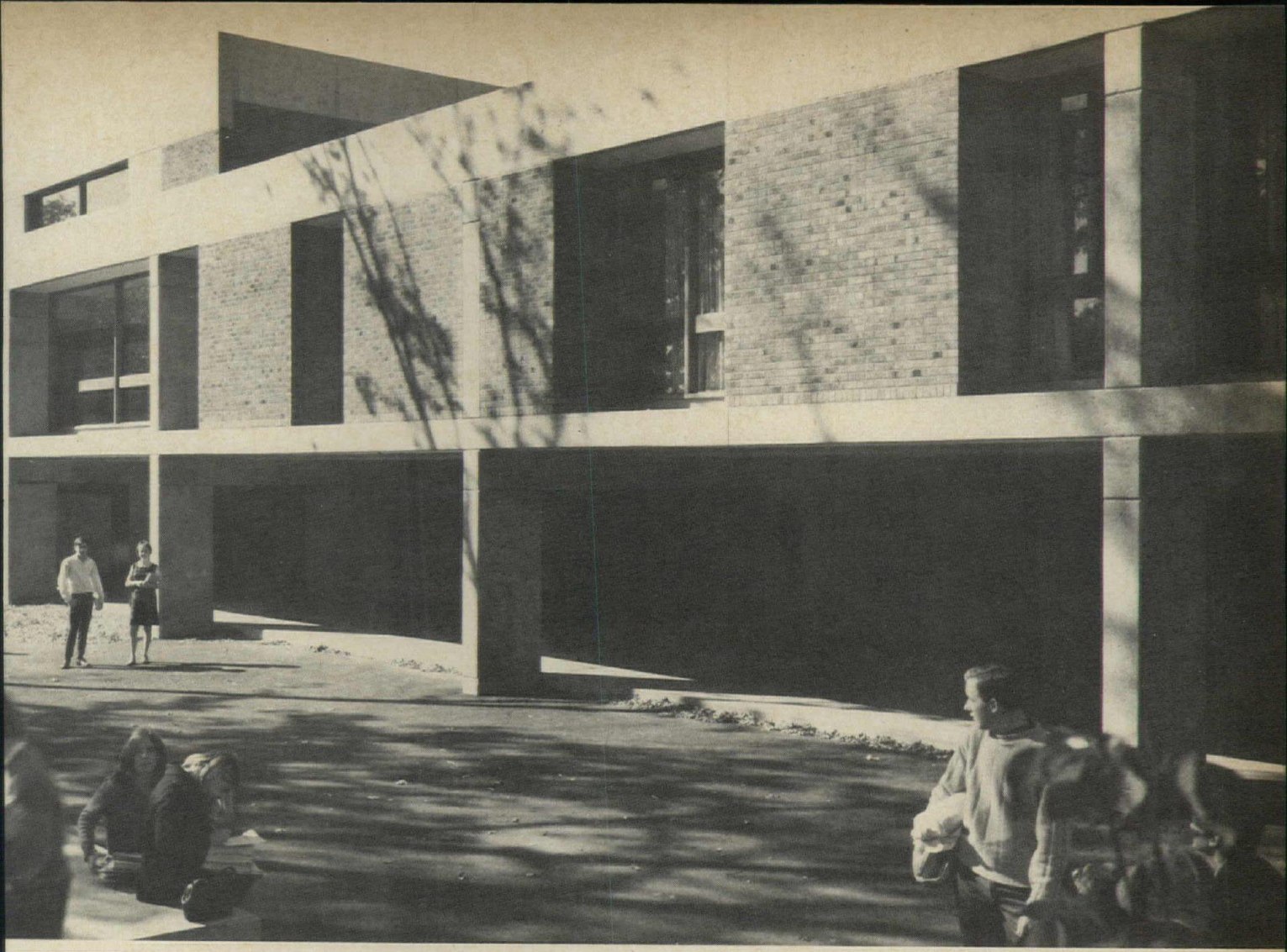
EAST GREENWICH HIGH SCHOOL, East Greenwich, Rhode Island. Architects: *Albert Harkness and Peter Geddes (Randolph E. Anderson, principal-in-charge);* and *The Architects Collaborative Inc. (John C. Harkness, principal-in-charge);* structural engineers: *Gilbert Small & Company, Inc.;* mechanical and electrical engineers: *Francis Associates;* educational consultant: *Dr. Sidney Rollins;* contractor: *Turgeon Construction Company.*

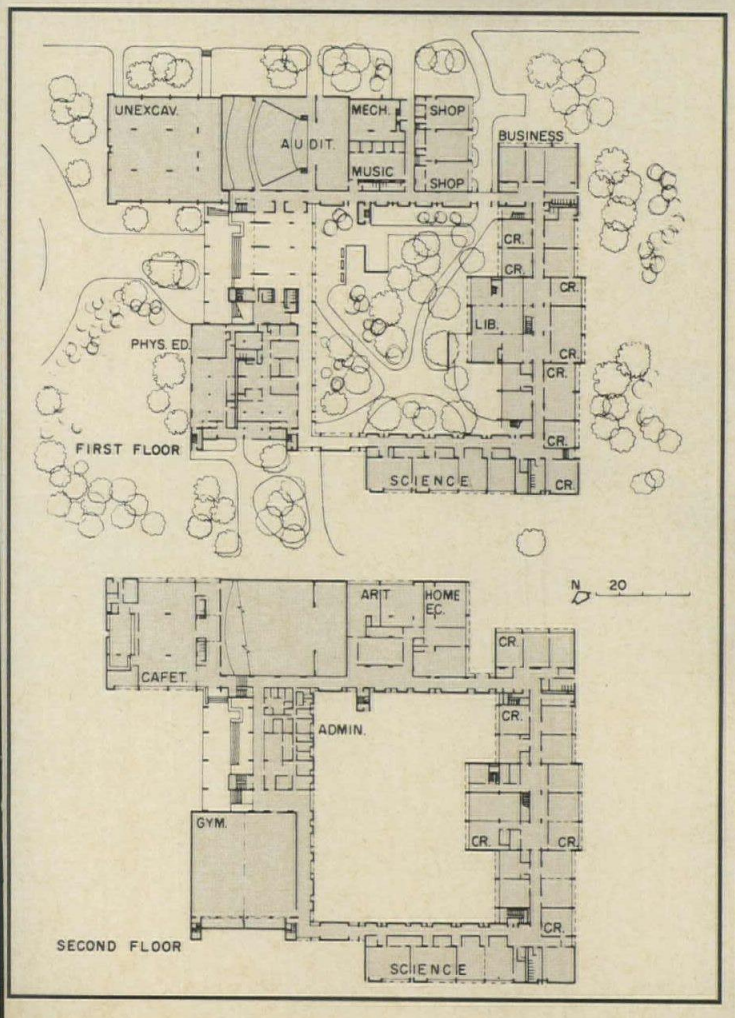


The plan of this senior high school organizes the various facilities into a very efficient scheme. The gym and auditorium are placed on either side of the main entrance to permit large groups of people to be handled easily, either simultaneously or at separate times; a split-level cafeteria is closely related to the auditorium for community functions, and may also be reached from either the first or second floors. While most classrooms are standard size (and some are divisible), spaces such as the library and music rooms are two stories, and have windows from the second level corridors overlooking the spaces "to increase the sense of involvement of all students in the activities."





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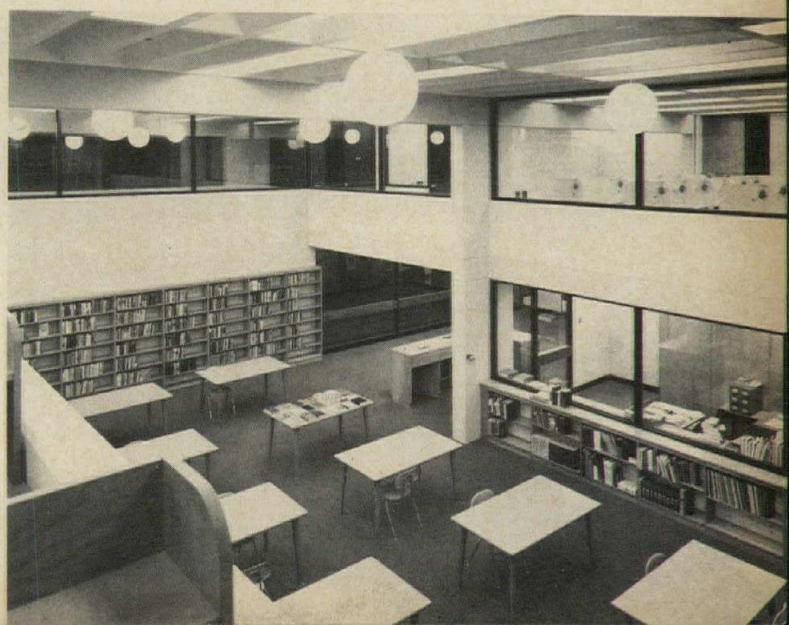
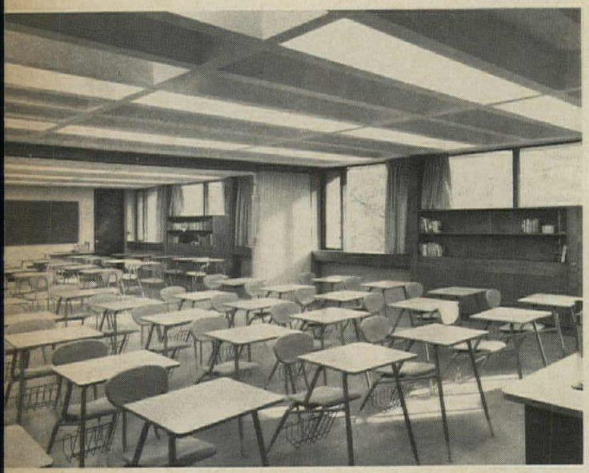
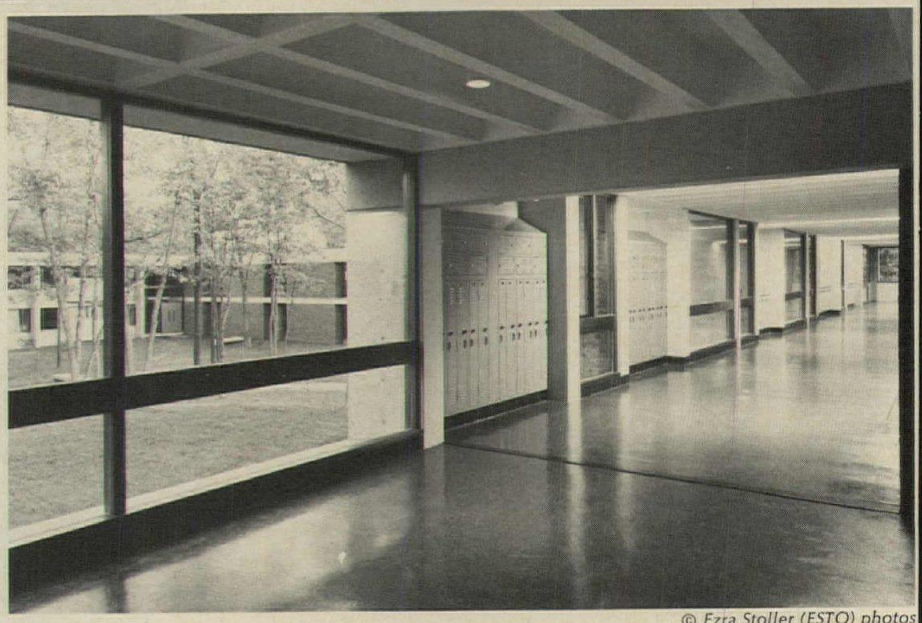


EAST GREENWICH HIGH SCHOOL





© Ezra Stoller (ESTO) photos

The structure of the East Greenwich High School is one of great clarity and strength: panels of red-brown brick, fitted into a frame of sandblasted and "form board" concrete create the basic enclosure. Inside, the mechanical systems are well integrated with the structure: lighting is fitted into the ribbed slab ceilings; heating pipes are contained in wood-baffled "packages" which incorporate unit ventilators, teachers' lockers, and book shelving, and form a strong design element on the exterior of the school.

Sprinklers proved effective in McCormick Place-type fire

In a simulated exhibition hall at their test buildings in Northbrook, Illinois, Underwriters' Laboratories, Inc. recently checked the effectiveness of automatic sprinklers under conditions similar to those that destroyed Chicago's multi-million-dollar exhibition center. An exhibit area was constructed, using draperies and display material identical to those present in the original fire, and the fire was started in a manner similar to that believed to have caused the actual fire. Tests were conducted to determine: 1) the rate at which an uncontrolled fire would spread in a building similar to McCormick Place and 2) the water discharge density (gpm per min per sq ft) and area of protection for the design of automatic sprinkler systems to control or extinguish fires in exhibition halls having ceiling heights of 30 ft or 50 ft.

Two fire tests were conducted in a building having a ceiling height of 30 ft, and one test was conducted in a building with a 50-ft-high ceiling. Cardboard cartons and other combustible packing materials were placed behind booths and under tables to simulate typical conditions, and display tables were covered with the types of fabric commonly used in exhibits. Individual displays were sectioned off by draperies.

In the first test, sprinkler discharge was delayed for nearly 6 min after ignition—this time corresponding to the reported delay between discovery of fire in McCormick Place and receipt of the first alarm by the fire department.

However, sprinkler discharge was started 15 sec before this time because temperatures in excess of 1500 degrees were being recorded at the ceiling, and this was deemed hazardous to the test facility. The results of the first test indicated that 0.20 gpm per sq ft discharge density could control or extinguish the fire. Actually, the first sprinkler opened at 2 min 56 sec, but the valve controlling the sprinkler system was not opened until 5 min 45 sec after the start of the fire.

In the second test, sprinklers were allowed to discharge water as soon as they opened—2 min after ignition.

In the third test, in which ceiling height was 50 ft, the water discharge was delayed until 6 min had elapsed, which was 50 sec after the first sprinkler actually opened. Eleven of the 12 sprinklers used in the test had opened by the time the sprinkler system was discharging water, and eight of them opened within 15 sec of the time the first sprinkler opened.

In the first test, approximately 80 per cent of all exhibit and display booth material was destroyed by fire. In the second test the fire did not extend much beyond the booth of origin, producing approximately 15 per cent damage. In the third test, again the fire did not extend much beyond the booth of origin, with damage estimated at 20 per cent.

Another phase of the tests was to determine if protected steel beams would resist heat sufficiently to prevent collapse of a building. In the first test an unprotected beam reached a temperature of 1355 F, while a beam protected with 1 in. of asbestos fiber reached only 168 F. Additional tests were conducted to evaluate the ignitability of combustibles by molten aluminum, and the flame resistance of various drapery materials present in the McCormick Place fire.

THIS MONTH'S AE SECTION

Object lessons derived from luxury hotel fire

Evaluation of last December's $1½-million fire in Montreal's year-old Château Champlain Hotel has given object lessons in design against fire for a new brand of large, complex urban centers, and a review session of basic fire-protection ABC's as well.

Originating in the hotel's restaurant, where a late-night unsnuffed candle was presumed to have set aflame the foamed-plastic base of a food table display, the fire swept through ground-floor restaurants and bars. Dense smoke climbed to the upper levels of the hotel tower and adjoining shopping plaza, penetrating widely through nine floors. Volumes of water flooded rooms and destroyed machinery and flooring before the fire was quenched an hour later.

Yet considerable effort had been expended in assuring modern fire-resistive construction of the hotel's 480-ft structural steel tower. Also, all combustible-type interior finish in the public rooms—including wood panelling and draperies—was fire-retardent-treated. Minimum local requirements, in short, had been generously met, according to Donal M. Baird, director of fire protection engineering of the Canadian Underwriters' Association.

The problem, according to Baird writing in the Fire Journal, was open communication over an extensive floor area without smoke or fire barriers, total lack of windows or other means of

emergency ventilation on the floor of the fire, and a substantial fire load in an area without automatic sprinklers. For example, fuel in the furnishings and decor was unexpectedly large, and spaces having plastic shrubbery, foam upholstery and other luxury combustibles were left unsprinklered. Further, an automatic vent system at the top of the elevator shaft complied with the building code, but since it was heat- instead of smoke-actuated it never opened at all. Unvented fumes and intense heat choked off attempts to activate the two standpipes provided at the service core, and firemen had trouble getting through the windowless lower floors to get at the seat of the blaze.

Design for the handicapped—the effort is still too small

In every community, virtually all of the buildings and facilities most commonly used by the public have features that bar the physically handicapped. And the most common causes of inaccessibility are due to failure to think of the needs of the handicapped at the design and planning stage. So says a report of the National Commission on Architectural Barriers to Rehabilitation of the Handicapped, chaired by Leon Chatelain, Jr., A.I.A. Example: Of nearly 3000 architects surveyed by the National League of Cities, only about a third of the 700 replying said they had knowledge of standard specifications for making buildings accessible.

Common causes of inaccessibility include: 1) steps and curbs; 2) inaccessible elevators; 3) steep and narrow walks; gratings in walkways; 4) doors that are too narrow, that revolve, or that are hard to open; 5) lack of parking spaces reserved for the handicapped and designed for their use; 6) lack of accommodations for wheel-chairs in theaters, stadiums, and other public gathering places; 7) too-narrow aisles in cafeterias, restaurants, libraries, auditoriums, etc.; 8) too-small public toilet stalls and telephone booths; 9) too-high telephones, drinking fountains, vending machines, light switches, fire alarms, etc.

Since one out of 10 persons has some disability that prevents him from using buildings designed only for the physically fit, what action did the Commission think ought to be taken? Major recommendations: 1) promulgate Federal legislation requiring all new public buildings and facilities using Federal funds to be designed to accommodate the handicapped; 2) require Federal agencies to follow accessibility standards on new construction, and budget for feasible changes in existing buildings; 3) encourage states to do the same; 4) urge revision of building codes, requiring that privately-owned structures be built for accessibility and, when renovated, to incorporate such provisions; 5) assign responsibility and funds to specific units of various governmental agencies at all levels to conduct and/or support research and demonstrations; 6) expand public and privately-supported education and information programs.

Progress cited includes the formulation of a standard on accessibility by the United States of America Standards Institute; action by 44 states requiring that public buildings be made accessible; action by universities and colleges; improvements in transporation facilities; Federal research grants; cost studies by the National League of Cities.

Surprisingly, of seven major manufacturer trade groups questioned, none had established any policy about meeting the U.S.A. Standards Institute standard on accessibility. A number of them thought that their members' standard products would have to be altered to make them usable by the handicapped. The report, "Design for All Americans," is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402 for 50 cents.

Corps of Engineers to have building research lab

By early next year the Corps of Engineers hopes to have over 100,000 sq ft of space completed for the start of a new Construction Research Laboratory sited several miles from the University of Illinois campus. Beyond this $3.25-million first phase, plans are to increase the space to over 260,000 sq ft by 1973. Head of the laboratory will be Lieutenant Colonel Rodney E. Cox. The laboratory is expected to be staffed initially by personnel now at the Ohio River Research Division of the Corps. Some of the research is likely to include instrumentation of buildings to evaluate their overall performance, tied in with computer studies to project future needs.

New lumber grading rules simplify job of specification

Western Wood Products Association, which supervises quality control for 40 per cent of the nation's output of softwood lumber, has published new grading rules that promise to make it easier for architects and engineers to specify their materials. They also are the first grading rules that relate sizes of 2-in. nominal lumber to moisture content. New sizes of dimension lumber are those recommended last year by the American Lumber Standard Committee.

Whether or not the Department of Commerce intends to promulgate a new lumber standard is still not clear. In June, Representative John Dingell wrote FTC that Commerce had dropped plans to do so. (Producers of green lumber are said to have an eight per cent advantage in the manufacture of present lumber sizes, since they do not have to take into account shrinkage of lumber prior to its sale.) Improvements in the new grading rules include:

1. Nominal 2-in. lumber dried to 19 per cent moisture content will be surfaced at 1½ in. Unseasoned lumber will be surfaced to 1⅝ in. Widths are also related to moisture content.

2. Span tables are more accurate, with design values updated in line with the most recent ASTM standards, and applied to improve stress grades of framing lumber. WWPA has complied with ASTM recommendations to accept lower ratings for modulus of elasticity and tension.

3. Numbers replace names for dimension grades, except for the top grade. Designations will be Structural, #1, #2, #3 and #4.

4. Stress grading extends to all Structural #1 and #2 dimension lumber 6 in. or more in width, to Structural grade in 4-in. width, and to 2 by 4s in the Light Industrial Framing category.

5. Applicable working stresses are shown for the first time for all 11 Western species covered by the quality control program.

6. A streamlined system has been devised to select the right pieces for particular joist and rafter spans. Mills adopting this system include *J* and *R* symbols on the stamp for each piece which keys to a simple span chart.

WWPA says that the architect will find design values easier to ascertain and specify than before. For the first time, applicable working stresses are shown for all 11 lumber species covered by WWPA's grading supervision. Where species are close enough in properties, design values are consolidated in species groups. For example, the "Hem-Fir" stamp covers Western hemlock, five true firs and Inland-Southwest Douglas fir. Design values for such groupings are derived by the principles set for the latest ASTM standards.

WWPA's Product Use Manual—excerpted from the rules book for the convenience of architects and others—and a new Grade Stamp Manual are available without charge from Western Wood Products Association, 700 Yeon Building, Portland, Oregon 97204. The Grading Rules Book costs $1.00.

Failure of a high-rise system: how safe should the structure really be?

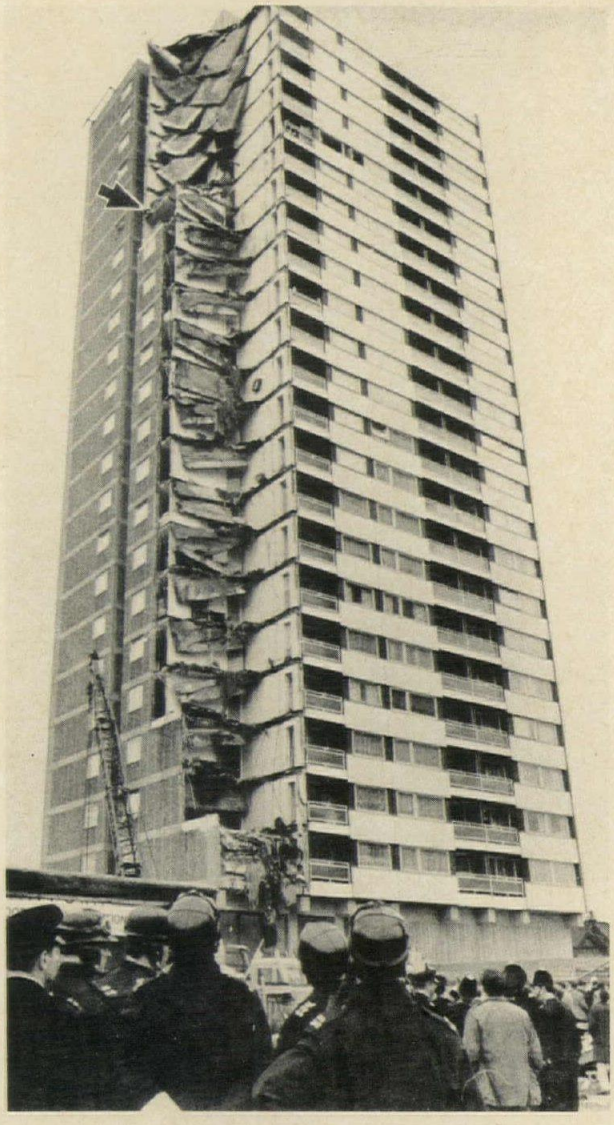
The collapse of a 24-story wing of a newly-occupied high-rise apartment in London last May is making experts take a long, hard retrospective look at the disaster in an inquiry that could have implications for prefab or component building in high-rise structures.

Ronan Point, as the now-famous building is called, was one of nine similar blocks under construction for the London Borough of Newham using the Danish Larsen and Nielsen system of prefabrication. The method, widely used throughout Western Europe and in Turkey and Hong Kong, employs precast factory-made components.

Load-bearing outside and interior walls of the structure and floor panels fell like dominos, the whole 24-story corner shearing off the rest of the building with a kind of modular clarity that reflected the geometry of its construction. Three persons died in the collapse.

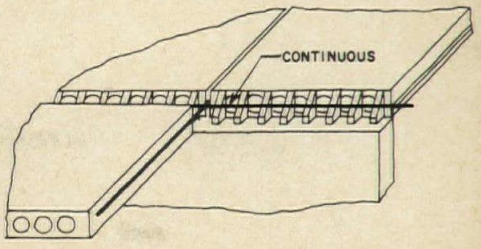
Reports from a full-scale inquiry, initiated for Britain's Ministry of Housing to investigate the collapse, are being closely followed by U.S. structural engineers and concrete specialists alike, although this and similar systems have not yet migrated to this country. They have, however, attracted widespread interest in the United States' search for lower-cost housing.

Pending an official report due this month, an interim letter put out by the inquiry in mid-August indicates that a gas explosion was the immediate cause. The explosion, thought to have originated on the 18th floor of the building, apparently blew out two load-bearing exterior wall panels, leaving the six floors above without support. These progressively fell, taking with them the apartments below. But the root of the failure was found to lie in the joints that connected the stacked floors and wall slabs, as it was observed that their design did not provide continuity connection to assure mutual interaction of the components under severe overload. The theory is that the explosion followed ignition of gas pockets accumulated at ceiling level. But experts agree that other factors, however remote—including ground settlement, accidental damage and other types of internal explosions—could likewise have caused the failure. In the words of one British engineer, Bernard Clark, speaking before the inquiry, "We should not have buildings such that, when there is an explosion, the whole lot comes down. This



The entire corner section of this London apartment gave way when a gas explosion dislodged two load-bearing panels on an upper floor. Blame for the disaster has been unofficially laid on the faulty joint design of a prefabrication system then in widespread and accident-free use throughout Western Europe.

Cutaway of the joint reveals panels' toothed bearing edge with single rod reinforcement, which while normally adequate, proved unable to resist the severe loading. The toothed edge was designed to increase bonding surface for in-situ concreting, but may in fact have contributed to the joint's weakness.



is where the weakness of the joint is shown up. If this building had been joined properly at the joints, it is quite possible that the ceiling and some internal walls may have cracked, but we would not have had a cascading collapse." Progressive collapse in frame buildings is virtually unknown, it was observed.

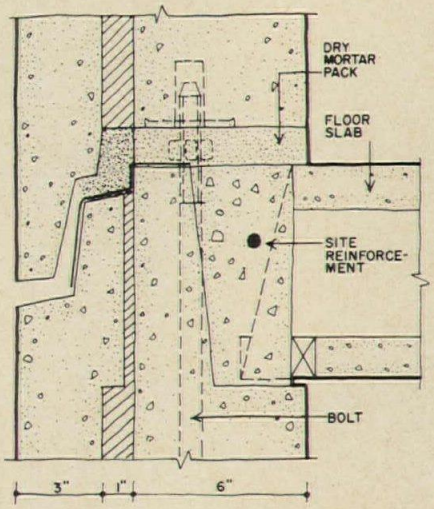
The Larsen and Nielsen floor panels used at Ronan Point come with teethed edges that bear on the wall slab, and the joint is concrete-bonded after erection. The theory is that these teethed edges provide better bonding with the field-finished joint than a smooth-ended slab. In tests conducted for the investigation, bond failure occurred only at some 40 times the normal live load of the rooms. The only reinforcement is a single steel rod inserted laterally in the joint before concreting. Wind loads for a system of the Ronan Point type are handled by diaphragm action of the floor slabs, which transfer wind loads on walls to a monolithically acting stair core resisting forces in shear. The panel joints seem to have been erected correctly, and workmanship was discounted as a contributing factor in the collapse.

In retrospect, it is clear that since an explosion was a potential hazard, even though remote, an effective type of joint continuity should have been provided. While wind and other normal loads were provided for, evidently the possibility of an internal explosion was simply never considered.

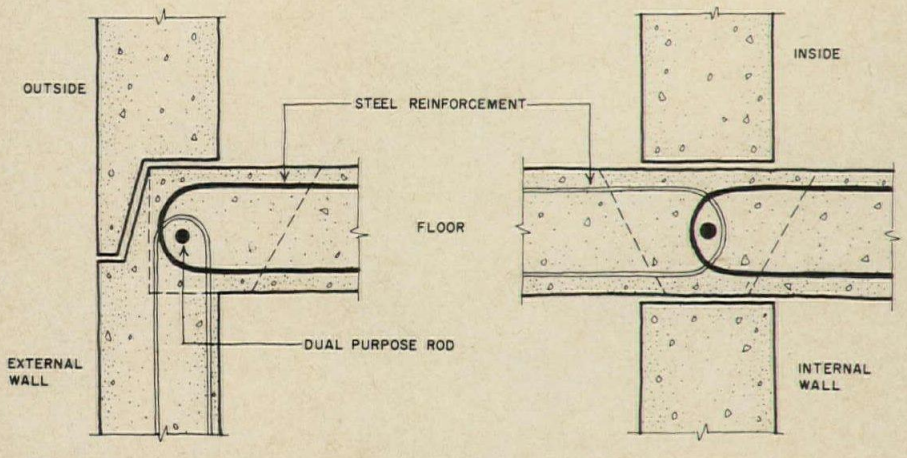
There are about a dozen systems in use in Great Britain based on the Larsen and Nielsen method, and the system itself has been used without mishap for several thousand low- and high-rise apartments throughout Europe since its start in the Danish market some 15 years ago. Ronan Point's liability to progressive collapse, according to the interim report, may now call into question prefab building systems that depend on large, load-bearing wall panel construction. As an initial measure, advisors to Britain's Ministry of Housing have devised the panel joint shown to the left to reinforce systems of the Larsen and Nielsen type—and to restore tenants' confidence in them.

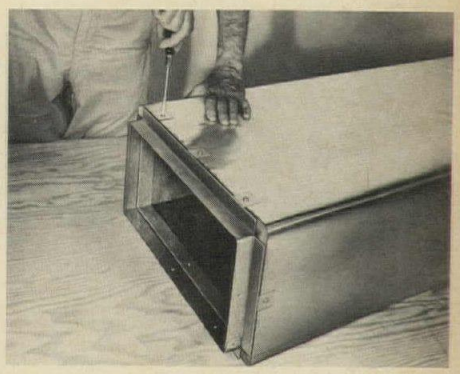
Experts here say that such a disaster would have been less likely in the U. S., where engineers are accustomed to designing joint continuity—or at least some form of tie between wall and floor panels —for much lower structures. Close tolerances tend to be built into many European systems which often fit together with clockwork precision, with the result that perhaps more confidence is placed in the "designed for" performance of the structure. But by and large engineers here are likely to favor more conservative details geared to the realities of domestic construction and labor practices. Though such precast panel systems are not presently available on the U.S. market, concern in the wake of the British experience may continue to mount here too, as precision-designed European systems are beginning to capture American imagination, and as a number of domestic designs are pioneered here.

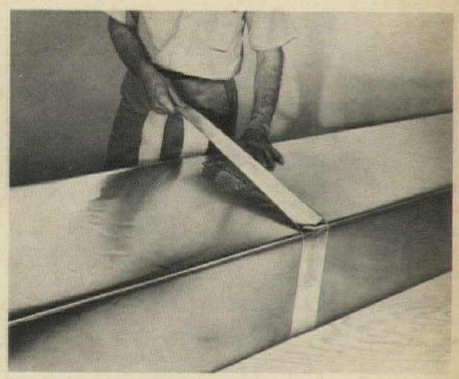
The joint said to be responsible for the London flat collapse fails to provide a tie that assures mutual action of wall and floor slabs under severe loading. Following crane-erection of the precast panels, a single steel rod is inserted for reinforcement, and concrete is poured-in-place. Dry mortar pack provides bearing for wall slab placed above. Bolt is adjustable to assure a consistent bearing surface.



A correct panel joint, as devised by advisers to the British Housing Ministry, could employ steel reinforcement embedded in the precast panels to help achieve continuity. Projecting loops in the joint are threaded before in-situ concreting by a lateral rod that can both tie wall and floor together and cantilever the wall.







In the largest application to date, the Louisville Federal Building has fibrous glass ducts up to 37-in. wide, though for larger duct (at left in photo above) wrapped sheet metal was used. Typical fibrous glass duct sections, right, get T-shaped reinforcement and airtight tape sealing at joint.

Guidelines for using fibrous glass ducts in larger types of buildings

By J. M. Barnhart, executive secretary, National Insulation Manufacturers Association

When the National Fire Protection Association recently removed from its fire code nearly all restrictions on the use of fibrous glass ducts, it opened the way for much greater application of the material which has proved itself for use on any low-velocity system—except for exhaust systems—where sheet metal duct can be used.

As local code bodies amend their codes to reflect the changes in the NFPA standard, and as designers gain greater familiarity with fibrous glass duct, the decision whether to design in sheet metal or fibrous glass duct will undoubtedly rest on the relative importance of performance and cost. Fibrous glass duct is less expensive than lined or wrapped sheet metal, but obviously more costly than bare sheet metal.

During the past 18 months, designers have been calling for large quantities of fibrous glass duct, principally for use in schools and office buildings. The reason is that not only does the installed cost compare favorably with acoustic-lined or wrapped sheet metal, but it also forms an exceptionally air-tight system with superior thermal and acoustical properties and an integral vapor barrier.

Until now, the engineers who have been designing fibrous glass duct systems have been working with only manufacturers' literature to guide them. This condition has been changed with the publication of the Sheet Metal and Air Conditioning Contractors National Association "Installation Manual for Nonmetallic Ducts," issued concurrently with the revision of the NFPA code. The manual covers fabrication, reinforcement and installation, and was developed through the cooperative efforts of the National Insulation Manufacturers Association, the Sheet Metal Workers International Association and SMACNA.

Fibrous glass duct is not a new material—the first installation was in 1952—but until last year, use was limited mainly to small installations, usually homes and light commercial buildings. The average installation took about 6000 sq ft of board—equivalent to a 1500-ft run of 12-in. by 12-in. duct. Between 1961 and 1967 about 100 million square feet were installed.

During 1967, usage moved upward sharply as designers began calling for large quantities in schools, office buildings, industrial plants and other large buildings.

The largest installation during 1967 used 300,000 square feet, at least a dozen took more than 100,000 square feet, and jobs of more than 50,000 square feet were commonplace.

Fortunately for both the designers and the contractors who worked with the fibrous glass duct prior to publica-

tion of the "Manual for Nonmetallic Ducts," the primary technology of the basic material is fully established. Fibrous glass has been used as acoustical and thermal lining in sheet metal ducts since 1946 and its insulating and sound attenuation properties are well known.

The evolution from a liner to the duct itself was a natural and logical step, since the borosilicate fibers of fibrous glass have both inherent strength and inherent insulating properties. Used as a liner for sheet metal, only the insulating and acoustical properties come into play. The phenolic binder, it was found, provided a means of using the strength characteristics of the fibers.

The addition of a membrane vapor barrier—metal foil or polyvinyl chloride—produces a duct material that is light, strong, easily worked by accepted sheet metal practices, and maintains the accepted insulating and acoustical excellence of fibrous glass.

Four companies produce fibrous glass duct material in three basic shapes:

1) *Board.* This material is supplied in flat panels in sizes up to 4 by 10 ft. Thicknesses available are 1 in., 1.5 in., and 2 in. It is available as standard-duty and heavy-duty board.

2) *Rigid round duct.* Available in inside diameters from 4 in. to 36 in. and in lengths to 6 ft. Thickness varies from .75 in to 1.5 in. depending on diameter.

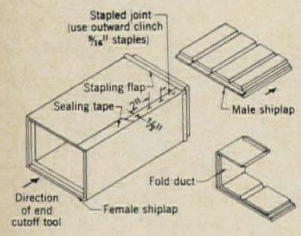
3) *Flexible round duct.* Available in inside diameters from 4 in. to 18 in. and lengths of 6 ft and 7 ft. Spiral-wound reinforcing wire permits bends to 180 degrees without change of inside diameters.

Regardless of manufacturer, several basic characteristics are common and may be used in preliminary design work. These include allowable transmission capabilities, thermal and acoustical properties, permeability, puncture resistance, resistance to static loading and impact, reaction under negative and positive pressures, fire resistance, friction coefficients, and reinforcement requirements. Taken individually:

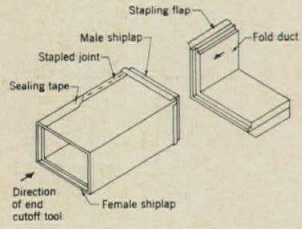
(1) *Transmission capabilities.* The material is designed for systems with air velocities up to 2000 fpm and as much as 2 inches of static pressure at temperatures not higher than 250 F. With the recent changes in NFPA 90A, there is no limit on air volume.

2) *Thermal properties.* The k-values of fibrous glass ducts are excellent. With an average conductivity of .23 at 75 F mean temperature, the designer can almost disregard thermal conductivity.

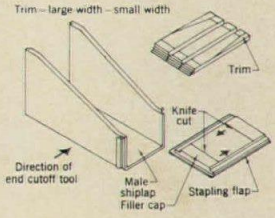
3) *Acoustical properties.* A major advantage of fibrous glass, whether used as liner material or as the duct itself, lies in its sound absorption properties. The fibrous glass ducts have the



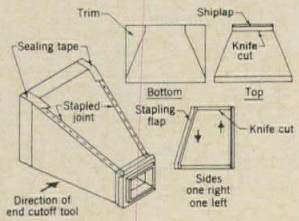
DUCT SECTION ONE PIECE



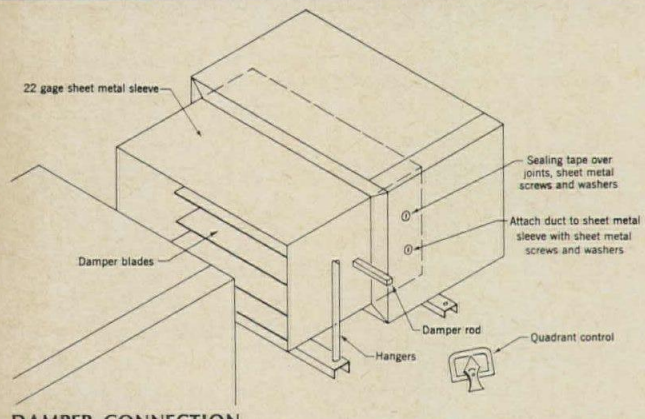
DUCT SECTION TWO PIECE



COMMON DEPTH TRANSITION

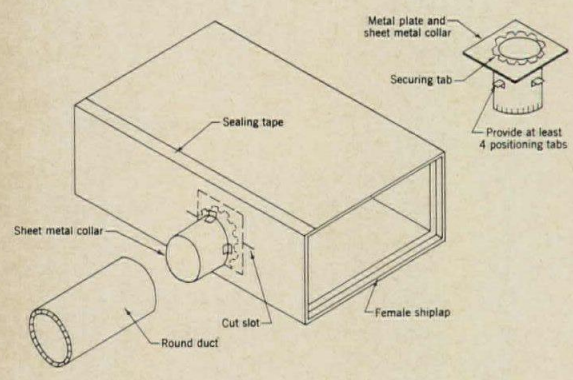


FOUR WAY TRANSITION



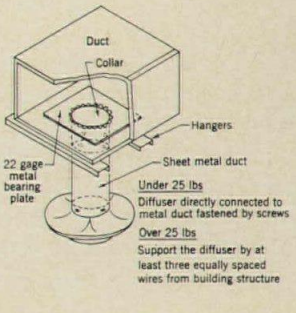
DAMPER CONNECTION

Representative industry details show fibrous glass duct construction as well as the generally used connections, takeoffs and elbows. Note where metal reinforcement is used to provide extra strength and rigidity. Not only can dampers and vanes be installed in fibrous glass duct, but exposed grilles are also possible. With flat ducts, after the board has been cut and folded, the duct is made firm and airtight by first stapling the joint flap and covering it with sealing tape. Round ducts use sheet metal pipe for reinforcement.

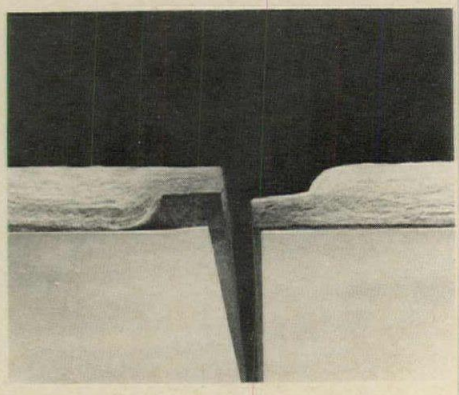


ROUND DUCT TAKEOFF

Typical rigid board is composed of borosilicate glass fibers, a phenolic binder and a vapor barrier on outer surface. Premolded shiplap end simplifies joining.



DIFFUSER CONNECTION



additional advantage of being free from drumming and vibration problems associated with metal ducts.

4) *Permeability.* While itself unaffected by moisture, most fibrous glass insulation offers little resistance to moisture penetration. It can hold moisture in the interstices between fibers. This is not true of fibrous glass ducts, which have low permeability and absorption rates. Permeability varies with the vapor barrier casing. For example, the material typically absorbs no more than 2 per cent moisture by weight at 120 F and 95 per cent relative humidity.

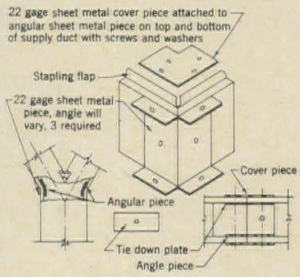
5) *Puncture resistance.* When a section of fibrous glass duct is subjected to 265 F interior temperatures and 125 F exterior temperature for 60 days, the vapor barrier will not be penetrated by a 2-lb plunger with a 9/16-in. steel head falling a distance of 20 inches.

6) *Resistance to static and impact loading.* It is easy to demonstrate the ability of fibrous glass duct systems to resist static and impact loading. The static load test prescribed by UL 181, Underwriters' Laboratories Standard for Air Ducts, requires that a duct section with a centrally-located joint be supported on 8-ft centers. Those more than 24-in. wide are supported on 4-ft centers. A 10-lb load is hung from the midpoint of the length of duct with a 1-in.-wide pipe strap. After five minutes the maximum allowable deflection is 0.7 per cent of the distance between supports. After an hour the allowable deflection is 0.8 per cent; after a day, 1.0 per cent. When the weight is removed, the length of duct must return to a deflection of 0.8 per cent within five minutes. The inner and outer surfaces cannot be ruptured, nor can joints and seams be fractured.

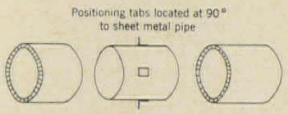
The same length of duct is used for the impact test. The duct is placed on a firm, flat surface and hit with a 20-lb. sand bag dropped at least 10 inches, with center joint being the point of impact. After impact, the vertical inside dimension cannot have been decreased permanently more than 15 per cent. The inner and outer surface cannot have ruptured and the joints and seams cannot show any signs of fracturing or damage that would allow air leakage.

7) *Operating pressures.* Although board and rigid round fibrous glass duct sections are recommended for systems with operating pressures up to 2 inches, w.g., they are able to withstand much higher pressures. The same is true of flexible fibrous glass duct, which is recommended for pressures up to 1.5 inches, w.g.

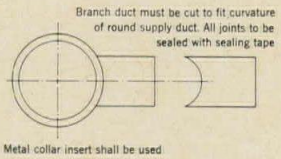
8) *Fire resistance.* All fibrous glass materials manufactured by members of NIMA can be called fire resistant, and



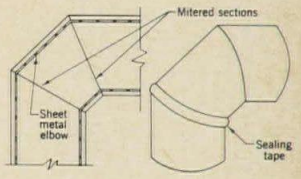
WYE SECTION



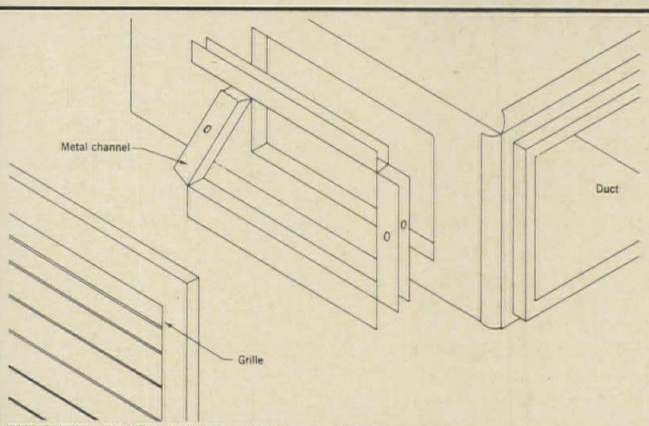
ROUND DUCT CONNECTION



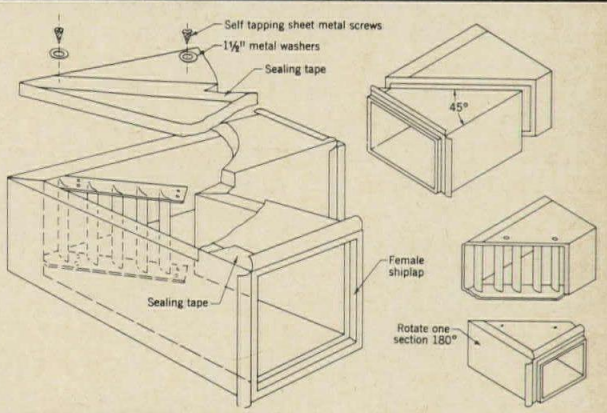
ROUND DUCT TAKEOFF



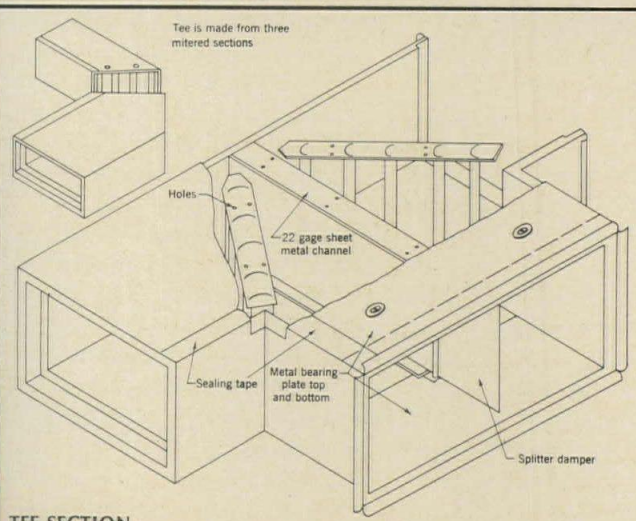
ROUND DUCT 90° ELBOW



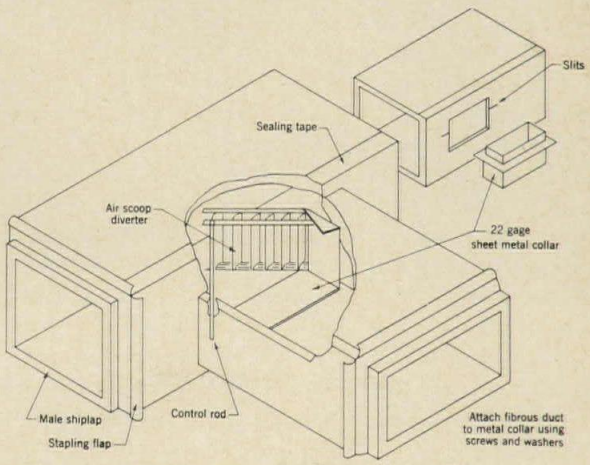
EXPOSED DUCT FLUSH GRILLE CONNECTION



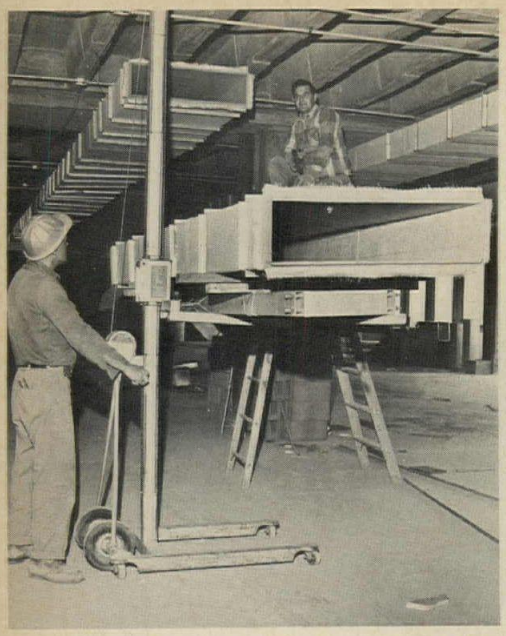
SQUARE ELBOW WITH VANES

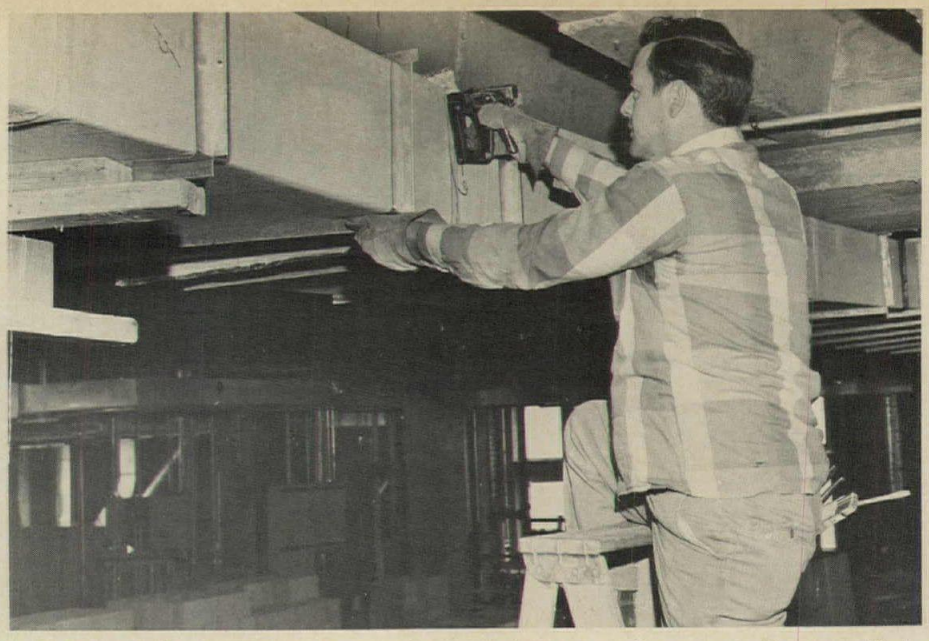


TEE SECTION



ADJUSTABLE TAKEOFF





Fork-lift dolly hoists a duct section, above left. Forks will hold section in place until joint is sealed and hangars attached. Right, worker staples overlapped vapor barrier before tape-sealing joints. Hangars will be attached to reinforcement through small hole at left in the photograph.

carry an Underwriters' Laboratories label.

The Factory Mutual Engineering Division, Associated Factory Fire Insurance Companies, after a series of tests, reported that the introduction of cool air from other inlets cools the hot gasses and tends to retard or stop further burning rather than increase it. Factory Mutual also found that when a duct becomes severely involved it quickly collapses. This substantially reduces the possibility of the fire spreading.

When the fire tests were completed, the Factory Mutual Rating Bureau reviewed the results and concluded that fibrous glass ducts are noncombustible and there would be no insurance premium differential between heating and air conditioning duct systems using metal or fibrous glass.

Flame spread rating for fibrous glass duct materials manufactured by members of NIMA range from 15 to 20. Smoke development ratings range from 0 to 20. Fuel contributed ratings are 20 to 25. These ratings are better than the limits set by UL 723 and UL 181 for Class 1 and Class 2 ducts.

9) *Coefficient of friction.* The roughness factor, e, of the smoothest fibrous glass board is 0.00065 compared with 0.0005 for galvanized steel. For velocities of 500-2400 fpm, the air friction correction factor will not exceed 1.1. Other board and rigid round materials have correction factors ranging between 1.25 and 1.4. These have relatively little effect on duct size, as can be seen in the fact that a 36-in. rigid round fibrous glass duct is equivalent to a 35-in. round sheet metal duct.

Flexible fibrous glass ducts have more complex friction values. Designers should consult the manufacturer's data to determine friction loss for a given diameter and air flow.

In practice, most engineers find there is no great difference in sizing fibrous glass ducts, especially when they are specified as alternates to lined sheet metal ducts. Normally, the outer dimensions will be the same.

10) *Reinforcement.* Publication of the SMACNA "Installation Manual for Nonmetallic Ducts" represents a move toward standardization in reinforcement recommendations by the four manufacturers of fibrous glass duct materials. The SMACNA manual covers all sizes of rectangular supply and return ducts up to 84-in. by 24-in.

The fabrication procedure for straight ducts from board is simple. The boards are grooved by machine or hand, then folded, the seams are stapled and they are sealed with an appropriate UL Class 1 closure system as recommended by the manufacturer.

Most fittings can be made from fibrous glass. Joints are made as male and female shiplap seams with the male shiplap of each section upstream. Necessary sheet metal accessories such as turning vanes, take-off scoops, shoes, collars and dampers usually are fastened with sheet metal screws and washers or extended tabs.

Round sections are even easier to put together. Joints are made with metal inserts. Additional reinforcement is not needed. Elbows, branches, reductions, offsets and dampers are formed with sheet metal inserts. Joints and other cuts in the vapor barrier are taped to provide barrier integrity and strength.

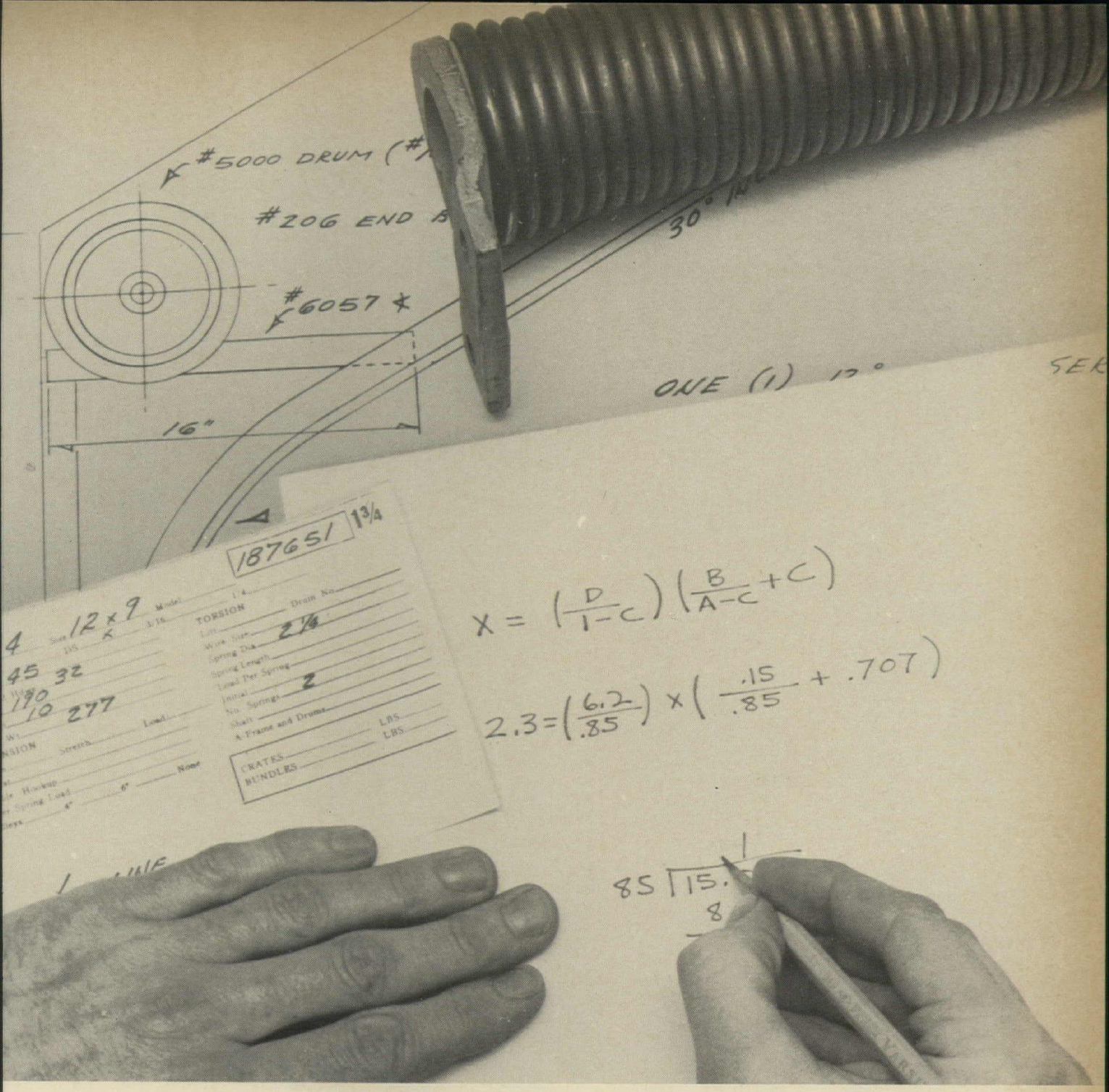
Obviously, the closure systems used in the ducts are important. Four different tape systems are in use, each matched to a particular manufacturer's products. They are: 1) aluminum foil backed with a heat-sealing adhesive; 2) pressure-sensitive vinyl plastic; 3) a solvent-base adhesive covered with pressure-sensitive tape; and 4) an open-web glass fiber tape applied with two coats of vapor-seal mastic.

As mentioned earlier, schools have been the prime application of fibrous glass ducts, accounting for 28 per cent of the non-housing volume. The fact that they were used in the School Construction Development System concept undoubtedly has stirred interest among school designers and school officials.

Office buildings, especially Federal office buildings, are the next largest application. In 1967 they accounted for 23 per cent of non-housing sales. The new Federal building in Louisville, with 300,000 square feet of board, is the largest installation to date.

Other types of buildings using substantial quantities are non-housekeeping residential buildings and apartments (13 per cent), factories (12 per cent), stores and shopping centers (10 per cent), and churches and theaters (9 per cent).

Many of the buildings in which fibrous glass ducts have been installed recently are types expressly excluded by older versions of NFPA 90A, indicating widening acceptance by building code officials as experience grows. These include theaters, restaurants, gymnasiums and other assembly buildings, plus hospitals and institutions. The new version of NFPA 90A eliminates restrictions on use with such occupancies.



Raynor custom winds springs for each overhead-type door? Why doesn't everyone?

Amazing, but true. Raynor calibrates each spring to within a half pound of the finished door weight! (Even including paint, glass and hardware). Costly? Sure. It also takes etxra time and special machines to custom wind and load test every single spring. But, Raynor knows it's the only way to assure perfect balance and longer life in overhead-type doors.

That's another reason why all Raynor doors — wood, Raylon (fiberglass), aluminum or steel — give extra years of smooth, trouble-free operation. And, to top it all off, every Raynor door is permanently registered on data film for positive identification and quick replacement of damaged parts years from now. Specify Raynor — it's the brand you can depend on.

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Fortunately, the architect who designed this building didn't have to think about who would clean the roof.

He used GAF's Ruberoid® T/NA 200 roofing membrane with a Du Pont Tedlar* finish on the Dane County Memorial Coliseum's roof.

This way he didn't have to worry about cleaning problems because he didn't have any. T/NA 200 roof resists dirt accumulation, chalking, fungus and only an occasional rainstorm is needed to keep it clean.

T/NA 200 is also lightweight, competitive in cost and has reflective powers that keep air conditioning costs down.

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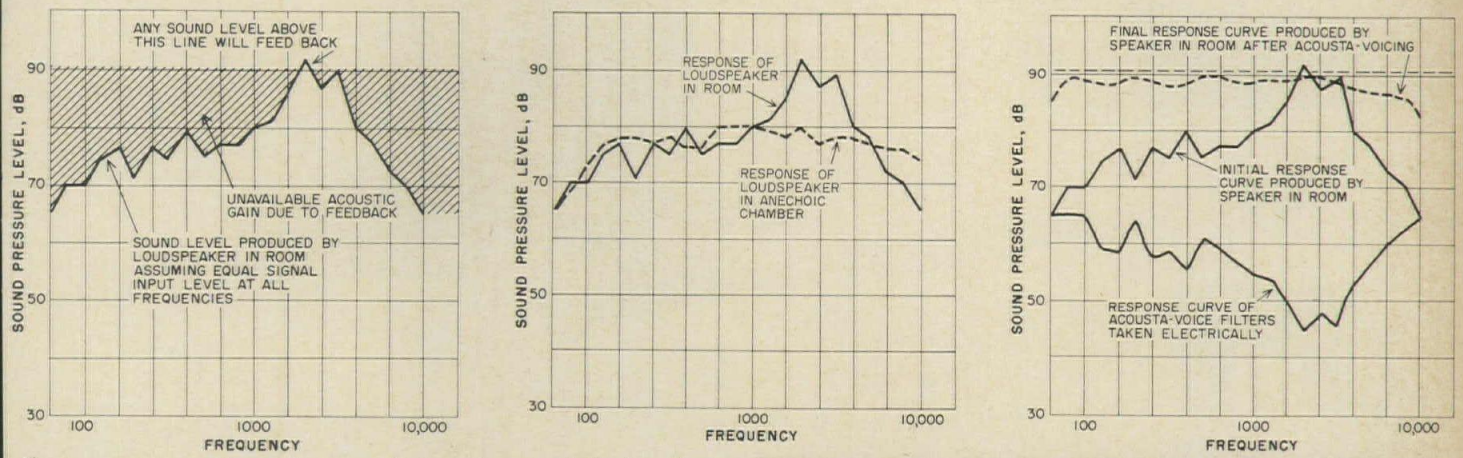
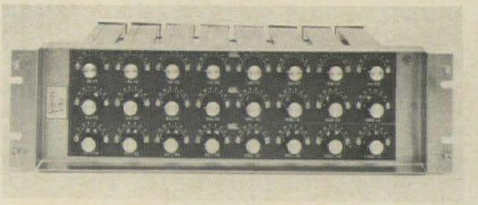
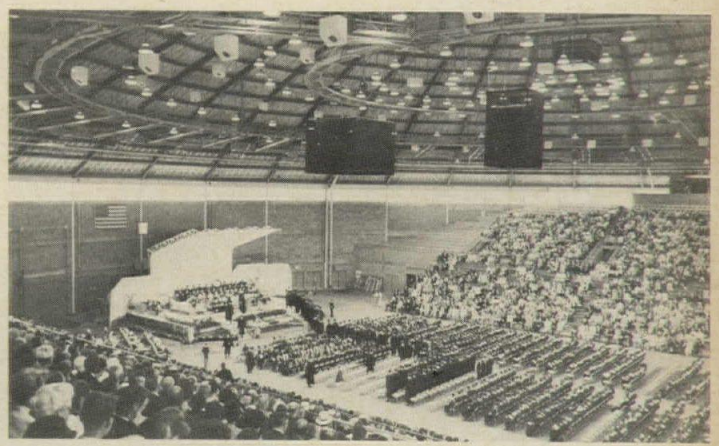


Above: room acoustics make some frequencies sound louder than others, even though speaker response, itself, is basically flat. Center: amplification of sound system is limited by the peak at 2000 cycles caused by room acoustics. Far right: *Acousta-Voice* filters alter response of speaker in room so that it resembles that measured in an anechoic chamber (completely sound-absorbent space). Photos show typical set of *Acousta-Voice* filters in a cabinet mounting, and interior of fieldhouse at Montana State University, which has an *Acousta-Voice* installation.





New sound system can be easily "tuned" for changing room demands

Acousta-Voicing, which allows the engineer quickly and accurately to cut back amplification of frequencies that cause feedback, promises to be a major development in electronic sound-reinforcing systems.

Feedback, which causes the "squealing" noise often produced in poorly designed or operated electronic sound reinforcing systems, results when the microphone picks up sound from the loudspeaker and causes the amplifier to oscillate. With sophisticated built-in amplification systems, feedback is significant because it may limit the degree of amplification possible. The reason: Some rooms may "overemphasize" sound at certain frequencies, making these frequencies predominant. Thus, setting the volume of the system below the point at which feedback occurs may cause insufficient amplification of the other frequencies, resulting in poor articulation and lack of naturalness.

One way to correct the problem has been to eliminate some of the audio spectrum where the preponderance of system-room interaction takes place. However, this may remove an important segment of the sound source.

More recently, electrical filters have been incorporated in sound systems to reduce amplification *only* at the frequencies overemphasized by the room. But this technique can be time-consuming for the engineer who adjusts the system.

Acousta-Voicing uses calibrated, resettable filters, which the engineer adjusts after determining the feedback frequencies with a precision oscilloscope. The filters actually reduce the amplification of feedback-prone frequencies so that the sound system will produce an equal response to all desired frequencies. Inasmuch as dial settings can be established, quickly changed to different frequencies, and then reset, it is possible in a room that is changed "architecturally"—such as in multiple-use space—to adjust the sound system to work equally well in all situations.

With *Acousta-Voicing*, it is not necessary for the microphone to remain behind loudspeakers. Amplification is reported possible even when the person speaking at the microphone stands as close as 10 ft in front of the loudspeaker.

Further, the *Acousta-Voice* system permits a higher reverberation time than is usually considered possible for ideal speech conditions.

Thus, *Acousta-Voicing* will help assure that there will be proper sound distribution with adequate volume and that the program material will sound naturally balanced and consistent from space to space. ▪ Altec Lansing, Anaheim, Calif.

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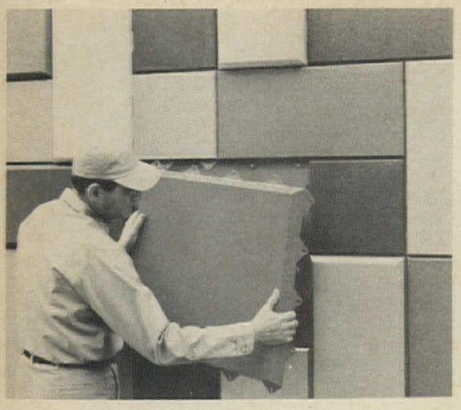

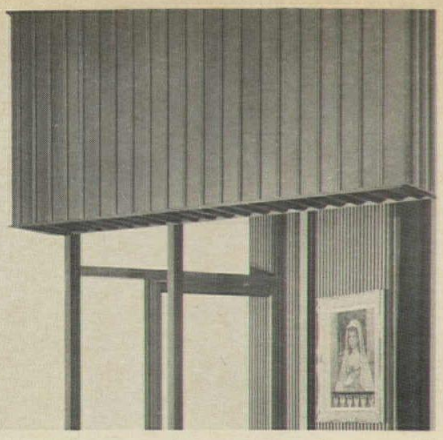

ALUMINUM FACINGS / Colored aluminum panels in the *Vistatone* system can be mixed to create different patterns. The tabbed, interlocking panels are fastened to new or old facades by nailing or riveting against aluminum or wood furring strips. Besides adding rigidity, the arrangement completely conceals the fasteners.

Another facing, *Shadowform*, is a solid, heavy-gauge, extruded facing available in shades of bronze and black *permanodic* finish. It is reported abrasion-resistant and impervious to weather conditions or industrial fumes. The facing is designed in five profiles and two feature strips, and profiles and colors may be mixed. The facing also can be used for interiors or for soffits, column or spandrel coverings, roof edging or special trim. ▪ Kawneer Company, Niles, Mich.

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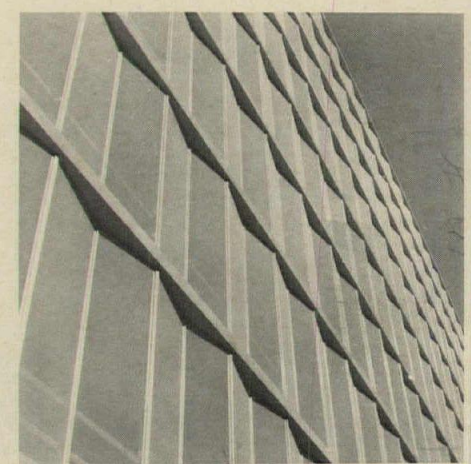

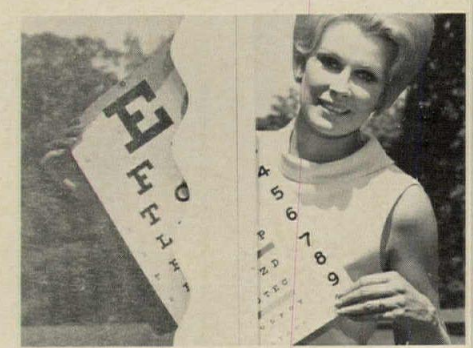

SCREENING / *Fiberglas* screening that is dentproof, rustproof, easy to see through, and simple to clean may be finding increased use in the fields of sun, heat and wind screening. An apartment house, for example, may install the screening on terraces, providing a horizontal pyramid effect. It may be used on windows and doors to add accent, since it is available in a variety of colors. ▪ Owens-Corning Fiberglas Corporation, Toledo, Ohio.

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254
PITTCO DOORS open San Antonio Convention Center

Hemisphere '68 opens its doors. And the new Convention Hall, Theater and Arena do it with PITTCO®—the versatile aluminum doors now offered in complete entrance and framing systems.

PITTCO Doors offer more design freedom. Specify three standard stile widths in a range of standard sizes. Or have them built to your custom specifications. Available in a variety of anodized colors, you can even mix and match two-tone combinations.

PITTCO Doors have slim, elegant lines. All hardware has hidden fastenings. And its tie-rod construction makes the door exceptionally strong.

Here you see custom PITTCO Doors in bronze-colored anodized aluminum, framed with PITTCO's 6550 series flush glaze system. For additional information consult Sweet's Architectural File or PITTCO Architectural Metals, PPG INDUSTRIES, 1500 Murden St., Kokomo, Indiana 46901.

PPG INDUSTRIES

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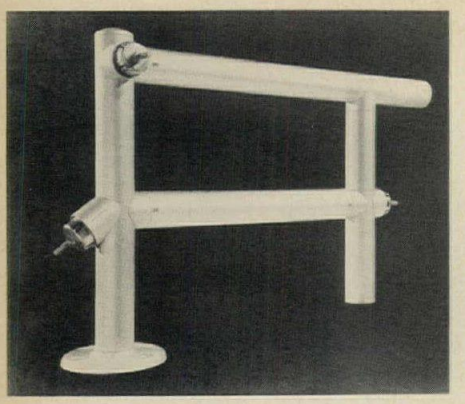

HANDRAIL SYSTEM / This non-welded system has been developed for industrial and commercial applications such as athletic and recreational facilities, cafeterias and food handling areas, and shopping centers and transportation terminal facilities. The basic component is 1½-in. extruded and anodized aluminum pipe in lengths of 15 and 24 feet. Fittings are also anodized aluminum and fasteners are stainless steel. ▪ Reynolds Metals Company, Park Ridge, Ill.

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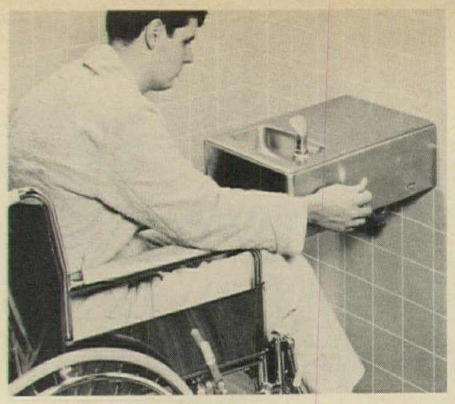

WHEEL-CHAIR FOUNTAIN / This water fountain, designed especially for safe, effortless use by wheel-chair patients, extends 22 in. from the wall and mounts 34 in. above the floor. The corners are rounded and there is no interference from pipes. ▪ The Halsey W. Taylor Company, Warren, Ohio.

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STADIUM SEATING / *Perma-Glass* seating is permanently colored, pressure-molded fiber glass seating that never needs wire-brushing, priming, painting or re-numbering. Seats are available in any color, can have factory-applied numbers, and can be furnished with contoured back rests. ▪ Miracle Equipment Company, Grinnell, Iowa.

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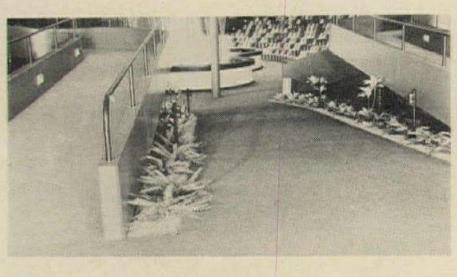

OCEANARIUM CARPET / Two of the newest attractions of the world's largest (50 acres) oceanarium, Sea World near San Diego, have installed 1584 square yards of *"Decathlon"* contract carpet. An estimated 95 per cent of Sea World's 1½-million annual visitors attend the new attractions, a good test for the carpet of 100 per cent *Vectra* olefin fiber. ▪ Wellco Carpet Corp., Calhoun, Ga.

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After facing the problems of automating 4000 buildings, we can tailor just the right system to yours.

Actually, buying a Honeywell one-man control system is kind of like buying a car today.

Sure, we vary features, options and accessories to customize the system to your client's building. But the designs of the basic equipment have been pre-tested and proven in thousands of other buildings. You don't have to buy a costly, custom-built, one-of-a-kind system.

Advantages? Your client gets his system on time. You get it working on time. And there's 18 years of automation experience to help him operate and maintain it properly. An 18-year history of solving the kinds of cost and installation problems you're now facing.

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It had to be more than aluminum.

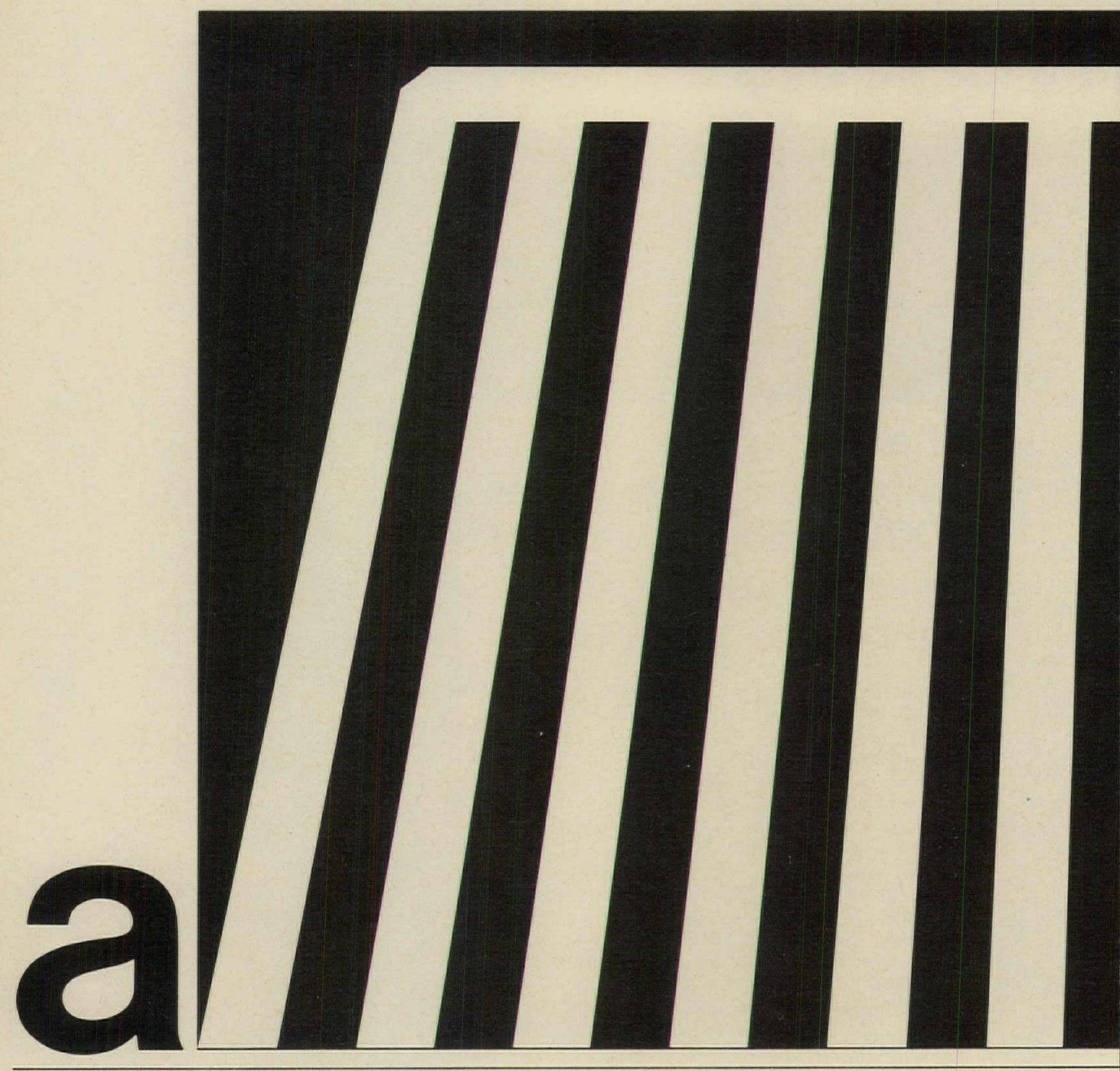
It had to be Alcoa.

Take vertical lines of white marble, contrast them with blended lines of aluminum and glass, and you have the dramatic new 50-story General Motors building in New York.
(a) Towering columns of marble climb quickly skyward. Glass and aluminum blend together as an entity in the dimensional window bays. An innovative advance, creating an exciting building.

Alcoa was charged by the architect with blending bronzetone aluminum with bronze solar glass. We had the resources, capabilities, imagination and experience to completely oversee this vital aspect of the project. Alcoa had total responsibility for the appearance of the aluminum used on the exterior of the building. This included the vital metallurgical processes of extruding and color control achieved

Change for the better with Alcoa Aluminum

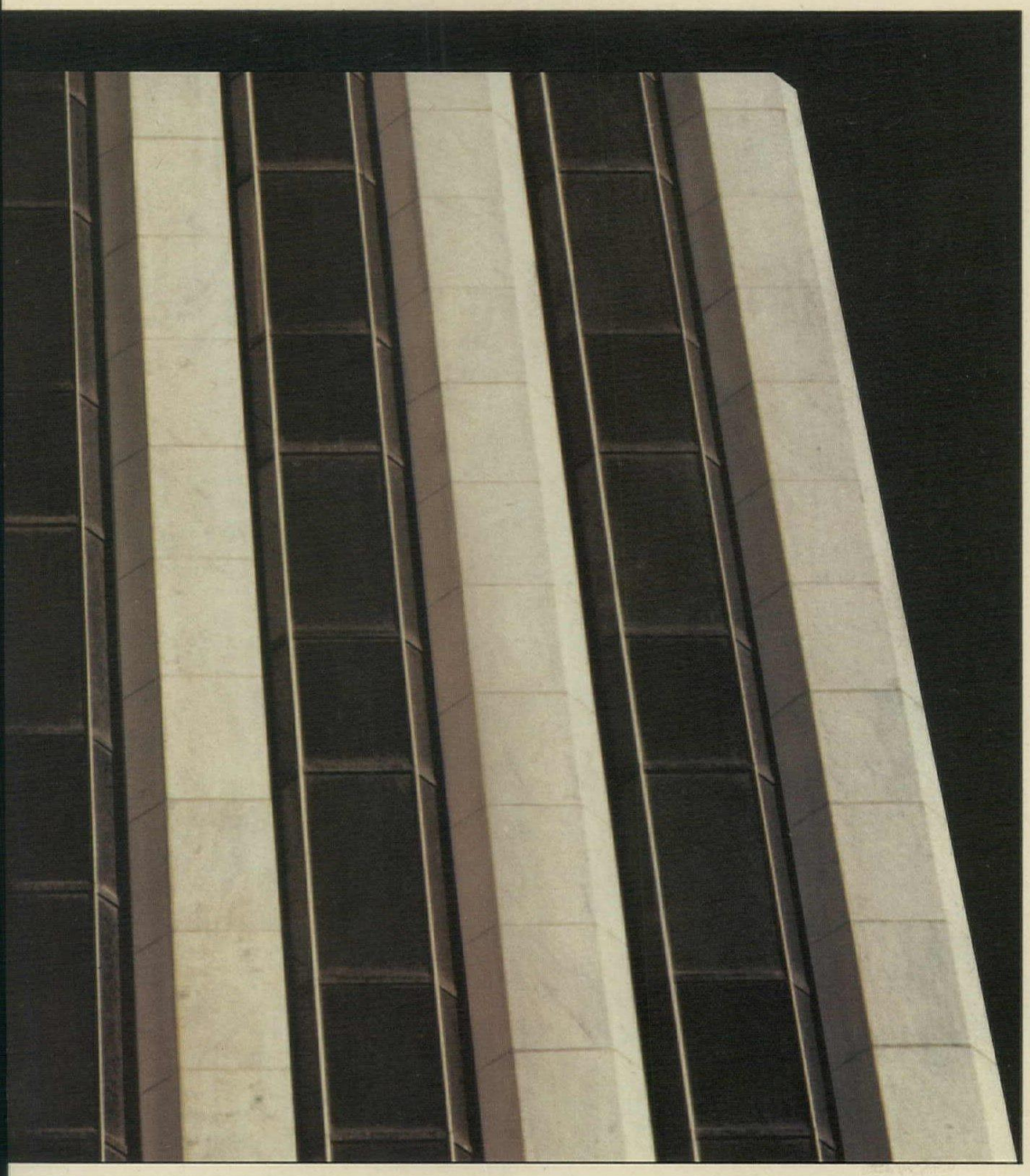
ALCOA



through the Duranodic* 300 process. Total quality control: the key element planned and executed by Alcoa.
The metal: Alcoa® Aluminum with an Alcoa Duranodic 300 finish in medium bronze tones, carefully complementing the bronze solar glass.
(b) Duranodic 300 was specified because the *original* color and beauty must last with a minimum of maintenance. The rich Duranodic color is an integral part of the metal oxide that permeates its cell structure, and provides natural protection of up to 1.2 mils. Corrosion and abrasion resistance is greatly increased.
At the General Motors building, Alcoa was there from the planning stages—the best time to call in Alcoa. We have the capabilities to work with you from concept to conclusion.
Alcoa stands ready to supply you with a whole lot more than aluminum.
Call your local Alcoa sales office, and talk to Alcoa at the tissue talking stage.

*Trade Name of Aluminum Company of America

Architect: Edward Durell Stone and Emery Roth and Sons
General Contractor: George A. Fuller Co.
Aluminum Wall Fabricator: General Bronze Corp.
Aluminum Finisher: Hankins & Johann
Aluminum Louver Fabricator: Arrow Louver and Damper Corp.



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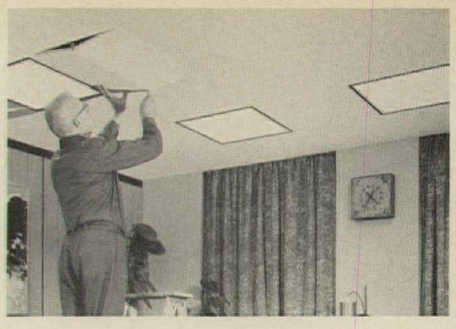

ACCESSIBLE CEILING SYSTEM / Besides affording quick and total access to the plenum, this accessible tile system, recommended for acoustical tiles, can satisfy changing space needs. Ceiling tiles, lighting fixtures and partitions are merely disengaged from the suspension system—each tile is individually supported—and reassembled in the desired pattern. ▪ Armstrong Cork Company, Lancaster, Pa.

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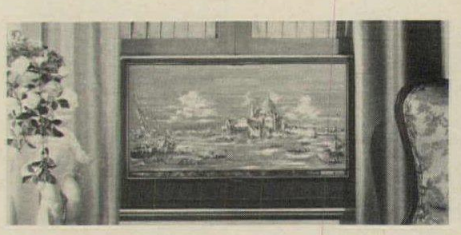

SCENIC AIR CONDITIONERS / Three scenic panels have been added to a series of reversible decorator panels that can be slipped into the front of the company's air conditioners. The three panels, which are reproductions from the James Seeman collection, are an Old World map, an Aegean landscape, and a Venetian scene (shown). There is even a panel to which art can be applied. ▪ Airtemp Division, Chrysler Corporation, Dayton, Ohio.

Circle 308 on inquiry card

INTEGRATED FURNITURE / Architect Warren Platner has designed a line of steel office furniture that includes desks, companion pieces, tables, modular credenzas and a full range of files. *The Source Group* is available in two versions: Group 1 has highest styling; Group 2 is special economy. ▪ Corry Jamestown Corporation, Corry, Pa.

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more products on page 200

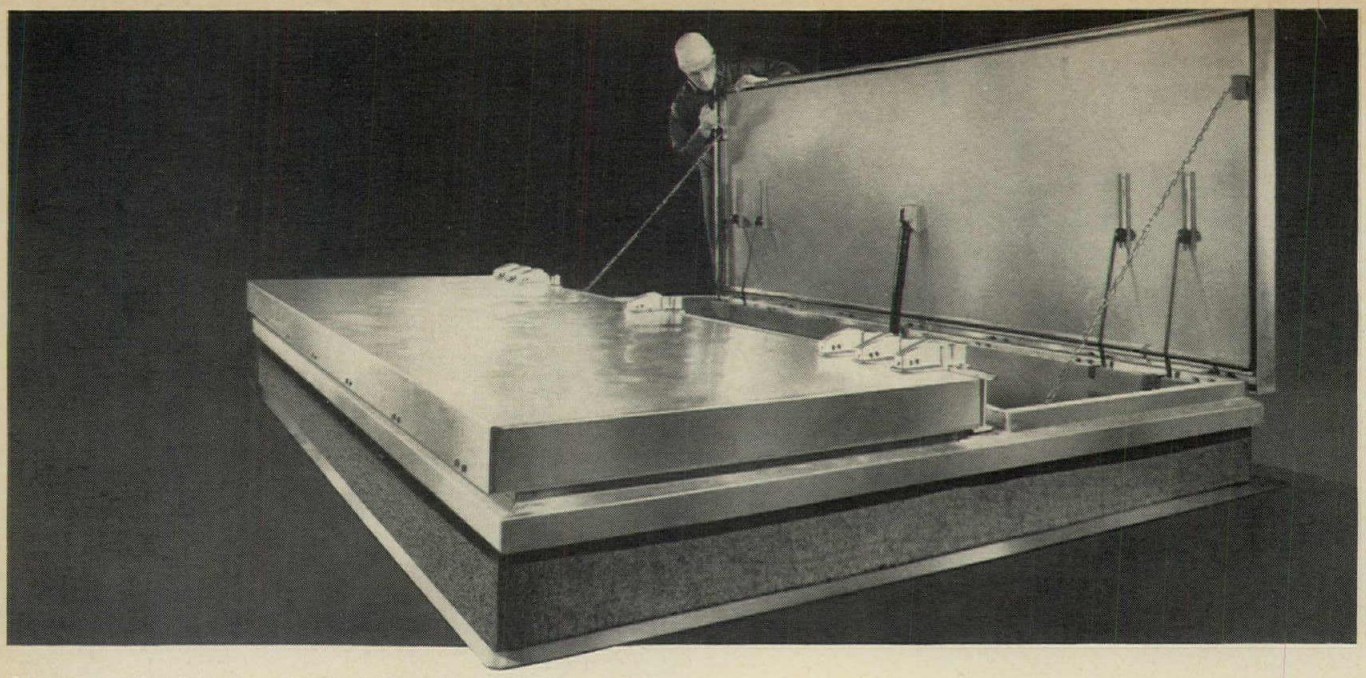
SONICWAL®

Silently at work
in your church, classrooms, office,
club, dining room...wherever you need space divided
Acoustical class 38 in wood or Formica® clad

Panelfold

PANELFOLD WOOD FOLDING DOORS AND PARTITIONS, 1090 E. 17 St., Hialeah, Florida
SEE SCALE/4 SCALE/8 SCALE/12 SONICWAL STC 38 IN SWEET'S 17j Pa AND 13d Pa

For more data, circle 84 on inquiry card



Start mentioning special hatches and most manufacturers don't even want to talk to you. Some won't budge an inch on their standard sizes. What to do?

Ask about Inland's two-step answer. Step one: you design the roof opening and specify the hatch's operating characteristics. Step two: We will modify a standard Milcor hatch or custom design one to match your exact needs. Typical modifications include: special height curbs, special insulation, metal outside liners for curb insulation, cylinder locks, special sizes, explosion release cover mechanisms.

We can make a Milcor hatch to match your special needs.

We have a lot to offer in standards too. Single or double leaf roof styles, sidewalk or floor doors, and smoke hatches available in a choice of metals, finishes and sizes. Standard or special, Milcor roof hatches and floor doors are strong and dependable. And all are counterbalanced for easy manual operation.

Write for the new Milcor Roof Hatch and Door catalog no. 211. Inland-Ryerson Construction Products Co. Dept. K, 4033 W. Burnham Street, Milwaukee, Wisconsin 53201.

Formerly Inland Steel Products Company and the structural fabricating, reinforcing steel and post tensioning divisions of Joseph T. Ryerson & Son, Inc.

Inland-Ryerson
Construction Products Company

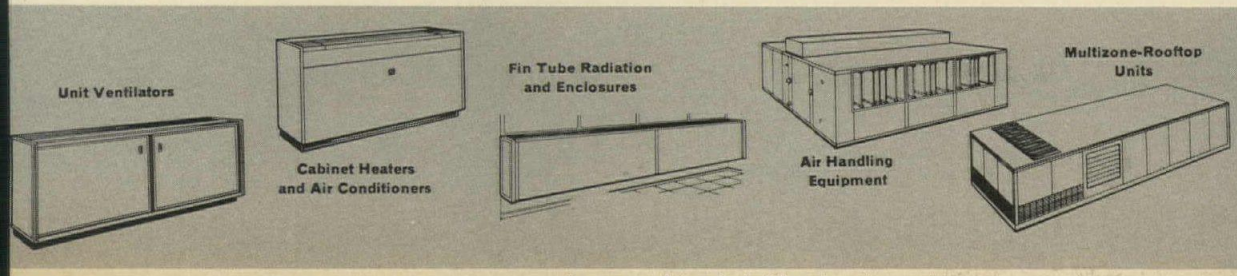
For more data, circle 85 on inquiry card

COMPARE THIS UNIT VENTILATOR WHEN YOUR REPUTATION DEMANDS QUALITY

naturally it's **SCHEMENAUER**

Comparison is still the surest way to measure quality. And we're confident our classroom unit ventilator will pass the test because it's the finest available today. But don't take our word. Convince yourself with a fair comparison. Compare the heavy extruded aluminum air outlet grille, the exclusive wall-aligning strip, the student-proof plastic laminate top, the 12 contemporary colors. Compare the heavy cored, double walled doors and end caps, the slide-out fan board, the special long-life motor with only one moving part, and the extruded aluminum construction on all leading surfaces. Then compare the superior design and construction of our matching auxiliary units . . . bookcases, sinks, tray racks. We could go on and on, but we'll let **you** do it. It's hard to stop when you start comparing, but we're convinced you'll finally stop at Schemenauer. Call your nearest Schemenauer representative for comparison details, or write directly to us. Schemenauer Manufacturing Company, Holland, Ohio 43528

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



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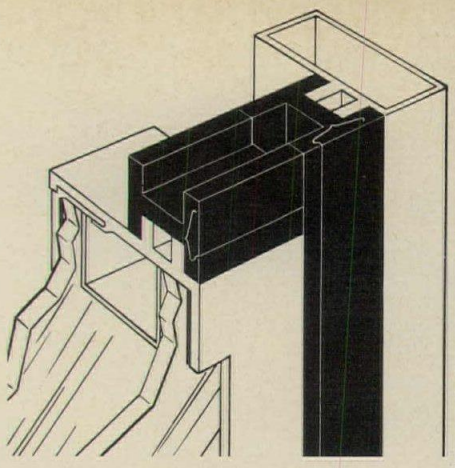
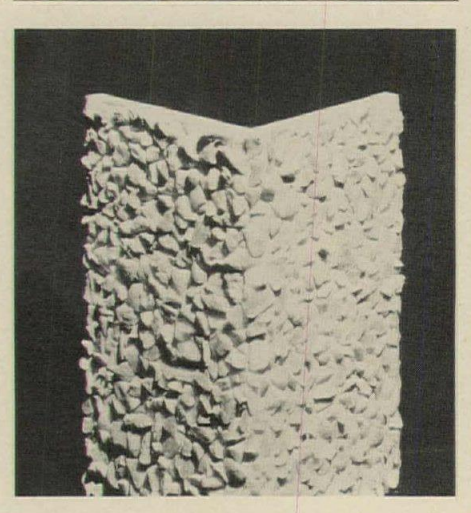


NOISE-REDUCING WINDOWS / A window installation technique is reported to substantially dampen sound transmission from the outside into rooms and to speed construction. The assembly is constructed of an aluminum subframe into which is glazed a hermetically-sealed unit constructed of two panels of glass of different thickness, separated by 2 in. of dead air space. Frames are fabricated in subassemblies and shipped to the site to be "zipped" into place with a hand-held tool. Tests have shown that the installation can reduce the transmission of sound by as much as 44 decibels. ▪ Unit Products Corporation, Dearborn, Mich.

Circle 310 on inquiry card



ARCHITECTURAL PANELS / These high-strength, thin exposed-aggregate panels, made of polyester resins, can incorporate a variety of exposed stone and other aggregate. Insulating material can be incorporated in the panels, and cast shapes for corners and roof mountings are available. Panels range in size from 1 ft by 1 ft to 10 ft by 21 ft. Because of their reported high strength, panels may be thin and extremely lightweight. ▪ Chemical Precast, Inc., Edison, N.J.

Circle 311 on inquiry card

This administration building is "painting" itself

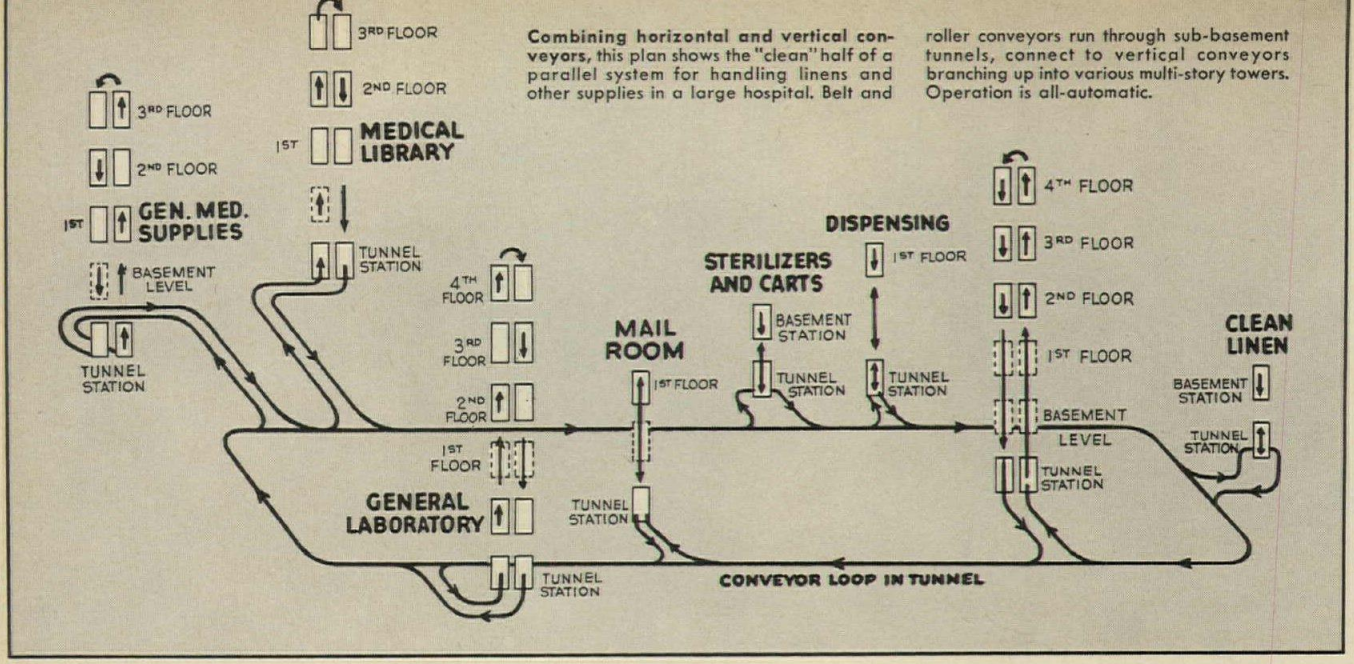
Rocky Mountain National Park Administration Building. Owner: National Park Service, George B. Hartzog, Jr., Director. Architect: Edmond Thomas Casey, Taliesin Associated Architects of The Frank Lloyd Wright Foundation. General Contractor: Kunz Construction Co., Arvada, Colorado. Structural Fabricator: PeCo Steel Corp. (formerly Aladdin Iron & Steel Corp.).

Location: Rocky Mountain National Park, Estes Park, Colorado. Exterior: bare USS COR-TEN Steel that "paints" itself as it weathers and needs no painting. COR-TEN steel develops a tight, dense, attractive oxide coating that inhibits atmospheric corrosion, heals itself if it is scratched, and looks better the longer it weathers.

The architects chose COR-TEN steel to blend with the surroundings. Nature provides the rich, earthy color and the texture. Exterior wall panels and fascia are formed 18-gage COR-TEN steel sheets. The truss-like load-bearing exterior wall system is made of welded COR-TEN steel rectangular structural tubing.

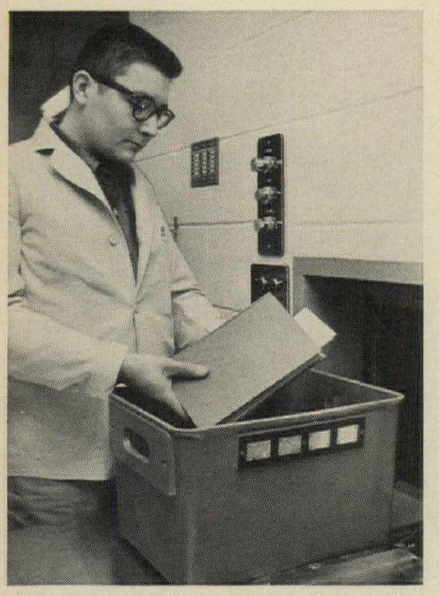
Bare USS COR-TEN Steel is a natural for appearance, minimum maintenance, and for structural use. With a minimum yield point of 50,000 psi it is about 40% stronger than structural carbon steel in most sections, and it permits lighter members with no sacrifice of strength. USS COR-TEN Steel is available in a full range of structural shapes, plates, bars, sheets, and structural tubing. For full details on the use of bare COR-TEN steel in architectural construction, contact a USS Construction Marketing Representative through the nearest USS Sales Office. U. S. Steel, P. O. Box 86, Pittsburgh, Pa. 15230. USS and COR-TEN are registered trademarks.

USS **Cor-Ten**
High-Strength
Low-Alloy Steel



Combining horizontal and vertical conveyors, this plan shows the "clean" half of a parallel system for handling linens and other supplies in a large hospital. Belt and roller conveyors run through sub-basement tunnels, connect to vertical conveyors branching up into various multi-story towers. Operation is all-automatic.

Pushbutton conveyor system speeds hospital supplies to any of 17 stations



Automatic control is an integral part of a Recordlift System. It employs the magnetic tab principle of conveying encoded digital information—one of the most reliable, economical, maintenance-free systems devised.

Operation is fast and automatic. Operator simply loads the basket, places it on the loading station, pushes the proper button for the desired destination—and away it goes!

PLANNING for materials handling in multi-story buildings can become an easy matter—when you specify a STANDARD CONVEYOR *Recordlift* System.

A *Recordlift* System *unifies* a building. General supplies, mail, records, files and other materials go up, down, and throughout the building at the push of a button. The cost and congestion of interfloor messengers is saved—speed and efficiency are gained.

Ideal for hospitals

Widely used in office buildings, banks, libraries, etc., *Recordlift* Systems have long proved ideal for handling hospital supplies.

The plan above, for example, shows the "clean" portion of an extensive double *Recordlift* System being designed for a new 700-bed hospital.

Has two-lane traffic

Two separate horizontal-vertical conveyor systems will run side-by-side throughout the building complex. One will handle clean linen; the other, soiled. The systems will also handle mail, books, records, forms, publications, medical supplies, instruments and lab specimens.

There are 17 pushbutton stations on the clean system, 14 on the soiled. The entire double system has about 4,300 feet of conveyor—3,000 feet horizontal. The vertical footage includes 8 *Recordlifts* and 12 reciprocating lifts.

Provisions are included for adding 7 more stations to the clean system and 8 more to the soiled.

Dispatching is simple

Any station can send to any other station in each separate system. For reasons of cleanliness, the two systems do not connect at any point.

Dispatching is simple, fast and selective. The operator merely loads the 20½" x17½"x10" container (2 will hold a complete change of linen for 3 beds), pushes the button for the proper station, and the system delivers it.

Write for data file

If you are concerned with multi-story buildings which call for streamlined distribution of everyday supplies, be sure to investigate STANDARD CONVEYOR *Recordlift* Systems.

Write today for an illustrated data file. Or simply clip this ad to your letterhead and mail it.

LISTED IN SWEET'S—SECT. 24d/ST • SALES AND SERVICE IN OVER 40 CITIES—SEE YOUR YELLOW PAGES

Standard Conveyor COMPANY

312-L Second St., North St. Paul, Minnesota 55109

Automatic Pneumatic Tube Systems • Recordlift Systems • Mechanized Dish Handling Systems • Escaveyor Continuous Vertical Conveyors • Custom Engineered Conveyor Systems • Sorting Systems, Automatic and Semi-Automatic • Heavy-Duty Conveyors for Industrial Plants, Factories, Special Applications • Pre-Engineered Handidrive Conveyors and Components • Pallet Stackers and Dispensers • Case Unstackers • Spiral Chutes

For more data, circle 88 on inquiry card

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, page 269-270.

ALUMINUM / "Aluminum Standards & Data 1968-69" is a 174-page publication that is said to contain much information not previously available in the Association's publications. ▪ The Aluminum Association, New York City.

Circle 400 on inquiry card

MASONRY SPECIFICATION / Two four-page brochures aid in preparing architectural specifications for waterproofing, restoring, protecting and correcting masonry surfaces. ▪ Tamms Industries, Lyons, Ill.

Circle 401 on inquiry card

COMPACT KITCHENS / Kitchens for efficiency apartments, vacation and second homes, recreation rooms and college dormitories are described in a 20-page catalog. Units range from 29-in. refrigerator to full service centers. ▪ Crane Co., Chicago.*

Circle 402 on inquiry card

LIGHTING / A 12-page illustrated brochure describes lighting controls for industrial, commercial and outdoor applications. ▪ General Electric Company, Schenectady, N.Y.*

Circle 403 on inquiry card

SUN CONTROLS / Aluminum sun control devices are presented in a 16-page bulletin. Featured are octalinear grilles, fixed sunshades, airfoil sunshades, sun curtains and fins. There are photographs of actual installations. ▪ Construction Specialties, Inc., Cranford, N.J.*

Circle 404 on inquiry card

GLASS / Another issue of "Creative Ideas in Glass" presents color photographs of new buildings and gives information on their use of glass. ▪ American Saint Gobain Corporation, Kingsport, Tenn.*

Circle 405 on inquiry card

GLAZING PRODUCTS / A 24-page manual contains illustrations and information on caulking, sealants and glazing products. Applications range from wood windows to joints in marble, and the manual includes building expansion and construction joints in precast concrete, curtain wall and others. ▪ DAP Inc., Dayton, Ohio.*

Circle 406 on inquiry card

**Additional product information in Sweet's Architectural File.*

more literature on page 212

For more data, circle 91 on inquiry card

The number is Menlo 921L

Your number for efficiency. Functional, contemporary beauty. Menlo captures the style, quality and security typical of each Corbin UNIT® Lockset. You'll also find these features in the complete line of Corbin exit devices, door closers and other types of locksets.

Your Corbin distributor can furnish you with complete data on this design, or write P. & F. Corbin, Division of Emhart Corporation, New Britain, Connecticut 06050. In Canada—Corbin Lock Division.

CORBIN®

For more data, circle 89 on inquiry card

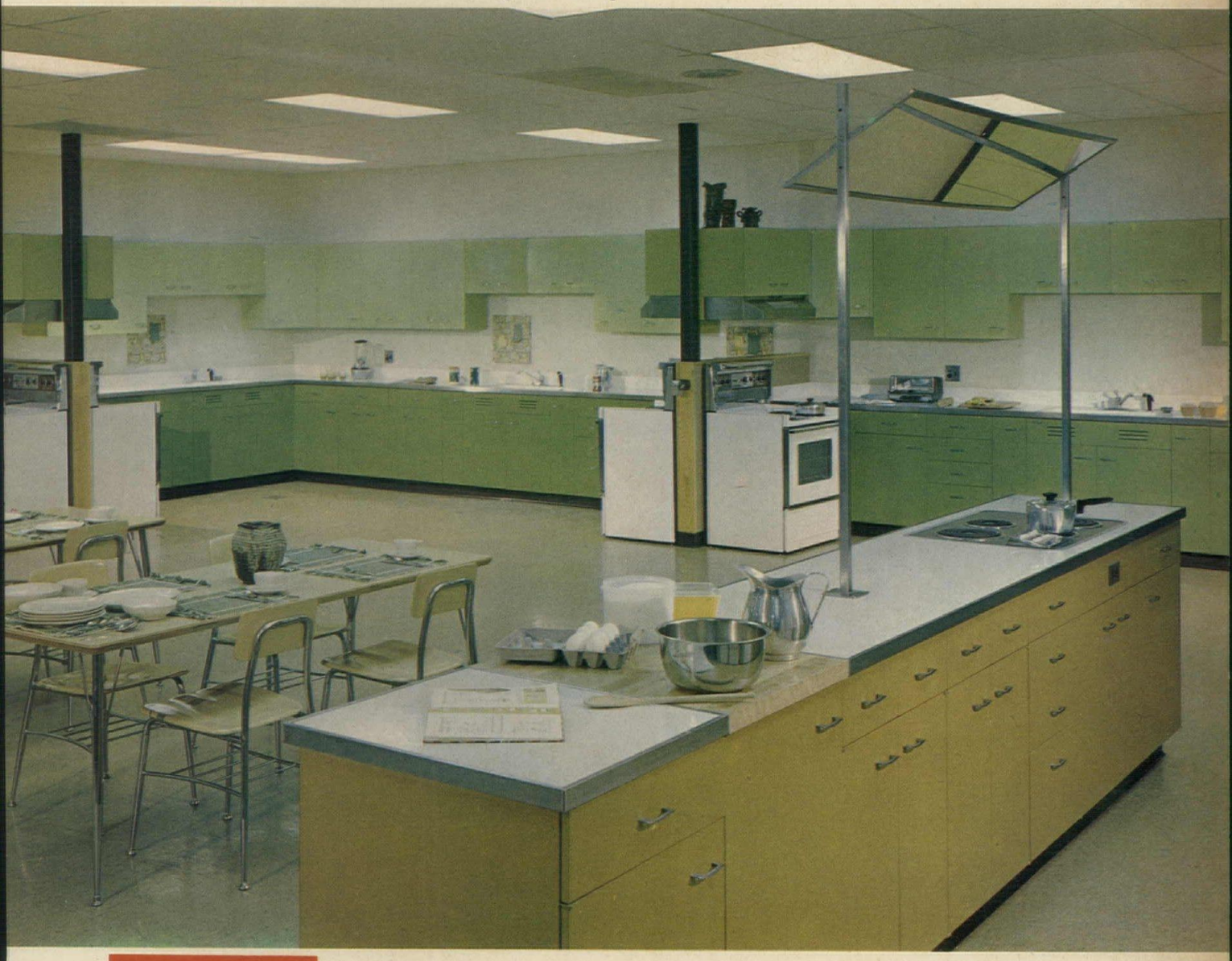
Classroom sewing area—efficient, colorful, creative.

"St. Charles"®

COLORFUL CUSTOM CLASSROOMS *work wonders!*

Students and teachers are stimulated by classrooms that are handsome, colorful, practical and neatly organized . . . which describes every custom-classroom designed by St. Charles. Here is superb casework. Here is matchless efficiency. Here is an inspired choice of colors, materials and textures. Consider your food and sewing laboratories, arts and crafts classrooms, and all other special rooms requiring casework . . . and consider calling St. Charles.

Custom food preparation classrooms—beautiful storage and work space.



StC

CUSTOM SCHOOL STORAGE FURNITURE

St. Charles Manufacturing Company, St. Charles, Illinois

30 YEARS OF LEADERSHIP IN CREATING CUSTOM CASEWORK

Write Dept. 300 for our School Storage Furniture Catalog

continued from page 204

DISCHARGE LAMPS / A 28-page booklet covers the physical, electrical and performance characteristics of high-intensity lamps. ▪ General Electric Company, Cleveland.*

Circle 407 on inquiry card

WOOD GRADES / A Grade Change Guide summarizes the revisions for 11 western softwood species covered by 1968 Grading Rules. ▪ Western Wood Products Association, Portland, Ore.*

Circle 408 on inquiry card

GREENHOUSE PIPING / A 4-page bulletin explains how steel pipe is used for construction, watering and heating purposes in greenhouses. ▪ American Iron and Steel Institute, New York City.*

Circle 409 on inquiry card

COMMUNICATION EQUIPMENT / A 16-page catalog gives technical information on products for installations ranging from military complexes to convention centers, hospitals, theaters and churches. Included are microphones for all purposes, speakers, speech input equipment and military and civil defense warning systems. ▪ Altec Lansing, Anaheim, Calif.*

Circle 410 on inquiry card

BELOW-GRADE WATERPROOFING / A system of encasing the entire foundation area in 40-mil sheet plastic is described in a 4-page brochure. ▪ Amercoat Corporation, Brea, Calif.*

Circle 411 on inquiry card

RESTAURANT VENTILATION / Eight pages of capacity charts aid in selecting the proper range hood exhaust fans. Information on roof and wall ventilators and curbs and automatic louvers is included. ▪ Loren Cook Co., Berea, Ohio.

Circle 412 on inquiry card

SHOPPING-CENTER AUTOMATION / An 8-page brochure offers advice on central control, proprietary security systems and preventive maintenance. Among the suggestions for power and manpower savings: cutting back on unneeded air-conditioning and other mechanical operations; bringing information and control of mechanical equipment to one point; and centralizing proprietary security systems. ▪ Honeywell's Commercial Division, Minneapolis.

Circle 413 on inquiry card

Additional product information in Sweet's Architectural File.

more literature on page 220

Butler County
Community Junior College
El Dorado, Kansas

Architects: Schaefer-Schirmer
& Eflin

Roof: Designer Early American
by Ludowici-Celadon Co.

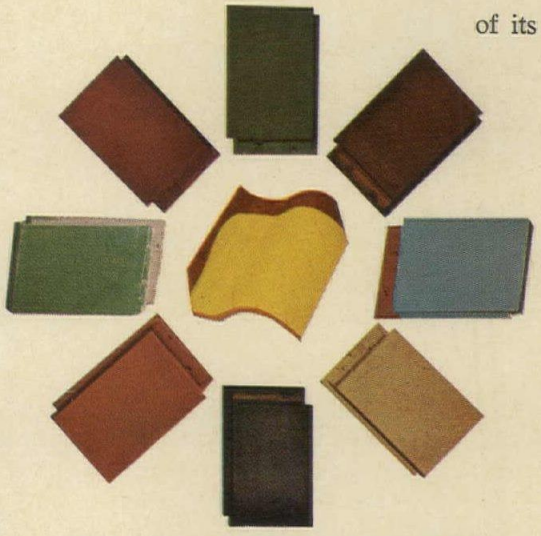
Award-winning Architects Choose

Ludowici Clay Roofing Tile...

The roofs of these graceful college buildings are the focal point of attention—provide distinctive styling that set the pattern for the overall structural design.

Award winning architects prefer Ludowici Roofing Tile because of its versatile beauty—its practical durability and non-fading colors.

Varied patterns, colors and surfaces offer an unlimited choice of roof styling in hard-burned clay—all architecturally sound and with award-winning quality of design.



WIDE SELECTION OF OTHER PATTERNS,
TEXTURES & COLORS

For additional information write or phone:

LUDOWICI-CELADON COMPANY

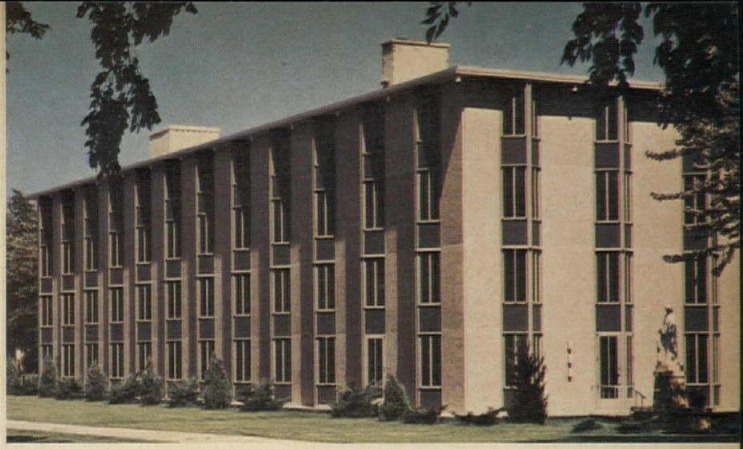
75 East Wacker Drive • Chicago, Illinois 60601

Manufacturers of quarry tile, the nation's largest producer of roofing tile and NAILON Facing Brick.

UNIFORM SYSTEM
Division No. 7

For more data, circle 96 on inquiry card

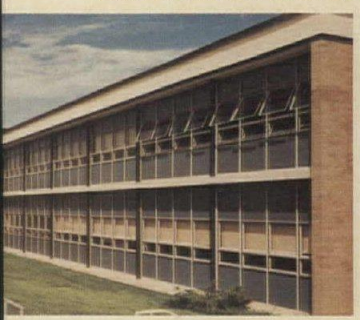
Blue Cross, Blue Shield Office Building - Omaha, Nebraska
Architect — Dana, Larson & Roubal
Contractor — Lueder Const. Co.



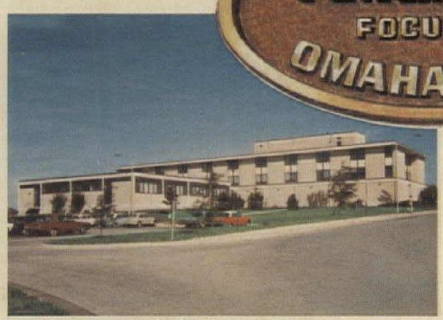
Dormitory for Duchesne College - Omaha, Nebraska
Architect — Leo A. Daly
Contractor — Butler Const. Co.

FENMARK'S FOCUS ON OMAHA, NEB.

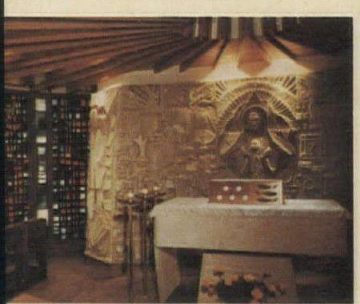
University of Nebraska - Omaha, Nebraska
College of Medicine Hospital
Architect — Henningson, Durham & Richardson
Contractor — A. Borchman & Sons



rt Crook School - Omaha, Nebraska
chitect — Martin, Money and Assoc.
ntractor — Butler Construction Co.

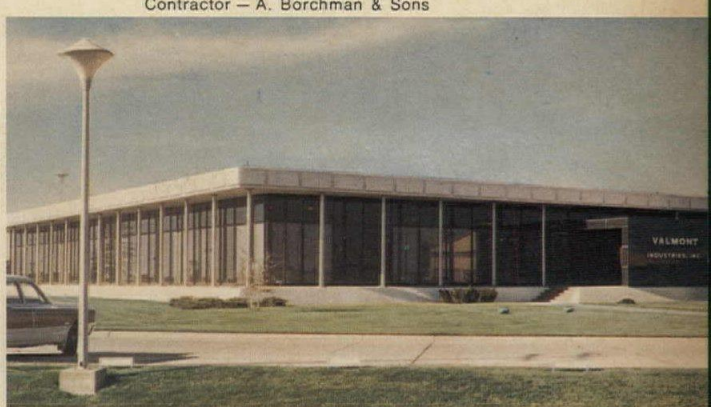


Ehrling Bergquist U.S.A.F. Hospital
Offutt Air Force Base - Omaha, Nebraska
Architect — Leo A. Daly & U.S. Corps of Engineers
Contractor — Peter Kiewit & Sons



sters of Mercy - Omaha, Nebraska
chitect — Leo A. Daly
ntractor — Butler Const. Co.

First West Side Bank - Omaha, Nebraska
Architect — Stanley J. How
Contractor — Foster-Smetana Const. Co.



Valmont Industries Inc. - Valley, Nebraska
Architect — Henningson, Durham & Richardson
Contractor — Lueder Const. Co.

FENMARK Grid Wall System *REFLECTS THE EXCITEMENT OF "FENMARK CITY, U·S·A." — OMAHA, NEBRASKA*

ARCHITECTS PREFER THE TOTAL DESIGN FLEXIBILITY OFFERED BY

FENMARK *all-steel* GRID WALL SYSTEM

Wherever you look in this progressive western city, its architectural integrity is reflected in a wide range of handsome structures . . . schools, office buildings, dormitories, banks, stores, apartments, churches . . . even fire stations. Many of these exciting edifices feature one common ingredient . . . FENMARK all-steel Grid Wall Systems. And for sound reason. FENMARK features an ultra-thin profile, has the strength of steel, is load-bearing and carries a 5-year warranty for factory pre-finish, water-tightness and structural performance. This is why owners, architects and contractors alike prefer the considerable advantages offered by FENMARK. Today, in Omaha, Nebraska and across the nation, this totally versatile grid wall is being designed into a great variety of buildings . . . for once you design with or use FENMARK, it's difficult to settle for less.

For full color brochure, please write TODAY on your company letterhead.

FENESTRA MARMON

FENESTRA

DIVISION OF THE MARMON GROUP, INC. (MICHIGAN)
ERIE, PENNSYLVANIA 16505

Factory prefinished in eight colors . . . oven cured at 360° F. Also available prime painted.

For more data, circle 98 on inquiry card

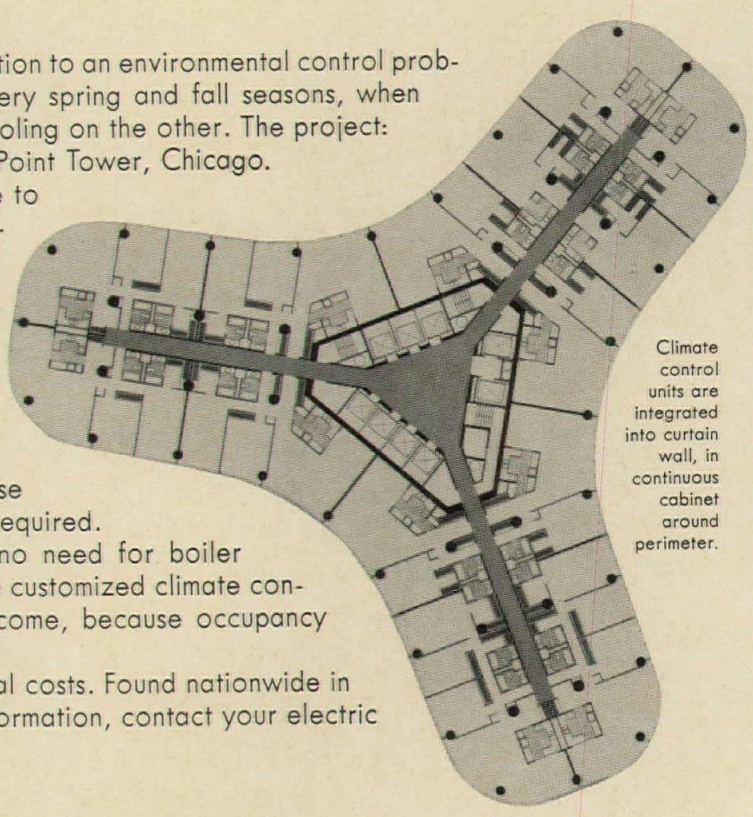
Every apartment an environmental island... by All-Electric design.

Again All-Electric design provides a superior solution to an environmental control problem: how to counteract solar load during blustery spring and fall seasons, when heating is required on one side of a building, cooling on the other. The project: the world's tallest apartment building . . . Lake Point Tower, Chicago.

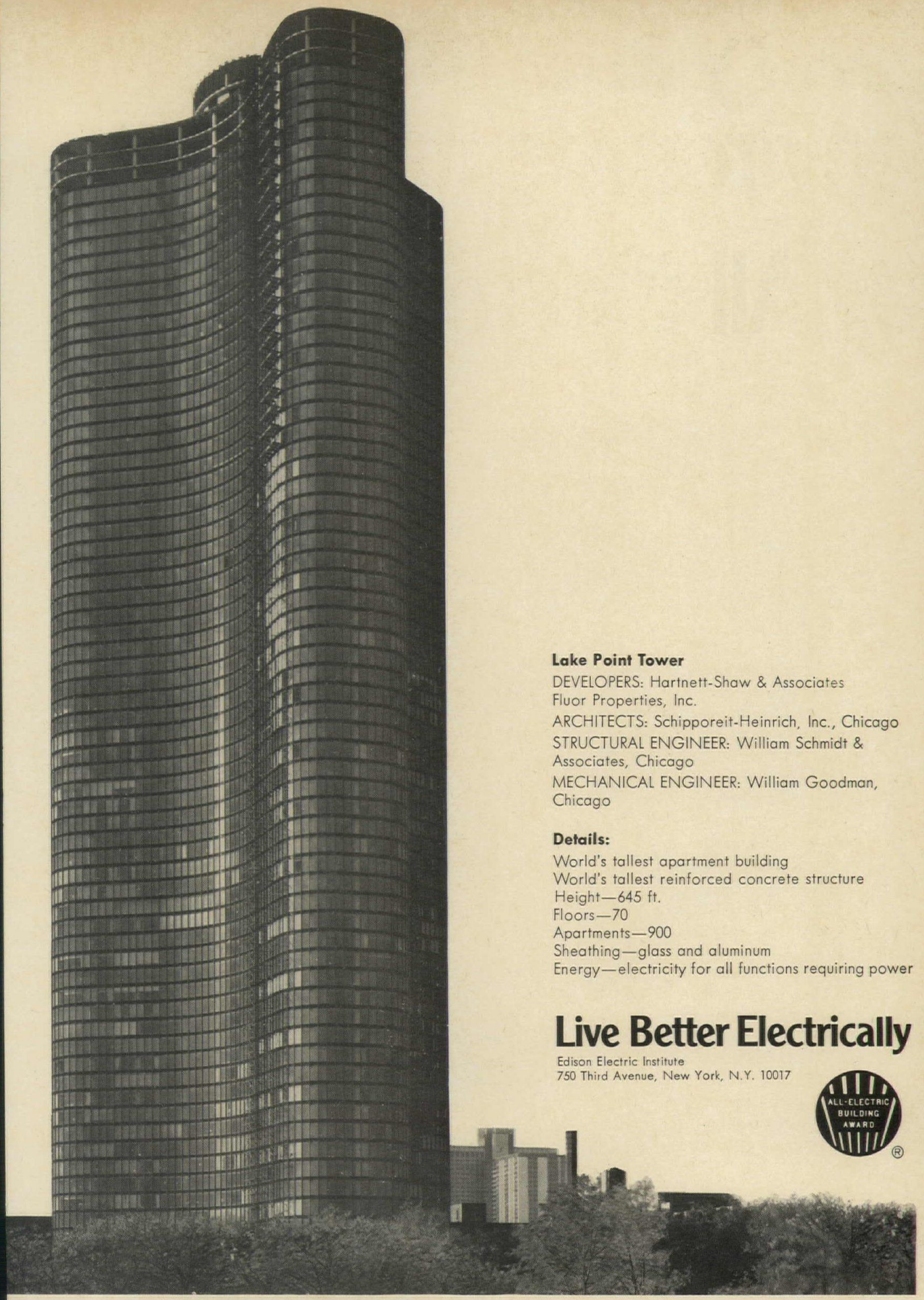
By going All-Electric, the designers were able to isolate each apartment as an environmental entity, each with its own year-round climate control system. Tenants could thereby control their own room temperatures with precision. Repeat: with precision. Possible only with All-Electric design.

Other advantages to going All-Electric: Space savings, because no central boiler room was needed. Lower construction costs, because neither smokestacks nor long pipe runs were required. Lower maintenance costs, because there was no need for boiler room attendants. Higher owner income, because customized climate control helped justify higher rents. Early owner income, because occupancy could begin before completion of construction.

All-Electric design. Design freedom at practical costs. Found nationwide in hundreds of thousands of buildings. For more information, contact your electric light and power company.



Climate control units are integrated into curtain wall, in continuous cabinet around perimeter.



Lake Point Tower

DEVELOPERS: Hartnett-Shaw & Associates
Fluor Properties, Inc.

ARCHITECTS: Schipporeit-Heinrich, Inc., Chicago

STRUCTURAL ENGINEER: William Schmidt & Associates, Chicago

MECHANICAL ENGINEER: William Goodman, Chicago

Details:

World's tallest apartment building
World's tallest reinforced concrete structure
Height—645 ft.
Floors—70
Apartments—900
Sheathing—glass and aluminum
Energy—electricity for all functions requiring power

Live Better Electrically

Edison Electric Institute
750 Third Avenue, New York, N.Y. 10017

ALL-ELECTRIC BUILDING AWARD ®

For more data, circle 99 on inquiry card

Dual in the sun

Certain-teed Dual 80, for built-up roofing, goes down before the moon comes up.

We do more work in our plant. Less work is required on the job. Fewer steps and less handling, on the job, means a higher quality finished product. Dual 80 is "the half finished roof".

We impregnate our high quality organic fibered felt with saturating asphalt and enclose the impregnated felt with mineral stabilized asphalt, giving you a roof that's half finished before it leaves our plant.

Rugged Dual 80, eliminates felt curling and fish mouthing. Requires less handling and fewer operations. Reduces the chance of membrane damage being caused by workmen.

Specify Dual 80, "the ished roof". It goes dow moon comes up. Write teed Products Corpora Ardmore, Pennsylvan

CERTAINTE

For more data, circle 100 on inquiry card

. . . improved light, improved sound. With Dimensionaire*: an environmental ceiling system by Owens-Corning Fiberglas. It's a totally integrated air, light and sound system for people who want to improve their working environment.

For example, Mr. William Quinn, vice president—engineering of the Fairmount Chemical Company, wanted to improve his working environment. He turned to Dimensionaire. A system that can answer many environmental problems.

There were the problems of wanting a good-looking system, that would give uniform air distribution in private and general offices and an open reception area. Ducts and diffusers were considered, along with ventilated ceilings. Mr. Quinn then turned to Dimensionaire. It has a multi-vaned linear air bar—moving air in a unique pattern. Leaving no hot or cold corners. No stale corners. Just a totally fresh outlook.

Then Mr. Quinn saw the light with Dimensionaire. With two-foot-wide 3-D troughs with fluorescent lamps shielded by plastic lenses. They don't glare and hurt the eyes, but give comfortable illumination at working level. The troughs also give a clean uncluttered appearance that's easy on the eyes, too.

Dimensionaire then went easy on the ears, breaking the noise barrier. With 2 x 8 ft. ceiling boards of Fiberglas† textured glass cloth that absorb 95% of sound striking the abuse-resistant surface.

Dimensionaire also went easy on Mr. Quinn's budget. Eliminating separate material costs for ducts and diffusers, lighting units and acoustical ceilings. Just one system. From one company—Owens-Corning Fiberglas. Mr. Quinn improved his working environment with Dimensionaire: An environmental system by Owens-Corning Fiberglas. Shouldn't you?

Write for detailed case histories and cost analysis on the Dimensionaire Ceiling System to: Owens-Corning Fiberglas Corporation, 717 Fifth Avenue, New York, N. Y. 10022.

OWENS/CORNING FIBERGLAS ®

DIMENSIONAIRE: AN ENVIRONMENTAL CEILING SYSTEM

*Trademark (Reg. U.S. Pat. off.) OCF Corp.
†Trademark of OCF Corp.

continued from page 212

STANDARD STEEL DOORS / A recommended selection and usage guide has been developed to establish criteria for 1⅜ in. and 1¾ in. doors. The guide discusses the types and styles available, and a table indicates proper usage for apartment, dormitory, motel, hospital and other applications. ▪ Steel Door Institute, Cleveland.

Circle 414 on inquiry card

WALK-IN COOLERS / An 8-page brochure discusses flexibility and space savings of foam-in-place walk-in coolers and freezers for commercial installations. The booklet also describes modular construction of wall panels, which makes possible any size or shape walk-in. ▪ Clark Equipment Company, Niles, Mich.*

Circle 415 on inquiry card

FLOORING / A 24-page booklet, "25 Ideas for Decorating with Floors," is illustrated with color room settings and gives ideas for any room in the house. ▪ Azrock Floor Products, San Antonio, Tex.*

Circle 416 on inquiry card

HEATING / "Today's Concept of Heating Today's Buildings" is a 20-page brochure offering a comprehensive explanation of the *Thermalux* Electric Heating System. ▪ United States Gypsum Company, Chicago.*

Circle 417 on inquiry card

SCULPTURED DOORS / Doors available in a variety of sizes, patterns and hand-rubbed natural wood finishes are pictured in an 8-page booklet. Original design-carved doors are also possible. ▪ Sculptured Wood Products, Provo, Utah.

Circle 418 on inquiry card

STEEL DOORS / "Hardware on Steel Doors (Reinforcement—Application)" gives information regarding accepted design methods of reinforcing and recommended practices for hardware on standard steel doors and frames. ▪ The Steel Door Institute, Cleveland.

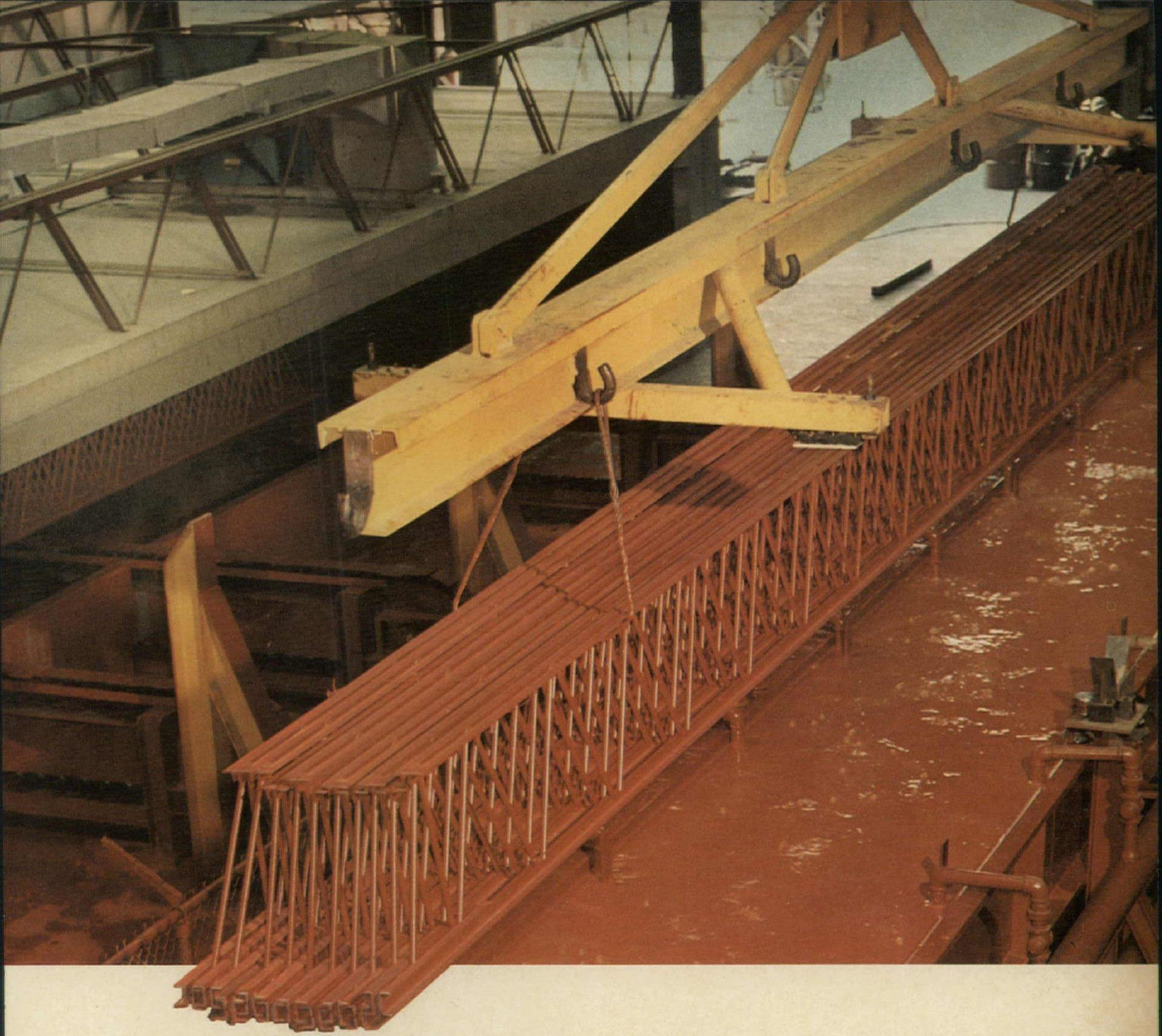
Circle 419 on inquiry card

MAKE-UP AIR HEATERS / A 14-page catalog describes a complete line of gas make-up air heaters and steam/hot water models. Contents include diagrams, data tables and accessory tables. ▪ Modine Manufacturing Company, Racine, Wis.

Circle 420 on inquiry card

* *Additional product information in Sweet's Architectural File.*

more literature on page 224



NEW ELECTROPAINTING PUTS TOUGH, UNIFORM PROTECTIVE COATING ON LACLEDE JOISTS

One of the most advanced painting methods available is now used to apply a highly durable and uniform protective coating on Laclede Open Web Steel Joists.

The new process, called electropainting, uses the same principle employed in electroplating. The positively-charged joists, immersed in a bath, attract the negatively charged paint particles, which build up on the surface of the joists in a tight, dense coating of uniform thickness. Thickness of coating is directly proportional to the applied voltage, and can be closely controlled throughout the painting process.

The coating applied by this process has many advantages:

1. Coverage is uniform and complete, including sharp edges, corners and hard-to-reach nooks and crannies
2. There are no tears, drips, runs or excess paint
3. Excellent weatherability and abrasion resistance are obtained
4. Painting is consistent in quality from batch to batch
5. Finish coats may be easily applied over the primer
6. The coated joist has excellent finished product appearance

The electropainting process in a red finish is now standard on all shop coated Laclede open web steel joists. Specify Laclede electropainted steel joists for your next construction job.

STEEL JOIST STANDARD INSTITUTE

Steel

LACLEDE STEEL COMPANY

St. Louis, Missouri 63101

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NEXT
MID-MAY . . .

RECORD HOUSE

America's 20 best-planned houses of the year will be featured in RECORD HOUSES OF 1969. A year in preparation, the mid-May annual will present to Record subscribers the work of a wide variety of architects ranging from the well-known to those talented architects new to the ranks of major innovators.

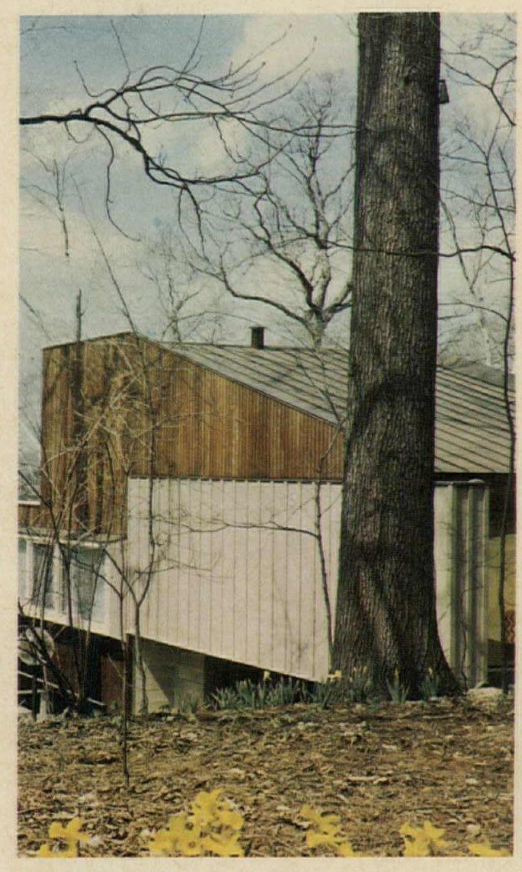
The houses will win for their architects and owners Architectural Record's coveted ANNUAL AWARD OF EXCELLENCE FOR HOUSE DESIGN. All 20 award-winning houses will be fully detailed with photographs (many in full color) plans, schematics. This highly visual presentation of each house, coupled with a clear statement of the problems and purposes behind it's planning, will make RECORD HOUSES OF 1969 an ideal tool for opening your clients' eyes to ways in which architecture can serve their individual needs, aspirations and way of life.

To contribute further to this goal, selected editions of RECORD HOUSES OF 1969 will be placed in the hands of the nation's most productive "Sweet's-qualified" interior designers, in addition to "Sweet's-qualified" builders.

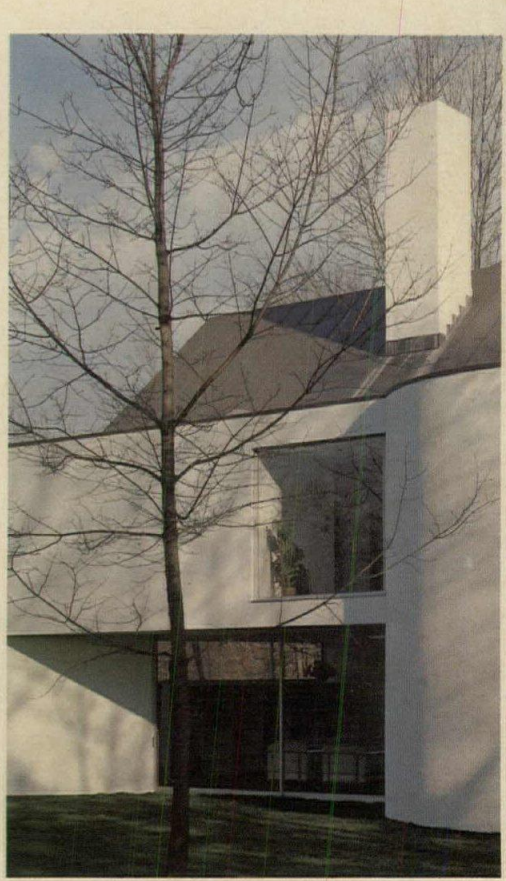
The distribution of RECORD HOUSES annuals to architects, engineers, interior designers and builders is dedicated to mutual understanding among all, in the interest of better housing.

The house building and buying public will find it on sale at leading bookstores.

Note: The houses shown here are from RECORD HOUSES OF 1968.



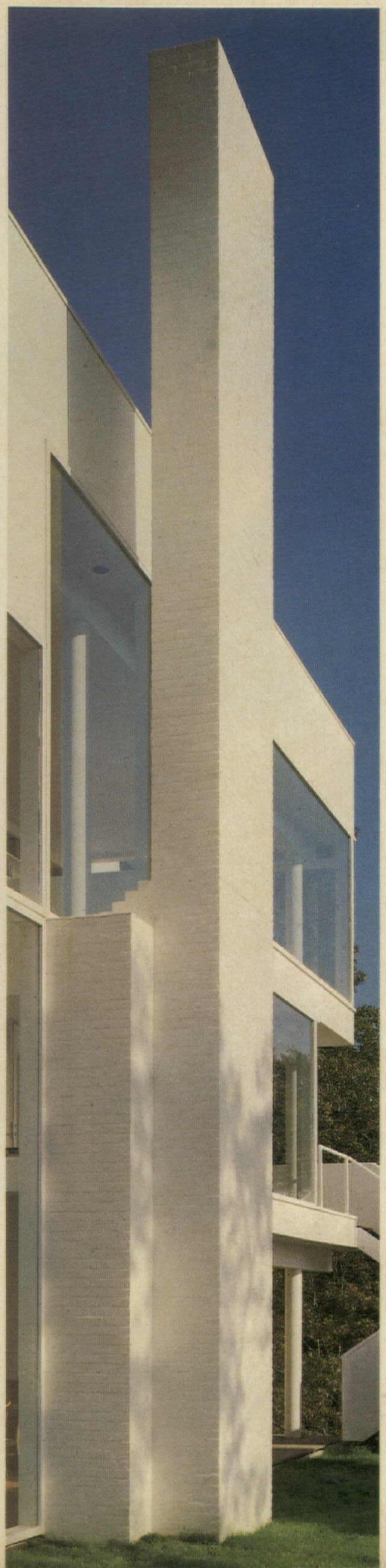
Hillside House, Baltimore, Maryland.
Architect: J. William Ilmanen.
Photo by Norman McGrath.



Suburban House, Purchase, New York.
Architects: Charles Gwathmey and Richard Henderson of Gwathmey & Henderson.
Photo by Bill Maris.

OF 1969

and House, New York State.
ct: Edward L. Barnes.
by Green © (ESTO).



Woodland House, New York State.
Architect: Edward L. Barnes.
Photo by Green © (ESTO).

Smith House, Darien, Conn.
Architect: Richard Meier.
Photo by © Ezra Stoller (ESTO).

ARCHITECTURAL
RECORD
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continued from page 220

HEATING AND COOLING / Complete information on a line of aluminum heating and cooling equipment includes registers, grilles, diffusers and accessory items. ▪ Hart & Cooley Manufacturing Co., Holland, Mich.*

Circle 421 on inquiry card

SAFETY GLAZING / A 14-page brochure contains information on *Plexiglas* acrylic plastic as a breakage-resistant safety glazing material. The brochure discusses all the characteristics of the material, including its light weight, transparency, and reduced glare. ▪ Rohm and Haas Company, Philadelphia.

Circle 422 on inquiry card

PLENUMS / A loose-leaf bulletin describes pre-engineered, prefabricated acoustic/thermal plenums that are said to be effective noise barriers, thermal barriers, and supplemental silencers. ▪ Industrial Acoustics Company, Inc., Bronx, N.Y.*

Circle 423 on inquiry card

STEEL ROOF DECK / An 8-page booklet includes charts on the safe uniform load for short-span narrow-rib deck and long-span wide-rib deck. Booklet also discusses an all-acrylic polymer roof deck, available in colors, that gives added protection and versatility to deck. ▪ EPIC Metals Corporation, Pittsburgh.

Circle 424 on inquiry card

AIR CONDITIONING / A 14th edition lists products licensed to use the AMCA Certified Ratings Seal. Included are 603 products of 65 manufacturers in the U.S. and Canada. ▪ Air Moving and Conditioning Association, Inc., Park Ridge, Ill.

Circle 425 on inquiry card

CARPETING / Two technical bulletins detail the use of *Brunsmet* metal fibers in the construction of shockfree rugs and carpets. Complete specification data included. ▪ Brunswick Corporation, Chicago.*

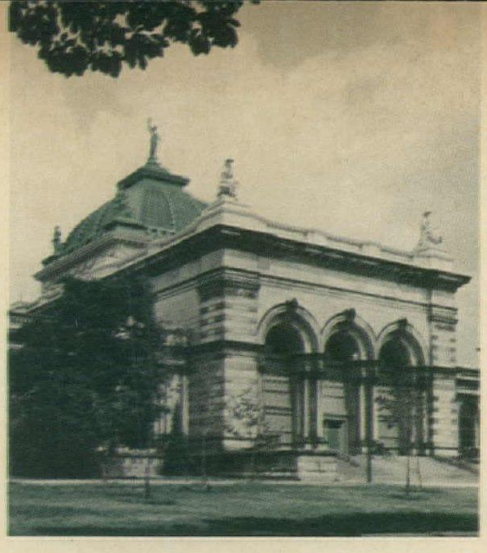
Circle 426 on inquiry card

OFFICE CHAIRS / A color booklet presents one secretarial and three executive contemporary chairs designed by Max Pearson. The trim, compact designs allow adjustment with mechanisms that disappear into the chairs. ▪ Knoll Associates, New York City.*

Circle 427 on inquiry card

**Additional product information in Sweet's Architectural File.*

more literature on page 232



Memorial Hall in Philadelphia, erected for the 1876 Centennial Exposition. The statue of "Columbia" at the dome top, the dome's supporting members and the statuary groups at the corners of the building were all coated with PLY-LASTIC.

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The natural patina of the statues was simulated, too, by specifying PLY-LASTIC in *copper verde.*

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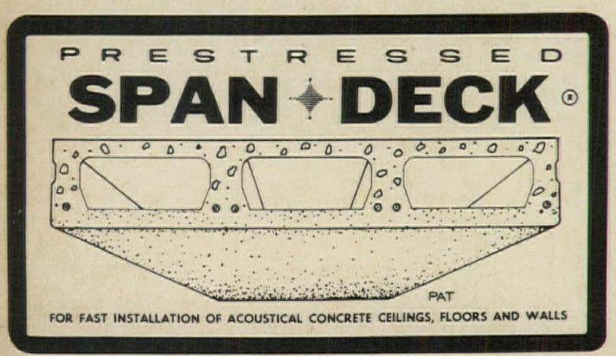

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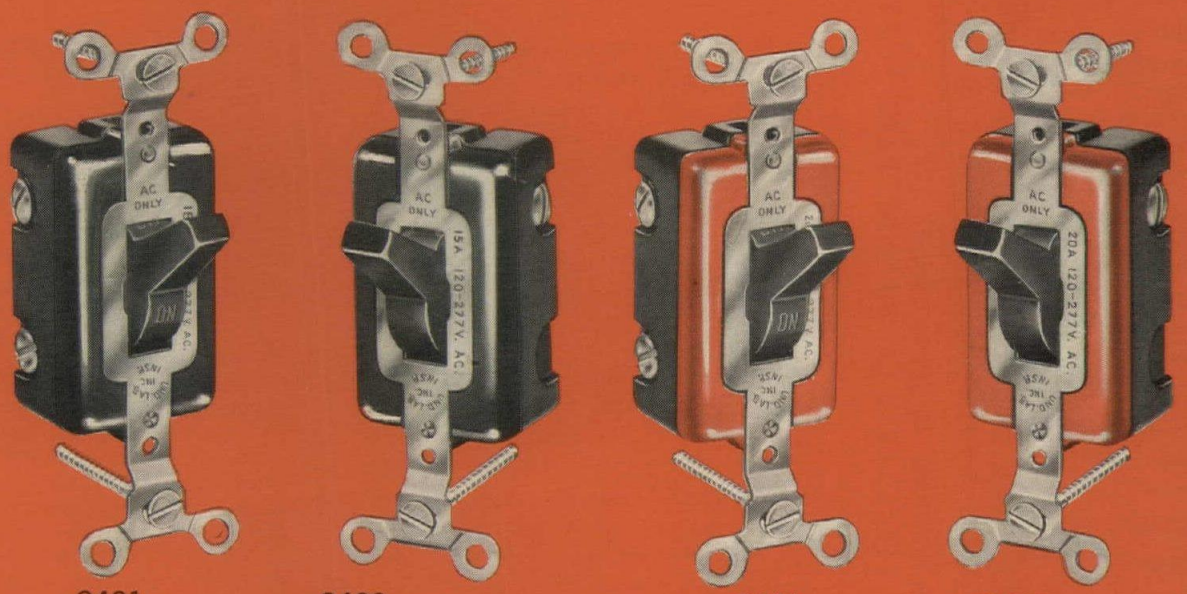

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Circle F No-Klik switches have successfully completed over **7,500,000 cycles** of test under load. Taking 50 cycles per day as a high average, this means that Circle F No-Klik switches can have a life span of more than **410 years.** Insist on No-Klik® switches manufactured with the old-fashioned virtues . . . CRAFTSMANSHIP . . . PERFORMANCE . . . SENSIBLE PRICES . . . and our LIFETIME GUARANTEE. See your local Circle F distributor.

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continued from page 224

STAINLESS STEEL / The 12-page July issue of "Stainless Steel in Architecture" describes some existing curtain wall designs including both high-rise and low structures. There is a 4-page technical section designed for separate filing, and there is information on cost-cutting techniques. ▪ American Iron and Steel Institute, New York City.*

Circle 428 on inquiry card

IN-DUCT HEATER / Units that are fabricated to suit customer's requirements can be used for prime heat in new buildings, for auxiliary heat, and for supplemental heat and zone reheat to achieve proper temperature in an air-conditioning system. An 8-page bulletin gives information. ▪ ILG Industries Inc., Chicago.*

Circle 429 on inquiry card

LIGHTING TROFFERS / A series of "hidden door" lighting troffers that create the illusion of a frameless lens are the subject of a 4-page brochure. Because the troffers are said to prevent a large proportion of lighting heat from entering the occupied space, subsequent savings are reported in duct, fan and chilling coil sizes. ▪ Sechrist Manufacturing Co., Denver.

Circle 430 on inquiry card

COATINGS / An 8-page brochure presents *Maintz* maintenance-free architectural coating "developed specially for weatherproofing commercial and institutional building roofs of unusual configuration." ▪ West Chester Chemical Company, West Chester, Pa.

Circle 431 on inquiry card

WALL AND ROOF SYSTEMS / Two brochures present complete translucent wall systems and complete skylight and skyroof systems. Color photographs show several installations. ▪ Kalwall Corporation, Manchester, N.H.*

Circle 432 on inquiry card

COLLEGE AUTOMATION / A 16-page booklet spells out economic advantages of automation for community and junior colleges. The booklet cites the experiences of three junior colleges in the St. Louis area and describes how centralization brought control of all scattered mechanical equipment to one point. ▪ Honeywell's Commercial Division, Minneapolis.

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**Additional product information in Sweet's Architectural File.*

now available 1969 edition

Standard Specifications and Load Tables for Open Web Steel Joists

It's a complete working handbook from the Steel Joist Institute—32 pages of technical information, with everything you need for fast, accurate specification of joists to carry uniform load on spans up to 96 feet. Covers J-Series, H-Series, LJ-Series and LH-Series joists. Write for your free copy today.

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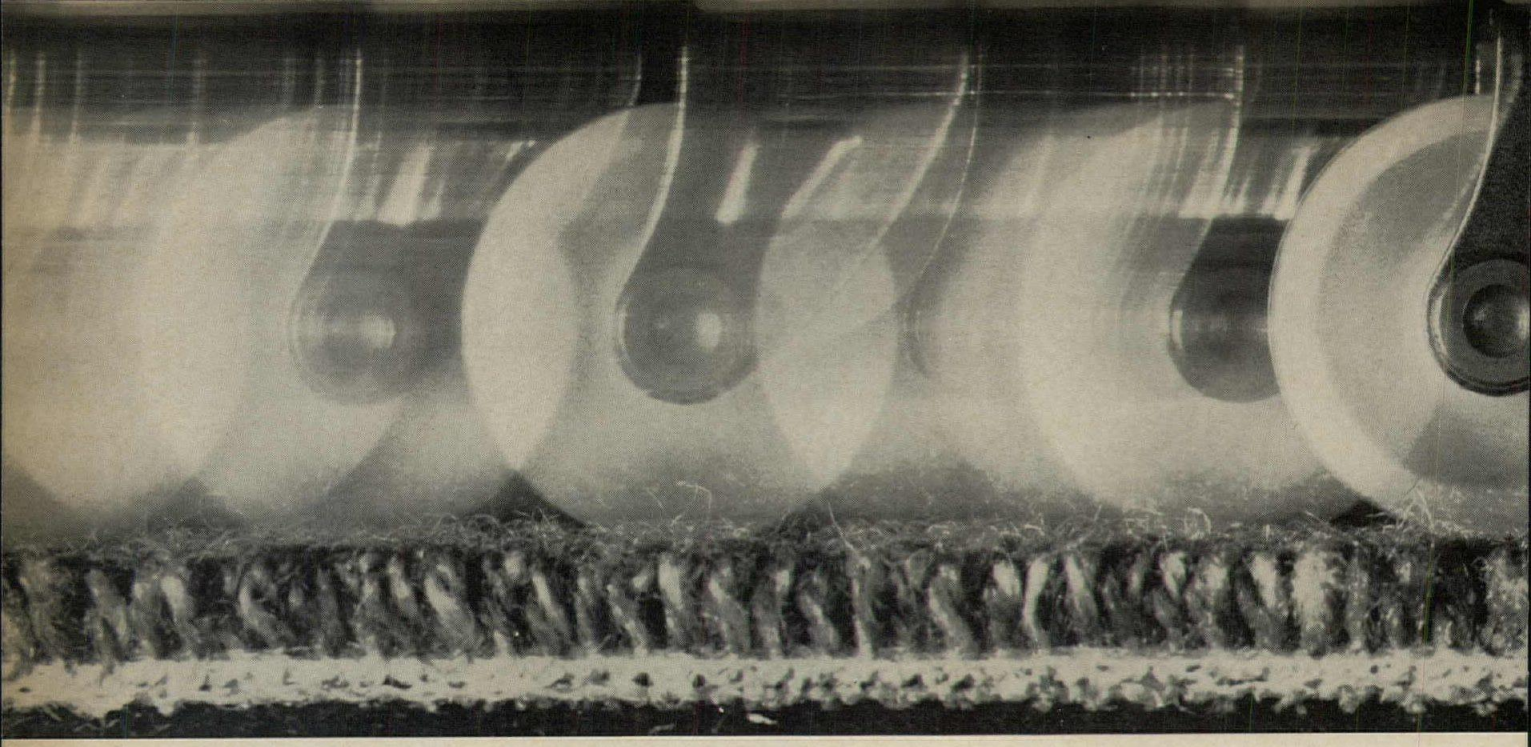

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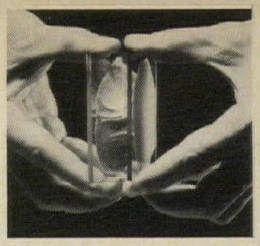

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Mono eats dirt (...if it has to.)

Pioneering is a lonely business. *Only when you go it alone.*

■ When pioneers join forces, have a good idea where they're headed and have the heart to hang in there, pioneering is usually a gratifying group adventure.

So it has been for the ever-widening circle of membership in the Prestressed Concrete Institute in the decade since its inception. While lacking the almost-lost-in-obscurity beginning of ancient building materials, prestressed concrete is no patiently plodding frontiersman. Rather, like the jet, it has spread its swept-back wings and soared. Evidence of that is everywhere for all to see. In terms of what has already been accomplished, prestressed concrete has long since passed the point of no return.

PCI represents all facets of precast and prestressed concrete, whether pre-tensioned, post-tensioned, or architectural precast. Its members include producers, architects, engineers, industry suppliers, educators, students, and technicians.

■ The Institute serves principally in three areas: (1) To gather and disseminate knowledge of whatever nature will advance the industry's cause; (2) Through

continuous research and development, to increase the use of prestressed and precast concrete; (3) To establish and maintain industry-wide design and production standards.

■ The entire construction industry has benefitted significantly from many Institute-sponsored activities. Among them were original PCI specifications, the first published in the U.S. The PCI Building Code was the first national code on prestressed concrete. An Institute committee developed and recently released new guide specifications for the industry. A PCI-AASHO joint committee is continuing to prepare design standards that assure economy in bridge structures.

As a result of PCI fire tests, two, three and four-hour U.L. label service is now available on most prestressed concrete building elements.

■ Each year, an internationally prominent Awards Jury selects and suitably recognizes excellence in design originality. This competition does more than merely herald those so recognized. It spotlights design creativity to benefit the entire construction industry.

Annually, PCI convenes to offer stimulating technical forums on design, research, production, and new developments. Formal presentations, panel discussions, and shirt-sleeve sessions combine to form balanced, rewarding meeting programs. State and regional conferences throughout the year augment this annual event.

■ Numerous publications regularly keep PCI members aware of industry advances as they occur. Among the most recent are a long-span bridge study, one on fire resistance, and a 156-page book containing 341 illustrations, *Schools of Prestressed Concrete,* which covers planning, design, and construction in all areas of educational building.

Several high-priority PCI programs of promise are currently in various stages of development. They include preparation of a prestressed concrete handbook, industry-wide product standardization, intensive fire research, further implementation of quality-control techniques, safety practices, coordination of research by agencies throughout the U.S. and Canada, and cooperation with foreign countries in exchanging design concepts and manufacturing procedures. *(PCI is the sole U.S. representative to the world prestressed concrete organization, Federation Internationale de la Precontrainte.)*

■ It is perhaps no accident that design and management people of pioneering mind should have become attracted to prestressed concrete. Although modern as tomorrow, the credentials of prestressed concrete as a trustworthy construction material are beyond question, providing as it does the strengths of both concrete and steel. No mere building *ingredient,* this. No commodity. But a unique structural and design medium with inimitable, innate characteristics.

The use of prestressed concrete faces ever more far-flung horizons, as broad as the true professional's endless quest for the new, the better, the lower-cost way to improve mankind's lot. And, in the process, his own.

■ In the belief that those of like mind get further, faster, when banded together, we invite you to consider joining PCI. If, of course, you are not already a member. Simply call or write us.

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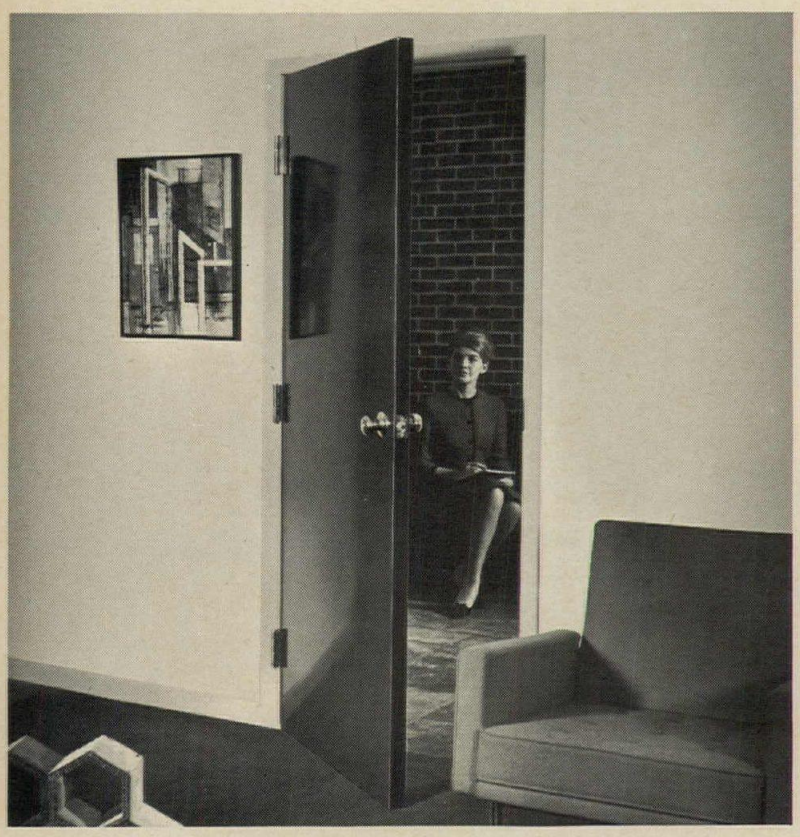
The cleancut door

Discover the elegant yet practical door. Discover Steelcraft.



This steel door has a lot going for it. Like clean, uncluttered design. It's Steelcraft's flush door. Besides beauty, it has these practical aspects:

- A beveled edge, for free and easy operation, plus the perfect door/frame fit.
- Honeycomb core bonded to steel faces provides superlative impact and flexing resistance, an absolutely flat surface free of weld marks and waves.
- High thermal insulation (.38 U factor vs .51 for solid wood), and efficient sound deadening (32.0 DB rating).

Select your Steelcraft flush doors from over 56 different designs; in 6′8″, 7′0″, 7′2″ and 8′0″ heights; and with 20, 18, and 16 gage steel faces. And of course, Steelcraft offers a full line of matching flush labeled doors.

For complete information on The Cleancut Door, write Steelcraft, 9017 Blue Ash Road, Cincinnati, Ohio 45242 U.S.A.

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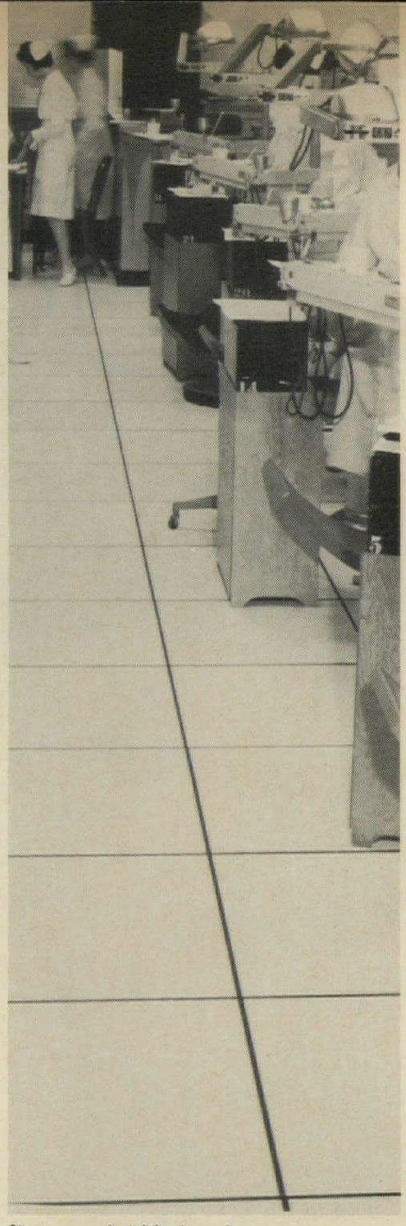
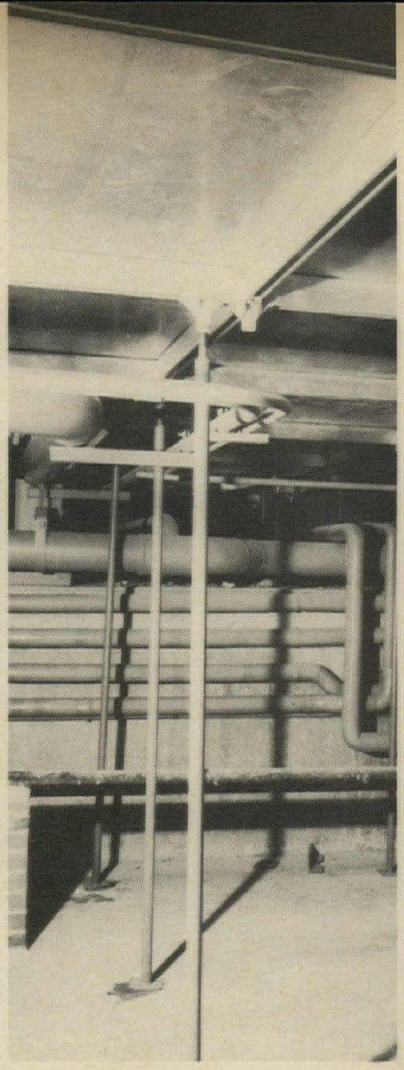
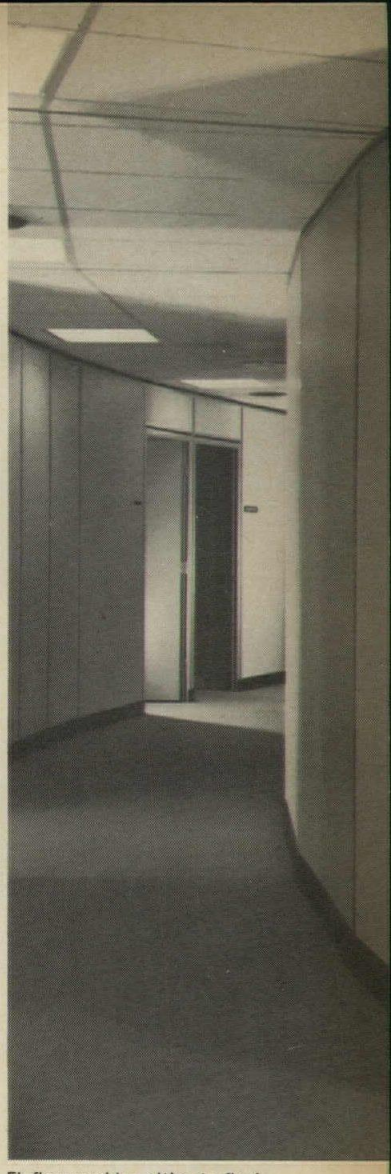
The idea started with computer rooms. Elaflor's vinyl plenum seal combined with Data-Aire modular air conditioning units gave highly effective under-floor cooling circulation while panels lifted out easily for instant access to utilities and cabling.



Now, see what it's done for a laboratory area. Electrical, water, gas, air, and drainage lines are completely concealed, yet completely accessible for repair or alterations. Lines can be brought up anywhere, even the middle of the room for full design freedom.



Lowered ceilings are a commonplace technique in renovation work. But here, they raised the floor. This avoids ripping out, provides an ultra-convenient place to run utilities. A simple way to even up different levels varying from inches to feet.



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continued from page 106

Carl C. McElvy, A.I.A. has joined the Los Angeles office of **John B. Parkin Associates** as consultant.

Ian MacKinlay, A.I.A. & Associates has announced the appointment of **George S. Winnacker, A.I.A.,** as principal of the firm and the change of its firm name to **MacKinlay/Winnacker, A.I.A., & Associates. Murray McNeil, A.I.A., Don R. Yancey, A.I.A.** and **Thomas H. Cline, P.E.,** have been added as associates. The Orinda, California firm has opened a Guam office headed by Mr. Winnacker.

The New York and New Canaan, Connecticut firm, **McMillan Griffis Mileto,** is now known as **Robert S. McMillan Associates, Architects and Planners.**

Michael Rounds Metcalf, Architect, has opened a new firm for the practice of architecture located at 2828 Stanley Street, Stevens Point, Wisconsin.

J. Arthur Miller has been appointed director of design for **Harley, Ellington, Cowin and Stirton, Inc.,** Detroit-based architectural and engineering firm.

Ted A. Niederman has been appointed as an associate to the Baltimore architectural and planning firm of **Rogers, Taliaferro, Kostritsky, Lamb.**

Charles W. Sherman, A.I.A. and **George K. Harris, A.I.A.** have been elected executive vice president and vice president, respectively, of **O'Dell, Hewlett and Luckenbach, Inc.,** Birmingham, Michigan architectural and engineering firm.

Adrian Wilson Associates, Los Angeles-based architects and engineers, announce the appointment of **John H. O'Hair,** vice-president, to head their Washington, D.C. office.

Michael R. Tye, A.I.A. and **William A. Sanders, P.E.** have been elected staff associate members of **J. N. Pease Associates, Architects/Engineers/Planners** of Charlotte, North Carolina.

Five senior associates have been elected by **The Perkins & Will Partnership,** Chicago-based architects: **John P. Gallagher, Richard A. Jones, Saul H. Klibanow, Russell G. Moy and Donald J. Richards.** Elected as associates were: **John J. Clemency, Roy F. Deng, B. Jack Golden, Paul H. Handing, John K. Holton, Robert R. Kumlin, Dennis Kunicki, Raymond L. Moldenhauer and Sheldon Schlegman.**

Don Reay, A.I.A. is now director of the San Francisco firm, **City & Regional Planning Associates Inc.**

Stephen Richardson, F.A.I.A. and **William H. Carleton, A.I.A.** announce that they have joined in full partnership with former associates of the firm, **Allen D. Moses, A.I.A., John L. Rogers, A.I.A., Phillip L. Jacobsen, A.I.A.** and **James E. Hussey, A.I.A.** to continue the Seattle practice of **Young, Richardson & Carleton** under the new firm name of **The Richardson Associates.**

Marvin J. Richman, A.I.A. has joined the firm of **Jonas Vizbaras/Architect** as senior associate.

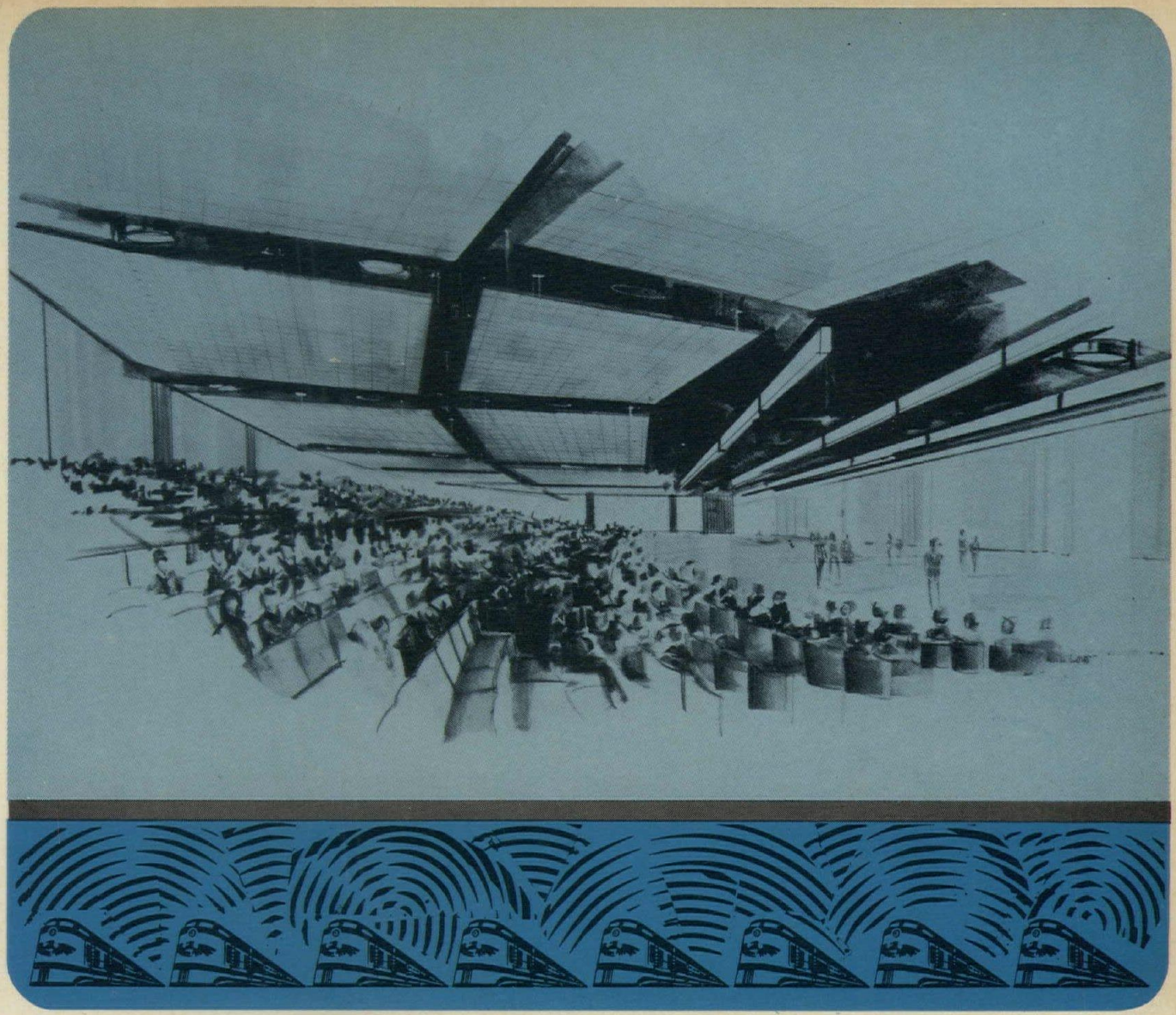
Two Cleveland firms, **Dalton, Grimm Johnson and Associates** and **Schafer, Flynn and van Dijk, Architects,** have merged to form the new partnership of **Schafer, Flynn, van Dijk and Dalton, Grimm, Johnson, Architects.**

Sherwood, Mills and Smith, Stamford, Connecticut-based architectural firm, has changed its name to **The SMS Partnership/Architects** and has opened a New York City office located at 101 Park Avenue. **Willis N. Mills Jr., A.I.A., Robert T. Packard, A.I.A.** and **Howard A. Patterson Jr., A.I.A.** have been named associate partners of the firm.

W. Allan Tuomaala and **Arnold Serlin** are now associates of **Siegal Avrin Associates, Inc., Architects,** of Detroit.

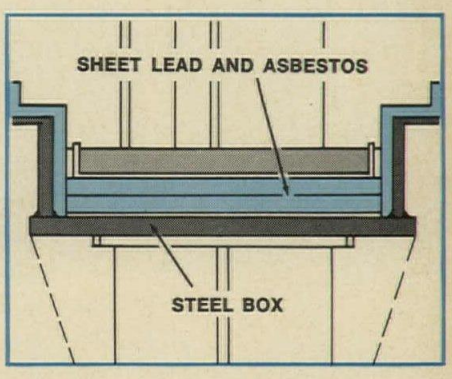
Donald R. Sledd has been named associate of **Marshall & Brown, Inc., Architects & Engineers** of Kansas City, Mo.

continued on page 256



Lead-asbestos cushions let the Forum sit on Penn Station without feeling it

The rumble of trains rolling in and out of Penn Station directly below will never reach the audience in the Forum—an auditorium in New York's new Madison Square Garden Sports & Entertainment Center. They'll sit in vibrationless quiet because the entire amphitheatre is isolated from the rest of the building by lead-asbestos pads. □ These pads—alternating layers of sheet lead and asbestos—are confined in steel boxes affixed to the main flooring over the station and to the supporting perimeter columns of the main building. The beams and supporting columns of the Forum fit into these boxes and rest against the insulating pads, effectively separating the Forum from the vibration-carrying elements of the main building construction. □ Lead's limpness, density, mass, corrosion-resistance and versatility of form offer permanent answers to vibration and sound attenuation problems in buildings, aircraft, boats and machinery.



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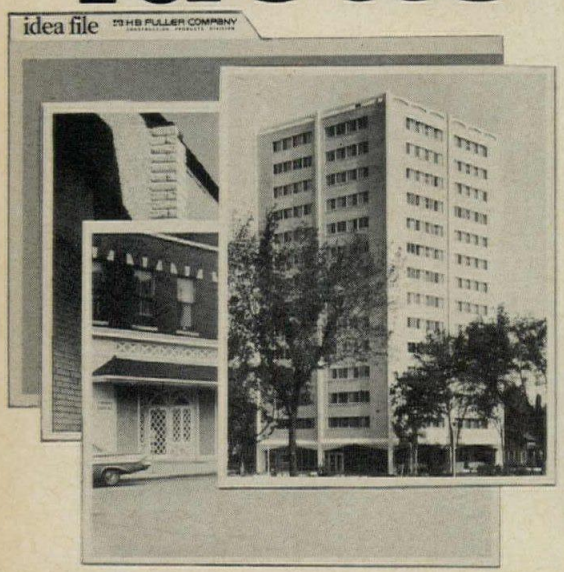

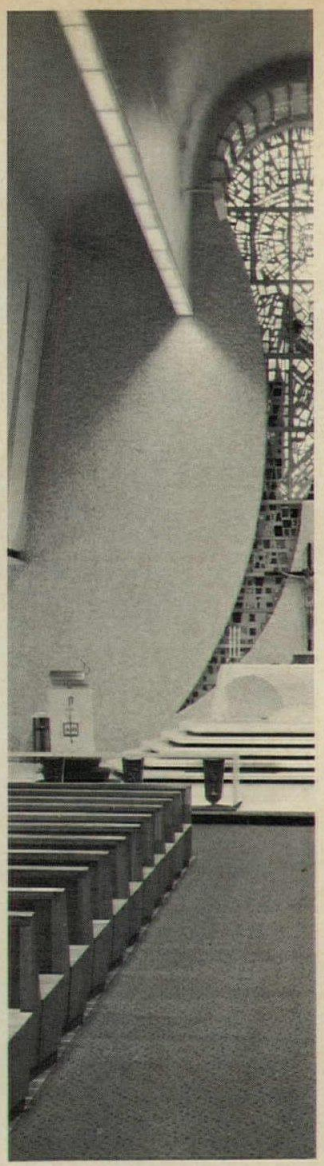

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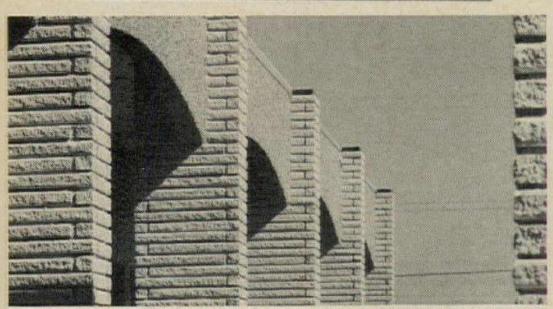

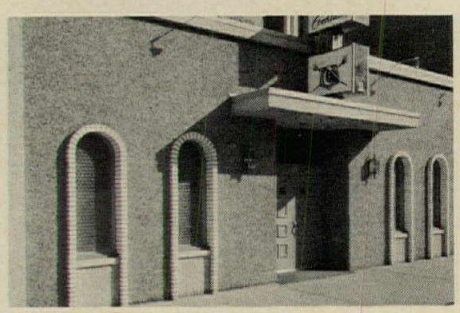

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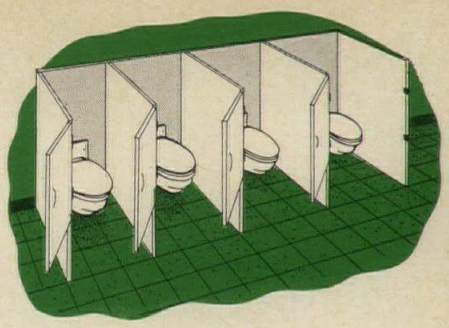
if you "value-evaluate" the restrooms you will install off-the-floor fixtures



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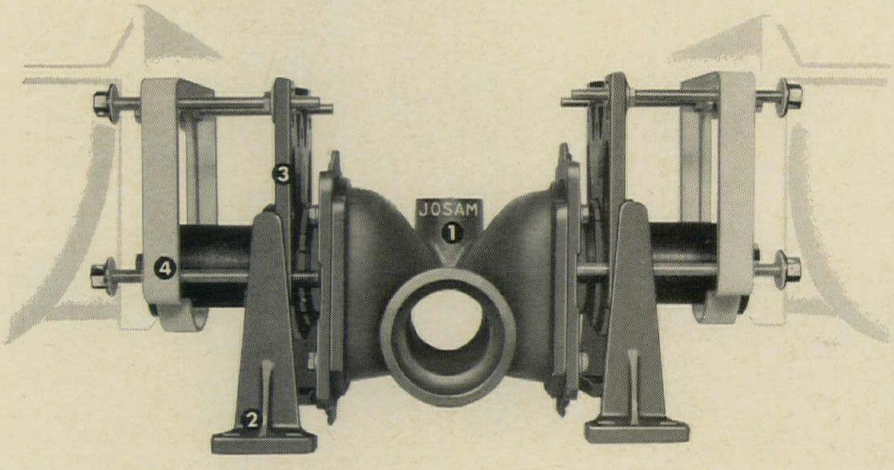

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saves chase space . . . reduces the number of connections

2 **buttress foot**
Provides maximum strength . . . saves installation time

3 **invertible carrier body**
Fits all types of toilets . . . saves handling time

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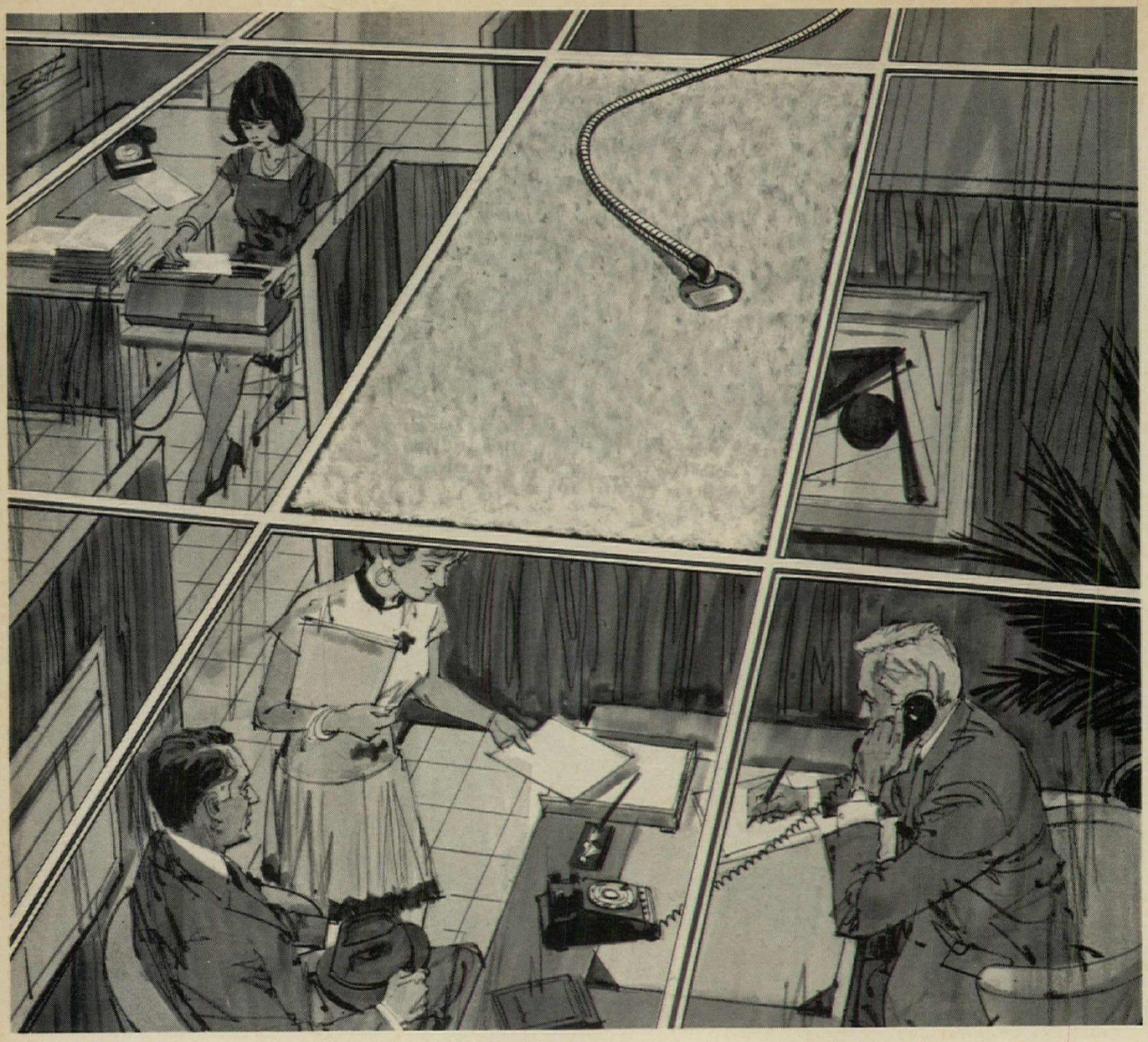
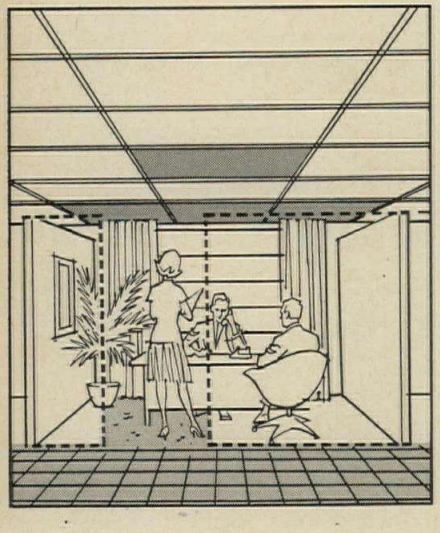


Office needs can change overnight, so drop in a heating system that can change, too.



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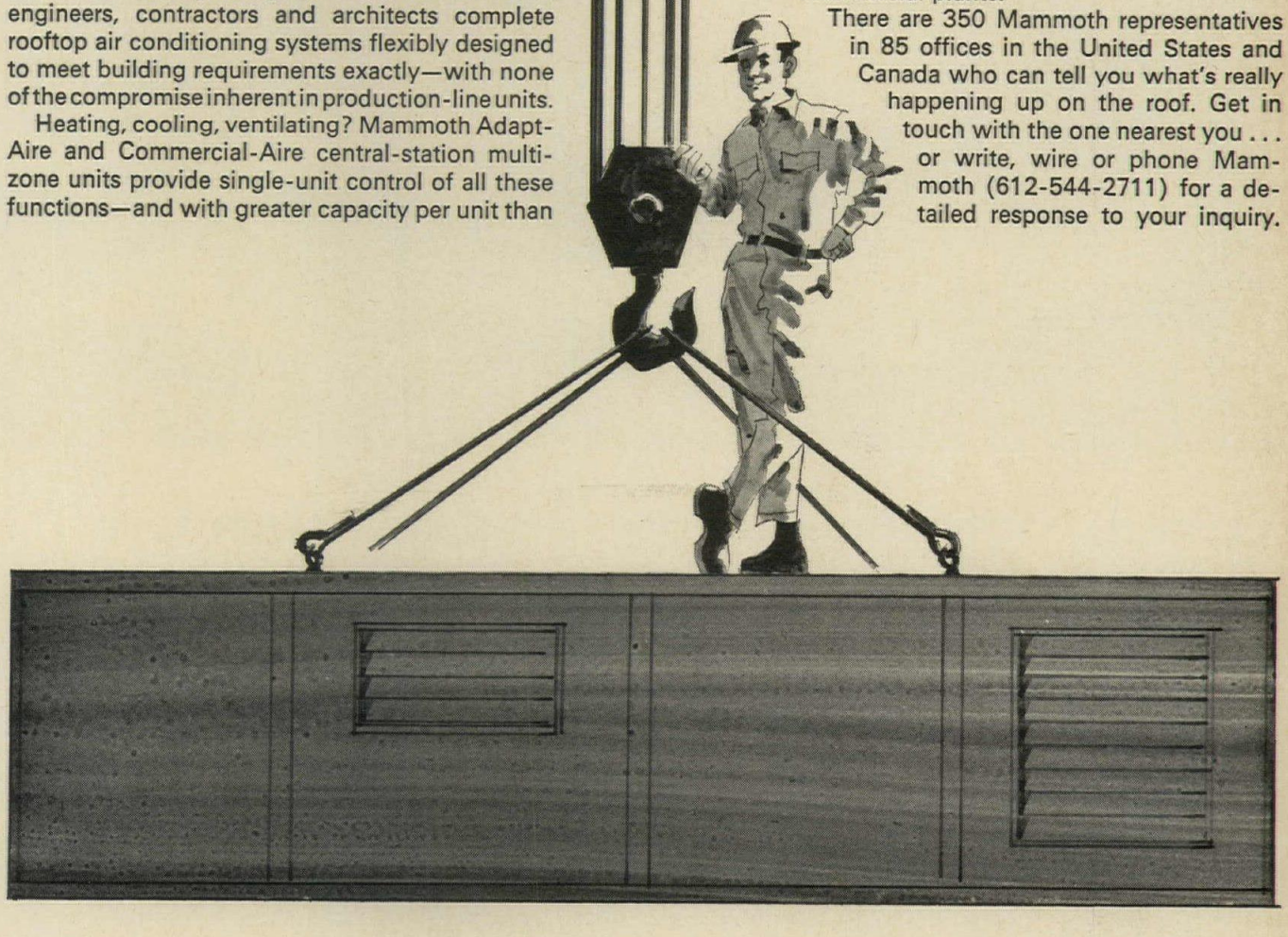

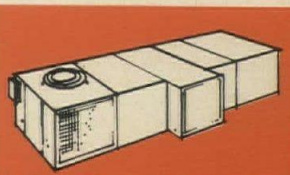

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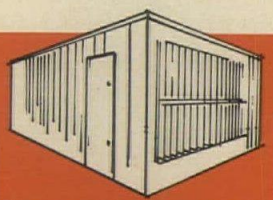

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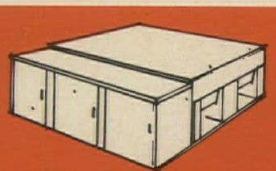

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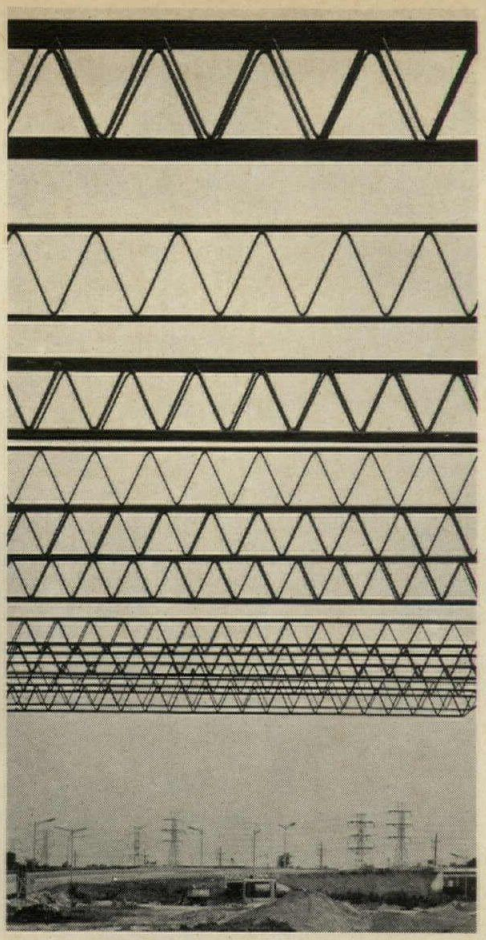

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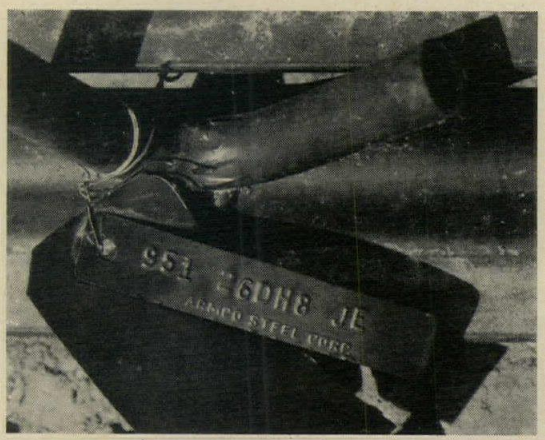

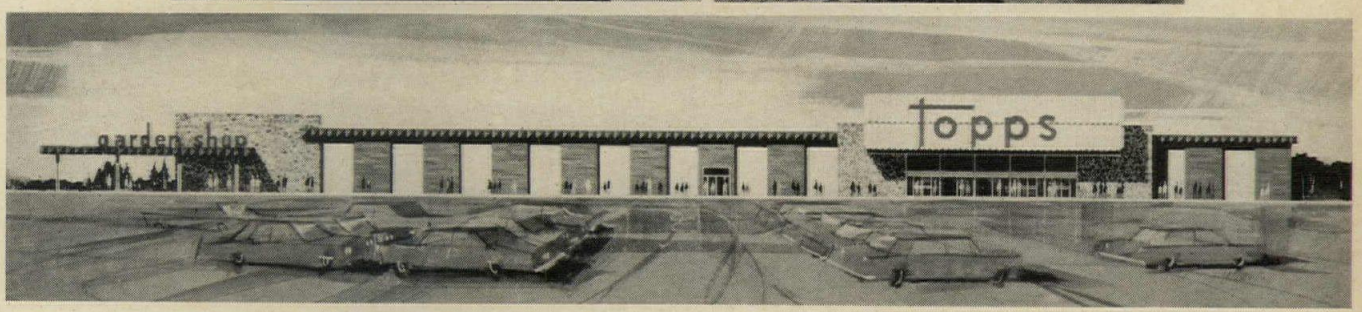

This Illinois store is building with Armco's new Deep Shortspan Joists

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Contractor: Welso Construction Co., Chicago
Joist Supplier: Inland-Ryerson Construction Products Co., Chicago

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continued from page 240

Douglas Cole Smith, A.I.A. is now a vice president and partner of the Cambridge, Massachusetts firm of **Ashley, Myer & Associates, Architects.**

Edwin T. Steffian and Associates, Inc., Architects, Planners, Boston, have announced the change of their firm name to **Steffian, Steffian and Bradley, Inc.**

Cyril B. Beveridge and **Wilbur L. Woods** have become associates in the firm of **Richard G. Stein and Associates,** New York City architects.

Donald R. Sunshine, R. Thomas Jaeger and **Philip A. Kupritz** have formed a partnership for the practice of architecture to be known as **Sunshine, Jaeger, Kupritz and Associates/Architects.** The new firm is located in Park Ridge, Ill.

John A. Thacker, Architect recently opened an office for the general practice of architecture and planning. The new firm is located at 2977 Peak Avenue, Boulder, Colorado.

Tuchman—Canute Architects of Akron, Ohio recently announced the election of **Roger N. Ryan** and **Robert J. Wyatt** as partners.

Petroff and Jones Associates, Architects of New York City have named **LeRoy E. Tuckett, A.I.A.** an associate partner.

James H. McManama, A.I.A. has become a partner of **Wells & Meagher, Architects,** and the Roanoke, Virginia's firm name has been changed to **Wells, Meagher & McManama.**

Prescott W. Coleman, A.I.A. and **Brainard Joy Gannett, A.I.A.** have recently been named associates in the firm, **Wolff-Zimmer-Gunsul-Frasca-Ritter.** The architecture and planning firm is located in Portland, Oregon.

NEW ADDRESSES

R. L. Anderson, Architect, 9 Court Street, Westminster, Maryland.

Kenneth W. Brooks, F.A.I.A., Architect, 121 South Wall St., Spokane, Wash.

Office of Richard R. Bergmann, Architects, 112 Main, New Canaan, Conn.

Brown Guenther Battaglia Galvin Architects, 250 W. 57th St., New York.

Charles J. W. Chamberland, A.I.A., 850 Dreier Street, Honolulu.

Conklin & Rossant, Architects, 251 Park Avenue South, New York City.

Anthony D'Elia, Jr., Architect, 116 Taft Avenue, Edison, New Jersey.

Alvin Fingado and Associates Architects, 538 Grand Avenue, Oakland, Calif.

Linn A. Forrest, Architects, A.I.A., 1000-A Harbor Way, Juneau, Alaska.

Percival Goodman, F.A.I.A., Architect, 2114 Broadway, New York City.

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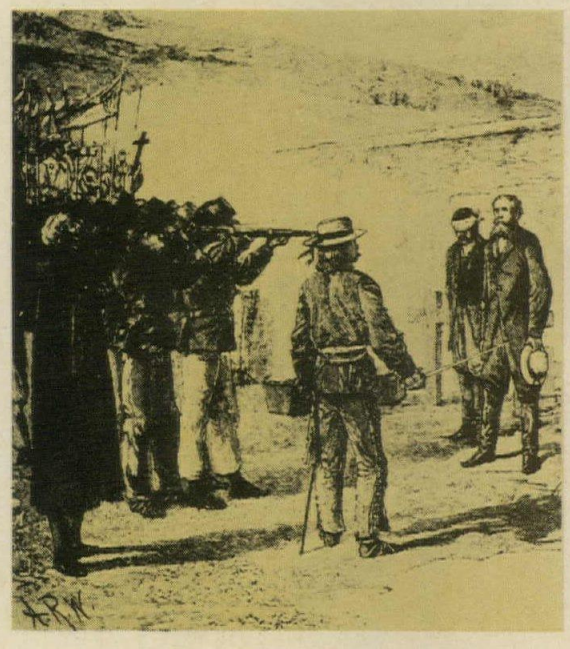

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1. Date of Filing.—Oct. 1, 1968.

2. Title of Publication.—ARCHITECTURAL RECORD (combined with American Architect, Architecture and Western Architect and Engineer).

3. Frequency of Issue.—Monthly, except May, when semi-monthly.

4. Location of Known Office of Publication.—330 West 42nd Street, City, County and State of New York—10036.

5. Location of Headquarters or General Business Offices of the Publishers.—330 West 42nd Street, City, County and State of New York—10036.

6. Names and Addresses of Publisher, Editor and Managing Editor.—Publisher: Blake Hughes, 330 West 42nd Street, New York, N.Y.—10036; Editor: Walter F. Wagner, Jr., 330 West 42nd Street, New York, N.Y.—10036; Managing Editor: Jeanne M. Davern, 330 West 42nd Street, New York, N.Y.—10036.

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8. Known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities.—None.

9. Not Applicable.

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B. Paid circulation. 1. Sales through dealers and carriers, street vendors and counter sales—average no. of copies each issue during preceding 12 months—none; actual number of copies of single issue published nearest to filing date—none. 2. Mail subscriptions—average no. copies each issue during preceding 12 months, 48,863; actual number of copies of single issue published nearest to filing date, 51,200.

C. Total paid circulation—average no. copies each issue during preceding 12 months, 48,863; actual number of copies of single issue published nearest to filing date, 51,200.

D. Free distribution by mail, carrier or other means—average no. copies each issue during preceding 12 months, 4,573; actual number of copies of single issue published nearest to filing date, 4,099.

E. Total distribution—average no. copies each issue during preceding 12 months, 53,436; actual number of copies of single issue published nearest to filing date, 55,299.

F. Office use, left-over, unaccounted, spoiled after printing—average no. copies each issue during preceding 12 months, 3,947; actual number of copies of single issue published nearest to filing date, 1,767.

G. Total—average no. copies each issue during preceding 12 months, 57,383; actual number of copies of single issue published nearest to filing date 57,066.

I certify that the statements made by me above are correct and complete.

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By John J. Cooke,
Vice President & Secretary

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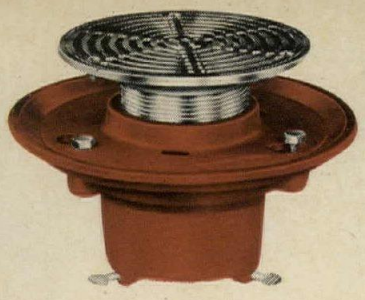

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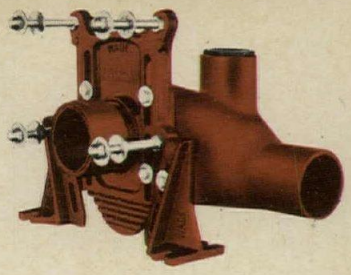

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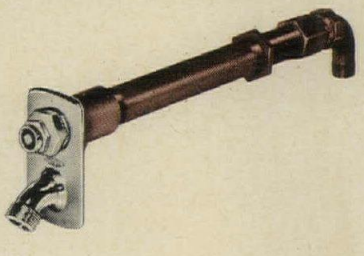

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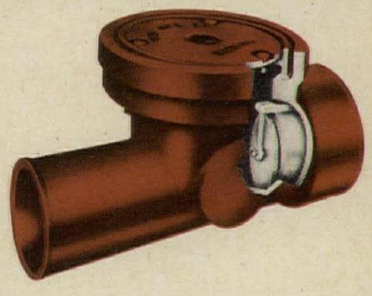

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